PROPELLER - GENERAL

1. General Description

A. The propeller is a constant speed type that operates by engine driven hydraulic pressure opposing the natural centrifugal twisting moment of rotating blades and spring force to obtain the correct pitch for the engine load. Engine oil is supplied to a power piston in the propeller hub by means of the propeller shaft. An engine driven McCauley governor controls the amount of oil pressure applied. Increasing oil pressure decreases RPM and increases pitch. Decreasing oil pressure increases RPM and decreases pitch.

B. This section discusses the description, removal, and installation of the propeller. The scope of this chapter is to help guide the service and repair technician through the description, removal, inspection, servicing, and installation of the Hartzell 3-bladed propeller and hub, model PHC-J3YF-IRF and blades model, F7691D-1.

2. Propeller Overhaul

A. Refer to Hartzell Overhaul Manual No. 113B and Standard Practices Manual No. 202A for complete overhaul and maintenance instructions.

NOTE: Only approved propeller shops are authorized for propeller overhaul and major repairs.

3. Tools & Equipment

A. The mechanic should be equipped with a complete set of the necessary tools that include the following:

(1) Wrenches - 1/4 inch through 1-1/4 inches
(2) Common and Phillips Head Screwdrivers
(3) Pliers - Common, Diagonal Cutters, Needle Nose, Duck Bill, Snap Ring, Safety Wire
(4) Ratchets 1/4 inch, 3/8 inch, 1/2 inch drive
(5) Sockets - 1/4 inch drive 5/32 inch through 1/2 inch, 3/8 inch drive 3/8 inch through 1 inch, 1/2 inch drive 7/16 inch through 1-1/4 inches
(6) Sockets (Deepwell) - 1/2 inch drive, 7/16 inch through 1 inch
(7) Feeler Gauges
(8) Leather or Soft Plastic Mallet
(9) Torque Wrenches (refer to note) 0-500 in.-lbs. and 0-100 ft.-lbs.
(10) Micrometers (refer to note)
(11) Slide Hammer
(12) Pullers
(13) Thickness Gauges
(14) Vernier Calipers (refer to note)
(15) Small Hole Gauges

NOTE: Must be currently calibrated, and the calibration must be traceable to the National Bureau of Standards.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SPINNER AND PROPELLER - MAINTENANCE PRACTICES

1. Spinner and Propeller Removal and Installation

A. **Removal of Spinner and Propeller** - (Refer to Figure 201.)

(1) Remove the upper and lower engine cowling per instructions in Chapter 71-10-00.

(2) Remove 15 spinner to propeller hub attachment screws and fiber washers, and remove the spinner from the propeller hub.

(3) Using a black felt tip marker, mark the position of the propeller hub to the engine crankshaft.

(4) Remove six propeller hub flange to engine crankshaft flange retaining nuts and washers, and remove the propeller and hub assembly from the aircraft.

(5) Remove six spinner bulkhead to propeller hub nuts and washers, and remove the spinner bulkhead from the propeller hub.

NOTE: Use clean rags to cover the cavity in the crankshaft and hub.

B. **Installation of Spinner and Propeller**

(1) Install the spinner bulkhead onto the propeller hub. Install six spinner bulkhead to propeller hub retaining nuts. Torque nuts 240 to 264 in.-lbs.

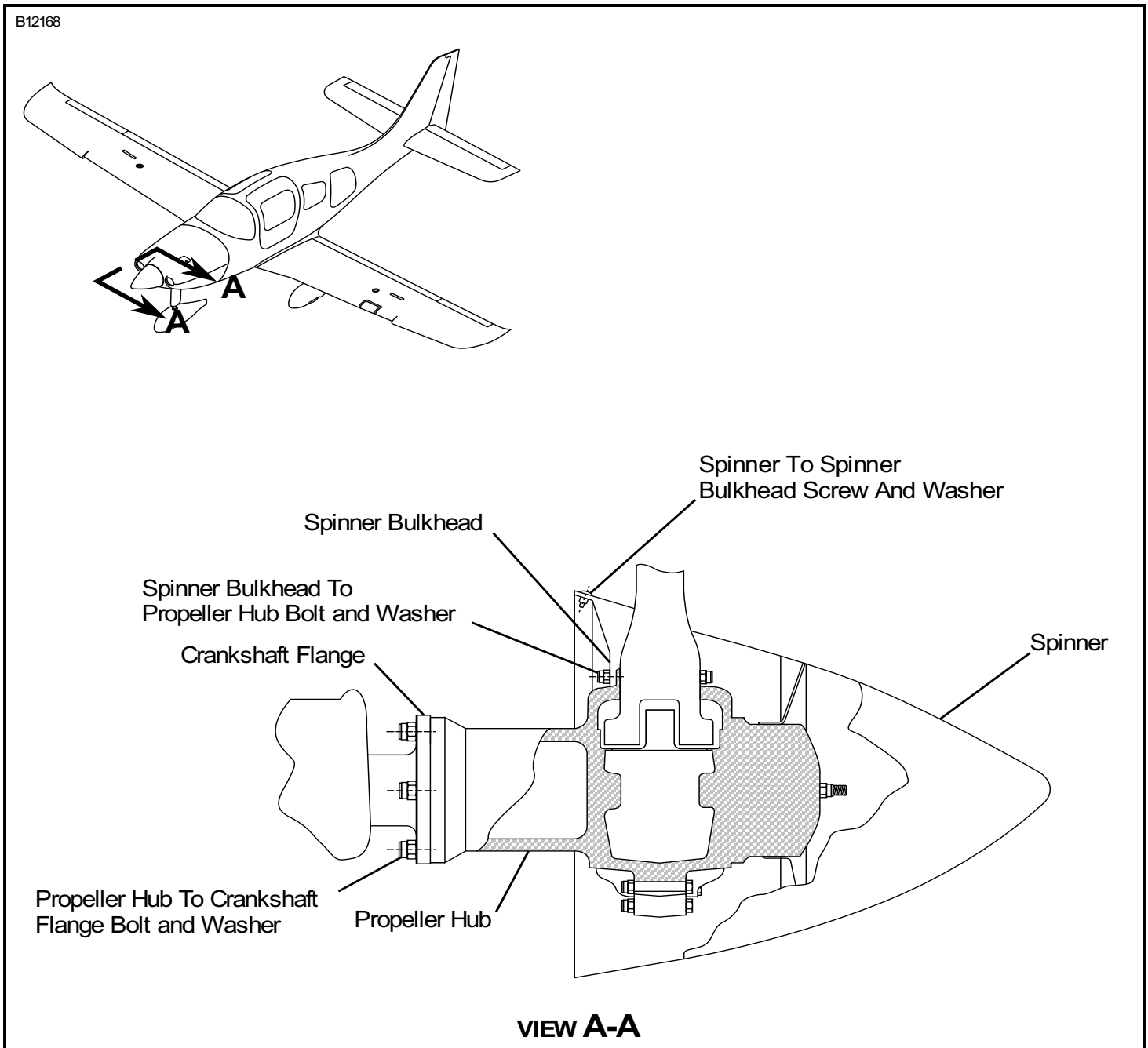
(2) Install a new O-ring seal into the propeller hub groove. Fit the propeller hub assembly onto the engine crankshaft dowl pins with index marks aligned. Install six new propeller hub to engine crankshaft flange retaining nuts and washers. Torque nuts 60 to 70 ft.-lbs. Apply torque seal to all six retaining nuts and hub studs.

(3) Install the spinner over the propeller bulkhead so that spinner mounting holes align with the nut-plate holes in the spinner bulkhead. Install 15 spinner to spinner bulkhead attachment screws and fiber washers. Torque screws 30 to 36 in.-lbs.

(4) Install the upper and lower engine cowling per Chapter 71-10-00.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Propeller Hub



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

PROPELLER GOVERNOR - MAINTENANCE PRACTICES

1. Propeller Governor Removal and Installation

A. Removal of Propeller Governor

(1) Remove the lower engine cowling per instructions in Chapter 71-10-00.

(2) Disconnect the governor control cable from the governor. Refer to Figure 202.

(3) Remove four governor to engine attachment nuts and washers. Refer to Figure 201.

(4) Remove the baffling attachment bracket from the mounting stud, and remove the governor. Refer to Figure 203.

(5) Remove the governor from the engine. Refer to Figure 201.

B. Installation of Propeller Governor

(1) Install a new governor gasket over the mounting pad studs on the engine. Refer to Figure 201.

(2) Install the governor onto the mounting pad studs. Refer to Figure 201.

(3) Install the baffling attachment flange over the mounting stud, and attach to the baffling in reverse order as disassembled. Torque the baffling flange retaining bolt and washer 30 to 36 in.-lbs. Refer to Figure 203.

(4) Install four governor to engine attachment nuts and washers. Torque nuts 180 to 220 in.-lbs. lubricated with TCM Part #646943 Anti Seize Lubricant or Loctite Anti-Seize Lubricant 767. Refer to Figure 201.

(5) Using a new cotter pin, connect the governor control cable to the governor control arm in reverse order as disassembled. Refer to Figure 202.

(6) Install the lower engine cowling per instructions in Chapter 71-10-00.

2. Governor Adjustment

A. The following governor adjustment procedures are required to allow for proper maximum engine RPM adjustment. Before any adjustment is made to the McCauley governor, the engine oil supply must be at normal operating temperature. For safety reasons it is necessary that two technicians perform the governor adjustment procedure described below.

B. Propeller Governor Adjustment

(1) Remove engine cowling as described in Chapter 71-10-00.

(2) Using wheel blocks, block the airplane's main gear.

(3) With the emergency brake engaged and feet on the rudder pedals, start the engine and allow the engine oil to warm up to a normal operating temperature of 100°F minimum.

(4) With the engine at normal operating temperature and the brakes fully engaged, push the propeller control knob into the full high RPM position.

(5) Slowly push in the throttle control until maximum engine RPM is achieved. If maximum RPM is not 2700 RPM (+0, -25 RPM), shut down the engine. The RPM gauge located on the airplane instrumentation panel may be used to determine engine RPM.

(6) Carefully adjust the limit screw on the McCauley governor. Extrapolate for 2,700 RPM assuming 1/4 turn equals 25 RPM.

(7) Start the engine and perform the following steps until a maximum engine RPM of 2,700 is achieved or adjustments do not affect RPM.

(a) With the engine at normal operating temperature and the brakes fully engaged, push the propeller control knob into the full high RPM position.

(b) Slowly push in the throttle control until maximum engine RPM is achieved. If maximum RPM is not 2700 RPM (+0, -25 RPM), shut down the engine. The RPM gauge located on the airplane instrumentation panel may be used to determine engine RPM.

(c) Carefully adjust the limit screw on the McCauley governor. Extrapolate for 2,700 RPM assuming 1/4 turn equals 25 RPM.

(8) Shut down the engine. Install the engine cowling as described in Chapter 71-10-00.

(9) Fly the aircraft.

(10) Perform the steps above from the beginning through starting the engine, if required, to achieve 2,700 RPM maximum.

(11) When the propeller is correctly adjusted there must be 1/8 inch to 1/4 inch nominal distance between the knob and the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

panel as shown in Section 76-20-00, Figure 206.

(12) Shut down the engine.

(13) Safety wire the governor limit screw per MS33540.

(14) Install the engine cowling as described in Chapter 71-10-00.

C. **Propeller RPM at Static Conditions** - Note that a properly set governor may not achieve 2,700 RPM static, even at full power. The propeller low pitch stop will prevent the required low pitch for full RPM. Proper static RPM is 2,650 to 2,700.

3. Troubleshooting

A. **Symptom** - Propeller surging or wandering is observed.

(1) **Probable Cause No. 1** - There is excessive transfer bearing leakage. Engines with excessive transfer bearing leakage can experience surging because the governor may not be able to get enough pressure to the propeller. This will cause a delay in propeller responsiveness, and by the time the propeller responds to earlier governor inputs, they have changed, resulting in propeller wandering.

(a) **Solution for No. 1** - Perform a transfer bearing leakage test per engine manufacturer's instructions. If the test indicates a high rate of leakage (even though it may still be on the high side of "acceptable" tolerance), this may be your cause. Install the suspect governor on a known "good" aircraft. If the problem disappears, engine work may be indicated.

(2) **Probable Cause No 2.** - The engine oil is dirty. Contaminants in dirty engine oil can cause blockages of close tolerance passages in the governor, leading to erratic operation.

(a) **Solution No. 2** - Frequent engine oil changes, as often as every 30 hours, should eliminate the problem.

(3) **Probable Cause No. 3** - There is excessive play in the aircraft propeller control linkage. Excessive "play" in the linkage between the governor and the cockpit control often leads to erratic operation. Specifically, if the propeller RPM is suddenly changing and holding a new setting on its own, this could indicate a loose linkage.

(a) **Solution No. 3** - Trace the linkage, locate unsecured sections, and tighten as needed. Please note that although linkages may appear to allow full governor control while the engine is off, it may not in the air. Engine vibration and "stretch" of the mount during operation can often aggravate the condition; therefore, it is important the entire length of the linkage be properly secured, even if the ends alone are tight.

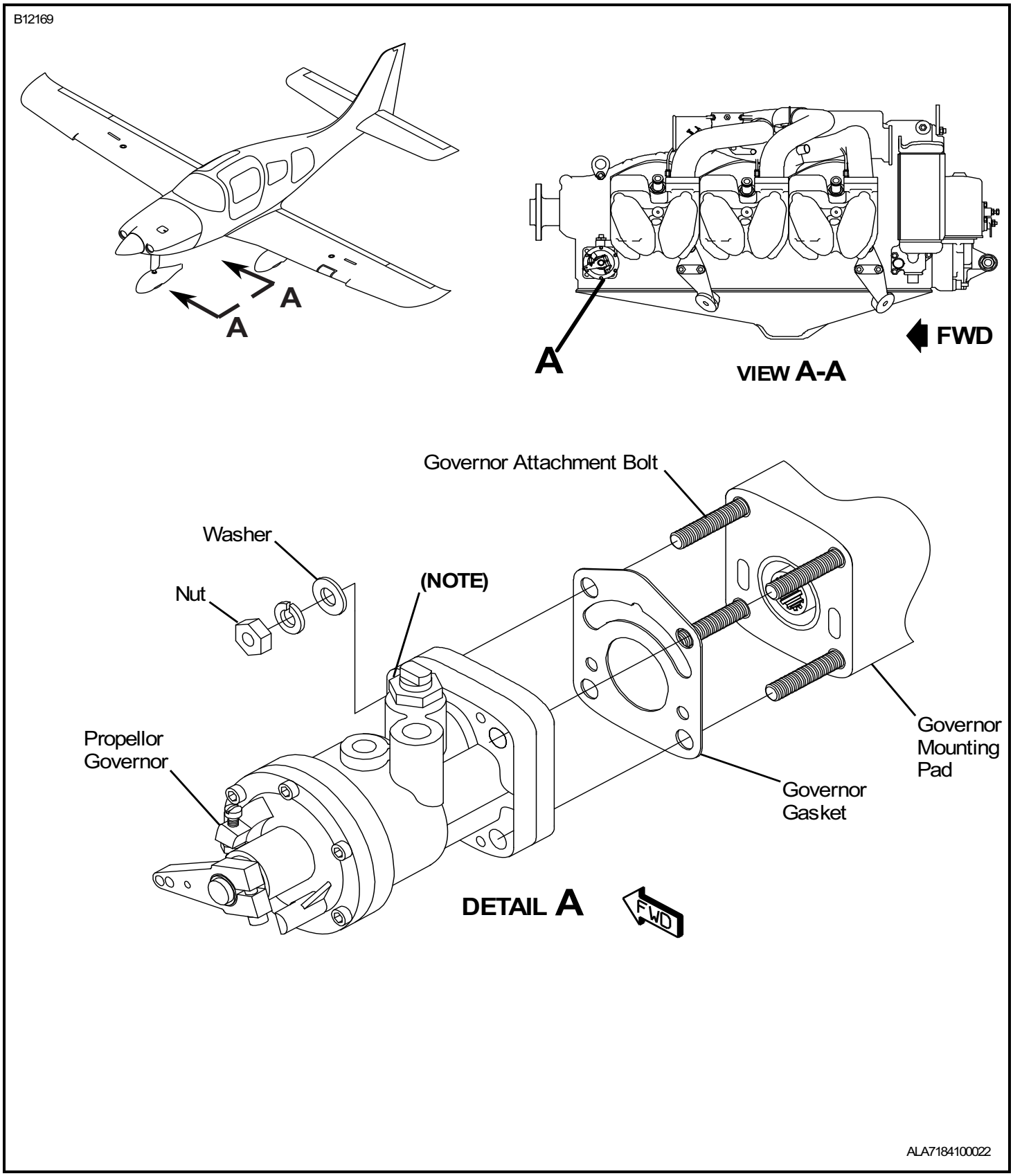
(4) **Probable Cause No. 4** - There is excessive propeller friction. The propeller may be over-resistant to pitch movement. Either excessively tight shimming of the propeller blades, internal corrosion, or part failure causing binding can cause friction.

NOTE: This is rarely the cause of RPM malfunction

(a) **Solution No. 4** - Check amount of blade play. A total lack of blade "shake" may indicate excessively tight blade shims. If this is suspected, have the propeller checked by a qualified FAA approved propeller repairman. Note that this check and any needed correction can usually be performed with the propeller installed on the aircraft.

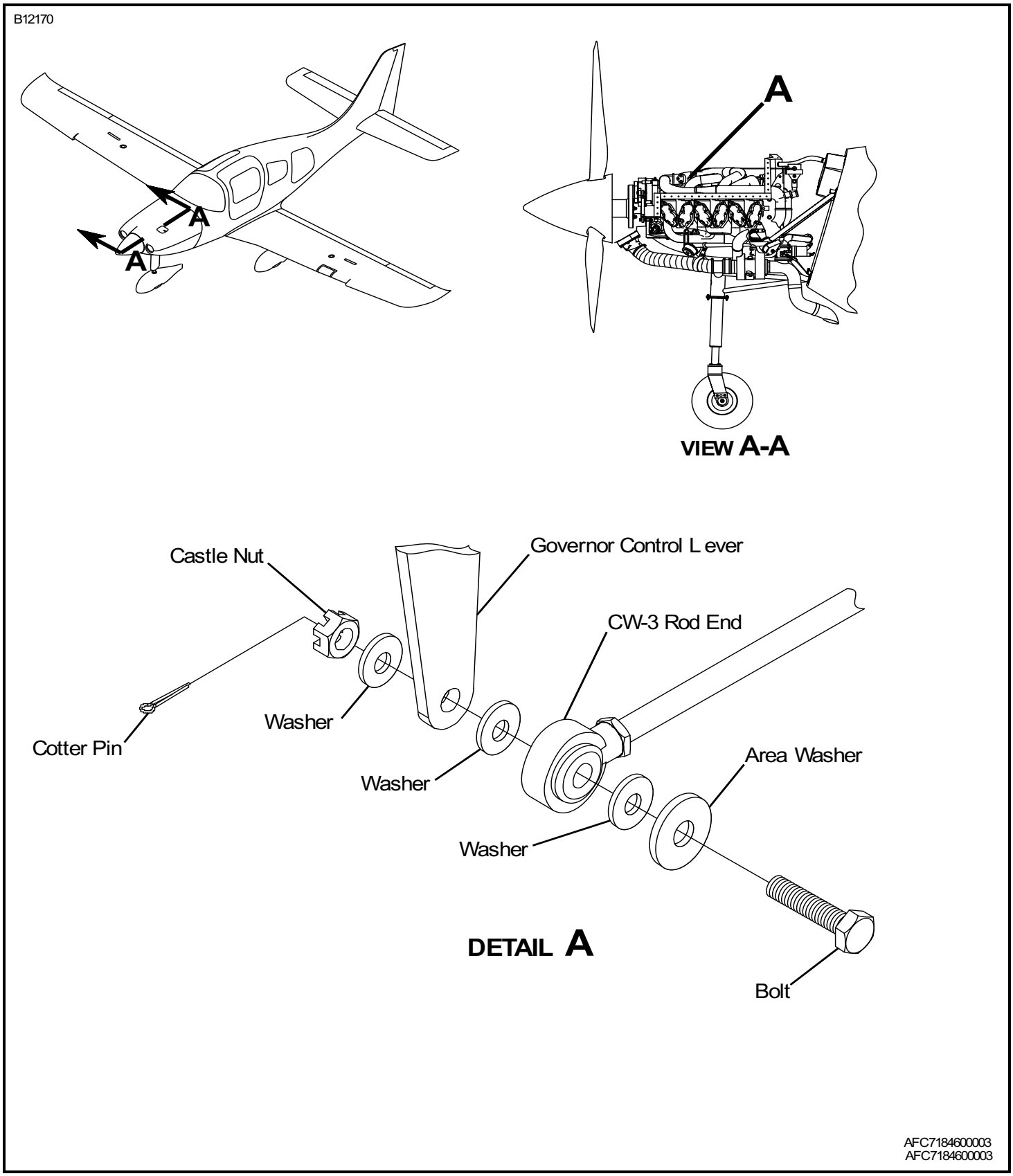
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Governor to Engine Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Governor Control Cable Attachment

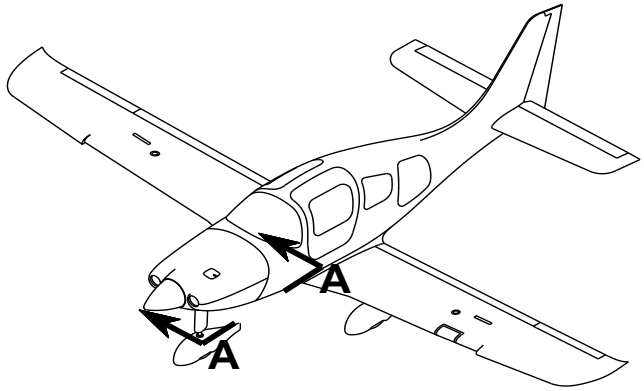


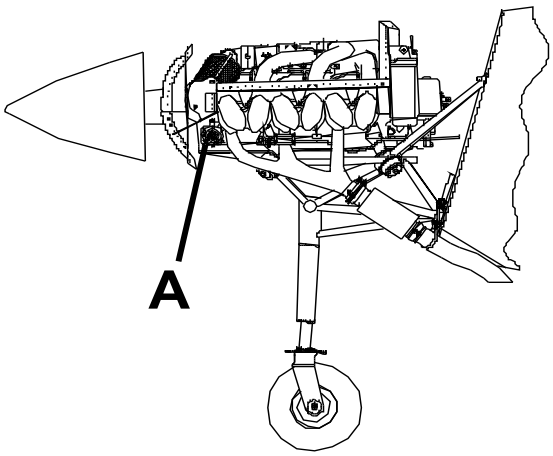
AFC7184600003

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

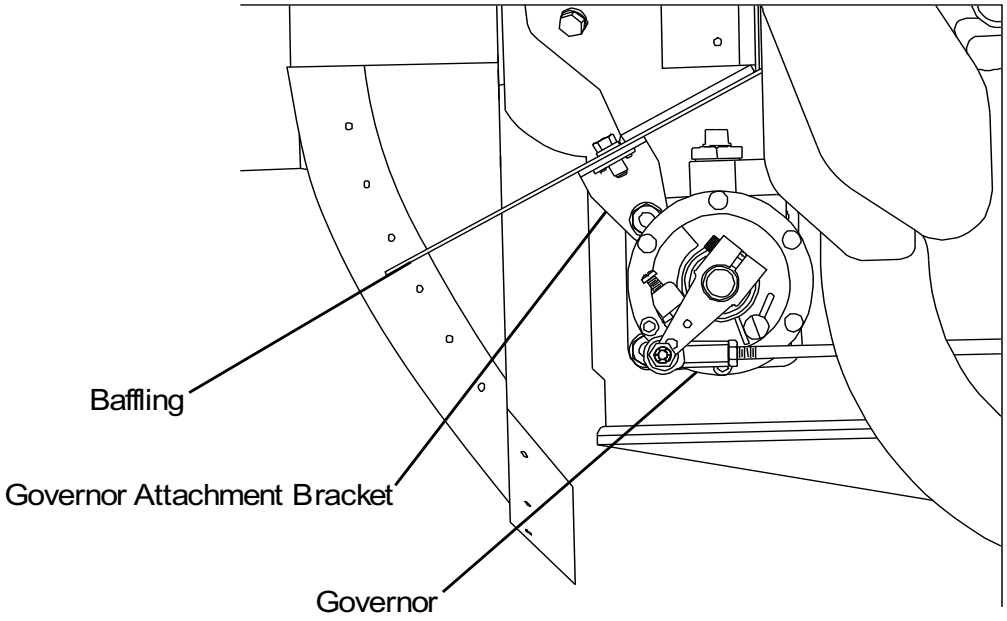
Figure 203 : Sheet 1 : Baffling Attachment

B12171





VIEW A-A

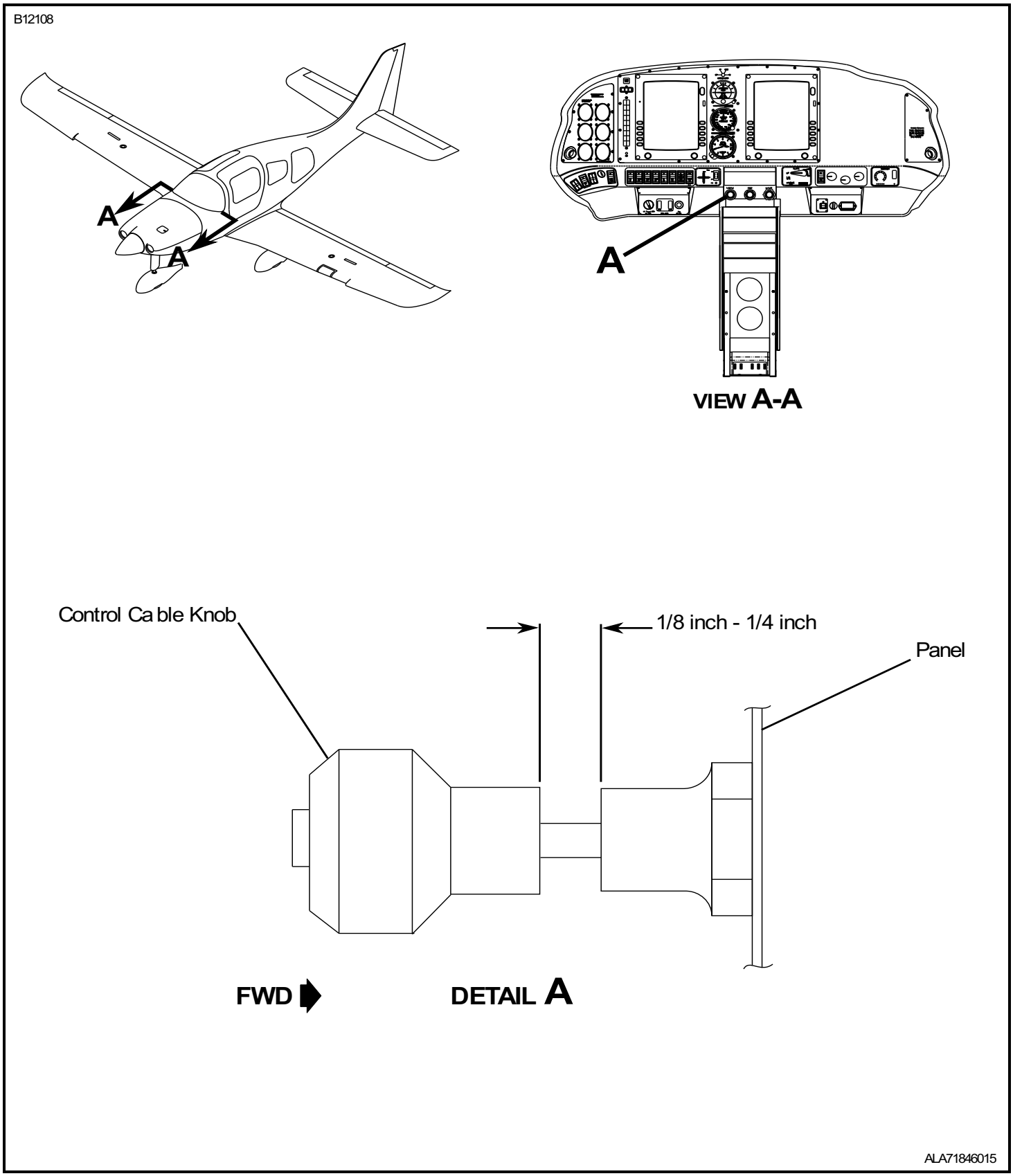


DETAIL A

ALB71844100B1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Proper Control Position



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENGINE FUEL SYSTEM - GENERAL

1. General

NOTE: See Teledyne Continental Motors Permold Series Maintenance Manual Model IO-550-N Form Number X30634A for specific maintenance information. Contact Teledyne Continental Motors to ensure you have the latest revision to their manual. It is the responsibility of the owner or operator of the airplane to maintain the revision schedule for all manuals related to the Teledyne Continental Motors Permold Series Model IO-550-N.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

IGNITION - GENERAL

1. General

NOTE: See the Teledyne Continental Motors Permold Series Maintenance Manual Model IO-550-N Form Number X30634A for specific maintenance information of the ignition system. Contact Teledyne Continental Motors to ensure you have the latest revision to their manual. It is the responsibility of the owner or operator of the airplane to maintain the revision schedule for all manuals related to the Teledyne Continental Motors Permold Series Model IO-550-N.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

IGNITION SWITCH - MAINTENANCE PRACTICES

1. Ignition Switch

A. **Description** - The ignition switch is located in the master switch panel and is a standard aircraft switch that provides on and off electrical control of the magnetos and includes the start position. The switch is key-operated and mounts from the rear of the master switch panel.

B. **Removal and Installation**

(1) Remove the left knee bolster panel per instructions in Chapter 25-11-00 to gain access to the rear of the master switch panel.

(2) Remove the metal collar around the front side of the switch, and pull the switch out through the rear of the panel.

(3) Remove and label the seven wires on the back of the switch.

(4) Installation is a direct reversal of removal. Install the wires as labeled.

C. **Troubleshooting**

(1) If there is no magneto drop or no shutoff, verify the ground wire at the back of the switch is intact.

(2) If the starter will not engage, verify that there is power to the switch on the "B" terminal (marked on the back of the switch).

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENGINE INDICATION - GENERAL

1. General

A. This chapter includes instructions on the maintenance, removal, and installation of equipment that provides a means of monitoring the operating conditions of the engine. Information from technical publications provided by the manufacturer's of the various pieces of engine monitoring equipment are not covered in this manual and should be consulted prior to any maintenance of the equipment. Information contained in this chapter provides the basic procedures for the removal and installation of the different pieces of the engine indicating system.

B. The instruments that display the status of the various engine systems are located on the engine instrument panel. This panel is to the left side of the flight instrument panel. The left and right fuel quantity gauge is at the top left of the panel and is discussed in Chapter 28-40-00. The suction and ammeter gauges are at the middle left of the panel and are discussed in Chapter 37-20-00 and Chapter 24-30-00. The oil pressure and oil temperature gauge is located at the bottom left of the panel and is discussed in Chapter 79-00-00. The tachometer, manifold pressure, fuel flow, cylinder head, and exhaust gas temperature gauges are located on the right side of the engine instrument panel and are discussed in this chapter.

CAUTION: Before any maintenance, removal, or installation of equipment is performed, make sure both the master and avionics switches are in the off position. Failure to do so could result in damage to these instruments.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

TACHOMETER, MANIFOLD PRESSURE AND FUEL FLOW - MAINTENANCE PRACTICES

1. Tachometer

A. Removing the Tachometer

(1) Remove the engine instrument panel per instructions in Chapter 25.

(2) Unplug the connector going into the back of the tachometer.

(3) Unscrew the four screws surrounding the tachometer.

B. Installation of the Tachometer

(1) Put the tachometer in its slot, and screw it into the engine instrument panel.

(2) Plug the connector into the back of the tachometer.

(3) Reinstall the engine instrument panel.

C. Troubleshooting the Tachometer Transducer

(1) The tachometer transducer is located in the right magneto.

(2) Verify that there is approximately 10VDC of excitation to the transducer with the master switch on and the tachometer connected to the aircraft wire harness.

(3) Verify ground is good.

(4) Check the continuity of the signal wire to the tachometer.

(5) If all these points check good, replace the transducer.

D. Removing the Tachometer Transducer

(1) The tachometer transducer is located in the right magneto.

(2) Loosen the magneto to gain access to the bottom of the magneto.

(3) Remove the transducer.

(4) Re-time the magneto.

E. Installing the Tachometer Transducer

(1) Loosen the right magneto.

(2) Install the transducer.

(3) Re-time the magneto.

2. Manifold Pressure Gauge

A. Removing the Manifold Pressure Gauge

(1) Remove the engine instrument panel per instructions in Chapter 25-11-00.

(2) Unplug the connector going into the back of the gauge.

(3) Unscrew the four screws surrounding the manifold pressure gauge.

B. Installation of the Manifold Pressure Gauge

(1) Put the gauge in its slot and screw it into the engine instrument panel.

(2) Plug the connector into the back of the gauge.

(3) Reinstall the engine instrument panel.

C. Troubleshooting the Manifold Pressure Transducer

(1) The manifold pressure transducer is located on the top of the engine alongside the throttle butterfly valve.

(2) Verify that there is approximately 5VDC of excitation to the transducer with the master switch on and the manifold pressure gauge connected to the aircraft wire harness.

(3) Verify ground is good.

(4) Check the continuity of the signal wire to the manifold pressure gauge.

(5) If all these points check good, replace the manifold pressure transducer.

D. Removing the Manifold Pressure Transducer

(1) The manifold pressure transducer is located on the top of the engine alongside the throttle butterfly valve.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(2) Remove the connector.

(3) Remove the transducer.

E. **Installing the Manifold Pressure Transducer**

(1) Install the transducer.

(2) Install the connector.

(3) Check for connector clearance with the throttle arm.

3. Fuel Pressure/Flow Gauge

A. **Removing the Fuel Pressure/Flow Gauge**

(1) Remove the engine instrument panel per instructions in Chapter 25-11-00.

(2) Unplug the connector going into the back of the gauge.

(3) Unscrew the four screws surrounding the fuel flow gauge.

B. **Installation of the Fuel Pressure/Flow Gauge**

(1) Put the gauge in its slot and screw it into the engine instrument panel.

(2) Plug the connector into the back of the gauge.

(3) Reinstall the engine instrument panel.

C. **Troubleshooting the Fuel Pressure Transducer**

(1) The fuel flow transducer is located on the top of the engine on the right side.

(2) Verify that there is approximately 5VDC of excitation to the transducer with the master switch on and the fuel flow gauge connected to the aircraft wire harness.

(3) Verify ground is good.

(4) Check the continuity of the signal wire to the fuel flow gauge.

(5) If all these points check good, replace the fuel flow transducer.

D. **Removing the Fuel Pressure Transducer** - (Refer to Figure 201.)

(1) With the upper cowling removed, disconnect the electrical connector from the top of the fuel flow transducer.

(2) Disconnect the fuel line from the bottom of the fuel flow transducer.

(3) Remove the tangential worm clamp used to secure the transducer to the upper bracket.

(4) Remove the screws, washers, and nuts used to attach the upper and lower brackets together.

(5) Loosen the two large clamps used to connect the upper and lower bracket retaining ears to the engine intake manifold runner-tube until the retaining ears on the upper bracket can be slid under the clamp.

(6) Remove the upper bracket.

(7) Remove the rubber vibration washer from the top of the fuel flow transducer.

(8) Pull the fuel flow transducer up and out of the bottom bracket.

E. **Installing the Fuel Pressure Transducer** - (Refer to Figure 201.)

(1) Install the fuel flow transducer into the lower bracket.

(2) Install the rubber vibration washer onto the upper part of the fuel flow transducer.

(3) Install the upper bracket over the transducer. Slide the upper bracket retaining ears under the two large intake manifold runner-tube clamps. Position the clamps in the same location as before removal.

(4) Reinstall the upper and lower bracket attachment screws, washers, and nuts in reverse order as disassembled. Torque nuts 30 to 36 in.-lbs.

(5) Reinstall the tangential worm clamp around the transducer and the upper bracket. Tighten the clamp until the transducer is completely contained.

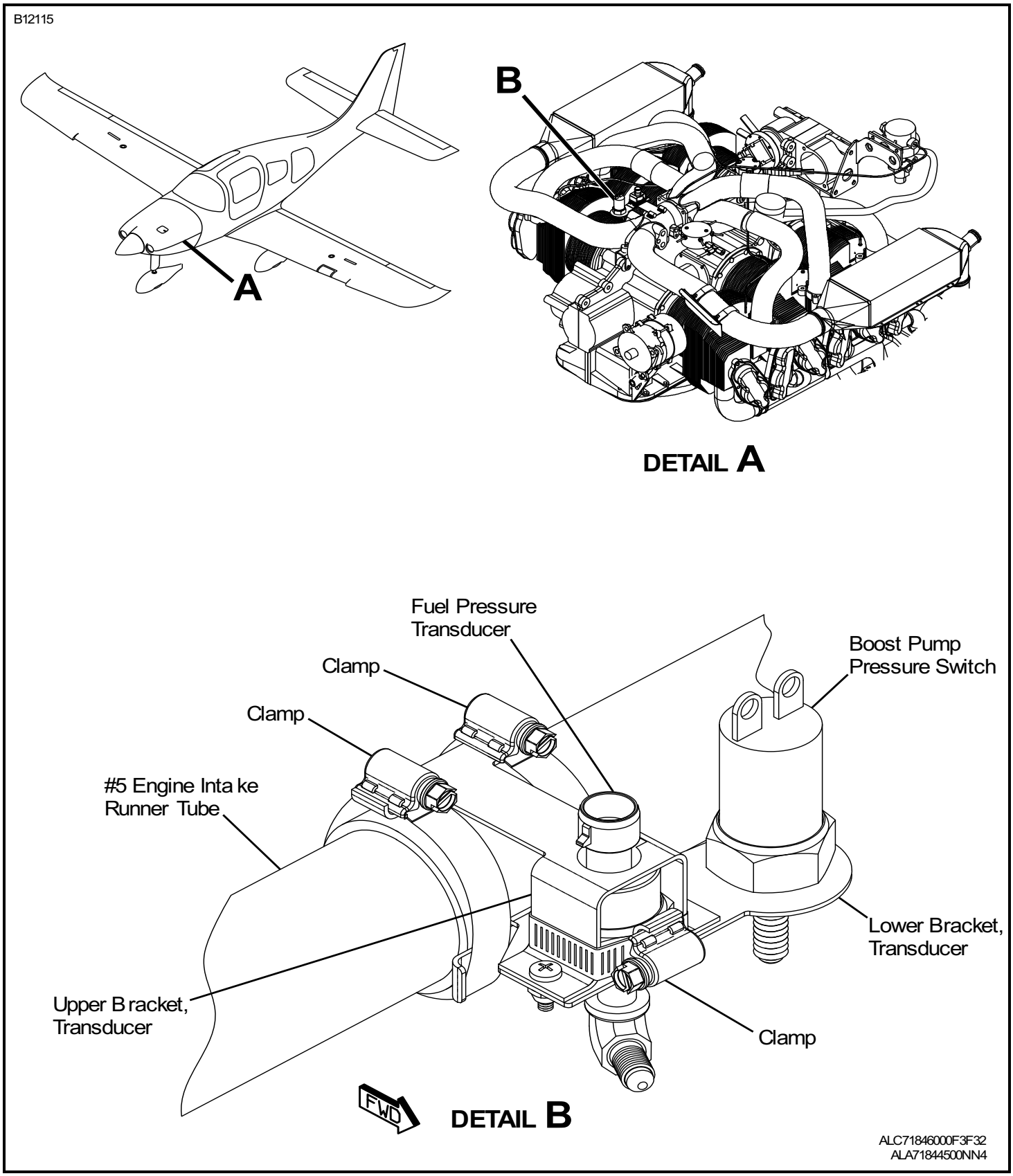
(6) Reconnect the metered fuel pressure line to the bottom of the transducer. Torque fuel line fitting 75 to 80 in.-lbs.

(7) Reconnect the electrical connections to the top of transducer.

F. **Other References** - Refer to Chapter 28 for information on the fuel system.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Fuel Pressure Transducer



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENGINE TEMPERATURE - MAINTENANCE PRACTICES

1. Cylinder Head Temperature Gauge (without Digital Engine Scanner)

A. Removing the Cylinder Head Temperature Gauge

(1) Remove the engine instrument panel. Refer to Chapter 25-11-00 for instructions.

(2) Unplug the connector going into the back of the gauge.

(3) Unscrew the four screws surrounding the cylinder head temperature gauge.

B. Installation of the Cylinder Head Temperature Gauge

(1) Put the gauge in its slot, and screw it into the engine instrument panel.

(2) Plug the connector into the back of the gauge.

(3) Reinstall the engine instrument panel.

C. Removing the Temperature Probe

(1) The temperature probe is attached with a bayonet clip to cylinder No. 2.

(2) Push the probe up into the cylinder, turn it, and remove.

D. Testing of the Cylinder Head Temperature Gauge

NOTE: Testing of the cylinder head temperature gauge will require the use of a thermocouple oven, a reliable heat probe, and a power source independent of the airplane.

(1) Plug the thermocouple oven into the power source.

(2) Place the probe from the cylinder head temperature gauge into the top of the thermocouple oven heating element.

(3) Place the standard probe into the bottom of the heating element.

(4) Compare the temperatures.

E. Calibration of the Cylinder Head Temperature Gauge

(1) Field calibration of the cylinder head temperature gauge is not available. For calibration of the cylinder head temperature gauge, see a qualified instrument technician.

2. Exhaust Gas Temperature (without Digital Engine Scanner)

A. Removing the Exhaust Gas Temperature Gauge

(1) Remove the engine instrument panel per instructions in Chapter 25-11-00.

(2) Unplug the cable going into the back of the gauge.

(3) Unscrew the four screws surrounding the exhaust gas temperature gauge.

B. Installation of the Exhaust Gas Temperature Gauge

(1) Put the gauge in its slot, and screw it into the engine instrument panel.

(2) Plug the cable into the back of the gauge.

(3) Reinstall the engine instrument panel.

C. Removing the Temperature Probe

(1) The temperature probe is attached with a clamp to the exhaust tube on cylinder No. 2.

(2) Loosen the clamp, and remove the probe.

D. Testing of the Exhaust Gas Temperature Gauge

NOTE: Testing of the exhaust gas temperature gauge will require the use of a thermocouple oven, a reliable heat probe, and a power source independent of the airplane.

(1) Plug the thermocouple oven into the power source.

(2) Place the probe from the exhaust gas temperature gauge into the top of the thermocouple oven heating element.

(3) Place the standard probe into the bottom of the heating element.

(4) Compare the temperatures.

E. Calibration of the Exhaust Gas Temperature Gauge

(1) Field calibration of the exhaust gas temperature gauge is not available. For calibration of the exhaust gas temperature gauge, take it to a qualified instrument technician.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

3. Oil Temperature and Pressure Indication

A. Oil Temperature and Pressure Gauge Removal

(1) Remove electrical power from the airplane. Refer to Chapter 24, Battery - Maintenance Practices.

(2) Remove the engine instrument panel located on the left side of the instrument panel. Refer to Chapter 25, Instrument Panels and Electrical Panels - Maintenance Practices.

(3) Remove the electrical connector from the back of dual indicating oil temperature/pressure gauge located in the lower left of the engine instrument panel.

(4) Remove the screws from the engine instrument panel around the face of dual indicating oil temperature/pressure gauge.

(5) Remove the gauge from the engine instrument panel.

B. Oil Temperature and Pressure Gauge Installation

(1) Put the dual indicating oil temperature/pressure gauge in lower left opening on the back of the engine instrument panel.

(2) Install the screws through the front of the panel to the gauge.

(3) Install the electrical connector to the back of the dual indicating oil temperature/pressure gauge.

(4) Install the engine instrument panel. Refer to Chapter 25, Instrument Panels and Electrical Panels - Maintenance Practices.

(5) Restore electrical power to the airplane. Refer to Chapter 24, Battery - Maintenance Practices.

(6) Operate the engine in accordance with the Airplane Flight Manual and observe proper oil pressure and oil temperature indications.

C. Oil Temperature Bulb Removal

(1) Remove the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.

(2) Remove the safety wire from the oil temperature bulb located below the oil cooler.

(3) Place a suitable container under the oil temperature bulb to contain the oil that will drain from the engine when the oil temperature bulb is removed.

(4) Remove the oil temperature connector from the oil temperature bulb.

(5) Remove the oil temperature bulb and discard the gasket.

D. Oil Temperature Bulb Installation

(1) Install a new gasket with the oil temperature bulb below the oil cooler.

(2) Torque the oil temperature bulb 190 to 210 in.-lbs. Refer to Chapter 20, Torque Data - Maintenance Practices.

(3) Remove the container used to catch oil drained from the engine during the removal of the oil temperature bulb and clean any oil drips or spills with a clean cloth.

(4) Install the oil temperature connector to the oil temperature bulb.

(5) Install 0.032 safety wire on the oil temperature connector and oil temperature bulb to the engine. Refer to Chapter 20, Safetying - Maintenance Practices.

(6) Run the engine and check for normal operating temperatures in accordance with the Airplane Flight Manual.

(7) With the engine shut down, check the installation to ensure there are no oil leaks.

(8) Install the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.

E. Oil Pressure Transducer Removal

(1) Remove the electrical connection from the end of the oil pressure transducer.

(2) Using a wrench, hold the AN912-3J bushing. Remove the oil pressure transducer from the oil cooler case. Refer to Figure 201.

F. Oil Pressure Transducer Installation

(1) Apply Teflon thread sealant (not tape) to the threads of the oil pressure transducer.

(2) Install the oil pressure transducer into the AN912-3J fitting. Using a wrench, hold the AN912-3J bushing, and torque the oil pressure transducer 60 to 80 inch-lbs.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(3) Attach the electrical connection to the end of the oil pressure transducer.

G. **Oil Pressure Transducer Troubleshooting**

(1) The oil pressure transducer is located next to the Hobbs oil pressure switch under the oil cooler.

(2) Verify that there is approximately 5VDC of excitation to the transducer with the master switch on and the oil pressure gauge connected to the aircraft wire harness.

(3) Verify ground is good.

(4) Check the continuity of the signal wire to the oil pressure gauge.

(5) If all these points check good, replace the oil pressure transducer.

4. Hobbs Switch

A. Refer to Chapter 31-00-00 for information on the Hobbs switch.

5. Oil Temperature

A. Refer to Chapter 79-00-00 for information on the oil temperature system.

6. Digital Engine Scanner

A. The J.P. Instruments EDM-700 Digital Engine Scanner is an option and may be installed on aircraft S/N 40010 and On. For instructions other than what is provided in this manual, contact J.P. Instruments at P.O. Box 7033, Huntington Beach, CA 92646. The EDM-700 is installed in the engine instrument panel in the lower right position and displays CHT and EGT in digital and analog format. When the EDM-700 system is installed, an additional circuit breaker will be installed on the fourth row of the circuit breaker panel and labeled "ENG SCAN".

B. **Removal of the Scanner Unit**

(1) Remove the engine instrument panel per instructions in Chapter 25-11-00.

(2) Unplug the two connectors at the back of the instrument.

(3) Remove the buttons on the face of the unit.

(4) Remove the four, 6-32 screws on the front of the panel, and slide the unit out of the slot.

C. **Installation of the Scanner Unit**

(1) Remove buttons on the face of unit before installing.

(2) Slide unit into slot and install four, 6-32 screws. Screws must not penetrate the face more than 0.125 inch

(3) Replace buttons on the face of the unit.

(4) Connect the two connectors at the back of the unit.

(5) Replace the engine instrument panel per instructions in Chapter 25-11-00.

D. **Removal of the EGT Probe**

(1) Remove the cowling per instructions in Chapter 71-10-00.

(2) Remove the clamp. Refer to Figure 202.

(3) Remove the probe from the exhaust stack, then remove it from the thimble and washer.

(4) If necessary, remove wiring from the clamps at the baffling and the baffling attach bracket on the engine boss by removing the bolt, washers, clamp, and nut.

E. **Installation of the EGT Probe** - (Refer to Figure 202.)

(1) Insert the stainless steel thimble through the hole in the clamp.

(2) Insert the probe in the thimble, and apply the sealing washer between the thimble and the exhaust stack. Note that the curve of the washer follows the curve of the exhaust stack.

(3) Insert the probe in the exhaust stack so that the tip of the probe is in the approximate center of the exhaust stack. Do not go over center. The slot in the thimble must be positioned longitudinally with the length of the exhaust stack or the probe will not lock firmly.

(4) Torque clamp 40 to 50 inch-lbs., and trim excess strap from clamp (not to exceed a 1 inch tab).

(5) If wiring was removed from the clamps, install the bolt, washers, clamp, and nut. For clamps on the baffling, tighten the nut until the clamp is compressed and does not rotate. For clamps on the baffling attach bracket on the engine boss, torque bolt 72 to 84 inch-lbs.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(6) Install the cowling per instructions in Chapter 71-10-00.

F. **Removal of the CHT Probe**

(1) Remove the cowling per instructions in Chapter 71-10-00.

(2) Remove the wiring from the probe.

(3) Loosen and remove the probe.

G. **Installation of the CHT Probe**

(1) Install the probe and tighten.

(2) Connect wires.

(3) Replace cowling per instructions in Chapter 71-10-00.

H. **EDM-700 Initial Set-up**

(1) The Engine Data Management System is set-up in the Cessna 300 to measure the cylinder and exhaust temperatures only. Most settings will be made by the pilot in-flight. In this example, the Cylinder Head Temperature (CHT) alarm will be set at the high of 460°F.

(a) Turn on the battery power. Wait for the EDM to complete its self-test (approximately one minute).

(b) Press and hold both buttons on the instrument for 5 seconds until the word PROGRAM appears.

(c) Tap the STEP (left) button until the words END Y appear.

(d) Press and hold both buttons for 5 seconds until the words FAC LIM appear.

(e) The display is then set to sequence through all available options.

(f) Tap the STEP button to advance to the next item in the list until the words 450 H CHT appear.

(g) Tap the LF (right) button to change the value of the High CHT Warning Alarm in 5°F increments.

(h) Hold the LF button to increase a numerical value; tap the LF button to decrease a numerical value.

(i) Set the value to 460°F H CHT.

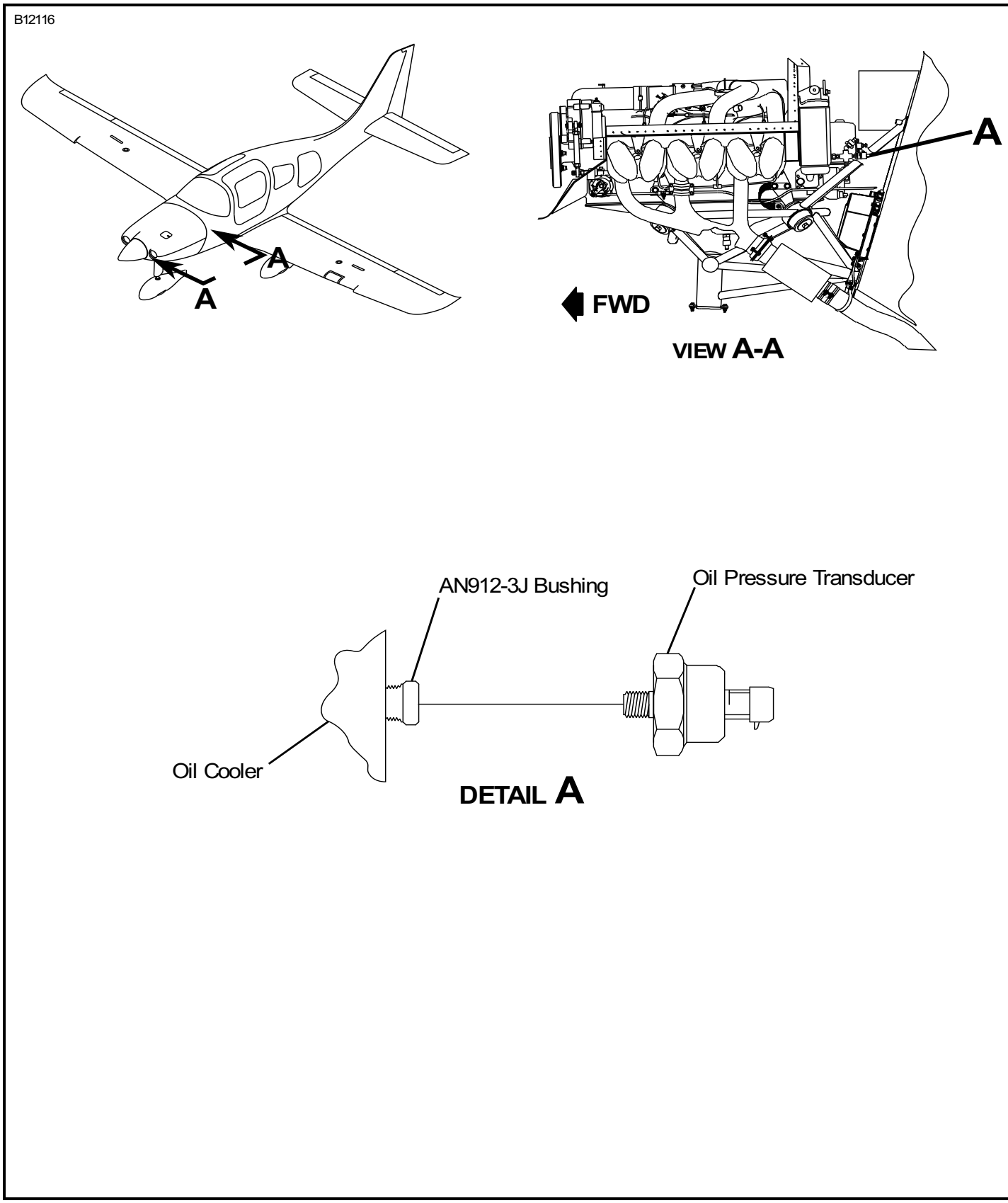
(j) Pause for 10 seconds.

(k) Tap the LF button until the words END Y appear.

(l) Tap once more to exit set-up.

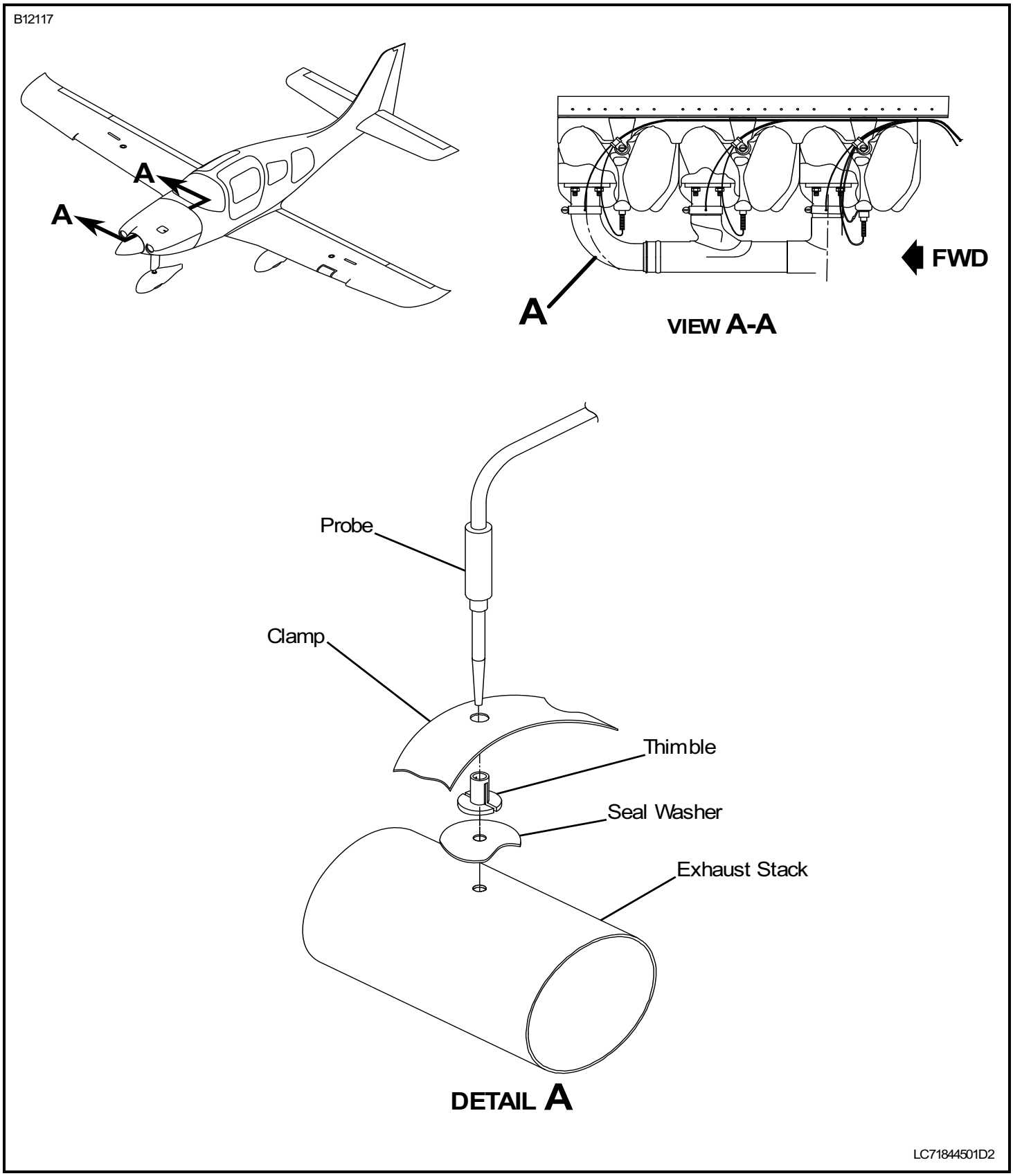
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Oil Pressure Switch



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : EGT Probe for Digital Engine Scanner



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

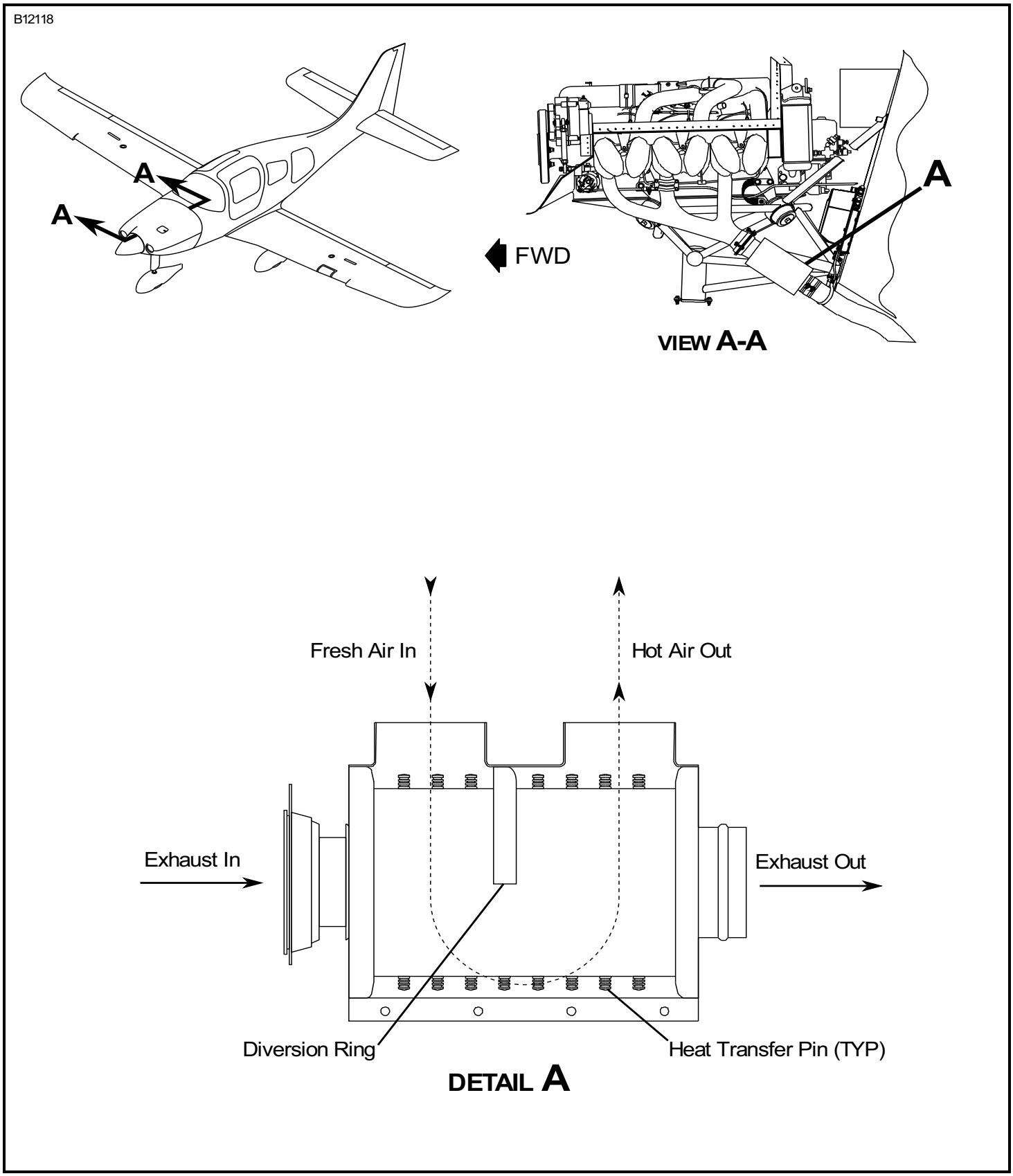
EXHAUST - GENERAL

1. Exhaust System Description and Operation

A. This document describes operation, removal, and installation of the IO-550-N engine exhaust system. The exhaust system is a dual outlet configuration with baffle-style mufflers and canister-style heat exchanger. The exhaust system is a dual outlet configuration consisting of a left and right side manifold, muffler, and tailpipe. A canister-style heat exchanger is housed over the right side muffler. Exhaust gasses produced by the engine are channeled through the manifold and muffler, then out the tailpipe. Mufflers are a non-glass packed baffle design fabricated to lower engine exhaust noise to the required dB(A) levels while still providing high flow characteristics. Small pins welded within the right muffler, transfer heat into the heat exchanger chamber. Fresh air is channeled through the heat exchanger chamber where it is heated, then routed into the environmental control system for use as cabin floor heat and windshield defrosting. Refer to Figure 1.
Manifold to muffler connections are established using a conventional ball joint method. Spring pressure is used to seat the ball formation between the manifold and muffler flanges. Refer to Figure 2.
Muffler to tailpipe connections are established using D-clamps. A formed ridge at both the muffler outlet pipe and receiving tailpipe end create an interlocking configuration when D-clamps are assembled over muffler to tailpipe connections. Refer to Figure 3.
Both the left and right side tailpipes are supported at each end by reinforced silicone straps. These straps control vibration and movement that occurs during engine operation as well as support the weight at the exit end of each tailpipe. Refer to Figure 4, Sheet 1 and Figure 4, Sheet 2.
The muffler assembly contains a tone cone (shown in Figure 5) that decreases exhaust noise.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

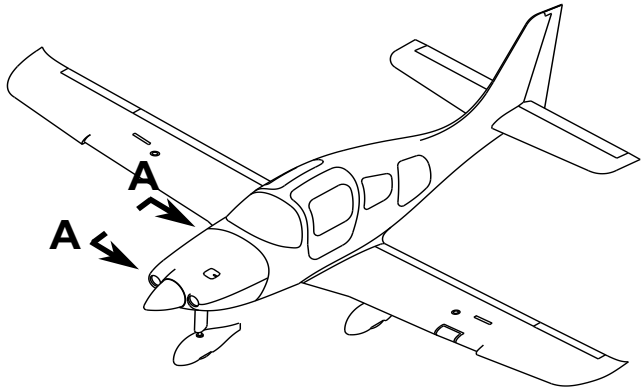
Figure 1 : Sheet 1 : Exhaust System

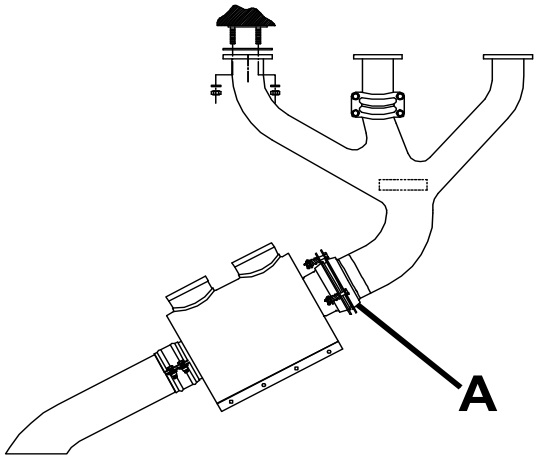


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

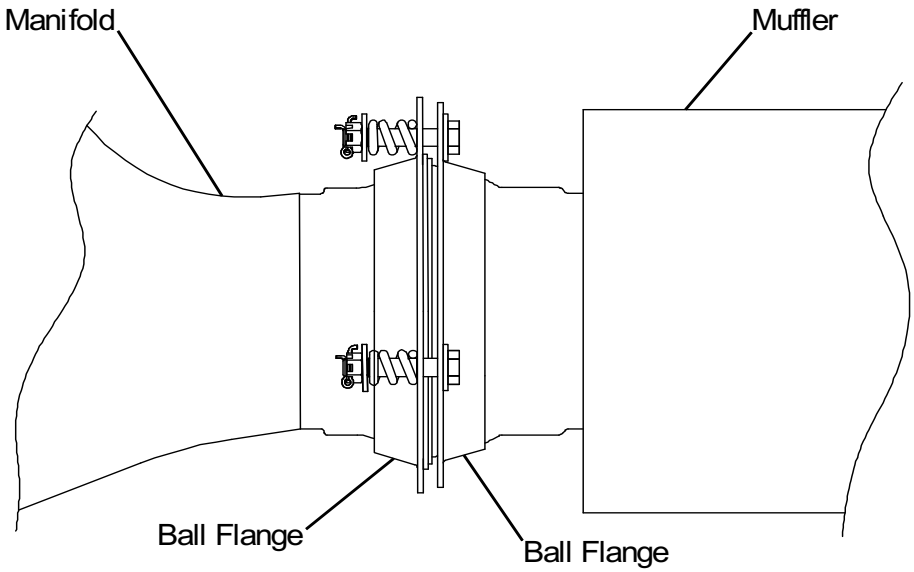
Figure 2 : Sheet 1 : Manifold to Muffler Connection

B12119





VIEW A-A

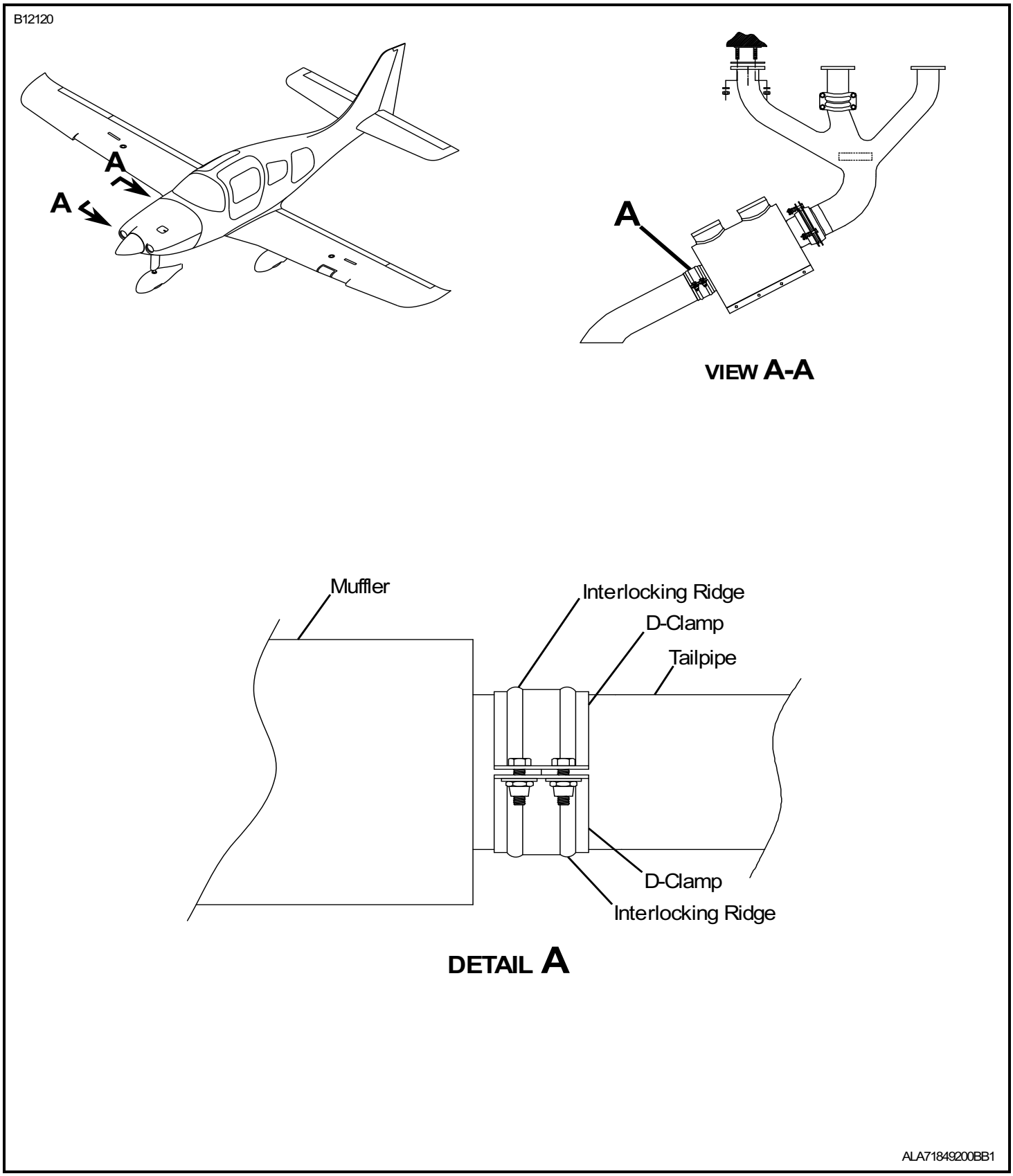


DETAIL A

ALA71849200BB1

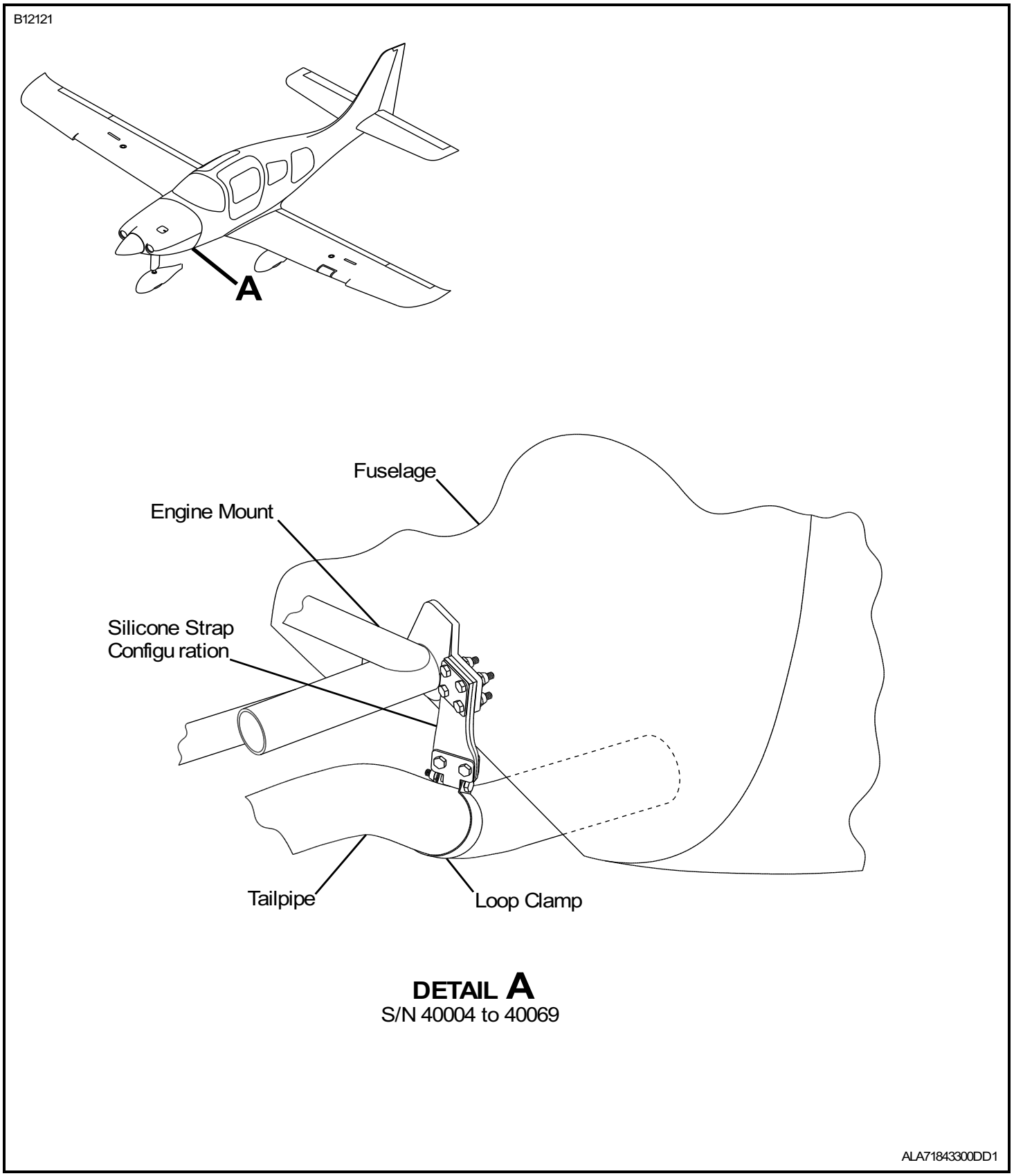
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 3 : Sheet 1 : Muffler to Tailpipe Connection



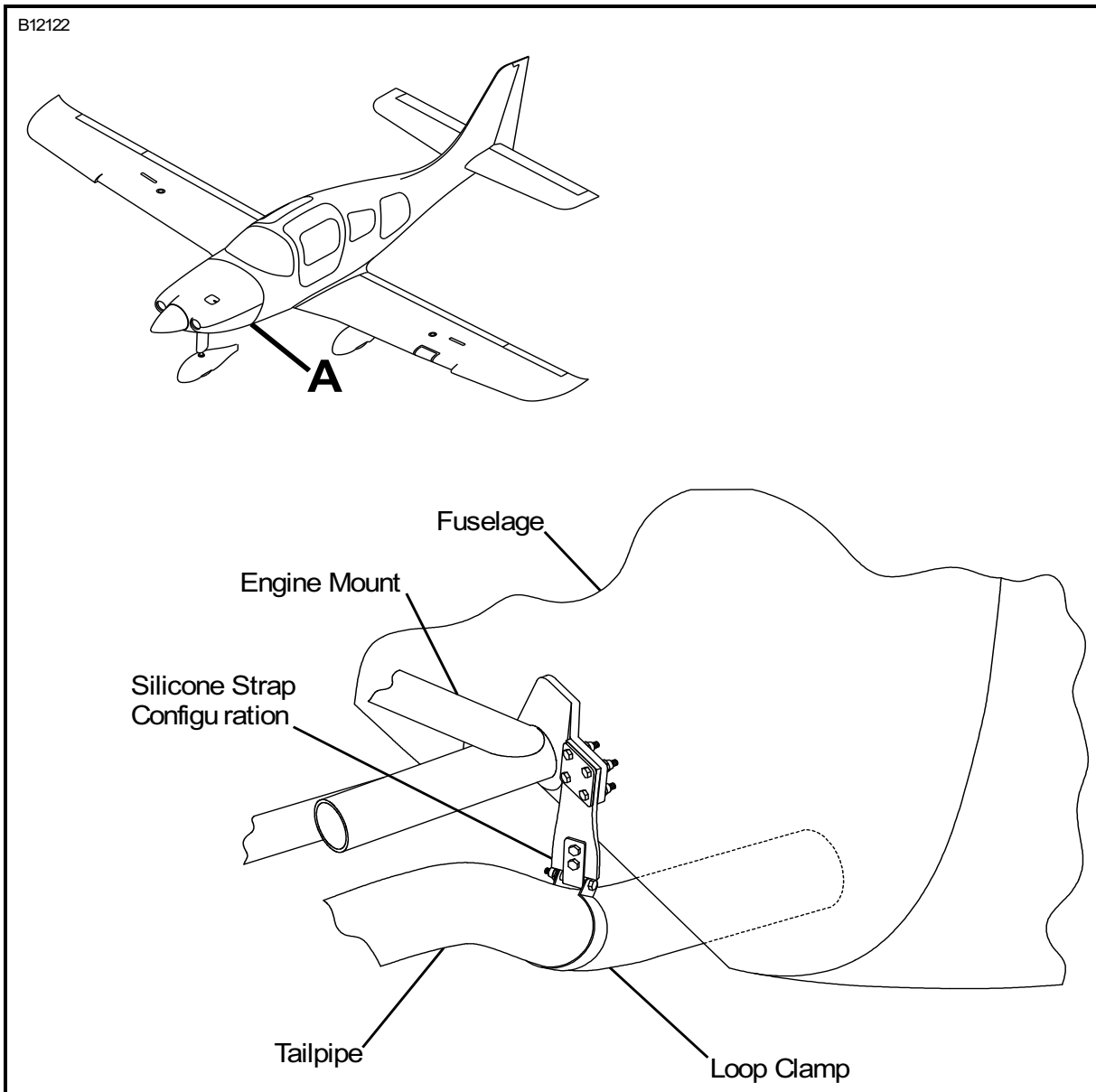
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 4 : Sheet 1 : Tailpipes



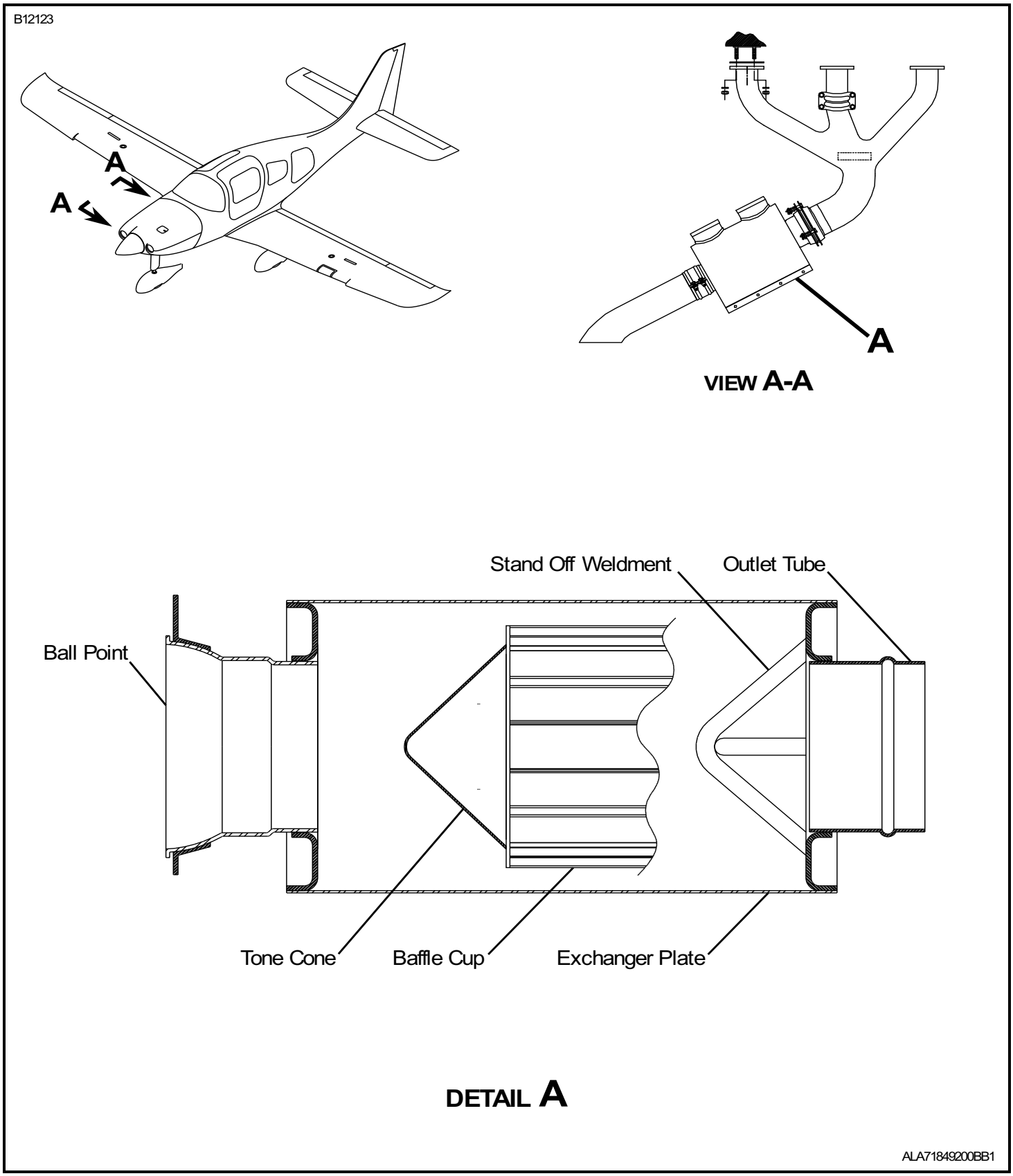
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 4 : Sheet 2 : Tailpipes



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 5 : Sheet 1 : Muffler Assembly with Tone Cone



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

EXHAUST - MAINTENANCE PRACTICES

1. Tools & Equipment

A. The mechanic should be equipped with a complete set of the necessary tools that include the following:

(1) Wrenches - 1/4 inch through 1 1/4 inch

(2) Common and Phillips Head Screwdrivers

(3) Pliers - Common, Diagonal Cutters, Needle Nose, Duck Bill, Snap Ring, Safety Wire

(4) Ratchets 1/4 inch, 3/8 inch, 1/2 inch drive

(5) Sockets – 1/4 inch drive 5/32 inch through 1/2 inch, 3/8 inch drive 3/8 inch through 1 inch, 1/2 inch drive 7/16 inch through 11/4 inch

(6) Sockets (Deepwell) -1/2 inch drive, 7/16 inch through 1 inch

(7) Feeler Gauges

(8) Leather or Soft Plastic Mallet

(9) Torque Wrenches (refer to note) 0-500 in.-lbs. and 0-100 ft.-lbs.

(10) Micrometers (refer to note)

(11) Slide Hammer

(12) Pullers

(13) Thickness Gauges

(14) Vernier Calipers (refer to note)

(15) Small Hole Gauges

NOTE: Must be currently calibrated, and the calibration must be traceable to the National Bureau of Standards.

WARNING: Mufflers must never be replaced with anything other than the OEM unit.

2. Exhaust System Removal

A. With the upper and lower cowling removed from the aircraft, remove the EGT probe from the left, rear exhaust manifold runner tube. Loosen the EGT clamp until the tail of the clamp is free, then carefully pull the EGT out of the exhaust runner tube. Refer to Figure 201. If the optional digital engine scanner is installed, remove the EGT per instructions in Chapter 77-20-00.

B. Loosen clamps and carefully pull the ducting hoses away from the heat exchanger. If ducting is stuck, gently twist the ducting while pulling outward to prevent damage to ducting material. Refer to Figure 202.

C. Remove the right and left side exhaust hanger clamp attachment bolt, nut, and washer. Pull the silicone straps out of the metal hanger clamps, and remove the clamps from the tailpipes.

D. Remove the nuts and washers attaching the exhaust manifold flange to the cylinder head at all flange locations, and remove the exhaust system from the engine. Refer to Section 78-00-00, Figure 4. Discard all flange gaskets.

E. Remove the cotter pins, bolts, springs, nuts, and washers connecting the exhaust manifold to the muffler from both the left and right side exhaust. Refer to Figure 203. Discard all cotter pins.

F. Remove the bolts, nuts, and washers attaching the muffler to the tailpipe D-clamp, and remove the D-clamps from both the left and right side exhaust. Refer to Section 78-00-00, Figure 2.

G. Remove the expansion D-clamp bolts, nuts, and washers, and remove the D-clamps from both the left and right side middle of the exhaust manifold runners.

H. Remove the middle riser tube from the middle manifold runner tube. Refer to Figure 204.

I. Remove the four sheet metal screws from the heat exchanger shroud, and remove the shroud. Note the position of the shroud inlet and outlet tubes before removing.

3. Exhaust System Cleaning

A. Cleaning the exhaust system is required before inspection. With the exhaust system completely disassembled, wash each component in a mineral spirit or Stoddard solvent solution, and wipe dry with a clean cloth. Light air pressure may also be used to dry parts.

WARNING: Never use a wire brush, abrasive paper, or abrasive cleaners to remove dirt and carbon deposits

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

from the exhaust system. These products will remove any visual evidence of exhaust leakage that would otherwise render the part unacceptable during inspection.

4. Exhaust System Inspection

A. The entire exhaust system must be thoroughly inspected for cracks, breaks, or burn-throughs that could lead to a possible engine fire, poor engine performance, or poor heat exchanger function. Inspect both the inside and outside exhaust manifold, muffler, heat exchanger, tone cone, and tailpipe locations under good lighting using a 10 X (power) magnifying glass and borescope (recommended) looking for the following imperfections:

(1) Gray, red, or black gas stains at all welds, pins, bends, and seams that would indicate a crack or break.

(2) Pitting, scaling, or rippling that would indicate burn-through from intense heat and metal expansion/contraction.

(3) Chafing of metal at all clamp locations that would indicate a loose or defective connection.

(4) Eroding, missing, or deformed heat exchanger transfer pins.

(5) Bulging and/or distortion of surfaces that would indicate metal fatigue.

(6) Eroding muffler inner baffle components.

(7) Broken springs.

(8) Bolts that show signs of chafing due to improper alignment.

(9) Flange holes that show signs of chafing or elongation due to improper alignment.

B. Indication of exhaust leakage at the D-clamp connections may be normal due to regular use and clamp design. Determination of the seriousness of any such indications must be made during inspection of the exhaust system.

5. Exhaust System Installation

A. Install the left and right side riser tubes into the left and right middle manifold runner tubes. Position the D-clamps over the formed ridges on both the left and right side middle manifold runner and riser tubes. Install bolts, washers, and nuts finger tight in reverse order as disassembled. Do not tighten nuts. Nuts will be tightened after final positioning of exhaust system. Refer to Figure 204.

B. Install the heat exchanger shroud on the center and over the right-side muffler. Install four sheet metal screws. Torque screws 30 to 36 in.-lbs.

C. Install the right-side heat exchanger/muffler assembly to the right-side exhaust manifold. Install springs, bolts, washers, and nuts finger-tight in reverse order as disassembled. Do not tighten nuts. Nuts will be tightened after final positioning of the exhaust system. Refer to Section 78-00-00, Figure 2.

D. Install the left-side muffler to the left-side exhaust manifold. Install springs, bolts, washers, and nuts finger-tight in reverse order as disassembled. Do not tighten nuts. Nuts will be tightened after final positioning of the exhaust system. Refer to Section 78-00-00, Figure 2.

E. Install the right-side tailpipe to the right-side exhaust assembly. Position D-clamps over the formed ridges in both the muffler and tailpipe. Install bolts, washers, and nuts fingertight in reverse order as disassembled. Do not tighten nuts. Nuts will be tightened after final positioning of the exhaust system. Refer to Section 78-00-00, Figure 3.

F. Install the left-side tailpipe to the left-side exhaust assembly. Position D-clamps over the formed ridges in both the muffler and tailpipe. Install bolts, washers, and nuts finger-tight in reverse order as disassembled. Do not tighten nuts. Nuts will be tightened after final positioning of exhaust system. Refer to Section 78-00-00, Figure 3.

G. Install the left and right-side exhaust assembly to the engine. Install a new flange gasket TCM P/N 652458 between the exhaust manifold flange and cylinder head at all locations. Install nuts and washers at all flange locations (refer to Figure 203) and wet torque nuts with 50W aviation oil 100 to 110 in.-lbs. Torque the D-clamps nuts at the left and rightside middle manifold runner tube to the riser tube locations 30 to 36 in.-lbs. Refer to Figure 204.

H. For aircraft 40004 to 40039, install the metal band clamps over the left and right-side tailpipes. Position the clamps directly under the silicone hanger straps. Connect the left and right-side metal band clamps to the silicone hanger straps with bolts, nuts, and washers in reverse order as disassembled leaving hanger nuts finger-tight. Position the left and right-side tailpipes so that the outlet end of the pipe is pointing down and away from the airplane fuselage. Torque the left and right side hanger clamp nuts 30 to 36 in.- lbs. Refer to Section 78-00-00, Figure 4.

I. For aircraft 40040 and on, install the metal band clamps over the left and right-side tailpipes. Position the clamps directly under the Teflon hanger straps. Connect the left and right-side metal band clamps to the silicone hanger straps with bolts, nuts, and washers in reverse order as disassembled leaving hanger nuts finger-tight. Place two washers on each bolt between the Teflon strap and the bracket to fill the gap. Position the left and right-side tailpipes so that the outlet end of the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

pipe is pointing down and away from the airplane fuselage. Torque the left and right side hanger clamp nuts 30 to 36 in.-lbs. Refer to Section 78-00-00, Figure 4. Note that Section 78-00-00, Figure 4 shows the double silicone straps, however, the single Teflon strap assembly looks the same.

J. Rotate the right-side muffler/heat exchanger inlet and outlet tubes to position noted during disassembly. Torque the left and right-side muffler to the tailpipe D-clamp nuts 30 to 36 in.-lbs. Refer to Section 78-00-00, Figure 3.

K. Verify that the ball joint connections at the left and right-side manifold to muffler connections are properly aligned, then tighten the ball joint retaining nuts until the cotter pin can be inserted. Install a new cotter pin P/N MS24665-151 at all left and right-side locations per MS33540. Refer to Section 78-00-00, Figure 2.

L. Install the EGT probe into the left rear manifold runner tube. Insert the clamp tail into the clamp barrel, and tighten the clamp making sure the EGT probe is fully seated against the runner tube. Refer to Figure 201

M. Connect the ducting tubes and clamps over the inlet and outlet heat exchanger tubes in reverse order as disassembled. Tighten ducting clamps. Refer to Figure 202.

6. Exhaust System Testing

A. Standard Testing

(1) With the upper and lower cowling removed and the engine running at full operating temperature, check for exhaust leaks at all ball joint, D-clamp, EGT probe, and manifold flange gasket locations.

(2) Check that all wires, hoses, and devices are sufficiently located away from all exhaust components.

(3) After the exhaust has been run tested, install the upper and lower cowling, and check for interference between any part of the exhaust system and cowling.

B. Pressure Testing

(1) Every 1000 hours or every 5 years, whichever occurs first, the exhaust should be pressure tested using the following procedure.

(a) Remove the exhaust per instructions in the Exhaust System Removal section.

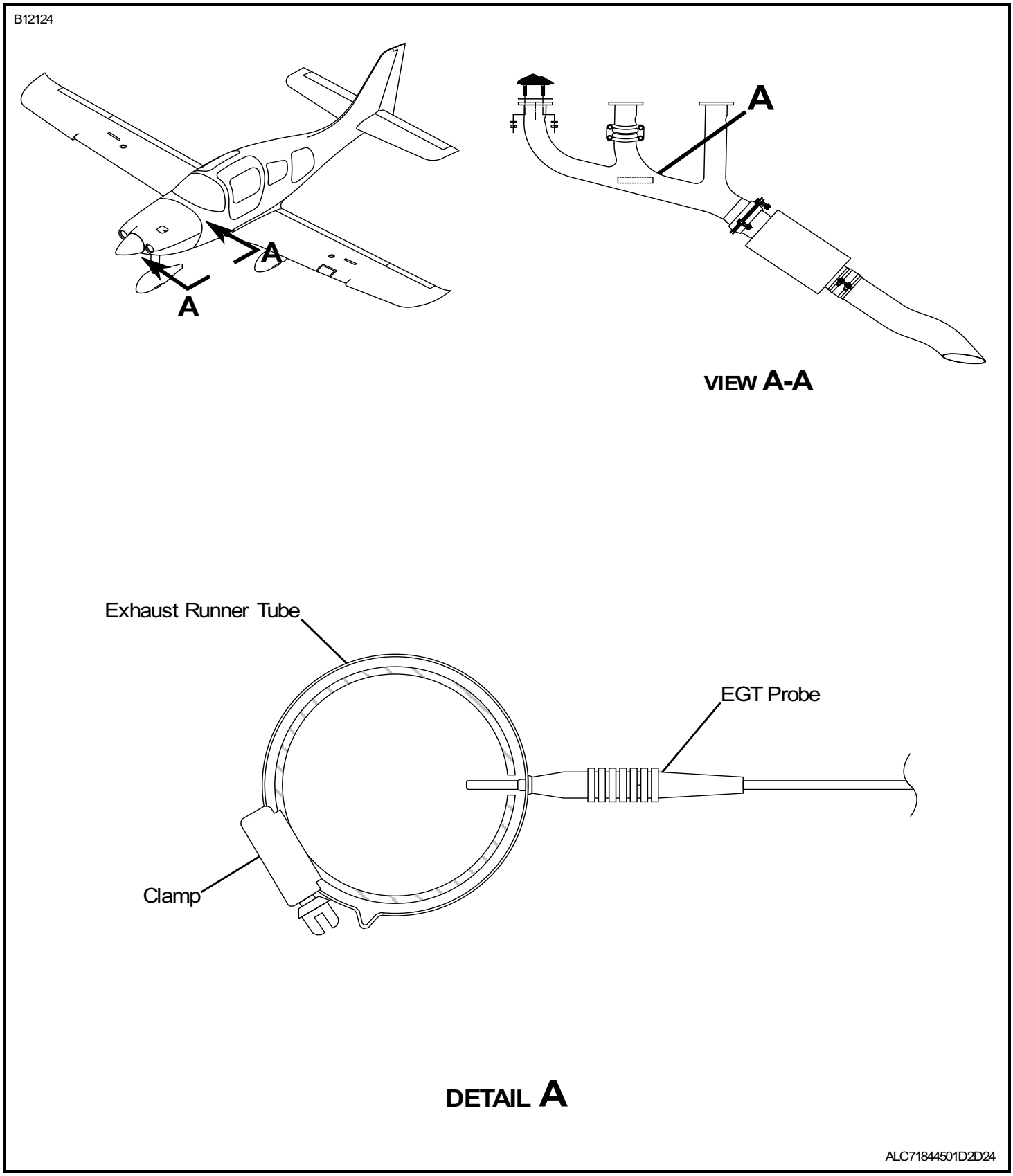
(b) Completely submerge the part under water with 15 psig ± 2 psig of air pressure inside the part.

(c) Look closely to determine if air bubbles are escaping.

(d) If leaks are found, mark the area with a marker, and return the parts for repair or install new parts.

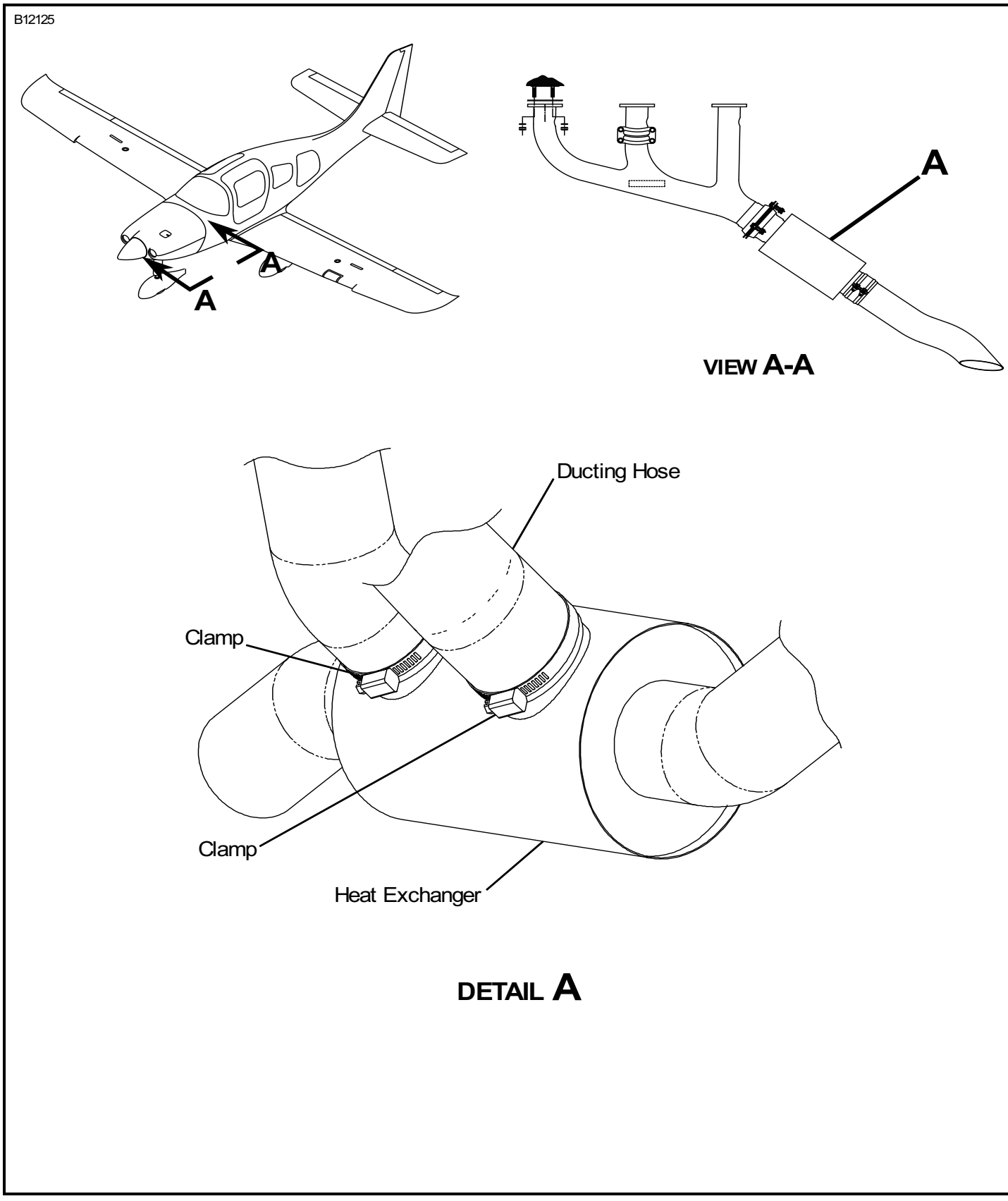
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : EGT Probe in Exhaust Runner Tube



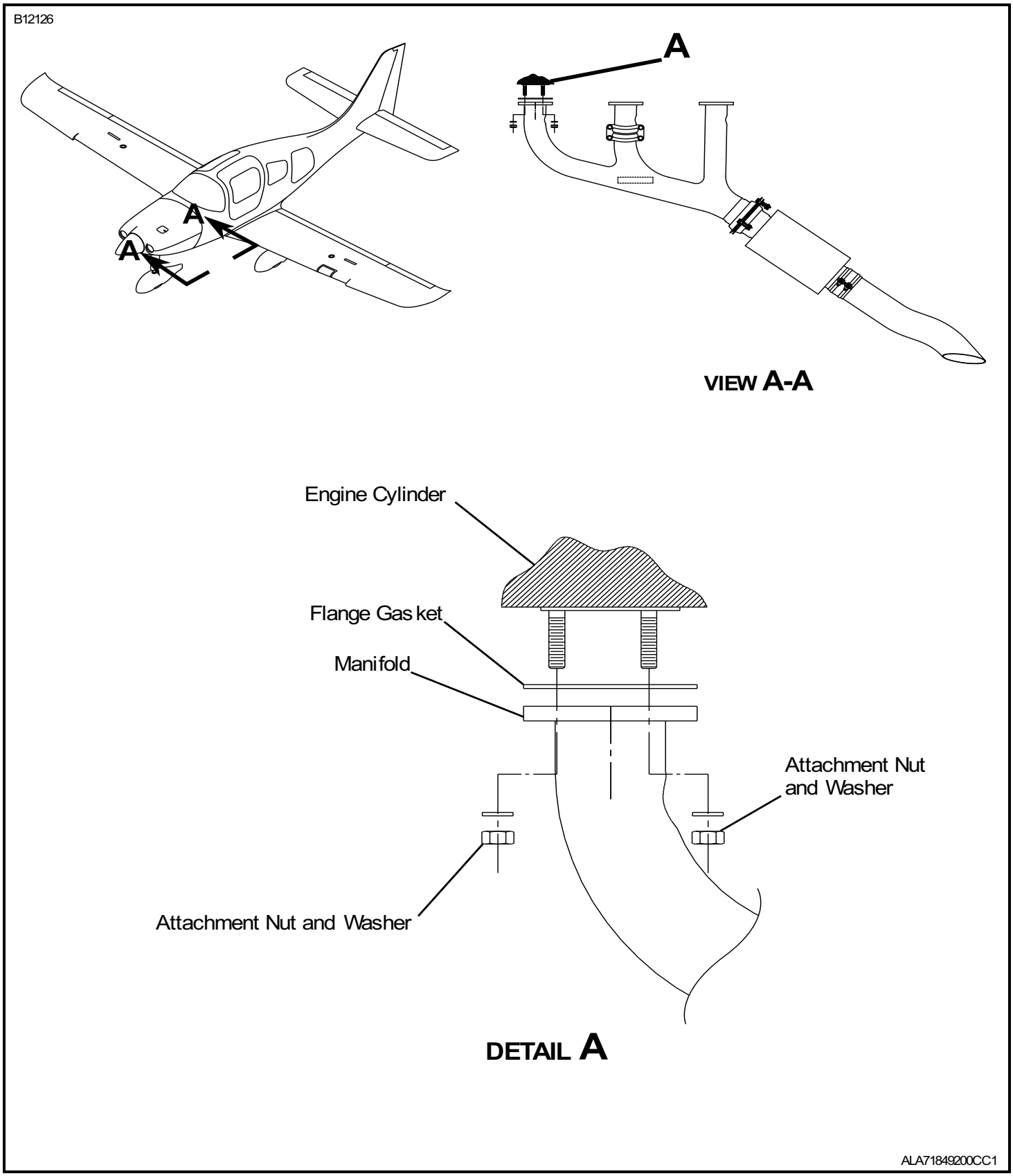
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Heat Exchanger and Ducting



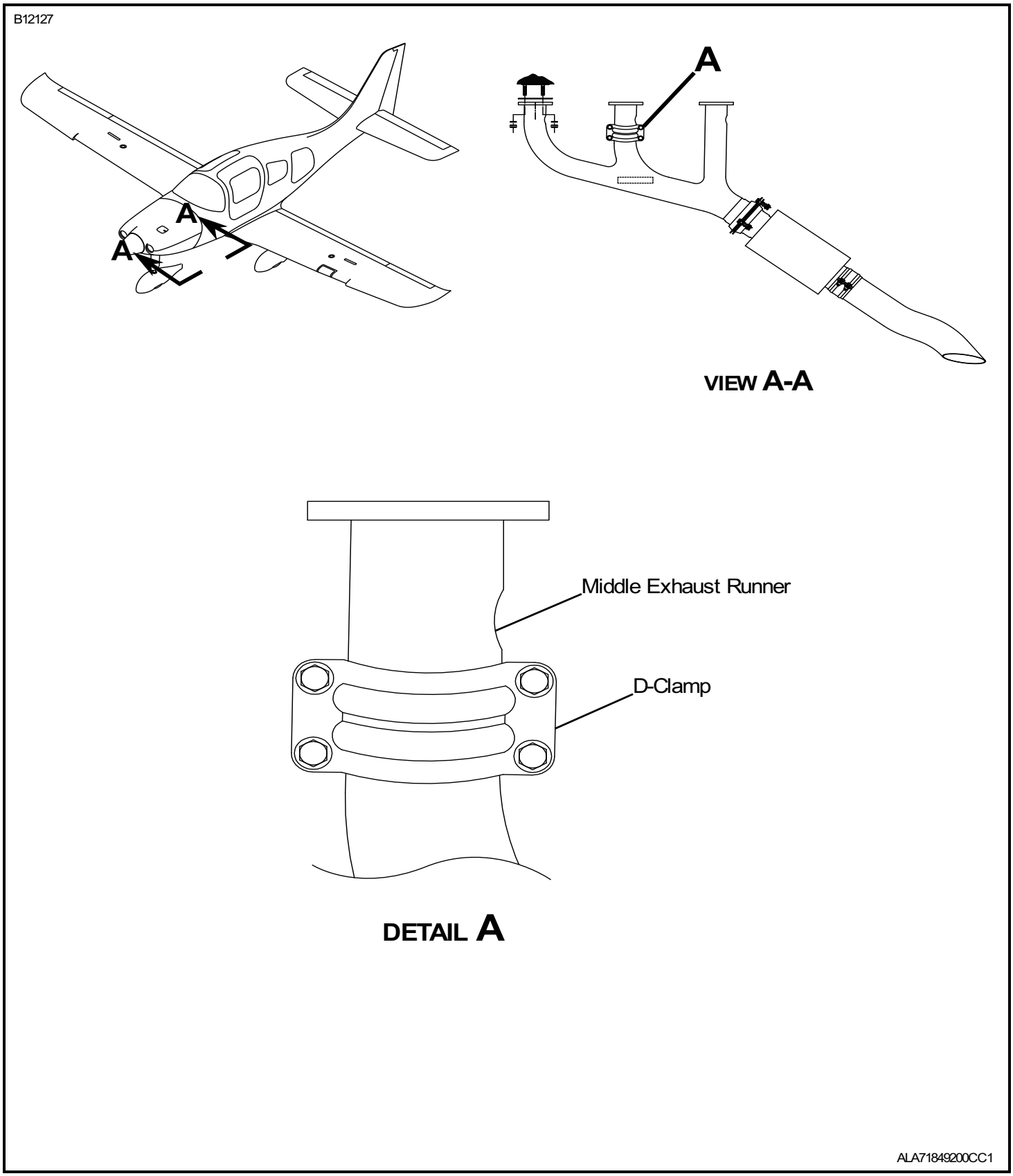
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Manifold Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

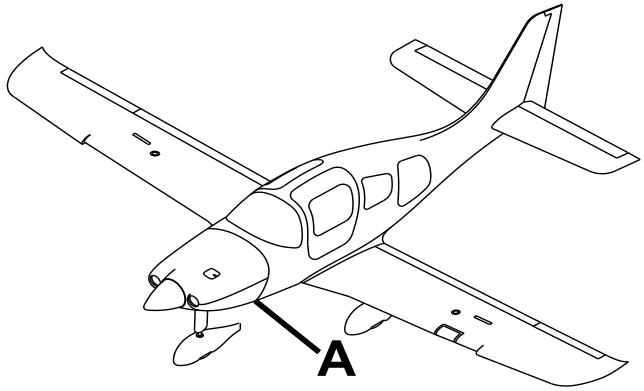
Figure 204 : Sheet 1 : Exhaust Runner and D-Clamp

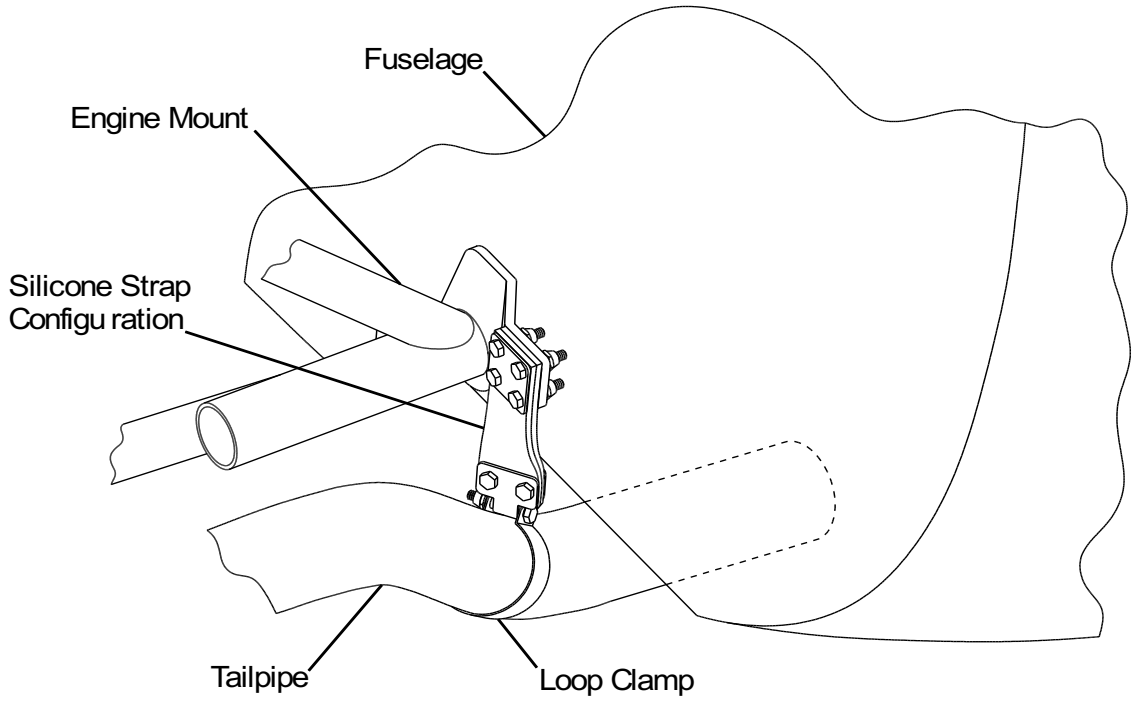


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 4 : Sheet 1 : Tailpipes

B12121



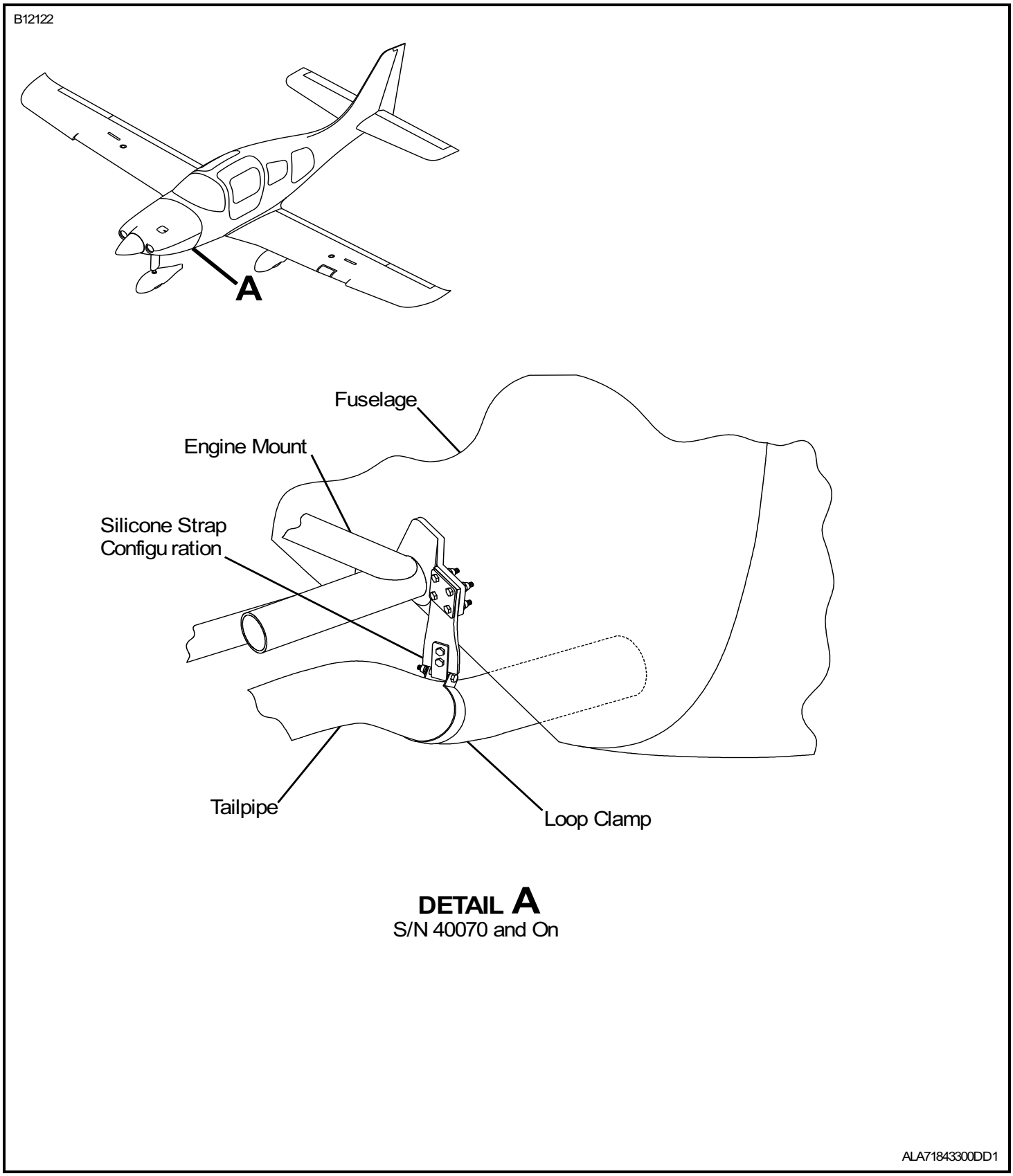


DETAIL A
S/N 40004 to 40069

ALA71843300DD1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

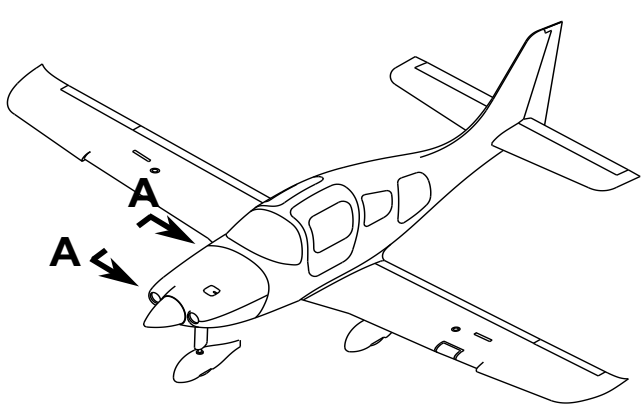
Figure 4 : Sheet 2 : Tailpipes

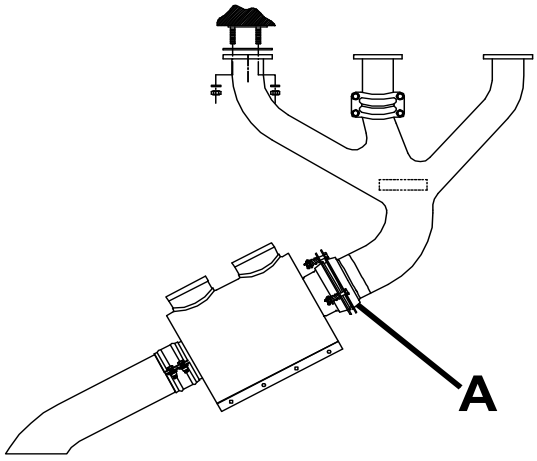


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

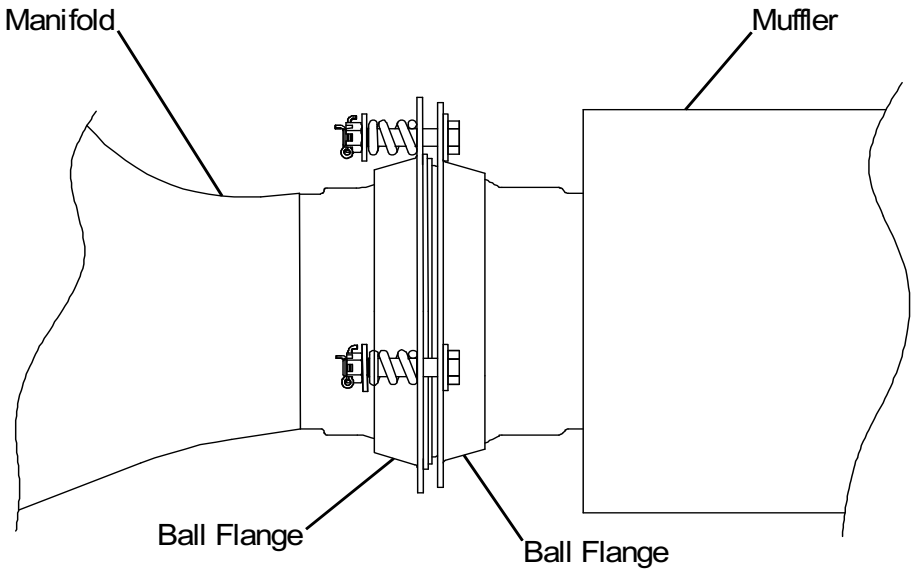
Figure 2 : Sheet 1 : Manifold to Muffler Connection

B12119





VIEW A-A



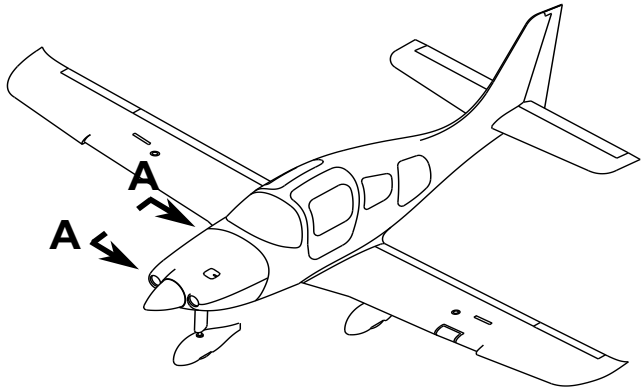
DETAIL A

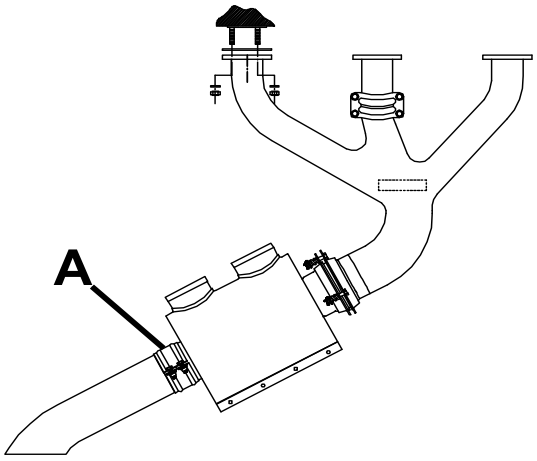
ALA71849200BB1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

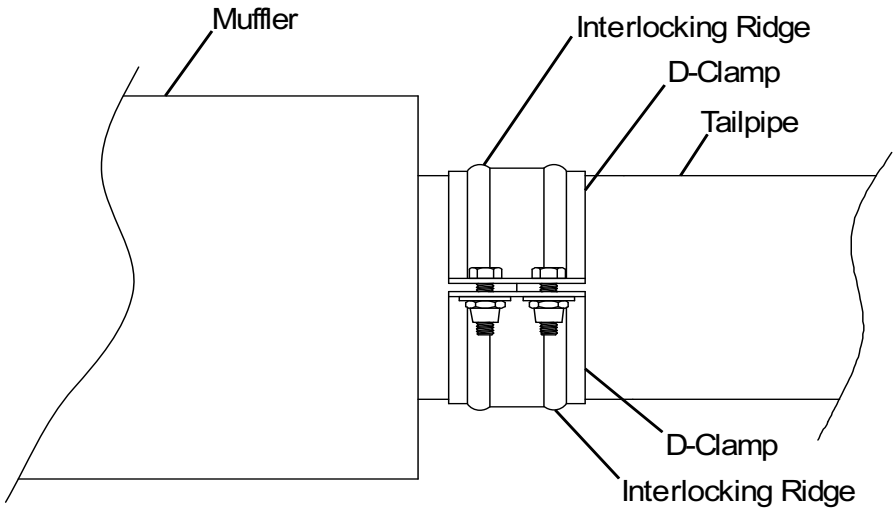
Figure 3 : Sheet 1 : Muffler to Tailpipe Connection

B12120





VIEW A-A



DETAIL A

ALA71849200BB1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

OIL - GENERAL

1. General

A. The oil system for the engine has several important functions. The engine oil reduces friction of moving parts, removes heat from the engine, removes contaminants from the engine with a filter and protects the engine from corrosion. The engine oil system provides lubrication and a hydraulic source for the constant-speed propeller and governor. This section provides reference information to the procedures to maintain the airplane oil system.

NOTE: This manual contains some information about operating limits for convenience, refer to the approved Airplane Flight Manual or Type Certificate Data Sheet for a complete listing operating limitations.

B. Engine Oil Pressure and Temperature Indication

(1) The engine oil pressure and temperature indication is located on the engine instrument panel located on the left side of the pilot's side instrument panel.

C. Engine Oil Pressure and Temperature Sensing

(1) The engine oil pressure transducer is found near the oil cooler on the left side of the engine and is installed in a cross fitting just above Hobbs oil pressure switch. Refer to Chapter 77, Engine Temperature - Maintenance Practices.

(2) The oil temperature bulb is installed near the bottom of the oil cooler in the oil drain screen.

D. Oil Servicing

(1) For information about oil servicing and change intervals, refer to Chapter 12, Replenishing - Servicing.

E. Refer to the Teledyne Continental Motors Permold Series Maintenance Manual Model IO-550-N Form Number X30634A for specific maintenance information. Contact Teledyne Continental Motors to ensure you have the latest revision to their manual. It is the responsibility of the owner or operator of the airplane to maintain the revision schedule for all manuals related to the Teledyne Continental Motors Permold Series Model IO-550-N.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STARTING - GENERAL

1. General

NOTE: See Teledyne Continental Motors Permold Series Maintenance Manual Model IO- 550-N Form Number X30634A for specific maintenance information. Contact Teledyne Continental Motors to ensure you have the latest revision to their manual. It is the responsibility of the owner or operator of the airplane to maintain the revision schedule for all manuals related to the Teledyne Continental Motors Permold Series Model IO-550-N.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LIST OF REVISIONS

1. Revisions

A. This Maintenance Manual includes the original issue and the revisions listed in Table 1. Put revisions in this manual when they are received. This will make sure that this manual has the most current maintenance and inspection procedures.

Table 1. Original Issue - Mar 1/2009

Revision Number	Date	Revision Number	Date
1	Jan 1/2012	2	Jul 1/2012
3	Mar 1/2013	4	Sep 1/2015
5	Sep 1/2016		

B. FAA Approved Airworthiness Limitations are incorporated in this maintenance manual as Chapter 4. Revisions to Chapter 4 are dated as approved by the FAA Regional Manager, Aircraft Certification Office. To make sure that the maintenance information required under Title 14 of the Code of Federal Regulations, Parts 43.16 and 91.409 is current, the revisions listed in Table 2 must be incorporated in Chapter 4 as they are issued.

Table 2. Original Issue - Mar 1/2009

Revision Number	Date
1	Mar 1/2012

2. Export Compliance

A. This publication contains technical data and is subject to U.S. export regulations. This information has been exported from the United States in accordance with export administration regulations. Diversion contrary to U.S. law is prohibited. ECCN: 9E991

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INTRODUCTION

1. General

A. The information in this publication used the data available at the time of publication and is updated, supplemented, and changed by service letters, service bulletins, publication revisions, reissues, and temporary revisions, which are supplied by subscription services available from Cessna Customer Service. All of these changes become part of and are specifically included in this publication. The latest changes to this publication are given through the Cessna Customer Service subscription services and/or Cessna Service Centers and Cessna Service Stations.

WARNING: The purchaser is warned not to use the data in Cessna's maintenance/service manuals and parts catalogs when parts are designed, manufactured, remanufactured, overhauled, and/or approved by entities, other than Cessna, are installed. when non-Cessna parts are used, the data in Cessna's maintenance/service manuals and parts catalogs are no longer applicable. All of the inspection intervals, replacement time limits, overhaul time limits, the method of inspection, life limits, cycle limits, etc., Cessna recommends are given when new, remanufactured, or overhauled Cessna approved parts are installed. All inspection intervals, replacement time limits, overhaul time limits, the methods of inspection, life limits, cycle limits, etc., for non-Cessna parts must come from the manufacturer and/or seller of the non-Cessna parts.

B. Inspection, maintenance and parts requirements for Supplemental Type Certificate (STC) installations are not given in this manual. When the airplane has an STC installation, those parts of the airplane that the installation has an effect on, must be examined in accordance with the inspection program published by the owner of the STC. Cessna-supplied inspection criteria may not be valid for airplanes that have STC installations because they may change the systems interface, operating characteristics and component loads or stresses on adjacent structures.

2. Coverage

A. The Cessna Model 300 Maintenance Manual is prepared with information given by the ATA (Air Transport Association) Specification Number 2200 for Manufacturer's Technical Data.

B. The information in this maintenance manual is applicable to US certified Model 300 airplanes.

C. This manual gives the necessary information required to help maintenance personnel service, examine, troubleshoot, remove and replace components or repair systems on the Model 300 airplanes.

D. Additional information not given in this manual can be found in the Cessna Aircraft Company Model 300 Electrical Manual and Illustrated Parts Catalog. For technical aid applicable to this manual, contact Cessna Customer Service.

E. Use the technical publications available from manufacturers of the different airplane components and systems, which are not covered in this manual, as necessary for maintenance of those components and systems.

3. Temporary Revisions (Paper Version of this Manual Only)

A. Additional information, when it is available, may be supplied by a temporary revision. This service is used to give, without delay, new information, which will help maintain safe flight and ground operations. Temporary revisions are numbered consecutively in the ATA chapter assignment. Page numbering uses the three-element number, which matches the maintenance manual. Temporary revisions are incorporated into the maintenance manual at the next regularly scheduled revision.

4. Serialization

A. All Model 300 airplanes are assigned a serial number. Serial numbers are assigned one after the other to each airplane as it is made and will stay with the airplane during its service life. The serial number is shown on the airplane identification plate.

B. This maintenance manual includes Model 300 airplanes Serial Numbers 40004 and On. The airplane serial number may be shown in the text or in an illustration to identify maintenance instructions specified for an airplane. Instructions and illustrations that are not identified by airplane serial number(s) are standard or optional and they are applicable to airplanes with the system(s) or component(s) installed.

5. Compact Disc-Read Only Memory (CD-ROM)

A. Model 300 publications are available in paper and as electronic media CD-ROM. The paper publications are available as individual publications, such as Maintenance Manual, Illustrated Parts Catalog, etc., while the electronic service publications are all supplied on the CD-ROM. These publications are kept up to date through subsequent revisions.

6. Service Bulletins

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

A. Service bulletins prepared for the Model 300 airplanes are recorded in the Service Bulletin List. The Service Bulletin List gives service bulletin information.

(1) Service Bulletin Number - Service bulletins are given numbers by ATA chapter number, followed by a number that is in sequence that has at least two digits, and starts with the numbers zero and one (01).

(2) Service Bulletin Date - The service bulletin date is the date the service bulletin was printed.

(3) Manual Incorporation Date - This shows how the service bulletin affects the manual.

(a) Date - This shows when the service bulletin information was put into the manual.

(b) No Effect - This shows the service bulletin does not affect the manual.

(c) Other self-explanatory statements can show other replacement data.

(4) Title - The title identifies the service bulletin by nomenclature. It is the same title shown on Page 1 of the service bulletin.

7. Maintenance Manual Use

A. Division of Subject Matter.

(1) The Model 300 Maintenance Manual is divided into four major sections. The major sections are separated into chapters. Each chapter has its own List of Effectivity Page and Contents page. The manual divisions are as follows:

(a) Major Section 1 - Airplane General

Chapter	Title
4	Airworthiness Limitations
5	Time Limits and Maintenance Checks
6	Dimensions and Areas
7	Lifting and Shoring
8	Leveling and Weighing
9	Towing and Taxiing
10	Parking, Mooring, Storage and Return to Service
11	Placards and Markings
12	Servicing

(b) Major Section 2 - Airframe Systems

Chapter	Title
20	Standard Practices - Airframe
21	Air Conditioning/Environmental Control System
22	Auto Flight
23	Communications
24	Electrical Power
25	Equipment/Furnishings
26	Fire Protection
27	Flight Controls
28	Fuel
31	Indicating/Recording Systems
32	Landing Gear and Brakes
33	Lights
34	Navigation

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

35	Oxygen
37	Vacuum
39	Electrical Panels

(c) Major Section 3 - Structures

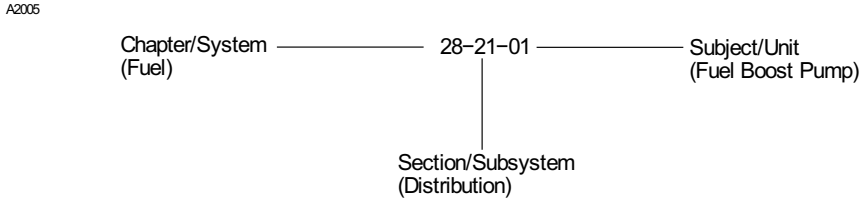
Chapter	Title
51	Standard Practices - Structures
52	Doors
53	Fuselage
55	Stabilizers
56	Windows
57	Wings

(d) Major Section 4 - Power Plant

Chapter	Title
61	Propeller
71	Powerplant
73	Engine Fuel System
74	Ignition
76	Engine Controls
77	Engine Indication
78	Exhaust
79	Oil
80	Starting

B. Page Number System.

(1) The page number system used in the Cessna Model 300 Maintenance Manual has three-element numbers that are separated by dashes. The three-element number is found at the bottom right corner of the page, to the left to the page number. The date is found below the page number.



(2) When the chapter/system element number is followed with zeros in the section/subsystem and subject/unit element number (28-00-00), the information is applicable to the entire system.

(3) When the section/subsystem element number is followed with zeros in the subject/unit element number (28-21-00), the information is applicable to the subsystems in the system.

(4) The subject/unit element number is used to identify information applicable to units in the subsystems. The subject/unit element number continues in sequence from the number -01- with the number of subsystem units in which maintenance information is necessary.

(5) All system/subsystem/unit (chapter/section/subject) maintenance data is separated into specified types of information: Description and Operation, Troubleshooting, Maintenance Practices, etc. Blocks of page numbers that are in sequence are used to identify the type of information:

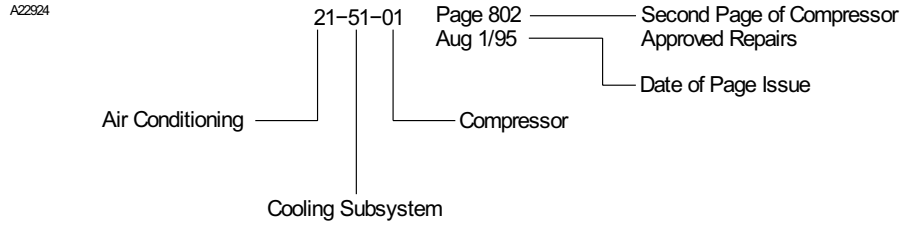
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(a) Description and Operation or Troubleshooting information may not be included if the procedure is easy. When subtopics are short, they may be put together into the Maintenance Practices section. Maintenance Practices can have a mix of subtopics that includes information to service, remove, install, adjust, test, clean, paint or do approved repairs.

(b) Longer procedures that are not as easy to do may be included in a specified section.

Page 1 through 99 - Description and Operation
Page 101 through 199 - Troubleshooting
Page 201 through 299 - Maintenance Practices
Page 301 through 399 - Servicing
Page 401 through 499 - Removal/Installation
Page 501 through 599 - Adjustment/Test
Page 601 through 699 - Inspection/Check
Page 701 through 799 - Cleaning/Painting
Page 801 through 899 - Approved Repairs

(6) A typical page number:



(7) Illustrations use the same figure numbers as the page block in which they appear. For example, Figure 202 would be the second figure in a Maintenance Practices section.

8. List of Effective Pages (Paper Version of this Manual Only)

A. A List of Effective Pages is supplied at the start of each maintenance manual chapter. All pages in the specified chapter are recorded in numerical sequence on the List of Effective Pages with the date of issue for each page.

9. Revision Filing Instructions (Paper Version of this Manual Only)

A. Regular Revision.

(1) Pages to be removed or put in the maintenance manual are given in sequence by their three-element number (chapter/section/subject) and page number on the List of Effective Pages. When two pages show the same three-element number and page number, the page with the most recent date of page revision date must be put in the maintenance manual.

(2) The date column on the List of Effective Pages will help you make sure the correct page(s) are in the manual.

(a) When a page is added to the chapter, the word "Added" will be put adjacent to the related page number on the List of Effective Pages.

(b) When a page is removed from the chapter, the word "Deleted" will be put adjacent to the related page number on the List of Effective Pages.

B. Temporary Revision.

(1) Put temporary revisions in the chapter where they apply. Refer to the filing instructions that are supplied on the cover page of the temporary revision.

(2) Remove a temporary revision when the data has been included in the maintenance manual or when it has been replaced by a different temporary revision. A Record of Temporary Revisions is found in each chapter, immediately after the List of Effective Pages. A Date Removed column on the Record of Temporary Revisions will show the date the temporary revision data was included in the manual. The temporary revision can be removed at that time.

10. Identifying Revised Material

A. Additions or revisions to text is in a section will be identified by a revision bar adjacent to the change in the left margin of the page.

B. Chapter 5 has revision bars to show revised text. Inspection items are also shown as REVISED, ADDED or DELETED and include the date the item code was revised. Also, a revision date can be found in the lower right corner of the page,

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

below the page number.

C. When large technical changes are made to text in a section, a revision bar will be shown the full length of the text.

11. Dimensions and Units

A. Dimensions and Units.

(1) All dimensions and units are given in both English and metric (International System of Units [SI]) units in the text and the illustrations. The English value is given and then the metric unit is given in parenthesis.

(2) Metric units are given in standard abbreviations.

(3) Station lines and locations are not given in metric units

12. Abbreviation

A. Abbreviations are not often given in this manual; however, abbreviated identification for switches, circuit breakers and annunciator panel legends are shown as they are seen on the placards or electroluminescent panels.

13. Warnings, Cautions and Notes

A. Warnings, cautions and notes, related to the procedures being done, are used. Each gives important information.

(1) WARNING - Tells maintenance personnel how to use the materials, processes, methods, procedures or limits, which must be followed accurately to prevent injury or death to persons.

(2) CAUTION - Tells maintenance personnel how to use the materials, processes, methods, procedures or limits, which must be followed accurately to prevent damage to equipment.

(3) NOTE - Tells maintenance personnel how to use methods, which will make the work easier.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

GENERAL DESCRIPTION

1. General

A. The Cessna 300 (LC40-550FG) is a pre-molded composite built, semi-monocoque, four seat, single engine, low wing, tricycle gear design airplane. The airplane is certified in the utility category and is used primarily for transportation and related general aviation uses. In this section, a brief overview of the airplane and its basic systems is provided, as well as a three-view drawing of the airplane. Refer to Figure 1.

2. Basic Construction Techniques

A. The construction process used to build the shell or outer surfaces of the fuselage, wing, and most control surfaces involves creating a honeycomb sandwich. The sandwich consists of two outer layers of pre-preg fiberglass around a honeycomb interior. The term pre-preg fiberglass means the fibrous material is impregnated with catalyzed epoxy resin by the manufacturer of the fiberglass. This process ensures consistency in surface thickness and strength. The honeycomb sandwich is assembled in molds of the wing, fuselage, and control surfaces. A vacuum is used during the heat curing procedure to ensure proper compaction. Other structural components of the airplane, like ribs, bulkheads, and spars, are constructed in the same manner. In areas where added structural strength is needed, such as the wing spars, carbon material is added to the honeycomb sandwich.

B. **Fuselage** - The fuselage is built in two halves, the left and right sides; each side contains the area from the firewall back to, and including, the vertical stabilizer. The bulkheads are inserted into the right side of the fuselage through a process known as secondary bonding. The two fuselage halves are bonded together, and the floors are bonded in after the fuselage halves are joined. Before the fuselage is assembled into one unit, cables, control actuating systems, and conduits are added at this point because of the ease in access. To prevent damage to the leading edge of the vertical stabilizer, anti-erosion tape may be installed on aircrafts S/N 40010 and On.

C. **Wings and Fuel Tanks** - The bottom wing skin and two spars are one continuous piece. The spars are placed in the bottom wing and bonded to the bottom inside surface. Next, the ribs are inserted and bonded to the inside surfaces of the bottom wing and to the spars. Finally, after wires, conduits, and control tubes are inserted, the two top wing halves are bonded to the bottom wing and all the spars and ribs. The airplane has integral fuel tanks, commonly referred to as a wet wing. The ribs, spars, and wing surfaces are the containment walls of the fuel tanks. All interior seams and surfaces within the fuel tanks are sealed with a fuel impervious substance. To prevent damage to the leading edge of the wing, anti-erosion tape may be installed on aircrafts S/N 40010 and On.

D. **Horizontal Stabilizer** - The horizontal stabilizer is two separate halves bonded to two horizontal tubes that are bonded to the fuselage. The shear webs and ribs are bonded into the inside surface of the lower skin and the upper skin is then bonded to the lower assembly. To prevent damage to the leading edge of the horizontal stabilizer, anti-erosion tape may be installed on aircrafts S/N 40010 and on.

3. Flight Controls

A. Refer to Chapter 27.

B. **Ailerons and Elevator** - The ailerons and elevator are of one-piece construction with most of the stresses carried by the control surface. Additional structural support is provided by the end caps and the drive rib which is used to mount the control's actuating hardware. The aileron and elevator control systems are operated through a series of actuating rods and bellcranks that run between the control surface and the control stick in the cockpit.

C. **Rudder** - The rudder is of one-piece construction with most of the stresses carried by the control surface. Additional structural support is provided by the drive rib which is used to mount the control's actuating hardware. The rudder control system is operated through a series of cables and mechanical linkages that run between the control surface and the rudder pedals in the cockpit.

4. Rudder Limiter

A. Refer to Section 27-01-00, Rudder Limiter System.

B. The rudder limiter, which is an integral part of the stall system, is designed to limit the normal full left rudder deflection of 17 degrees to only 11.5 degrees. The rudder limiter system is automatically armed in a relaxed position when the aircraft's electrical power is turned on. The system is activated when two conditions exist, the airplane's stall warning is active, and the engine manifold pressure is more than 12 inches of Hg. When the system is activated, a solenoid near the left rudder pedal moves a cam that physically limits the travel of the left rudder pedal. There is a time delay of approximately one second before the system is activated. This delay feature prevents inadvertent activation of the rudder limiter in turbulent air. A light located in the annunciator panel, triggered by a magnetic sensor located next to the rudder limiter cam acts as a

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

visual indication of when the rudder limiter is engaged.

C. Two points need to be emphasized regarding the operation of the rudder limiter. First, if a left rudder deflection of greater than 11.5 degrees exists before the stall warning is active with a throttle setting greater than 12 inches of Hg, the cam cannot engage. In addition, if a left rudder deflection of greater than 12 degrees exists while the stall warning is active and before the throttle setting is greater than 12 inches of Hg, then the cam cannot engage when the throttle is advanced beyond 12 inches of Hg. Second, if the rudder limiter is activated and pressure is applied to the left rudder pedal so that the rudder limiter cam is engaged and then the conditions which caused the rudder limiter to activate cease to exist so that the rudder limiter action is no longer needed, then the pressure on the left rudder pedal must be released in order for the rudder limiter cam to disengage. In either of these two conditions the cam actuation does not override the rudder input. It should also be noted that should the manifold pressure gauge itself or the stall warning horn become inoperative, the rudder limiter will still be functional provided that the stall warning vane is still operative.

5. Trim System

A. The airplane is equipped with a three-axes trimming system. The elevator trim tab is located on the right side of the elevator; the aileron trim tab is on the aileron of the right wing; and the rudder trim tab is in the middle of the rudder. The aileron and elevator trim tabs are electrically controlled by two switches in the trim assembly panel, which is above the engine controls. The two trim motors are protected by one-amp circuit breakers located in the circuit breaker assembly panel. The rudder trim tab is a fixed tab that may be manually adjusted when not in flight. Refer to Section 27-00-00

6. Wing Flaps

A. The airplane is equipped with Fowler flaps. During flap extension, the flaps move out from the trailing edge of the wing which increases both the camber and surface area of the wing. The flaps are powered by a 32-watt motor located under the front passenger's seat and protected by a 10-amp circuit breaker located in the circuit breaker panel. Refer to Section 27-50-00.

7. Door Seal System

A. The airplane is equipped with a pneumatic door seal system that limits air leakage and improves soundproofing. An inflatable gasket around each main door expands when the door seal system is turned on. An electrical motor near the pilot's rudder pedals operates the system, which maintains a differential pressure of 12 to 15 psi. The system is activated by a switch in the rocker switch panel labeled 'Door Seal' and is protected by a five-amp circuit breaker. The door seal system should be turned on before takeoff and turned off after landing. However, a limit switch will turn off the pump when the door locking mechanism is disengaged. Similarly, if the door locking mechanism is not properly engaged, the pneumatic door seal system will not operate. Refer to Section 52-20-00.

8. Landing Gear

A. The airplane has tricycle landing gear with the two main wheels located behind the center of gravity (CG) and a nose wheel forward of the CG point. The main gear is made from high quality rod steel that has been gun-drilled. The main gear is attached to a tubular steel gearbox that is bolted to the bottom of the fuselage, just aft of the wing saddle. There are 15x6.00-6 tires (tire width and rim diameter in inches) which are inflated to 55 psi and mounted to the gear with Cleveland disk brakes. Composite wheel fairings are mounted over each main gear tire to reduce drag. Refer to Section 32-10-00.

B. The nose gear has a nitrogen and oil filled oleo type strut that is bolted to the engine mount and serves as a shock absorber. The landing or vertical impact is absorbed by forcing oil through orifices in the piston and an internal plug or barrier. A rotation key or vane working within an oil filled pocket contains rotational movements (shimmy dampening). Both of these movements, vertical and rotational, are fully contained within the main cylinder body and under normal usage will require little maintenance. Refer to Section 32-20-00

9. Engine and Propeller

A. The airplane engine is a Teledyne Continental Motors' Aircraft Engine Model IO-550-N. It is a horizontally opposed, six-cylinder, fuel injected, air-cooled engine that uses a high-pressure wet-type oil sump for lubrication. There is also a full flow, spin-on, disposable oil filter. The engine has top air induction, an engine mounted throttle body, and a bottom exhaust system. On the front of the engine, accessories include a hydraulically operated propeller governor and a gear driven alternator. Rear engine accessories include a starter, gear driven oil pump, gear driven fuel pump, and dual gear driven magnetos and vacuum pumps. Refer to Chapter 71. The airplane is equipped with a Hartzell three-bladed constant speed propeller with a McCauley governor. Refer to Chapter 61.

10. Fuel System

A. The fuel system has two tanks that gravity feed to a three-position (Left, Right, and Off) fuel selector valve located between the pilot and copilot seats. The fuel flows from the selected tank to the auxiliary fuel pump and then to the strainer. From

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

this point it goes to the engine-driven pump where, under pressure, it is sent to the throttle/mixture control unit and then on to the fuel manifold valve for distribution to the cylinders. Unused fuel from the continuous flow is returned to the selected fuel tank. A pressure gauge on the metered side of the fuel manifold valve measures system pressure and displays both the fuel pressure and the equivalent fuel flow reading on the same gauge. Refer to Chapter 28.

11. Electrical System

A. The airplane electrical system is designed to normally operate at 14.2 volts. Power is supplied by a 60-amp alternator (continuous rating) and storage is maintained by a 25 amp-hour (at a 20-amp discharge rate) lead-acid battery located in the engine compartment. The voltage regulator is designed to maintain ±0.4 volts of the normal voltage. There is an alternator switch in the cockpit area that disconnects the alternator and stops the excitation. A red Alt Out light in the annunciator panel illuminates if the alternator becomes inoperative. At 16 volts output, an overvoltage control will stop the excitation to the alternator. The airplane is equipped with a voltmeter that measures bus voltage and an ammeter that measures the charging or discharging of the battery. Refer to Chapter 24.

12. Environmental Control System

A. The environmental control system (ECS) incorporates the use of an air-to-air heat exchanger, ram intake air, and an electric fan to distribute heated and outside air to various outlets within the cabin. The ECS essentially consists of two subsystems, heated air and fresh air. Heated air is sent to a floor vent system and defroster, and fresh air is ducted through the eyeball vents. The system demand affects the volume of flow to a particular vent. As more vents are opened, the airflow to each vent is decreased. Refer to Chapter 21.

13. Flight Instruments

A. The airplane is equipped with two engine-driven suction pumps that provide high velocity airflow to drive the gyros in the attitude and heading indicators. The pitot-static system measures pressure differences in ram air from the pitot tube and ambient air from the static air vent. Static air is also used as the pressure source for the vertical speed indicator and the altimeter. Refer to Chapter 34.

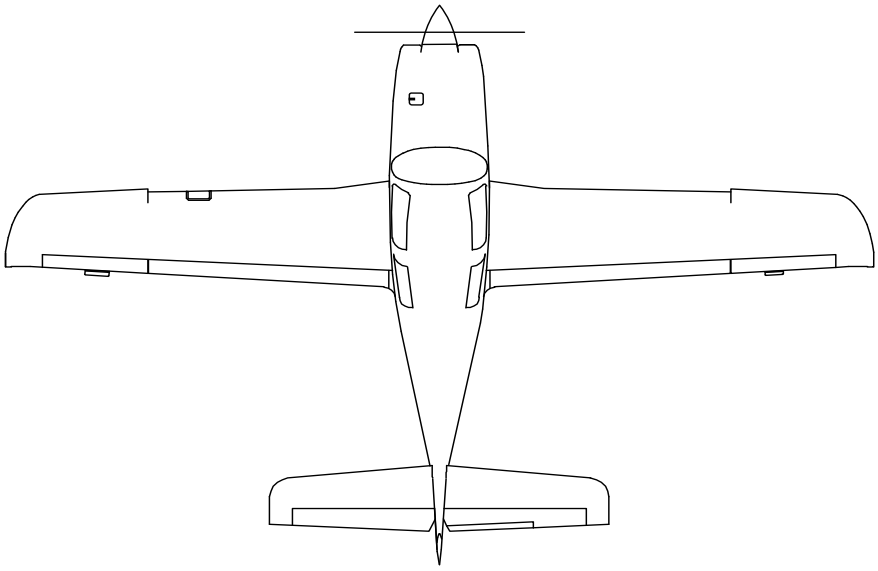
14. Three-View Drawing of the Airplane

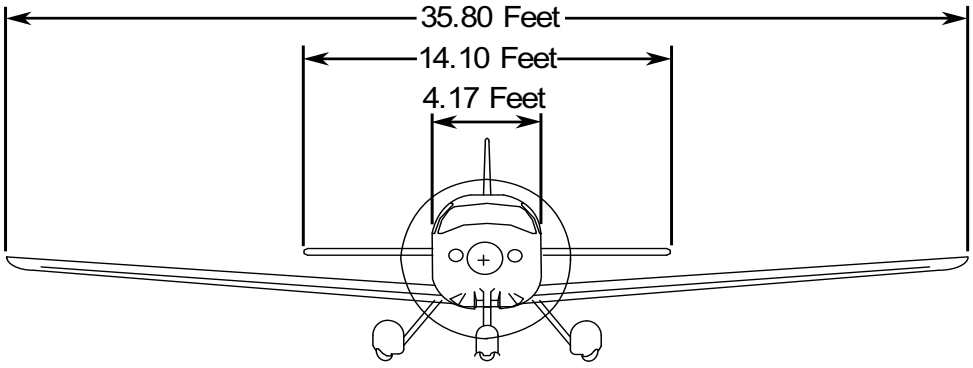
<table>
<tr><th colspan="2">Dimensions</th><th>Weight Data</th><th colspan="2">Speed Data</th><th>Specifications</th></tr>
<tr><td>Wing Area</td><td>141.2 Sq. Ft.</td><td rowspan="2">Empty Weight: 2200± Llbs.</td><td>Stall Speed</td><td>57 KIAS</td><td rowspan="2">Engine - 310HP lO-550-N Continental</td></tr>
<tr><td>Wing Span</td><td>35.8 Ft.</td><td>Maneuvering Speed</td><td>149 KIAS</td></tr>
<tr><td>Length</td><td>25.2 Ft.</td><td rowspan="2">Gross Weight: 3400 Lbs.</td><td>Cruising Speed</td><td>190 KCAS</td><td rowspan="2">Propeller - 78 inch Hartzell/McCauley</td></tr>
<tr><td>Height</td><td>9 Ft.</td><td>Never Exceed Speed</td><td>235 KCAS</td></tr>
</table>

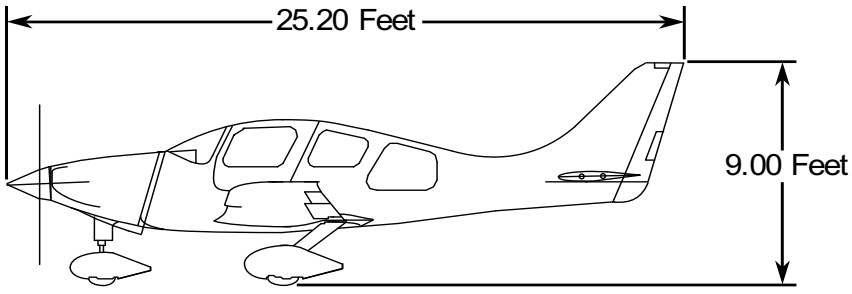
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Cessna 300 (LC40-550FG)

B11761







LC57605000C1
LC57605000A1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ICA SUPPLEMENT LIST

ICA Supplement Number	Title	ICA Supplement Date	Manual Incorporation Date
ICA-T240-27-00001	Rudder Cable Tube Insert and Clamp Installation	May 07/2010	March 1/2013

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENVIRONMENTAL CONTROL SYSTEM - GENERAL

1. General - Scope and Definition

A. The Cessna 300 (LC40-550FG) Environmental Control System (ECS), shown in Figure 1, works much like an automotive application where there is control over temperature throughout the front and rear cabin area. The ECS incorporates the use of an air-to-air heat exchanger, ram intake air, and an electric fan to distribute heated and outside air to various outlets within the cabin. The ECS essentially consists of two subsystems, heated air and fresh air. Heated air is sent to the floor vent system and defroster, and fresh air is ducted through the eyeball vents. The system demand affects the volume of flow to a particular vent. As more vents are opened, the airflow to each vent is decreased. Ram air enters through a duct on the right side of the engine cowling and flows to either the heat exchanger (located on the right exhaust manifold) or the fresh air manifold. Air to the heat exchanger, depending on the control settings, is mixed with outside air in the heater valve. The air next passes through a fan unit before entering the distribution system. Operating the single speed fan will increase the airflow through the system (not including the eyeball vents).

B. An air mixing valve takes both incoming hot and fresh air and mixes them according to the needs of the passengers.

C. Like a car, there are distinct levels of ECS control. Starting at the windshield area, there is a defrost plenum directly built into the fuselage. This will allow the pilot or copilot to defrost the windshield during cold weather conditions and supply fresh air to that location during periods of high ambient temperature. The defrosting system is operated by adjustment of the Defrost Air Knob in the ECS panel. Turning the knob clockwise will increase the airflow to the windshield. The temperature of the defrost air is controlled by the same center knob that controls the floor air system.

D. Just below the defrost plenum and located at the outer edges of the instrument panel are adjustable eyeball vents, one each for the pilot and copilot. Like most airplanes, these vents supply only fresh air to the front seat positions and may be manually directed to a desired location. Turning the adjustment ring on the vent counterclockwise opens the vent and increases airflow; turning the vent clockwise closes the vent and decreases airflow.

E. Farther down and closer to the pilot and copilot’s feet is a floor vent tube. Like the defrost plenum, this tube can direct hot, fresh, or mixed air to the lower front cabin area.

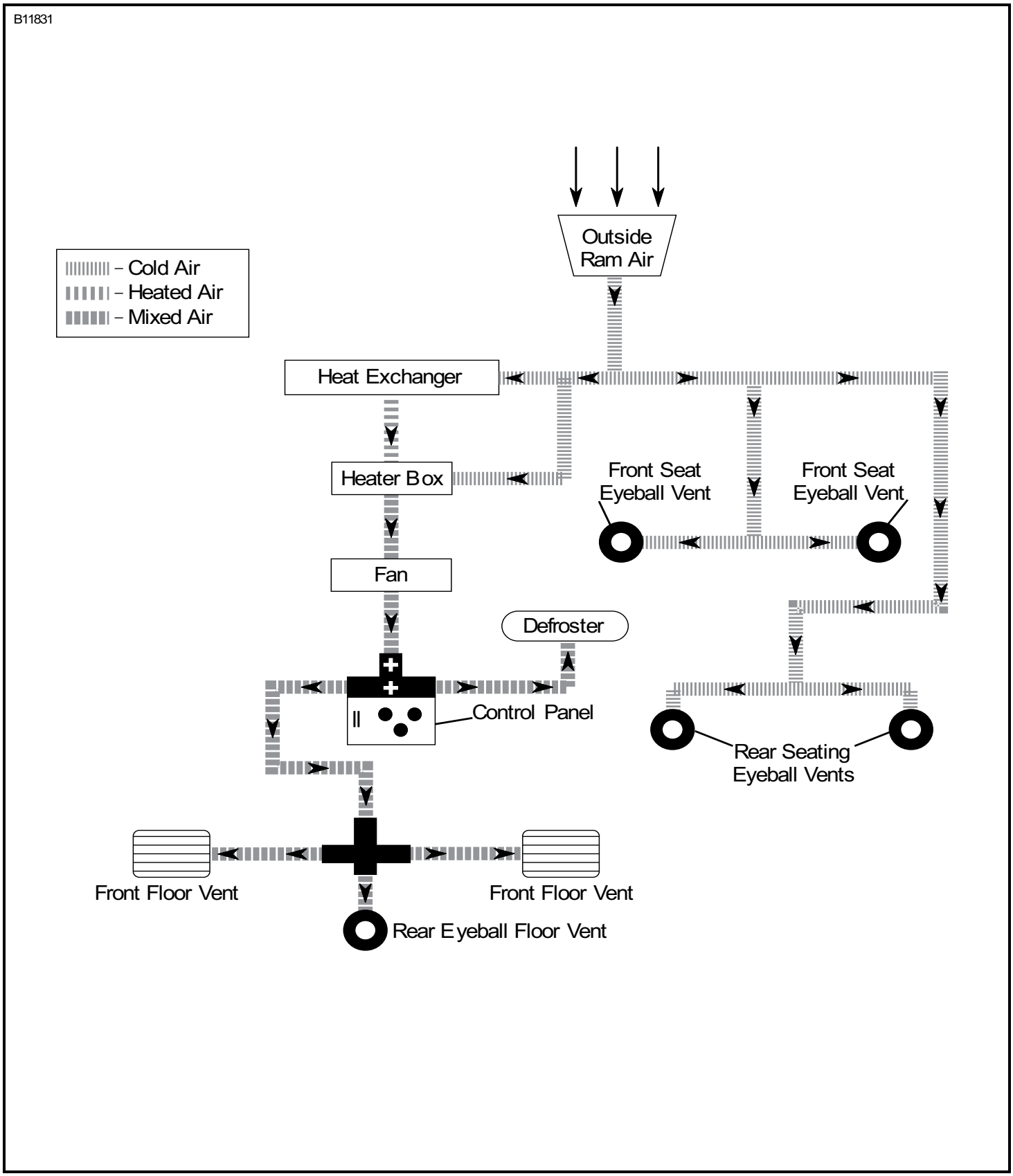
F. Directly tied into the floor vent tube and located at the aft end of the center console is an adjustable eyeball vent (two eyeball vents for S/N 40004 to 40008). This vent supplies the rear passengers the same air temperature as the floor and defrost vents but with the ability to be manually turned off independently or directed to a desired location. Turning the adjustment ring on the vent counterclockwise opens the vent and increases airflow; turning the vent clockwise closes the vent and decreases airflow.

G. Just to the outside of each rear passenger and located on the interior side panel is a fresh air eyeball vent identical to the ones located in the front instrument panel. Like the front, these vents supply only fresh air and may be manually adjusted or directed to a desired location. Turning the adjustment ring on the vent counterclockwise opens the vent and increases airflow; turning the vent clockwise closes the vent and decreases airflow.

H. An electrically controlled fan may be turned on while on the ground or during flight to supply cooler fresh air through the defrost plenum, floor tube, and rear passenger center console eyeball vent (two eyeball vents for S/N 40004 to 40008) during the summer or aid in deicing the windshield before and after takeoff during the winter months.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Environmental Control System Diagram



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENVIRONMENTAL CONTROL SYSTEM - MAINTENANCE PRACTICES

1. Distribution System

A. The distribution system includes the fan, air control valve, servo motor, defrost plenum, and eyeball and floor vents.

2. ECS Fan

A. Fan Removal

(1) Unplug the electrical connector plug, then cut and remove the plastic tie straps located at the inlet and outlet ports of the fan.

(2) Pull the flexible ducting away from the fan.

(3) Loosen and disconnect the main mounting clamp until the fan can be freed from the cradle housing.

(4) Remove the fan by pulling it out from underneath the instrument panel. Refer to Figure 201 and Figure 202 of Section 21-40-00.

B. Fan Installation

(1) Position the fan in the cradle leaving enough room between the heater control valve and the fan inlet port for flexible ducting.

(2) Connect and tighten the main mounting clamp around the fan motor housing.

(3) Slide the flexible ducting over the inlet and outlet ports of the fan, and secure using plastic tie straps.

(4) Reconnect the ELC connector.

(5) Turn on the power, and test the fan for proper operation.

C. **Fan Maintenance** - The electrically controlled ECS fan is a self-contained unit and requires only a periodic check for proper operation.

3. Servo Motor

A. Servo Motor Removal (S/N 40004 to 40049)

(1) Remove the heater control valve per Section 21-40-00, Heater Control Valve.

(2) Remove the heater control valve lid by removing the retaining screw, washer, and nut.

(3) Pull the lid out from the control valve retaining flange to expose the servo motor attachment screws.

(4) Remove the servo motor retaining screws, washers, spacers, and nuts.

(5) Remove the servo motor from the valve. To prevent unnecessary flap adjustment, do not loosen or remove the heater control valve flap adjustment plate hardware.

(6) Remove the servo motor actuator arm retaining screw, and remove the actuator arm. Refer to Figure 201.

B. Servo Motor Installation (S/N 40004 to 40049) - To assemble the servo motor to the heater control valve:

(1) Install the actuator arm to the servo arm with the screw, washer, and nut.

(2) Insert the plastic servo motor actuator arm roller into the slot on the heater valve flap adjustment plate.

(3) Install the servo motor to the heater valve with screws, washers, spacers, and nuts.

(4) Install the lid to the heater control valve by inserting the lid flange into the heater valve flange, and secure with a screw, washer, and nut.

(5) Install the heater control valve per the Heater Control Valve section of this manual.

C. Servo Motor Removal (S/N 40050 and on)

(1) With power on, adjust the temperature knob in the instrument panel to the full cold position, then turn power off.

(2) Remove the heater control valve per the Heater Control Valve section of this manual.

(3) Remove the servo motor to heater control valve attachment screws, washers, and nuts.

(4) Pull the servo motor back and away from the control valve until the servo motor drive arm to linier drive rod clevis is exposed.

(5) Remove the cotter pin, washer, and clevis pin, and remove the servo motor from the control valve.

D. Servo Motor Installation (S/N 40050 and on)

(1) With the servo motor arm in the fully extended position, install the servo motor drive arm into the linier actuator clevis, and reinstall the clevis pin, washer, and a new cotter pin.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(2) Align the mounting holes in the servo motor with the mounting holes in the heater control valve. Install screws, washers, and nuts only tight enough so that servo motor can be pushed forward by hand.

(3) With the heater control valve secured, hand push the servo motor forward until the silicone sealing cushion inside of control valve is fully seated against metal sealing ring. Tighten the servo mounting hardware.

E. **Maintenance** - The heater control valve servo motor is a self-contained unit and requires only a periodic check for proper operation.

F. **Integration with the Standby Battery** - The heater control valve servo is powered by two independent power supplies, the main power supply (aircraft battery and/or alternator), or the standby battery. The servo motor is wired directly into the motor control card located on the temperature and air control unit. From there the motor control card power source is wired directly to the turn coordinator circuit breaker located in the circuit breaker panel. Power is supplied to that breaker switch by either the standby battery (located under the right lower side of the windshield and against the fuselage) or the main power supply. Selection of standby battery power is accomplished by activating or deactivating the standby battery switch. Refer to Figure 202 for a schematic of the integration.

4. Defrost Plenum

A. **Removal/Installation** - The defrost plenum is an integral part of the fuselage and contains no moving parts; therefore, no removal is required.

B. **Maintenance** - The defrost plenum is an integral part of the fuselage, therefore, no maintenance is required.

5. Eyeball Vents (Instrument Panel)

A. **Eyeball Vent Removal** - To remove the eyeball vents from the instrument panel use the following instructions:

(1) Remove the left and right side instrument panel screws.

(2) Gently pull the instrument panel away from the main panel until the eyeball vent flexible ducting can be seen.

(3) Loosen the clamp securing the plastic plenum cap to the backside of the eyeball vent, and gently pull the plastic housing away from the vent.

(4) Loosen and remove the threaded eyeball vent retaining collar from the backside of the panel.

(5) Pull the eyeball vent out from the front of the panel. Refer to Figure 203 for a schematic of the eyeball vent installation.

B. **Eyeball Vent Installation** - To install eyeball vents into the instrument panel, use the following instructions:

(1) Insert the eyeball vent into the front, side instrument panel hole.

(2) Install the threaded eyeball vent retaining collar to the backside of eyeball vent.

(3) Press the plastic plenum cap onto the backside of the eyeball vent, and secure with clamp.

(4) Install the instrument panel to the main panel with screws.

C. **Eyeball Vent Maintenance** - The instrument panel eyeball vents are self-contained; therefore, no maintenance is required.

6. Eyeball Vents (Rear Interior Side Panels)

A. **Eyeball Vents Removal** - To remove the rear interior side panel eyeball vents use the following instructions.

(1) Remove the rear interior panel attachment screws, then gently pull the interior side panel up and away from the fuselage until the eyeball vent ducting can be seen.

(2) Loosen the clamp securing the plastic plenum cap to the backside of the eyeball vent, and gently pull the plastic housing away from the vent.

(3) Loosen and remove the threaded eyeball vent retaining collar from the backside of the panel.

(4) Pull the eyeball vent out from the front of the panel.

B. **Eyeball Vents Installation** - To install eyeball vents into the rear interior side panel use the following instructions:

(1) Insert the eyeball vent into the side panel hole.

(2) Install the threaded eyeball vent retaining ring to the backside of the eyeball vent.

(3) Press the plastic plenum cap onto the backside of the eyeball vent and secure with clamp.

(4) Install the rear interior panel to the fuselage, and attach it with screws.

C. **Maintenance** - The rear interior side panel eyeball vents are self-contained, therefore, no maintenance is required.

7. Floor Vent (Front)

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

A. **Removal/Installation** - The front floor vent is an integral part of the radio rack frame with no moving parts; therefore, no removal is required.

B. **Maintenance** - The front floor vent is self-contained; therefore, no maintenance is required.

8. Floor Vent (Rear)

A. **Floor Vent Removal** - To remove the rear floor vent (two vents for S/N 40004 to 40008) use the following instructions and refer to Figure 204:

(1) Gently pull the center console panel out and away from the main console.

(2) With the rear heat vent flexible ducting exposed, loosen the clamp securing the plastic plenum cap to the backside of the eyeball vent, and gently pull the plastic housing away from vent.

(3) Loosen and remove the threaded eyeball vent retaining collar from the backside of the panel.

(4) Pull the eyeball vent out from the front of the panel.

B. **Floor Vent Installation** - To install eyeball vent (two vents for S/N 40004 to 40008) onto the center console, use the following instructions and refer to Figure 204:

(1) Insert the eyeball vent into the side panel hole.

(2) Install the threaded eyeball vent retaining collar to the backside of the eyeball vent.

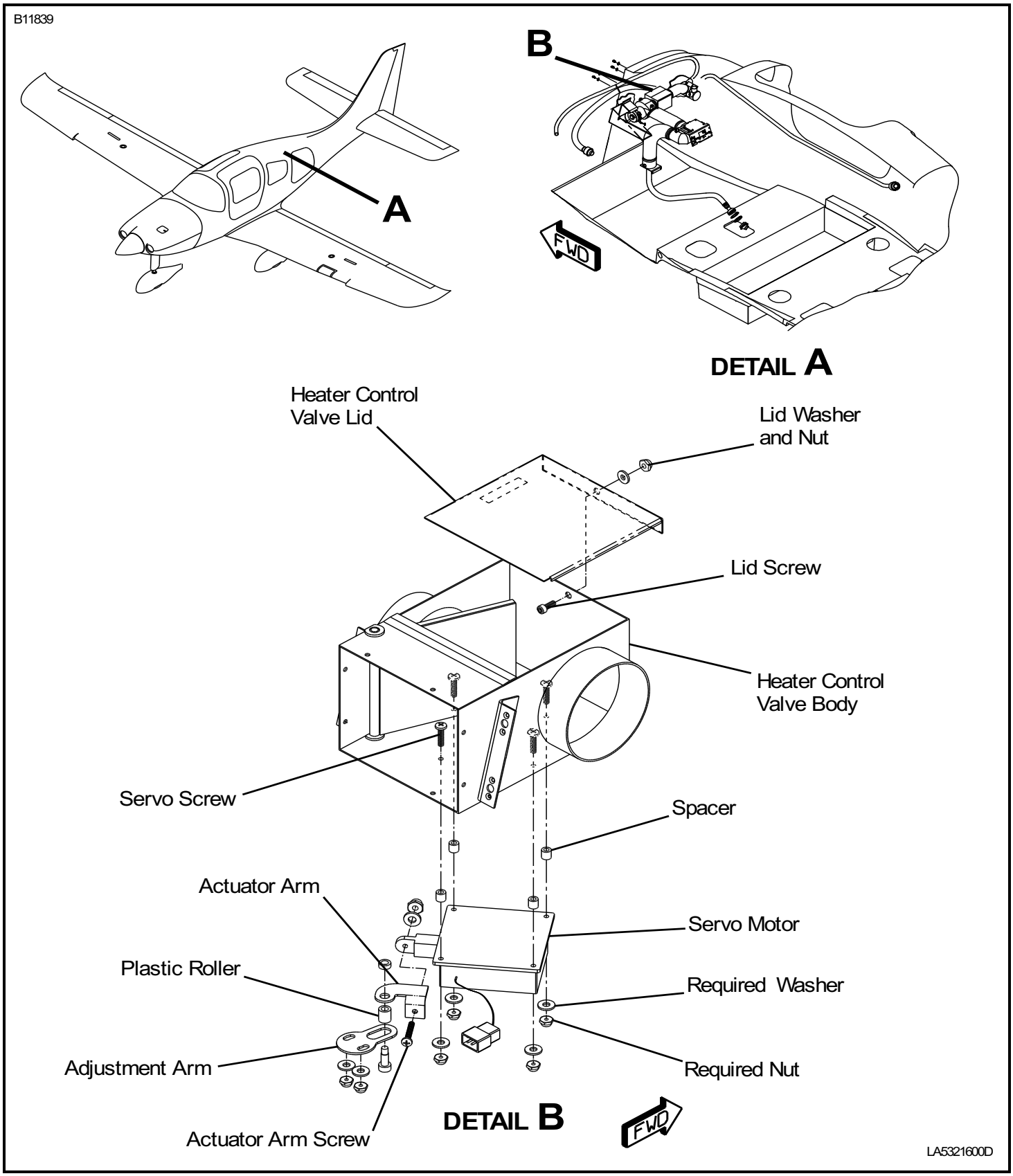
(3) Press the plastic plenum cap onto the backside of the eyeball vent, and secure with a clamp.

(4) Install the center console panel onto the main panel until the duel lock stripping is fully engaged.

C. **Eyeball Vents Maintenance** - The rear floor vent is self-contained; therefore, no maintenance is required.

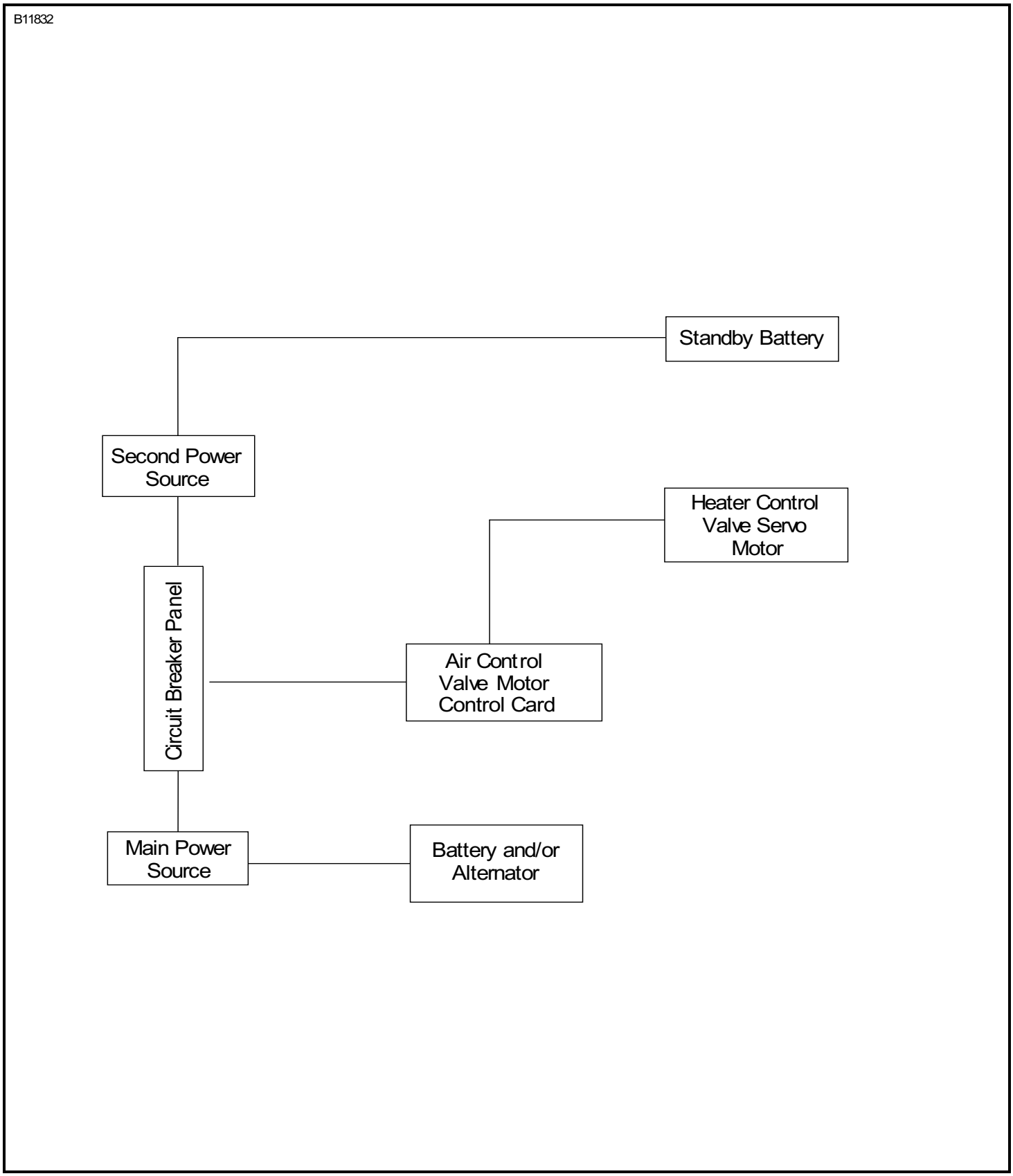
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Heater Valve (S/N 40004 to 40049)



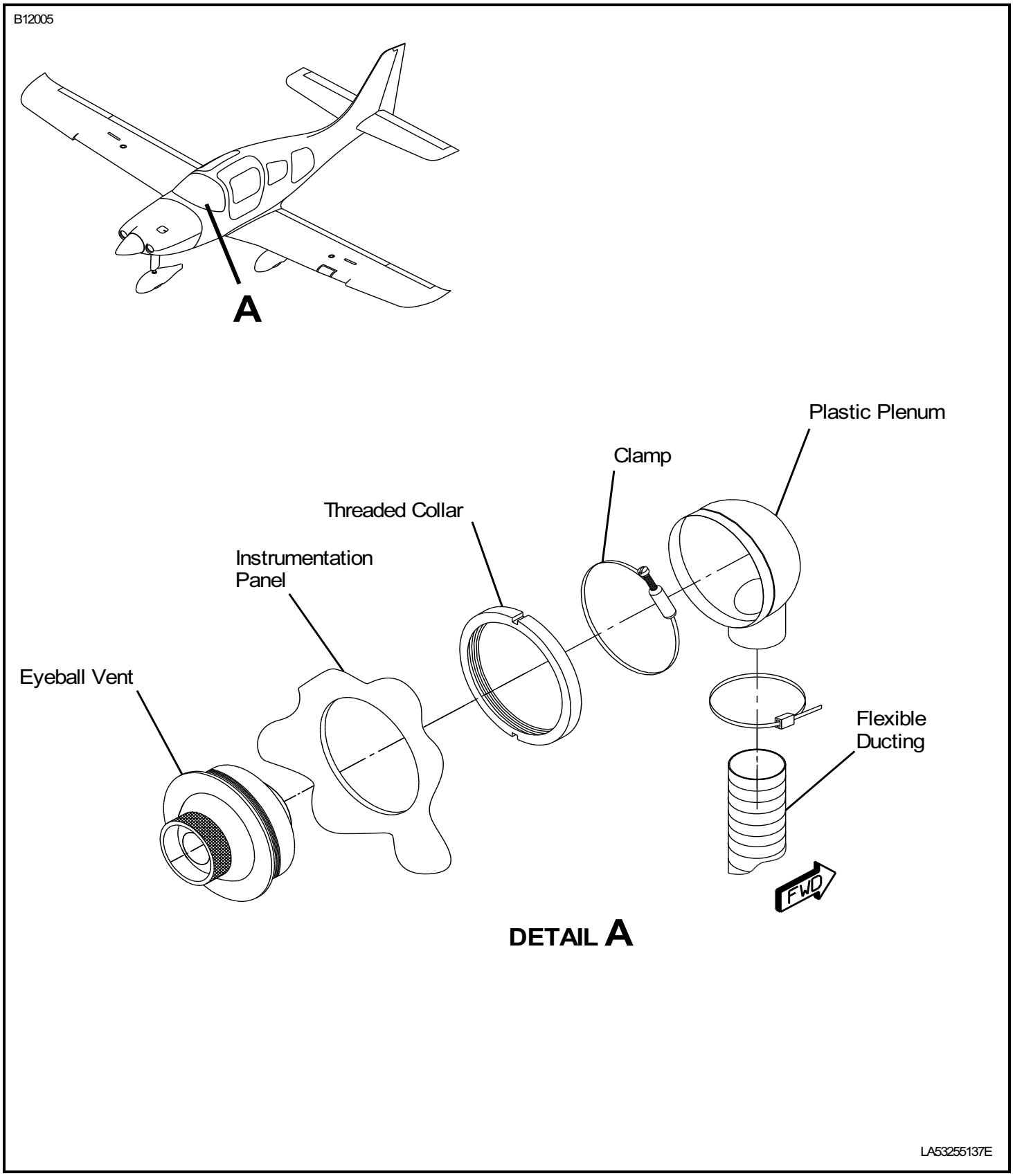
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Schematic of Heater Servo Motor Battery Connection



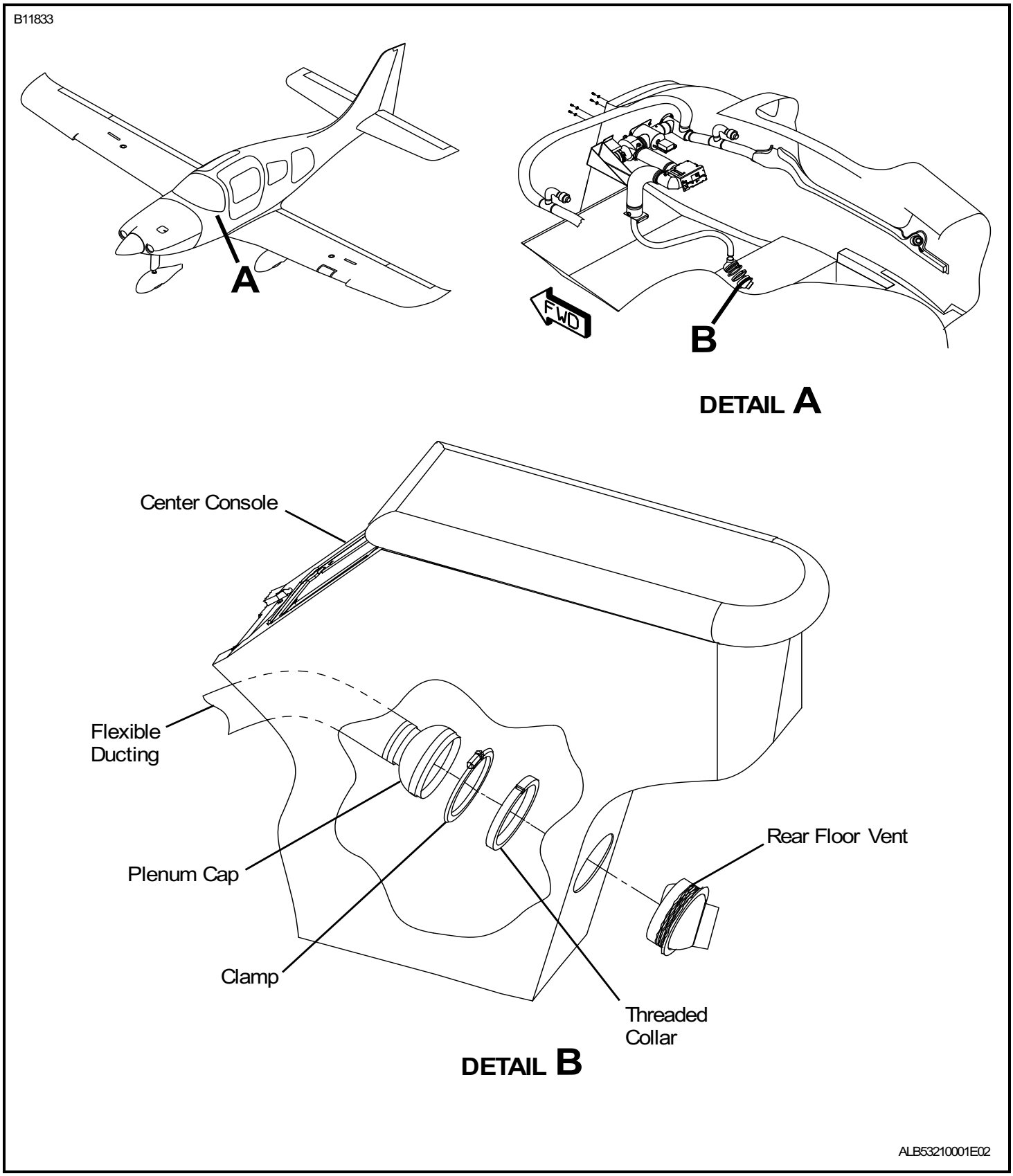
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Eyeball Vent Installation



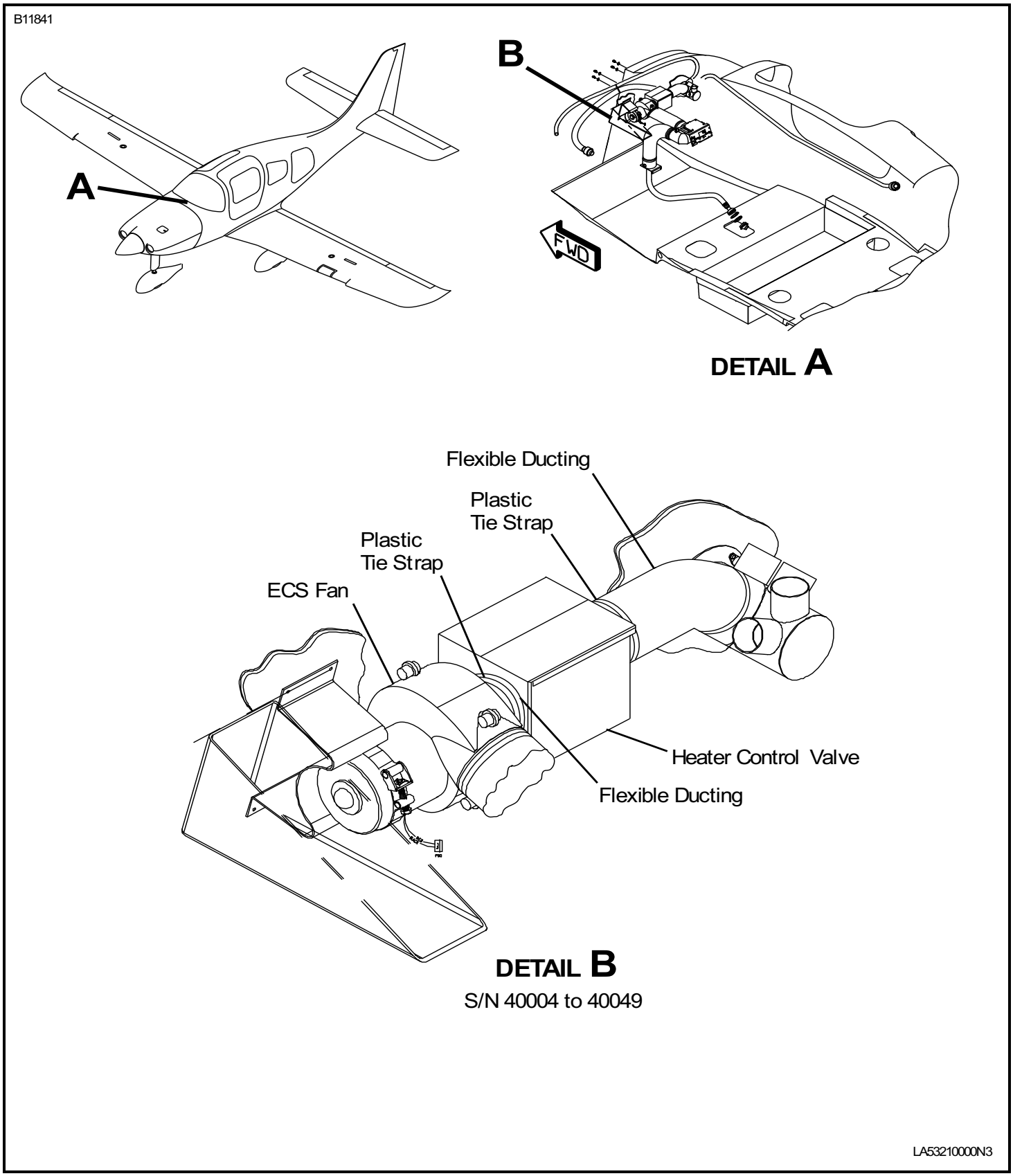
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Rear Floor Vent



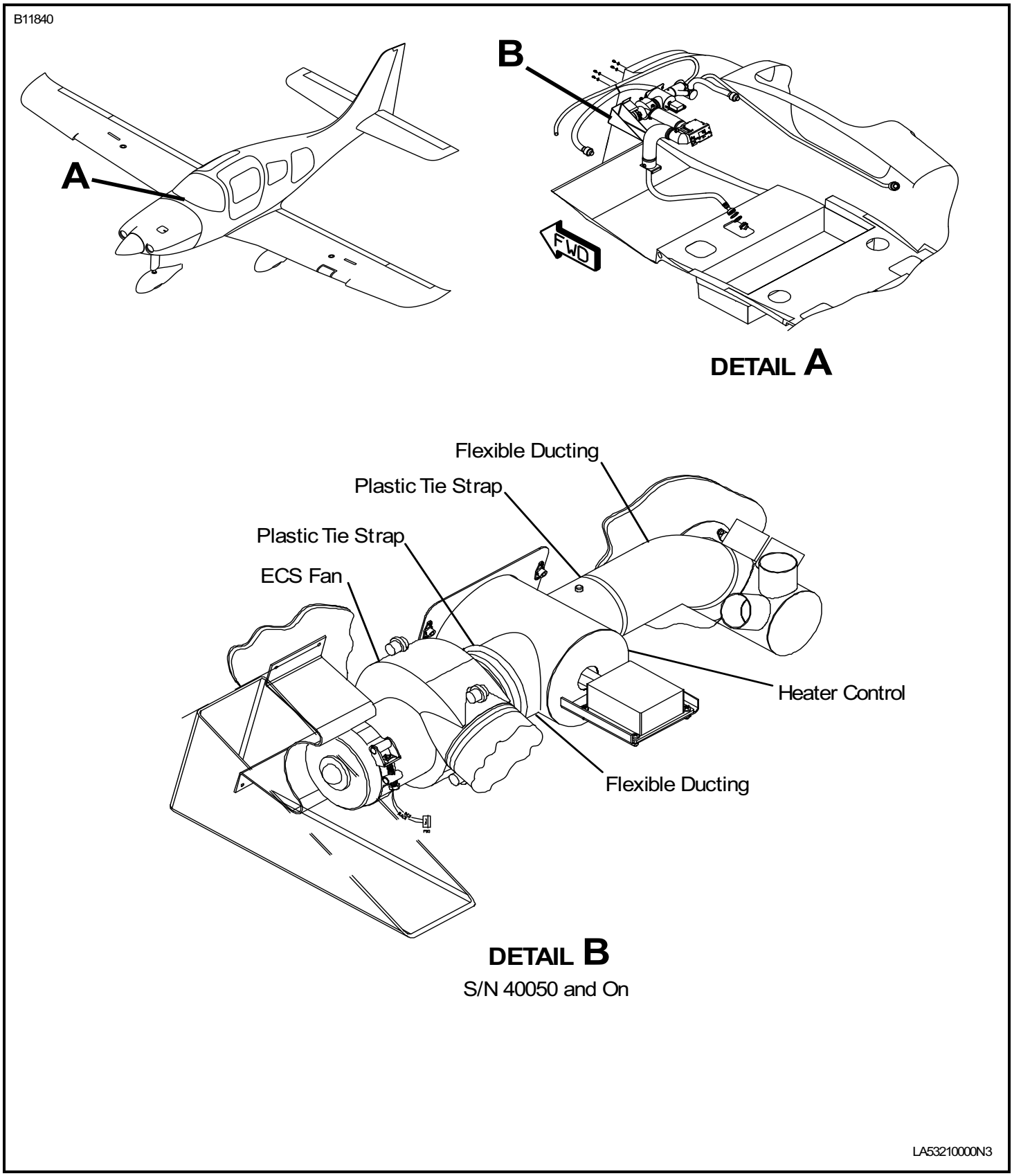
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Heater Control Valve Attachment



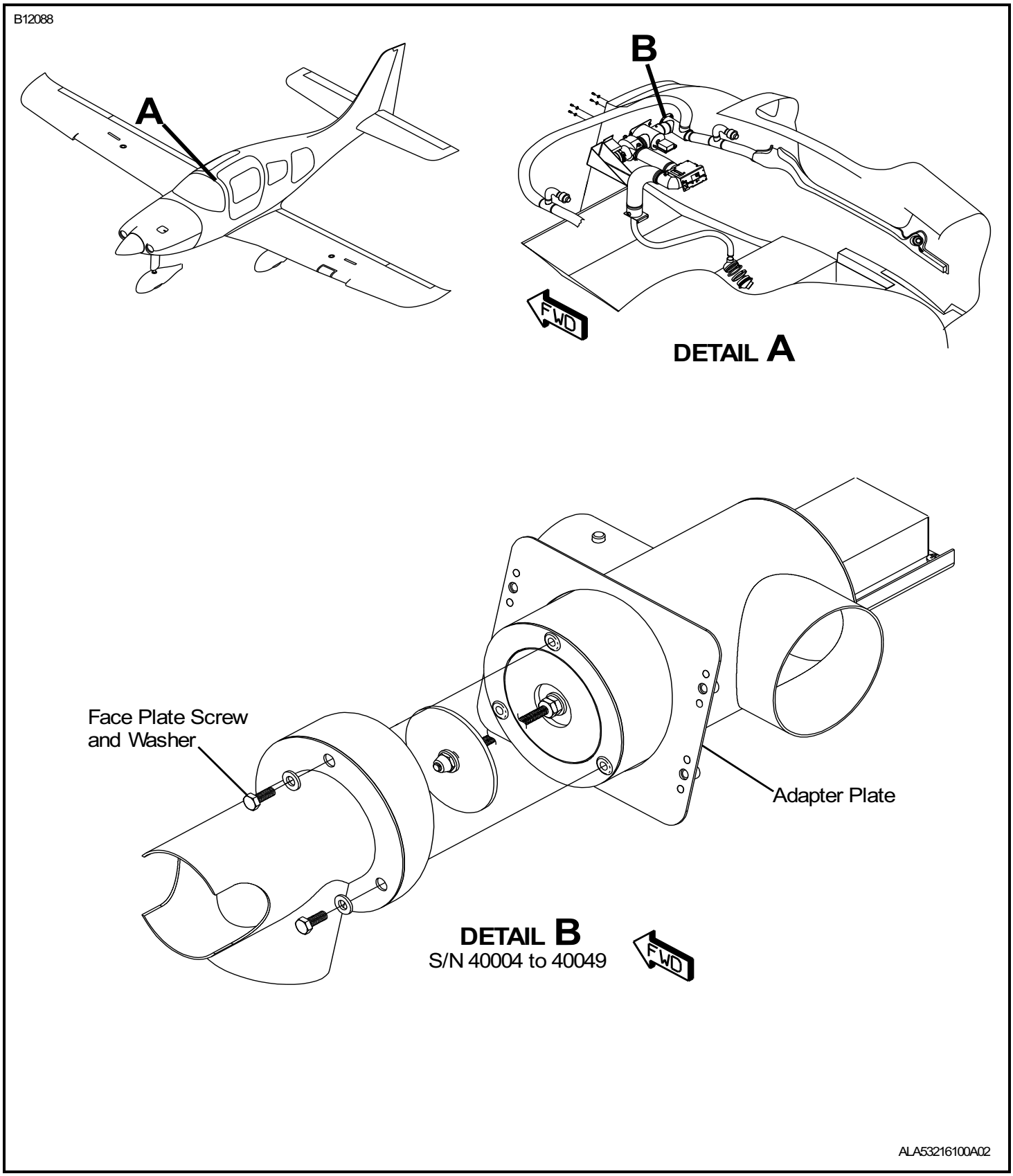
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 2 : Heater Control Valve Attachment



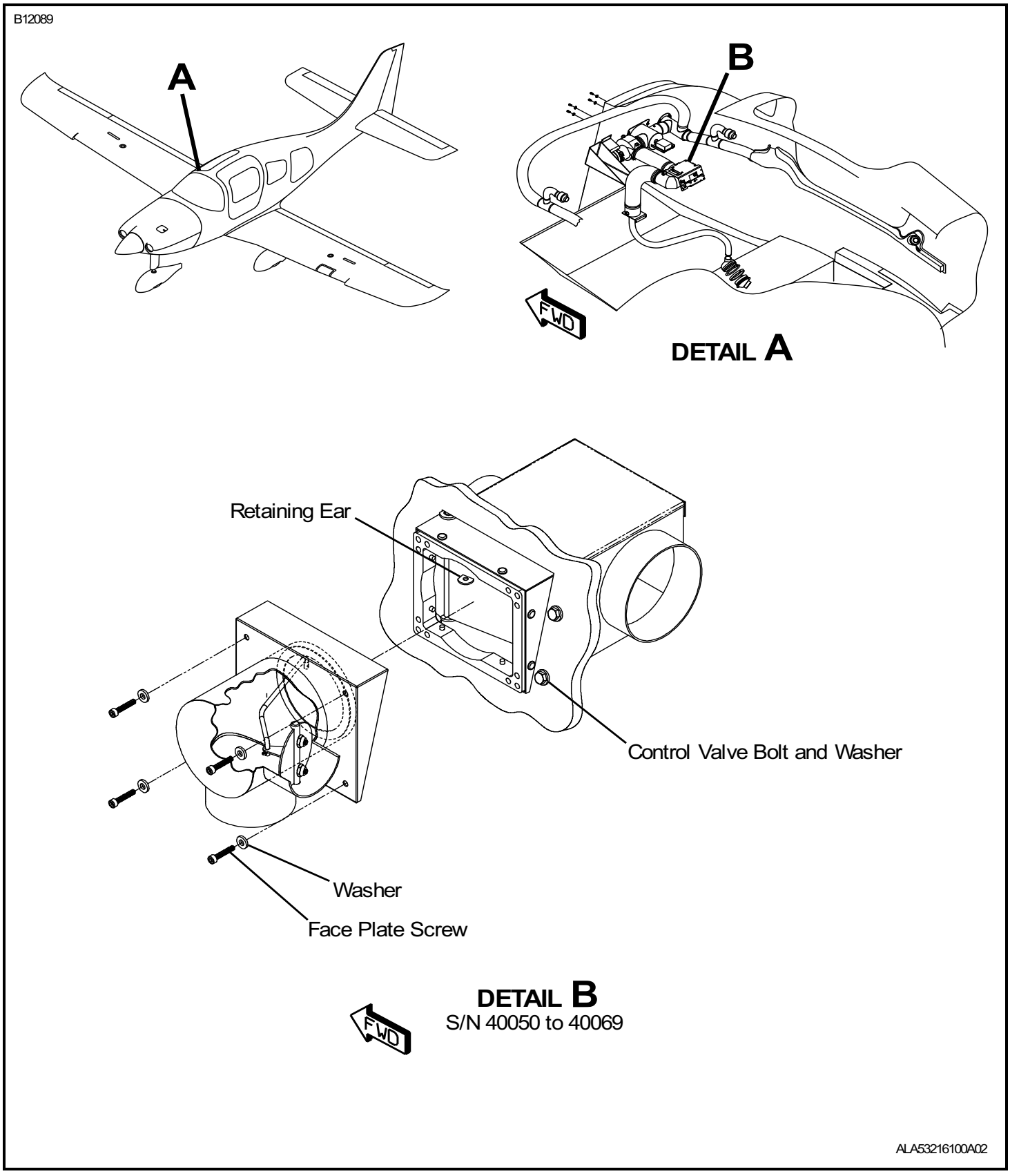
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Heater Control Valve and Faceplate Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 2 : Heater Control Valve and Faceplate Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

HEATING AND HEATER CONTROL VALVE - MAINTENANCE PRACTICES

1. Heating and Heater Valve

A. The following procedures are applicable to the heater and heater valve. A new design was installed on aircraft S/N 40050 but may be retrofitted on aircraft S/N 40004 and On.

2. Heater Control Valve

A. **Heater Control Valve Removal** - To remove the heater control valve from the airplane, use the following instructions:

(1) Loosen the steel clamp securing the flexible ducting to the heater control valve inlet tube located in the engine compartment, and pull the ducting away from the tube. Refer to Figure 201.

(2) Cut and remove the plastic tie straps from the inlet and outlet tubes of the heater control valve, and pull the flexible ducting away from the tubes. Refer to Figure 201.

(3) With the power on, position the heater control valve flap in the off position by rotating the temperature control knob to the full cold position.

(4) Turn off the power, then disconnect the heater control valve servo motor ELC plug.

(5) Remove the faceplate screws and washers, and pull the faceplate outward until the inner connecting linkage can be seen. Refer to Figure 202,and Figure 203.

(6) Disconnect the linkage from the control valve flap by removing the cotter pin and pulling the linkage out from the retaining ear.

(7) Remove the control valve bolts and washers. Pull the control valve out from under the instrument panel.

B. **Heater Control Valve Installation** - To install the heater control valve use the following instructions:

(1) Insert the control valve into the opening in the firewall from inside of the cabin area with the servo motor facing down.

(2) Install the control valve mounting bolts and washers from the engine compartment side of the firewall.

(3) Attach the interconnecting linkage rod to the control valve flap retaining ear using a new cotter pin.

(4) Install the faceplate onto the front of the control valve, then install the faceplate mounting screws and washers.

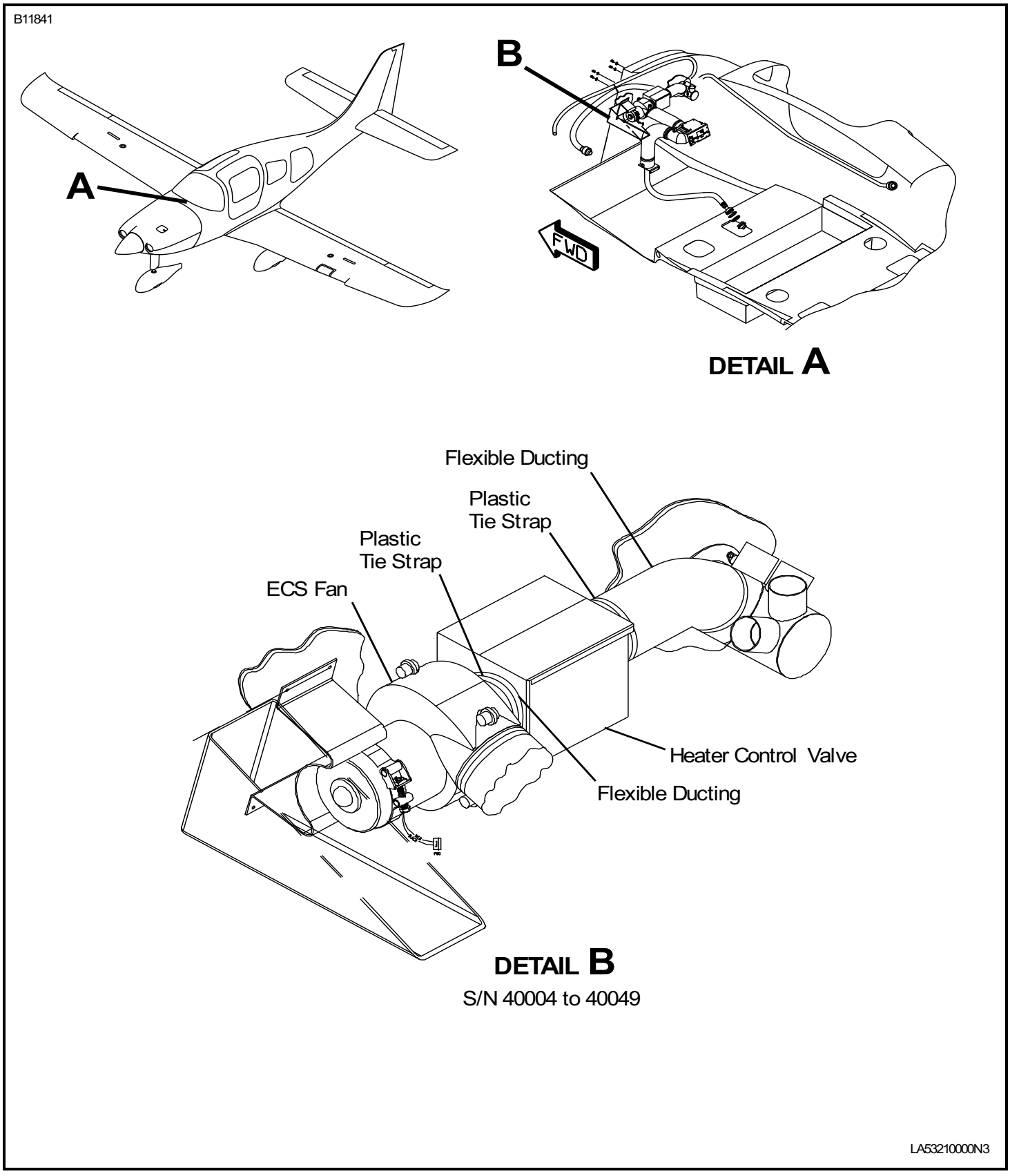
(5) Reattach the flexible ducting to the faceplate inlet tube with a steel clamp.

(6) Turn on the power and test the heater control valve for proper flap operation.

C. **Maintenance** - The heater control valve is a self-contained unit. Only a periodic check for proper flap operation is required.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

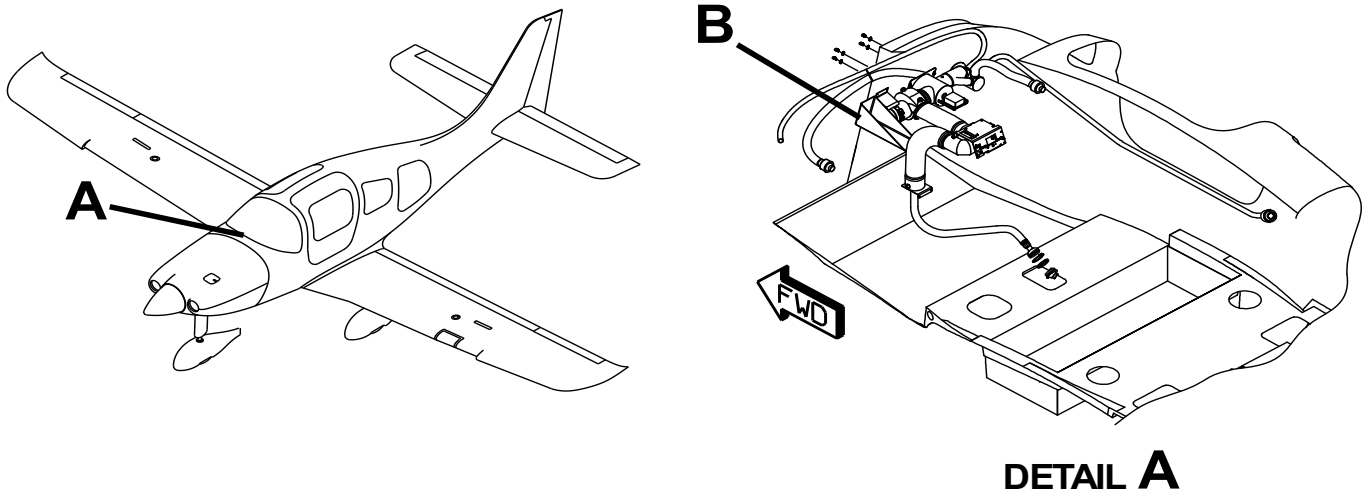
Figure 201 : Sheet 1 : Heater Control Valve Attachment



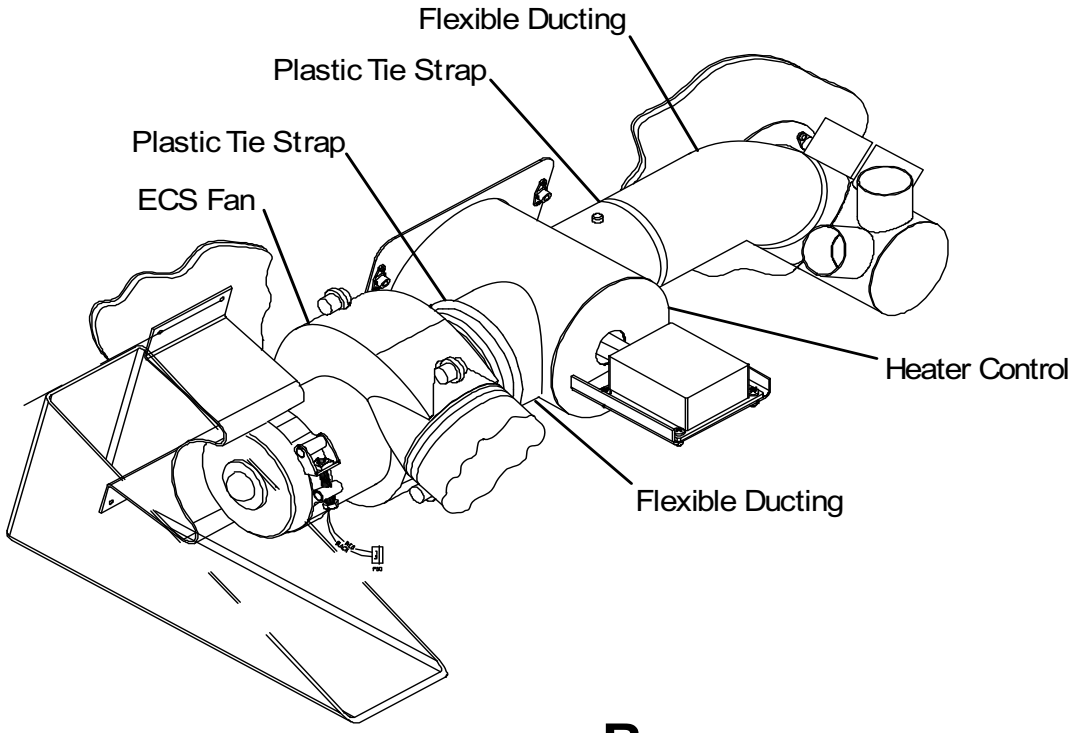
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 2 : Heater Control Valve Attachment

B11840



DETAIL A



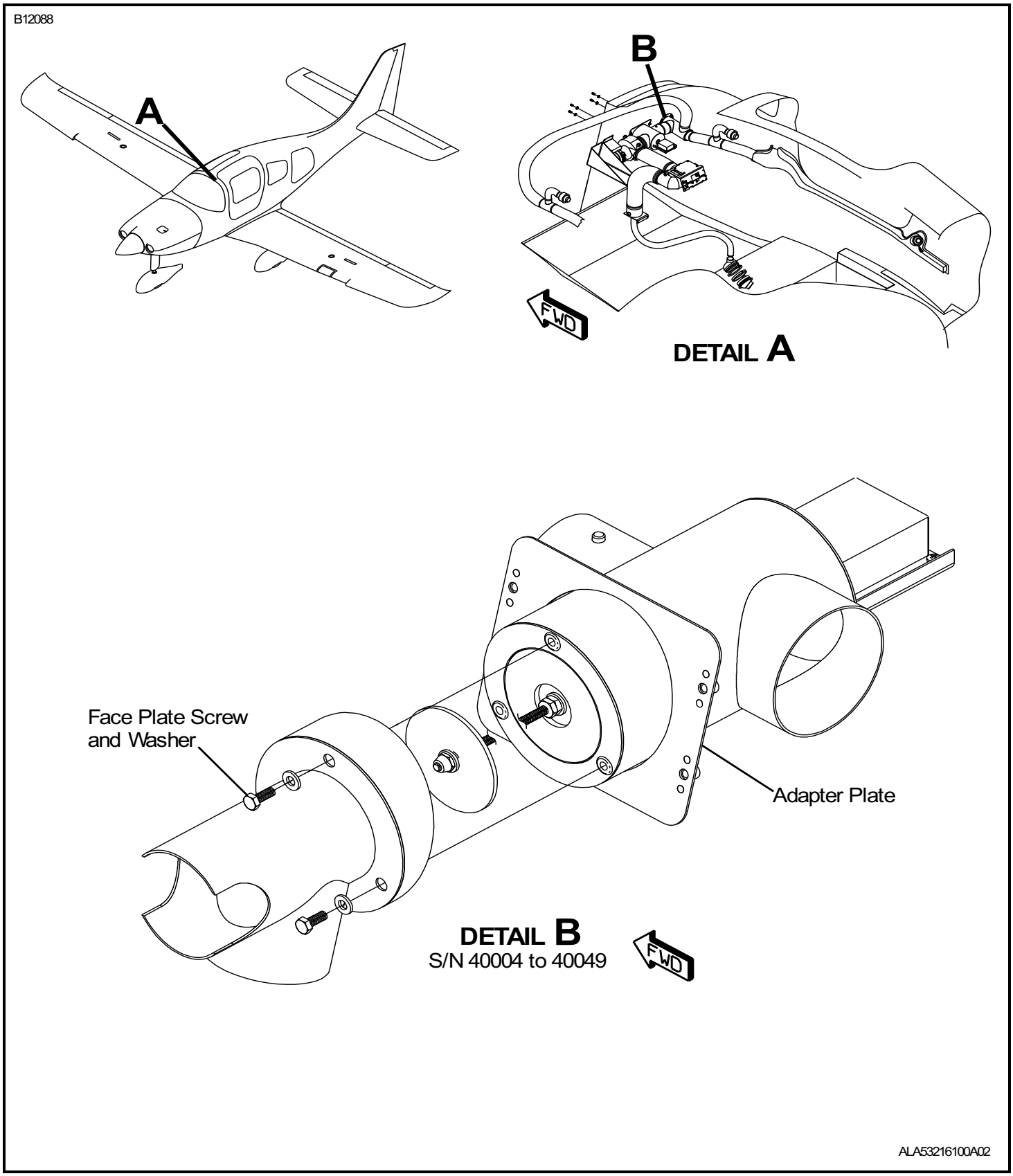
DETAIL B

S/N 40050 and On

LA53210000N3

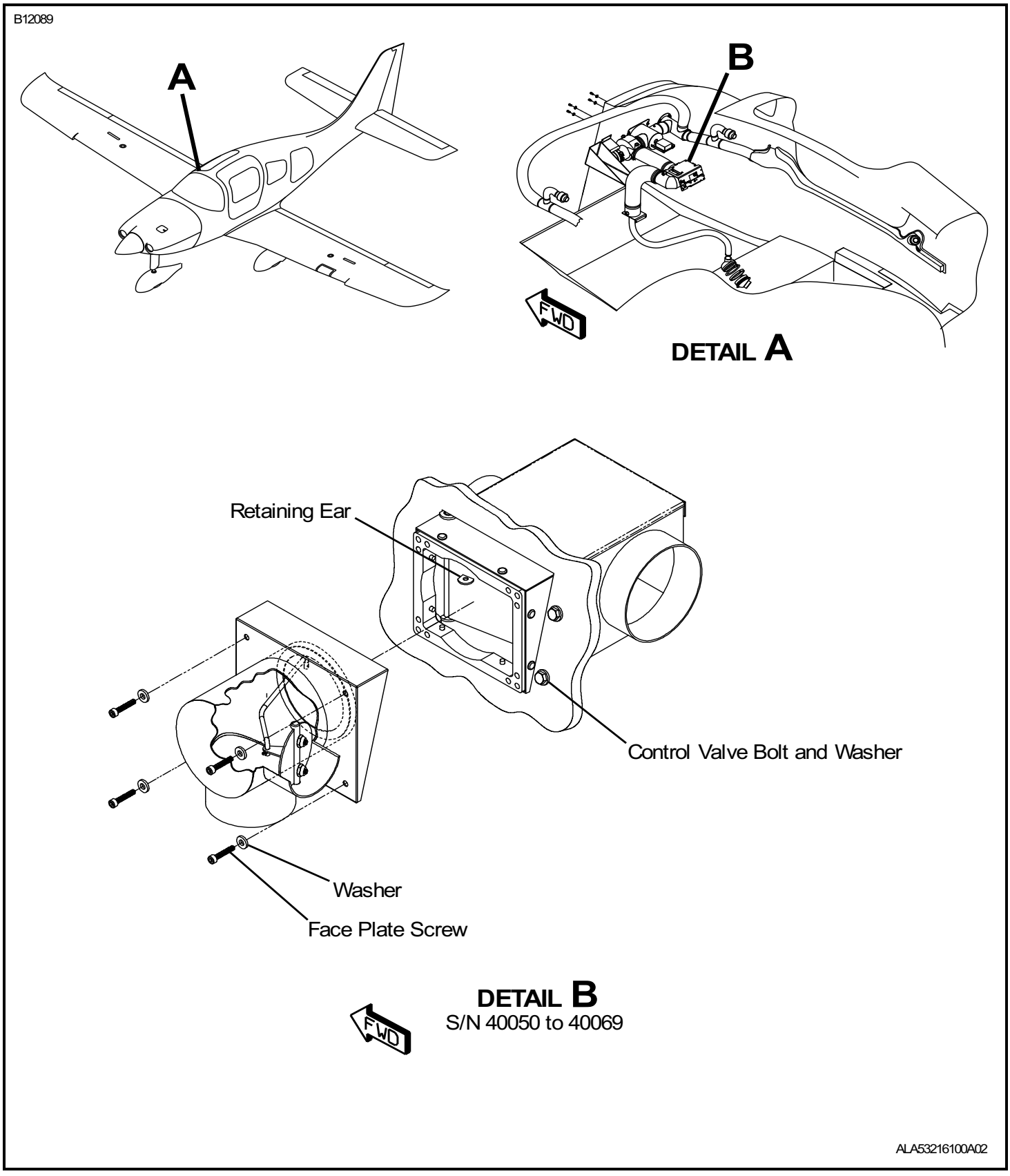
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Heater Control Valve and Faceplate Attachment



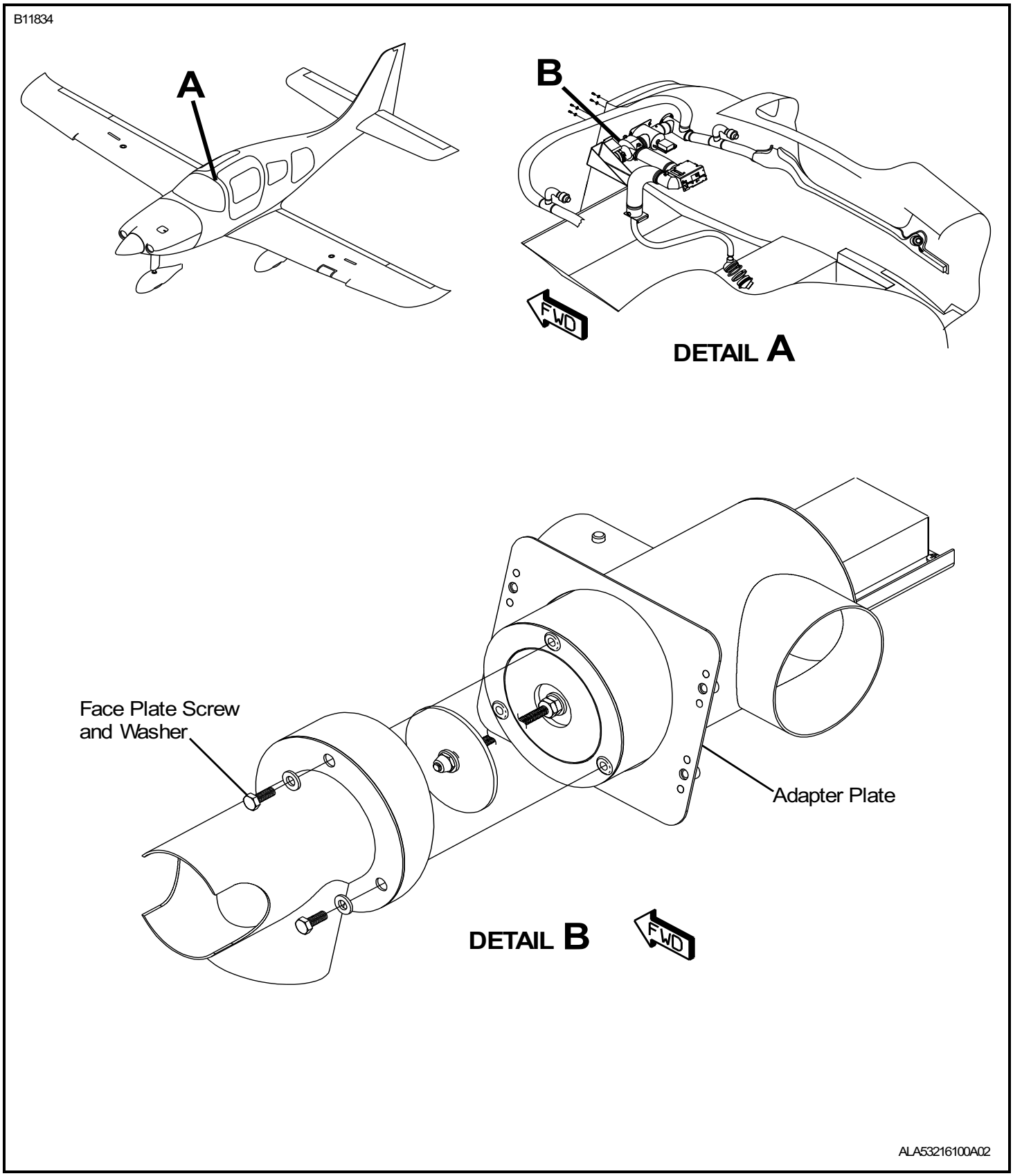
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 2 : Heater Control Valve and Faceplate Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : ECS Control Valve and Faceplate Attachment (S/N 40070 and on)



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

TEMPERATURE AIR CONTROL - MAINTENANCE PRACTICES

1. Temperature and Air Control Unit

A. **Removal of Air Control Unit** - To remove the temperature and air control unit use the following instructions:

(1) Turn the power off and remove the temperature and air control knobs from the control unit faceplate located on the instrument panel by removing the set screws at the bottom of each knob. Refer to Figure 202.

(2) Remove the copilot's side lower knee bolster panel.

(3) Remove the fan rocker switch by gently squeezing together the locking tabs located on the outer perimeter of the switch from behind the instrument panel.

(4) Carefully pull the rocker switch away from the instrument panel until wiring is exposed.

(5) Disconnect the wiring from the back side of the rocker switch, and remove the switch.

(6) Disconnect the ELC plug between the motor control card and the heater control valve servo motor.

(7) Cut the plastic tie straps located at the air control unit inlet and outlet tube locations.

(8) Pull the flexible ducting away from the air control unit.

(9) For aircraft 40004 through 40049, remove the screws and washers securing the air control unit tray to the instrument panel angle brace and remove the four 6-32 self-locking nuts and washers attached to the Pem studs. Refer to Figure 201, Sheet 1 and Figure 203, Sheet 1.

(10) For aircraft 40050 and On, remove the four 6-32 self-locking nuts and washers attached to the Pem studs. Refer to Figure 201, Sheet 2 and Figure 203, Sheet 2.

(11) Pull the air control unit forward (toward the firewall) and away from the instrument panel until the knob shafts are behind the instrument panel.

(12) Remove the air control unit by pulling it out from underneath the instrument panel.

B. **Installation of Air Control Unit** - To install the air control unit, use the following instructions:

(1) Place the unit onto the cover panel studs from the backside of the instrument panel, and secure with nuts and washers.

(2) On S/N 40004 to 40049 install the air control unit to the instrument panel cross brace with bolts and washers.

(3) Slide the flexible ducting onto the air control unit inlet and outlet tubes, and secure using plastic tie straps.

(4) Reconnect the motor control card to the servomotor ELC connector.

(5) Reconnect wiring to the backside of the fan rocker switch, and gently press the switch into the opening until the switch locking tabs are fully engaged.

(6) Install the temperature and air control knobs to the control shafts, checking for free knob rotation.

(7) Install the copilot's side knee bolster.

(8) Turn the power on, and check for proper fan and heater control valve flap operation.

C. **Air Control Unit Maintenance** - The temperature and air control unit is self-contained. Only a periodic check for fan, air control unit butterfly valve, and heater control valve flap operation is required. A functional check should be completed at each 100 hour or annual inspection using the following procedure. Refer to Section 21-00-00, General - Scope And Definition, for description of control operation.

(1) With cabin fan off, check adequacy of airflow for the front floor vents, rear floor vent, and defroster.

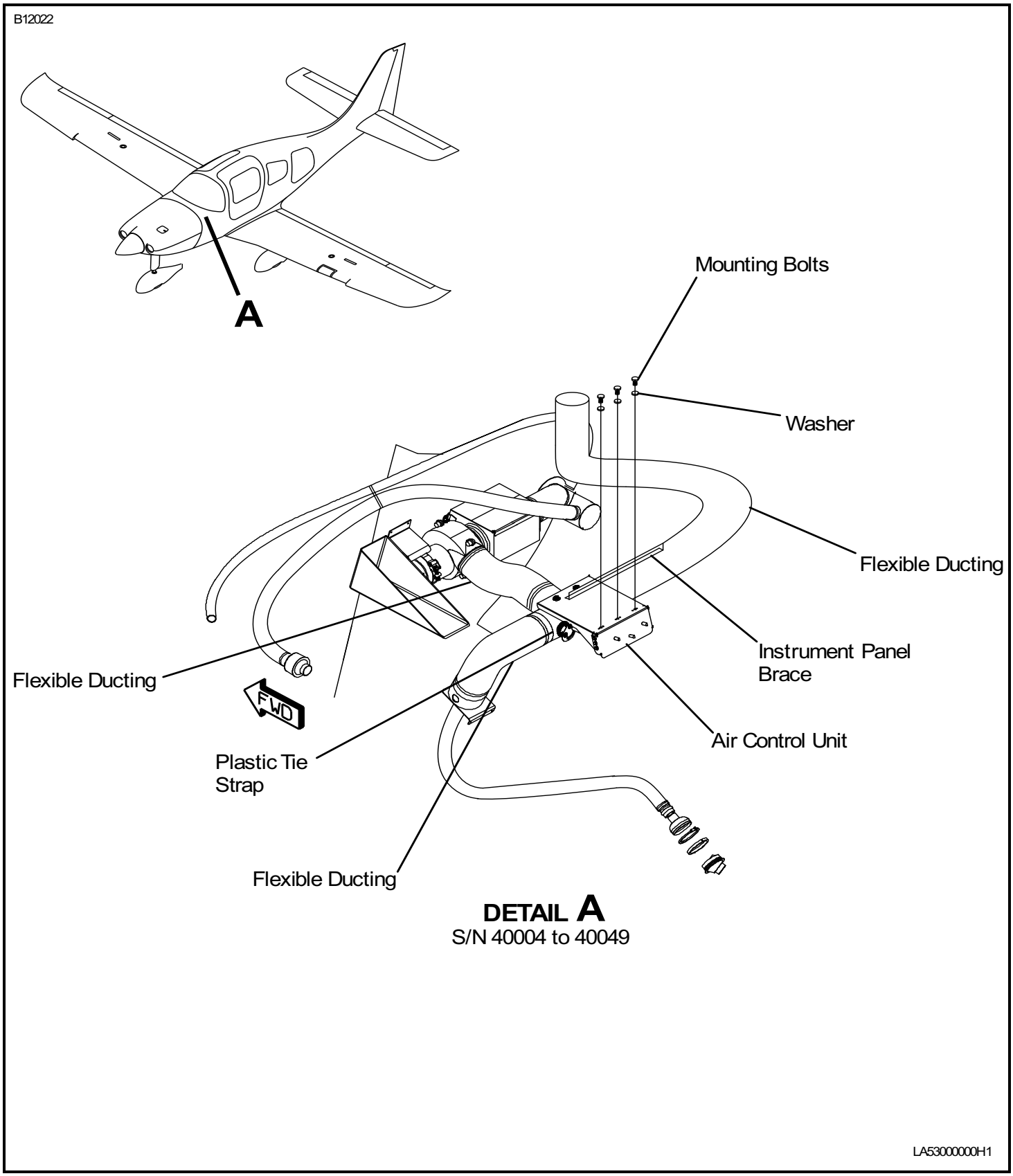
(2) Check for proper operation of the air volume control, temperature control, and air output control.

(3) Evaluate eyeball fresh air vents for proper operation.

(4) Evaluate the adequacy of the system in terms of crew and passenger comfort, as well as the defroster’s ability to control fogging of the windscreen.

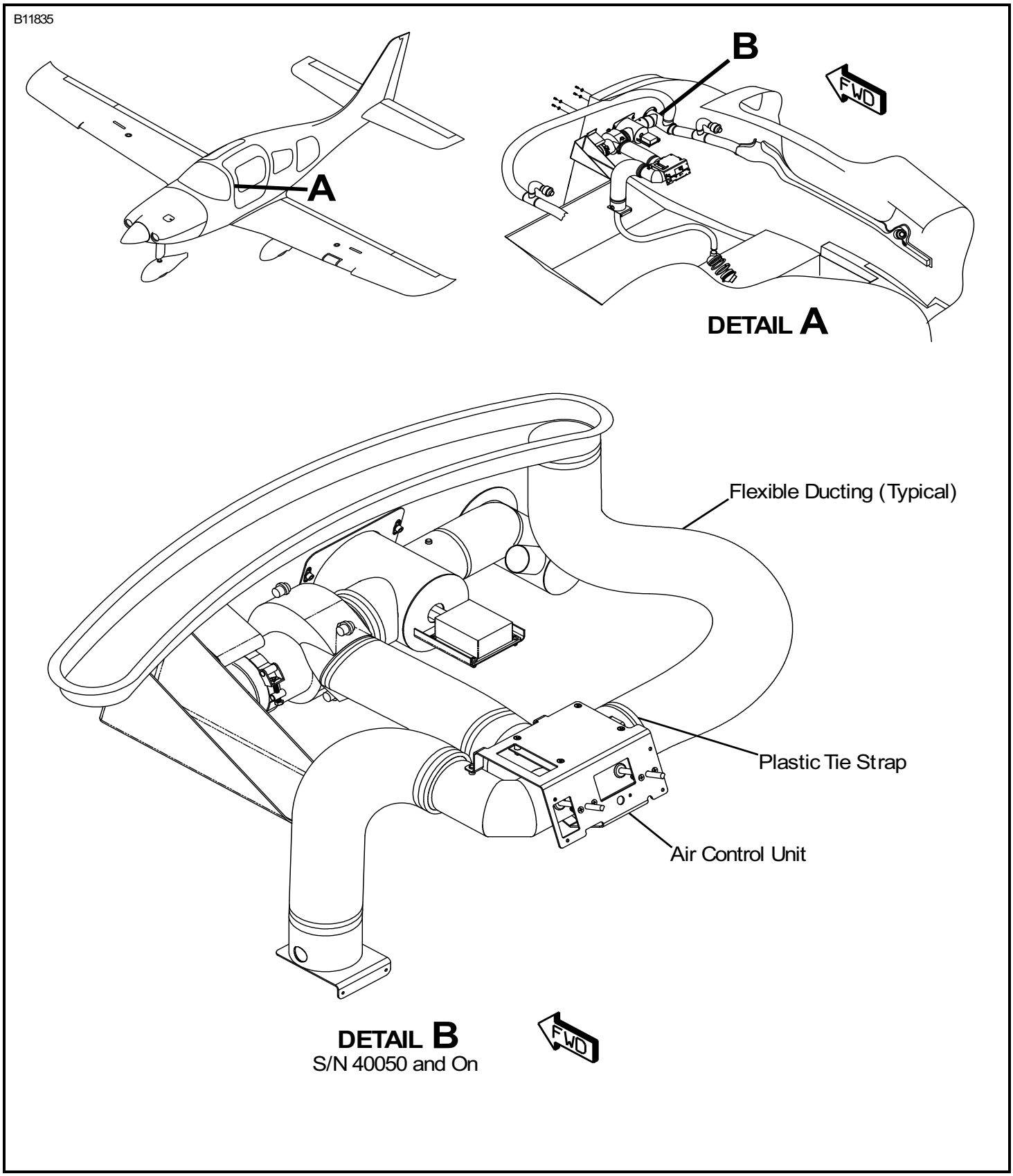
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Air Control Unit Attachment



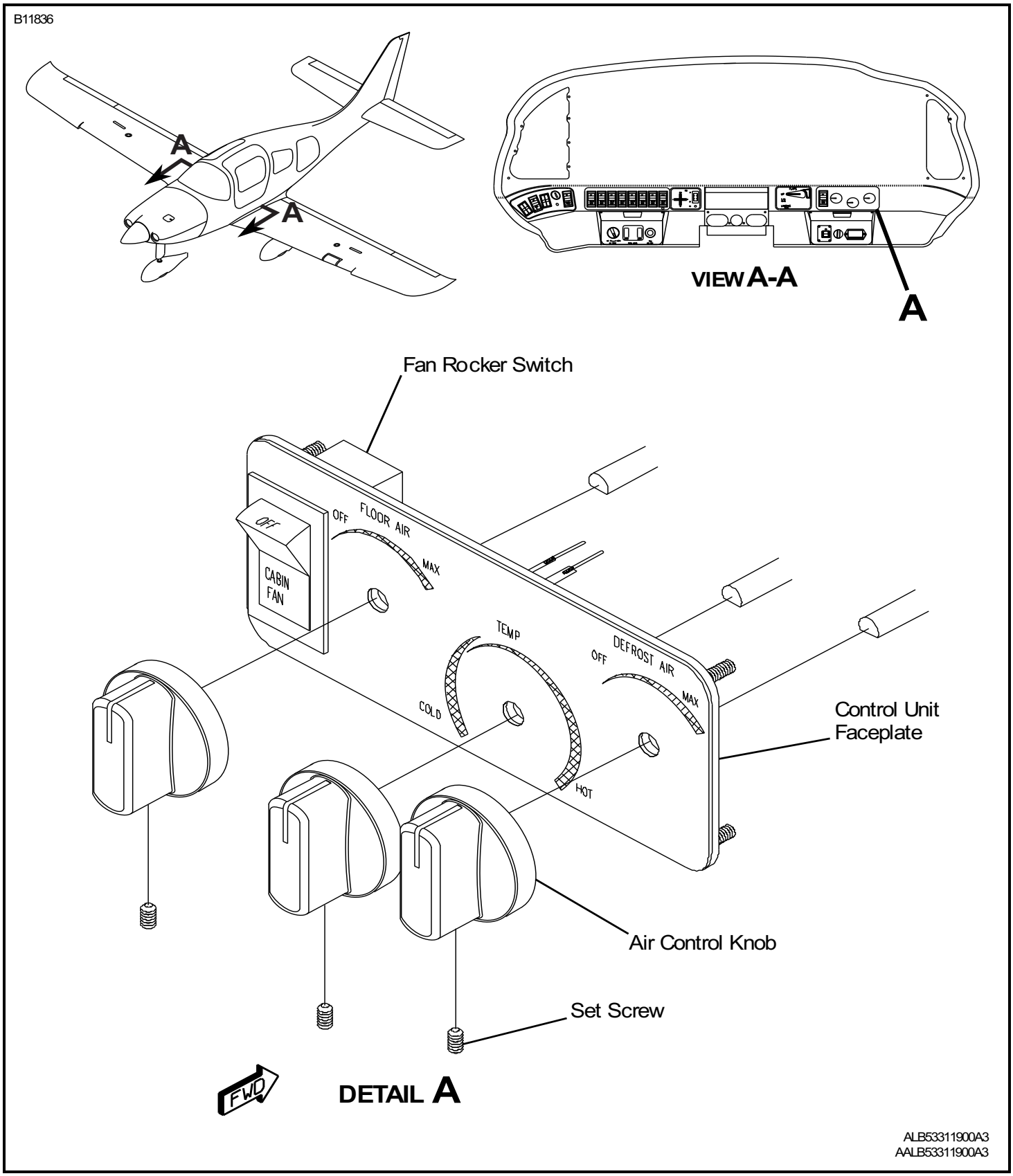
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 2 : Air Control Unit Attachment



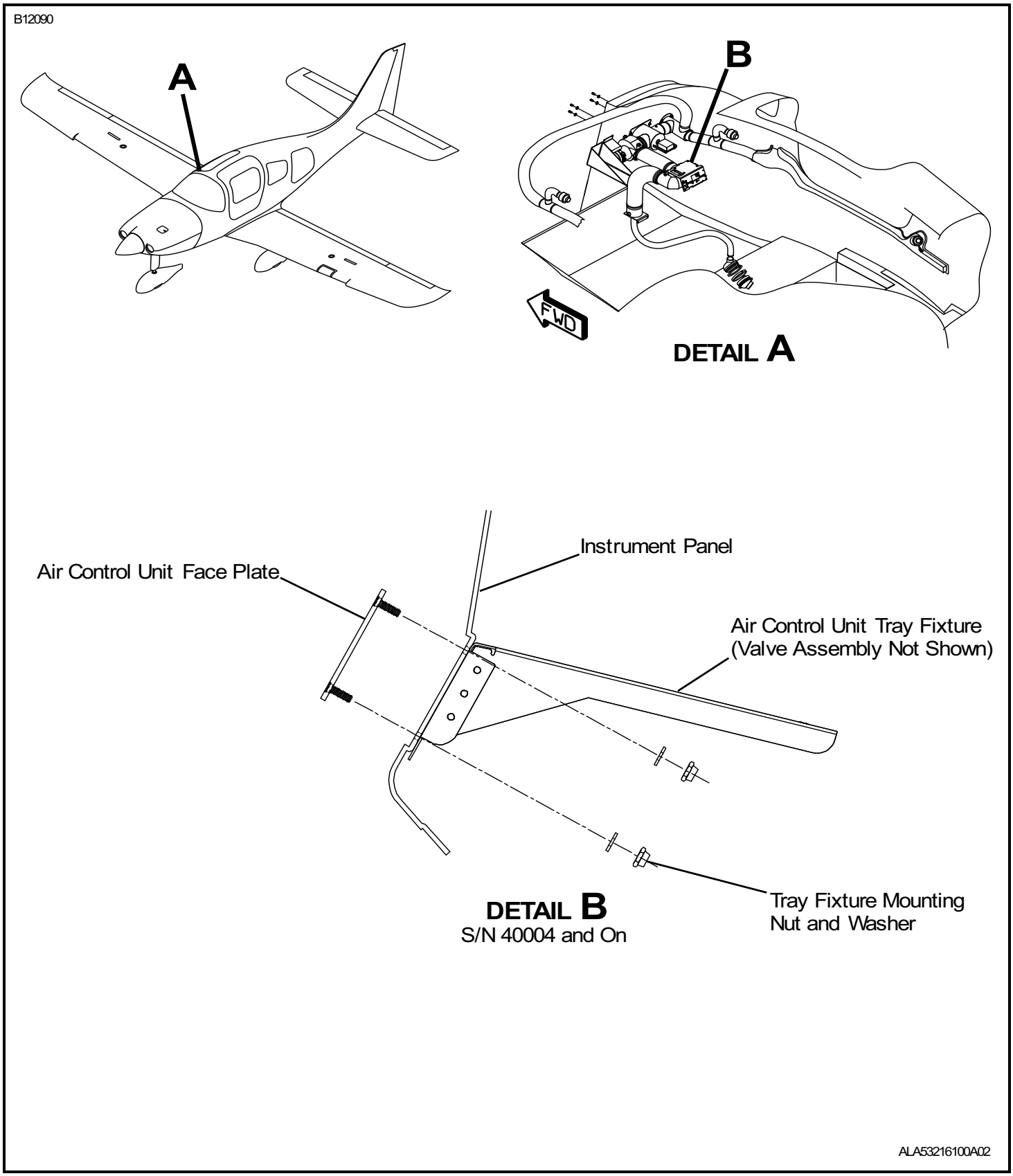
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : ECS Faceplate



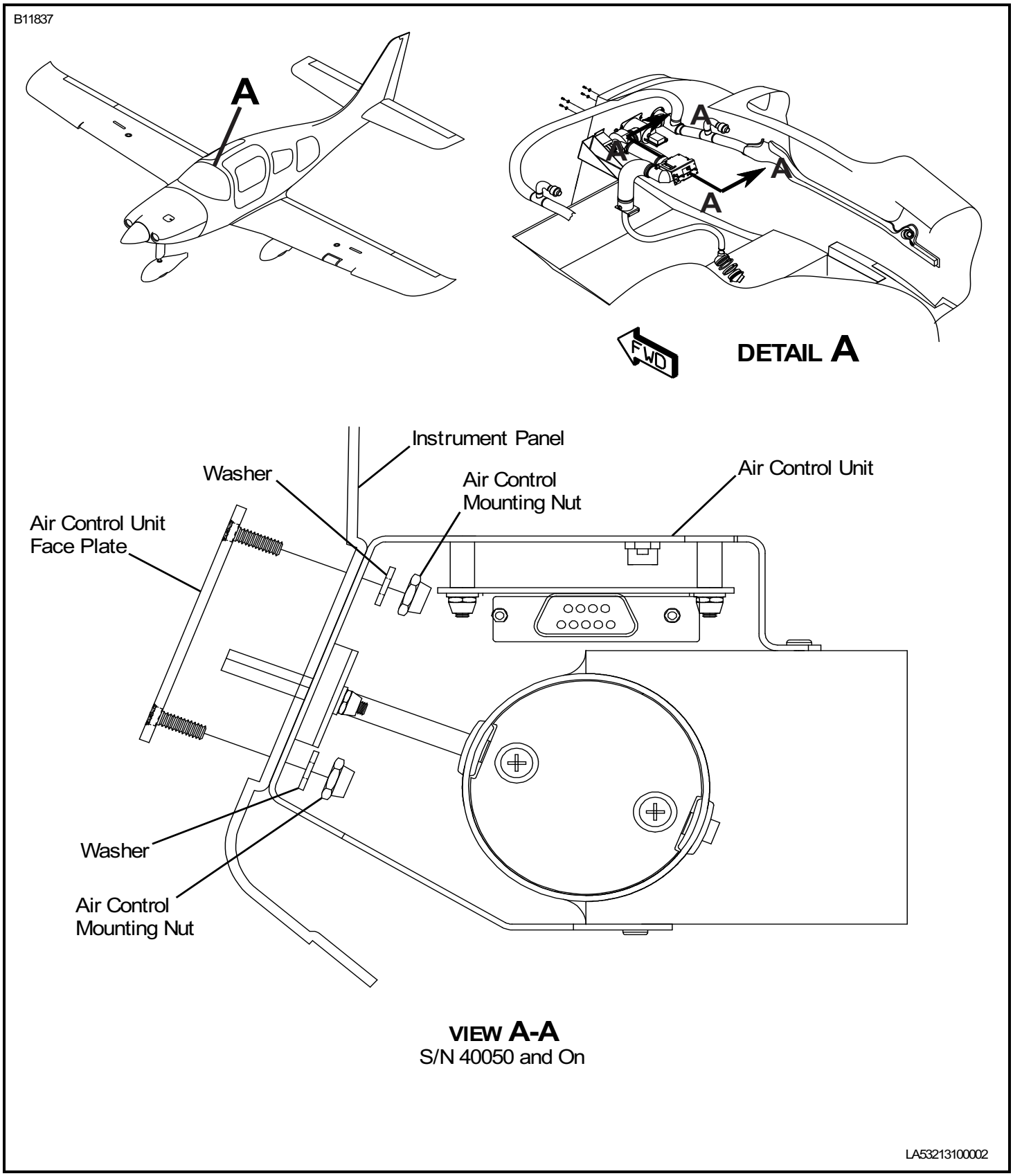
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Air Control Unit Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 2 : Air Control Unit Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FLIGHT CONTROLS - GENERAL

1. General - Scope and Definition

A. **General Description of System** - The Cessna 300 (LC40-550FG) has dual flight controls and may be flown from either the pilot's or copilot's seat. Dual pairs of foot pedals actuate the rudder and control the brakes, which are also used for steering (differential braking). Push-pull tubes actuate the ailerons and elevator. The rudder is actuated via foot pedals and control cables. The wing flaps are electrically actuated via a drive motor and push-pull tubes. Rod end bearings are used throughout the control system. These bearings do not require any maintenance. Longitudinal pitch trim is achieved via an electrically actuated trim tab located in the elevator. Lateral trim is achieved via an electrically actuated trim tab on the right aileron. Directional trim is achieved via a fixed trim tab on the rudder.

B. **Tolerances and Play** - Table 1 lists the allowable control and trim tab deflections, free play limits, and tolerances.

Table 1. Control Surface Requirements

Control Surface Deflections, Tolerances, and Free Play Limitations				
		Deflection	**Tolerance**	**Maximum Free Play Limits (NOTE 1)**
Wing Flaps	CruiseTakeoffLanding	0 degrees12 degrees40 degrees	+/- 1 degree	---
Ailerons	UpDown	21.6 degrees17.7 degrees	+/- 1 degree	---
Aileron Trim Tab	UpDown	22.4 degrees19.6 degrees	+/- 1 degree	0.063 inches(2.5 percent c)
Aileron Servo Tab	UpDown	13 degrees at 17.7 degrees aileron deflection19 degrees at 21.6 degrees aileron deflection	+/- 2 degrees	0.063 inches(2.5 percent c)
Elevator	UpDown	13.0 degrees12.0 degrees	+0 degrees/-0.5 degrees	---
Elevator Trim Tab	UpDown	21 degrees30 degrees	+/- 1 degree	0.080 inches(2.5 percent c)
Rudder	LeftRight	17 degrees17 degrees	+/- 1 degree	---
Rudder Limiter	Left	11.5 degrees	+/- 0.5 degrees	---
Rudder Trim Tab	---	+/- 30 degrees	N/A	---

NOTE 1:

The tab free play at the tab trailing edge should be less than 2.5 percent of the tab chord aft of the hinge line, measured at the station where the free play is measured.

C. **Rigging and Flight Controls** - Rigging and adjustment of the control system and surfaces is covered in their respective sections.

2. Trim System - General

A. The Cessna 300 (LC40-550FG) has a two-axis electric trimming system. The elevator trim tab is located on the right side of the elevator, and the aileron trim tab is on the right aileron. Both tabs are electrically controlled by a hat switch on each control stick, and the trim position is annunciated on the trim panel located to the right of the rocker switch panel. The trim servos are protected by one-amp circuit breakers. Refer to Figure 1 for an illustration of the system.
The trim surfaces are moved by push rods connected between each tab and a servomotor. The aileron tab has one actuating rod and the elevator tab has two. The second actuating rod on the elevator is a redundant system and is provided for the more critical tab in the system. The frictional device installed on the aileron tab should never be lubricated.

B. **Hat Switches** - The trim tabs are controlled through the use of a hat switch on the top portion of the pilot's and copilot's control stick at the three and nine o' clock positions, respectively. Moving the switch forward will correct a tail heavy condition, and moving it back will correct a nose-heavy condition. Moving the hat switch left or right will correct right-wing heavy and left-wing heavy conditions, respectively.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

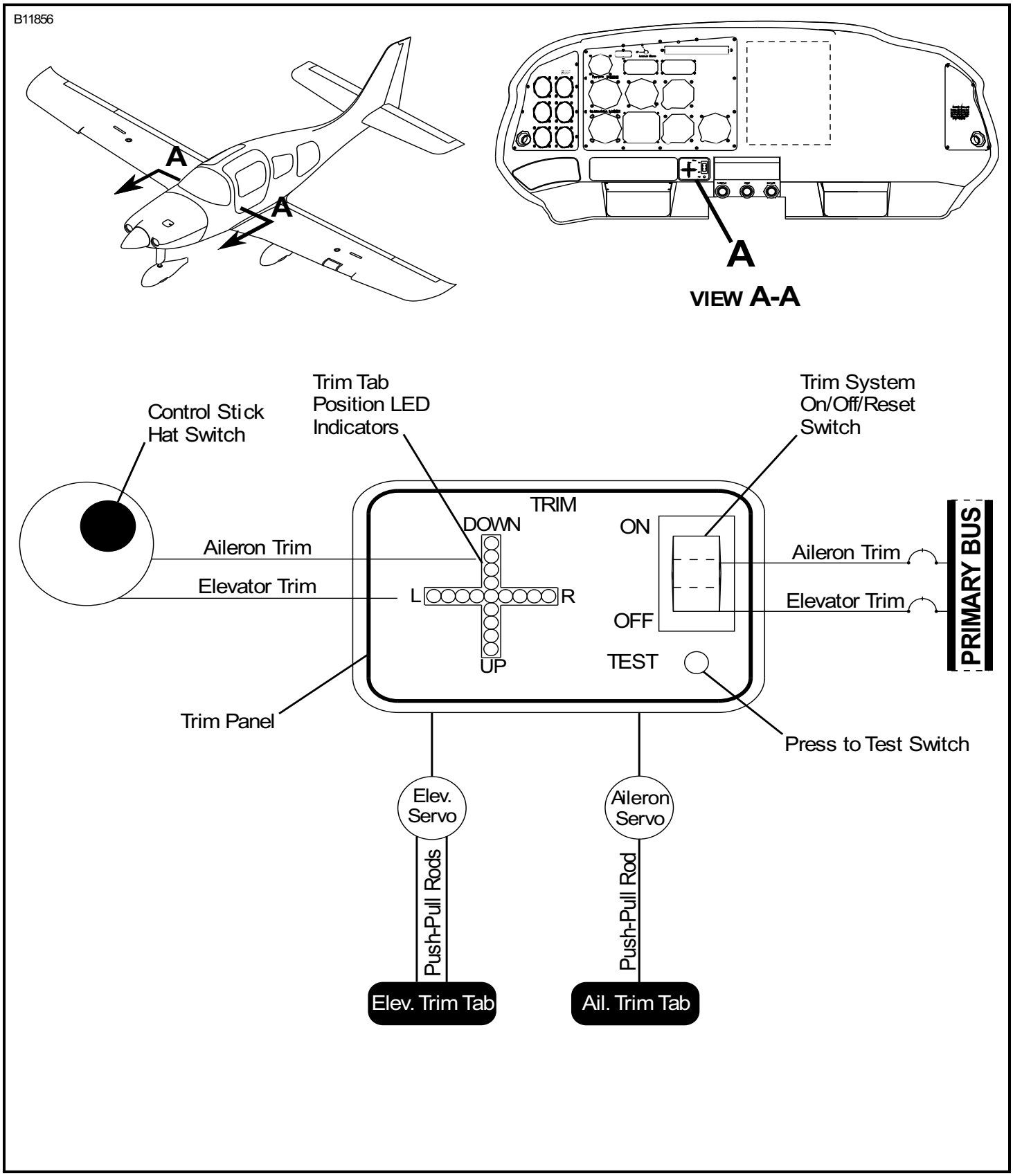
C. **Simultaneous Trim Application** - If both switches, pilot's and copilot's, are moved in the same direction at the same time, the trim will operate in the direction selected. If the switches are simultaneously moved in opposite directions, e.g., pilot's is nose down and copilot's is nose up, the trim will not move in either of the selected directions. Finally, if the switches are simultaneously selected in different directions, e.g., elevator trim is input by one pilot and aileron trim is input by the other, each trim tab will move in the direction selected.

D. **Trim Position Indicator** - The trim position is displayed on two light bars using a series of blue LEDs and two green LEDs that are arranged on the trim panel in the shape of a plus sign. The vertical lights indicate the position of the elevator trim, and the horizontal lights show the position of the aileron trim. The middle green lights in each bar indicate the approximate neutral position.
The blue lights are sequentially lit and extinguished as the trim tab moves through its range of travel. If the two green LEDs in the middle of the "+" are lit and no blue lights are illuminated, both tabs are in the approximate neutral position. The LED's level of brightness is controlled by the position lights switch. When the position lights are on, the trim lights are in the dim mode, and when the position lights are off, the trim lights are in the bright mode.
Should one or all of the trim indicator LEDs stop functioning, remove the trim panel, and have it serviced by a qualified avionics repair technician.

E. **Trim On/Off Switch** - The trim system on/off switch on the right side of the panel turns off power on all the trim tabs. This switch is used if a runaway trim condition is encountered. Refer to the POH for an expanded discussion of this issue. The press-to-test switch verifies the operation of all the LEDs associated with the trim, flaps, fuel tank position, and annunciator panel. When the test position is selected, all related LEDs illuminate in the bright mode. A light that fails to illuminate should be replaced.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Trim System Layout



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CONTROL SURFACE STATIC BALANCING - MAINTENANCE PRACTICES

1. Control Surface Static Balancing - General

A. Control surface balance must be checked when control surfaces are repaired, altered, or repainted. All control surfaces must be repainted in accordance with Cessna document SX512701, Prime and Paint Procedures. The control surface balance limits shown in Table 201 apply to a complete painted control surface only. Complete control surfaces include (as applicable) balance weight, all attachment hinges and hardware, trim tabs, grounding straps, and static wicks.

Table 201. Control Surface Static Balance Limits

		Maximum Total Weight	TE Hinge Moment*
Aileron	LeftRight	7.40 lbs.7.80 lbs.	+2.25 to +3.25 in.-lbs.
Elevator	---	32.30 lbs.	+37.00 to +39.00 in.-lbs.
Rudder	---	14.35 lbs.	+6.20 to +9.20 in.-lbs.

NOTE 1:

All hinge moments are trailing edge heavy.

NOTE 2:

If specified moments cannot be met, heavier balance weights may be obtained from the manufacturer. This approach should be considered before reworking any repair or restripping and repainting the affected control surface. A lighter weight can be produced by shaving existing balance weight per the instructions outlined in the sections below.

2. Required Equipment for Balancing

A. Obtain or otherwise fabricate two knife-edges (shown in Figure 201) and supports approximately 6 - 12 inches in height such that they may be placed on a table and stabilized to prevent tipping. The knife-edge hinge supports must be level and perpendicular to the control surface hinge axis. The knife-edges should have attached a 1.5 to 2.0 inch section of MS20001P5 piano hinge to match the elevator attachment hinge. The knife-edges should also be small enough in height to fit within the rudder at the hinge pin locations.

B. A calibrated scale accurate to ±0.01 lbs.

C. Calculator.

D. Calibrated leveling device (smart level, bubble level, etc) accurate to ±0.2 degrees.

3. Balancing Procedures - Aileron

A. **Aileron Static Balancing** - Use the following procedure for static balancing the ailerons.

(1) Mount the two knife-edges horizontally such that a line drawn through the hinge line support points is level and perpendicular to the supporting knife-edges.

(2) Set the aileron trim tab to the neutral position.

(3) Remove the ailerons per the instructions in Section 27-10-00, Ailerons.

(4) On the left aileron, tape the servo tab in the neutral position with a small piece of masking tape. Tape the two drive rods to the servo tab hinge. Include all attachment hardware for the control rods.

(5) Install the attachment hardware into each of the three hinges.

(6) Place either aileron on the knife-edges such that the inboard and outboard attachment bolts are resting on the knife-edges. Swing the aileron up and down to ensure that the knife-edges do not interfere with the aileron and hinges.

(7) Position the aileron such that the chord line is level, and measure the trailing edge weight at the inboard end. To check that the chord line is level, measure the angle of the top surface of the aileron at the inboard end, and confirm that it is 10.9±0.2 degrees from horizontal. Refer to Figure 202.

(8) Calculate the moment by multiplying the control surface load by 6.72 in. (moment arm). Compare this value with that in Table 201.

(9) If the moment is too light, material may be removed from the balancing weight to achieve the correct moment. Remove material from the aft face of the balancing weight first. If further weight reduction is needed, remove material from between the two fastener holes. The cross-hatched areas in Figure 203 indicate the areas where material may be removed from the aileron balancing weights. The width may be adjusted as long as a minimum of 0.125 inches gap is maintained between the counterweight and the aileron cove in the wing.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(10) If the moment is too heavy, a heavier balancing weight may be obtained from the manufacturer.

WARNING: Do not remove material from the forward or lower edge of the balancing weights. It is important that the contour of the forward and lower edge and the width of the balancing weights be maintained.

4. Balancing Procedures - Elevator

A. **Elevator Static Balancing** - Use the following procedure for static balancing the elevator.

(1) Mount the two knife-edges horizontally such that a line drawn through the hinge line support points is level and perpendicular to the supporting knife-edges.

(2) Set the elevator trim tab to the neutral position.

(3) Remove the rudder per the instructions in Section 27-20-00, Rudder.

(4) Remove the elevator per the instructions in Section 27-30-00, Elevator System, General.

(5) Remove the forward half of the elevator attachment hinge by cutting the safety wire and removing the hinge wire.

(6) Turn the elevator upside down, and align the hinge with the hinge sections located on the knife-edges. Reinsert the hinge wire into the piano hinge on the elevator.

NOTE: Position the knife-edges such that they are equal distant from each end of the elevator.

(7) With the elevator chord line level, accurately measure the control surface load at the trailing edge a distance of 20.00±0.125 inches from either end. The elevator chord line is level when the angle of the upper or lower surface is 6.0±0.2 degrees, measured perpendicular to the hinge line. Refer to Figure 204.

(8) Calculate the moment by multiplying the control surface load by 10.00 inches (moment arm). Compare this value with that in Table 201.

(9) If the moment is too light, material may be removed from the balancing weight to achieve the correct moment. Refer to Figure 205, Sheet 1 for the areas from which material may be removed for aircraft S/N 40004 to S/N 40009. Refer to Figure 205, Sheet 2 for aircraft S/N 40010 and On; cross-hatched areas indicate where material can be removed. For aircraft S/N 40010 and On, remove material from the center hole first, followed by the mounting holes, aft hole first. When removing material from the balancing weights, remove equal amounts of material from the balancing weight on each end of the elevator.

WARNING: Do not remove material from the forward or lower edge of the balancing weights and do not reduce the overall width of the balancing weights. It is important that the contour of the forward and lower edge and the width of the balancing weights be maintained.

5. Balancing Procedures - Rudder

A. **Rudder Static Balancing** - Use the following procedure for static balancing the rudder.

(1) Remove the rudder per the instructions in Section 27-20-00, Rudder.

(2) Mount both knife-edges horizontally and parallel to each other.

(3) Place the rudder on the knife-edges such that there is one knife-edge on the top and lower hinge pins. A line drawn through the hinge line support points must be level and perpendicular to the supporting knife-edges. Move the rudder up and down to ensure that the knife-edges do not interfere with the rudder and cause friction that could affect the surface load.

(4) With the rudder chord line level, accurately measure the control surface load at the trailing edge at the lower edge of the trim tab, refer to Figure 206. The rudder has a symmetrical cross section and thus the chord line is level when the center of the leading edge is at the same height as the center of the trailing edge.

(5) Calculate the moment by multiplying the control surface load by 10.00 in. (moment arm). Compare this value with that in Table 201.

(6) If the moment is too light, the balancing weight may be shaved down to achieve the correct moment. When shaving the balancing weight, maintain a minimum thickness of 0.375 in. from the edge of the bolt hole to the top edge of the part, refer to Figure 207 for details.

6. Rudder Limiter System

A. **Description of Rudder Limiter System**

(1) **Operation** - The rudder limiter is an integral part of the stall system on the Cessna 300 (LC40-550FG). The system is a part of the safety-of-flight design of the Cessna 300 and is an important factor in spin resistance. It is designed to

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

limit full left rudder deflection from a normal (approximately) 17.0±1.0 degrees to approximately 11.0±0.5 degrees during certain aircraft angle of attack and engine conditions. The system is activated when two conditions simultaneously exist: (1) the airplane's stall warning is active and (2) the engine manifold pressure is more than 12 inches of Hg. When the system is activated, a solenoid near the left rudder pedal moves a cam that physically limits the travel of the left rudder pedal. There is a time delay of approximately one second before the system is activated. This delay feature prevents inadvertent activation of the rudder limiter in turbulent air.

(2) **Fail-Safe Feature** - The rudder limiter comes with a fail-safe feature. The system is armed when the airplane's electrical power is turned on; however, all electronic and electrical switching is in the relaxed position. When the stall warning is active and manifold pressure is more than 12 inches of Hg, the system activates from this relaxed armed position. If either of the two inputs to the system should fail, the rudder limiter will still operate. For example, if the manifold pressure transducer becomes inoperative, the rudder limiter will be activated by the sole input from the stall warning. Conversely, if the stall warning fails, the rudder limiter will be functional, provided the stall warning detector is operative, i.e., freely moves up and down. The operating condition of this fail-safe system can be verified from time to time through the use of a special ground testing procedure.
The rudder limiter operates only when the stall warning is active and the throttle is advanced to a setting that produces more than 12 inches of Hg manifold pressure. Deflection of the right rudder pedal is unaffected by the rudder limiter system.

B. **Rudder Limiter Assembly Removal**

(1) The rudder limiter assembly is located on the pilot's side of the cabin, on the left side of the rudder crossover tube behind the rudder pedals. To easily access the rudder limiter assembly, you must first remove the pedals, the knee bolster, and the pilot's seat. Refer to Chapter 25 and 27 for details on removal of these items.

(2) Unfasten the rudder limiter assembly by unscrewing the cap screws as shown in Figure 208.

(3) Disconnect the wires on the solenoid and proximity switch.

(4) Remove the rudder limiter assembly.

C. **Rudder Limiter Assembly - Installation**

(1) Perform installation in the reverse sequence of the removal procedure. Refer to Figure 208.

(2) Adjust the firewall stop by loosening the stop nut and screwing out the stop until it firmly touches the firewall. Re-tighten the stop nut.

(3) Re-connect the wires to the proximity switch and solenoid.

(4) Test function of the rudder limiter assembly by following the steps listed in the Rudder Limiter Test paragraph.

D. **Rudder Limiter Solenoid Replacement** - It is not necessary to remove the entire rudder limiter assembly when replacing the solenoid, shown in Figure 209.

(1) Disconnect the solenoid.

(2) Screw the nut off the solenoid, and slide the solenoid off the bracket.

NOTE: Care must be taken to prevent the spring that is located on the other side of the nut holding the solenoid from coming off.

(3) Installation is the opposite of removal. Torque the nut 100 to 110 in.-lbs.

(4) Test function of the rudder limiter assembly by following the steps listed in Rudder Limiter Test paragraph.

E. **Rudder Limiter Sensor Replacement** - It is necessary to remove the entire rudder limiter assembly when replacing the sensor, shown in Figure 209.

(1) Remove the rudder limiter assembly.

(2) Remove the retaining nut from the sensor, and slide the sensor off of the rudder limiter bracket.

(3) Installation is the opposite of removal.

(4) Ensure the gap between the end of the sensor and limiter cam is 0.15±0.07 inches.

(5) Ensure proper on and off operation by checking continuity. With the cam nearest the sensor, the circuit should close. With the cam against the stud the circuit should be open.

F. **Rudder Limiter Test** - The purpose of this test is to verify operation of the manifold pressure transducer, the solenoid and rudder pedal cam, and the general integrity of the rudder limiter system.

WARNING: The rudder limiter is an integral part of the Cessna 300 aircraft. It is mandatory that the rudder

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

limiter be in full working order for any flight. Should problems exist that are not described in this manual, contact the factory for assistance.

NOTE: The rudder limiter assembly is factory-set and should be replaced as a unit instead of field modification of components.

(1) While sitting in the pilot's seat with the master switch on and the engine off, depress the test button on the trim panel. Refer to Figure 210.

(2) When the test button is depressed, the pilot will hear (after a one-second delay) and feel the solenoid near the left rudder pedal engage, at which time the RUDR LMTR annunciator will illuminate, and the left rudder travel will be restricted.

(3) When the operation is verified, release the test switch. The rudder limiter test switch is also used to test the integrity of the trim, flap, and fuel tank LEDs. The pilot should remember that anytime these lights are tested, the rudder limiter will engage.

(4) With the master switch on and the engine off, pull the stall warning circuit breaker and have someone move the stall vane to the up position.

(5) The rudder limiter should engage even though there is no aural stall warning.

(6) Repeat the procedure with the engine instrument's circuit breaker pulled and the stall warning breaker reset.

(7) This time the rudder limiter will engage with an aural stall warning, even though there is no manifold pressure indication.

G. **Troubleshooting the Rudder Limiter Cam System**

SYMPTOM	PROBABLE CAUSE	ACTION
Rudder limiter fails to activate	Solenoid does not activate	1. Check the rudder limiter cam system circuit breaker. 2. Press the test button, and listen for the solenoid to activate. 3. Push the stall vane up. After about a second, a click near the pedals should be heard as the rudder limiter engages.
Rudder limiter fails to activate	Bad wiring or connectors (refer to wiring manual for further details)	1. Check for continuity and current at the solenoid. Replace bad connectors or wiring. 2. Check the circuit breaker, and replace breaker if needed. 3. If wiring is acceptable, then replace the rudder limiter assembly.
Rudder limiter fails to activate	Mechanical blockage	1. Check that any foreign material such as carpet is not blocking the cam. 2. Check that solenoid shaft moves freely when activated. If it does not move freely, replace the rudder limiter assembly.
Rudder limiter annunciator fails to light with rudder limiter engaged	Light bulb burned out	1. Test the annunciator light using the annunciator test switch. If light does not operate, replace LED. (Refer to Chapter 33)

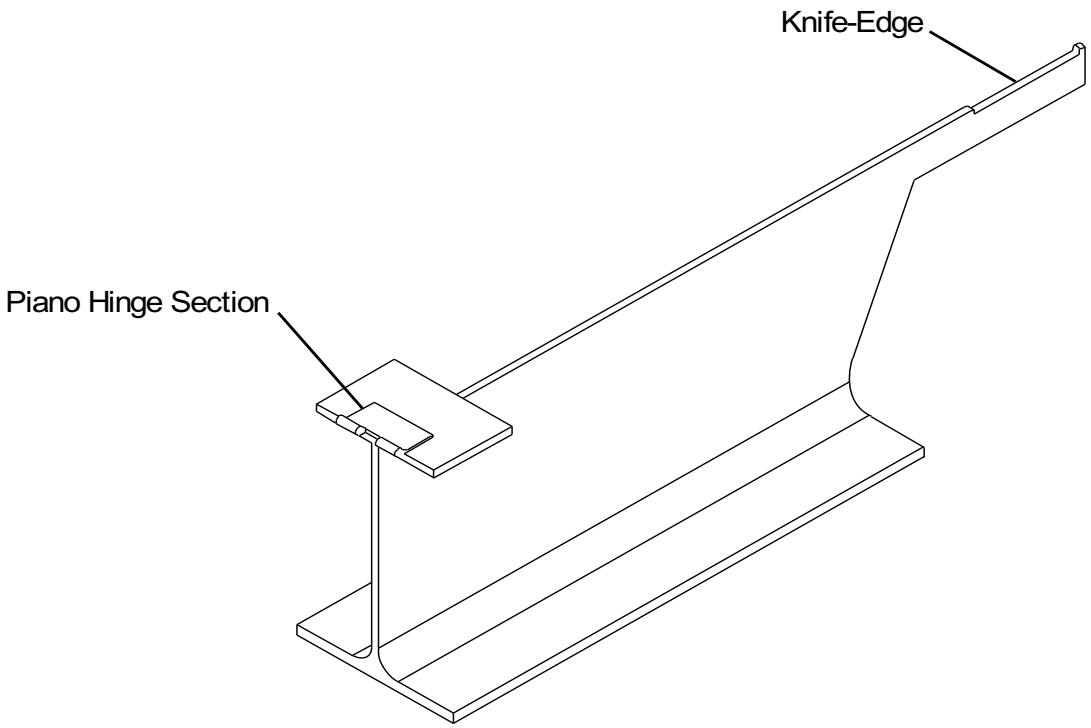
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Rudder limiter annunciator fails to light with rudder limiter engaged	Proximity switch failure	1. With electrical power on, place magnetic screwdriver between proximity switch and rudder limiter cam. 2. If the annunciator fails to light, check the wiring and connections. 3. If they are correct, replace the rudder limiter assembly.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

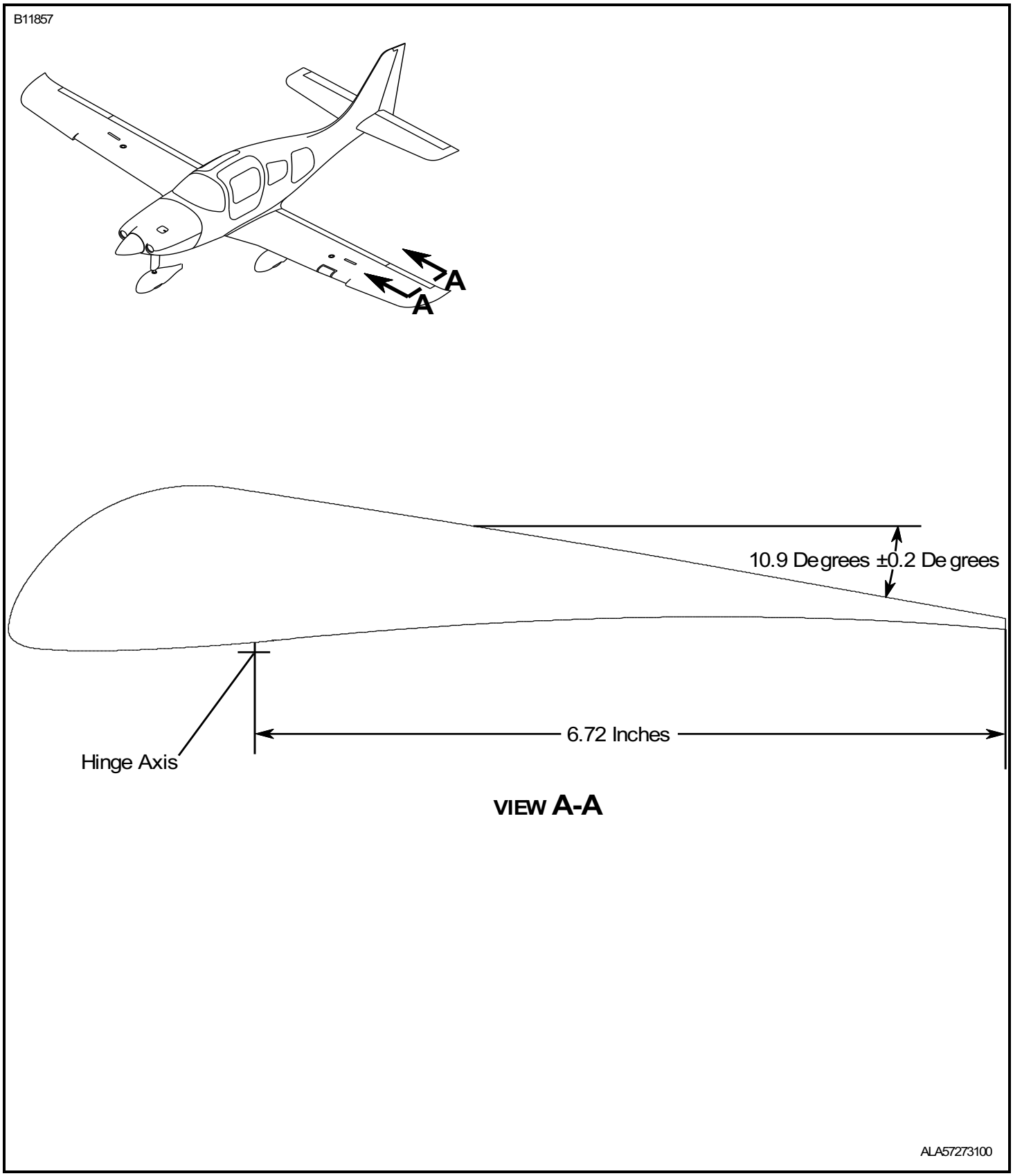
Figure 201 : Sheet 1 : Typical Knife-Edge

B11858



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

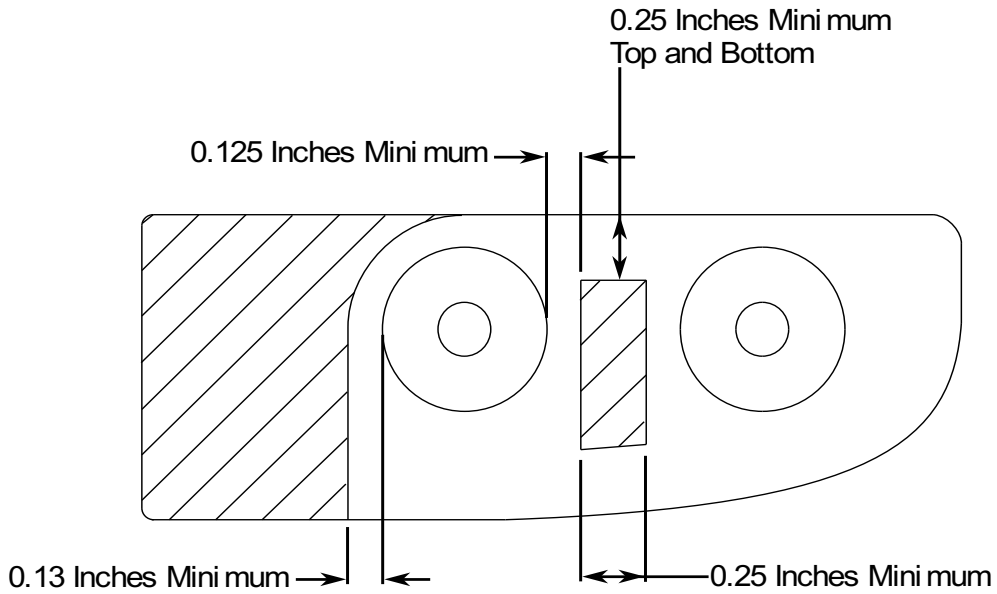
Figure 202 : Sheet 1 : Level Aileron Chord Line and Moment Arm



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

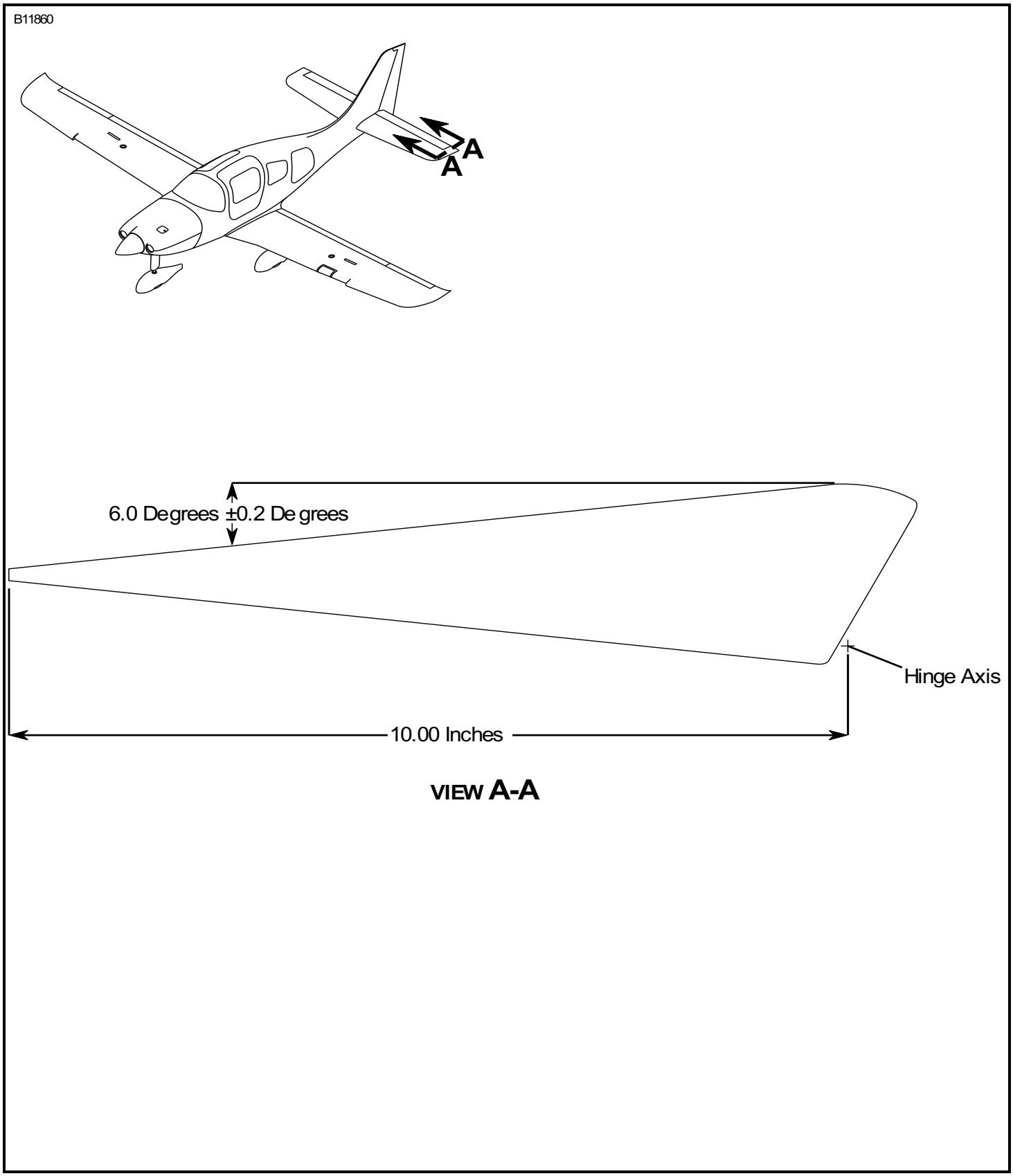
Figure 203 : Sheet 1 : Allowable Areas of Material Removal, Aileron Balancing Weight

B11859



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

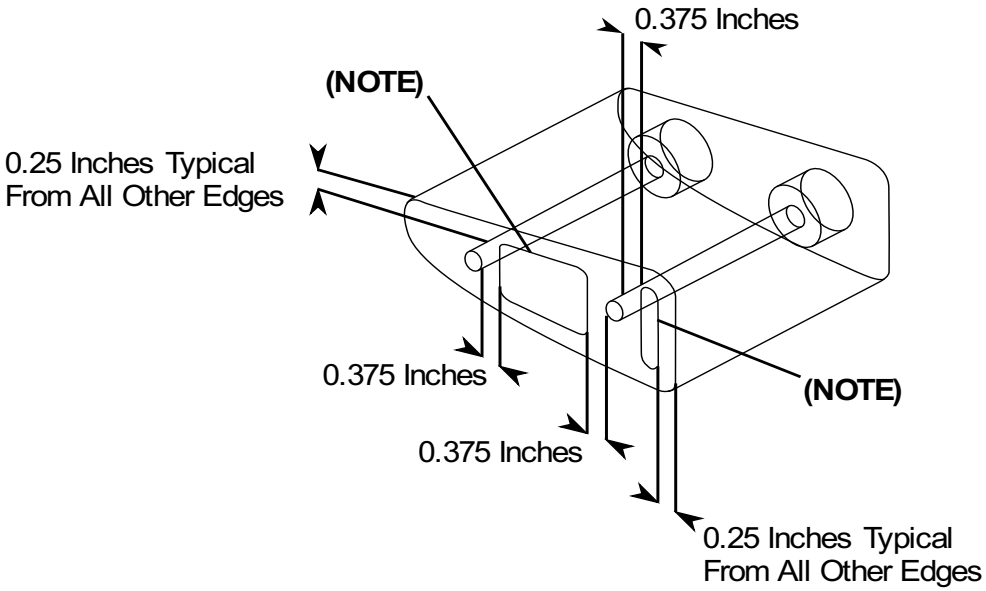
Figure 204 : Sheet 1 : Level Elevator Chord Line and Moment Arm



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Allowable Areas of Material Removal, Elevator Balancing Weight

B11862



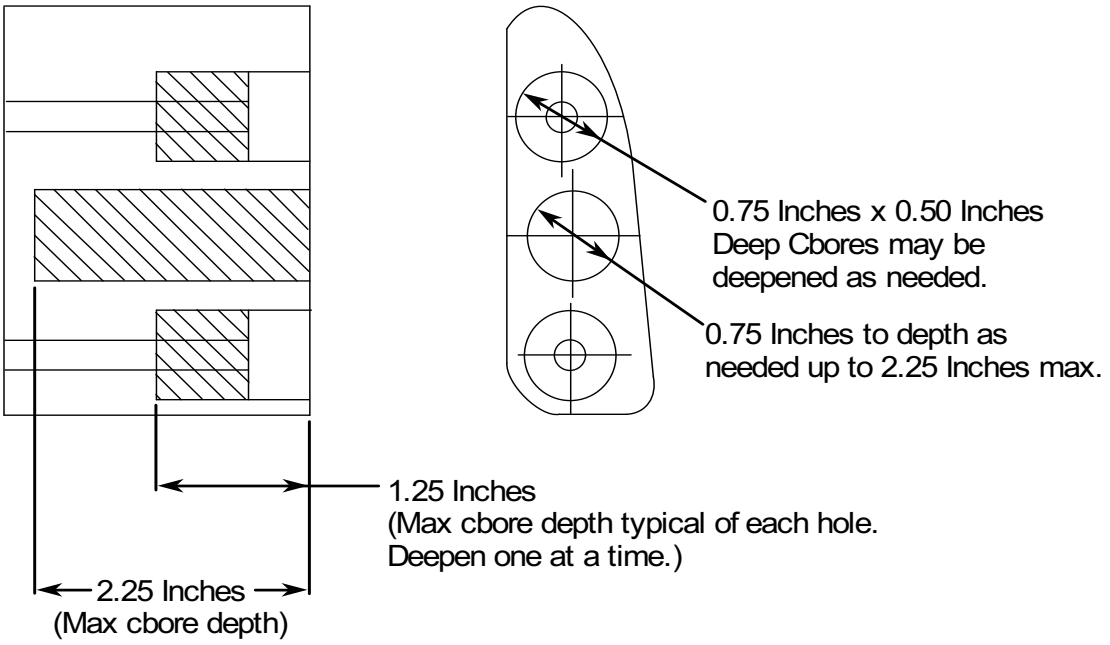
S/N 40004 to 40009

NOTE: Remove Material From These Areas As Necessary

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 2 : Allowable Areas of Material Removal, Elevator Balancing Weight

B11861

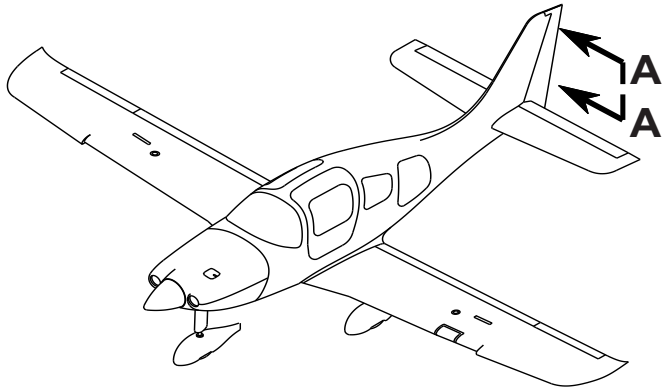


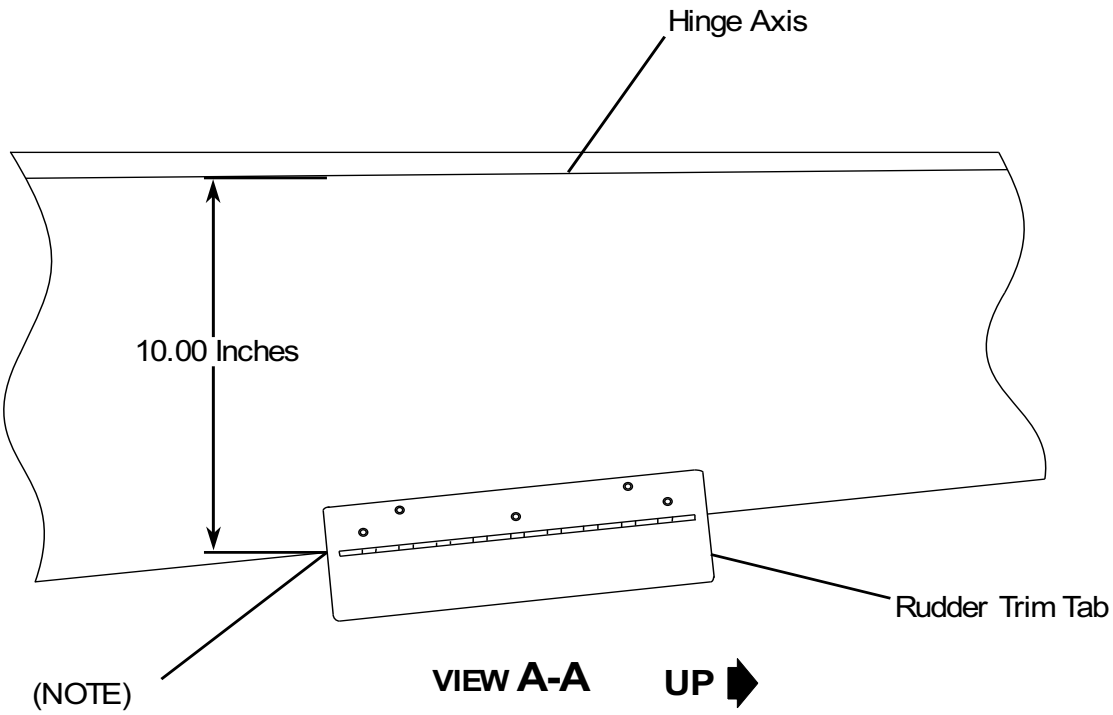
DETAIL B
S/N 40004 to 40010

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Location for Measuring the Rudder Surface Load

B11863



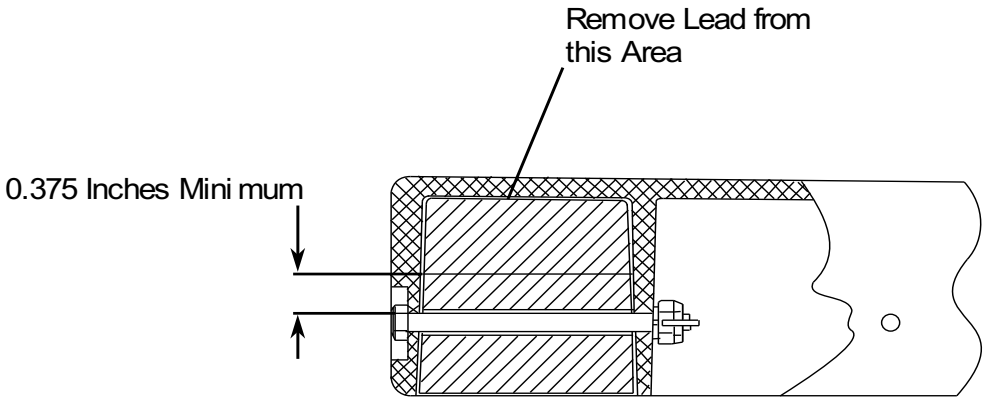


NOTE: Measure control surface load at this location.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

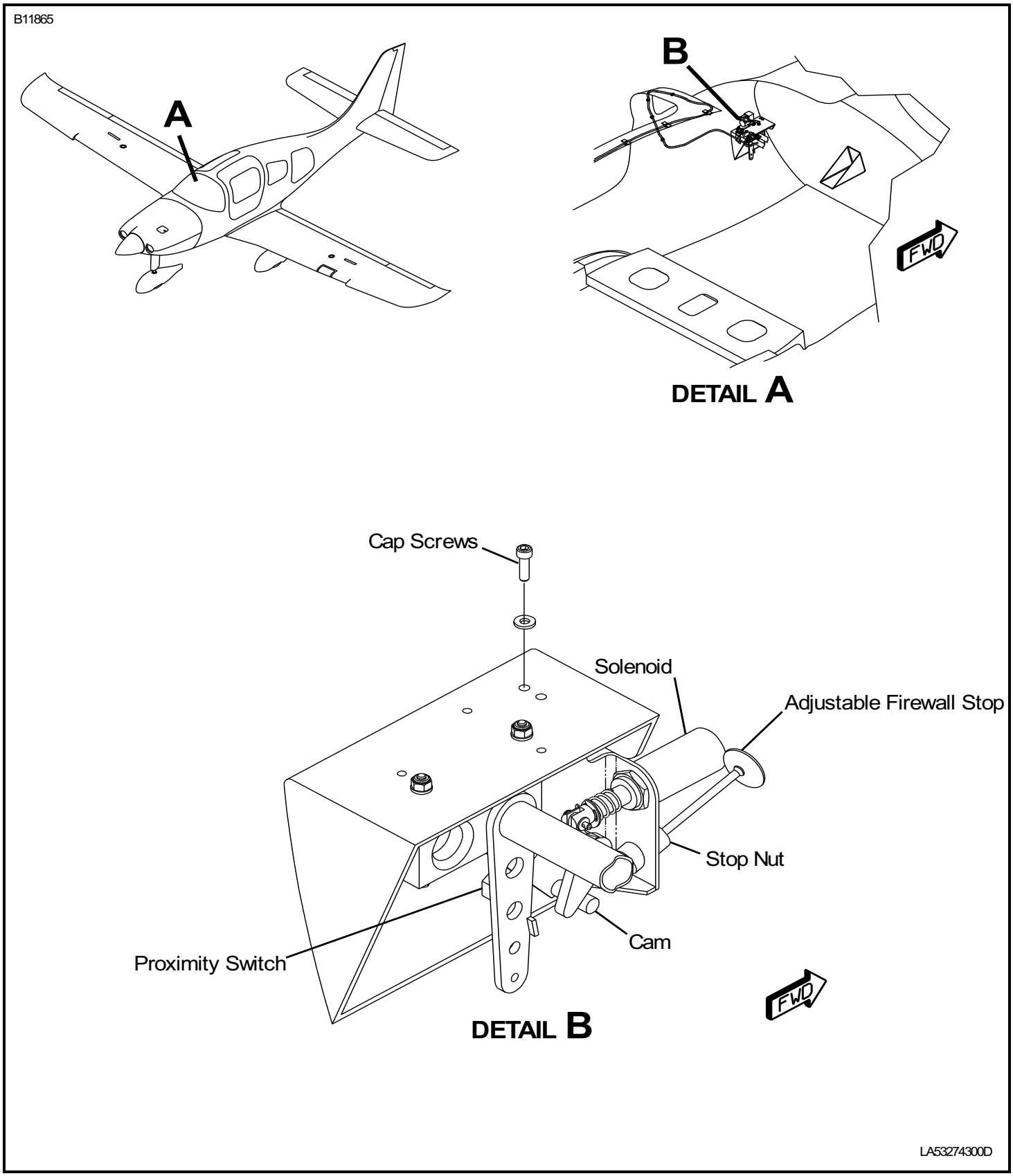
Figure 207 : Sheet 1 : Allowable Area of Material Removal, Rudder Balancing Weight)

B11864



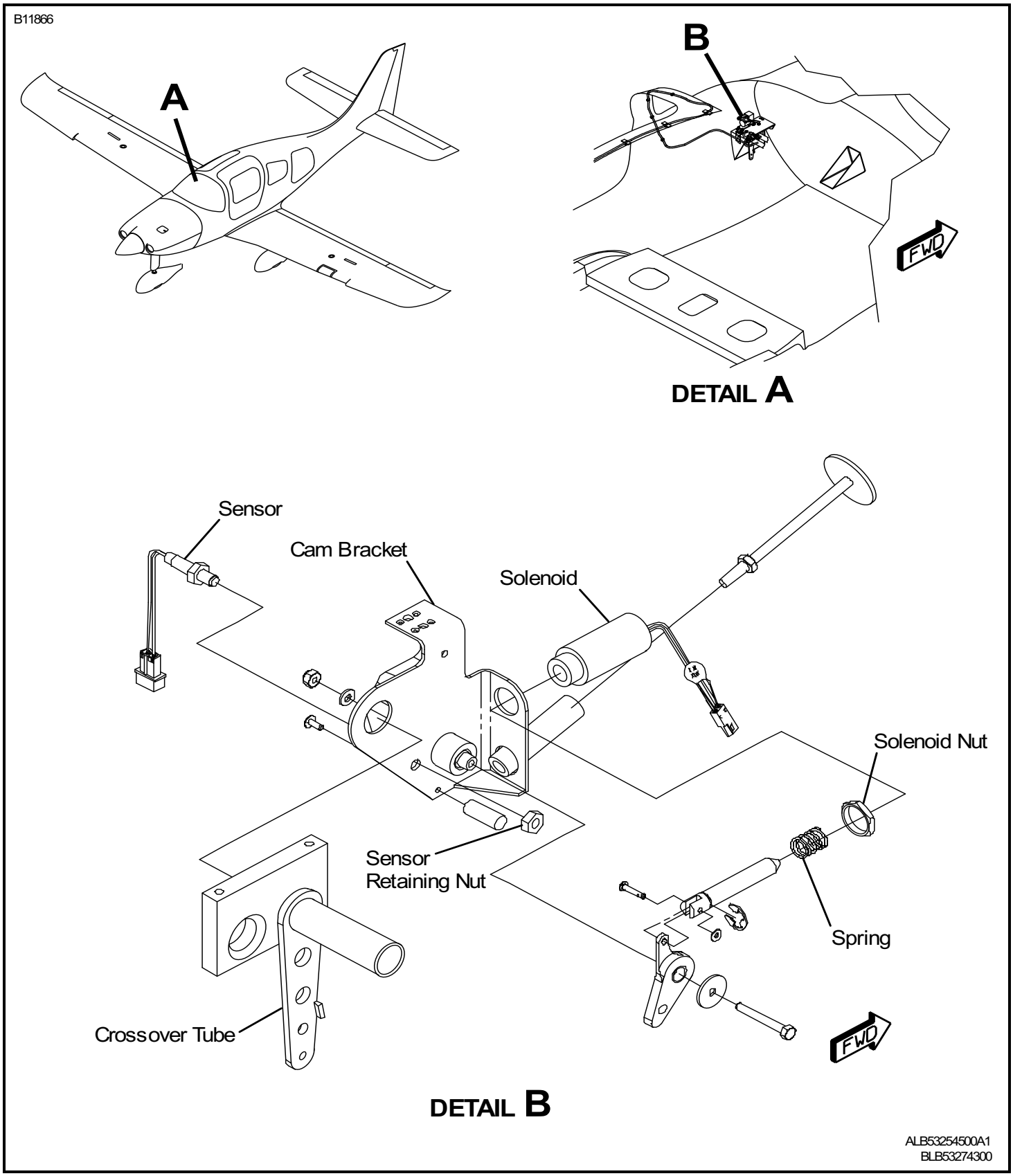
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : Rudder Limiter Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

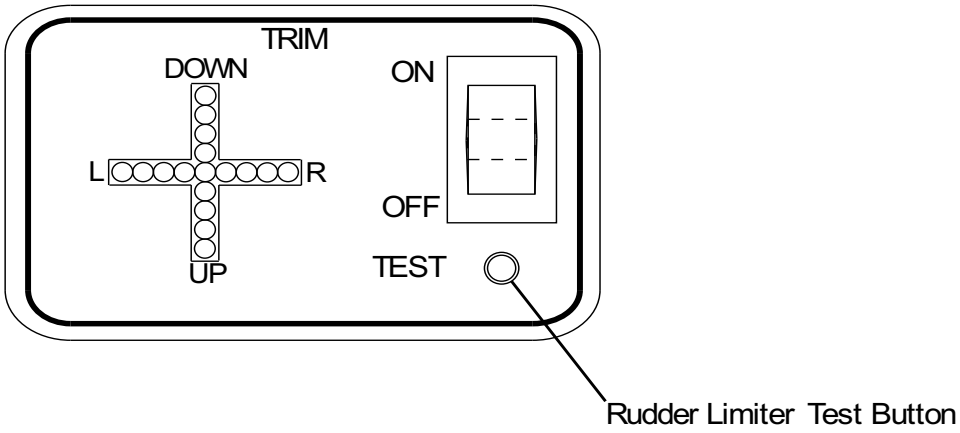
Figure 209 : Sheet 1 : Rudder Limiter Assembly (Exploded View)



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 1 : Rudder Limiter Test Button

B11867



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

AILERON CONTROL SYSTEM - MAINTENANCE PRACTICES

1. Aileron System - General

A. The ailerons are of a carbon fiber composite construction. The left aileron has a servo tab for reducing pilot forces during flight. The right aileron has an electrically actuated trim tab that is used for lateral trim during flight. Lead counterweights static balance the ailerons.

2. Ailerons

A. Removal and Installation of the Ailerons

(1) Disconnect the aileron final drive from the aileron drive horn by removing the cotter pin, castellated nut, and bolt.

(2) Disconnect the grounding strap at the middle aileron hinge from the aileron by removing the AN526-832R8 screw.

(3) On the right wing, disconnect the aileron trim servo wire, accessed through the outer wing-bay access panel.

(4) On the left aileron, disconnect the servo tab drive rods from the wing aileron hinge by removing the cotter pins and clevis pins.

(5) Remove the aileron from the wing aileron hinges by removing the cotter pin, castellated nut, and bolt at each of the three hinge locations.

(6) Slide the aileron straight aft. Take care not to move the right aileron too far aft and break the wiring connector for the trim system.

(7) Gently pull the wiring harness for the aileron servo from out of the wing, and disconnect the wiring connector.

(8) Reinstall the ailerons in the reverse order.

(9) After installing the ailerons, check that the deflections per Section 27-00-00, Table 1, are correct.

B. Rigging and Adjustment of the Ailerons

The aileron control system is rigged at the factory and should not need any further adjustments. For new ailerons, or ailerons requiring significant readjustment in order to achieve the correct deflection limits, use the following procedure.

NOTE: Keep the flaps in the fully-retracted position (0 degrees) during the rigging process.

(1) With the aileron final drives disconnected, verify smooth operation throughout the full range of travel for each aileron.

(2) Place the flap/aileron deflection template, part number TA57270000, on the upper surface of the wing between the outboard end of the flaps and the inboard end of the aileron.

(3) The downward deflection of an aileron should be approximately 17.7 degrees. If the deflection of an aileron is not enough, carefully sand material from its down-stop to achieve this deflection. If the deflection is too great, contact the manufacturer for new aileron down-stops.

(4) Level the aircraft about the roll axis before proceeding.

(5) Disconnect the aileron crossover control rod in the center section of the wing from the aileron torque tubes. Set both control sticks in the cockpit to a position of 88±2 degrees as shown in Figure 201. Adjust the rod ends on the crossover tube so the assembly may be installed between the torque tubes and tighten the jam nuts. Reinstall the torque tube.

(6) With the aileron control rods disconnected, lock both the left-hand and right-hand aileron bellcranks in the neutral position within the bellcrank brackets by placing a 1/4 in. diameter pin through the rigging hole. An AN4 bolt works well for this.

(7) With the control sticks still at 88±2 degrees, adjust the rod ends on the aileron control rods as required to allow them to fit between the aileron torque tubes and the bellcranks. Finger-tighten the control rod connections.

(8) Clamp the ailerons in the neutral position (0 degrees deflection on the rigging template). Adjust the length of the final drive to fit between the bellcrank and the aileron hinge and finger-tighten the connections.

(9) Remove the pins from the bellcranks and release the control sticks. Unclamp the ailerons and rotate them until they reach the up-stop (which is controlled by the down-stop on the opposite aileron). The up-stop on one aileron and the down-stop on the opposite aileron should make contact at the same time while ensuring the trailing edge is inside the template up-travel window. Both right-hand and left-hand sides are set in this manner. If more travel is needed, a combination of up-stop adjustment and/or careful sanding of material from the down-stop on the opposite aileron may be required. Continue this procedure until both ailerons meet all of the deflection requirements of Section 27-00-00, Table 1.

(10) Ensure that the gap at the outboard edge of the aileron between the wing and the aileron is 0.123 to 0.309 inches.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(11) Ensure that the gap at the inboard edge of the aileron between the flap and the aileron (when the flaps are retracted) is 0.125 to 0.250 inches. Ensure positive clearance when the flaps are extended.

(12) Ensure that the gap between the wing trailing edge and the aileron (when the aileron is in neutral position) is 0.150 to 0.250 inches along the entire span of the aileron.

(13) Verify there is sufficient thread engagement on all rod ends by checking that the threads are visible within the witness hole on each.

(14) Once the correct aileron deflections and proper gaps are achieved, retighten all jam nuts and torque 12 to 15 ft.-lbs.

C. **Rigging and Adjustment of the Ailerons (Minor Adjustment Only)**

For ailerons requiring only minor adjustment, use the following procedure:

NOTE: Keep the flaps in the fully-retracted position (0 degrees) during the rigging process.

(1) With the aileron final drives disconnected, verify smooth operation throughout the full range of travel for each aileron.

(2) Place the flap/aileron deflection template, part number TA57270000, on the upper surface of the wing between the outboard end of the flaps and the inboard end of the aileron.

(3) The downward deflection of an aileron should be approximately 17.7 degrees. If the deflection of an aileron is not enough, carefully sand material from its down-stop to achieve this deflection. If the deflection is too great, contact the manufacturer for new aileron down-stops.

(4) Level the aircraft about the roll axis before proceeding.

(5) Remove the pins from the bellcranks and release the control sticks. Unclamp the ailerons and rotate them until they reach the up-stop (which is controlled by the down-stop on the opposite aileron). The up-stop on one aileron and the down-stop on the opposite aileron should make contact at the same time while ensuring the trailing edge is inside the template up-travel window. Both right-hand and left-hand sides are set in this manner. If more travel is needed, a combination of up-stop adjustment and/or careful sanding of material from the down-stop on the opposite aileron may be required. Continue this procedure until both ailerons meet all of the deflection requirements of Section 27-00-00, Table 1.

(6) Ensure that the gap at the outboard edge of the aileron between the wing and the aileron is 0.123 to 0.309 in.

(7) Ensure that the gap at the inboard edge of the aileron between the flap and the aileron (when the flaps are retracted) is 0.125 to 0.250 inches. Ensure positive clearance when the flaps are extended.

(8) Ensure that the gap between the wing trailing edge and the aileron (when the aileron is in neutral position) is 0.150 to 0.250 inches along the entire span of the aileron.

(9) Verify there is sufficient thread engagement on all rod ends by checking that the threads are visible within the witness hole on each.

(10) Once the correct aileron deflections and proper gaps are achieved, retighten all jam nuts and torque 12 to 15 ft.-lbs.

D. **Service and Maintenance of the Ailerons**

The ailerons do not require any service or maintenance. The ailerons should be visually inspected annually for cracking at all hinge attachment locations. A tap test should be conducted on the aileron at the outboard end cap to aid in detection of any latent damage, delaminations, or disbonds. The rod end bearings used throughout the aileron control system do not require maintenance other than cleaning during routine inspections to remove any accumulation of dust or grime. Liquid lubricants should not be used on the rod end bearings as this may cause the Teflon liner to swell, creating excess friction in the bearing. Should the rod end need to be replaced, please contact the manufacturer.

The aileron linear bearing should be inspected every 100 hours or annually. Inspect each side of the bearing for foreign object debris. Ensure there is no debris or adhesive attached to the control rod, bearing housing, bearing race, or ball bearings. Move the aileron controls through their full range of motion and ensure there is no scarring or damage to the control rod, especially in the vicinity of the linear bearing. Normal wear at the linear bearing is indicated by a slightly darker color on the control rod. If damage is noted contact the manufacturer.

The aileron control rods should be visually inspected every 500 hours or biennially. To remove the push-pull tubes for inspection:

(1) Remove the aileron bellcrank access panel located on the lower surface of the wing directly in front of the inboard aileron hinge.

(2) Disconnect the aileron push-pull tube from the aileron bellcrank.

(3) Remove the aft wing belly access panel to gain access to the aileron crossover tube.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(4) Disconnect the aileron push-pull tube from the aileron torque tube bellcrank.

(5) Slide the push-pull tube out and down to clear the wing belly.

NOTE: It may be necessary to loosen or reposition the roll servo mount to give enough clearance to prevent damage to the rod during removal and installation.

(6) Reinstall the push-pull tubes in the reverse order.

(7) Reinstall all access panels and check the aileron controls for binding and friction.

CAUTION: Never lubricate the bearings that support the aileron torque tube.

3. Aileron Trim Tab

A. Removal and Installation of the Aileron Trim Tab

(1) Remove the four MS24693-C28 countersunk screws from the aileron trim servo access panel located on the lower surface of the right aileron.

(2) Disconnect the aileron trim tab drive rod and friction device clevis from the trim tab drive horn by removing the cotter pins and the clevis pins.

(3) Remove the MS24665-151 cotter pins on either end of the piano hinge, and remove the hinge wire. Once the hinge wire is removed, the aileron trim tab may be removed.

(4) Remove the four MS24693-C28 countersunk screws from the top surface of the right aileron.

(5) Carefully remove the trim tab servo from within the aileron.

(6) Once the trim motor is clear of the aileron, disconnect the wiring harness.

(7) Reinstall the trim motor and trim tab in the reverse order. Torque all screws 10 to 12 in.-lbs.

B. Rigging and Adjustment of the Aileron Trim Tab

The aileron trim tab and servo are preset at the factory, and further adjustment should not be necessary. Should the trim tab servo motor need to be replaced, contact the manufacturer for a replacement part and for detailed rigging instructions. The trim tab deflections should be checked periodically to ensure that the trim system is functioning properly. Use the following procedure for checking the trim tab deflections.

(1) Place the aileron/flap deflection template, part number TA57270000, on the upper wing surface between the outboard end of the flap and the inboard end of the aileron.

(2) Set the aileron to the neutral (0 degrees) position.

(3) Using a smart level or other calibrated angle-measuring device, check the deflections shown in Figure 202.

C. Service and Maintenance of the Aileron Trim Tab

The aileron trim tab is a flat aluminum plate. The trim tab does not require any maintenance. The trim tab hinge should be inspected annually for wear and corrosion. The hinge may be lubricated with MIL-L-7870 general purpose lubricating oil to help reduce wear and friction. The aileron trim tab friction device should be inspected every 500 hours, or biennially, and adjusted as necessary to 13.4 to 19.0 lbs. sliding friction. The friction device should be free from oils, grease, dirt, etc. If excessive wear is noted or smooth operation is not possible, the friction device should be replaced. A replacement, part number LA57273240, may be obtained from the manufacturer. The attachment bracket should be inspected every 500 hours or biennially for wear and replaced as necessary. The trim tab motor is a sealed unit and does not require service or maintenance. Refer to Figure 203.

4. Aileron Trim Tab Servo

A. Removal and Installation of the Aileron Trim Tab Servo

(1) Remove the four MS24693-C28 countersunk screws from the aileron trim servo access panel.

(2) Disconnect the aileron trim tab drive rod and friction device clevis from the trim tab drive horn by removing the cotter pins and clevis pins.

(3) Remove the four MS24693-C28 countersunk screws from the upper surface of the right aileron.

(4) Carefully remove the trim tab motor from within the aileron.

(5) Once the trim motor is clear of the aileron, disconnect the wiring harness.

(6) Reinstall the trim tab motor in the reverse order. Torque all screws 10 to 12 in.-lbs.

B. Rigging and Adjustment of the Aileron Trim Tab Servo

The trim tab motor is preset at the factory and should not need further adjustment. Should adjustment be necessary, use

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

the following procedure.

(1) Disconnect the friction device drive rod from the trim tab drive horn.

(2) Extend the trim motor drive arm all the way out.

(3) Set the trim tab at the up deflection limit, and adjust the drive rod as necessary to line up with the trim tab drive horn.

(4) Retract the trim motor drive arm, and check that the trim tab deflection angle is correct. Adjust the clevis on the drive rod as necessary to achieve the correct deflection. Maintain proper thread engagement (threads must be visible through the inspection hole located in the clevis).

(5) With the trim tab connected to the motor, retract the tab to the neutral position.

(6) Adjust the friction device drive rod, and connect it to the trim tab drive horn.

(7) Reinstall all clevis pins and cotter pins.

(8) Recheck deflection angles, and repeat above procedure if necessary.

C. **Service and Maintenance of the Aileron Trim Tab Servo**

The aileron trim tab servo is a sealed unit and does not require service or maintenance. Should the motor begin to slip or stop functioning properly, contact the manufacturer for a replacement.

5. Aileron Servo Tab

A. **Removal and Installation of the Aileron Servo Tab**

(1) Remove the cotter pins and clevis pins that attach the threaded drive rods to the servo tab bracket.

(2) Remove the MS24665-151 cotter pins from both ends of the piano hinge.

(3) Remove the hinge wire from the hinge, and remove the servo tab from the aileron.

(4) Reinstall the servo tab in the reverse order. Apply zinc oxide to the threaded push rod where the clevis attaches. Recheck deflections.

B. **Rigging and Adjustment of the Aileron Servo Tab**

The aileron servo tab is preset at the factory and further adjustment should not be necessary. The servo tab deflections should be checked periodically to ensure that the system is functioning properly. Use the following procedure for checking the servo tab deflections.

(1) Place the aileron/flap deflection template, part number TA57270000, on the upper wing surface between the outboard end of the flap and the inboard end of the aileron.

(2) Set the aileron to the neutral, 0 degree, position.

(3) Set the servo tab to the neutral, 2 degrees trailing edge down, position (refer to Figure 204) by adjusting the drive rod clevises as necessary. Maintain proper thread engagement (threads must be visible through the inspection hole located in the clevis).

(4) Cycle the aileron to the up and down deflection limits, and check the servo tab deflection angles as shown in Figure 204.

(5) Adjust the drive rods as necessary to achieve the correct deflections. Maintain proper thread engagement (threads must be visible through the inspection hole located in the clevis). Torque all jam nuts 30 to 36 in.-lbs.

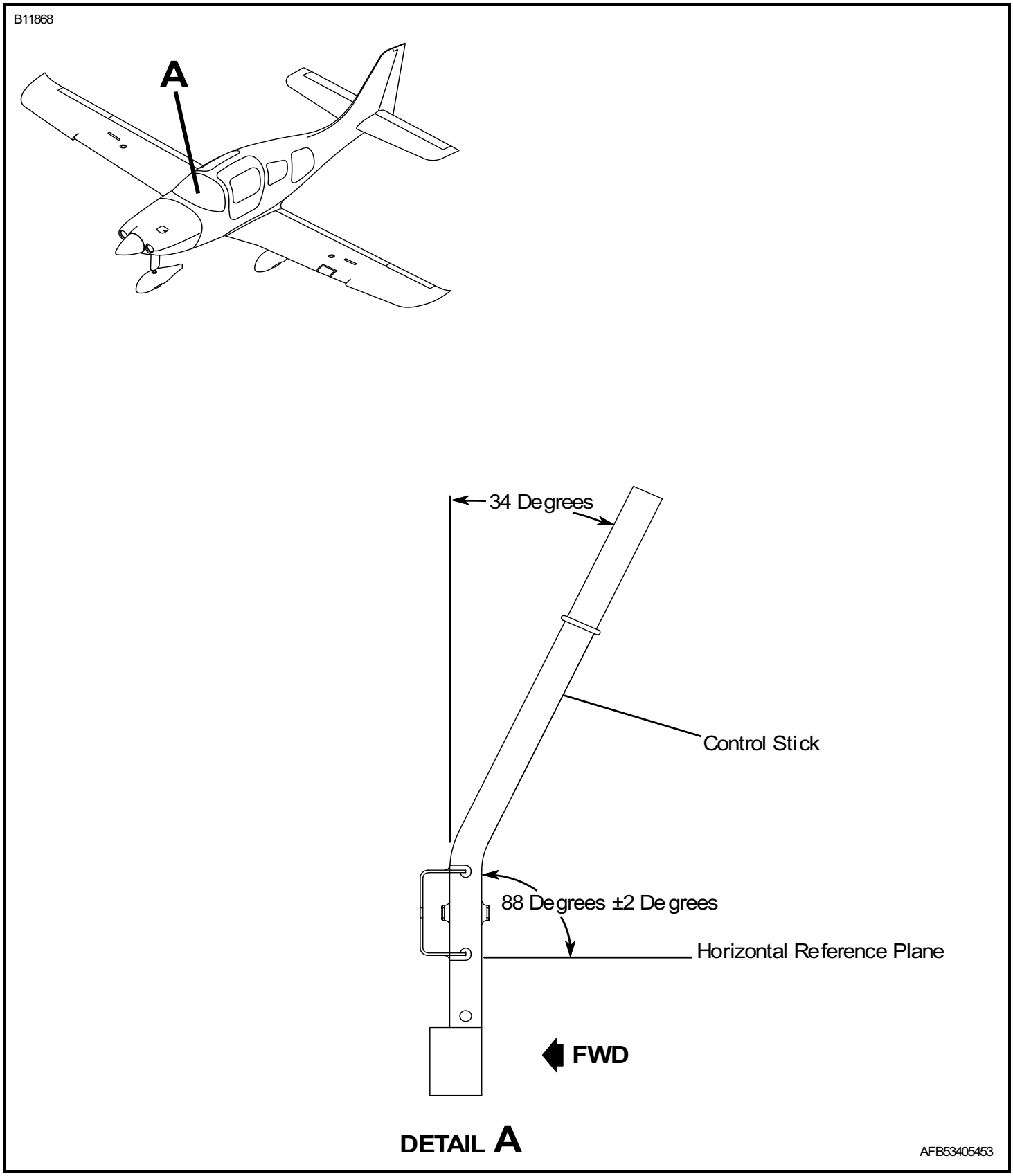
NOTE: Aileron servo tab deflection angles are measured with respect to a nominal horizontal reference plane.

C. **Servicing and Maintenance of the Aileron Servo Tab**

The aileron servo tab does not require any service or maintenance. The attachment hinge should be inspected every 500 hours or biennially for wear and replaced if necessary. The hinge may be lubricated with MIL-L-7870 general purpose lubricating oil to help reduce friction and wear.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

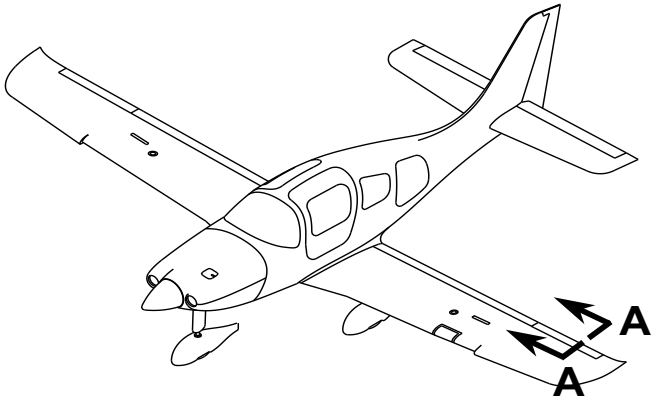
Figure 201 : Sheet 1 : Control Stick Neutral Position for Aileron Rigging

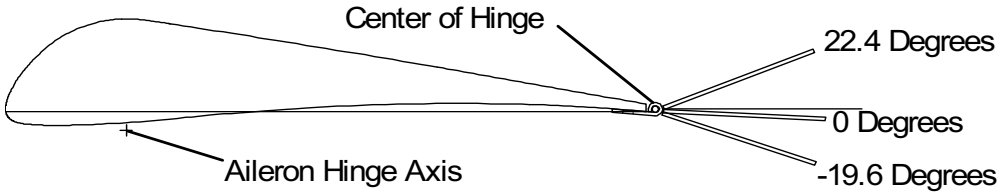


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Aileron Trim Tab Deflection Angles

B11869





FWD VIEW A-A

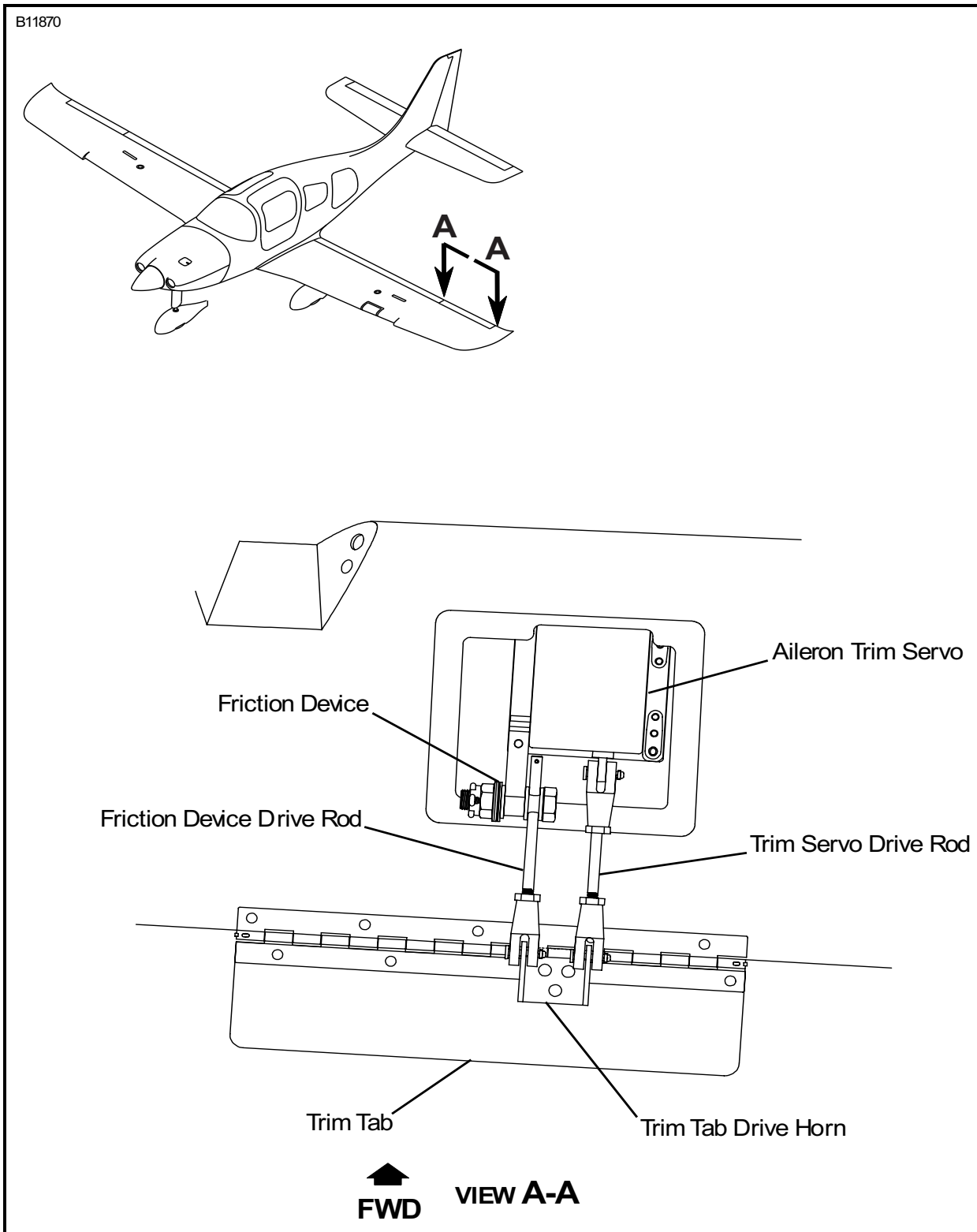
Tab 22.4 Degrees Up ± 1 Degree With Aileron at 0 Degrees

Tab 3 Degrees Down ± 1 Degrees With Aileron at 0 Degrees (NEUTRAL R EF)

Tab 19.6 Degrees Down ± 1 Degree With Aileron at 0 Degrees

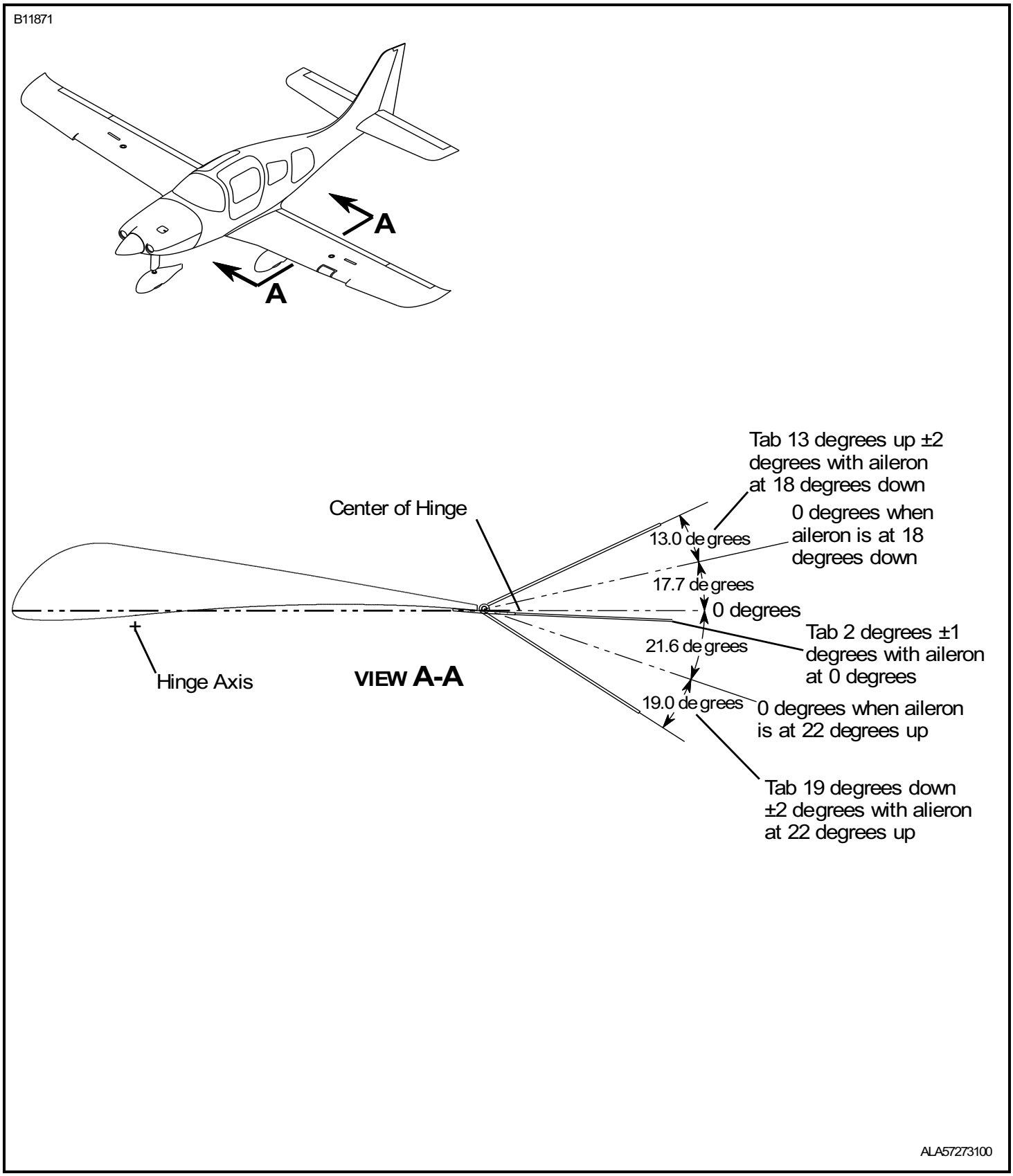
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Aileron Trim System



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Aileron Servo Tab Deflection Angles



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

RUDDER CONTROL SYSTEM - MAINTENANCE PRACTICES

1. Rudder System - General

A. The rudder attaches to the aft vertical closeout rib at three hinge points. Rudder cables attached to the rudder drive horn link the rudder to the rudder pedals. A fixed rudder trim tab is attached to the rudder at approximately mid span. The trim tab is ground adjustable for pilot comfort during cruise or takeoff power settings. A lead counterweight is used to static balance the rudder.

2. Rudder

A. Removal and Installation of the Rudder

(1) Detach the two rudder cables from the drive horn by removing the cotter pin from each nut, and then removing the bolt.

(2) Remove and discard the cotter pin from the lower hinge, and remove the castellated nut and washer.

NOTE: If the washer between the nut and the lower bracket is an NAS1149F0463P (approximately 0.500 inch diameter) then you must discard it and replace it with an MS15795-853 (approximately 0.688 inch diameter) washer.

(3) Remove the rudder by lifting it up and aft. Take care not to pull too far aft and break the metal braid that is still attached to the rudder leading edge.

(4) Once the rudder is removed, detach the metal braid by removing the attachment screw.

(5) Install the rudder in the reverse order. For S/N 40006 and on, a maximum of one NAS1149F0432P washer may be used to ensure there is a minimum clearance of 0.062 to 0.125 inches between the rudder actuator and the rudder attachment assembly. Refer to Figure 201.

(6) Install the MS15795-853 washer, castellated nut and cotter pin.

(7) Recheck all attachments for security and safety.

B. Upper Rudder Hinge Removal and Installation

NOTE: The Instructions are the same for both the middle and upper hinge.

(1) Remove the Upper Rudder Hinges. (Refer to Figure 201).

(a) Remove the rudder. Refer to Rudder Removal and Installation.

(b) Remove the bolts and washers that attach the hinge to the vertical stabilizer.

(c) Remove the hinge from the airplane.

(2) Install the Upper Rudder Hinges. (Refer to Figure 201).

(a) Put the hinge in place on the airplane.

(b) Attach the hinge with bolts and washers.

(c) Torque the bolts to 33 inch-pounds, +3 or -3 inch-pounds (3.73 N-m, +0.34 or -0.34 N-m).

(d) Install the rudder. Refer to Rudder Removal and Installation.

C. Lower Rudder Hinge Removal and Installation

(1) Remove the Lower Rudder Hinge. (Refer to Figure 201).

(a) Remove the rudder. Refer to Rudder Removal and Installation.

(b) Remove the screws and bolts that attach the hinge to the vertical stabilizer.

(c) Remove the hinge from the airplane.

(2) Install the Lower Rudder Hinge. (Refer to Figure 201).

(a) Put the hinge in place on the airplane.

(b) Attach the hinge with bolts, screws, and washers.

(c) Torque the bolts and screws to 33 inch-pounds, +3 or -3 inch-pounds (3.73 N-m, +0.34 or -0.34 N-m).

(d) Install the rudder. Refer to Rudder Removal and Installation.

D. Rigging and Adjustment of the Rudder

The rudder deflections are preset at the factory and should not need any further adjustment. If the rudder cable is replaced, the deflections will need to be rechecked and adjusted as necessary. Should this need to be done, use the rigging procedure as outlined below.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

NOTE: Rigging of the rudder will be easier with at least two individuals: one to hold the template in the proper position and one to make the required adjustments.

CAUTION: If the inner rudder cable tube is removed, make sure that when the tube is installed again the barbed insert is installed in the forward end of the tube. If the inner and outer tube clamp bolt and nut were loosened, the nut must be tightened to a torque of 20-25 inch pounds. Refer to Figure 202.

(1) Remove the locking clips from the left and right turnbuckles at the forward end of the rudder cable near the rudder pedals. Remove the locking clips from the rudder pedal interconnect turnbuckle (located behind the instrument panel near the firewall), and loosen the interconnect cable.

(2) Ensure that the rudder cables are not attached to the rudder pedal crossover arms.

(3) Thread the left rudder cable, right rudder cable and rudder pedal interconnect turnbuckles so that the clevis threads are just visible. Apply three turns to each clevis to put the threads inside the turnbuckle.

(4) Clamp the elevator in the neutral position such that the trailing edge is in alignment with the trailing edge of the horizontal stabilizer.

(5) Adjust the rudder to the neutral position by moving it left and right until it is centered about the vertical tail.

(6) Position the rudder deflection template, part number TA53550000, on the rudder such that the radius portion is located at the bottom edge of the rudder trim tab and the middle portion is aligned with the leading edge of the rudder. This action will position the template perpendicular to the hinge axis of the rudder.

(7) Move the rudder to the left and right until it contacts the rudder stop.

(8) Confirm that the deflection limits are 17±1 degrees. If the deflection limits are greater than the allowed tolerance, shim the rudder stop with thin washers as necessary to achieve the correct deflection. If the limits are less than the allowed tolerance, grind on the angled face of the stop until the desired angle is achieved.

NOTE: If grinding on the rudder stop is required to achieve the required rudder deflection, apply zinc oxide primer or a similar corrosion protecting treatment to the exposed metal.

(9) Attach the rudder cables to the rudder pedal crossover rods.

(10) Align the rudder to the 17±1 degree position on the right and push the pilot's side right rudder pedal to its full forward position.

(11) Two methods, as follows, may be used for attaching the rudder cables to the rudder drive horn. The first method employs a cable thimble, compression sleeve, and shackle. The second method utilizes a fork end cable terminal. Whichever method is used, contact Cessna for parts and instructions.

(a) Cable Thimble, Compression Sleeve and Shackle (Refer to Figure 203.)

1 At the aft of the plane pull the left side rudder cable taut and mark the cable, with an indelible marker, where it intersects with the forward edge of the connection hole in the rudder drive horn.

2 Using a cable thimble, clevis, and temporary clamp form a loop at the end of the rudder cable with the indelible mark at the apex of the loop. DO NOT remove excess cable.

3 Align the rudder to the 17±1 degree position on the left and push the pilot's side left rudder pedal to its full forward position.

4 At the aft of the plane pull the right side rudder cable taut and mark the cable, with an indelible marker, where it intersects with the forward edge of the connection hole in the rudder drive horn.

5 Using a cable thimble, clevis, and temporary clamp form a loop at the end of the rudder cable with the indelible mark at the apex of the loop. DO NOT remove excess cable.

6 Temporarily connect the rudder drive cables to the rudder drive horn. Insert excess cable into the fuselage. Ensure that the temporary clamp does not catch on the fuselage as the rudder deflections are adjusted.

7 Align the rudder to the 11.5±0.5 degree position on the template.

8 On the pilot's side, pull the left rudder pedal to its full aft position.

9 Engage the rudder limiter, and depress the left rudder pedal until the connecting arm contacts the rudder limiter cam.

10 Place an adjustable rod or similar device between the left rudder pedal and the vertical face of the floor directly beneath the pilot's seat. Adjust the rod so as to maintain enough pressure on the left rudder pedal to keep the rudder limiter cam in the engaged position.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

11 Adjust the left rudder cable turnbuckle until the rudder cable is tight.

12 Unblock the rudder pedal and the rudder. Set the rudder to 0 degrees deflection.

13 Adjust the right side rudder cable turnbuckle until the right rudder pedal is aligned with the left rudder pedal.

14 With the rudder at 0 degrees deflection, adjust the rudder pedal interconnect turnbuckle until it takes a weight of 5 lbs. to deflect the cable 1.00±0.25 inches.

15 Recheck all deflections, and repeat the rigging procedure as necessary until the proper deflections are achieved.

16 Without disturbing the turnbuckles, disconnect the rudder cables from the rudder pedal crossover rods. Disconnect the rudder cables from the rudder drive horn.

17 Disconnect the rudder cables from the rudder drive horn.

18 Using an indelible marker, make three marks on the rudder cable and cable thimble to facilitate alignment of the cable onto the thimble after the temporary clamp has been removed.

19 Remove the temporary clamp.

20 Insert the cable end into a compression fitting and form a loop.

21 Align the cable onto the thimble using the three indelible marks as a guide.

22 Snug the compression fitting up against the thimble and compress the fitting.

23 Reattach the rudder cables to the rudder horn and to the pedal crossover rods and recheck all deflections. Repeat the rigging procedure as necessary until the proper deflections are achieved.

24 Cut off excess rudder cable at the compression fitting.

(b) Fork End Cable Terminal (Refer to Figure 203.)

1 Temporarily attach fork end cable terminals to the left and right side of the rudder drive horn.

2 At the aft of the plane insert the rudder cable into the left fork end cable terminal and pull it taut. Mark the cable, with an indelible marker, where it intersects with the inner edge of the terminal sleeve just behind the fork of the terminal.

3 Align the rudder to the 17±1 degree position on the left and push the pilot's side left rudder pedal to its full forward position.

4 At the aft of the plane insert the rudder cable into the right fork end cable terminal and pull it taut. Mark the cable, with an indelible marker, where it intersects with the inner edge of the terminal sleeve just behind the fork of the terminal.

5 Disconnect the rudder cables from the pedal crossover rods.

6 Remove the terminals and cut the rudder cables 1/8 inch behind the mark toward the fore of the aircraft.

7 Insert the rudder cable into the left cable terminal so that the cable is 1/8 inch inside the terminal sleeve at the fork end.

8 Swage the fork end cable terminal.

NOTE: The swaging tool required to swage the fork end cable terminal is a special tool not available in most repair shops. Contact Cessna for instructions.

9 Insert the rudder cable into the right cable terminal so that the cable is 1/8 inch inside the terminal sleeve at the fork end.

10 Swage the fork end cable terminal.

11 Reattach the rudder cables to the rudder horn and to the pedal crossover rods.

12 Align the rudder to the 11.5±0.5 degree position on the template.

13 On the pilot's side, pull the left rudder pedal to its full aft position.

14 Engage the rudder limiter, and depress the left rudder pedal until the connecting arm contacts the rudder limiter cam.

15 Place an adjustable rod or similar device between the left rudder pedal and the vertical face of the floor directly beneath the pilot's seat. Adjust the rod so as to maintain enough pressure on the left rudder pedal to keep the rudder limiter cam in the engaged position.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

16 Adjust the left rudder cable turnbuckle until the rudder cable is tight.

17 Unblock the rudder pedal and the rudder. Set the rudder to 0 degrees deflection.

18 Adjust the right side rudder cable turnbuckle until the right rudder pedal is aligned with the left rudder pedal.

19 With the rudder at 0 degrees deflection, adjust the rudder pedal interconnect turnbuckle until it takes a weight of 5 lbs. to deflect the cable 1.00±0.25 in.

20 Recheck all deflections, and repeat the rigging procedure as necessary until the proper deflections are achieved.

(12) Reinstall the locking clips into all turnbuckles.

(13) Cycle the rudder from left to right to ensure that there is no binding or excessive friction in the system.

E. **Service and Maintenance of the Rudder** - The rudder does not require any service or maintenance. However, due to its composite construction, the rudder should be visually inspected annually for cracking at all hinge attachment locations and the trim tab attachment location. A tap test should be conducted on the rudder at the drive horn location to aid in detection of any latent damage or disbonds along the lower rudder rib. The rudder does not have any access panels, therefore, the counterweight needs to be removed in order to inspect the internal structure. To remove the rudder counterweight, remove the attachment screws, and slide the counterweight straight off. The rudder may also be inspected via the holes at the middle and top rudder hinge pin locations. Common inspection tools that may be used or needed are mirrors, bore scopes, etc.

The rudder should be removed and inspected for wear or corrosion of the hinge pins. If wear or corrosion results in a pin diameter of less than 0.238 inch the hinge pin must be replaced. You can apply lubricant or a corrosion preventative compound to the hinge pins on assembly to help minimize corrosion but the spherical bearings used in the attachment brackets on the vertical closeout rib do not require any maintenance and should not be lubricated. The hinge brackets should be inspected for corrosion or other damage and replaced if necessary.

F. **Rudder Cable Removal** - The rudder cable should be inspected thoroughly and replaced if any excessive wear or damage is observed. To remove the rudder cable, use the following steps:

(1) Contact the manufacturer for a replacement.

(2) Detach the rudder cable from the rudder drive horn per the rudder installation and removal instructions in this section.

(3) Cut the rudder cable to remove the turnbuckle, and slide the cable aft through the aft end of the fuselage.

(4) Install the new rudder cable by inserting the end without turnbuckle into the fore end of the rudder cable tube and sliding it aft to exit at the rudder drive horn.

Follow the procedures in Adjustment - Rudder Trim Tab for connection, rigging, and adjustment. Ensure that the requirements listed in Section 27-00-00, Table 1 are met.

3. Rudder Trim Tab

A. **Removal and Installation of the Rudder Trim Tab** - Should the trim tab need to be replaced, carefully drill out the five CCR264CS-4-02 attachment rivets to remove the trim tab. Obtain a new trim tab, part number LA53550001, from the manufacturer and reinstall with five new rivets of the same type and size. Take care when drilling out rivets so as not to enlarge holes.

CAUTION: Due to the carbon fiber composite construction of the rudder, do not use aluminum rivets. The new rivets must be of a corrosion resistant material (i.e. stainless steel) in order to prevent galvanic corrosion.

B. **Adjustment of the Rudder Trim Tab** - The rudder trim tab is a flat aluminum plate that is riveted to the trailing edge of the rudder at approximately mid-span. The trim tab is attached with five CCR264CS-4-02 countersunk rivets. The trim tab may be adjusted for pilot comfort during cruise or takeoff power settings. The trim tab is not adjustable during flight and must be adjusted while on the ground. To adjust the rudder trim tab, use the following instructions:

(1) Clamp two pieces of wood or other rigid material to either side of the trim tab. The wood blocks should be equal in length to the trim tab.

(2) Align the edges of the wood block with the slots in the trim tab.

(3) Once the wood blocks are positioned correctly, simply bend the trim tab in the desired direction. Do not exceed the deflection angles described in Section 27-00-00, Table 1.

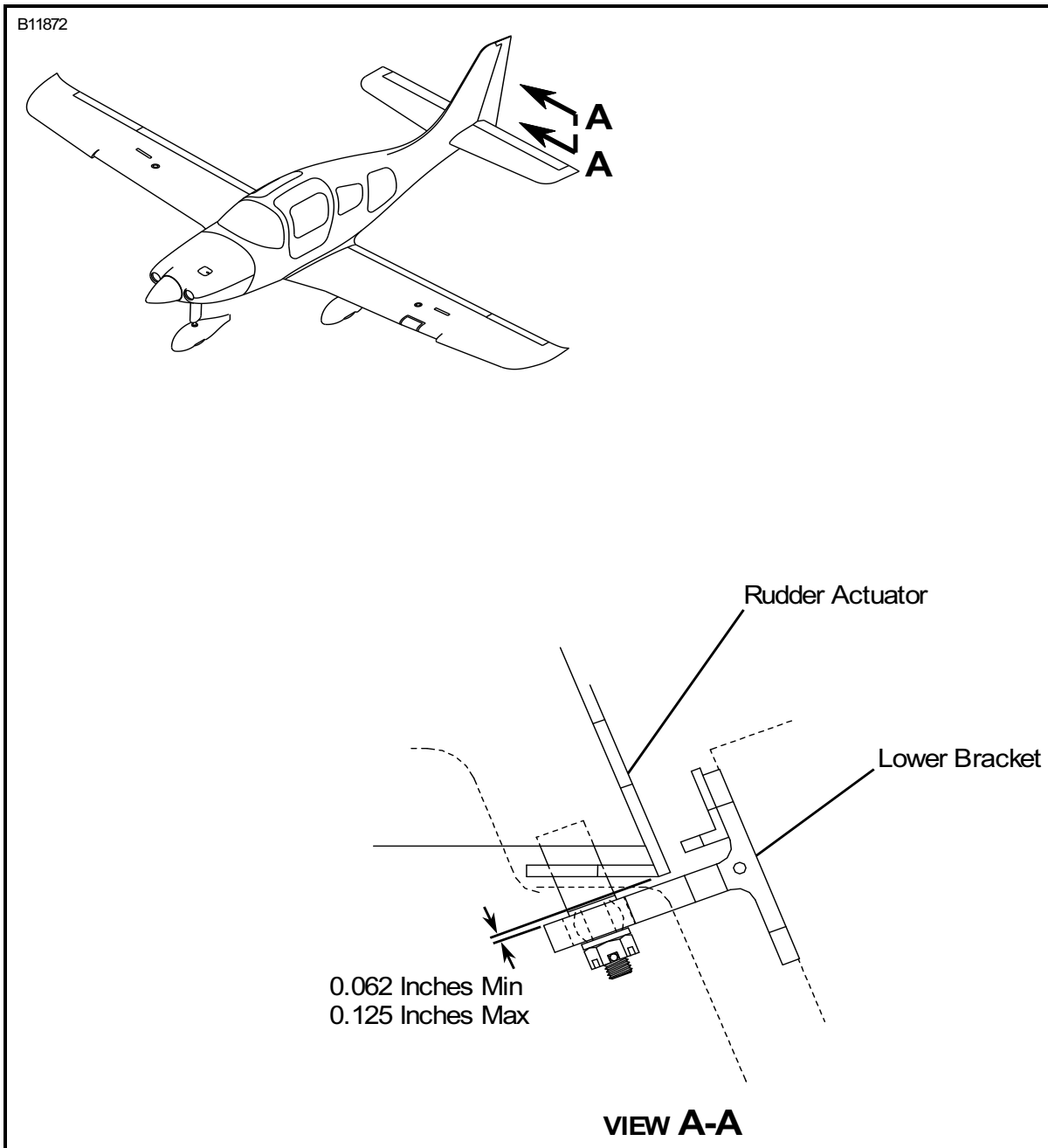
C. **Service and Maintenance of the Rudder Trim Tab** - The rudder trim tab should be inspected for wear and cracking of the slots that run the length of the tab (bend line). If excessive wear or cracking is observed, the trim tab should be

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

replaced.

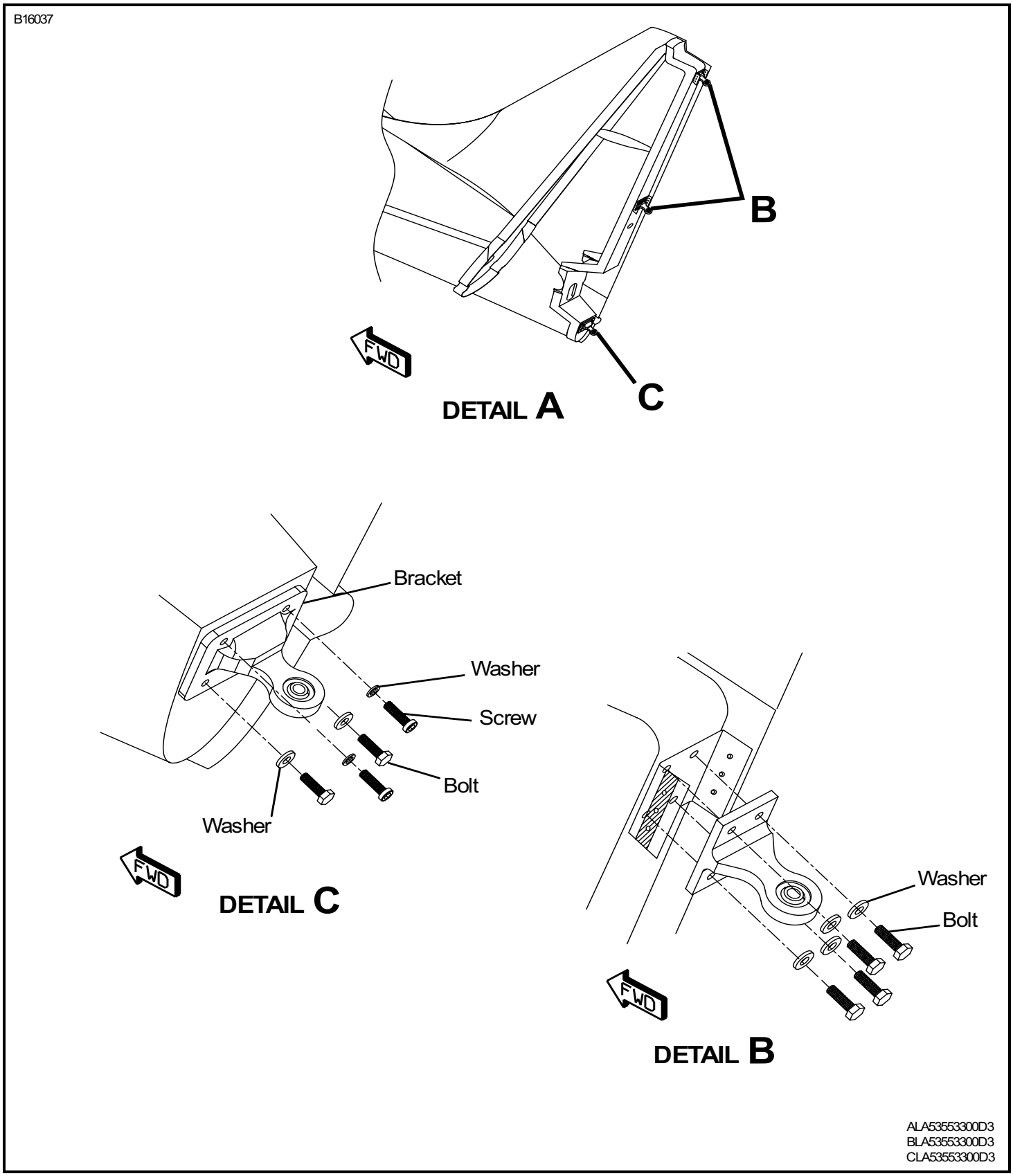
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Rudder Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

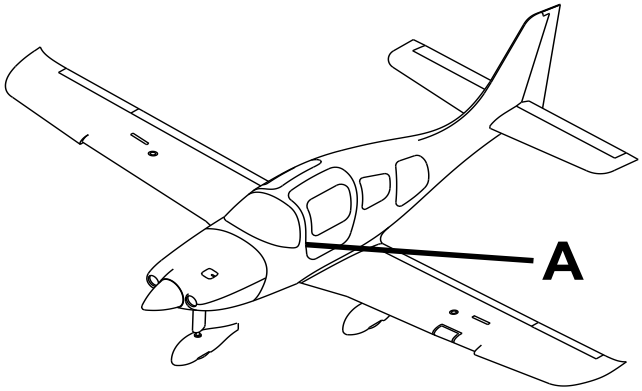
Figure 201 : Sheet 2 : Rudder Installation

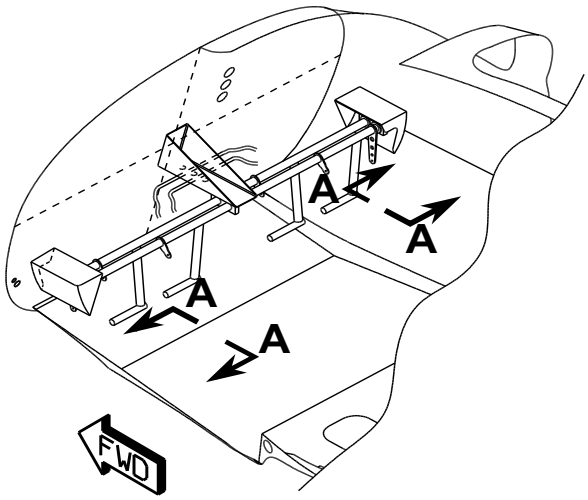


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

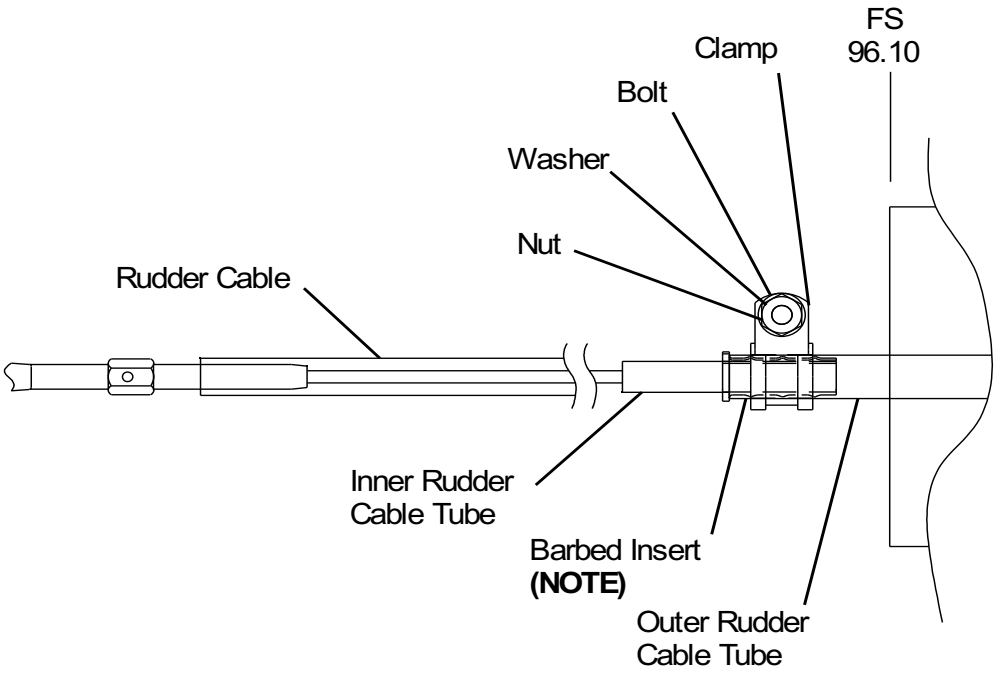
Figure 202 : Sheet 1 : Forward Rudder Cable Installation

B11873





DETAIL A



VIEW A-A
Right Side Shown, Left Side Opposite

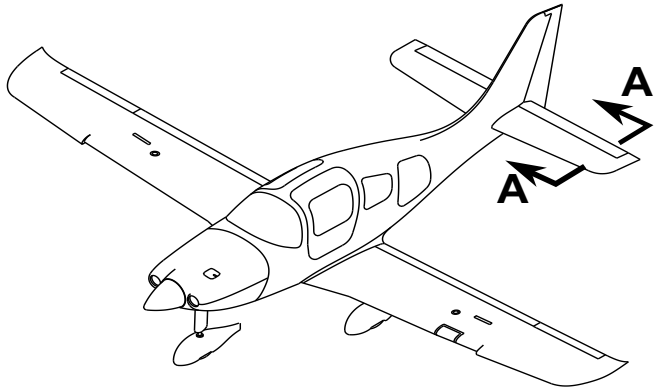
NOTE: Airplanes Incorporating SB10-27-03

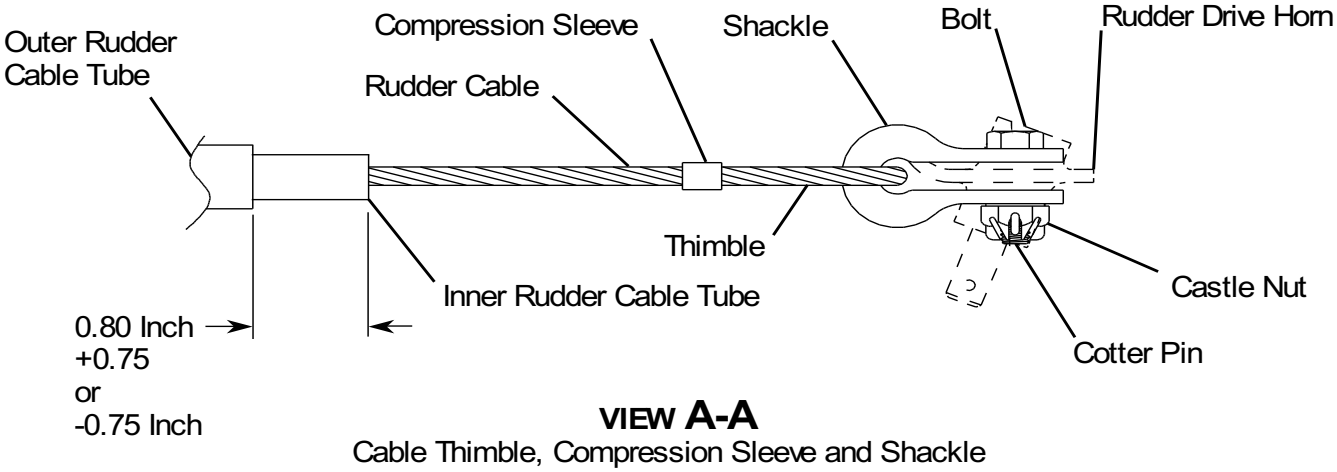
ALA53274000
AA2895001-1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

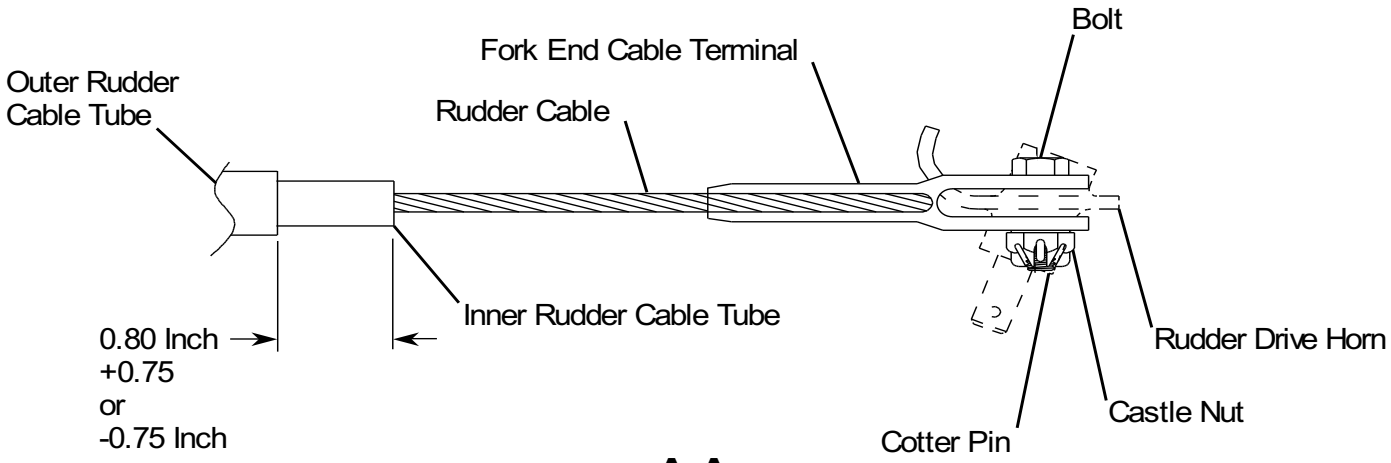
Figure 203 : Sheet 1 : Aft Rudder Cable Installation

B11874





VIEW A-A
Cable Thimble, Compression Sleeve and Shackle
Left Side Shown, Right Side Opposite



VIEW A-A
Fork End Cable Terminal
Left Side Shown, Right Side Opposite

AALA53274000
AALA53274000

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ELEVATOR CONTROL SYSTEM - MAINTENANCE PRACTICES

1. Elevator System – General

A. The elevator is of a carbon fiber composite construction and is attached to the horizontal stabilizer with two piano hinges. A series of push-pull tubes connects the elevator to the left and right control sticks. Simple rod end bearings are used throughout the elevator control system. Lead counterweights balance the elevator.

CAUTION: Due to its size and weight, removal of the elevator may require more than one individual.

2. Elevator

A. Removal and Installation of the Elevator

(1) Remove the rudder per the instructions in Section 27-20-00, Rudder

(2) Remove the cotter pin and retaining hardware from the aft elevator push rod and the elevator drive horn.

(3) Remove the 36 MS24694-C50 screws that attach the elevator hinge to the horizontal stabilizer.

(4) Remove the elevator by sliding it straight aft. Take care not to move it too far aft and break the wiring connector.

(5) Disconnect the wiring connector for the elevator trim servo and the grounding strap at the elevator horn, and remove the elevator completely from the aircraft.

(6) Install the elevator in the reverse order. Recheck all attachment hardware for security and safety. Torque all attachment screws 30 to 36 in.-lbs.

B. Rigging and Adjustment of the Elevator

(1) Remove the following interior panels per the instructions in Chapter 25: FLSPL, FLSPR, MLSPL, MLSPR, right and left door tread.

(2) Remove the baggage bulkhead access panel per the instructions in Section 53-30-00, Baggage Bulkhead Access Panel.

(3) With the elevator securely fastened to the horizontal stabilizer, clamp the elevator such that its trailing edge is aligned with the trailing edge of the horizontal stabilizer.

(4) Set the control stick to the vertical (0 degrees) position as shown in Figure 201.

(5) Loosen the jam nuts on the rod end bearings on all elevator push-pull tubes as shown in Figure 202.

(6) Place the elevator deflection template, part number TA55270000, on the horizontal stabilizer 76.5 inches inboard from the tip of the horizontal stabilizer and perpendicular to the hinge axis. This template has three slots that define the neutral, upper, and lower elevator deflection locations. The middle slot defines the neutral position, while the upper and lower slots define the upper and lower deflections limits, respectively. Refer to Figure 203

(7) With the elevator in the neutral position (trailing edge in alignment with the middle slot on the template) rotate the elevator upwards until it just contacts the stop. Check that the trailing edge of the elevator is between the upper and lower edges of the uppermost slot on the template.

CAUTION: Do not press too hard on the elevator against the elevator up stop, as this will cause a false indication of the elevator deflection.

(8) Rotate the elevator to the down position, and allow the elevator to rest freely against the down stops. Check that the trailing edge is between the upper and lower edges of the lower slot on the template.

(9) Adjust the elevator up and down stops as necessary to align the trailing edge of the elevator between the upper and lower edges of the top and bottom slots in the template.

(a) To adjust the elevator up stop, loosen the jam nut, turn the socket head cap screw in the desired direction until the proper up deflection is met, then re-tighten the jam nut and torque 72 to 84 in.-lbs. For aircraft serial number 40007 and On, torque the jam nut 100 in.-lbs.

(b) To adjust the elevator down stops and increase the amount of down deflection, sand on the surface of the stop located in the counterweight pockets until the proper down deflection is achieved. If the down deflection is too much, contact the manufacturer for new elevator stops.

(10) Adjust the rod end bearings in the elevator push-pull tubes such that the following criteria are met:

(a) The elevator deflections per Section 27-00-00, Table 1, are achieved.

(b) The control stick is in a vertical (0 degrees) position when the elevator is at neutral (0 degrees deflection). Refer to Figure 201.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(c) The elevator interconnect weldment has adequate clearance (0.125 inches minimum) with the adjacent aircraft structure.

(d) Control stick is free from interference with adjacent side interior panels and the instrument panel.

(e) All rod ends have a minimum 0.5 in. thread engagement (threads should be visible through inspection hole in ends of push-pull tubes).

(11) Ensure that the gap between the outboard end of the elevator and the horizontal stabilizer is 0.125 to 0.250 inches.

(12) Torque all jam nuts 90 to 120 in.-lbs.

(13) Cycle the control stick fore and aft to ensure that there is no binding in the system.

C. **Servicing and Maintenance of the Elevator**

The elevator is attached to the horizontal stabilizer with two piano hinges. Each hinge should be inspected annually for excessive wear and cracks. The hinge may be lubricated with MIL-L-7870 general purpose lubricating oil to help reduce wear and friction. The rod end bearings used throughout the elevator control system do not require maintenance other than cleaning during routine inspections to remove any accumulation of dust or grime. Liquid lubricants should not be used on the rod end bearings as this may cause the Teflon liner to swell creating excess friction in the bearing. Should the rod end need to be replaced, contact the manufacturer.

3. Elevator Trim Tab

A. **Removal and Installation of the Elevator Trim Tab**

(1) Gain access to the elevator trim motor by removing the access panel located on the lower surface of the elevator.

(2) Disconnect the trim motor drive rods from the trim tab drive horn by removing the cotter pins and clevis pins.

(3) Rotate the trim tab upwards to gain access to the screws attaching the trim tab hinge to the elevator.

(4) Remove the 11 AN526C632R screws attaching the hinge to the elevator.

(5) Reinstall the trim tab in the reverse order, and torque all screws 10 to 12 in.-lbs.

(6) Run the trim tab to the up and down deflection positions to ensure that there is no binding of the system.

B. **Rigging and Adjustment of the Elevator Trim Tab**

The elevator trim tab deflections are preset at the factory and should not require any further adjustment. The trim tab deflections should be checked periodically to ensure that the system is functioning properly. If the trim tab deflections are checked and found to be outside the acceptable limits per Section 27-00-00, Table 1, contact the manufacturer for further instructions.

C. **Servicing and Maintenance of the Elevator Trim Tab**

The trim tab is attached to the elevator with one piano hinge. The hinge should be visually inspected annually for excess wear and cracking and replaced as necessary. The hinge should be replaced if the hinge becomes worn to the point that the trim tab free play limits per Section 27-00-00, Table 1 are exceeded. The hinge may be lubricated with MIL-L-7870 general purpose lubricating oil. Should the nutplates located on the nutplate assembly, part number LA55273818, inside the elevator become worn or stripped, contact the manufacturer for a replacement.

4. Elevator Trim Tab Servo (S/N 40004 to 40039)

A. **Removal and Installation of the Elevator Trim Tab Servo**

NOTE: If it is necessary to install a new trim tab servo on aircraft S/N 40004 to 40039, it is recommended that a new style servo be installed. Refer to the Elevator Trim Tab Servo (S/N 40040 and On) section. Contact the factory for a kit.

(1) Remove the rudder per the instructions in Section 27-20-00, Rudder.

(2) Remove the elevator per the instructions in the Removal and Installation of the Elevator section.

(3) Gain access to the elevator trim motor by removing the access panel located on the lower surface of the elevator.

(4) Disconnect the trim motor drive rods from the trim tab drive horn by removing the cotter pins and clevis pins.

(5) Remove the six AN526C632R10 screws that attach the trim motor hinge to the elevator hinge.

(6) Carefully remove the trim motor from within the elevator.

CAUTION: Take care when removing the trim motor so as not to damage the wiring and connectors located on the outside of the trim motor housing. Should any of the wiring or connectors become damaged or break, contact the manufacturer for a replacement.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(7) After removing the trim motor, disconnect the wiring harness.

(8) Reinstall the trim motor in the reverse order. Torque all screws 10 to 12 in.-lbs.

B. **Rigging and Adjustment of the Elevator Trim Tab Servo**

The elevator trim motor is an integral part of the elevator trim tab. The trim tab deflections are preset at the factory, therefore, the trim tab and motor should not require any further adjustment unless it needs to be removed and replaced. If the trim tab deflections are checked and found to be outside the acceptable limits per Section 27-00-00, Table 1, the following procedure should be used.

(1) Using elevator trim template TA55273800 Rev B, measure out from the right side of the vertical 23.875 in. to BL 26.175. Carefully place the template on the elevator and over the trim tab. Have an assistant drive the elevator trim tab to the full down position (trim tab up) as indicated by the template.

NOTE: Actuation of the elevator trim system may have to be stopped before the `DOWN' microswitch is activated. If the microswitch is activated before full down travel is achieved, adjust the clamp on the drive rod so that the full throw of the trim tab can be accomplished. Pay no attention to position indications at this point.

(2) With the trim tab in the full down position (trim tab up), adjust the clamp on the microswitch position drive rod (refer to Figure 204, Sheet 1) so that the allen head set screw just closes the microswitch, deactivating the motor.

NOTE: Slight bending of the microswitch arm may be required to fine tune this adjustment.

CAUTION: The microswitch arm is very fragile. BEND CAREFULLY! If the microswitch arm breaks, the actuator unit must be returned to the manufacturer for repair/replacement.

(3) With a felt tip pen, place a mark on the microswitch position drive rod where it enters the actuator housing. Refer to Figure 204, Sheet 1. This will serve as a reference point while adjusting the position indication rod.

(4) Loosen both screws on the clamp between drive rod and microswitch position drive rod. Refer to Figure 204, Sheet 1. Turn on the aircraft power. Being careful not to move the microswitch position rod, carefully move the clamp while an assistant watches the trim panel indications. Adjust so that the upper blue light (full down indication) on the trim panel is illuminated. Tighten both screws on the clamp.

(5) Using trim tab template TA55273800 Rev B as a reference, have an assistant drive the elevator trim system to the full up position (trim tab down).

NOTE: Actuation of the elevator trim system may have to be stopped before the `UP' microswitch is activated. If the microswitch is activated before full up travel is achieved, adjust the clamp on the drive rod so that the trim tab can be moved to match the required template markings.

NOTE: Slight bending of the microswitch arm may be required to fine tune this adjustment.

(6) Mark the microswitch position drive rod with a felt tip pen as it enters the actuator housing. Loosen both screws on the clamp between the drive rod and position drive rod. Have an assistant watch the trim panel while moving the clamp until the bottom blue light on the trim panel (full up indication) is illuminated. Tighten screws.

(7) Drive the elevator trim system to the full down position using the control stick trim button while an assistant watches the actuator and trim tab linkage for clearances and smooth operation.

CAUTION: If the microswitch is severely misadjusted, damage to the aircraft and/or components may occur while trimming to either stop. Watch carefully during this phase of operation for clearances and any indication of binding.

(8) Using template TA55273800 Rev B, check position of the trim tab. Drive the elevator trim system to the full down position again, if necessary. Check trim panel position indications. Repeat Steps 5 and 6 if necessary.

(9) Drive the elevator trim system to the full up position while an assistant checks actuator and trim tab linkage for clearances and smooth operation.

CAUTION: If the microswitch is severely misadjusted, damage to the aircraft and/or components may occur while trimming to either stop. Watch carefully during this phase of operation for clearances and any indication of binding.

(10) Using template TA55273800 Rev B, check position of trim tab. Repeat Step 7 if necessary. Check trim panel position indication. Repeat Step 8 if necessary.

(11) Cycle the elevator trim system through full deflections, checking for security, proper travel, and indications.

NOTE: When the trim tab is in the neutral position (faired evenly with elevator), the trim panel should

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

indicate one green light above center.

(12) Install the elevator trim actuator cover panel.

C. **Servicing and Maintenance of the Elevator Trim Tab Servo**

The elevator trim motor should be removed for inspection and service every 3000 hours. The trim motor drive rod gears should be inspected for wear and lubricated with heavy-duty gear grease. The worm gears attached to the drive motor shaft do not need to be lubricated but should be inspected for wear. If any of the gears are worn, they should be replaced. Replacements may be obtained from the manufacturer.

5. Elevator Trim Tab Servo (S/N 40040 and On)

A. **Removal and Installation of the Elevator Trim Tab Servo**

(1) Gain access to the elevator trim motor by removing the access panel located on the lower surface of the elevator.

(2) Disconnect the trim motor drive rods from the trim tab drive horn by removing the cotter pins and clevis pins.

(3) Remove the six AN526C632R10 screws that attach the trim motor hinge to the elevator hinge.

(4) Carefully remove the trim motor from within the elevator.

CAUTION: Take care when removing the trim motor so as not to damage the wiring and connectors located on the outside of the trim motor housing. Should any of the wiring or connectors become damaged or break, contact the manufacturer for a replacement.

(5) After removing the trim motor, disconnect the wiring harness.

(6) Reinstall the trim motor in the reverse order. Torque all screws 10 to 12 in.-lbs.

B. **Rigging and Adjustment of the Elevator Trim Tab Servo**

The elevator trim motor is an integral part of the elevator trim tab. The trim tab deflections are preset at the factory, therefore, the trim tab and motor should not require any further adjustment unless it needs to be removed and replaced. If the trim tab deflections are checked and found to be outside the acceptable limits per Table 1, the following procedure should be used.

(1) Using elevator trim template TA55273800 Rev B, measure out from the right side of the vertical 23.875 in. to BL 26.175. Carefully place the template on the elevator and over the trim tab. Have an assistant drive the elevator trim tab to the full down position (trim tab up) as indicated by the template.

NOTE: Actuation of the elevator trim system may have to be stopped before the `DOWN' microswitch is activated. If the microswitch is activated before full down travel is achieved, back-off the screw on the potentiometer drive bracket so that the full throw of the trim tab can be accomplished.

(2) With the trim tab in the full down position (trim tab up), adjust the down screw on the potentiometer drive bracket (refer to Figure 204, Sheet 2) so that the screw just closes the microswitch, deactivating the motor. Tighten the jam nut on the adjusting screw.

(3) Using trim tab template TA55273800 Rev B as a reference, have an assistant drive the elevator trim system to the full up position (trim tab down).

NOTE: Actuation of the elevator trim system may have to be stopped before the UP microswitch is activated. If the microswitch is activated before full up travel is achieved, back-off the up-screw on the potentiometer drive bracket so that the trim tab can be moved to match the required template markings.

(4) With the trim tab in the full up position (trim tab down) adjust the up screw on the potentiometer drive bracket so that the screw just closes the microswitch deactivating the motor. Tighten the jam nut on the adjusting screw.

(5) Drive the elevator trim system to the full down position using the control stick trim button while an assistant watches the actuator and trim tab linkage for clearances and smooth operation.

CAUTION: If the microswitch is severely misadjusted, damage to the aircraft and/or components may occur while trimming to either stop. Watch carefully during this phase of operation for clearances and any indication of binding.

(6) Using template TA55273800 Rev B, check position of the trim tab. Repeat Step 2 if necessary. Check trim panel position indications.

(7) Drive the elevator trim system to the full up position while an assistant checks actuator and trim tab linkage for clearances and smooth operation.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CAUTION: If the microswitch is severely misadjusted, damage to the aircraft and/or components may occur while trimming to either stop. Watch carefully during this phase of operation for clearances and any indication of binding.

(8) Using template TA55273800 Rev B, check position of trim tab. Repeat Step 6 if necessary. Check trim panel position indication.

(9) Cycle the elevator trim system through full deflections, checking for security, proper travel, and indications.

(10) Cycle the elevator trim system through full deflections, checking for security, proper travel, and indications.

NOTE: When the trim tab is in the neutral position (faired evenly with elevator), the trim panel should indicate one green light above center.

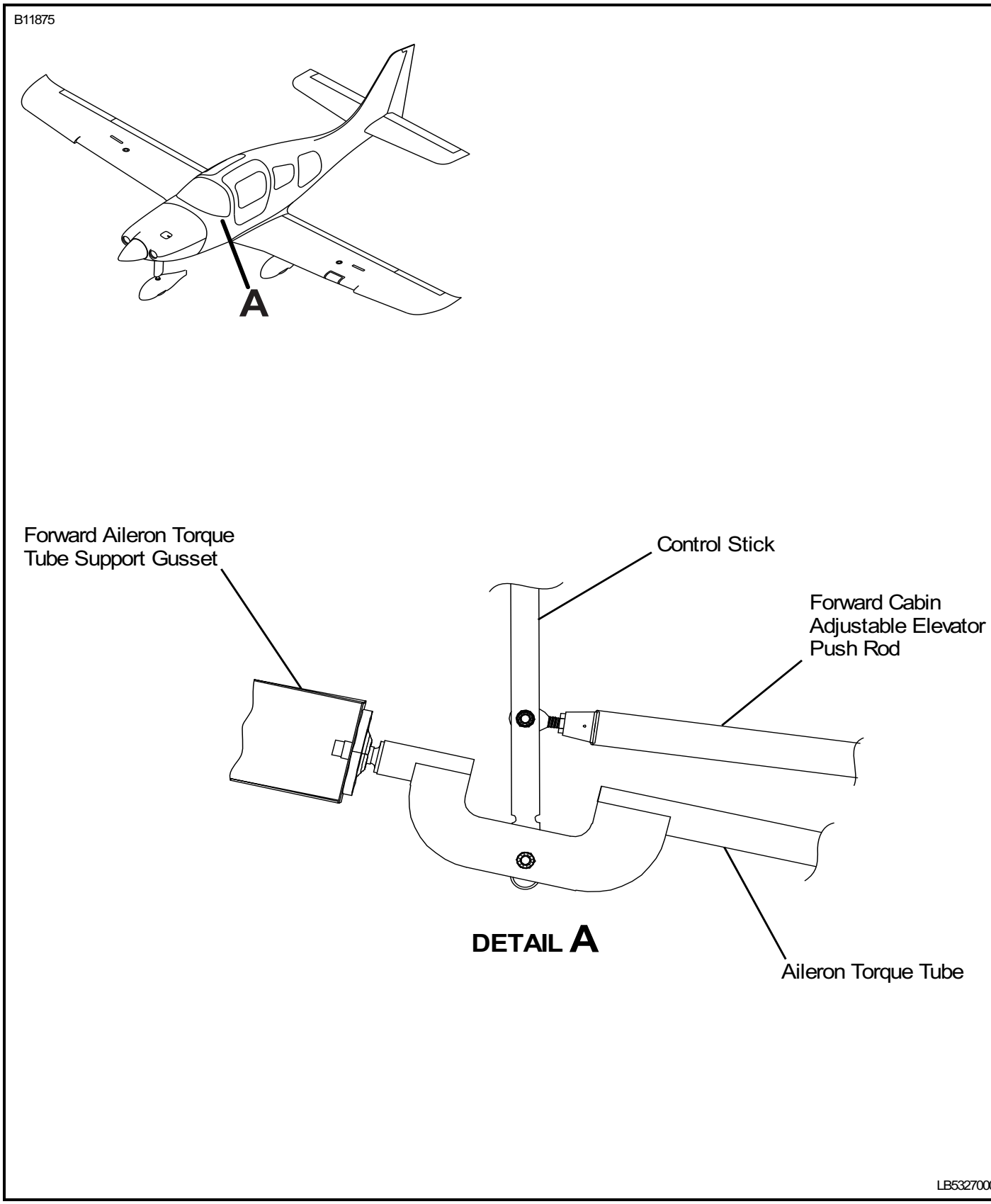
(11) Install the elevator trim actuator cover panel.

C. **Servicing and Maintenance of the Elevator Trim Tab Servo**

The elevator trim motor should be removed for inspection and service every 3000 hours. The trim motor drive rod gears should be inspected for wear and lubricated with heavy-duty gear grease. The worm gears attached to the drive motor shaft do not need to be lubricated but should be inspected for wear. If any of the gears are worn, they should be replaced. Replacements may be obtained from the manufacturer.

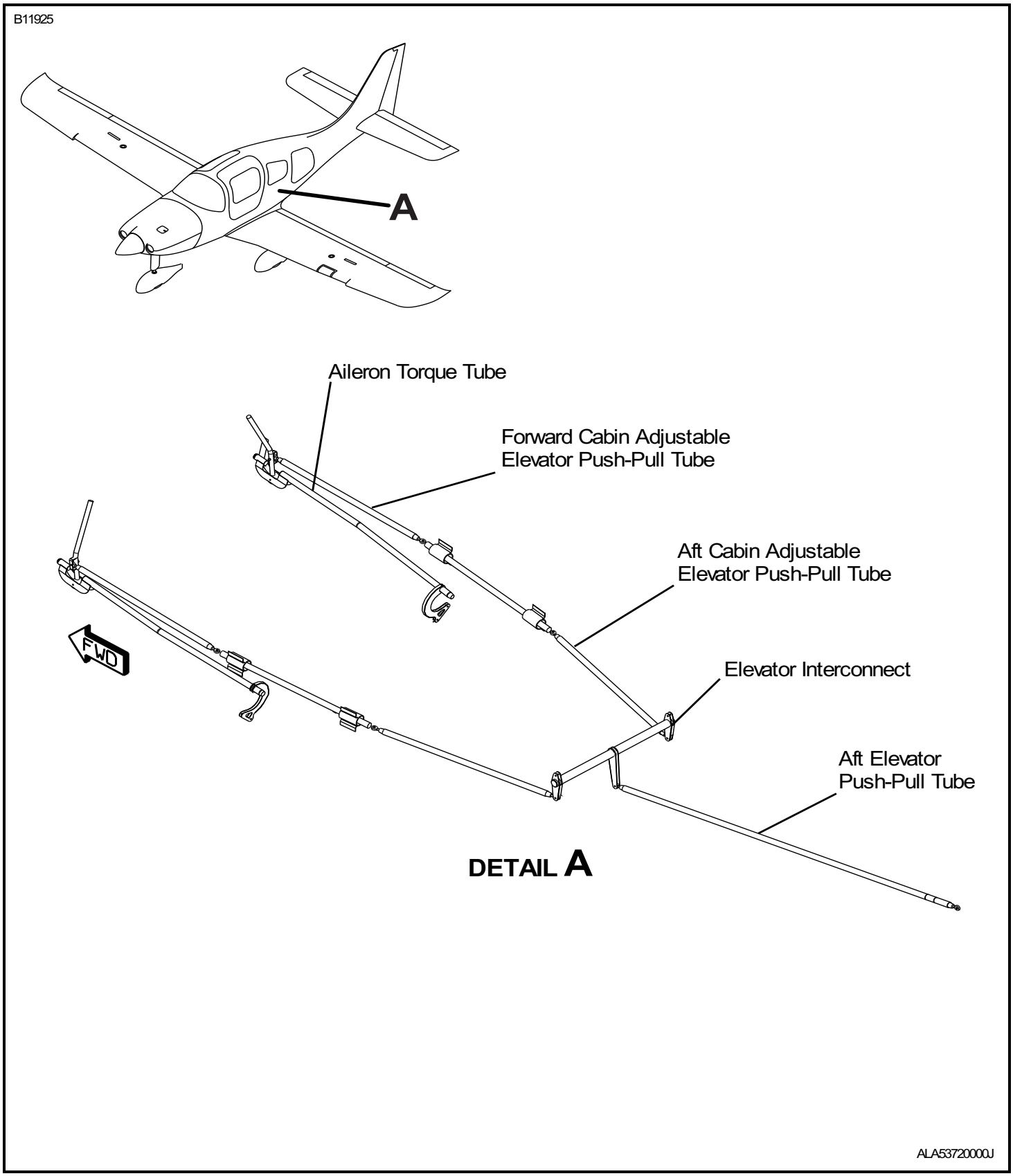
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Control Stick Neutral Position



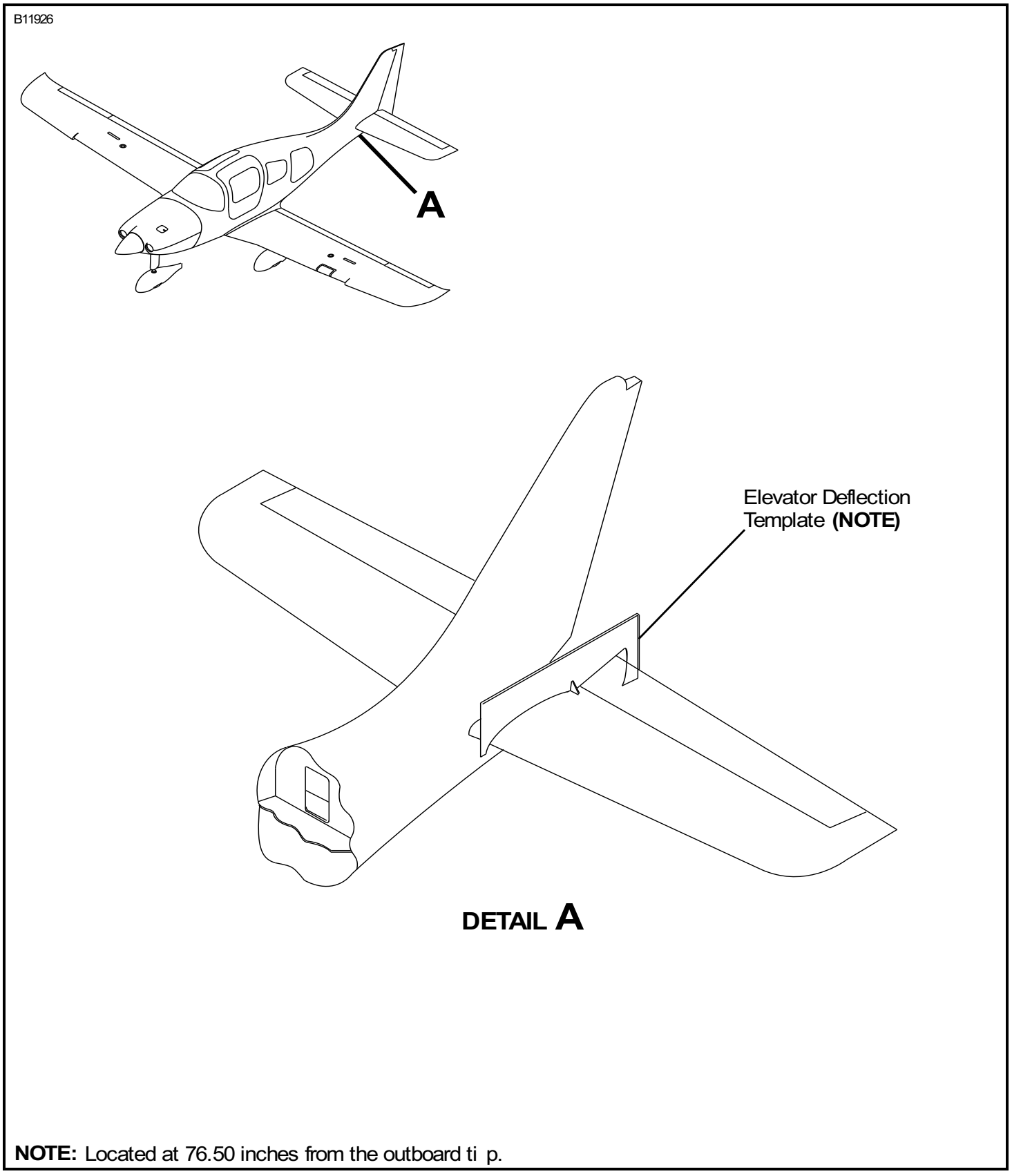
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Fuselage Control System Layout



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Elevator Deflection Template

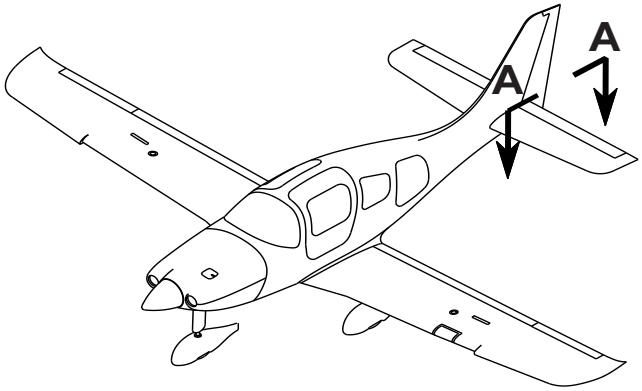


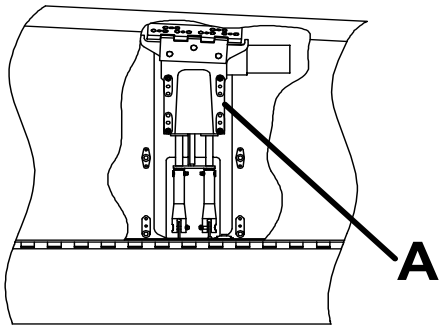
NOTE: Located at 76.50 inches from the outboard ti p.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

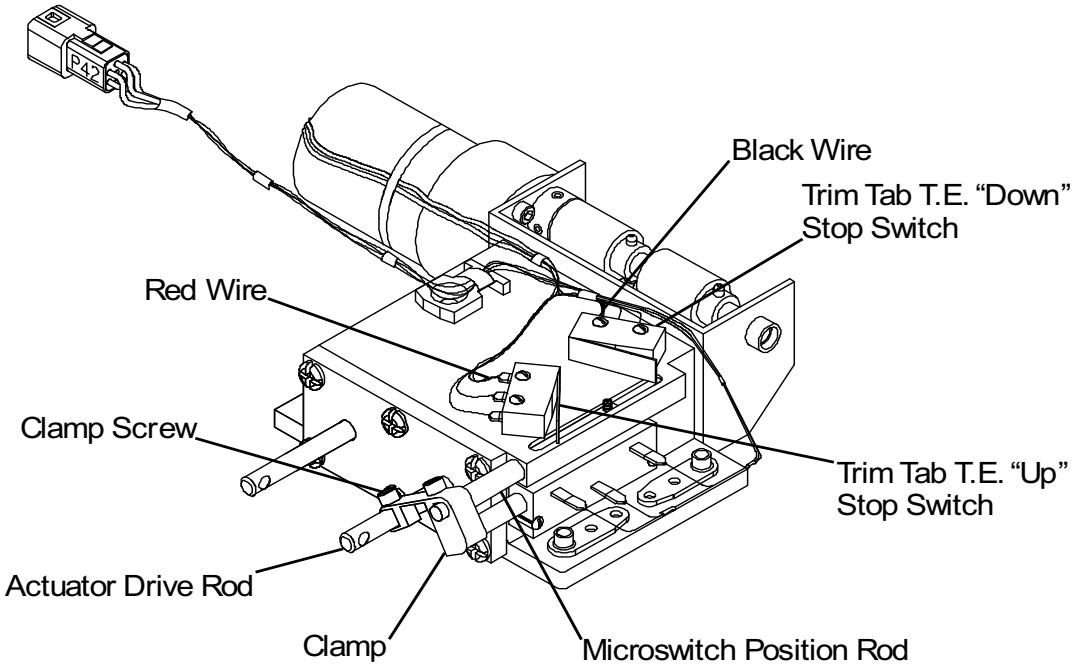
Figure 204 : Sheet 1 : Elevator Trim Actuator

B11927





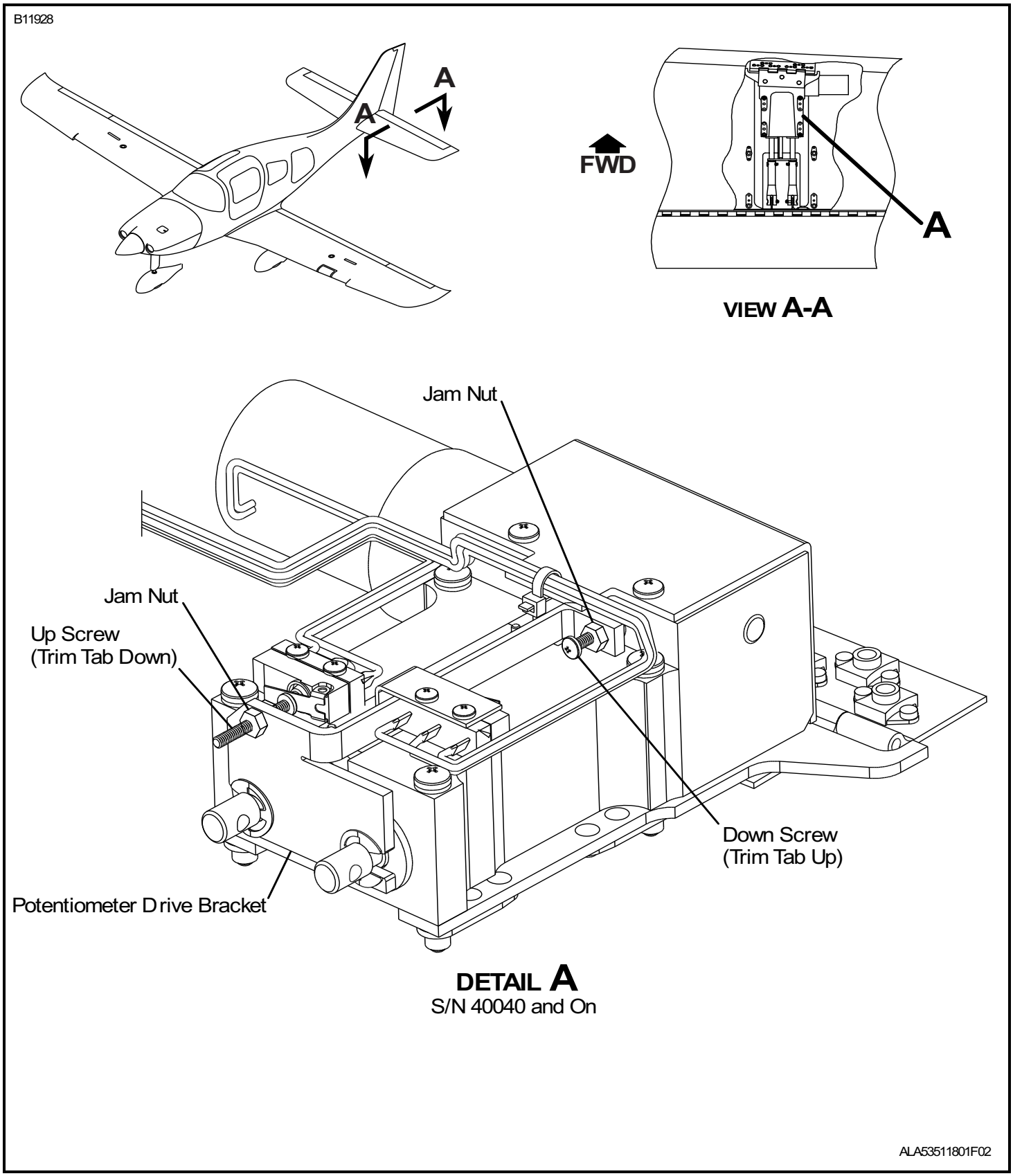
FWD VIEW A-A



DETAIL A
S/N 40004 to 40039

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 2 : Elevator Trim Actuator



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FLAP CONTROL SYSTEM - MAINTENANCE PRACTICES

1. Flap System - General

A. The flap system is located in the wing, aft of the rear spar, with the exception of the electrical system linking the flap switch to the electric flap actuator. The system uses four control rods with rod ends mounted on each threaded control rod. The rod ends use a Teflon liner which requires no lubrication. Refer to Figure 201 and Figure 202.

B. Primary flap stops are electric provided by the limit switch assembly. The flap system secondary stops are mechanical with up stops provided by the flap hinges and the flap central bellcrank assembly. Down stops are provided by the flap actuator. Refer to Chapter 33 for additional information regarding the electrical connections and flap switch.

2. Flaps

A. Removal and Installation of Flaps

(1) Lower flaps to the landing position.

(2) Remove the cotter pin, castellated nut, bolt, and washers from the flap drive control rod to the flap. Note that small washers may be installed between the flap drive hinge and the control rod end. These washers are used to increase the misalignment capability of the rod ends, and each aircraft may have a different number of washers, or none at all.

(3) Remove the cotter pins, castellated nuts, washers, and bolts from the flap hinge pivots.

(4) Remove the flap by pulling the flap aft and away from the wing.

(5) Reinstall in the reverse order.

(6) Torque all castellated nuts 72 to 84 in.-lbs., and install cotter pins.

B. Rigging and Adjustment of the Flaps

Once the flap system is properly rigged, only minor adjustments are required unless components such as control rods, actuator, or limit switches are replaced. It is important to start the rigging with the flap actuator and the flap central bellcrank. To rig the flap system, use the following steps.

(1) With the flap control rods disconnected from the outboard bellcranks, extend the actuator (flap switch up/cruise position).

(2) By adjusting the limit switch rod (refer to Figure 204) and the actuator rod end if necessary, adjust the flap up position so a 0.063 inch spacer fits between the flap central bellcrank and the web on the central bellcrank bracket as shown in Figure 203. Adjustments can easily be made with the actuator retracted (landing position). Torque the limit switch jam nuts 72 to 84 in.-lbs. and the flap actuator rod end jam nut 30 to 36 ft.-lbs. A minimum of 11/2 diameter thread engagement is required on the actuator rod end.

(3) Pin the outboard bellcranks with a 0.25-inch diameter bolt or equivalent, and adjust the flap control rods with the actuator set in the up position. Refer to Figure 204.

(4) Adjust the left and right control rod assemblies to length between the flap central bellcrank in the up position and the pinned outboard bellcranks. After adjusting the control rod assemblies, torque the jam nuts 140 to 180 in.-lbs., and verify that the minimum thread engagement is achieved by checking that the threads extend past the inspection hole in the control rods. Torque bolts through the bellcrank and control rods 72 to 84 in.-lbs., and install the cotter pin in the castellated nut. Refer to Figure 204. Note the use of washers between the bellcrank and both sides of the rod end. If replacement of these washers is necessary, they may be replaced with AN960-416 washers.

(5) After adjusting the left and right control rod assemblies, adjust the final drive length to achieve a 0±1 degree deflection with the flaps in the up position. After adjusting the correct length, torque the jam nuts 140 to 180 in.-lbs., and verify that the minimum thread engagement is achieved by checking that the threads extend past the inspection hole in the control rods. Refer to Figure 205. Torque bolts through the bellcrank and control rods 72 to 84 in.-lbs., and install the cotter pin in the castellated nut. Note the use of washers between the bellcrank and both sides of the rod end. If replacement of these washers is necessary, they may be replaced with AN960-416 washers.

(6) Using the flap/aileron template, part number TA57270000, lower the flaps to the takeoff position, and adjust the takeoff micro-switches to achieve 12±1 degrees deflection on both flaps. With the extension micro-switch adjusted, move the retraction microswitch as close as possible to the extension switch without interference. Note when adjusting the switches, always check deflection when the flaps are extended from the up position to the takeoff position. Refer to Figure 206.

(7) Lower the flaps to the landing position, and adjust the landing micro-switch to achieve 40±1 degrees deflection on both flaps using the rigging template.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(8) Ensure that the gap at the inboard edge of the aileron between the flap and the aileron (when the flaps are retracted) is 0.125 to 0.250 inches. Ensure positive clearance when the flaps are extended.

(9) Actuate the flap system, and check for binding or rubbing of components with the flap system. If problems are noted, re-check the rigging.

C. **Servicing and Maintenance of the Flaps**

The flaps do not require any service or maintenance. The flaps should be visually inspected annually for cracking at all hinge attachment locations. A tap test should be conducted on the flap at the inboard and outboard end caps to aid in detection of latent damage or disbonds. Liquid lubricants should not be used on the rod end bearings as this may cause the Teflon liner to swell creating excess friction in the bearing. Should the rod end need to be replaced, contact the manufacturer.

3. Flap Actuator

A. The flap system is actuated by an electric linear actuator mounted to a bracket on the aft spar in the belly-section of the aircraft wing. This actuator assembly includes a motor, clutch, ballscrew, and limit switch assembly. The limit switch assembly provides the electronic flap stops for the three positions: cruise, takeoff, and landing.

(1) **Removal and Installation of the Flap Actuator**

(a) Flaps must be in the cruise or landing position to remove the actuator. It is recommended to place the flaps in the cruise (up) position.

(b) Access the flap actuator through the flap and aileron pushrod access panel.

(c) Disconnect the power wire bundle to the actuator assembly. Refer to Figure 207.

(d) Tape or block the flaps to prevent them from moving when the flap actuator is disconnected from the central flap bellcrank.

(e) Through the holes in the flap central bellcrank bracket, disconnect the flap actuator from the bellcrank as shown in Figure 207.

(f) Remove the bolt holding the actuator to the bracket. Note the spacers and washers as shown in Figure 208 and Figure 209.

(g) Remove the actuator from the airplane.

(h) Reinstall in the reverse order.

(i) If the limit switches have been moved, a recheck of the flap rigging is required and adjustments required as necessary.

(j) Torque all 0.250-inch diameter bolts 72 to 84 in.-lbs. and all 0.375 in. diameter bolts 240 to 260 in.-lbs., and install the cotter pin.

(2) **Maintenance of the Flap Actuator**

(a) During normal inspections and maintenance, there should be checks for binding, fretting, chafed wires, and slop in the actuator mounting. Check the groove for the limit switch assembly and the limit switch rod (refer to Figure 204).

(b) If there is excess play in the actuator mounting, inspection and possible replacement of the spacers is required. To replace the spacers, follow the instructions for actuator removal and installation. Install new spacers, bolts, and washers as necessary.

(c) Reinstall in the reverse order.

(d) If the limit switches have not been moved, a recheck of the flap rigging is required and adjustments required as necessary.

(e) Torque all 0.250-inch diameter bolts 72 to 84 in.-lbs. and all 0.375 inch diameter bolts 240 to 260 in.-lbs., and install the cotter pin.

(f) If problems are found with the micro-switches, replacement is required. Contact the manufacturer for replacement micro-switches. Replace the micro-switch by removing wires and unscrewing the micro-switch. Replacement is a direct reversal of the removal. Re-rigging is required for the replaced micro-switch.

(g) If the internal clutch requires replacement, contact the manufacturer for a replacement actuator.

(h) All the bearings and rod ends used in the flap system are Teflon ball bearings that require little maintenance other than cleaning during routine inspections. Do not use liquid lubricants as they cause the Teflon to swell

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

creating excess friction in the bearing. If bearings or rod ends require replacement, contact the manufacturer for replacement parts.

(i) During normal inspections, check control rods, bellcranks, hinges, and brackets for excessive wear, cracks, scratches, and corrosion. Replace worn or damaged components as necessary.

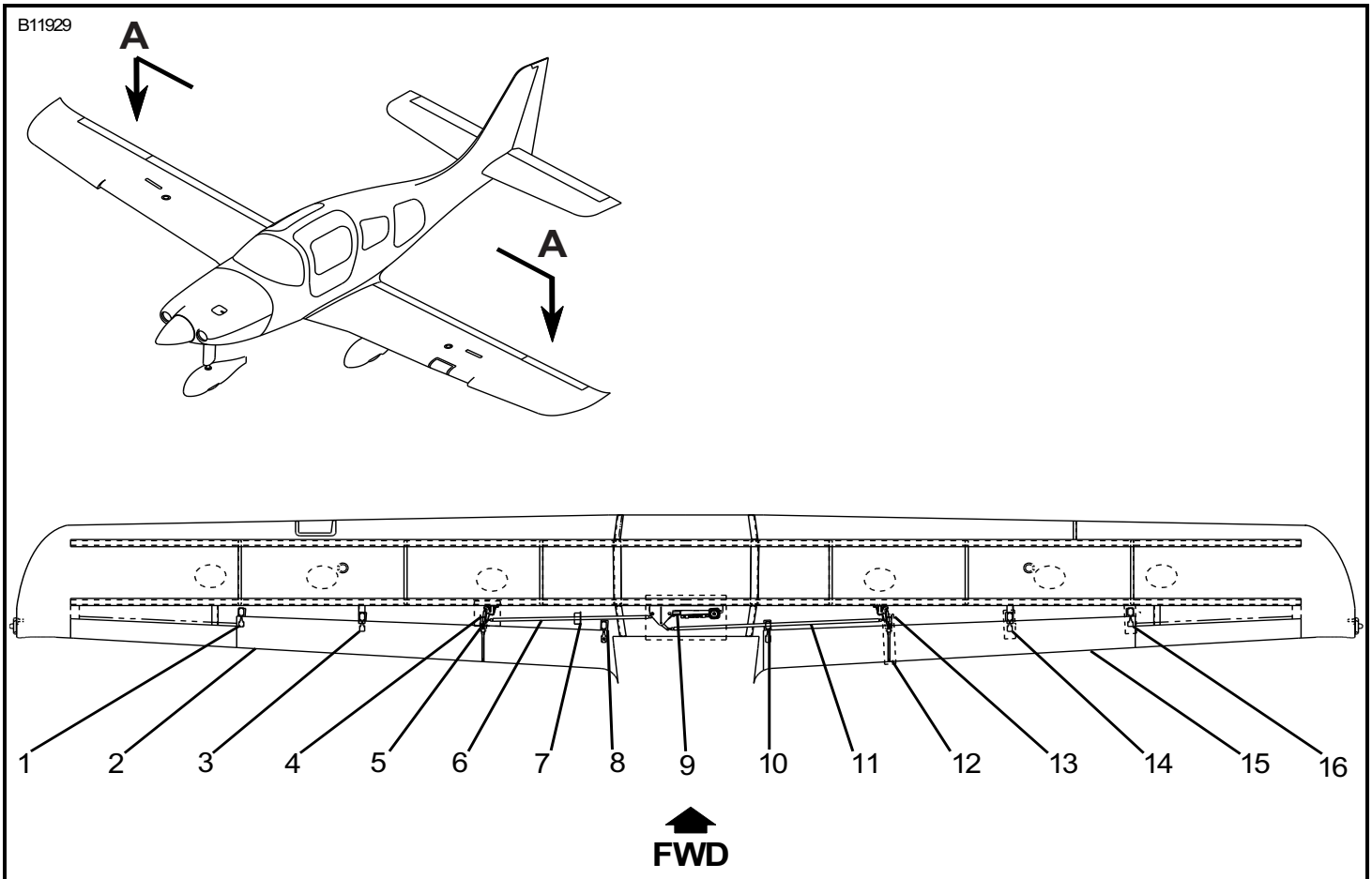
(j) Refer to Chapter 24 of this manual for detailed maintenance procedures of the flap electrical system.

(3) **Integration with the Standby Battery of the Flap Actuator**

Flap system integration with the standby battery is solid state and does not require maintenance. Refer to Section 24-35-00, Standby Battery, for detailed information.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Flap System Overview



VIEW A-A

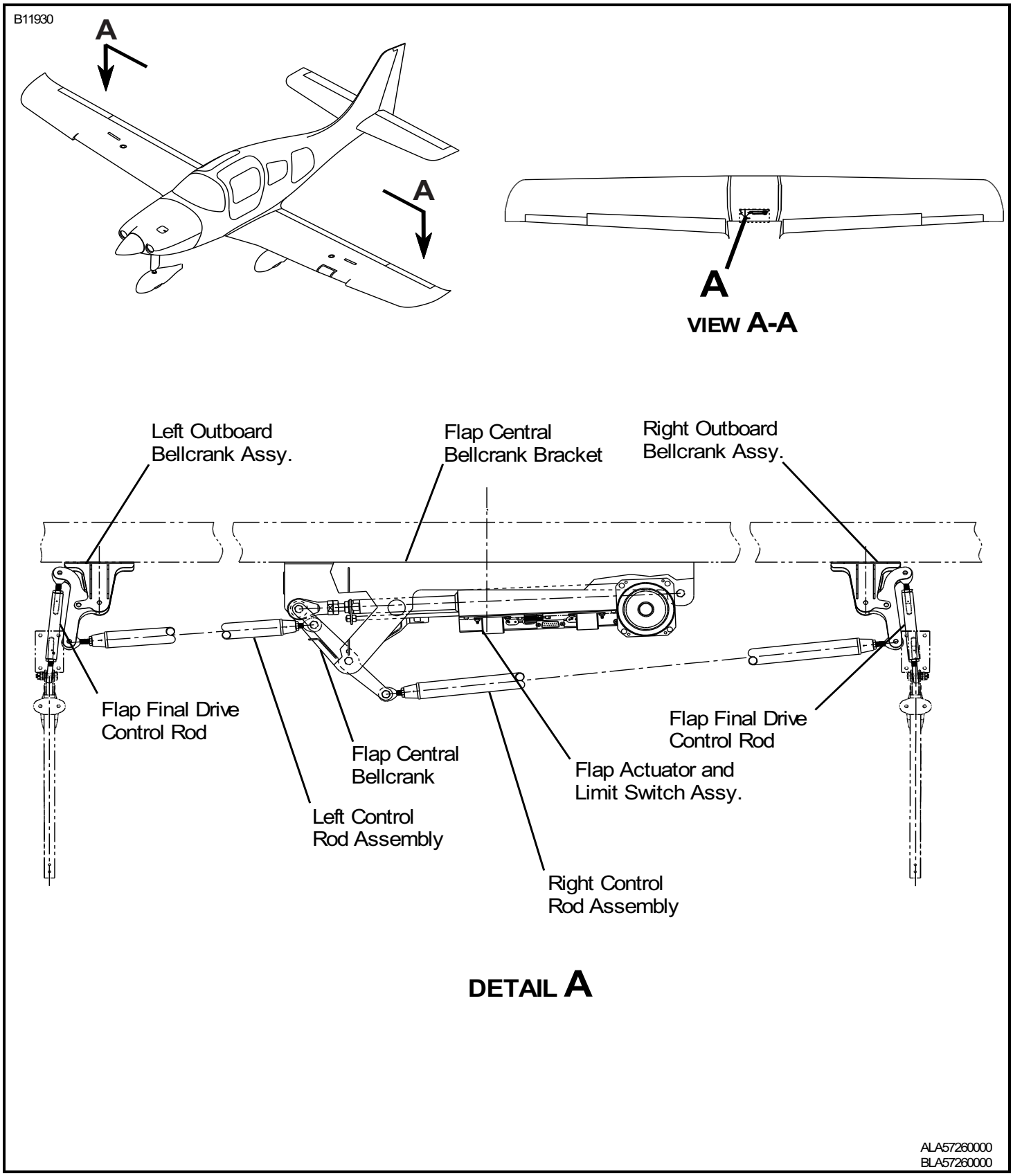
No.	ITEM	No.	ITEM
1.	WS 143.5 flap hinge assembly	9.	Flap central bellcrank and actuator assembly
2.	Left flap control surface	10.	WS 26.5 flap hinge assembly
3.	WS 104.5 flap hinge assembly	11.	Right flap control rod
4.	Flap drive bellcrank and final drive - left wing	12.	WS 65.5 flap hinge assembly (drive hinge)
5.	WS 65.5 flap hinge assembly (drive hinge)	13.	Flap drive bellcrank and final drive - right wing
6.	Left flap control rod	14.	WS 104.5 flap hinge assembly
7.	Left flap control rod guide*	15.	Right flap control surface
8.	WS 26.5 flap hinge assembly	16.	WS 144 flap hinge assembly

* The control rod guide is not present on all aircraft

ALA57260000

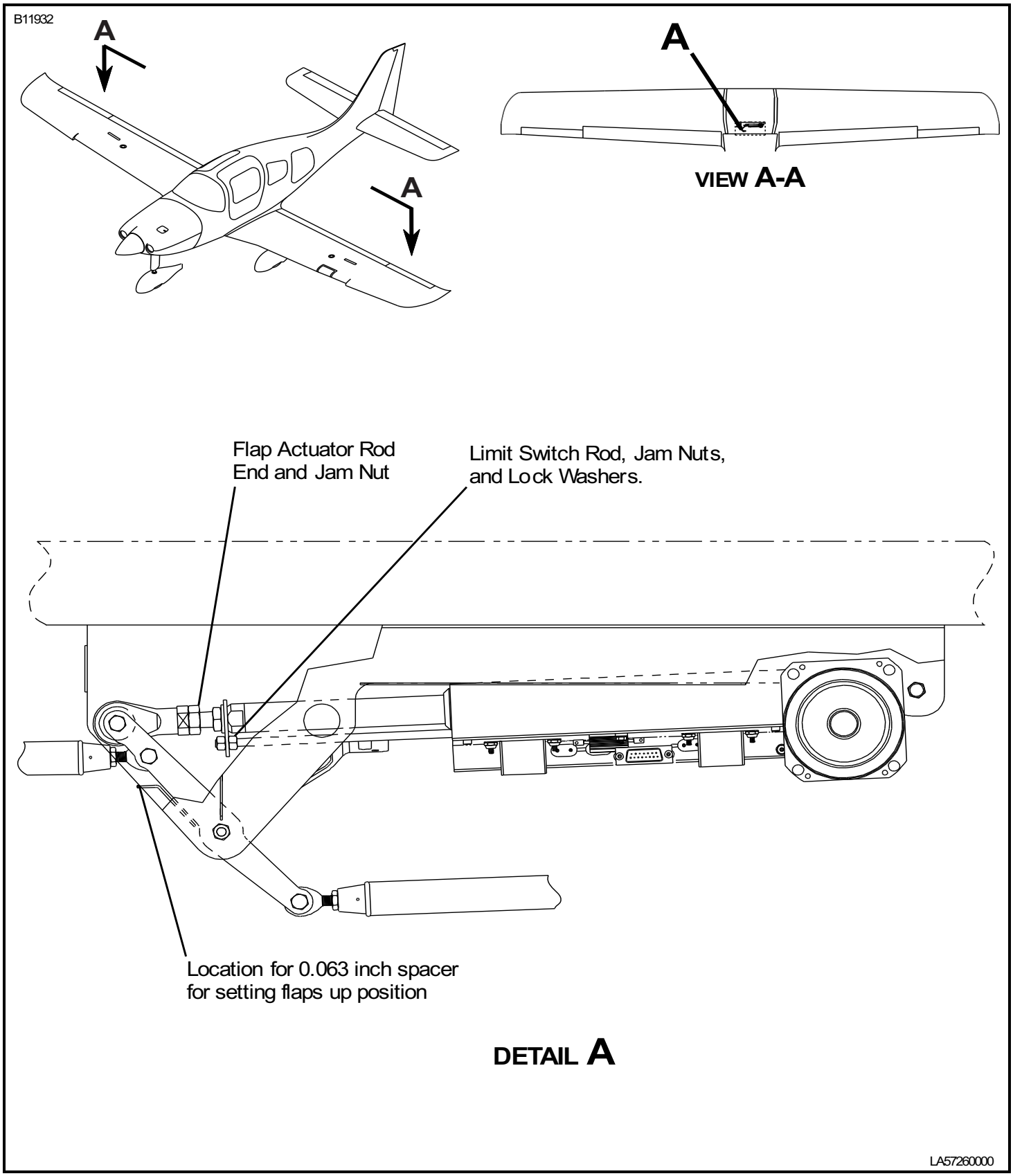
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Flap Rigging Overview



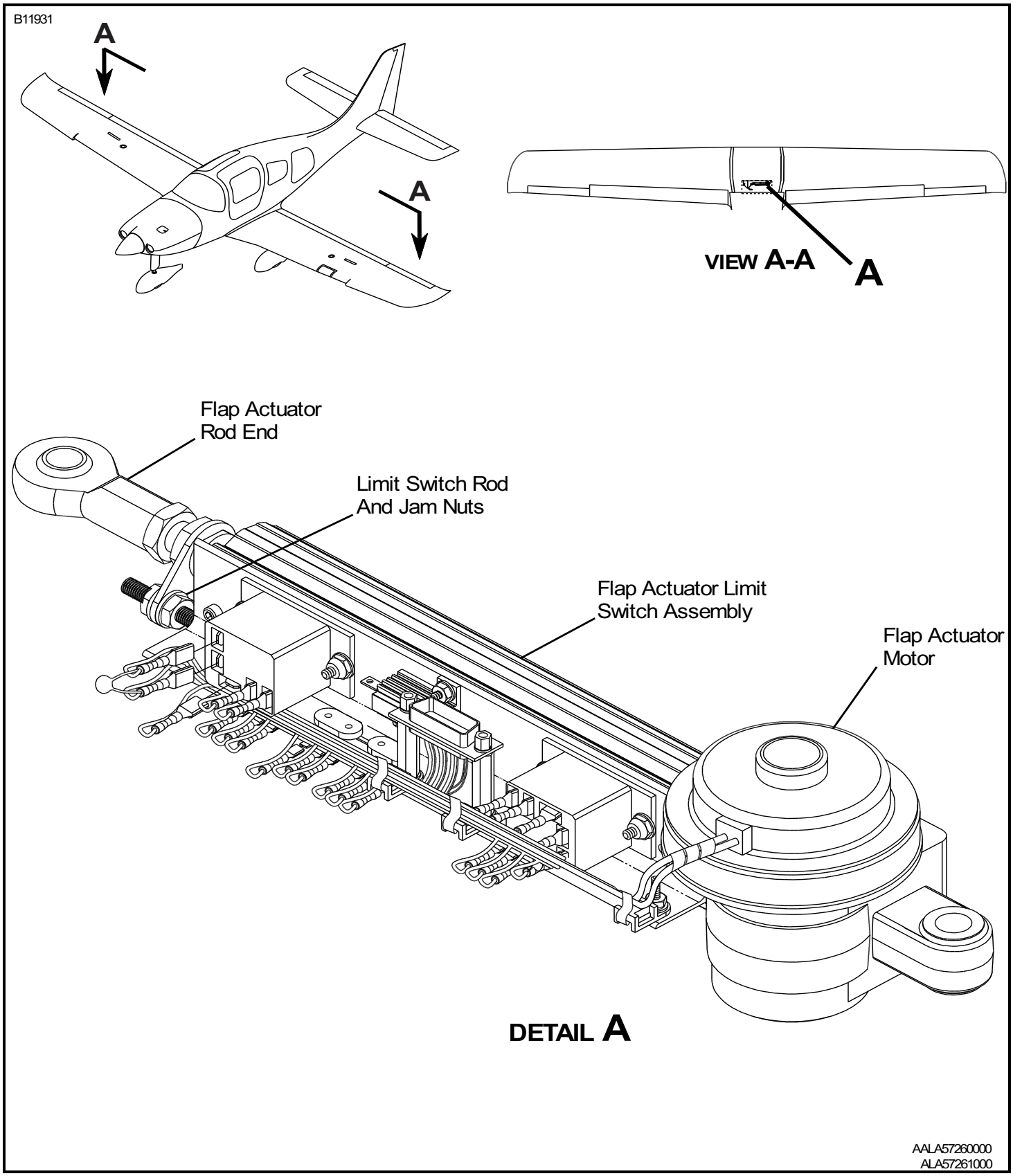
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Flap Central Bellcrank and Flap Actuator



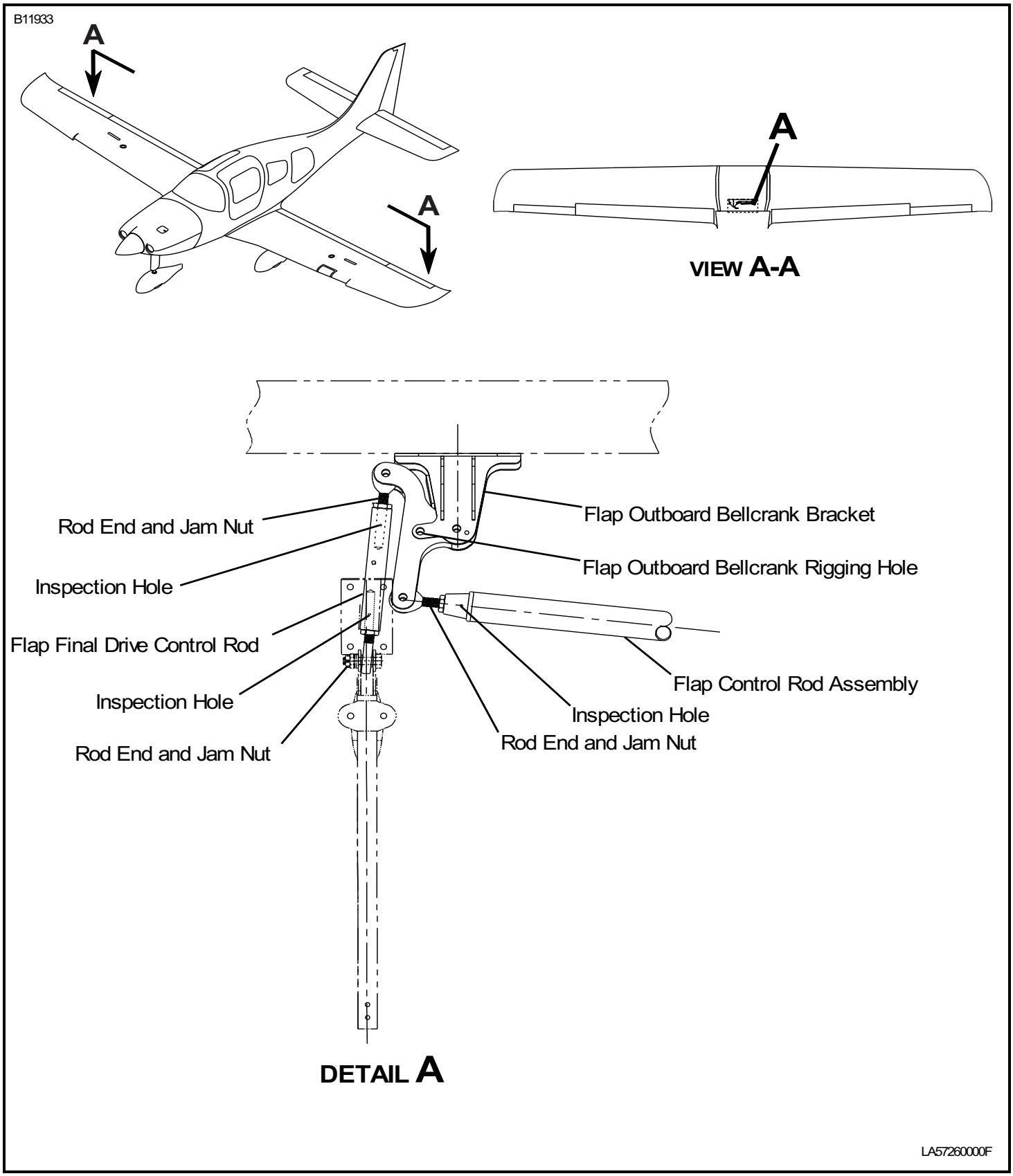
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Flap Actuator Detail - Top View



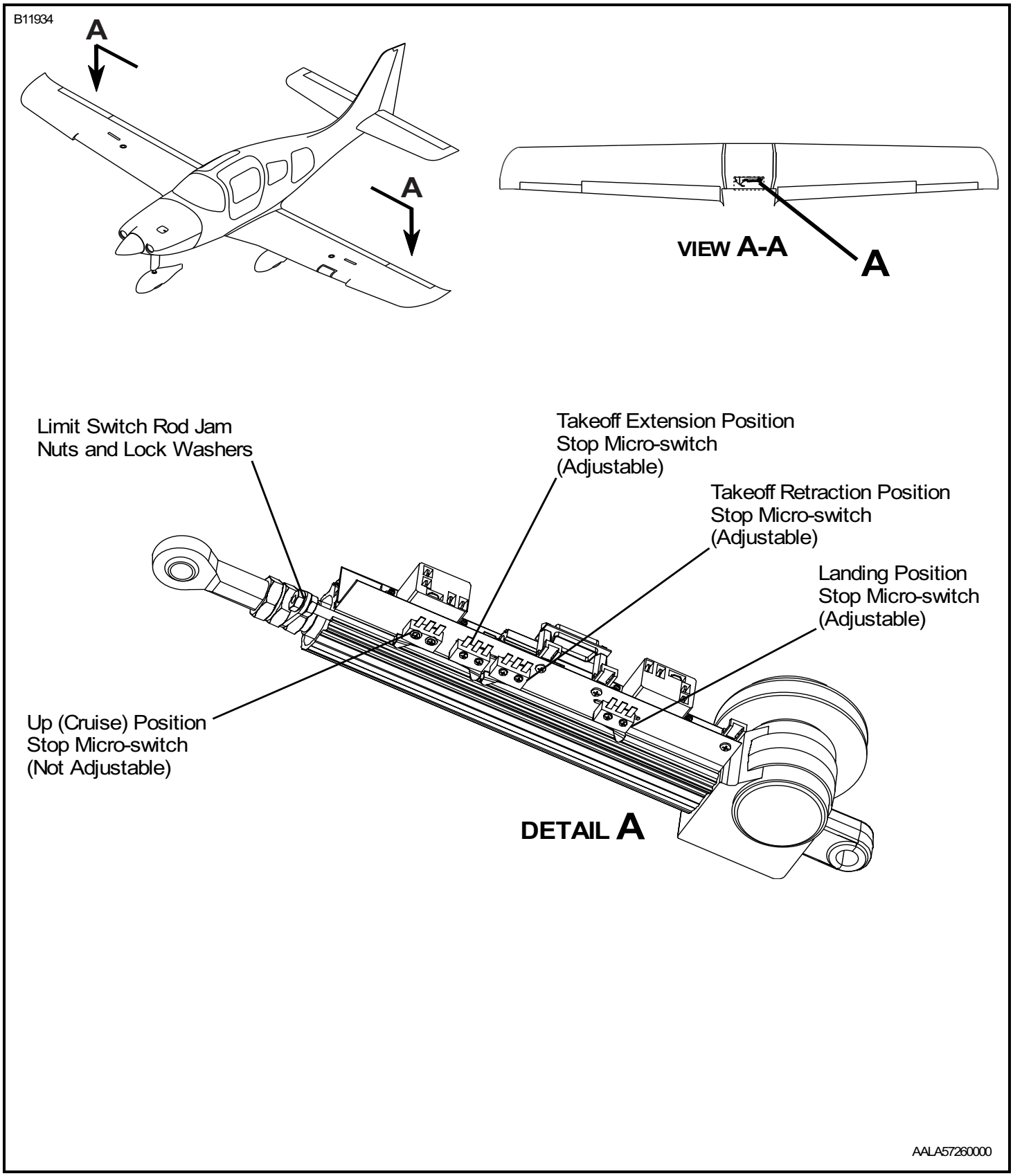
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Flap Outboard Bellcrank and Final Drive



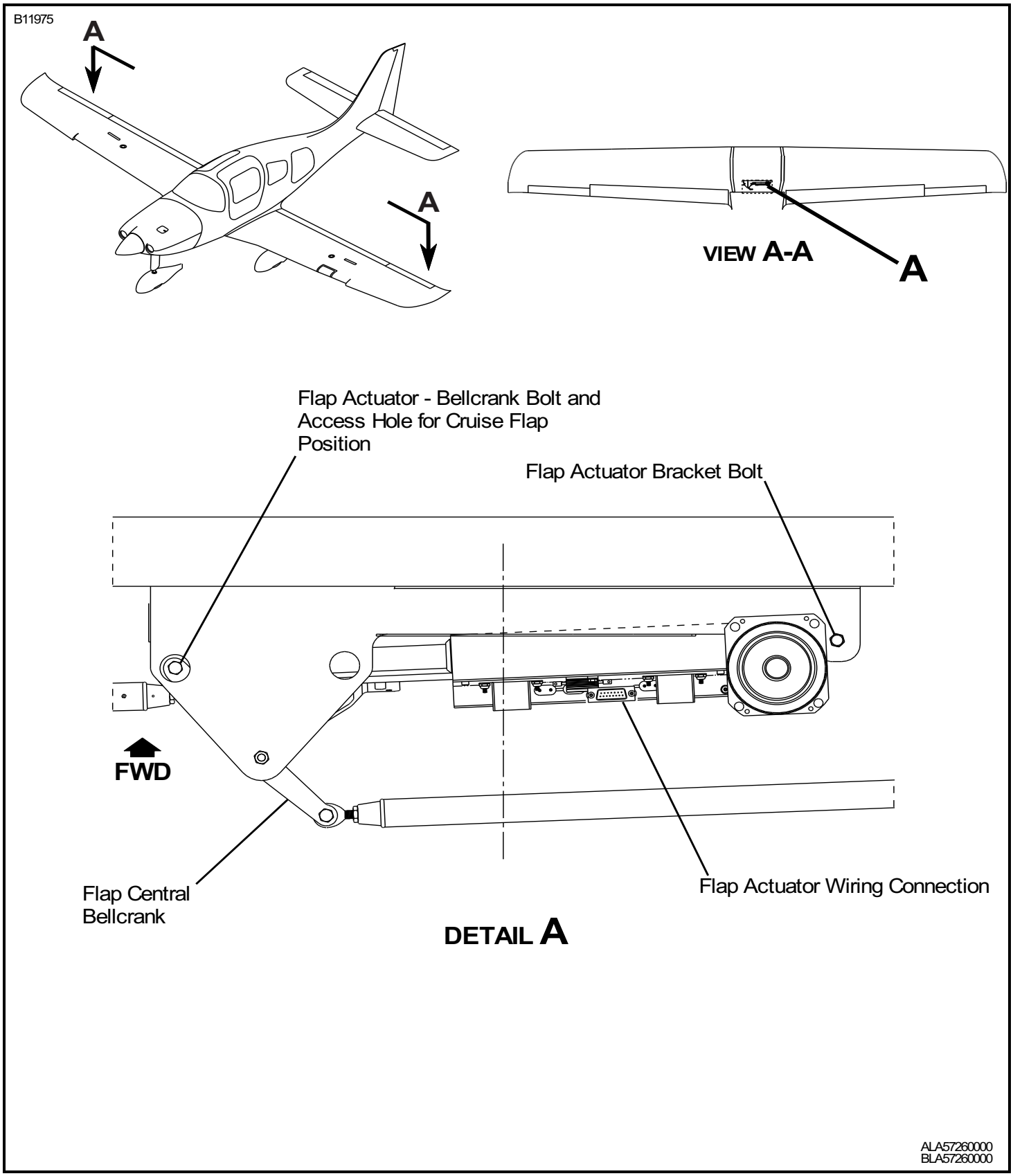
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Flap Actuator and Limit Switch Detail



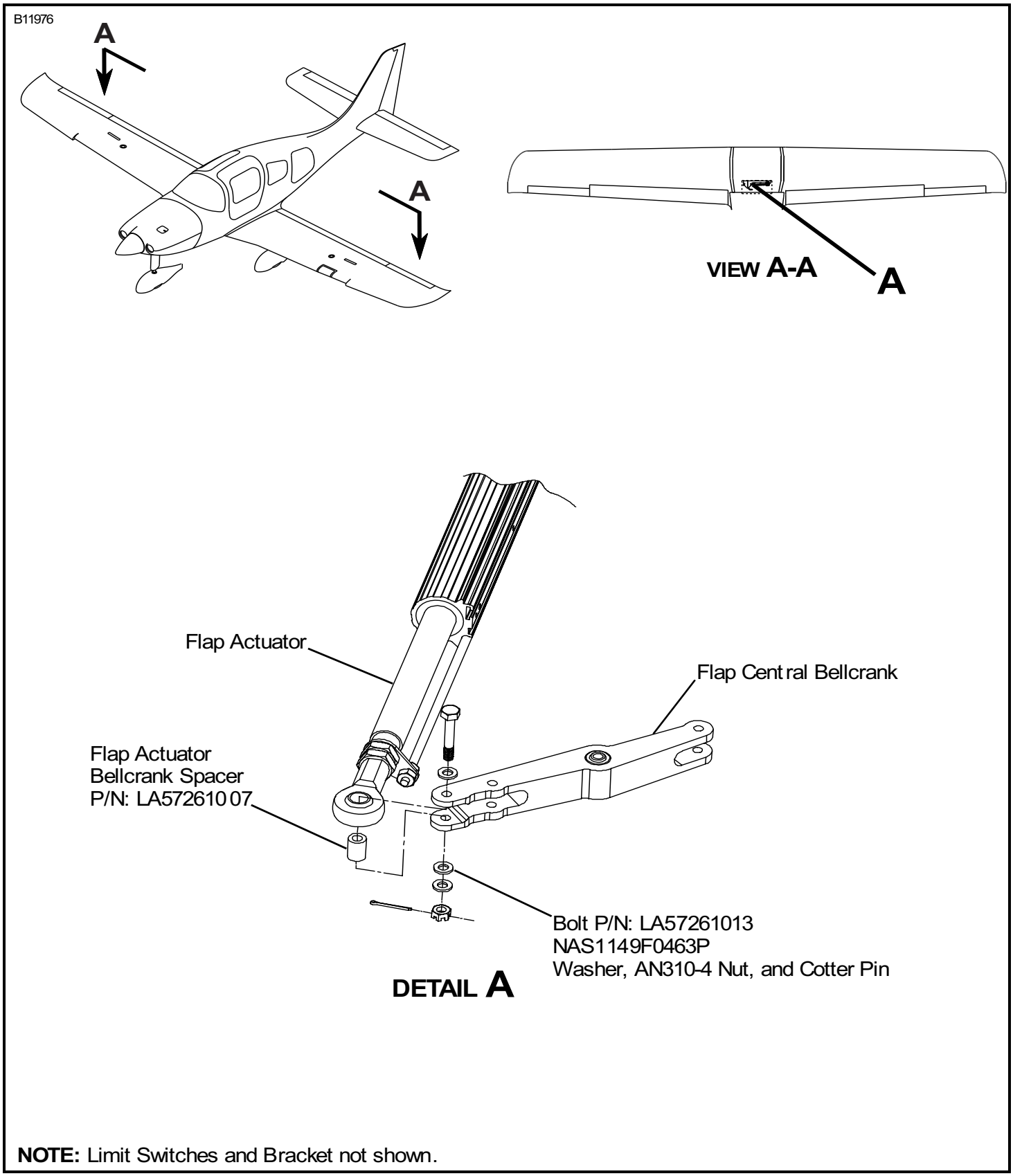
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Flap Central Bellcrank and Actuator Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

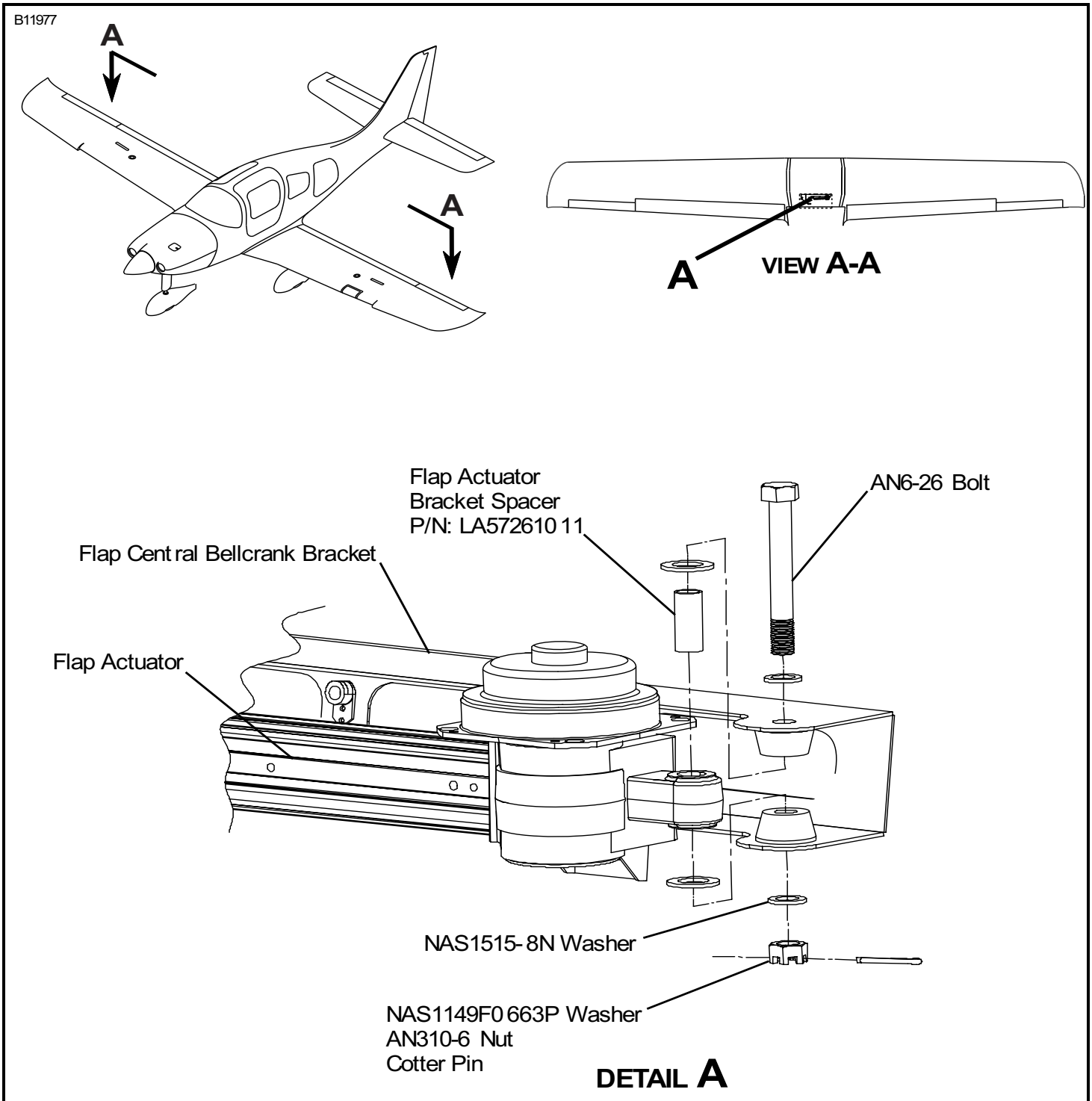
Figure 208 : Sheet 1 : Flap Actuator to Bellcrank Bolt and Spacer Detail



NOTE: Limit Switches and Bracket not shown.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Flap Actuator to Bracket Bolt and Spacer Detail



NOTE: Limit Switches not shown.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUEL - GENERAL

1. General - Fuel System

A. **Overview** - The fuel system has two tanks that gravity feed to a three position (Left, Right, and Off) fuel selector valve located in the wing and actuated from the selector knob in the forward part of the arm rest between the pilot and copilot seats. The fuel flows from the selected tank to the auxiliary fuel pump and then to the strainer. From this point, the fuel goes to the engine-driven pump where, under pressure, it is sent to the throttle/mixture control unit and then on to the fuel manifold valve for distribution to the cylinders. Unused fuel from the continuous flow fuel injector system is returned to the selected fuel tank. A pressure gauge on the metered side of the fuel manifold valve measures system pressure and displays both the fuel pressure and the equivalent fuel flow reading on the same gauge.Each fuel tank contains a slosh box near the fuel supply lines. A partial rib near the inboard section of the fuel tank creates a small containment area with a check valve that permits fuel flow into the box but restricts outflow. The slosh box is like a mini-fuel tank that is always full. The slosh box's function, in conjunction with the flapper valves, is to ensure short-term positive fuel flow during adverse flight attitudes, such as when the airplane is in an extended sideslip or subject to the bouncing of heavy turbulence. Refer to Figure 1, Sheet 1 and Sheet 2 for diagrams of the Fuel System.

B. **Fuel Quantity Indication** - The airplane has integral fuel tanks, commonly referred to as a "wet wing." Each wing has two internal, interconnected compartments that hold fuel. The wing's slope or dihedral produces different fuel levels in each compartment and requires two floats in each tank to accurately measure total quantity. The floats move up and down on a pivot point between the top and bottom of the compartment, and the position of each float is summed into a single indication for the left and right tanks. The positions of the floats depends on the fuel level; changes in the float position increases or decreases resistance in the sending circuit, and the change in resistance is reflected as a fuel quantity indication. The indicators are powered by the airplane's electrical system, protected by a two-amp circuit breaker and will not operate with the master switch turned off.

C. **Fuel Selector** - The fuel tank selector handle is between the two front seats, at the forward part of the arm rest. The selector is movable to one of three positions: Left, Right, and Off. The fuel tank selector handle is connected to a drive shaft that moves the actual fuel valve assembly located in the wing saddle. Moving the fuel tank selector handle applies a twisting force to move the fuel selector valve.

D. When the fuel tank selector handle is moved to a particular position, positive engagement occurs when the fuel selector valve rests in one of the three available detents: Left, Right, and Off. The left and right tanks are changed by rotating the handle to the desired tank position; initially, a small amount of additional pressure is required to move the valve out of its detent. A spring-loaded release knob in the selector handle prevents inadvertent movement beyond the right and left tank positions. To move to the off position, pull up on the fuel tank selector and rotate the handle until the pointer is in the off position and the fuel valve is seated in the detent. To move the handle from the off position to the left or right tank, pull up on the selector, and rotate the handle to the desired tank.

E. When a tank is selected and the selector is properly seated in its detent, one of two green lights on the left and right side of the fuel gauge will illuminate to indicate which tank is selected. If a tank is selected, and a green light is not illuminated, then the selector handle is not properly seated in the detent. In addition, if the fuel selector is not positively seated in either the left or right detent, or is in the off position, a red FUEL VALVE light indication is displayed on the annunciator panel.

F. **Fuel Low Annunciators** - There is a separate system, independent of the fuel quantity indicators, which displays a low fuel state. A fuel level switch in each tank activates a L LOW FUEL or R LOW FUEL light on the annunciator panel when there is less than 8 gallons of usable fuel remaining in that tank. The fuel warning light has a 30 second delay switch, which limits false indications during flight in turbulent air conditions.

G. **Fuel Vents (S/N 40004 to S/N 40079)** - There is a ventilation source for the fuel tank in each wing. The vents are wedge-shaped recesses built into the access panel. The vents are located under the wing approximately 5 ft. inboard from the wing tip and positioned to provide positive pressure to each tank. The vents should be open and free of dirt, mud, and other types of clogging substances. The tanks are cross-vented with a line between the right and left tanks. When fuel expands beyond a tank’s capacity, it is sent to the other tank or out the fuel vent if both tanks are full. A fuel vent check valve limits draining from the vents if the airplane is parked in a sloped area. However, an internal tank pressure of more than 2 to 3 psi will bypass the check valve and allow fuel to drain from the vents. The cross venting provides two vent sources for each tank, and both tanks are vented even if one of the fuel vents is clogged.

H. **Fuel Vents (S/N 40080 and On)** - There is a ventilation source for the fuel tank in each wing. The vents are wedge-shaped recesses built into the access panel. They are located under the wing approximately 5 feet inboard from the wing tip and positioned to provide positive pressure to each tank. The vents should be open and free of dirt, mud and other types of clogging substances. When fuel expands beyond a tank’s capacity, it is sent out the fuel vent if both tanks are full.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

An internal tank pressure of more than two to three psi will allow fuel to drain from the vents.

l. **Fuel Drains and Strainer** - The inboard section of each tank contains a fuel drain near the lowest point in each tank. The fuel drain can be opened intermittently for a small sample, or it can be locked open to remove a large quantity of fuel. The gascolator, or fuel strainer, is located under the fuselage, on the left side, near the wing saddle. Open the accessory door in this area for access to the gascolator. The gascolator is a conventional drain device that operates by pushing up on the valve stem. There is an internal bypass in the strainer that routes fuel around the filter if it becomes clogged.

2. Servicing

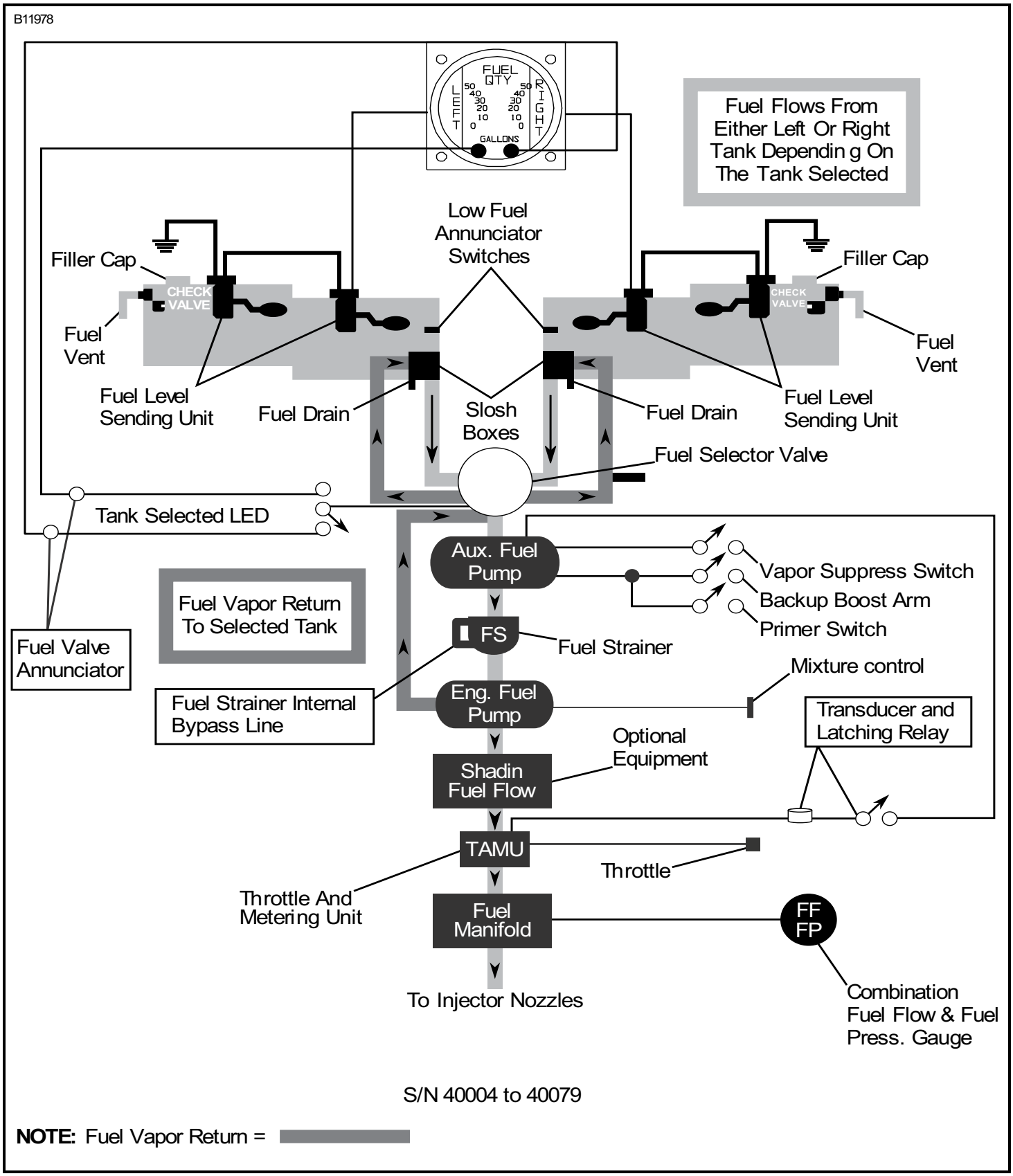
A. Refer to Chapter 12-00-00 of this manual for detailed instructions.

3. Fuel Additives

A. Refer to Chapter 12-00-00 of this manual for detailed instructions.

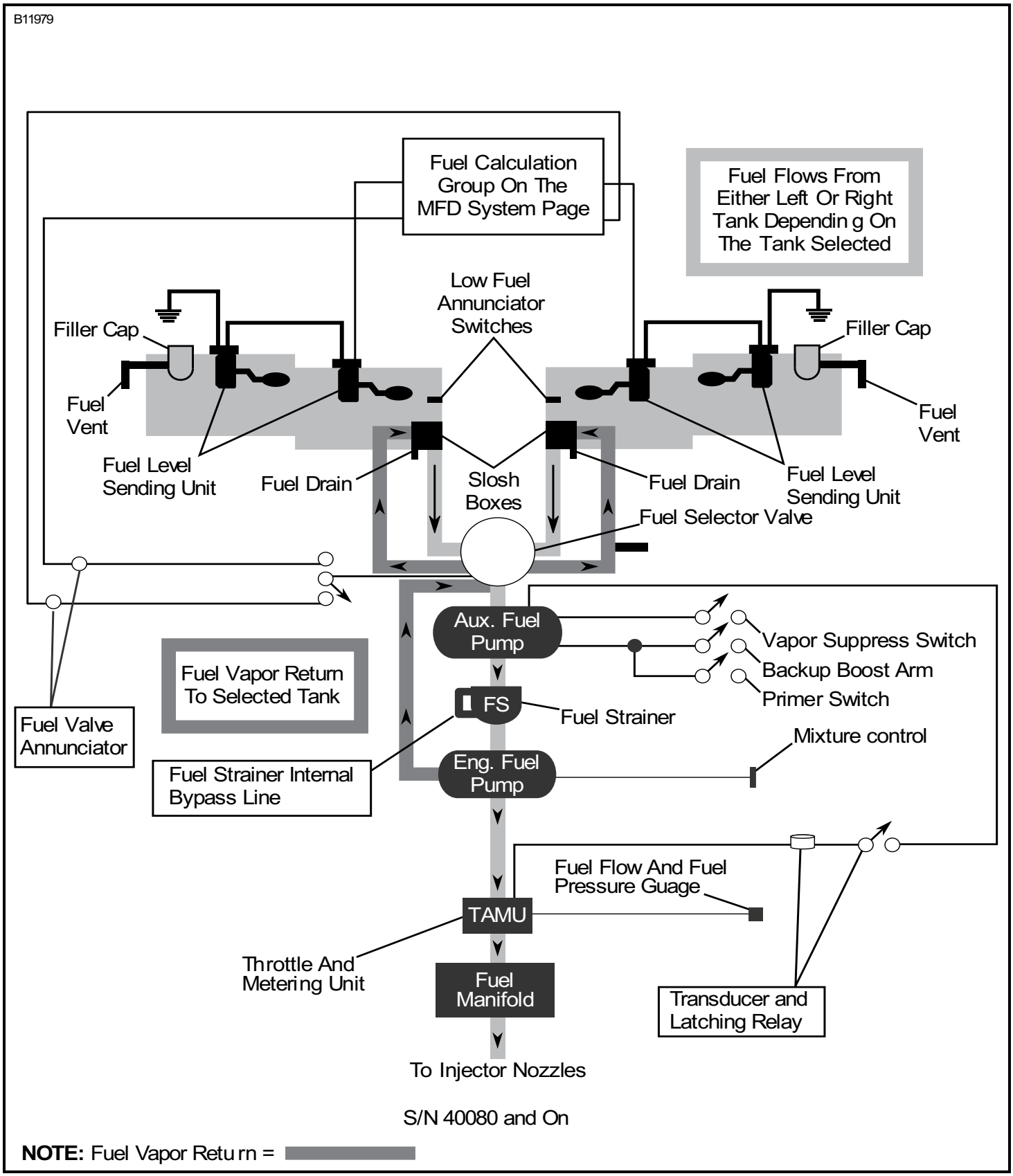
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Fuel System Diagram



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 2 : Fuel System Diagram



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STORAGE - MAINTENANCE PRACTICES

1. Storage - Venting and Check Valves (S/N 40004 to 40079)

A. **Venting and Check Valves** - The fuel tank venting system on the Cessna 300 includes two float valves located in the WS 145 center rib in the expansion space of the integral fuel tank. The fuel tank crossover vent that connects the expansion spaces of the left and right fuel tanks provides redundant fuel tank venting.

B. **Removal of Fuel Tank Vent Float Valves** - (Refer to Figure 201 and Figure 202.)

(1) De-fuel the fuel tanks and open the outboard access panel/fuel vent and the outboard fuel bay access panel.

(2) Remove the nut, fuel tank hose line, and washer from the float valve.

(3) Remove the fuel tank vent float valve.

C. **Installation of Fuel Tank Vent Float Valves**

(1) Apply fuel tank access door sealant per Chapter 28-11-00, the Sealants for Panels, Valves, Fittings, and Switches section on the inside of the rib (tank side). Sealant may squeeze onto the outside of the rib but must be cleared from threads. Refer to Figure 203 and Figure 204.

(2) Install the float valve.

(3) Install the washer, hose line, and nut. Torque nut 150 to 200 in.-lbs.

D. **Removal and Installation of Fuel Tank Crossover Vent Lines**

(1) For installation and removal of the fuel tank crossover vent lines, contact the factory.

(2) Refer to Figure 205 and Figure 206 for Fuel Tank Vent Valve details.

E. **Testing and Maintenance Practices - Fuel Tank Float Valves**

(1) Verify smooth and unrestricted movement of the float, and visually inspect the primary vent valve seal.

(2) With the float closed, apply a suction on the fuel tank vent hose. If greater than 1 psig is applied without the secondary pressure relief opening, contact the manufacturer for a replacement valve.

F. **Testing and Maintenance Practices - Fuel Tank Crossover Vent Lines** - (Refer to Figure 207.)

(1) To clean the vent line, remove the fuel vent crossover hose located in the leading edge D-Section of each wing above the fuel line access panel.

(2) Remove the hose while supporting the fuel fitting through the forward spar, and blow out each line. If restrictions are found and cannot be cleaned out, contact the factory for replacement instructions.

2. Storage - Venting (S/N 40080 and On)

A. The fuel tank vents are located in the outboard access panels. These panels have a molded scoop mounted flush with the lower surface of the wing with a bonded aluminum tube for the attachment of the fuel vent hose from the expansion area of the fuel tank. The fuel vent hose connects to the fuel vent near the top of the rib at WS 145.00. The hose is installed such that the lowest point in the line is the vent opening.

B. **Venting Removal** - (Refer to Figure 208.)

(1) De-fuel the fuel tanks and open the outboard access panel/fuel vent and the outboard fuel bay access panel.

(2) Remove the hose clamp around the vent hose, and slide the hose off the vent tube bonded in the rib.

(3) If required for hose replacement, remove the hose clamp around the access panel vent tube, and slide off the tube.

C. **Venting Installation** - (Refer to Figure 208.)

(1) Slide the vent hose over the vent tube bonded in the rib, and install the clamp. Torque 17 to 18 in.-lbs.

(2) Slide the vent hose over the access panel vent tube, and install the clamp. Torque 17 to 18 in.-lbs.

(3) Re-install access panels.

3. Fuel Level Sensors

A. **General Description** - Each wing tank has two fuel level float sensors that indicate the quantity of fuel in the tank.

B. **Removal of the Fuel Level Sensors**

(1) Remove the 15, 6-32 flat head screws from the fuel tank access panel nearest the fuel level sensor that requires access. (There are four fuel tank access panels, two on each wing. The access panel locations are shown in Chapter 57-10-00.) Slowly peel the panel away from the wing (the panel is also attached with sealant).

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(2) Remove four, 10-32 hex head bolts attaching the sensor to the bracket, noting the position of the grounding strap.

(3) Remove the nut from the center fuel sensor bolt, noting the attachment of the grounding strap.

(4) Remove the sensor.

C. **Installation of the Fuel Level Sensors**

(1) Set the sensor on the bracket and align the four bolt holes, ensuring that the float on the sensor is pointed inboard. Refer to Figure 209.

(2) Install four, 10-32 hex head bolts with the bolt heads away from the bracket (only four of the five sensor holes will be bolted through) while reattaching the ground strap under the bolt it was initially removed from. Torque the bolts 30 to 36 in.-lbs.

(3) Reattach the grounding strap under the center sensor bolt, and replace the nut. Refer to Figure 210, Sheet 1 for aircraft S/N 40004 to 40079 and Figure 210, Sheet 2 for aircraft S/N 40080 and on.

(4) Replace the access panel by applying PR-1428 sealant to the side of the access panel that will contact the wing skin joggle. Apply Permatex No. 2 thread-locker to each screw and replace the screws in the access panel. Torque the screws 12 to 20 in.-lbs. and let sit for five minutes. Re-torque each screw 12 to 15 in.-lbs. Repeat this procedure until the access panel is flush with the wing surface.

4. Slosh Boxes, Fuel Pickup, and Vapor Return

A. **General Description** - The slosh box is an internal sub-compartment mounted in the inboard section of the fuel tank. The purpose of the slosh box is to provide a compartment around the fuel pickup to hold fuel during low fuel level operation. Refer to Figure 211, Figure 212, Figure 213 and Figure 214.

B. **Replacing Vapor Return Lines**

(1) Contact the manufacturer when replacing the in-tank vapor return lines.

C. **Fuel Tank Strainer Removal**

(1) Defuel the aircraft, then open the inboard fuel bay panel.

(2) Remove the slosh box lid to gain access to the fuel tank finger strainer. Refer to Figure 215.

(3) Loosen the hose clamp, and remove the finger strainer.

D. **Fuel Tank Strainer Installation**

(1) Installation is a direct reversal of the removal.

(a) Torque nut 17 to 18 in.-lbs.

E. **Replacing the Slosh Door**

(1) During normal operation, the slosh door should not wear. During tank inspections verify smooth operation of the door without binding.

F. **Removing the Slosh Door** - (Refer to Figure 216.)

(1) Access the slosh door through the inboard fuel bay access panel.

(2) Unbolt and remove the four mounting bolts that attach the slosh door to the slosh box.

G. **Installing the Slosh Door** - (Refer to Figure 216.)

(1) Installation is a direct reversal of removal.

5. Testing Fuel System

A. **Procedures for Pressure Testing of Fuel Tank (S/N 40004 to 40079)**

(1) Two people are required to perform this test. One person is needed to observe the manometer and one person is needed to pressurize the tanks.

(2) Place the fuel selector in the off position.

(3) Connect two 4 foot lengths of plastic hose such as Tygon (OD 3/8 inch and ID 1/4 inch) to the left and right wing fuel tank vents. Use sealant tape at the connection points to ensure a tight seal.

(4) Connect a digital manometer that reads between 0 and 5 psig (0.01 psig accuracy) to the vent hose on the left wing.

(5) Pressurize the right wing until the manometer reads 1.00 psig ± 0.05 psig. This can be done with a low-pressure, hand-held pump, however great care must be taken not to over-pressurize the tanks.

(6) The observer should call out manometer readings at each 0.01 psig.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(7) The pressure cannot drop more than 0.10 psig over two minute duration.

(8) While the fuel tank is still under pressure, apply a soapy solution to the following items to check for leak. All fittings and connectors on the fuel system from the spar to the fuel selector, around the left and right flap outboard bellcrank brackets, and the left and right fuel vent line fitting and attachment to the WS 145 rib.

(9) If a leak is suspected, contact the manufacturer for further instructions.

B. **Procedures for Pressure Testing of Fuel Tank (S/N 40080 and On)**

(1) Two people are required to perform this test. One person is needed to observe the manometer, and one person is needed to pressurize the tanks.

(2) Place the fuel selector in the off position.

(3) Connect a 4 foot length of plastic hose such as Tygon (OD 3/8 inch and ID 1/4 inch) to the left wing fuel tank vent. Use sealant tape at the connection points to ensure a tight seal.

(4) Connect a digital manometer that reads between 0 and 5 psi (0.01 psig accuracy) with a T-fitting to the vent hose.

(5) Pressurize the wing from the manometer until the manometer reads 1.00 psi ± 0.05 psi. This can be done with a low-pressure, hand-held pump, however great care must be taken not to over-pressurize the tanks. The observer should call out manometer readings at each tenth of an inch.

(6) Crimp or cap off the hose and wait for two minutes. The pressure cannot drop more than 0.10 psig.

(7) While the fuel tank is still under pressure, apply a soapy solution to the following items to check for leak: All fittings and connectors on the fuel system from the spar to the fuel selector, around the left and right flap outboard bellcrank brackets, and the left and right fuel vent line fitting and attachment to the WS 145 rib.

(8) Repeat the procedure for the right wing.

6. Fuel Tank Drains

CAUTION: It is recommended to operate the drain in a well-ventilated area away from structures when working with fuel or fuel vapors.

CAUTION: When operating the fuel sump drain, care must be taken not to force the internal poppet into the drain, as damage to the drain may occur, and the drain may be stuck in the open position.

A. Each of the two integral fuel tanks are equipped with a sump drain for the sampling of fuel and removal of moisture and residual fuel from the tanks. The fuel tank sump is located inside the slosh box as described in the Slosh Boxes, Fuel Pickup, and Vapor Return section of this manual. Each drain is mounted to the wing skin with a castellated nut. An O-ring and sealant seal the drain to the wing skin. Some features of the drains used on the Cessna 300 include a replaceable primary O-ring seal that can be replaced without draining the tanks and a locking position to aid in the de-fueling of the aircraft.

NOTE: The primary O-ring seal on the fuel tank sump drain is replaceable when the drain is installed without de-fueling the aircraft. Refer to the instructions on the Replacement of the Primary O-Ring Seal.

NOTE: Contact the factory for replacement drains and access panels if required.

B. **Removal of Fuel Tank Sump Drain**

(1) De-fuel the fuel tank that will have the drain removed. It is recommended to at least partially de-fuel the other wing tank to prevent a large fuel imbalance.

(2) Remove the inboard fuel tank access panel taking special care in the removal of the panel.

(3) Remove the slosh box lid, as shown in Figure 217, and by removing the eight bolts to gain access to the drain.

(4) Remove the castellated nut from the drain; use a two-prong spanner on the outside of the drain to prevent spinning during removal. Remove the drain valve. Refer to Figure 218.

C. **Installation of the Fuel Tank Sump Drain**

(1) Add a film of the fuel tank sealant discussed in Chapter 28-11-00, the Sealants for Panels, Valves, Fittings, and Switches section to the upper surface of the valve assembly flange. Do not allow the sealant into the O-ring groove in the flange.

(2) Slip a new O-Ring, MS29513-021 or equivalent, over the drain, and insert in the wing.

(3) Torque castellated nut 48 to 60 in.-lbs.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

D. **Fuel Tank Sump Drain Maintenance Practices**

(1) Cleaning - Periodic cleaning of the bottom of the drain and primary O-ring seal is recommended.

(a) To open the drain to access the primary O-ring seal, turn the white poppet 55 degrees clockwise using a Phillips screwdriver, and let the poppet drop down as shown in Figure 219. An internal seal will stop the flow of fuel so de-fueling of the tank is not necessary.

(b) Clean the O-ring and area surrounding the primary seal.

(c) Push gently up and rotate 55 degrees counterclockwise to re-seal.

(2) Replacement of Primary O-Ring Seal

(a) To open the drain to access the primary O-ring seal, turn the white poppet 55 degrees clockwise using a Phillips screwdriver, and let the poppet drop down. An internal seal will stop the flow of fuel so de-fueling of the tank is not necessary.

(b) Remove the worn seal, clean the O-ring groove and surrounding area.

(c) Replace the primary O-Ring seal, available through the manufacturer.

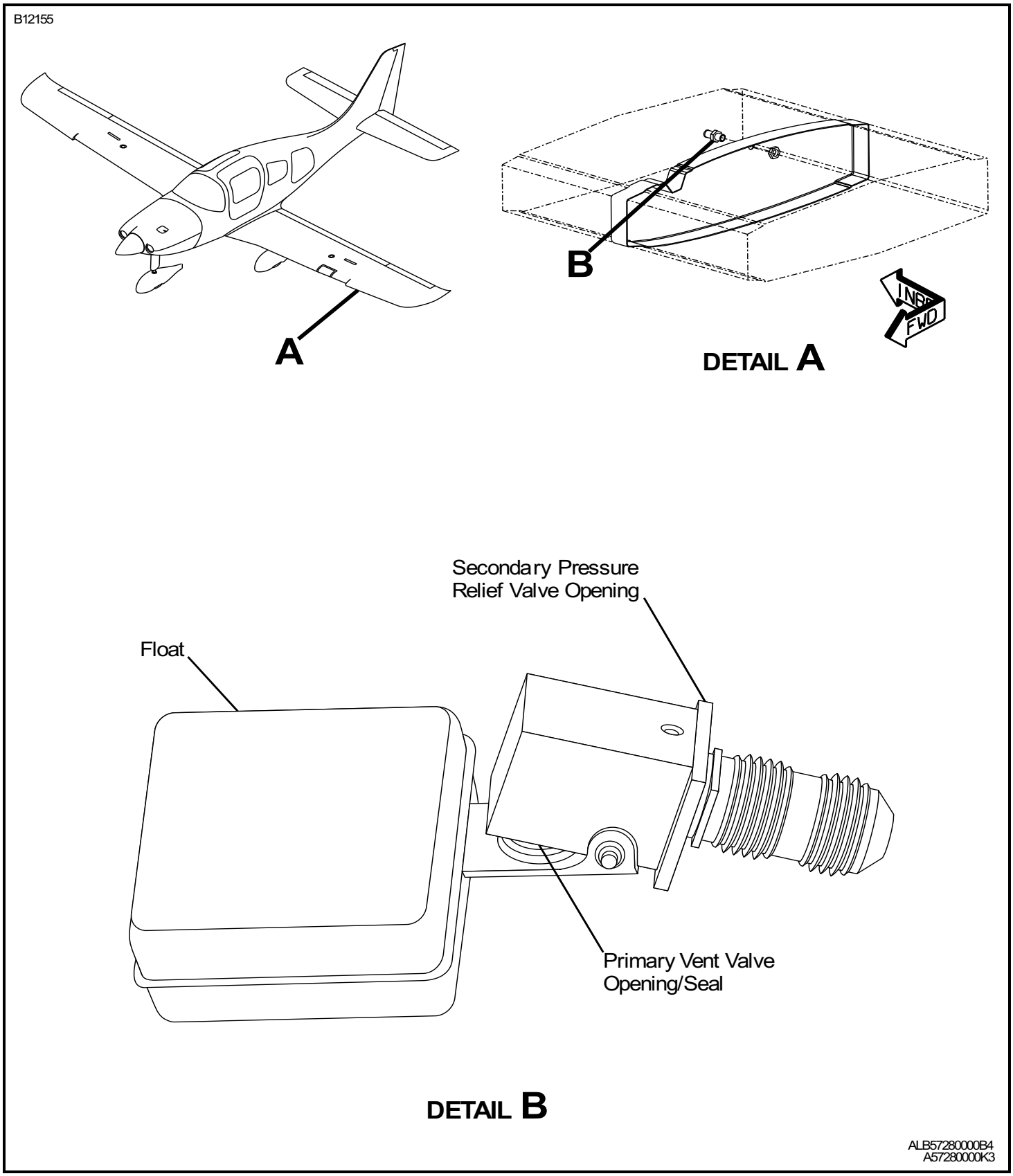
(d) Push gently up, and rotate 55 degrees counterclockwise to re-seal.

E. **Fuel Testing**

(1) The fuel should be tested for contaminants before each flight by taking a fuel sample from the fuel drains. The operation of the fuel drain is similar to other aircraft. To operate, gently push up on the white poppet and drain the required amount of fuel. Do not force the poppet past the initial stop. Damage may occur to the drain, and the poppet may not return to the closed position.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

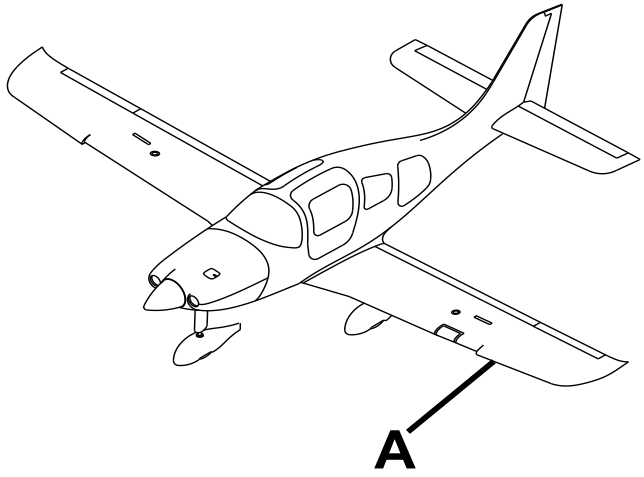
Figure 201 : Sheet 1 : Fuel Tank Vent Float Valve

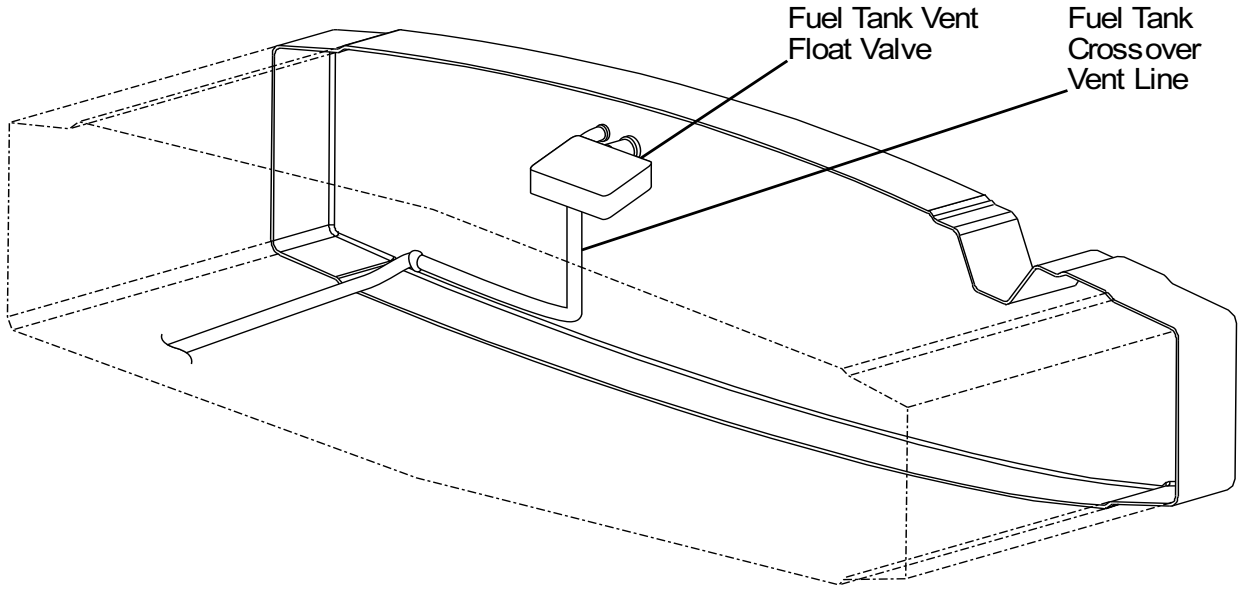


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : WS 145.0 Rib with Float Valve Installed (Facing Outboard)

B12156





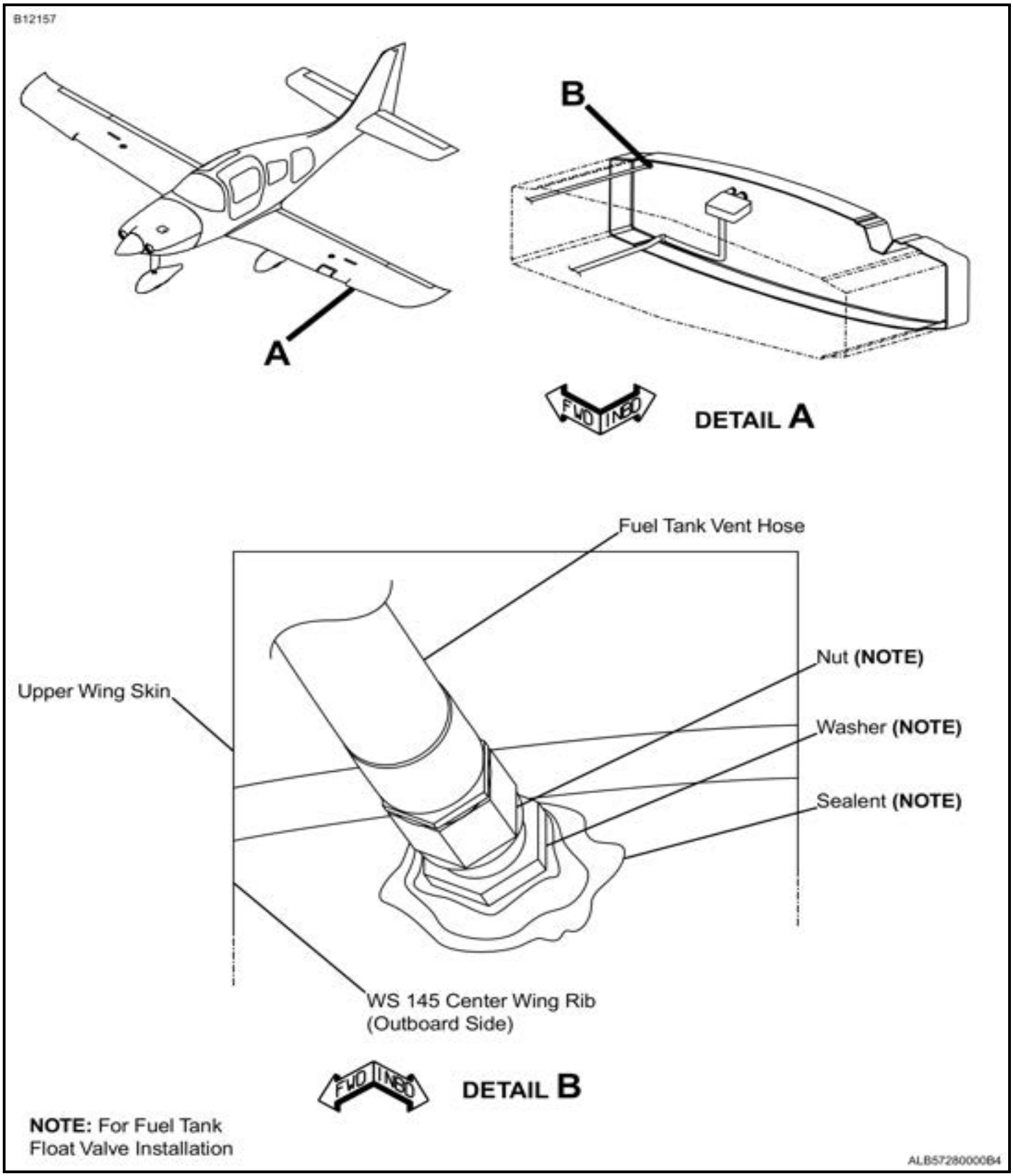


DETAIL A

ALB57280000B104

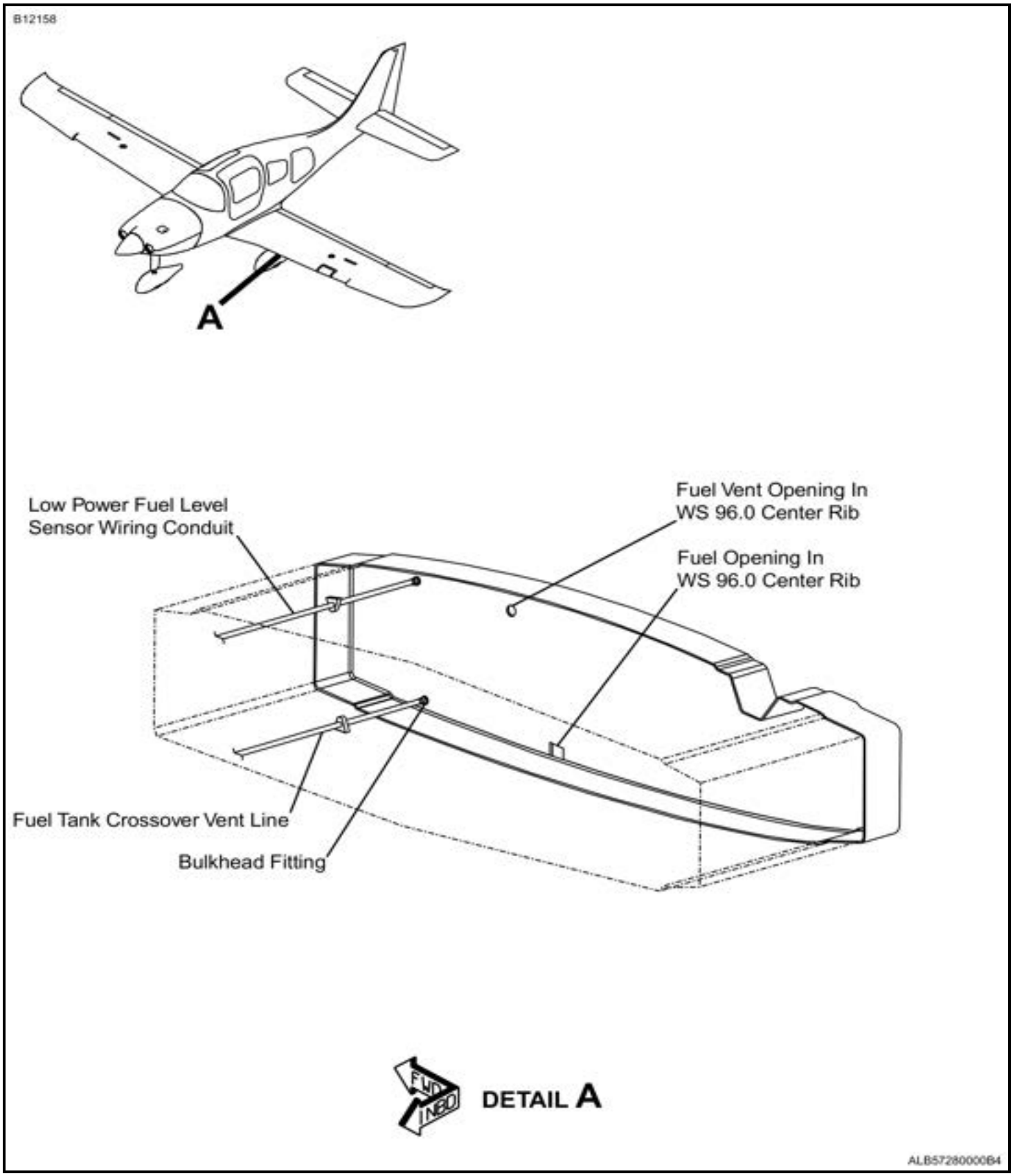
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Outboard Detail of Fuel Tank Vent Valve



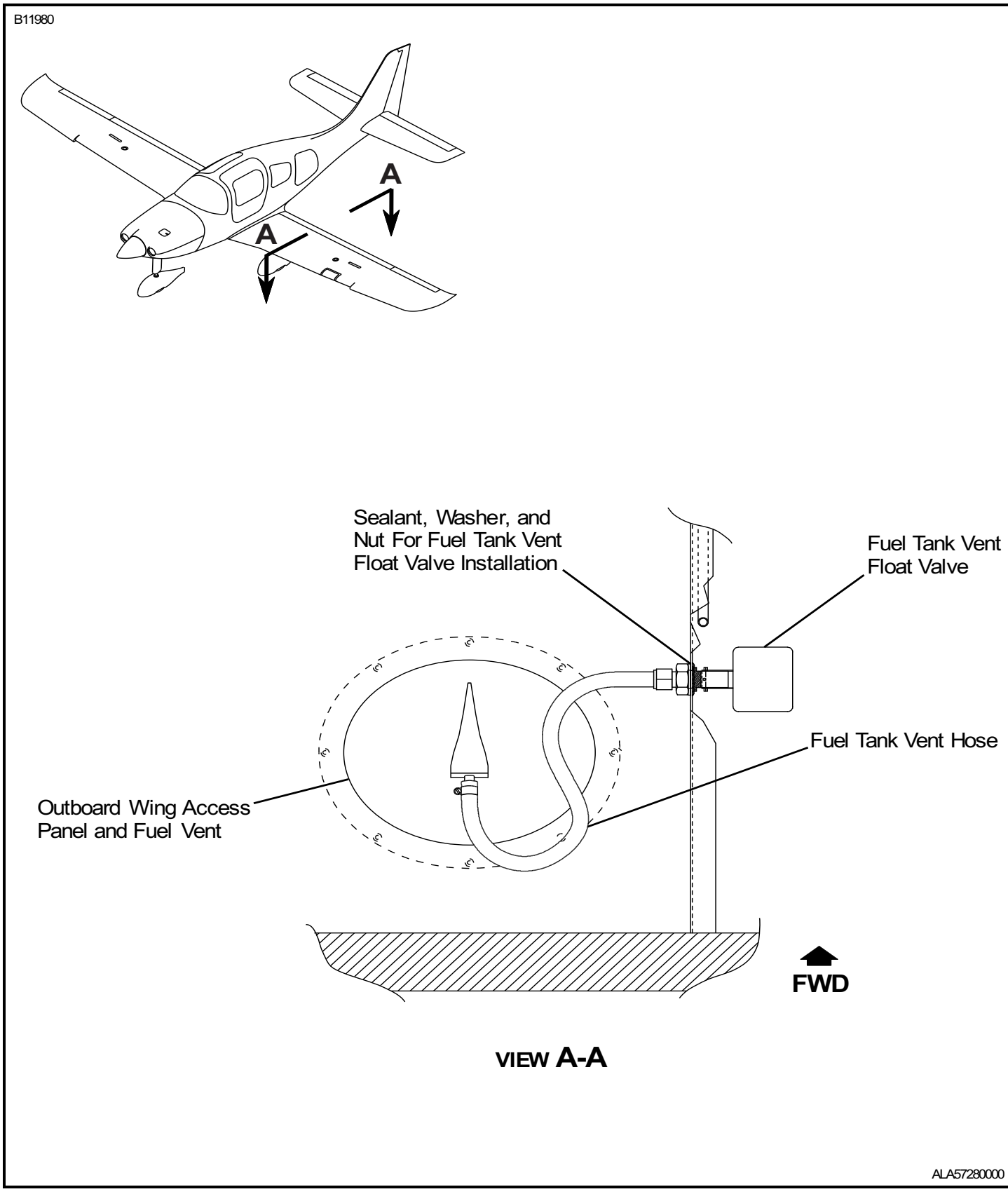
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : WS 96.0 Center Rib, Fuel Tank Detail (Facing Outboard)



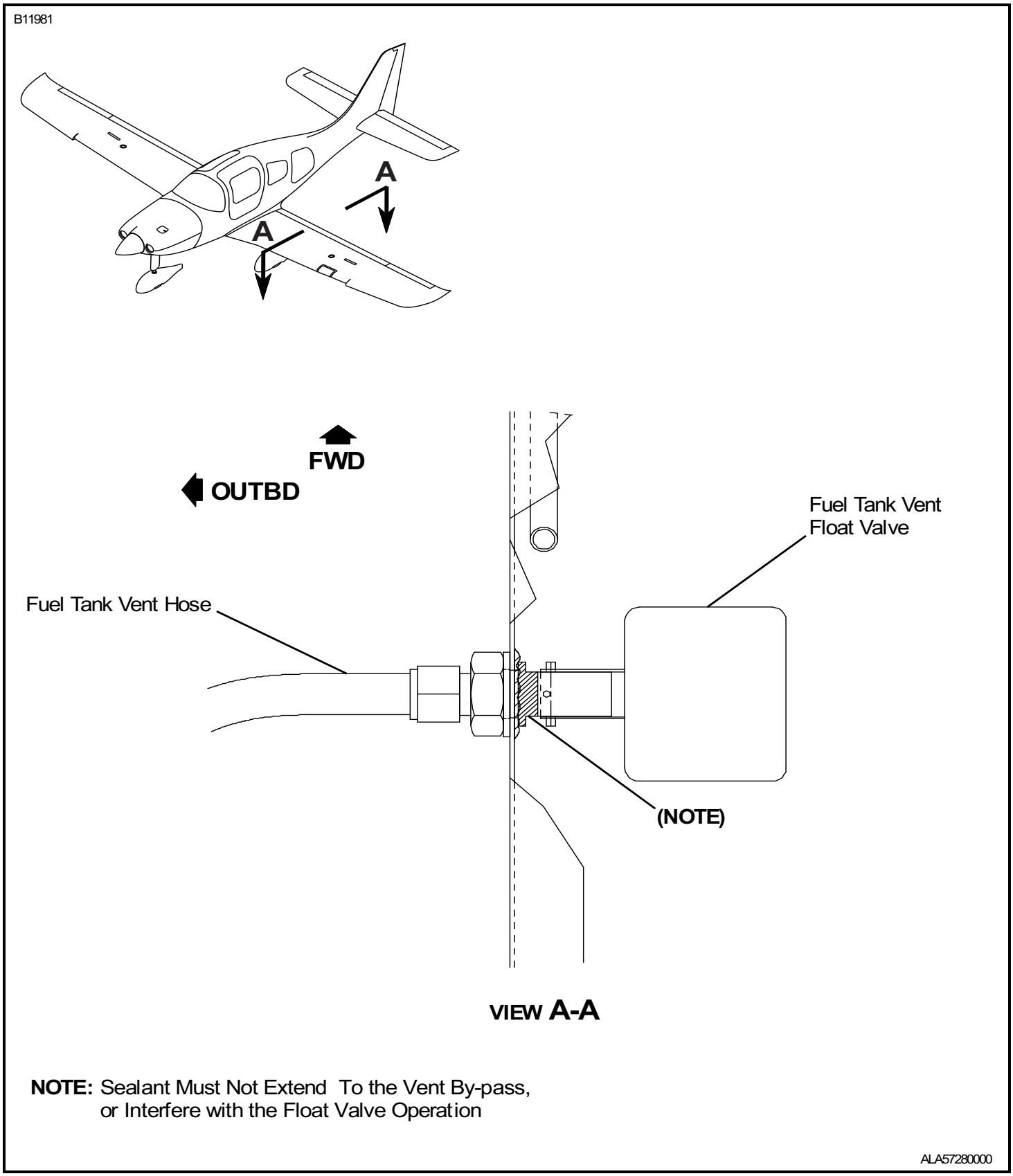
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Fuel Tank Vent Valve



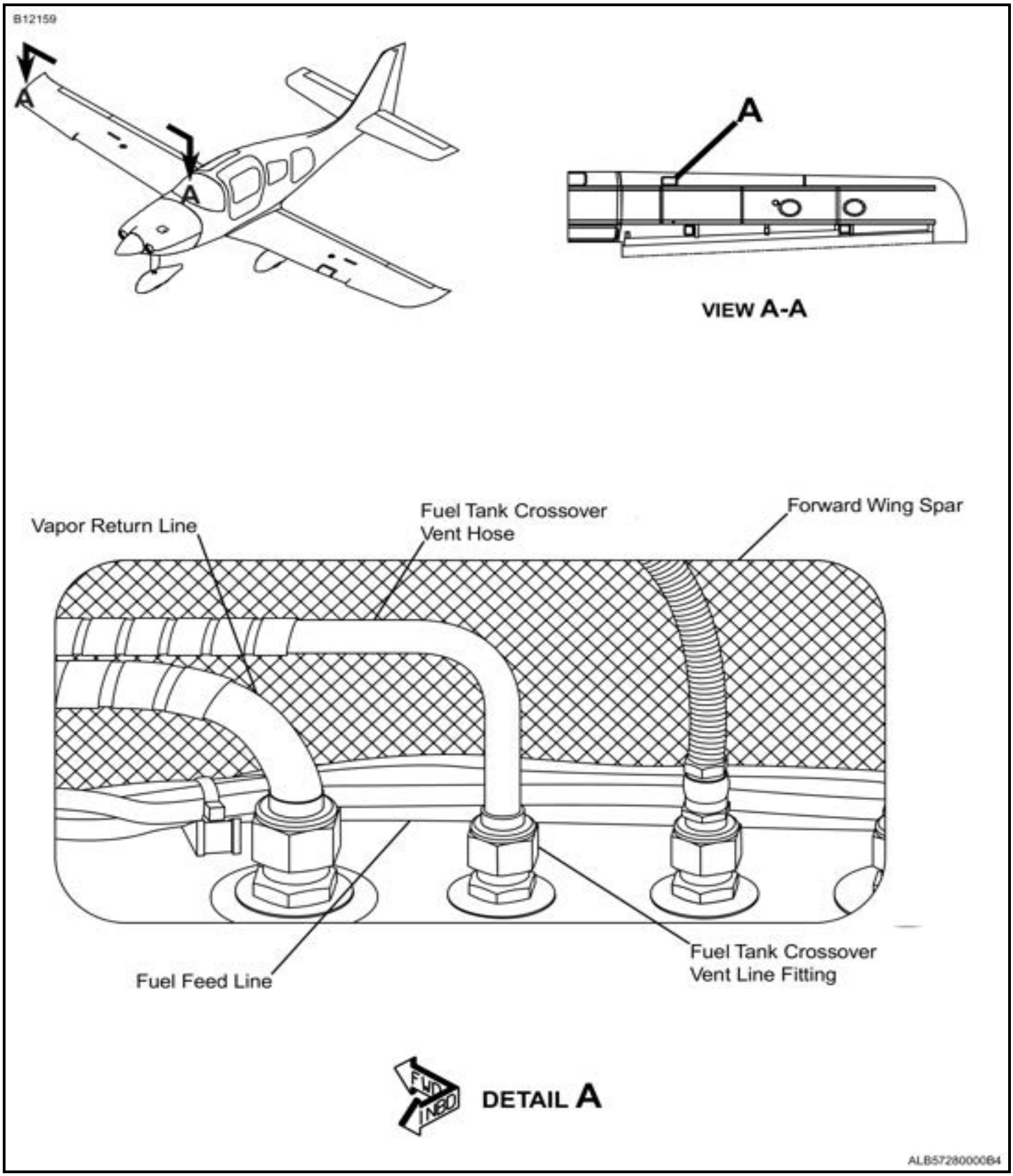
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Fuel Tank Vent Valve Installation Detail



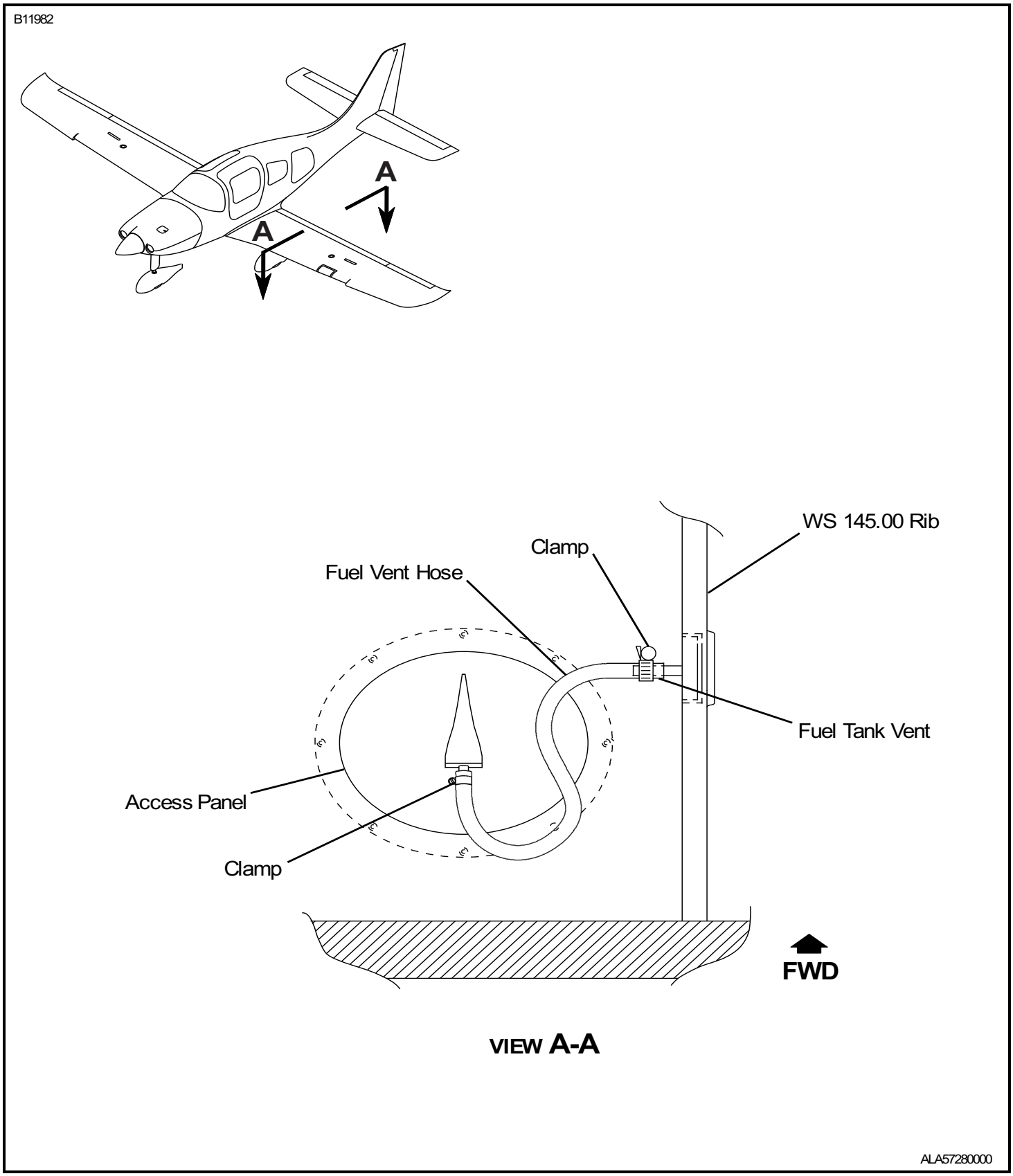
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Fuel Line Access Panel Detail



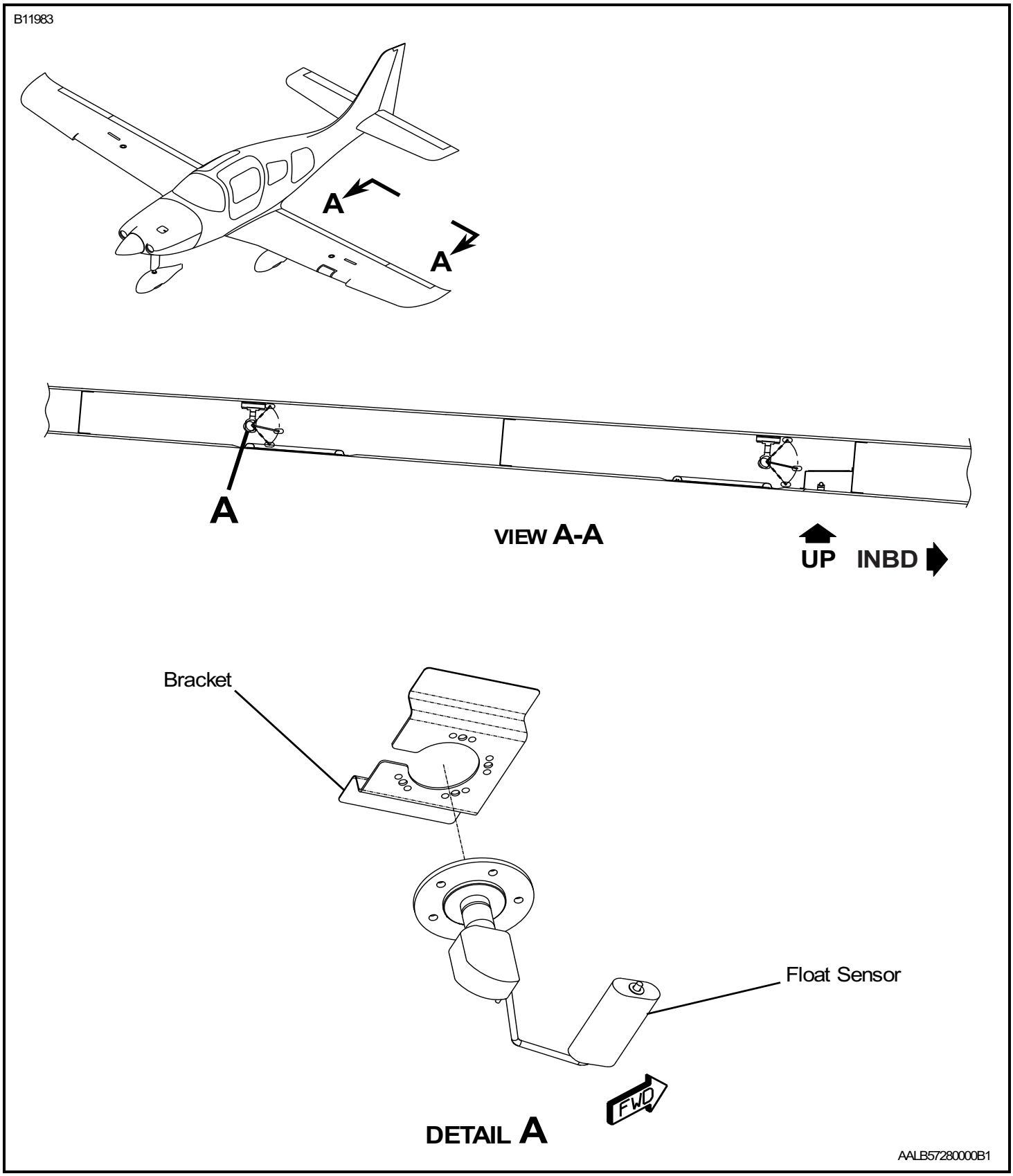
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : Fuel Tank Vent (Left Side Shown)



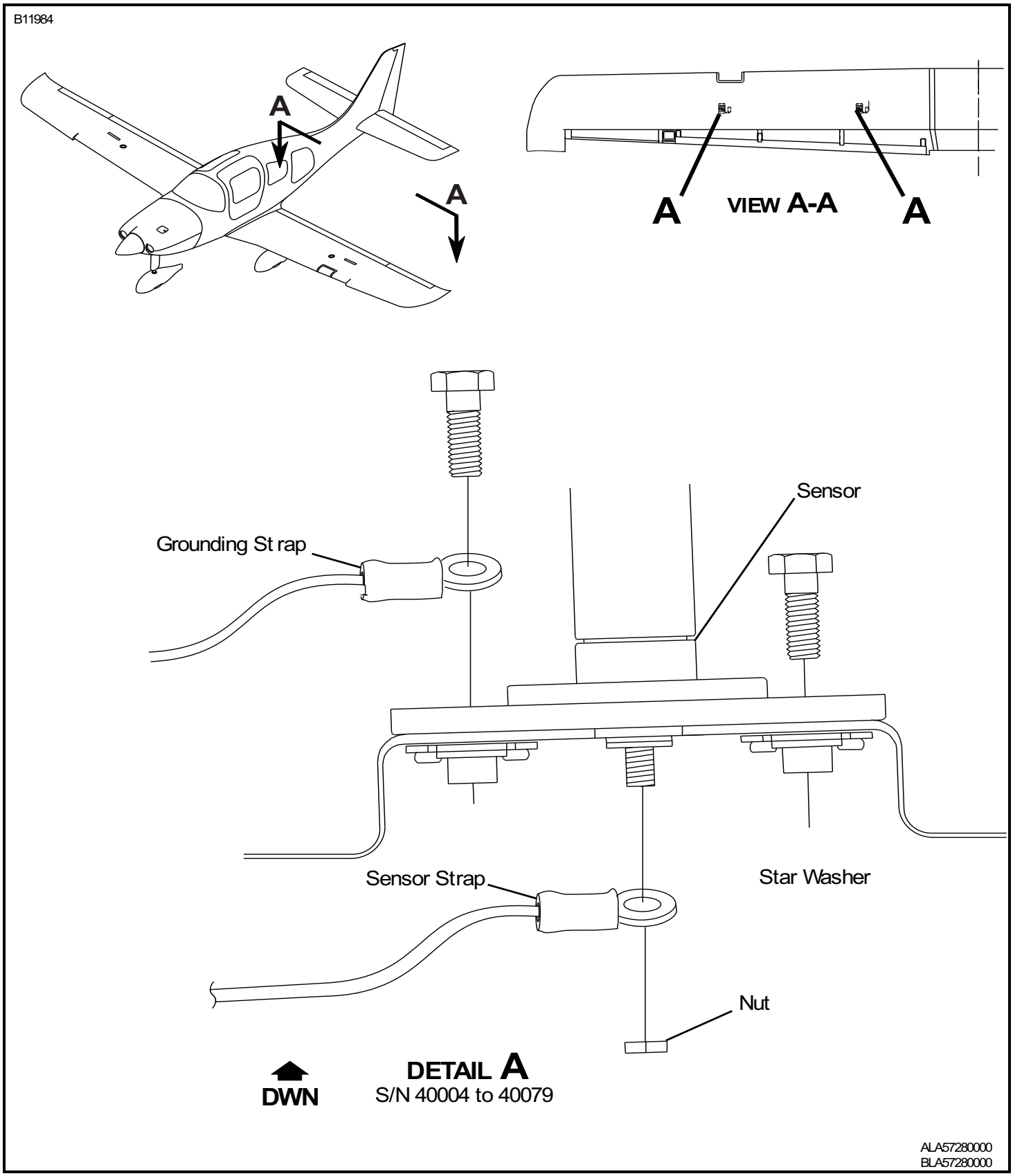
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Outboard Fuel Level Sensor



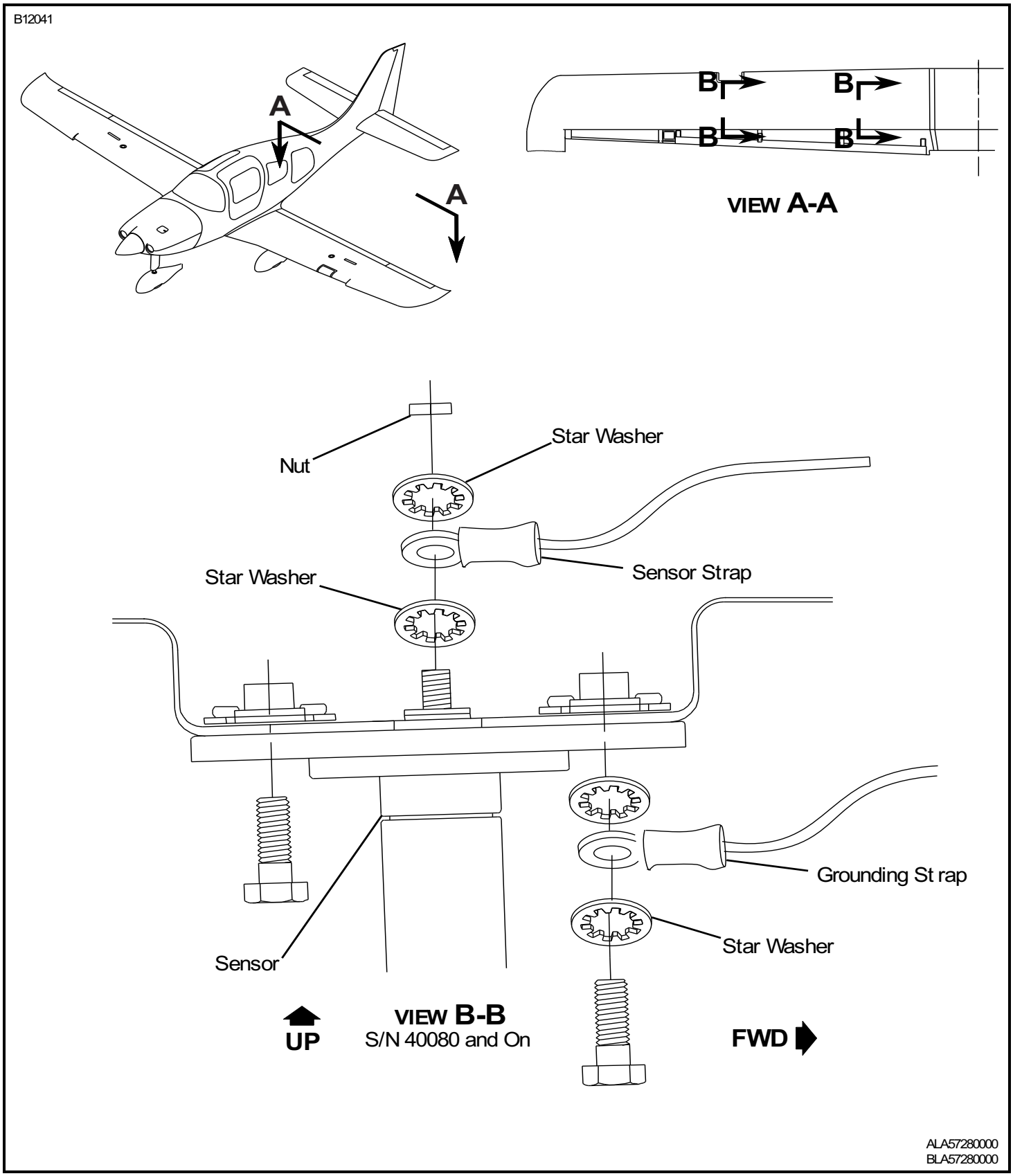
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 1 : Grounding Strap Locations for Fuel Level Sensor



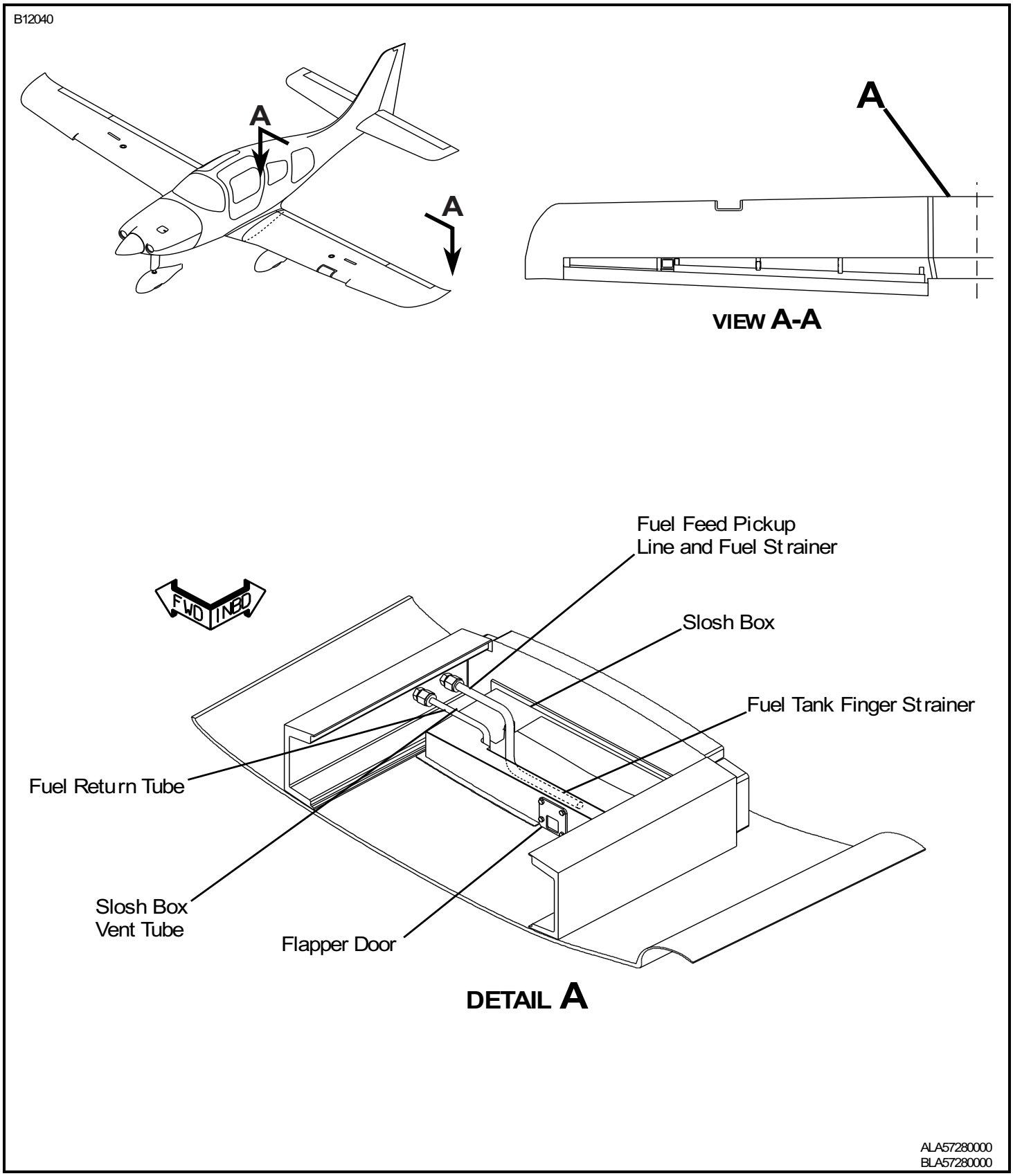
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 2 : Grounding Strap Locations for Fuel Level Sensor



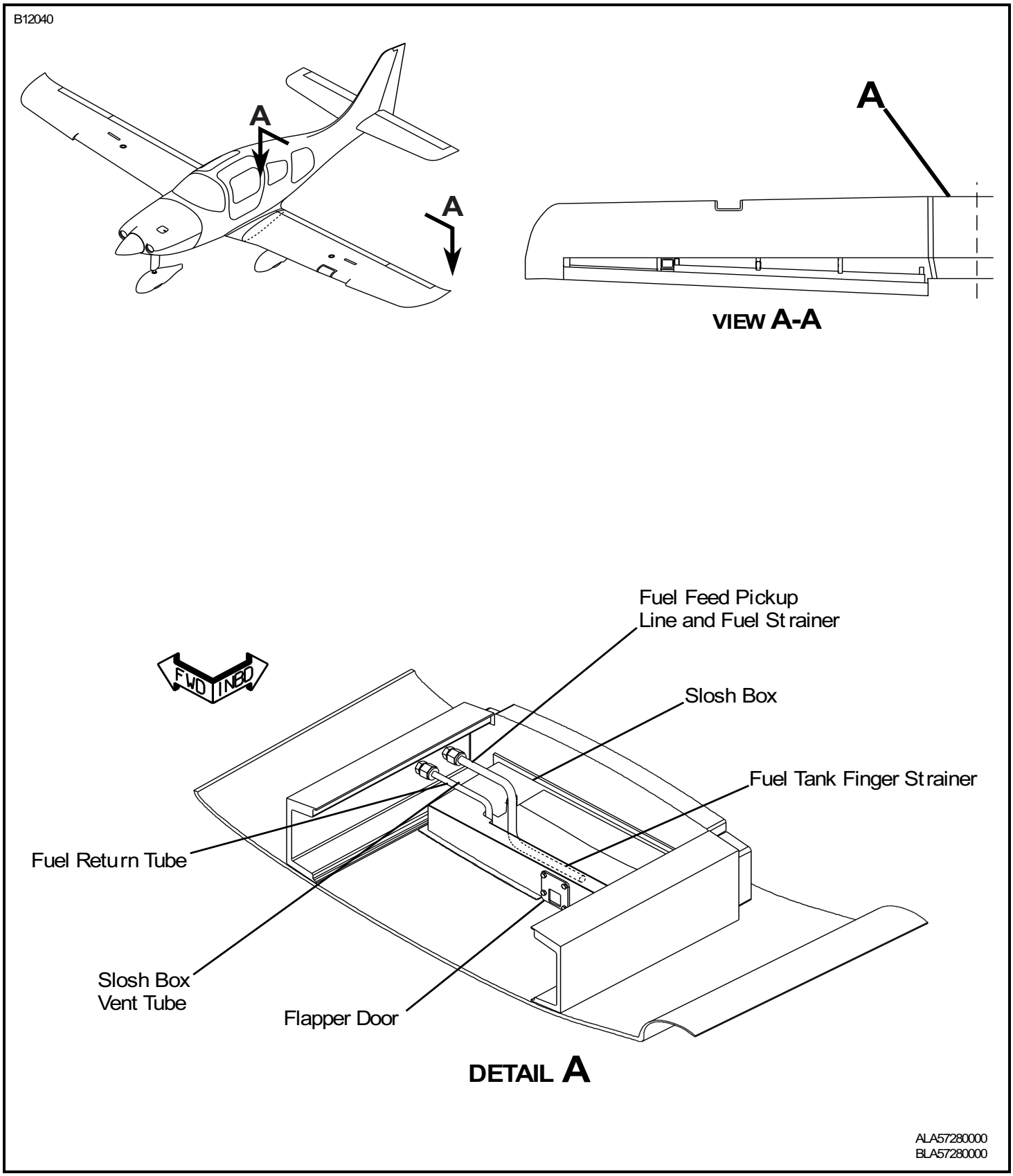
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 211 : Sheet 1 : Slosh Box, Fuel Pickup, Vapor Return, and Crossover Vent (S/N 40004 to 40079)



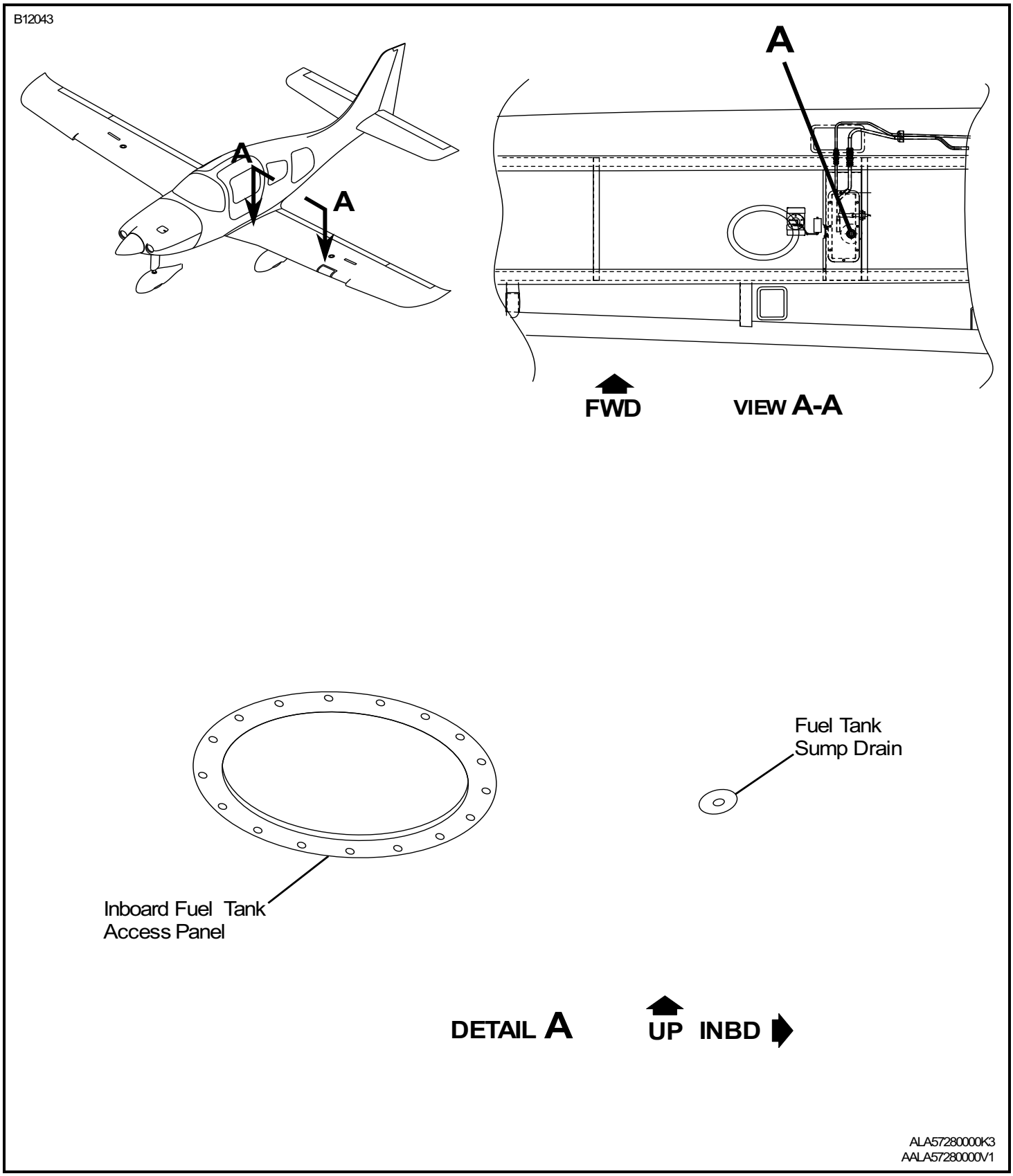
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 212 : Sheet 1 : Slosh Box, Fuel Pickup, Fuel Return (S/N 40080 and On)



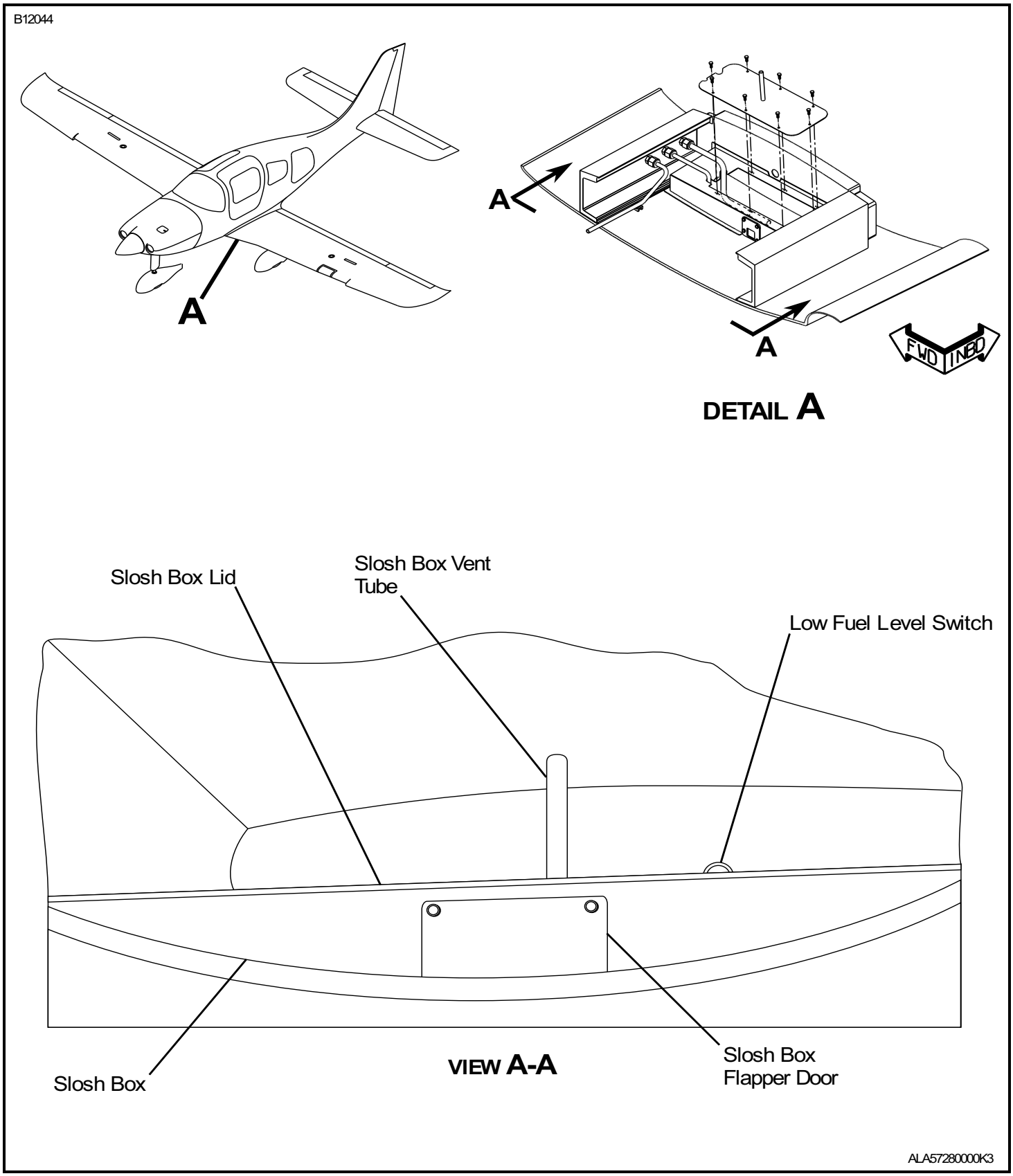
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 213 : Sheet 1 : Inner Fuel Tank Access Panel and Fuel Drain



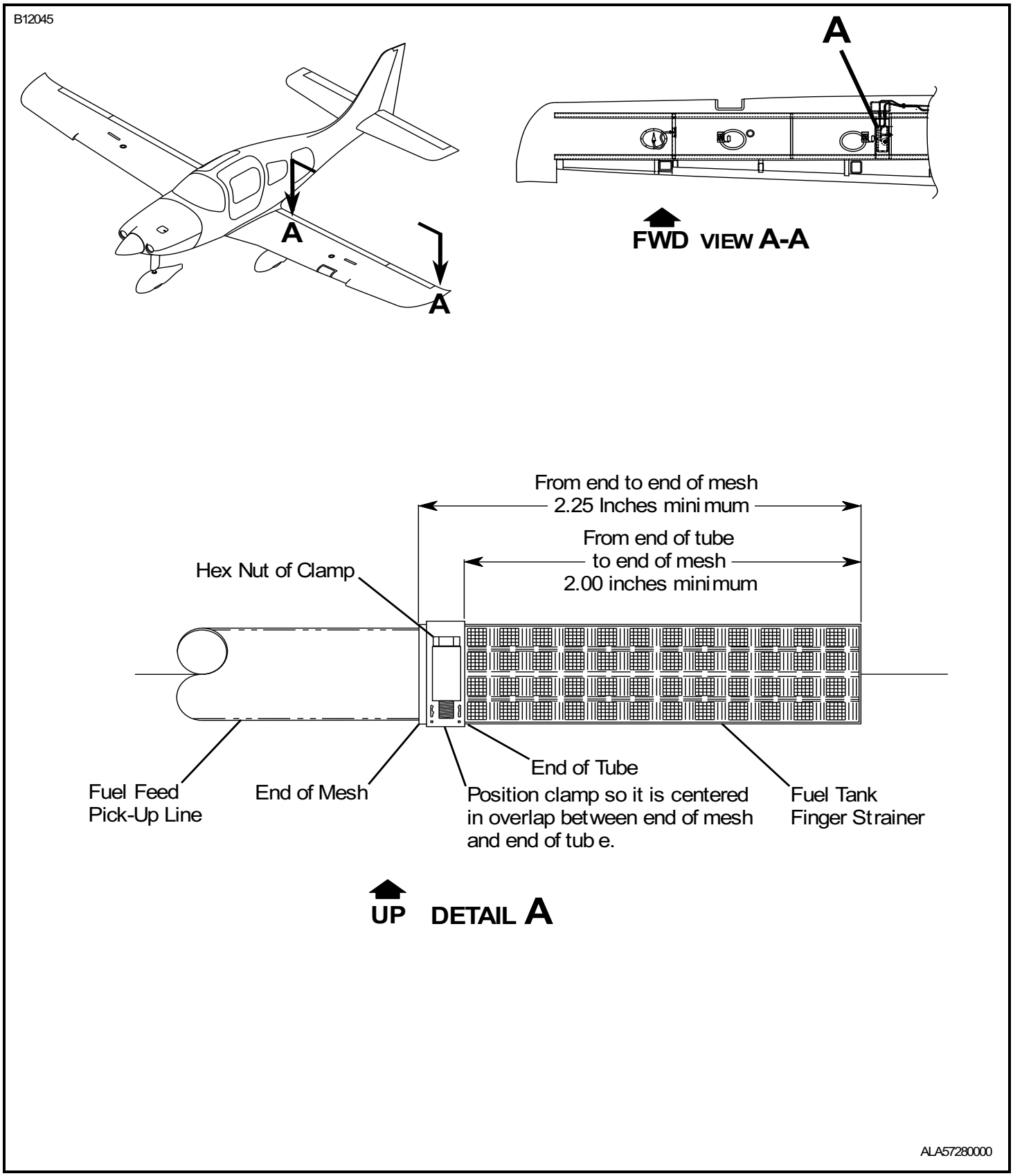
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 214 : Sheet 1 : Slosh Box, Slosh Door, Low Level Float Switch (Facing Inboard)



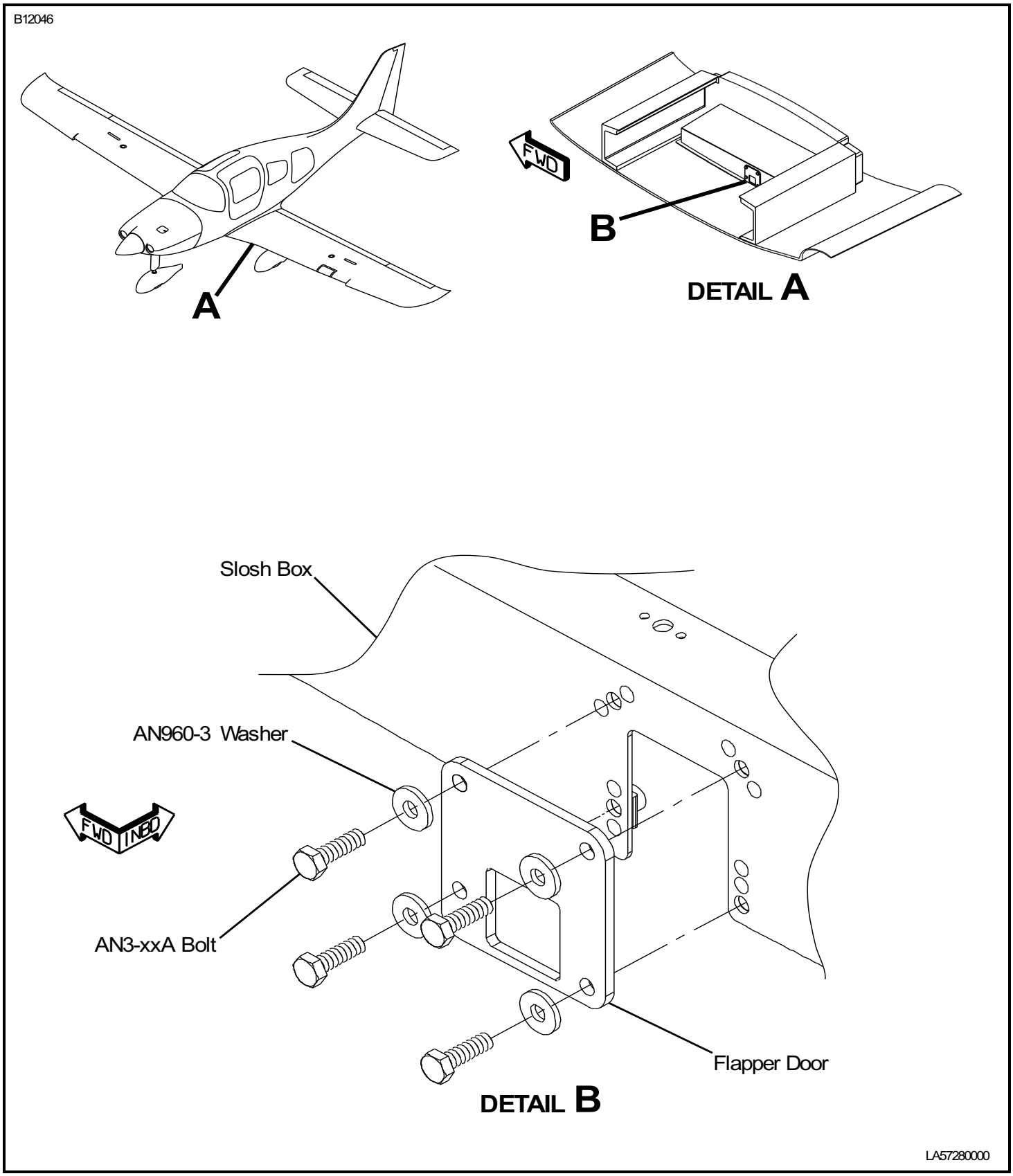
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 215 : Sheet 1 : Finger Strainer Attachment Detail



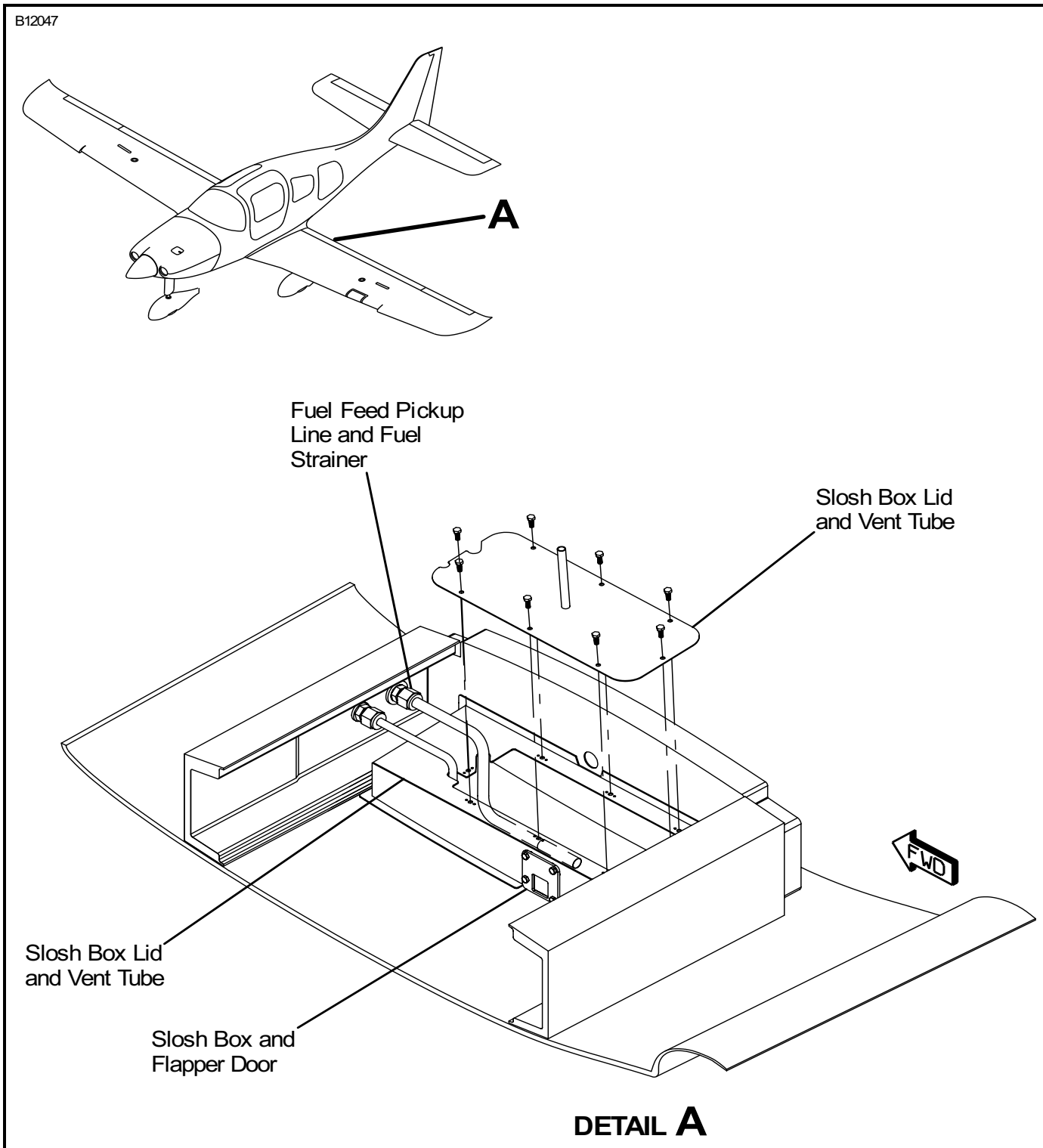
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 216 : Sheet 1 : Slosh Door Installation/Removal



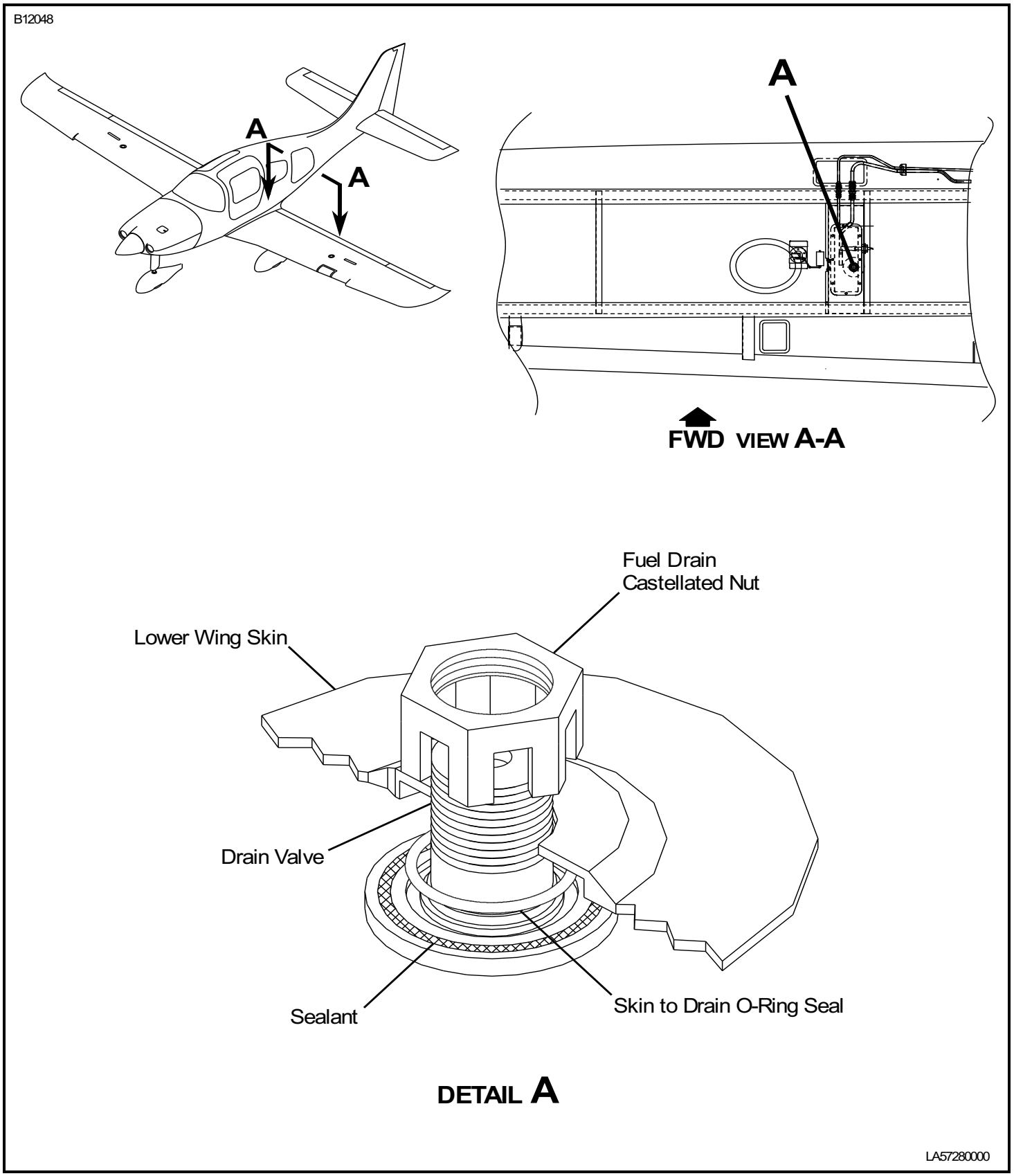
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 217 : Sheet 1 : Slosh Box Lid Removal



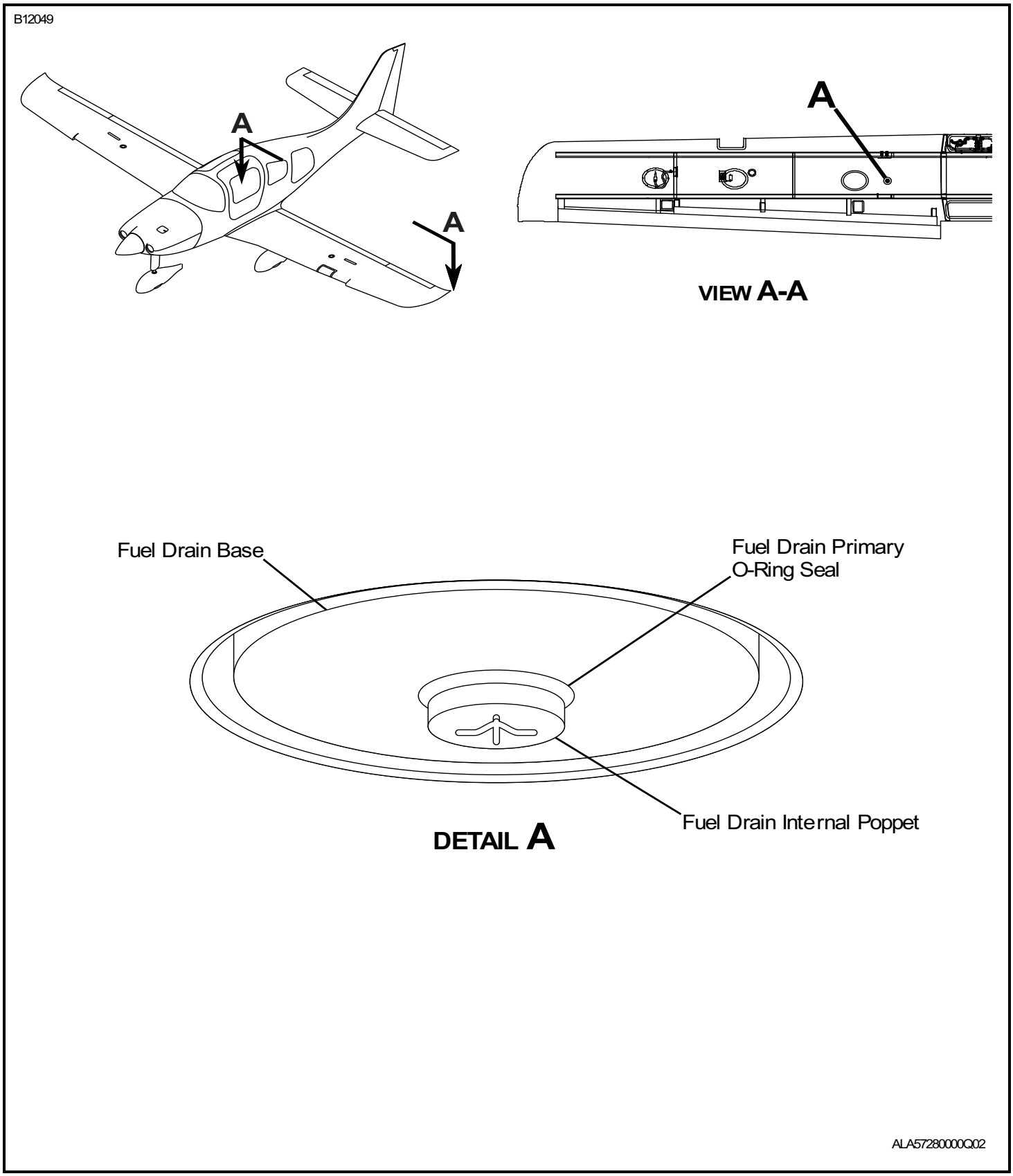
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 218 : Sheet 1 : Fuel Tank Sump Drain Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 219 : Sheet 1 : Fuel Drain Primary Seal Replacement



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUEL TANK SEALING - MAINTENANCE PRACTICES

1. Fuel Tank Sealing Maintenance Practices

A. This section discusses the general procedures and special tools and equipment for repairing leaks in the fuel tanks.

WARNING: The use of sealant is safe provided reasonable care and protective equipment is used. When working with fuel tank sealant, avoid ingestion, direct contact with skin, eyes, open breaks in the skin, etc. A well-ventilated area is required when working with sealant. Wash hands before eating or smoking. If sealant contacts skin, flush area with warm water.

NOTE: Approved fuel system materials may be obtained from the manufacturer.

B. **General Procedures**

(1) When working with fuel tanks and the fuel system, take all applicable safety precautions, and perform work in a well-ventilated area.

(2) The materials used for the Cessna 300 are selected for long life under normal conditions expected in the life of the aircraft. This section covers minor maintenance of the fuel tanks and fuel tank sealing. If a problem is outside the scope of this section, contact the manufacturer.

C. **Special Tools and Equipment**

(1) Gloves - Polyethylene

(2) Cheese cloth

(3) Brush - if brushable sealants are used

(4) Soft plastic spatula

(5) Mixing cup or container

(6) Mixing sticks

(7) MPK and/or Acetone for surface preparation

2. Discussion of Terms and Techniques

A. Application Life: Refer to Pot Life.

B. Pot-Life: Time after mixing a material until it becomes difficult to work with and apply.

C. MPK: Methyl n-Propyl Ketone

D. MSDS: Material Safety Data Sheet

3. Classification of Leaks

A. It is required to inspect for leaks both inside and outside the aircraft on a periodic basis. Note that leaks can form inside the wing away from the slipstream and can be inspected for through the access panels and holes on the wing. Refer to the Location Of Inspection Covers section in Chapter 57-10-00 for access panel locations.

B. Fuel Leak Classification - Refer to Figure 201.

(1) Stain - A slow fuel leak that evaporates soon after it is exposed to the air, leaving a blue or green stain (blue for 100 LL, green for 100).

(2) Seep - A slow fuel leak that reappears shortly after the area is cleaned.

(3) Slow to Heavy Seeps - A seeping occurring in open and closed areas that do not constitute a flight hazard.

(4) Running Leaks - A leak occurring in open areas, and must be repaired prior to flight. This is usually an indication of other damage, and the manufacturer should be contacted.

4. Sealants for Panels, Valves, Fittings, and Switches

A. The same sealant is used on the fuel bay access panels, float valve, fittings through the forward spar, and low level float switches.

(1) **Approved Sealants:**

(a) PRC PR-1428 Class B

1 PR-1428 Class B is a two-part manganese cured, polysulfide based sealant. When mixed, it can be applied by spatula or extrusion gun.

2 The sealant is available from the manufacturer or directly from the sealant manufacturer.

3 Manufacturer:

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Courtaulds Aerospace
Sealants, Adhesives and Coatings Division
21800 Burbank Boulevard
P.O. Box 4226
Woodland Hills, California 91365-4226
USA
Phone: (818) 702-8900
Fax: (818) 702-7317

4 Health Precautions:

a Refer to sealant manufacturer's warnings and MSDS.

b Uncured PR-1428 may produce irritation following contact with skin. When handling PR-1428 Class B, avoid contact with the body, especially contact with open breaks in the skin and ingestion. Wash hands before eating or smoking after working with any sealants or chemicals. Obtain medical attention in case of extreme exposure or ingestion. For further information, refer to the MSDS for the product.

5 Refer to Table 201 for available Cure Rates.

Table 201. PR-1428 Available Cure Rates

Sealant Number	Tack Free Time at 77°F (25°C)	Cure Time at 77°F (25°C)
PR-1428 B-1/2	4 Hours	8 Hours
PR-1428 B-2	8 Hours	20 Hours

6 Mixing Instructions:

a Mix per manufacturer's instructions.

7 Storage Life:

a The storage life of PR-1428 Class B is approximately nine months when stored at temperatures below 80°F (27°C) in original unopened containers. Check date of sealant prior to use.

5. Sealant Repair

A. Minor Sealant Repairs:

(1) Clean around the damaged area to remove any fuel residue.

(2) Clean around the damaged area, scuffing the sealant, and cleaning with MPK or Acetone.

(3) Dry the area prior to applying fuel tank sealant.

(4) Apply fuel tank sealant with a brush or spatula, avoiding blobs, stalactites, or stalagmites. Any flakes or splashes also must be removed to prevent blockage of the fuel strainers and filters.

(5) Allow sealant to completely cure prior to closing tanks and returning aircraft to service.

B. Major Sealant Repairs:

(1) Contact the manufacturer for repair procedures.

C. Approved Sealants:

(1) AC-236

(a) AC-236 is a two-component, liquid polysulfide polymer system for fuel tank sealing. When mixed it can be applied by brush, spatula, extrusion, injection gun, or roller depending on class of sealant.

(b) The sealant is available from the manufacturer or directly from the sealant manufacturer.

(c) Manufacturer:

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Advanced Chemistry and Technology (AC-Tech)
7341 Anaconda Avenue
Garden Grove, California 92841
USA
Phone: (714) 373-2837
Fax: (714) 373-1913

(d) Health Precautions:

1 Refer to sealant manufacturer's warnings and MSDS.

2 The sealant is considered safe when handled with reasonable care. Avoid contact with the body, especially contact with open breaks in the skin and ingestion.

3 Wash hands before eating or smoking after working with any sealants or chemicals. Obtain medical attention in case of extreme exposure or ingestion. If accelerator contacts the skin, immediately wipe off and wash with waterless hand cleaner followed by soap and water. For further information, see the sealant manufacturer's MSDS for the product.

(e) Refer to Table 202 for available Cure Rates.

Table 202. AC-236 Available Cure Rates

Sealant Number	Application Life at 77°F (25°C) and 50 percent RH	Tack Free Time at 77°F (25°C) and 50 percent RH	Cure Time at 77°F (25°C) and 50 percent RH
AC-236 A-1/2	0.5 Hour	7 Hours	24 Hours
AC-236 A-1	1 Hour	16 Hours	30 Hours
AC-236 A-2	2 Hours	24 Hours	48 Hours
AC-236 B-1/2	0.5 Hour	8 Hours	24 Hours
AC-236 B-1	1 Hour	16 Hours	40 Hours
AC-236 B-2	2 Hours	24 Hours	48 Hours
AC-236 B-4	4 Hours	30 Hours	90 Hours
AC-236 B-6	6 Hours	48 Hours	120 Hours
AC-236 C-20	20 Hours	48 Hours	Not Available
AC-236 C-80	80 Hours	96 Hours	Not Available

NOTE: AC-Tech AC-236 A1/2 and B1/2 is recommended because of its workability and pot-life. The longer pot life and cure times are not recommended for field repair.

(f) Mixing Instructions:

1 Mix per manufacturer's instructions.

(g) Curing of Sealant:

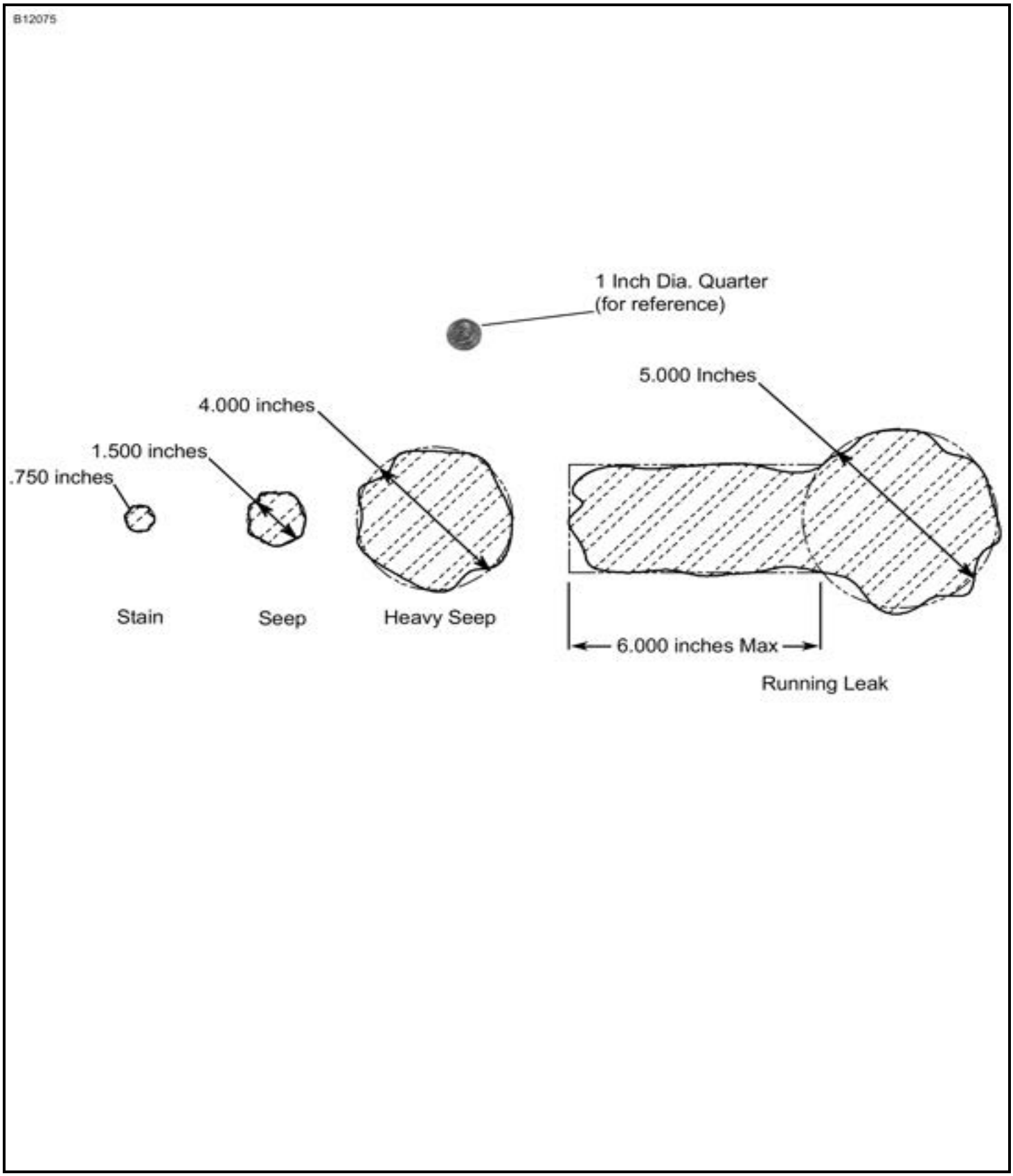
1 Cure sealant per sealant manufacturer's recommendations prior to fueling the aircraft.

(h) Storage Life:

1 The storage life of AC-236 is nine months after the date of shipment when stored at temperatures below 80°F (27°C) in original unopened containers. Storage at lower temperatures increases shelf life. Contact sealant manufacturer for more information. Check date of sealant prior to use.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Fuel Leak Classification



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUEL DISTRIBUTION - MAINTENANCE PRACTICES

1. Fuel Lines

A. **Removal and Installation for S/N 40004 to 40079** - (Refer to Figure 201, Sheet 1.)

(1) If replacement of fuel lines is required, contact the manufacturer for further instructions.

B. **General Practices for Fuel Line Assembly for S/N 40080 and On** - (Refer to Figure 201, Sheet 2.)

(1) Re-bending, unbending, or tweaking tube assemblies to accomplish proper thread alignment and engagement is permissible on assembly with all established clearances, tiedowns, high points, and/or low points maintained. Prior to assembly, blow tubes clean and verify the ends are not damaged prior to installation. If the tube is not going to be installed after cleaning, cap ends to prevent contamination. As an aid for assembly and to prevent galling of mating surfaces, lubricants (e.g. petroleum based) or anti-seize products may be used on the threaded portions of fittings, connectors, etc. Such lubrication is required for stainless steel-to-stainless steel fitting connections.

(2) **AN Fittings** - When required or specified, standard AN flare (i.e. 37 degrees) shall be added to the end(s) of tubing. In forming flares, cut the tube ends square per the cutting procedures in this section, and deburr the ends per the deburring procedures in this section. The tubing is then flared using the correct 37-degree aviation flare forming tool for the size of tubing and type of fitting. A double flare is used on soft aluminum tubing with a 3/8-inch outer diameter and under, and a single flare on all other tubing sizes. Use appropriate caution when tightening; tighten per paragraph 5 of this section. Over tightening will damage the tube or fitting, which may cause a failure. Under-tightening may cause leakage which could result in system failure.After flaring, tubes formed with the "Standard AN flare" (i.e. 37 degrees) will conform to the angles shown in Figure 202 and dimensions shown in Table 201.In addition, the flares must meet the following requirements:

- The flare shall be square with the centerline of the tube within 0.5 inches for the distance covered by the length of the sleeve.
- The circular runout between the inner and outer surfaces of the flare shall not exceed 0.005 full indicator movement (F.I.M.) with the tubing O.D.
- The sealing surface shall be free of pit marks, radial or longitudinal scratches and indentations. Flare sealing surface shall not exceed 32 microinches.
- If necessary, it is recommended that the flared end of the tube be burnished during installation.

Table 201. AN Flared Tube Dimensions

TUBE SIZE NOMINAL O.D. (inches)	"A" DIAMETER (inches)		"B" RADIUS ±.010 (inches)
0.125	.200	+.000 -.010	.032
0.188	.302		
0.250	.359		
0.313	.421		
0.375	.484		.048
0.500	.656		.062
0.625	.781		
0.750	.937		.078
1.000	1.187	+.000-.015	.093
1.250	1.500		
1.500	1.721		.109
1.750	2.106		
2.000	2.356		
2.500	2.856		
3.000	3.356		

(3) **Tube Cutting** - This section is provided as a guideline for tube cutting prior to installation of fuel lines. It is assumed that personnel performing this have had basic training on the use of the tools involved in correctly cutting tubing and

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

preparing the tubing for installation.

NOTE: For a good quality cut, do not rush the process. Always use a sharp cutting wheel and replace the wheel when it becomes dull.

(a) Measure and mark the tubing in the correct location for cutting/trimming. Note that based on the method of deburring, the user may have to compensate for the removal of material after cutting.

(b) Maintain pressure on the cutter wheel by gradually tightening the handle as you rotate the cutter around the tube. Refer toFigure 203 and Figure 204.

(c) Cutting the tube can be accomplished by either rotating the tube, the cutter completely around the tube, or by rocking it back and forth as shown in Figure 204.

(d) To cut deeper, give a 1/8 turn of the knob for each two revolutions around the tube as shown in Figure 205.

(e) Deburr the ends of the tubing per the Tube Deburring paragraph.

(4) **Tube Deburring** - To ensure proper sealing of tubing with the fittings outlined in this specification, the ends of the tubing must be free of burrs, scratches, etc. This section describes some methods of deburring the ends of the tubing to provide the best surface for sealing and for proper system operation. Tube cutters burr into the ID of the tube and this must be removed prior to installation of the tube. Cutting tubing with a hacksaw will burr both the OD and the ID of the tubing.These also must be removed prior to tube installation. Small burrs on the OD may prevent the tubing from being fully inserted into the fitting. ID burrs, or chips, may cause the fittings to leak or cause damage and contamination to the system. Small scratches in the outside surface of the tubing may be removed by carefully polishing out the defect using fine grit sandpaper, Scotch-Brite®, or other equivalent. Following any deburring or polishing, the tube must be cleaned inside and out to prevent introducing foreign material into the systems. Figure 206 shows the proper way to deburr the OD of a cut tube using a file. Note that the file is at a shallow angle to chamfer the end slightly. If there is a raised portion of the tube from cutting, remove this also while deburring. Be careful only to remove the least amount of material from the tube to remove the burr. Removing too much material during deburring at this point will weaken the tube when installed.
Figure 207 shows the use of a deburring tool to deburr the ID. As in deburring the OD, be careful not to remove excessive material, and only remove the burrs from the tube. There should be a slight chamfer on the ID end of the tube, and it must be free of nicks, protrusions, etc., as these affect the system operation and the strength of the tube. Figure 208 shows the use of a tubing deburring tool that can deburr both the OD and ID of the tubing. As with the above noted methods, be careful not to remove excessive material from the tube as this will weaken the tube when installed.

(5) **Torque Values for Flared Tube Fittings** - The following torque values must be used when tightening flared tube fittings. Over-tightening will damage the tube or fitting, which may cause a failure. Under-tightening may cause leakage which could result in system failure.

Table 202. Material and Torque Specification

Size	Tube O.D.	Material and Torque Specification			
		Tube Material	Fitting Material	*Inch Pounds	*Foot Pounds
- 2	1/8	Steel	Steel	75 - 85	6.3 - 7.1
		Aluminum	Steel/Aluminum/Brass	20 - 30	1.7 - 2.5
		Plastic	Steel/Aluminum/Brass/Plastic	10 - 15	.8 - 1.3
- 3	3/16	Steel	Steel	95 - 105	7.9 - 8.8
		Aluminum	Steel/Aluminum/Brass	25 - 35	2.1 - 2.9
		Plastic	Steel/Aluminum/Brass/Plastic	15 - 20	1.3 - 1.7
- 4	1/4	Steel	Steel	135 - 150	11.3 - 12.5
		Aluminum	Steel/Aluminum/Brass	50 - 65	4.2 - 5.4
		Plastic	Steel/Aluminum/Brass/Plastic	25 - 30	2.1 - 2.5
- 5	5/16	Steel	Steel	170 - 200	14.2 - 16.7
		Aluminum	Steel/Aluminum/Brass	70 - 90	5.8 - 7.5
		Plastic	Steel/Aluminum/Brass/Plastic	35 - 45	2.9 - 3.8

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

- 6	3/8	Steel	Steel	270 - 300	22.5 - 25
		Aluminum	Steel/Aluminum/Brass	110 - 130	9.2 - 10.8
		Plastic	Steel/Aluminum/Brass/Plastic	55 - 65	4.6 - 5.4
- 8	1/2	Steel	Steel	450 - 500	37.5 - 41.7
		Aluminum	Steel/Aluminum/Brass	230 - 260	19.2 - 21.7
		Plastic	Steel/Aluminum/Brass/Plastic	115 - 130	9.6 - 10.8
-10	5/8	Steel	Steel	650 - 700	54.2 - 58.3
		Aluminum	Steel/Aluminum/Brass	330 - 360	27.5 - 30
		Plastic	Steel/Aluminum/Brass/Plastic	165 - 180	13.8 - 15
-12	3/4	Steel	Steel	900 - 1000	75 - 83.3
		Aluminum	Steel/Aluminum/Brass	460 - 500	38.3 - 41.2
		Plastic	Steel/Aluminum/Brass/Plastic	230 - 250	19.2 - 20.8
*Dry torque values shown, except as noted in General Notes below					
General Notes					
Use a steel flare nut when using steel tubing. Either steel, brass or aluminum flare nut may be used with aluminum or plastic tubing. Plastic flare nuts to be used with plastic tubing only.Pre-Install tube flare fitting finger tight. If parts do not assemble finger tight, check for foreign material on threads and/or damaged threads. Do not force assemblies together.Maintain cleanliness of tube fittings. Protect all fitting threads from damage and dirt contamination.When attaching stainless steel to stainless steel or stainless steel to aluminum, use MIL-T-5544 Anti-seize/lubricant on fitting threads. To prevent contamination, do not apply Anti-seize to tapered seat. Use lower torque value when Anti-seize is used.					

C. **Removal of Fuel Return and Fuel Feed Fuel/Fuel Pickup Line at WS 48.0 and 50.25**

(1) Loosen the B-nut on both sides of the bulkhead fittings, and slide the nuts onto the fuel lines. Slide off the fuel lines from both sides of the bulkhead fitting.

(2) Remove the nuts on both sides of the bulkhead fitting, and slide out the bulkhead fitting as shown in Figure 209 and Figure 210.

D. **Installation of Fuel Return and Fuel Feed Fuel/Fuel Pickup Line at WS 48.0 and 50.25**

(1) Insert the bulkhead fitting through the O-ring and through the spar insert as shown in Figure 209 and Figure 210. Tighten the bulkhead nuts at WS 48.0, 18 to 20 ft.-lbs. and at WS 50.25, 10 to 12 ft.-lbs.

(2) Slide the fuel line onto the bulkhead fitting, then slide the B-nut over the bulkhead fitting. Torque per values listed in Table 202.

E. **General Leak Check for Each Line, Tube, or Fitting** - After any maintenance on the fuel lines or fittings, check each system for leaks with 90 psi air or nitrogen, and apply a soapy solution at each junction for 30 seconds. After a successful no-bubbles leak check, clean and dry the junctions. Apply a sentry stripe at nut to tube, nut to fitting, and fitting to mounting surface.

2. Fuel Selector

A. **Removal and Installation of the Fuel Selector for S/N 40004 to 40079**

(1) The fuel selector assembly connects the fuel selector knob and drive tube to the fuel selector valve and drive tube through the center console with a spring loaded slip joint to allow for manufacturing tolerances and normal deflections during flight. Refer to Figure 211.

(a) To remove the fuel selector assembly, first remove the three pan head 8-32 screws and washers located on the bottom side of the center console under the fuel selector knob.

(b) Remove the cotter pin, two washers, and stepped clevis pin located just above the floor that connect the upper and lower drive tubes.

(c) The upper drive tube assembly, including the fuel selector knob, can now be removed through the top of the center console.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(d) Installation is the reverse of the above.

(2) **Fuel Selector Knob** - The fuel selector knob is held against the detent barrel by a spring. Refer to Figure 211.

CAUTION: The spring is under pressure. Use proper safety precautions and equipment when removing the cotter pin to keep the cotter pin, washers, spring, and drive tube from flying apart.

(a) Remove the spring-loaded cotter pin from the upper drive tube.

NOTE: Once a cotter pin is removed, it must be discarded. Do not reuse a cotter pin.

(b) Remove the two washers, spring, and detent barrel from the drive tube.

(c) Remove the three flat head 8-32 screws that attach the fuel selector knob to the drive tube.

(d) Installation is the reverse of the above.

B. **Removal of the Fuel Selector Valve for S/N 40080 and On**

(1) Remove the pilot's side seat per instructions in Chapter 25-10-00.

(2) Remove the carpet to gain access to the forward wing saddle access panel, and remove that panel per instructions in Chapter 25-31-00.

(3) Remove the center console access panels per instructions in Chapter 25-12-00.

(4) Disconnect all wiring to the selector, and mark and label connectors.

(5) Remove the four countersunk 6-32 screws, self-locking nuts, and washers attaching the upper fuel selector plate to the center console.

(6) Slide the upper portion of the fuel selector assembly off the splined shaft. Refer to Figure 214.

(7) Remove the two truss head screws and large area washers securing the vapor barrier and grommet to the floor. Slide the vapor barrier and grommet off of the spindle and splined shaft. Refer to Figure 213.

C. **Installation of the Fuel Selector Valve for S/N 40080 and On**

(1) Wire the fuel selector valve per instructions in the LC40-550FG Wiring Manual.

(2) Rotate the spindle selector to the left fuel tank detent, and adjust the microswitch so that the roller face on the activated switch is 1.01 +0.03/-0.05 from the face of the spindle (refer to Figure 212). Ensure the left fuel tank annunciator illuminates, and tighten the microswitch attachment screws 3.8 to 4.5 in.-lbs.

(3) Rotate the spindle selector to the right tank position, and repeat the previous step.

(4) Rotate the selector back to the left tank position.

(5) Slide the vapor barrier plate and grommet over the top of the fuel selector spindle, and position the grommet so it is mounted in the vapor barrier plate and over the solid shaft of the selector. While sliding the grommet, it is acceptable to stretch the grommet over the lower universal joint. The vapor barrier plate should be flush with the top of the floor. Refer to Figure 213 and Figure 214.

(6) Install two 10-32 truss head screws and two large area washers in the two rivnuts installed in the floor as shown in Figure 213.

(7) Slide the upper portion of the fuel selector coupling over the splined shaft, as shown in Figure 214.

(8) Attach the upper fuel selector plate to the center console by installing the four countersunk 6-32 screws, self-locking nuts and washers in the upper fuel selector plate. Torque to 10 in.-lbs.

(9) Install the center console access panels per instructions in Chapter 25-12-00.

(10) Install the pilot's side wing saddle access panel, carpet, and pilot's seat per instructions in Chapter 25.

D. **General Leak Check for Each Line, Tube, or Fitting** - After any maintenance on the fuel lines or fittings, check each system for leaks with 90 psi air or nitrogen, and apply a soapy solution at each junction for 30 seconds. After a successful no-bubbles leak check, clean and dry the junctions. Apply a sentry stripe at nut to tube, nut to fitting, and fitting to mounting surface.

E. **System Check** - Follow the instructions in the Testing Fuel System section to assure system integrity.

F. **Maintenance Practices**

(1) Periodic inspection of the fuel lines, hoses, fittings, etc., is required to check for leaks, chafing, or damage.

(2) Cleaning is required on top of and around the fuel selector linkage by vacuuming or wiping with a damp cloth to clean away dust and debris that may have worked into the area.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

G. **First 500 Hour Inspection and Every 1000 Hours Thereafter**

(1) Ensure valve rotates freely to all positions

(2) With power applied to the aircraft, ensure that annunciators on instrument panel indicate correct selector position.

(3) Remove upper knob and ensure socket-head, countersunk screw is tight. If not, remove screw, apply a drop of thread-locking compound (Loctite 242 or equivalent), and reinstall. Tighten until snug.

(4) Inspect interconnect shaft between upper detent plate and the valve body. Check that roll pins are securely in place and that there is no sign of chafing or excessive wear.

(5) Check lobed plate on valve body and verify it actuates microswitches as selector is moved to the various positions. Replace broken or worn microswitches.

(6) Inspect valve body for any signs of leaking. If leakage is evident, check security of fuel line connections. Correct any loose connections. If no loose connections are found, remove valve body and repair or replace.

3. Auxiliary Fuel Pump

A. The Cessna 300 is equipped with an electric auxiliary fuel pump to provide both vapor suppression and backup boost pump operation. The pump is located on the fuel module mounted to the forward spar, below the front seats. Access is through the fuel system access panel located on the belly of the aircraft.

(1) **Removal of Auxiliary Fuel Pump**

(a) Verify aircraft power is turned off.

(b) Turn the fuel selector to the off position.

(c) Disconnect the auxiliary fuel pump wire connector.

(d) Disconnect the fuel lines.

(e) Loosen the hose clamps, and move clamps to release the fuel pump.

(2) **Installation of Auxiliary Fuel Pump**

(a) Installation is a direct reversal of the removal of the auxiliary fuel pump.

(b) Hand tighten the flared tube fittings connecting the fuel lines to the fuel pump until the assembly is complete and then tighten 150-250 in.-lbs.

(c) Prior to tightening the hose clamps around the fuel pump ensure that the fuel lines are not pre-stressed. Tighten hose clamps 10-15 in.-lbs.

4. Primer Switch

A. **Removal and Installation of the Primer Switch**

(1) Refer to Chapter 33 of this manual for detailed instructions.

B. **Primer Switch Maintenance Practices**

(1) Refer to Chapter 33 of this manual for detailed instructions.

5. Automatic Fuel Boost Pump System

A. **System Overview** - The purpose of the automatic fuel boost pump system is to reduce pilot workload in case of a primary engine driven fuel pump failure during takeoff. The system is operated by arming the backup pump system prior to takeoff and during climb to cruise altitude. Once armed, the system will turn on the backup pump if it senses a pressure drop in the unmetered fuel line. The system provides at least 79 percent power, or 246 hp, within two seconds of an engine driven fuel pump failure as tested by Teledyne Continental Motors (TCM). Figure 215 shows the overview of the automatic boost pump system and the relationship of the primer switch, the vapor suppression switch, and the boost pump arm switch to the boost pump.

The system includes a fuel line, pressure switch, a warning light, system-armed light, systemarming switch, and the wires and connectors to the auxiliary fuel pump. Refer to the Auxiliary Fuel Pump section. The fuel line is located between the T-fitting on the TCM IO-550-N throttle metering unit (TMU) and the fuel pressure switch. Refer to Figure 216.

Use Type V, Class E sealant (RTV162) to completely cover the wire terminals and the wire bundle assembly where it attaches to the switch. Refer to Chapter 20, Solvents, Sealants and Adhesives - Description and Operation, Table 1, Engine and General Purpose Materials.

The system activated by the back-up pump switch will illuminate the system-armed light located directly below the switch. The boost pump pressure switch senses unmetered fuel pressure coming from the engine's fuel injection system by means of a fuel line connected directly between the fuel pressure switch and the fuel injection metering valve on the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

unmetered fuel pressure side. When the fuel pressure drops below 5.5 ± 0.5 psi and the back-up pump switch is in the armed position, the switch operates a latching relay, turning on the boost pump and illuminating the fuel pump annunciator. If the system is off, the annunciator light will still illuminate when the un-metered fuel pressure is below 5 psig. Figure 217 shows the location of the cockpit controls for the fuel pump and automatic fuel pump system.

B. **Automatic Fuel Boost Pump System Maintenance Practices**

(1) System Check Out

(a) Verification of Normal Operation If the operation of the automatic boost pump system is in question, a ground test, at a minimum, should be conducted prior to the next flight. This includes an engine warm-up and run-up test to verify that the system is operating correctly. If the system fails the ground test, or the system is still in question, further system checks must be performed.

(b) Ground Testing For the ground tests, an indication different from what is defined as normal constitutes a test failure, and testing should be stopped. In case of a system failure, check the pressure switch, follow the electrical troubleshooting section, or contact the factory. This test requires starting the engine, and due to the nature of the testing, may cause flooding of the engine. Proper safety precautions must be taken to prevent fire and damage to personnel, the system, or the aircraft.

WARNING: Testing of the backup boost pump system requires engine runs, running the fuel boost pump, and priming the engine. As with any work around aircraft, the engine must be assumed to be ready to run and able to turn over at any time. Precautions must be taken to prevent personal injury and damage to aircraft and surroundings.

1 Turn the master switch on. With the engine not running, the FUEL PUMP annunciator light must be illuminated.

2 With the throttle partially open and the mixture full rich, press the primer button until an indication is registered on the fuel flow/pressure gauge. When flow indicated is above 0 GPH, the FUEL PUMP annunciator light must be extinguished.

3 Return the throttle and mixture to the full aft position, (mixture to idle cutoff and throttle to closed).

4 Turn the back-up pump switch to ARMED. The system armed light must be illuminated, the fuel pump must be running, and the FUEL PUMP annunciator light must be illuminated. Turn the switch to off after verification of the above items.

CAUTION: At this point in the backup boost pump system testing, the engine should be well primed, if not flooded. Care must be taken to prevent damage to personnel, the engine, and the aircraft during starting. Refer to the Pilot's Operating Handbook for starting the engine with a flooded engine.

5 Start the engine and allow the engine to warm up prior to performing any engine run-up tests. During startup, the FUEL PUMP annunciator light must extinguish once the engine starts.

6 With the engine running and with engine temperatures in the green, turn on the backup boost pump system. Only the system-armed light should illuminate, and the boost pump should not operate. This can be verified by watching the fuel pressure/flow gauge for any fluctuations when the system is turned on and off. Refer to Figure 218.

7 With the system armed, prop set at full forward (max RPM), and engine running at 2000 RPM, slowly pull the mixture back until the indicated fuel flow is approximately 10 GPH. Continue pulling the mixture back until the boost pump system turns on the boost pump. If the pressure drops below 0 GPH and/or the engine quits, the system is not operating correctly. If the mixture is at idle cut-off, the system did not engage as indicated by the FUEL PUMP annunciator light, and the engine is still running, the engine fuel system must be re-calibrated per Chapter 73. Return the mixture to the previous setting when completed with this test point.

NOTE: If the mixture is pulled completely back to the idle cut-off position, the system may not be able to provide enough fuel pressure to run the engine.

8 With the system armed, perform a full power run-up with a quick retraction of the throttle to idle. The system should not operate as indicated by the illumination of the FUEL PUMP annunciator light or engaging of the electric boost pump.

9 Turn off the system, and shutdown the engine. If no failures are noted, the system is considered safe for

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

flight. If the system is in question, re-test, or contact the manufacturer prior to flight. In case of a system failure, check the electrical system as documented in the following section.

(2) Electrical Troubleshooting

(a) Pump does not turn on with zero fuel pressure and the back-up pump switch is armed.

1 Fuel Pressure Sensor

a Verify with an ohmmeter that one of the terminals has a good ground (0- 1 ohms) and mark it GND.

b With the aircraft power on and the back-up pump switch armed, verify with a voltmeter that approximately 12 volts is on the other terminal.

c Jumper the two terminals on the fuel pressure sensor, and immediately place the back-up pump switch in the arm position.

CAUTION: Do not run the pump more than 2-3 seconds.

d If the pump runs with the fuel pressure sensor terminals jumped, replace the fuel pressure sensor.

2 Back-up Pump Rocker Switch

a With aircraft power on, move the rocker switch to the armed position.

b If the light does not illuminate but the pump turns on, replace the "armed" light.

CAUTION: Do not run the pump more than 2-3 seconds.

c If the light does not illuminate and the pump does not turn on, depress the primed button briefly.

1. If the pump turns on, replace the rocker switch.
2. If the pump does not turn on, replace the circuit breaker. (3) K-7 Latching Relay (located on right side of fuselage behind the right

3 K-7 Latching Relay (located on right side of fuselage behind the right kidney panel on the instrument panel)

a With the fuel pressure sensor terminals jumpered, move the back-up pump switch to the armed position. With your hand on the relay, you should feel the relay actuate. If not, replace the relay.

4 Boost Pump

a With an ohmmeter, verify that the pump has a good ground at pin 3 of the disconnect plug (0-1 ohms).

b With a voltmeter, verify that 12 volts is on pin 2 of the disconnect plug while the vapor suppress switch in on.

c Verify that 12 volts is on pin 3 of the disconnect plug while the back-up switch is in the armed position.

d If all three above checks are OK, replace the pump. Refer to the Auxiliary Fuel Pump section for installation and removal instructions.

5 Vapor Suppression is inoperative (Low Speed)

a Check for operation of pump's low-speed operation with the back-up pump switch in the off and armed position.

1. If the low speed only works with the back-up pump switch off, check for voltage on (± 12 volts) both sides of the power diode (located on the instrument panel under the terminal junction block). If there is only voltage on one side, replace the diode.
2. If the low speed only works with the back-up pump in the armed position replace the back-up pump switch.

C. Removal and Installation of Automatic Fuel Boost Pump System

(1) Boost Pump Pressure Switch Removal

(a) Verify aircraft power is turned off.

(b) Verify the mixture is in the idle cutoff position and the engine is not primed.

(c) Turn the fuel selector to off.

(d) Remove the upper engine cowling.

(e) Disconnect the two wire leads from the fuel pressure switch.

(f) Disconnect the pressure line from the fuel pressure switch.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(g) Remove the jam nut, lock washer, and pressure switch.

(2) Boost Pump Pressure Switch Installation

(a) Installation is a direct reversal of the removal of the fuel pressure switch.

(b) Torque the nut 240 to 280 in.-lbs.

(c) Reconnect the un-metered pressure hose to the bottom of the switch. Torque the fitting 75 to 80 in.-lbs.

(d) Reconnect the electrical connections to the top of the switch.

(3) Fuel Pump Removal and Installation

(a) Refer to the Auxiliary Fuel Pump section for removal and installation instructions.

(4) Electrical Components

(a) Power Diode Removal. Refer to Figure 219.

1 Remove the glare shield and right side kidney panel.

2 Cut the wires from the diode, and mark the cut wires.

3 Remove the diode, and replace with a new diode.

(b) Power Diode Replacement

1 Install diode.

2 Slide heat shrink over the wire, and using good solder practices, solder and heat shrink the wires.

3 Install the right side kidney panel and glare shield.

4 Test the system by turning on the vapor suppress (Low Speed), and the pump should stay on when the back-up pump is activated.

(c) Arm Light Removal

1 Remove the left side knee bolster.

2 Loosen the switch plate, and pull out from the instrument panel 2-3 inches.

3 Remove the old light after cutting the wires.

(d) Arm Light Installation

1 Install a new light, and crimp the terminals on after inserting through the mounting hole.

2 Re-install the switch plate and left knee bolster.

3 Test the arm light operation by momentarily arming the back-up pump switch.

(e) K-7 Latching Relay Removal

1 Remove the glare shield and right side kidney panel.

2 Gain access to the mounting plate under the standby battery.

3 Carefully mark the wires to the relay.

4 Remove the relay.

(f) K-7 Latching Relay Installation

1 Replace the relay, paying close attention to the orientation of the relay.

2 Re-attach the wires to the terminals.

3 Replace removed items and glare shield.

4 Functional test the entire back-up pump system per the System Check Out section.

(g) Rocker Switches Removal

1 Remove the left side knee bolster.

2 Loosen the switch plate, and pull out from the instrument panel 2-3 inches.

3 Carefully mark the wires to the switch.

4 Remove the defective switch from the metal plate.

(h) Rocker Switches Installation

1 Install the replacement switch, and connect the wires to the terminals.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

2 Reinstall the switch plate and left side knee bolster.

3 Functional test the entire back-up pump system per the System Check Out section.

6. Fuel Gascolator

A. **Fuel Gascolator Removal and Installation**

(1) Normal use and maintenance does not require removal of the gascolator from its mounting. If removal and replacement of the whole gascolator is required, contact the manufacturer.

(2) If maintenance practices do not maintain correct functioning of the gascolator, contact the manufacturer for removal and replacement instructions.

B. **Fuel Gascolator Maintenance Practices**

(1) Periodic cleaning of the filter is required for proper operation of the fuel system as indicated in Chapter 5 of this manual.

C. **Removal of the Gascolator Bowl and Filter**

(1) Turn the fuel selector to the off position.

(2) Drain any residual fuel from the gascolator.

(3) Remove the safety wire securing the gascolator bowl mounting ring. Refer to Figure 220.

(4) Turn the ring clockwise, as seen from the bottom, until the ring is unthreaded. Note the alignment of the arrow on the bowl to the line on the gascolator base as shown in Figure 221, Sheet 1 and Sheet 2.

(5) Pull gently straight down on the bowl to remove and access the filter/bypass element.

(6) Unscrew the filter/bypass element, and carefully clean the filter and bypass. Check for smooth operation of the bypass.

(7) Clean the gascolator bowl, and inspect the O-ring seal. Replace the seal as necessary. Contact the manufacturer for replacement O-rings.

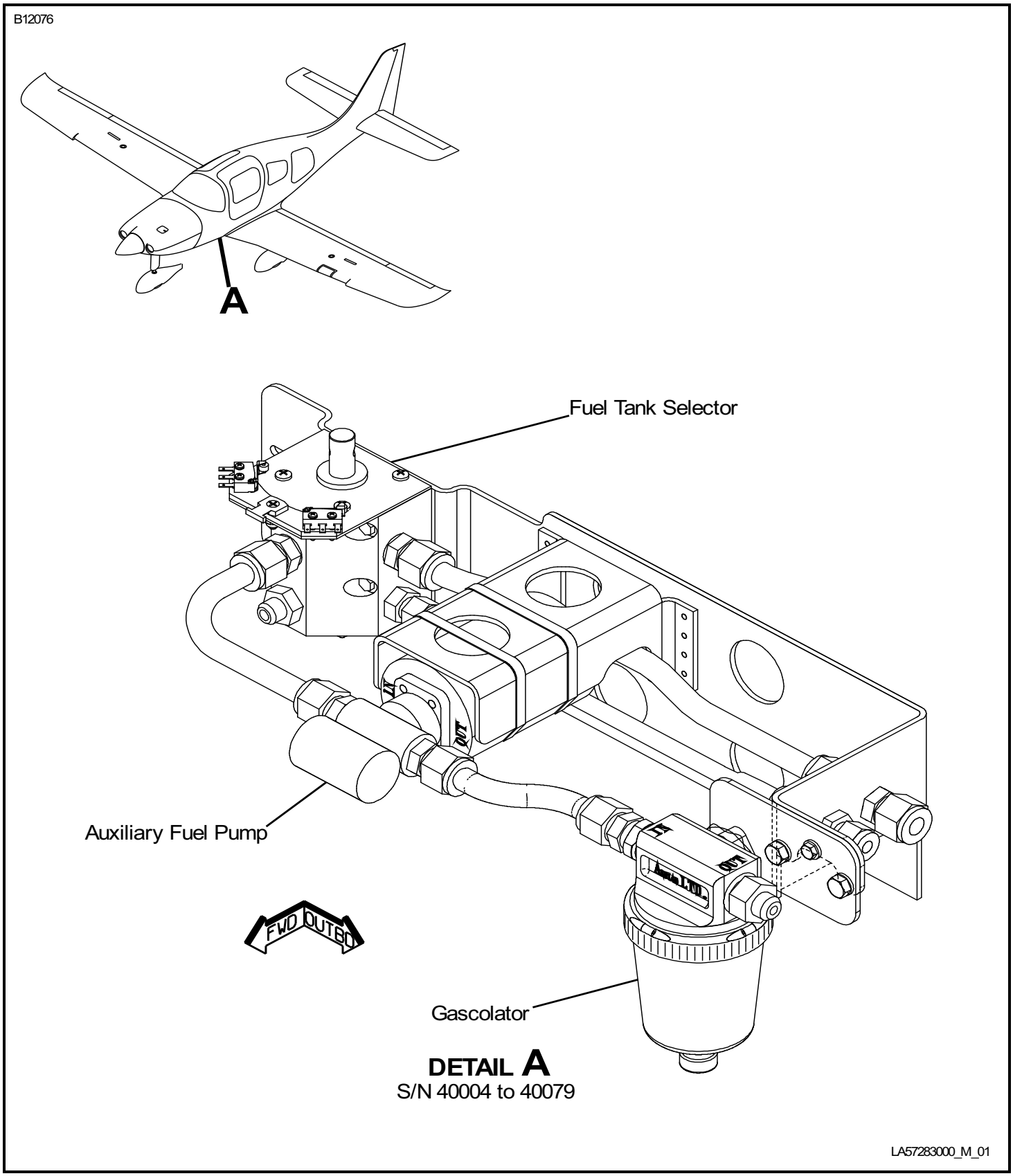
(8) Reassembly is a direct reversal of removal. Note the pin on the top of the gascolator bowl must fit into the groove of the gascolator base.

D. **Fuel Strainer Internal Bypass and Filter Replacement**

(1) If the internal bypass/filter requires replacement, contact the manufacturer.

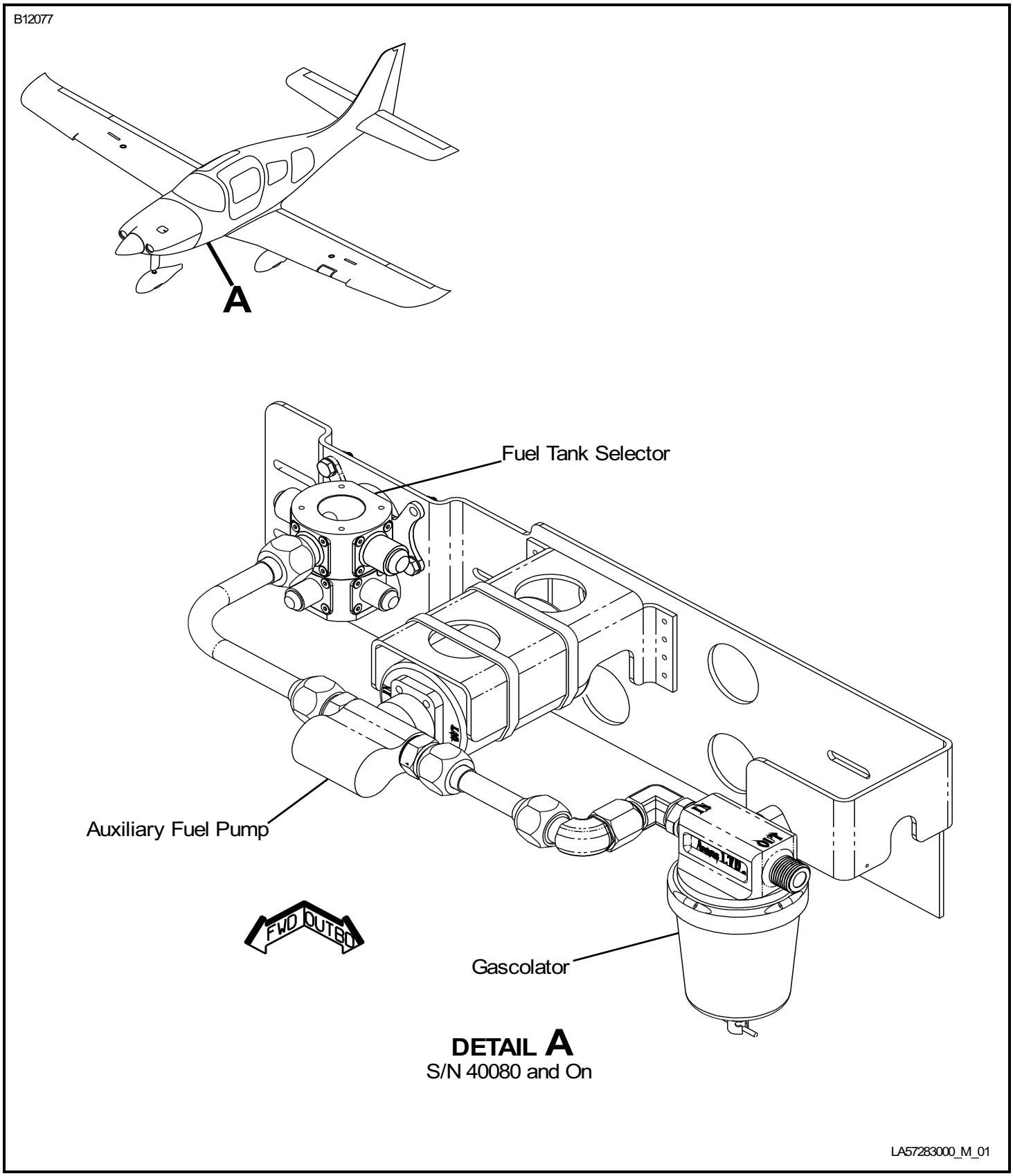
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Fuel Selector, Pump, and Gascolator Module



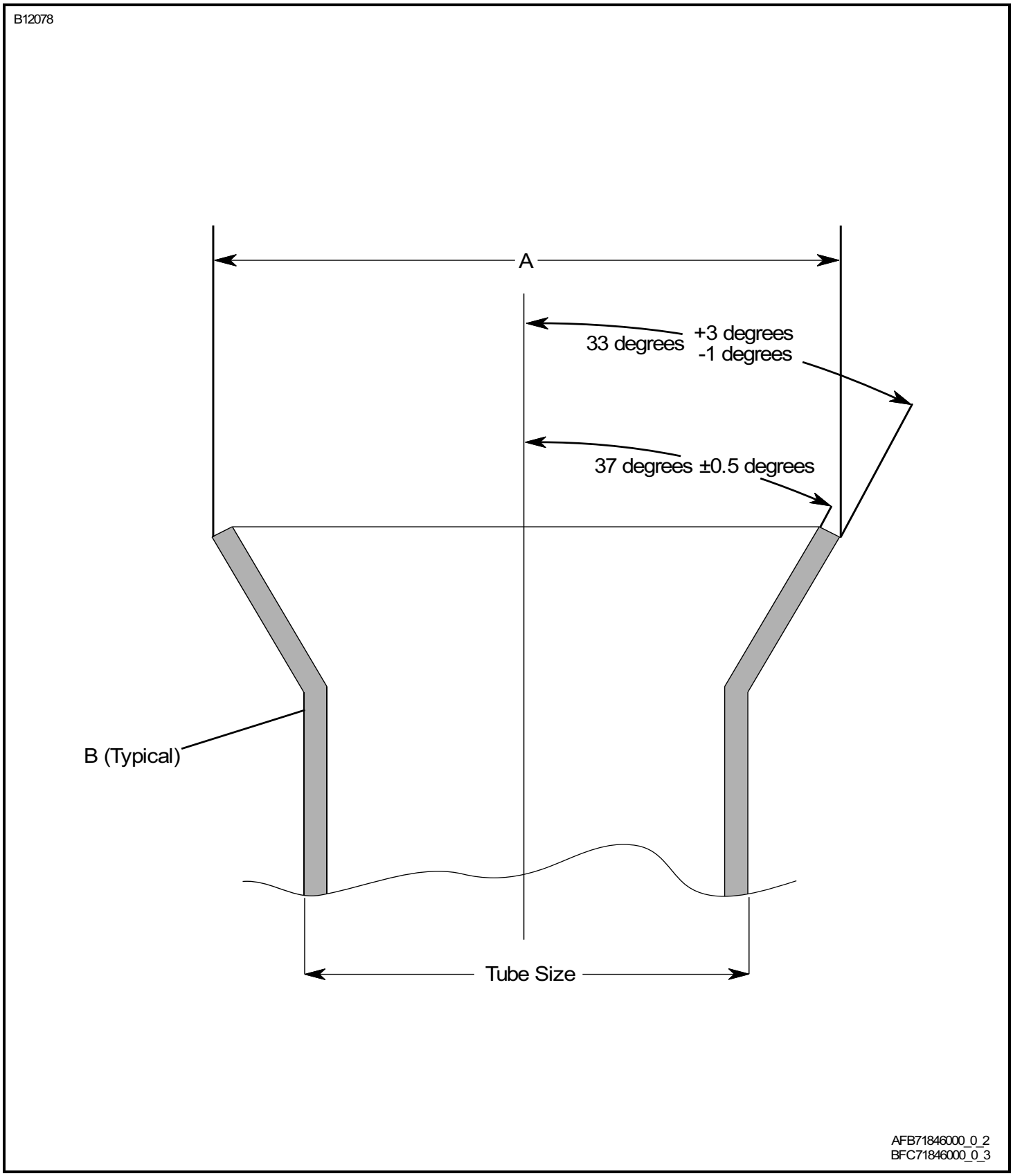
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 2 : Fuel Selector, Pump, and Gascolator Module



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

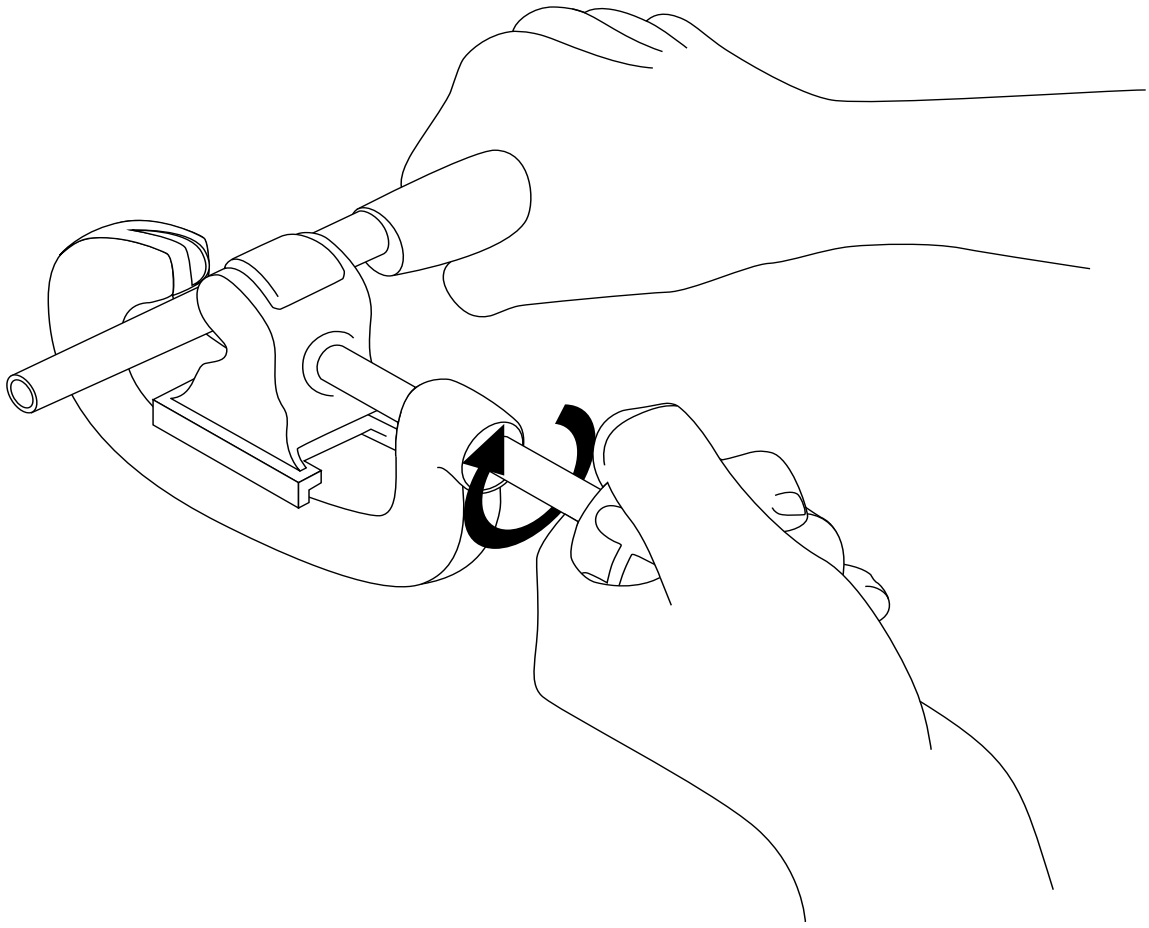
Figure 202 : Sheet 1 : AN Flared Tube Angles



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Inserting the Tubing into the Tube Cutter and Adjusting the Cutter

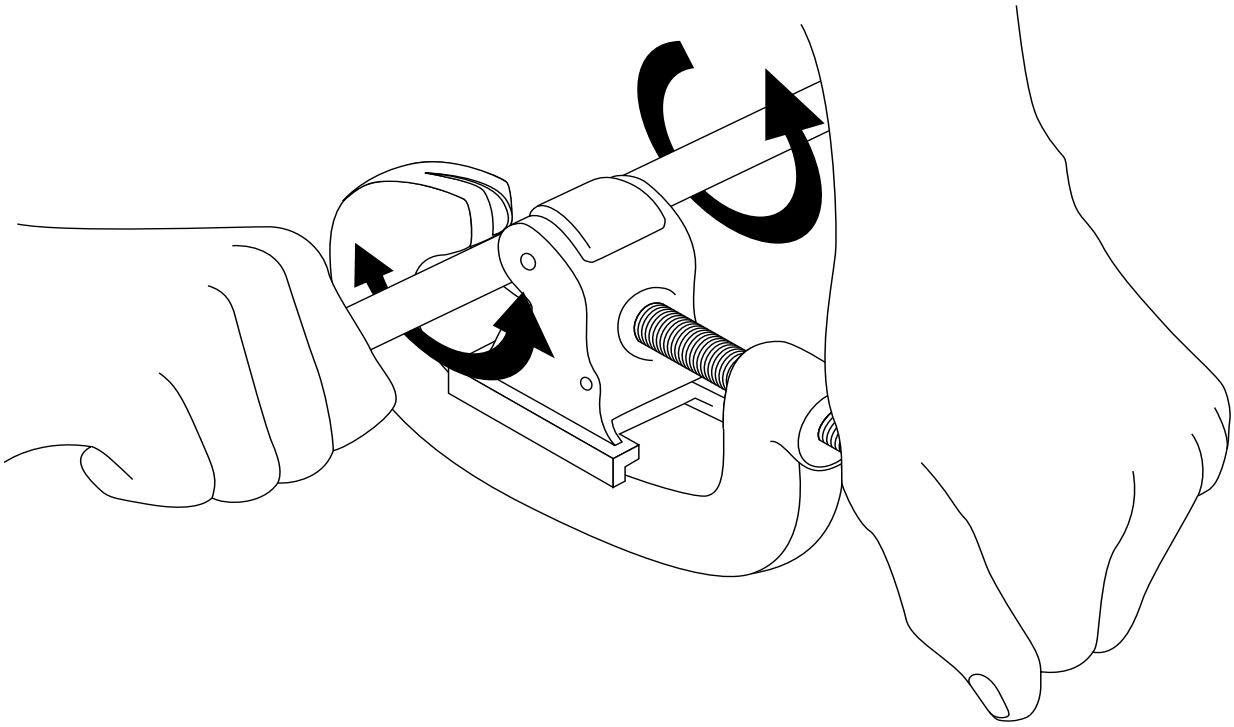
B12079



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Cutting the Tube with Tube Cutter

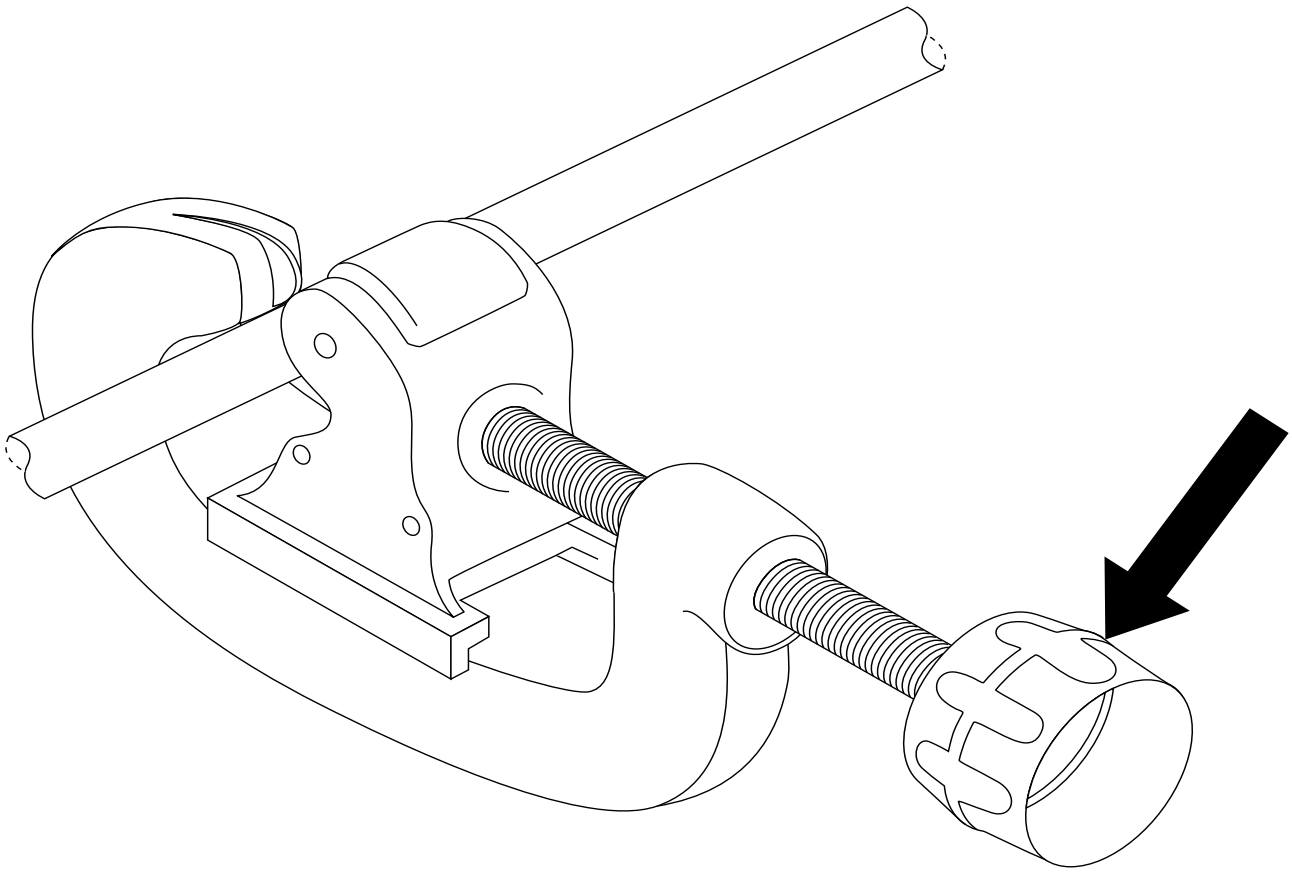
B12080



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Adjusting the Tubing Cutter to Cut Deeper

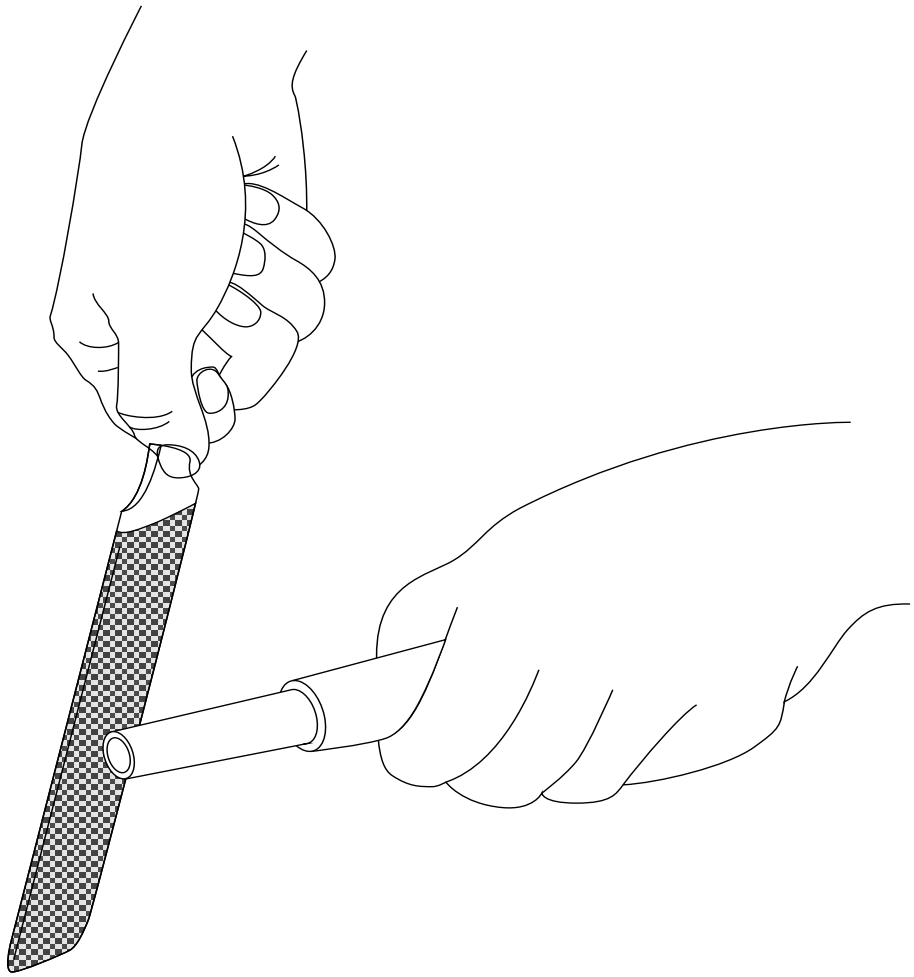
B12081



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

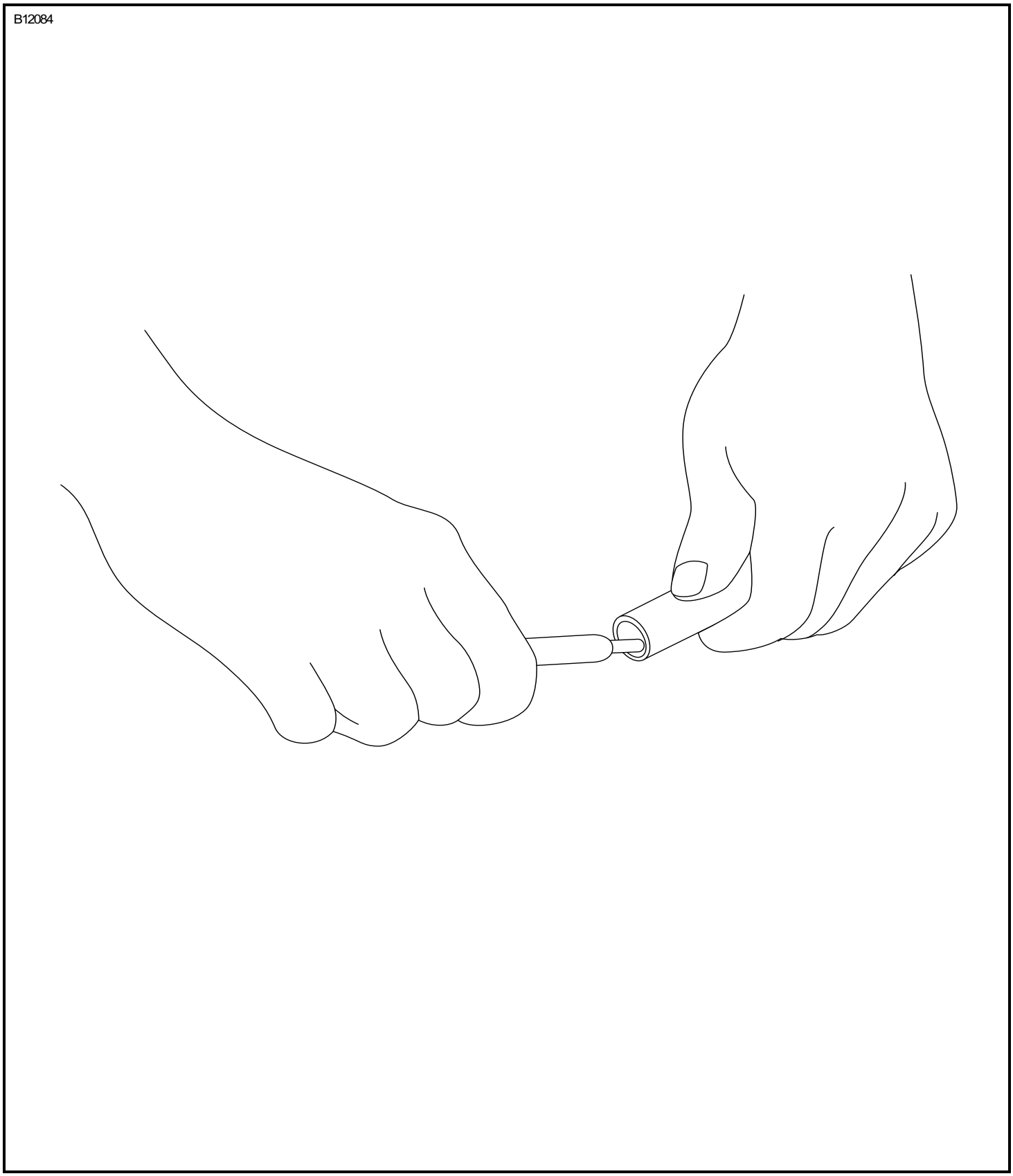
Figure 206 : Sheet 1 : OD Deburring Using a File

B12082



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

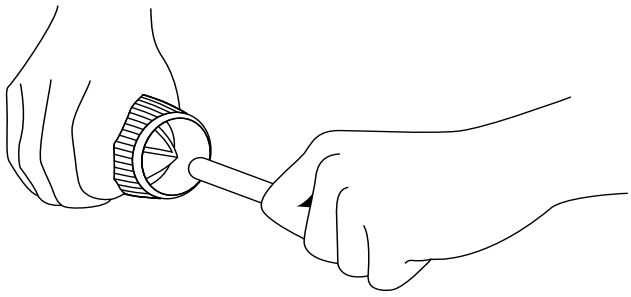
Figure 207 : Sheet 1 : Deburring using a Deburring Tool



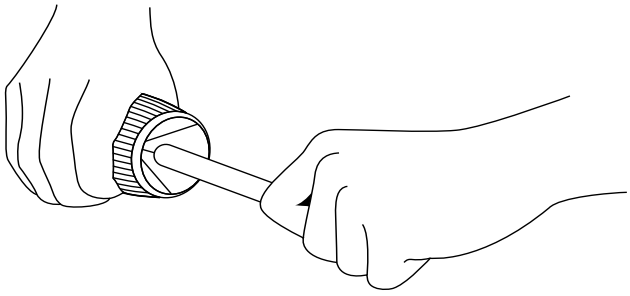
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : OD and ID Deburring using a Tube Deburring Tool

B12083



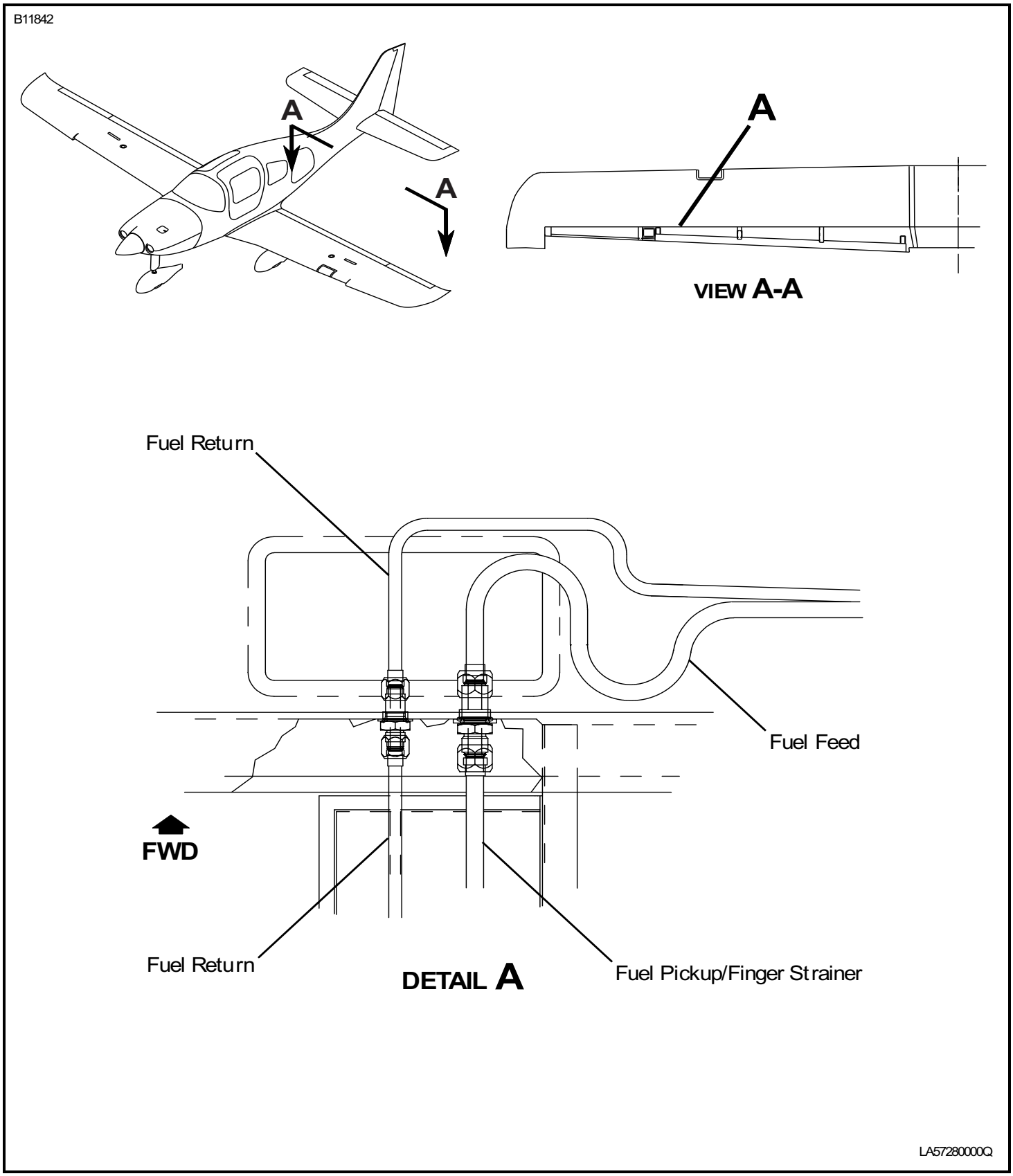
ID Deburring With
Swagelok Deburring Tools



OD Deburring With
Swagelok Deburring Tool

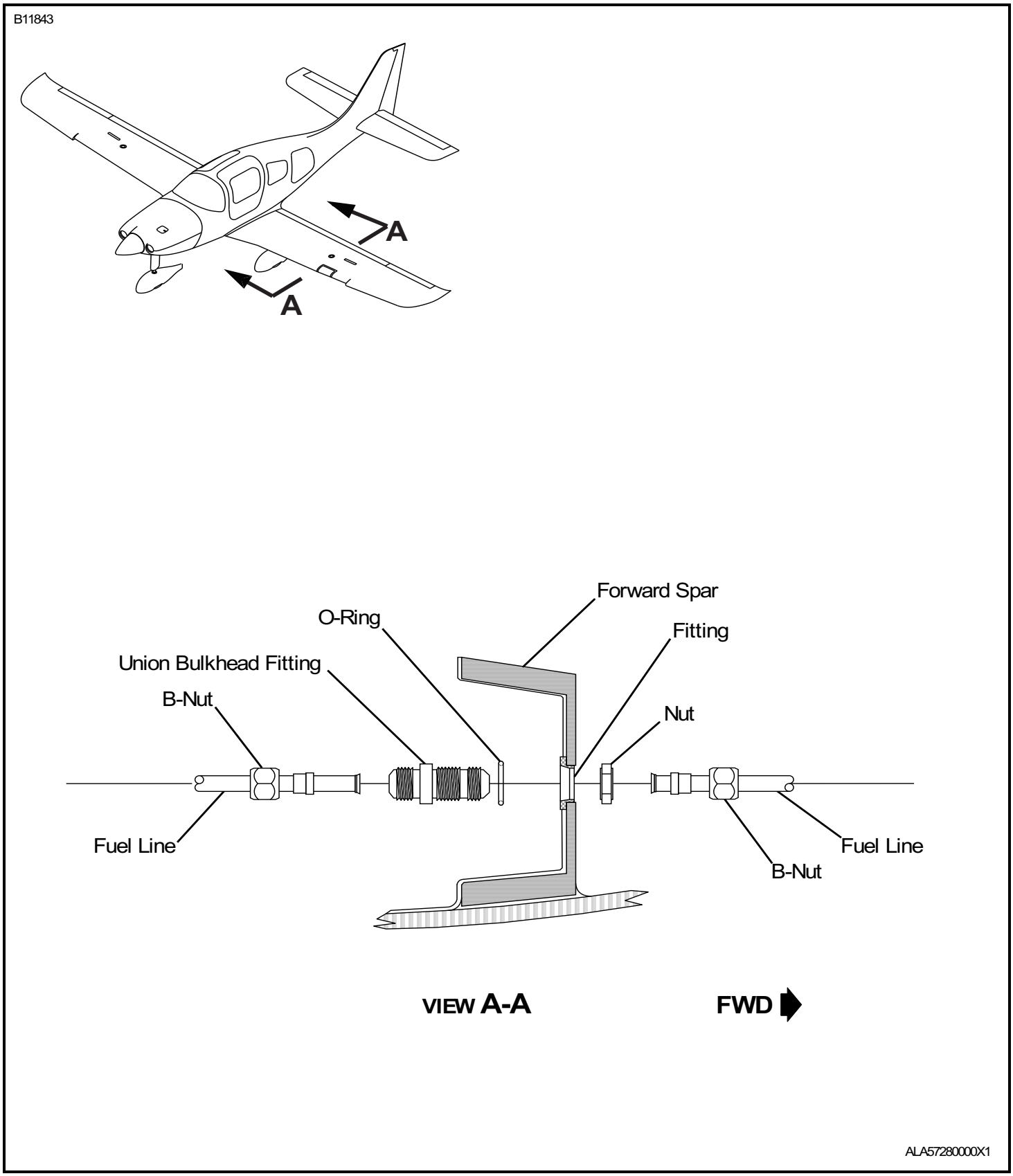
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Fuel Return, Fuel Feed, and Fuel Pickup Lines



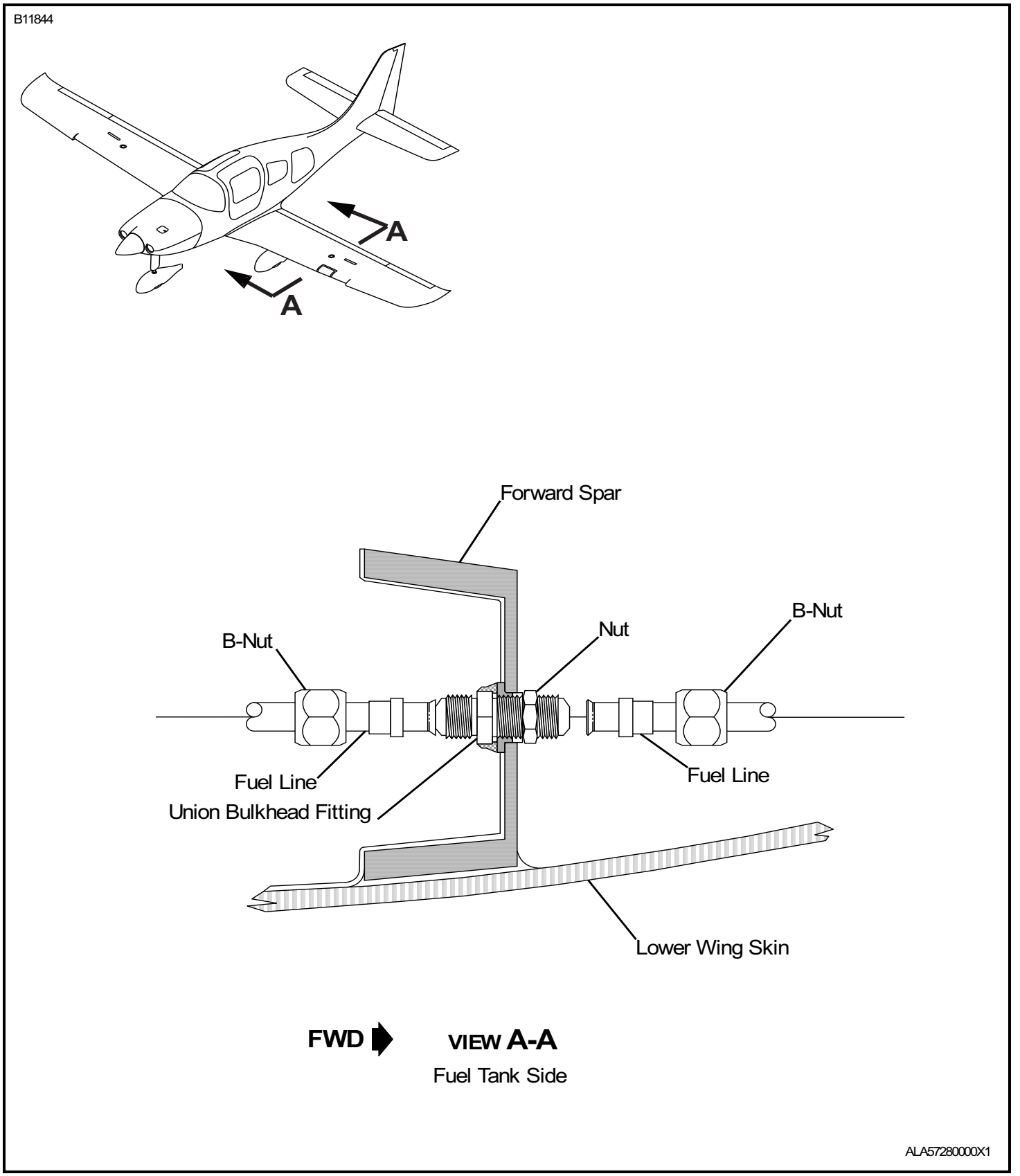
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 1 : Installation of Fuel Line Fittings WS 48.0 & WS 50.25



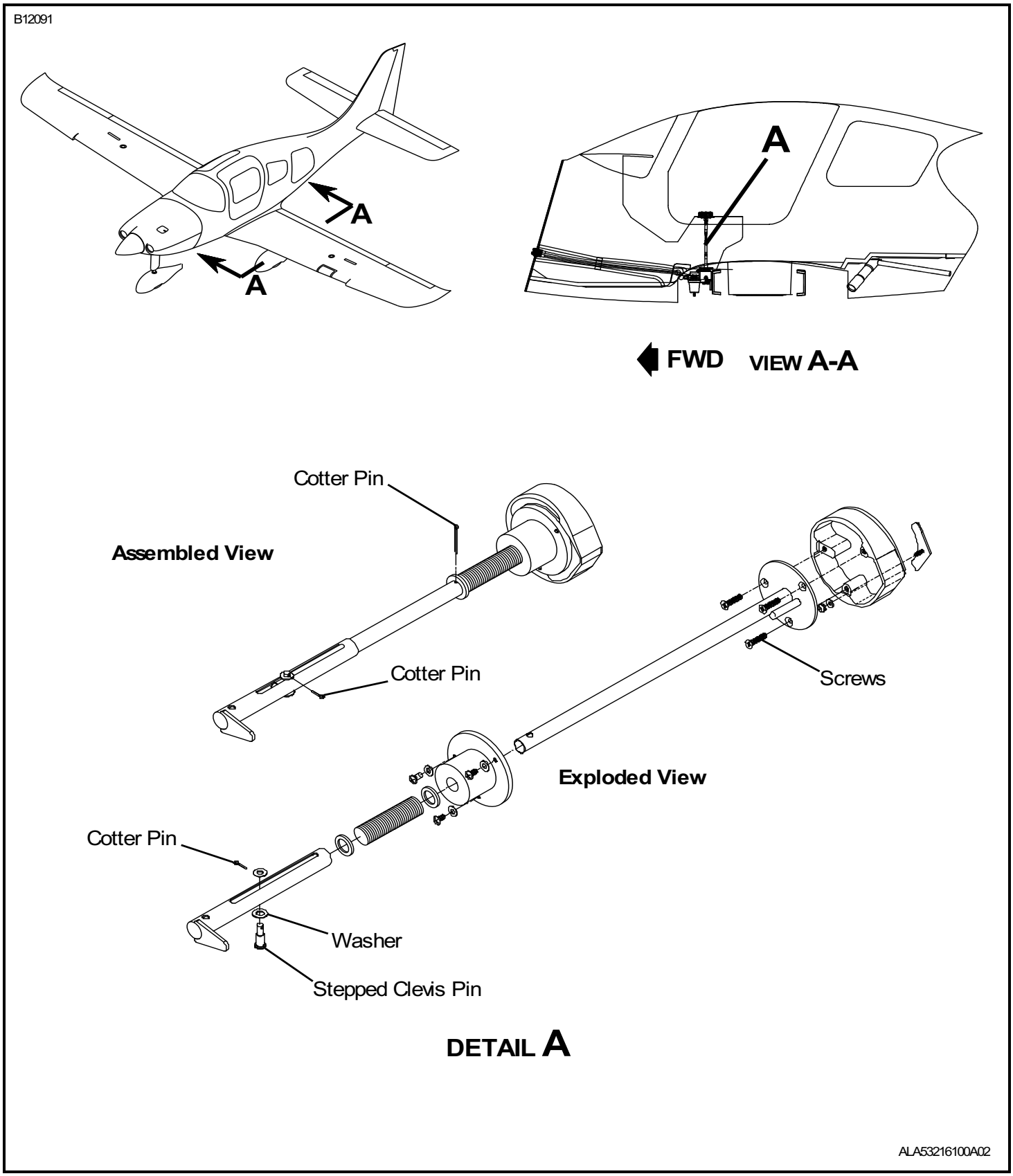
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 2 : Installation of Fuel Line Fittings WS 48.0 & WS 50.25



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 211 : Sheet 1 : Fuel Selector Assembly (S/N 40004 to 40079)



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 212 : Sheet 1 : Fuel Selector Microswitch Position (S/N 40080 and On)

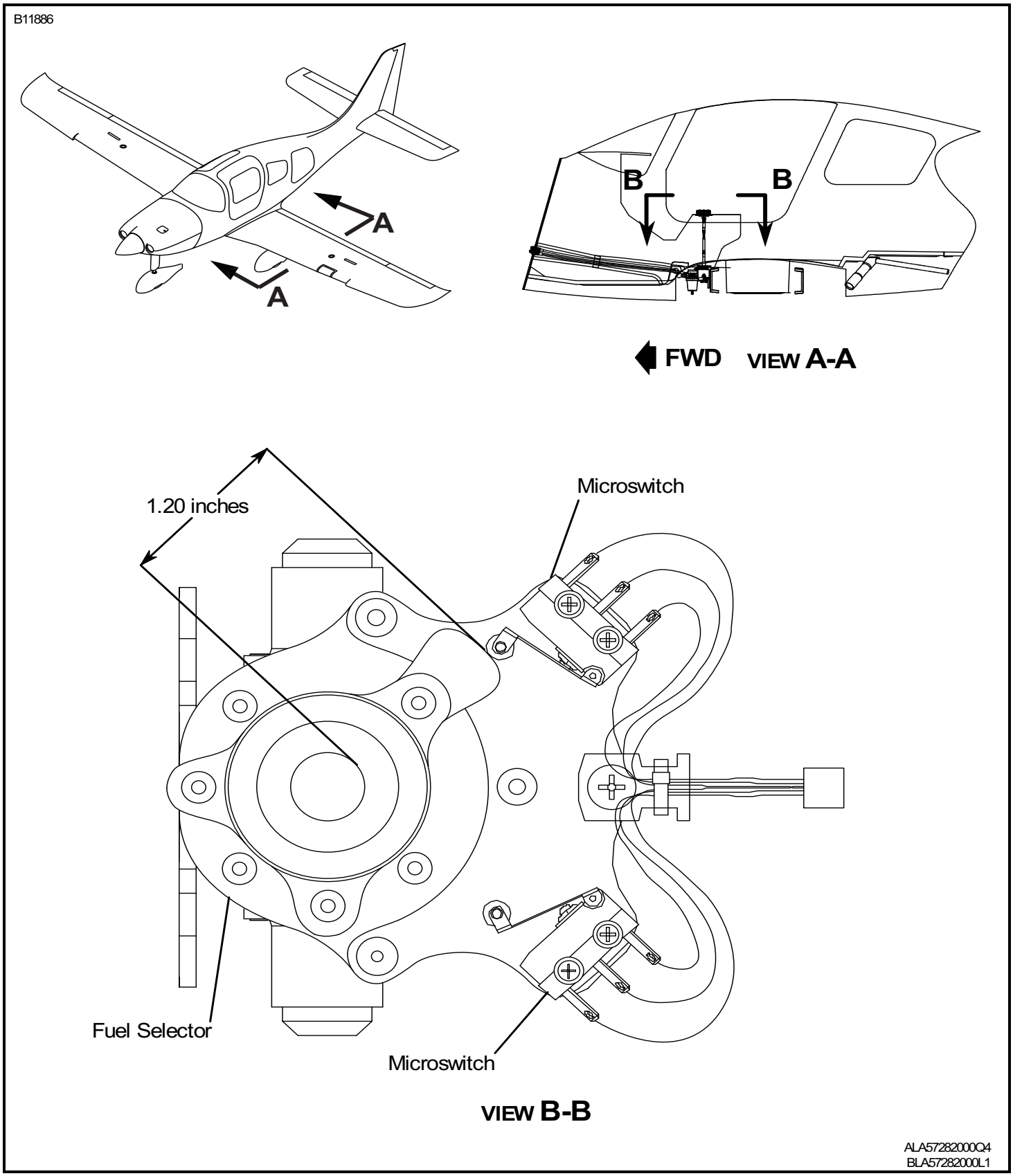
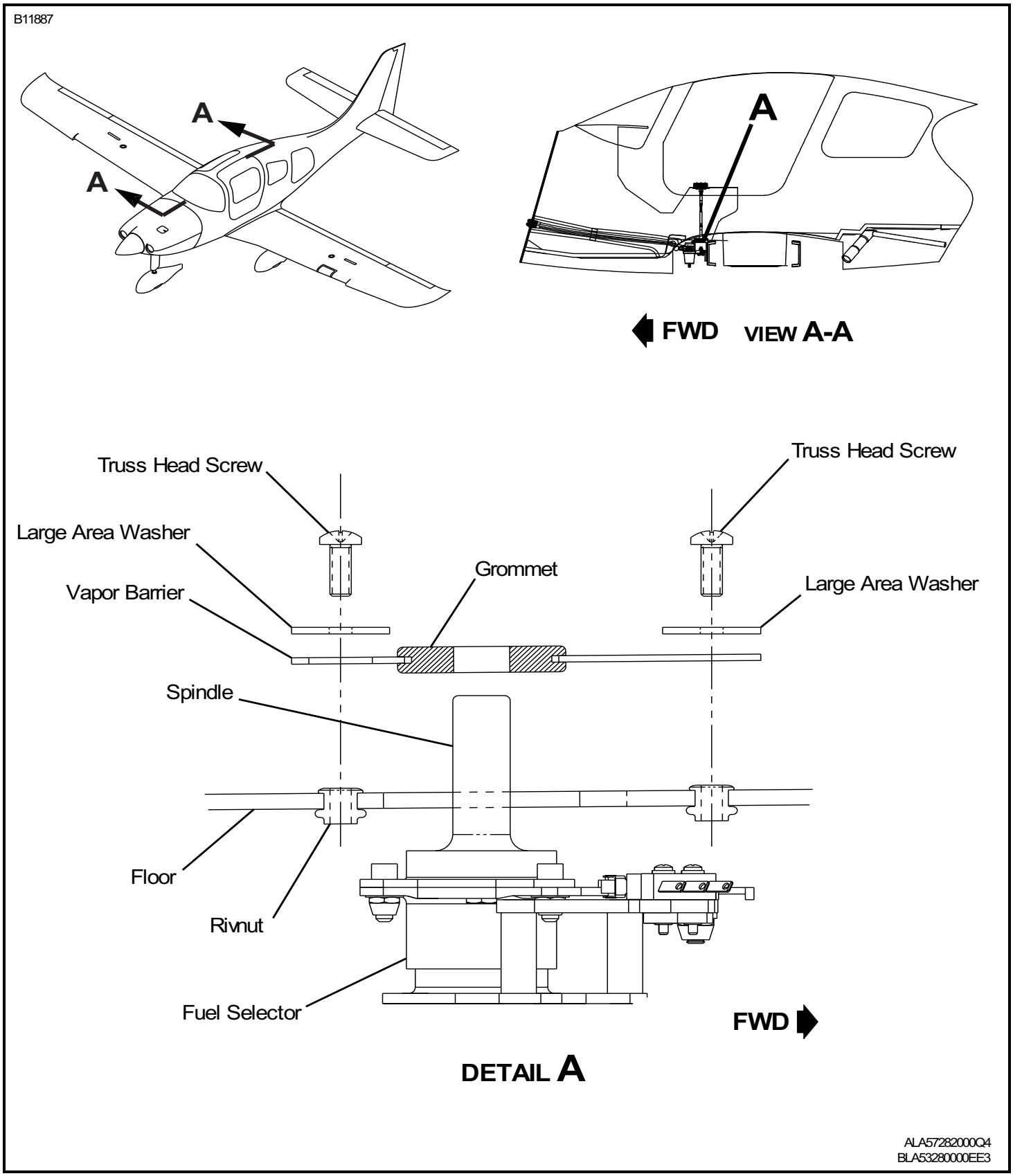
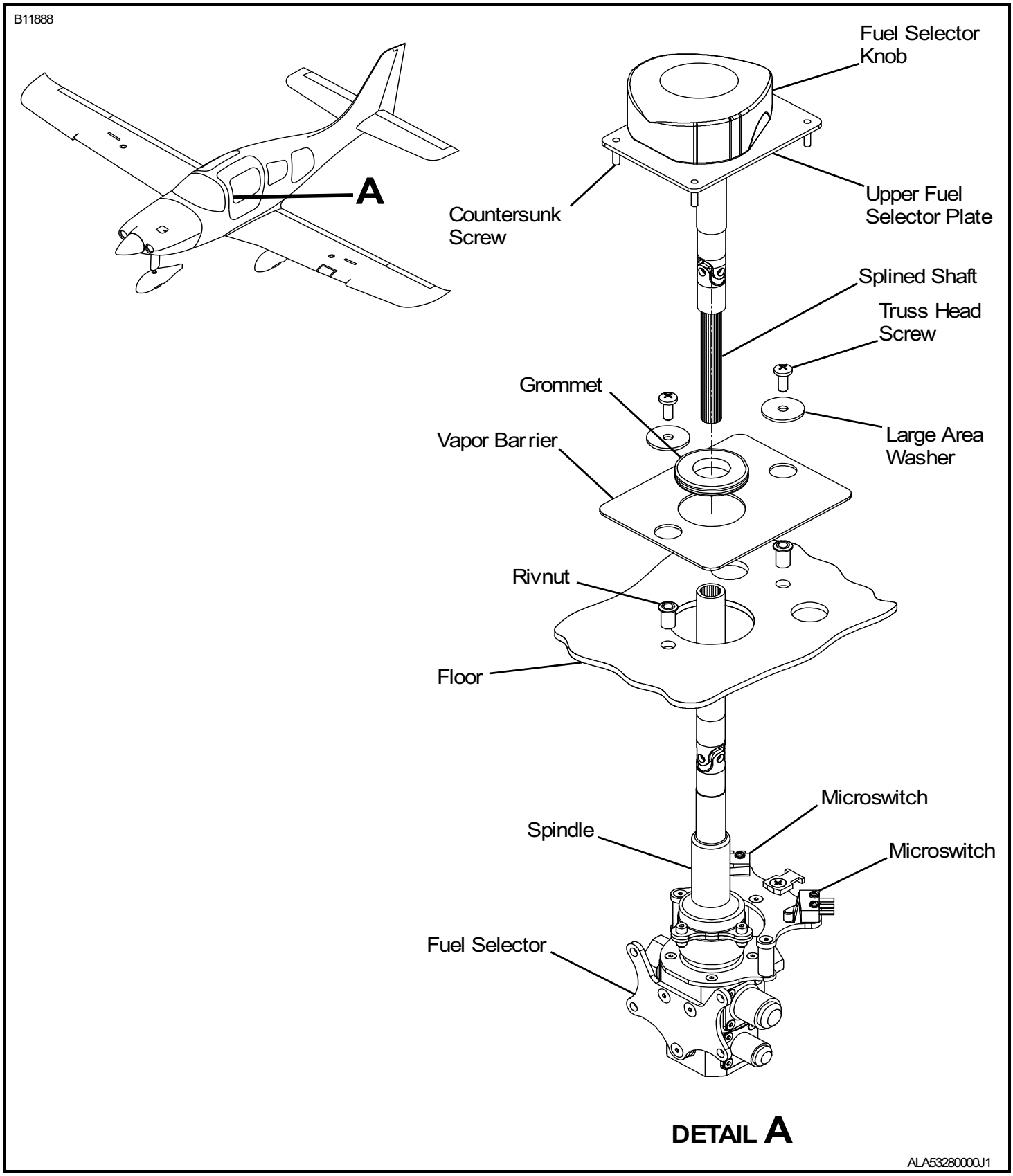


Figure 213 : Sheet 1 : Fuel Selector Assembly Viewed from Passenger Seat (S/N 40080 and On)



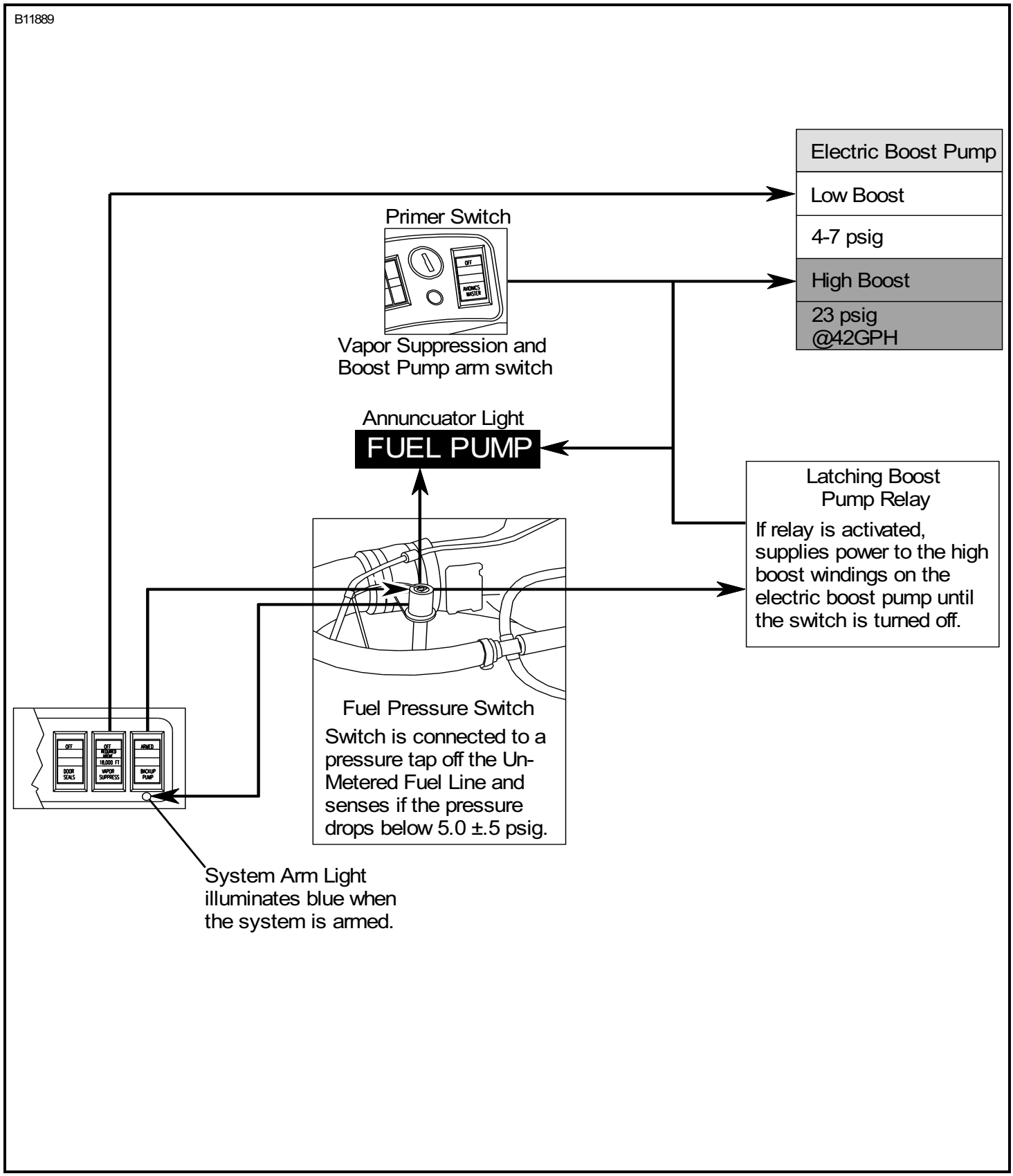
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 214 : Sheet 1 : Fuel Selector Assembly (S/N 40080 and On)



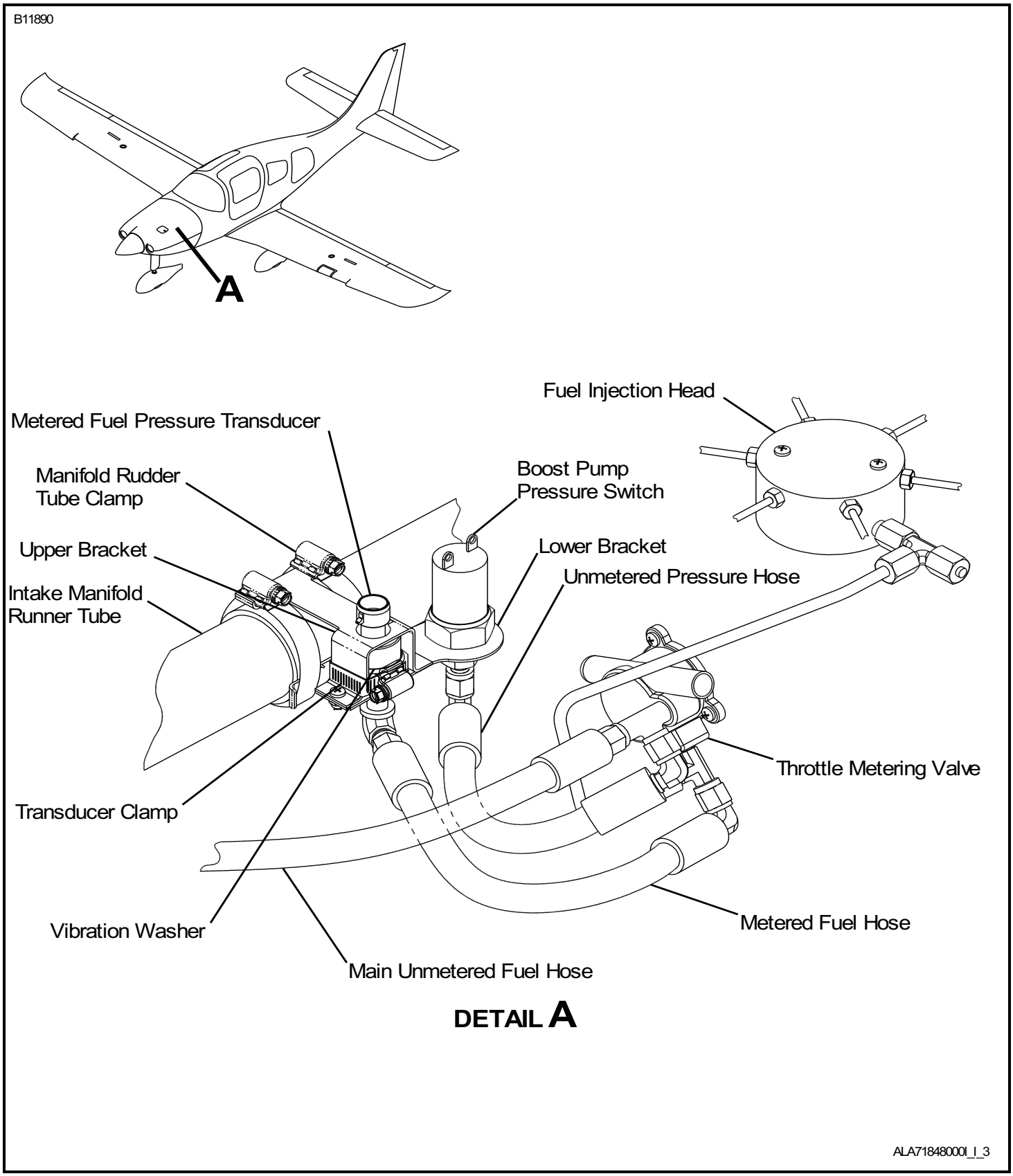
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 215 : Sheet 1 : Automatic Fuel Boost Pump System Overview



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

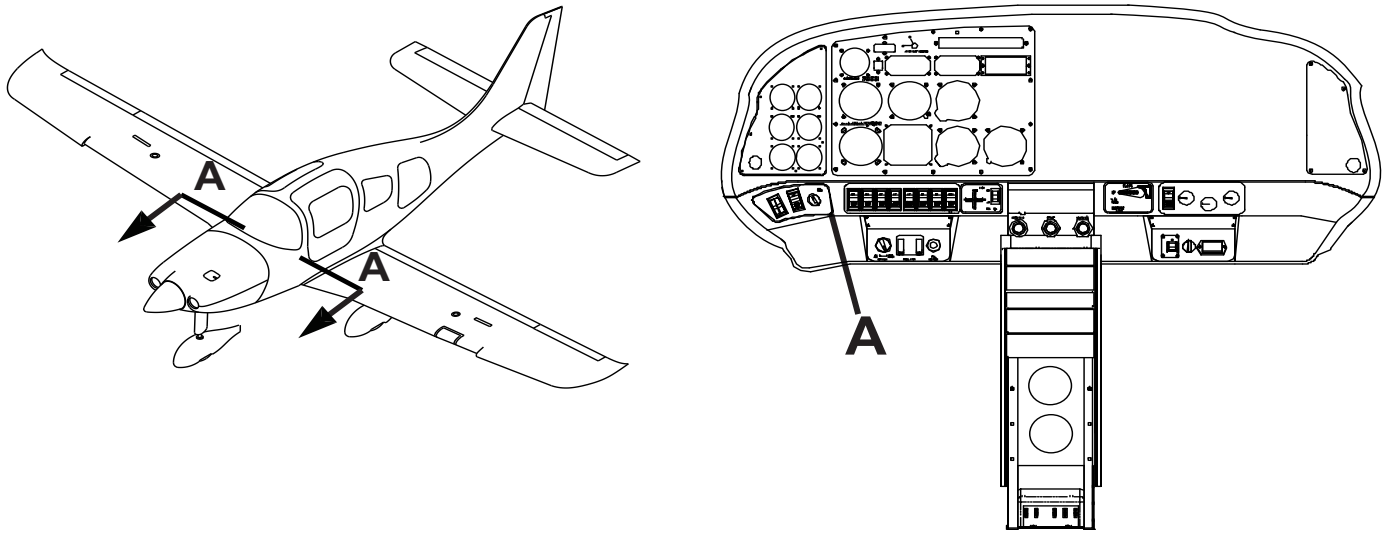
Figure 216 : Sheet 1 : Pressure Switch Installation



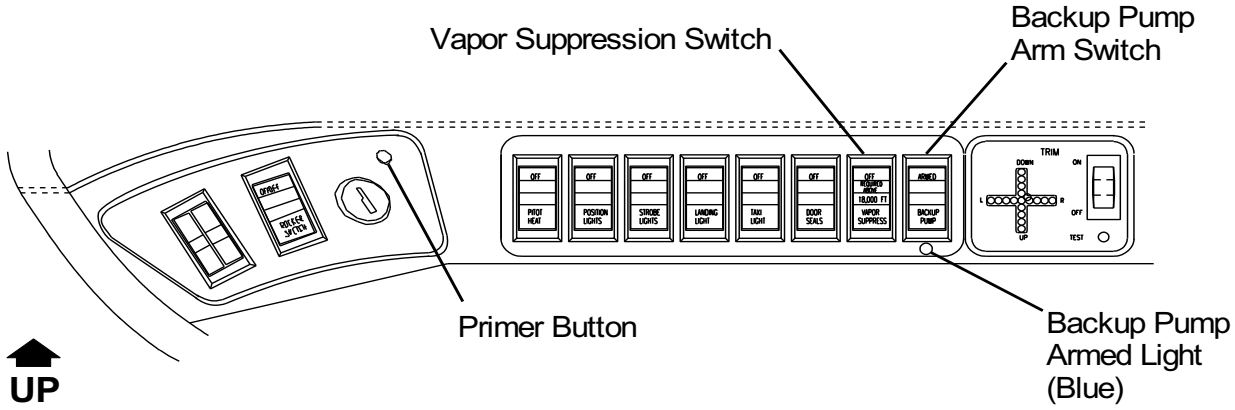
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 217 : Sheet 1 : Fuel System Cockpit Switches

B11891



VIEW A-A



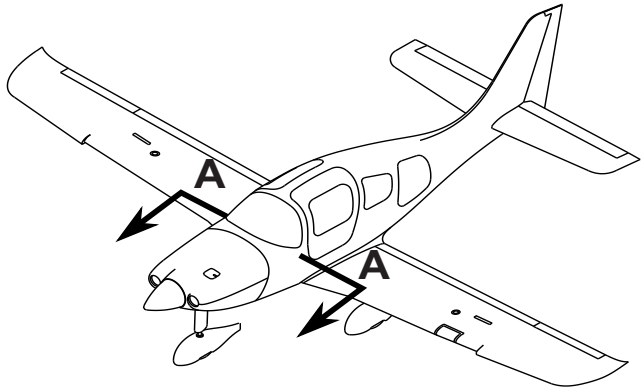
DETAIL A

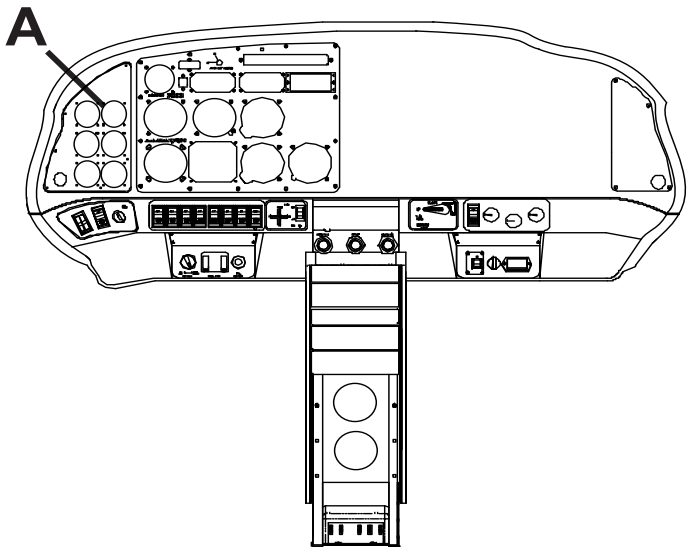
ALC53310000C2

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

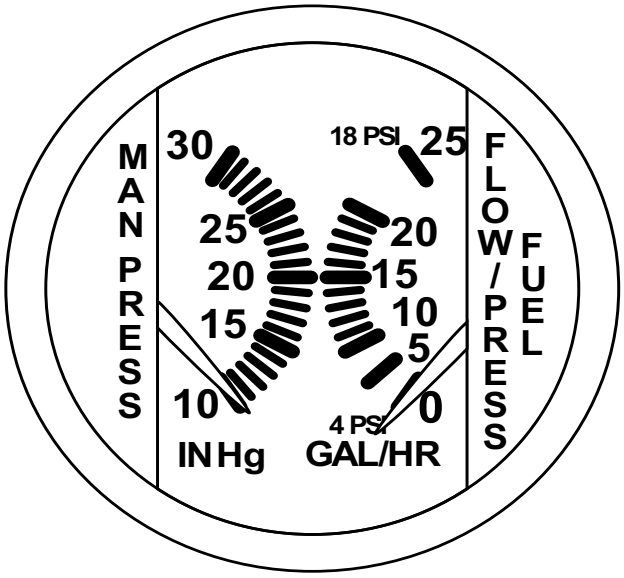
Figure 218 : Sheet 1 : Fuel Pressure/Flow Gauge

B12072





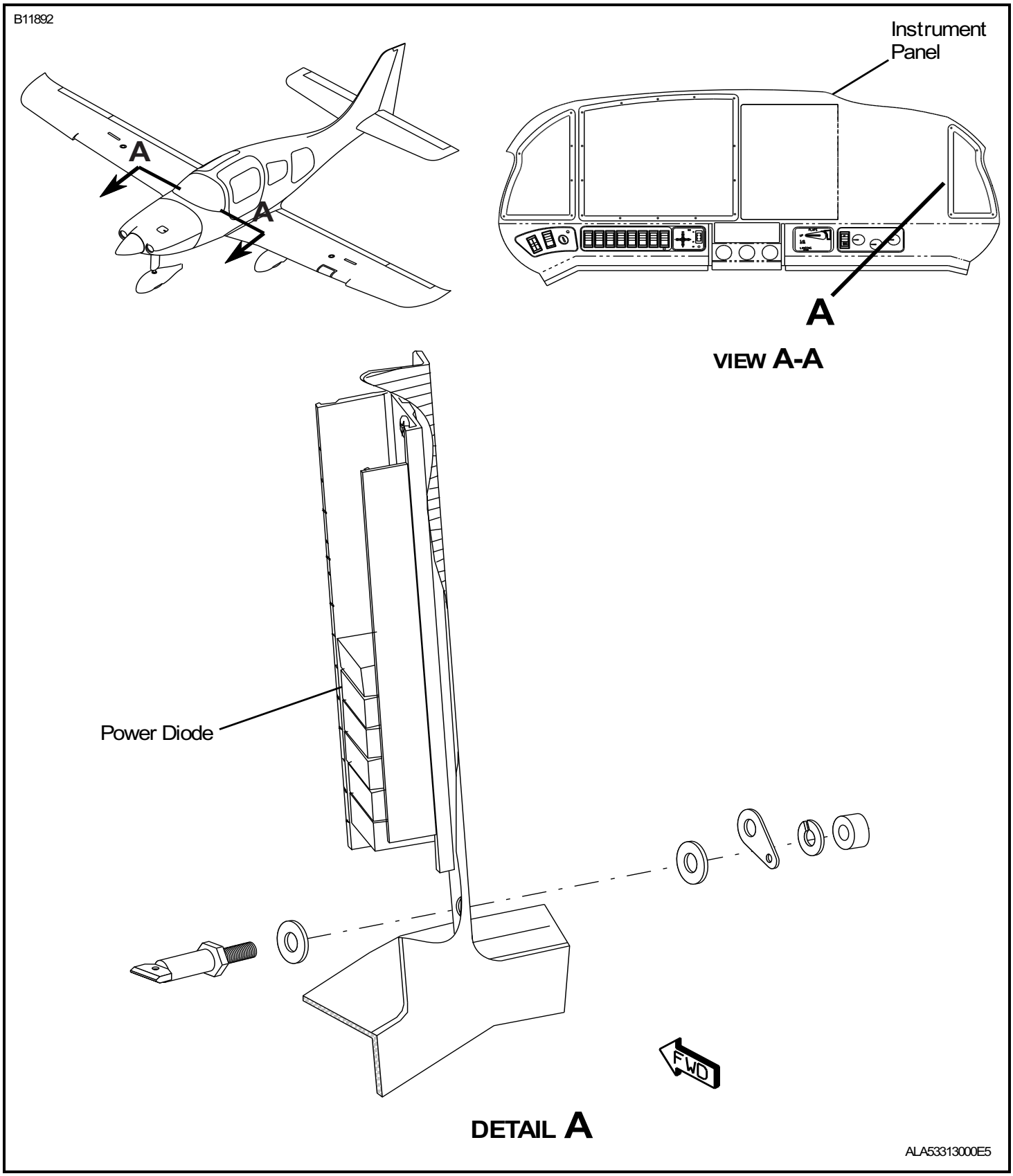
VIEW A-A



DETAIL A

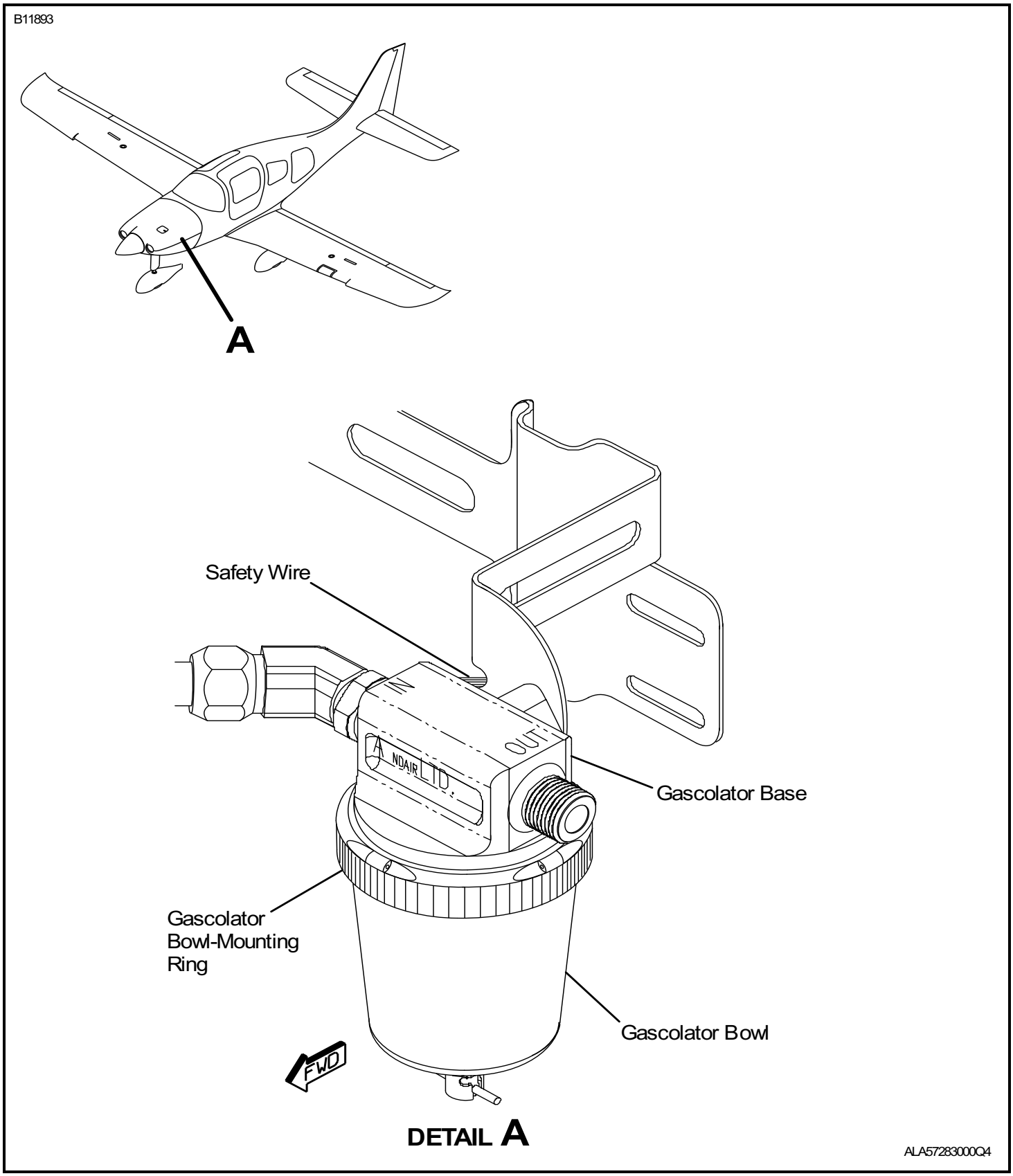
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 219 : Sheet 1 : Power Diode Location and Installation



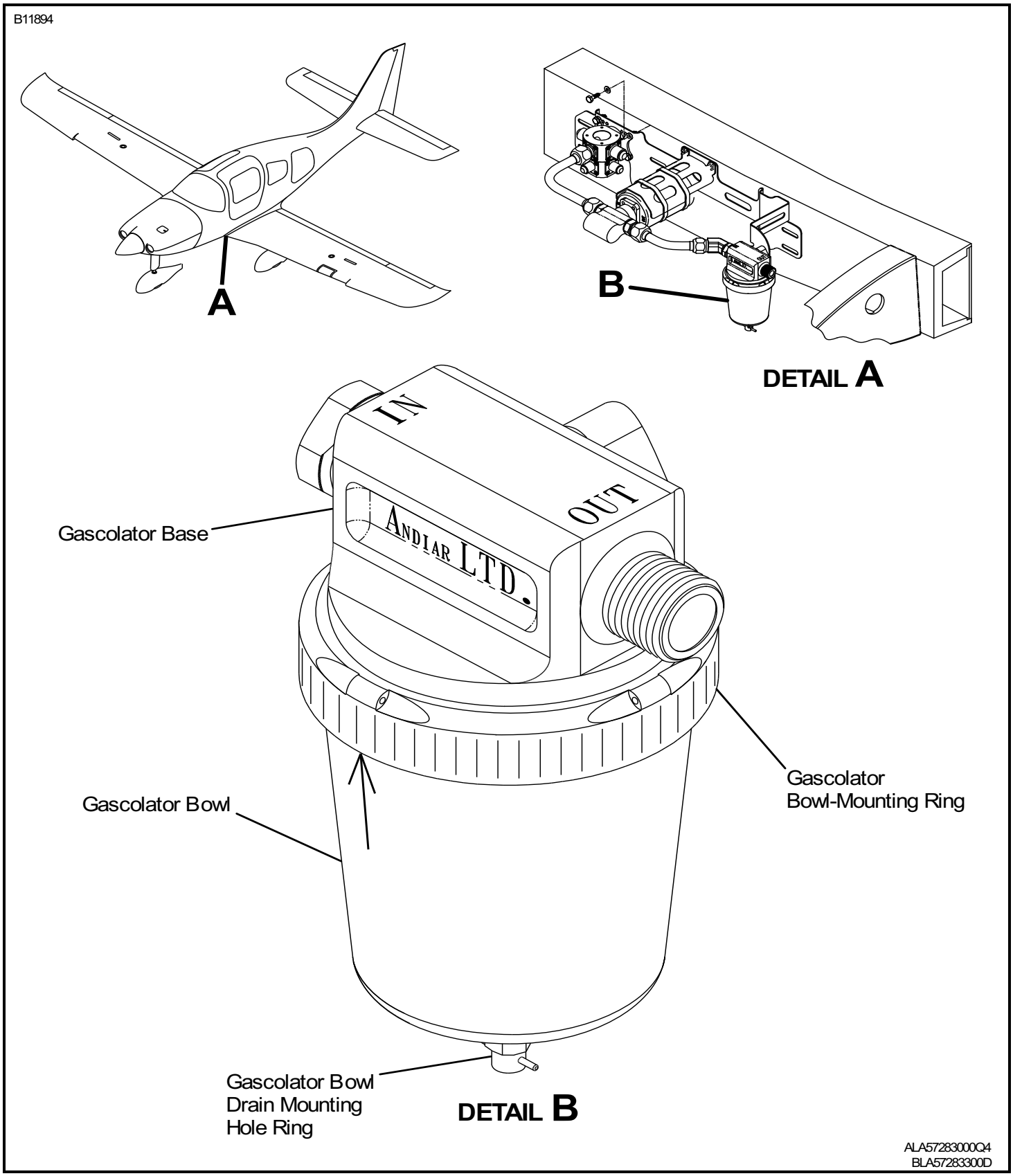
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 220 : Sheet 1 : Gascolator Safety Wiring and Mounting



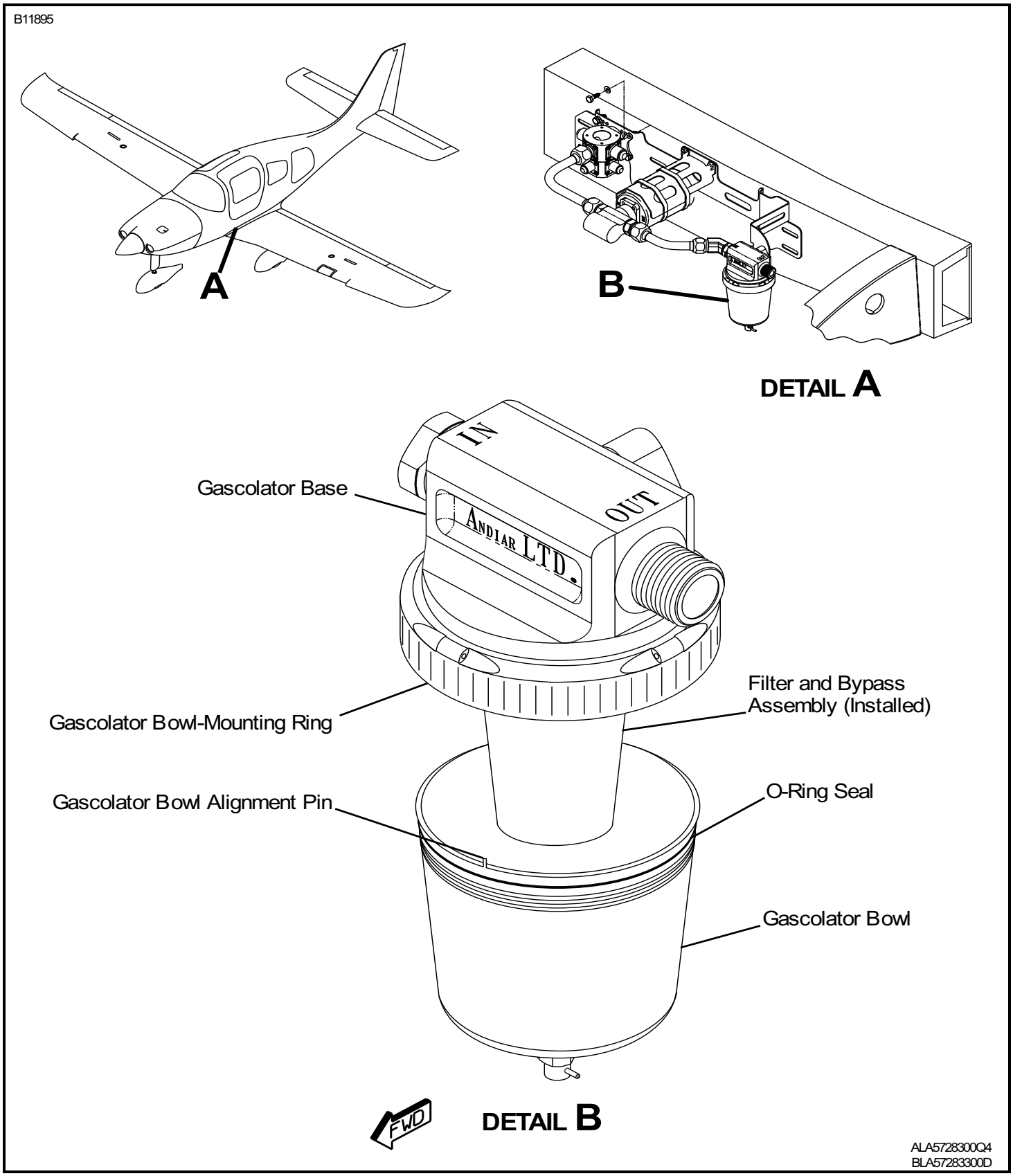
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 221 : Sheet 1 : Gascolator Detail



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 221 : Sheet 2 : Gascolator Detail



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUEL INDICATING SYSTEM - MAINTENANCE PRACTICES

1. Indicating

A. The fuel system indicating system on the Cessna 300 includes a fuel level gauge, low fuel level warning lights, fuel tank selector lights located in the fuel level gauge, and a fuel selector warning light. The fuel level is measured using two tank-mounted float level sensors, one in the inboard fuel tank bay, and one in the outboard fuel tank bay. The low fuel level sensors are float switches mounted approximately through the middle of the inboard fuel tank rib at WS 46.0. The fuel selector valve indicator lights use micro-switch sensors mounted on the top of the fuel selector.

2. Fuel Quantity Gauges and Fuel Annunciators

A. Fuel Quantity Gauges and Fuel Annunciators Maintenance Practices

(1) Refer to Chapter 33 of this manual for detailed instructions for electrical system maintenance practices.

(2) Mechanical maintenance is not required unless errors in the system are suspected. Inspect and replace defective fuel sensors as necessary per instructions in Chapter 28-10-00, the Fuel Level Sensors section.

B. Removal and Installation of Fuel Quantity Gauges and Fuel Annunciators

(1) Refer to Chapter 33 of this manual for detailed instructions.

3. Fuel Valve Indicator Lights

A. Fuel Valve Indicator Lights Description and Operation

(1) The fuel valve is equipped with two micro-switches to sense the position of the fuel selector. The selected tank is displayed on the fuel level gauge with a green LED showing the selected fuel tank. If no green LED is illuminated, the selector is off the tank, in between tanks, or in the off position. During these conditions, a FUEL VALVE warning light illuminates.

B. Testing Fuel Valve Indicator Lights

(1) With the master switch on (battery only if the engine is not running) place the fuel selector in the left tank detent. The fuel warning light should be extinguished, and the green light on the fuel level gauge should be illuminated.

(2) Repeat for the right tank.

(3) Verify that both green lights are extinguished and the fuel warning light is illuminated when the valve is in between tanks or in the off position.

(4) Contact the factory if the indicator lights are not functioning properly.

4. Low Fuel Annunciators (Left and Right Tanks)

A. Removal and Installation of Low Fuel Annunciators - Fuel Tank Low Fuel Level Floats

(1) If removal of the low fuel level switch is required, contact the manufacturer for further instructions.

B. Testing Low Fuel Annunciator

(1) With less than six gallons of usable fuel in the fuel tank, and the aircraft level, the low fuel warning annunciator should be illuminated for the tank with the low fuel quantity.

(2) During fueling, the low fuel level warning should extinguish prior to 10 gallons usable fuel being in the tank.

(3) If a low fuel level sensor is suspected, replace per instructions in the Fuel Level Sensors section.

(4) Visually inspect the low fuel level float switch or visible damage and freedom of movement.

(5) If a faulty switch is suspected, refer to Chapter 33 for detailed instructions.

C. Replacing Low Fuel Annunciator Lights

(1) Refer to Chapter 33 of this manual for detailed instructions.

5. Digital Fuel Management System

A. The Shadin Miniflo-L™ Digital Fuel Management System is an option and may be installed on aircraft S/N 40008 and on. The Miniflo-L is installed with an STC. For detailed maintenance and installation instructions other than what is provided in this manual, contact Shadin Company, Inc. at the address given in Chapter 2. The Miniflo-L unit is installed in the flight instrument panel above the attitude indicator. When the Miniflo-L system is installed, an additional circuit breaker will be installed on the fourth row of the circuit breaker panel and labeled "F Flow".

B. Removal and Installation of the Digital Fuel Management System

(1) Turn off the master switch.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(2) Remove the glare shield per instructions in Chapter 25-11-00.

(3) Disconnect the connector on the back side of the unit.

(4) Remove the four 4-40, flat head screws from the flight instrument panel, and slide out the unit.

(5) Installation is the direct reversal of removal.

C. **Initial Set-up Procedure** - The total usable fuel must be programmed into the unit's memory. Total usable fuel for the aircraft is 98 gal.

(1) Turn the battery master ON.

(2) Move the ADD/FULL toggle switch to the FULL position and hold for the entire procedure.

(3) While pressing the ENTER/TEST button, move the USED/REM toggle switch to the REM position. Hold both in this position while the system is counting down for 15 seconds, as displayed on the unit in the left most window.

(4) The word FUL and the current *full fuel value* (number of gallons) will appear in the display window. Release the ENTER/TEST button and the USED/REM toggle switch. Keep holding the ADD/FULL toggle switch in the FUL position.

(5) While still holding the ADD/FULL toggle switch in the FUL position, move the USED/REM toggle switch to the REM position to increase the *full fuel value* (number of gallons), or to the USED position to decrease the *full fuel value* (number of gallons). The longer you hold the USED/REM toggle switch in either position, the faster the counter will update the *full fuel value* (number of gallons).

(6) After reaching the correct *total usable fuel* figure, press the ENTER/TEST button and the computer will store that number as full fuel. The word FUL disappears and the computer returns to the operating mode. Finally, release the ADD/FULL toggle switch.

(7) To verify that the data is stored properly, press the ENTER/TEST button and hold for 3 seconds. The computer will run a diagnostic check and display the word GOOD. If the set-up is successful, it displays the maximum *total usable fuel* value, FUL 98.0, as the third or fourth display.

NOTE: Keep the power turned on for at least one minute to ensure that computer has enough time to store and set the figures into the program.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

NAVIGATION - GENERAL

1. General

A. **Scope** - This chapter describes the navigation systems that provide navigational information. Flight instruments are operated by ram air, barometric air pressure differences, electric current variations, aircraft electrical power, or references to the earth's magnetic field.

B. **Descriptions**

(1) **Description of Pitot-Static System** - The pitot-static system has two components: ram air from the pitot tube and static air from the static air vent. Refer to Figure 1.

(a) The pitot tube is located under the right wing, and the static port is located on the right side of the fuselage, halfway between the copilot's cabin door and the horizontal stabilizer.

(b) The pitot system provides ram air pressure. The amount of ram compression depends on air density and the rate of travel through the air. The ram air, in conjunction with static air operates the airspeed indicator. The static system also provides static (uncompressed) air for the altimeter, vertical speed indicator, autopilot altitude sensor, and a blind encoder that is integrated with the airplane's transponder.

(c) The pitot-static system is extremely sensitive to changes in pressure, therefore, it must be kept free of moisture and obstruction. If moisture, leaks, or obstructions exist within the system, the three diaphragm gauges will give inaccurate readings.

(d) The pitot-static system includes drains located under the belly of the fuselage (center of the wing stub) and another located inside the fuselage near the static air vent.

(e) The tubing used for the pitot system is blue, and the tubing used for the static system is white.

(2) **Description of Stall Warning System** - The stall warning system consists of an audible buzzer mounted to the speaker in the forward section of the overhead console The system is activated by a vane-type switch located on the leading edge of the left wing. Under normal flight conditions, the airflow over the wing keeps the vane in a neutral position. The vane is connected to an electrical switch that is open under normal flight operations. When the airplane approaches its critical angle of attack, the airflow moves the vane up and closes the switch. The switch is set to activate approximately 5 to 10 knots above the aircraft stall speed in all normal flight configurations.

WARNING: The stall warning system is a critical component of the Cessna 300 rudder limiter system and must be accurately set and calibrated by flight test.

(3) **Description of systems using gyros** -The Cessna 300 uses three gyro systems: attitude gyros, directional gyro, and turn coordinator (roll rate gyro). The directional gyro and attitude gyros are vacuum driven. The Allied Signal KI 525 horizontal situation indicator (HSI) is electrically driven. The turn coordinator gyro is also electrically driven.

(4) **Description of Marker Beacon/Instrument Landing System** -

(a) **Marker Beacon Receiver** - The marker beacon receiver is located on the far left, top side of the audio panel. There are three lights: blue (outer marker), amber (middle marker), and white (inner/airway marker), which give a visual and aural indication when the respective marker is crossed in flight. The MKR button in the audio panel must be depressed for the audio portion to function. There is also a marker beacon repeater indicator located in the flight instrument panel above the artificial horizon. The repeater indicator must be functional for IFR operations using the marker beacon receiver.

(b) **High and Low Sense Switches** - The high and low sense switches control the sensitivity of the marker beacon receiver. In the High position, the outer marker is received about a mile from the receiver. In the Low position, the airplane must be directly above the marker beacon receiver to receive the aural and visual indication. Many pilots set the marker switch to the higher sensitivity for an advance indication of approaching the outer marker and then set the sensitivity to the lower level when the marker signal is received. Doing this will silence the tone and visual indication until the airplane is closer to the marker, giving the pilot a more precise indication.

(c) Holding the three-position switch in the Test position applies voltage to all three marker lamps to indicate they are functioning. The Test position is spring-loaded so that when the toggle switch is released, it returns to the Low position. The photocell in the faceplate automatically measures ambient light conditions and dims the marker lights, the label backlighting, and the lights in the audio selector buttons. The panel light will be dim when using the Test switch in low ambient light.

(d) The aural portion of the marker is turned on and off by selecting and deselecting the MKR audio switch on the audio selector panel. The markers do not have an automatic audio reset function, and if the audio for the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

markers is deselected, it stays off until reselected.

(e) **Remote Marker Beacon Repeater Indicator** - A remote marker beacon (MB) repeater indicator (Outer, Middle, and Inner Markers) is located above the artificial horizon. The three remote lights are connected to the SL15 audio panel, which contains the receiver and controls for the remote marker beacons. MB annunciations are also displayed on the SL15 audio panel and provide a backup source for station passage. The remote marker beacon repeater indicator must be functional for IFR operations.

(5) **Description of GPS, GPS/Comm, Nav Systems** -

(a) **UPSAT Apollo ACU** - The Apollo ACU is a self-contained unit that will provide all necessary functions required for switching HSI/CDI data inputs between a conventional Nav (VOR) receiver and an approach certified GPS receiver. The Apollo ACU will also denote specific modes selected by the front panel switches and various outputs from the GPS receiver.

(b) **UPSAT Apollo GX 50 GPS** - The Apollo GX50 is an approach certified GPS receiver with a high definition moving map display on a sunlight viewable screen. The aircraft's position relative to airports, runways, VOR's, NDB's, intersections, and SUA's can be viewed on the large moving map display. Operation is through the use of Smart Keys. Airspaces and navaids can be added or deleted from the map with a single press of a button. The GX50 is TSO-C129a Class A1 approved for IFR non-precision approach operation.

(c) **UPSAT Apollo GX 60 GPS/Comm** - The GX60 is a navigation and communication system in a single unit. The Apollo GX60 is an approach certified GPS receiver with features including a high definition moving map display. The aircraft's position relative to airports, runways, VOR's, NDB's, intersections, and SUA's can be easily viewed on the moving map display. Operation is through the use of Smart Keys. Airspace and navaids can be added or deleted from the map with a single press of a button. The GX60 is TSO-C129a Class A1 approved for IFR non-precision approach operation.

(d) **UPSAT Apollo SL30 Nav/Comm** - The SL30 provides navigation and communications with a 760 channel VHF communications transceiver with 200 channel VOR, Glideslope, and Localizer receivers. Besides traditional Nav/Comm features, the SL30 also incorporates functions such as automatic decoding of the Morse code station identifier for VOR/LOC/ILS, most-used frequency storage in unit memory, and a built-in course deviation indicator. The SL30 has the ability to monitor the standby comm frequency. The SL30 VHF receiver operates from 108 MHz to 117.95 MHz, decoding both the VHF Omni Range and Localizer navigation signals. The built-in glideslope receiver will automatically tune the corresponding glideslope paired frequencies (328 MHz to 335 MHz) when the localizer is tuned.

(e) **UPSAT Apollo SL15 Audio Panel** - The Apollo SL15 Audio Selector Panel/Intercom System (ASPIS) is frequently referred to as the audio panel. The primary purpose of the panel is to control communication and navigation selections, intercom functions, and the marker beacons. In addition, the unit has provisions for two stereo entertainment inputs. Refer to Chapter 23.

(f) **UPSAT Apollo SL70 Transponder** - The Apollo SL70 Mode A/C transponder is designed for both VFR and IFR operations. Features include a squawk code display and selection; transponder mode selection for standby, on, and altitude; built-in altitude hold; and ident button and single-button VFR squawk.

(g) **Bendix-King KCS 55A Compass System** - The KCS 55A system consists of four basic components: the panel mounted KI 525A Horizontal Situation Indicator (HSI), a magnetic slaving transmitter, a directional gyro, and the panel mounted KA 51B Slaving Control and Compensator Unit.

(h) **Bendix-King KI 256 Flight Director** - The operational characteristics of the Bendix/King KI 256 single cue flight director is similar to the basic attitude indicator display in that it is vacuum driven, has approximately the same gimbal design and tumbling parameters, and is self-erecting. The KI 256 displays pitch and roll attitude and pitch and roll commands. The KI 256 contains an air-driven vertical gyro. The engine must be running and the gyro must be up to speed before the system will operate.

(i) **Bendix-King KI 525A Horizontal Situation Indicator (HSI)** - The Bendix/King KI 525A pictorial navigation indicator displays constantly slaved gyro magnetic heading information along with VOR/LOC course deviation and glideslope deviation indications. It is part of the King KCS 55A compass system, which also includes a KA 51B slaving control and compensator unit, a KMT 112 magnetic slaving transmitter, and a KG 102 directional gyro.

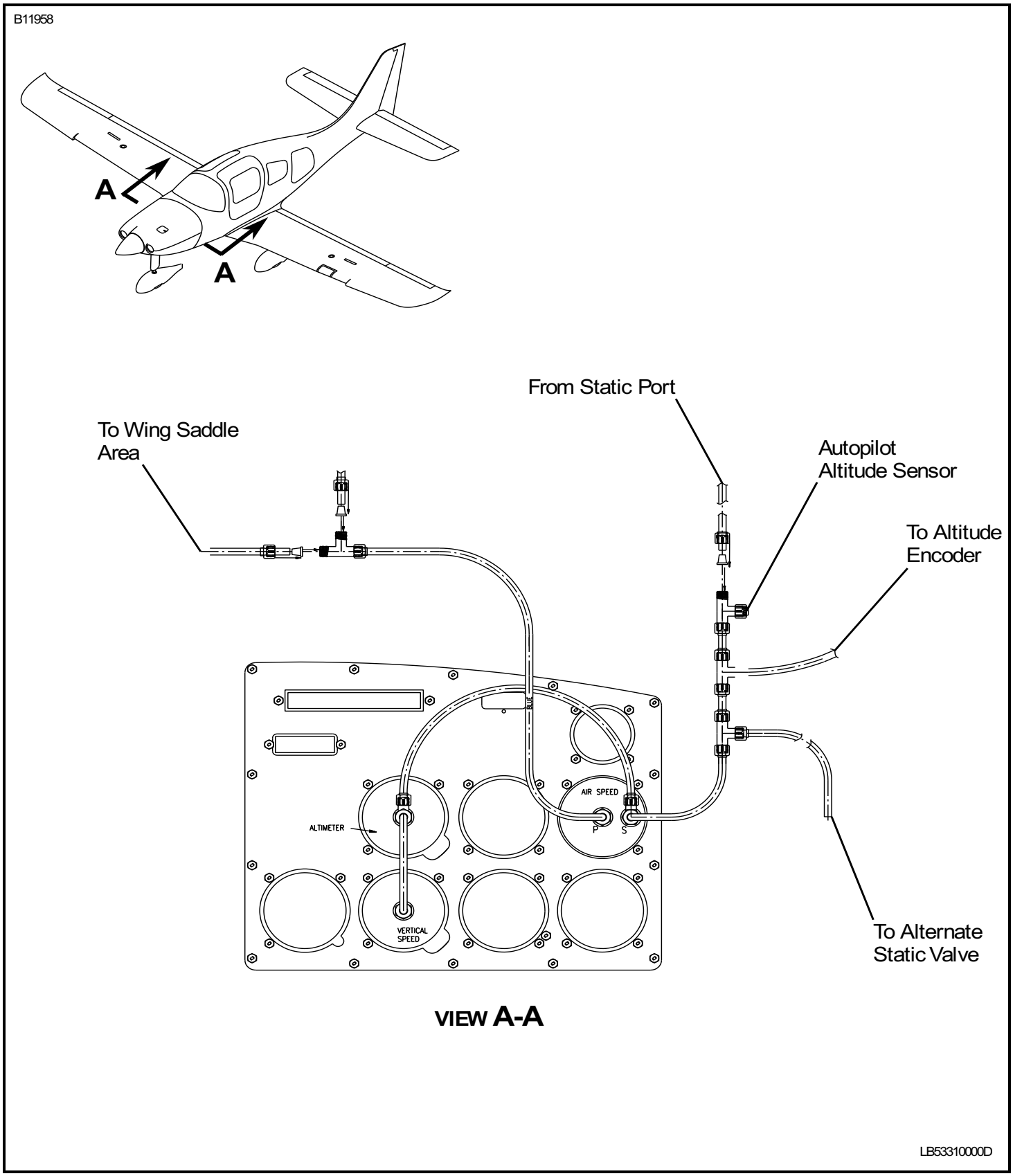
(j) **Sigmatek 5000B-70 (8 degree Tilt) Attitude Indicator** - The attitude indicator is a vacuum-driven basic attitude display.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CAUTION: Before any maintenance, removal, or installation of equipment is performed, make sure both the master and avionics switches are in the off position. Failure to do so could result in damage to equipment.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Pitot-Static System Diagram



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

PITOT-STATIC SYSTEM - MAINTENANCE PRACTICES

1. Flight Environment Data/Pitot-Static System

A. Pitot System - Removing Pitot Assembly

CAUTION: To avoid injury, turn off the master switches, and pull the circuit breaker for this unit prior to touching it.

(1) The pitot assembly is located under the right wing.

(2) Remove the access panel next to the pitot assembly.

(3) Remove the screws securing the pitot assembly to the wing. Refer to Figure 201.

(4) Disconnect the ram air tube connector at the B-nut.

(5) Disconnect the electrical plug.

(6) Remove the pitot assembly from the airplane.

B. Pitot System - Installing Pitot Assembly

(1) Secure the pitot assembly to the wing structure with screws. Torque screws 10-12 in.- lbs. Refer to Figure 201.

(2) Connect the electrical wire plug for the pitot heater.

(3) Connect the ram air tube connector ('B' nut) to the female connector. Tighten the nut finger-tight, and turn a quarter-turn with a wrench.

(4) Install the access panel next to the pitot assembly.

C. Pitot System - Pitot Heat Testing

(1) Turn the master switch (battery side) on.

(2) Turn the pitot heat rocker switch on.

CAUTION: To avoid injury, do not grip the pitot assembly if the heat has been turned on for more than one minute.

(3) Touch the pitot assembly to determine if the temperature is increasing.

(4) If the assembly does not become warm to the touch within 60 seconds, the heating component is malfunctioning and should be replaced.

D. Pitot System - Clean Out and Drain

(1) The pitot system moisture collection tube is located at the low point of the pitot system in the wing (underside of the fuselage). Refer to Figure 202.

(2) Remove the fuel module access panel to gain access to the moisture collection tube.

(3) Remove the plastic nut from the union fitting. Refer to Figure 203.

(4) If moisture is present, remove the entire moisture collection tube for cleaning or replacement.

(5) Reassemble the moisture collection tube (tighten the nut finger-tight and turn a quarter-turn with a wrench).

(6) Reinstall the fuel module access panel.

E. Static Pressure System Inspection and Leakage Test

- The following procedure outlines inspection and testing of the static pressure system, assuming the altimeter has been tested and inspected in accordance with current Federal Aviation Regulations.

(1) Ensure the static system is free from moisture and restrictions.

(2) Ensure no alterations or deformations of the airframe surface have been made which would affect the relationship between air pressure in the static pressure system and true ambient air pressure for any flight configuration.

(3) Ensure the static pressure alternate source valve, located on the pilot-side knee bolster, is turned to "NORM." Refer to Figure 204.

(4) Attach a source of suction to the static system moisture collection tube using sealant tape at the connection points to ensure a tight seal, and tape over the normal static pressure port (located on the right side of the fuselage, halfway from the door to the tail).

(5) Slowly apply suction until the altimeter indicates a 1000 feet increase in altitude.

WARNING: When applying or releasing suction, do not exceed the range of the vertical speed indicator or

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

airspeed indicator.

(6) Cut off the suction source to maintain a closed system for one minute. Leakage shall not exceed 100 feet of altitude loss as indicated on the altimeter.

(7) If the leakage rate is within tolerance, slowly release the suction source, and remove the tape from the static port. If the leakage rate exceeds the maximum allowable, tighten all connections, and repeat the leakage test. If the leakage rate still exceeds the maximum allowable, proceed to the next step, otherwise, the test is complete.

(8) Disconnect the static pressure lines from the airspeed indicator, vertical speed indicator, and altitude encoder. Use suitable fittings to connect the lines together so the altimeter is the only instrument still connected into the static pressure system.

(9) Repeat the leakage test to check whether the static pressure system or the bypassed instruments are the cause of leakage. If instruments are at fault, they must be repaired by an appropriately rated repair station or replaced. If the static pressure system is at fault, use the following procedure to locate leakage.

WARNING: Do not apply positive pressure with the airspeed indicator connected to the static pressure system.

CAUTION: To avoid damage to equipment, always apply pressure or suction slowly when testing.

(10) Attach a source of positive pressure to the normal static port.

(11) SLOWLY apply positive pressure until the altimeter indicates a 500 feet decrease in altitude, and maintain this altimeter indication while checking for leaks. Coat the line connections and static source flange with LEAK-TEC or a solution of mild soap and water. Watch for bubbles to locate leaks.

(12) Tighten leaking connections, and repair or replace parts found to be defective.

(13) Reconnect the airspeed and vertical speed indicators into the static pressure system and repeat the leakage test, steps (3) through (7), above.

F. **Static Pressure System - Clean Out and Drain**

(1) The static system sump/water trap is located behind the interior panel on the right side of the aircraft's baggage area. Refer to Figure 205.

(2) Remove the right-side interior curved side panel to gain access to the static sump.

(3) Remove the plastic nut from the union fitting.

(4) If moisture is present, remove the entire moisture collection tube by unscrewing the B-nut at the T-connection. When the sump assembly is no longer connected to the pitot system, slide it out of its bracket.

(5) Clean or replace the drain.

G. **Static Pressure System - Install Moisture Collection Tube**

(1) Before reconnecting the moisture collection tube assembly to the T-connector, be sure that both are clean and free of debris.

(2) Reassemble the moisture collection tube assembly to the static pressure line (tighten the nut finger-tight and turn it a quarter-turn with a wrench).

(3) Assure the collection tube is fastened to the tie-wrap block.

(4) Reinstall the interior panel.

(5) Retest the static system as per the Static Pressure System Inspection and Leakage Test section above.

H. **Static Pressure System - Removal and Install Normal Static Port**

(1) The static port is bonded into the fuselage skin. It must be removed and replaced by qualified composite technicians.

(2) Refer to Chapter 51 for composite repairs.

I. **Alternate Static Source Valve Removal**

(1) Disconnect the left knee bolster from the instrument panel. Refer to Chapter 25-11-00 for instructions on the removal of the knee bolster.

(2) Disconnect the static line from the alternate static source valve. Refer to Figure 206.

(3) Insert a small, flat bladed tool into the slot on the backside of the valve to spread the valve from the operator control knob, and remove the valve.

Alternate Static Source Valve Installation

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

J. (1) Snap the static source valve to the operator. Refer to Figure 206.
(2) Operate the valve to check for freedom of operation.
(3) Reconnect the static line to the valve and finger-tighten the nut plus a quarter-turn.
(4) Reinstall the left knee bolster.

K. **Alternate Static Source Testing**
(1) Note the altimeter elevation setting.
(2) Turn the alternate static source valve operator knob to "NORM."
(3) Attach a source of suction to the normal static port.
CAUTION: To avoid damage to equipment, always apply pressure or suction slowly when testing.
(4) SLOWLY apply suction until the altimeter indicates a 100 foot increase in altitude.
(5) Turn the alternate static source valve operator knob to "ALT." The altimeter should drop back to its original setting.
(6) If the altimeter does not drop back to its original setting, replace the alternate static source valve assembly.

2. Static Air Instruments

A. The altimeter, vertical speed indicator, blind altitude encoder, and airspeed indicator all utilize static air as a major component of their functionality.
(1) **Altimeter, Vertical Speed Indicator, and Airspeed Indicator Removal**
(a) Unfasten the main plate of the instrument panel. Refer to Figure 207.
(b) Carefully slide the plate out of the instrument panel.
(c) Unfasten the instrument from the plate.
(d) Disconnect the wires and the static lines going into the back of the instrument.
(2) **Altimeter, Vertical Speed Indicator, and Airspeed Indicator Installation**
(a) Slide the instrument into its slot in the main plate.
(b) Fasten the instrument to the main plate.
(c) Connect the proper wires and static lines into the back of the instrument.
(d) Gently slide the main plate into the instrument panel.
(e) Refasten the main plate to the instrument panel. Refer to Figure 207.
(3) **Blind Altitude Encoder - Removal**
(a) The blind altitude encoder is attached to a metal plate connected to the firewall on the passenger's side. To access the blind encoder, remove the instrument panel glare shield. The blind encoder is on the bottom left corner of the metal plate. Refer to Figure 208.
(b) Unhook the wires and static lines connected to the blind encoder.
(c) Remove the knurled bolt above the blind encoder, and remove it from its mounting.
(4) **Blind Altitude Encoder Installation**
(a) Place the blind encoder in its mounting.
(b) Finger-tighten the knurled bolt above the blind encoder.
(c) Reconnect the wires and static lines to the blind encoder.
(5) **Blind Altitude Encoder Testing**
(a) Set the system master and avionics switch on.
(b) Wait for the blind encoder to warm up (must be warmed internally to within a few degrees of 140°F (60°C)). The instrument is encased within a heated thermostatically controlled manifold that keeps the temperature of the unit within a few degrees of 140°F (60°C). The encoder will not provide altitude information to the transponder until the manifold assembly reaches its operating temperature. The time required for the heat assembly to reach operating temperature is a function of cockpit ambient air temperature. Table 201 shows the approximate warm-up times for a range of different ambient temperatures.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Table 201. Blind Altitude Encoder Heating Requirements

Cockpit Ambient Temperature	Required Operating Temperature	Warm-Up Time (minutes)
70°F (21°C)	140°F (60°C)	4 to 6
0°F (-18°C)	140°F (60°C)	Up to 10
-55°F (-48°C)	140°F (60°C)	30 to 45

(c) Set the barometric scale on the altimeter to 29.92 inches of Hg.

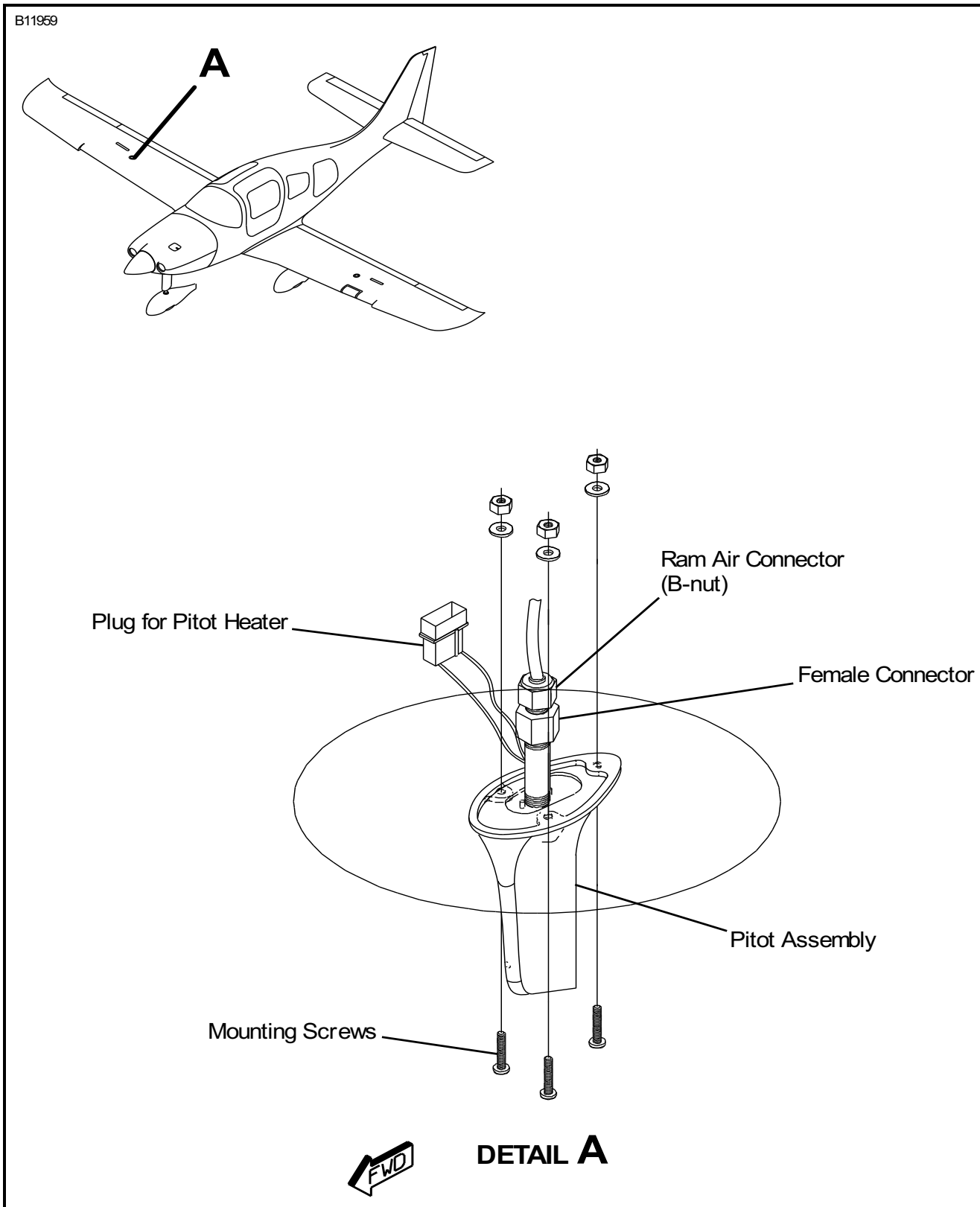
(d) View the blind encoder altitude readout on the UPS Apollo GPS or the UPS Apollo Transponder. The difference between the blind encoder readout and the altimeter cannot be more than 125 feet.

(e) If the altitude encoder readout is not within 125 feet, have a qualified avionics shop check out the system.

(6) **Blind Altitude Encoder Interface with Standby Battery System** - The blind altitude encoder is an integral part of the standby battery system. Refer to Chapter 24-35-00 for details on the standby battery system.

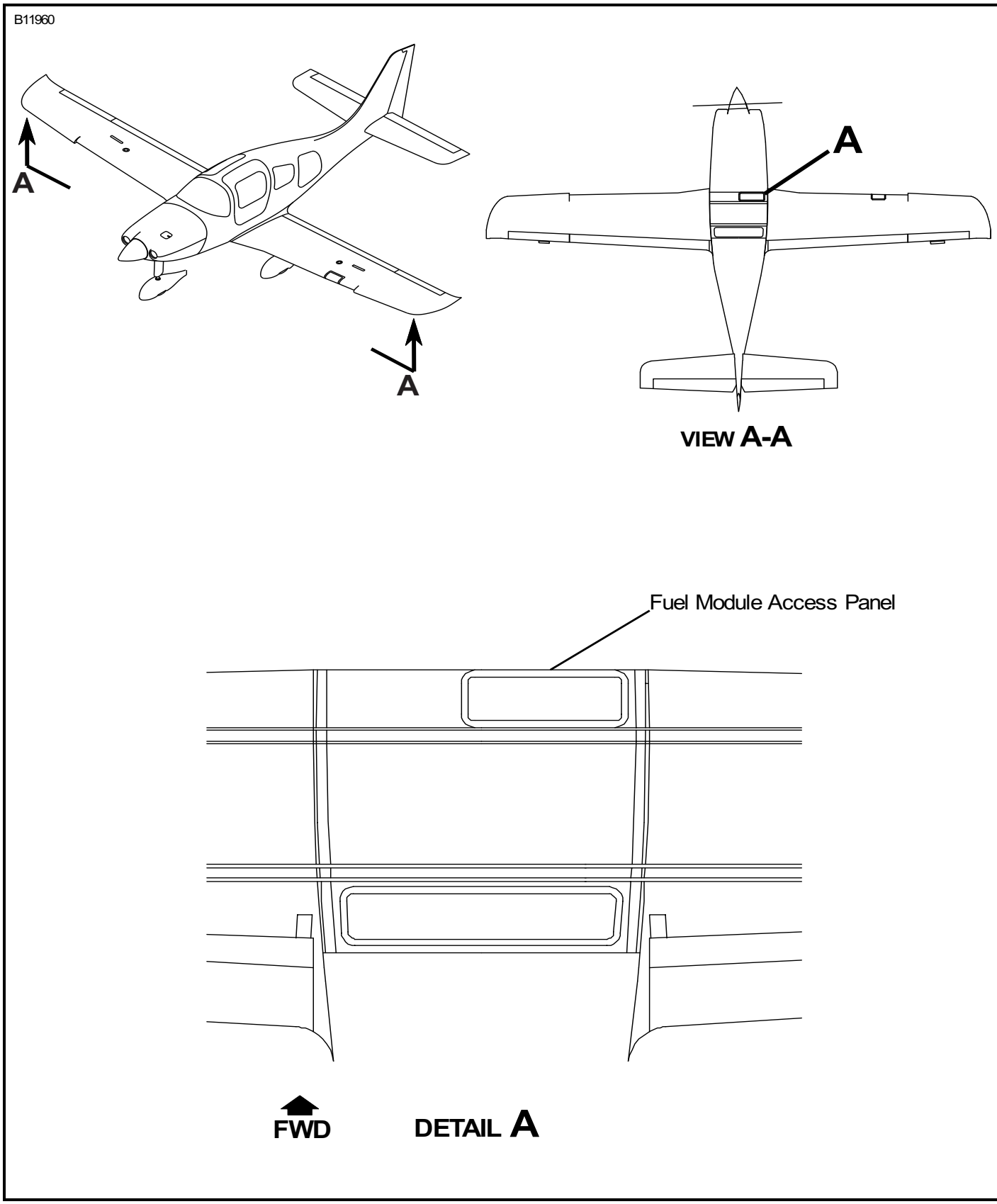
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Pitot Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

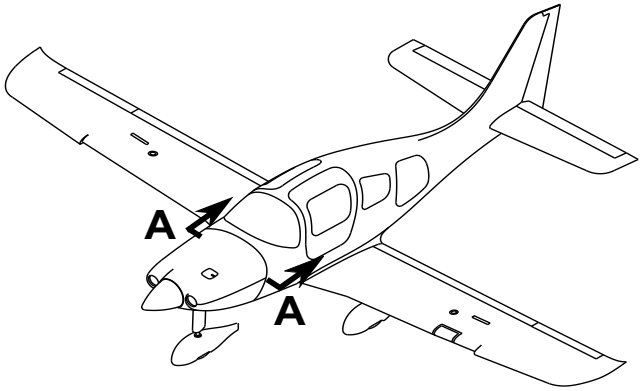
Figure 202 : Sheet 1 : Fuel Module Access Panel

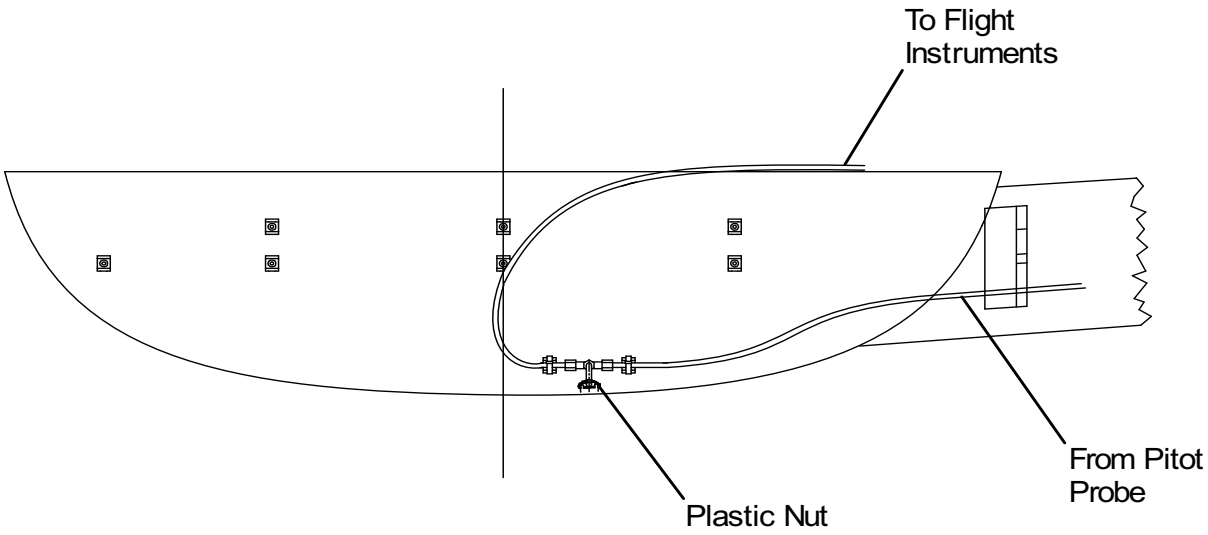


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Pitot Moisture Collection Tube

B11961



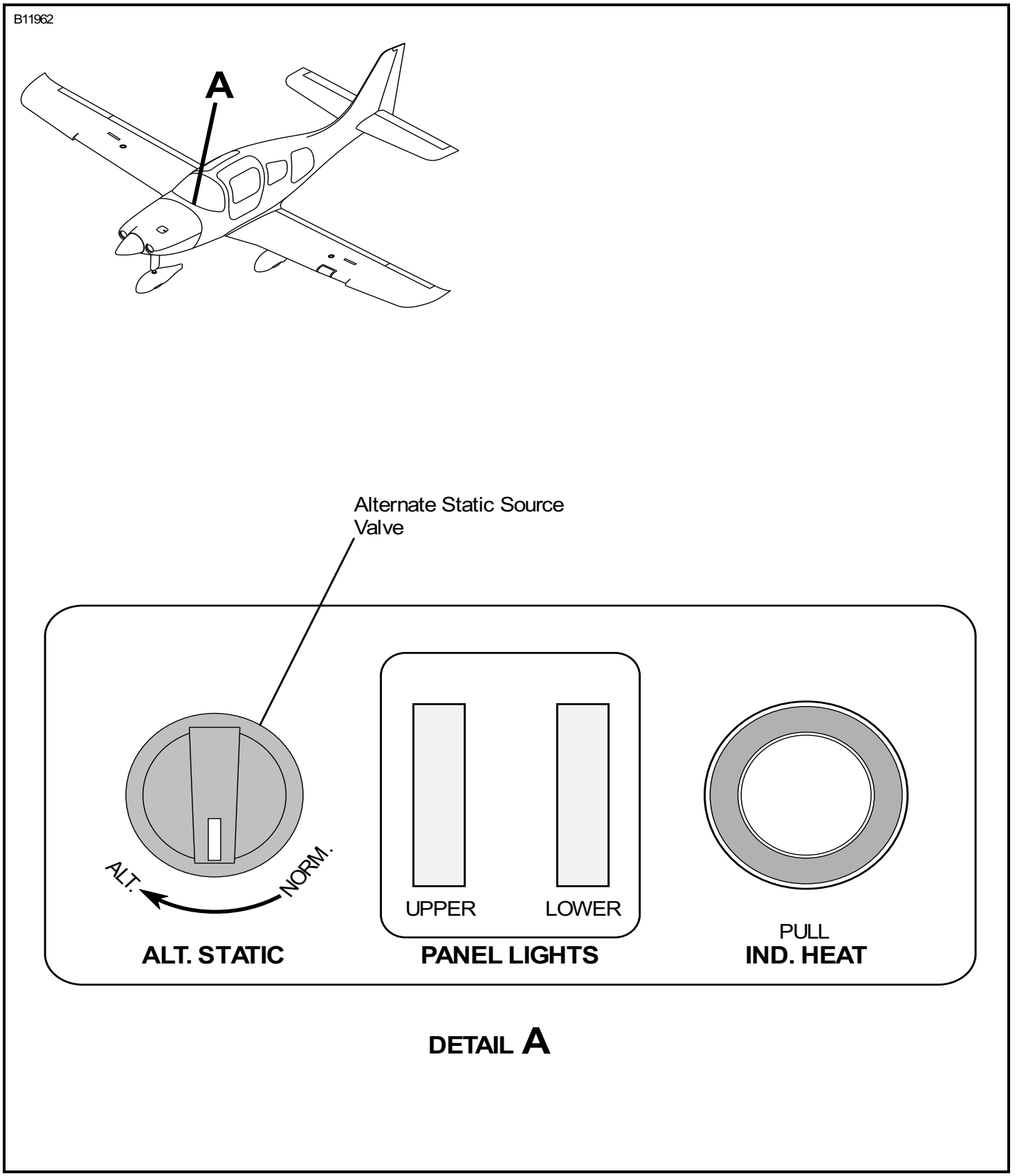


VIEW A-A

LB57312000-

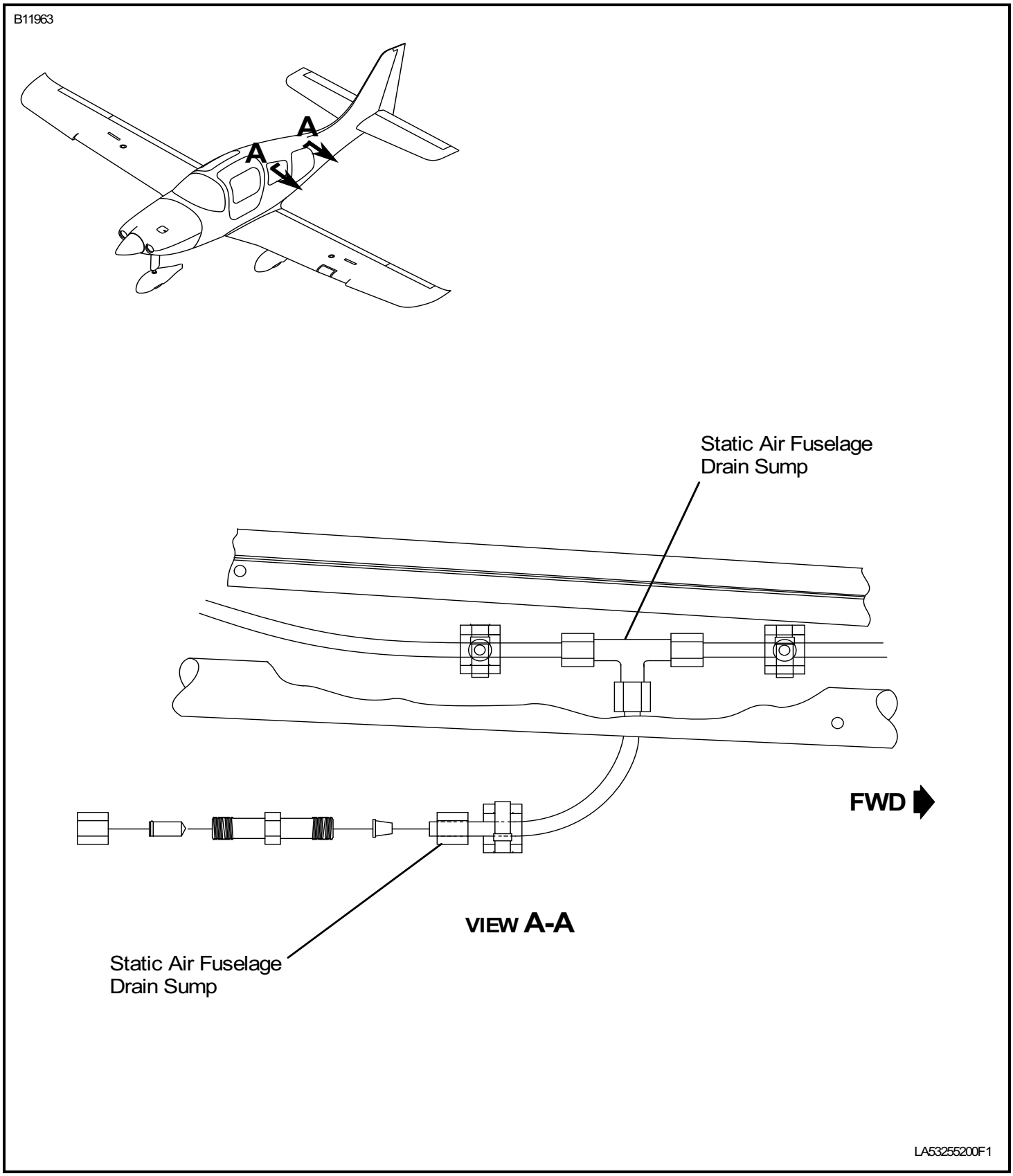
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Alternate Static Source Valve



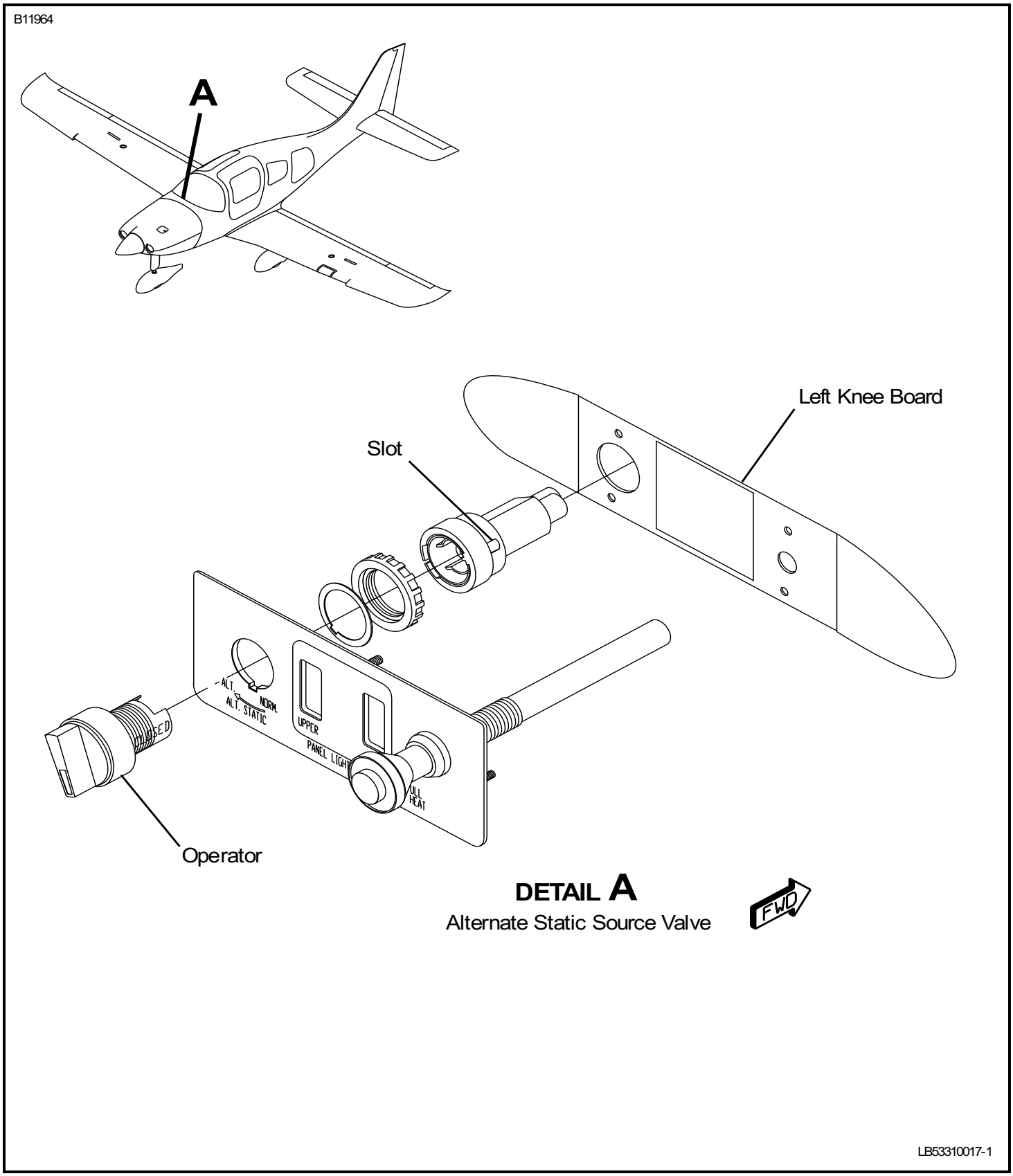
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Baggage Area Static Air Sump Drain



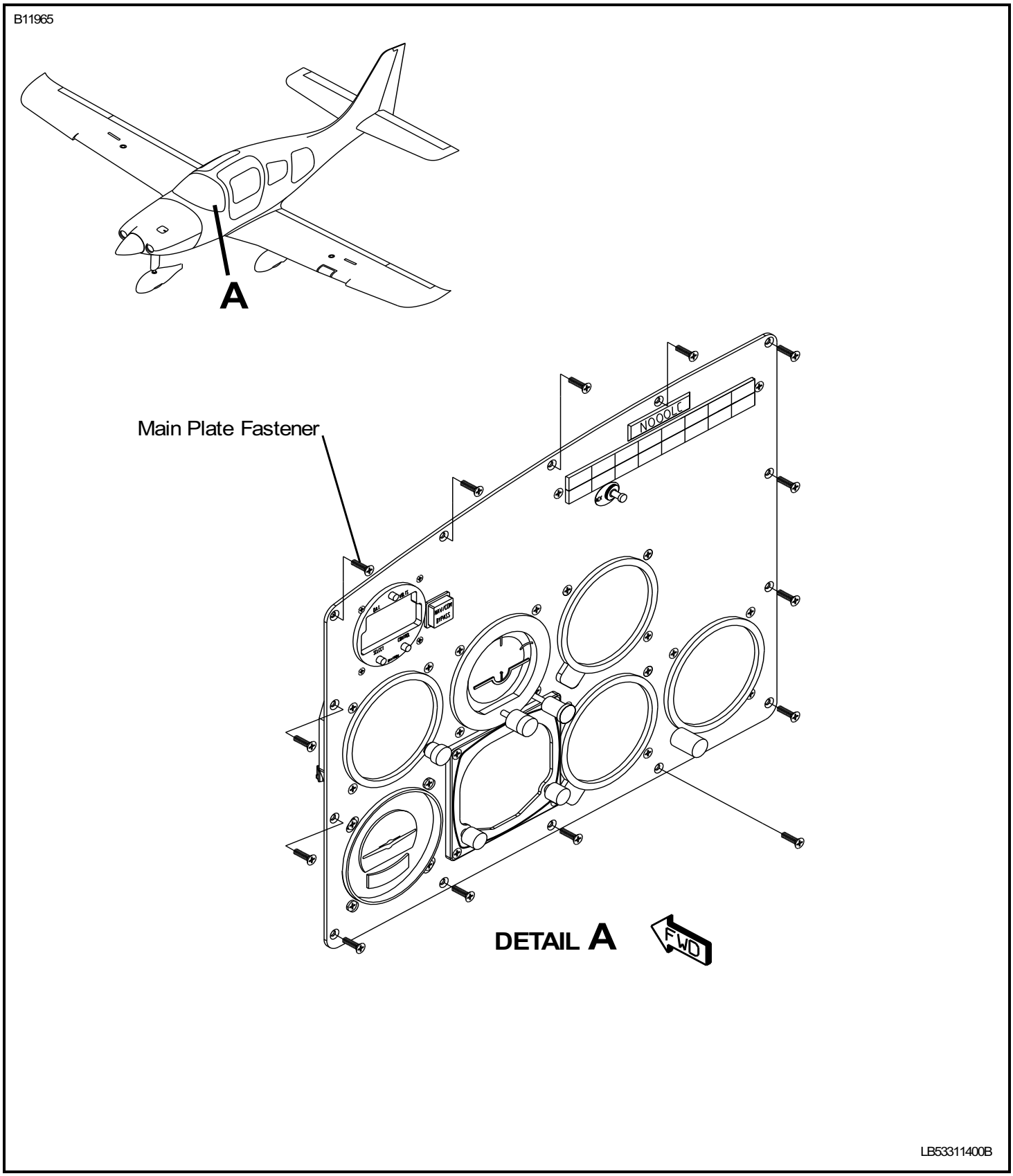
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Alternate Static Source Valve



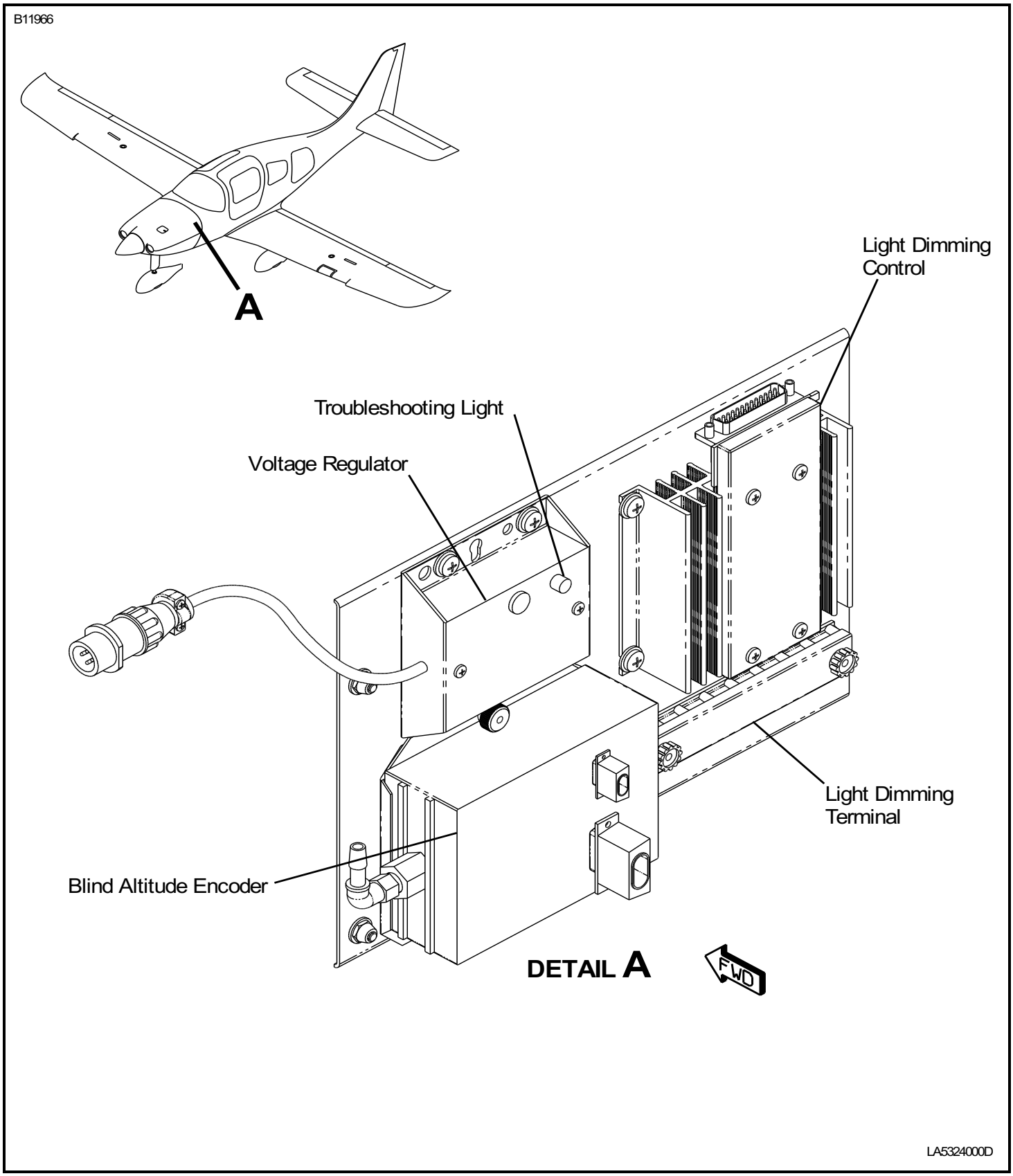
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Instrument Panel Main Plate



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : Accessories Unit Mounting Plate



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STALL WARNING SYSTEM - MAINTENANCE PRACTICES

1. Stall Warning System

A. **Stall Warning Detector Assembly Location** - The stall warning detector assembly is located on the left wing on the leading edge about halfway between the fuselage and the wing tip. Refer to Figure 201.

B. **Stall warning Detector Assembly Removal**

(1) With an erasable marker, mark the outline (position) of the faceplate onto the wing.

(2) Remove the two screws connecting the faceplate to the wing.

(3) Disconnect the two wires after labeling the wires with their corresponding terminal positions.

C. **Stall Warning Detector Assembly Installation**

(1) Connect the two wires to the proper terminals.

(2) To be sure the wires are connected correctly, turn the master switch on and push the stall warning vane up. If the stall warning buzzer sounds, the unit is installed correctly.

(3) Align the faceplate with markings.

(4) Fasten screws in the top right and bottom left corner.

(5) Proceed with the test of the stall warning detector assembly.

D. **Stall Warning Detector Assembly Testing**

WARNING: This test should only be performed by qualified pilots at a sufficient altitude to safely recover from a stall and in an area where it is safe to perform this maneuver.

(1) Test fly the airplane to determine if the stall warning detector actuates at the correct airspeed. Commence the test at 20 KIAS above the stall speed, and bleed off speed at a rate of 1 knot per second until 5-10 KIAS above stall speed. The stall warning buzzer should sound between 5-10 KIAS above the stall speed.

WARNING: Do not bend the metal tab (vane) to adjust the stall warning detector.

(2) If the stall warning buzzer sounds at speeds in excess of 10 KIAS above the stall speed, loosen the mounting screws on the stall warning detector assembly, and move the assembly slightly down.

(3) If the stall warning buzzer does not sound before reaching a speed of 5 KIAS above stall speed, loosen the mounting screws on the stall warning detector assembly, and move the assembly slightly up.

E. **Stall Warning Buzzer Removal**

(1) Remove the overhead console. Refer to Chapter 25-30-00 for overhead console removal. Also refer to Figure 202 for the location of the buzzer in the overhead console.

(2) Disconnect the connector attached to the buzzer. Refer to Figure 203.

(3) Remove the attachment screw.

F. **Stall Warning Buzzer Installation**

(1) Using the screw, fasten the stall warning buzzer to the overhead console. Refer to Figure 202.

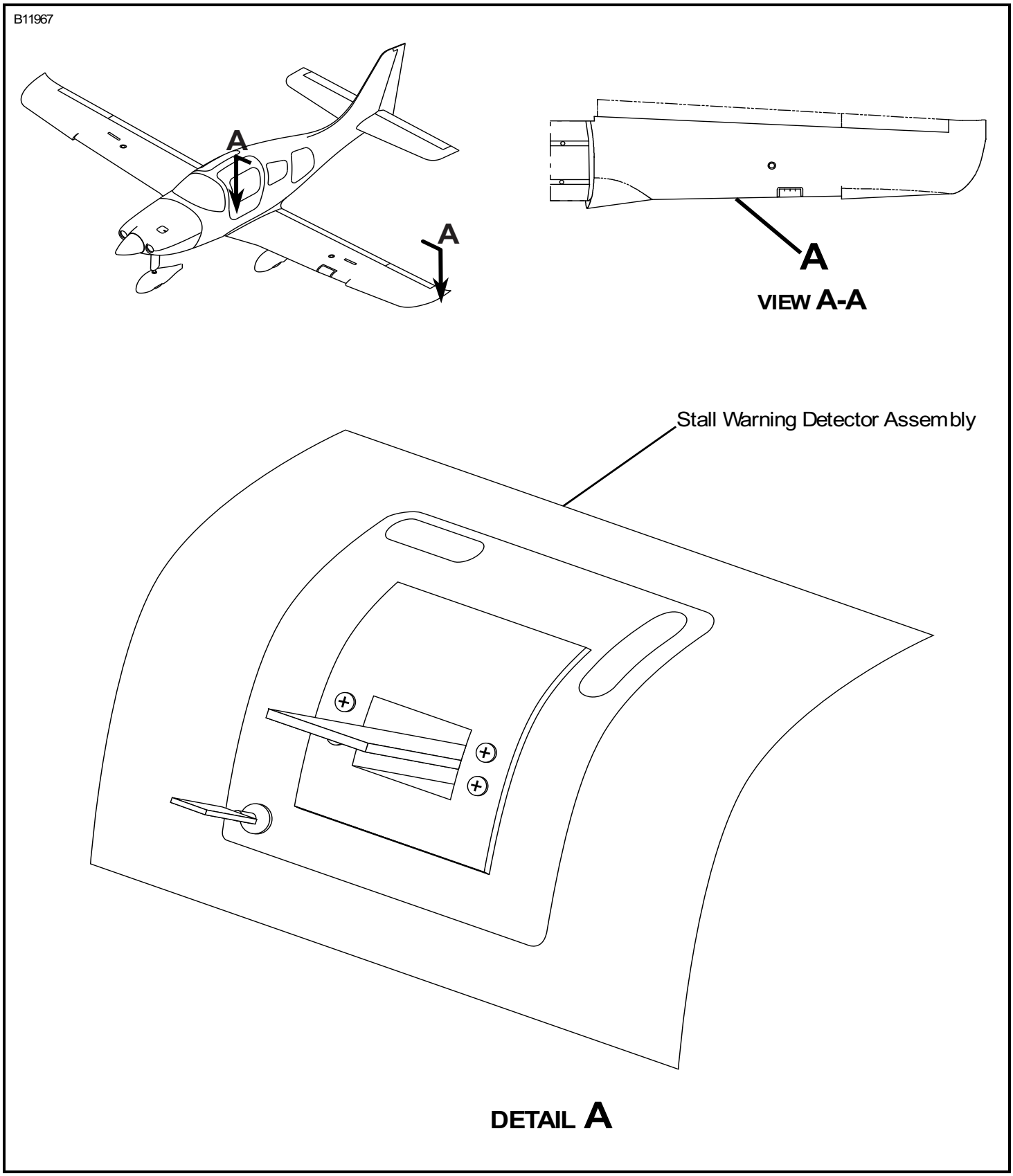
(2) Connect the wires to the buzzer using the connector shown in Figure 203.

(3) Test the operation of the horn by turning the master switch on, and push the stall warning vane up. If the stall warning buzzer can be heard, it is installed correctly.

(4) Reinstall the overhead console as shown in Chapter 25-30-00.

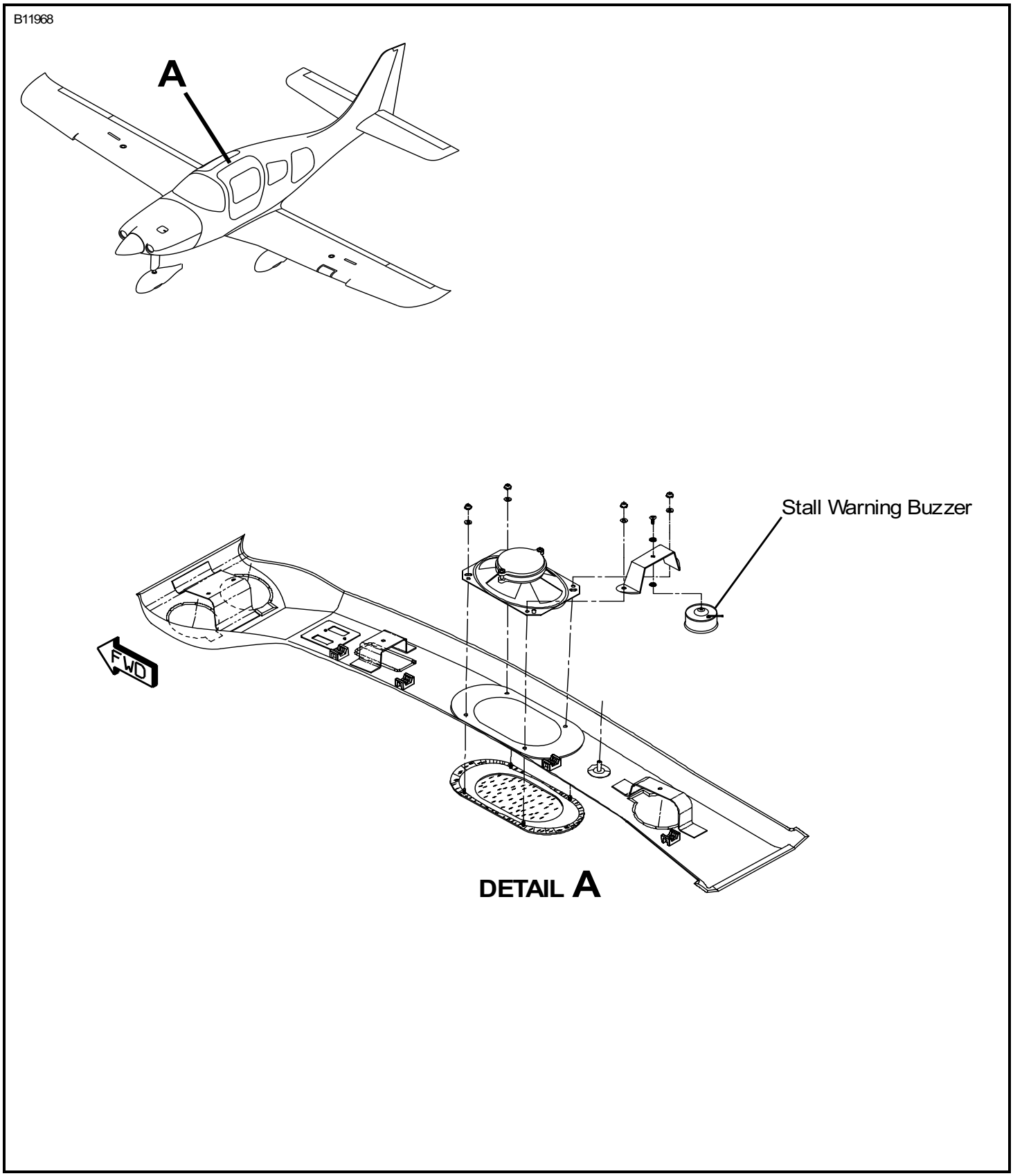
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Stall Warning Detector Assembly



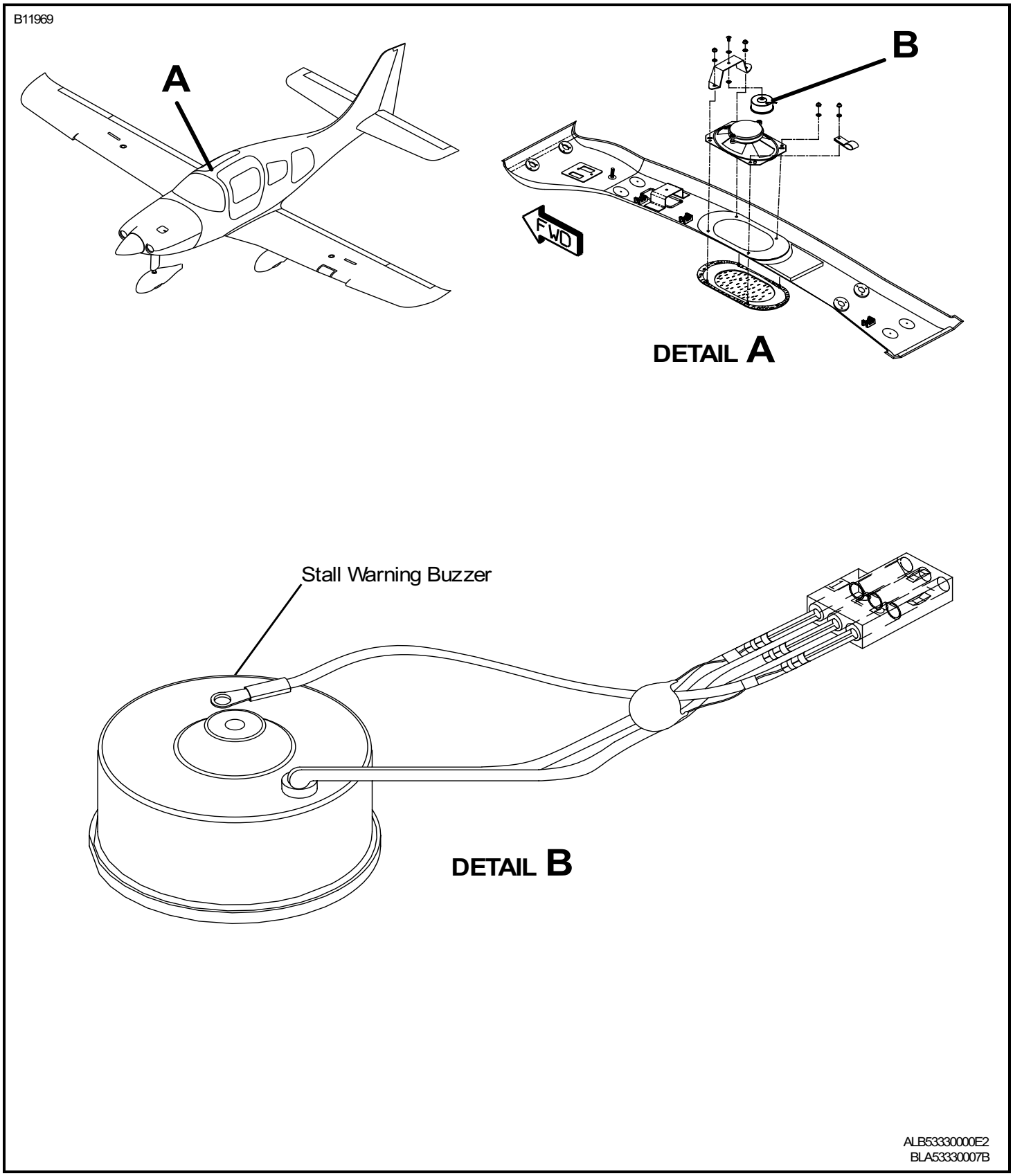
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Stall Warning Buzzer Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Stall Warning Horn



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ATTITUDE AND DIRECTIONAL SYSTEM - MAINTENANCE PRACTICES

1. Attitude and Directional Gyro Indicators

A. Attitude and Directional Gyro Indicators Removal

(1) Turn off the master switch.

(2) Remove the glare shield.

(3) Disconnect the compass and glare shield lighting wires.

(4) Unfasten the mounting screws attaching the indicator to the instrument panel.

(5) Identify, tag, and remove the vacuum line fittings and the electrical connector attached to the indicator.

(6) Remove the indicator through the top of the instrument panel.

B. Attitude and Directional Gyro Indicators Installation

WARNING: Permit no oil, grease, pipe compound, or any foreign material to enter ports prior to installation of fittings. Make sure that all air lines are clean and free of foreign particles and residue before connecting the lines to the gyro.

(1) Turn off the master switch.

(2) Carefully lay Teflon tape or paste on the threads, allowing one thread to be visible from the end of the fitting.

(a) Hold in place, and wrap in the direction of the threads so the tape will remain tight when the fitting is installed.

(b) Apply sufficient tension while winding to assure that the tape forms into thread groves. One full wrap plus 1/2 inch overlap is sufficient.

(c) After wrap is complete, maintain tension, and tear the tape by pulling in the direction of the wrap. The resulting ragged end is the key to the tape staying in place. (If sheared or cut, tape may loosen).

(d) Press tape into threads.

(3) Screw the fitting into the port being careful not to exceed torque requirements as noted on the decal located on the cover of the gyro.

(4) Place the instrument into its slot in the instrument panel.

(5) Screw in four screws that attach the instrument to the panel.

(6) Connect the vacuum lines and electrical connector.

(7) Reinstall the compass and glare shield wires.

(8) Reinstall the glare shield.

C. Attitude and Directional Gyros Testing

(1) Run the engine for at least two minutes to verify the vacuum is in the green band.

(2) Listen to determine if the gyro is operating properly.

(a) If the gyro noise is not heard, check the vacuum lines for kinks, and ensure the filter is clean and dry.

(b) If the lines and filter are undamaged, remove the indicator and take it to a qualified technician.

D. **Interface with Standby Battery System** - The HSI is an integral part of the standby battery system. Refer to Chapter 24-35-00 for details on the standby battery system.

2. Turn Coordinator

A. Turn Coordinator Removal

(1) Unfasten the main plate of the instrument panel. Refer to Section 34-10-00, Figure 207.

(2) Carefully slide the plate out of the instrument panel.

(3) Unfasten the turn coordinator from the plate.

(4) Remove the connectors attached to the indicator.

(5) Remove the turn coordinator by pulling it out of the instrument panel.

B. Turn Coordinator Installation

(1) Perform the steps for removal above, in reverse order.

(2) Level the aircraft (refer to Chapter 08-00-00).

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(3) If the ball is not in the center, loosen the mounting screws and adjust the turn coordinator until the ball is centered.

C. **Turn Coordinator Testing**

(1) Turn the master switch on. A red flag should disappear, indicating the power is on. Refer to Figure 201.

(2) Listen to the indicator to determine if the gyro is properly turning.

(3) If the gyro is not heard, remove the indicator, and take it to a qualified technician for replacement or repair.

D. **Interface with Standby Battery System** - The turn coordinator is an integral part of the standby battery system. Refer to Chapter 24-35-00 for details on the standby battery system.

3. Magnetic Compass

A. **Magnetic Compass Removal**

(1) Remove the glare shield.

(2) Disconnect the electrical connector. Refer to Figure 202.

(3) Remove the screws connecting the magnetic compass to the glare shield.

B. **Magnetic Compass Installation**

(1) Fasten the magnetic compass to the glare shield.

(2) Connect the electrical connector.

NOTE: Ensure no electrical wires are impinging in the area of the magnetic compass in the instrument panel area. Wires not properly stowed may cause interference with the performance of the magnetic compass.

(3) Reinstall the glare shield.

(4) Using a compass rose, check and denote the accuracy of the compass after installation with the engine running and avionics on.

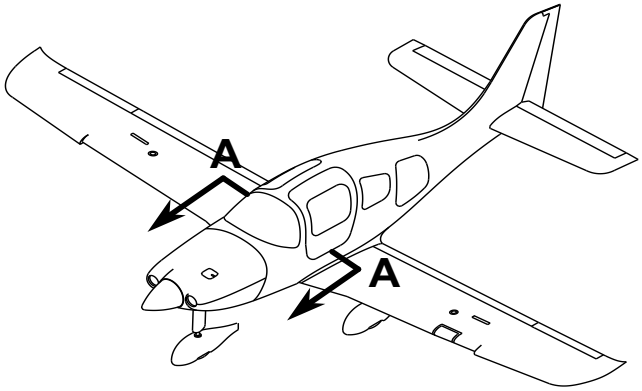
(5) Replace the compass correction card with a revised card indicating the new calibration date.

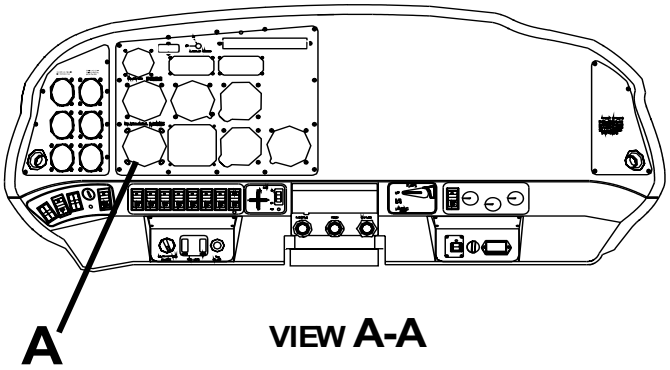
NOTE: The magnetic compass should be checked for calibration each time avionics or instruments are installed in the instrument panel. A qualified technician must calibrate the magnetic compass under these conditions.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

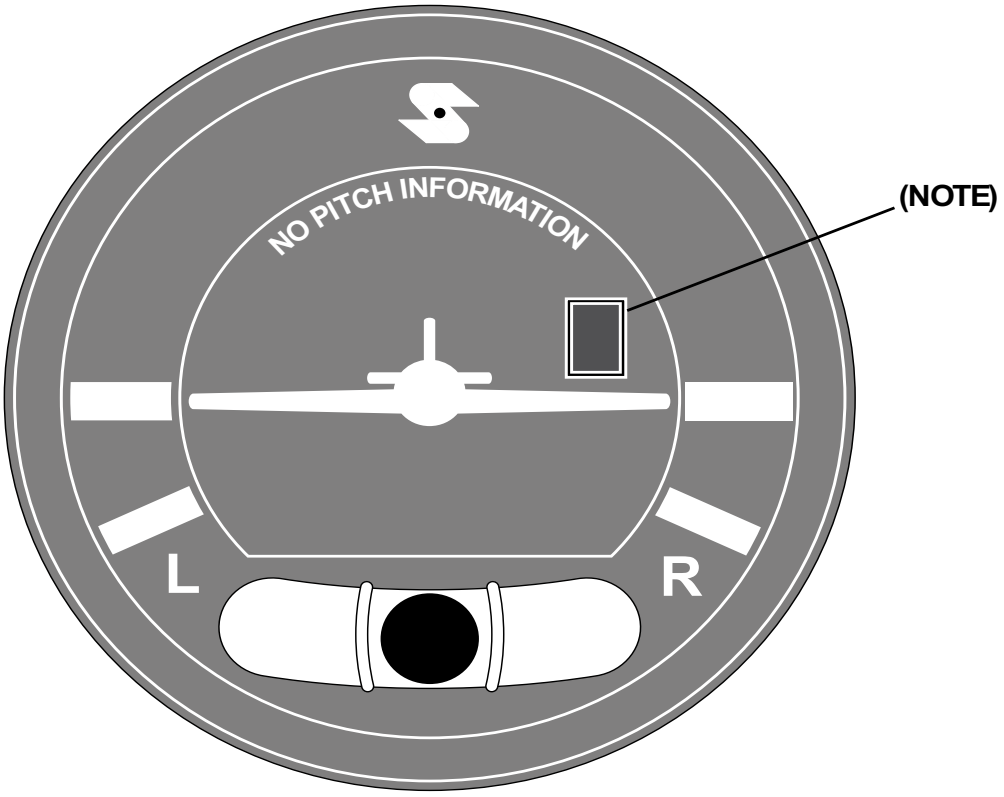
Figure 201 : Sheet 1 : Turn Coordinator Flag

B11995





VIEW **A-A**

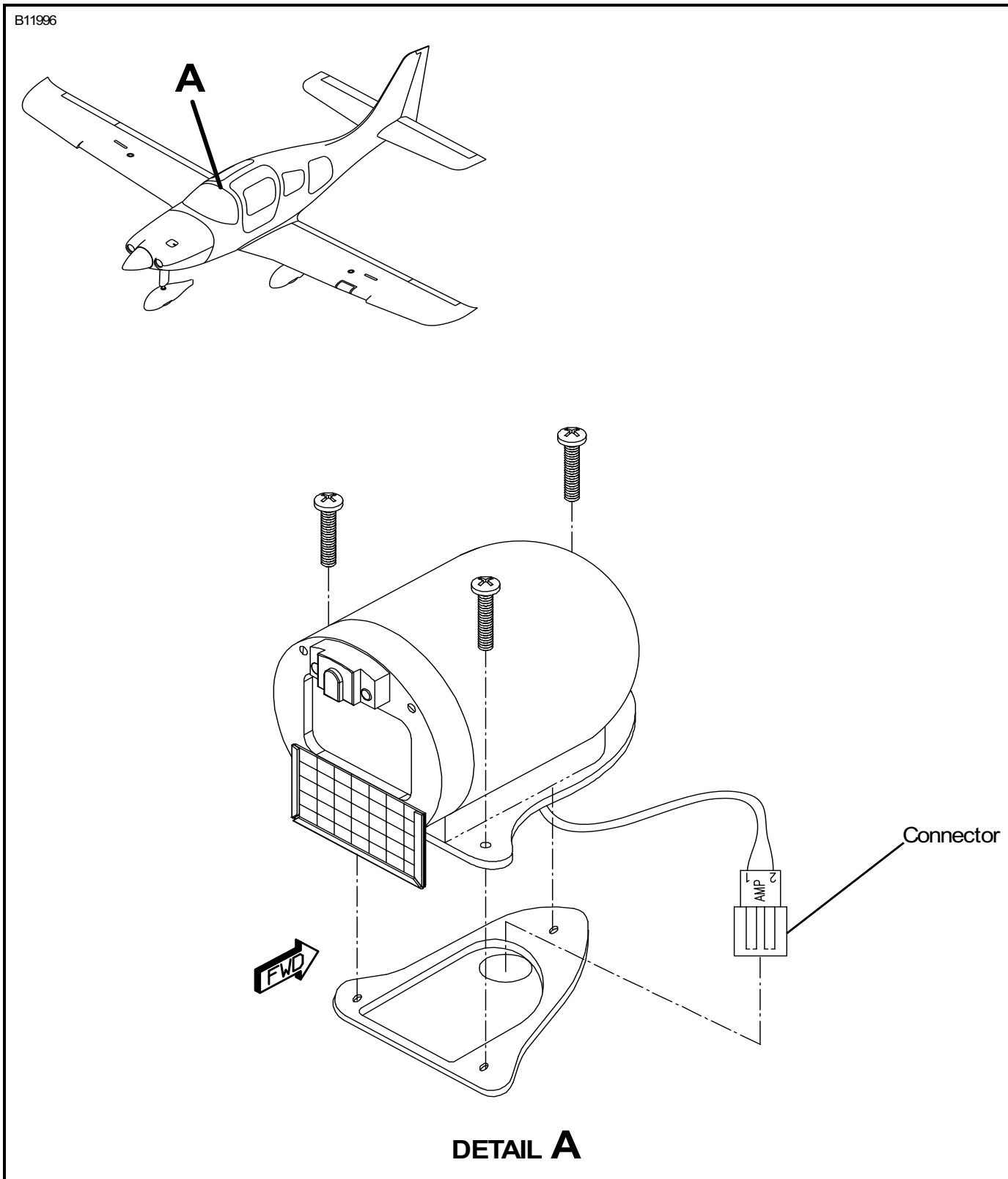


DETAIL A

NOTE: Red Flag:
Showing - Not Powered
Not Showing - Powered

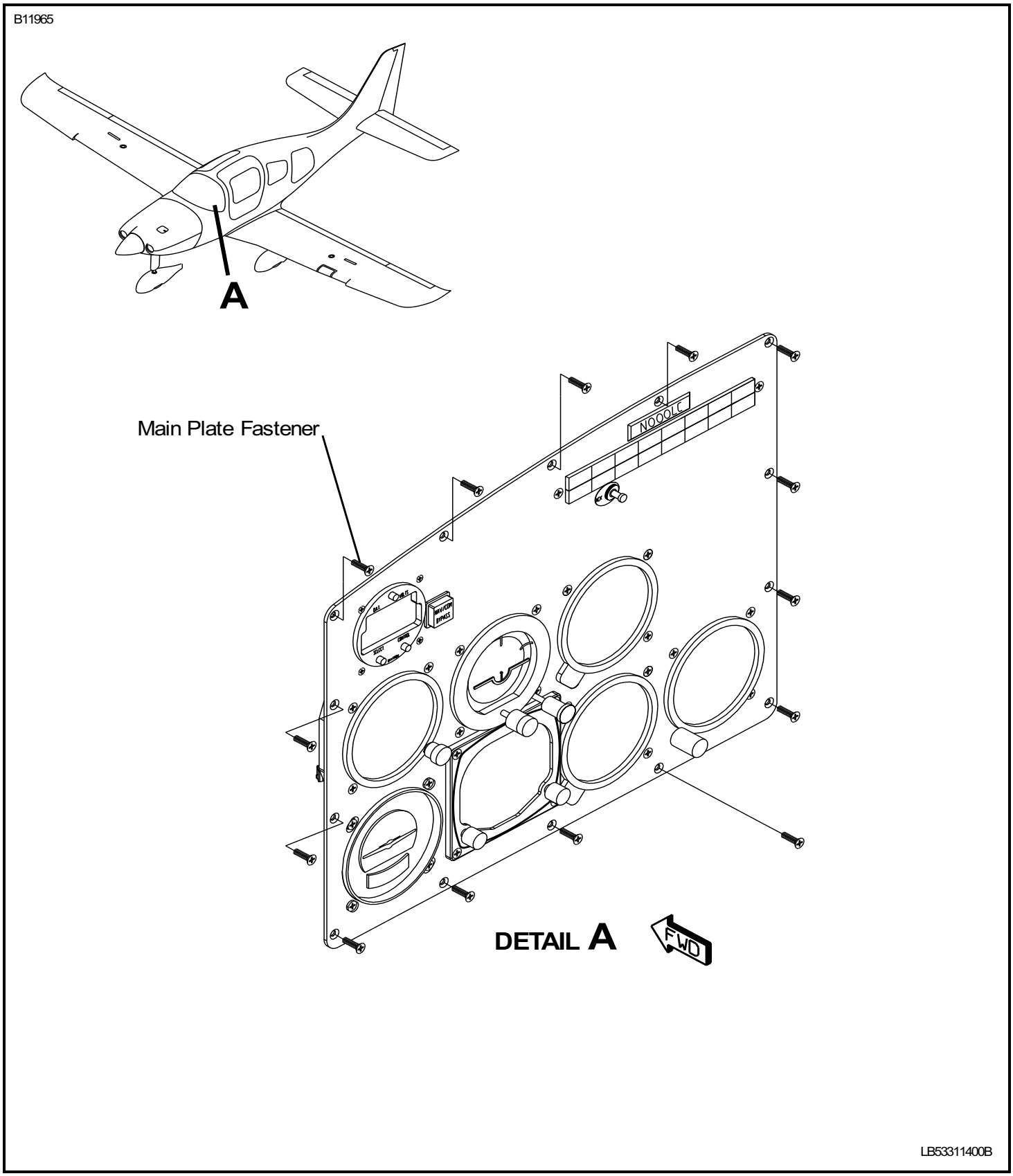
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Magnetic Compass



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Instrument Panel Main Plate



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

MARKER BEACON AND LANDING SYSTEM - MAINTENANCE PRACTICES

1. Marker Beacon Receiver

A. Marker Beacon Indicators

(1) There are two marker beacon indicators:

(a) As part of the UPSAT Apollo SL15 Audio Amplifier, described in Chapter 23-40-00.

(b) An S-Tec remote marker beacon light, located in the upper part of the main plate on the instrument panel. Refer to Figure 201.

B. Removal of Remote Marker Beacon

(1) Remove the glare shield and the glare shield electrical connectors.

(2) Unfasten the remote marker beacon indicator from the front of the panel. Refer to Figure 202.

(3) Disconnect the connector on the back side of the indicator.

(4) Remove the marker beacon indicator.

C. Replacement of Remote Marker Beacon

(1) Perform the steps for removal above in reverse order

D. Testing of Marker Beacon Indicator Lights

(1) Both the S-Tec remote indicator and the UPSAT Apollo SL15 audio amplifier marker beacon lights are tested by operating the test switch on the SL15.

(2) If any light bulb fails to illuminate, take the unit to a qualified radio technician to have the bulbs replaced.

(3) If all lights fail to illuminate, check for loose connections. If the lights still fail to illuminate, take the unit to a qualified radio technician for analysis.

E. Marker Beacon - Removal of Antenna

(1) The Marker Beacon Receiver antenna is located beneath the passenger footwell. Refer to Figure 203, Sheet 1 and Sheet 2.

(2) Removing the passenger footwell

(a) Remove all four seats.

(b) Lift the carpet in the footwell, and remove the screws connecting the footwell to the flanges.

(c) Remove the footwell from the plane.

(3) Unfasten the screws and washers connecting the antenna to the fuselage.

(4) Disconnect the antenna cable at the connector.

(5) Remove RTV white silicone sealant, if present, and remove the antenna.

F. Installation of Marker Beacon Antenna

(1) Connect the antenna cable to the antenna.

(2) Fasten the antenna to the fuselage with the screws and washers. If there is a gap between the base of the antenna and the wing skin after installation, fill the void around the antenna base with RTV white silicone sealant.

(3) Place the footwell into the flange, and fasten it.

(4) Install the carpet.

(5) Install the four seats.

2. Marker Beacon Antenna – Tuned Conditions

A. The marker beacon antenna is tuned at the factory when the airplane is manufactured. In most cases, further antenna tuning is not necessary. When the marker beacon is properly tuned, the conditions shown in Table 201 will be observed in flight. At an airplane speed of 90 knots, an altitude of 1000 feet above the marker beacon transmitter, and the receiver set at the low-sense setting, a station passage time of 13 to 20 seconds should be observed. Station passage is indicated by both a visual and an aural indication. The times listed assume that the airplane is on the centerline of the localizer course or tracking on the extended centerline of the ILS runway. If station passage times outside the parameters shown in Table 201 are observed in flight, the antenna on the airplane can be tuned using the steps described in the next paragraph.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Table 201. Marker Beacon Acceptable Conditions

Times for Marker Beacon Station Passage		
Ground Speed	**Time for Station Passage**	**Altitude AGL/Sense Setting**
90 Knots	13 to 20 Seconds	1000 feet/Low
110 Knots	11 to 16 Seconds	1000 feet/Low

B. **Marker Beacon Antenna Tuning Adjustments** - Construct a Test Antenna Platform (TAP). The TAP is a 2 foot, square piece of sheet aluminum (any thickness) with a CI-102 Comat marker beacon antenna attached in the exact center of the aluminum sheet. The gasket that comes with the antenna provides a template for drilling the attachment screw holes, the hole for the antenna jack, and the hole for the tuning slug. Be sure to install the gasket when mounting the antenna. Refer to Figure 204 and Figure 205 for a picture of the top and bottom of a typical TAP.

(1) When the TAP is assembled, attach a 6 to 10 foot antenna cable to the antenna jack on the bottom side.

(2) Remove the access cover under the wing center section, just aft of the airplane's marker beacon antenna. The cover spans the width of the airplane's underside and provides access to the aileron bellcranks and crossover assembly, flap motor, and the marker beacon tuning slug.

(3) In a level area, such as an airplane hangar, place the TAP directly below the airplane's marker beacon antenna. The TAP must be placed on a box or similar type structure so that the distance between the hangar floor and the top of the aluminum sheet is exactly 6 inches. Refer to Figure 206.

(4) When the TAP is directly under the airplane's marker beacon antenna (mirror image) and in a level position, 6 inches above the hangar floor, connect an IFR Model Nav 401 (or equivalent) signal generator to the TAP antenna cable.

(5) Turn on the master switch, avionics master switch, and audio panel, and set the marker beacon receiver to the high sense position.

(6) Turn on the signal generator, and set the selector to the marker beacon mode.

(7) Turn the signal output level of the Nav signal generator down (higher dBm) until the orange MM light on the audio panel just goes out. With an observer in the cockpit, adjust the tuning slug on the airplane's marker beacon receiver antenna with a 1/4 inch socket wrench. Rotate the tuning slug until there is a visual and aural indication in the cockpit. Since the setting of the airplane's antenna is unknown, it will be necessary to experiment with the rotation direction of the tuning slug, i.e., clockwise or counterclockwise. When performing the test, ensure that both the lights on the audio panel and repeater indicator are illuminated.

CAUTION: Do not rotate the tuning slug on the antenna more than 1-1/2 turns in either direction from where the procedure began.

(8) Repeat turning down the signal output level of the Nav signal generator until achieving peak performance from the Marker Beacon receiver and obtaining the lowest possible (highest dBm) signal from the test generator. When performing this adjustment, the minimum triggering level (MTL) of the audio panel should be at least -26 dBm. Further troubleshooting or adjustment of the audio panel should be made if -26 dBm MTL cannot be obtained.

(9) When the antenna is properly tuned, turn off the system and avionics master switches, and install the access cover.

C. **Marker Beacon Tuning Adjustments**

NOTE: Never adjust the tuning slug on the TAP antenna. It must remain positioned to the factory default setting.

3. Instrument Landing System - Nav Antenna

A. **Nav (ILS) Antenna Removal**

(1) The Nav Antenna is located in the vertical stabilizer. Refer to Figure 207.

(2) Remove the access panel on the vertical stabilizer by removing the screws.

(3) Loosen the set screw holding the left element in place.

(4) Grasp the antenna rod and twist counterclockwise to unscrew from the antenna body.

(5) Repeat step 4 for the antenna on the opposite side of the tail.

(6) Remove the screws mounting the Nav antenna body from the bulkhead.

(7) Disconnect the antenna cable from the antenna body.

B. **Nav (ILS) Antenna Installation**

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(1) Connect the antenna cable to the antenna body.

(2) Fasten the Nav antenna body to the bulkhead.

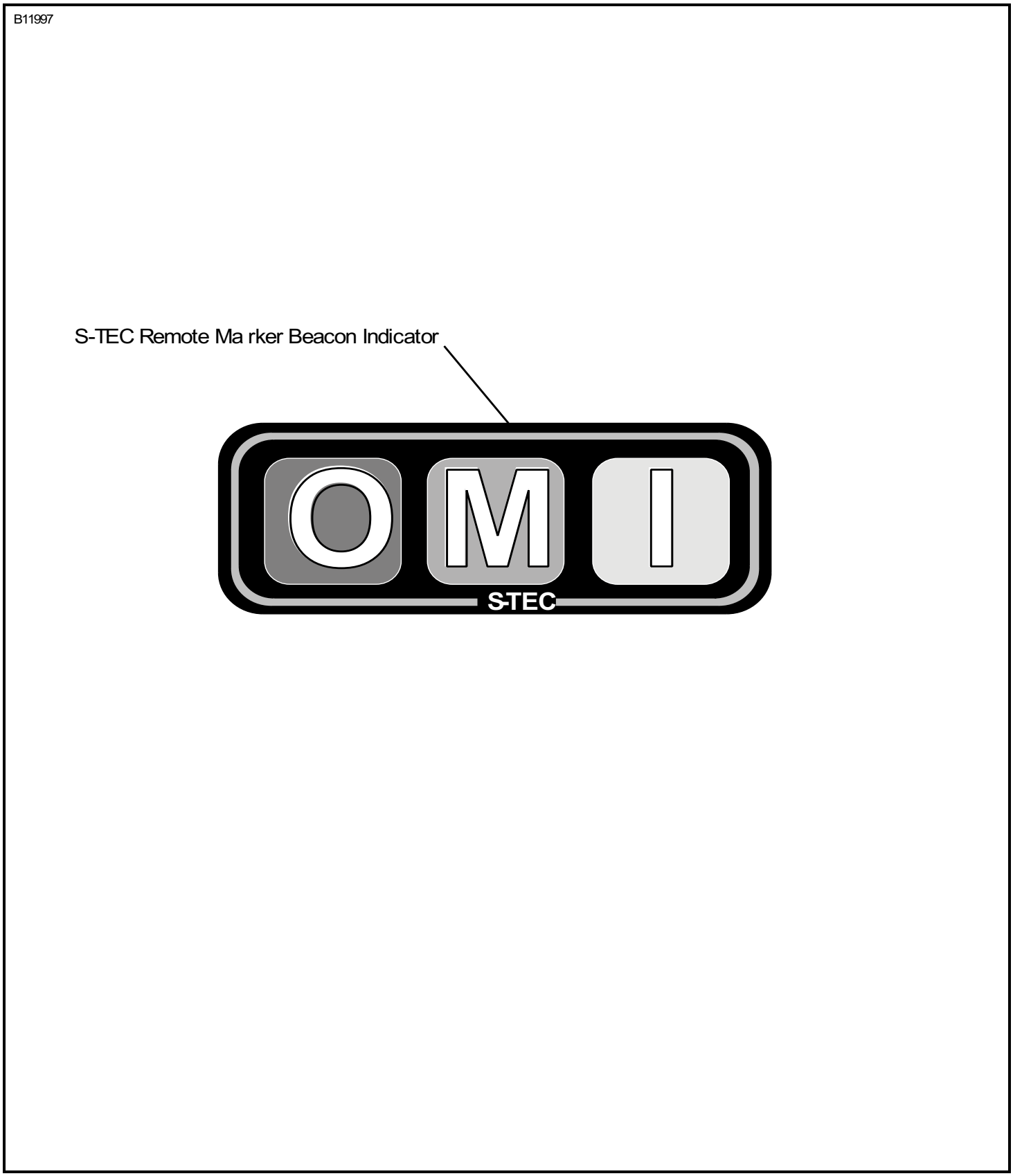
(3) Insert the antenna rods through the holes, and screw clockwise into the antenna body until snug.

(4) Tighten the set screw holding the left element in place. (The right element has Loctite on the two threads closest to the antenna rod prior to installation.)

(5) Install the access panel to the vertical stabilizer with the screws.

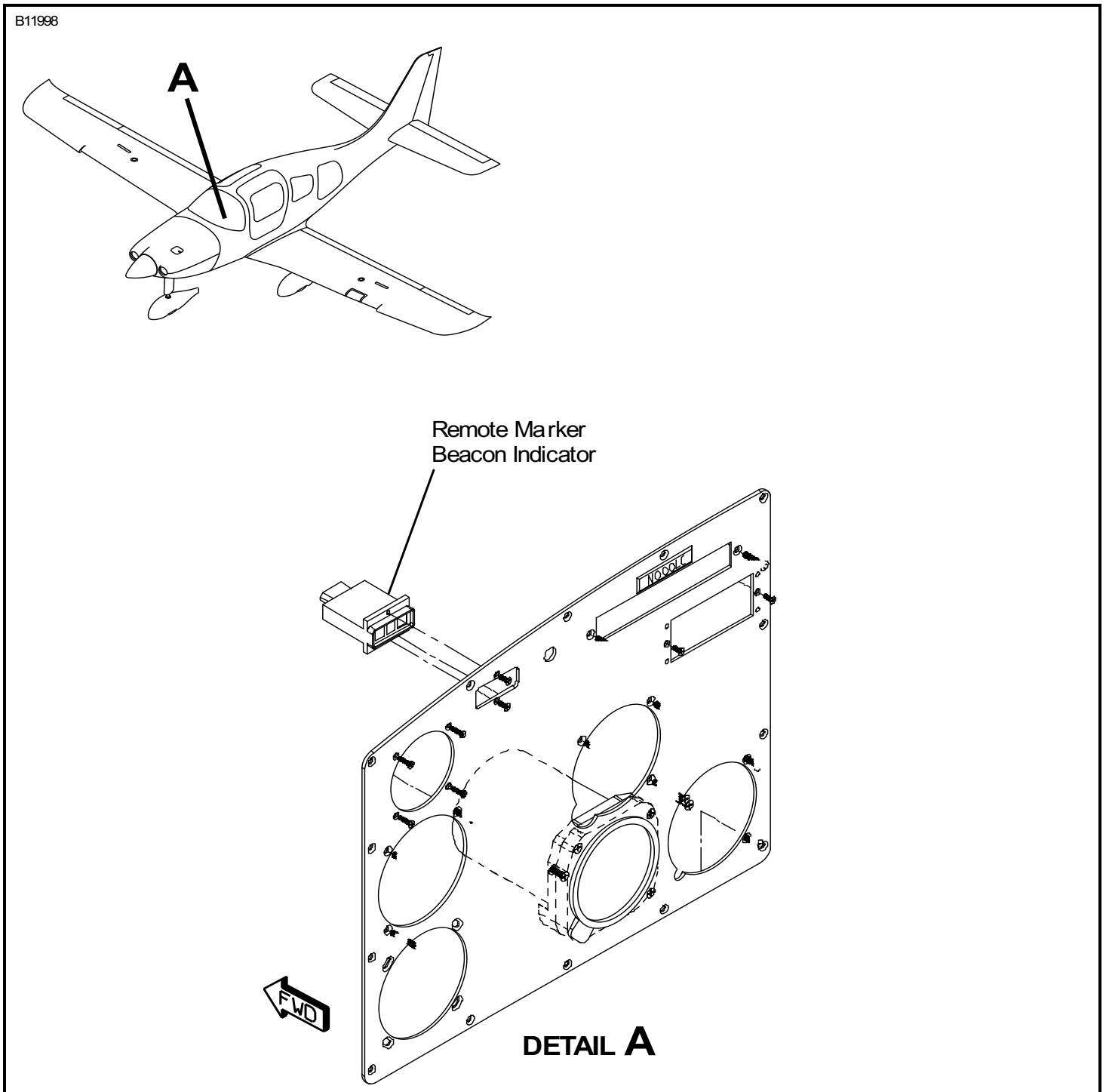
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : S-Tec Remote Marker Beacon Indicator



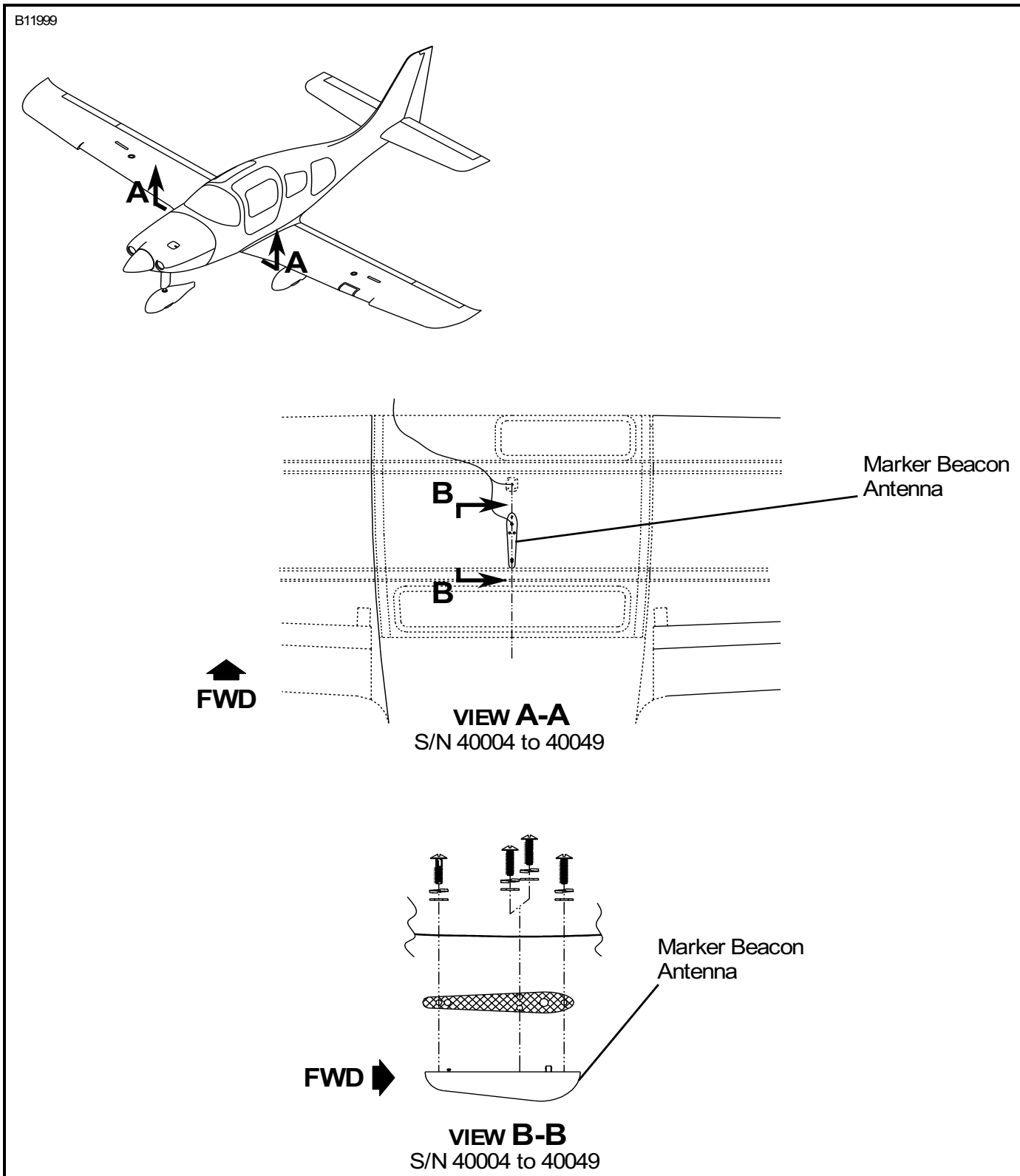
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : S-Tec Remote Marker Beacon Indicator



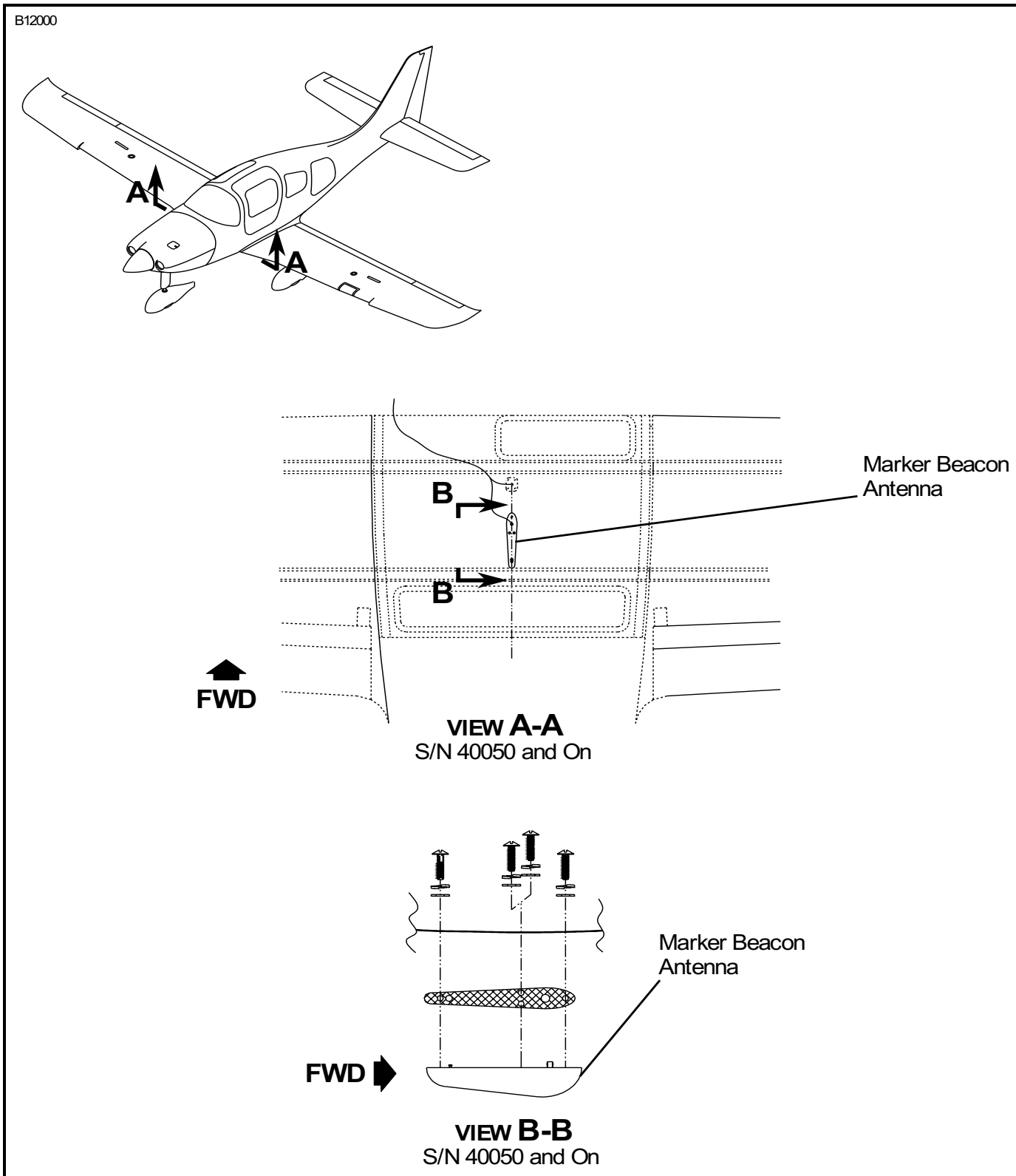
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Marker Beacon Antenna Location



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

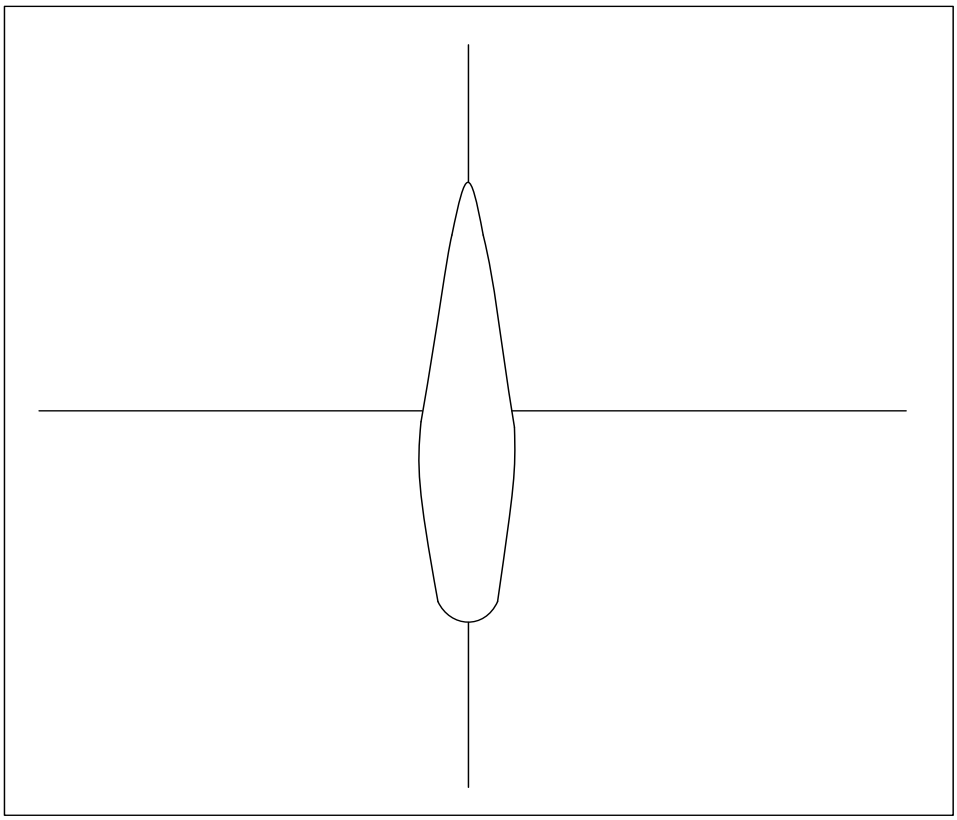
Figure 203 : Sheet 2 : Marker Beacon Antenna Location



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : TAP Top

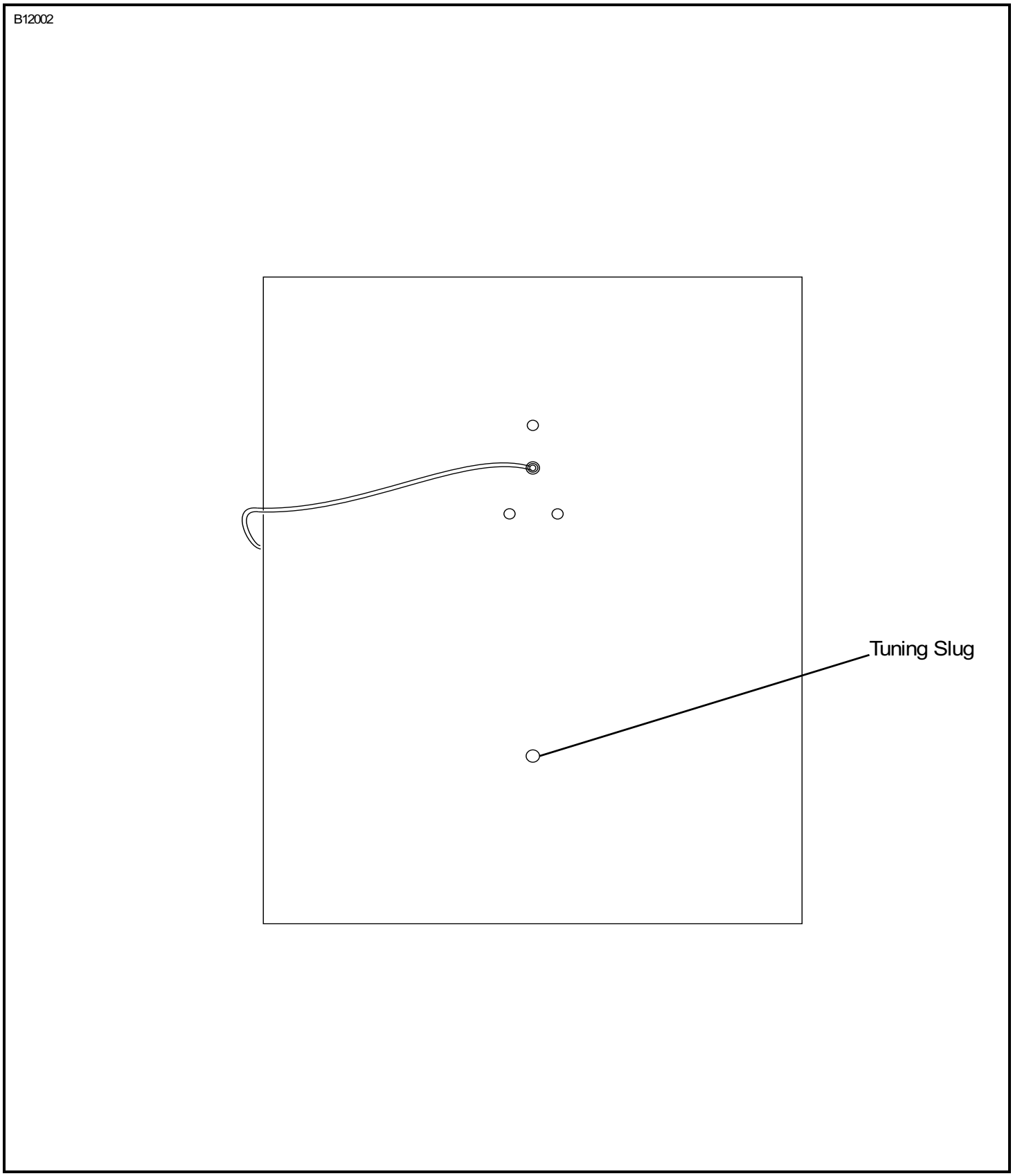
B12001



DETAIL A

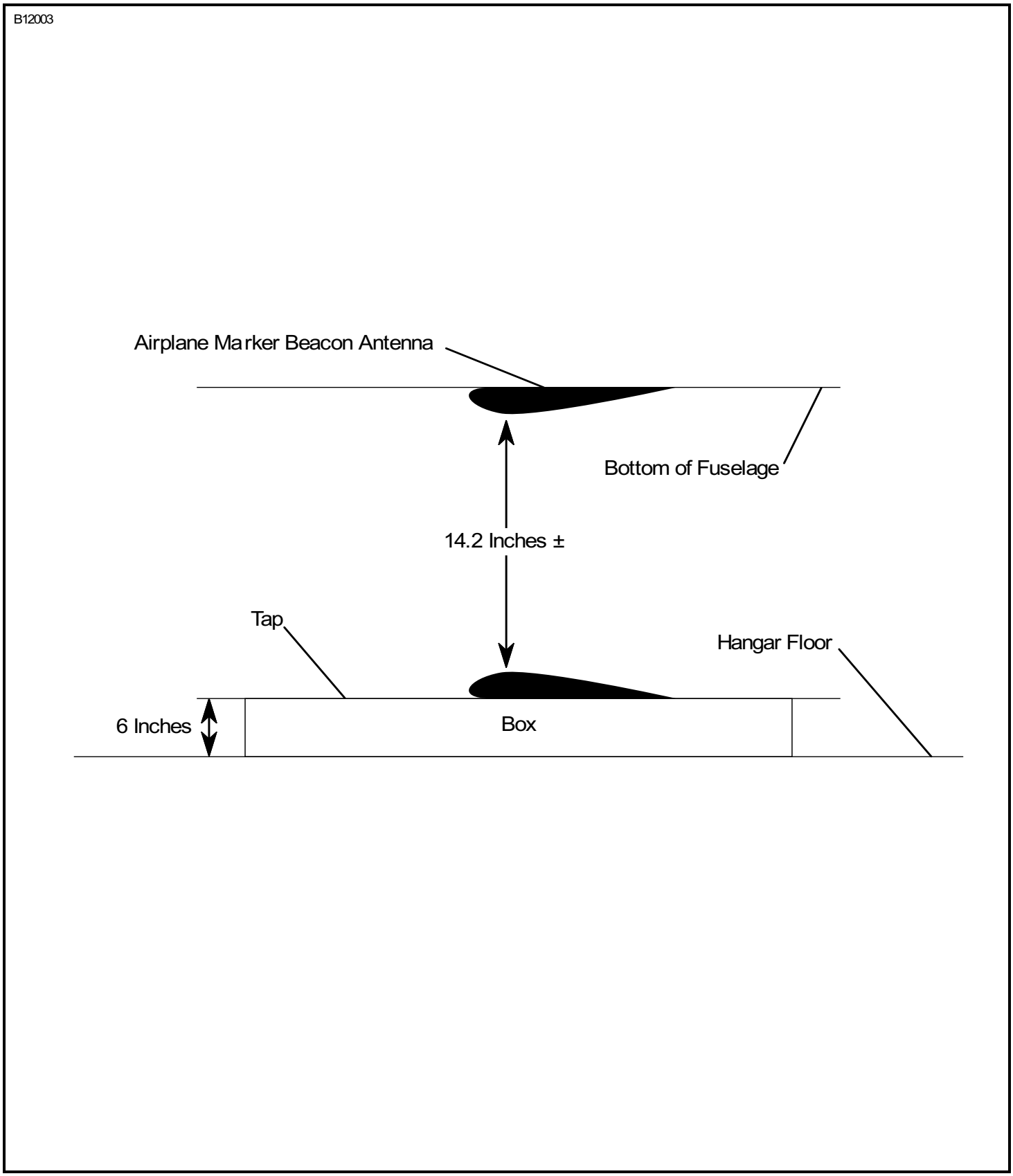
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : TAP Bottom



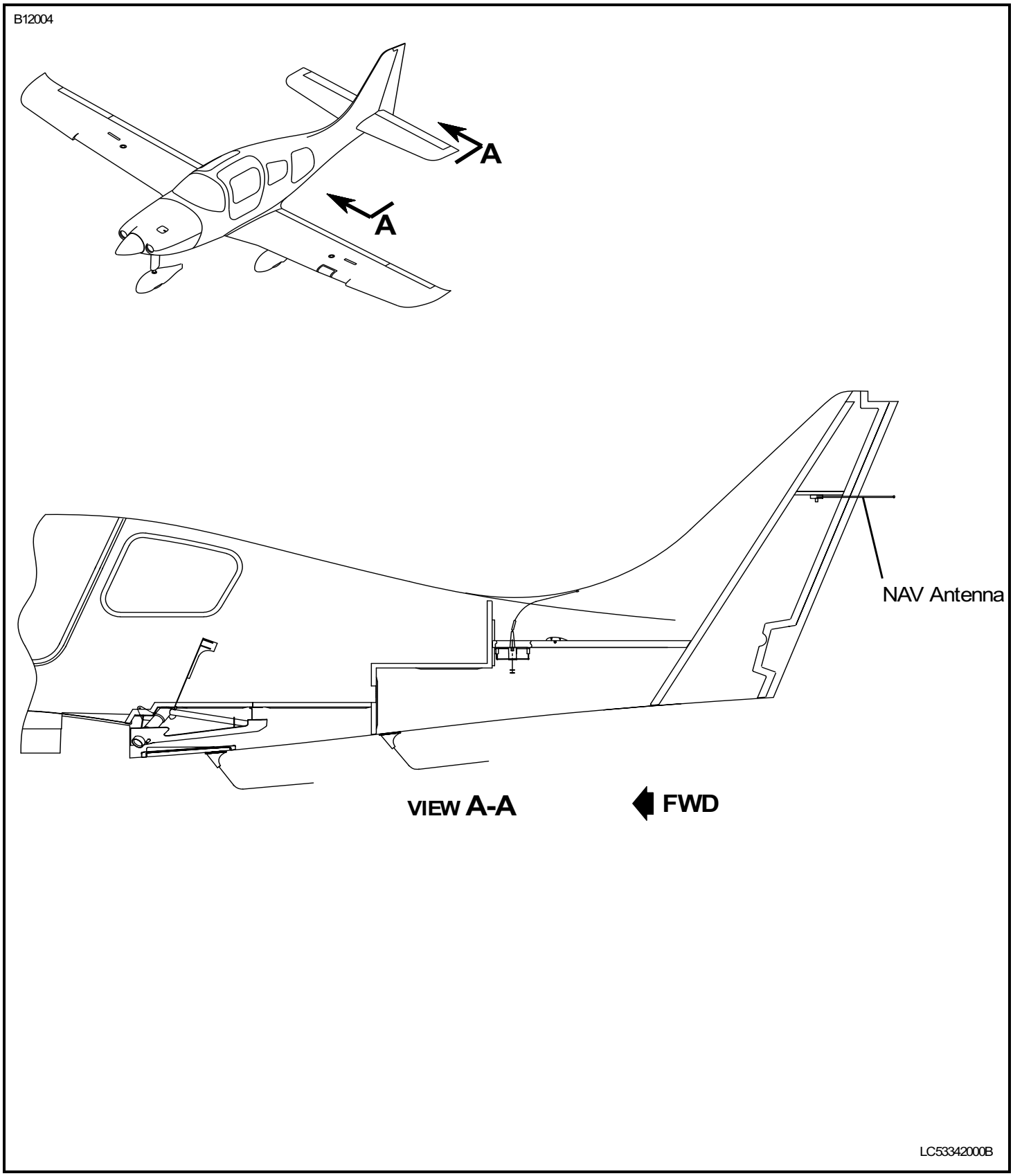
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Location of Test Antenna



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Nav Antenna Location



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

GPS, TRANSPONDER, AND GYRO - MAINTENANCE PRACTICES

1. UPSAT Apollo GX 60 GPS/comm

A. GX 60 GPS/Comm Removal

(1) The GX 60 GPS/Comm is located above the engine operating controls and can be removed by inserting an Allen wrench into the hole in the faceplate and turning counterclockwise.

(2) Slide the GX 60 GPS/Comm out of the rack, and remove the connectors.

B. GX 60 GPS/Comm Installation

(1) Fasten the connectors to the GX 60 GPS/Comm.

(2) Slide the GX 60 GPS/Comm into its slot above the engine operating devices, and lock it in place by inserting an Allen wrench into the hole on the cover plate and turning clockwise.

C. GPS Antenna

(1) The GPS antenna is located above the ELT in the space aft of the baggage compartment. Refer to Figure 201.

(2) To service the antenna, remove the aft baggage bulkhead upholstery plug and the cover plate

D. **Interface with Standby Battery System** - The GPS/Comm is an integral part of the standby battery system. Refer to Chapter 24-35-00 for details on the standby battery system.

2. UPSAT Apollo GX 50 GPS

A. The UPSAT Apollo GX 50 GPS unit is located above the engine operating console in place of the GX 60 GPS/Comm on some versions of the Cessna 300.

(1) **Removal and Installation** of the GX 50 is the same as that of the GX 60.

(2) **Initial Set-up**

(a) Turn the aircraft and avionics switches ON.

(b) With the GPS turned OFF, hold down the left-most and right-most "smart keys", and turn the GPS power ON.

(c) Rotate the large outer knob to INSTALL OPTIONS, then press SEL.

(d) Rotate the small inner knob to select IFR, then rotate the large outer knob to select YES. Press ENT when done.

(e) Rotate the small inner knob to select APPR, then rotate the large outer knob to select YES. Press ENT when done.

(f) Rotate the small inner knob to select SAR, then rotate the large outer knob to select NO. Press ENT when done.

(g) Rotate the large outer knob to the serial port configuration "CH Rx Tx" page, then press SEL (selection fields will start flashing).

(h) Use the large outer knob to select CH, then rotate the small inner knob to select 1. Press ENT when done.

(i) While still in the CH mode, rotate the small inner knob to select 2. Press ENT when done.

(j) Use the large outer knob to select Rx, then rotate the small inner knob to select NAV (for software versions prior to 3.3, select NONE). Press ENT when done.

(k) While still in the Rx mode, rotate the small inner knob to select AltEnc. Press ENT when done.

(l) Use the large outer knob to select Tx, then rotate the small inner knob to select MapCom. Press ENT when done.

(m) While still in the Tx mode, rotate the small inner knob to select GPSS (for software versions prior to 3.3, select NONE). Press ENT when done.

(n) Rotate the large outer knob "Extended MovMap Data Format" page, then Press SEL.

(o) Use the small inner knob to alternate between DISABLE and ENABLE. When ENABLE is present, press ENT to accept changes.

(p) When setup is complete and to return to normal operation, switch the unit’s power knob OFF then back ON.

(3) **Interface with Standby Battery System** - The GPS is an integral part of the standby battery system. Refer to Chapter 24-35-00 for details on the standby battery system.

3. UPSAT Apollo ACU Remote GPS Annunciator

A. ACU Remote Removal

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(1) The ACU is located in the instrument panel on the main instrument plate. Refer to Figure 202.

(2) Remove the glare shield, and remove any fittings installed into the back of the ACU.

(3) Unfasten the mounting screws on the face of the ACU.

(4) Slide the unit out of the instrument panel.

B. **ACU Remote Installation**

(1) Install any fittings into the back of the ACU remote.

(2) Slide the unit into its slot in the instrument panel, and screw in the mounting screws.

(3) Install the glare shield.

C. **ACU Remote Testing**

(1) Press "TEST" to ensure the annunciator lights are all operative. Refer to the UPSAT manual for servicing to the unit.

(2) If the annunciator lights are operative, but do not operate when the GPS receiver shows it should, check wiring (refer to wiring manual) for continuity.

(3) If no apparent wiring or bulb outage is discovered, refer to the UPSAT GPS manual for instructions. Only qualified technicians should service this unit.

D. **ACU Remote Interface with Standby Battery System** - The ACU is an integral part of the standby battery system. Refer to Chapter 24-35-00 for details on the standby battery system.

4. UPSAT Apollo SL30 NAV/Comm

A. **SL30 Nav/Comm Removal**

(1) The SL30 is located in the radio rack and can be removed by inserting an Allen wrench into the hole in the faceplate and turning counterclockwise. Refer to Figure 203.

(2) Slide the SL30 out of the rack.

(3) Remove the unit.

B. **SL30 Nav/Comm Installation**

(1) Slide the SL30 into its slot in the radio rack.

(2) Lock it in place by inserting an Allen wrench into the hole on the cover plate and turning clockwise.

C. **SL30 Nav/Comm Testing**

(1) Other than for checking for loose connections, all testing and service must be accomplished by a qualified radio technician.

D. **SL30 Nav 1 Initial Set-up Procedures** - Nav 1 interacts with the HSI located in the flight panel, bottom row under the Flight Director. This setup procedure should be done while seated in the left pilot seat with the ACU NAV/GPS button in the NAV position.

(1) Turn the aircraft and avionics power switches ON and the SL30 unit OFF.

(2) On the SL30 unit, press and hold the (arrow) and SYS buttons at the same time and turn the power knob to ON.

(3) Let go of buttons after 3 to 4 seconds.

(4) Turn the large knob one click clockwise, and follow step by step directions as given on the unit’s screen for calibrating the resolver.

(5) When done with the setup, turn the unit off and back on again.

(6) Press the NAV button, and adjust the frequency to 110.00.

(7) Press the OBS button then rotate the left hand knob with the green/yellow arrow located on the HSI instrument. The screen display on the unit should follow the rotation of the arrows on the HSI. If not, repeat the entire process.

E. **SL30 Nav 2 Initial Set-up Procedures**

(1) Follow the steps above for the SL30 Nav 1 Initial Set-up Procedures.

(2) Press the OBS button, then rotate the OBS knob on the NAV indicator instrument. The screen display on the unit should follow the rotation of the arrows on the NAV indicator instrument. If not, repeat the entire process.

F. **SL30 Nav/Comm Interface with Standby Battery System** - The #1 Nav/Comm, if the aircraft is configured with the Premium IFR package (has HSI, Flight director, GX 50 GPS, and two Nav/Comm’s), is an integral part of the standby

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

battery system. Refer to Chapter 24 for details on the standby battery system.

5. Mid-Continent Instruments MD-200 Navigation Indicator

A. **MD-200 Removal** - The MD-200 is located in the main plate of the instrument panel. Refer to Figure 204.

(1) Turn off the master switch.
(2) Disconnect the main plate from the instrument panel.
(3) Disconnect the connector on the back of the MD-200.
(4) Remove the screws connecting the MD-200 to the instrument panel.

B. **MD-200 Installation**

(1) Place the MD-200 in its hole in the instrument panel.
(2) Connect the electrical connectors into the back of the MD-200.
(3) Refasten the screws connecting the MD-200 to the main plate of the instrument panel.
(4) Install the main plate of the instrument panel.

6. UPSAT Apollo SL70 Transponder

A. **SL70 Removal** - The SL70 is located in the radio rack.

(1) Turn off the master switch.
(2) Remove the SL70 by inserting an Allen wrench into the hole in the faceplate and turning counterclockwise. Refer to Figure 205.
(3) Slide the SL70 out of the rack.
(4) Disconnect the electrical and antenna connections.

B. **SL70 Installation**

(1) Perform the steps for removal above in reverse order.

C. **Transponder Antenna Removal** - (Refer to Figure 206)

(1) Turn off the master switch.
(2) Remove the access plate under the center of the wing (aircraft belly area).
(3) Unfasten the antenna cable.
(4) Unfasten the antenna, and remove the antenna and the gasket.

D. **Transponder Antenna Installation**

(1) Turn off the master switch.
(2) Follow the steps for removal above, in reverse order.
(3) Ensure proper electrical bonding of the antenna to the aircraft surface.
(4) Restore electrical power.

E. **Initial Set-up Procedure**

(1) Turn the aircraft and avionics power switches ON and the SL70 unit OFF.
(2) On the SL70 unit, press and hold the IDENT and ALT buttons at the same time, and turn the power knob to ON while holding the buttons for 3 to 4 seconds.
(3) Rotate the large outer knob to the SL70 CONF page.
(4) Rotate the small inner knob to the ASRC page.
(5) Press the IDENT button (the altitude field will start to flash), and rotate the small inner knob to select SER.
(6) Press the IDENT button to save the selection.
(7) Rotate the small inner knob to the BAUD page.
(8) Press the IDENT button (the BAUD field will start to flash), and rotate the small inner knob to select 1200.
(9) Press the IDENT button to save the selection.
(10) When setup is complete, return to normal operation by switching the unit's power knob to OFF then back to ON.

7. Bendix/King KG 102A Remote Gyro and KI525 A HSI Indicator

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

A. **KG 102A Remote Gyro Removal** - The KG 102A is located in the avionics shelf under the baggage compartment floor. Refer to Figure 207.
   (1) Remove the carpet and access panel from the baggage compartment floor.
   (2) Loosen the mounting screws that hold the KG 102A in its tray. Refer to Figure 208.
   (3) Disconnect all connectors to the unit.
   (4) Remove the unit.

B. **KG 102A Remote Gyro Installation** - (Refer to Figure 208.)
   (1) Connect the wiring and connectors to the KG 102A.
   (2) Place the KG 102A in its place in the instrument shelf.
   (3) Install screws to connect the KG 102A to the tray and torque screws 10 to 12 inch-lbs.
   (4) Install the access panel.
   (5) Replace the carpet.

C. **KMT 112 Slaving Transmitter Removal** - (Refer to Figure 208.)
   (1) Remove the access panel on the underside of the left outboard wing. Refer to Figure 207.
   (2) Disconnect the electrical connections.
   (3) Unfasten the nuts, and remove the unit.

D. **KMT 112 Slaving Transmitter Installation - Use King Installation Manual**
   (1) Install the unit with the arrow on top facing forward, using the same hardware or new brass hardware only.
   (2) Connect the electrical connectors.
   (3) At a compass rose, adjust the unit per manufacturer's manual.
   (4) Finger-tighten the nuts. Do not over-tighten.
   (5) Install the access panel.

E. **KI 525A Removal** - (Refer to Figure 209.)The KI 525A is located in main plate of the instrument panel.
   (1) Unfasten the main plate, and carefully slide it out far enough to work on the back side of the KI 525A.
   (2) Unfasten the mounting screws that surround the KI 525A, and slide it forward while slipping the mounting plate off the back of the unit.
   (3) Disconnect connectors installed into the back of the KI 525A.

F. **KI 525A Installation** - (Refer to Figure 209.)
   (1) Slide the unit into the instrument panel, and slide the mounting bracket over the back of the unit.
   (2) Install the connectors into the back of the KI 525A.
   (3) Fasten the mounting screws through the front of the instrument panel and then into the mounting plate. Torque screws 6 to 8 inch-lbs.

G. **KA 51B Slaving Control Removal** - (Refer to Figure 207.) The KA 51B is located in the engine instrument plate of the instrument panel.
   (1) Unfasten the engine instrument plate, and carefully slide it out far enough to work on the backside of the KA 51B.
   (2) Unfasten the mounting screws from the KA 51B, and slide it forward.
   (3) Disconnect the connectors installed into the back of the KA 51B.

H. **KA 51B Installation** - (Refer to Figure 207.)
   (1) Follow the steps for removal, above, in reverse order.
   (2) At a compass rose, adjust the unit per the manufacturer’s manual.

8. Bendix-King KI 256 Flight Director

A. **Flight Director Removal** - The KI 256 is located in the main plate of the instrument panel.
   (1) Remove the fasteners surrounding the main plate of the instrument panel. Refer to Section 34-10-00, Figure 207.
   (2) Slide the plate out far enough to work on the back side of the KI 256.
   (3) Unfasten the mounting screws that surround the KI 256, and slide it forward while slipping the mounting plate off the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

back of the unit.

(4) Disconnect the fittings and connectors installed in the back of the KI 256.

B. **Flight Director Installation** - (Refer to Figure 210.)

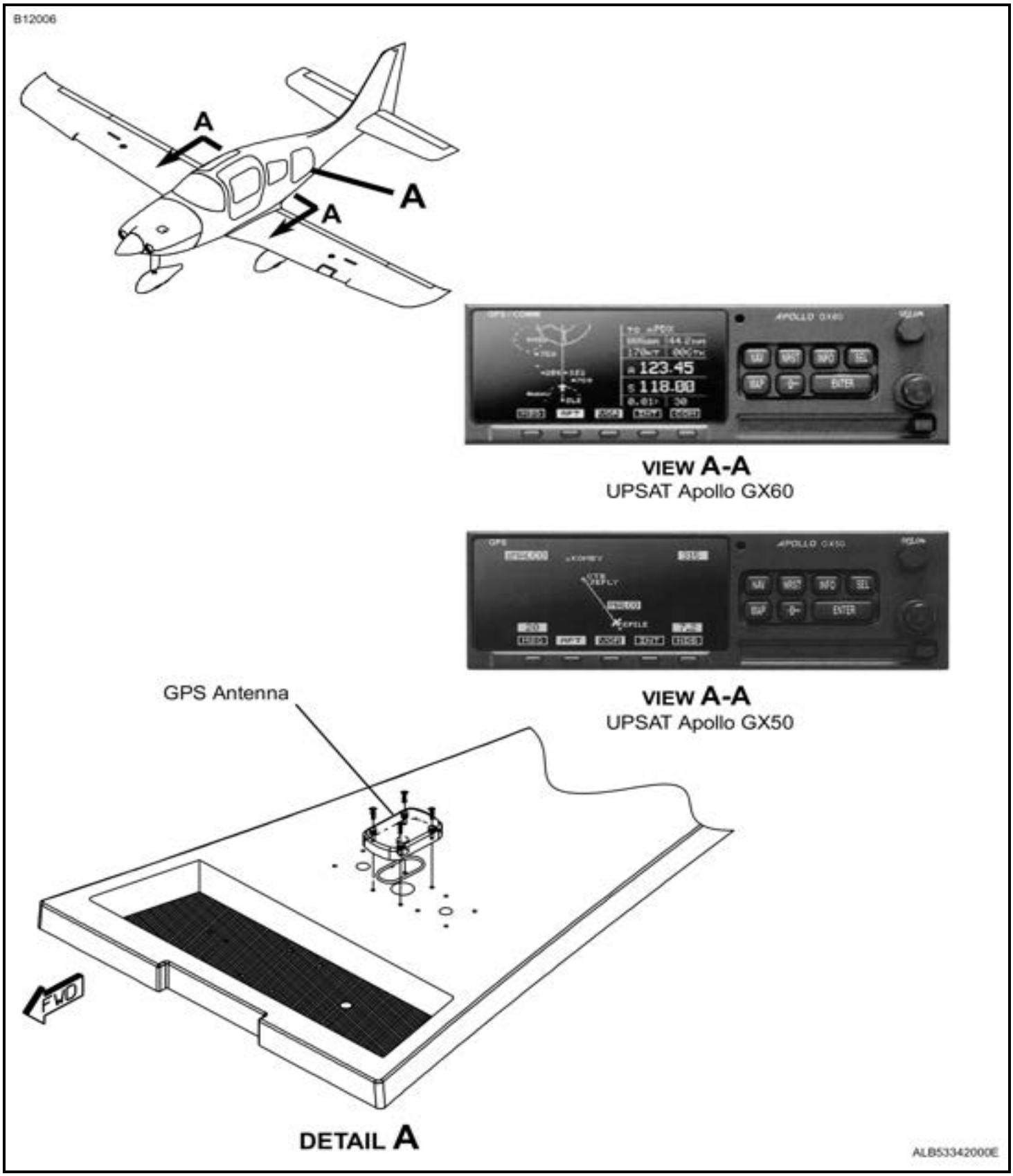
(1) Slide the unit into the instrument panel, and slide the mounting bracket over the back of the unit.

(2) Install the fittings into the back of the KI 256.

(3) Fasten the mounting screws through the front of the instrument panel, and then into the mounting plate. Torque screws 6 to 8 inch-lbs.

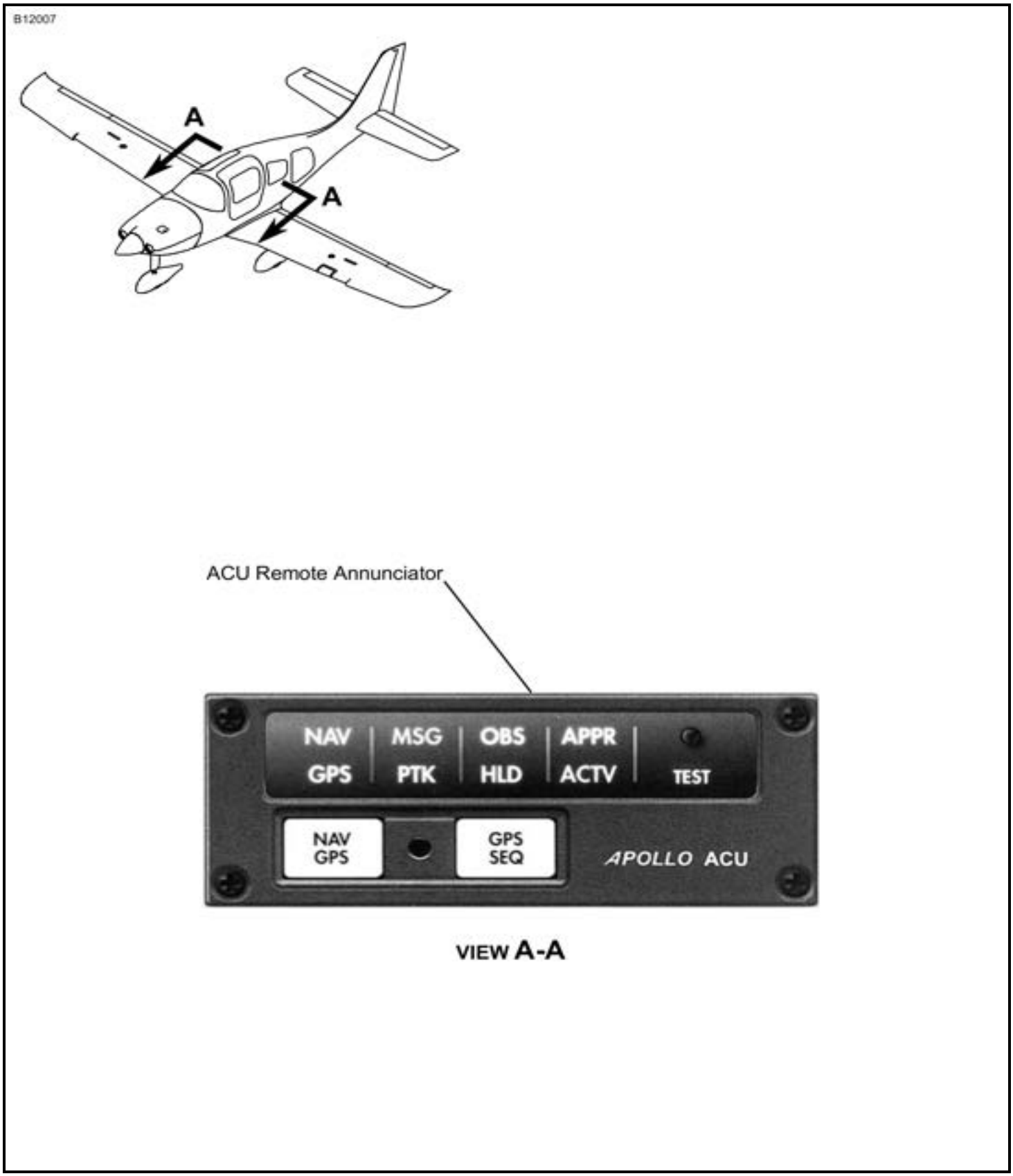
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : UPSAT GPS System



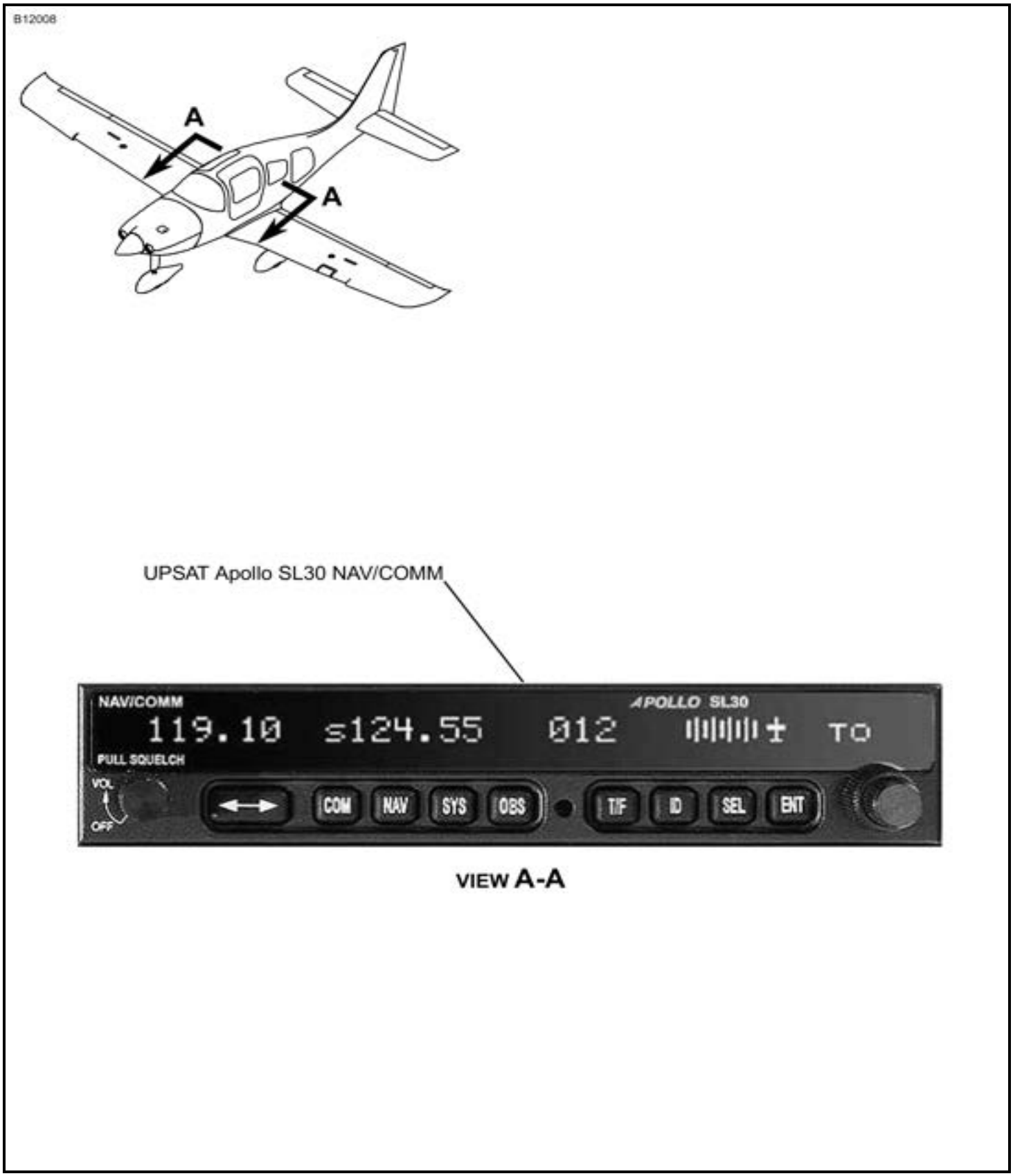
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : ACU Reomote Annunciator



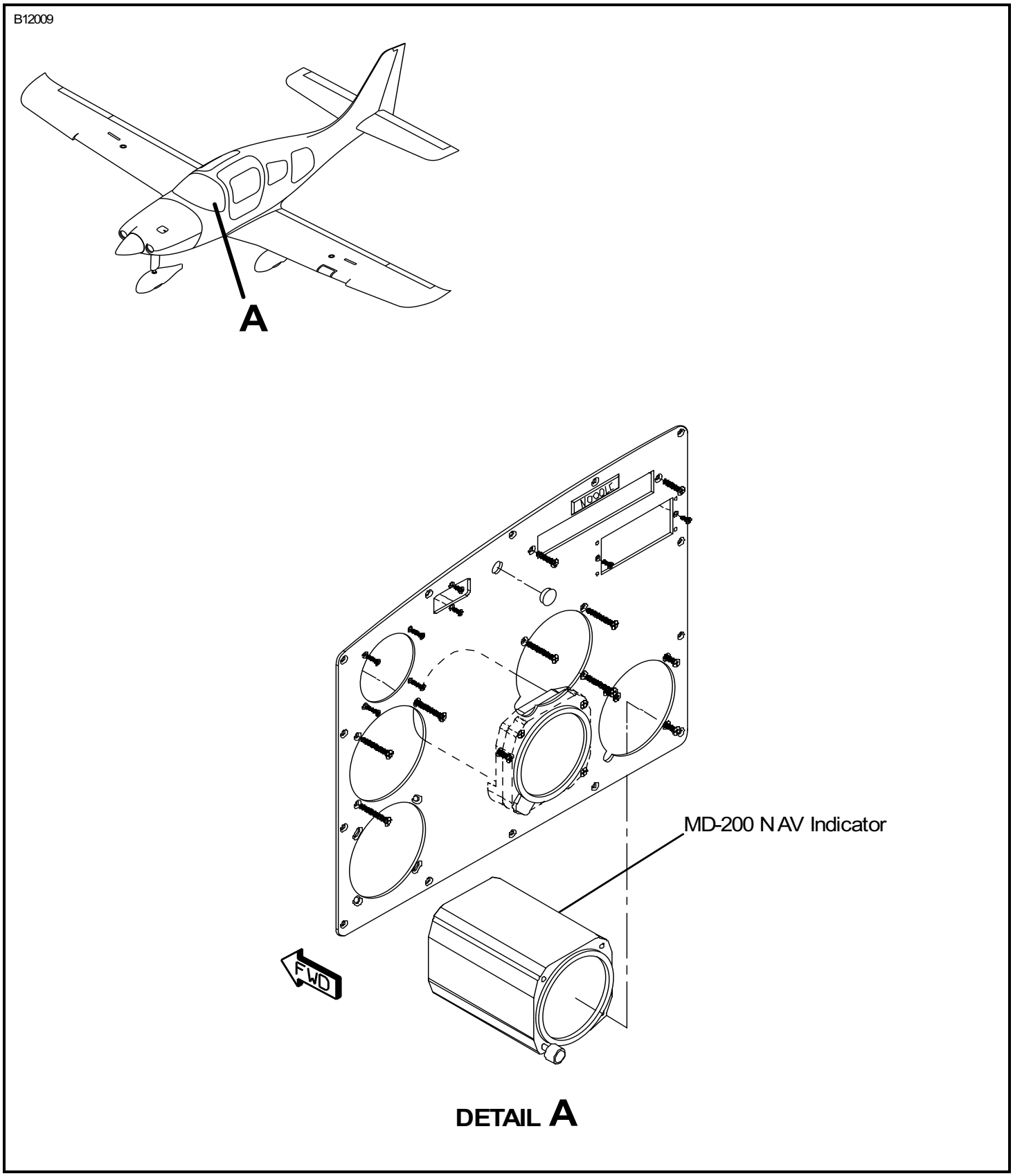
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : UPSAT Apollo SL30 Nav/Comm



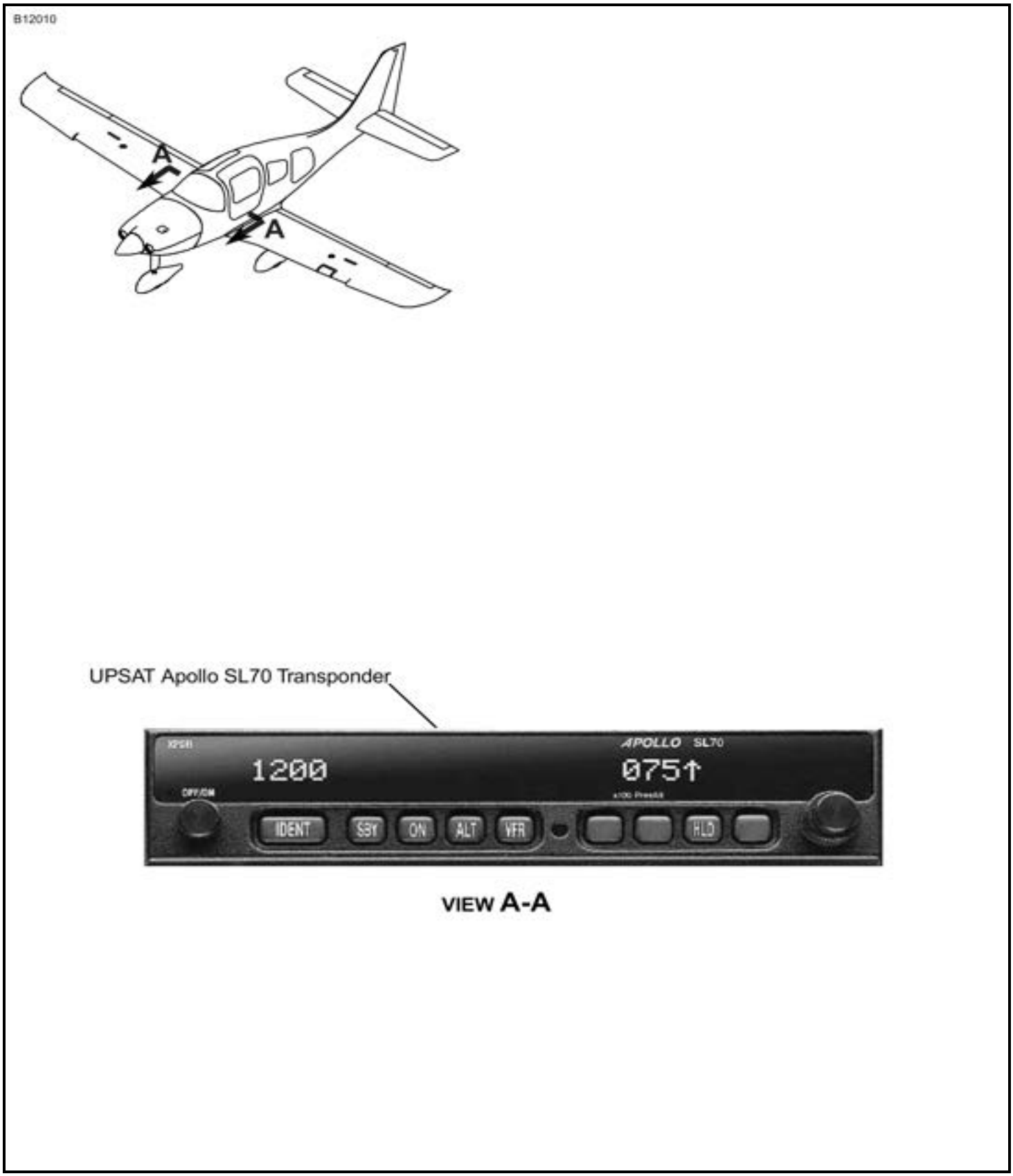
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Mid Continent Instruments MD-200 Nav Indicator Location



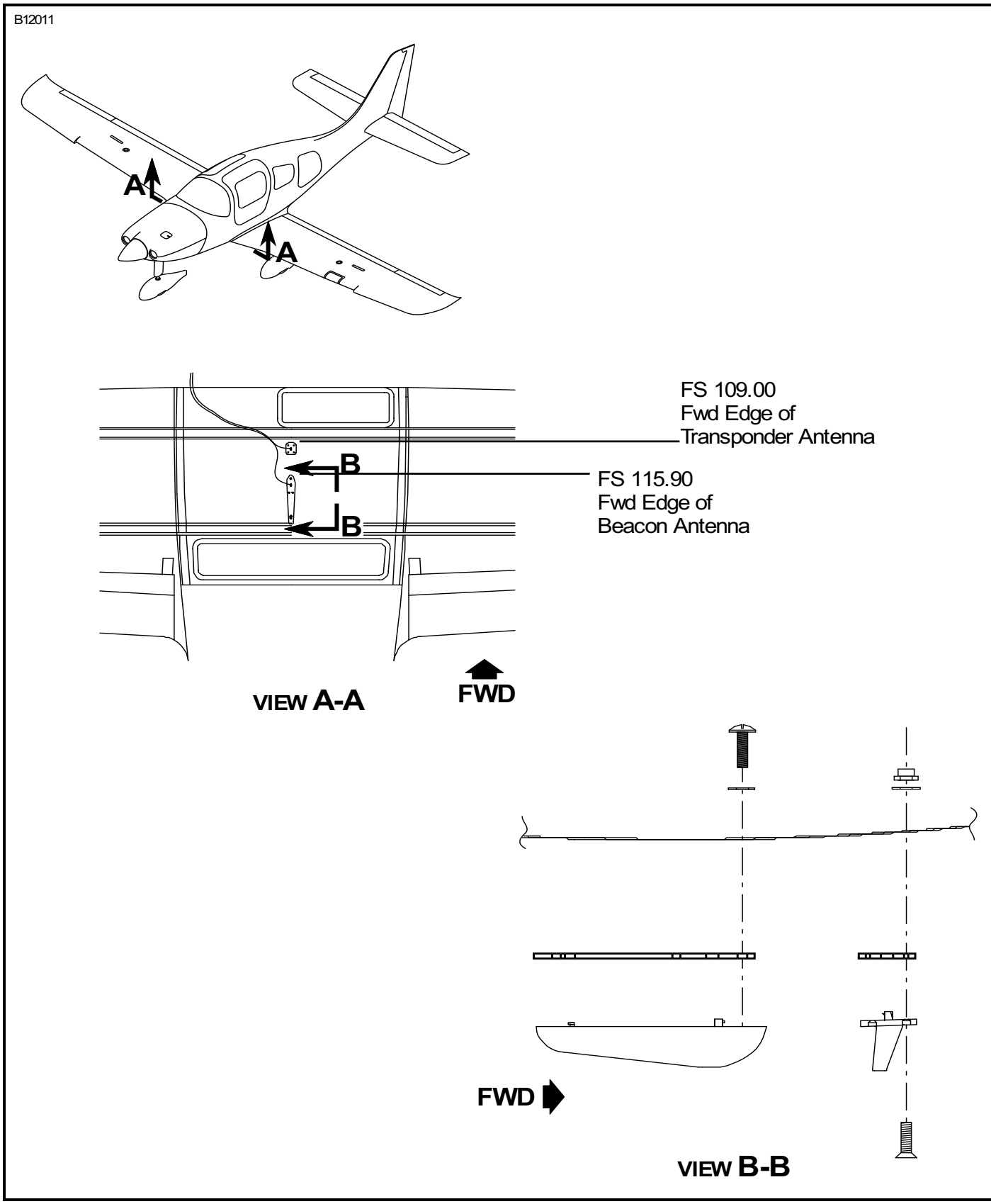
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : UPSAT Apollo SL70 Transponder



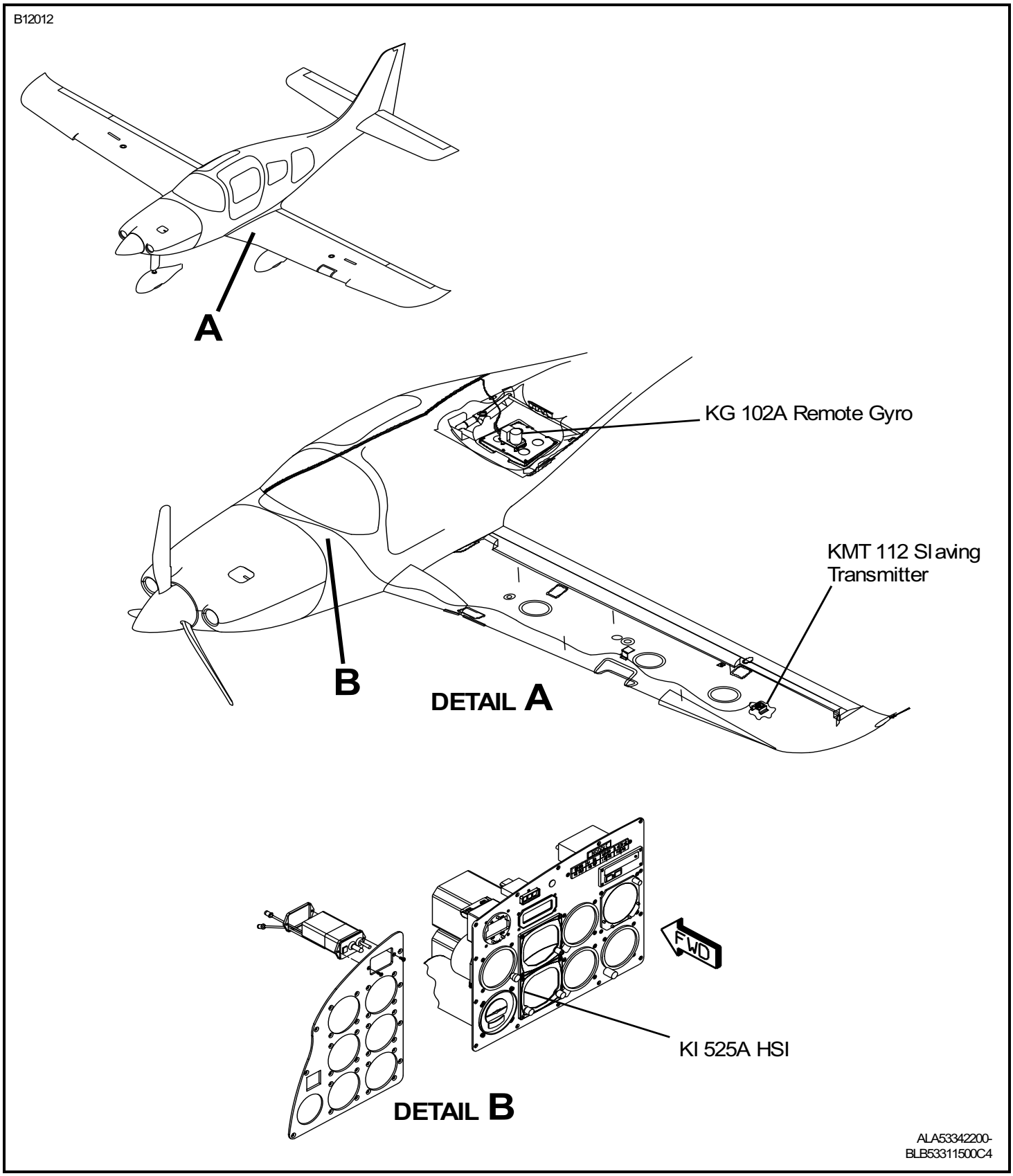
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Transponder Antenna Location



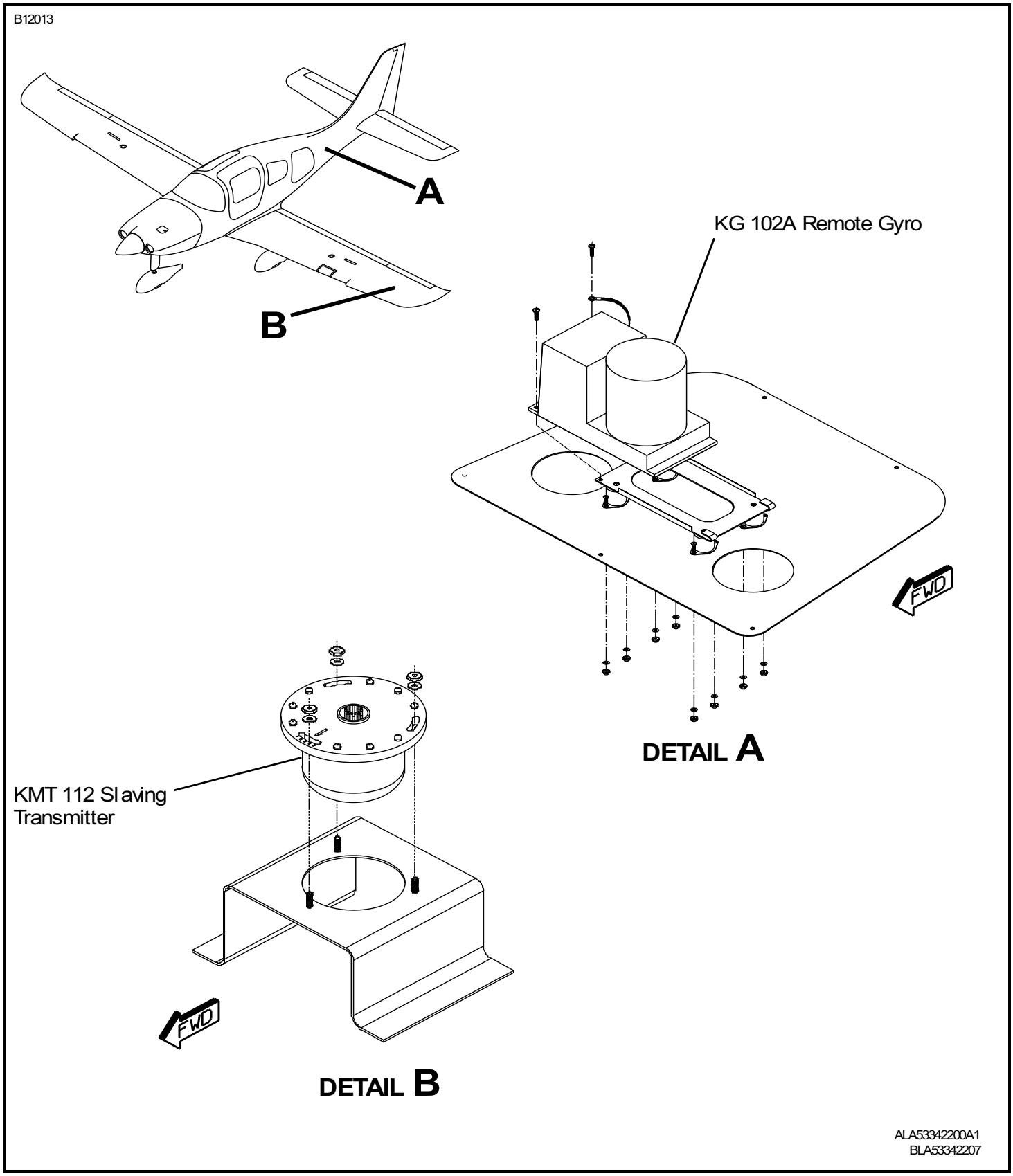
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : HSI - Remote Slaving System



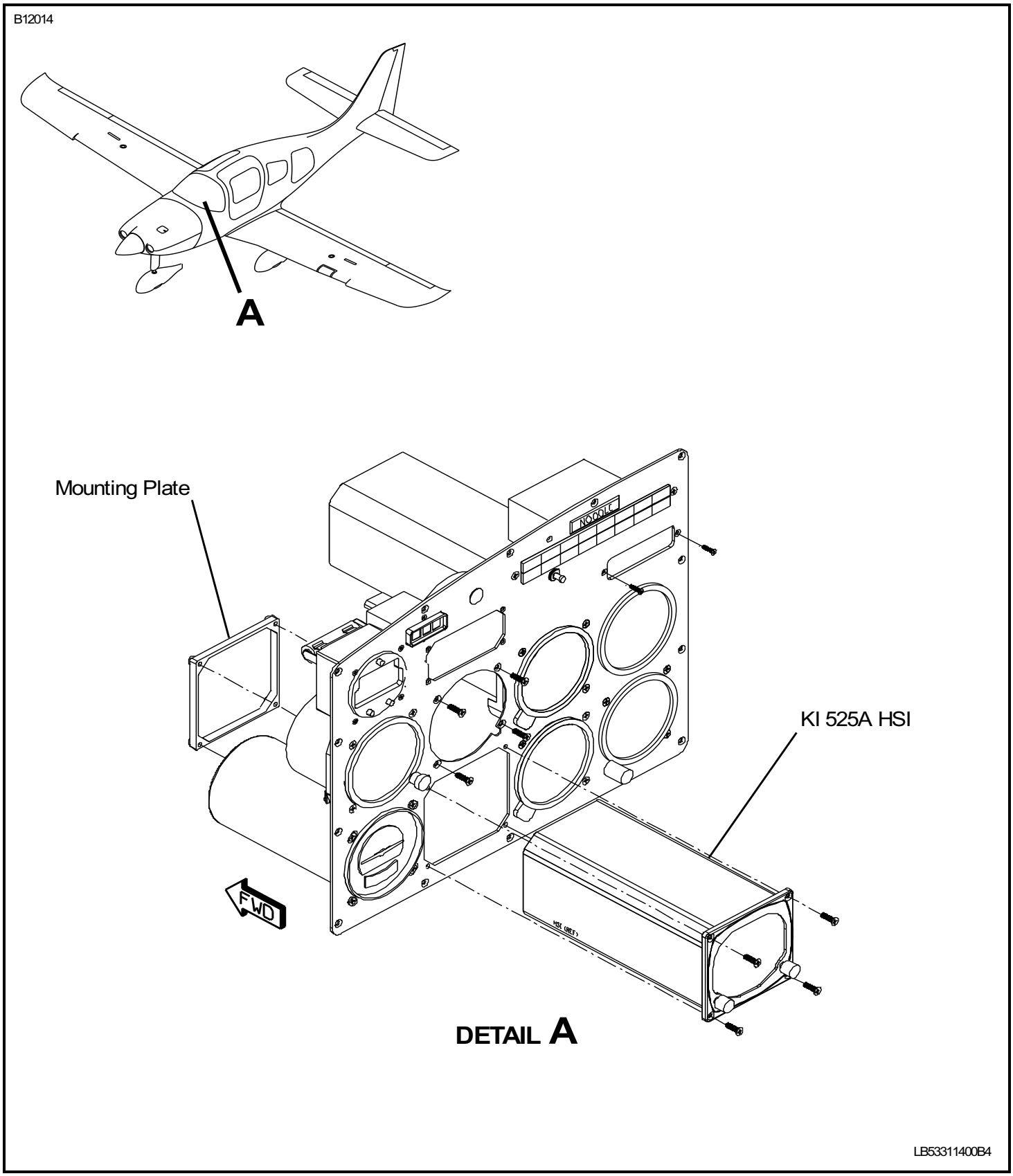
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : HSI Remote System Installation



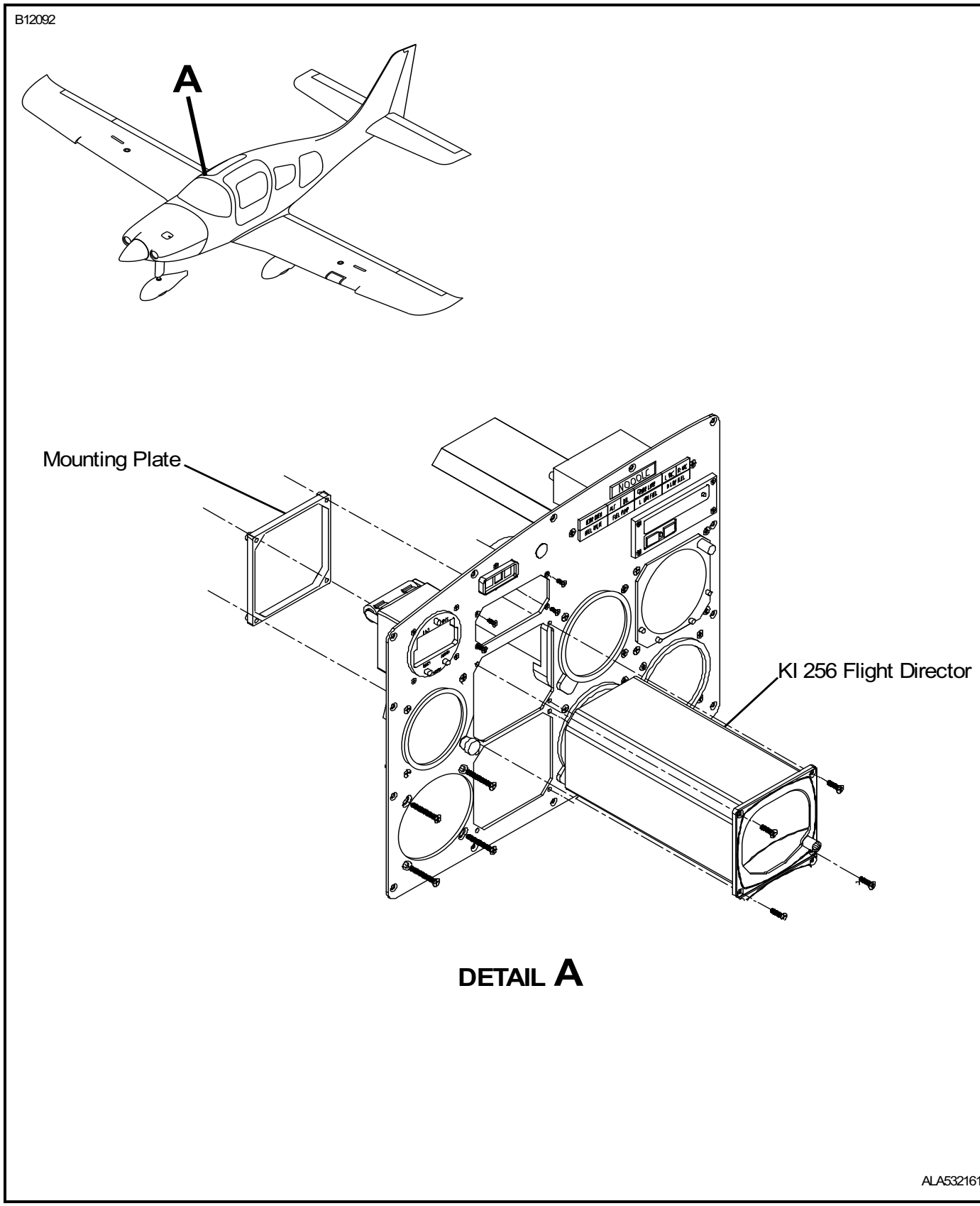
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : KI 525A HSI Installation



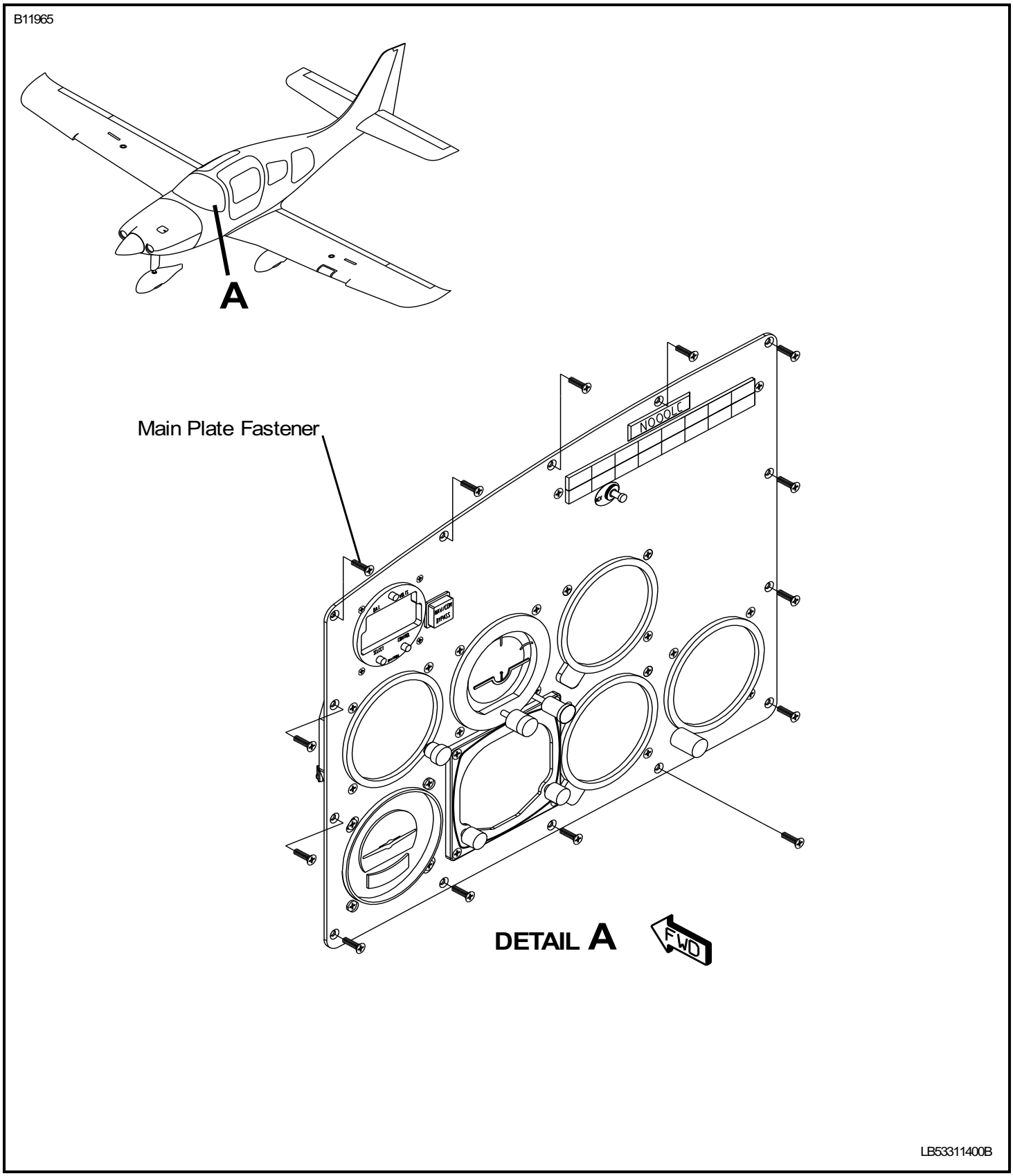
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 1 : Bendix-King KI 256 Flight Director Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Instrument Panel Main Plate



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FLIGHT DISPLAY SYSTEMS - MAINTENANCE PRACTICES

1. Avrotec/Avidyne FMP300 Moving Map Display

A. **Moving Map Display Removal** - The moving map display is located in the instrument panel and its remote controller is located on the front of the center console just below the fuel selector knob.

(1) Remove the glare shield, instrument panel main plate (refer to Section 34-10-00, Figure 207), and the right side plate.

(2) Move the main plate away from the instrument panel far enough to disconnect and label all connectors, then completely remove the panel.

(3) Disconnect any connectors installed into the back of the moving map.

(4) Using a long Phillips screwdriver, reach through the right side panel and with the left hand, guide the screwdriver to the mounting screws on the right side of the display. Remove the screws.

(5) Reaching through the area where the main plate was, unfasten the mounting screws from the left side of the display.

(6) Tilt the display back (towards the firewall), and slide it out of the main plate opening in the instrument panel.

B. **Moving Map Display Installation**

(1) Perform the steps for removal above in reverse order. Refer to Figure 201

C. **Remote Controller Removal**

(1) Remove the side access panel on the center console.

(2) Unfasten the mounting screws from the back of the controller.

(3) Unfasten the connector from the back of the controller.

(4) Remove the controller.

D. **Remote Controller Installation**

(1) Fasten the connector to the back of the controller. Refer to Figure 202.

(2) Insert the controller into position, and fasten the mounting screws. Torque screws 10 to 12 inch-lbs.

(3) Replace the side panel.

E. **Moving Map Initial Set-up Procedures**

(1) Turn on the aircraft and avionics power switches.

(2) Turn on the FMP300 unit using the rotary power switch located near the upper left corner of the unit.

(3) Wait for the unit to power up and cycle to the Avidyne screen with no footer (approximately 3 minutes).

(4) Depress the MENU knob on the data input device located in the center console below the fuel tank selector knob.

(5) Rotate the MENU knob to scroll the on-screen menu to SETUP.

(6) Depress the MENU knob to accept the selection SETUP.

(7) Rotate the MENU knob again to scroll the on-screen menu to DEVICES.

(8) Depress the MENU knob to accept the selection DEVICES.

(9) Rotate the MENU knob to scroll the on-screen menu to LIGHTNING.

(10) Depress the MENU knob to accept the selection LIGHTNING.

(11) Rotate the large unmarked outer knob on the data input device to select SENSOR TYPE.

(12) Rotate the small unmarked inner knob on the data input device to select WX500/GPS Heading/and Lightning ahead warning.

(13) Rotate the large outer knob to select OPERATIONAL MODE.

(14) Rotate the small inner knob to select WEATHER.

(15) Confirm HEADING and LIGHTNING are enabled.

(16) Press ENT on the data input device to accept changes.

(17) Again access the SETUP then DEVICES menus as detailed above.

(18) Select GPS SETUP from the on-screen menu and confirm or change the set-up as shown in Table 201.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Table 201. GPS Setup

Use Large Outer Knob To Highlight Selections Listed Below	Use Large Outer Knob To Highlight Selections Listed Below
Receive	King/Aviation Format
COM Port	COM1
BAUD Rate	9600

(19) Press ENT on the data input device to accept changes.

(20) To shut the unit down press ESC on the data input device one or more times until back at the setup screen.

(21) Check for local position Sectional Load, and verify local position on the map.

(22) Rotate the MENU knob to highlight SHUT DOWN.

(23) Depress the MENU knob to accept the selection SHUT DOWN.

(24) Press the ENT button, wait for the screen message OK TO TURN OFF SYSTEM.

(25) Turn the rotary power switch to the OFF position.

F. **Moving Map Display Testing and Operation**

(1) Refer to manufacturer's instructions.

2. MX20 Multi-Function Display

A. **Display Removal** - The map displays are located in the instrument panel, and the controller is located on the display unit. Refer to Figure 203.

(1) Insert a 3/32 inch hex wrench through the hole at the bottom center of the unit you want to remove.

(2) Turn the wrench counterclockwise at least 5 turns, and gently pull the unit away from the instrument panel until free.

B. **Display Installation**

(1) Slide the unit into the tray and insert a 3/32 inch hex wrench through the hole at the bottom center of the unit you want to remove.

(2) Turn the wrench clockwise while pushing on the unit. Do not over-torque the locking screw.

C. **Initial Set-up Procedure**

(1) Turn the aircraft power and MX20 power to ON.

(2) Immediately after the self-test of the unit is complete, press line select keys 1, 4, and 6 in sequence. Do not press any other buttons before starting the sequence. (Line select keys are located vertically along the right hand side of the MX20 unit below the rotary power knob, and are numbered in order with the top key as 1.

(3) Depress the FN function key, one or more times until INSTL is displayed above the smart keys.

(4) Select the INSTL function by pressing the smart key directly below the INSTL label on the screen. The Enable/Disable Functions will be the first screen to appear and FUNC will be highlighted above the smart keys.

(5) Set the Enable/Disable Functions per Figure 204, Sheet 1 and Sheet 2 by pressing the line key next to the function label.

(6) Press the smart key below the DATA label while still in the INSTL function. Set the External Data Sources per Figure 205, Sheet 1 and Sheet 2 by pressing the line key next to the function label.

(7) Press the smart key below the MISC label while still in the INSTL function. Leave everything on these pages at factory defaults as shown in Figure 206, Sheet 1 and Sheet 2.

NOTE: After making final setting adjustments, do not power off for 30 seconds.

(8) Press Enter/Menu to confirm all settings.

(9) After the 30-second waiting period, turn the MX20 power off to apply all configuration settings.

3. WX-500 Stormscope

A. WX-500 Stormscope Processor and Tray Removal - (Refer to Figure 207.)

(1) Disconnect the wiring connectors.

(2) Remove the locking nut on front of the mounting tray.

(3) Slide out the stormscope from the mounting tray.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(4) Remove the four 10-32 self-locking nuts, washers, screws, and spacers, and remove the stormscope mounting tray from the avionics shelf.

B. WX-500 Processor and Tray Installation - (Refer to Figure 207.)

(1) Install the four 10-32 self-locking nuts, washers, screws and spacers to attach the tray to the avionics shelf.

(2) Push the processor into the mounting tray aligning the holes on the opposite side of the handle with the pins on the tray.

(3) Tighten locking nut to secure the processor to the tray.

(4) Reconnect wiring connectors.

C. WX-500 Stormscope Antenna Removal - (Refer to Figure 208.)

(1) Remove the antenna wiring connector.

(2) Remove two screws attaching the antenna and gasket to the fuselage and antenna plate.

(3) If necessary, remove two screws attaching the antenna plate to the fuselage. If these screws do not go through the gasket, they must be removed.

D. WX-500 Stormscope Antenna Installation - (Refer to Figure 208.)

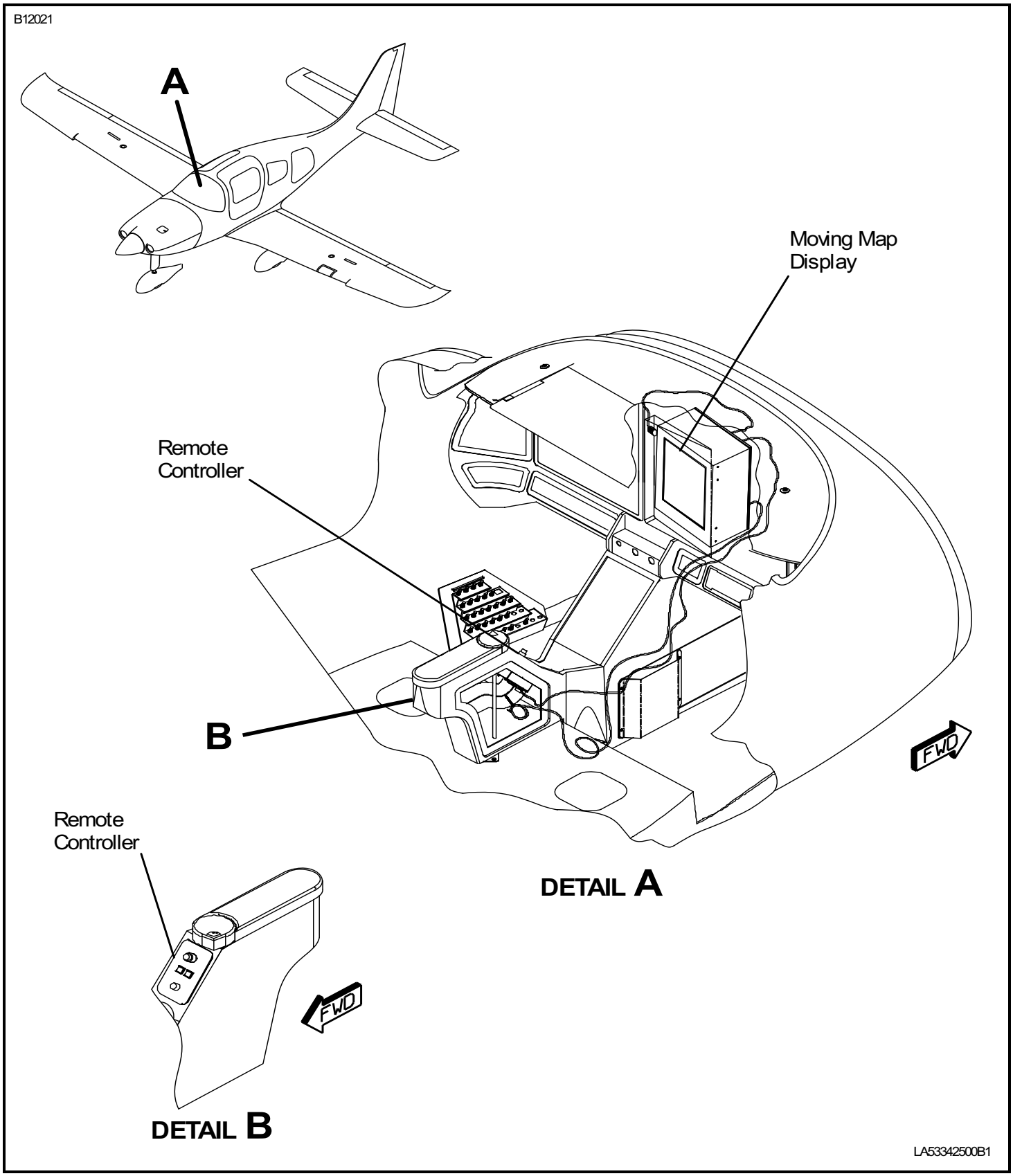
(1) If necessary, install two screws attaching the antenna plate to the fuselage. Ensure these screws go through the gasket. Torque 30 to 36 inch-lbs.

(2) Install two screws attaching the antenna and gasket to the fuselage and antenna plate. Torque 30 to 36 inch-lbs.

(3) Attach antenna wiring connector.

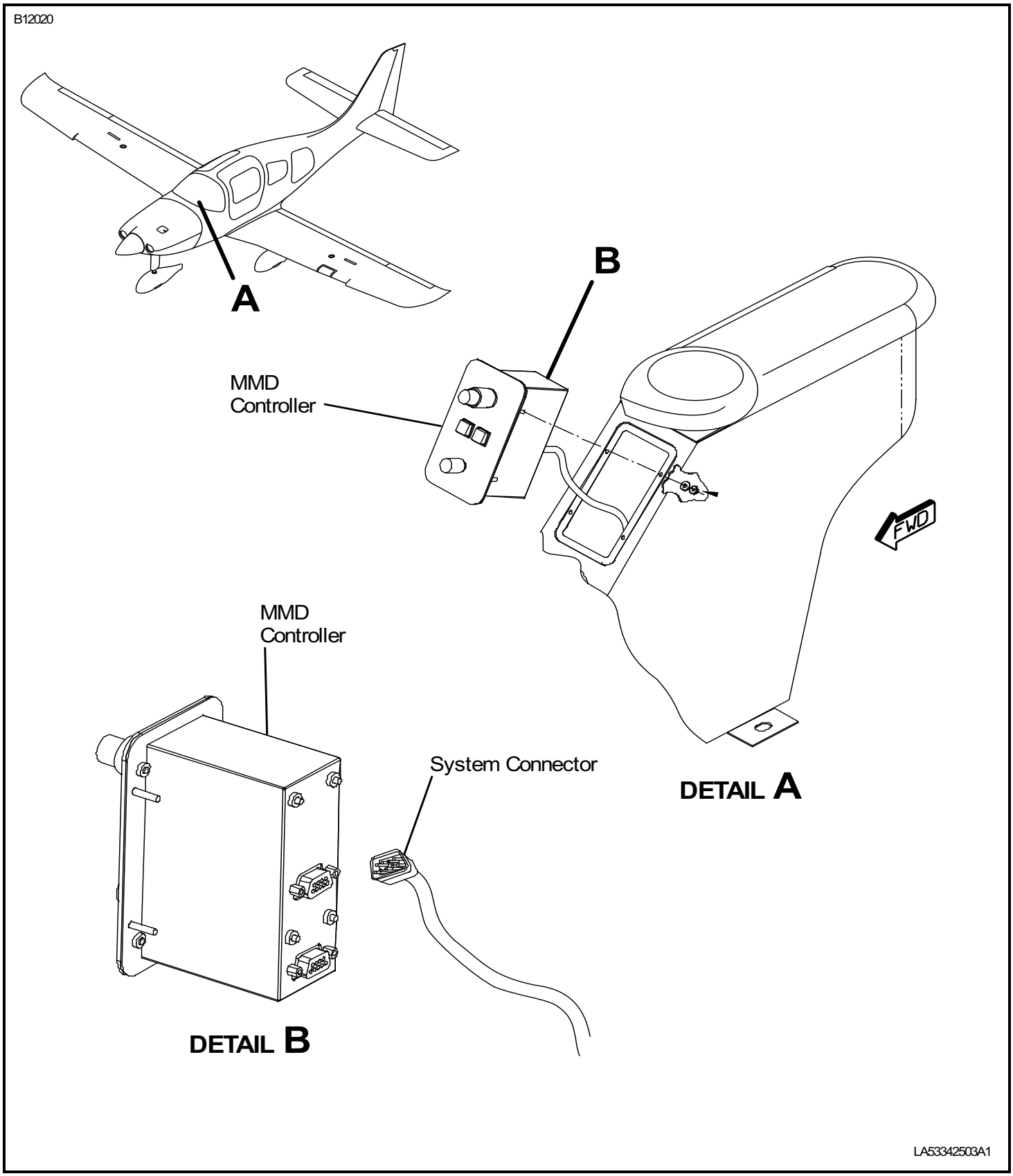
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Moving Map Installation



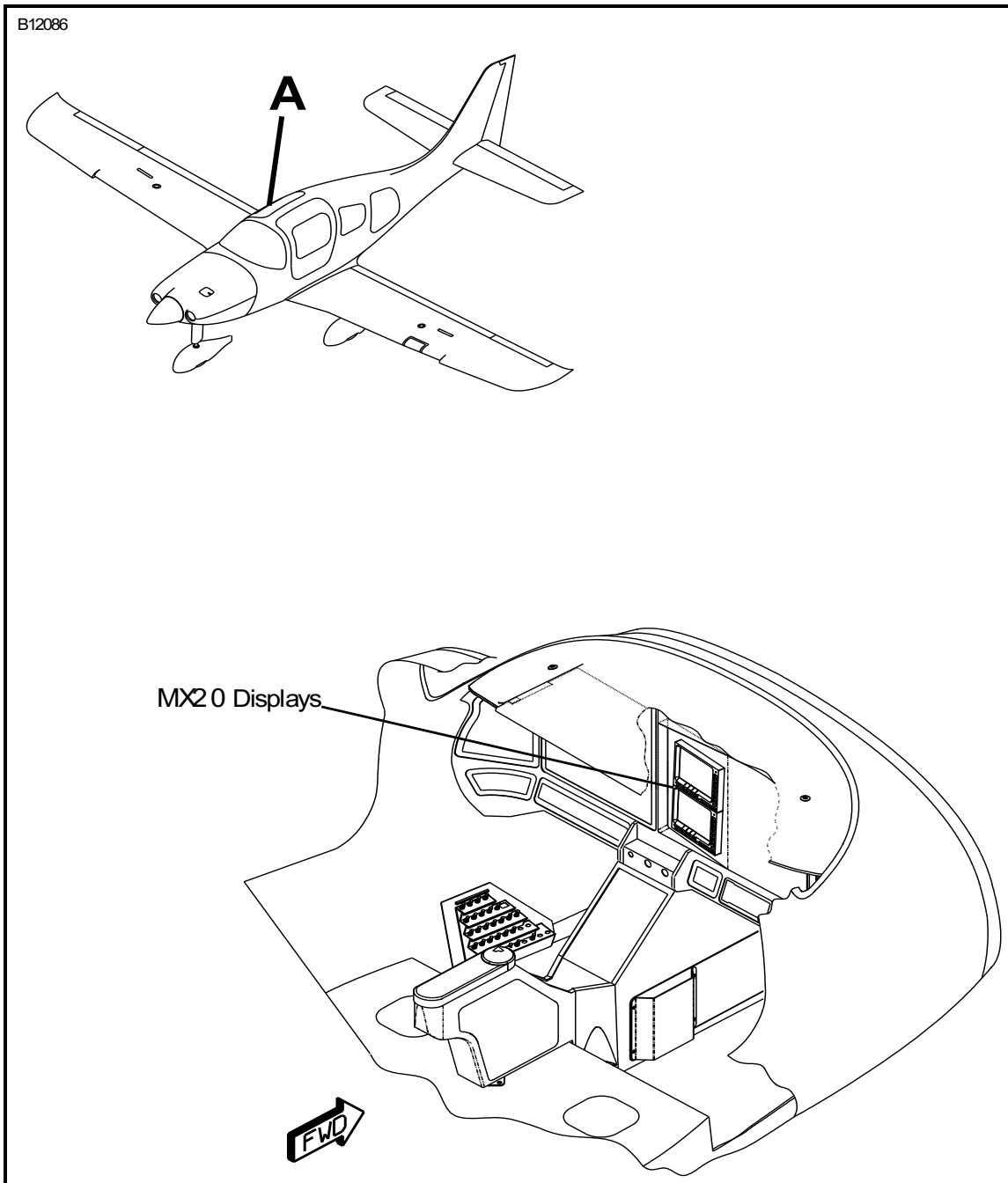
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Moving Map Display Controller



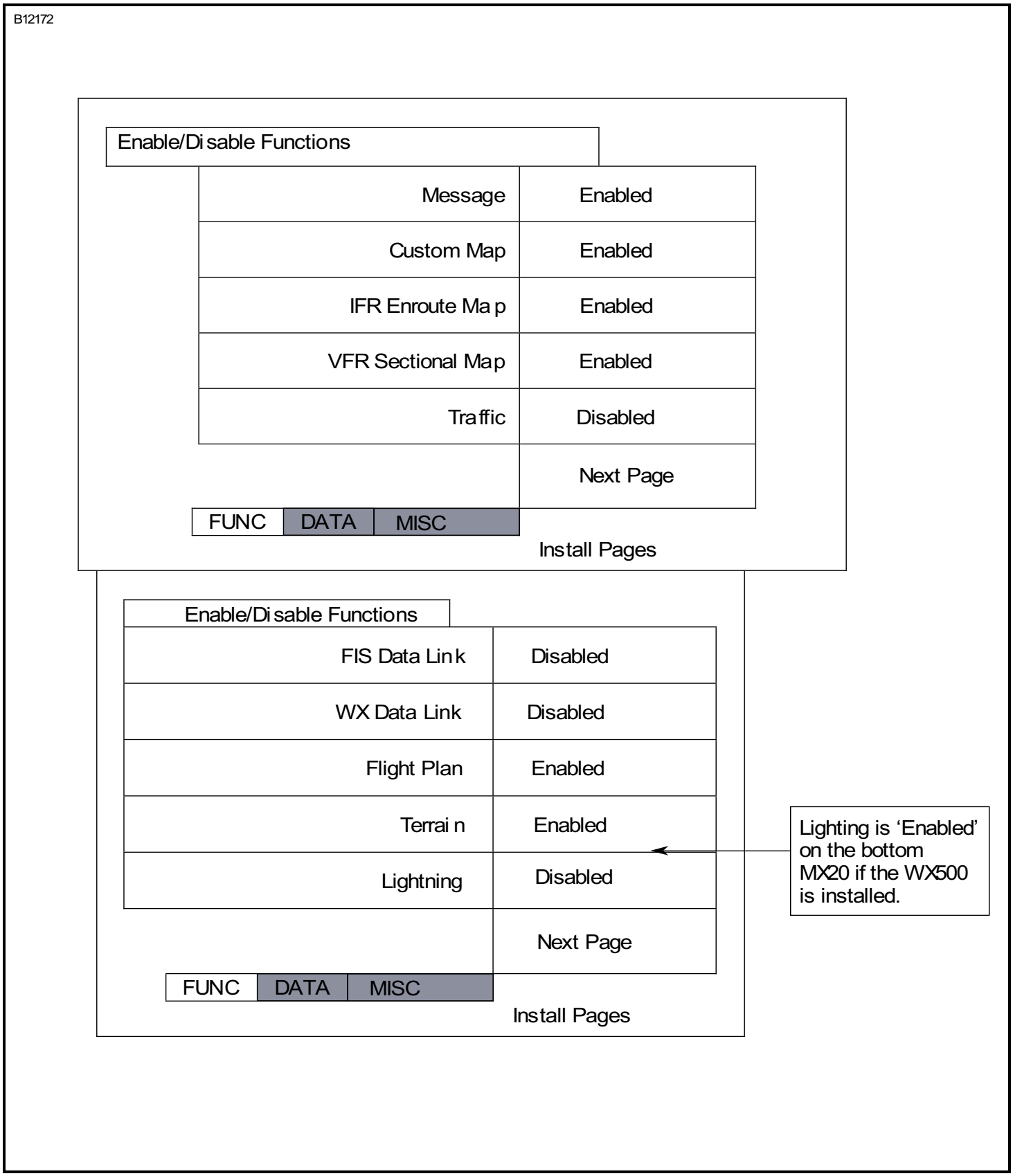
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : MX20 Displays



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

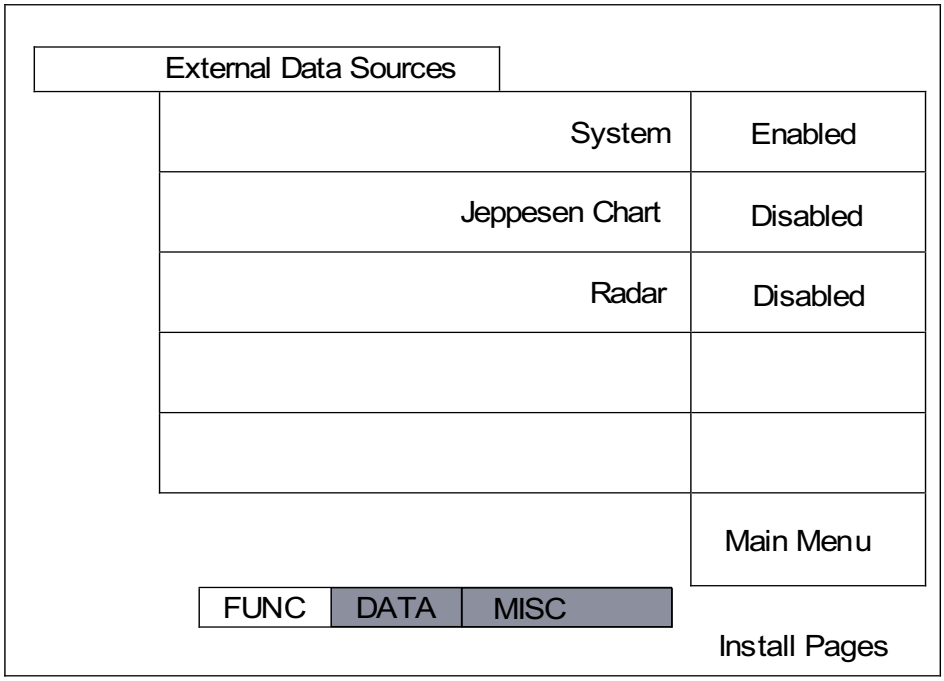
Figure 204 : Sheet 1 : MX20 Enable/Disable Functions Screen



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

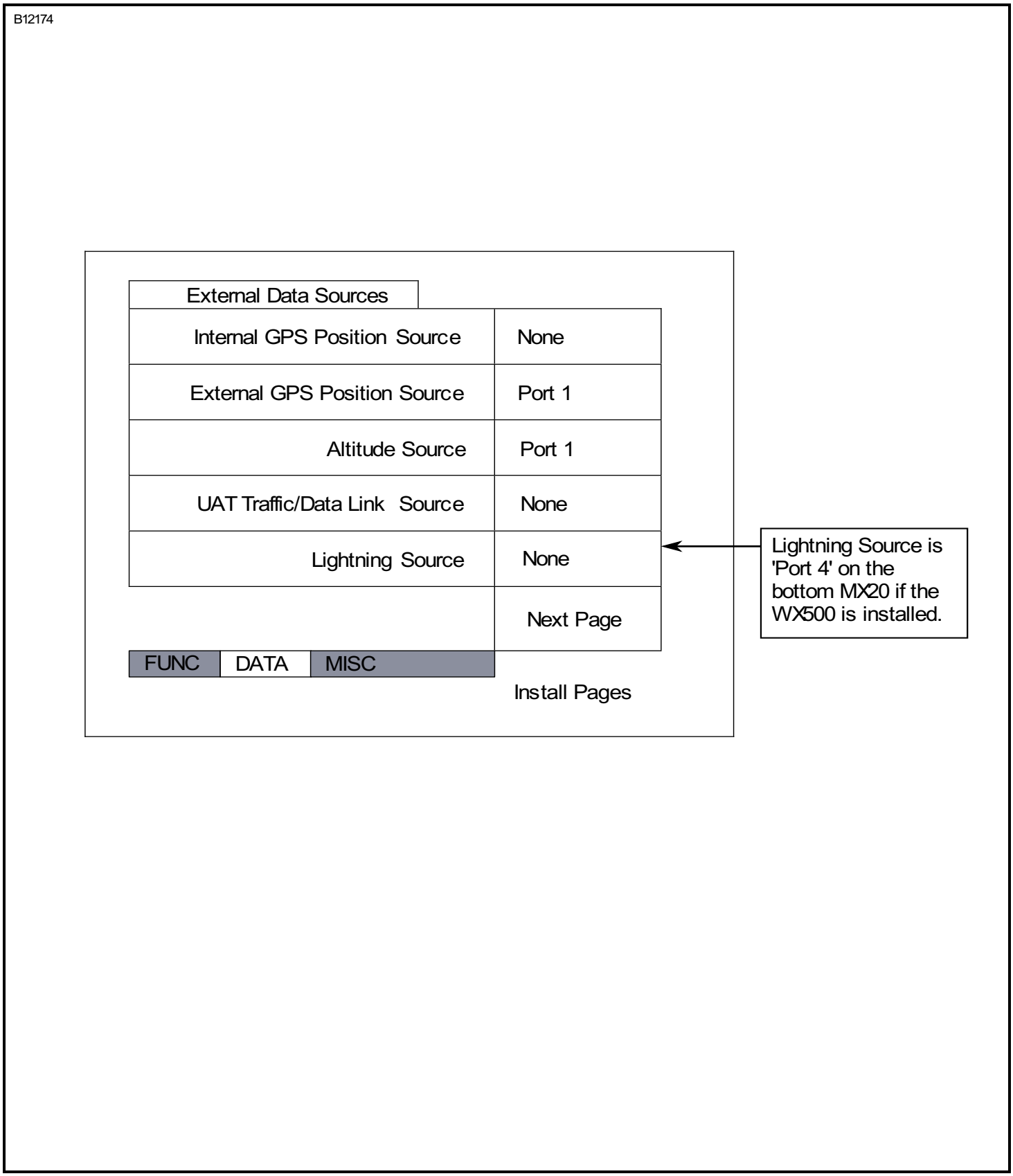
Figure 204 : Sheet 2 : MX20 Enable/Disable Functions Screen

B12173



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

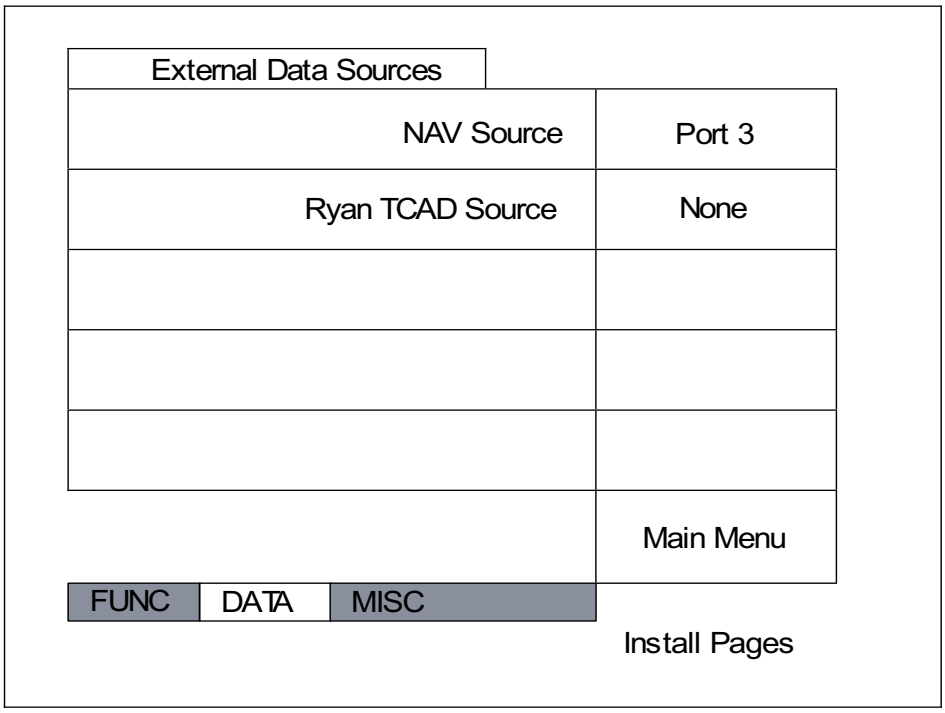
Figure 205 : Sheet 1 : MX20 External Data Sources Screen



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 2 : MX20 External Data Sources Screen

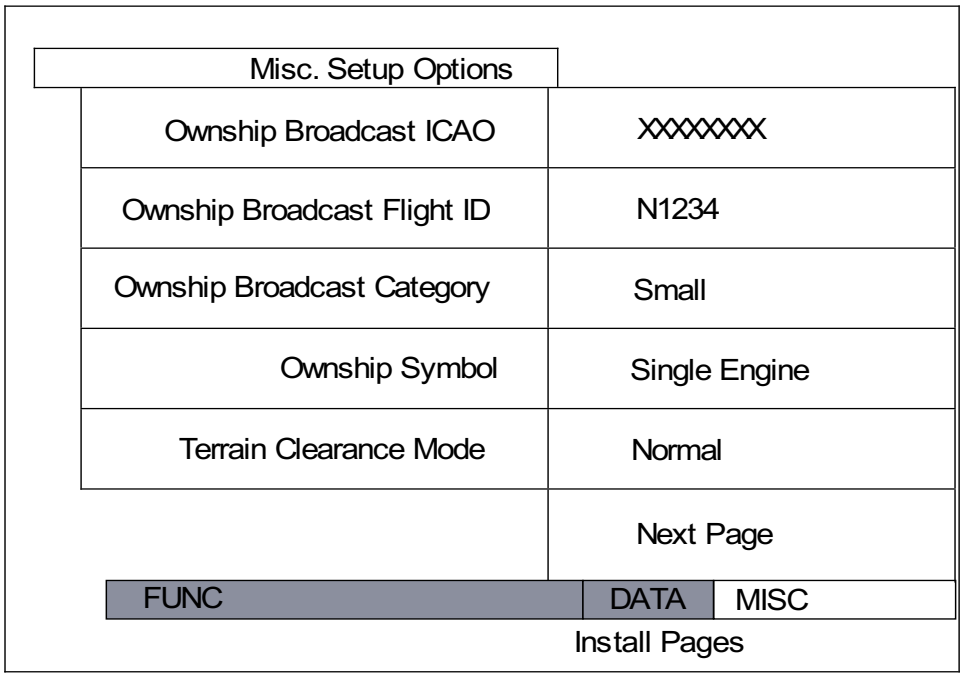
B12175



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : MX20 Miscellaneous Setup Options

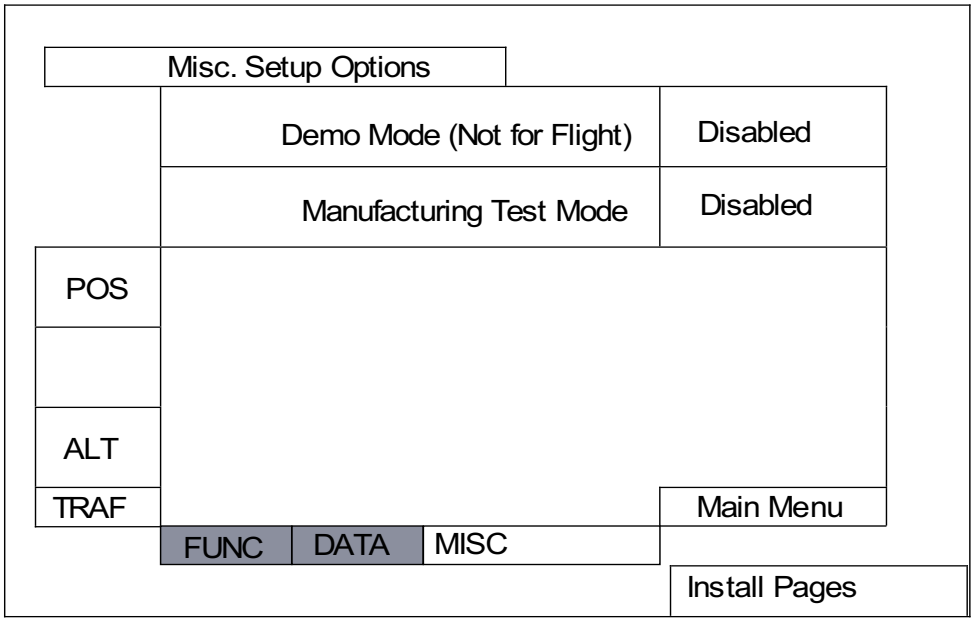
B12176



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

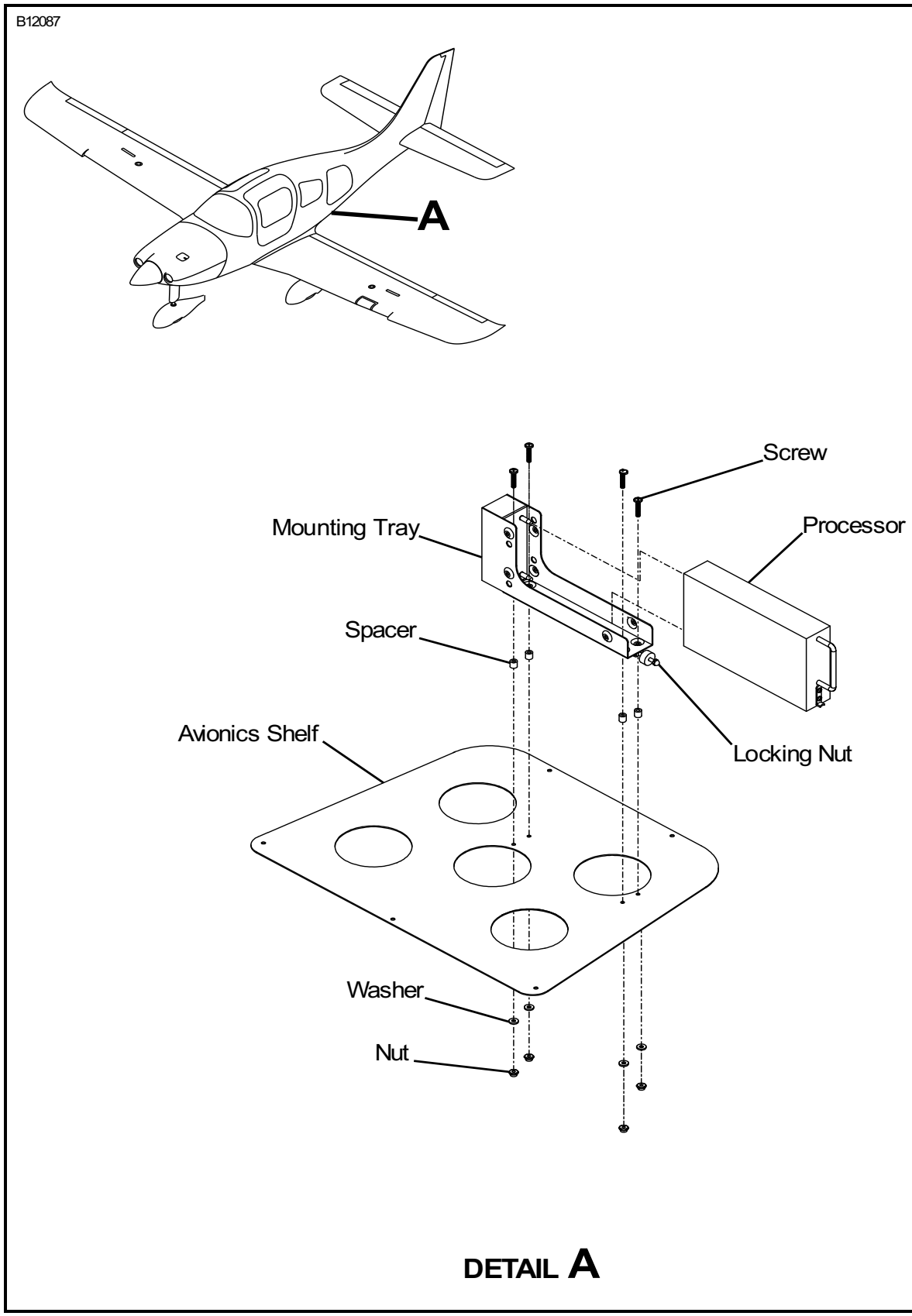
Figure 206 : Sheet 2 : MX20 Miscellaneous Setup Options

B12177



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

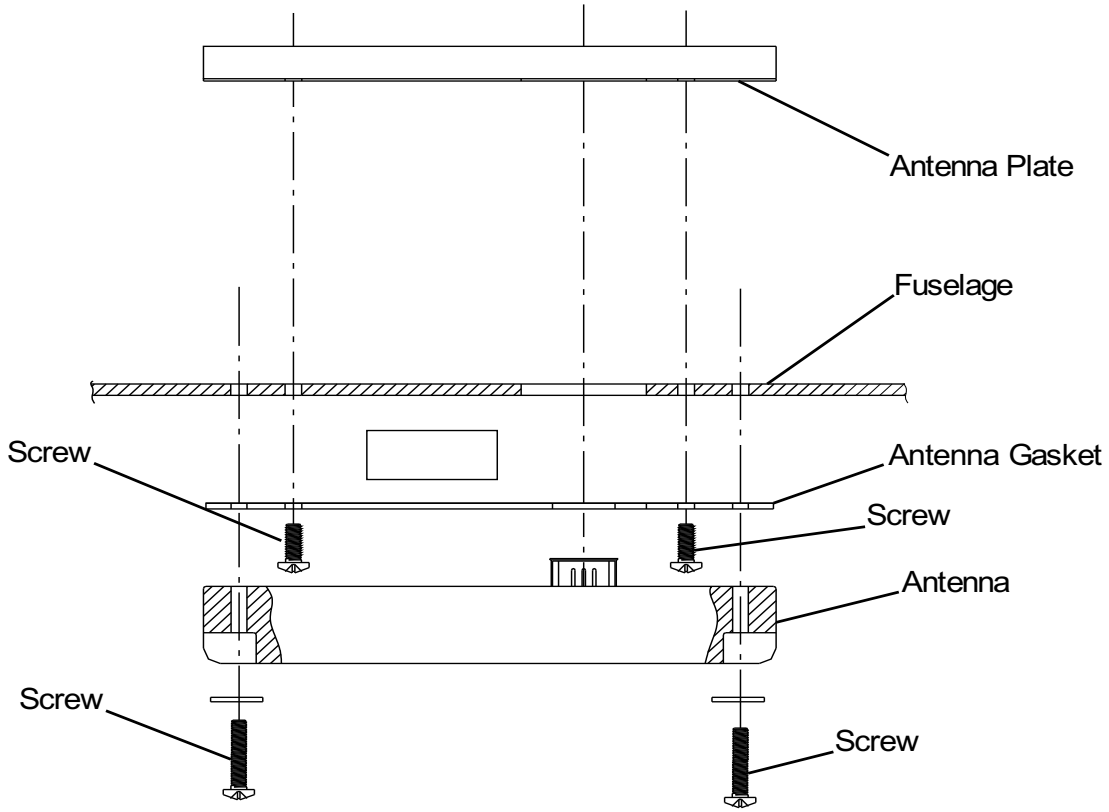
Figure 207 : Sheet 1 : Stormscope Processor and Mounting Tray



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

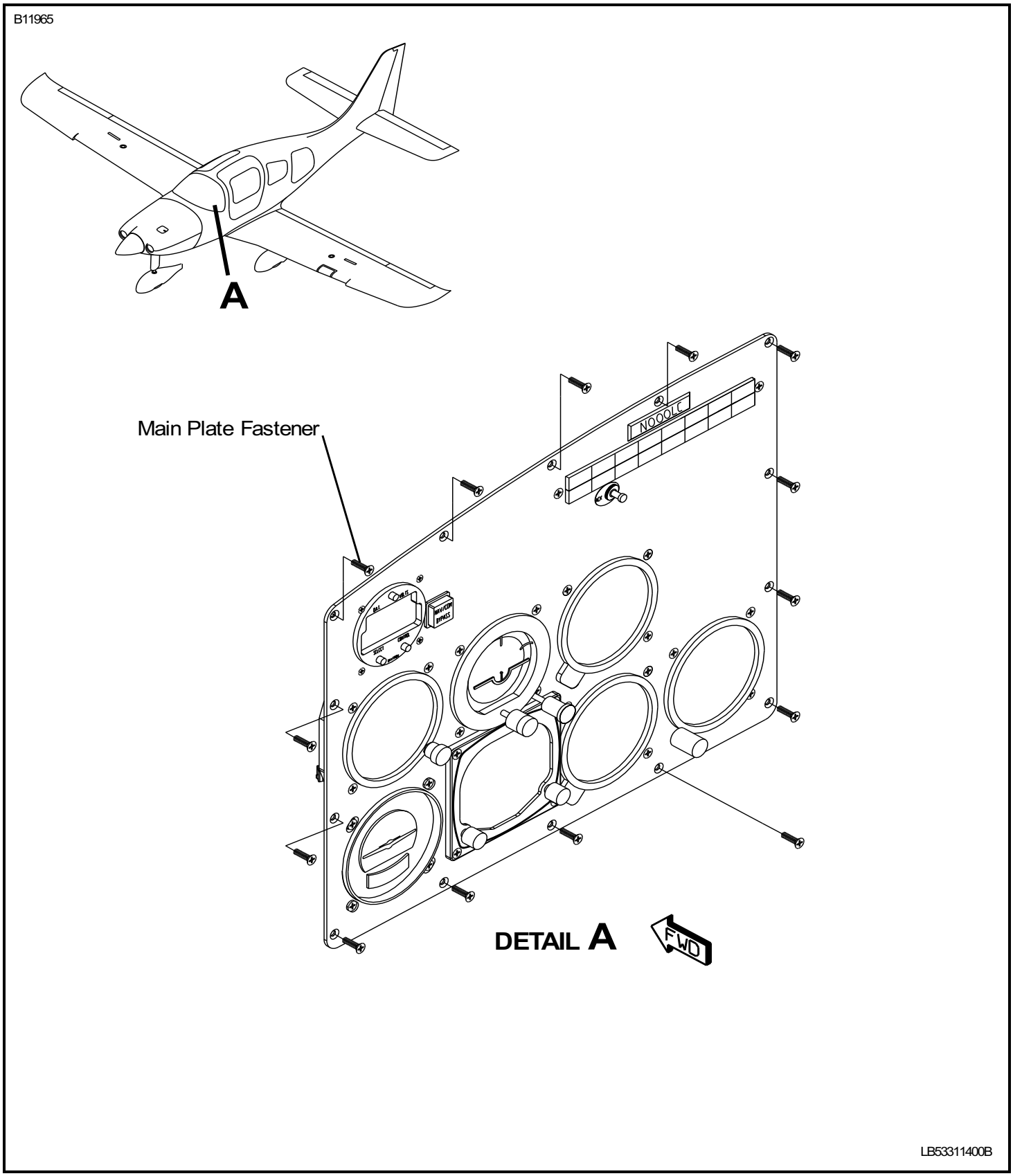
Figure 208 : Sheet 1 : Stormscope Antenna Installation

B12085



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Instrument Panel Main Plate



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

DOORS - GENERAL

1. General Description of Cabin and Baggage Doors

A. **Cabin Doors** - Each cabin door is constructed of an inner and outer composite panel bonded together. The door skin is constructed of carbon cloth. The doubler or door inner panel is constructed of glass and carbon cloth. The doors are mounted in a gull wing configuration with the hinges located at the top of the aircraft. With the door unlatched, a slight nudge or pull will start the opening of the door, and a gas strut will assist to fully open the door.

B. **Latching Mechanism** - From the exterior, the latching mechanism on each cabin door is operated through movement of the exterior door handle. The handle is mounted on the side of the door in the bottom, aft position and has two ranges of movement. The handle is recessed into the door with adequate room for a handhold. A safety release on the handle must be disengaged before the door will open. The release is activated by pulling the handle away from the door. Moving the forward end of the handle from its normal middle position to the six o'clock position disengages the latching mechanism. To secure the door, return the handle to the middle position. In the full open position, the handle will be somewhat lifted in an internal mechanism detent. This prevents the latching pins from striking the side of the fuselage as the door is closed. After closing the door, lifting the handle will free it from the detent and allow it to rotate and engage the latching pins. From the interior, both latching mechanisms are engaged and disengaged through use of a handle near the bottom, aft position of the interior door. Again, the safety release is disengaged by pulling the handle away from the door. To activate the latching mechanism, move the door handle down from its near horizontal position until the slide bolts are fully engaged and the curved end of the handle is resting in the safety detent. There are placards on the interior doors labeled "Open" and "Closed" with direction arrows. When both doors are properly closed with the latching mechanism engaged and the baggage door is locked, the "Door Open" annunciator in the upper left position of the annunciator panel will be extinguished.

C. **Door Locks** - The right cabin door can only be locked from the inside using a finger/thumb latch. It is placarded to remain unlocked during flight. The left cabin door can only be key locked from the outside. A distinction is made here between the terms *latching mechanism* and the security *door locks* . The latching mechanism ensures that the doors will remain secured during flight. The door locks are primarily antitheft devices and restricts use of the latching mechanism.

D. **Door Hinges** - Each door is hinged at the top of the door with two hinges. Half of the hinge is attached to the cabin door. The other half of the hinge, the hinge block, is bolted into cutouts in the top of the fuselage. There are hinge pins attached to the hinge element, which are secured with a dowel. The hinge pins of each hinge are inserted into the hinge block, however, they are secured differently on each side. On the left side the pins are held in the hinge block by the emergency exit wires, and on the right side the pins are secured with roll pins. Refer to Figure 1, and Figure 2, Sheet 1 and Sheet 2.

E. **Emergency Exit Door Release** - There is an emergency door release located in the forward left wing saddle in the compartment that contains the fuel gascolator. The release cable is designed to release the hinges on the pilot's door during emergency egress from the airplane when it is in the inverted position, and the passengers are incapacitated. Detailed operational information is contained in the *Pilot's Operating Handbook and FAA Approved Airplane Flight Manual*.

The emergency door release cable is in a black housing that runs from the gascolator compartment, under the front seat box, and exits the seat box on the copilot's side. From this point, the cable runs through a sealed composite channel forward to the right kickpanel, then up through the right rollover structure and across the front of the windshield to an area near the left, forward overhead light panel. For S/N 40058 and on, the cable runs through a cable housing attached to the cabin and the right rollover structure with cable ties. Refer to Figure 1. When the emergency cable strap in the gascolator compartment is activated, the steel wires that run through the hinge pins and hinge block are pulled out of the hinge block, which permits removal of the door, once the latching mechanism is disengaged.

The forward part of the cable is connected to a thimble-ring, which is part of the thimble-ring assembly. The thimble-ring contains a stainless steel wire with a Nicopress swage collar. One of the steel wires runs through the forward hinge block of the left door, through a hole in the hinge pin, and exits slightly aft of the hinge block. The other stainless steel wire runs through a guide block and then into the aft hinge block in the same manner as the forward hinge block. Refer to Figure 2, Sheet 1 and Sheet 2, and Figure 3.

F. **Baggage Door** - The baggage door is piano hinged at the top and opens with a gas spring assist similar to the cabin door. The baggage door is key locked fore and aft by a common key, which is the same key that is used in the left cabin door lock. The forward lock of the baggage door retains the key so that it can only be removed when the lock is in the latched position. The aft baggage door lock, like the left cabin door lock, allows key removal in either the latched or unlatched positions. To open the baggage door, insert the key into each lock and rotate 90 degrees clockwise. Open the aft lock first. Once the aft lock is unlatched, remove the key, and open the forward lock. This design reduces the possibility

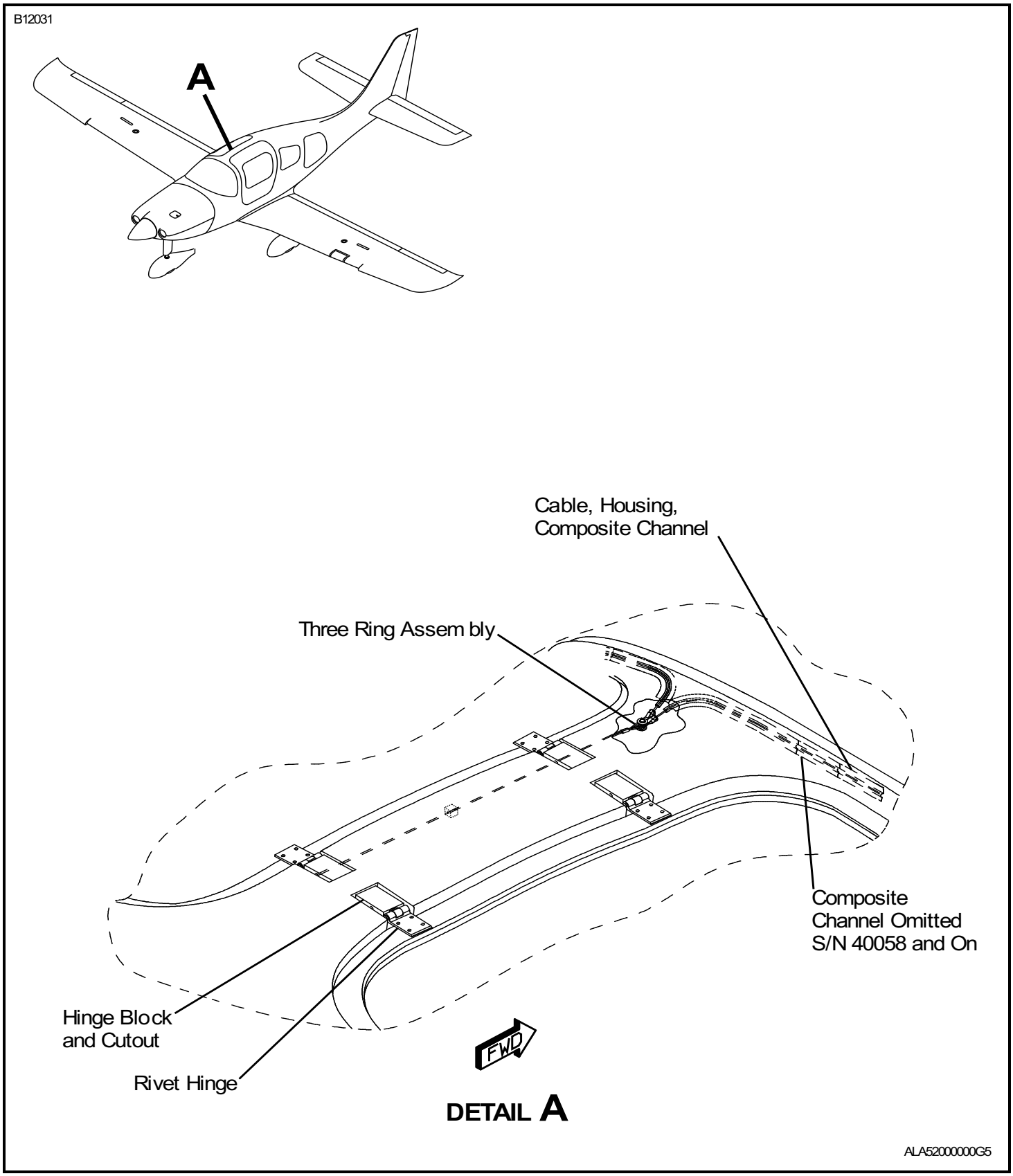
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

of taking off with the baggage door open, provided the ignition and baggage door keys are on the same key ring. When the second lock is unlatched, the gas strut will raise the door. The baggage door is part of the door annunciator system. If the baggage door is not properly closed and the forward latch secured, the red "Door Open" light in the annunciator panel will illuminate.

G. **Door Seal System** - The airplane is equipped with a pneumatic door seal system that limits air leakage and improves soundproofing. An inflatable gasket around each main door expands when the door seal system is turned on. An electric motor near the pilot's rudder pedals operates the system, which maintains a differential pressure of 12 to 15 psi. The system is activated by a switch in the rocker switch panel labeled "Door Seal" and is protected by a five-amp circuit breaker. The cabin doors must be closed for the door seal system to operate. The latching mechanism of each door moves a plunger-type switch, which, assuming the baggage door and the other main door are properly latched, turns off the door open annunciator and enables the system.The cabin door latching mechanism also controls the dump valve. When either cabin door latching mechanism is moved more than a half inch towards the open position, the dump valve is engaged, the pump is turned off, and the pressure in the seals is dumped. This prevents inadvertent operation of the doors when they are sealed; however, setting the doors seal switch to the off position after landing is recommended. Normally, the door seal switch remains in the on position for the entire flight. If the system pressure drops below 12 psi, the air pump will cycle on until pressure is restored. If the pump runs continuously, it is an indication that a seal is damaged and incapable of holding pressure. In this situation, the door seal system should not be operated until repairs are made.

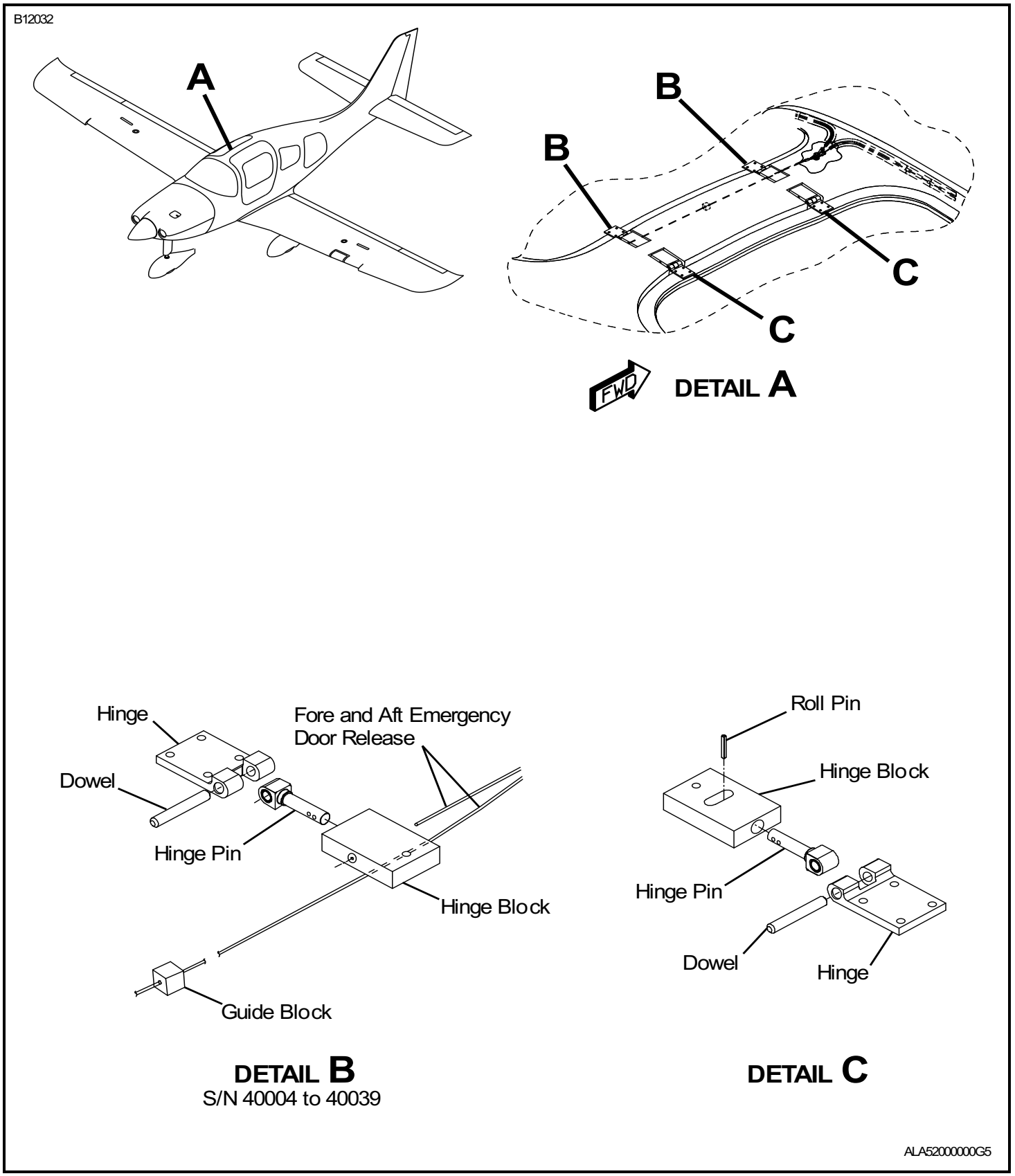
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Door Hinges



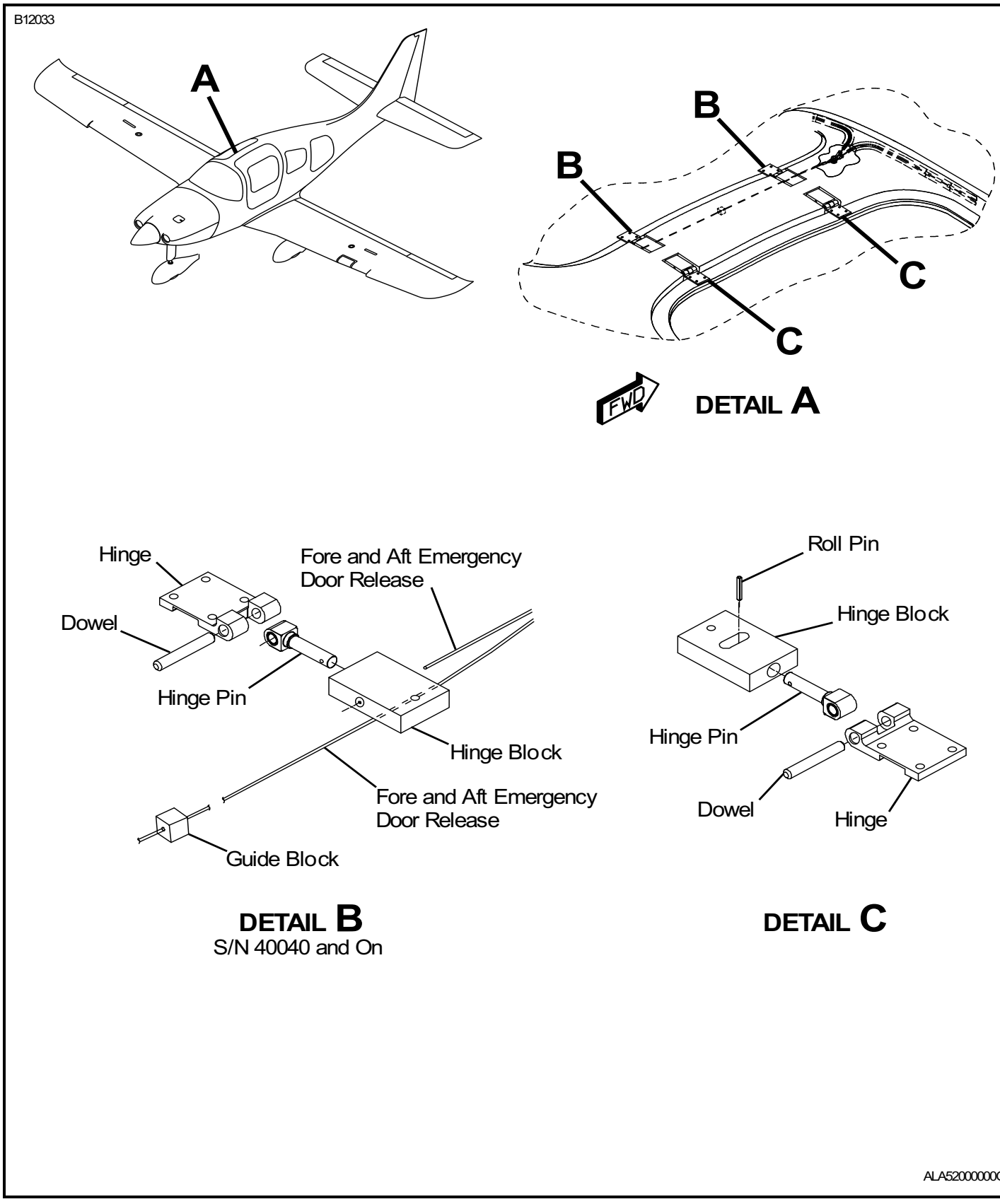
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Door Hinge Assembly



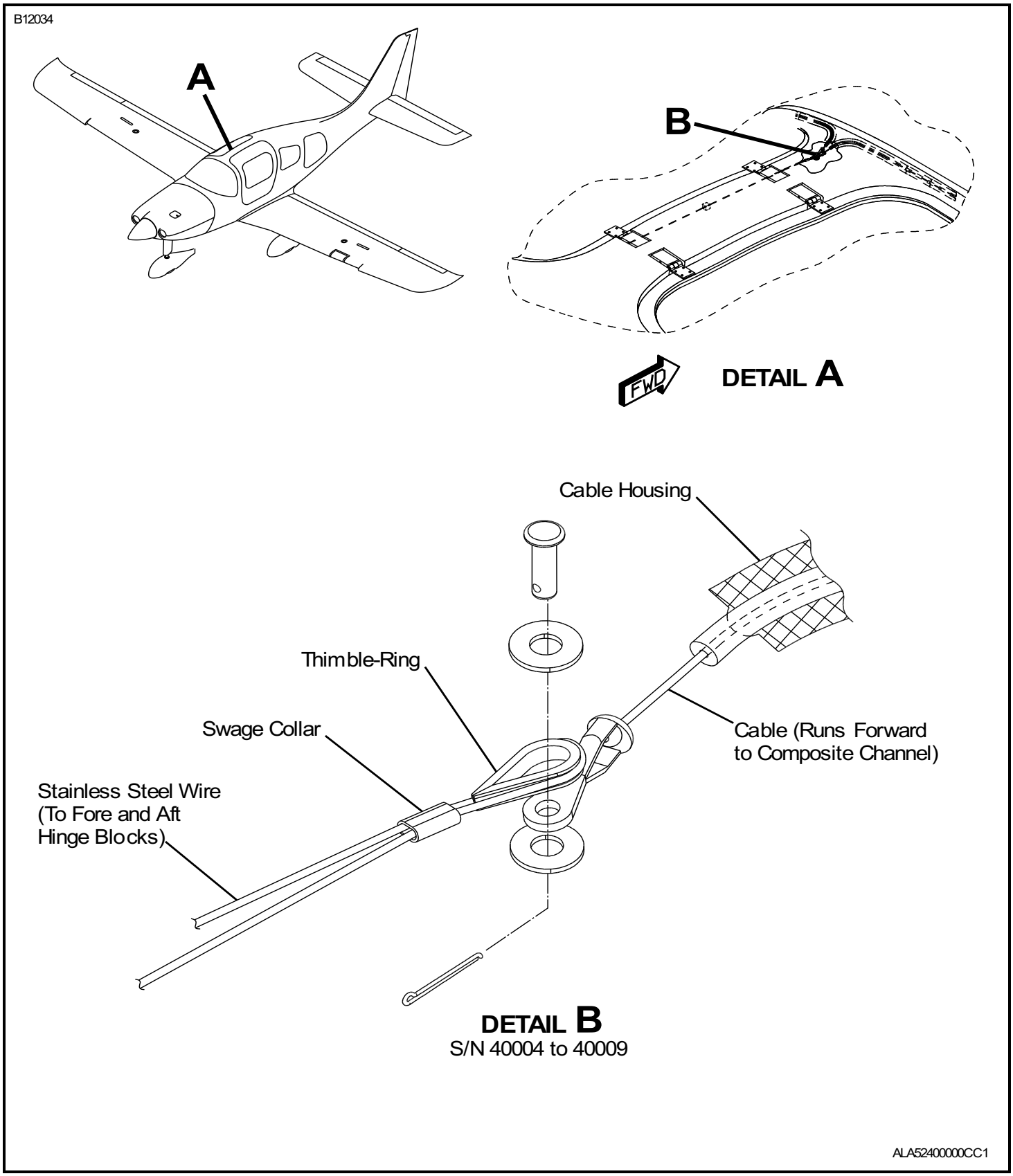
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 2 : Door Hinge Assembly



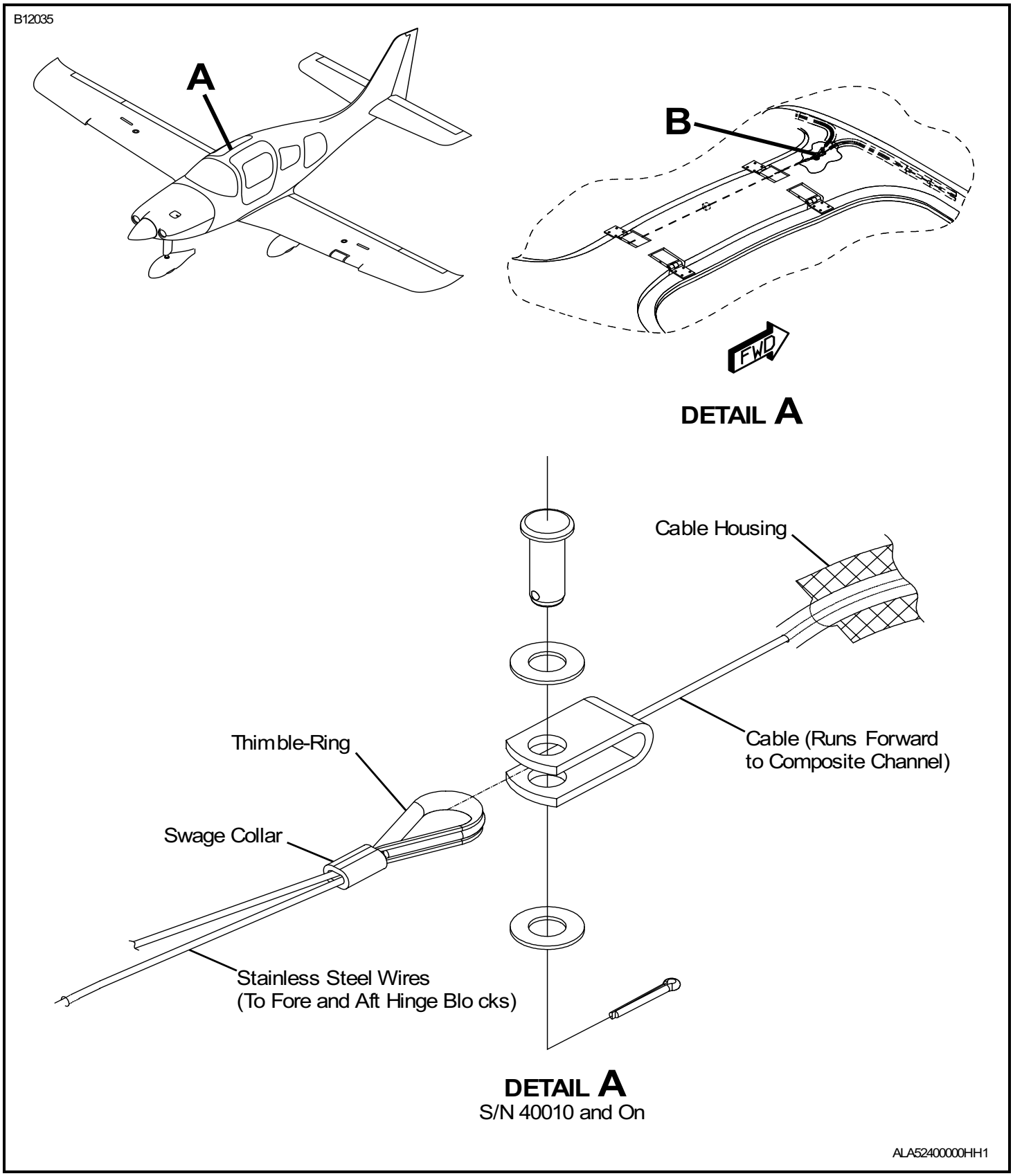
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 3 : Sheet 1 : Emergency Door Release Cable



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 3 : Sheet 2 : Emergency Door Release Cable



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CABIN AND BAGGAGE DOOR - MAINTENANCE PRACTICES

1. Cabin Door Removal

A. Removal of the cabin door can be accomplished as follows.

(1) Disconnect the pneumatic door seals using the following steps.

(a) With the door in the full open position, use a Phillips screwdriver to loosen the Adel Clamp on the air supply hose near the air supply nipple in the overhead panel. Refer to Figure 201.

(b) Disconnect the supply hose from the nipple in the overhead panel.

(2) Disconnect the gas strut from the door jam using the following steps.

(a) Support the door in the full open position so that all weight is removed from the gas strut.

(b) The gas strut is secured to the door by a retaining cap located in the end of the strut. Remove the strut retaining cap by inserting a small flat-blade screwdriver just under the base of the cap and prying up on it. Raise the cap in increments by moving the blade of the screwdriver around the circumference of the cap. Refer to Figure 202.

(3) There are two methods for removing the doors. (1) Quick Removal - door removal without removing the interior hinge bolts, and (2) Standard Removal - removal of the interior hinge bolts. The Quick Removal method may only be used for removal of the left door. The right door must be removed with the Standard Removal technique. The technique used depends on the maintenance task.

(4) Overhead Panel Description - There are basically five panels in the overhead portion of the main cabin area.

(a) **Center Overhead Light Panel (COLP)** - This panel is located in the center portion of the main cabin area and contains the electrical lights and speaker. Refer to Chapter 25-30-00 in this manual for removal of the COLP.

(b) **Forward Overhead Side-Panels (FOSP)** - The forward panels to the left and right of the COLP are referred to as the left and right overhead side-panels. Remove the left and right forward panels by removing the six forward screws in each door casing.

(c) **Aft Overhead Side-Panels (AOSP)** - These side panels are just aft of the FOSP and normally require only removal of the first two screws in the door casing that supports these panels. Normally, removing these two screws will provide sufficient access to the aft hinge bolts and emergency door release cable. Care must be taken to not damage these panels when removing/installing the hinge bolts and emergency door release stainless steel wire.

2. Quick Removal Left Door

A. Follow the steps below for quick removal of the left door.

(1) Remove the pneumatic air supply line and gas strut as described in the Cabin Door Removal section.

(2) Remove the COLP, left FOSP, and the forward two screws of the left AOSP.

(3) Close the door, and engage the latching mechanism.

(4) Pre-load the door, i.e., a person on the outside of the door should push in and down.

(5) Grasp the thimble-ring, which is connected to the emergency door release wires, and pull forward toward the windshield until the stainless steel wires are removed from the hinge blocks. The thimble-ring is located forward of the door cutout in the area of the left overhead panel. Refer to Section 52-00-00, Figure 1 and Section 52-00-00, Figure 3, Sheet 1 and Sheet 2. It may work better to grasp the thimble-ring with needle-nose pliers.

(6) From the outside, disengage the door locking mechanism, and carefully open the door while keeping pressure on the door hinges. When the door is about half open, pull it away from the cabin. It works best if two people perform this operation. While the door is not too heavy, its size and shape makes it somewhat awkward to handle with just one person.

3. Installation For Left Door (Quick Removal Method)

A. Use the following steps for installing the left door after it was removed using the Quick Removal Method.

(1) Insert the hinge pins into the hinge blocks. It works best if two people do this since the size and shape of the door makes it somewhat awkward to handle. Also, the door should be held in about the half open position while the hinge pins are inserted into the hinge blocks.

(2) After the hinge pins are inserted in the hinge block, slowly rotate the door into the door opening, and secure the door latching mechanism.

(3) Preload the door, i.e., a person on the outside of the door should push in and down.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(4) Apply wax or mold release to the last 3 inches of the wire, then with the door pre-loaded, use needle-nose pliers to reinsert the fore and aft stainless steel wires through the hole in the composite cutout and into the hinge block. Ensure that the wire goes through the block and exits each hinge block on the aft side.

(5) Reinstall all overhead panels that were removed or partially removed. Follow instructions in Chapter 25-30-00 for the COLP. Torque screws in the FOSP and AOSP 10 to 12 inches-lbs.

(6) Reconnect the gas strut and. the pneumatic air supply line using the reverse of the procedures described in the Cabin Door Removal section.

4. Standard Removal Of The Left Door

A. **General** - The "Standard Removal" of the left door involves removal of the hinge blocks. Refer to Section 52-00-00, Figure 2, Sheet 1 and Sheet 2. The hinge blocks are secured by four bolts that are inserted into threaded holes in the bottom of the block. The bolts, which have a 3/8 inch hex head, are accessed from within the cockpit. The following points must be considered when removing the hinge blocks.

(1) The locations of the hinge blocks are not interchangeable. Accordingly, each hinge block must be labeled with its location prior to removal, i.e., LF, LR, etc.

(2) For aircraft S/N 40004 to 40039, the rivets on the dynamic hinge should never be removed unless there is a compelling reason to do so, e.g., a cracked hinge or a door replacement. Contact the manufacturer for specific instructions for removing and installing the rivets on the door hinge.

(3) For aircraft S/N 40040 and on, the screws on the dynamic hinge need not be removed unless there is a compelling reason to do so, e.g., a cracked hinge or a door replacement. Contact the manufacturer for specific instructions for removing and installing the screws on the door hinge.

B. Use the following procedure for the Standard Removal of the left door:

(1) Follow the instructions in the Quick Removal Left Door section.

(2) Remove the lockwire from the hinge bolts.

(3) Using a 3/8 inch socket wrench, back all the bolts about halfway out of the hinge block.

(4) Apply an upward pressure on the hinge bolts to break the silicone seal around the base of both the forward and aft hinge blocks.

(5) Remove all hinge bolts from the hinge block.

(6) Remove all excess silicon from the hinge block and cutout in the top of the fuselage.

5. Standard Removal of the Right Door

A. **General** - There is no "Quick Removal" procedure for the right door. The "Standard Removal" of the right door involves removal of the hinge blocks. Refer to Section 52-00-00, Figure 2, Sheet 1 and Sheet 2. The hinge blocks are secured by four bolts that are inserted into threaded holes in the bottom of the block. The bolts, which have a 3/8 inch hex head, are accessed from within the cockpit. The following points must be considered when removing the hinge blocks.

(1) The locations of the hinge blocks are not interchangeable. Accordingly, each hinge block must be labeled with its location prior to removal, i.e., RF, RR, etc.

(2) The rivets on the rivet hinge should never be removed unless there is a compelling reason to do so, e.g., a cracked rivet hinge or a door replacement. Contact the manufacturer for specific instructions for removing and installing the rivets on the door hinge.

B. Use the following procedure for the Standard Removal of the right door:

(1) Remove the pneumatic air supply line and gas strut as described in the Cabin Door Removal section.

(2) Close the door and engage the latching mechanism.

(3) Remove the roll pin in the right door hinge blocks. Refer to v.

(4) From the outside, disengage the door locking mechanism, and carefully open the door while keeping pressure on the door hinges. When the door is about half open, pull it away from the cabin. It works best if two people perform this operation. While the door is not too heavy, its size and shape makes it somewhat awkward to handle with just one person.

NOTE: It is permissible to remove the right door, using the Standard Door Removal, without disconnecting the roll pins. If this technique is used, the hinge block remains attached to the right door. While this eliminates the need to remove and possibly damage the roll pin, it does

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

require removal of interior paneling and breaking the silicon seal. If the interior panels are removed, follow instructions in the Installation of Hinge Blocks and Doors section to reinstall the hinge blocks.

(5) Remove the lockwire from the hinge bolts.

(6) Using a 3/8 inch socket wrench, back all the bolts about halfway out of the hinge block.

(7) Apply an upward pressure on the hinge bolts to break the silicone seal around the base of both the fore and aft hinge blocks.

(8) Remove all hinge bolts from the hinge block.

(9) Remove all excess silicon from the hinge block and cutout in the top of the fuselage.

6. Installation of Hinge Blocks and Doors

A. Use the following steps for installing the door hinge blocks.

(1) Place the hinge block over its appropriate position as previously marked.

(2) Install the No. 10 hinge block bolts (four per hinge) and torque 30 to 36 inch-lbs.

(3) Lockwire the four bolts on each hinge per MS33540.

(4) Place a small bead of RTV 5818 (or equivalent) silicone around the base of each hinge block. Do not allow RTV on hinge wires.

(5) Install the left door per instructions in the Installation For Left Door (Quick Removal Method) section.

(6) Install the right door per the following instructions:

(a) Insert the hinge pins into the hinge blocks. It works best if two people do this because the size and shape of the door makes it somewhat awkward to handle. Also, the door should be held in about the half open position while the hinge pins are inserted into the hinge blocks.

(b) After the hinge pins are inserted in the hinge block, slowly rotate the door into the door opening, and secure the door latching mechanism.

(c) Preload the door, i.e., a person on the outside of the door should push in and down.

(d) With the door preloaded, installed the roll pin in the hinge block.

(7) Reinstall all overhead panels that were removed or partially removed. Follow instructions in Chapter 25-30-00 for the COLP. Torque the screws in the FOSP and AOSP 10 to 12 inch-lbs.

(8) Reconnect the gas strut. and the pneumatic air supply line using the reverse of the procedures described in the Cabin Door Removal section.

7. Baggage Door Removal and Installation

A. Use the following steps for baggage door removal. Refer to Figure 203.

(1) Remove the left side push-pull tube channel cover in the baggage compartment by first removing the fore and aft screws on top of the channel cover and sliding it out of the floor clips.

(2) Remove the gas strut from the door in the same manner as described in the Cabin Door Removal section, gas strut disconnection paragraph.

(3) Remove the covered cabin door surround inside the baggage compartment for access to the self-locking nuts (Nyloks). The surround is secured by two screws on the bottom and is inserted in clips on the top of the door opening. Remove the screws on the bottom of the surround, and push up to remove the surround from the clips.

(4) Remove the baggage door piano hinge by removing the six, No. 8 x 1/2 inch screws with self-locking nuts (Nyloks) that hold it to the top of the doorjamb. Note: The two top clips which hold the cabin door surround are removed when the piano hinge is removed.

B. To install the baggage door use the following steps.

(1) Using two people, attach the piano hinge and torque the six screws 20 to 25 inch-lbs. Note: Be sure to reattach the clips for the surround.

(2) Reinstall the baggage door surround. First, insert the top portion into the clips and then attach the screws to the base. Torque screws 30 to 36 inch-lbs.

(3) Reinstall the gas strut onto the ball stud.

(4) Install the push-pull tube channel cover and torque screws 30 to 36 inch-lbs.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

C. Other parts on the baggage door have the following specifications.

(1) If the three screws with self-locking nuts on the door brace are removed and installed, they should be torqued 30 to 36 inch-lbs.

(2) If the ball studs on the door brace or overhead bracket are removed and installed, they should be torqued 140 to 180 inch-lbs.

8. Cabin and Baggage Door Locks

A. **Left Door Lock** - To remove the left door lock, use the following steps.

(1) Set the door latching mechanism to the open position, open the door completely, and stand on the skid strips of the left wing. Ensure that the door lock is in the unlocked position.

(2) Remove the interior door handle by removing the aft cotter pin and clevis as shown in Figure 204, Sheet 1. Note, there are two clevis pins in the door handle.

(3) When the clevis is removed, slide the handle aft to remove it.

(4) Remove the four Phillips screws on the interior door access panel, and remove the panel. Note, a spacer around the door mechanism will normally fall out as the panel is removed.

(5) Mark the position of the drive tab on the interior of the door panel. This is a convenient reference when reinstalling the door lock.

(6) Remove the two pan head Phillips screws that hold the door lock in place, and remove the door lock. Refer to Figure 204, Sheet 1 and Sheet 2 .

B. **Right Door Lock** - To remove the right door lock, use the following steps.

(1) Place the thumb latch in the locked position, and remove the four Phillips screws holding the right door access panel in place. Remove the panel.

(2) Before removing the right door lock from the access panel, mark the inside of the access panel with the location of the drive tab when in the locked position. This is a convenient reference when reinstalling the door lock. Note that when viewing the panel from the exterior, the thumb latch is in the three o'clock position, and the drive tab (behind the panel) is in the one o'clock position. Refer to Figure 205, Sheet 1 and Sheet 2.

(3) Remove the latch screw and lock washer. It is important to mark the relationship of the latch to the drive tab, the drive tab to lock, and lock to the access panel since the drive tab can be assembled upside down and rotated to any of four positions.

(4) Remove the nut from the lock assembly to remove the lock.

C. **Baggage Door Locks** - To remove the baggage door locks, use the following steps. Refer to Figure 206, Sheet 1 and Sheet 2.

(1) Remove the upholstered panel on the interior of the door. The panel is held onto the baggage door with four Christmas Tree clips approximately arranged in the shape of a diamond. **Do not pull the upholstered panel by the edges since this can cause damage to the panel.** It works best to insert a hand between the panel and the door with the palm facing the panel. Move palm towards the area of the bottom or right clamp, and force the panel away from the door.

(2) Note the orientation of the door lock, and make a reference mark for reinstallation.

(3) Remove the two No. 6 self-locking nuts (Nyloks), the two washers, locating plate, and the lock.

(4) The self-locking nut holding the lock tab can be removed if the tab needs to be replaced.

9. Installing Door Locks

A. To install the locks, reverse the steps described in the Cabin And Baggage Door Locks section for each particular door lock. However, the following items need to be considered.

(1) Ensure that the door locks are oriented in the proper direction since it is possible to install both the left and right locks backwards or upside down.

(2) Access panel screws should be tightened until they bottom out.

(3) The two screws holding the lock on the **left door** should be torqued 12 to 15 inch-lbs.

(4) The **screw** on the **right door** lock should be torqued 40 to 50 inch-lbs in aircraft S/N 40004 to 40014 and 38 to 44 inch-lbs. in aircraft S/N 40015 and on.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(5) The **nut** on the **right door** lock should be torqued 100 to 120 inch-lbs.

(6) The two No. 6 **baggage door** self-locking nuts should be torqued 6 to 8 inch-lbs.

(7) The self-locking baggage door nut that retains the lock tab should be torqued 36 to 42 inch-lbs.

10. Cabin and Baggage Door Annunciator System

A. **Cabin Doors** - The cabin door annunciator switch is mounted on the forward door pin receptacle in the fuselage. The switch is retained with two opposing setscrews. The left or right FOSP (refer to the FOSP section) must be removed to gain access to the switch. To remove or adjust the switch, use the following steps. Refer to Figure 207.

(1) **General** - With the right or left side panel removed (depending on which switch is accessed), loosen the set screws on the top and bottom of the door bolt receptacle.

(2) **Installation or Adjustment of Door Annunciator Switch** - With the door closed and latched and the baggage door locked, move the switch aft towards the door bolt until it activates the plunger switch (turns off the Door Open annunciator), then move the switch an additional 0.025 inch aft. With the set screws removed, apply Form-AGasket #2 by Permatex to the threads, and reinsert and tighten the set screws.

(3) **Switch Removal** - To remove the switch, loosen the two set screws, unplug the commercial-type connector, and remove the switch.

B. **Baggage Door** - The baggage door annunciator switch is part of the forward locking mechanism. When the lock tab is moved to the locked position, the tab moves the contact on the snap-action switch. This action removes the ground on the switch and turns off the door annunciator light when the left and right doors are closed with the ground removed from their switches. To remove or adjust the baggage door annunciator switch, use the following steps. Refer to Figure 208, Sheet 1 and Sheet 2.

(1) **Switch Removal or Adjustment** (S/N 40004 to 40019) - The baggage door annunciator switch is mounted to the forward baggage door striker plate with two No. 2 pan-head screws. To adjust the switch, loosen the screws and the oversized holes will permit minor adjustment. To remove the switch, remove the No. 2 screws and washers, and disconnect the commercial-type connector.

(2) **Switch Installation** (S/N 40004 to 40019) - To install the switch, secure it to the forward striker plate with the two No. 2 screws, placing the washers as shown in Figure 208, Sheet 1, and torque 2 to 4 inch-lbs.

(3) **Switch Removal or Adjustment** (S/N 40020 and On) - The baggage door annunciator switch is mounted to a stud plate that mounts through the switch bracket with two washers and self-locking nuts. To remove the switch, remove the two self-locking nuts and washers, and disconnect the commercial-type connector. To adjust the switch, close and lock the door, and slide the switch toward the lock tab until the switch is activated. Slide an additional 0.020 inch toward the lock tab before torquing the nuts.

(4) **Switch Installation** (S/N 40020 and On) - To install the switch, secure it to the stud plate that mounts through the switch bracket with two washers and self-locking nuts with Loctite. Torque nuts 2 to 3 inch-lbs.

(5) **Test the System** - Close and lock the baggage door, and close the lock to the cabin doors while sitting in the cockpit. Turn on the master switch. If the Door Open annunciator light is not illuminated, the switch is properly adjusted. If the annunciator light remains on, adjust the switch as described in the Switch Removal or Adjustment step above (moving the switch closer to the lock tab), and retest the system.

(6) **Troubleshooting** - If during flight, the door open annunciator light activates intermittently, the following troubleshooting procedure should be followed.

(a) Ensure that the baggage door hinge is securely fastened to both the door and the fuselage. Check the hinge for excessive wear. Repair or replace the hinge as required.

(b) Check the locks for correct mounting and function. With the key inserted into the lock, the key should only turn approximately 90 degrees. If there is under or overrotation, replace the lock.

(c) Ensure the lock is properly secured to the door. The lock must be firmly held inside the tapered hole in the door by the locating plate. The protruding studs for attachment of the lock plate to the door should not be bent, causing misalignment of the lock. The lock plate should not be loose. Repair or replace as required.

(d) Ensure that the lock tab is secured to the lock. Confirm that the lock tab is fully seated onto the lock shaft and the shaft nut is tight. When closed and latched, there should be minimal (0.06 maximum when measured at the lock tab) inboard or outboard door movement. Make sure the rain seal is not loose and interfering with door closing. The lock tab may be bent inboard or outboard as required to decrease this door movement.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(e) Inspect the switch lever arm to see if it is bent excessively or broken. Also, examine the lever arm attachment/pivot points for wear or breakage.

(f) Finally, make sure the switch retaining screws are tight enough to prevent switch movement during activation of the switch. Repair or replace as required.

(g) If, after performing the above listed preliminary checks along with any required repairs or parts replacements resulting from above inspections, the problem still exists, adjustments to the switch may be required.

(h) Loosen the switch retaining screws, and move the switch as far as possible toward the lock. Although there is a very limited amount of movement available for this adjustment, it is usually sufficient to ensure switch activation. Tighten screws 2 to 4 inch-lbs.

(i) There is also a very limited amount of adjustment available by loosening the shaft nut on the lock and moving the lock tab as far as possible toward the switch before tightening the shaft nut 36 to 42 inch-lbs.

(j) A new, longer lock tab can also be fabricated and used to replace the existing lock tab in extreme cases.

(k) Although bending the lever arm may result in proper switch activation, it is not the preferred or recommended method. The lever arm tends to be brittle and break when trying to bend it. In addition, without proper support of the lever arm, the arm pivot points are easily distorted or destroyed when trying to bend the lever arm.

11. Removal of the Cabin Door Latching Mechanisms

A. Removal of the cabin door latching mechanisms is accomplished by using the following instructions. Refer to Figure 209, Sheet 1 and Sheet 2.

(1) Remove each door handle by removing the cotter pin of the short clevis pin, located through the ears of drum, and then removing the clevis pin. Each handle can be slipped out of the remaining clevis pin in the spindle.

(2) Remove four screws attaching the access panel in the cabin door. Remove the bushing in the access panel before removing the panel. The bushing may be glued to the access panel.

(3) Remove the cotter pin, washer, and clevis pin for each push tube at the connection of the drum ears. The latching pin assemblies can be removed from the door through the access panel.

(4) From the access panel, remove the hex head bolt, washers, nut (located under mounting plate), and spacer.

(5) Remove the truss head screw (located under the exterior handle), washer, nut (located on the access panel side), spacer and the pan head screw. This will allow removal of the remaining mechanism. The mechanism will need to be rotated to get the ears through the slot in the mounting block.

(6) Depressing the spring retainer will allow access to remove the snap ring. Remove the snap ring, spring retainer, spring, and spring housing.

(7) Identify the mating cam, drum, and spindle to the door (left or right) before disassembly. The spindle has two buttons which are opposite of each other and positioned to match the door. The remaining two holes match button locations for the other door.

(8) Remove the cam and spindle from the drum by removing the pin through the drum.

(9) Remove the cotter pins and clevis pins from the spindle.

(10) Some parts are common to both left and right cabin doors; however, it is not good practice to interchange door parts without close examination to size, shape, and length.

12. Reassembling the Cabin Door Latching Mechanisms

A. Use the following steps for reassembling the cabin latching door mechanism. Refer to Figure 209, Sheet 1 and Sheet 2. Use light oil or grease on moving parts during assembly, but keep fasteners dry.

(1) Assemble the long clevis pins and new cotter pins to the spindle per MS33540.

(2) Assemble the mating cam on the drum with the flat face adjacent to the face of the latch pin drive ears. Button positions on the cam must match the door to be assembled (left or right). Buttons may be bonded with Loctite 243 or equivalent on aircraft S/N 40015 and On.

(3) Assemble the mating spindle with the drum, and align the slots of the spindle with the ears of the drum. Insert the pin through the cam, drum, and spindle.

(4) Assemble the spring housing, spring, and spring retainer onto the pin. Depress the spring retainer, and assemble the retaining ring with the sharp edge away from the retainer and into the groove of the drum.

(5) Add nylon washer to each end of the assembly by assembling through the access panel of the mating door. With the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

washer end of the drum toward the mounting plate, pass the drum ears through the slot in the mounting plate. Rotate the assembly to position the ears on the exterior of door at the aft location of the door.

(6) Attach the cam to the mounting block with spacers, washers, bolt, screw, and nuts. Assemble the screw from the exterior of the door. Torque nut of screw and bolt 30 to 36 inch-lbs.

(7) Reassemble the latch arms and pins with new cotter pins per MS33540. Assemble mating latch arms and pins of door through the access panel and through bushings in the door. Attach to the drum ears with the clevis pin and new cotter pins per MS33540.

(8) Assemble the left door lock assembly with the mounting plate over the spindle, drive tab (marking shown) on lock, lock tab on drive tab, and nut torqued 36 to 42 inch-lbs.

(9) Install pan head screw through door skin and mounting plate. Torque 12 to 15 inch-lbs.

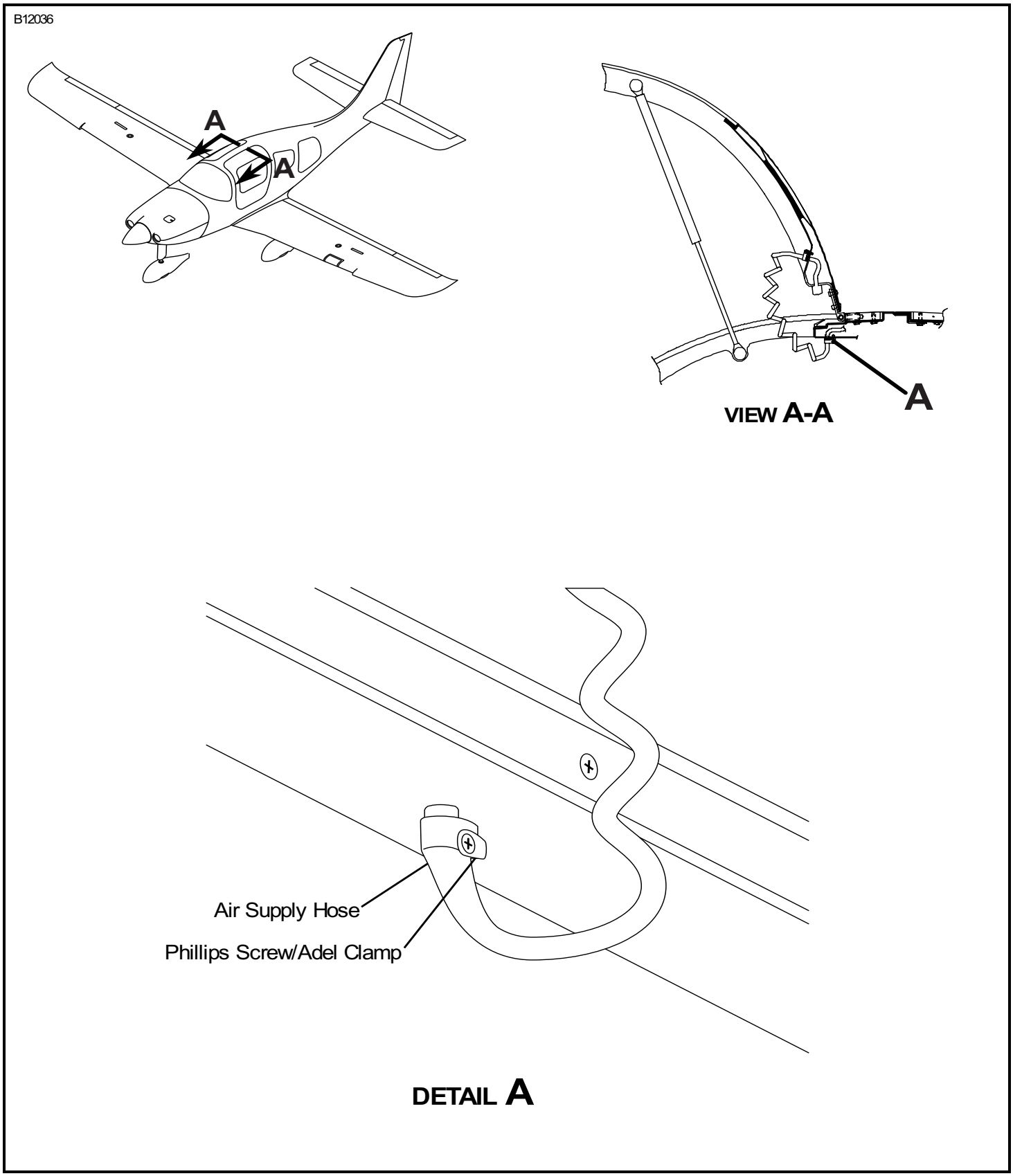
(10) Assemble the left door lock assembly to the mounting plate from the access panel with the plate over studs with two nuts and washers torqued 12 to 15 inch-lbs.

(11) Assemble the right door lock assembly to the access panel with the thumb latch pointing aft on the panel side with countersink screw holes. Assemble with a star washer, and torque nut 100 to 120 inch-lbs. Align marks on the lock tab, drive tab, and lock assembly, and attach with lock washer and screw. Torque screw 36 to 42 inch-lbs.

(12) Assemble the access panel bushing over the ears of the drum. After cycling latches several times with the access panel in place, bond the bushing to the access panel (countersunk screw holes showing) with Loctite 454, and attach the access panel to the door with flat head screws.

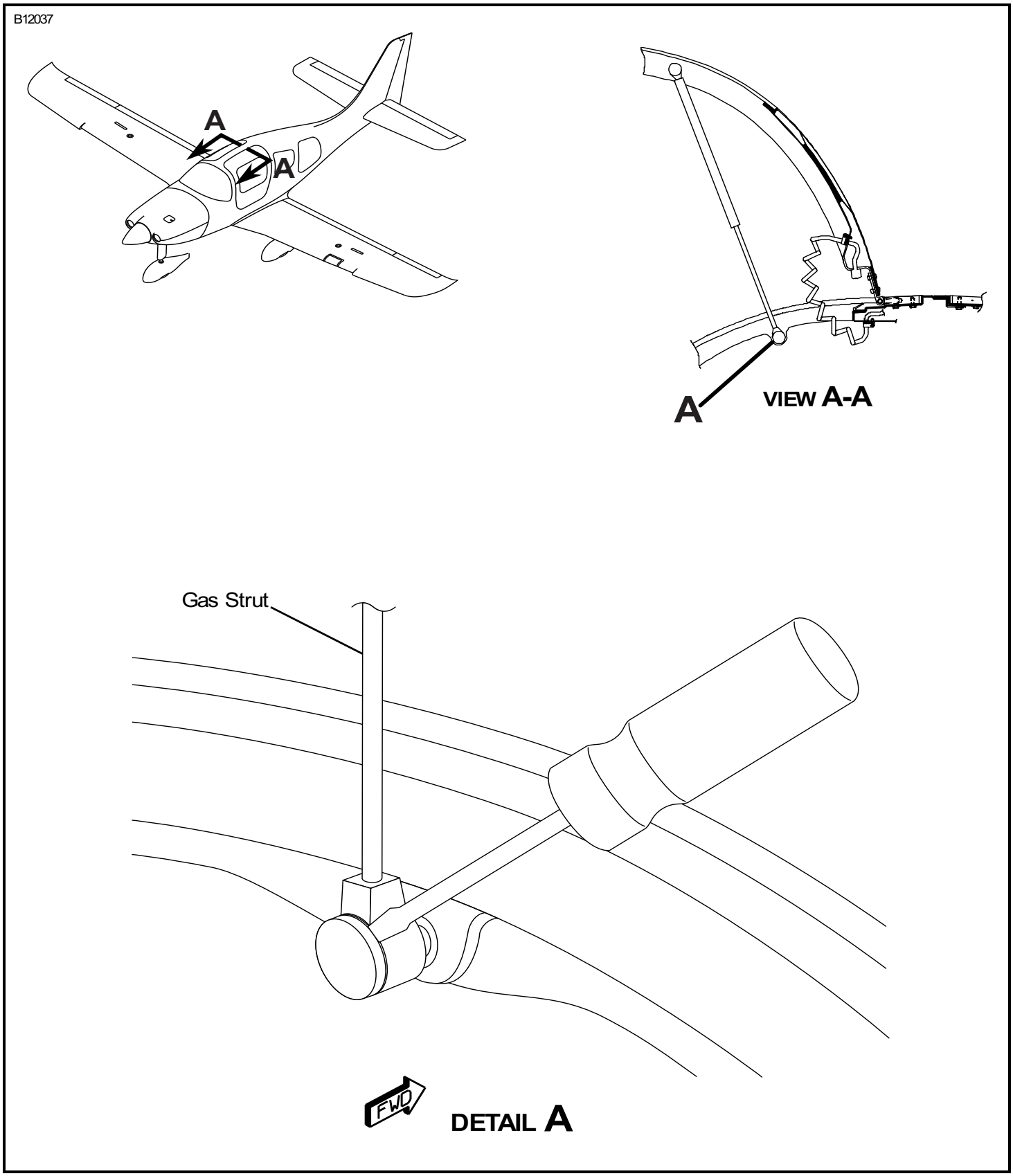
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Pneumatic Door Seal Removal



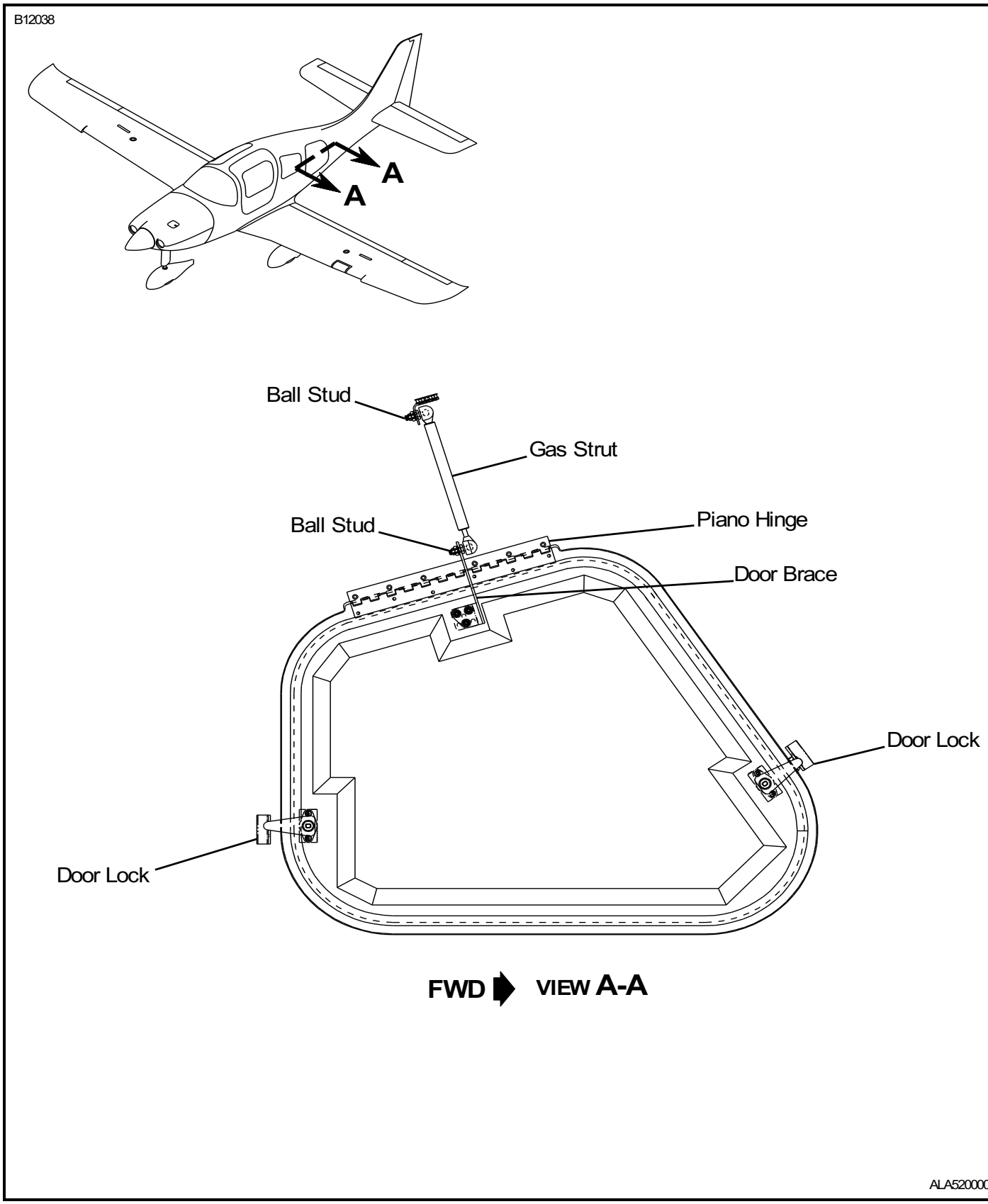
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Gas Strut Removal



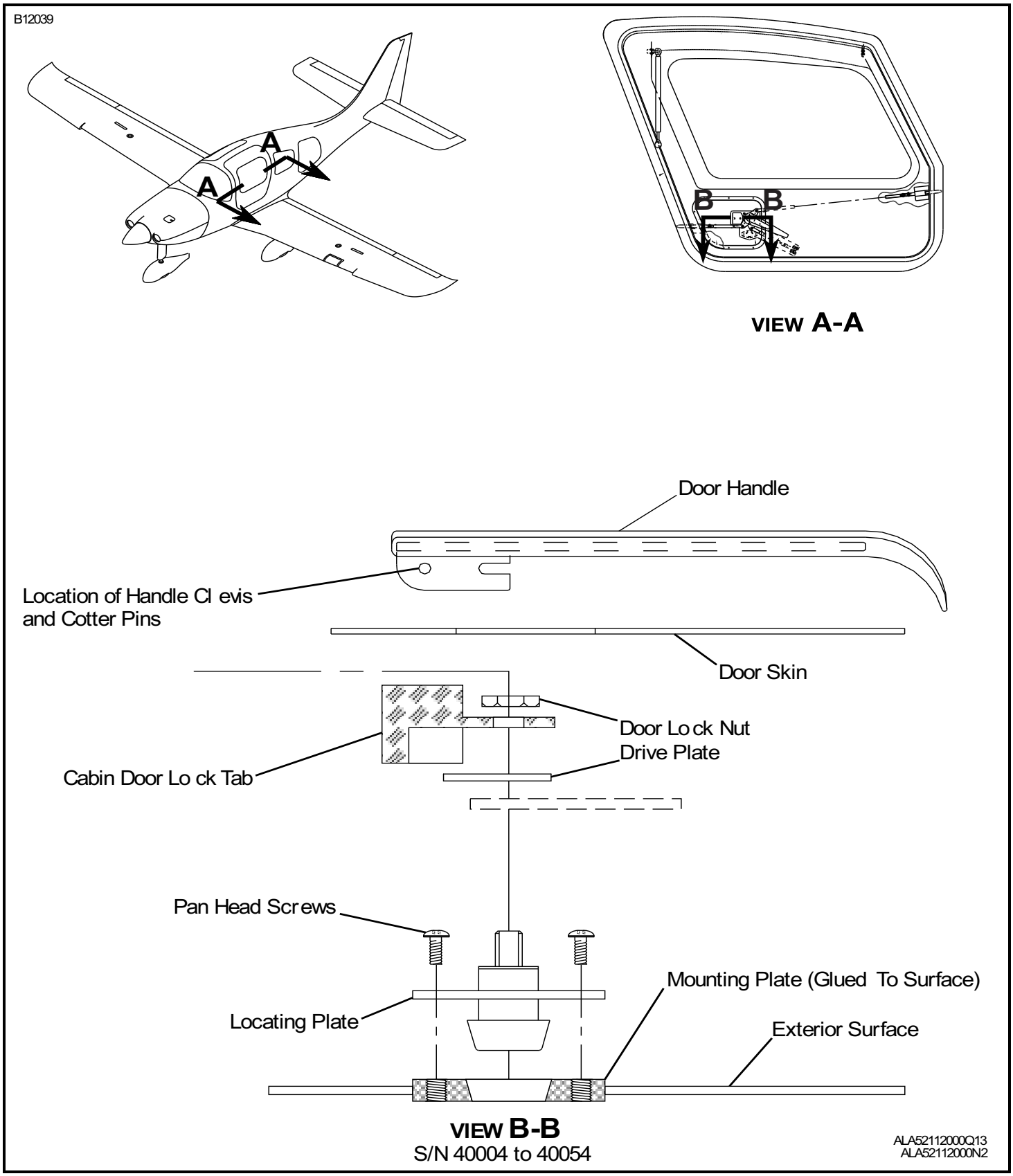
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Baggage Door



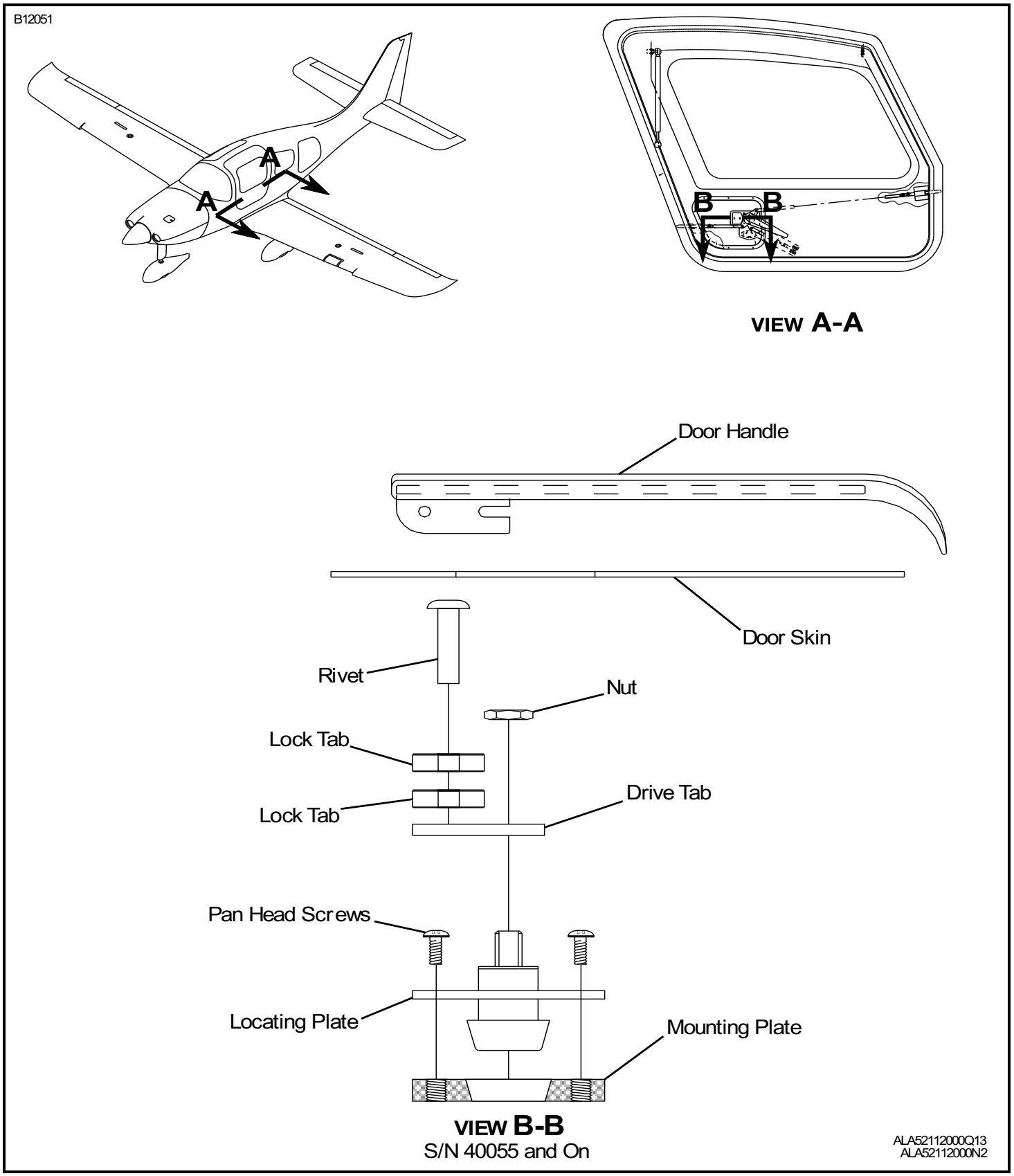
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Left Door Lock Assembly



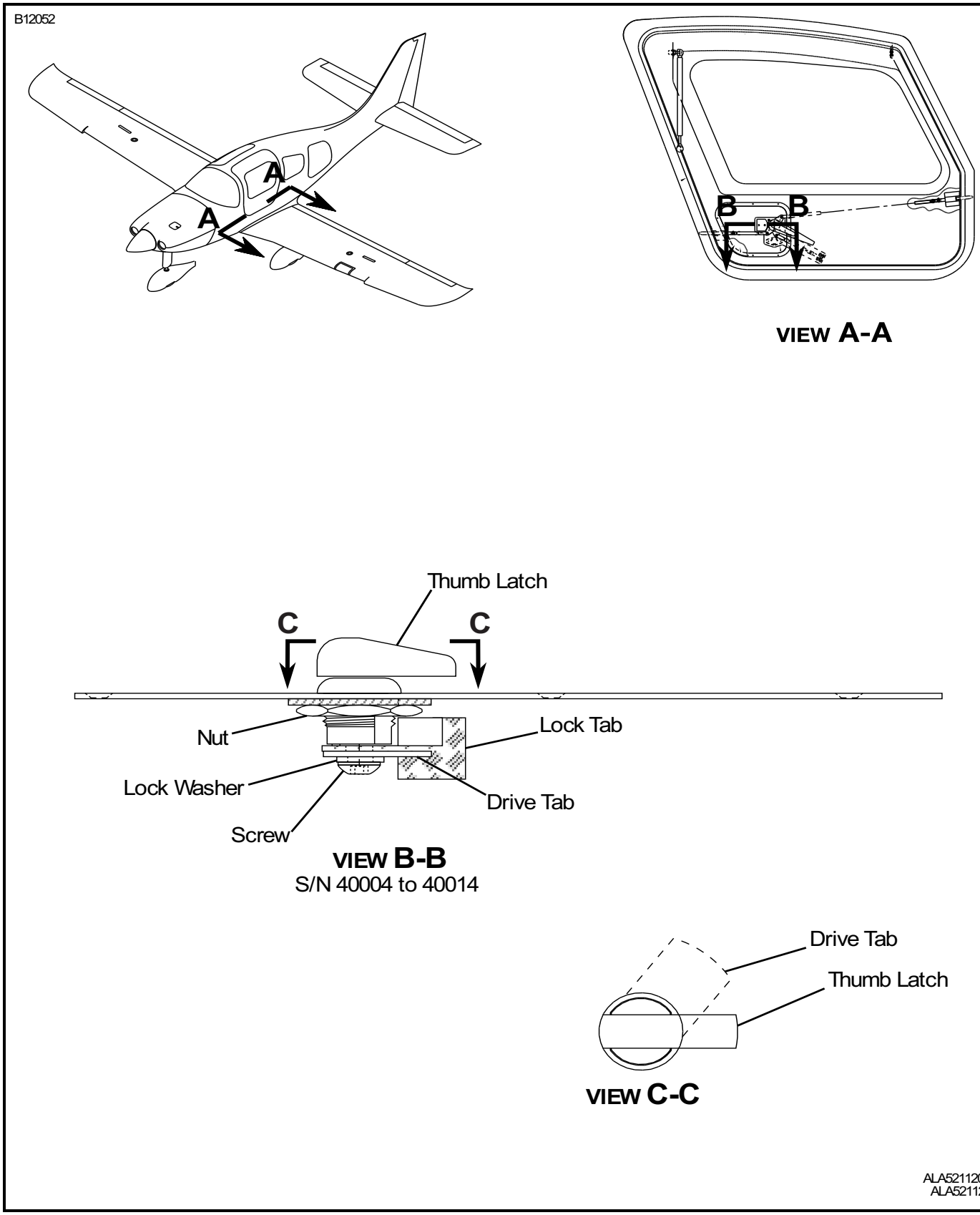
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 2 : Left Door Lock Assembly



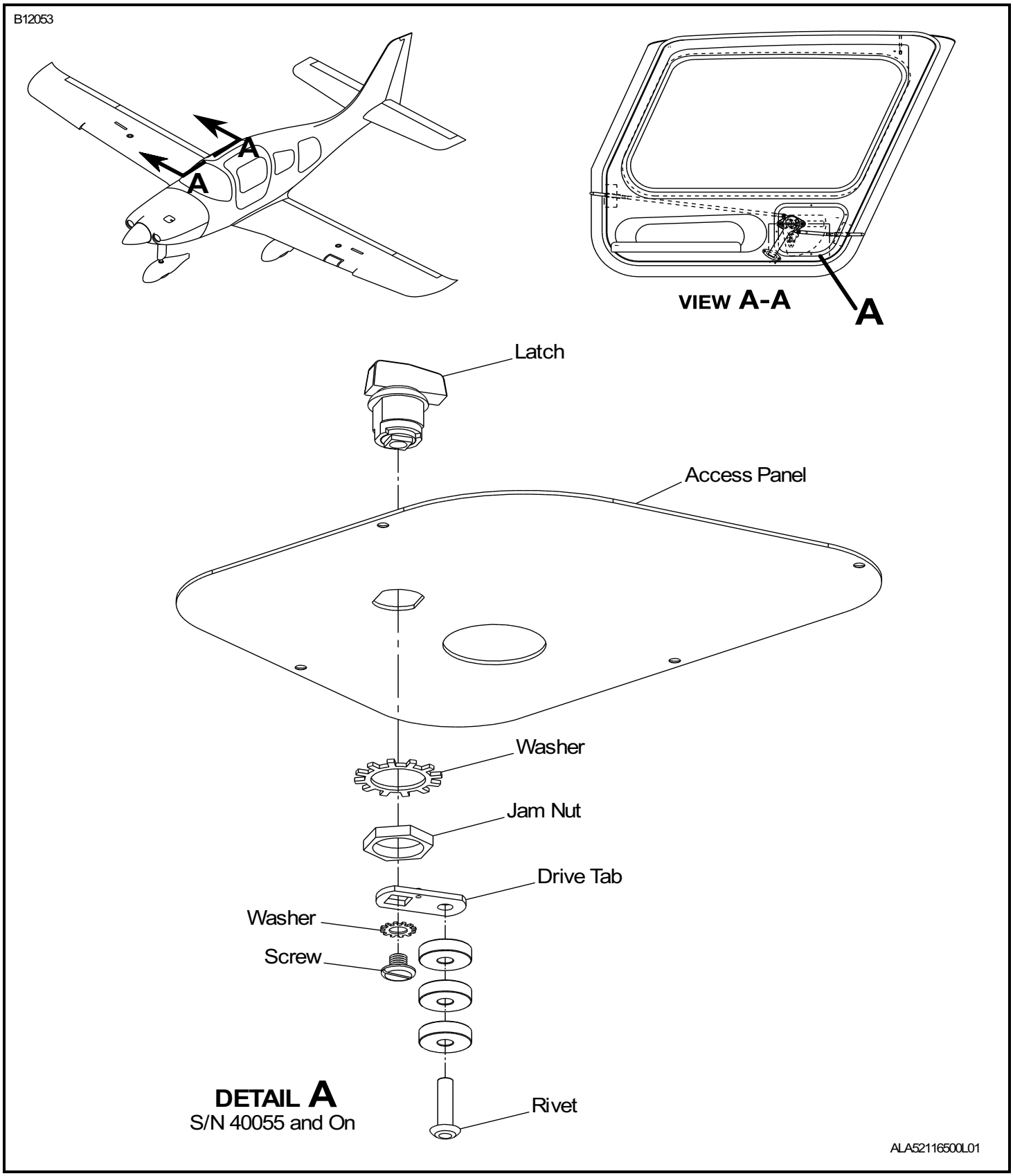
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Right Door Lock Assembly



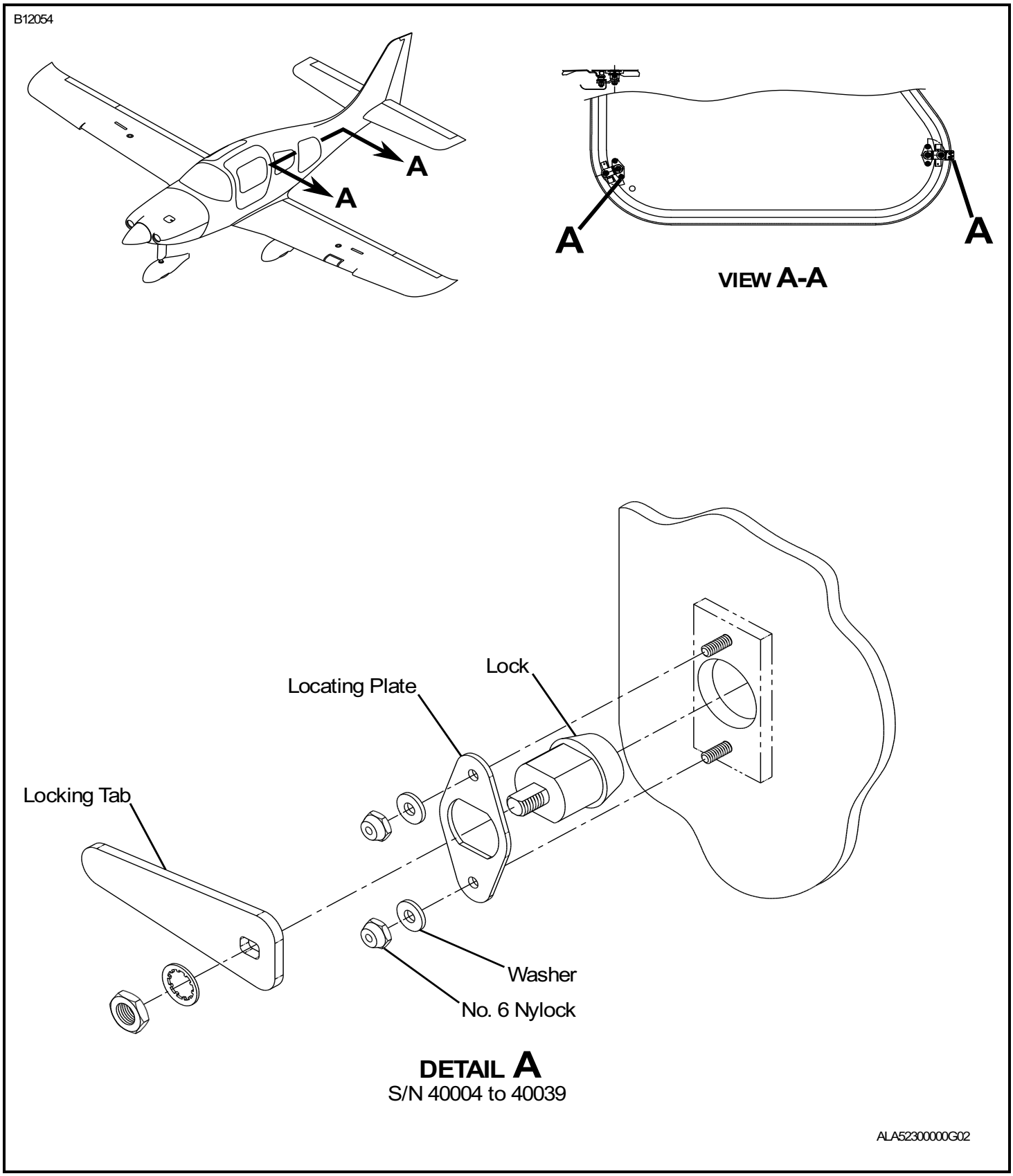
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 2 : Right Door Lock Assembly



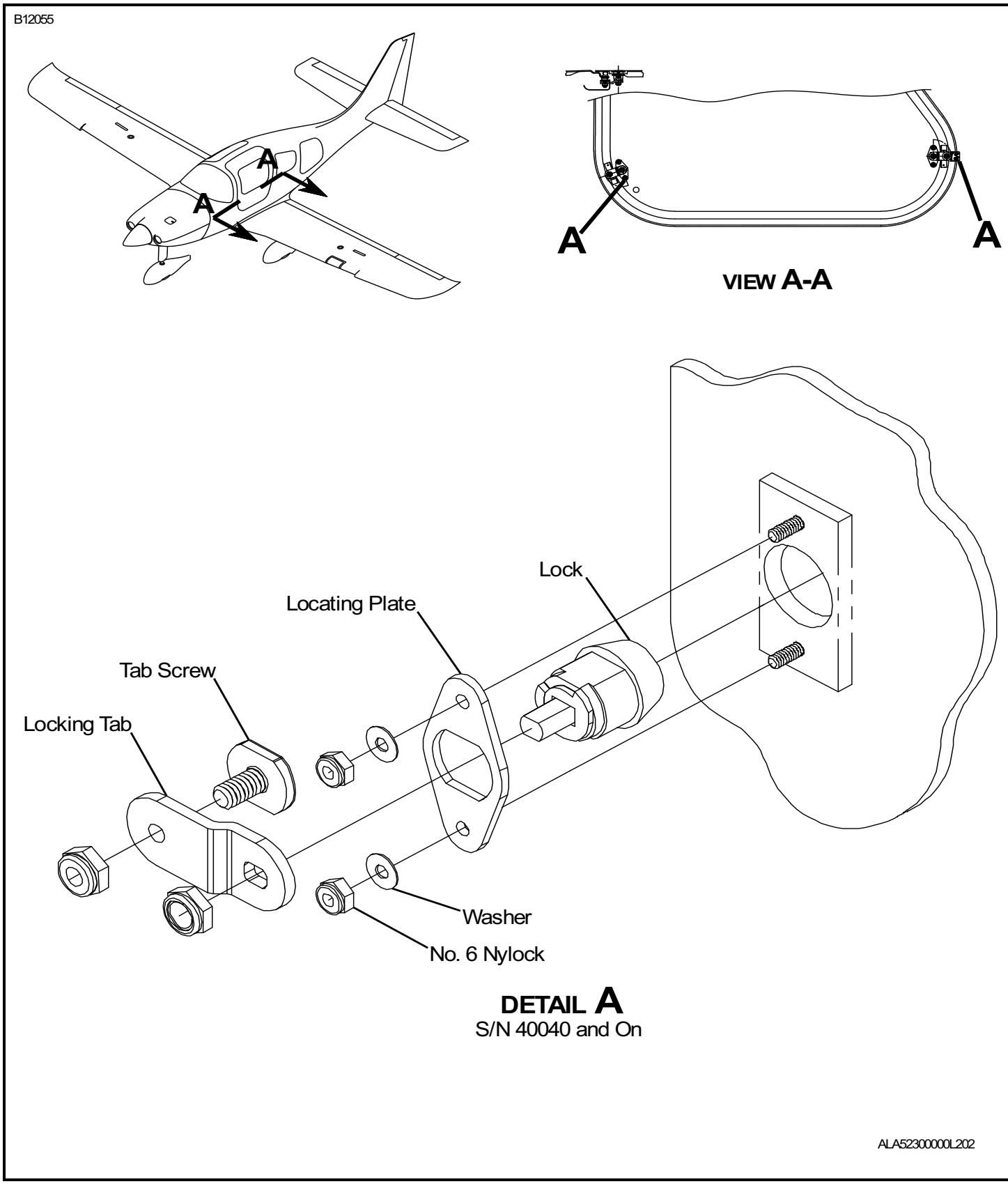
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Baggage Door Lock



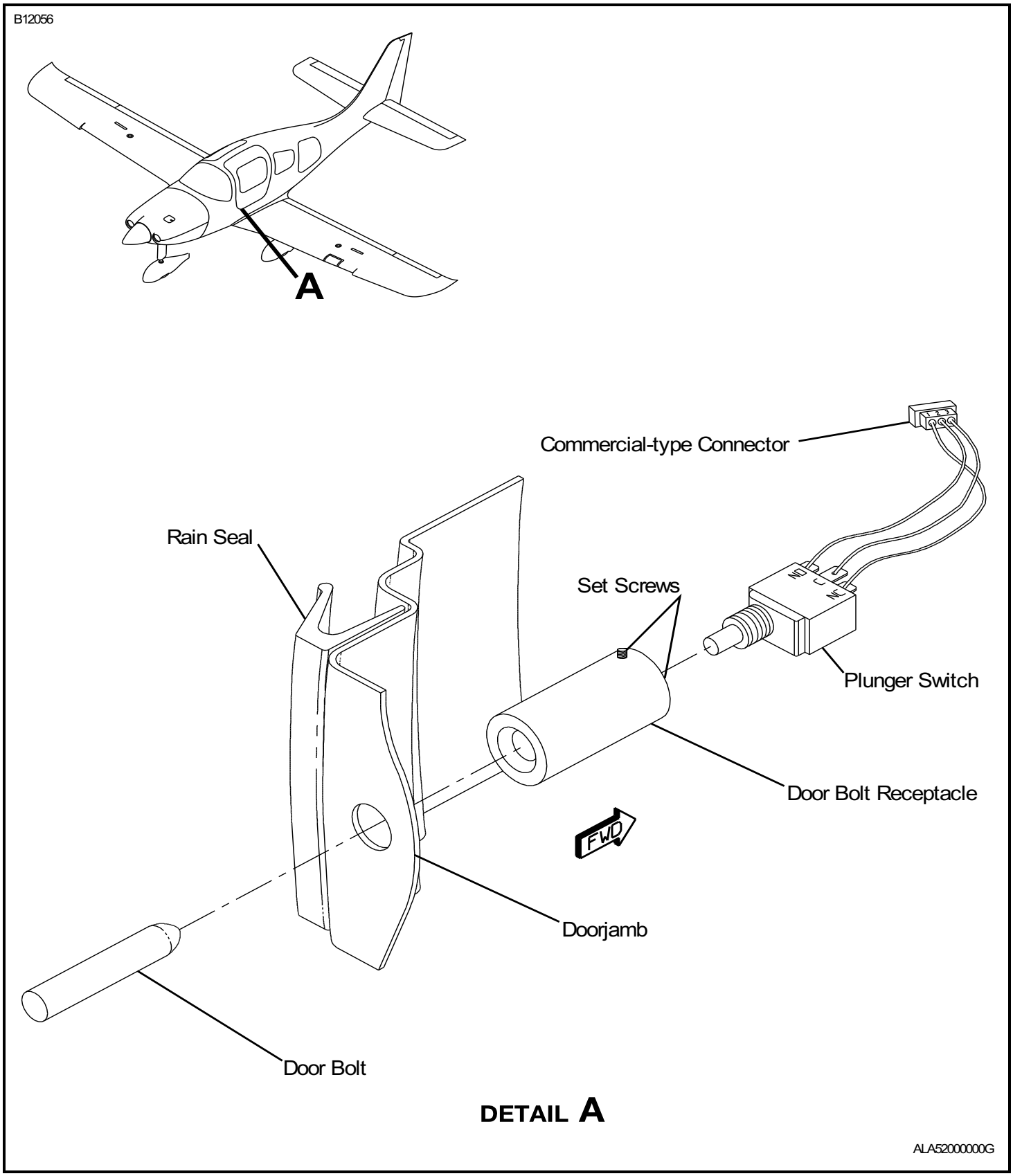
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 2 : Baggage Door Lock



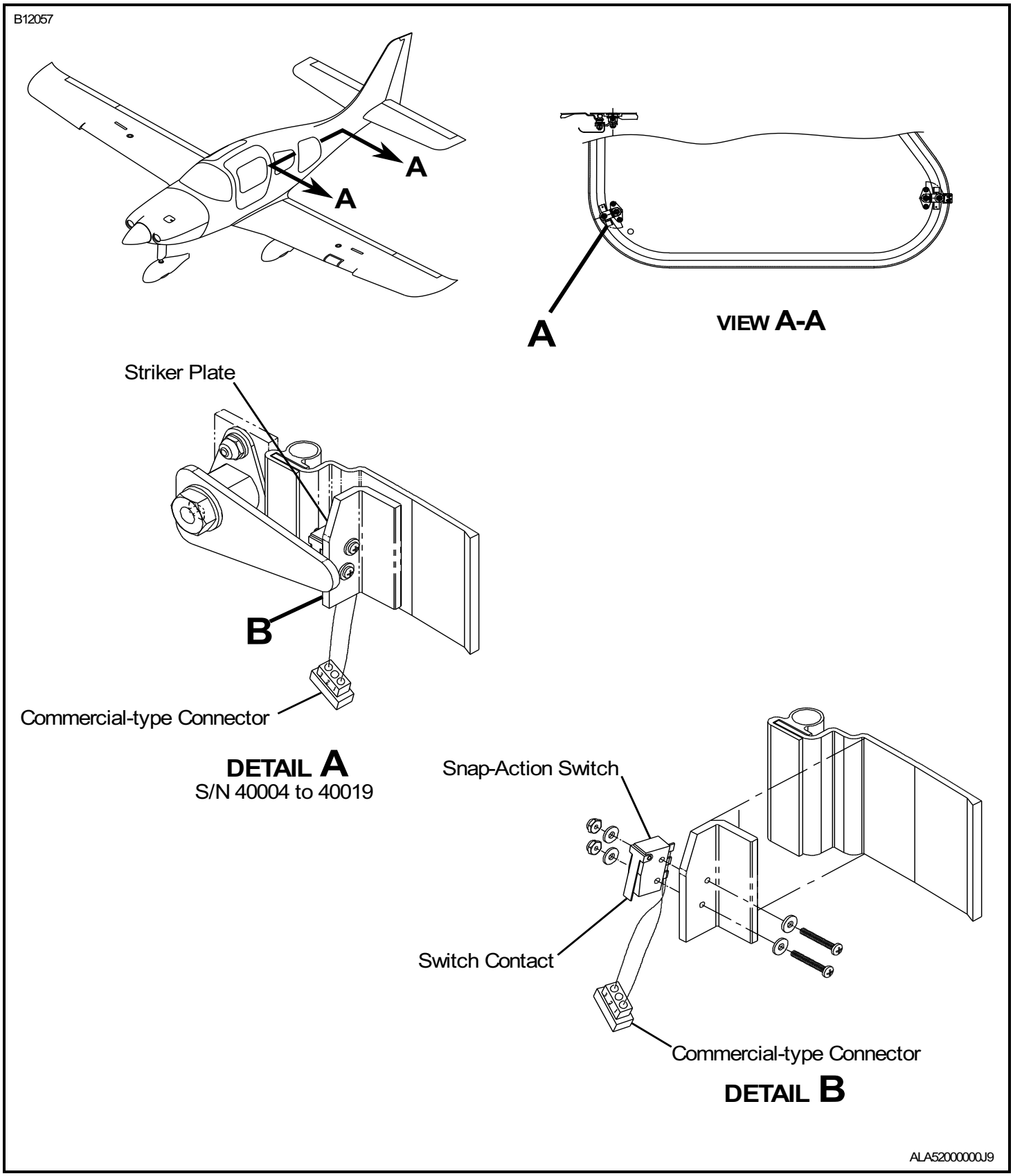
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Cabin Door Annunciator Switch Assembly



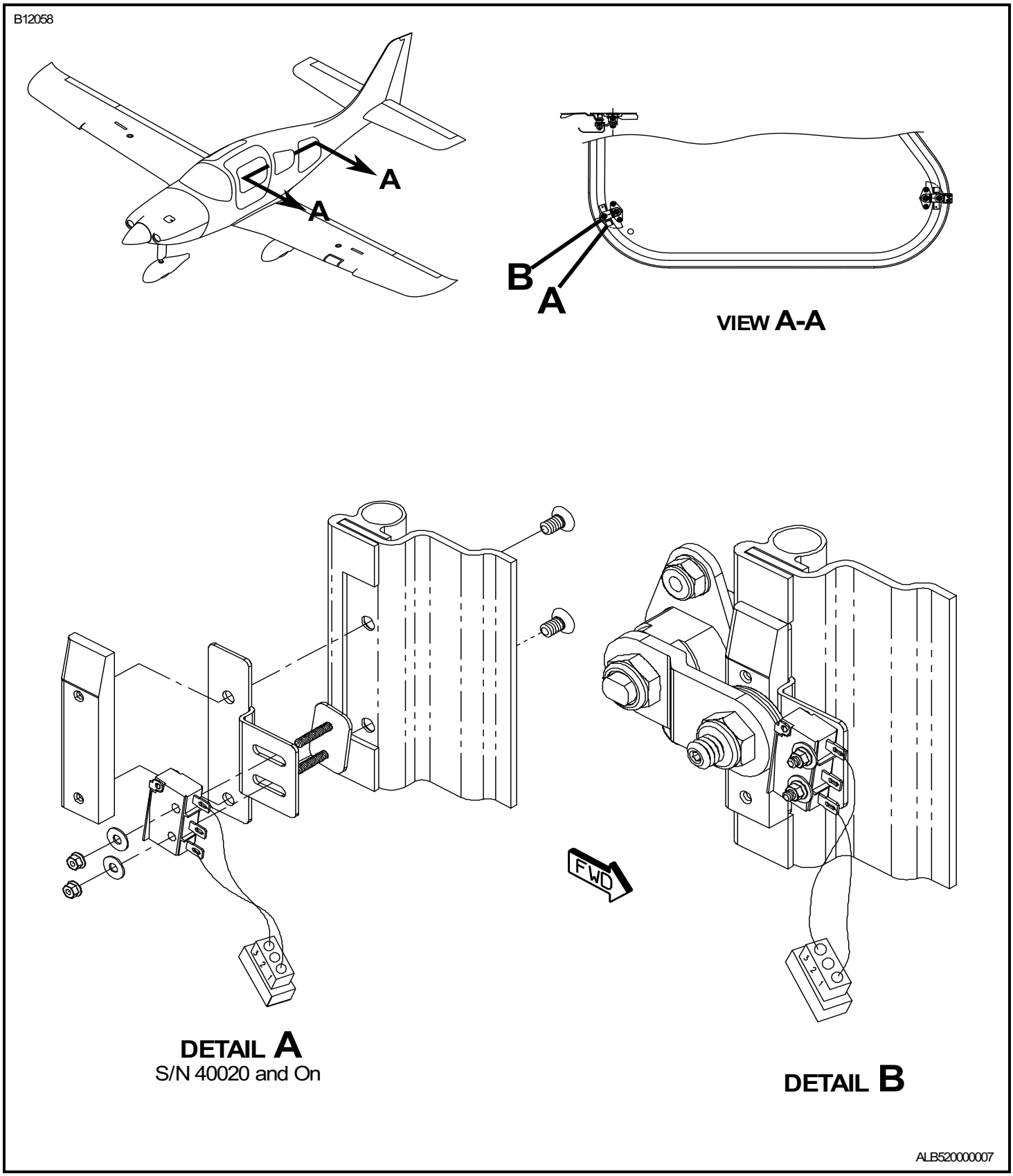
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : Baggage Door Switch Assembly



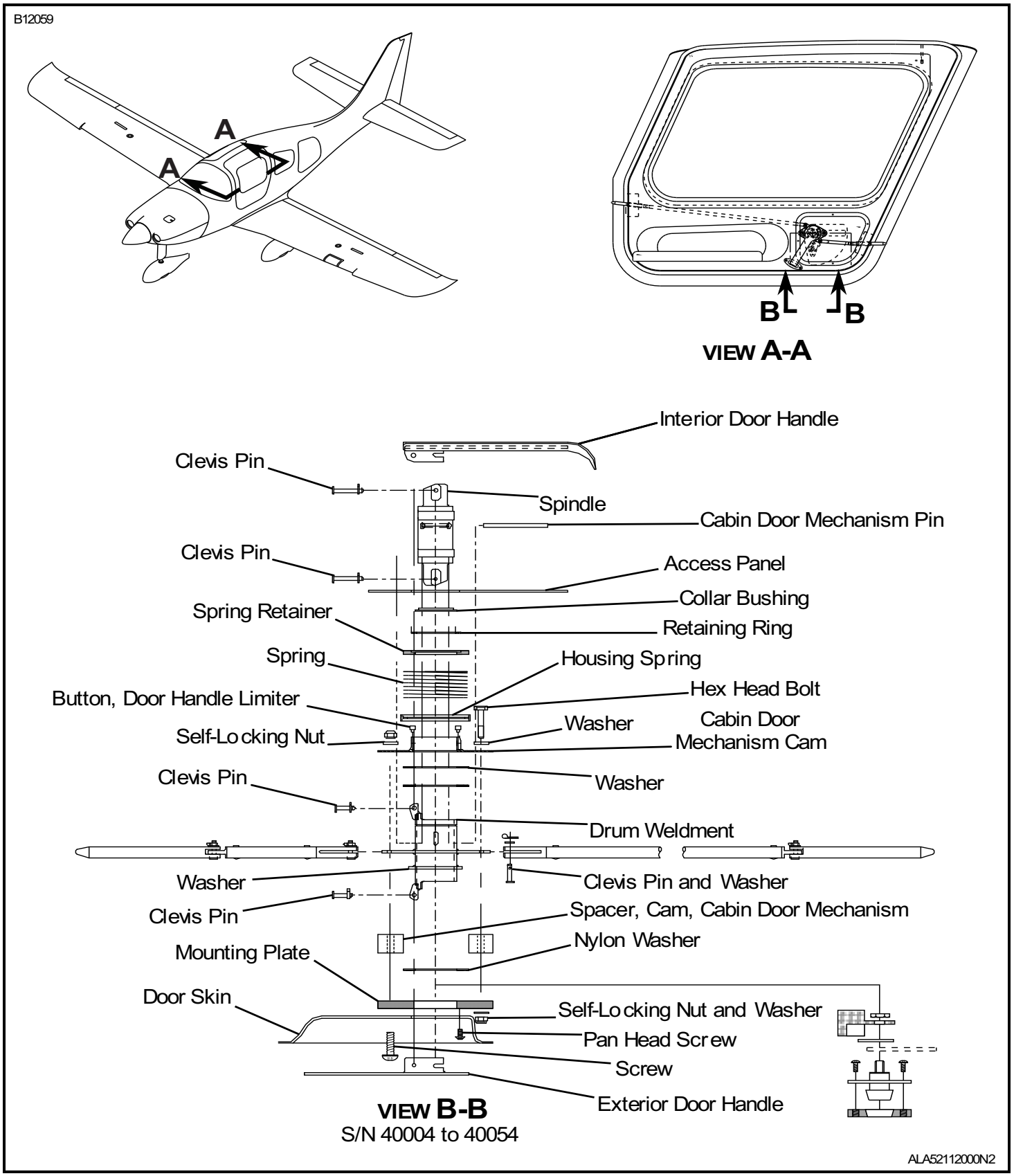
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 2 : Baggage Door Switch Assembly



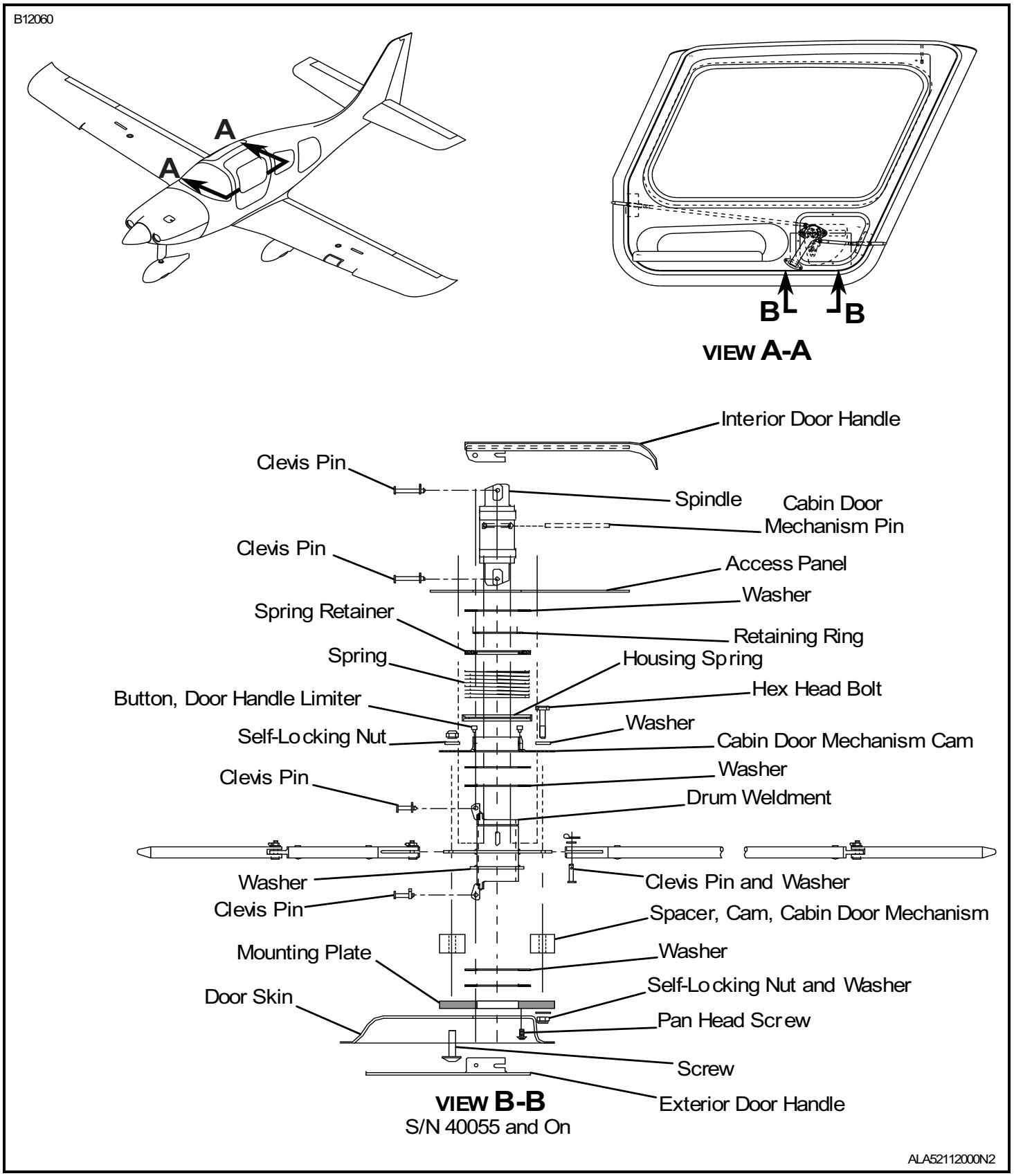
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Cabin Door Locking Mechanism



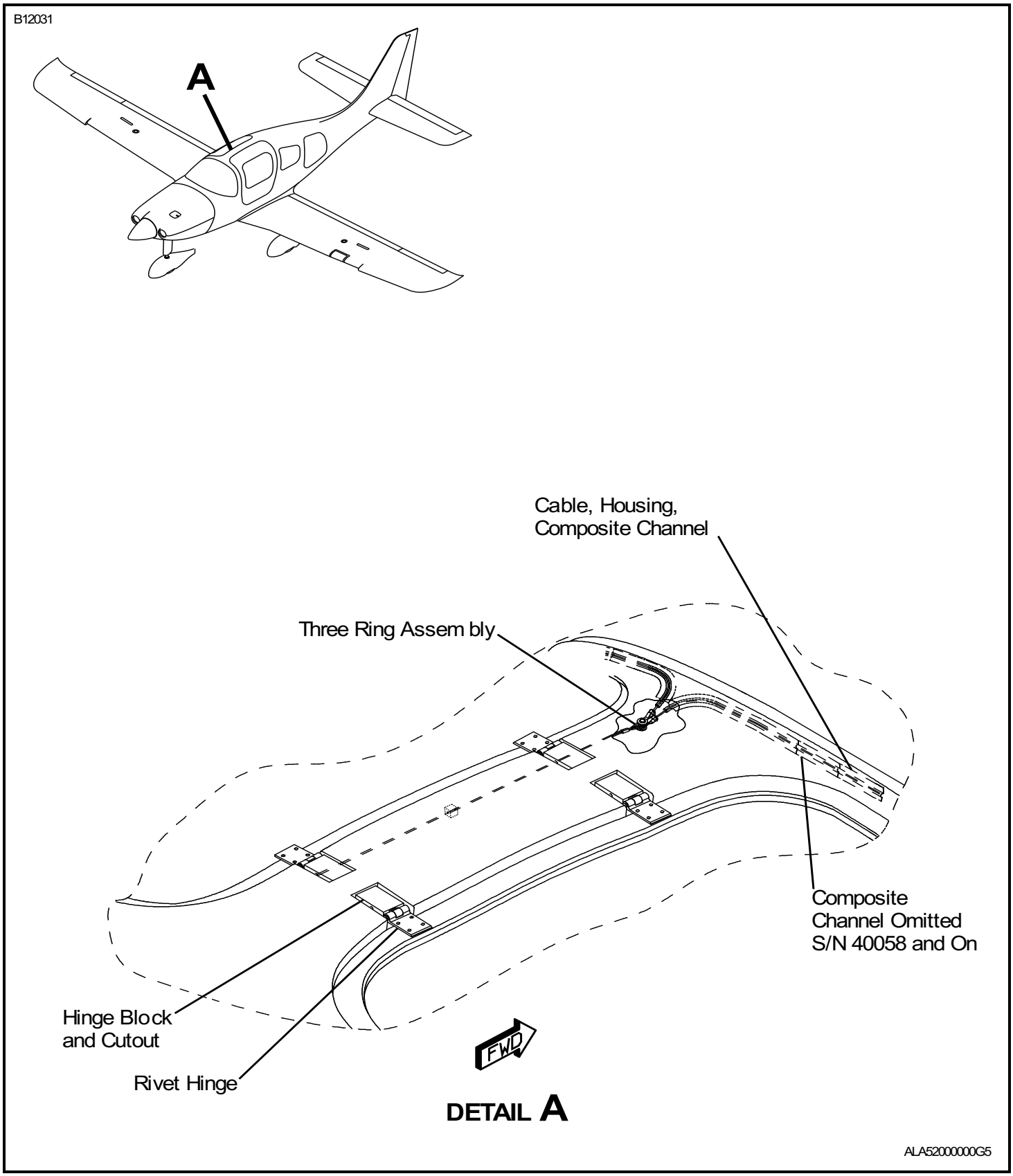
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 2 : Cabin Door Locking Mechanism



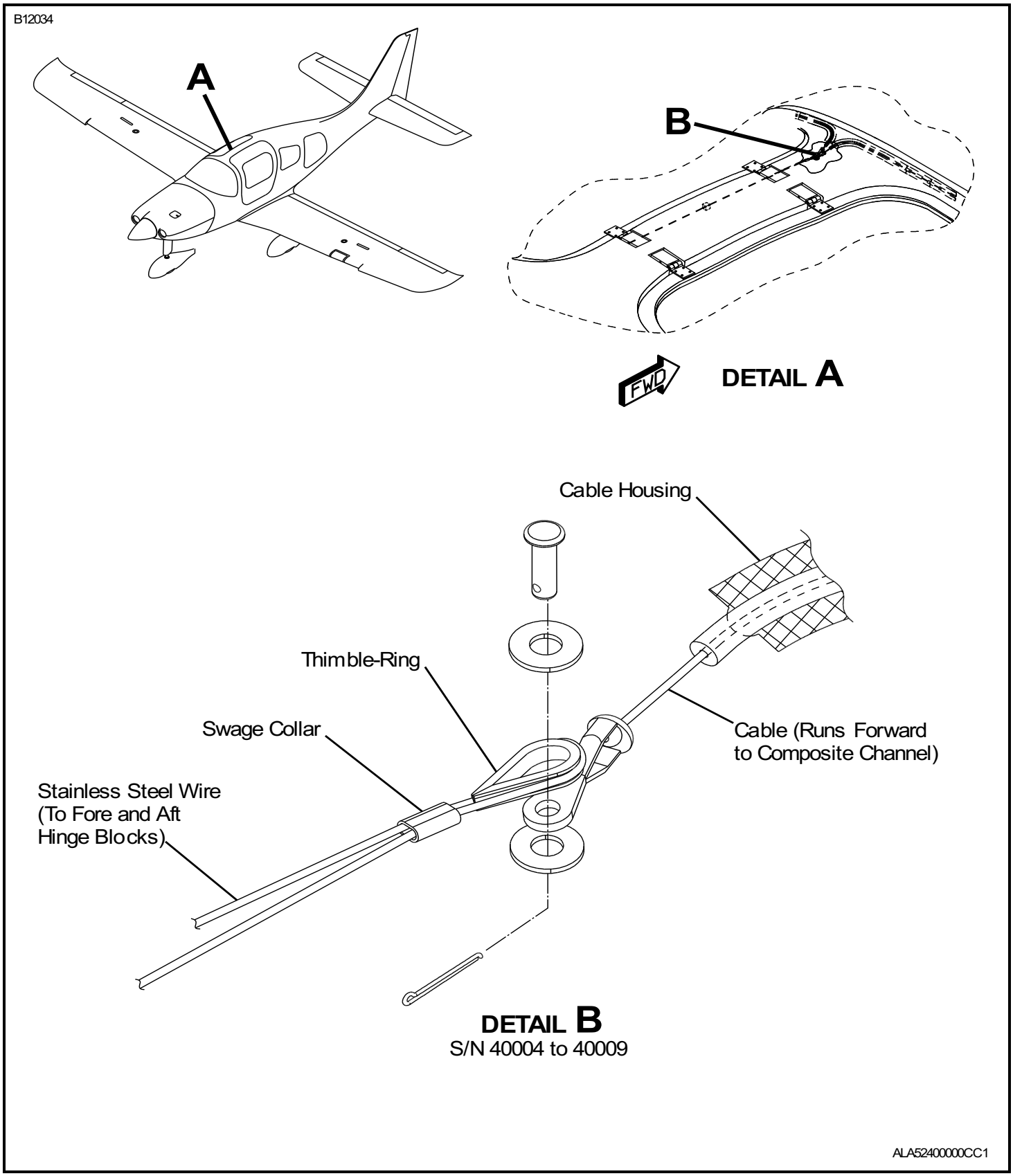
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Door Hinges



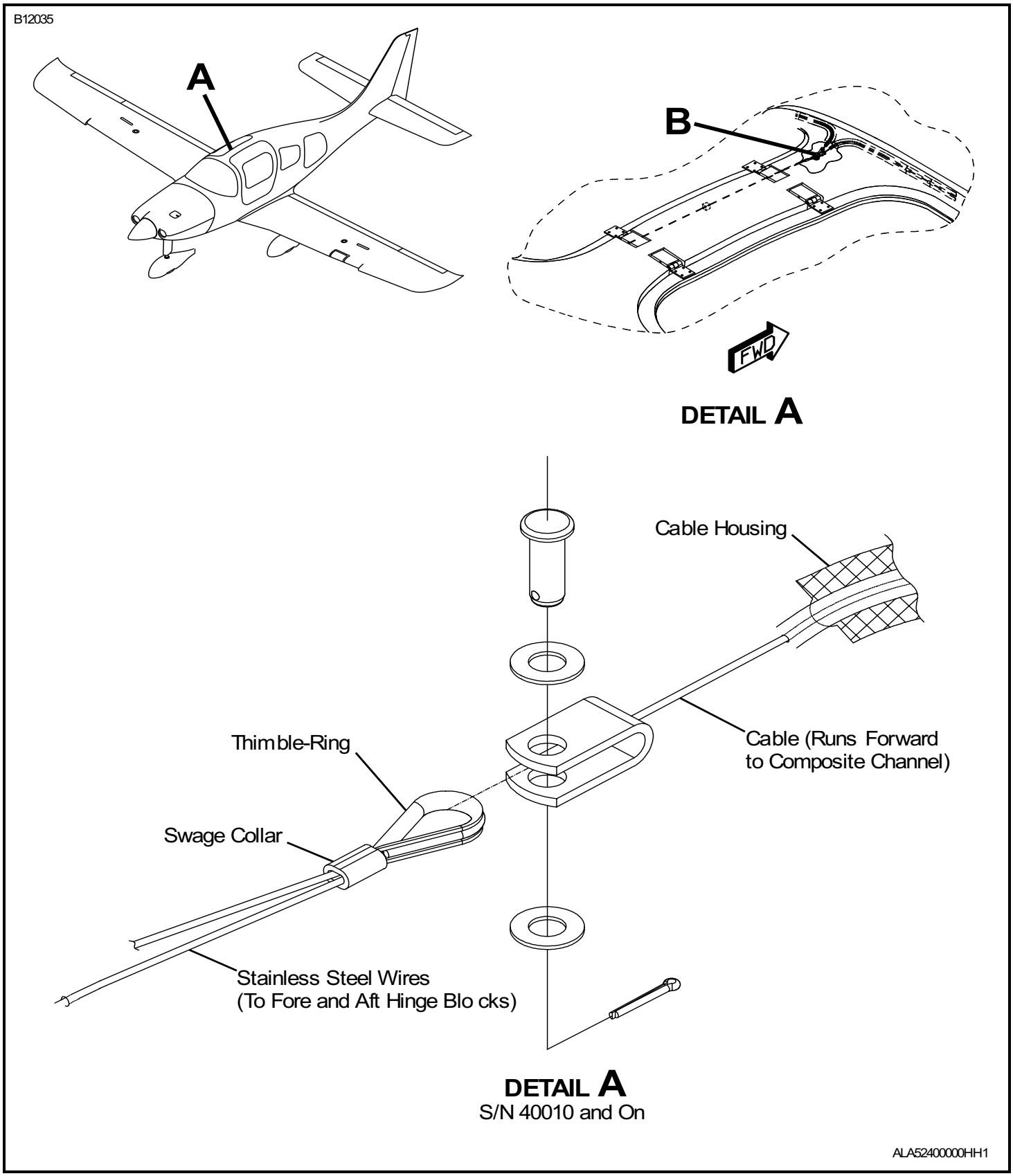
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 3 : Sheet 1 : Emergency Door Release Cable



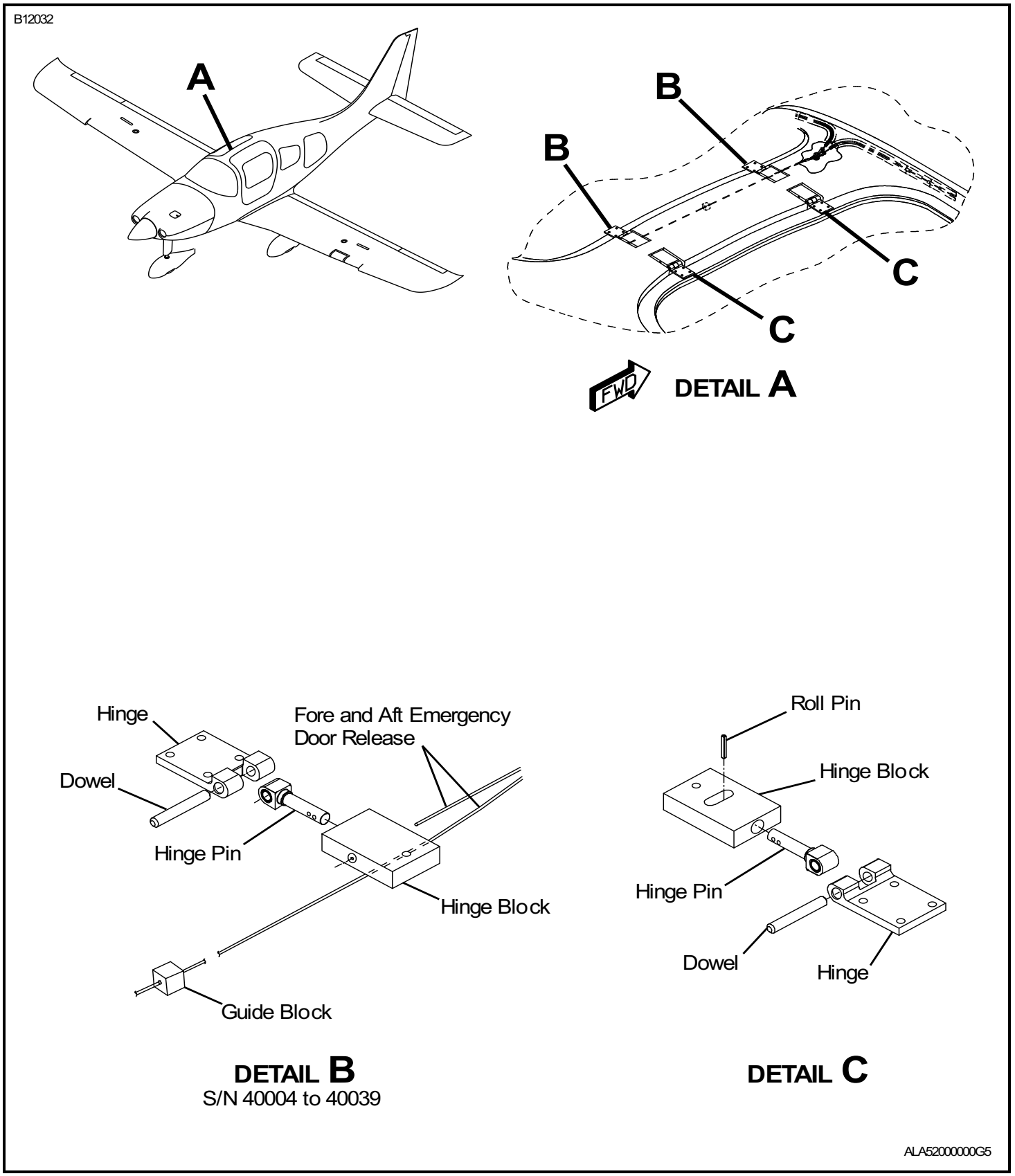
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 3 : Sheet 2 : Emergency Door Release Cable



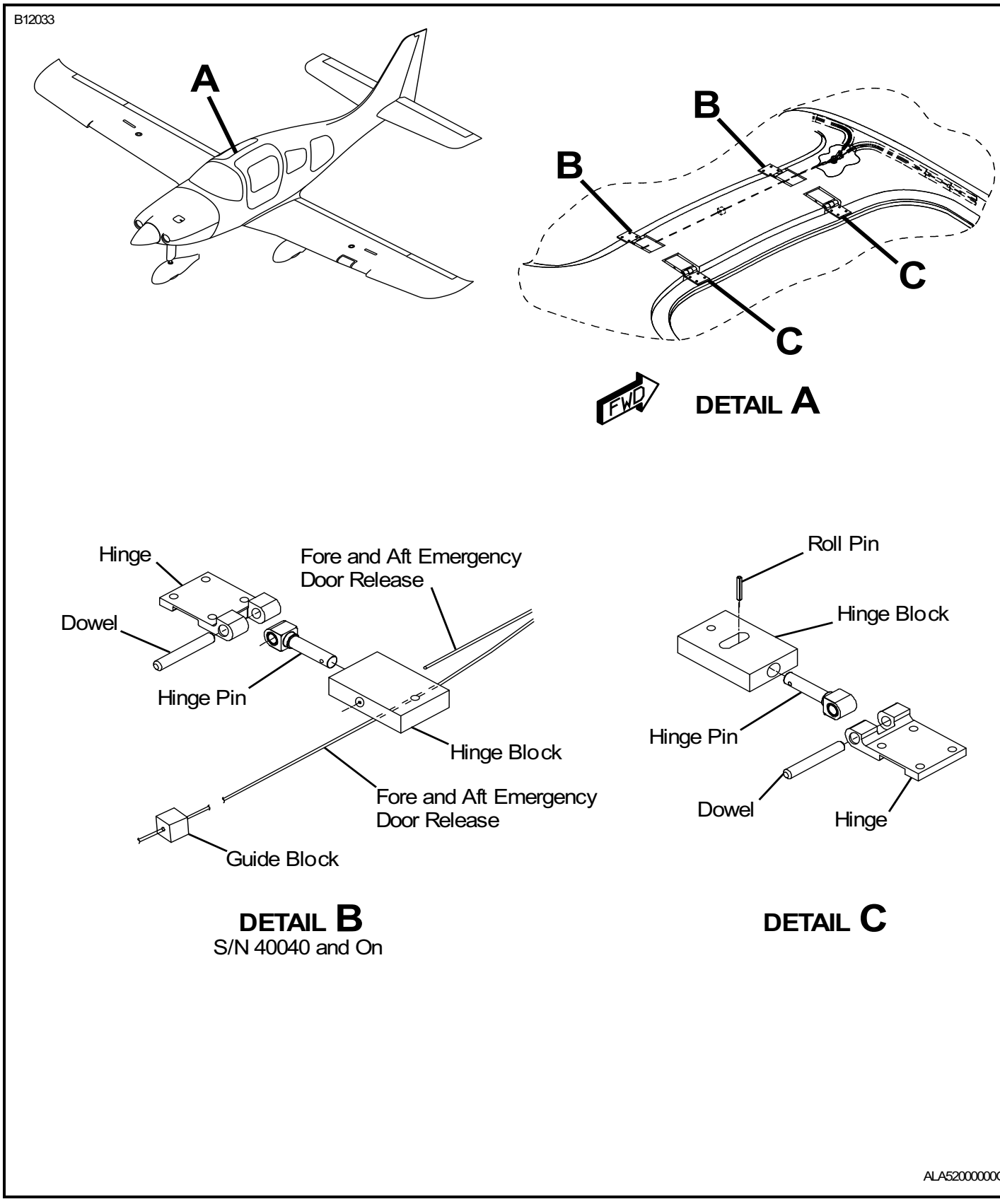
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Door Hinge Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 2 : Door Hinge Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

DOOR SEAL SYSTEM - MAINTENANCE PRACTICES

1. Door Seal System

A. General - The door seals are inflated by an electric pump located forward of the pilot's side rudder pedals near the firewall. Two other devices are associated with the electric pump: a pressure switch and a dump valve, which are mounted to the same surface as the pump. The electric pump draws air from the cabin, through a filter, and then pumps it to a pressure switch. From that point the air moves to a T-fitting. One part of the T-fitting supplies pressure to a dump valve, and the other part supplies pressure to the door seals. Refer to Figure 201, Sheet 1, Figure 201, Sheet 2, Figure 202, Figure 203 and Figure 204, Sheet 1.

B. **Pressure Switch** - The pressure switch maintains the system pressure at between 12 and 15 psi and turns the pump on and off at these two limits, respectively.

C. **Dump Valve** - The dump valve is a solenoid that requires two conditions to be energized and not dump pressure from the system. The master switch must be on and the Door Open Annunciator must be extinguished. If one of the cabin doors is opened or the master switch is turned off, the solenoid will de-energize and pressure is dumped from the system.

D. **Supply Lines** - The supply lines for the door seal are routed from the pump assembly, behind the lower kick panel, up through the rollover structure, and then aft, above the emergency release cables, to the aft part of the door openings. At this point a T-fitting routes air to the right and left doors. A coil assembly transfers the flow from the cabin to the door.

E. **Location of Nipples** - There are 14 plastic nipples in the system to which plastic hosing is connected. Since system leaks are frequently at the connection points, the location of each nipple is important.

(1) Seven nipples are located in the pump assembly.

(2) Three nipples are located in the overhead panel.

(3) Two nipples are associated with each door, one at the cabin connection and one at the door connection.

2. Troubleshooting The Door Seal System

A. **Symptom** - Door seal system cycles on and off every few seconds.

(1) **Probable Cause** - Supply line between the pump and pressure switch has a leak.

(2) **Action** - Replace the supply hose, and recheck the system.

B. **Symptom** - Pump runs continuously or turns on and off every minute or so.

(1) **Probable Cause** - A leak somewhere in the system.

(2) **Action** - Isolate the area of the leak.

(a) Use a hemostat to isolate a leak in the system. First, clip off the system at a point between the output of the pump assembly and the supply to the door seals. It will be necessary to remove the left side kick panel (refer to Chapter 25) or the right FOSP. Refer to the FOSP section in Chapter 52-10-00. Operate the system with the hemostat in place. If it holds pressure for more than two minutes, the problem is in one of the following areas:

1 The overhead T-fitting supply lines.

2 The supply lines to the doors.

3 The supply line from the pump to the overhead T-Fitting, somewhere forward of the hemostat.

(b) If the system leaks when the hemostat is applied between the output of the pump and the supply to the system, the leak is probably in one of the following areas:

1 The supply line between the hemostat and the pump assembly.

2 The supply line between the pump assembly T-fitting and the dump valve.

3 The supply line between the pressure switch and the pump assembly T-fitting.

(c) Depending on which side of the system the leak is first isolated, continue to move the hemostat in the appropriate direction until the exact location is determined, and replace the supply line/Clippard hose per instructions in the Replacing Air Supply Lines/Clippard Hose section. The following points should be remembered:

1 There may be more than one leak in the system.

2 To access the pump assembly, it works best to remove the engine instrument panel.

C. **Symptom** - Door Seal System will not turn on.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(1) **Probable Cause** - The most probable causes are listed below in their most likely order:

(a) Door latch plunger-type switches need adjustment.

(b) Doors are not completely closed.

(c) Circuit breaker is popped.

(d) Pressure switch is defective.

(e) Pump is defective.

(2) **Action** - Perform the actions below in the order listed.

(a) Ensure the Door Open annunciator is operative so that when the door latching mechanism is activated the Door Open light turns off.

(b) Ensure that the door seal circuit breaker is in.

(c) If the doors are functioning properly, jumper past the pressure switch. If the pump turns on, the problem is a defective pressure switch. Replace switch per instructions in the Replacing Pump Assembly Components section.

(d) If jumpering past the pressure switch does not turn on the pump, the pump is defective. Replace the pump per instructions in the Replacing Pump Assembly Components section.

D. **Symptom** - There are no leaks in the system, however, the pump runs but will not adequately inflate the door seals.

(1) **Probable Cause** - The pump filter is clogged or the dump valve is defective.

(2) **Action** - Clean the filter. If this does not cure the problem, place a hemostat on the line between the pump assembly T-fitting and the dump valve. If the system pressurizes the door seals, the problem is a defective dump valve. Replace the dump valve per instructions in the Replacing Pump Assembly Components section.

3. Replacing Air Supply Lines/Clippard Hose

A. If a supply line leak is isolated, it must be replaced with Clippard hose Part No. 3814-6.

B. The fit of the hose to the supply nipple is very tight, and in most cases, it will require cutting the hose off. The hose can be heated slightly with a heat gun, however, extreme care must be used to not damage the nipple or other components.

C. Ensure the new hose is routed through the same plastic guides as the old hose. Normally, if the hose is inserted past the first barb on the nipple, this is sufficient.

D. To replace the door coil, use the following steps:

(1) Remove the Adel clamps from the cabin and the door. Refer to the Standard Removal Of The Right Door section of Chapter 52-10-00.

(2) Gently pull on the door coil so that it draws the nipple and Clippard hose from the overhead cabin hole and the hole in the door.

(3) Remove the door coil from each nipple, and install the new one.

(4) Feed the Clippard hose back into the overhead panel and door, and reinstall the Adel clamps.

4. Replacing Pump Assembly Components

A. **Dump Valve** - Removal and installation of the dump valve requires removal and installation of the two No. 6 screws, which are inserted into threaded holes in the dump valve. Refer to Figure 204, Sheet 1 and Sheet 2. Ensure the Clippard hosing and the electrical connection are removed. Torque screws 10 to 12 inch-lbs.

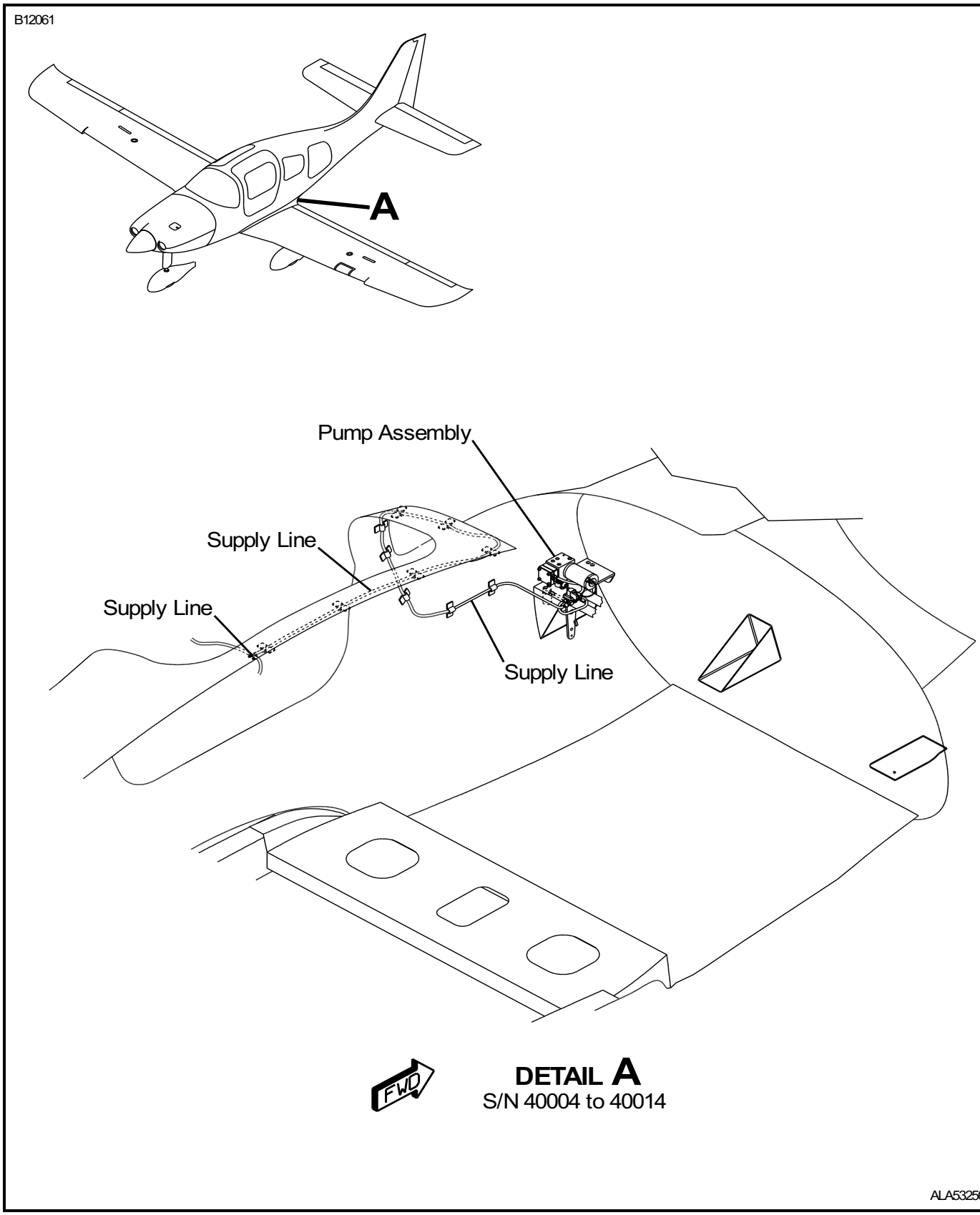
B. **Pressure Switch** - The pressure switch is removed and installed through removal and installation of the four No. 2 screws with self-locking nuts and washers. The two electrical connections must be removed and the Clippard hosing must be removed as well. Refer to Figure 204, Sheet 1 and Sheet 2. To **adjust the switch pressure**, T-in a calibrated pressure reading device to the system, and turn the pressure adjustment screw until the output pressure is 14 psi. Torque 2 to 3 inch-lbs.

C. **Pump** - The pump is removed and installed by removal/installation of the three top screws and washers, which are attached to a threaded rubber isolator. Refer to Figure 204, Sheet 1 and Sheet 2. Ensure that all electrical connections are removed and that the Clippard hosing is removed. Torque screws 30 to 36 inch-lbs in aircraft S/N 40004 to 40014 and 20 to 25 inch-lbs. in aircraft S/N 40015 and On.

D. **Nipples** - Nipples for the dump valve and the air filter are installed at the factory. If it is necessary to replace the nipples, they should be hand tightened plus 1/4 of a turn.

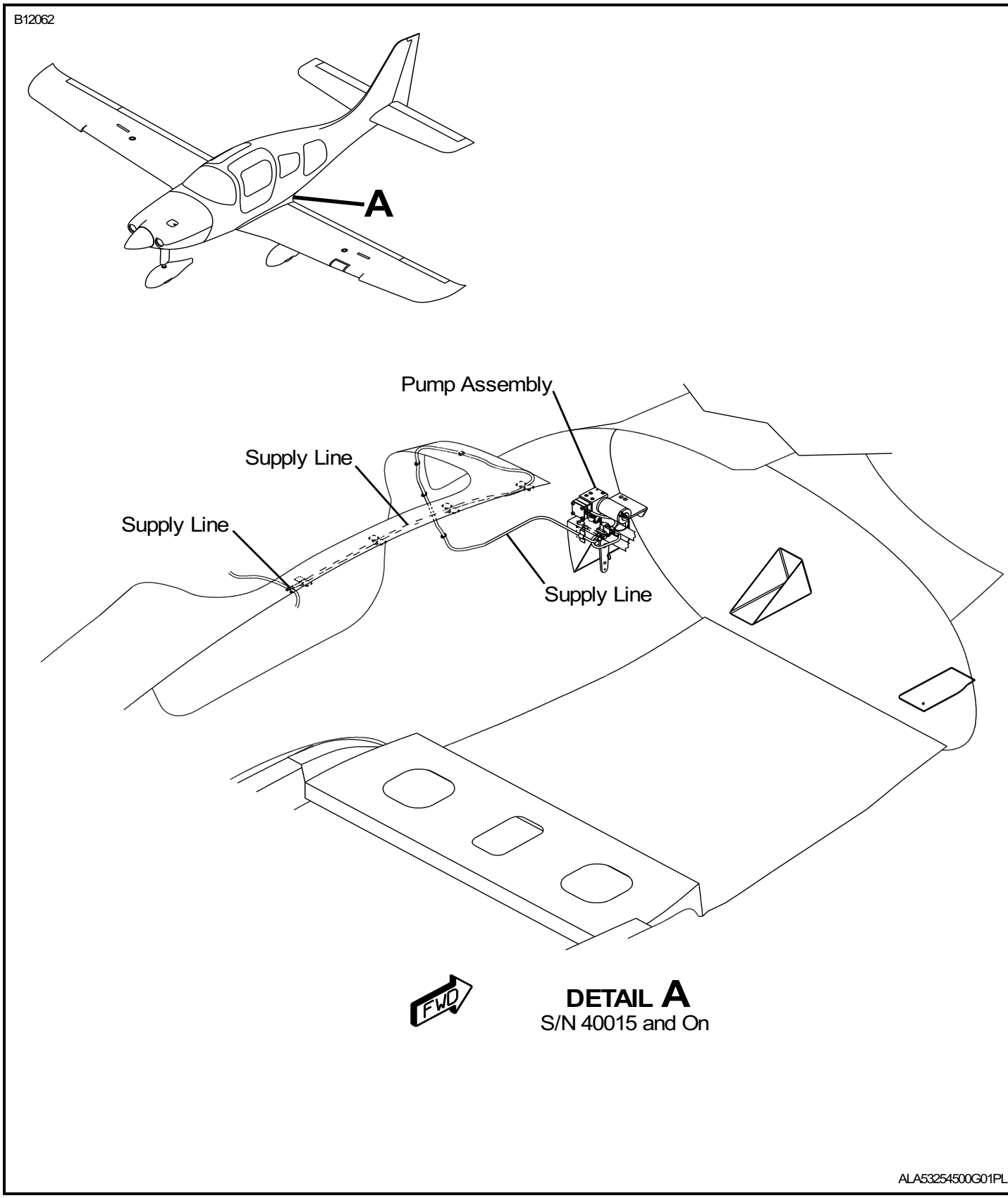
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Location of Door Seal Pump and Lines



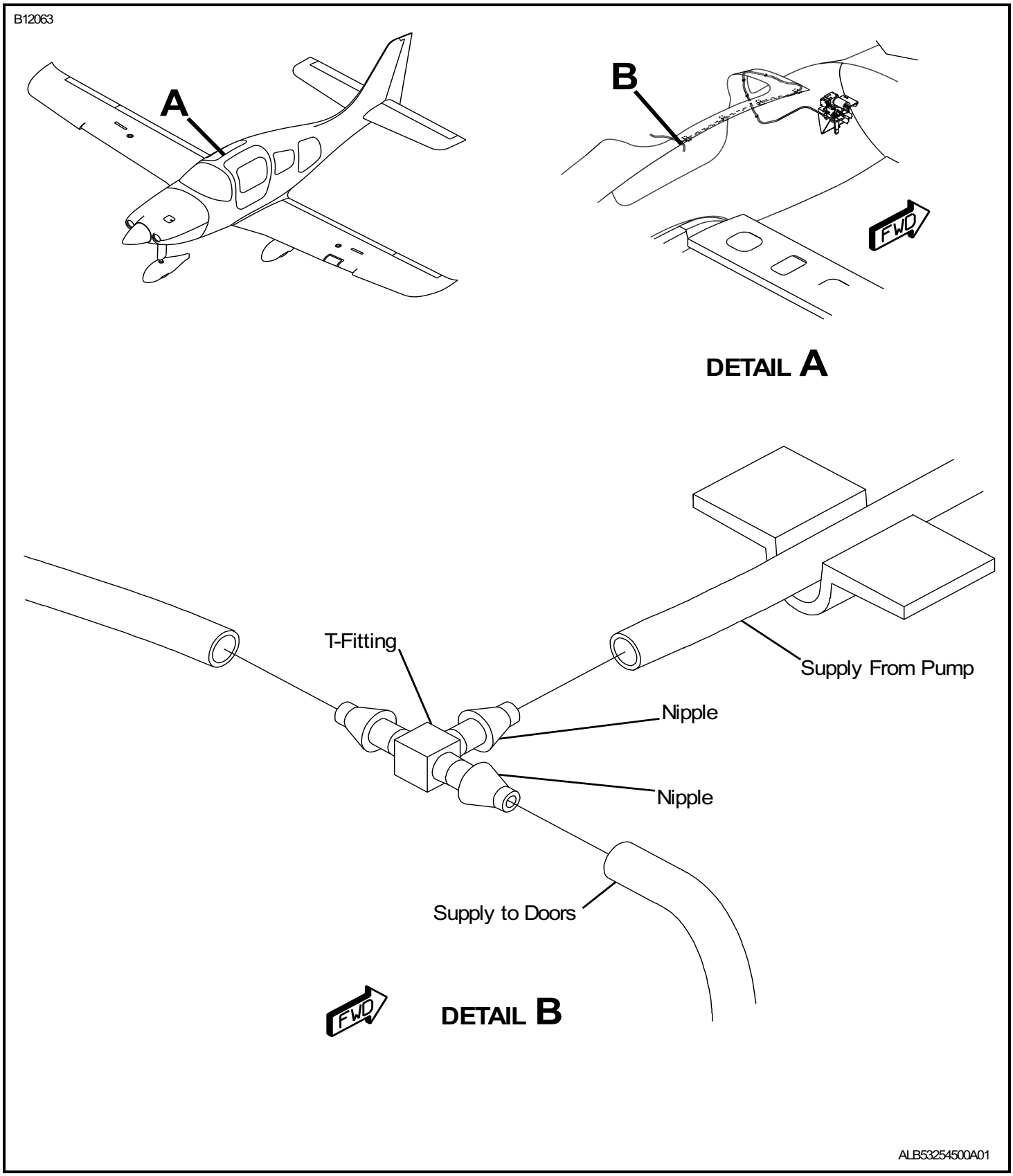
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 2 : Location of Door Seal Pump and Lines



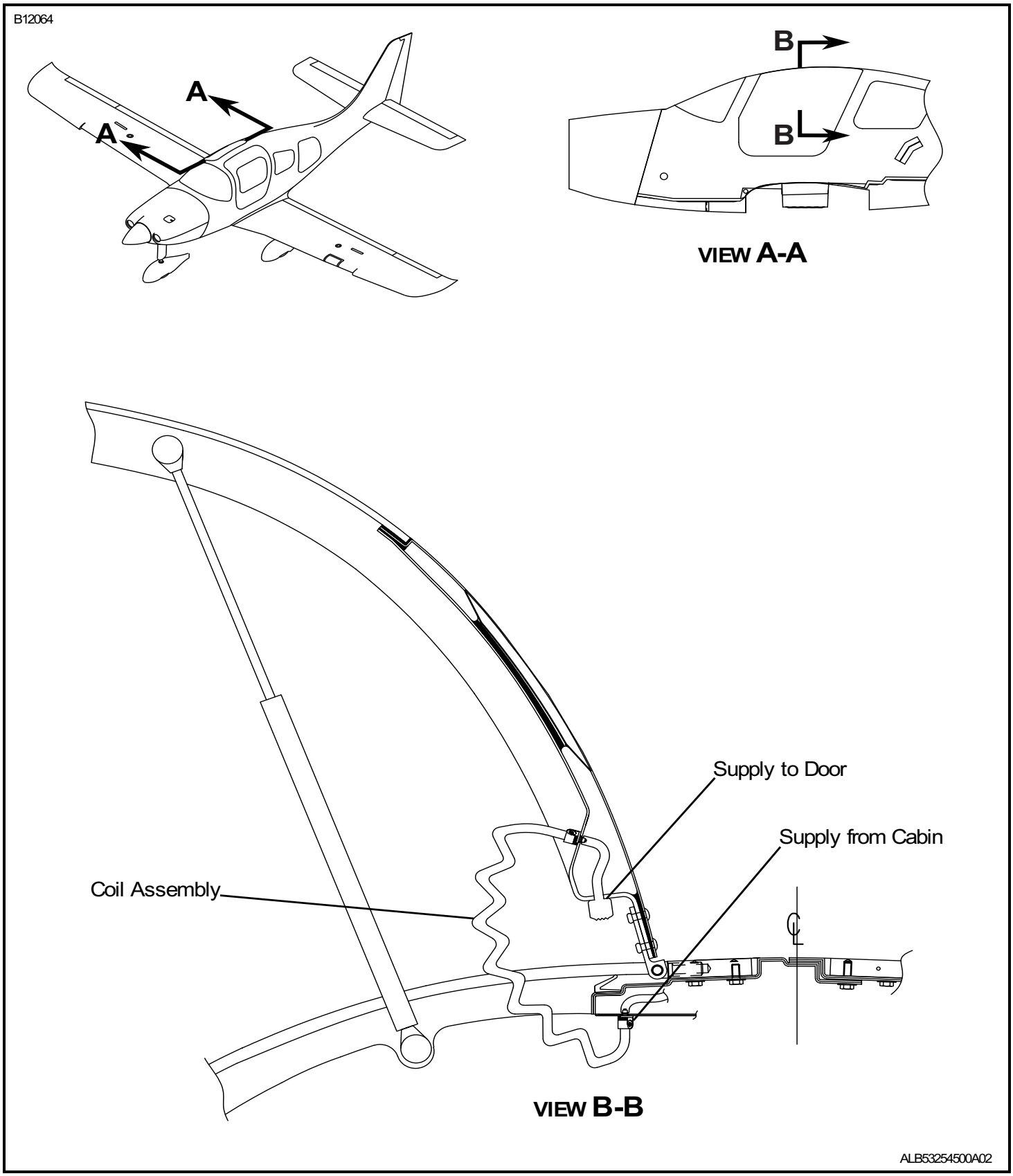
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Door Seal T-Connector



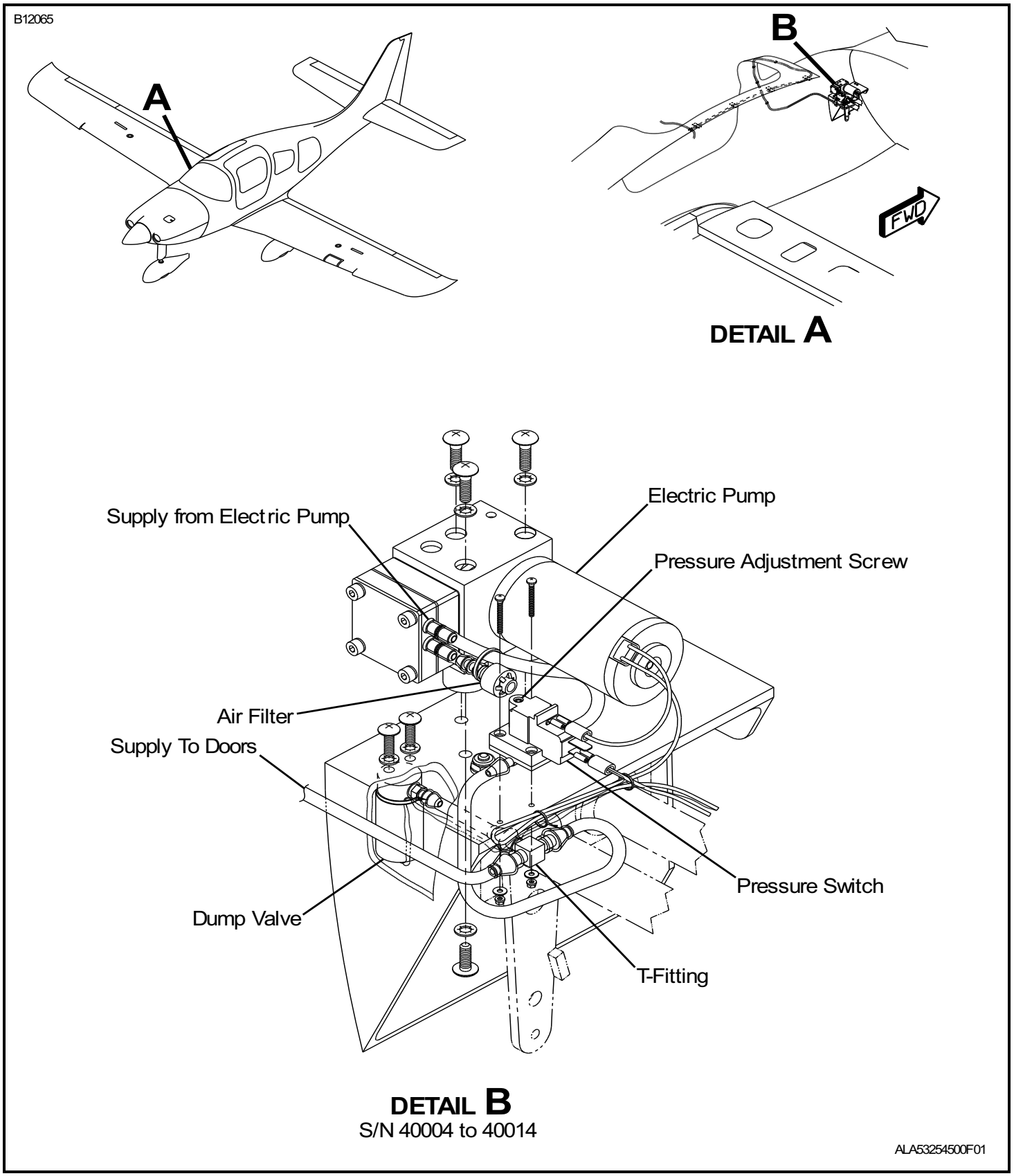
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Door Seal Door Connections



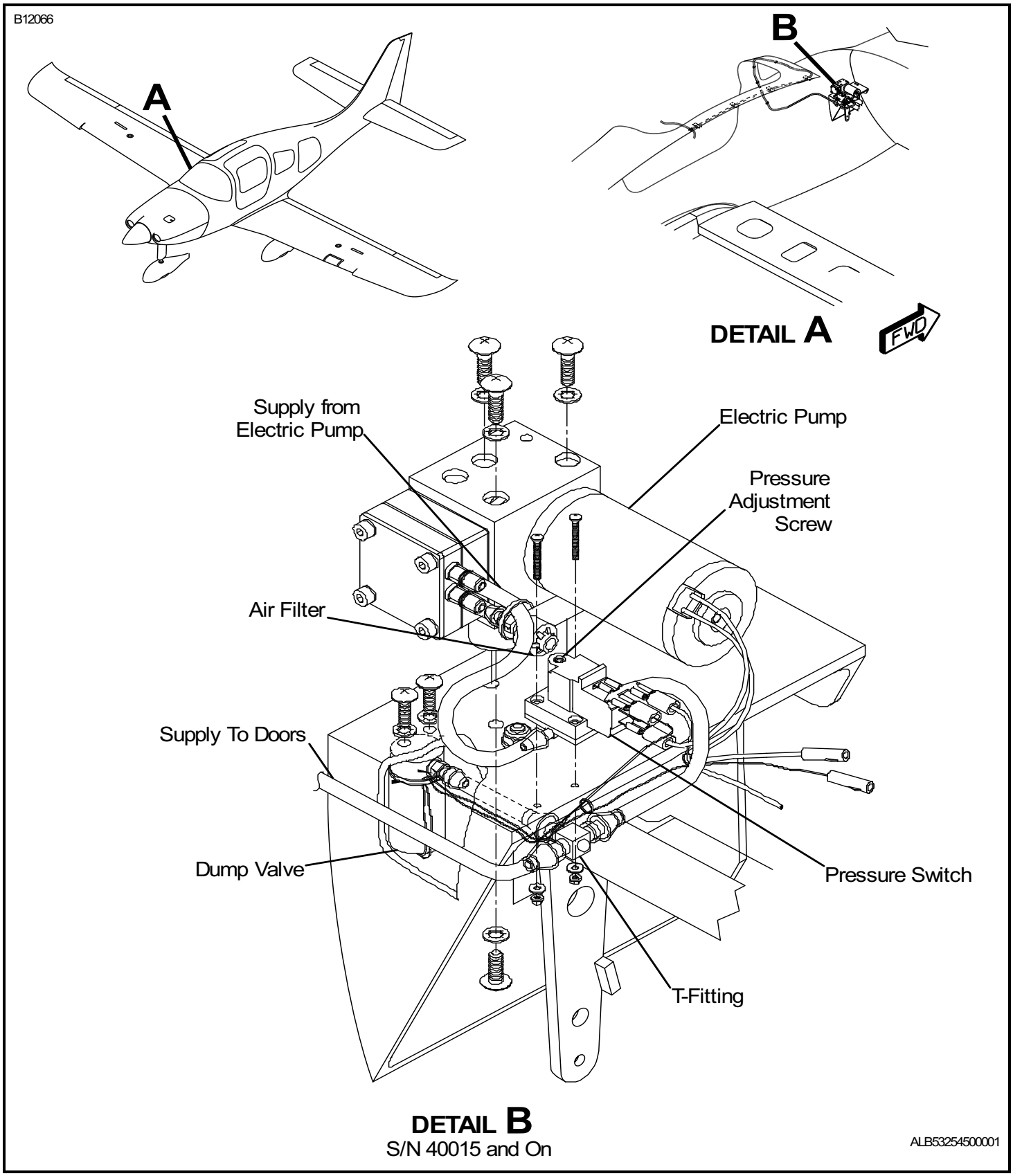
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Door Seal Pump Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 2 : Door Seal Pump Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUSELAGE - GENERAL

1. General

A. This chapter will provide information on the fuselage structure and attach items for the Cessna 300 (LC40-550FG) aircraft. The fuselage of the Cessna 300 is a composite semi-monocoque design with an integral vertical stabilizer structure. Doors and access panels allow access to the interior areas for inspection and maintenance. Most of the structural components are permanently bonded together. The fuselage structure carries loads from the engine mount, wing, horizontal, and main landing gear. This structure consists of the fuselage skins, vertical shear web, vertical shear closeout, antenna bulkhead, baggage bulkhead, rear floor, footwell, forward floor, and forward floor under-floor bulkhead. Hardware hardpoints exist for the seatbelts, engine mount, and instrument panel. Aileron, elevator, and rudder controls also run in the fuselage, and support structure and hardpoints allow mounting provisions for these components. The fuselage is primarily constructed from glass fabric composites with honeycomb cores. Carbon fiber fabric is used on the engine mount attachment gussets. Uni-carbon fiber is used in the fuselage longerons and rollover structure. The fuselage longerons are located in two strips along the fuselage sides above the wing saddle. The rollover stiffeners are located in the "A" and "B" pillars on the fore and aft sides of the doors. The bulkheads and floors are permanently bonded to the fuselage shells with specially thickened epoxy adhesive and an epoxy primer. Moisture drain holes are located in the bottom of the fuselage along the centerline.

CAUTION: Only experienced personnel should attempt the repair work described in this manual. The repair of composite materials is not difficult but requires certain hands-on skills where experience is necessary. These composite repairs will be time limited due to resin gel time and must be completed in a timely fashion.

WARNING: To prevent personal injury, refer and adhere to instructions contained in the appropriate Material Specification Data Sheet (MSDS) accompanying the material you are using for any repair.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUSELAGE AND PRIMARY STRUCTURE - DESCRIPTION AND OPERATION

1. Identification and Inspection of Fuselage Components

A. **Inspection of Fuselage Primary Structure** - Damage to the composite fuselage structure can usually be identified visually. Damaged areas will show a characteristic white or milky color. Undamaged areas will be translucent brown to green. The use of tap testing and other non-destructive methods may be required. Carbon fiber damage is more difficult to identify. The use of tap testing and other nondestructive methods will be required. Tap testing and other non-destructive methods can identify damage to the bonded joints in the fuselage. Refer to Chapter 51 for specific inspection techniques.

2. Painting

A. Painting of the fuselage should follow the requirements in Chapter 51-70-00.

3. Lightning Strike Protection

A. Lightning Strike Protection must comply with the requirements of Chapters 20 and 51.

4. Fuselage Primary Structure Description

A. Refer to Figure 1 for External Features. Refer to Figure 2 for Internal Features.

B. **Firewall** - The fuselage firewall is a structural composite member. The firewall features co-cured carbon fiber upper engine mount gussets and lower carbon fiber engine mount gussets, together with the forward floor, that are bonded to the firewall. On the engine side, the firewall is covered with a stainless steel firewall plate with fiberfrax and phenolic insulators and phenolic hard points. The firewall plate is sealed around the edge with silicone rubber. The hardware attached to the firewall holds the stainless steel plate and phenolic fittings in place. The engine mount bolts to the firewall. Engine controls, fuel lines, electrical wiring, and heating and ventilation air pass through the firewall. The cockpit side of the firewall is covered by sound barrier foam.

C. **Forward Cabin Floor** - The forward cabin floor extends from the firewall to the footwell. The forward cabin floor is bonded to the fuselage skins, firewall, and wing mount saddle. Sound insulation is bonded to the bottom side of this floor.

D. **Forward Cabin Floor Support** - The forward cabin floor support is located under the forward floor and provides stiffening for the forward floor and instrument panel radio rack assembly. The support is bonded to the forward cabin floor and fuselage skins. There is no access to this structure.

E. **Cabin Footwell** - The footwell is a structural member that is attached to the fuselage floors by screws. The center attachment bracket for the front seat belts is bolted to the footwell.

F. **Aft Cabin Floor and Aft Baggage Floor** - The aft cabin and aft baggage floors are bonded together, and the joint is reinforced with glass cloth. These floors cover the main gearbox. The main gearbox can only be removed from the aircraft by cutting away these floor bulkheads.

NOTE: Removal of these floors can only be done with factory approval and specific instructions. These floors are bonded to the fuselage sides, wing attach saddle, and aft baggage bulkhead.

G. **Avionics Shelf Frame** - The avionics shelf frame supports the avionics shelf. This shelf is designed to hold a multitude of components and hardware. The shelf frame is bonded to the fuselage skins.

H. **Aft Baggage Bulkhead** - The Z-shaped aft baggage bulkhead carries the elevator crossover torque tube. It also serves as the hat rack baggage floor. The bulkhead features two access panels, the baggage bulkhead and antenna bulkhead panels. The bulkhead is bonded to the fuselage sides, aft baggage floor, and antenna bulkhead.

I. **Antenna Bulkhead** - The antenna bulkhead is a structural member that provides lateral and torsional shear carry-through. It is bonded to the aft baggage bulkhead, fuselage sides, and vertical shear web.

J. **Vertical Shear Web** - The vertical shear web is the main structural shear web in the vertical stabilizer. It is bonded to the fuselage sides, which form the vertical stabilizer, antenna bulkhead, and NAV bulkhead.

K. **Vertical Shear Closeout** - The vertical shear closeout is a shear web and provides hardpoints for the rudder hinges and elevator up stop. This shear web is bonded to the fuselage sides and NAV bulkhead.

L. **NAV Bulkhead** - The NAV bulkhead provides a mount for the NAV antenna. It spans the NAV antenna access panel opening and ties into the vertical shear webs.

M. **Seat Back Flange** - The seat back flange is a bonded support for the rear seat backs. It is bonded to the fuselage skins and aft cabin floor.

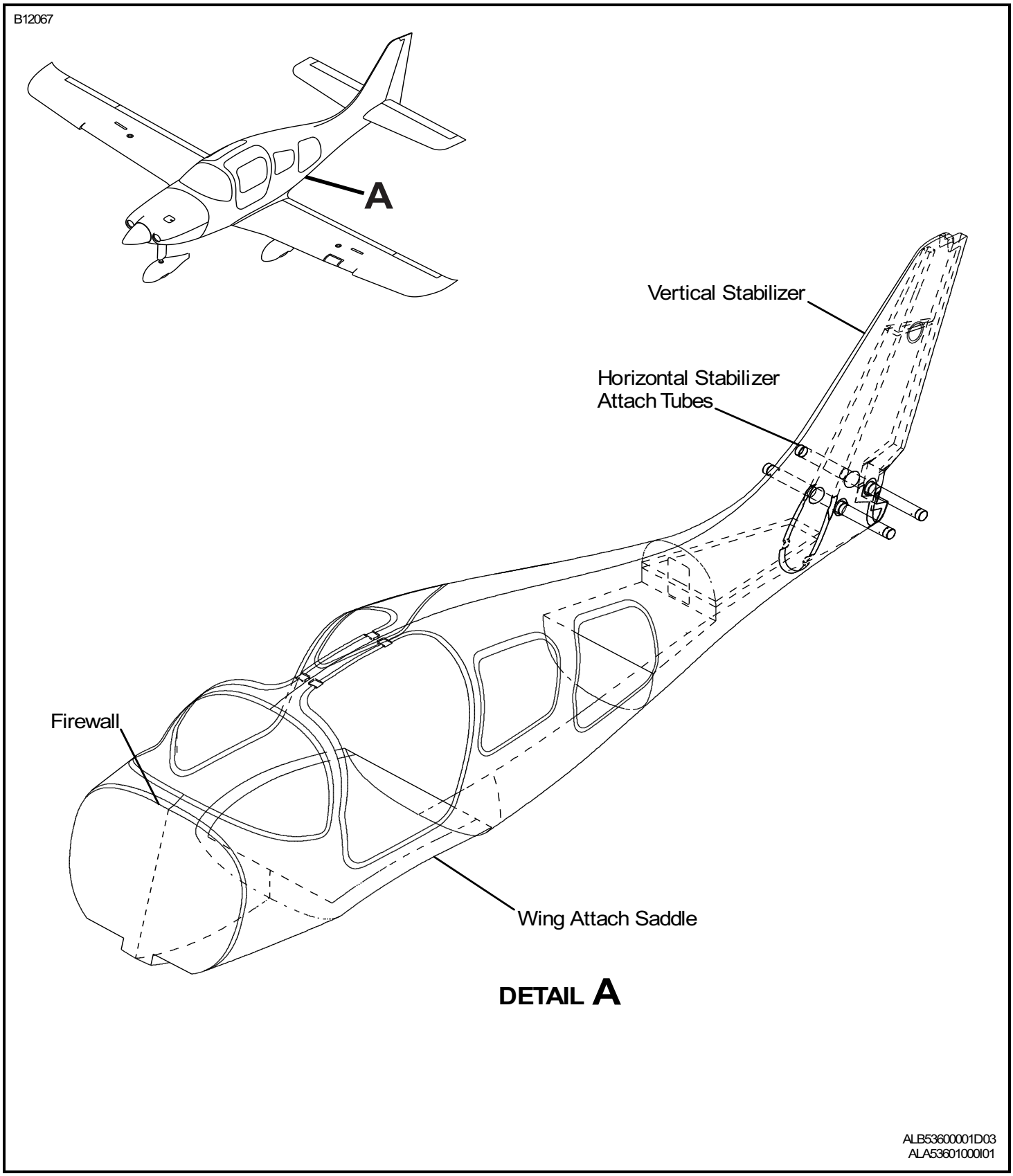
N. **Instrument Panel Mounting Brackets** - The instrument panel is mounted to five bonded-on composite brackets. These brackets are located on the top center, left and right sides, forward near the firewall, and the left and right sides just forward

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

and below the bottom of the "A" pillar. Two more brackets on the left and right side support the knee bolster portion of the instrument panel.

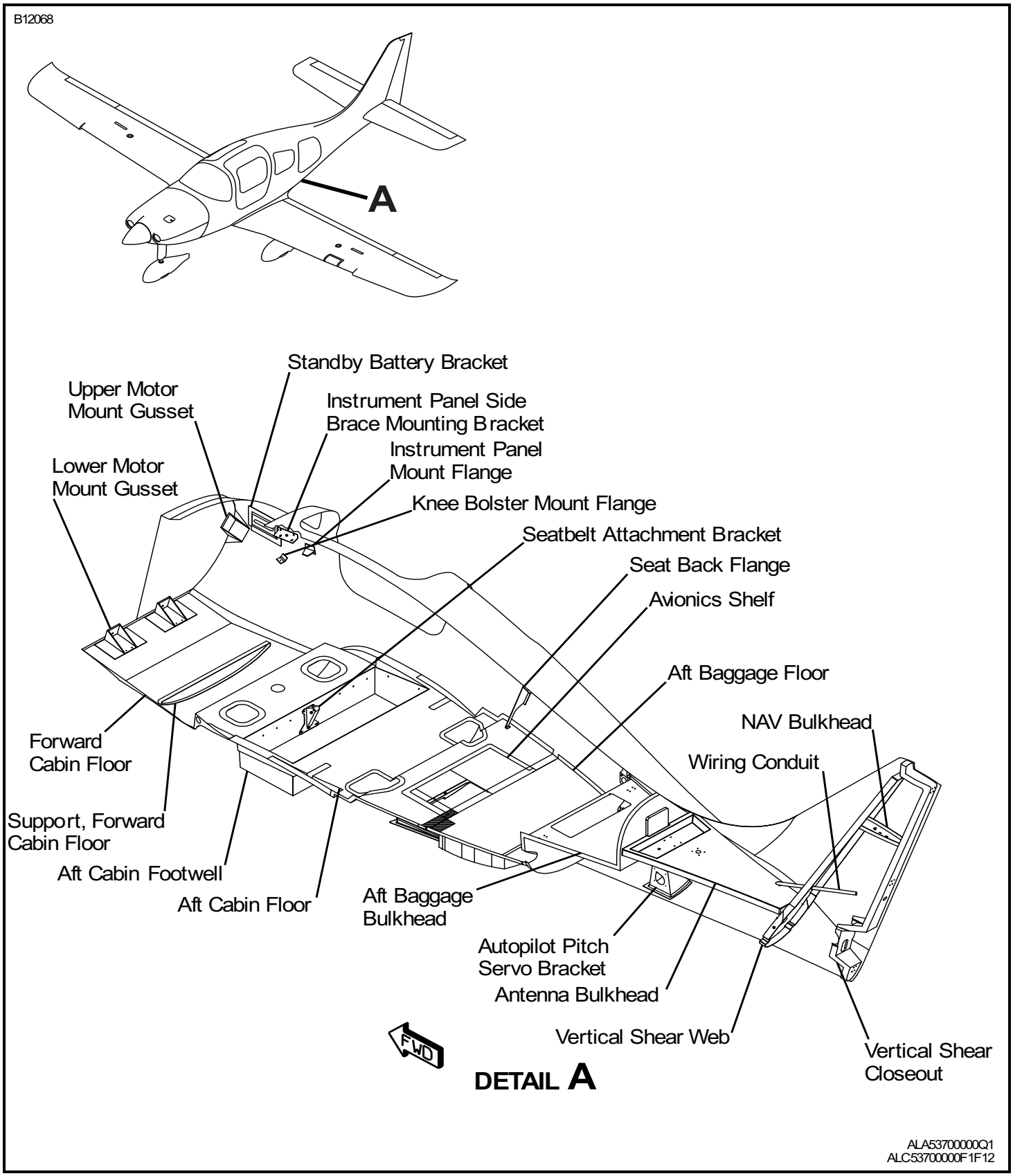
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Fuselage Structure - External Features



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Fuselage Structure - Internal Features



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUSELAGE ACCESS - DESCRIPTION AND OPERATION

1. Fuselage Access Panels

A. The fuselage has numerous access panels located on the exterior and interior of the fuselage as shown in Figure 1. This paragraph describes the panels and how to remove and replace them.

(1) **NAV Antenna Access Cover** - The NAV antenna access cover is located on the left side of the vertical stabilizer about mid span and provides access to the NAV antenna. This panel is removed by unscrewing the attachment screws. Installation is a direct reversal of the removal process.

(2) **Air Outlet Vent Access Panel** - The air outlet vent access panel is located under the horizontal stabilizer on the right hand side of the aircraft. It can be used to inspect the fuselage between the vertical stabilizer shear webs. The aft-most end of the elevator push rod can also be seen from this location. The panel is removed by unscrewing the attachment screws. Installation is a direct reversal of the removal process.

(3) **Antenna Bulkhead Access Panel** - The antenna bulkhead access panel is located on the baggage bulkhead. It provides access to the antennas mounted on the shelf. Access to both the top and bottom of this shelf is accomplished through the same access panel. The panel is removed by unscrewing the attachment screws. Installation is a direct reversal of the removal process.

(4) **Baggage Bulkhead Access Panel** - The baggage bulkhead access panel is located in the rear of the baggage area. It can be used to access the elevator crossover and its three elevator pushrod fittings, the Comm antenna, and the autopilot pitch servo. The panel is removed by unscrewing the attachment screws. Installation is a direct reversal of the removal process.

(5) **Avionics Shelf Access Panel** - The avionics shelf access panel is located in the middle of the forward baggage floor. It is used to access the avionics shelf, Comm antenna, step bolts, and rear gearbox attachment bolts. The panel is removed by unscrewing the attachment screws. Installation is a direct reversal of the removal process.

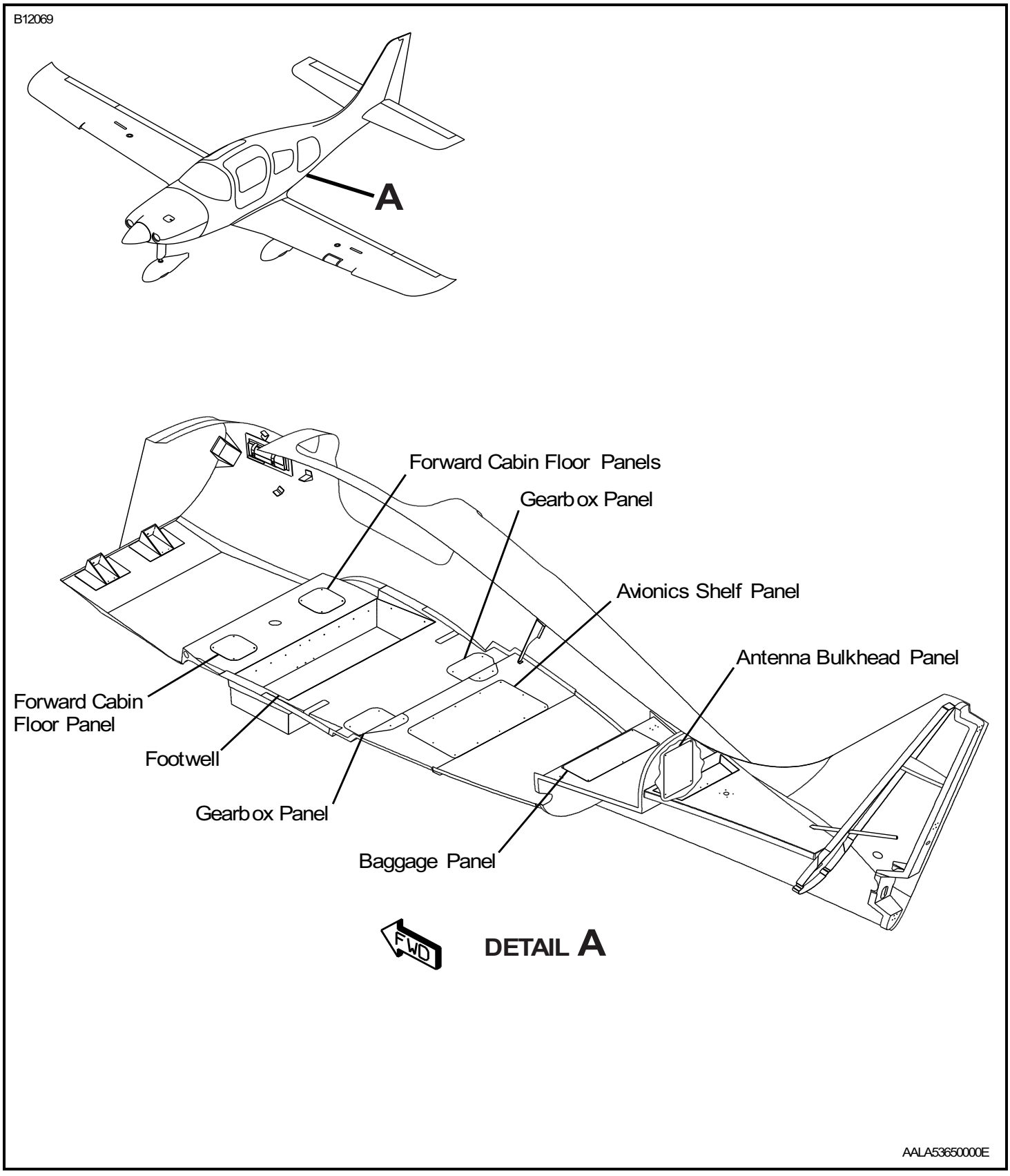
(6) **Main Gearbox Access Panels** - Left and right side main gearbox access panels are located on the rear seat floor. These panels can be used to access the gearbox and forward attachment bolts for inspection. These panels are removed by unscrewing the attachment screws. Installation is a direct reversal of the removal process.

(7) **Footwell** - The footwell can be removed to provide access to the wing attach bolts. This is a structural member of the fuselage and contains the front seat belt attach bracket. It is installed with AN526C1032R10 screws torqued 30 to 36 in.-lbs. with NAS1149F0363P washers (AN960-10). The length of these screws shall be appropriate for the attachment.

(8) **Forward Cabin Floor Access Panels** - The forward cabin floor access panels are located under the front seats. The panels provide access to the front seat rail mounting. They also allow inspection of the fuel system components mounted on the front wing spar from above. These panels are removed by unscrewing the attachment screws. Installation is a direct reversal of the removal process. For S/N 40080 and on, there is only one access panel and it is located under the co-pilot's seat.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Fuselage Access Panels



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

AERODYNAMIC FAIRINGS - DESCRIPTION AND OPERATION

1. Aerodynamic Fairings

A. Aerodynamic fairings attached to the fuselage consist of left and right wing fillets.

(1) **Wing Fillets** - The wing fillets are bonded to the fuselage skins outside surface. They form an aerodynamic transition between the fuselage and the wing. The fillets are not bonded to the wing. The main gear leg fuselage transition panel is located at the junction of the main gear legs and the fuselage. They extend out to the root of the flaps and butt up to the wing belly at the forward edge. The fillets have a small panel for the ingress and egress steps. These steps are optional. If the steps are not present, this panel will not serve any function. The step panel allows access to the step attachment bolts. The wing fillets should be inspected periodically for cracks and impact damage.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CONTROL SYSTEM SUPPORTS - DESCRIPTION AND OPERATION

1. Control System Supports

A. This section describes the location of control system supports in the fuselage as seen in Figure 1.

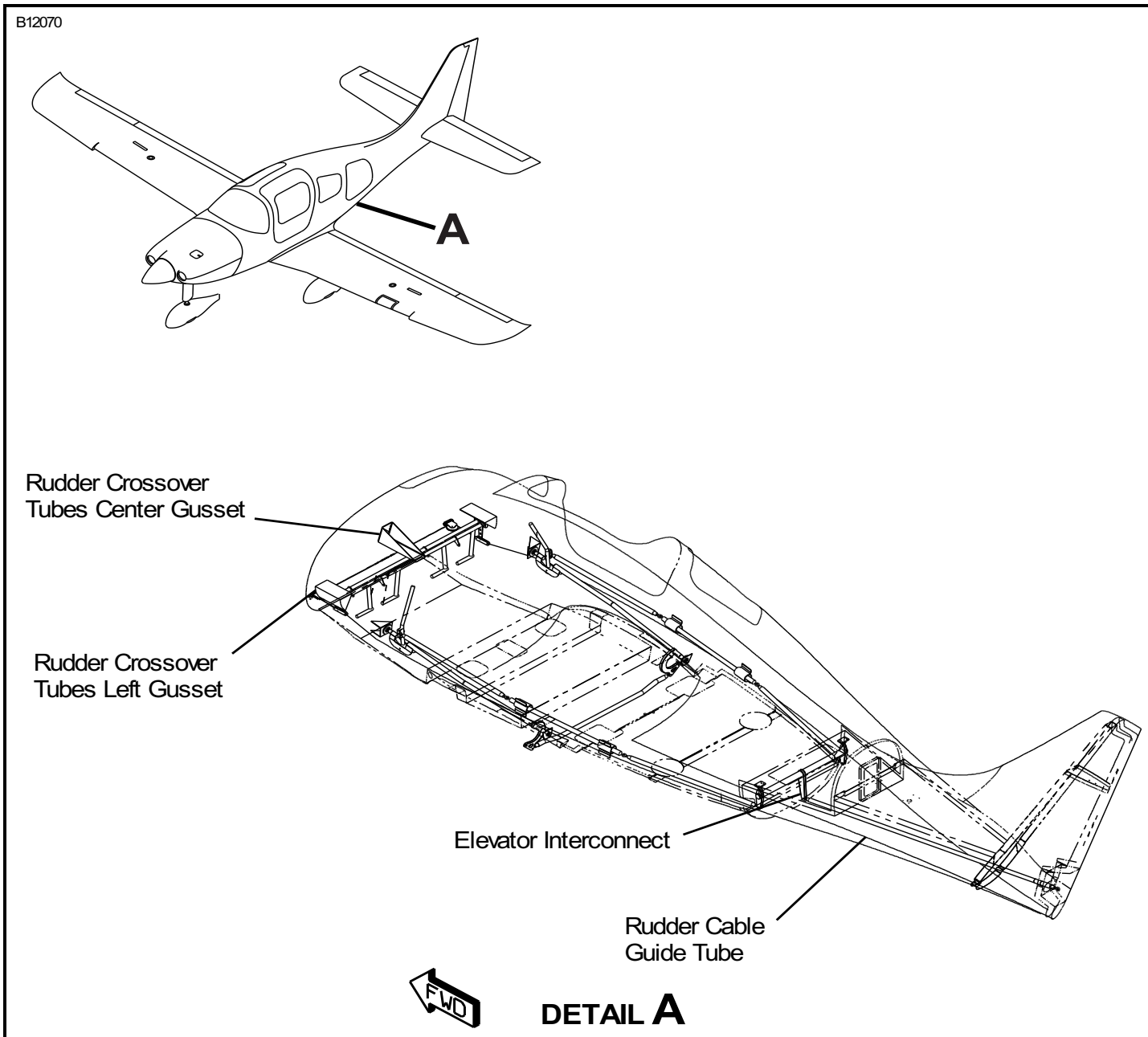
(1) **Rudder Pedal Crossover Tube Support Brackets** - Three bonded composite brackets support the rudder pedal control system. The brackets are located on the left and right fuselage sides under the instrument panel and at the firewall centerline. The left bracket provides mounting for the rudder limiter system.

(2) **Aileron Torque Tube Gussets** - Two gussets located at the forward and aft ends of each aileron torque tube support the stick assembly. The spherical bearing cups for the aileron torque tubes are bolted to these gussets.

(3) **Rudder Cable Guide Tubes** - Rudder control cable guide tubes are co-cured with the fuselage skins. These guide tubes normally hold a control cable sleeve secured with hose clamps on either end. The rudder control cables run fore and aft in these replaceable sleeves.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Control System Support



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUSELAGE COMPONENTS - MAINTENANCE PRACTICES

1. Removal, Installation, and Maintenance Practices for Fuselage Components

A. This section describes the basic inspection, removal, and installation of components attached to the fuselage.

(1) **Horizontal Stabilizer Attach Tubes** - The horizontal stabilizer mounting is accomplished with two steel tubes permanently attached to the fuselage structure.

(a) The horizontal tubes should be securely bonded to the fuselage. No free play should be evident. Any cracks between the tubes and the fuselage structure will be cause to contact the factory for repair instructions.

(b) These tubes should be visually inspected for corrosion and nicks.

(c) Surface corrosion and shallow nicks should be removed with careful application of fine grit sanding paper or crocus cloth. The surface finish of the reworked area must be 63 micro-inches per inch or better. This process will remove the protective plating from the tubes. These areas should be protected with zinc chromate primer. Care must be taken with the application of any protective coatings as they may prevent the reinstallation of the horizontal stabilizers.

(d) Deep nicks and corrosion will require factory approval for repair. Replacement of the horizontal attach tubes will also require factory approval.

(2) **Fuselage Seat Belt Attach Hardpoints** - Each shoulder belt inertial reel is mounted to the fuselage. The forward inertial reels mount to steel brackets on the "B" pillar. The rear seat shoulder belt inertial reels are tang mounted to a through bolt in the fuselage skin. Refer to Chapter 25-13-00 for details on removal and replacement of seat belts.

(3) **Cabin Door Attach Hardpoints** - The cabin doors mount with two hinges and are secured with two pins. The door hinges are mounted on the top of the door. The hardpoints provide a structural mounting for the metallic door hinges. Emergency release cable guides are bonded to the fuselage and run from the belly to the door hinges. Each door is secured front and aft by latch pins. The latch pins interface with the fuselage hardpoints in the fuselage door flanges. Refer to Chapter 52-10-00 for details on inspection, removal, and replacement of the cabin door and components.

(4) **Leading Edge Tape** - Optional leading edge anti-chafe tape may be added to the aircraft. The anti-chafe tape is 1 inch wide, adhesive-backed, clear, urethane tape that prevents pitting and wear on the leading edges of the vertical and horizontal stabilizer. To apply the tape, thoroughly clean the leading edges using isopropyl alcohol. The 1 inch wide tape should be centered along the leading edge of the surface. The tape should end at the beginning of the vertical and horizontal stabilizer tip curve. Use a rubber scraper/squeegee as required to smooth the tape and remove air bubbles from underneath the tape. To remove the tape, slowly pull the tape back on itself, and clean the surface with isopropyl alcohol. The anti-chafe tape should be inspected at each 100 hour or annual inspection to ensure that it is not peeling up and is properly attached.

(5) **Fuselage Handles** - Optional fuselage handles are available with certain aircraft to assist entering the aircraft. The handles are located behind the passenger windows. Certain aircraft may be retrofitted with handles. Contact the manufacturer to determine if the aircraft may be retrofitted and for instructions. The handles may not be permanently removed without getting additional instructions from the manufacturer.

(a) **Temporary Removal of Handle**

1 Remove the portion of the headliner on the inside of the aircraft to gain access to the handle screws.

2 Remove the two 10-32 screws and washers, and remove the handle.

(b) **Handle Installation or Tightening of Loose Handle**

1 Apply 262 threadlocker to the two 10-32 screws, and install the washer and screw. Torque 20 to 25 in.-lbs.

2 Re-install the headliner using Keystone ADH105P adhesive as necessary.

(6) **Fuselage Steps** - Optional fuselage steps are available with certain aircraft to assist entering the aircraft. The steps are located behind and below the trailing edge of the wing. Certain aircraft may be retrofitted with the steps. Contact the manufacturer to determine if the aircraft may be retrofitted and for instructions. The steps may not be permanently removed without getting additional instructions from the manufacturer.

(a) **Temporary Removal of Step**

1 Remove the exterior step access panel by removing the four countersunk screws.

2 Remove the interior aft cabin floor access panel per instructions in Chapter 25-30-00 to gain access to the nuts securing the steps.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

3 Remove the two lower hex-head bolts, flanged nuts, and washers, and mark the hardware so that it can be put back in the same lower holes.

4 Remove the two upper hex-head bolts, flanged nuts, and washers, and mark the hardware so that it can be put back in the same upper holes.

5 Remove the step and any shims that may be present.

(b) **Step Installation**

1 Position step against fuselage and align using shims.

2 Install the two upper hex-head bolts, flanged nuts, and washers. Tighten snug plus 1/4 turn.

3 Install the two lower hex-head bolts, flanged nuts, and washers. Tighten snug plus 1/4 turn.

4 Replace the exterior step access panel by installing the four countersunk screws. Torque 12 to 15 inches-lbs.

5 Replace interior aft cabin floor access panel per instructions in Chapter 25-30-00.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUSELAGE COMPONENTS - ADJUSTMENT/TEST

1. General

A. This section gives the information needed to complete the inspection of fuselage components and related structural components. For additional information on the fuselage structure, refer to Section 53-00-00, Fuselage - General.

2. Aft Fuselage Inspection

A. Complete an inspection of the aft fuselage.

(1) Remove the horizontal stabilizers. Refer to Section 55-10-00, Horizontal Stabilizer - Maintenance Practices.

(2) Remove the aft baggage bulkhead access panel and the antenna bulkhead access panel. Refer to Section 53-30-00, Fuselage Access - Description and Operation.

(3) Remove the air outlet vent access panel from below the right horizontal stabilizer. Refer to Section 53-30-00, Fuselage Access - Description and Operation.

(4) Thoroughly clean and dry the inspection surface on the exterior skin of the aft fuselage to remove any loose dirt, contaminates and grease.

(5) Complete a visual inspection of the left and right aft fuselage exterior skin surfaces shown in Figure 501.

(a) Inspections must be completed in accordance with Section 20-95-02, Structural Inspections - Description and Operation.

(b) Put a mark on damaged areas to indicate the location and size of the area where the damage is found.

(c) Put a mark on any areas where you are uncertain whether damage exists to indicate that the area is suspect.

(6) Complete a visual inspection of the left and right aft fuselage interior skin surfaces shown in Figure 501 that are visible through the air outlet vent panel and through the aft baggage bulkhead access panel.

(a) Inspections must be completed in accordance with Section 20-95-02, Structural Inspections - Description and Operation.

(b) Use of a borescope or digital camera attached to a pole is recommended for areas that are not visible to the technician.

(c) Put a mark on damaged areas to indicate the location and size of the area where the damage is found.

(d) Put a mark on any areas where you are uncertain whether damage exists to indicate that the area is suspect.

(7) Complete a tap test of the left and right aft fuselage exterior skin surfaces that are within a 7-inch radius of the leading edge of the horizontal stabilizers. Refer to Figure 501.

(a) The tap test must be completed in accordance with Section 20-95-00, Tap Testing - Description and Operation as well as the instructions that follow:

CAUTION: Do not strike the fuselage with a sharpened hammer or any other tool that has sharp edges. Fuselage damage can result if a blunt-ended tap hammer or equivalent is not used.

(b) Use a blunt-ended tap hammer or equivalent with a head that weighs 1.0 ounce, +0.3 or -0.3 ounce to lightly tap the fuselage in each 1-inch^2 area throughout the inspection zone.

(c) Compare similar structures within the inspection zone for changes in the response pitch.

1 Areas with structure under the skin will have a higher pitch response than areas where there is no structure under the skin. Refer to Figure 501 to see areas that have structure under the skin.

(d) The inspection area is 2 plies thick (less than 0.020 inch), except for a 4-ply band that is located 5.0 inches above to 4.0 inches below the chord of the horizontal stabilizer. This 4-ply band extends forward and aft through the entire inspection zone.

(e) A "flat" or "dead" pitch response is considered unacceptable.

(f) Put a mark on damaged areas to indicate the location and size of the area where the damage is found.

(g) Put a mark on any areas where you are uncertain whether damage exists to indicate that the area is suspect.

(h) If any damage is found or if there are suspect areas that have not been proven to be acceptable, contact Cessna Customer Service by phone or fax at the following numbers:

1 Phone: 316-517-5800

2 Fax: 316-517-7271

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

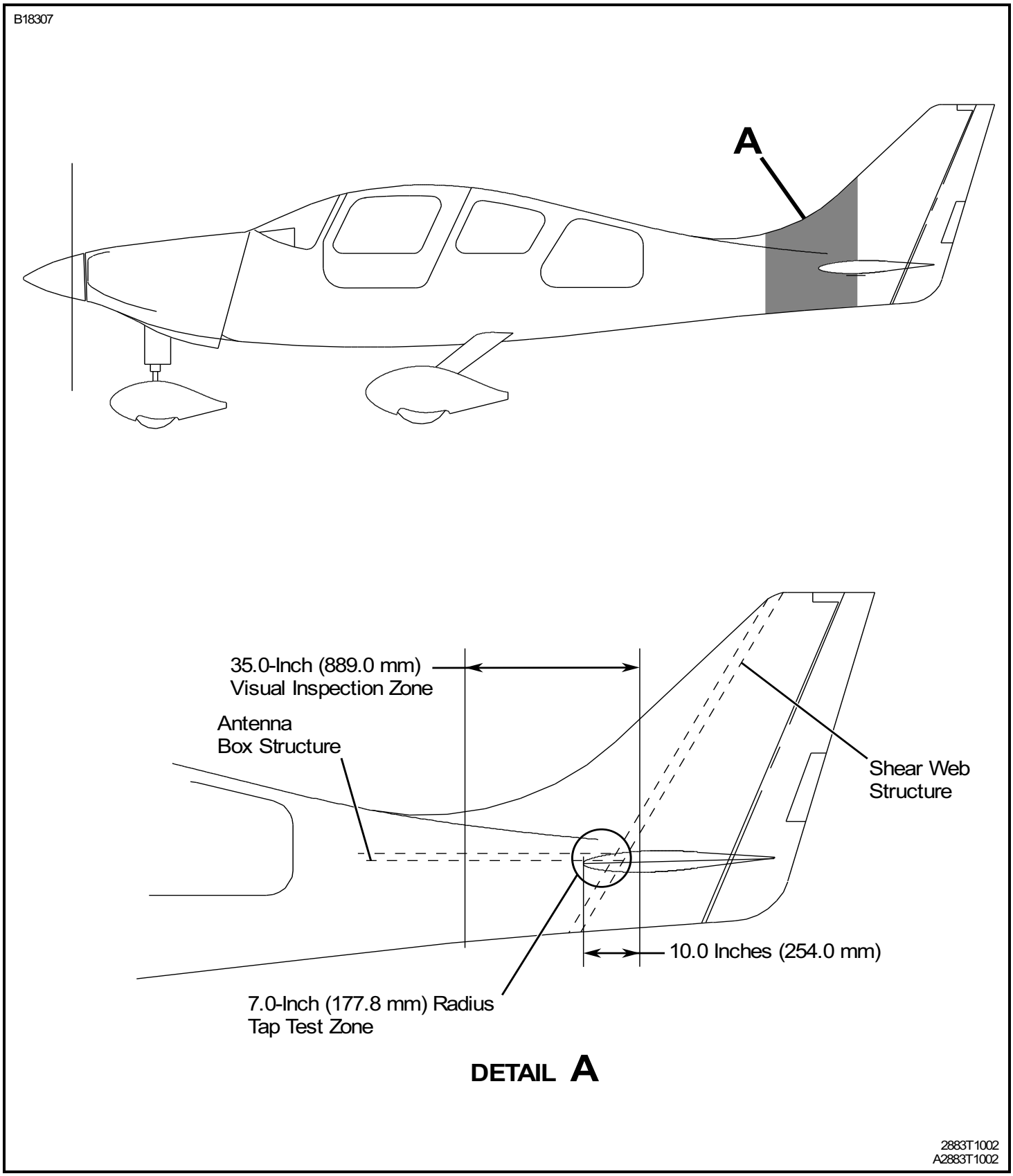
(8) Install the aft baggage bulkhead access panel and the antenna bulkhead access panel. Refer to Section 53-30-00, Fuselage Access - Description and Operation.

(9) Install the air outlet vent access panel on the right horizontal stabilizer. Refer to Section 53-30-00, Fuselage Access - Description and Operation.

(10) Install the horizontal stabilizers. Refer to Section 55-10-00, Horizontal Stabilizer - Maintenance Practices.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 501 : Sheet 1 : Aft Fuselage Inspection Zone



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

POWERPLANT - GENERAL

1. General Description

A. This document describes the troubleshooting, maintenance, removal, installation, and storage of the IO-550-N engine. For engine related information not found in this document, refer to applicable Teledyne Continental Motors maintenance manuals.

2. Tools & Equipment

A. The mechanic should be equipped with a complete set of the necessary tools that include the following:

(1) Wrenches - 1/4 inches through 1-1/4 inches
(2) Common and Phillips Head Screwdrivers
(3) Pliers - Common, Diagonal Cutters, Needle Nose, Duck Bill, Snap Ring, Safety Wire
(4) Ratchets - 1/4 inch, 3/8 inch, 1/2 inch drive
(5) Sockets - 1/4 inch drive 5/32 inch through 1/2 inch, 3/8 inch drive 3/8 inch through 1 inch, 1/2 inch drive 7/16 inch through 1-1/4 inches.
(6) Sockets (Deepwell) - 1/2 inch drive, 7/16 inch through 1 inch.
(7) Feeler Gauges
(8) Leather or Soft Plastic Mallet
(9) Torque Wrenches (refer to note) 0-500 in.-lbs. and 0-100 ft.-lbs.
(10) Micrometers (refer to note)
(11) Slide Hammer
(12) Pullers
(13) Thickness Gauges
(14) Vernier Calipers (refer to note)
(15) Small Hole Gauges

NOTE: Must be currently calibrated, and the calibration must be traceable to the National Bureau of Standards.

3. Engine Description and Operation

A. IO-550-N2 or IO-550-N15 (platinum) Technical Description Manufacturer - Teledyne Continental Motors Model - IO-550-N

B. Cylinders:

(1) Arrangement - horizontally opposed
(2) Compression Ratio - 8.5:1
(3) Firing Order - 1-6-3-2-5-4
(4) Number of Cylinders - 6
(5) Bore (inches) - 5.25
(6) Stroke (inches) - 4.25
(7) Piston Displacement (inches^3) - 550
(8) Brake Horsepower - 310

C. Operating Limits:

(1) Crankshaft Speed (RPM, rated maximum continuous operation) - 2700
(2) Crankshaft Speed (RPM, idle) - 600 Min.
(3) Intake Manifold Pressure at Idle (In. of Hg) - 18.5 Max.
(4) Fuel Control System - Continental Continuous Flow Injector
(5) Oil Pressure at Idle (psi @ 75° F) - 10
(6) Oil Pressure at Normal operation (psi @ 200° F) - 30 to 60
(7) Oil Sump Capacity (U.S. Quarts) - 8

D. Oil Temperature Limits:

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(1) Minimum for Takeoff - 100° F

(2) Limit - 240° F

(3) Recommended Operational - 170° to 220° F

E. Ignition Timing (compression stroke, breaker opens):

(1) Right Magneto, degrees BTC - 22° ± 1°

(2) Left Magneto, degrees BTC - 22° ± 1°

F. Ignition:

(1) Spark Plug - TCM 634675 or Champion RHB32E

(2) Spark Plug Gap - Per manufacturer

(3) Spark Plug Torque (in.-lbs.) - 300 to 360

(4) Magnetos (left and right) - S6RSC-25

4. Engine Removal, Cleaning, and Installation

A. This section provides instructions to remove and install the engine and engine mount. Refer to the following sheets in Figure 1:

(1) Sheet 1: Propeller Governor, Left Side Exhaust, Exhaust Hanger, Muffler

(2) Sheet 2: Battery Box, Induction Tube, Exhaust Hanger, Heat Exchanger/Muffler, Right Side Exhaust, Warm Air Tube

(3) Sheet 3: Ventilation Tube, Magnetos, Oil Filler/Dipstick, Crankcase Breather Hose, Fuel Distribution Valve

(4) Sheet 4: Oil Cooler, Oil Filter, Brake Fluid Reservoir, Power Distribution Grid, Vacuum Shuttle Valve, Vacuum Pump

(5) Sheet 5: Induction Tube, Air Filter

(6) Sheet 6: Power Distribution Grid, Alternator Output Wire, Starter

(1) **Engine Removal**

NOTE: Always install a new cotter pins at all control cable connections.

1. Place all cabin switches and the fuel shutoff valve in the off position.
2. Secure the tail of the aircraft using a jack stand and an undertail tiedown configuration.
3. Remove the upper and lower engine cowling per the Engine Cowling section.
4. Remove the battery box lid and disconnect the positive and negative battery leads from the battery. The negative lead does not need to be disconnected from the engine case.
5. Disconnect the ground strap between the engine mount and engine case at the engine mount side of the ground strap.
6. Remove the propeller, spinner, and hub assembly from the engine (refer to Chapter 61).
7. Remove the exhaust hangers from the tailpipes by removing the steel clamps from the hanger buckle.
8. Disconnect the P1, P2, and P3 power leads from the power distribution grid.
9. Disconnect the alternator output wire from the power distribution grid.
10. Disconnect the starter power lead at the starter terminal stud.
11. Disconnect the grounding straps from the radio rack and the ground power plug from the baffle mounting bracket. Refer to Figure 2.
12. Disconnect the main and return fuel lines from the firewall bulkhead fittings.
13. Disconnect the fuel injection head drain hose from the drain tube.
14. Disconnect the engine fuel pump drain hose from the drain tube.
15. Remove the manifold drain hose sniffle valve from the drain tube flange leaving hoses attached.
16. Disconnect the crankcase breather hose from the drain tube.
17. Disconnect the vacuum pump hoses from the shuttle valve located on the firewall.
18. Remove the fresh air ventilation ducting hose from the fresh air manifold on the firewall.
19. Remove the inlet and outlet hot air ventilation ducting hoses from the exhaust heat exchanger.
20. Remove the throttle cable from the throttle control lever and cable attachment bracket.
21. Remove the fuel mixture cable from the engine fuel pump mixture control arm and cable attachment bracket.
22. Remove the propeller governor cable from the governor control lever and cable attachment bracket.
23. Cut the safety wire, and disconnect the warm air control cable from the induction tube butterfly valve lever arm. Pull the warm air cable out from the induction tube retaining ears.
24. Remove all clamps and tie straps used to fasten down wiring, cables, fuel lines, and hoses that will interfere

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

with engine removal.

25. Remove the exhaust manifolds from the engine (refer to Chapter 78).
26. Remove four engine isolator bolts, outer isolator cushions, and spacers from the engine.
27. With the proper hoist and hoist attachment connected to the engine lifting eyes, remove the engine from the aircraft.

(2) **Engine Cleaning**

(a) Before cleaning the engine, cover or remove all electrical components subject to damage from cleaning solution saturation. Plug all openings using suitable plastic caps, rubber plugs, and covers. Use standard solvent or mineral spirits to thoroughly clean all areas of the engine. Low air pressure may be carefully used to assist cleaning and drying of the engine components.

CAUTION: Never use high pressure washers or cleaning devices to clean the engine.

(3) **Engine Installation**

(a) With the proper hoist and hoist attachment connected to the engine lifting eyes, hoist the engine into position making sure attachment bolt holes in the engine standoff legs align with the center holes in the engine isolator cushions.

1 Install four engine outer isolator cushions, spacers, safety wire tabs and bolts. Torque bolts 33 to 37 ft.-lbs.

2 Install safety wire per MS33540.

3 Install the exhaust manifolds to the engine per instruction in Chapter 78.

4 Install the warm air control cable through the induction tube retaining ears and connect the cable end to the induction tube butterfly valve lever arm. Torque the cable retaining nut and bolt configuration 20 to 24 in.-lbs. Safety wire the warm air control cable housing to the induction tube retaining ears per MS33540.

5 Install the propeller governor cable to the cable attachment bracket. Torque retaining bolts 30 to 36 in.-lbs. Connect the cable end to the propeller governor control lever.

6 Install the fuel mixture control cable to the mixture control bracket. Torque retaining bolts 30 to 36 in.-lbs. Connect the end of the cable to the engine fuel pump mixture control arm lever.

7 Install the throttle control cable to the cable attachment bracket. Torque retaining bolts 30 to 36 in.-lbs. Connect the end of the cable to the throttle control lever.

8 Install the inlet and outlet hot air ventilation ducting to the exhaust heat exchanger, and tighten the steel retaining clamp.

9 Install the fresh air ventilation ducting hose to the fresh air manifold on the firewall, and tighten the steel retaining clamp.

10 Connect the vacuum pump hoses to the shuttle valve located on the firewall, and tighten the steel retaining clamps.

11 Connect the crankcase breather hose to the drain tube, and tighten the steel retaining clamp.

12 Install the manifold drain hose sniffle valve to the drain tube flange. Torque the sniffle valve retaining nut 240 to 280 in.-lbs.

13 Connect the engine fuel pump drain hose to the drain tube, and tighten the steel retaining clamp.

14 Connect the fuel injection head drain hose to the drain tube, and tighten the steel retaining clamp.

15 Connect the main and return fuel lines to the firewall bulkhead fittings. Torque the main fuel line fitting 450 to 500 in.-lbs. Torque the return fuel line fitting 270 to 300 in.-lbs.

16 Connect the starter power lead to the starter terminal stud. Torque the terminal stud retaining nut 140 to 180 in.-lbs.

17 Connect the alternator output wire to the power distribution grid. Torque the retaining nut 30 to 36 in.-lbs.

18 Connect the grounding straps from the the radio rack and the ground power plug to the baffle mounting bracket. Refer to Figure 2. Torque the nut to 22 ft-lbs.

19 Connect the P1, P2, and P3 power leads to the power distribution grid.

20 Connect the exhaust hangers to the tailpipes. Torque the clamp retaining nut 12 to 15 in.-lbs.

21 Install the propeller, spinner, and hub assembly to the engine per instructions in Chapter 61.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

22 Connect the ground strap between the engine and engine mount. Torque the retaining bolt on the mount side of the ground strap 30 to 36 in.lbs.

23 Install in reverse order as disassembled all clamps and tie straps used to fasten down wiring, cables, fuel lines, and hoses which will chafe, rub, or interfere with surrounding objects during engine operation.

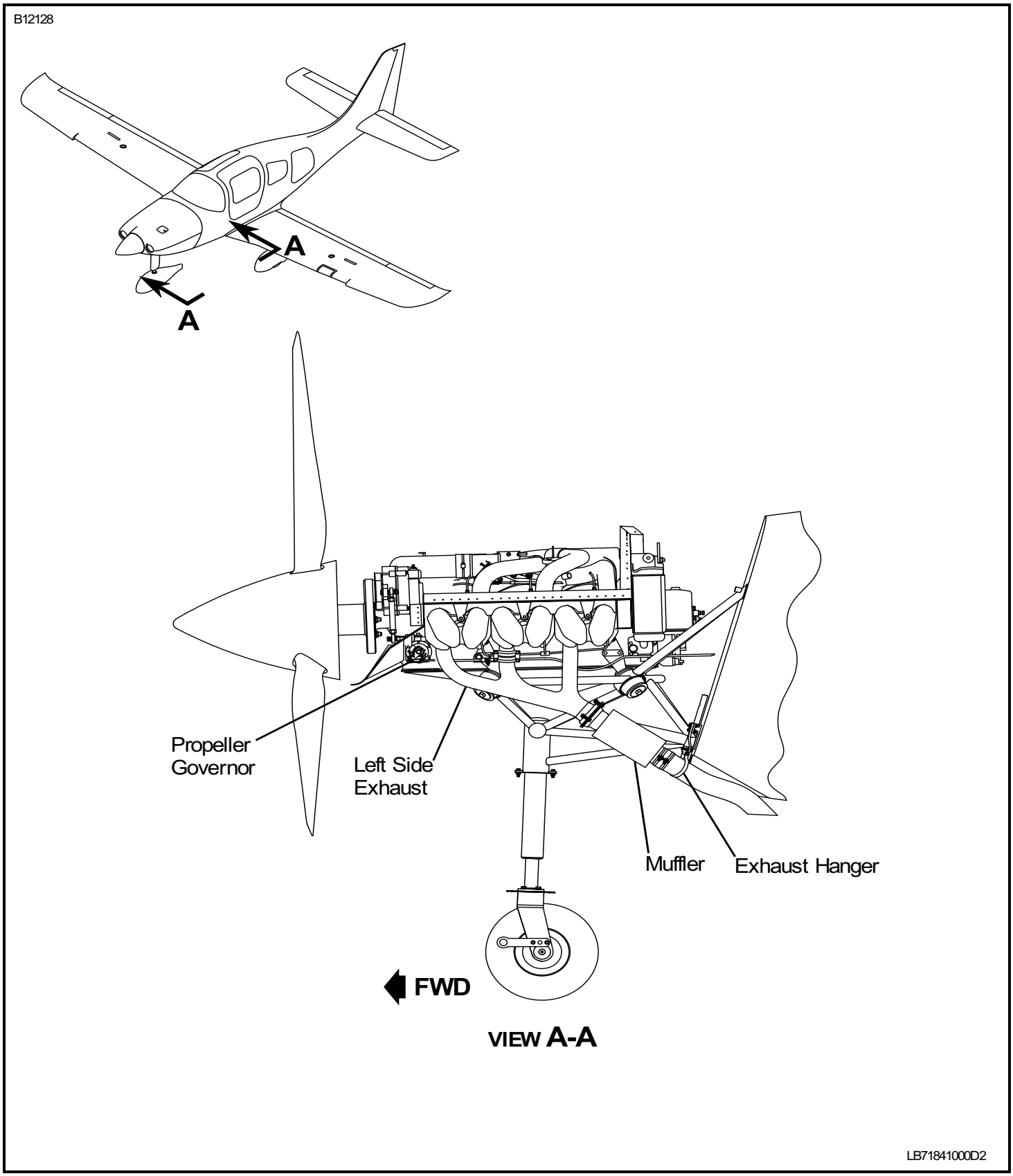
24 Connect the positive and negative battery leads to battery. Install the battery box lid. Install the safety wire between the battery box lid retaining bolts.

25 Install the upper and lower cowling per the Engine Cowling section.

26 Remove the jack stand and undertail tie down configuration from the tail of the aircraft.

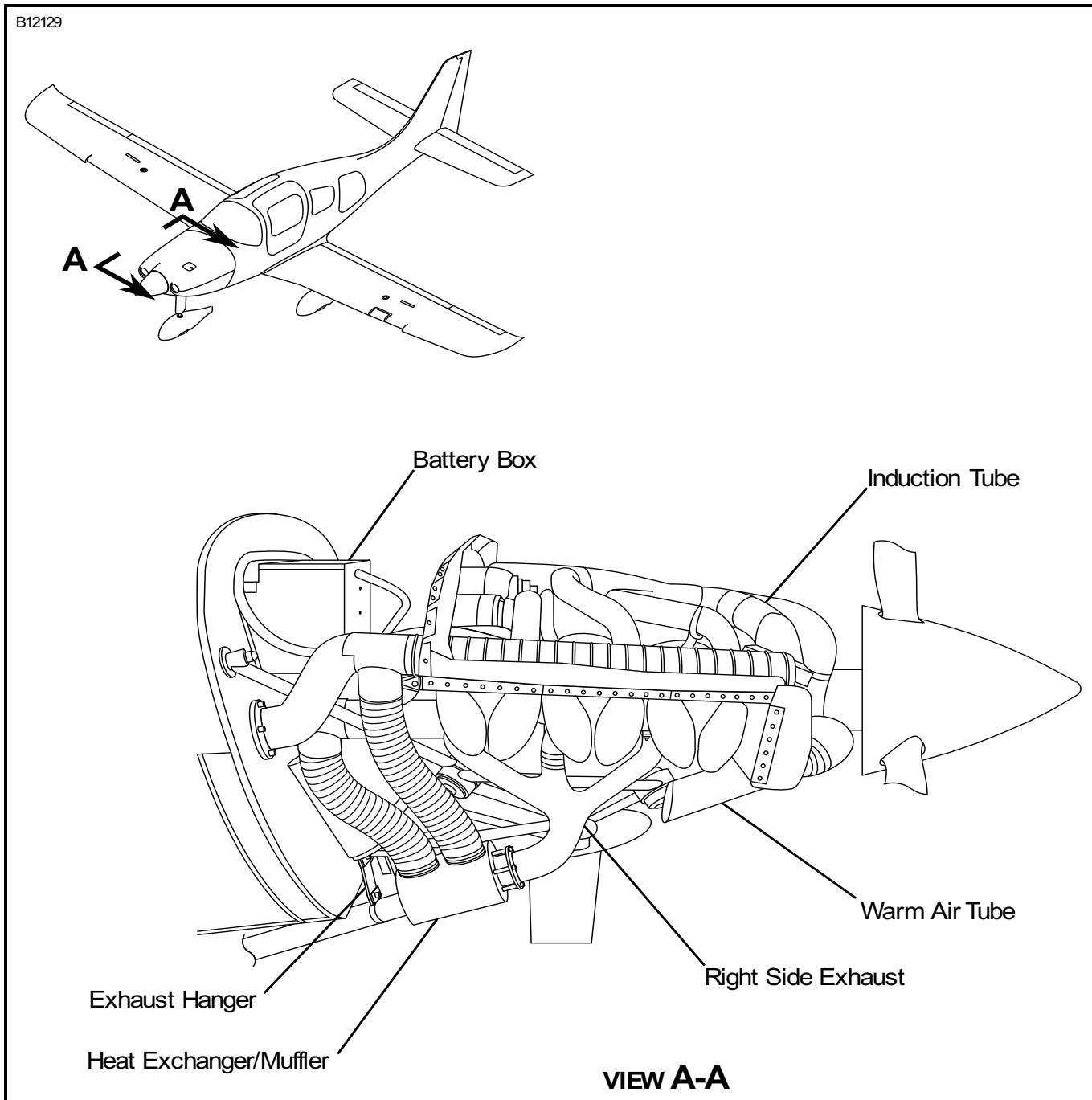
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Engine



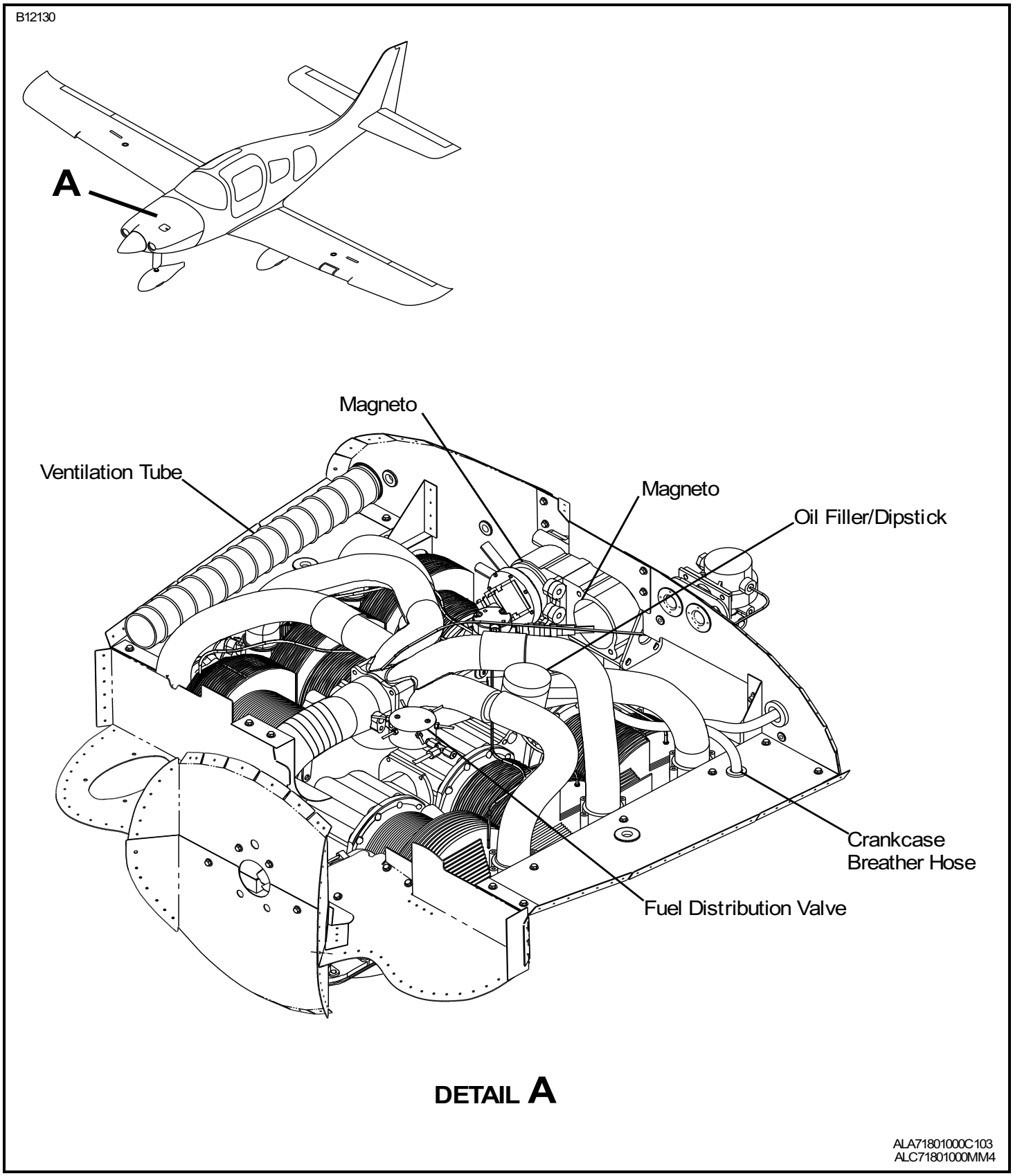
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 2 : Engine



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

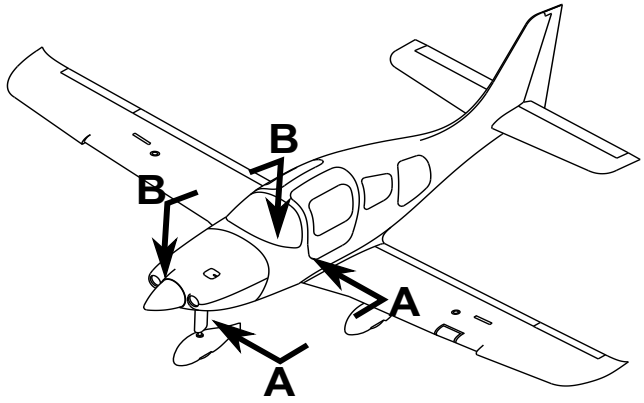
Figure 1 : Sheet 3 : Engine

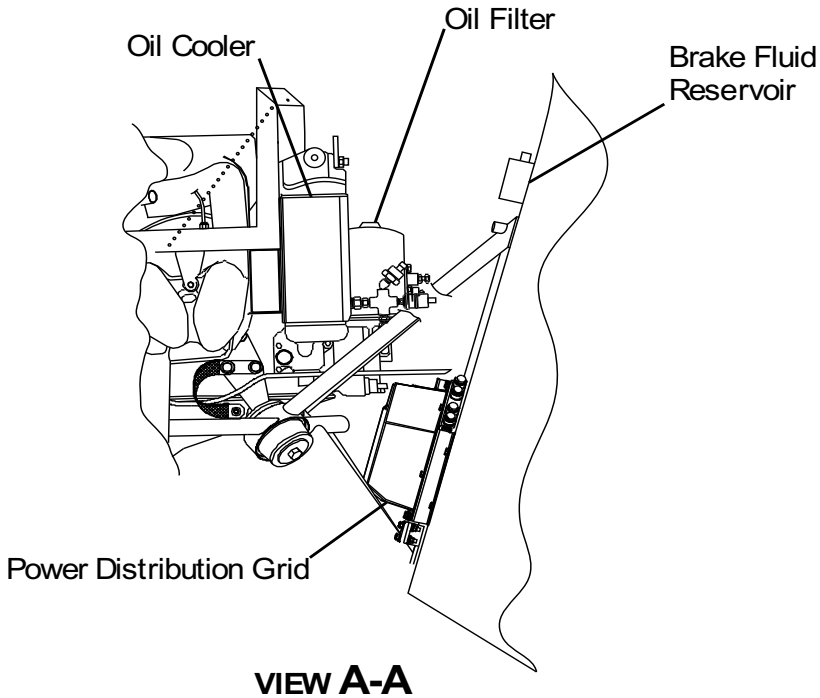


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

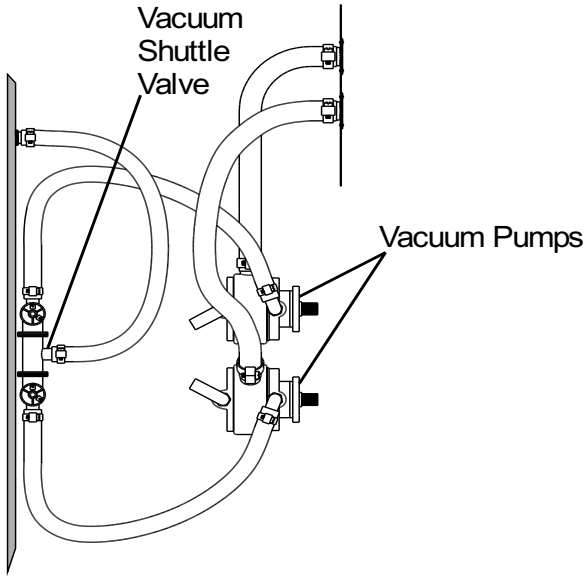
Figure 1 : Sheet 4 : Engine

B12131





VIEW A-A



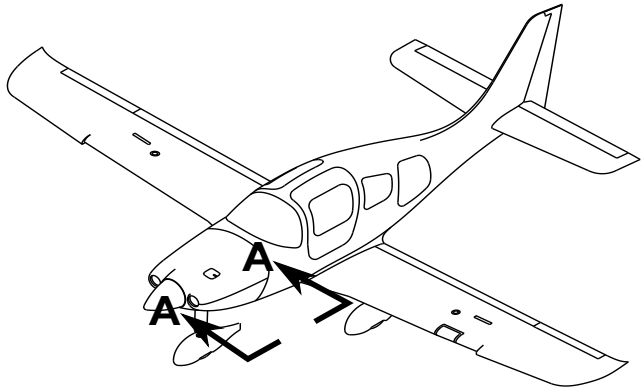
VIEW B-B

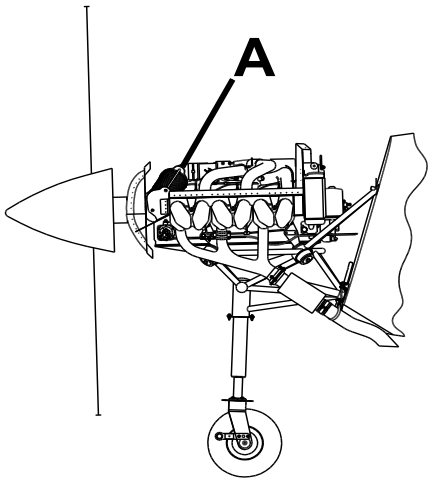
ALA71844700BB1
ALB71841000D2D21

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

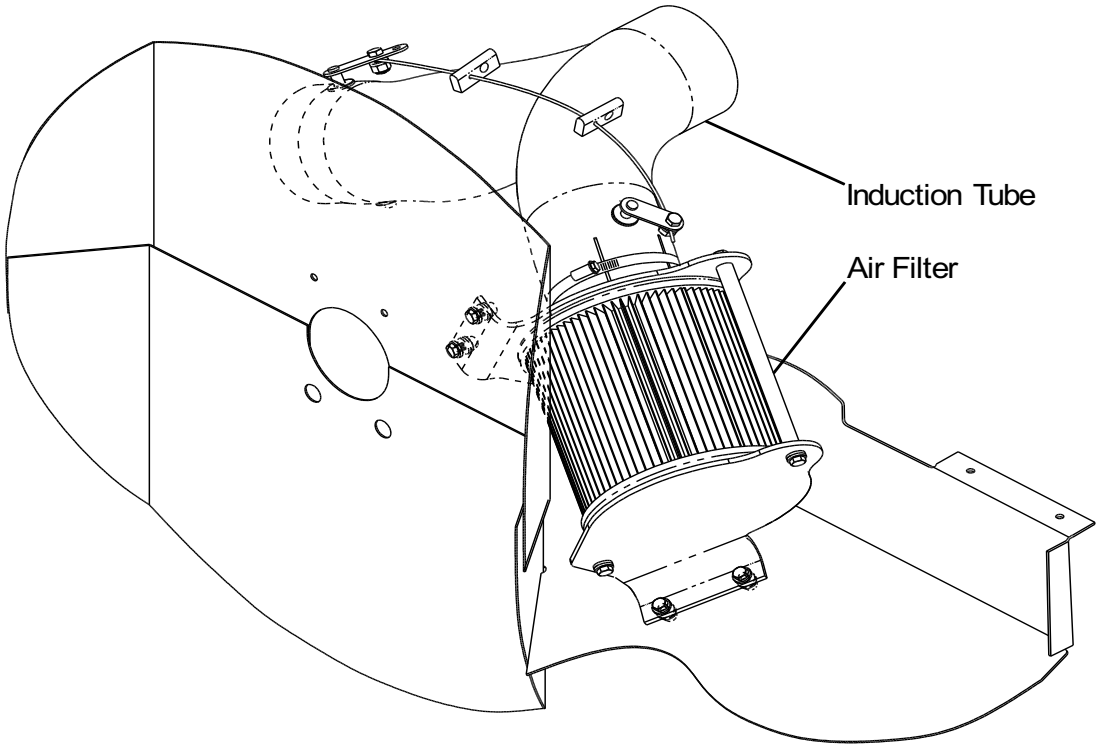
Figure 1 : Sheet 5 : Engine

B12132





VIEW A-A



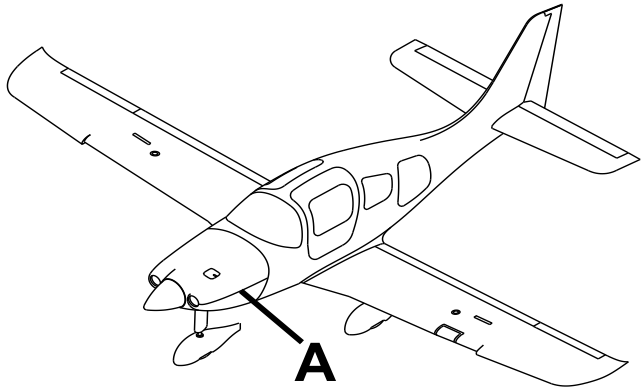
DETAIL A

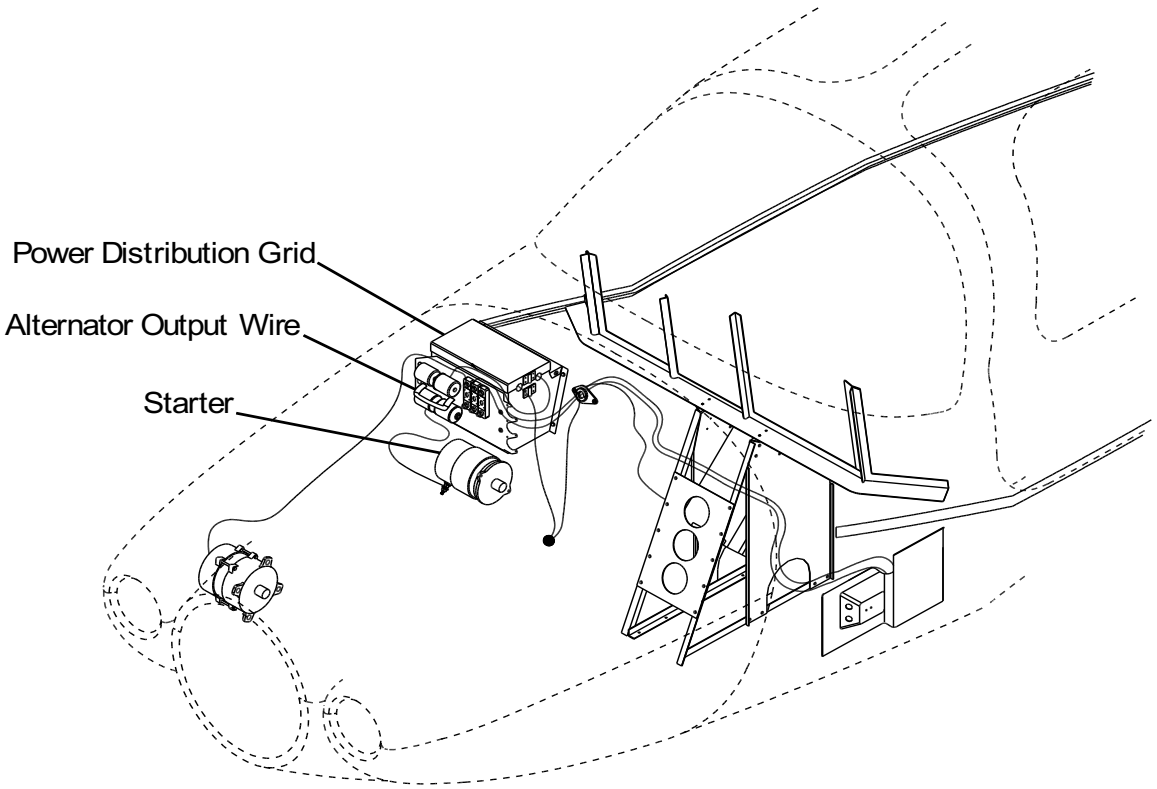
ALA71844100CC2

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 6 : Engine

B12133





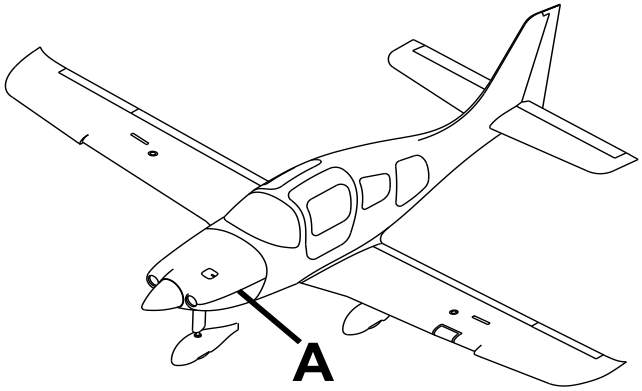
DETAIL A

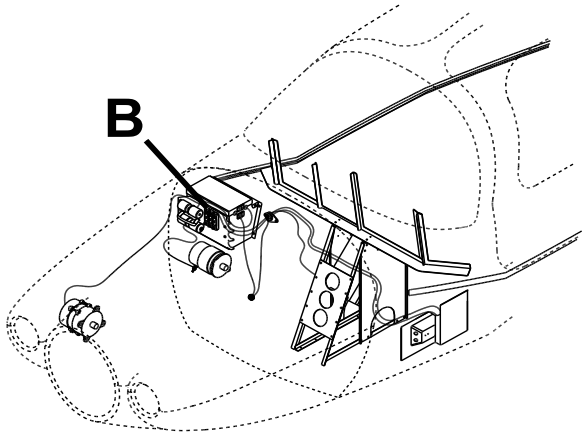
ALA71510000AA1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

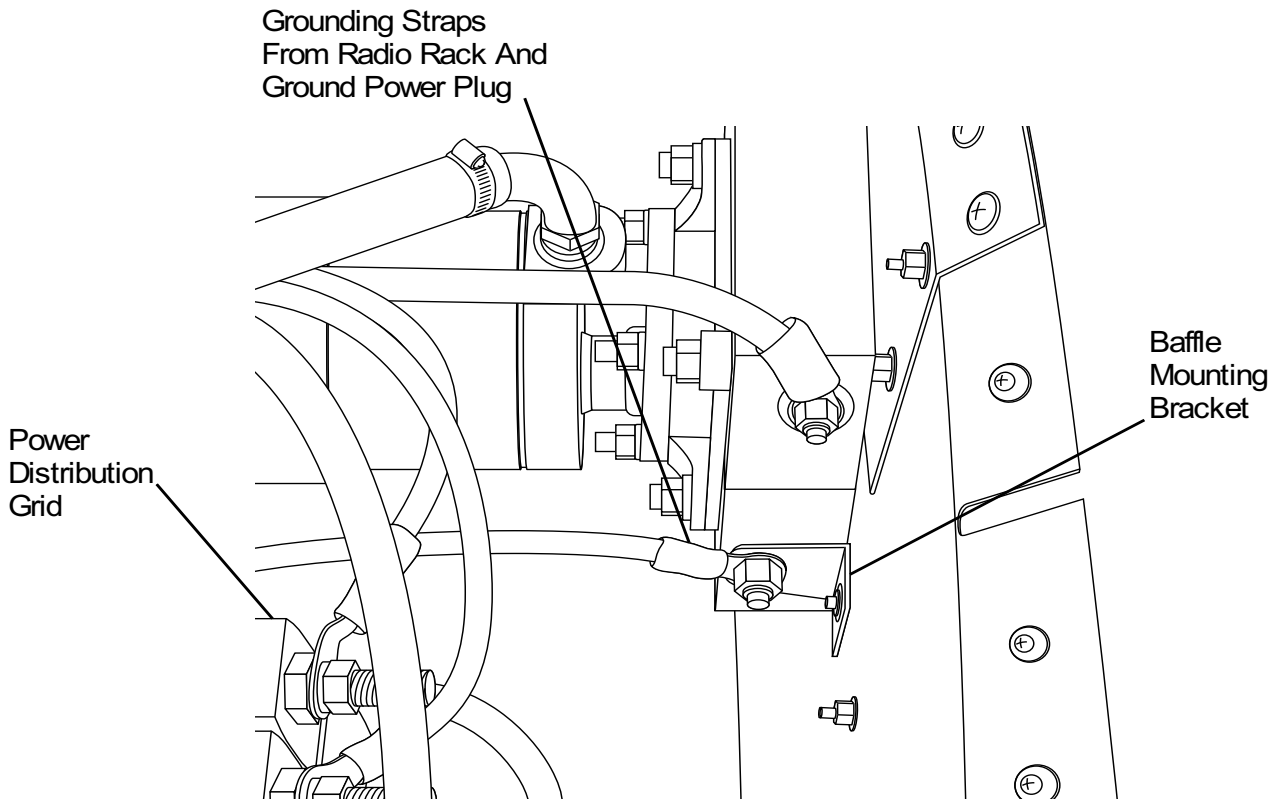
Figure 2 : Sheet 1 : Engine

B12134





DETAIL A



DETAIL B

ALA71510000AA1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

POWERPLANT - TROUBLESHOOTING

1. Engine Troubleshooting

A. The following diagnostic tests are basic guidelines to follow when diagnosing engine starting and running problems. More detailed information on the engine's internal components can be found in the Teledyne Continental Motors Permold Series Maintenance Manual FORM NO. X30634A or Overhaul Manual FORM NO. X30568A.

(1) Engine Cranks Over But Will Not Start

(2) Engine Stalls At Idle RPM

(3) Engine Misfires During High RPM

(4) Low Fuel Pressure at Fuel Pressure Gauge

(5) High Engine Oil Temperature

(6) High Engine Cylinder Head Temperature

Table 101. Engine Cranks Over But Will Not Start

If:	Action To Be Taken:
Engine is not cranking over fast enough	Replace or recharge batteries, clean or replace battery terminal connections, or replace faulty starter.
NOTE: Before considering the following options, ensure that the low boost pump has been turned on to prevent possible vapor lock.	
No spark is present at engine spark plugs AND impulse couplings are not clicking	Replace or repair magnetos.
No spark is present at engine spark plugs AND impulse couplings are clicking	Repair or replace ungrounded magnetos.
No fuel flow is present on fuel gauge AND no fuel is present in fuel tanks	Fill tanks with fuel.
No fuel flow is present on fuel gauge AND fuel is present in fuel tanks	Check that fuel pump mixture control is in proper position, boost pump is working properly, all fuel valves are open, and all fuel filters are free flowing.
Fuel flow is present at fuel gauge	Check for flooded engine.

Table 102. Engine Stalls At Idle RPM

If:	Action To Be Taken:
Idle stop screw is not adjusted correctly	Adjust idle stop screw.
Mixture control lever is not adjusted correctly	Adjust mixture control lever.
Magneto capacitor is not functioning properly	Repair or replace magneto capacitor as necessary.
Engine spark plugs are oil fouled	Check engine compression and overhaul top of engine.

Table 103. Engine Misfires During High RPM

If:	Action To Be Taken:
Fuel line, valve, or filter is blocked	Clean or replace fuel lines, valves, and filters to remove all restrictions.
Engine fuel pump operation is inadequate	Repair or replace fuel pump or pump shaft.
Timing is incorrect	Re-time magnetos.
Magneto internal timing fails due to broken keyway, worn out bearings, or oil saturation from leaking oil seal	Repair or replace magneto as necessary.
Breaker points are improperly adjusted	Readjust breaker points.
Capacitor is not functioning correctly	Replace capacitor.
Valve spring is broken	Replace valve spring.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Valve is sticking or burnt	Overhaul top end of engine.
None of the above	Replace worn or sticking hydraulic tappet or worn camshaft.

Table 104. Low Fuel Pressure at Fuel Pressure Gauge

If:	**Action To Be Taken:**
Fuel line, valve or filter downstream from fuel pressure transducer is blocked.	Clean or replace fuel lines, valves or filters to remove all restrictions.
Engine fuel pump is not operating properly.	Repair or replace as necessary.
Fuel pressure transducer is not functioning correctly.	Replace fuel pressure transducer.
None of the above.	Replace fuel pressure gauge.

Table 105. High Engine Oil Temperature

If:	**Action To Be Taken:**
Oil level in engine crankcase is low	Fill with correct grade engine oil.
Engine oil viscosity is incorrect	Re-service engine oil system using correct grade of oil.
Engine oil filter is plugged	Replace oil filter.
Engine oil cooler is externally blocked	Clean oil cooler fins.
Engine oil cooler vernatherm is not functioning correctly	Replace vernatherm valve.
Engine oil cooler is internally blocked	Remove and flush oil cooler.
Oil temperature gauge or sending unit is not functioning correctly	Replace as necessary.

Table 106. High Engine Cylinder Head Temperature

If:	**Action To Be Taken:**
Improper grade of fuel is being used	Drain fuel tanks and refill using proper grade of fuel.
Cylinder head cooling fins are blocked	Clean cooling fins.
Magneto timing is incorrect	Re-time magnetos.
Magneto internal timing fails due to broken key-way, worn out bearings, or oil saturation from leaking oil seal	Repair or replace magneto as necessary.
Breaker points are improperly adjusted	Readjust breaker points.
Capacitor is not functioning correctly	Replace capacitor.
CHT probe or temperature gauge is not working correctly	Replace as necessary.
Engine pistons have excessive carbon buildup	Overhaul top of engine.
Engine cylinders have leaking exhaust valves	Overhaul top of engine

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENGINE COWLING - MAINTENANCE PRACTICES

1. Engine Cowling Removal, Installation, and Maintenance

A. Removal of Engine Cowling

(1) Using suitable pliers or by attaching a drill/driver, remove the hinge pins from the left and right side of the cowling by pulling the pins outward through the front inlet holes. Refer to Figure 201.

NOTE: When using a powered drill/driver select low speed and low torque.

(2) Remove the screws attaching the nose gear fairing to the lower cowling and the two screws on the outboard rear nose gear attaching the cowling to the fuselage. Do not remove the screw attaching the rear center fairing to the fusealge. This screw will hold the nose fairing in place when installing the lower cowling. Refer to Figure 202.

(3) Remove the six front cowling attachment screws. Refer to Figure 203.

(4) Remove the screws attaching the lower cowling to the fuselage. An assistant will be required to help hold the lower cowling and prevent it from falling and hitting the nose wheel pant or ground. Refer to Figure 204.

(5) Remove the lower cowling from the aircraft.

(6) Remove screws attaching the upper cowling to the fuselage. Refer to Figure 204.

(7) Remove the upper cowling from the aircraft.

B. Installation of the Cowling

(1) With an assistant, install the lower cowling onto the fuselage so that cowling attachment screw holes align with the corresponding holes in the fuselage joggle. Install the number one attachment screw (closest to the hinge) and the lowest screw that shows good alignment. Repeat for the opposite side. The screws should be loose. Do not final torque at this time. Refer to Figure 204.

(2) Position the upper cowl against the bulkhead and insert all fasteners. Do not start the threads at this time.

(3) Insert the hinge pins by hand through the front pin holes, located next to the outboard areas of the air inlet holes, and into the hinge elements until they stop. The pin holes are not on all aircraft and their use is optional, if present. Refer to Figure 205. As necessary, apply a light coating of Aeroshell 15W50 engine oil, Mil-L-7870 lubricating oil, or Dow Corning DC 7 silicone release compound to the first two inches of the hinge pin to aid installation.

(4) Attach the hinge pin to a drill/driver and feed the pin into the hinge elements while simultaneously manipulating the cowl halves as required. Insert both pins completely before proceeding.

NOTE: When using a powered drill/driver select low speed and low torque.

NOTE: It is recommended to insert the copilot side hinge pin first. Hinge elements at the leading edge become obscured by engine baffling on the pilot's side.

(5) Install all remaining lower cowl fasteners. Tighten all upper and lower cowl fasteners beginning with the top center an progressing circumferentially toward the nose wheel fairing. Torque screws 30 to 36 in.-lbs.

(6) Align the nose fairing attachment screw holes with the corresponding holes in the lower cowling, and install the attachment screws. Torque screws 20 to 25 in.-lbs. Install two outboard rear nose gear and cowling-to-fuselage attachment screws. Torque screws 30 to 36 in.-lbs. Refer to Figure 202.

(7) Install the upper cowling so that the cowling attachment screw holes align with the corresponding holes in the fuselage joggle, and install the attachment screws. Torque screws 30 to 36 in.-lbs. Refer to Figure 204.

(8) Install front six cowling attachment screws. Torque screws 30 to 36 in.-lbs. Refer to Figure 203.

C. **Maintenance of Cowling** - The only cowling maintenance item is to repair the fire resistant paint on the inside of the upper and lower cowl that may have been worn off due to the rubbing of the baffling on the cowl. The fire protective paint used is Ocean Fire Retardants #477 two-part epoxy. When the paint is exposed to flame, it puffs up to form a very dense, insulating, spongy foam crust, which retards heat penetration to the underlying surface. Use the following repair method to repaint worn areas inside the cowling:

(1) Ensure the surface of the damaged area is dry and free from oil or grease.

(2) Mix eight parts #477A with 1 part #477B by volume. Allow 60 minutes for the paint to activate at a room temperature of 70° F.

(3) Using a brush, apply two coats of paint to the damaged area 23 to 27 mils thick. Allow 60 minutes of drying time between coats.

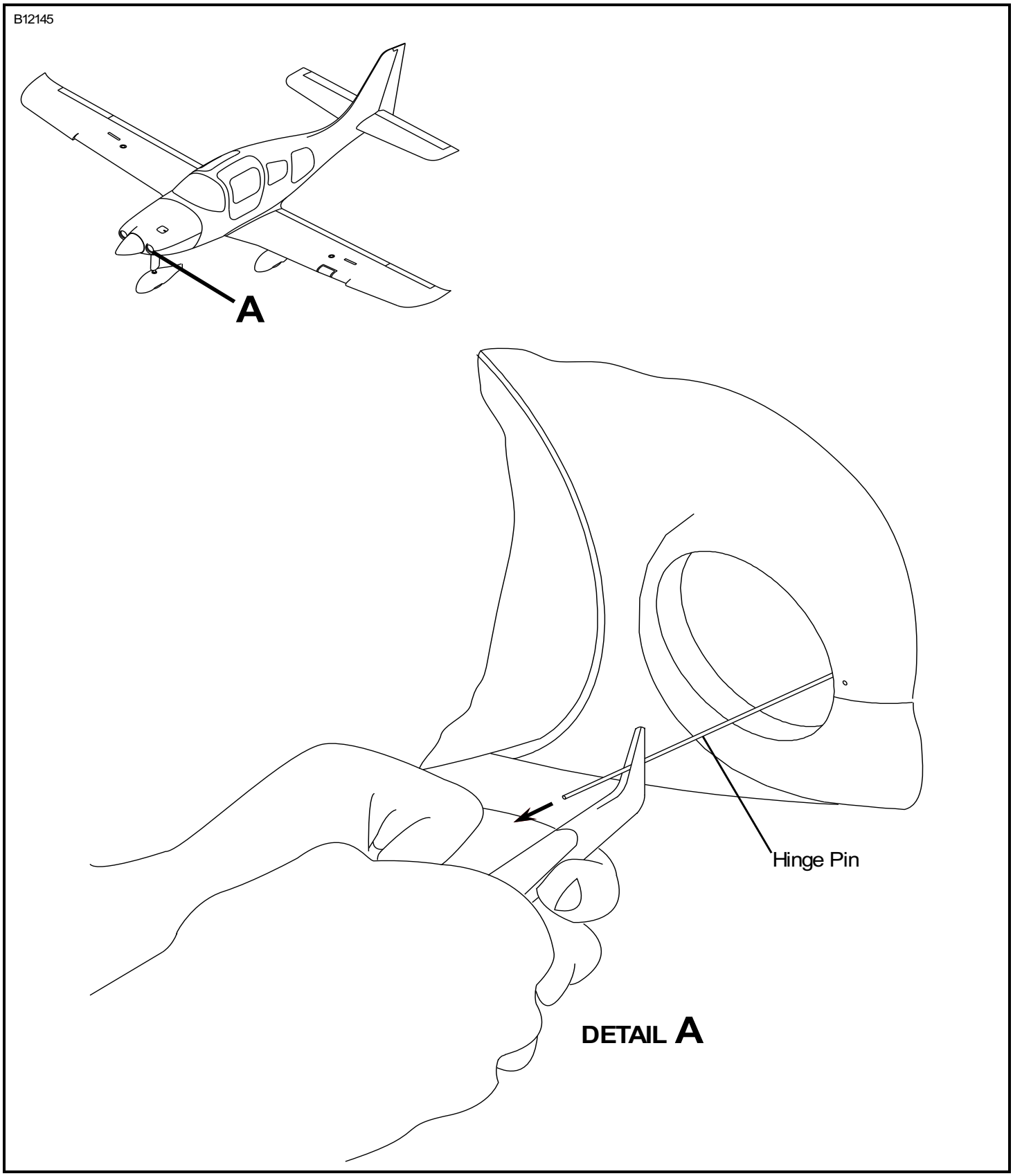
(4) Cure times at 70° F are:

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(a) Dry to recoat - 60 minutes
(b) Dry to touch - 4 hours
(c) Dry to handle - 24 hours
(d) Through cure - 7 days

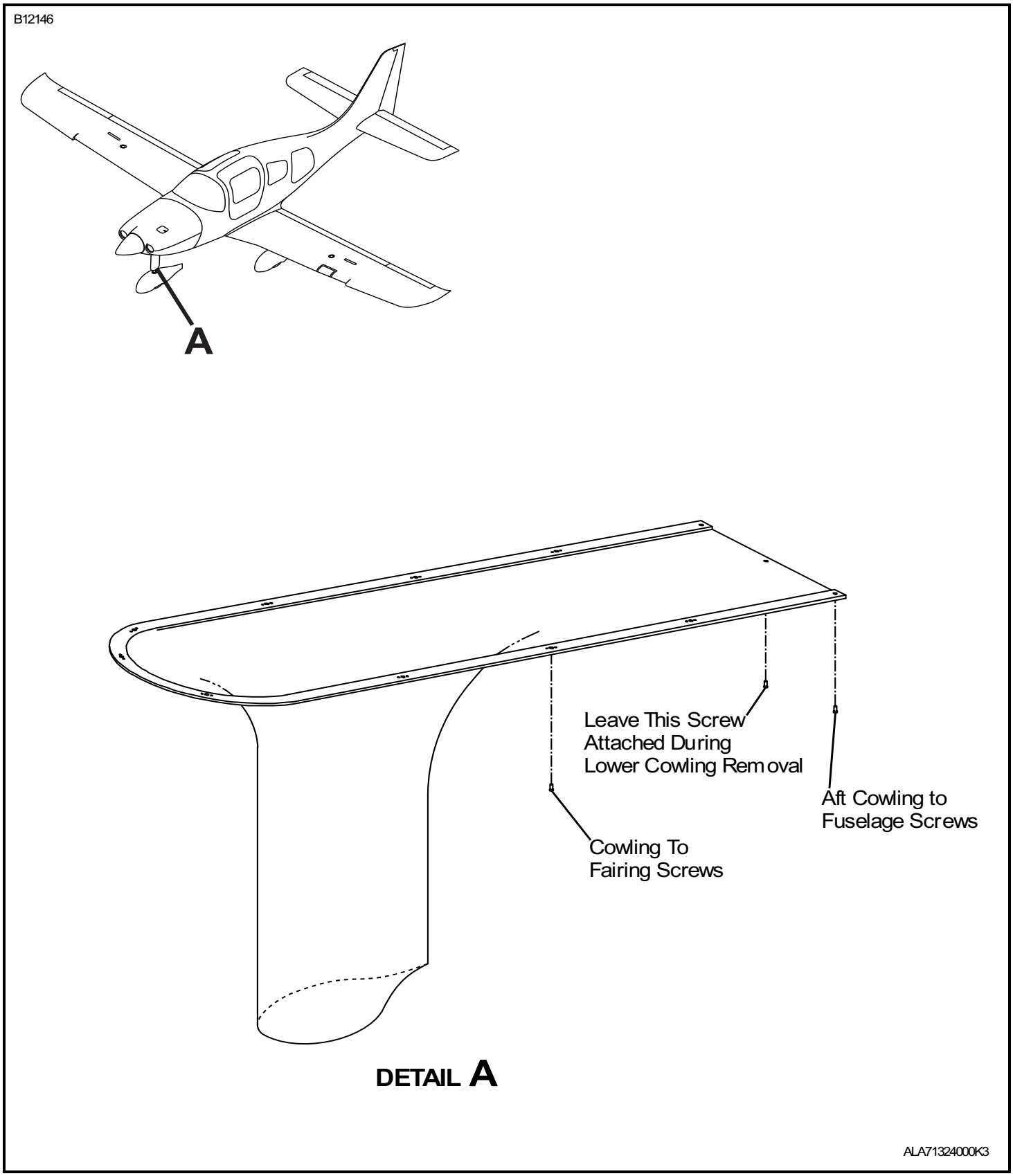
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Removing Hinge Pins from Cowl



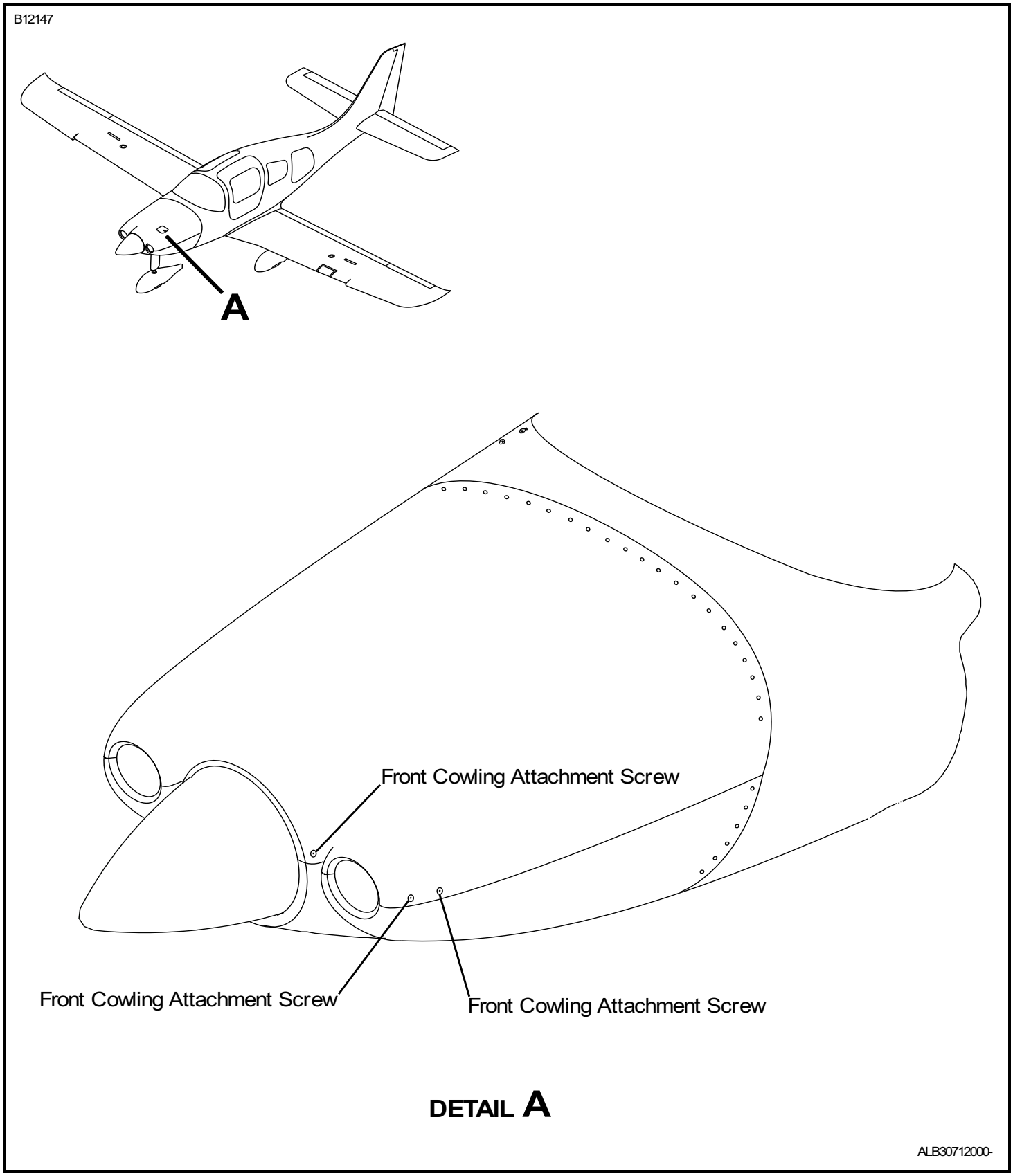
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Cowling Screws



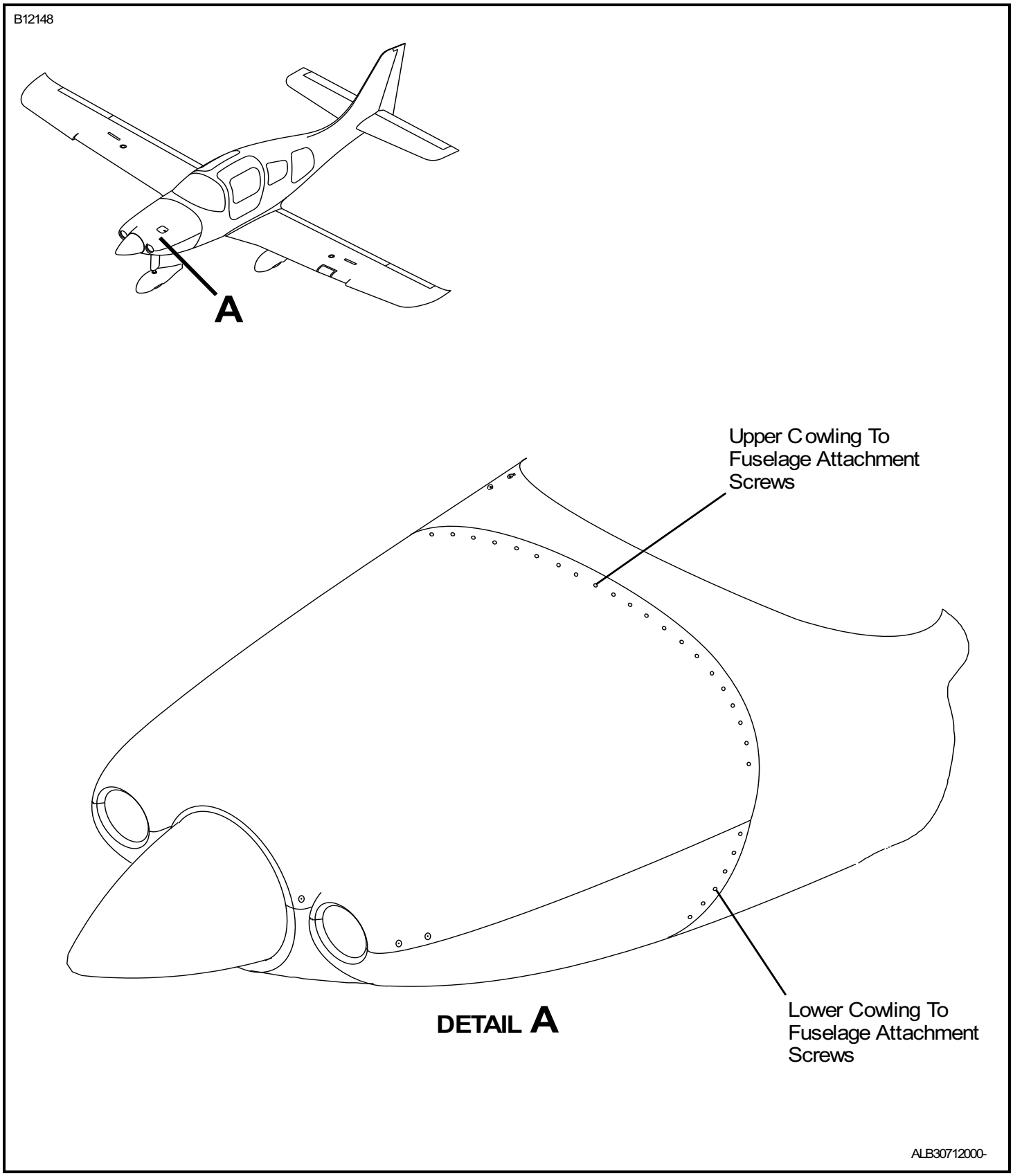
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Front Cowling Screws



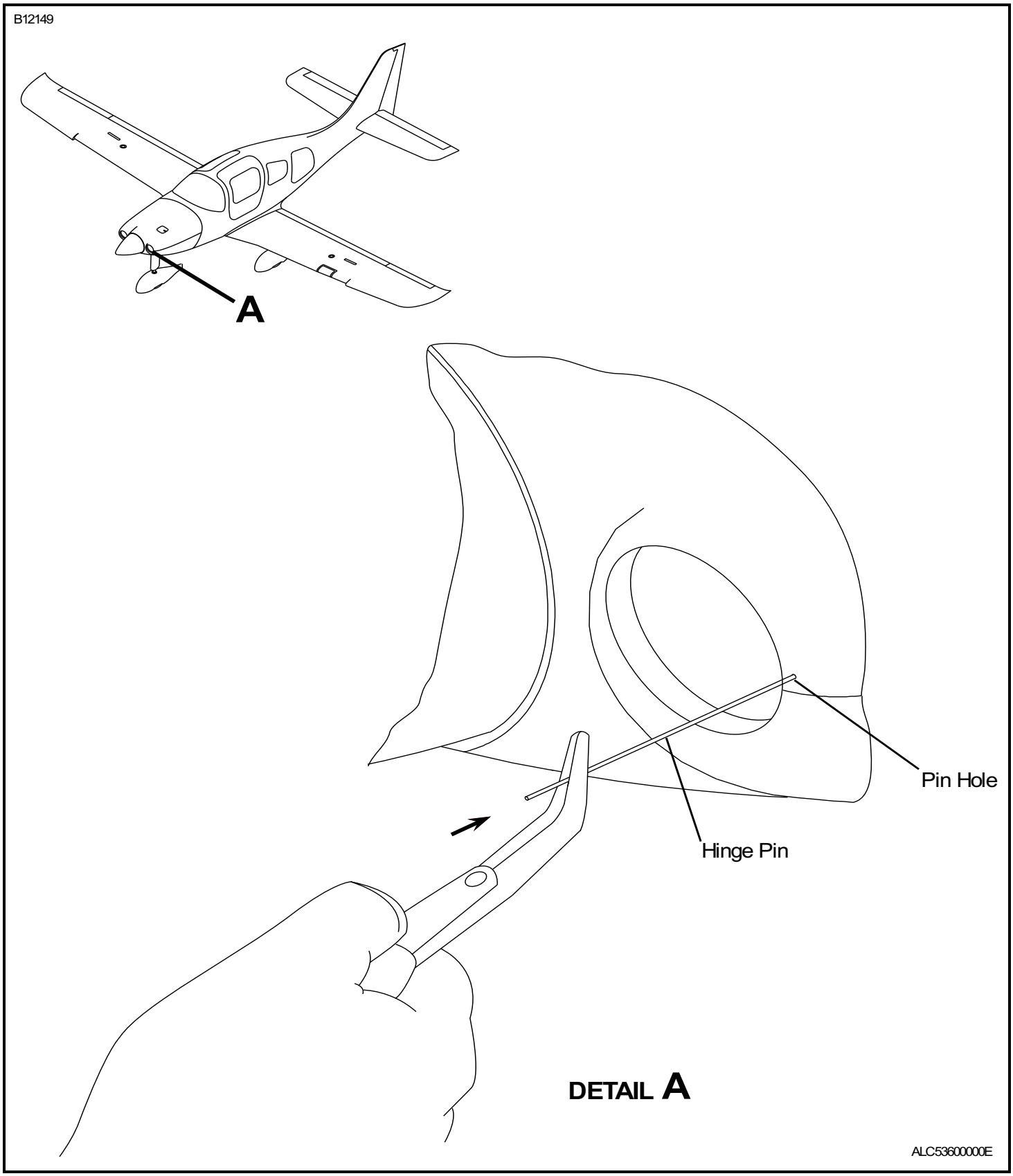
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Screws Attaching the Cowling to the Fuselage



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Installing Hinge Pins



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENGINE MOUNT - MAINTENANCE PRACTICES

1. Engine Mount Removal, Inspection, and installation

A. Removal of the Engine Mount - (Refer to Figure 201.)

(1) With the engine removed per the Engine Removal, Cleaning, and Installation section and the tail of the aircraft fully secured using a jack stand and undertail tie strap, remove the nose gear and nose gear fairing per instructions in Chapter 32-20-00.

(2) Remove all additional clamps and tie straps used to attach wiring, cables, and hoses to the engine mount.

(3) Remove the bolts attaching the upper and lower engine mount to the firewall.

CAUTION: Use caution when removing the bolts from the firewall to prevent bushings and washers on the inside of the firewall from falling out and getting lost.

(4) Remove the engine mount from the firewall.

B. Inspection of the Engine Mount

(1) Inspect all engine mount tubes and welds using bright light and a 10X (ten power) magnifying glass for signs of cracking, chafing, rusting, and pitting. Do not weld any part of the engine mount. If a crack is found, replacement of the engine mount is required. Small undamaged areas where corrosion protection has chafed off may be protected by removing all visible surface rust with a wire brush and applying a quality high temperature rust preventative paint.

C. Installation of the Engine Mount

(1) Position the engine mount onto the firewall with the upper mounting pad tubes protruding through the firewall and into the backside bushings.

(2) Install the four engine mount bolts and washers through the front of the engine mounting pad tubes. To ensure the bolts do not "shank out", one additional AN960-716 washer (for a total of two washers) may be used under the bolt head to attain a minimum protrusion of two threads and a maximum protrusion of 3.5 threads through the nut after torquing. Thread protusion includes the chamfer at the end of the bolt. Make sure the upper engine mount firewall bushings do not fall out while inserting the bolts. When correctly installed, bushings slide inside of the engine mounting pad tubes.

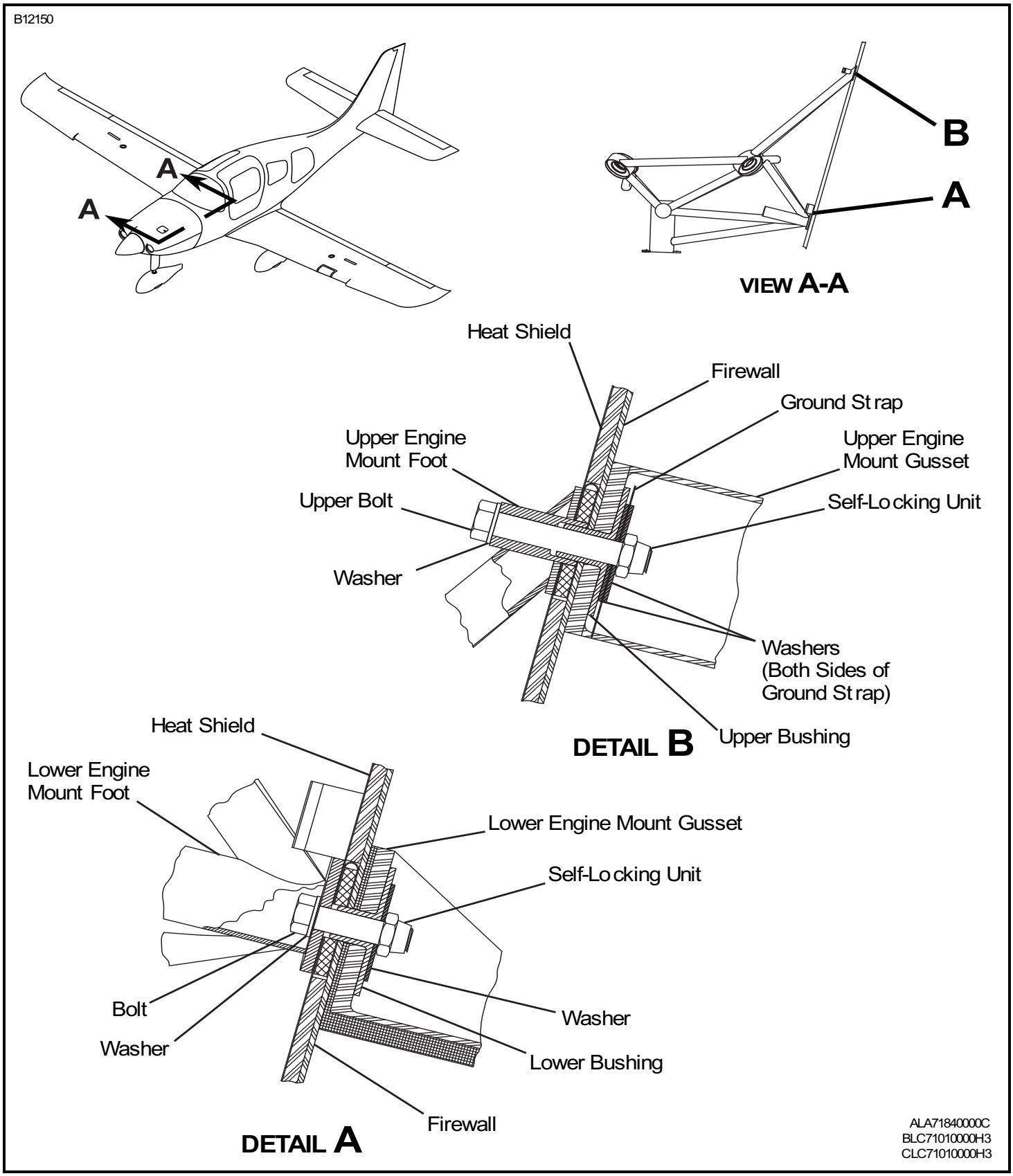
(3) Install engine mount washers and nuts at the backside of the firewall. One washer at each lower bolt and two washers at each upper bolt. Make sure that the ground straps are installed between the two washers at the upper mounting bolt locations.

(4) Torque the engine mount bolts 55 to 60 ft.-lbs.

(5) Install in reverse order as disassembled all clamps and tie straps used to fasten down wiring, cables, and hoses which will chafe, rub, or interfere with surounding objects during engine operation.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Engine Mount to Fuselage Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

AIR INDUCTION SYSTEM - MAINTENANCE PRACTICES

1. Engine Air Filter Removal and Cleaning

A. Refer to Figure 201.The engine air filter is a lifetime unit that must be cleaned and inspected on a regular basis per the following instructions. K & N has a servicing kit available (Part No. 99-5000).

(1) Remove the upper cowling from the aircraft per instructions in the Engine Cowling section.

(2) Loosen the large ducting clamp connecting the ducting hose to the upper air filter housing.

(3) Remove four bolts, nuts, and washers securing both the upper and lower air filter housings to the baffling, and remove the air filter assembly.

(4) Remove two bolts and nuts and four washers from the upper and lower air filter housing spacers, and remove the air filter.

(5) Tap the filter element to dislodge any large embedded dirt, then brush with a soft bristle brush.

(6) Roll the filter in a shallow tray filled to a depth equal to 3/4 of the depth of one pleat with K & N filter cleaner (Part No. 99-0621). Do not let dirty solution run inside of the filter. Let the filter sit for five minutes to dissolve dirt.

(7) From the inside out, rinse the filter with low pressure cold water, preferably from a garden hose. Shake loose water from the filter and allow to air dry. Do not use any form of high pressure air to dry the filter.

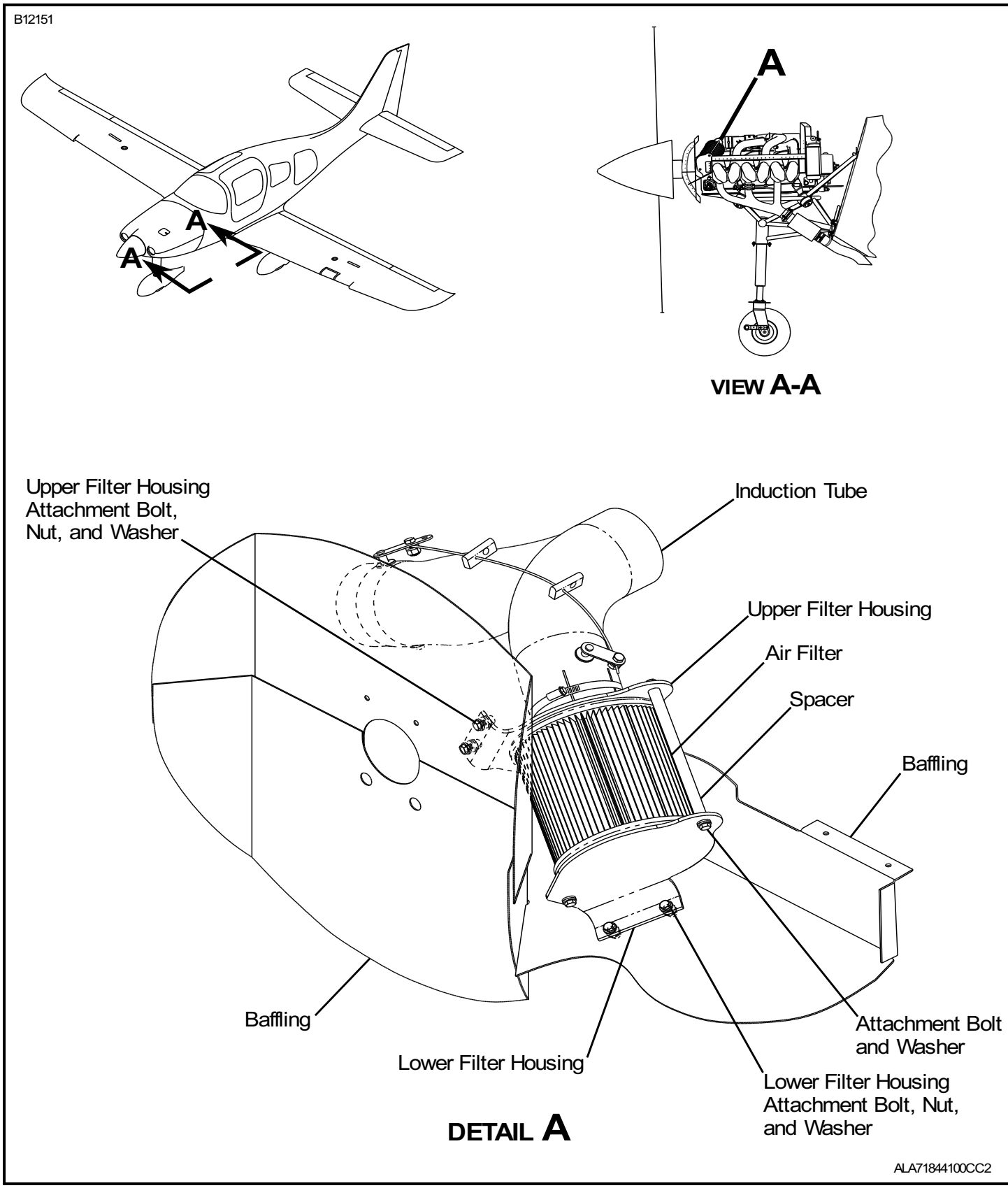
(8) Re-oil the filter using K & N oil (Part No. 99-0516 aerosol, Part No. 99-0533 squeeze bottle) by applying oil down into each pleat with one pass per pleat. Wait ten minutes and re-oil any white spots still showing.

NOTE: Do not use any oils such as transmission fluid, motor oil, diesel fuel, WD-40, LPS, or other light weight oils on the filter. Use only K & N products.

(9) Reinstall the filter in reverse order as disassembled. Torque four filter housing to baffling retaining bolts 30 to 36 in.-lbs.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Engine Air Filter



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENGINE FUEL DRAIN - MAINTENANCE PRACTICES

1. Engine Fuel Drain Tree Removal, Inspection, and Installation

A. Engine Fuel Drain Tree Removal - (Refer to Figure 201.)

(1) Remove the upper cowling from the aircraft per instructions in the Engine Cowling section.

(2) Using suitable wrenches, remove the fuel drain tree hard line fittings from the left and right side of the engine. Use caution not to back out fittings in the engine cylinders during removal.

(3) Using suitable wrenches, remove the left and right side drain hoses from the sniffle valve fitting. Refer to Figure 202.

(4) Remove the engine oil pan retaining screws at the fuel line hose clamp locations, and remove hose clamps.

(5) Detach the fuel line retaining clamps at the aft end of the engine mount, and remove the hose clamps.

(6) Remove all tie straps that will prevent the fuel drain tree hoses and hard line from being removed.

(7) Remove the fuel drain tree hoses and hard lines.

(8) Using suitable wrenches, remove the fuel drain hoses from the fuel drain tree hard lines.

(9) Remove the sniffle valve to drain tube flange retaining nut and washer, and remove the sniffle valve. Refer to Figure 202.

B. Inspection of Engine Fuel Drain Tree

(1) Inspect all fuel drain tree hoses for burning, cracking, deterioration, and chafing. Inspect all fuel drain tree hose fitting ends for cracking and stripped or cross-threaded threads. Inspect fuel drain tree hard lines for vibration cracks, crushed tubes, and bending deformities. Inspect fuel drain tree hard line fitting ends for stripped or cross-threaded threads. If in doubt about a possible crack, use a 10X (ten power) magnifying glass to thoroughly inspect the suspicious area. Inspect the sniffle valve for a jammed or blocked internal check ball by blowing through the inlet side of the valve. Air should freely pass the check ball and exit the outlet side of the valve. Blowing air through the outlet side of the valve or applying vacuum to the inlet side of the valve should seat the check ball and prevent air from passing through the valve. Replace all defective parts found in any of the fuel drain tree hoses, hard lines, or sniffle valve components.

C. Installation of Engine Fuel Drain Tree

(1) Install the sniffle valve into the drain tube flange, and install the retaining nut. Torque the retaining nut 240 to 280 in.-lbs. Refer to Figure 202.

(2) Using suitable wrenches, attach the drain hoses to the fuel drain tree hard line fittings. Torque fittings 135 to 150 in.-lbs. Refer to Figure 202.

(3) Connect the fuel drain tree hard line fittings to the engine cylinder heads. Use caution not to turn the fittings in the engine cylinders during installation. Refer to Figure 201.

(4) Route the drain hose in reverse order as disassembled. Torque fitting 135 to 150 in.-lbs.

(5) Connect the fuel drain hose fittings to the sniffle valve fitting ends. Torque the hose fittings 135 to 150 in.-lbs.

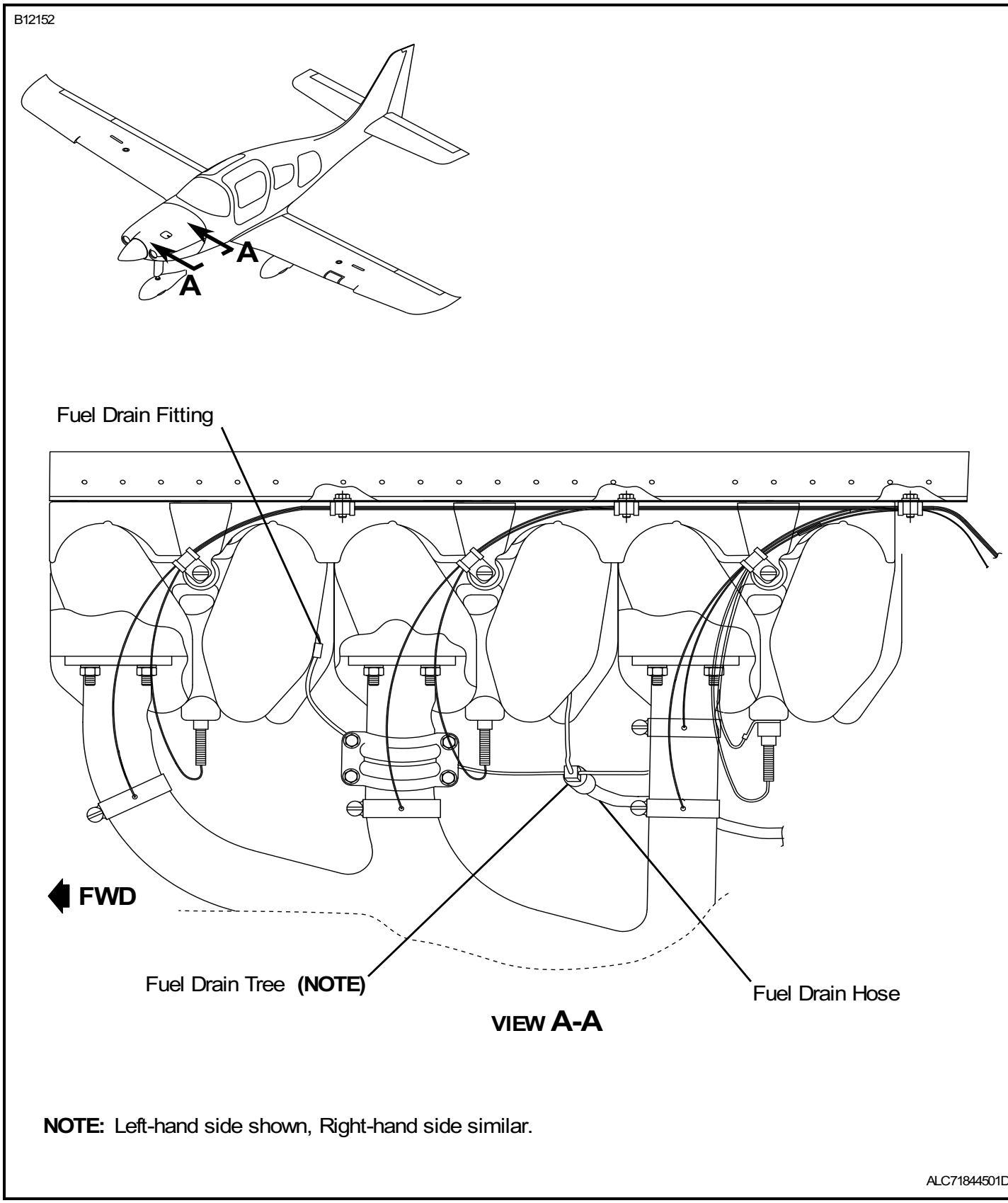
(6) Install the fuel drain hose retaining clamps over the fuel drain hoses at the oil pan attachment screw locations. Attach the hose clamps to the oil pan using the oil pan retaining screws. Torque the oil pan retaining screws 155 to 175 in.-lbs.

(7) Install the fuel drain hose retaining clamps over the fuel drain hoses at the aft engine mount locations using hose clamp bolts, nuts, and washers in reverse order as disassembled. Torque hose clamp retaining bolts 30 to 36 in.-lbs.

(8) Install new tie straps at all locations noted prior to removing the fuel drain tree hoses and hard lines.

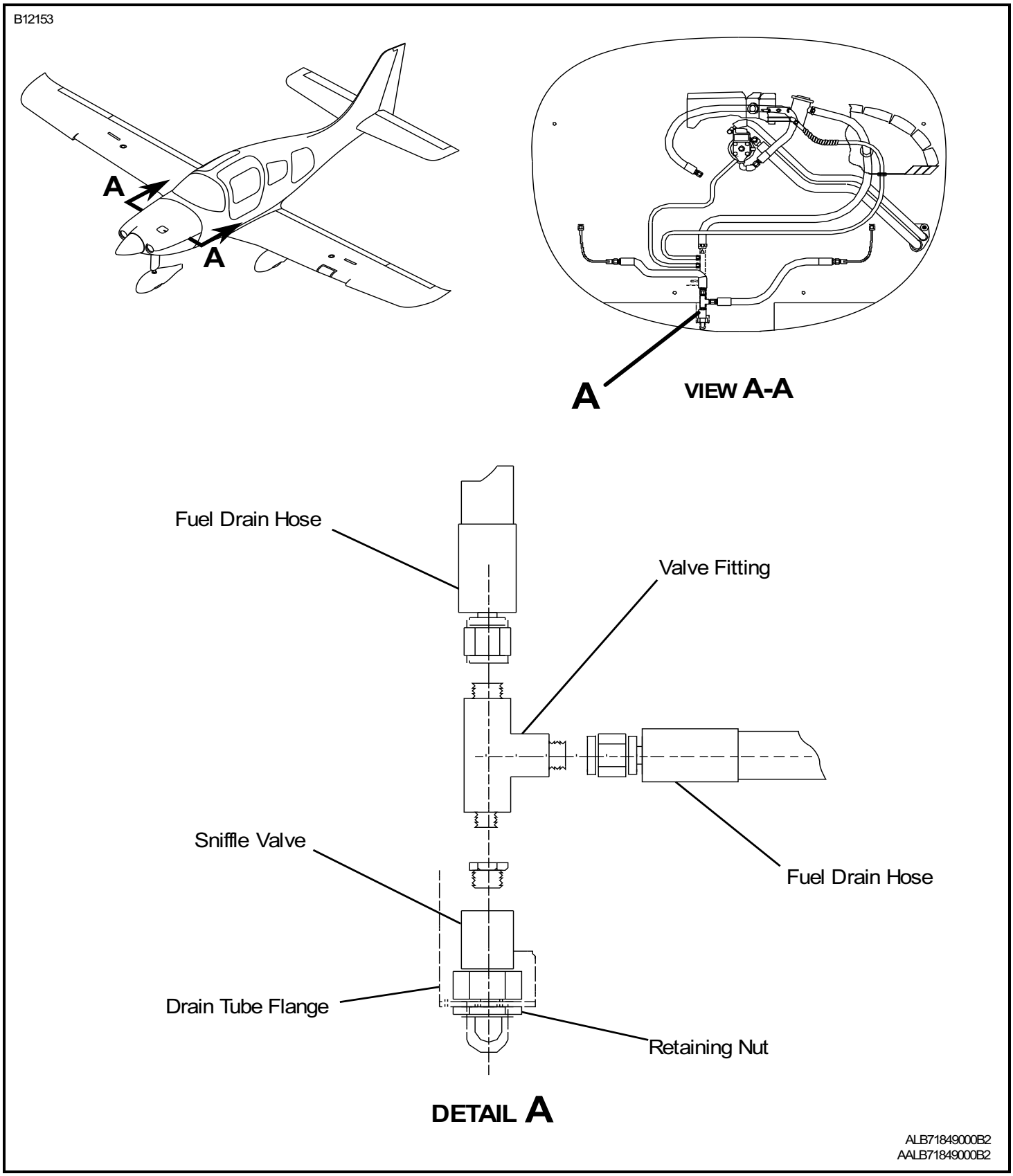
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Fuel Drain Tree



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Fuel Drain Hoses and Valves



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

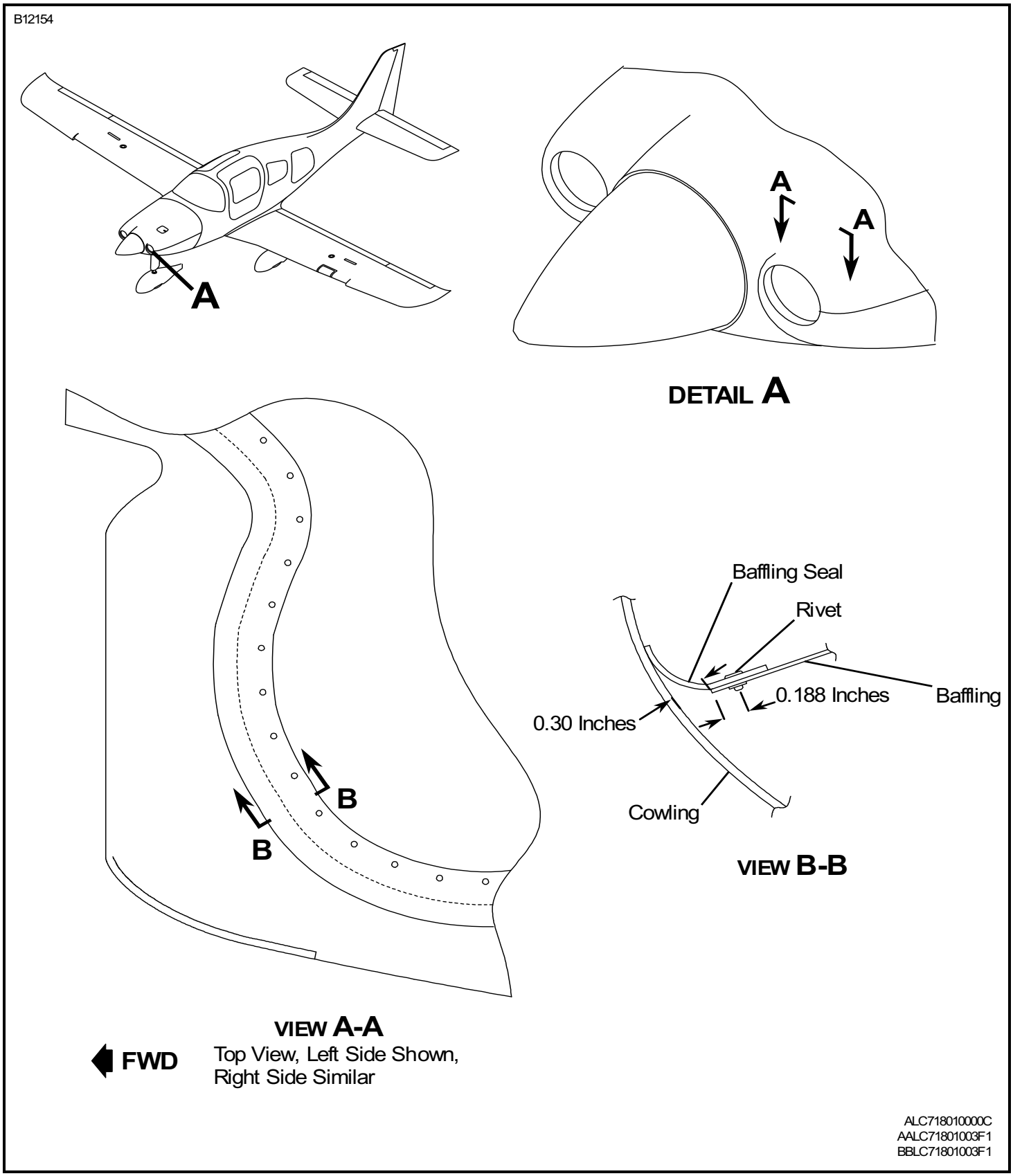
ENGINE BAFFLING - MAINTENANCE PRACTICES

1. Engine Baffling

A. The engine baffling directs airflow over the engine for proper cooling and consists of thin aluminum with silicone sheet seals. Baffling should be checked at each inspection for cracks, excessive gaps, and security of mounting to engine. During routine inspections, the gap between the forward left and right side baffling and cowling skin just below the air inlet locations should be checked. A minimum of 0.30 inches must exist between the edge of the aluminum baffling and the lower cowling skin at these locations. If adjustment is necessary, pull back the baffling seal, and trim away the baffling material as needed. Leave no less than 3/16 inch of material between the center of the rivets used to attach the baffling seal and the edge of the baffling. Refer to Figure 201.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Baffling at Cowling Below Air Inlet



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ENGINE CONTROLS - GENERAL

1. General Description

A. This document discusses the description, operation, removal, installation, adjustment, testing, maintenance, and inspection of the IO-550-N engine fuel mixture and throttle control systems.

2. Tools & Equipment

A. The mechanic should be equipped with a complete set of the necessary tools that include the following:

(1) Wrenches - 1/4 inch through 1 1/4 inches
(2) Common and Phillips Head Screwdrivers
(3) Pliers - Common, Diagonal Cutters, Needle Nose, Duck Bill, Snap Ring, Safety Wire
(4) Ratchets – 1/4 inch, 3/8 inch, 1/2 inch drive
(5) Sockets – 1/4 inch drive 5/32 inch through 1/2 inch, 3/8 inch drive 3/8 inch through 1 inch, 1/2 inch drive 7/16 inch through 1 1/4 inches
(6) Sockets (Deepwell) - 1/2 inch drive, 7/16 inch through 1 inch
(7) Feeler Gauges
(8) Leather or Soft Plastic Mallet
(9) Torque Wrenches (refer to note) 0-500 inch-lbs. and 0-100 ft.-lbs.
(10) Micrometers (refer to note)
(11) Slide Hammer
(12) Pullers
(13) Thickness Gauges
(14) Vernier Calipers (refer to note)
(15) Small Hole Gauges

NOTE: Must be currently calibrated, and the calibration must be traceable to the National Bureau of Standards.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

THROTTLE CONTROL - MAINTENANCE PRACTICES

1. Throttle Description, Operation, Removal, and Installation

A. A throttle plate located inside the intake manifold controls combustion air during engine operation. A linear motion push-pull control cable is directly connected to the throttle plate lever arm. Refer to Figure 201. During engine operation, the pilot adjusts the incoming air quantity by either pulling out or pushing in on the control cable. A locking mechanism is built into the pushpull cable to prevent the cable from moving after the desired position has been set. Rotating the thumbwheel clockwise increases the force required to move the throttle (increases friction). Rotating the thumbwheel counterclockwise decreases the force required to move the throttle (decreases friction).

(1) **Throttle Cable Removal**

(a) Remove the throttle control cable from the throttle plate control arm. Remove the bolt, nut, washers, and cotter pin. Refer to Figure 202.

(b) Remove the throttle control cable housing from the throttle cable bracket. Remove the bolts, nuts, clamp, spacer, and washers. Refer to Figure 203.

(c) Remove the cable guide plates from the firewall heat shield. Remove the screws, guide plates, and washers. Refer to Figure 204.

(d) With the GPS and cover plate removed, loosen and remove four panel screws. Pull the panel out from the instrument console until the throttle control cable backing nut can be accessed. Loosen the backing nut, and gently pull the throttle control cable out of the panel.

(2) **Throttle Cable Installation**

(a) Install the throttle control cable through the panel cover. Slide the backing nut and washer over the cable housing and torque the backing nut 240 to 280 in.-lbs

(b) Install the panel cover assembly into the instrument console, and install four panel screws. Torque the panel screws 12 to 15 in.-lbs.

(c) Route the cable through the firewall bulkhead. Install the GPS and cover plates in reverse order as disassembled.

(d) Install the throttle control cable to the throttle plate control arm. Install the bolt, washers, new cotter pin, and nut in reverse order as disassembled. Torque nut 30 to 36 in.-lbs. Refer to Figure 202.

(e) Install the throttle cable housing to the throttle cable bracket. Install the bolts, washers, clamp, spacer, and nuts in reverse order as disassembled. Torque nuts 30 to 36 in.-lbs. Refer to Figure 203.

(f) Install the cable guide plates, screws, and washers in reverse order as disassembled. Torque screws 30 to 36 in.-lbs. Refer to Figure 204.

(3) **Throttle Cable Adjustment and Testing**

(a) Remove the throttle cable from the throttle plate control arm (refer to Figure 202), and push the cable into the full open condition.

(b) Loosen the jam nut on the eyelet end of the throttle control cable.

(c) Move the throttle plate control arm into the full open position, and check that the arm is fully seated against its stop.

(d) Adjust the cable eyelet until the backside of the throttle control cable knob is 1/8 to 1/4 inch from the cable panel nut (refer to Section 76-20-00, Figure 206) and the bolt can be reinserted through the rod eye and throttle plate lever arm. In this position and with the bolt inserted, push in on the throttle control knob. A spring effect should be felt while pushing in on the cable knob the distance shown in Section 76-20-00, Figure 206 due to flexing in the cable housing.

(e) Install the throttle control cable to the throttle plate control arm. Install the bolt, washers, and nut in reverse order as disassembled. Torque nut 30 to 36 in.-lbs. Refer to Figure 202.

(f) Push then pull the throttle control cable fully in and out. No binding should be felt throughout its full range of motion.

(g) Check the throttle plate control arm motion while operating the cable.

(h) Check that all outside entities such as wiring and hoses are clear of the arm motion.

(i) Check that the cable-locking mechanism is functioning properly by not allowing cable movement unless the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

thumb wheel is loosened.

(4) **Throttle System Inspection and Maintenance**

(a) Check that no binding is present during push-pull cable operation. Replace the throttle control cable if binding is felt with the cable disconnected from the throttle plate control arm. If binding is present only with the cable connected to the throttle plate control arm, throttle plate service is required.

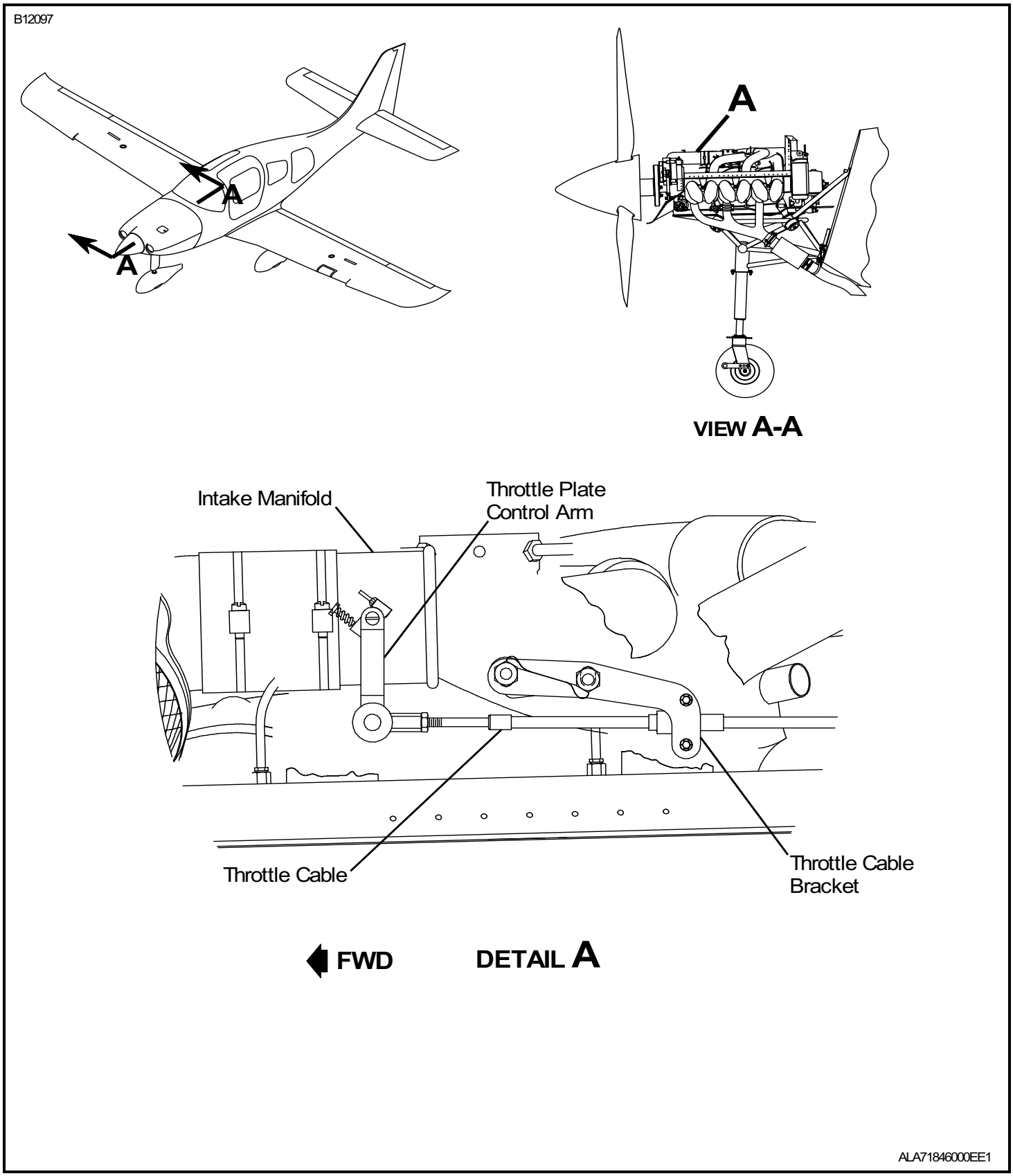
(b) Check that the throttle plate control arm is fully seated in the full open position with proper clearance between the control knob and cable panel nut. If required, adjust the fuel throttle control cable per the Fuel Mixture section.

(c) Check bolt torque at the cable to throttle cable bracket location. Refer to Figure 203. If nuts are loose or backed off, replace both bolts and nuts. Torque nuts 30 to 36 in.-lbs.

(d) The throttle control cable is a self-contained unit. No servicing of the cable is required.

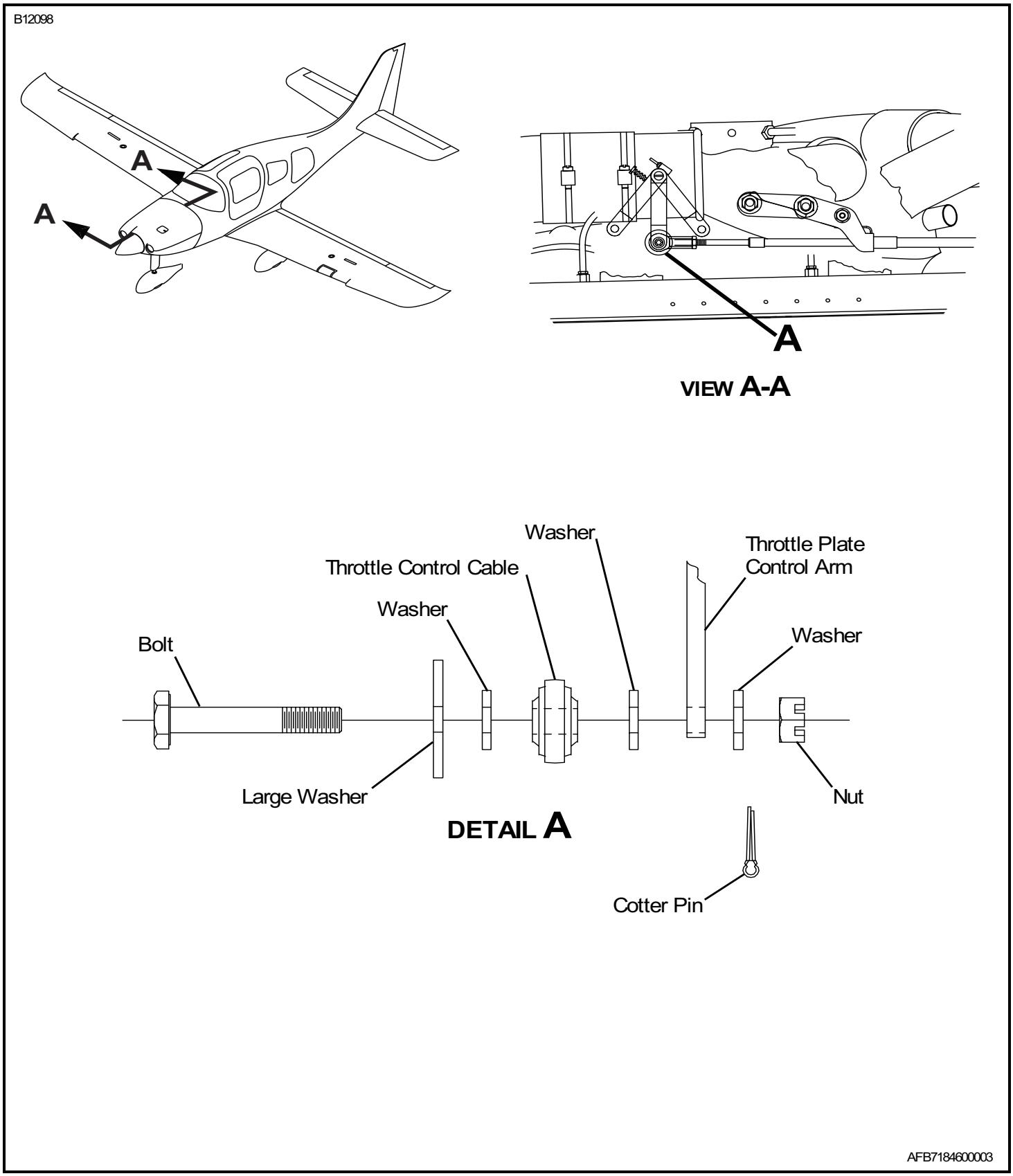
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Throttle Cable Assembly



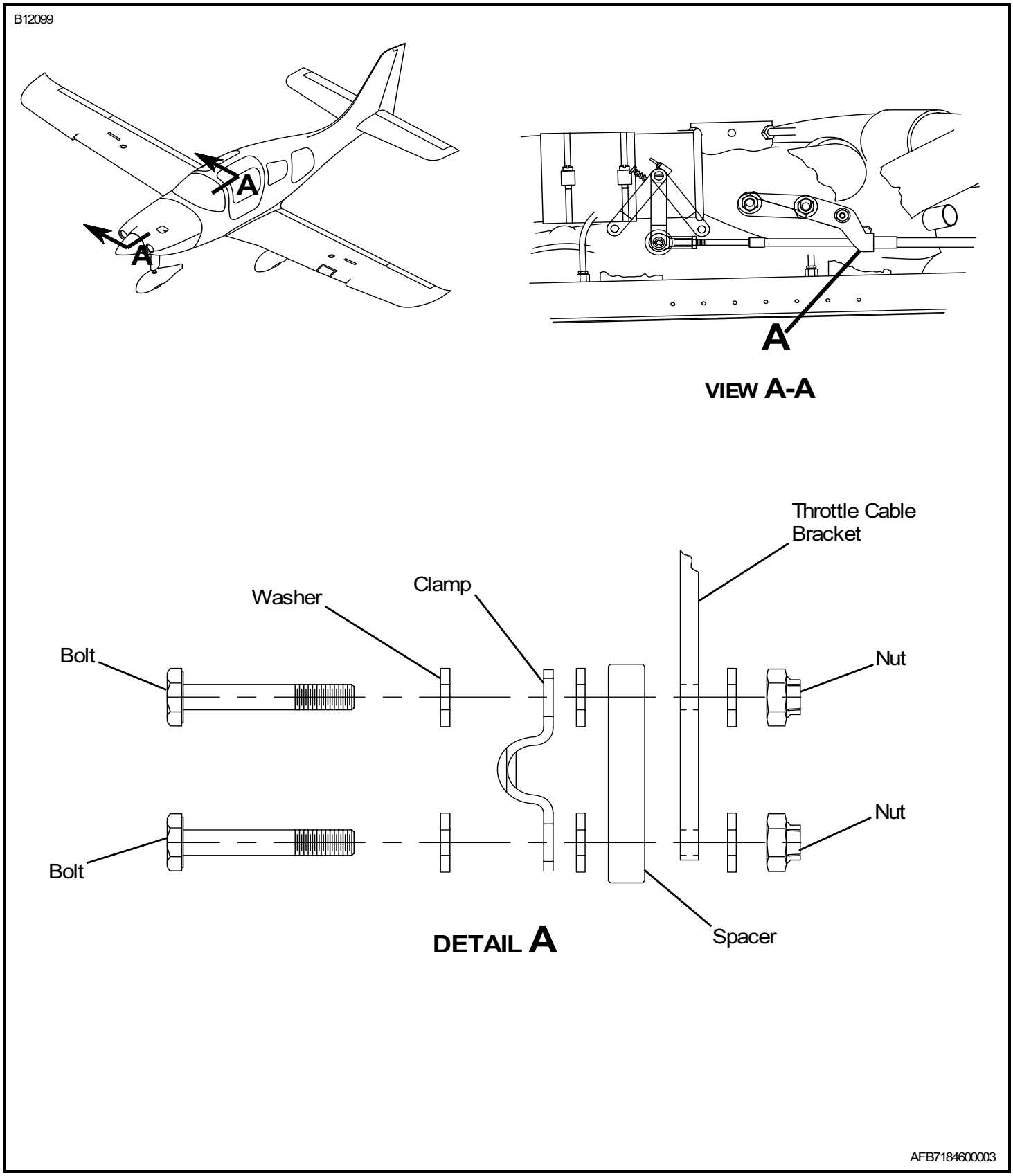
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Throttle Cable



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

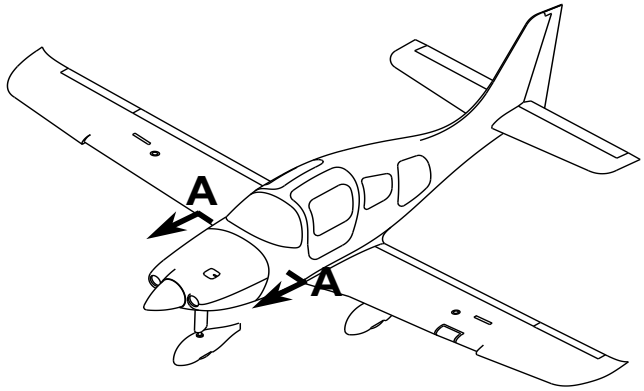
Figure 203 : Sheet 1 : Throttle Cable Attachment to Bracket

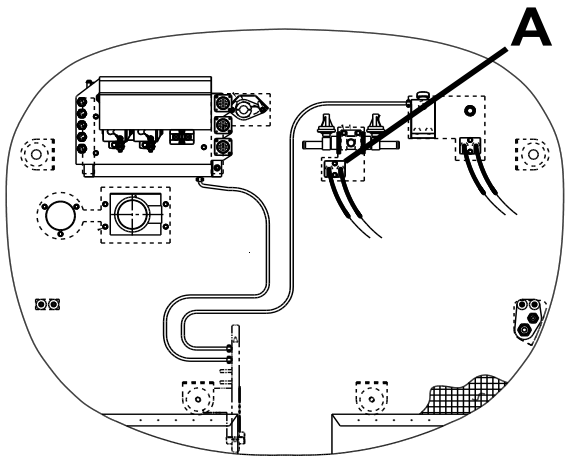


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

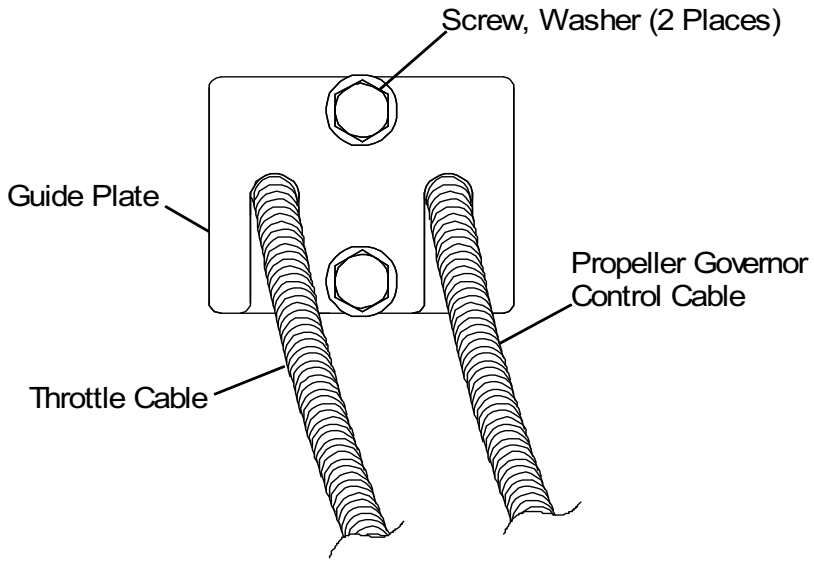
Figure 204 : Sheet 1 : Throttle Cable Guide Plate

B12100





VIEW A-A

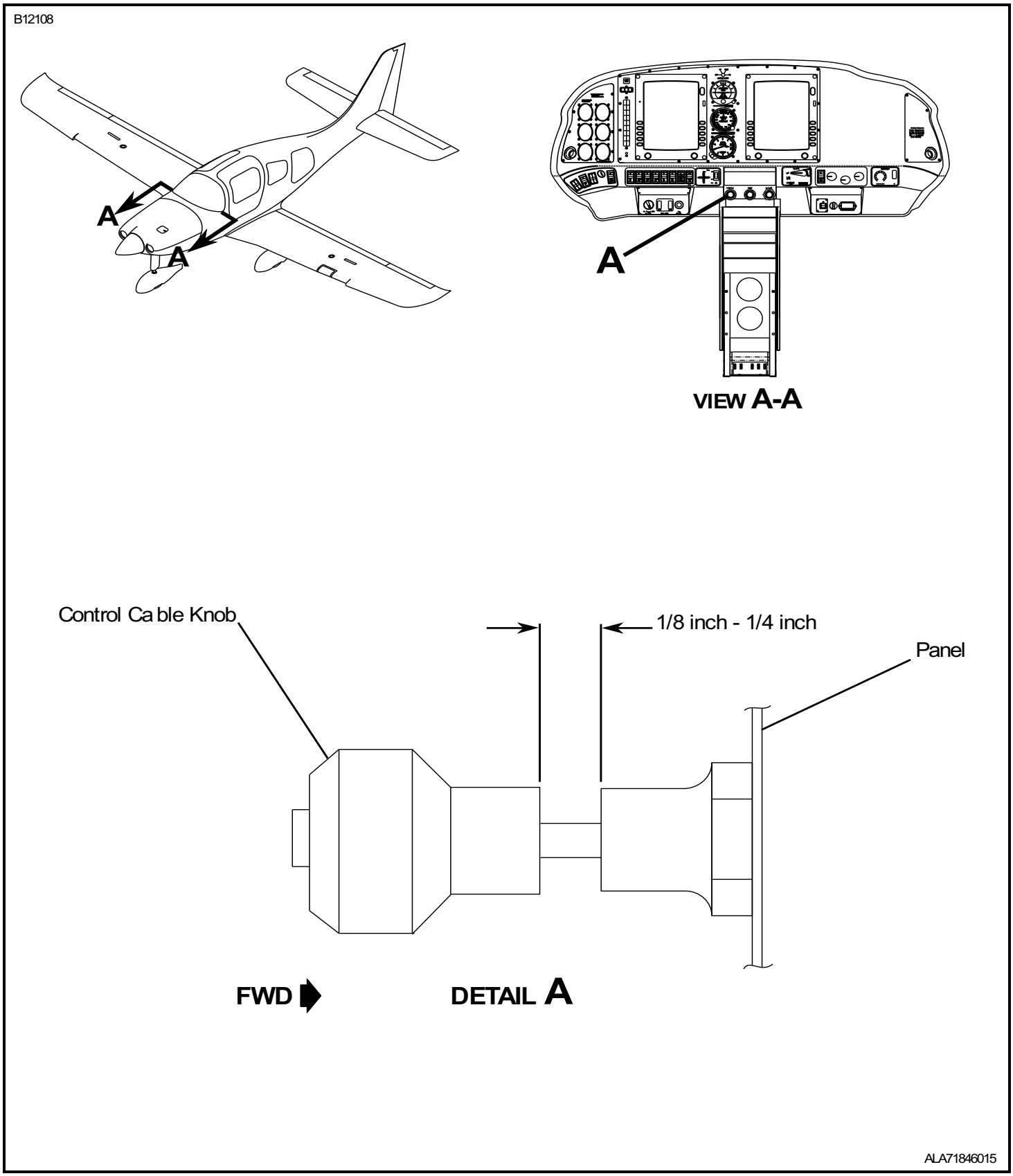


DETAIL A

ALA53260000G02

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Proper Control Position



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FUEL MIXTURE CONTROL - MAINTENANCE PRACTICES

1. Fuel Mixture Description, Operation, Removal, Installation

A. Fuel is delivered to the engine by a mechanical fuel pump mounted directly to the engine. The quantity or mixture of fuel is controlled by a linear motion push-pull cable attached directly to the fuel pump's mixture control arm (refer to Figure 201). During engine operation, the pilot adjusts the fuel mixture by either pulling out or pushing in on the control cable. A locking mechanism is built into the push-pull cable to prevent the cable from moving after the desired position has been set. To deactivate the locking mechanism the pilot presses a button located on the end on the cable knob allowing movement. Fine or precise adjust to the fuel pump mixture control arm can be accomplished by rotating the control knob either clockwise or counterclockwise resulting in small and controlled cable movement. A full rich spring is connected between the fuel pump mixture control arm or mixture arm washer, and the fuel mixture cable bracket. If the fuel mixture cable were to break or become disconnected, the full rich spring will pull the mixture control arm into the full rich position preventing engine stall.

(1) **Fuel Mixture Control Removal**

(a) Remove the fuel mixture control cable from the fuel pump mixture control arm. Remove the bolt, nut, washers, and cotter pin. Refer to Figure 202.

(b) Remove the mixture control cable housing from the fuel mixture control bracket by removing the bolts, nuts, clamp, spacer, and washers. Refer to Figure 203.

(c) Remove the cable guide plates from the firewall heat shield by removing the screws, guide plates, and washers. Refer to Figure 204.

(2) **Fuel Mixture Cable Installation**

(a) Install the fuel mixture control cable through the panel cover by sliding the backing nut and washer over the cable housing. Torque the backing nut 240 to 280 inch-lbs.

(b) Install the panel cover assembly into the instrument console, and install two or four panel screws, depending upon type of panel cover installed. Torque the panel screws 12 to 15 inch-lbs. Refer to Figure 205, Sheet 1, Sheet 2, or Sheet 3.

(c) Route the cable through the firewall bulkhead.

(d) Install the GPS and cover plates in reverse order as disassembled.

(e) Install the fuel mixture control cable to the engine driven fuel pump by installing the bolt, washers, new cotter pin, and nut in reverse order as disassembled. Torque nut 30 to 36 inch-lbs. Refer to Figure 202.

(f) Install the fuel mixture control cable housing to the fuel mixture bracket by installing bolts, washers, clamp, spacer, and nuts in reverse order as disassembled. Torque nuts 30 to 36 inch-lbs.

(g) With a large bend radius in the fuel mixture control cable between the firewall heat shield and the fuel mixture bracket, install the cable guide plates, screws, and washers. Torque screws 30 to 36 inch-lbs. Refer to Figure 204.

(3) **Fuel Mixture Adjustment and Testing**

(a) Remove the fuel mixture control cable from the fuel pump mixture control arm (refer to Figure 202), and push the cable knob into the full rich position.

(b) Loosen the jam nut at the eyelet end of the fuel mixture control cable.

(c) Move the mixture control arm into the full rich position, and check that the arm is fully seated against its stop.

NOTE: The full rich spring will hold the arm in the fully seated position.

(d) Adjust the cable eyelet until the backside of the fuel mixture control cable knob is 1/8 to 1/4 inch from the cable panel nut (refer to Figure 206) and the bolt can be reinserted through the rod eye and mixture control lever. In this position and with the bolt inserted, push in on the mixture control knob. A spring effect should be felt while pushing in on the cable knob the distance shown in Figure 206 due to flexing in the cable housing.

(e) Install the fuel mixture control cable to the fuel pump mixture arm by installing the bolt, washers, cotter pin, and nut in reverse order as disassembled. Torque nut 30 inch-lbs., then apply additional torque, if necessary, until the slot of the nut aligns with the hole in the bolt. Refer to Figure 202.

(f) Push then pull the fuel mixture control cable fully in and out. No binding should be felt throughout its full range of motion.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(g) Check the fuel pump mixture control arm motion while operating the cable.

(h) Check that all outside entities such as wiring and hoses are clear of arm motion.

(i) Check that the cable-locking mechanism is functioning properly by not allowing cable movement unless the knob button is pressed.

(j) Rotate the fuel mixture control cable knob fully clockwise and counterclockwise. Check that the fuel pump mixture control arm is moving in a smooth fashion while rotating the knob.

(4) **Fuel Mixture System Inspection and Maintenance**

(a) Check that no binding is present during push-pull and clockwise/counterclockwise cable operation. Replace the fuel mixture control cable if binding is felt with the cable disconnected from the fuel pump mixture control arm. If binding is present only with the cable connected to the fuel pump mixture control arm, fuel pump service is required.

(b) Check that the fuel pump mixture control arm is fully seated in the full rich position with proper clearance between the control knob and cable panel nut. If required, adjust the fuel mixture control cable per the Fuel Mixture section

(c) Check wear between the full rich spring hook-end and the fuel pump mixture control arm. Replace both the full rich spring and the fuel pump mixture control arm if wear is present.

(d) Check wear between the full rich spring hook-end and fuel mixture bracket shoulder bolt. Replace both the full rich spring and fuel mixture bracket shoulder bolt if wear is present.

(e) Check the bolt torque at the cable to fuel mixture bracket location. Refer to Figure 203. If nuts are loose or backed off, replace both bolts and nuts. Torque nuts 30 to 36 inch-lbs.

(f) The fuel mixture control cable is a self-contained unit. No servicing of the cable is required.

2. Induction Heat Cable

A. Two butterfly valves located inside the engine induction tube direct either fresh, mixed, or hot air into the engine. A linear motion push-pull control cable is directly connected to the butterfly valves (refer to Figure 207). As the cable moves, the two butterfly valves operate at 90 degrees rotation to each other. As one valve opens the other valve closes. Mixing of the air is accomplished when the two valves are positioned somewhere between the fully closed and fully open positions. During engine operation the pilot adjusts the incoming air temperature by either pulling out or pushing in on the control cable. A locking mechanism is built into the push-pull cable to prevent the cable from moving after the desired position has been set. To deactivate the locking mechanism, the pilot presses a button located on the end on the cable knob allowing movement.

(1) **Induction Heat Cable Removal**

(a) Remove the induction heat control cable from the hot air butterfly valve lever. Loosen the bolt, nut, and washers until the cable can be pulled out from the bolt. Refer to Figure 208.

(b) Remove the clamps used to secure the control cable to the retaining ears.

(c) Pull the induction heat control cable out from cable-restraining blocks and away from the induction tube.

(d) Remove the two clamps, bolts, washers, and nuts attaching the control cable to the baffling, and pull the cable through the rubber grommet in the rear baffling component. Refer to Figure 209.

(e) Remove the cable guide plates from the firewall heat shield by removing the screws, guide plates, and washers. Refer to Figure 210.

(f) Working from behind the left side knee bolster panel, loosen the control cable nut until completely disengaged from the cable threads. Refer to Figure 211. Pull the cable out from the knee bolster panel.

(2) **Induction Heat Cable Installation**

(a) Install the induction heat cable through the knee bolster panel by installing the lock washer and retaining nut over the cable housing, and screwing the nut onto the threaded part of the cable. Refer to Figure 211. Torque retaining nut 55 to 60 inch-lbs.

(b) Route the end of the control cable through the firewall, then through the rubber grommet on the rear baffling component. Refer to Figure 209.

(c) Reinstall the guide plates over the control cables passing through the firewall in reverse order as disassembled. Torque guide plate retaining screws and washers 30 to 36 inch-lbs.

(d) Route the end of the cable through the two induction tube retaining ears, and slide the end of the cable wire

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

through the hot air lever bolt.

(e) With the control cable knob in the full fresh air position (pushed completely in), position the butterfly valves inside of the induction tube so that the hot air valve is completely closed. Verify that when the control cable is completely pushed up against the housing, the butterfly valves are in their correctly adjusted position. Torque the cable wire retaining nut 20 to 24 inch-lbs. while in this position.

(f) Reinstall clamps at two cable retaining ear locations. Clamps should not be snug against inside of retaining ears. Refer to Figure 212.

(g) Reinstall the control cable to the baffling retaining clamps, bolts, washers, and nuts in reverse order as disassembled. Refer to Figure 209. Torque nuts 30 to 36 inch-lbs.

(3) **Induction Heat Control Cable Maintenance** - The induction heat control cable is a maintenance-free component. No lubrication is required.

(4) **Induction Heat Control Cable Inspection**

(a) Check the control cable function by pressing in the cable locking button and moving the cable fully in and out. No binding should be felt during cable operation.

(b) Check that the butterfly valves are moving at 90 degrees rotation to each other. Check the butterfly valve position by pushing in fully on the control cable knob. The fresh air valve should be fully open and the hot air valve fully shut while in this position.

(c) Check the safety wire connections at the cable to induction tube retaining ears. Connections should be tight and not allow any cable movement.

(d) Check the control cable wire to the hot air lever retaining bolt connection. Cable wire should be secure within the bolt with no slippage between the bolt and wire.

(e) Check the interconnect wire connections at both the fresh air valve and the hot air valve lever arms. Wire should be secure within the bolt with no slippage between the bolt and wire.

3. Induction Tube Interconnect Wire

A. **Induction Tube Interconnect Wire Removal**

(1) Loosen the interconnect wire retaining bolt, nut, and washers at the hot air valve and fresh air valve control levers until the interconnect wire can be pulled out from the bolts. Refer to Figure 208.

(2) Remove the interconnect wire from the induction tube retaining ears. Use caution not to bend or deform the interconnect wire during removal.

B. **Interconnect Wire Installation and Adjustment**

(1) Slide the interconnect wire through the two cable retaining ears on the engine induction tube.

(2) Insert the end of the interconnect wire into the hot air valve retaining bolt. Do not tighten the bolt. Refer to Figure 208.

(3) Insert the opposite end of the interconnect wire into the fresh air valve retaining bolt. Do not tighten the bolt. Refer to Figure 208.

(4) Position the fresh air butterfly valve in the full open position. Note that the main induction heat control cable knob should be pushed completely in while in this position.

(5) Position the hot air butterfly valve into the full closed position.

(6) Tighten both the fresh air and hot air interconnect wire retaining bolt nuts 20 to 24 inch- lbs.

C. **Interconnect Wire Maintenance** - The induction tube interconnect wire is a maintenance-free component. No lubrication is required.

D. **Interconnect Wire Inspection**

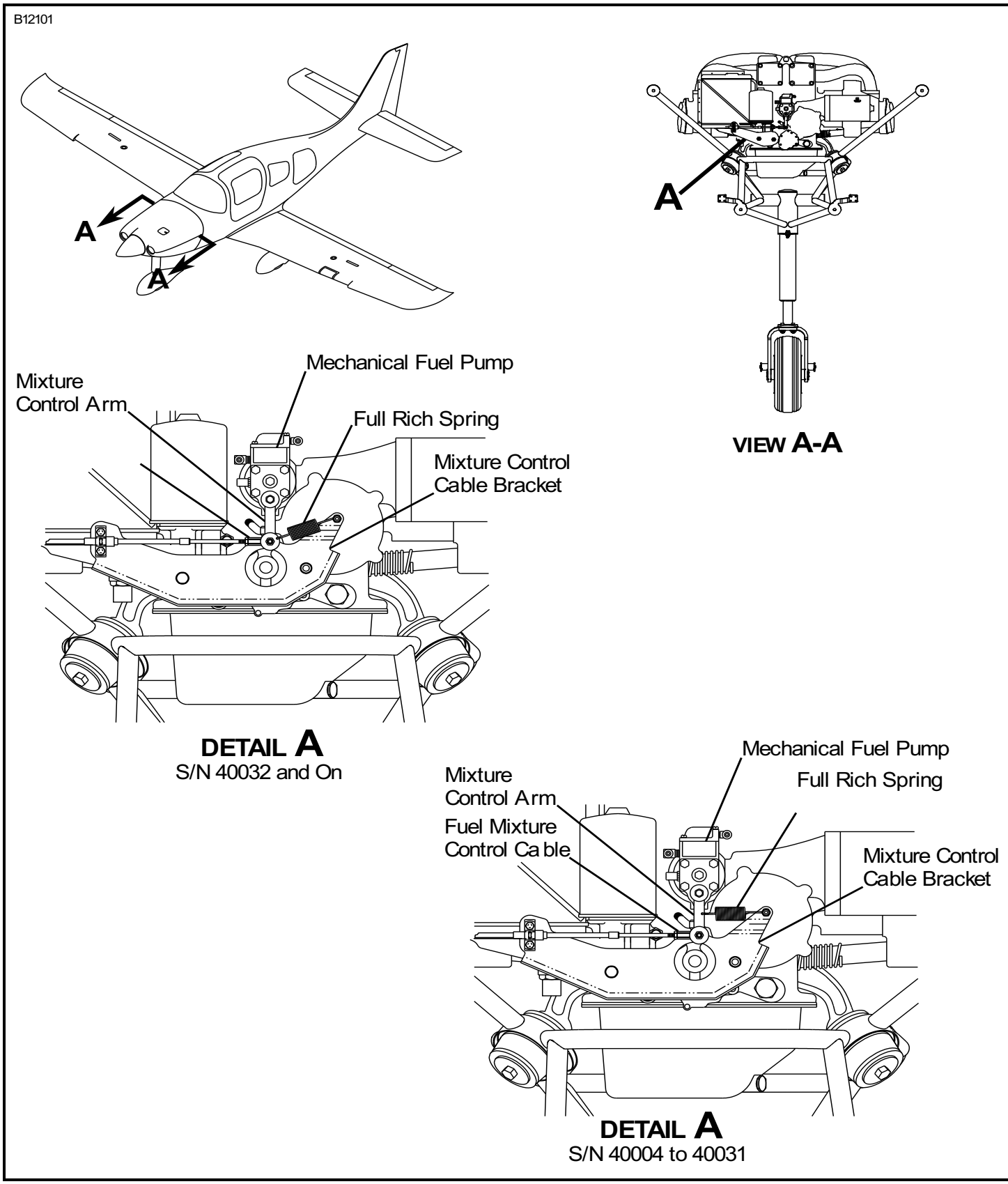
(1) Check the control cable function by pressing in the cable locking button and moving the cable fully in and out. No binding should be felt during cable operation.

(2) Check that the butterfly valves are moving at 90 degrees rotation to each other. Check the butterfly valve position by pushing in fully on the control cable knob. The fresh air valve should be fully open and the hot air valve fully shut while in this position.

(3) Check the interconnect wire connections at both the fresh air valve and hot air valve lever arms. Wire should be secure within the bolt with no slippage between the bolt and wire.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

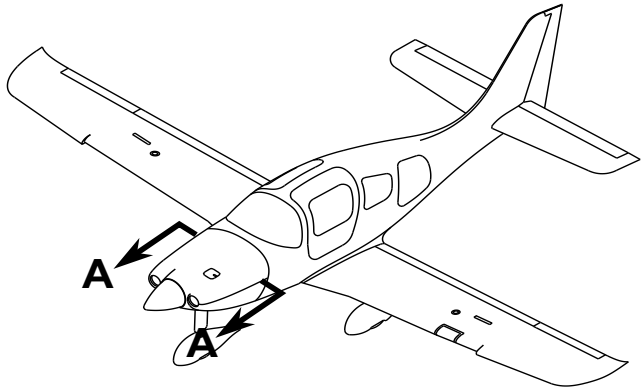
Figure 201 : Sheet 1 : Fuel Mixture Control

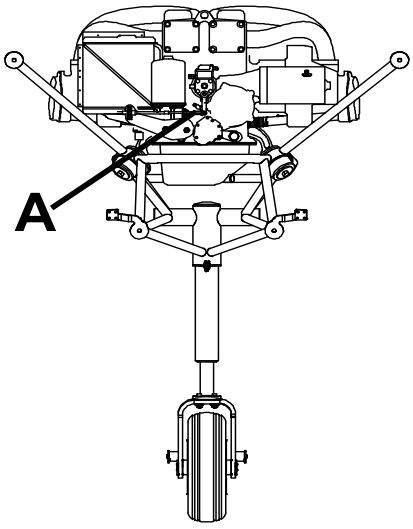


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

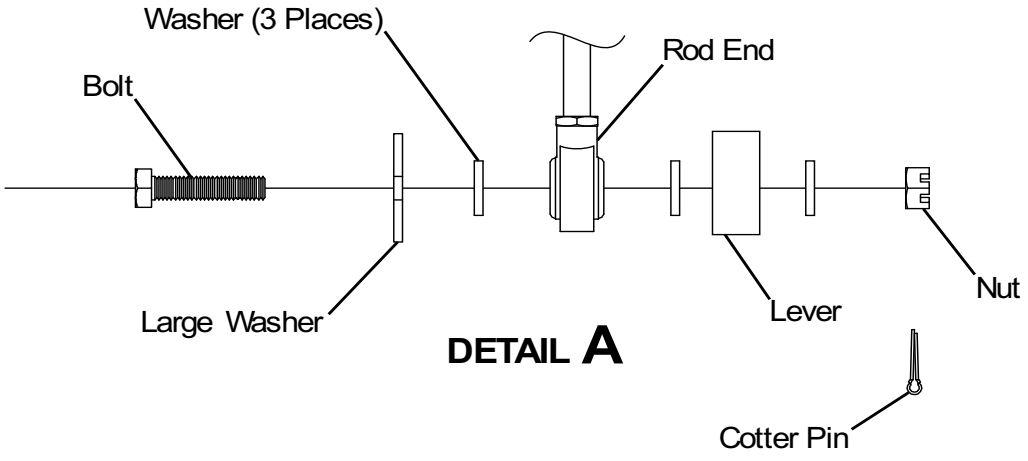
Figure 202 : Sheet 1 : Fuel Mixture Control Assembly

B12102





VIEW A-A



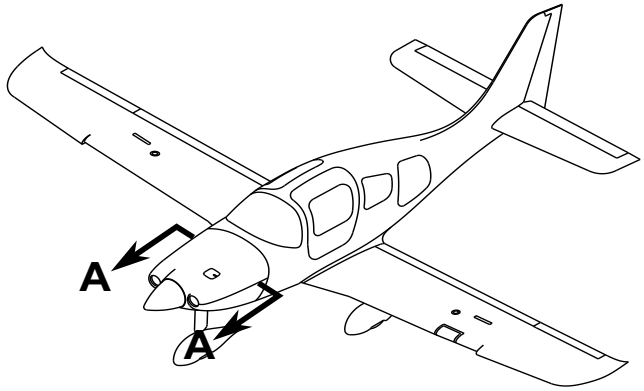
DETAIL A

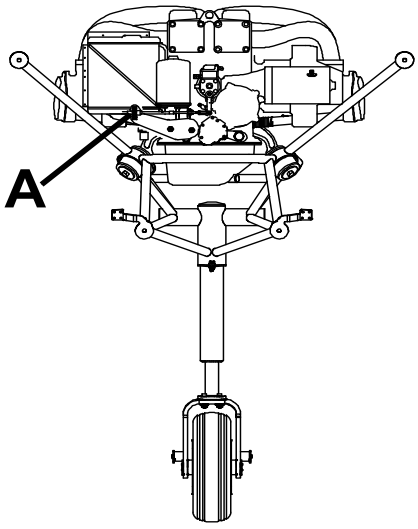
FB7184600003

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

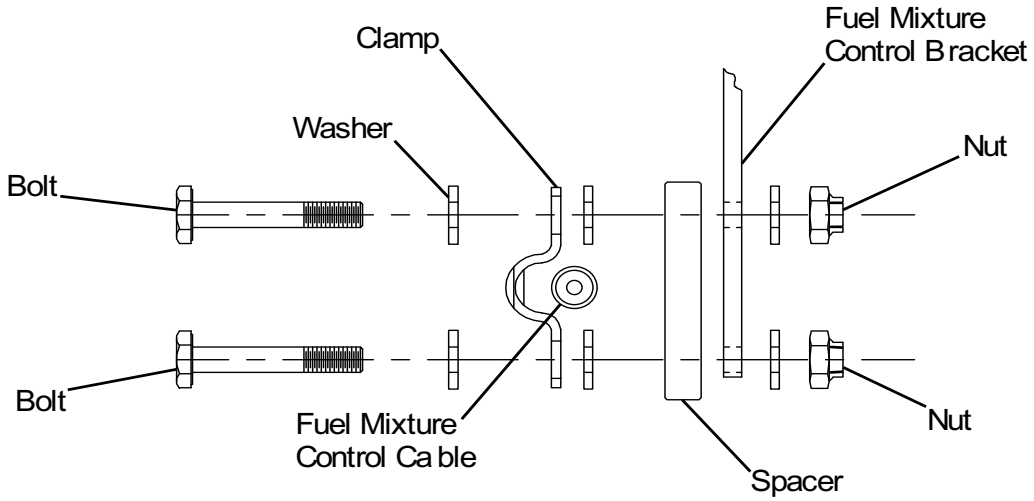
Figure 203 : Sheet 1 : Fuel Mixture Control Assembly

B12103





VIEW A-A



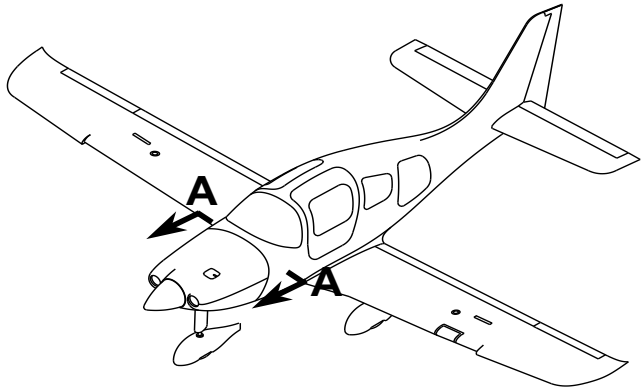
DETAIL A

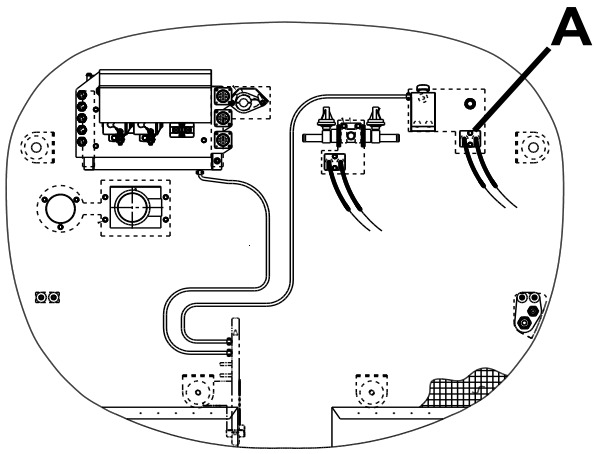
FB7184600003

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

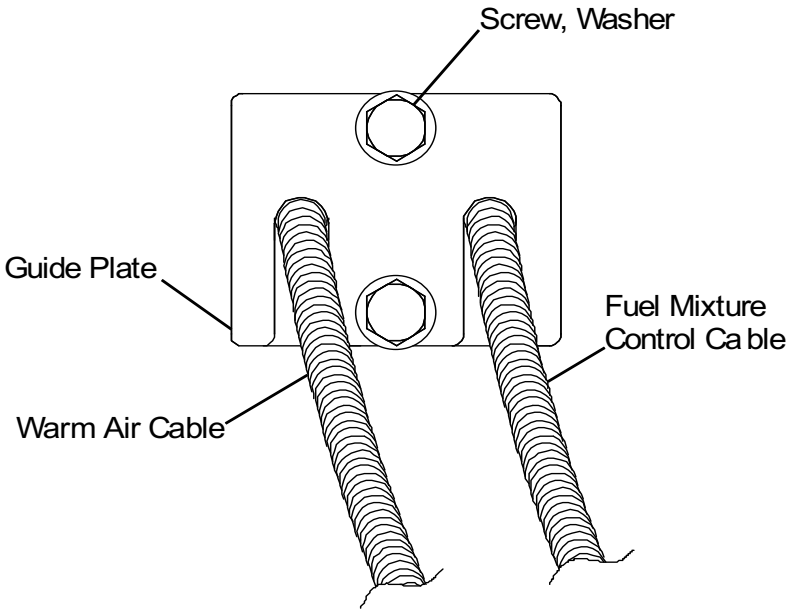
Figure 204 : Sheet 1 : Fuel Mixture Control Guide Plate

B12104





VIEW A-A

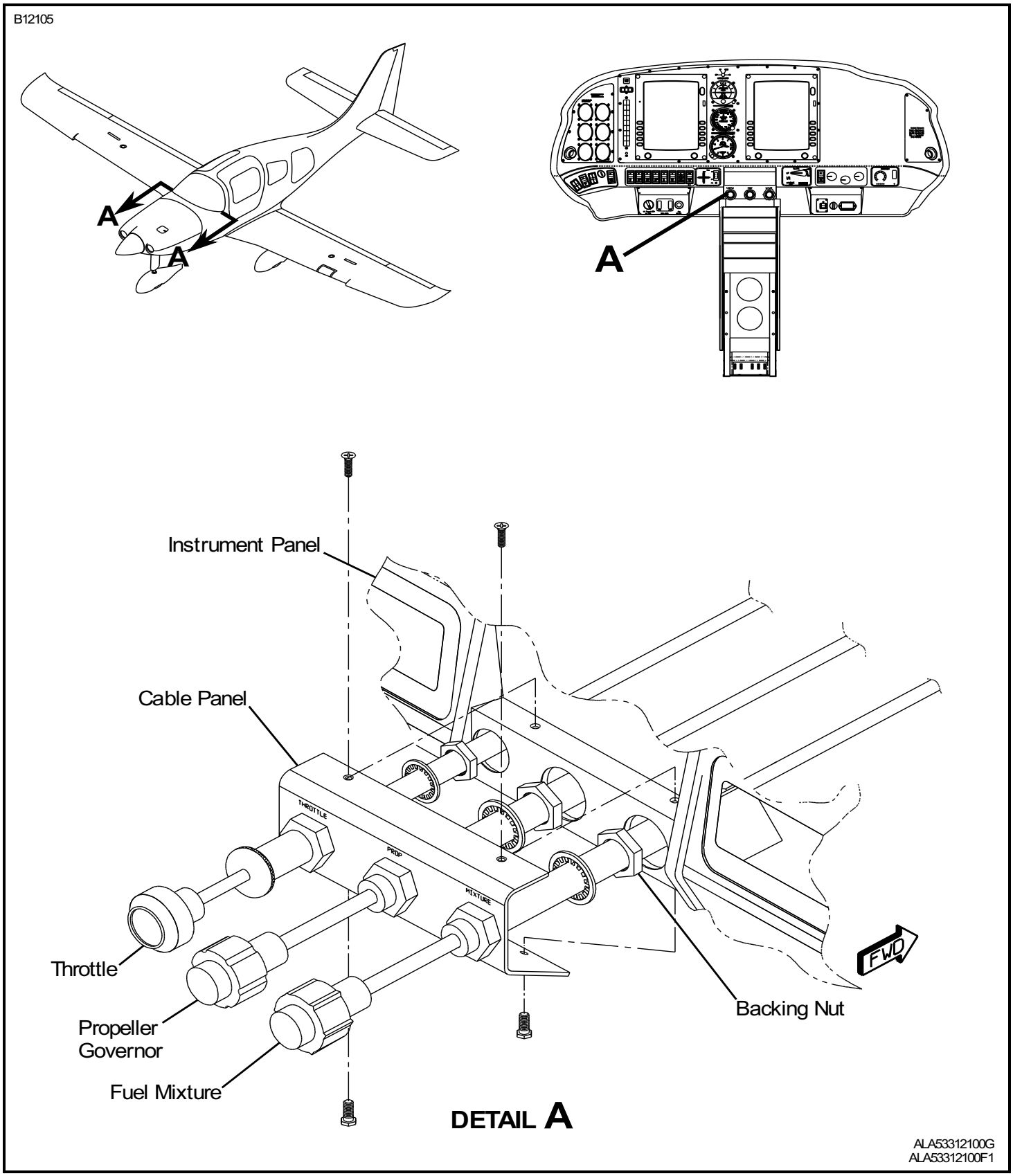


DETAIL A

ALA53260000G02

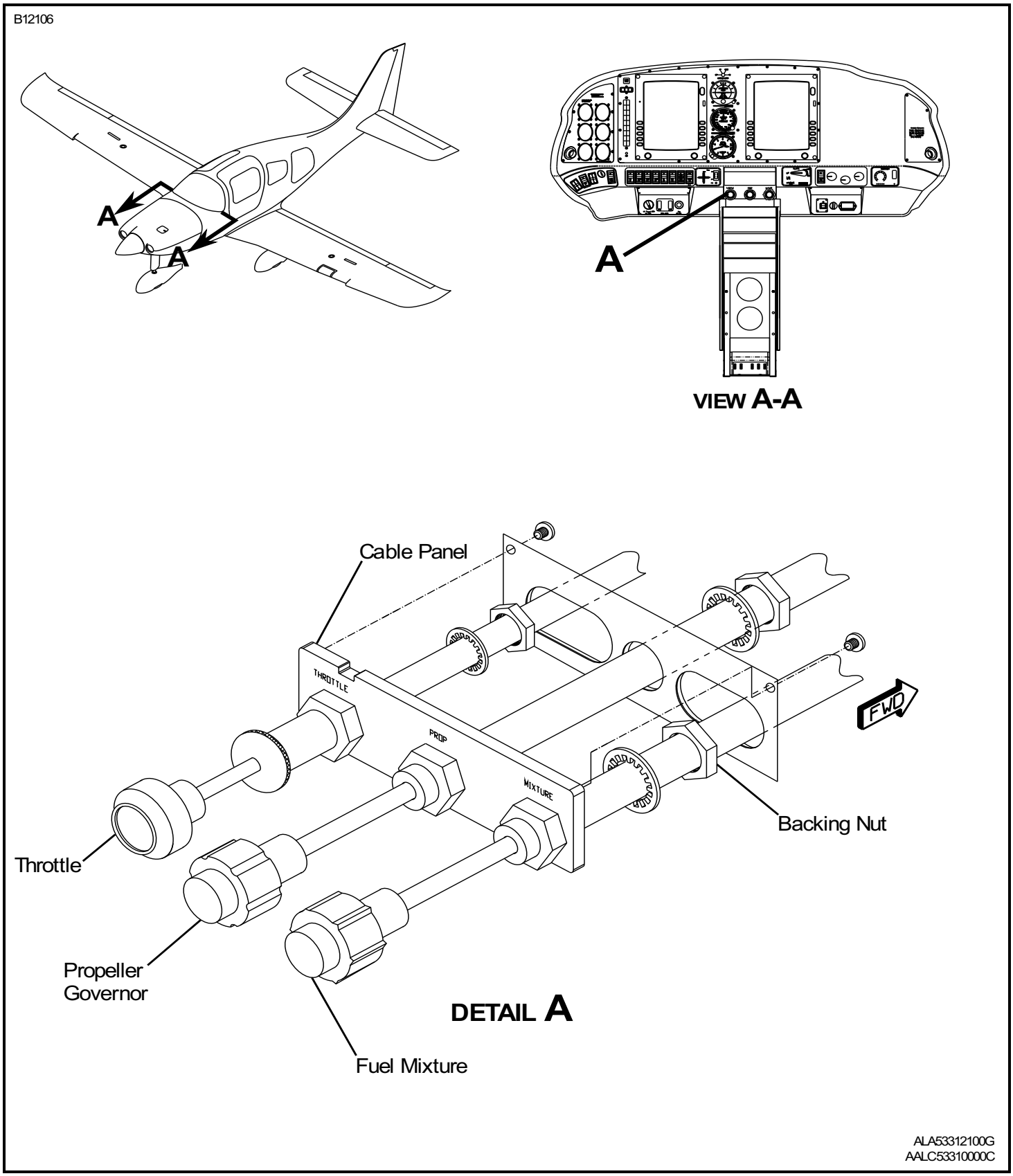
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Fuel Mixture Control Panel



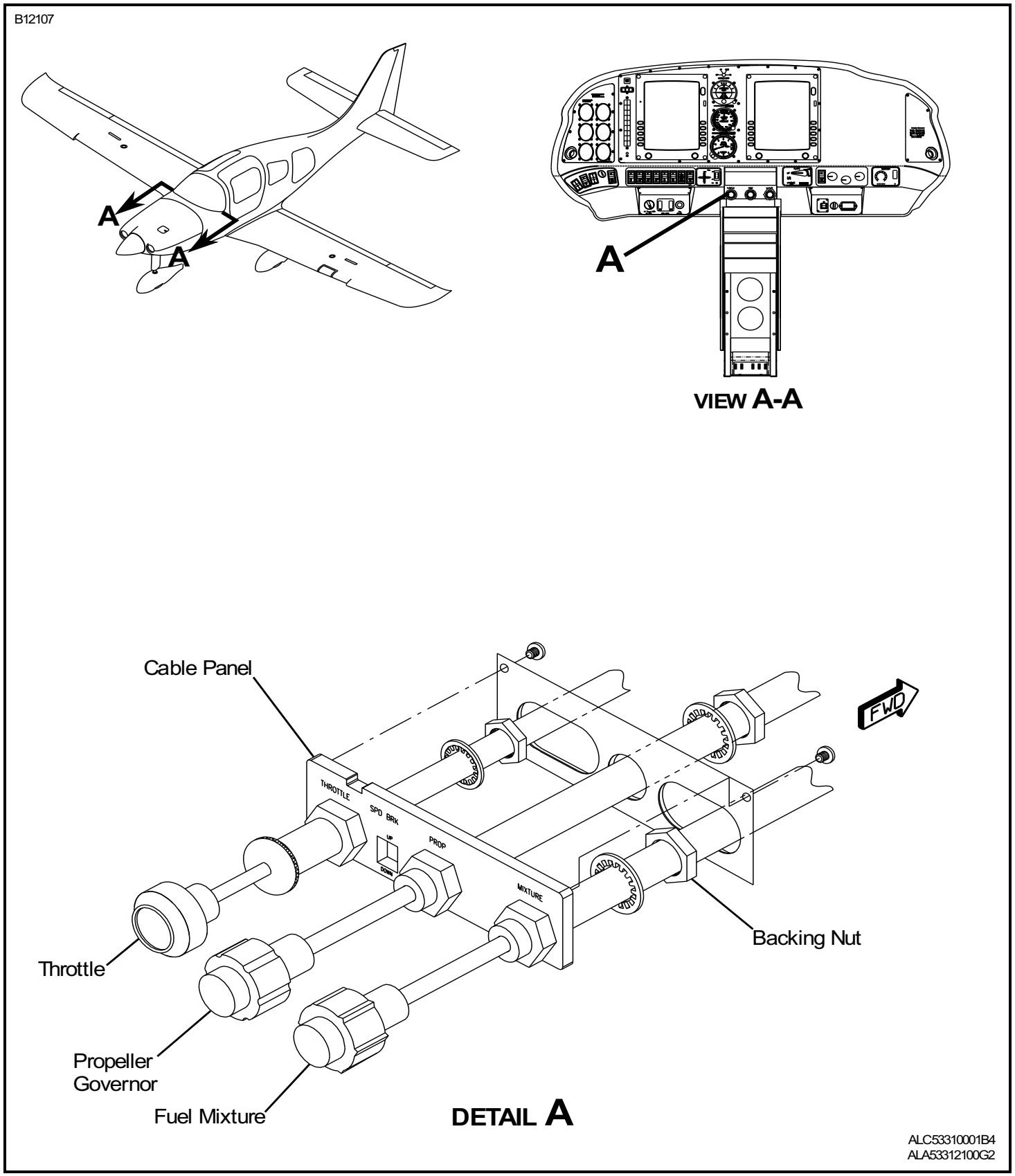
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 2 : Fuel Mixture Control Panel



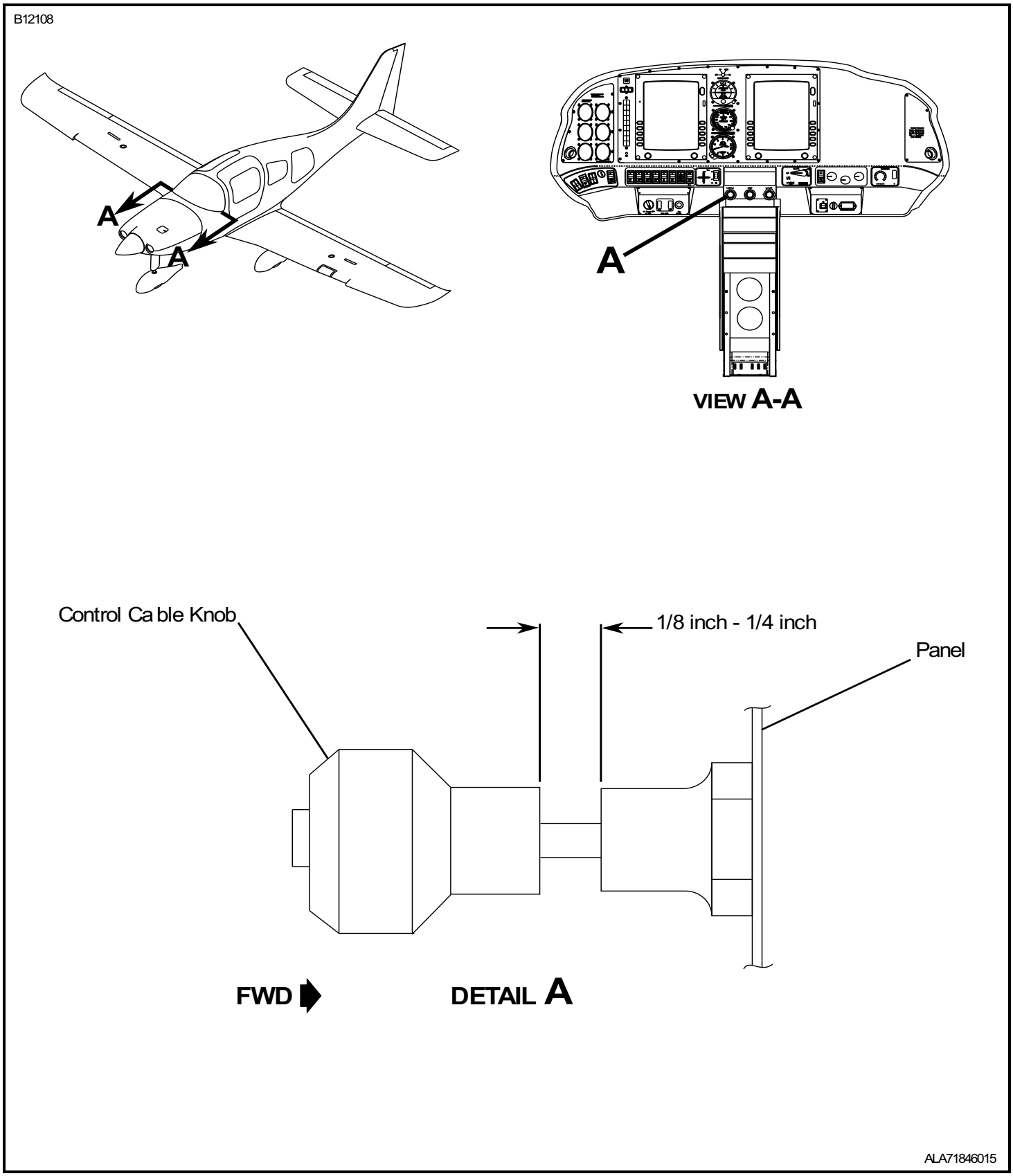
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 3 : Fuel Mixture Control Panel



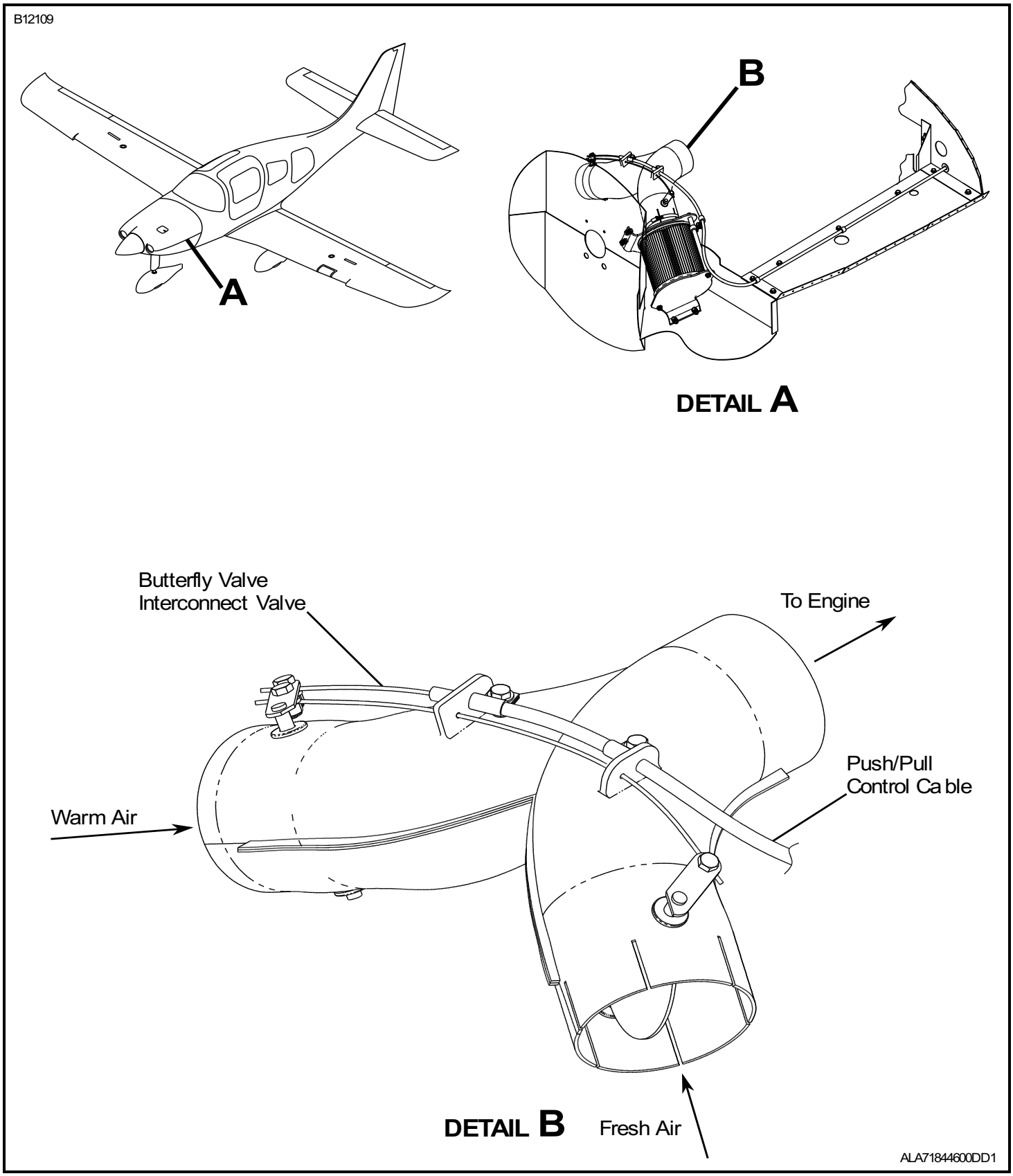
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Proper Control Position



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

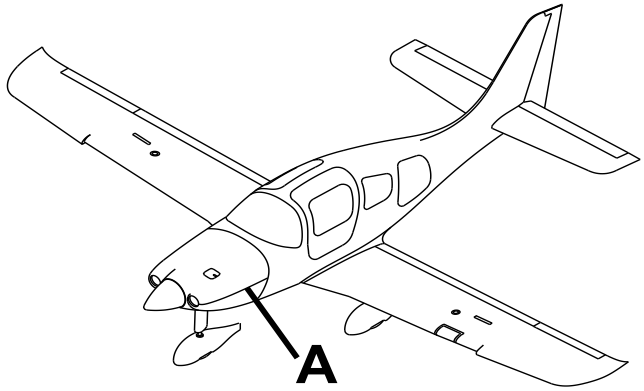
Figure 207 : Sheet 1 : Induction Heat

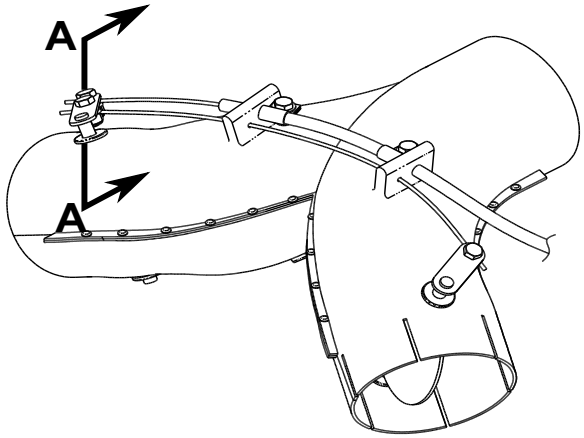


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

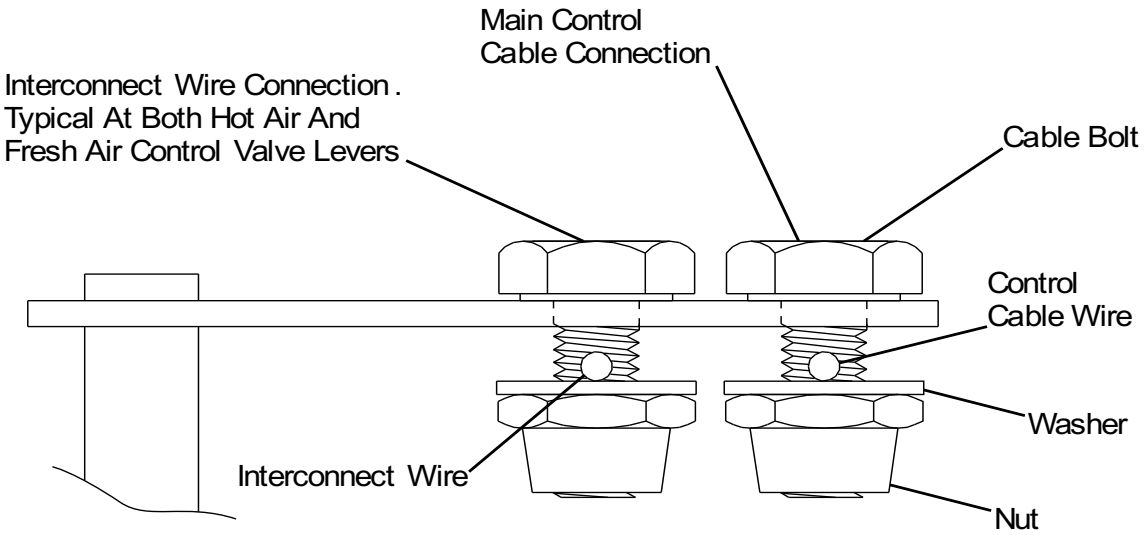
Figure 208 : Sheet 1 : Induction Heat Control Cable Connection to Valves

B12114





DETAIL A



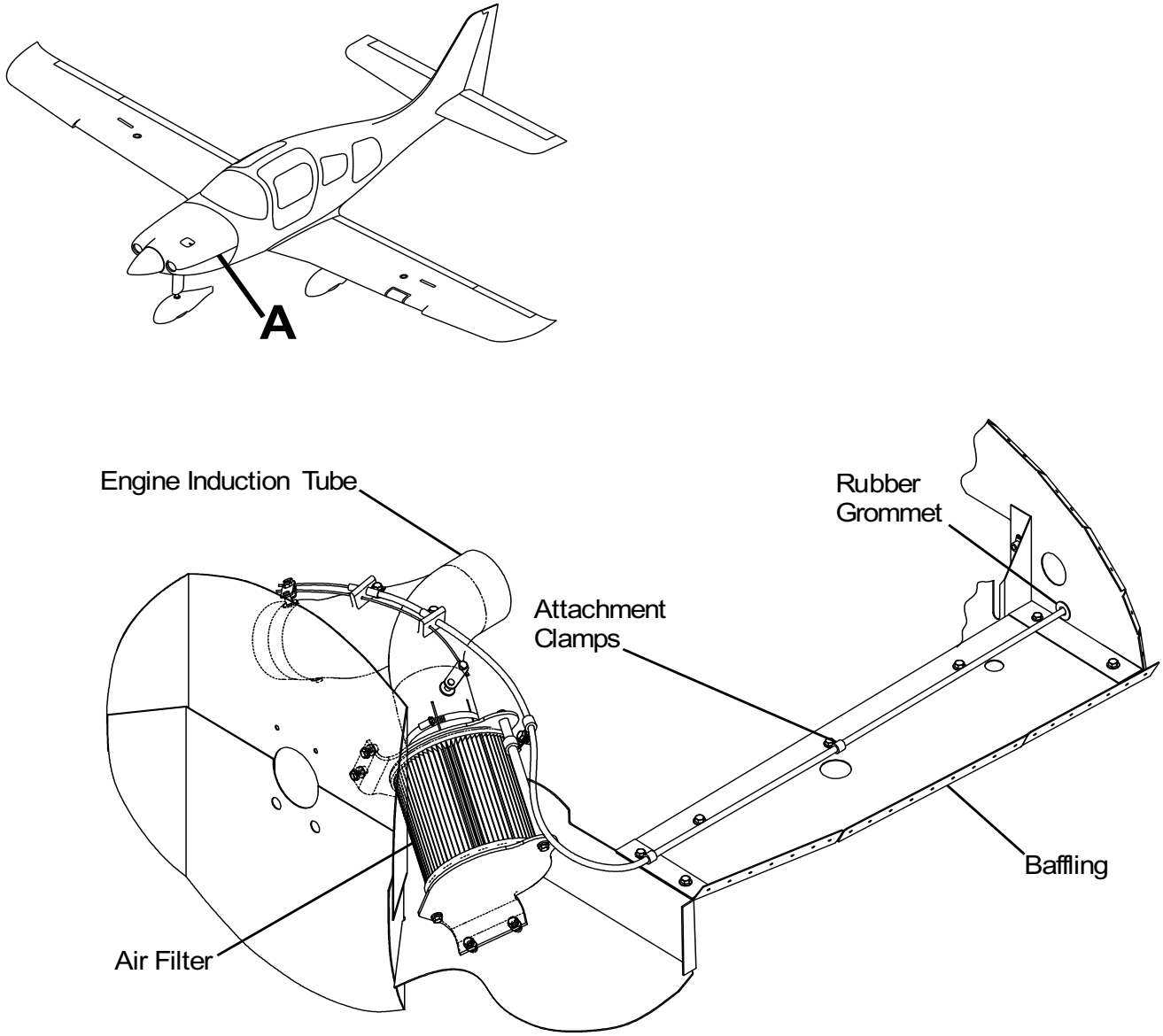
VIEW A-A

ALA71844600DD1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Induction Air Cable

B12111

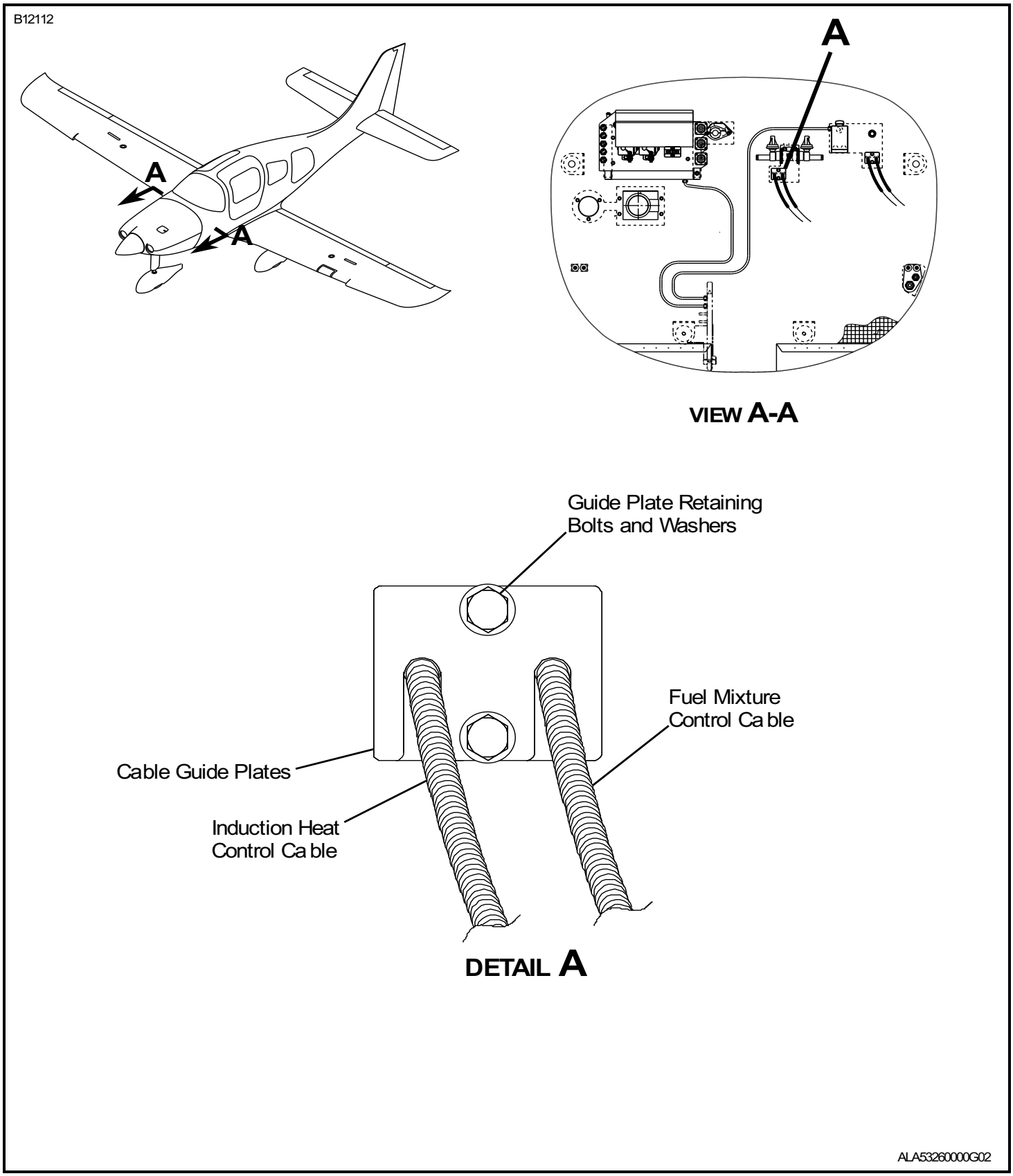


DETAIL A

ALA71846000GG3

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

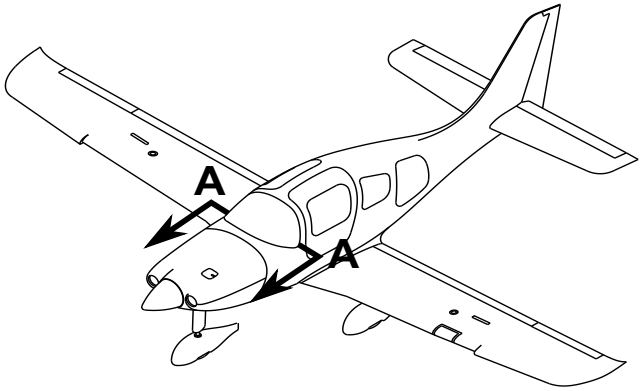
Figure 210 : Sheet 1 : Induction Air Guide Plate

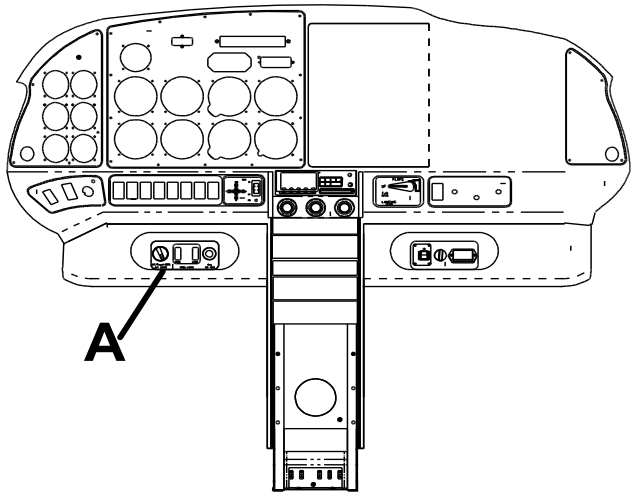


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

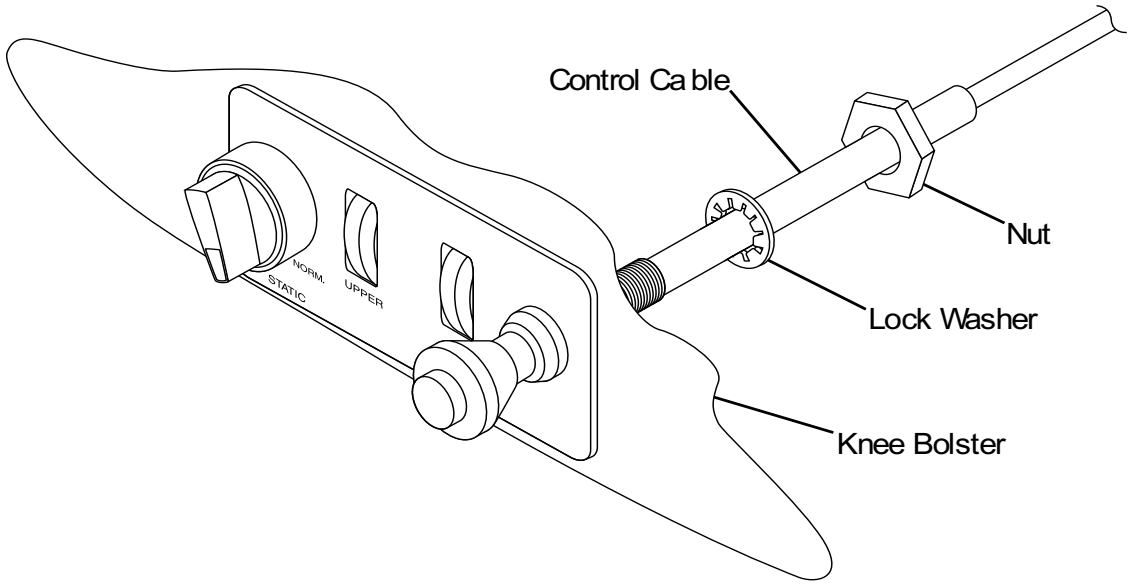
Figure 211 : Sheet 1 : Induction Air Control Cable Panel Assembly

B12113





VIEW A-A

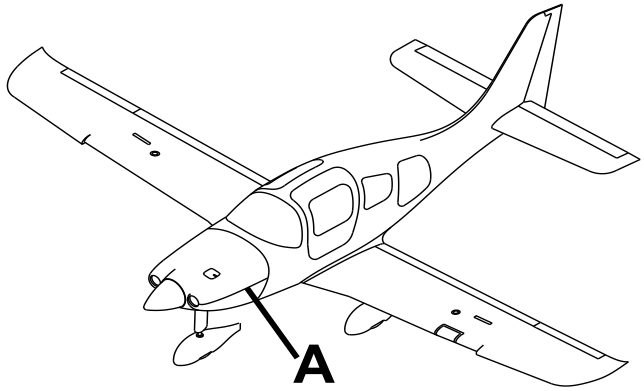


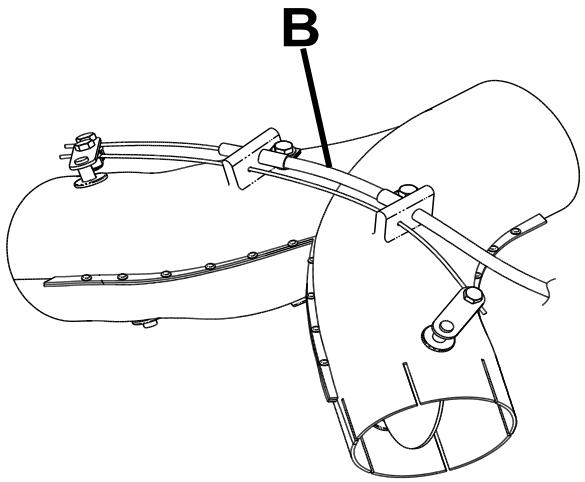
DETAIL A

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

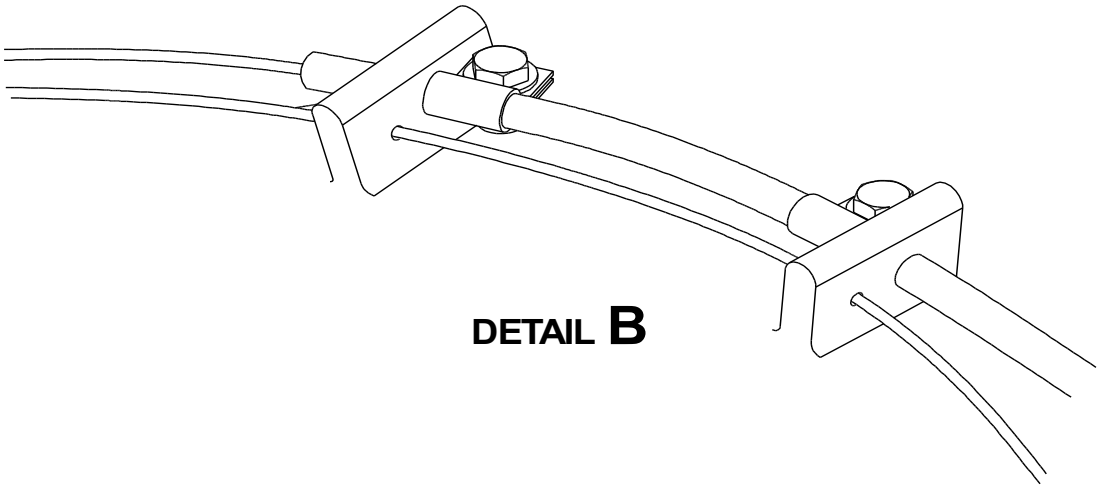
Figure 212 : Sheet 1 : Safety Wiring Control Cable

B12114





DETAIL A



DETAIL B

ALA71844600CC1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

AIRWORTHINESS LIMITATIONS

1. General

A. This section is FAA approved and specifies maintenance required under Sections 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved.

B. **Inspections** - This chapter contains mandatory maintenance tasks including inspections (below) and life-limited item replacement requirements (Section 4-10-00). An airframe inspection, in accordance with the inspections section, is required every 3000 hours. This 3000-hour period is known as an Airframe Service Cycle (ASC). The table below identifies and describes the required maintenance tasks for each ASC.

NOTE: These items are in addition to the items required to maintain the continued airworthiness of the airplane. After 25,200 TIS hours, the FAA requires a Major Airframe Inspection (MAI). The Major Airframe Inspection Checklist contains the MAI items.

C. **Grace Period** - The required inspections listed above must be performed within 100 hours of the specified interval or at the next annual inspection, whichever occurs first.

D. **Airframe Service Cycle Consistency** - If work is accomplished during the grace period, then the next inspection/part replacement is due at the time in service determined by adding the required interval to the BEGINNING of the grace period. For example, if the first ASC is accomplished during the grace period at 3099 hours TIS, then the next ASC is due at 6000 hours TIS (or within the grace period following 6000 hours). If work is accomplished early, then the next inspection/part replacement is due at the time in service determined by adding the required interval to the TIS at which the work was last accomplished. For example, if the first MAI was accomplished at 24,000 hours TIS, then the next MAI is due at 49,200 hours TIS (or within the grace period following 49,200 hours).

2. Airframe Service Cycle Inspection (Every 3000 Hours)

Table 1. Airframe Service Cycle Inspection (Every 3000 Hours) (Part 1)

INSPECTION AREA	MAINTENANCE TASK	CHAPTER NUMBER
Fuselage and Vertical Stabilizer		
Bonding of the two fuselage halves	**Visual inspection of the bonding seams**: Tap test seam area around fuselage halves in accordance with Section 20-95-00. This test detects unbonded areas by the change in audible response when the surface is systematically tapped.	53
Aft Fuselage	Complete the Aft Fuselage Inspection in accordance with the instructions given in Chapter 53, Fuselage Components - Adjustment/Test. **NOTE:** **This inspection must be completed by a composite technician that has been trained in accordance with the requirements found in the LC-550FG Series Structural Repair Manual, Chapter 51-00-01.**	53
Wing Attachment	Replace the wing attachment bolts and nuts with new bolts and nuts. There are a total of 28 bolts, 14 on each side of the wing saddle, that connect the fuselage to the wing as shown in Section 57-10-00, Figure 202. For S/N 40055 and On there are a total of 30 bolts, 15 on each side of the wing saddle, that connect the fuselage to the wing as shown in Section 57-10-00, Figure 203. The bolts vary in size from AN4-16 to AN4-20. When a bolt is removed, replace it with one that is the same size. The bolts must be replaced one at a time using a systematic process. It is recommended that the left forward bolt be removed and replaced first, and then continuing aft on the left side of the wing saddle. When the left side is complete, start on the right forward position and move aft.	53 and 57
CAUTION: **The right aft wing bolt is reversed from the other bolts. That is, the nut is on top rather than the bolt head. This is the correct method of installation and ensures clearance of the bolt from the flap actuating system.**		

Table 2. Airframe Service Cycle Inspection (Every 3000 Hours) (Part 2)

INSPECTION AREA	MAINTENANCE TASK	CHAPTER NUMBER

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Wing Attachment (continued)	Use the following steps to remove and install the wing bolts: 1. Remove carpeting and footwell panel in rear seat area, exposing area between front and rear spars. 2. Remove flap assembly panel plate under the aft wing area in the fuselage saddle, exposing area aft of rear spar. 3. Remove inspection cover in the fuel assembly panel, which is located in the left forward saddle area, exposing area forward of main spar. 4. Replace all bolts and nuts. The bolts must be removed and replaced one at a time to prevent misalignment of the wing. Refer to Chapter 57 for torque values. 5. When a bolt is removed, visually inspect the area adjacent to the bolt hole for evidence of damage, failure, and cracking. Refer to Chapter 57 regarding bolt length and torque requirements. 6. The bolts and nuts cannot be reused for any purpose. All bolts and nuts that are removed must be permanently discarded or destroyed, regardless of the time in service.	53 and 57
Cockpit Frame	Leave rear seat footwell exposed for this inspection. 1. Remove front and rear seats and front floor carpeting. 2. Remove carpeting from baggage floor and shelf. 3. Inspect the exposed area for signs of cracks, delamination, and fatigue.	25
Airframe Paint	Perform a detailed inspection of the airplane's clear-coat and paint. All paint must conform to the latest FAA approved revision of Cessna Document SX512701. Contact the manufacturer for information if paint repair is necessary. **NOTE:** **The airplane paint has a clear-coat cover that provides protection from UV rays. If the clear-coat is damaged, degradation of the paint and underlying surface is possible. The airframe paint does not have a specific life-limit. Its serviceability depends on the proper care of the airplane as discussed in Section 8 of the AFM/POH and the operating environment. For example, if the airplane is washed and waxed infrequently or the airframe is subject to a hail or dust storm, erosion and/or damage to the clear-coat is possible.**	51
Transparencies	Check all transparencies for excessive crazing, UV yellowing, and evidence of cracking. Replace as required.	56
Doors	Remove left and right doors with door hinge blocks and inspect hinge block attachment holes for evidence of damage. Inspect attachment screws of the dynamic hinge to the door for tightness.	52
Door Openings	Check door openings, particularly the corner of the door openings (including baggage compartment door), for evidence of cracking. **NOTE:** **Sometimes the paint may crack around a door opening without the underlying fiberglass surface being affected. If paint cracks are observed, the painted surface must be removed by sanding to verify there are no cracks in the fiberglass.**	52

Table 3. Airframe Service Cycle Inspection (Every 3000 Hours) (Part 3)

INSPECTION AREA	MAINTENANCE TASK	CHAPTER NUMBER
Wings		
Bonding of the Top and Bottom Wing	Visually inspect the bonding seams. Tap test seam area around leading and trailing edges in accordance with Section 20-95-00. The tap test detects unbonded areas by the change in audible response when the surface is systematically tapped.	57

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Bonding of Wing Skin to Ribs and Spars	Tap test areas where the top and bottom of the skin are bonded to the spars and ribs in accordance with Section 20-95-00. If the skin is separated, a sponginess will be felt or a dullness in tone will be heard when tapped.	57
Flight Control Surfaces and Systems		
Wing Flaps	Visually inspect bonding seams. Tap test seam area around leading and trailing edges in accordance with Section 20-95-00. The tap test detects unbonded areas by the change in audible response when the surface is systematically tapped. Check for cracks on drive rib.	27
Ailerons	Visually inspect bonding seams. Tap test seam area around leading and trailing edges in accordance with Section 20-95-00. The tap test detects unbonded areas by the change in audible response when the surface is systematically tapped. Check for cracks and buckling in area of drive rib.	27
Rudder	Remove rudder and perform visual inspection of the bonding seams. Tap test seam area around leading and trailing edges in accordance with Section 20-95-00. The tap test detects unbonded areas by the change in audible response when the surface is systematically tapped. Check condition of hardware for cracks, corrosion, and wear.	27
Wing Flap Actuator	Disassemble flap assembly and grease motor and gear train in accordance with Section 27-50-00. Check hardware for cracks, corrosion, and wear.	27
Aileron Push Tubes and Hardware	Check for wear and cracks. Inspect tubes for signs of corrosion. Check bellcranks and attachment hardware for signs of cracks and corrosion.	27
Elevator Push Tubes and Hardware	Check for wear and cracks. Inspect tubes for signs of corrosion. Check bellcranks and attachment hardware for signs of cracks and corrosion.	27
Elevator Trim Tab	Remove elevator trim tab and repack servo motor in accordance with Section 27-30-00, Elevator Trim Tab. Inspect hardware for cracks, corrosion, and wear.	27
Elevator	Remove elevator and inspect piano hinge for wear and corrosion.	27
Horizontal Stabilizer	Remove horizontal stabilizer and check stabilizer tube and bolts for cracks, corrosion, and wear. Replace as required.	27

Table 4. Airframe Service Cycle Inspection (Every 3000 Hours) (Part 4)

INSPECTION AREA	MAINTENANCE TASK	CHAPTER NUMBER
Fuel System		
Boost Pump	Overhaul per Duke Inc. instructions included in overhaul kit, or replace the boost pump.	28
Landing Gear		
Teflon Bushings In Gear Box	Remove landing gear and check Teflon bushings in gear box for each main gear leg for condition and wear. Refer to Chapter 32 for specific details about the landing gear.	32
Gear Box Attachment Bolts	Remove one attachment bolt from each side of the gear box and check for corrosion. If corrosion is noted, replace all attachment bolts in the gear box. If no corrosion is noted, replace bolts that were removed and check the torque on all bolts in the gear box in accordance with the Main Landing Gear Leg Abrasion Repair section in Section 32-10-00. Refer to Chapter 32 for specific details about the landing gear.	32
Landing Gear Alignment	Once landing gear is reinstalled, check camber and toe-in. Refer to Chapter 32 for specific details about the landing gear.	32

3. Life-Limited Parts

A. The items listed below are to be replaced with new items at the times/intervals shown.

Item	Location	Replacement Time/Interval

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

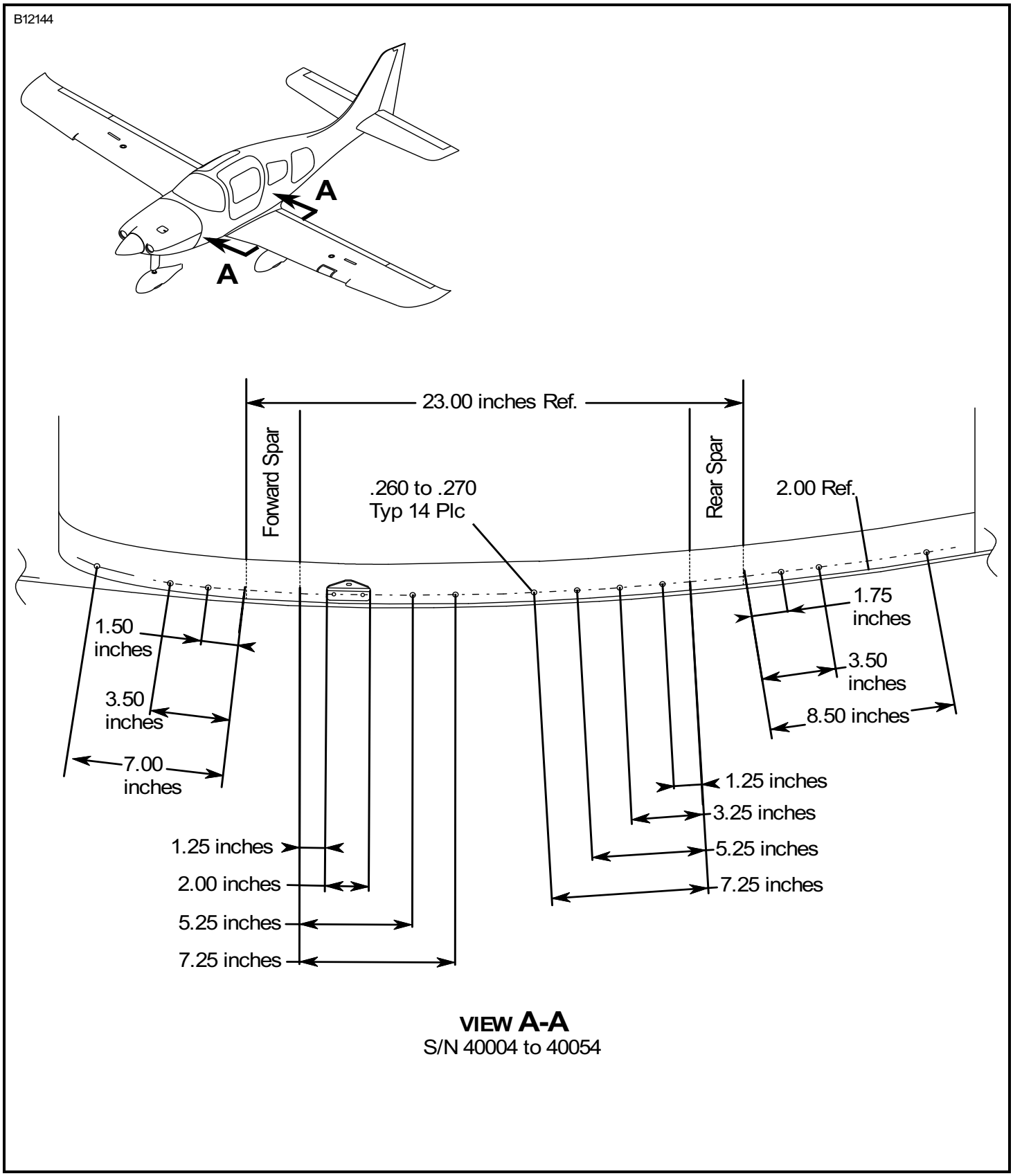
Emergency Locator Transmitter (ELT) Battery	Aft of the baggage compartment hat rack - Refer to Section 25-60-00 for more information.	Every 2 years (Artex 200), every 5 years (Artex ME406), or when the battery has been used for more than one hour or 50 percent of its life.
Standby Battery - Lithium Ion Type Battery	Behind the kidney panel on the right side of the instrument panel	Every five years based on the date the battery was manufactured (stamped on battery). However, if the battery is activated for any reason, it must be replaced.
System - Dry Sealed Lead-Acid Type Battery	Just forward of the firewall on the copilot's side	Every four years. However, if the battery fails to hold a charge, it must be replaced.
Front and Rear Seat Restraint Devices	At front and rear seats	Every 3000 hours or 10 years, whichever occurs first.
Parker Airborne Vacuum Pumps and Coupling	Top, rear of engine	The vacuum pumps and coupling must be replaced every 500 hours, or six years from date of manufacture, whichever comes first. However, after the first 250 hours of time in service, the left vacuum must be replaced. Thereafter, the pump with the most time in service must be replaced at 1000 hours time in service. Vacuum pumps must be replaced when subjected to a sudden stoppage.
Champion and Aero Accessories Vacuum Pumps and Coupling	Top, rear of engine	The vacuum pumps and coupling must be replaced every 1000 hours. However, after the first 500 hours of time in service, the left vacuum must be replaced. Thereafter, the pump with the most time in service must be replaced at 1000 hours time in service. Vacuum pumps must be replaced when subjected to a sudden stoppage.
Manifold Shuttle Valve Time Limitations	On firewall between brake reservoir and battery box	If at the 3000 hour inspection 10 or more years have elapsed since these parts were new, then replace with new parts. Also refer to Chapter 37 for specific details.
Parker Airborne Garter filter element for vacuum regulator (Not applicable for Champion and Aero Accessories vacuum system)	On outside of vacuum regulator	100 hours or annually, whichever comes first, and at each pump replacement.
Parker Airborne Vacuum air filter element (Not applicable for Champion and Aero Accessories vacuum system)	Between engine and flight instruments panel, near the top of the panel	500 hours or annually, whichever comes first, and each pump replacement.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Wing Attachment Bolts	Wing saddle	Every 3000 hours
Airplane		25,200 flight hours

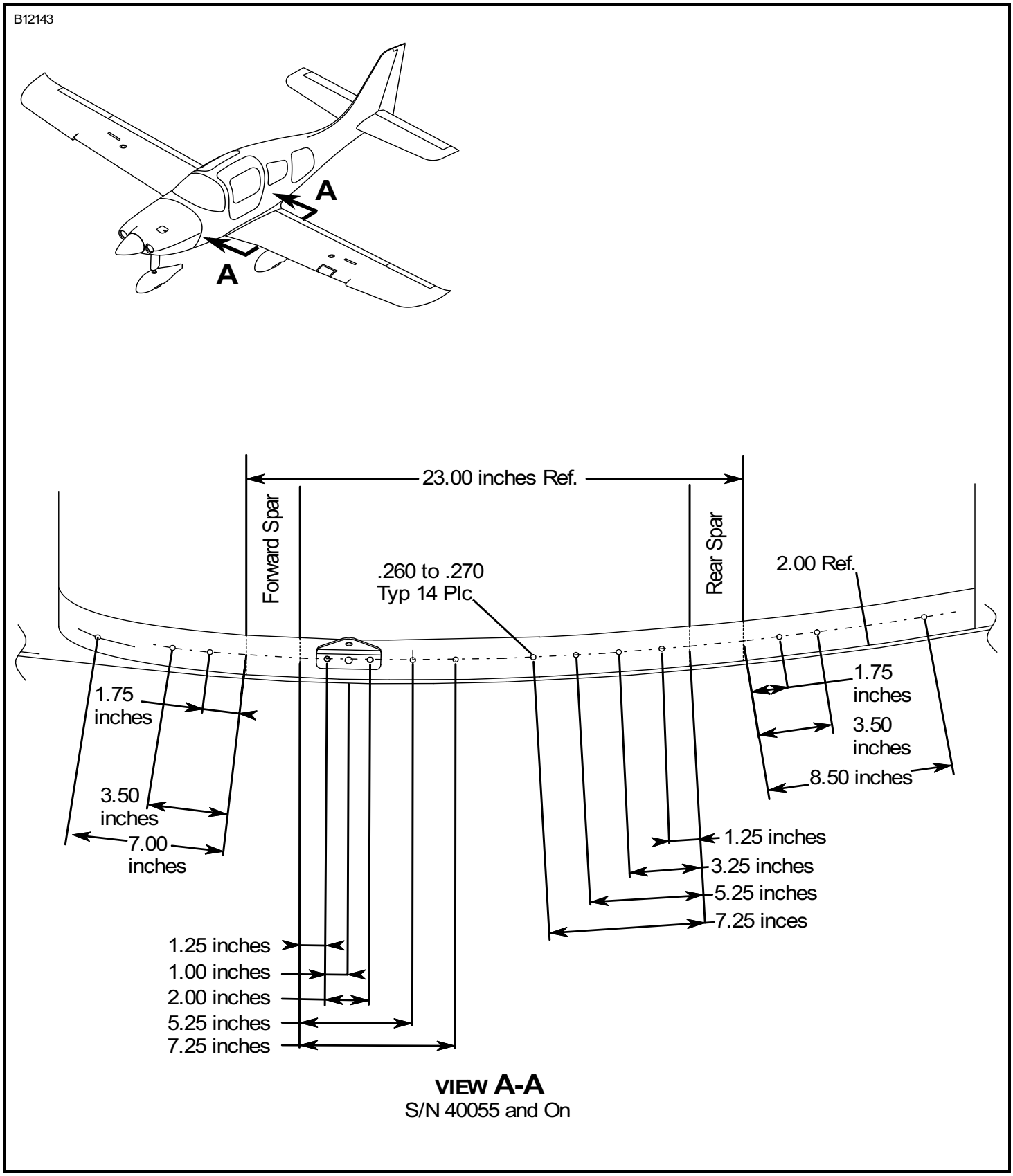
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Wing to Fuselage Attachment Bolt Locations



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

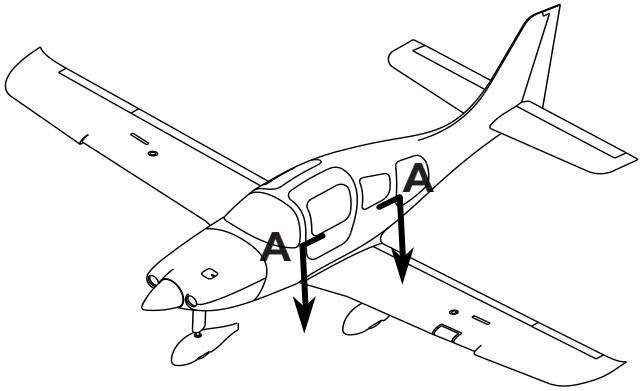
Figure 202 : Sheet 2 : Wing to Fuselage Attachment Bolt Locations

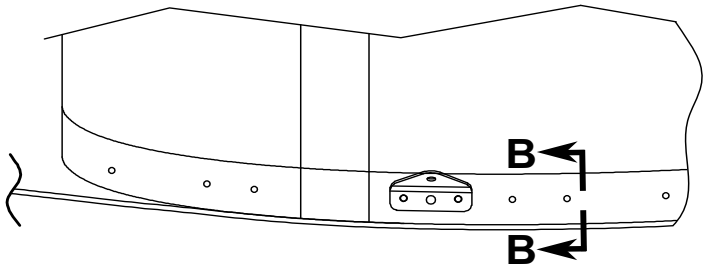


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

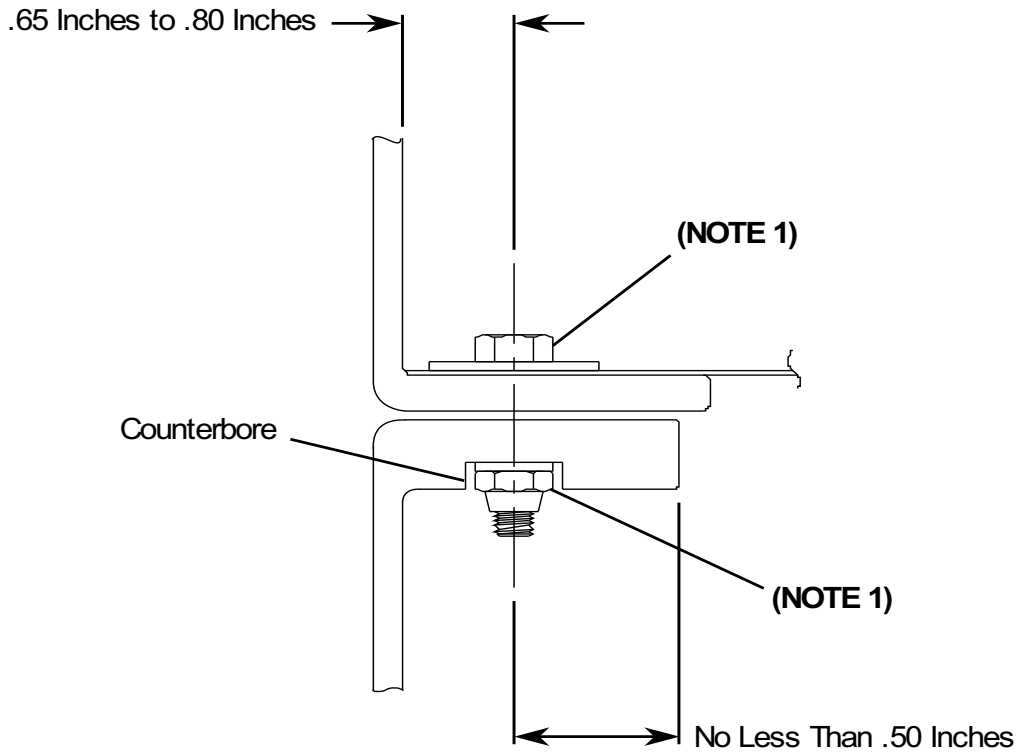
Figure 203 : Sheet 1 : Wing to Fuselage Attachment Bolt

B12160





VIEW **A-A**



VIEW **B-B**

UP **INBD**

NOTE 1: Torque nuts 72 to 84 lbs.-in. Where nuts are not accessible, torque bolt heads 79 to 92 lbs.-in.
NOTE 2: Tolerance on all dimensions is ±0.10 Inches.

AALA53570000M4
BBLA53570000M4

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

MAJOR AIRFRAME INSPECTION CHECKLIST

1. Major Airframe Inspection Checklist (Every 25,200 Hours)

A. Several pages will be added here that describe all the inspection items that must be performed on the Major Airframe Inspection. This checklist will be added to the manual as part of a revision level. There is currently a life limit on the airplane of 25,200 hours until this section is completed and approved by the FAA.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

GENERAL - TIME LIMITS AND MAINTENANCE CHECKS

1. General

A. This chapter sets forth recommended scheduled maintenance checks and component overhaul/replacement time periods. These requirements are in addition to those stipulated in Chapter 4. An inspection checklist is included which should be photocopied (or printed) and utilized during each scheduled inspection. The checklist includes the minimum items recommended by the manufacturer to be inspected and/or serviced. Also included is a list of special inspections and service items, which must be complied with in order to ensure the continued safe operation of this airplane.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

TIME LIMITS AND MAINTENANCE CHECKS

1. Time Limits

A. The information in Table 1 identifies either component time limits and/or required special inspections. These inspections must be incorporated into a 100 hour or annual inspection as applicable. If it is anticipated that the component time limit and/or special inspection will occur before the next applicable required inspection, it must be incorporated in the current required inspection.

Table 1. Time Limits & Special Inspection Items

Special Inspection Item	Time Period	Chapter
1. Replace vacuum regulator garter filter (foam filter located on the cabin side of the firewall near the central air paper filter) annually or every 100 hours, whichever comes first. If operating in environments of excessive atmospheric debris, replacement intervals should be reduced.	Every 100 hours or annually	37
2. Remove, inspect, clean, and reinstall fuel nozzles. If ultrasonic cleaning is available, it is the preferred method to use. **Do not** insert anything into fuel nozzle orifice. If cleaning will not remove internal deposits, fuel nozzle must be replaced.	At 1st 100 hour inspection and every 300 hours thereafter	28
3. Emergency Locator Transmitter (ELT) Battery	Every 2 years (Artex 200) or every 5 years (Artex ME406)	25
4. Altimeter and Static System Inspection - Refer to AC 43-6B, Appendix E of 14 CFR Part 43 and 14 CFR Part 91.	Every 24 calendar months	34
5. Automatic pressure altitude encoding system and transponder inspection and test - Refer to AC 43-6B, Appendix F of 14 CFR Part 43 and 14 CFR Part 91.	Every 24 calendar months	34
6. Replace Concorde RG-35A battery.	Every 4 years	24
7. Repack new wheel bearings (nose and main landing gear) after first 100 hours, then every 400 hours thereafter. This should be done more frequently if experience indicates the need based on the type of operations conducted.	Every 400 hours	32
8. Perform pressure test on fuel tanks.	Every 400 hours or biennially	28
9. Inspect fuel selector valve.	At 1st 500 hour inspection and every 1000 hours thereafter	28
10. Check fuel gauge accuracy.	Every 500 hours	28
11. Check central air filter (paper filter located behind the engine instruments, mounted to the I-panel support) and replace as required. Normally, the filter is replaced every 500 hours or annually, whichever comes first.	Every 500 hours or annually	37
12. Disassemble magnetos and inspect in accordance with TCM Manual X42002-1.	Every 500 hours	71
13. Overhaul magnetos in accordance with TCM Manual X42002-1.	Every 4 years or at engine overhaul, whichever occurs first.	71
14. Remove and inspect oil pressure relief valve in accordance with the TCM Overhaul Manual. Check plunger for scraping and nicks. Check the conical face for roughing. Check limits in accordance with TCM specifications. Replace or reface parts as required. Refer to Chapter 18 of the TCM Overhaul Manual.	Every 500 hours	71
15. Inspect exhaust tone cone.	Every 500 hours	78

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

16. Check the manifold shuttle valve per test instructions in Section 37-10-00, Maintenance of Manifold Shuttle Valve. If the manifold shuttle valve does not test properly it must be replaced. In any event, it should be replaced 10 years after the date of manufacture.	At 5 years and every year thereafter	37
17. Check and record the control deflections on the ailerons, flaps, elevator, and rudder.	Every 1000 hours	27
18. Inspect aileron control rods for cracking.	Every 500 hours or biennially	27
19. Inspect aileron linear bearing for foreign object debris. Ensure there is no debris or adhesive attached to the aileron control rod, bearing housing, bearing race, or ball bearings.	Every 100 hours or annually	27
20. Inspect aileron trim tab friction device for proper sliding friction. Assure device is free from oils, grease, dirt, etc.	Every 500 hours or biennially	27
21. Inspect and service elevator trim motor.	Every 3000 hours	27
22. Inspect the alternator to ensure that the brushes are not more than 75 percent worn and the bearings operate smoothly. If the brushes are more than 75 percent worn or the bearings do not operate smoothly, then replace the alternator. Ensure the clutch resistance is still 140 in.-lbs of torque or greater.	Every 1000 hours	24
23. Service alternator bearings.	Every 500 hours	24
24. Remove rudder and check hinges.	Every 1000 hours	27
25. Check resistance of all static wicks between the wick base and the tip. The test requires use of a megohmmeter, sometimes referred to as a Megger. A properly functioning static wick should indicate 1 to 100 megohms of resistance.	Every 1000 hours	20
26. On each main gear, remove the wheel pants, wheels, axles, strut fairings, and underside gearbox access panels. Perform detailed inspection of the landing gear legs. Look for evidence of metal fatigue, corrosion, cracks, and deformation. Pay particular attention to the area where the strut is inserted into the gearbox.	Every 1000 hours	32
27. Service nose strut.	Every 200 hours or annually	12
28. Remove front and rear seats, carpeting, and interior side panels. Inspect the four SAFE strips in the lower fuselage interior for wear, tearing, adhesion, and overall general integrity.	Every 1000 hours	20
29. Replace the induction air filter. **NOTE:** **The induction filter may need to be replaced more frequently if flight operations are routinely conducted in an area of high atmospheric debris or dust.**	Every 1000 hours or every 5 years whichever occurs first	71
30. Conduct exhaust system pressure test.	Every 1000 hours or every 5 years, whichever occurs first	78
31. Standby Battery. **NOTE:** **This item is required for IFR operations.**	Every 5 years from the date the battery was manufactured. If the standby battery is operated at any time during the five-year replacement cycle it must be replaced.	24

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

32. Inspect exterior emergency door release system. Activate exterior hinge release mechanism to ensure proper operation. Inspect hinge wires for corrosion, kinks, and wear. Replace as required. Move cable up and down to ensure ease of movement. Inspect overhead cabling for chaffing, binding, and frayed cables. To rearm the system, reinsert door hinge wires, and pull both the actuating cables back to their stops. Store the few inches of excess cable in a manner that prevents kinking or binding. Refer to Chapter 52.	Every 1000 hours or every 5 years whichever occurs first	52
33. Check distribution bus.	Every 1000 hours	24
34. Clean door seal system pump filter.	Every 1000 hours	52
35. Hard Landing Inspection - In the event of a hard landing, the aircraft should be inspected in accordance with Chapter 32.	After Hard Landing	32
36. Lightning Strike - In the event of a lightning strike, follow inspection and repair procedures in Chapter 20.	After Lightning Strike	20
RECOMMENDED REPLACEMENTS		
37. Replace or rebuild the gyroscopic attitude indicator (artificial horizon)	Every 1200 hours	34
38. Replace or rebuild the gyroscopic directional indicator (DG)	Every 1200 hours	34
39. Replace or rebuild the turn coordinator.	Every 1800 hours	34
40. Replace clock battery.	Every 2 years	31
41. Disassemble nose gear and replace all seals.	Every 1800 hours	32
42. Overhaul the propeller. **NOTE:** **The propeller must be overhauled at 2400 hours of time in service or 72 calender months, whichever occurs first by an authorized propeller overhaul facility.**	Every 2400 hours or 72 calendar months, whichever occurs first.	61
43. Overhaul the engine. **NOTE:** **The IO-550-N engine requires a complete overhaul every 2000 hours of time in service by an authorized engine repair facility. There are also overhaul limitations on the magnetos, which is discussed in the Time Limits section of Chapter 5. Inspect the engine mount bushings for corrosion; replace the bushing(s) if corroded.**	Every 2000 hours	71
44. Overhaul the propeller governor. **NOTE:** **The propeller governor requires a complete overhaul every 2000 hours of time in service by an authorized propeller repair facility.**	Every 2000 hours	61

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INSPECTION REQUIREMENTS

1. Inspection Requirements

A. **Annual Inspection** - Part 91.409 of the Federal Aviation Regulations (FARs) requires that an airplane must receive an annual inspection each 12 calendar months in accordance with part 43 of the FARs and be approved for return to service by a person authorized by the requirements of 43.7. For the purpose of the FARs, 12 calendar months extend from the particular day within the month the inspection is performed to midnight of the last day of the same month, one year later.

B. **100-Hour Inspection** - Part 91.409 of the FARs require that if an airplane is used to carry passengers for hire or give flight instruction for hire, the airplane must receive an inspection after 100 hours of time in service as specified in part 43 of the FARs. The 100 hour limitation may be exceeded by not more than 10 hours while en route to reach a place where the inspection can be done. The excess time used to reach a place where the inspection can be done must be included in computing the next 100 hours of time in service.

C. **50 Hour Inspection** - It is recommended that at each 50 hours of time in service the airplane receive a 50-Hour Inspection.

D. **Unscheduled Inspections** - If the limitations of the engine or airframe are exceeded such as a hard or overweight landing, the likely affected components and systems must be inspected as indicated in this chapter. Refer to Section 32-20-00, Hard Landing Inspection, for hard landing inspection details. If a situation occurs which is not covered in this chapter, consult Cessna for technical support and recommendations.

E. **Progressive Inspection** - At some point in the future the outline for a progressive maintenance program will be published and included as a revision to the Cessna Maintenance Manual.

F. **Component Inspections** - Time limits and special inspection requirements may exist for equipment manufactured by other suppliers and installed on Cessna Aircraft. These inspections and recommendations are determined by that manufacturer and should be followed to ensure continued airworthiness of that equipment and the aircraft as a whole.

2. Cessna 300 (LC40-550FG) Inspection Checklists

A. Chapter 5 contains the inspection items for the required and recommended inspections described in the Annual Inspection section through the 50 Hour Inspection section above. Prior to each 50 hour, 100 hour, or annual inspection, an engine run-up should be performed using the checklist in Figure 1. Depending on the specific types of operations, the owner or operator may need to modify and/or increase the frequency of some inspection and/or servicing items.

NOTE: All inspections and maintenance procedures must be in accordance with applicable Federal Aviation Regulations. Please refer to FAR parts 91.403, 91.207, 91.409, 91.411, and 91.413

Table 1. Post-Runup Checks

POST-RUNUP CHECKS	Each 50 hours	Each 100 hours	Annually
Engine cowling - Remove engine cowling.	[ ]	[ ]	[ ]
Engine oil - Drain within 30 minutes of engine shutdown. Oil sample should be collected within 15 minutes of engine shutdown. Replenish with appropriate grade of oil. This step may be deleted from the annual inspection, if desired, to keep oil changes on regular 50-hour intervals. However, regulations require that the oil filter still be cut open for inspection.	[ ]	[ ]	[ ]
Engine - Conduct engine differential compression check. Record on checklist coversheet. (Refer to latest TCM Service Bulletin for permissible drop and differential).		[ ]	[ ]
Oil filter - Replace and torque 16 to 18 ft-lbs. Cut open and inspect old oil filter.		[ ]	[ ]
Standby battery system - Check for copper safety wire on switch cover.		[ ]	[ ]
Exterior lights - Check operation of taxi and landing lights, position lights, and strobe lights.	[ ]	[ ]	[ ]
Pitot blade heater - Check operation. **WARNING: Heater gets extremely hot!** Check within 60 seconds after switching on. Do not operate longer than 2 minutes on the ground.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Stall warning system - Check operation.		[ ]	[ ]
Auxiliary lights - Check operation of courtesy entry lights, entry step lights, and baggage compartment light by opening one door at a time. Leave one door open to check operation of 10-minute lights-off timer.		[ ]	[ ]
Interior lights - Check operation of instrument flood bar, panel lights, instrument lights, overhead lights, electro-luminescent panels, and all dimming rheostats.		[ ]	[ ]
Annunciator lights - Check operation.		[ ]	[ ]
Flight controls - Check for smooth operation of all flight controls with flaps in retracted and extended positions. Leave flaps in extended position when checks are completed.		[ ]	[ ]
Door seals - Check operation of door seal air pump and inspect for air leaks in seals. **NOTE:** Both doors must be latched for system to operate.		[ ]	[ ]
Rudder limiter system - Check operation. Refer to Chapter 34 of the AFM/POH.	[ ]	[ ]	[ ]
ECS ventilation fan - Check operation.		[ ]	[ ]
Trim actuators - Check operation of all actuators and accuracy of position indicator LED's. Check switches on trim panel and on pilot's control stick.		[ ]	[ ]
Emergency Locator Transmitter (ELT) - Check operation of remote switch. **NOTE: ELT may be tested only within the first 5 minutes after each hour and should be limited to 3 aural tone sweeps.**		[ ]	[ ]
Flight controls - Operate controls through full range of motion feeling for binding, ratcheting and sloppiness, and listening for unusual noises.		[ ]	[ ]
Brakes - Check for sponginess.	[ ]	[ ]	[ ]
Aircraft battery - Fully charge, clean battery exterior surface, and clean battery cables. Check battery box for evidence of leakage.		[ ]	[ ]
Access panels, fairings, seats, carpets, covers, side panels, overhead panel (100 hour and annual inspection), and spinner - Remove for complete access for inspection. Check for missing or stripped screws. Do not remove nose wheel fairing at this point. Refer to the List of Inspection Areas for listing of the various access covers in the airplane.**WARNING: Do not remove fuel tank cover plates.**		[ ]	[ ]

Table 2. Aircraft Records

AIRCRAFT RECORDS	Each 50 hours	Each 100 hours	Annually
Aircraft logbooks - Determine total times, times since overhaul and times since last required or recommended maintenance checks and record on Inspection Coversheet.		[ ]	[ ]
Inoperative items - If any authorized inoperative items have been listed per FAR 91.213, inspect and maintain per FAR 91.405. Verify placard is installed per FAR 43.11. Refer to the equipment list of required items in Section 6, Appendix A, of the AFM/POH.		[ ]	[ ]
Airworthiness Directives (ADs) and Service Bulletins - Check for new and recurring ADs which may need to be complied with during this inspection. Also, check for applicable manufacturer's Service Bulletins.		[ ]	[ ]
Aircraft records - Check for presence and condition of aircraft federal registration form and airworthiness certificate.		[ ]	[ ]
Approved Flight Manual / Pilot's Operating Handbook (AFM/POH) - Verify that all revisions have been installed and that the Equipment List and Weight and Balance forms are current and correct.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Table 3. Engine And Propeller

ENGINE AND PROPELLER (Refer to Chapters 61 and 71 for Specific Details)	Each 50 hours	Each 100 hours	Annually
Cleaning - Clean engine. Protect magneto vents, vacuum pump shear shafts, cabin fresh air intakes, and vacuum pump outlets.		[ ]	[ ]
Engine - Inspect for obvious signs of damage, oil or fuel leakage, loose components, and chafing or deterioration of hoses, lines, and wires.	[ ]	[ ]	[ ]
Cylinders, rocker box covers, and pushrod tubes - Inspect for cracks, broken fins, oil, fuel or exhaust leakage, and discoloration of cylinder head. Check hardware for signs of loss of torque.		[ ]	[ ]
Crankcase and sump - Inspect for cracks, oil leakage, corrosion and signs of loss of torque of hardware. Inspect engine mount supports for condition.		[ ]	[ ]
Induction system - Inspect the induction tubes for security and condition and loose or leaking couplers. Inspect manifold pressure transducer for security of installation and condition of wires. Check operation and sealing of alternate air and heated air doors.		[ ]	[ ]
Induction air filter - Inspect for cleanliness and condition of sealing surfaces. Service per instructions in Chapter 12. Replace filter if the wire screens or the cotton gauze mesh is damaged.	[ ]	[ ]	[ ]
Exhaust heater muff - Remove heat muff sleeve. Conduct pressure check of heat muff/muffler, and inspect for security of studs.		[ ]	[ ]
Exhaust system - Inspect entire system for leaks, cracks, and security. Inspect muffler internal baffles for security.	[ ]	[ ]	[ ]
Fuel metering unit - Inspect for security and presence of fuel leakage. Check operation of throttle and mixture controls. Ensure levers hit stops before cables reach end of travel. Lube throttle lever with LPS-2.		[ ]	[ ]
Fuel manifold valve and distribution lines - Inspect for security, presence of factory seal installed on safety wire, and evidence of fuel leakage. Inspect distribution lines for security, cracks, and signs of leakage.		[ ]	[ ]
Engine-driven fuel pump - Inspect for security, general condition, and evidence of fuel or oil leakage.		[ ]	[ ]
Fuel hoses - Inspect all flexible fuel hoses for routing, chafing, security, and signs of leakage.		[ ]	[ ]
Magnetos - Inspect for security and condition. Check timing to engine and record:L____ degrees BTDC, R____ degrees BTDC. Timing must be within 22±1 degrees BTDC. If either magneto must be adjusted, check logbooks for previous magneto adjustments. If the same magneto has already been "bumped up" twice without being removed to check internal timing, that magneto must be removed for internal timing check.		[ ]	[ ]
Spark plugs - Inspect firing end for condition. Clean, gap, reinspect, and test spark plugs following appropriate plug manufacturer's service manual. Reinstall with new gaskets and torque to specifications.		[ ]	[ ]
Ignition harness - Inspect for routing, broken shielding, chafing, and security. Inspect spark plug ends for condition and evidence of electrical arcing.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Alternator - Inspect for security, general condition and signs of oil leakage. Inspect electrical connections for security. Check air blast tube for obstructions. Any evidence of alternator malfunction requires removal to conduct drive gear hub slippage inspection.		[ ]	[ ]
Electrical cables, wires, and connectors - Inspect for security, routing, chafing, signs of arcing, and proper termination.		[ ]	[ ]
Starter and starter solenoid - Inspect for security, general condition, and signs of oil leakage.		[ ]	[ ]
Oil cooler - Inspect for security of mounting, cracks, straightness of fins, and evidence of oil leakage around base and fin area. Clean debris from fins. Inspect condition and security of oil pressure switch and temperature bulb and associated wiring.		[ ]	[ ]
Vacuum pumps and hoses - Inspect for security and general condition. Have an assistant move the propeller while inspecting the shear shafts for condition. Inspect cooling ducts and shrouds for condition. Inspect vacuum hoses for hardness, deterioration, and cracks. Inspect pump for evidence of oil contamination. Replace as necessary.		[ ]	[ ]
Engine accessory case - Inspect accessory case and any additional accessories for security, condition, and evidence of leakage or loss of torque of hardware.		[ ]	[ ]
Crankshaft - Inspect for evidence of oil leakage, corrosion, pitting, cracks, discoloration, or signs of overstressing.		[ ]	[ ]
Propeller governor - Inspect for security, evidence of oil leakage, and tightness of lever on governor shaft. Check operation of propeller control cable. Ensure high-RPM stop is hit before cable reaches end of travel.		[ ]	[ ]
Spinner and spinner bulkhead - Inspect for cracks, security to propeller, and security of any dynamic balance weights. Clean inside of spinner.		[ ]	[ ]
Propeller hub - Inspect for cracks, corrosion, leakage of oil, excessive loss of grease, security of static balance weights, and security of mounting to crankshaft. Retorque **all** mounting nuts if loss of torque is suspected on any nut in accordance with Chapter 61. Service with appropriate grease.		[ ]	[ ]
Propeller blades - Inspect for play, cracks, nicks, dents, pitting, corrosion, and leading edge erosion. Dress propeller and paint back of blade. In operational areas of high humidity, wipe the metal surface with an oily rag.	[ ]	[ ]	[ ]
Cooling baffles and seals - Inspect for cracks, excessive gaps, and security of mounting to engine. Check intercylinder baffles for security.		[ ]	[ ]
Engine cowls - Inspect for cracks, chafing, heat damage, delamination, evidence of exhaust leakage, condition of fastening system, presence of oil filler door placard, and condition of paint.		[ ]	[ ]
ECS air inlet scoop - Inspect for obstruction of inlets and condition of scoop and screen.		[ ]	[ ]
Firewall - Inspect for cracks, buckling, unsealed holes, and other signs of damage. Although the firewall is not structural, problems here may indicate damage to the composite bulkhead underneath and should be closely checked out. Inspect all firewall-mounted accessories for security of mounting.		[ ]	[ ]
Engine mount/NLG support - Raise NLG off of the ground and inspect for cracks, corrosion, loss of torque of mounting hardware, chafing by cables, wires, hoses, etc., and make sure that any flexing item is secured to the mount.		[ ]	[ ]
Engine isolation mounts - Inspect for general condition signs of loss of torque of engine mount bolts. If necessary, torque bolts in accordance with Chapter 71. Check safety wiring and security.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Drain and vents lines - Inspect for security, condition, and obstructions.		[ ]	[ ]
Battery box - Inspect for security of mounting and condition. Ensure drain line is clear.		[ ]	[ ]
Vacuum manifold - Inspect for security of mounting, condition of hoses, and security of vacuum switches and wiring. Vacuum manifold must be tested and inspected per manufacturer's service manual at 5 years after **date of manufacture** and every 12 months thereafter.		[ ]	[ ]
Brake fluid reservoir - Inspect for condition, leakage, security, and fluid level. Service as necessary.	[ ]	[ ]	[ ]
Bonding ground straps - Inspect for condition.		[ ]	[ ]
Foreign Objects - Check engine compartment for foreign objects.	[ ]	[ ]	[ ]

Table 4. Fuselage Exterior & Empennage

FUSELAGE EXTERIOR AND EMPENNAGE (Refer to Chapter 53 and 55 for Specific Details)	Each 50 hours	Each 100 hours	Annually
Fuselage exterior surface - Inspect for obvious signs of damage, including cracks, holes, buckling, and rippling. Check condition of paint and cleanliness. Check drain holes for obstructions.	[ ]	[ ]	[ ]
Exterior placards - Inspect for presence and condition. Refer to Section 11-20-00, Exterior Placards, for required placards.			[ ]
Windows - Inspect for cleanliness, condition, and sealing.	[ ]	[ ]	[ ]
Cabin doors - Inspect for security and fit. Inspect skin, hinges, gas struts, latching mechanisms, door seals, and upholstery. Lubricate hinges and all moving parts with a quality petroleum or silicone-based oil. Check that door seals inflate properly.		[ ]	[ ]
Baggage door - Inspect for security and fit. Inspect door skin, upholstery, seal, hinge, and latching mechanism. Inspect door strut for condition and security. Lubricate hinge and all moving parts.		[ ]	[ ]
Entry assist step - Inspect for security and condition.		[ ]	[ ]
Pitot port - Inspect for obstruction of pitot, signs of damage, which may affect proper airflow, and security of attachment. Remove the pitot port before attempting to clear any obstructions, making sure the port is not enlarged or damaged in any way. Test for proper operation after reinstallation.		[ ]	[ ]
Static Port Drain - Check static port drain for evidence of water. Remove cap from drain line and allow any water within the system to drain. Leak check after reinstallation. **Caution: Do not apply compressed air to the system, since this will result in damage to the static air flight instruments.**			[ ]
Antennas - Inspect for security and condition.		[ ]	[ ]
Aircraft identification plate - Inspect for security and legibility.			[ ]
Fuselage skin - Perform generalized inspection of fuselage for visible damage and evidence of latent damage.		[ ]	[ ]
Aft Fuselage - Perform a visual inspection and tap test of the exterior aft fuselage skin and a visual inspection of the interior aft fuselage skin in accordance with Section 53-70-00, Aft Fuselage Inspection.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Exterior emergency door release - Inspect exterior emergency door release system. Inspect hinge wires for corrosion, kinks, and wear. Replace as required. Inspect overhead cabling for chaffing, binding, and frayed cables. Store the few inches of excess cable in a manner that prevents kinking or binding. Refer to Section 52-00-00, Emergency Exit Door Release.		[ ]	[ ]
Vertical stabilizer - Perform generalized inspection of vertical stabilizer for visible damage and evidence of latent damage. Inspect hinge attach points for security and condition. Ensure leading edge tape is secure.		[ ]	[ ]
Rudder - Inspect for signs of damage, looseness, play in bearings, and condition of hinge attachments and rudder cable horns. Check security of static balance weight. Check for obstruction of drain holes. Inspect bonding strap and static wicks for condition. Lubricate hinges and cable-attach points. Ensure rudder makes full contact with left and right rudder stops.		[ ]	[ ]
Horizontal stabilizer - Perform generalized inspection of horizontal stabilizer for visible damage and evidence of latent damage. Inspect hinge attach points for security and condition. Ensure leading edge tape is secure.		[ ]	[ ]
Elevators - Inspect for signs of surface damage, looseness or play in bearings, and condition of hinges and elevator horn. Check security of static balance weights. Inspect bonding straps and static wicks for condition. Check for obstruction of drain holes. Lubricate piano hinges **only** in accordance with Section 27-30-00. Ensure elevator makes full contact with up and down elevator stops.		[ ]	[ ]
Elevator trim tab and actuator - Inspect for condition, corrosion, and security. If the drive rods show any signs of corrosion, replace with new rods. Lubricate hinge and clevis bolt in accordance with Section 27-30-00. Check trim servo for smoothness of operation; free from binding. Measure and record total trim tab play: _____ inches.**CAUTION: Use special care to ensure trim tab friction devices are not lubricated.**		[ ]	[ ]
Rudder Trim - Check for proper security.		[ ]	[ ]

Table 5. Wings

WINGS (Refer to Chapter 57 for specific details)	Each 50 hours	Each 100 hours	Annually
Wing Saddle Area - Inspect wing spar for cracks, debonding, and attachment to airframe. Check visible attaching hardware for loss of torque. If necessary, torque hardware in accordance with Section 57-10-00, Wing Installation. Inspect aileron bellcranks for cracks and corrosion.		[ ]	[ ]
Fuel Tanks - Check that the airplane's fuel filler neck is grounded. Run a continuity check between each fuel filler neck and one of the exhaust stacks. Fuel cap resistance must be within 0 to 500 ohm. Also, check continuity of all static wicks or static wick attachment points to test the integrity of the lightning protection system.		[ ]	[ ]
Wing skins and exterior - Inspect for obvious signs of damage, including cracks, holes, buckling, and rippling. Check condition of paint and placards. Check drain holes for obstructions. Check fuel tank vents for obstructions. Ensure leading edge tape is secure.		[ ]	[ ]
Landing and taxi light assembly - Inspect for cracks, security of mounting, and cleanliness and condition of lens cover. Operate taxi and landing lights in a dark area and ensure that both lights are properly aimed. If lights are not properly aimed, adjust as required. Refer to Section 33-40-00, Taxi and Landing Light Adjustment, for detailed instructions.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Aileron and flap attach points - Inspect for security of attachment to wing.		[ ]	[ ]
Aileron (left) servo tab and servo tab clevis - Inspect for damage, looseness, or play in attach bearings and Belleville washers, and condition of rod end attachment. Check security of static balance weights. Inspect bonding straps and static wicks for condition. Check for obstruction of drain holes. Inspect servo tab for proper operation and condition of push-pull rod, bearings, and hinge. If the rods show any signs of corrosion, replace with new rods. Lubricate only servo tab hinge and clevis bolt in accordance with Section 27-10-00, Aileron Servo Tab. Measure and record total servo tab play: _____ inches. Refer to Section 27-00-00, Table 1.		[ ]	[ ]
Aileron, right - Inspect for damage, looseness, or play in attach bearings and Belleville washers, and condition of rod end attachment. Check security of static balance weights. Inspect bonding straps and static wicks for condition. Check for obstruction of drain holes. Inspect trim tab and actuator for condition and security. Lubricate only trim tab hinge and clevis bolt in accordance with Section 27-10-00, Aileron. Record total trim tab play: _____ inches. **CAUTION:** Use special care to ensure trim tab friction devices are not lubricated.		[ ]	[ ]
Aileron trim tab clevis - Inspect trim clevis and related hardware for evidence of corrosion and pitting. Check for proper security.		[ ]	[ ]
Aileron deflections - Ensure that both ailerons seat properly on their up and down stops.		[ ]	[ ]
Flaps - Inspect skins for condition and signs of debonding. Check hinges for play and attachment to wing and flap. Check hinges for corrosion. Check flap push-pull rods and rod end bearings for condition. Inspect condition of bonding strap.		[ ]	[ ]
Flap Motor and Flap Actuators - Clean and cycle flaps up and down to check for smooth operation.		[ ]	[ ]
Flap deflections - Ensure that flaps extend equally on each side of the airplane in both the takeoff and landing configurations. Measure the down deflection on each side using neutral ailerons as a reference point. The difference in static deflection should not be greater than 1/4 inch.			[ ]
Fuel Leaks - Check the security of the fuel tanks by inspecting the outer skin tank areas for evidence of fuel stains. Be sure to open the gascolator access panel and inspect all fuel line and fittings in this area.		[ ]	[ ]
Fuel filler and caps - Inspect for proper locking, condition of o-ring and receptacle, and presence and legibility of placards.		[ ]	[ ]
Wing interior - Inspect wing spar through outer access panel for signs of cracking or debonding. Inspect visible bonded areas of ribs and other structures.		[ ]	[ ]
Fuel Vent Hose - Check for proper connection of the fuel vent hoses to the outboard inspection panels. Check the condition of the hoses.		[ ]	[ ]
Flight controls - Inspect all push-pull rods, rod end bearings, and bellcranks for condition, play, and security of attachment. Ensure all rod end jamnuts are tight.		[ ]	[ ]
Contamination Test - Take fuel samples from both wings and fuel strainer. Inspect for contamination and proper grade of fuel. Clean strainer screen each 100 hours or annually, whichever occurs first.	[ ]	[ ]	[ ]

Table 6. Landing Gear

LANDING GEAR (Refer to Chapter 32 for specific details)	Each 50 hours	Each 100 hours	Annually

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Nose Gear and shimmy dampener - Place nose gear on a rotating table (shallow height - sometimes referred to a "Grease Plate") with the normal static weight of the airplane applied to the table. A firm and consistent resistance to the steering rotation should be felt through the full ±60 degrees of wheel movement.		[ ]	[ ]
Lifting the airplane - Install jacking pads and jack aircraft until all tires clear the floor. (Refer to Section 7-00-00 for jacking instructions.)		[ ]	[ ]
Nose landing gear - Remove nose gear wheel cover and strut fairing. Note that the four bolts attached to the nose gear fork must be removed to remove the nose wheel fairing.		[ ]	[ ]
Nose landing gear strut - Inspect from top to bottom for scratches, cracks, corrosion, and signs of overstress. Check for play in strut attaching brackets. Visually inspect for straightness along length of each strut.		[ ]	[ ]
Main landing gear - Remove main landing gear wheel fairings.		[ ]	[ ]
Hydraulic brake lines - Inspect brake lines that are tie wrapped to the main gear strut. Check for security and evidence of chaffing. Check for leaks as evidenced by the presence of hydraulic fluid stains.		[ ]	[ ]
Brake calipers and brake lines - Clean and inspect for condition, fluid leakage, and security of components. Check caliper for small amount of free-floating motion in torque plate. Clean anchor bolts and torque plate if caliper does not free-float. Do not lubricate.		[ ]	[ ]
Brake linings - Inspect brake linings, and replace if the wear lines are not visible.		[ ]	[ ]
Wheels and brake discs - Inspect for cracks and corrosion. Inspect brake discs for cracks, pitting, and signs of overheating. Inspect all hardware for signs of loss of torque in accordance with Cleveland Maintenance Manual AWBCMM0001-2/USA. Measure and record brake disc thickness: Left - _____ inches, Right - _____ inches.		[ ]	[ ]
Main landing gear tires - Inspect for flat spots, wear, splitting, and dry-rotting. Check tire pressure, and service as necessary.	[ ]	[ ]	[ ]
Main landing gear wheel pants - Inspect for condition. Clean interior.			[ ]
Main landing gear wheel assemblies - Rotate and check for binding, unusual noises, excessive friction, play in bearings, and security of attachment of axles.		[ ]	[ ]
Nose landing gear assembly - Verify operation of nose landing gear centering lock with strut fully extended. Remove four attaching bolts from bottom of NLG strut, remove wheel and fork assembly, and remove wheel pant. Remove fairing from strut assembly.		[ ]	[ ]
Nose landing gear strut and fairing - Inspect for cracks, corrosion, scratches on piston, fluid leakage, and signs of overstress. Check for security of attachment of strut to engine mount. Check for presence of steering limit markings and condition of strut fairing.		[ ]	[ ]
Nose landing gear fork assembly - Inspect for cracks, corrosion, signs of overstress, and sideloading. Inspect towing lug assemblies for cracks, distortion, and security of attachment.		[ ]	[ ]
Service nose strut - Check inflation pressure of nose gear, and service as required. Refer to Section 12-30-00, Servicing the Nose Strut for servicing instructions.		[ ]	[ ]
Nose landing gear wheel assembly - Inspect for cracks and corrosion. Check all hardware for signs of loss of torque in accordance with Chapter 32.		[ ]	[ ]
Nose landing gear tire - Inspect for flat spots, wear, splitting, and dry-rotting. Check tire pressure, and service as necessary.	[ ]	[ ]	[ ]
Nose landing gear wheel pant - Inspect for condition. Clean interior.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Wheel bearings (all) - Clean and inspect for damage, wear, and corrosion. Inspect bearing races for wear and damage. Repack with appropriate grease in accordance with Cleveland Maintenance Manual AWBCMM0001-2/USA. **NOTE:** Always wear rubber gloves when handling dry or repacked bearings!		[ ]	[ ]
Nose landing gear assembly - Reinstall strut fairing and wheel pant, then reinstall wheel and fork assembly on strut. Torque four attaching bolts 140 to 180 in-lbs., and apply torque seal.		[ ]	[ ]
Main landing gear - Reinstall outer and inner main gear wheel covers on each wheel.		[ ]	[ ]
Lowering airplane - Ensure all obstructions are clear from under aircraft and landing gear is ready for aircraft weight, then lower aircraft and remove jacking pads.		[ ]	[ ]

Table 7. Fuselage Interior

FUSELAGE INTERIOR (Refer to Chapters 21, 23, 25, 27, 28, 31, 37, 56, 57 for specific details)	Each 50 hours	Each 100 hours	Annually
Fire extinguisher - Remove fire extinguisher and inspect. Refer to Chapter 26 for instructions.		[ ]	[ ]
Inspection covers - Remove rear seat, rear seat inspection plates, ELT access cover, right and left console covers, and glare shield.		[ ]	[ ]
Flight controls - Inspect for nicks, scratches and dents in push-pull rods, play in rod end and linear bearings, security of linear bearing mounts and rudder cable guide tubes to fuselage.		[ ]	[ ]
Seats - Inspect all seat structures for cracks, corrosion, and general condition. Check seat controls for positive locking. Inspect cushions and upholstery for condition.		[ ]	[ ]
Seat tracks and stops - Inspect for cracks, wear of latching holes and tracks, and security of tracks and stops.		[ ]	[ ]
Restraint systems - Inspect belts for cuts, fraying, broken stitching, and presence of TSO tags. Check all buckles for proper locking and release. Check inertia reels for proper operation. Check attach points to structure for all belts.		[ ]	[ ]
Upholstery and trim - Inspect for general condition, attachment, and cleanliness.		[ ]	[ ]
Placards - Inspect for presence and condition of all required interior placards. Refer to Section 11-30-00, Interior Placards for required placards.		[ ]	[ ]
Instruments - Check security of instruments in panel and legibility of markings. Ensure that no magnetic tools are used during this procedure.		[ ]	[ ]
Avionics - Check security of radios, GPS display, indicators and controls on panel and center console, legibility of markings and operation of knobs. Ensure that no magnetic tools are used during this procedure.		[ ]	[ ]
Instrument panel, radio rack, and center console - Inspect for general condition, security of attachment, and cleanliness. Ensure that no magnetic tools are used during this procedure.		[ ]	[ ]
Magnetic compass - Inspect for security, clarity of glass, and signs of oil leakage. Inspect compass correction card for presence and legibility of all headings. Ensure that no magnetic tools are used during this procedure.		[ ]	[ ]
Fuel selector valve - Operate through full range and verify that valve locks into each detent. Ensure that green LED's in fuel gauge illuminate.		[ ]	[ ]
Fuel selector valve - Inspect fuel valve for evidence of fuel leakage.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Environmental Control System (ECS) controls - Check operation of manual controls.		[ ]	[ ]
ECS vents - Check all vents for proper operation of manual controls.		[ ]	[ ]
Instrument panel backside - Remove glare shield and inspect all wires, lines, hoses, control cables, instruments, etc., for any interference, chafing, and loose or stressed connections. Inspect structure of forward bulkhead, engine mount support structures, etc., for cracks, debonding, and general condition. Inspect soundproofing material for condition and adhesion to forward bulkhead.		[ ]	[ ]
Reinstall glare shield - Check security of attachment and condition. Check pullout shield for freedom of movement, condition, and security.		[ ]	[ ]
Vacuum regulator, filters, and hoses - Inspect regulator, central air filter bracket, and all fittings for security. Check all hoses for hardness, splitting, routing, and security. Replace vacuum central air filter and regulator garter filter at appropriate time interval. Refer to Section 05-10-00, Table 1 for special requirements.		[ ]	[ ]
ECS ducts - Inspect for cracks, holes, routing, and chafing.		[ ]	[ ]
Grounding rails - Inspect for cracks and security along forward length. Pay special attention to bonding straps connecting sections of rails at formers and to engine mount bolts.		[ ]	[ ]
Rudder pedals - Inspect for security, cracks, and play. Check for leakage from brake cylinders. Lubricate rudder cable clevis bolt and brake cylinder attach points. Do not lubricate rudder pedal torque tube pillow blocks.		[ ]	[ ]
Parking brake valve - Inspect for security of mounting and signs of leakage.		[ ]	[ ]
Standby Battery System (SBS) battery pack - Inspect for security of mounting. Check and record date on batteries: _____. Replace no later than this date or after operation.		[ ]	[ ]
Seat box structure - Inspect for cracks, debonding, and any signs of obvious damage.		[ ]	[ ]
Wing spar - Inspect for cracks, debonding, and security of attachment to fuselage.		[ ]	[ ]
MLG box support structure - Inspect for cracks, debonding, and security of hardware.		[ ]	[ ]
Floor and supporting structure - Inspect for cracks, holes, and security of attachment.		[ ]	[ ]
Flight controls (forward fuselage through baggage compartment) - Inspect for nicks, scratches, and dents in push-pull rods, play in rod end and linear bearings, security of linear bearing mounts, and attachment of rudder cable guide tubes to fuselage.		[ ]	[ ]
Baggage compartment floor - Inspect for cracks, holes, and security.		[ ]	[ ]
Hat shelf - Inspect for cracks, holes, and security.		[ ]	[ ]
Emergency Locator Transmitter (ELT) - Remove from tray and remove battery cover. Inspect for battery corrosion and any obvious internal or external damage to housing. Verify replacement date on battery matches date on housing placard. Reinstall battery cover. Test operation of G-switch in strict accordance with instructions in Section 25-60-00. Record battery replacement due date: _____		[ ]	[ ]
ELT installation and support shelf - Inspect ELT wiring and antenna cable for security, routing, and chafing. Check connectors for security of pins and proper connection. Inspect ELT tray and support shelf for cracks and security. Replace tray if any cracks are found.		[ ]	[ ]
Empennage interior structure - Inspect for cracks, debonding, or other signs of damage. Verify that all drain holes are clear of debris.		[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Access panels and fairings - Inspect for condition. Check fasteners and receptacles for condition.		[ ]	[ ]

Table 8. Inspection Wrap-Up

INSPECTION WRAP-UP	Each 50 hours	Each 100 hours	Annually
Fuselage and wings - Verify aircraft is free of any tools, parts, and debris, and reinstall all access fairings, panels, carpeting, seats, etc. removed for this inspection.	[ ]	[ ]	[ ]
Engine - Verify oil sump is properly serviced with oil, battery box is closed, and engine compartment is free of tools, rags, and debris, and install lower cowl.	[ ]	[ ]	[ ]
Engine - Run engine for no more than two minutes at 1000 to 1200 RPM. After shutdown, check for leaks at oil filter base, fuel nozzles, and any other components removed during this inspection. If no leaks are noted, install top cowling.	[ ]	[ ]	[ ]
Aircraft - Operate engine at 1000 to 1500 RPM to warm engine. Operate all aircraft systems to verify proper operation. As engine warms, operate engine systems at appropriate engine speeds and complete all checks listed on Inspection Coversheet.	[ ]	[ ]	[ ]
Aircraft records - Complete entries in logbooks, AD compliance lists, and any other required records and work orders.	[ ]	[ ]	[ ]

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Inspection and Run-up Checklist

B12178

Cessna 300 Inspection Checklist

Model LC40-550FG

Instructions for Continued Airworthiness

Reg. number	Serial number:	Owner's name:
Date started	Date completed	Work Order #

Inspection
50-hr ☐ 100-hr ☐ Annual ☐

Hobbs	Eng TSN	Prop TSN	**Mechanic's Name**
TT	Eng TSO	Prop TSO	

ELT battery due:
Standby Battery due:
Altimeter test due:
Transponder test due:
O2 bottle hydro. test due:
O2 bottle hydro. test due:
Fire extinguisher insp. due:
Magneto 500-hr insp. due:
Flexible hose rplcmt. due:
Misc.:
Misc.:
Misc.:
Oil sample? Yes ☐ No ☐
Comments

Differential compression check:
Taken: Hot ☐ Cold ☐

6 -	/80	5 -	/80
4 -	/80	3 -	/80
2-	/80	1 -	/80

Discrepancies Noted During Runup
(Additional space available on last page)

☐ See last page for additional comments.

RUNUP CHECKS

☐- check (☐) if okay. For all others, write actual indication.

System	Pre-inspection	Post-inspection
Boost/primer pump	☐	☐
High/Lo boost pump cut-off	☐	☐
Starter	☐	☐
Oil pressure (cool)	psi	psi
Charging system (1200 RPM)	Amps volts	Amps volts
Left brake	☐	☐
Right brake	☐	☐
Parking brake	☐	☐
Comm/Nav	☐	☐
Ignition ground test (idle)	☐	☐
Suction (1700 RPM)	in Hg	in Hg
L. Mag drop (1700 RPM)	RPM Drop	RPM Drop
R. Mag drop (1700 RPM)	RPM Drop	RPM Drop
Prop response (1200 RPM)	☐	☐
Oil temperature	°F	°F
CAUTION: Ensure CHT and oil temp. are in the green range.		
Static RPM	RPM	RPM
Fuel flow at static RPM	gph	gph
Induct. Heat (1700 RPM)	☐	☐
Defrost	☐	☐
Cabin heat	☐	☐
Oil pressure	psi	psi
Idle RPM	RPM	RPM
CAUTION: Allow engine to cool to 300°F (CHT) before shutdown.		
All annunciator lights are off	☐	☐
Check for fuel odors in cabin	☐	☐
Check for fuel stains on floor	☐	☐
Check fuel valve *off* function	☐	☐
Idle cutoff RPM rise	RPM Rise	RPM Rise

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LIST OF INSPECTION AREAS

1. List of Inspection Areas

Table 1. Cessna 300 (LC40-550FG) Inspection Access Areas

Area	Type of Access	Location	Inspection & Maintenance Items
Left Wing	Access Panel	Underside, inboard, below fuel tank	Fuel tank, two fuel sending units, slosh box, fuel low annunciator switch, vapor return lines
	Access Panel	Underside, middle, below fuel tank	Fuel tank, one fuel sending unit
	Access Panel	Underside, outboard	Fuel vent
	Access Panel	Underside trailing edge, near right side of aileron	Final aileron drive, mounting bolts to aileron, bellcrank assembly
	Access Panel	Underside towards leading edge, forward of inboard fuel tank access panel	Fuel lines and fuel lines to fuel tank connection fittings
	Access Panel	Aft of inboard fuel tank cover	Final drive for flap bellcranks
	Access Panel	Underside trailing edge, near middle of aileron	Aileron control rod linear bearing
Right Wing	Access Panel	Underside, inboard, below fuel tank	Fuel tank, two fuel sending units, slosh box, fuel low annunciator switch, vapor return lines
	Access Panel	Underside, middle, below fuel tank	Fuel tank, one fuel sending unit
	Access Panel	Underside, outboard	Fuel vent
	Access Panel	Underside trailing edge, near left side of aileron	Final aileron drive, mounting bolts to aileron, bell crank assembly
	Access Panel	Underside towards leading edge, forward of inboard fuel tank access panel	Fuel lines and fuel lines/fuel tank connection fittings, outside air temperature probe
	Access Panel	Aft of inboard fuel tank cover	Final drive for flap bellcranks
	Access Panel	Underside trailing edge, near middle of aileron	Aileron control rod linear bearing
Fuselage Exterior	Access Panel	Underside center near trailing edge of the flaps	Aileron bellcranks and crossover assembly, flap motor, marker beacon tuning slug
	Access Panel	Underside near left wing root	Auxiliary fuel pump, gascolator, wires and plugs for wing electrical (position/strobe lights, landing/taxi lights, stall horn, fuel quantity, and fuel low annunciator)
	Access Panel	Tail cone right side	Air vent, elevator push-pull rods
	Access Panel	Vertical stabilizer, left side	Antenna connection junction
	Engine Cowling - Top and Bottom	Forward of fuselage firewall	All engine and propeller parts and components.
	Access Panel	Under front seat bench	Fuel and fuel vent lines
	Access Panels (2)	Right side of center console (arm rests)	Fuel selector valve, environmental control system (ECS) heated air ducts
	Cover Panel	Rear seat footwell	Wing attachment bolts
	Access Panels (2)	Under rear seat back	Gear box

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Fuselage Interior	Access Panels (2)	Baggage compartment floor	Gear box
	Access Panel	Floor area of baggage compartment hat rack	Special optional avionics equipment (DME, HSI slaving transmitter, remote stormscope sensor, altitude hold computer for system 30 autopilot)
	Access Panel	Aft bulkhead of baggage shelf	ELT, elevator push-pull rods
	Cabin, Side-Trim Panels	Pilot's side - runs from control stick to rear seat back	Aileron and elevator push-pull rods, circuit breaker panel, control stick switches wiring, fuel lines, ECS fresh air ducts
	Cabin, Side-Trim Panels	Copilot's side - runs from control stick to rear seat back	Aileron and elevator push-pull tubes, communication wiring, control stick switches wiring, common wire bundle, ECS fresh air ducts
	Baggage Compartment Trim Panels (2)	Left and right sides of baggage compartment	Elevator push-pull rods
Controls	Access Panel	Right elevator, underside, middle	Trim tab servo motor
	Access Panel	Right side of rudder, middle	Trim tab servo motor
	Access Panel	Underside, right aileron	Trim tab servo motor

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

UNSCHEDULED MAINTENANCE CHECKS

1. General

A. During operation, the airplane can have forces put on it that make completion of unscheduled maintenance necessary. This section describes the conditions or events that will result in the need to complete an unscheduled maintenance procedure.

B. When the flight or maintenance crew reports that they have experienced of any conditions listed below, you must complete the unscheduled maintenance check requirements for that condition or event.

2. Unscheduled Maintenance Checks Defined and Areas of Inspection

A. Severe vibration or oscillatory yawing motion due to excessive braking or tire skidding.

(1) If the pilot reports that the airplane experienced severe vibration or oscillatory yawing motion due to excessive braking or tire skidding, complete the Aft Fuselage Inspection procedure found in Section 53-70-00, Fuselage Components - Adjustment/Test.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

DIMENSIONS AND AREAS - GENERAL

1. Powerplant Limitations

A. Number of Engines: One

B. Number of Cylinders: Six

C. Engine Manufacturer: Teledyne Continental

D. Engine Model Number: IO-550-N

E. Maximum Power: 310 BHP at 2700 RPM

F. Maximum Manifold Pressure: Full power at sea level

G. Maximum Manifold Pressure for Idle: 18.5 inches of Hg

H. Maximum Cylinder Head Temperature: 460° F

2. Powerplant Fuel and Oil Data

A. Oil Grades Recommended for Various Average Air Temperature Ranges

(1) Below 40° F: SAE 30, 10W30, 15W50, or 20W50

(2) Above 40° F: SAE50, 15W50, 20W50, or 20W60

B. Oil Temperature

(1) Maximum Allowable: 240° F

(2) Recommended takeoff minimum: 75° F

(3) Recommended flight operations: 170° F to 200° F

C. Oil Pressure

(1) Normal Operations: 30-60 psi (pounds per square inch)

(2) Idle, minimum: 10 psi

(3) Maximum allowable (cold oil): 100 psi

D. Approved Fuel Grades

(1) 100LL Grade Aviation Fuel (Blue)

(2) 100 Grade Aviation Fuel (Green)

E. Fuel Flow and Fuel Pressure

(1) Normal Operations: 10 to 22 GPH (7 to 16 psi)

(2) Idle, minimum: 1 to 2 GPH (4 psi)

(3) Maximum allowable: 25 GPH (18 psi)

3. Propeller Data and Limitations

A. Number of Propellers: One

B. Propeller Manufacturer: Hartzell

C. Propeller Hub and Blade Model Numbers: PHC-J3YF-IRF and F7691D-14

D. Propeller Diameters

(1) Minimum: 76 inches

(2) Maximum: 77 inches

E. Propeller Blade Angle at 30 inch Station

(1) Low: 14 degrees

(2) High: 35 degrees

4. Powerplant Instrument Markings

A. Table 1 shows applicable color-coded ranges for the various powerplant instruments within the aircraft.

Table 1. Powerplant Instrument Markings

INSTRUMENT	RED LINE Minimum Limit	GREEN ARC Normal Operating	RED LINE Maximum Limit

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Tachometer	Minimum for idle 600 RPM (No Placard)	2000 - 2700 RPM	2700 RPM
Manifold Pressure	N/A	18-28 inches Hg. (No Placard)	
Oil Temperature	Minimum for takeoff 75° F (No Placard)	160 - 210° F	240° F
Oil Pressure	Minimum for idle 10 psi (No Placard)	30 - 60 psi	100 psi (Cold Oil) (No Placard)
Fuel Quantity	"E" or "zero" reading in level flight means the remaining three gallons in each tank cannot be used safely in flight.	N/A	N/A
Fuel Pressure/Fuel Flow	N/A	10 - 22 GPH 4 - 14 psi (No Placard)	25 GPH (18 psi)
Cylinder Head Temperature	N/A	240 - 460° F	460° F
Vacuum	N/A	4.5 - 5.2 inches Hg.	N/A

5. Power Setting Limitations

A. Do not exceed 20 inches of Hg. manifold pressure below 2200 RPM. This requirement is not an engine limitation, but rather a harmonic condition inherent in the Cessna 300 (LC40- 550FG).

6. Weight Limits (Utility Category)

A. Maximum Ramp Weight: 3400 lbs.

B. Maximum Zero Fuel Weight: FS (103) 2725 lbs. - FS (110) 3228 lbs.

C. Maximum Empty Weight: 2568 lbs.

D. Maximum Takeoff Weight: 3400 lbs.

E. Minimum Flying Weight: FS (103) 2240 lbs. - FS (110) 2500 lbs.

F. Maximum Landing Weight: 3230 lbs

G. Maximum Baggage Weight: 120 lbs.

7. Center of Gravity Limits

A. Table 2 specifies the center of gravity limits for utility category operations. The variation along the arm between the forward and aft datum points is linear (straight line). The straight-line variation means that at any given point along the arm, an increase in moments (expressed as inch-pounds) changes directly according to the variations in weight and distance from the datum.

Table 2. Center of Gravity Limits

Category	Forward Datum Point and Weight	Aft Datum Point and Weight	Variation
Utility Category	103 inches 2240 to 2500 lbs.	110 inches 2500 to 3400 lbs.	Straight Line
Reference Datum: The reference datum is located at the tip of the propeller spinner. This location causes all arm distances and moments (the product of arm and weight) to be positive values.			

8. Cabin and Entry Dimensions

A. Maximum Cabin Width: 50 inches (Outside Dimension)/49 inches (Inside Dimension)

B. Maximum Cabin Length: (Firewall to aft limit of baggage compartment): 139.6 inches

C. Maximum Cabin Height: 47 inches

D. Minimum Entry Width: 33 inches

E. Minimum Entry Height: 28 inches/Clearance with Door Open: 46 inches

9. Space And Entry Dimensions Of Baggage Compartment

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

A. Maximum Baggage Compartment Width: 38.5 inches
B. Maximum Baggage Compartment Length: 52 inches
C. Maximum Baggage Compartment Height: 34.5 inches
D. Maximum Baggage Entry Width: 27 inches

10. Specific Loadings

A. Wing Loading: 24.08 lbs./ft. sq.
B. Power Loading: 11.3 lbs./hp.

11. Other Specifications

A. Wing Area: 141.2 sq. ft.
B. Wing Span: 35.8 ft
C. Angle of Incidence Wing: 0 degrees
D. Angle of Incidence Horizontal Stabilizer: -2.0 degrees
E. Dihedral: 4.5 degrees
F. Aspect Ratio: 9.18
G. Mean Aerodynamic Chord: 48.275 inches
H. Fuselage Length: 25.7 ft
I. Height of Vertical Stabilizer: 9 ft
J. Total Horizontal Stabilizer Area: 36.4 sq. ft.
K. Stabilizer Span: 14.1 ft
L. Vertical Stabilizer Area: 15.68 sq. ft.
M. Total Aileron Area: 5.75 sq. ft.
N. Rudder Area:4.46 sq. ft.
O. Total Flap Area: 20.36 sq. ft.
P. Total Elevator Area: 11.48 sq. ft.

12. Landing Gear

A. Nose Strut Pressure: 250 psi (Nitrogen)
B. Landing Gear Type: Fixed (Steel)
C. Landing Gear Track Width: 89.5 inches
D. Nose Tire Size: 5.00-5 (10 Ply)
E. Nose Tire Pressure: 88 psi
F. Main Gear Tire Size: 15x6.00-6 (6 Ply)
G. Main Gear Tire Pressure: 55 psi

13. Fuselage Stations

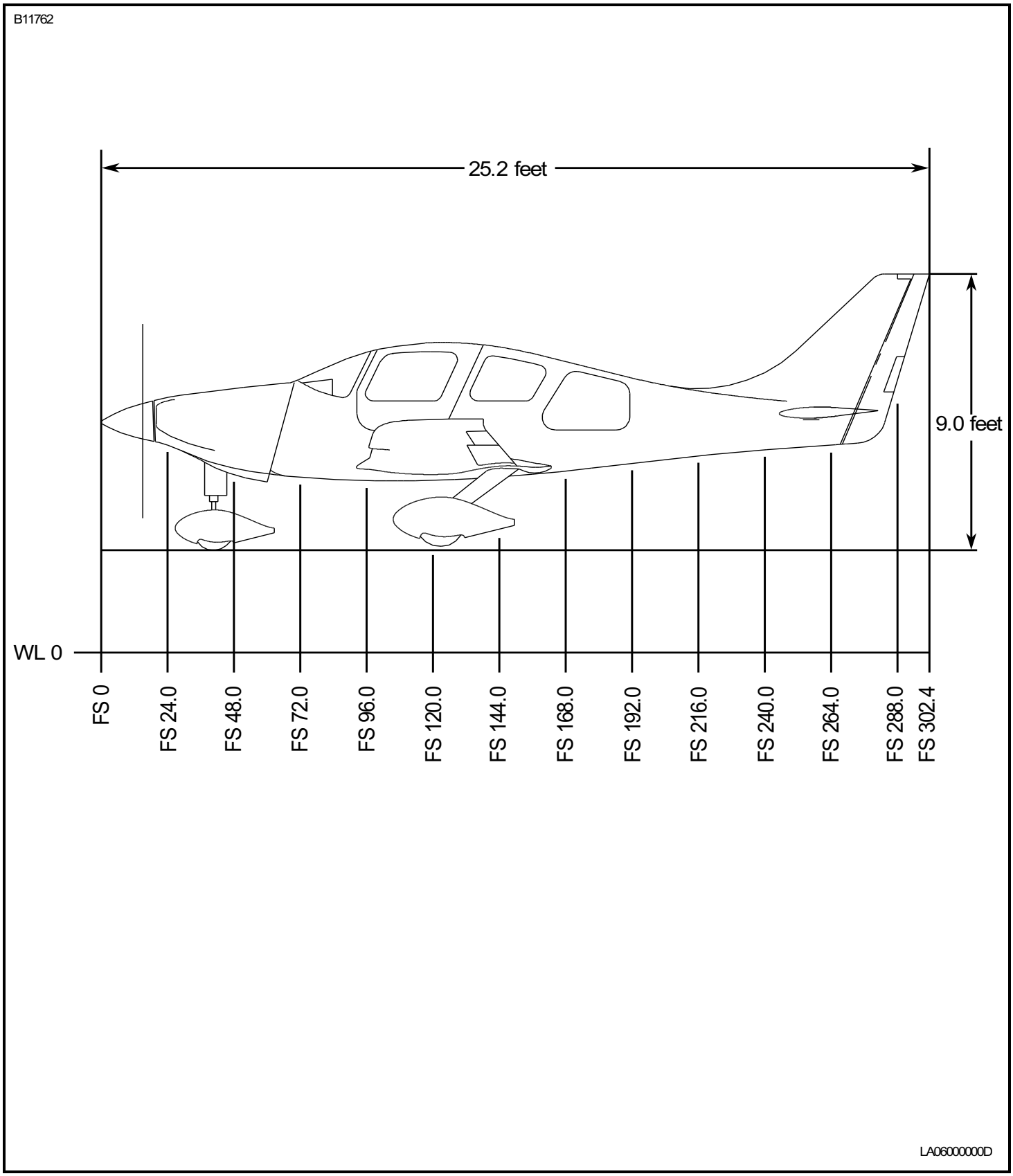
A. Refer to Figure 1 for fuselage stations (FS).

14. Wing and Horizontal Stabilizer Stations

A. Refer to Figure 2 for wing and horizontal stabilizer stations.

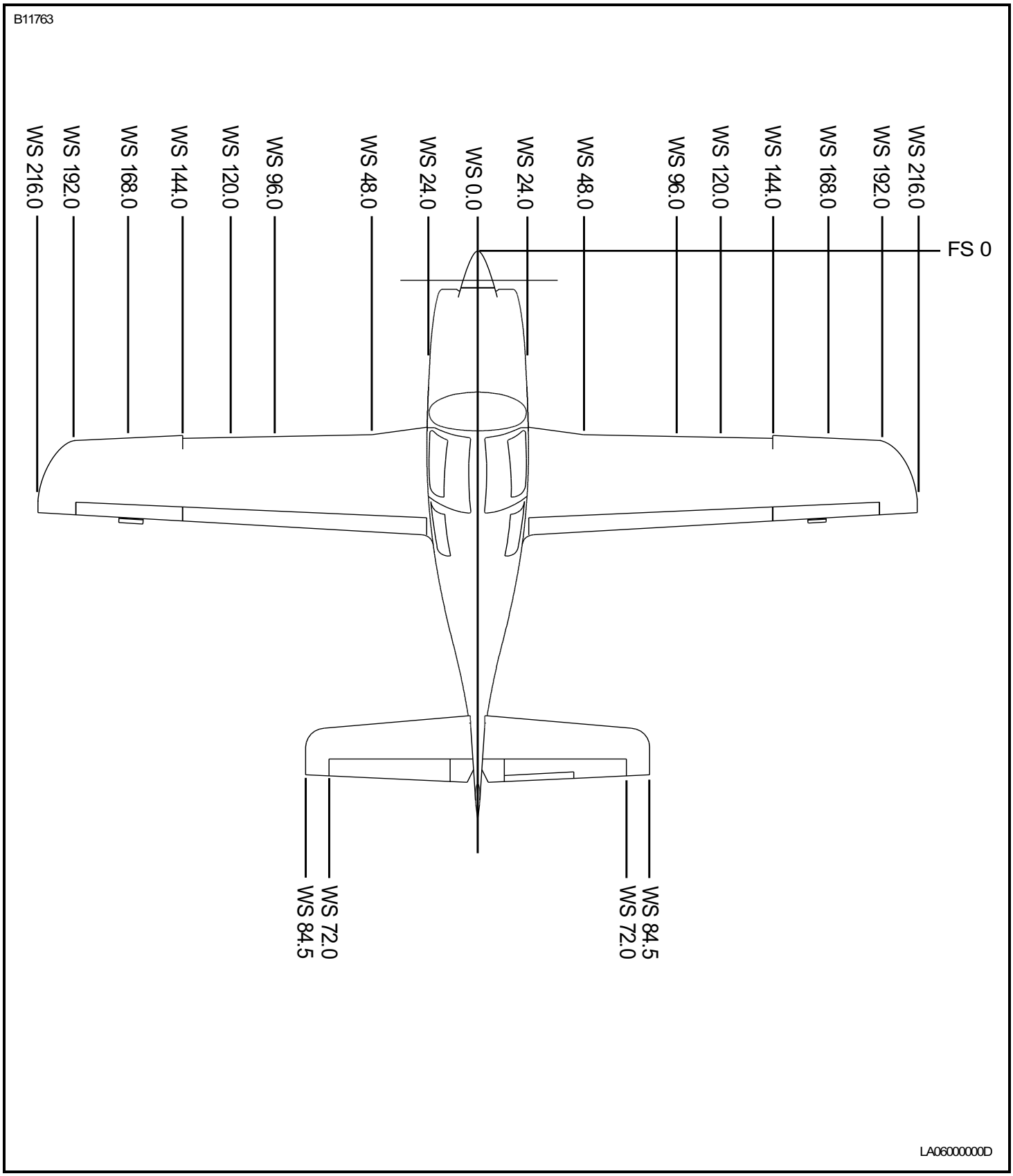
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Aircraft Fuselage Stations



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Wing Stations (WS)



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LIFTING AND SHORING - GENERAL

1. Jacking the Airplane

A. **Lifting Points** - There are two jack points under each wing proximate to the wing saddle. The points are near the center of mass of the longitudinal axis, and great care must be used when jacking the airplane. The tailskid is used as a third point of stabilization.

B. **Raising One Wing Only** - If only one wing is raised, as when changing a single tire, the airplane can be safely jacked by one person using the following steps:

(1) Perform operation in a level area, such as an airplane hangar.

(2) Set the parking brake and chock the nose tire and the main gear tire that is not raised.

(3) Place 50 pounds of ballast (usually sandbags) on the engine cowling, near the propeller.

(4) Place a jack under the jack point of the wing to be lifted and raise the jack up to the wing jack point. Take extra precaution to ensure the jack is properly stabilized, the base is locked in position, and the jack is lifting vertically. Be sure the raising point of the jack is properly inserted into the jack point on the wing.

(5) Slowly raise the jack until the desired ground clearance is achieved. The clearance between the bottom of the tire and lifting surface (ground or hangar floor) must not exceed three inches.

C. **Raising Both Wings** - If the airplane is simultaneously lifted by both jacks, follow the steps below:

(1) Perform operation in a level area, such as an airplane hangar.

(2) Use a minimum of three trained individuals when jacking the airplane, one person for each jack and one observer.

(3) Because the jack points are near the airplane's center of gravity, 50 pounds of ballast must be placed on the horizontal stabilizer. Sandbags are perfect for this operation since they distribute pressure evenly and will not mar the surface.

(4) Attach the tail to a stabilizing stand.

(5) Place the sandbags or other ballast on the horizontal stabilizer as close as possible to the longitudinal axis.

(6) Place a jack under each jack point of the wing. Raise the jacks up to the wing jack point. Take extra precaution to ensure the jacks are properly stabilized, the bases are locked in position, and the jacks are lifting vertically. Be sure the raising point of the jacks are properly inserted into the jack points on the wing.

(7) Slowly raise the jacks until the desired ground clearance is achieved. The observer must ensure the jacks are lifting vertically and there is no tail wobble. As the airplane is lifted off the surface, the observer must connect the stabilizing stand to the tail.

(8) Review all of the caution items on the next page.

D. **Raising with Two Jacks**

CAUTION: Several points must be considered when raising the airplane with two jacks:

(1) It is best to jack the airplane in an enclosed area. Wind gusts will destabilize the airplane and cause it to fall off the jacks.

(2) The airplane must be jacked in a level area on a concrete surface.

(3) Raise the jacks simultaneously in short increments to ensure the airplane stays as level as possible.

(4) If the jacks have locking pins, they must be inserted once the desired jacking height is achieved. Otherwise, the airplane must be continuously observed to ensure the jacks do not bleed off pressure. If the jack loses pressure while the tail is attached to the tail stand, damage to the tail will result.

(5) Once the airplane is on jacks, do not attempt to enter the airplane.

(6) When lowering the airplane, remove the tail stand support and bleed pressure evenly from jacks in short increments.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LEVELING AND WEIGHING - GENERAL

1. General

A. To determine the empty weight and center of gravity of the airplane, the airplane must be in a level area and in a particular configuration.

2. Airplane Configuration (Empty Weight)

A. The airplane empty weight includes eight quarts of oil (dipstick reading), unusable fuel, hydraulic brake fluid, and installed equipment.

B. Defuel the airplane per instructions in Section 12-00-00, Refueling and Defueling the Airplane.

C. Ensure the oil sump is filled to eight quarts (cold engine). Check the reading on the dipstick and service as necessary.

D. Place the pilot's and front passenger's seat in the full aft position.

E. Retract the flaps to the cruise (0 degrees) position.

F. Center the controls to the neutral static position.

G. Ensure all doors, including the baggage door, are closed when the airplane is weighed.

CAUTION: It is not recommended to weigh an airplane with full fuel and subtract the weight of the fuel to obtain empty weight because the weight of fuel varies with temperature. If this method of weight determination is used, fuel weight should be calculated conservatively. Use the specific weight of fuel at ambient temperature. Refer to Figure 1.

H. The following is offered as an example only. It is important to remember that the aircraft weight in the example does not apply to a specific airplane:

Example Calculations: Aircraft Weight With Fuel

Unconservative Calculation

Conventionally used fuel specific weight (6 lbs./U. S. gal.)

Total aircraft weight with fuel	= 3038 lbs.
Weight of fuel (98 gal. x 6 lbs./U. S. gal.)	= 588 lbs.
Airplane empty weight (3038 lbs - 588 lbs.)	= 2450 lbs.

Conservative Calculation

Fuel specific weight at 60° F (5.83 lbs./U. S. gal.)

Total Aircraft weight with fuel	= 3038 lbs.
Weight of fuel (98 gal. x 5.83 lbs./U. S. gal.)	= 571 lbs.
Airplane empty weight (3038 lbs - 571 lbs.)	= 2467 lbs.

3. Airplane Leveling

A. Since there are no perfectly level reference areas on the airplane and the use of Smart Levels is not common, the airplane is leveled by use of a plumb bob suspended over a fixed reference point in the baggage compartment. Moreover, since the use of jacks with load cells is not prevalent, the wheel scales method is described in this manual. The following steps specify the procedures for installing the plumb bob and leveling the airplane. These steps must be completed before taking readings from the wheel scales.

(1) The airplane must be weighed in a level area.

(2) Remove the left rear seat cushion and place in the footwell. When the cushion is removed, a small washer, which is bonded to the bottom of the seat frame, will be exposed.

(3) Using a string with a plumb bob attached to it, run the string over the gas strut door flange between the flange ball and the point where the baggage door gas strut attaches to the ball, and tie the string off around the front seatbelt bracket. Refer to Figure 2.

(4) The pointed end of the plumb bob, in a resting state, will be near a 3/16 inch washer bonded into the seat frame.

(5) Using the two-jack method (raising both wings) discussed in Section 7-00-00, Raising with Two Jacks, position the two main tires and the nose tire of the airplane on three scales. Ensure the brakes are set before raising the airplane off the floor. When all of the airplane's weight is on the three scales, move the jacks to a location that is not under the wings.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(6) It will be necessary to either deflate the nose tire or strut and/or main tires to center the plumb bob point over the washer. When the pointer of the plumb bob is over any part of the washer, the airplane is level.

(7) Once the airplane is level, release the brakes.

4. Using the Permanent Reference Point

A. To determine the empty weight center of gravity of the airplane, it is more convenient to work with the permanent reference. The permanent reference point on the airplane is located at the forward part of the wing bottom, in the center of the wing saddle and is 97.05 inches aft of the datum. The location is shown in Figure 3. There is a pronounced seam at the point where the fuselage is attached to the wing, and the leading edge of the wing bottom is easy to identify.

B. Suspend a plumb bob from the permanent reference point in the exact center as shown in Figure 3 and Figure 4, Sheet 2.

C. Determine the center point on each tire and make a chalked reference mark near the bottom where the tire touches the floor. On the main gear tires, the mark should be on the inside, near where the arrows point in Figure 4.

D. Create a lateral reference line between the two main gear tires. This can be accomplished by stretching a string between the two chalk marked areas of the tires, snapping a chalk line between these two points, or laying a 7.3 foot board between the points.

5. Measurements

A. Measure the distance along the longitudinal axis from the permanent reference point (tip of the plumb bob) to the lateral reference line between the two tires of the main gear. This is Measurement A in Figure 4.

B. Measure the distance along the longitudinal axis between the plumb bob to the mark on nose tire. This is Measurement B in Figure 4.

6. Converting Measurements to Arms

A. To convert Measurement A and B distances to arms, use the formulas shown in Table 1 and Table 2, respectively.

Table 1. Determining Main Gear Arm

MAIN GEAR	Measurement A Distance + 97.05 inches = Main Gear Arm

Table 2. Determining Nose Gear Arm

NOSE GEAR	97.05 inches - Measurement B Distance = Nose Gear Arm

7. Weights and Computations

A. The main gear scale should be capable of handling weight capacities of up to 1200 lbs., while the nose gear scale needs a capacity of at least 750 lbs.

B. Computing the total weight and moments requires seven steps or operations. These seven operations are shown below and also identified in Table 3.

Table 3. Determining Weight and Moments

	OperationNo. 1	**OperationNo. 2**	**OperationNo. 3**		**OperationNo. 4**		**OperationNo. 5**
Scale Location	**Weight Reading (lbs.)**	**Tare or Scale Error**	**Corrected Weight (lbs.)**	**X**	**Arm (Inches)**	**=**	**Moments (lbs.- inches)**
Right Main Gear	Right Scale Reading	Scale Error	Right Scale Weight ± Error	X	Main Gear Arm	=	Right Gear Moment
Left Main Gear	Left Scale Reading	Scale Error	Left Sale Weight ± Error	X	Main Gear Arm	=	Left Gear Moment
Nose Gear	Nose Scale Reading	Scale Error	Nose Scale Weight ± Error	X	Nose Gear Arm	=	Nose Gear Moment
Total Empty Weight and Empty Moments			**Total Corrected Weight** Operation No. 6				**Total Moments** Operation No. 7

(1) **Operation No. 1** - Enter the weight for each scale into the second column.

(2) **Operation No. 2** - Next, enter the scale error. The scale error is sometimes referred to as the tare and is entered in

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

the third column for each scale.

(3) **Operation No. 3** - Add or subtract the respective error for the three scales and enter the result into the forth column. This is the correct weight.

(4) **Operation No. 4** - Using the formulas shown in Table 1 and Table 2, determine the arm for the main gear and nose gear. Enter this information into the fifth column.

(5) **Operation No. 5** - Multiply the corrected scale weights times their respective arms to determine the moments for each location. Enter the moments for each computation in the sixth column.

(6) **Operation Nos. 6 and 7** - Sum the weights in the fourth column and the moments in the sixth column. Note: The areas of primary calculations are shaded.

C. The final step, which is to determine the empty center of gravity, is to divide the total moments by the total corrected weight. A detailed example of this computation is shown in Table 5.

8. Example of Empty Center of Gravity (CG) Determination

A. The following is offered as an example problem to aid in understanding the computation process. It is important to remember that the weights, arms, and moments used in the example problem are for demonstration purposes only and **do not** apply to a specific airplane.

B. For the example problem, assume the following:

(1) Scale Weights

(a) Right Main Gear - 924 pounds

(b) Left Main Gear - 923 pounds

(c) Nose Gear - 490 pounds

(2) Scale Error (Tare)

(a) Right Main Gear Scale is -2 pounds

(b) Left Main Gear Scale is -1 pound

(c) Nose Gear Scale is +3 pounds

(3) Measurements

(a) Measurement Distance A is 24.05 inches

(b) Measurement Distance B is 56.15 inches

C. These uncorrected scale weights and tares are shown in Table 4. Note that after correcting for scale error, the right, left, and nose gear weights are 922.0, 922.0, and 493.0 pounds, respectively.

D. The arm for the main gear is computed as follows using the formula in Table 1.

Measurement distance A + 97.05 inches = Main Gear Arm (MGA)or24.05 inches + 97.05 inches = 121.1 inches MGA

E. The arm for the nose gear is computed as follows using the formula in Table 2.

97.05 inches - Measurement Distance B = Nose Gear Arm (NGA)or97.05 inches - 56.15 inches = 40.9 inches NGA

F. The main and nose gear arms, as computed, are shown in Table 4.

G. The corrected weights of 922 pounds are then multiplied with the 121.1 inch main gear arm, which produces total moments of 111,654.2 lbs.-inches. In this example, the moments are the same for both the right and left gear since the weights are the same. However, it is not uncommon for the right and left gear weights to vary a few pounds.

H. Next, the corrected 493.0 nose gear weight is multiplied times its 40.9 inch arm, which produces a moment value of 20,163.7 lbs.-inches.

I. Finally, the total moments and corrected weight are summed. In the example below, the total weight is 2,337.0 pounds and the total moment is 243,472.1 lbs.-inches. All this information is summarized in Table 4. All required data for determining the empty center of gravity are now available.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Table 4. Sample Calculation of Weight and Moments

Scale Location	Weight Reading (lbs.)	Tare or Scale Error	Corrected Weight (lbs.)	X	Arm (Inches)	=	Moments (lbs.-inches)
Right Main Gear	924	-2	922.0	X	121.1	=	111,654.2
Left Main Gear	923	-1	922.0	X	121.1	=	111,654.2
Nose Gear	490	+3	+493.0	X	40.9	=	+20,163.7
Total Empty Weight and Empty Moments			2,337.0				243,472.1

The formula for determining empty weight center of gravity is expressed as follows:

Table 5. Determining Center of Gravity

Total Moments	= Center of Gravity or	243,472.1 lb.-inches	= 104.2 inches
Empty Weight		2 337 lbs.	

J. In Table 5, the empty center of gravity of the airplane is at fuselage station (FS) 104.2.

9. Changes in the Airplane's Configuration

A. **Determining Location (FS) of Installed Equipment in Relation to the Datum** - If equipment is installed in the airplane, the weight and balance information must be updated. Individuals and companies who are involved with equipment installations and/or modifications are generally competent and conversant with weight and balance issues. These individuals or companies must be aware that the fixed datum is located at fuselage station (FS) 97.05. Refer to Figure 3 and the section on Using the Permanent Reference Point.

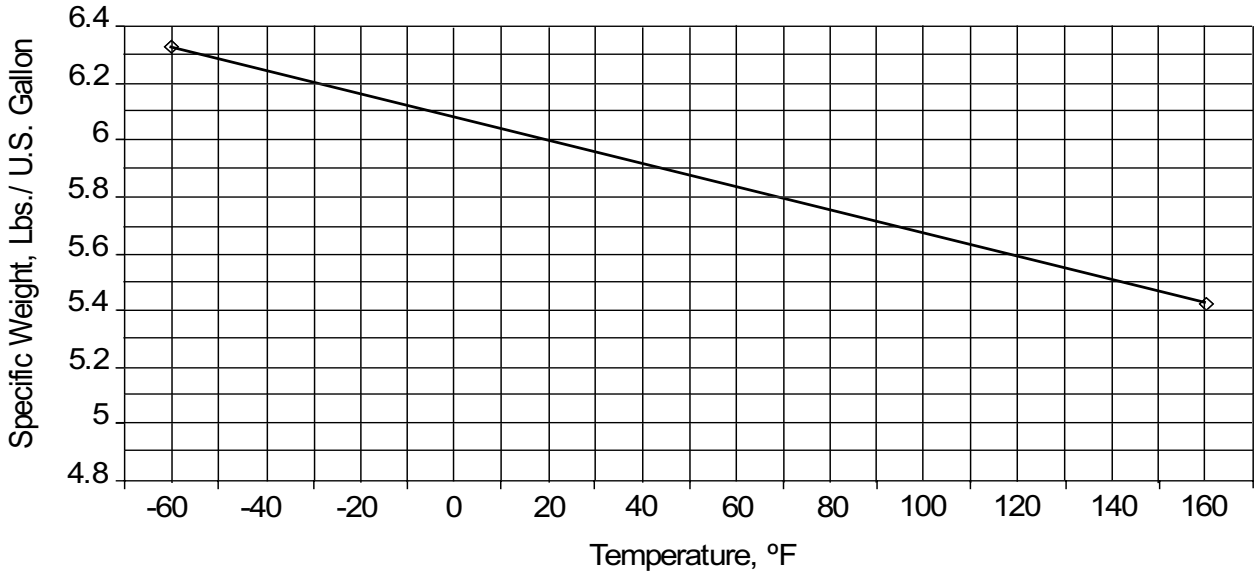
B. **Weight and Balance Forms** - There is a form in Appendix A of Chapter 6 of the *Pilot's Operating Handbook* that is used to track changes in the configuration of the airplane. When equipment is added or removed, these pages or an appropriate approved form must be updated. In either instance the required information is similar.

C. **Updating the Form** - Fill in the date the item is added or removed, a description of the item, the arm of the item, the weight of the item, and the moment of the item. Remember to multiply the weight times the arm of the item to obtain the moment. Finally, compute the new empty weight and empty moment by adjusting the running totals. If an item is removed, subtract the weight and moment of the item from the running totals. If an item is added, add the weight and moment of the item to the running totals.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Average Specific Weight of Aviation Gasoline (Mil-F-5572 Grade 100/130 Type) Versus Temperature

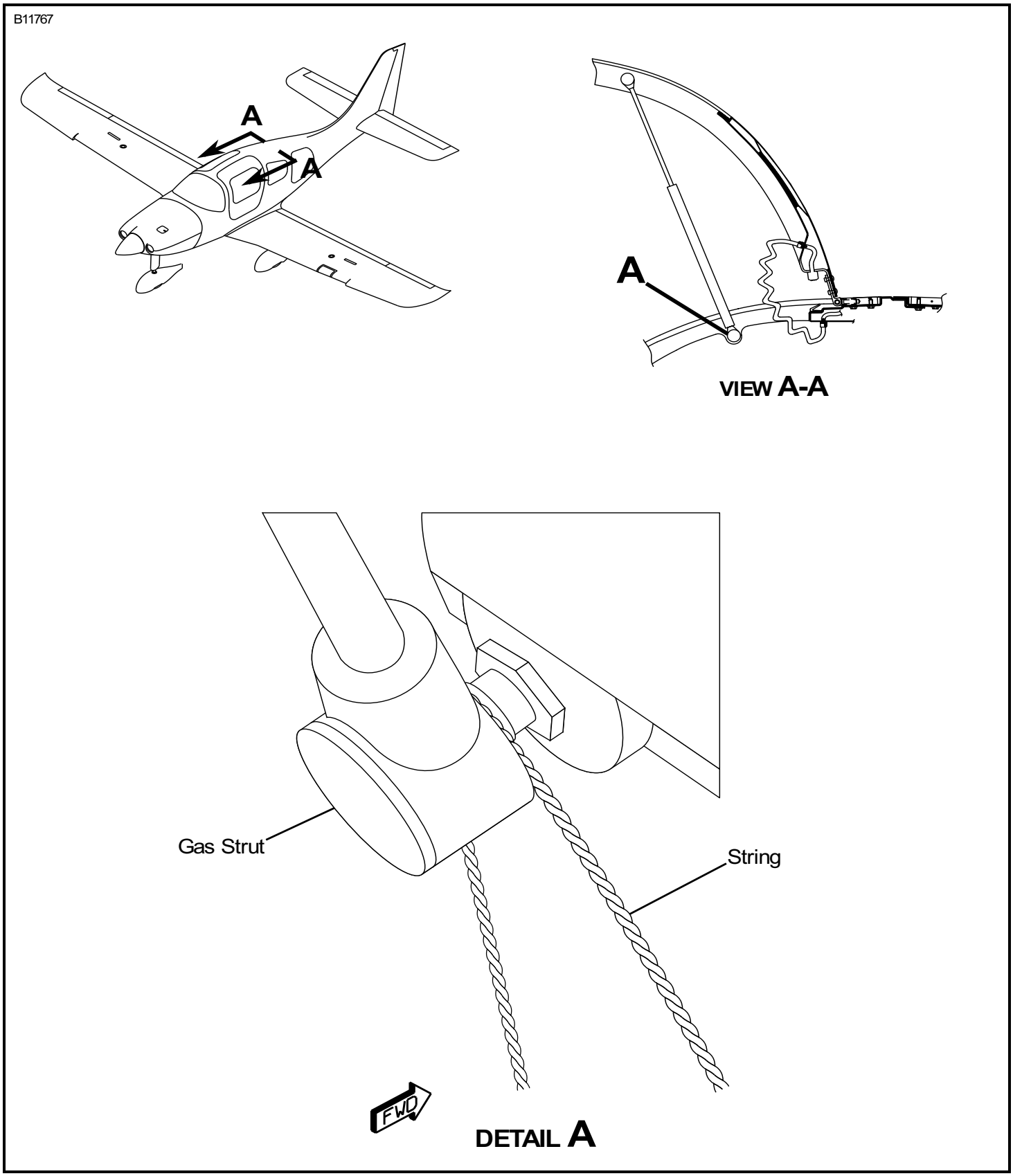
B12179



Average Specific Weight of Aviation Gasoline (Mil-F-5572 Grade 100/130 Type) Versus Temperature

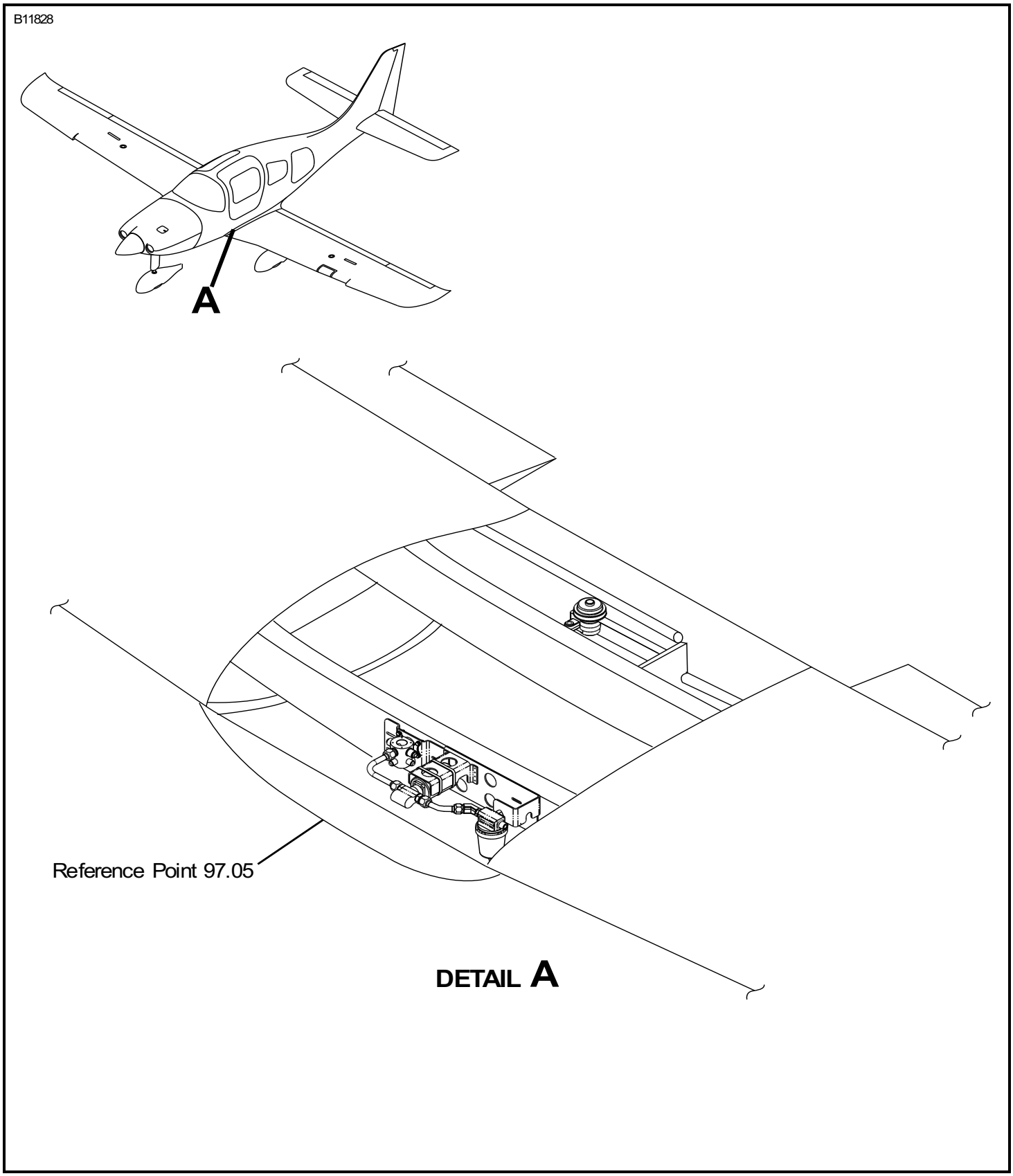
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Attaching String to Gas Strut



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

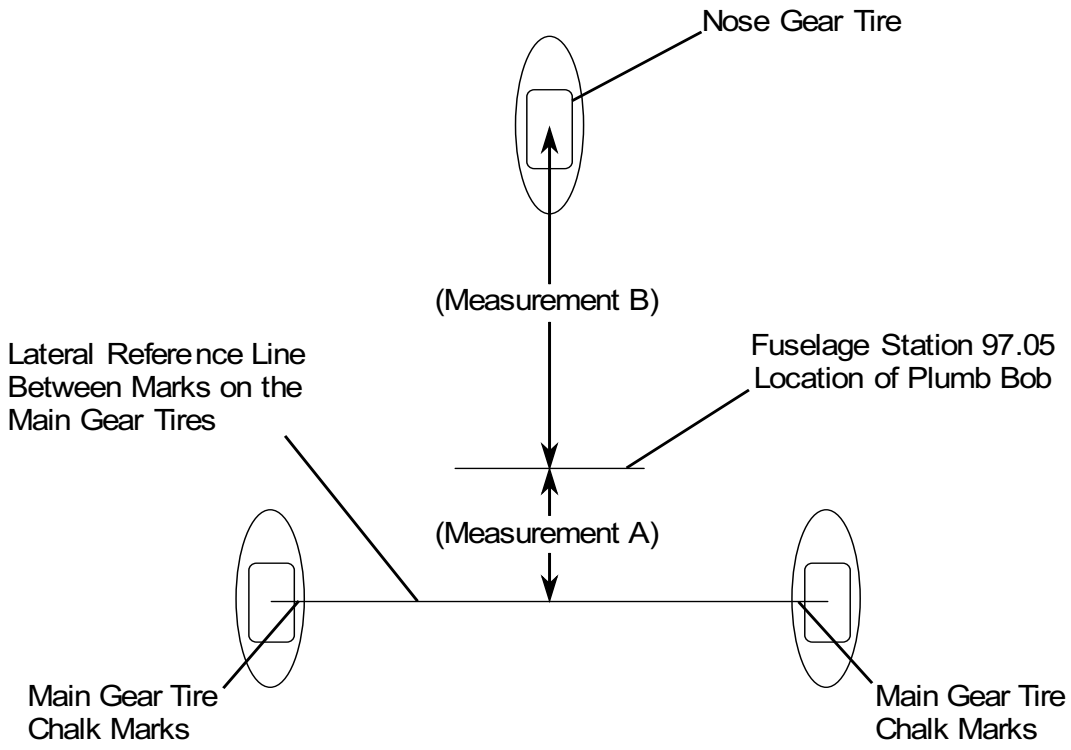
Figure 3 : Sheet 1 : Reference Point for on Wing Saddle



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 4 : Sheet 1 : Diagram of Measurements for Weighing

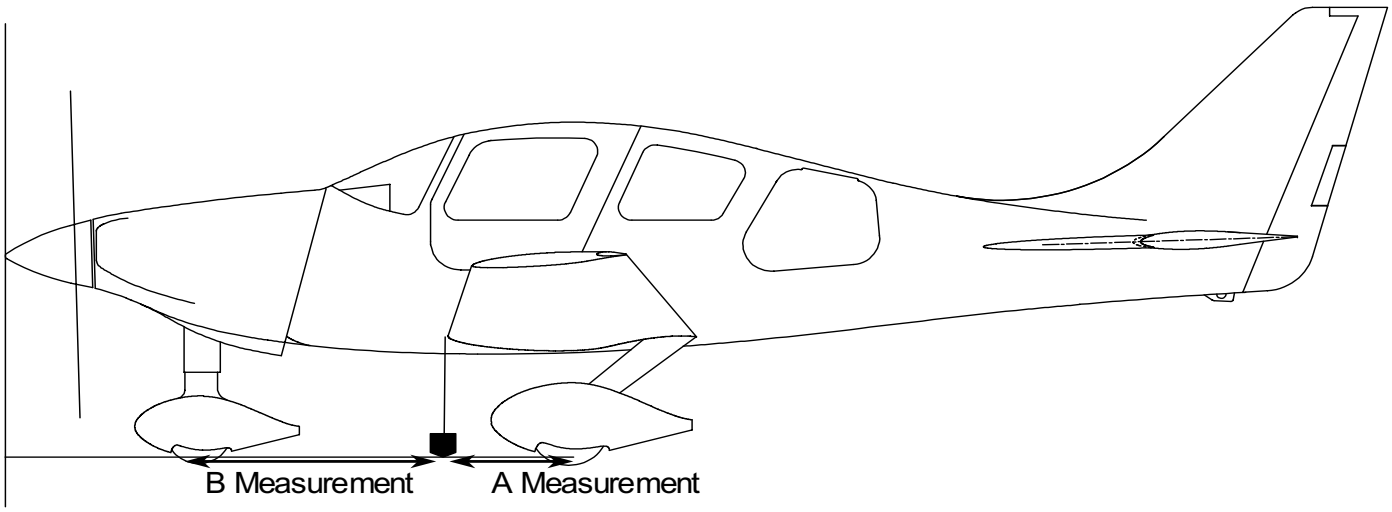
B11829



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 4 : Sheet 2 : Diagram of Measurements for Weighing

B11830



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

TOWING AND TAXIING - GENERAL

1. General

A. The following pages contain instructions for towing and taxiing the airplane. It is important to remember that the airplane has a free castoring nose wheel with stops at the 60 degree left and right positions. Personnel unfamiliar with the techniques required when taxiing an airplane with a free castoring nose wheel should be given appropriate instruction or a taxi checkout.

2. Ground Handling

CAUTION: Do not attempt to move the airplane by pushing or pulling on the propeller. This a common practice for airplanes with fixed pitch propellers, however, it is not recommended for constant speed propellers, since pressures applied to the propeller blades are transmitted to moving parts within the propeller hub. Over time, these forces could cause damage to the propeller.

A. Towing - A locking, hand-held tow bar is provided with the airplane and stored in the baggage compartment. The tow bar is inserted into two small holes in the nose wheel fairing, forward of the nose wheel axle. The tow bar must be locked in place before attempting to move the airplane. The tow bar is collapsible for storage by removing the locking pin. With the pin removed, slide the handle in and reinsert the locking pin. It is recommended that the airplane only be maneuvered during towing by use of the handheld tow bar. If it is necessary to tow with a vehicle, extreme care is required to ensure the rotation limits of the nose wheel (60 degrees left and right) are not exceeded. Since the rotation of the nose gear is limited by physical stops, rotating the gear beyond 60 degrees will damage the airplane.

B. It is a good idea to have another person serve as a spotter when towing the airplane, particularly if a vehicle is used. Remember that the airplane has vertical limitations as well as horizontal restrictions. The vertical stabilizer is frequently overlooked as an airplane is being pushed into a hanger with most of the attention directed towards the wingtips. When moving the airplane over uneven surfaces, remember that small up and down oscillations of the nose strut result in amplified movement of the vertical stabilizer. Finally, keep in mind that the height of the vertical stabilizer is affected by inflation levels of both the nose tire and strut. A flat tire or low nose strut will increase the height of the vertical stabilizer.

3. Taxiing

A. When taxiing, minimize the use of the brakes. Since the airplane has a free castoring nose wheel, steering is accomplished with light breaking. Avoid the tendency to ride the brakes by making light steering corrections as required and then allowing the feet to slide off the brakes and the heels to touch the floor.

B. Avoid taxiing in areas of loose gravel, small rocks, etc., since it can cause abrasion and damage to the propeller. If it is necessary to taxi in these areas, maintain low propeller speeds. If taxiing from a hard surface through a small area of gravel, obtain momentum before reaching the gravel.

C. The airplane is stable on the ground. The low wing design minimizes the tipping tendency from strong winds while taxiing. Still, the proper positioning of control surfaces during taxiing will improve ground stability in high wind conditions. Table 1 summarizes control positions that should be maintained for a given wind component.

Table 1. Control Positions for Wind Components

Wind Component	Aileron Position	Elevator Position
Left Quartering Headwind	Left Wing Aileron Up(Move Aileron Control to the Left)	Neutral(Hold Elevator Control in Neutral Position)
Right Quartering Headwind	Right Wing Aileron Up(Move Aileron Control to the Right)	Neutral(Hold Elevator Control in Neutral Position)
Left Quartering Headwind	Left Wing Aileron Down(Move Aileron Control to the Right)	Down Elevator(Move Elevator Control Forward)
Right Quartering Headwind	Right Wing Aileron Down(Move Aileron Control to the Left)	Down Elevator(Move Elevator Control Forward)

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

PARKING, MOORING STORAGE, AND RETURN TO SERVICE - DESCRIPTION AND OPERATION

1. Parking

A. During parking operations, it is best to head the airplane into the wind if possible. Normally, setting the parking brake is recommended, however, there are two situations where doing so is not a good idea.

(1) Do not set the parking brake if the brakes are overheated, which might result from a short field landing or extensive taxiing. It is best to not set the parking brake until the brakes have had a sufficient cooling period. A brake pad clamped to a hot chrome disk can cause uneven cooling of the brake disc, which could potentially warp it.

(2) Do not set the parking brake in cold weather. Accumulations of freezing rain, ice, and snow can freeze-weld the brake pad to the disk. Landing or taxiing in standing water at near-freezing temperatures can cause similar problems if the parking brake is set when the airplane is parked.

2. Securing the Airplane

A. In any event, whether the brakes are set or not set, the airplane should be chocked and the following items should be accomplished to secure the airplane.

B. Install the control lock.

C. Chock the main gear tires with chocks on both sides of each tire.

D. Attach a rope or chain to each tie-down point, and secure the rope or chain to a ramp tie-down point. There are three tie-down points, one on each wing and one on the tail. The ropes or chains should have a tensile strength of at least 750 lbs.

E. Install the pitot tube cover.

3. Storage

A. **Overview** - The storage of an airplane mostly deals with engine related items. Very little needs to or can be done to preserve the airframe, particularly for flyable and temporary storage. The best protection for the exterior is, of course, to hangar the airplane. If the airplane cannot be hangared, then a coat of wax using the material and techniques described in Section 8 of the *Pilot's Operating Handbook* should be applied to all exterior surfaces. In addition, all typical items associated with securing the airplane should be done. These include:

(1) Installing the pitot tube cover.

(2) Chocking all wheels and tying the airplane down with the parking brakes released.

(3) Installing the control lock.

(4) Topping off the fuel tanks.

(5) Cleaning the bolts and nuts on the brakes and applying a non-stick preservative like graphite or silicone.

(6) Installing other owner-option protection devices.

There are three types of storage categories; flyable, temporary, and indefinite. The time period and applicable storage procedure for each type is discussed below.

B. **Flyable Storage (7 to 30 days)** - If the airplane is to be maintained in flyable storage, then it should be flown for a minimum of 30 minutes every 30 days; ground running the engine is not a substitute for flying the airplane. During flyable storage, the propeller should be rotated by hand every seven days. This operation should include at least six complete revolutions of the engine. Stop the propeller 45 to 90 degrees from its original position. For maximum safety use the following procedures:

WARNING: Always assume that the engine could start when rotating the propeller by hand. Remain clear of the arc of the propeller blades at all times.

(1) Ensure that the ignition switch is set to the OFF position.

(2) Set the throttle to the CLOSED position.

(3) Set the mixture to IDLE CUT OFF.

(4) Set the parking brake and chock the wheels.

(5) Ensure that airplane tie-downs are secure.

(6) Open the cabin door on the pilot's side of the airplane.

(7) Always assume the propeller could start when moving it manually and use an appropriate technique for hand turning the propeller.

(8) Release the parking brake when the operation is completed.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

C. **Temporary Storage (up to 90 days)** - Use the following procedures to preserve the engine for temporary storage. Refer to the Airframe Preservation for Temporary or Indefinite Storage section below for airframe preservation items.

(1) Remove the top spark plug from each of the six cylinders and apply an atomized injection of preservation oil, MIL-L-46002, Grade 1. As the oil is injected into each cylinder, the piston should be near bottom dead center, and the preservation operation should be done at room temperature.

(2) When Step 1 is complete, and with none of the pistons at dead center, re-spray each cylinder thoroughly making sure to cover all interior surfaces.

(3) Install spark plugs.

(4) Spray approximately two ounces of preservation oil through the oil filler tube.

(5) Seal all engine openings exposed to the atmosphere with suitable plugs or moisture resistant tape.

(6) Tag engine, cowling, and other appropriate areas with the statement, "Do not turn propeller, engine preserved."

D. **Indefinite Storage (Over 90 Days)** - If the airplane is to be stored for a long period, follow the procedures listed below to preserve the engine. Refer to the Airframe Preservation for Temporary or Indefinite Storage section for airframe preservation items.

NOTE: During the storage period, FAA Airworthiness Directives and manufacturer's service bulletins may apply which require action based on calendar dates, not operating hours. These items must still be complied with even though the airplane is in storage.

NOTE: The dehydrator plugs must be visually checked every 30 days to verify that the color has not changed. Bad dehydrator plugs should be replaced. If more than half of the plugs change color, the bad plugs and all the desiccant bags on the engine should be replaced. Every six months the dehydrator plugs should be replaced and the cylinders re-sprayed with preservation oil. When removing the plugs, check the cylinder interior. If rust stains are noted, spray the cylinder with preservation oil, turn the prop through six revolutions, and then re-spray all cylinders.

(1) Drain the engine oil and refill with MIL-C-6529 Type II preservation oil. Start the engine and operate until normal temperature ranges are achieved. Fly the airplane for about 30 minutes and then allow the engine to cool to the ambient temperature.

(2) Remove the top spark plug from each of the six cylinders and apply an atomized injection of preservation oil, MIL-L-46002, Grade 1. As the oil is injected into each cylinder, the piston should be near bottom dead center, and the preservation operation should be done at room temperature.

(3) When Step 1 is complete, and with none of the pistons at dead center, re-spray each cylinder thoroughly making sure to cover all interior surfaces.

(4) Spray approximately two ounces of preservation oil through the oil filler tube.

(5) Install dehydrator plugs MS27215-1 or -2, in each of the top spark plug holes. Ensure the dehydrator plug is blue when installed. Protect and support the spark plug leads with AN-4060 protectors.

(6) Place a bag of desiccant in the exhaust pipes and seal the openings with moisture resistant tape.

(7) Seal the induction system with moisture resistant tape.

(8) Seal the engine breather by taping a dehydrator plug, M527215-2, in the lower end. Seal the "whistle hole" vent in the breather tube with moisture resistant tape.

(9) Tag engine, cowling, and other appropriate areas with the statement, "Do not turn propeller, engine preserved."

(10) Install plugs in engine cowl inlets, wing leading edge air inlets, and all other openings. **Do not plug or seal tank vents on the bottom of each wing.**

E. **Airframe Preservation for Temporary and Indefinite Storage** – If the airplane is to be stored for over 30 days, some or all the procedures below may be applicable, depending on the anticipated storage time period.

(1) Ensure the tires are free of grease, oil, tar, and gasoline. The presence of these items accelerates the aging process. Sunlight and static electricity convert oxygen to ozone, a substance that accelerates the aging process. Special tire covers can be installed which retard the erosion process.

(2) It is best if the weight of the airplane is removed from the tires to prevent flat spots. If the airplane cannot be blocked or set on jacks, then every 30 days each wheel should be rotated about 90 degrees to expose a new tire pressure point.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(3) If the airplane does not have a recent coat of wax, a new coat should be applied as discussed in Section 12-30-00, Exterior Cleaning and Care.

(4) Lubricate exposed exterior metal fittings, hinges, push rods, etc. Use plugs or moisture resistant tape to seal all openings except fuel vent holes and drain holes.

(5) Remove the battery and store in a cool, dry location. The battery may need periodic servicing and recharging depending on the storage period.

(6) Prominently tag areas where tape and plugs are installed.

4. Inspections During Temporary Storage

A. The following inspections should be performed while the airplane is in temporary storage:

(1) Check the cleanliness of the airframe as frequently as possible and remove any dust that has collected.

(2) Check the condition and durability of the protective wax coat and renew as required.

(3) Every 30 days, check the interior of at least one cylinder for evidence of corrosion.

5. Inspections During Indefinite Storage

A. The following inspections should be performed while the airplane is in indefinite storage:

(1) Check the condition of the dehydrator plugs every 30 days to verify that the color has not changed. Bad dehydrator plugs should be replaced. If more than half of the plugs change color, the bad plugs and all the desiccant bags on the engine should be replaced.

(2) Every six months the dehydrator plugs should be replaced and the cylinders resprayed with preservation oil. When removing the plugs, check the cylinder interior. If rust stains are noted, spray the cylinder with preservation oil, turn the prop through six revolutions, and then re-spray all cylinders.

NOTE: When an airplane has been in storage for a long period, the date of the required annual inspection may have passed. There is no requirement to perform this inspection during the temporary or indefinite storage period. However, the inspection must be completed before the airplane is returned to service.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

RESTORING - MAINTENANCE PRACTICES

1. Return to Service from Temporary Storage

A. To return an airplane that has been in temporary storage to active service, perform the following steps:

(1) Remove seal plugs, tape, and all methods of tagging the airplane, including items tagged on the airframe.

(2) Remove the bottom spark plug from each of the six cylinders and rotate the propeller several times to remove the preservation oil.

(3) Reinstall the spark plugs according to manufacturer's recommendations.

(4) Conduct a normal engine start, and idle the engine for several minutes until oil temperature is within normal limits. Monitor engine instruments to ensure they are within normal operating ranges.

(5) Stop the engine and inspect the entire airplane before test flying.

(6) Test fly the airplane.

2. Return to Service from Indefinite Storage

A. To return an airplane that has been in indefinite storage to active service, perform the following steps:

(1) Remove all dehydrator plugs, seal plugs, tape, and all methods of tagging the airplane including items tagged on the airframe.

(2) Drain the preservation oil, and service the airplane engine with the recommended lubricating oil.

(3) Remove the bottom spark plugs from each of the six cylinders, and rotate the propeller several times to remove the preservation oil.

(4) Re-install the spark plugs, and carefully rotate the propeller by hand several times to check for possible liquid lock.

(5) Conduct a normal engine start, and idle the airplane for several minutes until the oil temperature is within normal limits. Monitor all engine instruments to ensure they are within normal operating ranges.

(6) Stop the engine and inspect the entire airplane before test flying.

(7) Test fly the airplane.

3. Return to Service Airframe Items

A. To return the airframe portion of an airplane that has been in temporary or indefinite storage to active service, perform the following steps, as applicable:

(1) Remove all methods of tagging and sealing the airplane including any items on or in the engine area.

(2) Remove tire covers or other protective devices. Check the condition of the tires, and service to proper pressures. Cracked, deformed, and desiccated tires should be replaced.

(3) Thoroughly clean the exterior of the airplane, including the transparencies. If necessary, renew the protective wax coat. Refer to Section 12-30-00, Exterior Cleaning and Care, for instructions on care of the airframe.

(4) Check the condition and charge of the battery. If the battery is still serviceable, reinstall it in the airplane; otherwise, install a new battery.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

PLACARDS AND MARKINGS

1. General

A. The various airplane placards on the interior and exterior of the airplane are required items for the continued airworthiness of the airplane. The placards must be inspected at the required inspection intervals for cleanliness, legibility, and security. The following pages contain the text and location of all required interior and exterior placards. In addition, procedures for removal, replacement, and care are included.

2. Replacing Worn, Damaged, or Missing Placards

A. If necessary, refer to Chapter 11 in *The Cessna 300 (LC40-550FG) Parts Catalog* to determine the part number for the affected placard.

B. Use the following steps to remove and replace a placard:

(1) Apply the placard in a relatively warm area. It is best if the ambient air temperature and the temperature of the surface to which the placard is applied is above 70° F.

(2) Make a few reference marks around the old placard to aid in positioning the new one. If the placard is missing, refer to the Interior and Exterior Placards sections for the location, and then apply reference marks.

(3) Carefully remove the existing placard by raising one corner and slowly peeling it back. **Do not pull out on the Placard!** Pull in a manner that keeps the peeled portion near or parallel to the surface. It helps to apply primer remover between the glue on the back of the placard and the attachment surface.

(4) Do not remove the placard too quickly. A slow steady pull works best. Discard the placard once it is removed.

(5) Clean excess adhesive off of the attachment surface with PPG D837 spirit wipe.

(6) When the attachment surface is clean and dry, remove the paper backing on the new placard, and apply it using the reference marks described in step 2 above.

(7) Attach one end of the placard to the attachment surface, and slowly roll it on in a manner that avoids air bubbles. Because the airplane's surface has no rivets, air bubbles are infrequent.

(8) If the placard has a protective covering remove it at this point.

(9) If an air bubble does occur, prick the bubble with a small diameter needle. The number of holes depends on the size of the bubble. Five to ten needle holes are usually sufficient. Slowly work the placard until all air is removed.

3. Placard Care

A. Wash the placard with mild soap and water. Do not use petroleum based, caustic, or abrasive products. Avoid applying wax to placards because it may contain certain amounts of petroleum-based substances.

B. If there is any question about the composition of the cleaner being used, apply a small amount to a test corner of the placard, and wait a few minutes to see if it produces adverse results.

C. If aviation fuel accidentally comes in contact with a placard, immediately rinse with water.

D. Never apply paint to or paint over a placard.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

EXTERIOR - PLACARDS

1. Exterior Placards

A. Figure 1 contains images of exterior placards, by location.

(1) Sheet 1: On Oil Filter Access Door,

(2) Sheet 2: Near Pilot and Passenger Exterior Door Handles, On Main Wheel Fairing, On Nose Wheel Fairing, On Flaps Near Wing Root (Both Sides)

(3) Sheet 3: Near Fill Cap of Fuel Tank, Under Each Wing Near Fuel Drains, Under Left Side Wing Fillet Near Ground Power Supply Plug (S/N 40036 and On)

(4) Sheet 4: On Exterior of Gascolator Door (Underside of Fuselage), On Interior of Gascolator

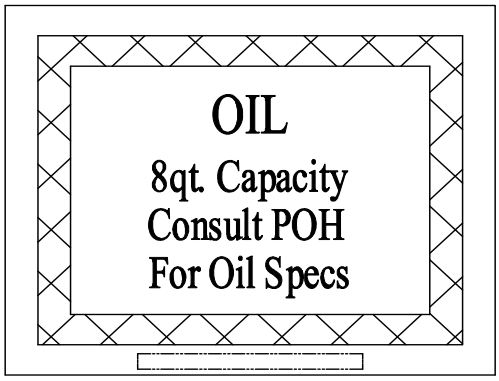
(5) Sheet 5: On Exterior of Fuselage - Forward of Wing on Pilot's Side

(6) Sheet 6: On Exterior of Fuselage - Forward of Wing on Copilot's Side, On Top of Nose Wheel Fairing (Pointing Aft), On Forward Portion of Nose Gear Fairing

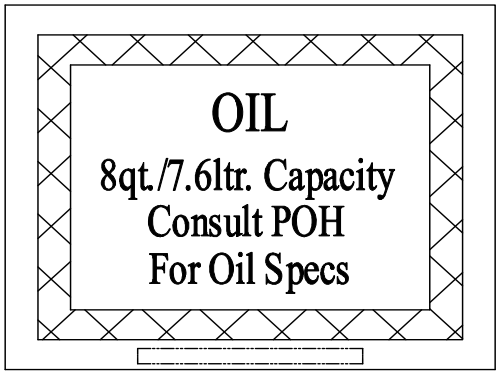
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Exterior Placards

B11778



Or

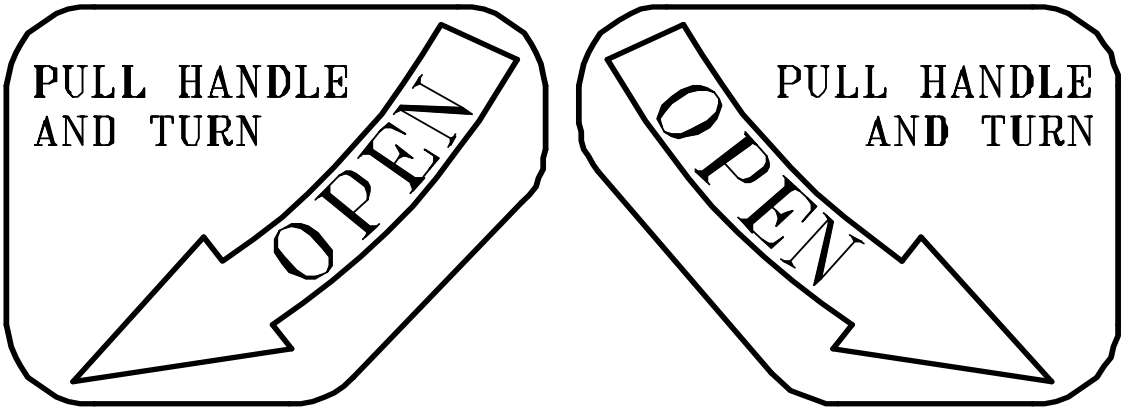


On Oil Filler Access Door

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 2 : Exterior Placards

B11773



Near Pilot and Passenger Exterior Door Handles

MAIN 55 psi

On Main Wheel Fairing

NOSE 88 PSI

On Nose Wheel Fairings

NO STEP

On Flaps Near Wing Root (Both Sides)

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 3 : Exterior Placards

B11774

AVGAS ONLY
MIN FUEL GRADE 100/100LL
TOTAL USABLE 49 GAL US
TOTAL CAPACITY 53 GAL US

Or

AVGAS ONLY
MIN FUEL GRADE 100/100LL
TOTAL USABLE 49 GAL US / 185 LTR
TOTAL CAPACITY 53 GAL US / 201 LTR

Near Fill Cap of Fuel Tank

FOR DRAINING OF WING FUEL SUMP:
TO OPEN: PRESS CUP GENTLY INTO BOTTOM OF VALVE TO DRAIN REQUIRED AMOUNT OF FUEL.
TO CLOSE: REMOVE CUP AND VALVE WILL CLOSE.

TO DRAIN WING TANKS: REFER TO MAINTENANCE MANUAL.

Under Each Wing Near Fuel Drains

12 VDC POWER
CONNECTION

Under Left Side Wing Fillet Near Ground Power Supply Plug (S/N 40036 and on)

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 4 : Exterior Placards

B11775

EMERGENCY
DOOR RELEASE
PRESS BUTTONS TO OPEN

On Exterior of Gascolator Door (Underside of Fuselage)

EMERGENCY DOOR RELEASE

Lift and turn cabin door handle.

Pull red strap loop.

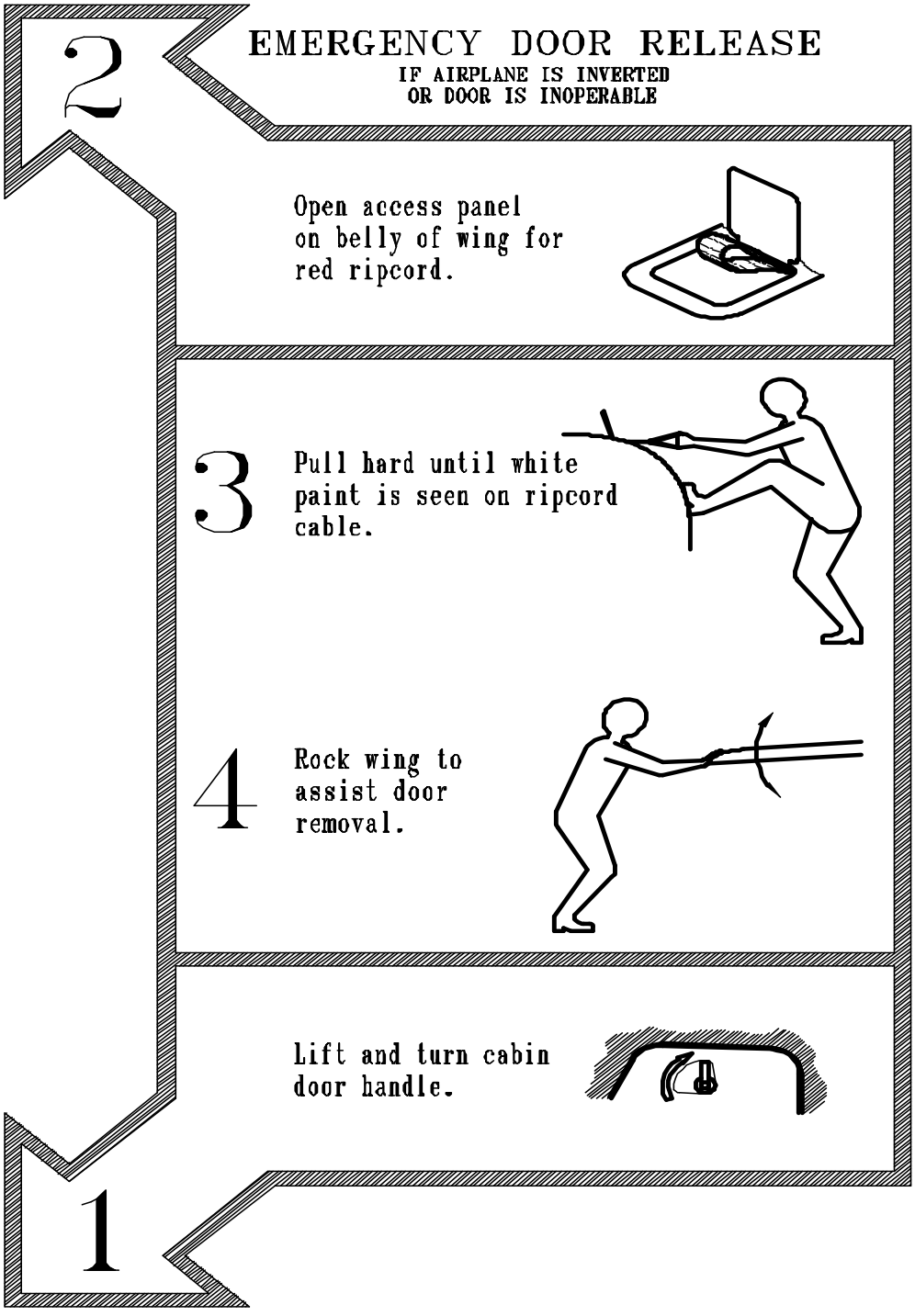


On Interior of Gascolator

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 5 : Exterior Placards

B11776

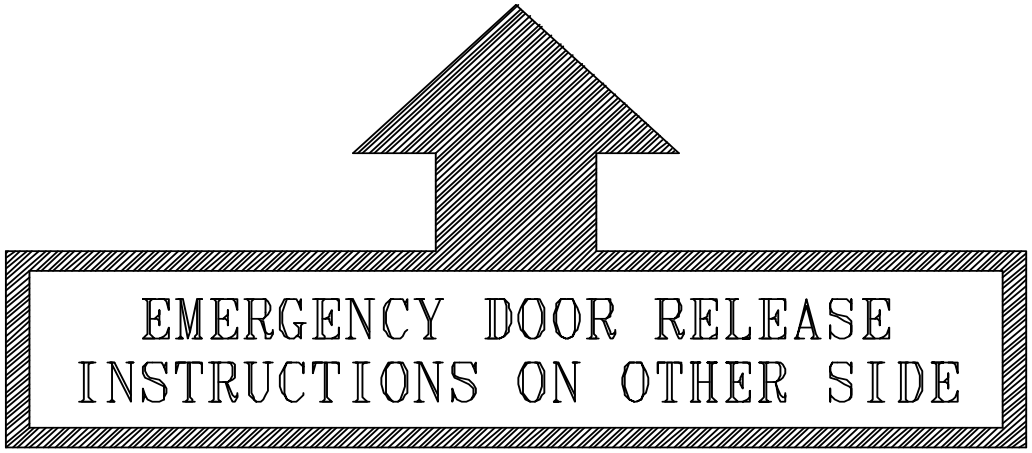


On Exterior of Fuselage - Forward of Wing on Pilot's Side

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 6 : Exterior Placards

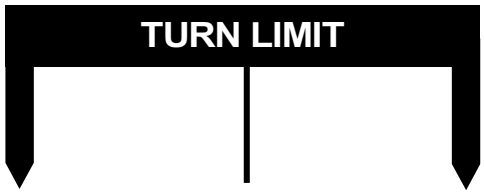
B11777



On Exterior of Fuselage - Forward of Wing on Copilot's Side



On Top of Nose Wheel Fairing - (Pointing Aft)



On Forward Portion of Nose Gear Fairing

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INTERIOR - PLACARDS

1. Interior Placards

A. Figure 1 contains images of interior placards, by location.

(1) Sheet 1: On Center Console Below Radios, Near Pilot and Copilot Interior Door Handles

(2) Sheet 2: Near Interior Door Handle on Passenger Side, On Bottom of Baggage Compartment Door Opening, On the Front of the Pilot's Seat Base on Escape Hatchet, In Aft Cabin on Aft Baggage Bulkhead, Under Left Rear Seat Next to Leveling Washer

(3) Sheet 3: Under All Seats, On Parking Brake Handle, Near Airspeed Indicator, Near Manifold Pressure Gauge

(4) Sheet 4: On Magnetic Compass, Above Copilot's Fresh Air Vent, Near the Left Dimmer Switch on the Pilot's Knee Bolster, On the Back Lower Portion of the Front Seat Headrests, On Forward Portion of Front Seat Center Armrest near Fuel Selector

(5) Sheet 5: On Engine Instrument Panel Above Fuel Gauge, On Engine Instrument Panel near EGT/CHT (when optional JPI digital engine scanner is installed)

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Interior Placards

B11768

FIRE EXTINGUISHER LOCATED UNDER CO-PILOT'S SEAT

The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane in the Utility category. Other operating limitations which must be complied with when operating this airplane in this category are contained in the Airplane Flight Manual.

Utility Category – No acrobatic maneuvers approved, except those listed in the Pilot's Operating Handbook.

FLIGHT INTO KNOWN ICING PROHIBITED.

SPINS PROHIBITED.

APPROVED FOR DAY/NIGHT – VFR/IFR.

NO SMOKING

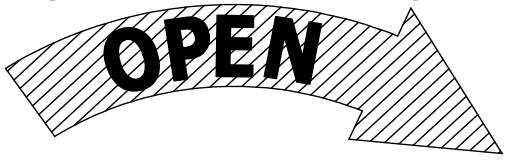
On Center Console Below Radios

EMERGENCY ESCAPE HATCHET UNDER FRONT OF PILOT SEAT

PULL HANDLE AND TURN



PULL HANDLE AND TURN



EMERGENCY ESCAPE HATCHET UNDER FRONT OF PILOT SEAT

Near Pilot and Copilot Interior Door Handles

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 2 : Interior Placards

B11769



Near Interior Door Handle on Passenger Side

TOTAL BAGGAGE WEIGHT 120 LBS., SHELF WEIGHT 20 LBS. MAX.
SEE WEIGHT AND BALANCE DATA FOR ADDITIONAL LOADING INSTRUCTIONS

Or

TOTAL BAGGAGE WEIGHT 120 LBS. (54 kg.), SHELF WEIGHT 20 LBS. (9 kg.), MAX.
SEE WEIGHT AND BALANCE DATA FOR ADDITIONAL LOADING INSTRUCTIONS

On Bottom of Baggage Compartment Door Opening

IN EMERGENCY
BREAK DOOR WINDOW

On the Front of the Pilot's Seat Base on Escape Hatchet

EMERGENCY LOCATION TRANSMITTER
LOCATED AFT OF THIS POINT. IT MUST
BE MAINTAINED IN ACCORDANCE WITH
THE FEDERAL AVIATION REGULATIONS

In Aft Cabin on Aft Baggage Bulkhead

AIRCRAFT LEVELING WASHER.
DO NOT REMOVE WASHER.

Under Left Rear Seat Next to Leveling Washer

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 3 : Interior Placards

B11770

SEAT BOTTOM CAVITY
MUST REMAIN CLEAR

Under All Seats

BRAKE
ENGAGED

On Parking Brake Handle

MANEUVERING SPEED: **148 KIAS (3400 LBS)**
127 KIAS (2500 LBS)

Near Airspeed Indicator

ABOVE 12,000 FT (PA) REDUCE: **V_{NE} 5 KIAS/1000 FT**
V_{NO} 4 KIAS/1000 FT

Near Airspeed Indicator

DO NOT EXCEED 20"
MANIFOLD PRESSURE
BELOW 2200 RPM

Near Manifold Pressure Gauge

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 4 : Interior Placards

B11771

For	N	30	60	E	120	150
Steer						
For	S	210	240	W	300	330
Steer						

DATE RADIOS ON

The magnetic direction indicator is calibrated for level flight with the engine, radios, and strobes operating.

On Magnetic Compass

Acrobatic Maneuvers:
Chandelles.....150 KIAS entry speed
Lazy Eights....150 KIAS entry speed
Steep Turns....150 KIAS entry speed
Stalls.....Slow Deceleration
SPINS PROHIBITED

Above Copilot's Fresh Air Vent



ALT. STATIC

Near the Left Dimmer Switch on the Pilot's Knee Bolster

NO SMOKING

EMERGENCY ESCAPE HATCHET
UNDER FRONT OF PILOT SEAT

On the Back Lower Portion of the Front Seat Headrests
(Embroidered into the leather with red stitching)

OFF
LIFT AND TURN

On Forward Portion of Front Seat Center Armrest Near Fuel Selector

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 5 : Interior Placards

B11772

MAXIMUM FUEL IMBALANCE NOT TO EXCEED 10 GAL

On Engine Instrument Panel Above Fuel Gauge

MAX
CHT
460°F

On Engine Instrument Panel Near EGT/CHT
(when optional JPI digital engine scanner is installed)

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SERVICING - GENERAL

1. Servicing

A. There are recommended and required servicing intervals specified in Section 5-10-00 and Section 5-20-00 of this maintenance manual. It is important to note that the servicing items for the recommended and required inspection intervals are based on typical operations. If the owner or operator of the airplane uses the airplane on an ongoing basis in an atypical environment, then the servicing procedures must be modified accordingly. These environmental conditions might include extremes in ambient temperature or humidity, operation in areas of high dust or sand, or unusual operating requirements, to mention a few.

B. In general, minimal servicing of the airplane is required between required maintenance inspection other than fuel, oil, and maintenance of proper tire pressures. In some instances, the nose strut may require unscheduled service, depending on how the airplane is used.

2. Refueling and Defueling the Airplane

A. The high-speed characteristics of the airplane make generation of static electricity more likely, so it is important for the airplane to be grounded to the fuel source during refueling and defueling operations. Place the fuel source grounding clamp on the right or left exhaust stack of the airplane before touching the filler neck of the fuel tanks with metal parts of the ground refueling/de-fueling equipment. Remember that refueling is often done at the conclusion of a flight, and the exhaust stacks may still be hot, so care must be used when attaching the clamp

B. Some defueling is possible using the defueling feature on the delivery system of the Avgas fuel supplier. This procedure is usually adequate for removing fuel when gross takeoff weight is an issue. To completely defuel the airplane use the following steps:

(1) Select a well-ventilated area for the defueling operation.

(2) Remove all fuel possible from the tank or tanks using the defueling feature on the Avgas delivery system.

(3) Disconnect the fuel line from the auxiliary fuel pump forward of the firewall.

(4) Connect a flexible hose to the fuel line, and direct the hose into a fuel receptacle.

(5) Set the fuel selector to either the left or right tank, depending on which tank is to be de-fueled.

(6) Operate the auxiliary boost in low until the tank is drained. When the pump first starts to cavitate, turn it off, and attempt no further defueling with the auxiliary boost pump.

3. Procedures for Draining the Fuel System

A. Using the procedures described in Procedures For Refueling and Defueling the Airplane will leave approximately three to four gallons in the fuel tank. If further draining is required to work on a fuel tank or to establish the empty weight with unusable fuel, use the following procedure:

(1) Select a well-ventilated area for draining fuel from the tank.

(2) Create a small (2-inch diameter) dam around the wing tank drain with aluminum foil tape (sometime referred to as speed tape) or a similar substance.

(3) Place a container with a large opening under the fuel drain.

(4) Set the wing fuel drain to the locked-open position, and drain until fuel stops running.

(5) At this point, approximately 4 to 8 ounces of undrainable fuel will remain in each tank. To establish the airplane's empty weight with unusable fuel, ensure the fuel drains are closed, and then add three gallons of fuel to each tank.

(6) If all fuel is to be drained from the airplane, perform the above procedures for both tanks, and then drain the gascolator.

4. Fuel Drains

A. The inboard section of each tank contains a fuel drain near the lowest point in each tank. The fuel drain can be opened intermittently for a small sample, or it can be locked open to remove a large quantity of fuel. The gascolator, or fuel strainer, is located under the fuselage, on the left side, near the wing saddle. The gascolator is a conventional drain device that operates by pushing up on the valve stem. There is an internal bypass in the strainer that routes fuel around the filter if it becomes clogged.

5. Fuel Contamination

A. To test for fuel contamination, fuel samples must be taken from each of the wing drains and from the gascolator before each flight and after the airplane is refueled. Wait approximately 10 minutes before taking a sample after refueling to allow

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

water and other contaminates to settle to the bottom of the tank. There are three types of contaminates that can inadvertently be introduced to the fuel system:

(1) sediment such as dirt and bacteria

(2) water

(3) the improper grade of fuel

B. The accumulation of sediments is an inherent issue with most aircraft and can never be completely eliminated. Refueling the airplane at the conclusion of each flight and using fuel from a supplier who routinely maintains the filtration of the refueling equipment will lessen the problem somewhat. If specks are observed in the fuel sampler, continue the sampling operation until no debris is observed. Be sure the sampling device is clean before using it.

C. The two more common sources of water contamination are condensation of water from the air within a partially filled fuel tank and water-contaminated Avgas from a fuel supplier. Again, refueling after each flight and proper filtration of the fuel delivery system will mitigate water contamination. Water, which is heavier than Avgas, will collect near the bottom of the sampling device. If water is observed in the fuel sampler, take additional fuel samples until all the water is removed.

D. Aviation fuel is dyed according to its grade, and on new aircraft, like the Cessna 300 (LC40-550FG), the filler neck is sized to only accept fuel of the proper grade. Still, the color of the fuel must be verified according to the specifications in the Fuel Contamination section, since the fuel truck might have been refilled improperly. If fuels of two different grades are mixed, the fuel sample will be clear. If an inferior, improper grade of fuel is noted, completely defuel and drain both tanks, and refuel with the proper grade of Avgas.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

REPLENISHING - SERVICING

1. Fuel Servicing and Recommended Fuel Grades

A. If possible and practicable, the airplane should be serviced at the conclusion of each flight. This procedure will significantly mitigate water accumulation in the fuel tanks. The following fuel grades are approved.

(1) 100LL Grade Aviation Fuel (Blue)

(2) 100 Grade Aviation Fuel (Green)

2. Fuel Capacities

A. Total Capacity: 106 US Gallons

B. Total Capacity Each tank: 53 US Gallons

C. Total Usable Fuel: 49 US Gallons in each tank (98 US Gallons Total)

3. Approved Fuel Additives

A. Under certain ambient conditions of temperature and humidity, water can be supported in the fuel in sufficient quantities to create restrictive ice formation along various segments of the fuel system. To alleviate the possibility of this occurring, it is permissible to add Isopropyl Alcohol to the fuel supply in quantities not to exceed 3 percent of the total. In addition, ethylene glycol monomethyl ether (EGME) and diethylene glycol monomethyl ether (DiEGME) compounds in accordance with military specification MIL-I-27686E may be added for this purpose. The EGME and DiEGME compounds must be carefully mixed with fuel concentrations not to exceed 0.15 percent by volume.

B. It is important that the approved fuel additives are mixed in correct proportions. Consideration is required to ensure the appropriate concentration levels are achieved when the tank is filled. For example, adding 40 gallons of fuel with a 0.15 percent concentration of EGME to a tank with 10 gallons of untreated fuel will produce a mixture of something less than 0.15 percent. Consideration must also be made for the unusable fuel in the tank since it will be combined with the total mixture.

C. The additives shall be added as the fuel is introduced to the fuel tank so that the mixture is properly combined. Alternatively, the additive can be mixed with a small amount of fuel in a separate container, such as a five-gallon can, and added to the fuel tank before normal fueling. Table 301 lists the number of ounces of each additive for a given fuel quantity.

4. Fuel Additive Mixture Table

WARNING: Proper mixing of EGME and DiEGME compounds is extremely important because concentrations more than 0.15 percent by volume can have a harmful effect on engine components.

Table 301. Fuel Additive Mixture Table

Fuel(Gallons)	Isopropyl Alcohol, 3 percent (fl. oz.)	EGME and Di-EGME, 0.15 percent (fl. oz.)		Fuel(Gallons)	Isopropyl Alcohol, 3 percent (fl. oz.)	EGME and Di-EGME, 0.15 percent (fl. oz.)
1	3.8	0.2		27	103.7	5.2
2	7.7	0.4		28	107.5	5.4
3	11.5	0.6		29	111.4	5.6
4	15.4	0.8		30	115.2	5.8
5	19.2	1.0		31	119.0	6.0
6	23.0	1.2		32	122.9	6.1
7	26.9	1.3		33	126.7	6.3
8	30.7	1.5		34	130.6	6.5
9	34.6	1.7		35	134.4	6.7
10	38.4	1.9		36	138.2	6.9
11	42.2	2.1		37	142.1	7.1
12	46.1	2.3		38	145.9	7.3
13	49.9	2.5		39	149.8	7.5
14	53.8	2.7		40	153.6	7.7

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

15	57.6	2.9		41	157.4	7.9
16	61.4	3.1		42	161.3	8.1
17	65.3	3.3		43	165.1	8.3
18	69.1	3.5		44	169.0	8.4
19	73.0	3.6		45	172.8	8.6
20	76.8	3.8		46	176.6	8.8
21	80.6	4.0		47	180.5	9.0
22	84.5	4.2		48	184.3	9.2
23	88.3	4.4		49	188.2	9.4
24	92.2	4.6		50	192.0	9.6
25	96.0	4.8		51	195.8	9.8
26	99.8	5.0		52	199.7	10.0

5. Engine Oil Capacity

A. The dipstick and oil filler cap access door are located on the top left engine cowl about two feet from the propeller hub. The engine must not be operated with less than six quarts of oil and must not be filled above eight quarts. For extended flights, the oil should be brought up to full capacity.

B. The engine drain-refill capacity is 8 quarts of oil. The airplane engine holds approximately 11 quarts of oil, however, about 3 quarts are for the oil cooler, oil filter, and propeller governor and cannot be drained from the system. Before checking the oil on a hot engine, ensure sufficient time has elapsed to allow the oil to drain back into the sump.

6. Recommended Oil for Engine Break-In Period

A. During the engine break-in period, straight mineral oil must be used for the first 25 hours unless the oil consumption has not stabilized. If the oil consumption has stabilized after the first 25 hours of the airplane's time in service, the oil and oil filter must be changed and a new supply of Teledyne Continental Motors specification MHS-24 (latest revision) ashless dispersant oil must be used. At 50 hours of time in service, the oil and oil filter shall be changed and the filter and discarded oil checked for evidence of metal particles. Thereafter, the oil and oil filter must be changed at every 100 hours of time in service.

B. If after the initial 25 hour break-in period the oil consumption has not stabilized, use the following procedure:

(1) Inspect and replace the oil filter.

(2) Drain and inspect the engine oil.

(3) Install a fresh supply of approved mineral oil.

(4) Continue to monitor oil consumption.

(5) When oil consumption stabilizes, remove, inspect, and replace the oil filter. Drain and inspect the engine oil, and add a new supply of Teledyne Continental Motors (TCM) specification MHS-24 (latest revision) ashless dispersant oil.

C. In the extremely unlikely event the oil consumption has not stabilized at 50 hours of time in service, the cylinders may need de-glazing or some other problem may exist. In either event the issue should be referred to TCM.

7. Oil Servicing

A. The oil grades shown in the Recommended Oil Grades section are recommended after the initial engine break-in period. Only lubricant oils conforming to Teledyne Continental Motors Specification MHS-24D (latest revision) can be used. Note, the approval for use of MHS- 25 synthetic oils has been removed. Each time the oil and the oil filter are changed, the discarded filter and oil must be checked for evidence of metal particles. Refer to Chapter 6 of the Teledyne Continental Motors maintenance manual.

8. Oil Filter Servicing

A. A full flow, spin on-type, 20-micron oil filter is used. As mentioned previously, the filter must be changed during the initial break-in period at 25 and 50 hours time in service. Thereafter, the filter must be replaced at every 100 hours time in service interval. If the airplane is predominately operated in conditions of high dust or other atmospheric debris, it is advisable to change the filter at 50 hour intervals. Refer to Chapter 6 of the Teledyne Continental Motors maintenance manual instructions for removal and replacement of the oil filter. Use a TCM filter or approved equivalent.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

9. Recommended Oil Grades

A. The following oil grades are recommended for the two ambient temperature ranges shown below:

(1) Below 40° F: SAE 30, 10W30, 15W50, or 20W50

(2) Above 40° F: SAE50, 15W50, 20W50, or 20W60

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FILTER, STRUT, BRAKE AND BATTERY - SERVICING

1. Induction Filter Servicing

A. The airplane has an oil impregnated, cotton gauze air filter, Part No. LA71844119. The cylindrical filter is a sandwich containing two wire screens that encase the gauze mesh. The filter must be serviced every 100 hours or more frequently if operating in areas of high atmospheric debris. To service the filter, use the following procedure:

(1) Remove the air filter from the engine per instructions in Section 71-60-00, Engine Air Filter Removal and Cleaning.

(2) Tap the filter a few times to remove larger surface dirt, then gently brush with a soft bristle brush.

(3) Spray filter cleaner (K and N Engineering Kit Part No. DA-71844119) liberally onto the entire element, and let soak for 10 minutes. Alternatively, the filter can be rolled in a shallow container filled with the cleaning solution until the unit is completely coated. Remove from the solution and let stand for 10 minutes. Never use gasoline, steam, caustic solutions, strong detergents, or part cleaning solvents.

(4) Rinse the filter with low-pressure water. Always flush from the clean side to the dirty side (inside to the outside of the filter). This removes dirt without further embedding it into the filter.

(5) After rinsing, gently shake off excess water, and let the filter drip-dry naturally for about an hour. Do not use compressed air, an open flame, or heat dryers. Compressed air will blow a hole in the element, while heat tends to shrink the cotton filter material.

(6) Apply aerosol or squeeze bottle oil (K and N Engineering Kit Part No. DA-71844119) to the cotton fiber. Ensure that oil is applied to each pleat of the filter. Set filter aside for about 20 minutes to allow oil to wick into the cotton fiber. Never use automatic transmission fluid, motor oil, diesel fuel, WD-40, LPS, or other light-weight oils.

(7) Inspect the filter, and oil areas that are not oil coated.

(8) Reinstall the filter per the instructions in Section 71-60-00, Engine Air Filter Removal and Cleaning.

B. When servicing the engine, ensure that the filter does not come in contact with gasoline, steam, caustic solutions, strong detergents, or part cleaning solvents. These substances can cause filter deterioration, and the filter must be replaced if any of these chemicals are inadvertently applied.

2. Tires and Wheels Servicing

A. Ensure tires are serviced to their proper pressures. Refer to Section 6-00-00 for pressure specifications. The following items must also be inspected:

(1) Check tires for flat spots, splitting, dry rot, cuts, and any other evidence of damage.

(2) Check valve stem slip marks for evidence of slippage.

(3) Check wheels for damage.

(4) Check wheel bearings for condition and lubrication.

CAUTION: The profile of replacement tires that are not a recommended brand should be measured precisely to ensure they are the same height and width. The use of tires that have slightly larger profiles can cause damage to the tire and to the wheel pant, particularly during landing operations.

B. **Tire Considerations** - The airplane is normally delivered with Goodyear tires. These tires have a profile that provides about 3/8 inch clearance between the tire and wheel pants. Other brands of tires with similar specifications and TSOs may have slightly larger profiles. Tires with larger profiles are not recommended since damage to the tire or wheel pant is possible, particularly during landing. If other brands of tires are used, the profile of the tire must be precisely measured and compared with the Goodyear tire.

3. Servicing the Nose Strut

A. The nose strut is normally serviced at required maintenance inspections. If less than three to four inches of chrome are visible on the nose strut or a low oil level is indicated, then unscheduled servicing is necessary. A low oil level in the nose wheel strut may be indicated by one or both of two symptoms. First, there will a general deterioration in shimmy damping of the nose strut. Second, the nose will have a tendency to bounce noticeably while taxiing. If either or both of these conditions are experienced, a low oil level in the nose strut is the most likely cause.

(1) **Cessna Nose Strut** (Refer to Figure 301 and Figure 302.)

CAUTION: Always wear safety goggles when releasing gas pressure.

WARNING: Removal of the AN7-6A bolt without de-pressurizing the strut could cause serious injury.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(a) Remove the nose strut from the nose gear per instructions in Section 32-20-00.

(b) Remove the valve cap from the strut Schrader valve. Using a small flat bladed screwdriver, gently press in on the Schrader valve core stem to slowly bleed off nitrogen gas pressure in the strut.

(c) Remove the AN7-6A bolt at the top of the strut.

(d) Pull the strut shaft to its fully extended position.

(e) Inflate the strut with nitrogen gas to a pressure of 50 psi.

(f) With the strut standing vertically, add MIL-H-5606F hydraulic oil through the AN7- 6A bolt hole until the chamber is full.

(g) Create an oil bleed device composed of a flexible hose inserted into a reservoir filled with MIL-H-5606F hydraulic oil. Ensure the hose is filled with oil and attach the free end to the AN7-6A bolt hole. Cycle the strut up, down, left, and right through its full range of motion until all air is removed.

(h) With the strut fully extended, remove the valve core from the Schrader valve and release the nitrogen gas pressure.

(i) Pinch shut the flexible hose on the oil bleed device and push the strut shaft up 3/4 inch from its fully extended position to correctly position the internal piston.

(j) Un-pinch the flexible hose.

(k) Ensure the valve core is free from contaminates and reinstall it into the Schrader valve. Tighten snug.

(l) Slowly pull the strut shaft to its fully extended position.

(m) Remove the bleed device and add additional hydraulic oil until the chamber is filled to the top.

(n) Replace the AN7-6A bolt and tighten snug.

(o) Inflate the strut with nitrogen gas until pressure reaches 250±25 psi. Best results are obtained using the following two techniques:

1 Apply enough physical force on the nitrogen hose chuck to ensure a tight seal on the filler valve. The volume of area being filled is small and requires a lot of physical pressure to hold the chuck on the valve.

2 When the strut is filled, remove the air hose chuck from the filler valve as quickly as possible. A persistent low nose gear strut is frequently the result of losing 50 pounds or so of pressure when the air chuck is removed. Over-pressurization will prevent full castoring movements of the nose wheel.

(p) With the strut firmly placed on the ground, attempt to compress the strut by hand. If the strut can be compressed, repeat the above instructions until all air is removed and the strut cannot be compressed.

(q) Torque the AN7-6A bolt at the top of the strut 80 to 100 in.-lbs.

(r) Install the Schrader valve cap and torque 10 to 15 in.-lbs.

(s) Install the nose strut into the nose gear per instructions in Section 32-20-00.

NOTE: Persistent and frequent loss of oil is an indication of more serious problems. The oil seals may need replacement or there may be issues with the integrity of the cylinder. Refer to Chapter 32 for information.

(2) **ESCO Nose Strut** (Refer to Figure 303.)

(a) Remove the lower cowling, using procedures described in Section 71-10-00, to expose the filler valve (Schrader valve).

(b) Remove all the weight from the nose strut by placing ballast on the tail, and let the strut settle for one hour.

(c) Release the nitrogen gas from the strut by pressing on the stem of the filler valve until most of the nitrogen is released. Hold a rag over the valve stem and use the hand to release the pressure to prevent a small amount of oil from being scavenged from the main cylinder as the nitrogen is released.

(d) Partially remove the valve core to evacuate the remaining gas in the cylinder.

(e) Remove the Schrader valve.

(f) Ensure that the strut is fully extended.

(g) Hydraulic oil that meets MIL-H-5606F can now be added slowly with a pump action oil can. Add oil until the level in the cylinder reaches the bottom of hole from which the Schrader valve was removed.

(h) Rotate the strut left and right throughout its full range of rotation (60 degrees each direction) to completely fill

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

internal components of the strut with oil. When internal components are full of oil, resistance should be felt while rotating the strut. Keep adding oil while rotating until the oil drains back out of the filler valve hole and no more can be added.

(i) Refit the Schrader valve and torque 150 to 200 in.-lbs.

(j) Ensure that the strut is fully extended. Insert the air hose chuck onto the valve stem. Fill until pressure reaches 250 psi. Best results are obtained using the following two techniques:

1 Apply enough physical force on the nitrogen hose chuck to ensure a tight seal on the filler valve. The volume of area being filled is small and requires a lot of physical pressure to hold the chuck on the valve.

2 When the strut is filled to 250 psi, remove the air hose chuck from the filler valve as quickly as possible. A persistent low nose gear strut is frequently the result of losing 50 pounds or so of pressure when the air chuck is removed.

(k) Repeat steps (c) through (g) and finish filling the strut with oil until oil drains back out the filler valve hole and no more can be added.

(l) Refit the Schrader valve and torque 150 to 200 in.-lbs. Insert the air hose chuck onto the valve stem. Fill until pressure reaches 250 psi, replace the Schrader valve cap and tighten snug. Over-pressurization will create a nose high attitude while taxiing and will prevent full castoring movements of the nose wheel.

(m) Lower the nose by progressively removing ballast from the tail. Pull down on the propeller to exert downward pressure on the nose gear. Verify that three to four inches of chrome are visible on the nose strut.

(n) Replace the lower cowling per instructions in Section 71-10-00.

NOTE: Persistent and frequent loss of oil is an indication of more serious problems. The oil seals may need replacement or there may be issues with the integrity of the cylinder. Refer to Section 32-20-00 for information.

4. Brake Fluids

A. Under most conditions, the airplane will not require servicing of the hydraulic system. There is a small hydraulic reservoir mounted on the left upper portion of the firewall (engine side). The reservoir contains an Allen screw, however, this area is not normally used for servicing the airplane. If brake sponginess is experienced, this is an indication that there is air in the system. More important, it may be an indication of a hydraulic leak in the brake system, and the areas proximate to the hydraulic lines, master cylinders, and brake assembly must be inspected for evidence of hydraulic oil. If no leaking is detected, then the brakes should be bled. Section 32-40-00 contains instructions for bleeding the brakes. If hydraulic fluid is added, use MIL-H-5606F.

5. Battery Servicing

A. The installed battery is a Concorde RG-35A, 26 amp-hour, valve regulated lead-acid (VRLA) design. Since the battery has no electrolyte, there is no required servicing of the unit. The posts and cables are serviced at 100 hour inspections if applicable, otherwise, they are maintained during the annual inspection. It is recommended that the battery be replaced every four years or sooner if poor overall performance is experienced.

6. Cleaning Aircraft

A. **Exterior Cleaning and Care** - The exterior painted surfaces are cleaned by washing with mild soap and water and drying with a soft towel or chamois. When operating in salt air environments, you will need to wash the airplane more frequently. The seal coats that are applied to the painted surface, in most instances, will provide adequate protection from moisture and the sun. Some additional protection is provided by waxing the painted surface and facilitates washing the airplane since bugs and dirt will not adhere as tightly to a waxed surface. A wax with a high concentration of carnauba is recommended. There are several commercial boat waxes available that are ideal for this use. Be sure to read the label with an eye for the percentage of carnauba in the compound.

NOTE: The exterior of the airplane should not be waxed within the first 90 days of the date of delivery. This period will ensure the painted surface has adequate time to cure. The exterior paint color on the upper fuselage area and the top of the wings has a good heat reflection index. This good index is required to ensure the continued bonding and integrity of the composite material. Only approved Cessna paint colors are permitted in these areas. Care must be taken to not lay dark, heat absorbing material on the top area of the wings and fuselage.

B. **Cleaning the Windshield and Windows** - The proper care of the windshield and windows (sometimes referred to as transparencies) is one of the more important exterior care items on the airplane. Never do anything that will scratch the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

surface of the acrylic plastic. The following points for cleaning and caring for the transparencies should be observed. Refer to the Transparency Repair section of Chapter 51 for approved cleaning materials and expanded procedures.

CAUTION: Do not use anything containing ammonia, aromatic solvents like MPK, acetone, lacquer thinner, paint stripper, gasoline, benzene, alcohol, anti-ice fluid, hydraulic fluid, fire extinguisher solutions, or window cleaner on the acrylic window surfaces. The use of these substances may cause the surface to craze.

NOTE: To remove difficult substance such as tape residue, oil, and grease, the safest solvents are 100 percent mineral spirits or kerosene. Some alcohols are safe, such as isopropyl alcohol.

(1) Prior to cleaning the windows, it is recommended that rings and watches be removed, as they can cause deep scratches. Long-sleeved shirts should be turned up a few rolls to hide exposed buttons.

(2) When removing bugs and dirt, avoid touching the surface. If possible, remove most of the dirt by flushing the windows and windshield with water and a mild dish soap mixture. Allow the accumulation of dirt and/or bugs to soak for a few minutes. If rubbing is required, a bare hand is best. When all the debris on the surface of the window is loosened, apply a second water flush, and then dry with a 100 percent cotton cloth.

(3) Use a good quality, non-abrasive cleaner/polish specifically intended for acrylic windows, and apply per the manufacturer's instructions. Use up and down or side to side movements when polishing. Never use a circular movement as this can cause glare rings.

(4) The best polishing cloth is the softest cotton available. One hundred percent cotton flannel is ideal and available in yard goods stores. **Never** use any type of paper product or synthetic material. In particular, never use shop rags or shop towels. Be sure the polishing cloth is clean and dry. Reserve polishing cloths should be stored in a plastic bag to limit dirt accumulation.

(5) Small scratches, the type that can be seen but cannot be felt with a fingernail, should be filled with a polishing compound that has scratch filling properties. A good quality, non-abrasive cleaner/polish specifically intended for acrylic windows frequently has scratch-filling properties and is satisfactory for regular use. Some scratches cannot be filled with a scratch-filling product. While the scratches cannot be felt, they are still visible, particularly when flying into the sun. In this instance, a mildly abrasive scratch removal cream can be used per manufacturer's recommendations. Scratches of greater magnitude require the use of high abrasives and removal of some of the window's surface around the greatest depth of the scratch. This procedure requires considerable expertise and frequently makes areas where the scratch was removed more objectionable than the original scratch.

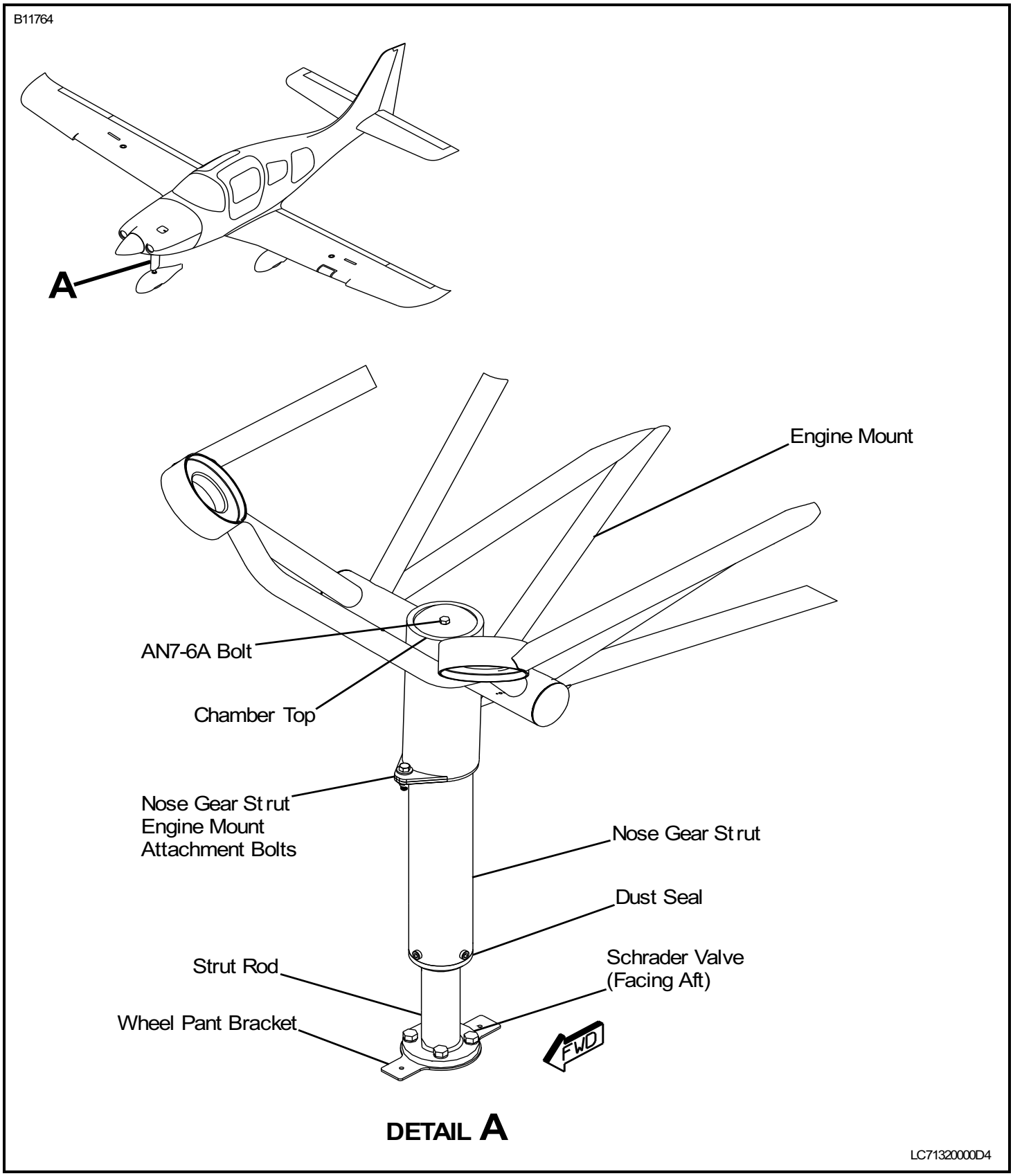
C. **Interior Cleaning and Care** - The useful life of the airplane's interior can be extended through proper care and cleaning. One of the major elements in the aging process is the interior's exposure to sunlight. If possible, the airplane should be hangared. Routine vacuuming is another item that helps extend the life of the airplane's interior, particularly the carpets. The leather seats, seatbacks, knee bolsters, glare shield and the like, should be routinely wiped with moist, soft cotton cloth. A general rule for spills is to blot the affected area with firm pressure for a few seconds. Never rub an area to remove a spill.

(1) Much of the airplane's interior is covered with high-quality leather. The leather is impregnated with polyvinyl chloride (PVC), and as treated, is impervious to most substances. The application of leather preservatives will provide little protection, and in some cases can cause problems. For difficult stains, such as an ink stain, remove with a mild soap and water. Do not use any type of chemical since these products tend to remove the impregnated PVC protection, and once removed it can never be reapplied.

(2) The carpet can be cleaned with a mild foam product, but care should be used not to over saturate the carpet. Follow the manufacturer's instructions regarding use of the foam cleaner. Small spots can be cleaned with a commercial spot remover; however, this must be done with care. Again, follow the recommended procedure of the manufacturer, and try a test application in an area of limited exposure.

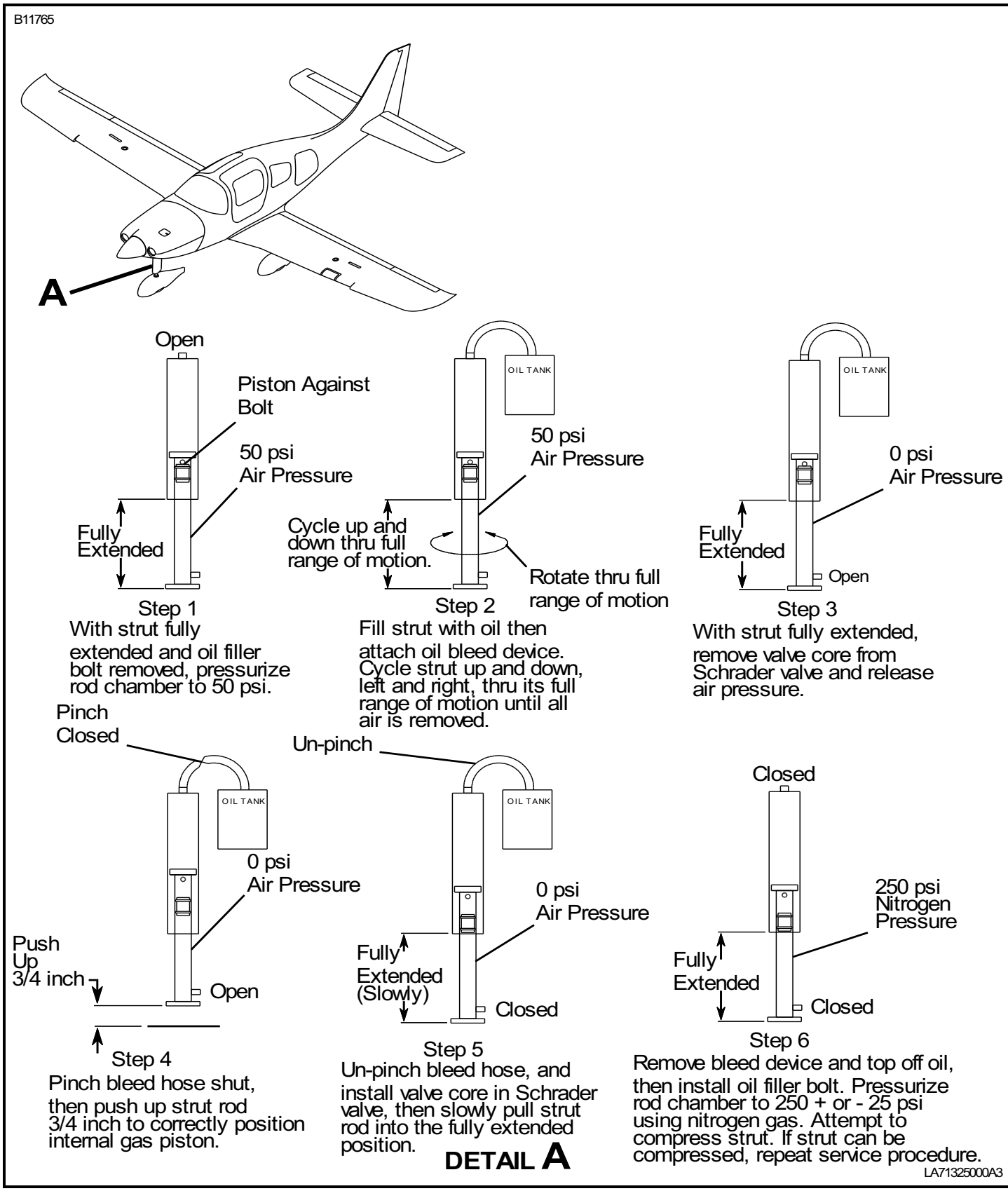
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 301 : Sheet 1 : Cessna Nose Strut Assembly



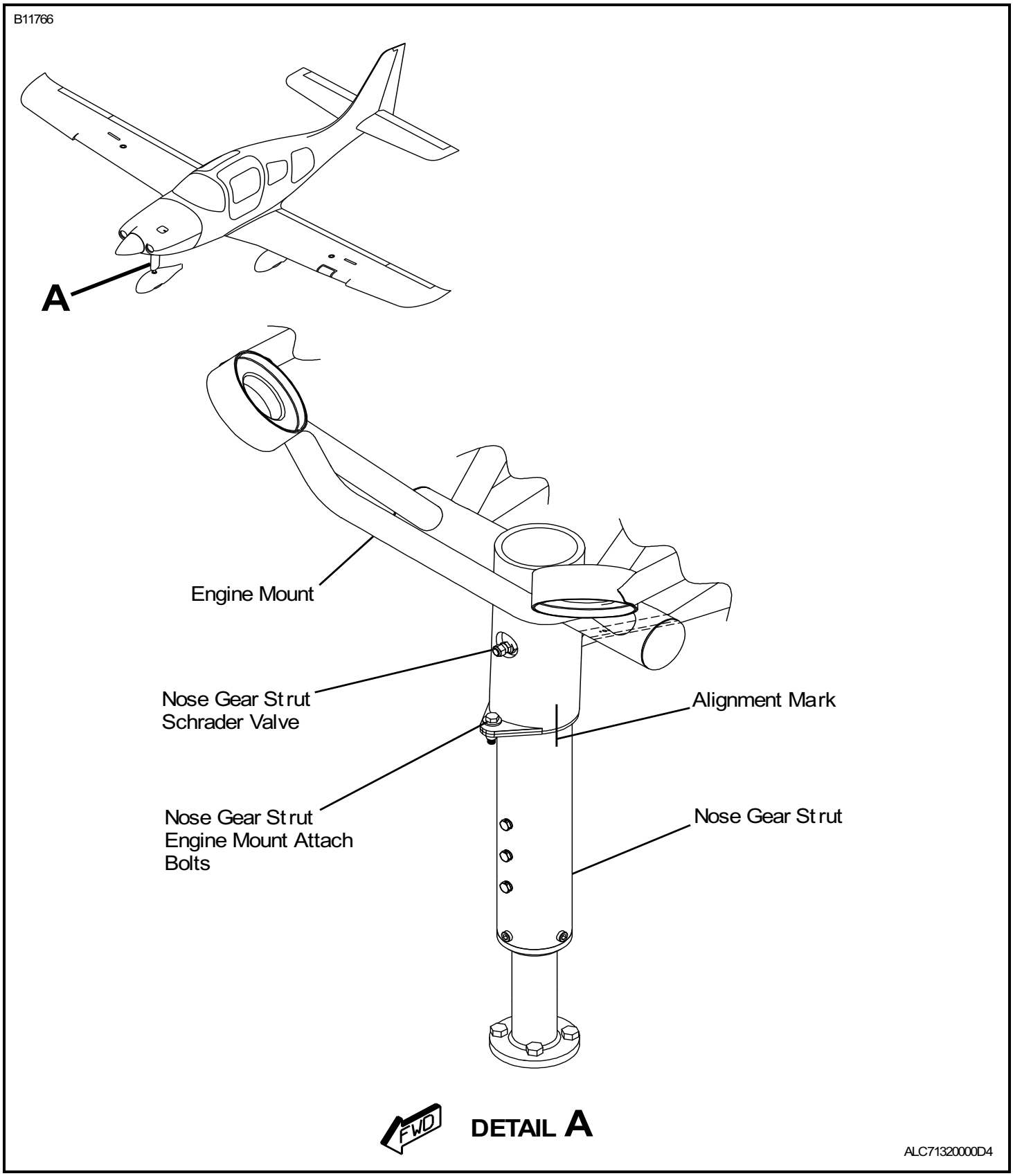
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 302 : Sheet 1 : Cessna Nose Strut Service



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 303 : Sheet 1 : ESCO Nose Strut Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STANDARD PRACTICES AIRFRAME - GENERAL

1. General

A. This chapter describes the standard maintenance practices for the Cessna 300 (LC40-550FG) aircraft. The items covered are typical and apply to many areas or systems of the aircraft. Unique maintenance procedures are covered in the appropriate chapter in the maintenance manual.

NOTE: Most of this chapter is derived from FAA Advisory Circular (AC) 43.13B, which should be used (latest revision) as the resource for this information.

2. Material and Tool Cautions - General

A. **Mercury**

(1) Mercury can corrode and embrittle metallic structures by the amalgamation process. Complete destruction of the load-carrying capability of the structure will result.

(2) No thermometers or equipment containing mercury can be used on the aircraft.

B. **Epoxy Resins**

(1) Epoxy resins, particularly the hardeners, are chemically active and can cause chemical burns, allergic reactions, and strong sensitization.

(2) Particular care should be taken to avoid contact with, or breathing the vapors from epoxy resins.

C. **Solvents**

(1) General use solvents may include the following:

(a) Gasoline

(b) Oil

(c) Alcohol

(2) Many of these solvents are flammable.

(3) These solvents can cause injury if contact with the skin or eyes is made.

(4) Many of these solvents are poisonous.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

TORQUE DATA - MAINTENANCE PRACTICES

1. Torque Data - Maintenance Practices

WARNING: The torque values outlined in this section and other chapters must be used during installation and repair of components. Improper torque values may result in over-stressing of components. Bolted joints in composite structures are sensitive to overload if improper over-torque is used.

A. **Torque Values** - Torque tables are listed in this section. If a component requires specific torque values, those values will be given in the applicable chapter and section of the maintenance manual. Refer to the following figures for specific types of torque values:

(1) Figure 202 / Table 202 - Values for Tapped Holes and Clearance Holes

(2) Figure 203 / Table 203 - Values for Nutplates

(3) Figure 204 / Table 204 - Values for Hose and Tube Fittings

(4) Figure 205 / Table 205 - Values for Rivnuts

(5) Table 206 - Recommended Torque and Clamp Load Specifications (Applicable to Fasteners with a Minimum Tensile Strength Greater Than 74 ksi)

(6) Table 207 - Recommended Jam Nut Torque and Clamp Load Specifications (Applicable to Fasteners With a Minimum Tensile Strength Greater Than 74 ksi)

B. **Free Running Torque** - The torque values listed do not include free running torque. The free running torque is the torque value to rotate the nut on the threaded shaft before contact, pull-up, and tightening. Self-locking nuts are used in applications where they will not be removed often. Repeated removal and installation will cause the self-locking nut to lose its locking feature. They should be replaced when they are no longer capable of maintaining the minimum prevailing torque.

C. **General Torquing Notes**

(1) The values given do not apply to threaded adjustment devices such as rod ends or turnbuckles.

(2) Appropriate torque wrenches should be used. Adjustments should be made for the readings if adapters are required. Refer to specific instructions supplied with the torque wrench.

D. **Torque Adapters** - Using one or more extensions with a torque wrench can put large side loads on torqued fasteners or anything they are attached to (i.e., hoses or tubes); therefore, the operator must support the fastener assembly appropriately when needed.When using an extended length adapter on a torque wrench (i.e. crow's foot), apply the following equation:

Table 201. Torque Equation

$T_E = (T \times L) / (L + E)$ where,

T = Specified torque value to achieveL = Wrench length from grip center to turn center. Refer to Figure 201. E = Length, in axial direction of wrench, from wrench turn center to extension turn center. Refer to Figure 201) T_E = Torque wrench setting when using adapter

Table 202. Values for Tapped Holes and Clearance Holes

GENERAL DESIGN DATA FOR TAPPED HOLES, CLEARANCE HOLES, AND TORQUE AND LOAD VALUES										
NOTE: **Refer to diagram in Figure 202 when consulting this table.**										
		Thread Size								
Thread Size		6-32	8-32	10-32	1/4-20	1/4-28	5/16-24	3/8-24	7/16-20	1/2-20
Max. Diameter		.138	.164	.189	.249	.249	.312	.374	.437	.499
Bolt Clearance Hole Diameter and Tolerance	.005 Tol	.148	.174	.200	.260	.260	.323	.385	.448	.510
	.010Tol	.158	.184	.210	.270	.270	.333	.395	.458	.520
Tap Drill Diameter	Min.	.1040	.1300	.1560	.1960	.2110	.2670	.3300	.3830	.4460
	Max.	.1140	.1389	.1641	.2067	.2190	.2754	.3372	.3918	.4537

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Tap Drill Point Max.		.0329	.0401	.0474	.0597	.0632	.0795	.0973	.1130	.1310
2 Thread Depth		.0625	.0625	.0625	.1000	.0714	.0833	.0833	.1000	.1000
Chamfer Dia.	Min.	.138	.164	.190	.250	.250	.313	.375	.438	.500
	Max.	.158	.184	.210	.270	.270	.333	.395	.458	.520
Tensile StressArea		.00909	.0140	.0200	.0318	.0364	.0580	.0878	.1187	.1599
Non-Lubricated (Dry)Recommended Torque		10 to 12 lb.-in.	20 to 25 lb.-in.	30 to 36 lb.-in.	72 to 84 lb.-in.	72 to 84 lb.-in.	140 to 180 lb.-in.	240 to 280 lb.-in.	55 to 60 lb.-in.	80 to 85 lb.-ft.
LubircatedRecommended Torque		6 to 8 lb.-in.	12 to 15 lb.-in.	20 to 25 lb.-in.	50 to 58 lb.-in.	50 to 58 lb.-in.	95 to 125 lb.-in.	165 to 195 lb.-in.	38 to 42 lb.-in.	55 to 60 lb.-ft.
Thread Length in Aluminum	6061-T6	.145	.225	.320	.440	.440	.550	.690	.790	.930
	2024-T4	.109	.170	.240	.330	.330	.420	.530	.600	.710
Approx. Load in Pounds (Metal)		540	840	1200	2100	2100	3400	5200	7000	9600
100 DegreeChamfer	Dia. +.010/-.000	.279	.334	.387	.510	.510	.638	.755	.894	1.022
	Depth +.005/-.000	.057	.068	.080	.106	.106	.133	.159	.186	.213

Table 203. Values for Nutplates

GENERAL DESIGN DATA FOR BLIND INSTALLATION OF NUTPLATES WITH MINIMUM 2 THREAD PROJECTION PER MS33588

NOTE:

Refer to the diagram in Figure 203 when consulting this table.

For maximum possible thread use:Pre-install bolt without mounting part(s) until lightly bottomed.

CAUTION:

Do not damage threads.

Measure distance between bolt head and structure. Distance should be no more than .9 x thickness of mounting part(s). For floating-type nutplates, add .010 to bolt clearance holes.Do not use aluminum rivets through carbon materials. Use stainless pop- or pull-type rivets when passing through carbon materials.REF: *Acceptable Methods, Techniques And Practices, Aircraft Inspection And Repair* , AC43.13-1B

		Thread Size							
Thread Size		6-32	8-32	10-32	1/4-28	5/16-24	3/8-24	7/16-20	1/2-20
Max. Diameter of Thread		.138	.164	.189	.249	.312	.374	.437	.499
Bolt Clearance Hole Diameter and Tolerance	.005 Tol	.148	.174	.200	.260	.323	.385	.448	.510
	.010Tol	.158	.184	.210	.270	.333	.395	.458	.520
2 Thread Minimum Projection		.0625	.0625	.0625	.1000	.0714	.1111	.1250	.520
Thread Length of Nutplate Ref.		.171	.188	.188	.219	.266	.282	.328	.547
2 Thread Projection + Nutplate		.234	.251	.251	.291	.349	.365	.428	.647
Min. Number of Turns		7.5	8.0	8.0	8.25	8.5	8.75	8.75	13.0
Ref. Tensile Stress Area		.00909	.0140	.0200	.0384	.0580	.0878	.1187	.1599

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Non-Lubricated (Dry)Recommended Torque(Metal)	10 to 12 lb.-in.	20 to 25 lb.-in.	30 to 36 lb.-in.	72 to 84 lb.-in.	140 to 180 lb.-in.	240 to 280 lb.-in.	55 to 60 lb.-in.	80 to 85 lb.-ft.
LubircatedRecommended Torque (Metal)	6 to 8 lb.-in.	12 to 15 lb.-in.	20 to 25 lb.-in.	50 to 58 lb.-in.	95 to 125 lb.-in.	165 to 195 lb.-in.	38 to 42 lb.-in.	55 to 60 lb.-ft.
Approx. Load in Pounds (Metal)	540	840	1200	2100	3400	5200	7000	9600

Table 204. Values for Hose and Tube Fittings

NOTE:
Refer to the diagram in Figure 204 when consulting this table.

Size/Thread		Material and Torque Specification(Dry torque values shown, except as noted in General Notes.)		
		Hose and/or Fitting Combination(Refer to Note 1)	Inch-Pounds	Foot-Pounds
-2	5/16-24	Steel to Steel	75-120	6.3 - 10
		Brass/Aluminum/Steel	50-80	4.2 - 6.7
-3	3/8-24	Steel to Steel	95-140	7.9 - 11.7
		Brass/Aluminum/Steel	70-105	5.8 - 8.8
-4	7/16-20	Steel to Steel	135-190	11.3 - 15.8
		Brass/Aluminum/Steel	100-140	8.3 - 11.7
-5	1/2-20	Steel to Steel	170-240	14.2 - 20
		Brass/Aluminum/Steel	130-180	10.8 - 15
-6	9/16-18	Steel to Steel	215-280	17.9 - 23.3
		Brass/Aluminum/Steel	150-195	12.5 - 16.3
-8	3/4-16	Steel to Steel	470-550	39.2 - 45.8
		Brass/Aluminum/Steel	270-350	22.5 - 29.2
-10	7/8-14	Steel to Steel	620-745	51.7 - 62.1
		Brass/Aluminum/Steel	360-430	30 - 35.8
-12	1/16-12	Steel to Steel	855-1055	71.3 - 87.9
		Brass/Aluminum/Steel	460-550	38.3 - 45.8

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

General Notes: Pre-Install hose onto fitting finger tight. If parts do not assemble finger tight, check for foreign material on threads and/or damaged threads. Do not force assemblies together.Maintain cleanliness of hose and fittings. Protect all fitting threads from damage and dirt contamination. When attaching stainless steel to stainless steel or stainless steel to aluminum, use MIL-T-5544 Anti-seize/lubricant on fitting threads. To prevent contamination, do not apply Anti-seize to tapered seat. Use lower torque value when Anti-seize is used.

NOTE 1:

Brass/Aluminum/Steel means any combination of brass to aluminum, brass to steel, or aluminum to steel.

Table 205. Values for Rivnuts

GENERAL DESIGN DATA FOR BLIND INSTALLATION OF RIVNUTS WITH MINIMUM 2 THREAD PROJECTION PER MS33588								
NOTE: **Refer to the diagram in Figure 205 when consulting this table.**								
For maximum possible thread use:Pre-install bolt without mounting part(s) until lightly bottomed. **CAUTION:** **Do not damage threads.** Measure distance between bolt head and structure. Distance should be no more than .9 x thickness of mounting part(s). Rivnuts are not self-locking. Do not use aluminum rivnuts through carbon materials. Use stainless rivnuts through carbon materials.REF: *Acceptable Methods, Techniques And Practices, Aircraft Inspection And Repair* , AC43.13-1B								
		Thread Size						
Thread Size		6-32	8-32	10-32	1/4-20	1/4-28	5/16-18	3/8-16
Max. Diameter of Thread		.138	.164	.189	.249	.249	.312	.374
Bolt Clearance Hole and Diameter	.005 Tol	.148	.174	.200	.260	.260	.323	.385
	.010Tol	.158	.184	.210	.270	.270	.333	.395
Recommended RivnutHole Dia.	Min.	.266	.266	.297	.391	.391	.531	.531
	Max.	.272	.272	.303	.397	.397	.538	.538
2 Thread Projection		.0625	.0625	.0625	.1000	.0714	.1111	.1250
Thread Length of Rivnut		.219	.188	.203			.278	
Min. Thread Projection		.281	.250	.266			.389	
Min. Number of Turns		9.0	7.0	8.5			7.0	
Head Height		0.30	.030	.030	.030	.030	.030	.030
Head Diameter Max.		.390	.390	.415	.515	.515	.685	.685
Non-Lubricated (Dry)Recommended Torque		10 to 12 lb.-in.	18 to 22 lb.-in.	30 to 36 lb.-in.	65 to 75 lb.-in.	70 to 80 lb.-in.	140 to 155 lb.-in.	230 to 270 lb.-in.
LubircatedRecommended Torque		6 to 8 lb.-in.	12 to 15 lb.-in.	20 to 25 lb.-in.	42 to 50 lb.-in.	50 to 58 lb.-in.	85 to 110 lb.-in.	160 to 190 lb.-in.
Approx. Load in Pounds		540	840	1200	2000	2100	3200	4900

Table 206. Recommended Torque and Clamp Load Specifications (Applicable to Fasteners with a Minimum Tensile Strength Greater Than 74 ksi)

Fastener Size	Nominal Diameter	Clamp Load	Torque Dry	Torque Lubed
			(Maximum Error of ±10 percent)	
	[in]	[lbs]	[in-lbs,**ft-lbs**]	[in-lbs,**ft-lbs**]
2-56	.0860	150	2.5	2.0
4-40	.1120	250	5.5	4.0
6-32	.1380	370	10	8.0

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

8-32	.1640	580	19	14
10-32	.1900	830	31	24
1/4-20	.2500	1310	66	49
1/4-28	.2500	1500	75	56
5/16-18	.3125	2160	140	100
5/16-24	.3125	2390	150	110
3/8-16	.3750	3200	**20**	**15**
3/8-24	.3750	3620	**23**	**17**
7/16-20	.4375	4900	**36**	**27**
1/2-20	.5000	6600	**55**	**41**

NOTE:

Applicable for standard or self-locking types of nuts

Table 207. Recommended Jam Nut Torque and Clamp Load Specifications (Applicable to Fasteners with a Minimum Tensile Strength Greater Than 74 ksi)

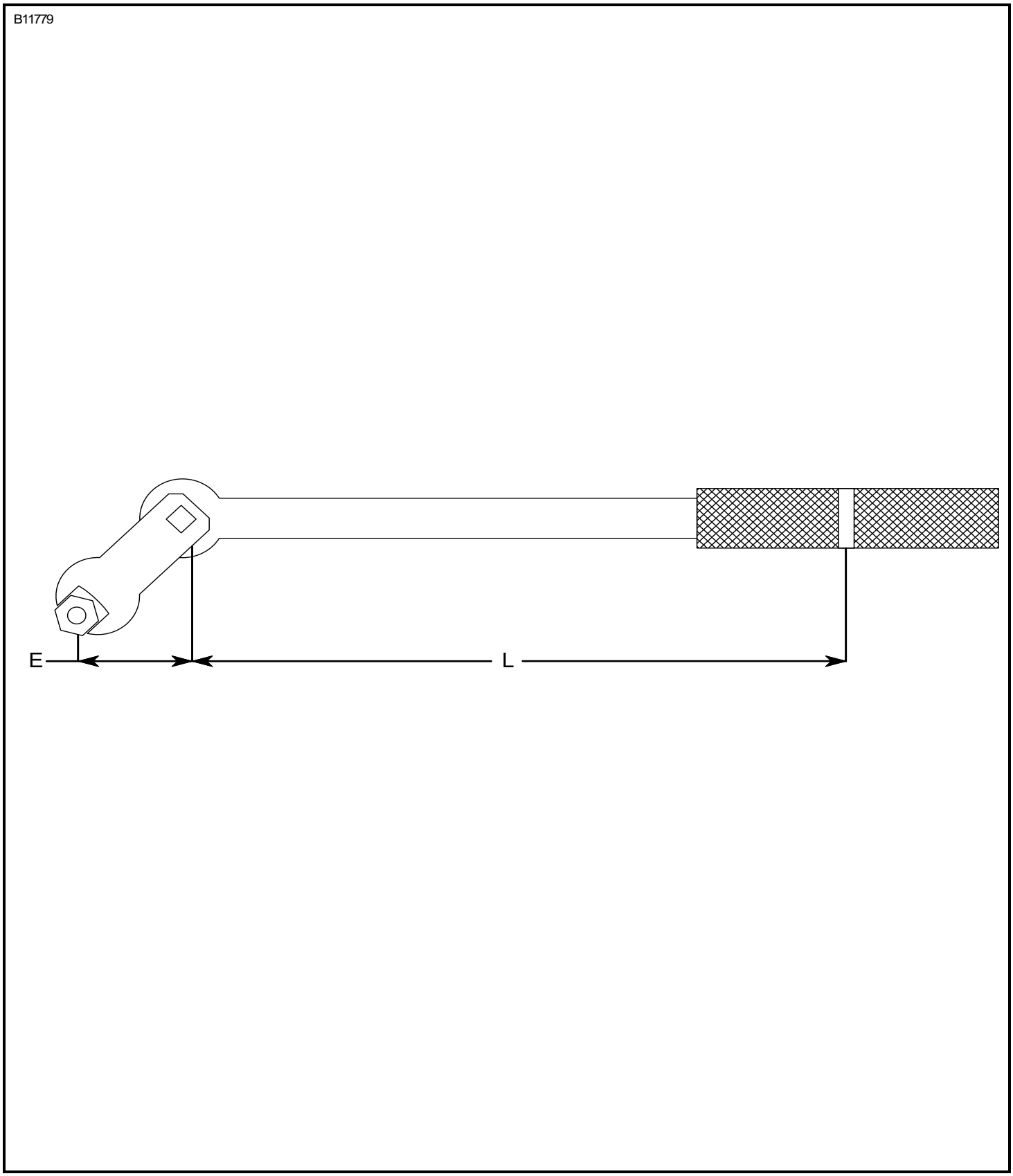
Fastener Size	Nominal Diameter	Clamp Load	Torque Dry	Torque Lubed
			(Maximum Error of ±10 percent)	
	[in]	[lbs]	[in-lbs,**ft-lbs**]	[in-lbs,**ft-lbs**]
2-56	.0860	62	1.0	0.8
4-40	.1120	100	2.5	1.5
6-32	.1380	150	4.0	3.0
8-32	.1640	250	8.0	6.0
10-32	.1900	360	14	10
1/4-20	.2500	550	27	20
1/4-28	.2500	730	36	27
5/16-18	.3125	800	50	37
5/16-24	.3125	1240	77	58
3/8-16	.3750	1330	100	75
3/8-24	.3750	1330	100	75
7/16-20	.4375	3120	**23**	**17**
1/2-20	.5000	3730	**31**	**23**

NOTE:

AN316 or equivalent

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

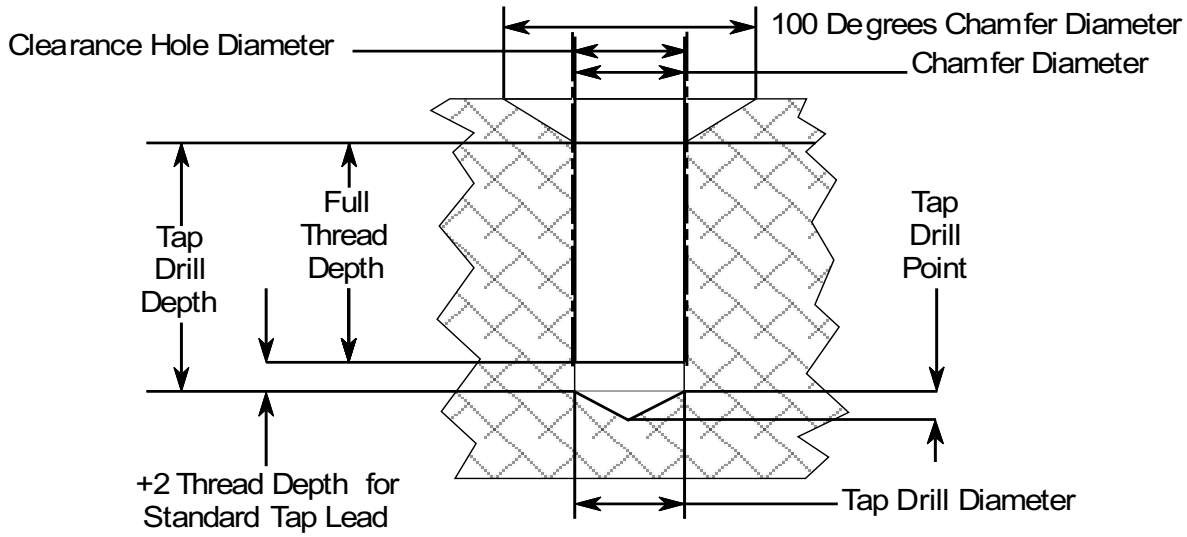
Figure 201 : Sheet 1 : Length Variable for Torque Adapter Equation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Values for Tapped Holes and Clearance Holes (Refer to Table 202)

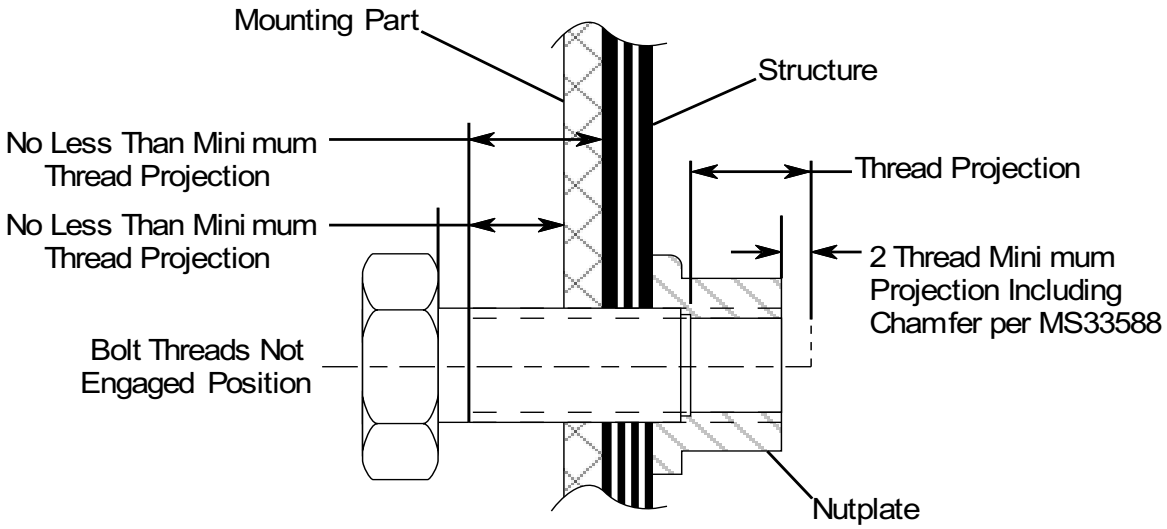
B11780



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Values for Nutplates (Refer to Table 203)

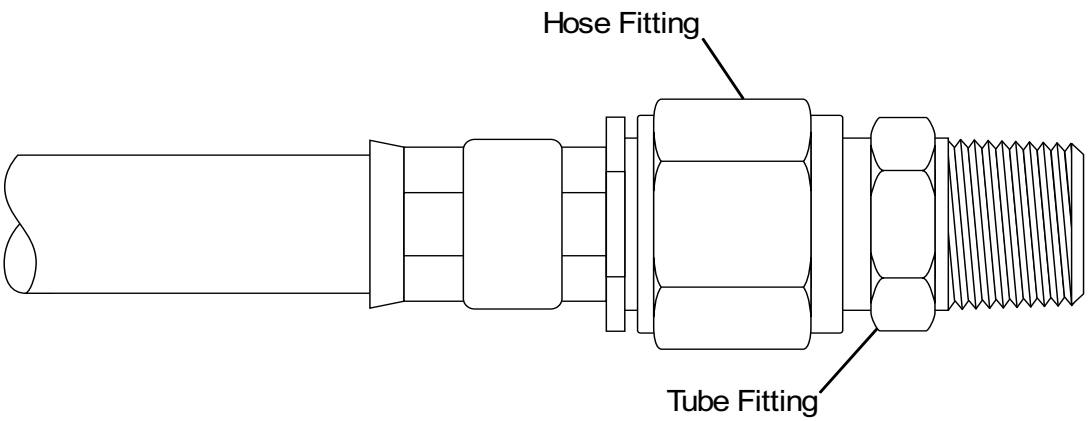
B11781



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Values for Hose and Tube Fittings (Refer to Table 204)

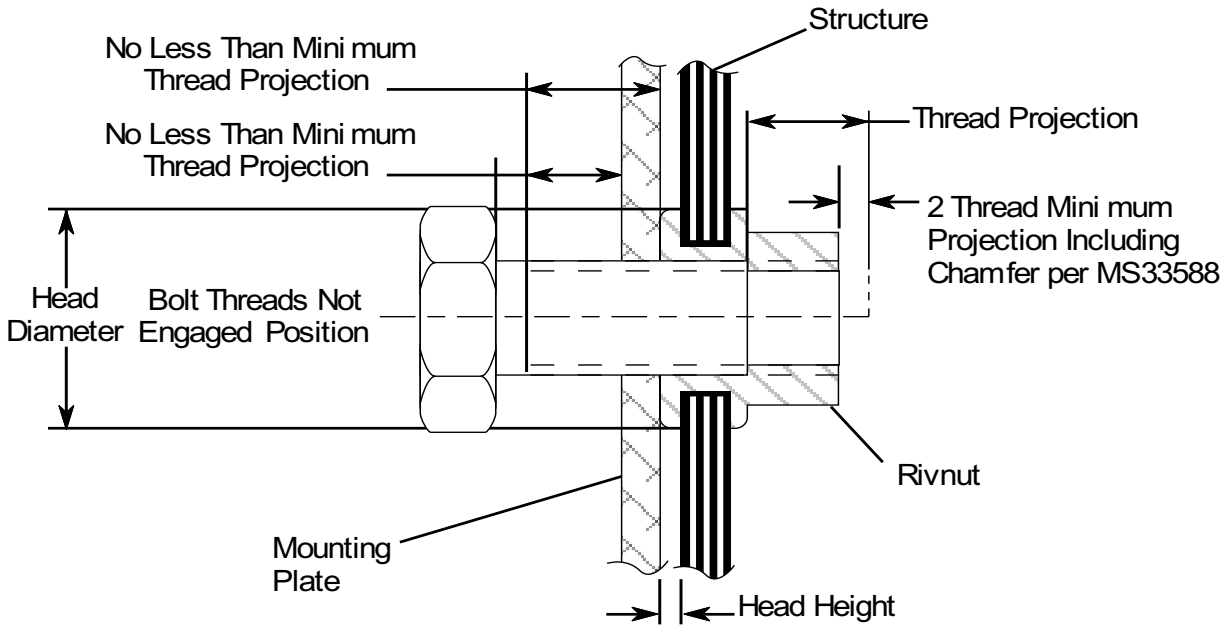
B11782



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Values for Rivnuts (Refer to Table 205)

B11783



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SAFETYING - MAINTENANCE PRACTICES

1. Safetying - Maintenance Practices

A. **General** - The word *safetying* is a term universally used in the aircraft industry. Briefly, safetying is defined as: "Securing by various means any nut, bolt, turnbuckle etc., on the aircraft so that vibration will not cause it to loosen during operation." These practices are not a means of obtaining or maintaining torque, but instead a safety device to prevent the disengagement of screws, nuts, bolts, snap rings, oil caps, drain cocks, valves, and parts. Three basic methods are used in safetying: safety-wire, cotter pins, and self-locking nuts. Retainer washers and pal nuts are also sometimes used.

(1) Wire, either soft brass or steel, is used on cylinder studs, control cable turnbuckles, and engine accessory attaching bolts.

(2) Cotter pins are used on aircraft and engine controls, landing gear, or any other point where a turning or actuating movement takes place.

B. **Safety Wire**

WARNING: Do not use stainless steel, monel, carbon steel, or aluminum alloy safety wire to secure emergency mechanisms such as switch handles, guard covering handles used on exits, fire extinguishers, emergency gear releases, or other emergency equipment. Some existing structural equipment or safety-of-flight emergency devices require copper or brass safety wire (0.020 inch diameter only). Where successful emergency operation of this equipment is dependent on shearing or breaking of the safety wire, particular care should be used to ensure that safetying does not prevent emergency operation.

(1) There are two methods of safety wiring; the double-twist method that is most commonly used, and the single-wire method used on screws, bolts, and/or nuts in a closely-spaced or closed-geometrical pattern such as a triangle, square, rectangle, or circle. The single-wire method may also be used on parts in electrical systems and in places that are difficult to reach. Refer to Figure 201.

(2) When using the double-twist method of safety wiring, 0.032-inch minimum diameter wire should be used on parts that have a hole diameter larger than 0.045 inches. Safety wire of 0.020-inch diameter (double strand) may be used on parts having a nominal hole diameter between 0.045 and 0.062 inches with a spacing between parts of less than 2 inches. When using the single-wire method, the largest size wire that the hole will accommodate should be used. Copper wire (0.020 inches diameter), aluminum wire (0.031 inches diameter), or other similar wire called for in specific technical orders, should be used as seals on equipment such as first-aid kits, portable fire extinguishers, emergency valves, or oxygen regulators. Refer to Figure 202.

CAUTION: Care should be taken not to confuse steel with aluminum wire.

(3) A secure seal indicates that the component has not been opened. Some emergency devices require installation of brass or soft copper shear safety wire. Particular care should be exercised to ensure that the use of safety wire will not prevent emergency operation of the devices.

2. Safety Wiring Procedures

A. There are many combinations of safety wiring with certain basic rules common to all applications. These rules are as follows:

(1) When bolts, screws, or other parts are closely grouped, it is more convenient to safety wire them in series. The number of bolts, nuts, screws, etc., that may be wired together depends on the application.

(2) Drilled bolt heads and screws need not be safety wired if installed with self-locking nuts.

(3) To prevent failure due to rubbing or vibration, safety wire must be tight after installation.

(4) Safety wire must be installed in a manner that will prevent the tendency of the part to loosen.

(5) Safety wire must never be over-stressed. Safety wire will break under vibrations if twisted too tightly. Safety wire must be pulled taut when being twisted and maintain a light tension when secured.

(6) Safety wire ends must be bent under and inward towards the part to avoid sharp or projecting ends, which might present a safety hazard.

(7) Safety wire inside a duct or tube must not cross over or obstruct a flow passage when an alternate routing can be used.

B. Check the units to be safety wired to make sure that they have been correctly torqued and that the wiring holes are properly aligned to each other. When there are two or more units, it is desirable that the holes in the units be aligned to each other.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Never over-torque or loosen to obtain proper alignment of the holes. It should be possible to align the wiring holes when the bolts are torqued within the specified limits. Washers may be used to establish proper alignment. However, if it is impossible to obtain a proper alignment of the holes without under-torquing or over-torquing, try another bolt that will permit proper alignment within the specified torque limits.

C. To prevent mutilation of the twisted section of wire when using pliers, grasp the wires at the ends. Safety wire must not be nicked, kinked, or mutilated. Never twist the wire ends off with pliers. When cutting off ends, leave at least four to six complete turns (1/2 to 5/8 inch long) after the loop. When removing safety wire, never twist the wire off with pliers. Cut the safety wire close to the hole, exercising caution.

D. Install safety wire where practicable with the wire positioned around the head of the bolt, screw, or nut, and twisted in such a manner that the loop of the wire fits closely to the contour of the unit being safety wired.

3. Twisting with Special Tools

A. Twist the wire with a wire twister as follows:

CAUTION: When using wire twisters and the wire extends 3 inches beyond the jaws of the twisters, loosely wrap the wire around the pliers to prevent whipping and possible personal injury. Excessive twisting of the wire will weaken the wire.

(1) Grip the wire in the jaws of the wire twister, and slide the outer sleeve down with your thumb to lock the handles of the spring-loaded pin.

(2) Pull the knob to make the spiral rod spin and twist the wire.

(3) Squeeze handles together to release the wire.

4. Securing Oil Caps, Drain Cocks, and Valves

A. When securing oil caps and drain cocks, the safety wire should be anchored to an adjacent fillister-head screw. Refer to Figure 203. This method of safety wiring is applied to wing nuts, filler plugs, single-drilled head bolts, fillister-head screws, etc., that are safety wired individually. When securing valve handles in the vertical position, the wire is looped around the threads of the pipe leading into one side of the valve, double-twisted around the valve handle, and anchored around the threads of the pipe leading into the opposite side of the valve. When castle nuts are to be secured with safety wire, tighten the nut to the low side of the selected torque range, unless otherwise specified. If necessary, continue tightening until a slot lines with the hole. In blind tapped hole applications of bolts or castle nuts on studs, the safety wiring should be in accordance with the general instructions of this chapter. Hollow-head bolts are safetyed in the manner prescribed for regular bolts.

NOTE: Do not loosen or tighten properly tightened nuts to align safety-wire holes.

NOTE: Although there are numerous safety wiring techniques used to secure aircraft hardware, practically all are derived from the basic examples shown in this text.

5. Proper Securing of Fittings

A. There are several examples on how to secure fittings listed in this section.

(1) Examples 1, 2, 3, and 4 (refer to Figure 204) apply to all types of bolts, fillister-head screws, square-head plugs, and other similar parts, which are wired so that tightening of the other part counteracts the loosening tendency of either part. The direction of twist from the second to the third unit is counterclockwise in examples 1, 3, and 4 (refer to Figure 204) to keep the loop in position against the head of the bolt. The direction of twist from the second to the third unit in example 2 is clockwise to keep the wire in position around the second unit. The wire entering the hole in the third unit will be the lower wire, except as in example 2. By making a counterclockwise twist after it leaves the hole, the loop will be secured in place around the head of that bolt.

(2) Examples 5, 6, 7, and 8 (refer to Figure 205) show methods for wiring various standard items. Note that wire may be wrapped over the unit rather than around it when wiring castle nuts or on other items when there is a clearance problem.

(3) Example 9 (refer to Figure 206) shows the method for wiring bolts in different planes. Note that wire should always be applied so that tension is in the tightening direction. Hollow-head plugs shall be wired as shown with the tab bent inside the hole to avoid snags and possible injury to personnel working on the engine.

(4) Examples 12 and 13 (refer to Figure 207) show methods for attaching lead seal to protect critical adjustments.

(5) Example 14 (refer to Figure 208) shows bolt wired to a right-angle bracket with the wire wrapped around the bracket.

(6) Example 15 (refer to Figure 208) shows the correct method for wiring adjustable connecting rods.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(7) Example 16 (refer to Figure 208) shows the correct method for wiring the coupling nut on flexible line to the straight connector brazed on rigid tube.

B. Fittings incorporating wire lugs shall be wired as shown in Examples 17 and 18. Where no lock-wire lug is provided, wire should be applied as shown in examples 19 and 20 with caution being exerted to ensure that the wire is wrapped tightly around the fitting. Refer to Figure 209.

C. Small size coupling nuts shall be wired by wrapping the wire around the nut and inserting it through the holes as shown.

D. Coupling nuts attached to straight connectors shall be wired as shown when the hex is an integral part of the connector. Coupling nuts on a tee shall be wired as shown so that tension is always in the tightening direction.

6. Securing With Cotter Pins

A. Cotter pins are used to secure such items as bolts, screws, pins, and shafts. The use of cotter pins is favored because they can be removed and installed quickly. The diameter of the cotter pins selected for any application should be the largest size that will fit consistent with the diameter of the cotter pin hole and/or the slots in the nut. Cotter pins should not be re-used on aircraft.

B. To prevent injury during and after pin installation, the end of the cotter pin can be rolled and tucked as shown in Figure 210 and Figure 211.

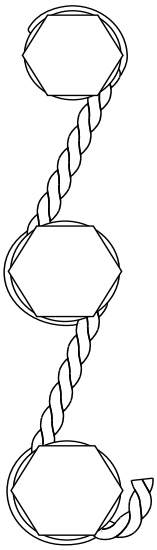
C. When tightening castellated nuts on bolts, begin by applying the minimum torque specified. If the cotter pin hole does not align with the slots in the nut, continue to tighten the nut until the next set of slots is aligned with the hole. In special cases where there is risk of the threads stripping or the bolt shearing, the maximum torque value specified may not be exceeded. For most installations, the nut may be over tightened to permit the slots to align with the hole.

NOTE: In using the method of cotter pin safetying ensure the prong, bent over the bolt, is seated firmly against the bolt shank and does not exceed bolt diameter. Also, when the prong is bent over the nut, ensure the bent prong is down and firmly flat against the nut and does not contact the surface of the washer.

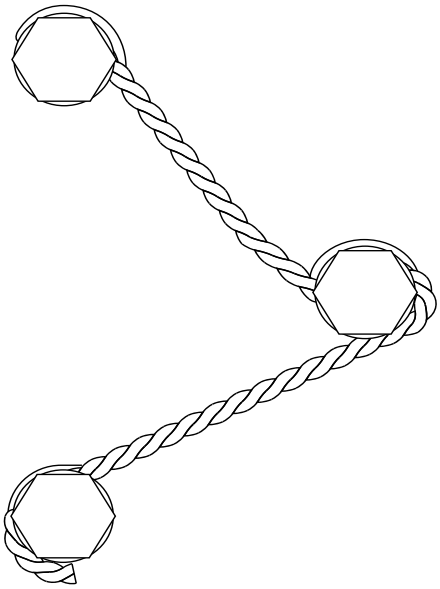
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Examples of Safety Wiring "Safetying"

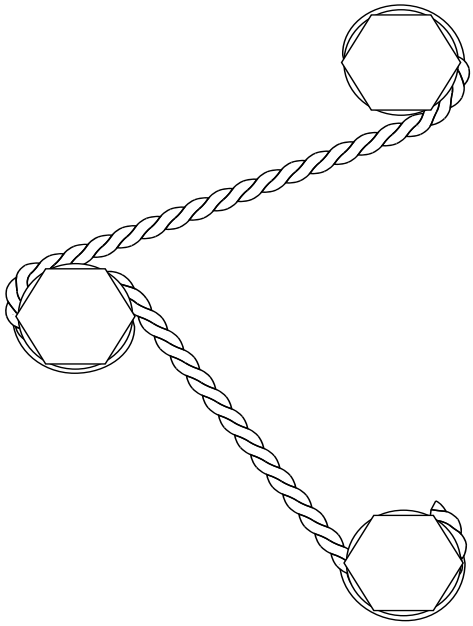
B11784



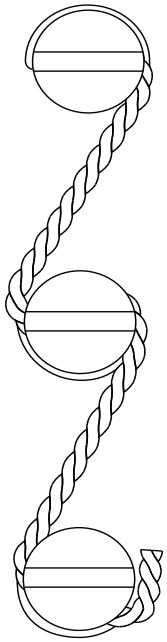
Example 1



Example 2



Example 3

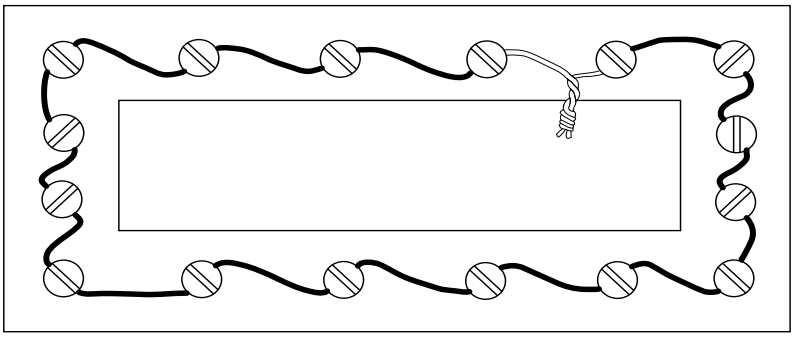


Example 4

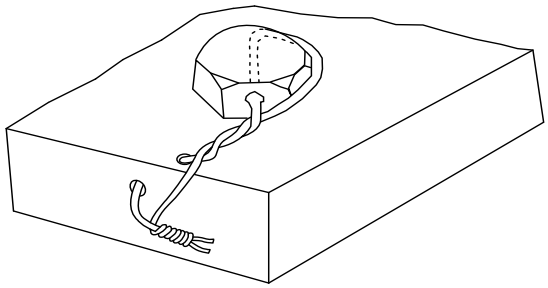
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Securing Screws, Nuts, Bolts, and Snap Rings

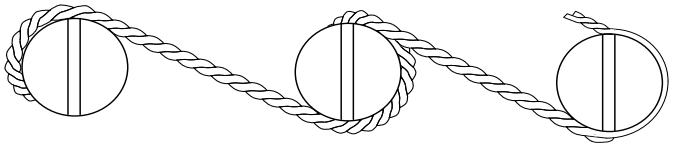
B11785



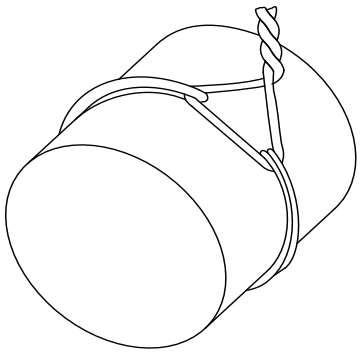
Small screws in closely spaced
Closed geometrical pattern
Single-wire method



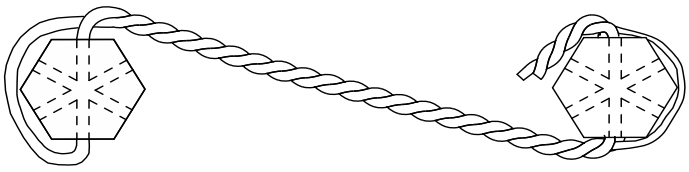
Single-Fastener Application
Double-Twist Method



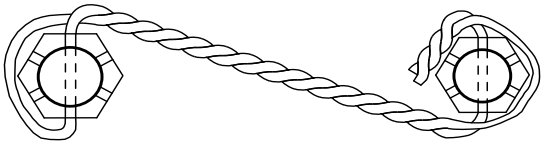
Screwheads
Double-Twist Method



External Snapring
Single-Wire Method



Boltheads



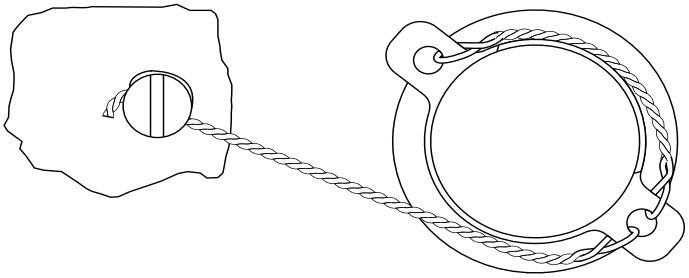
Castle Nuts

NOTE: The safety wire is shown installed for right-hand threads. The safety wire is routed in the opposite direction for left-hand threads.

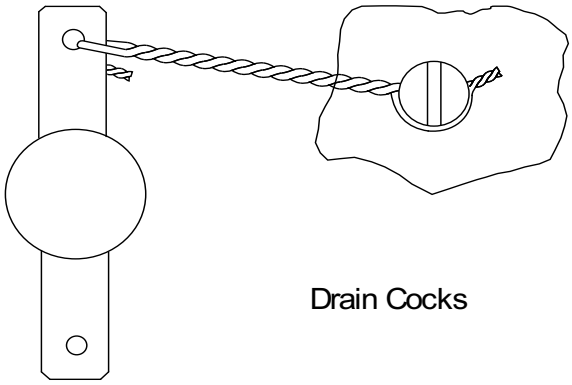
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Securing Oil Caps, Drain Cocks, and Valves

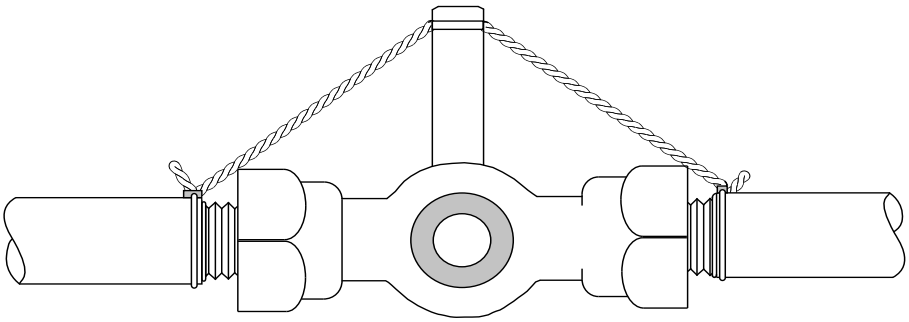
B11786



Oil Caps



Drain Cocks



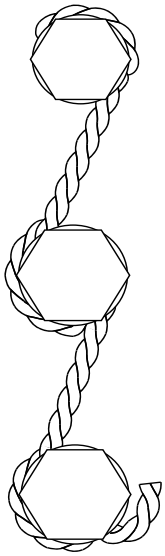
Valves

NOTE: The safety wire is shown installed for right-hand threads. The safety wire is routed in the opposite direction for left-hand threads.

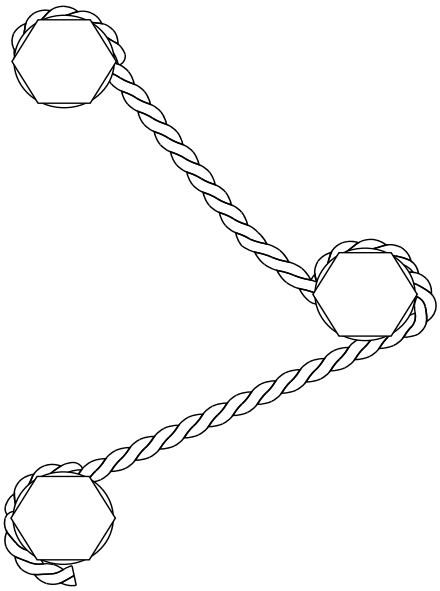
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Securing Bolts, Screws, Plugs, etc.

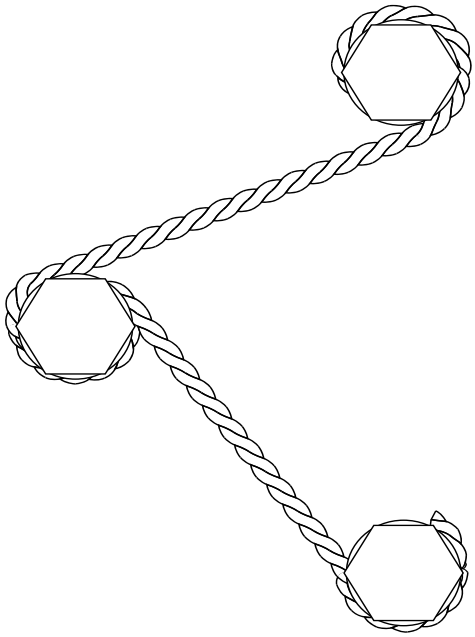
B11787



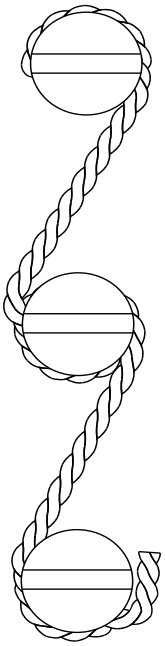
Example 1



Example 2



Example 3

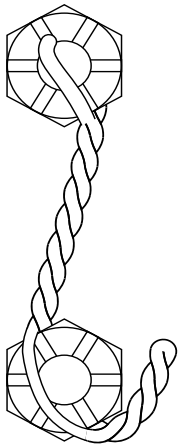


Example 4

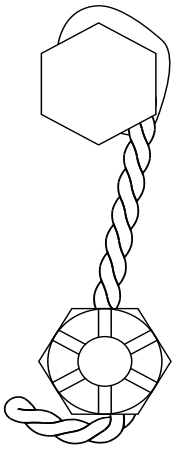
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Securing Various Standard Items

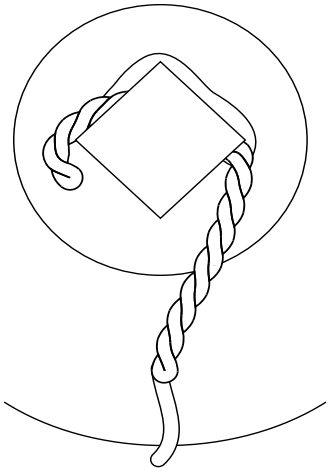
B11788



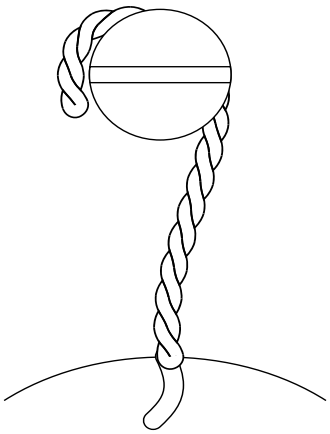
Example 5



Example 6



Example 7

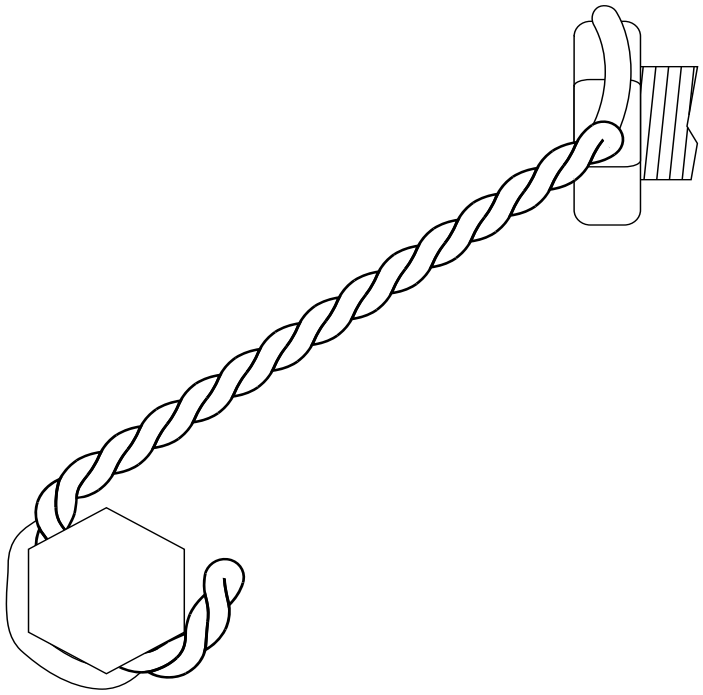


Example 8

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Wiring Bolts in Different Planes

B11789

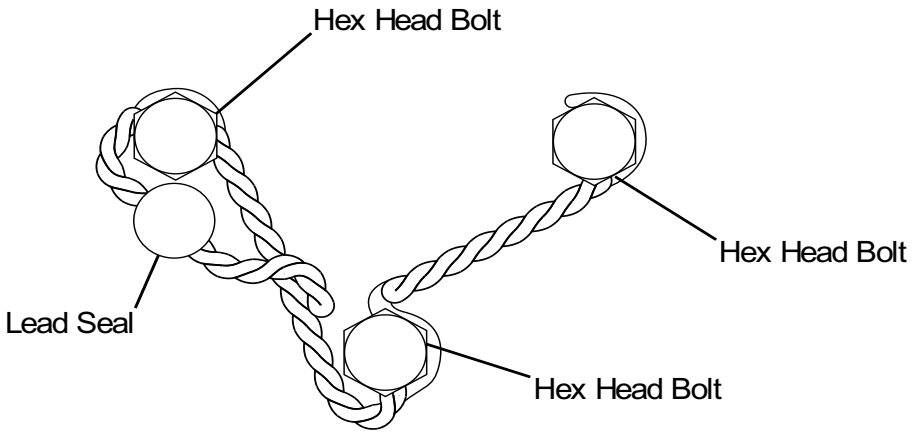


Example 9

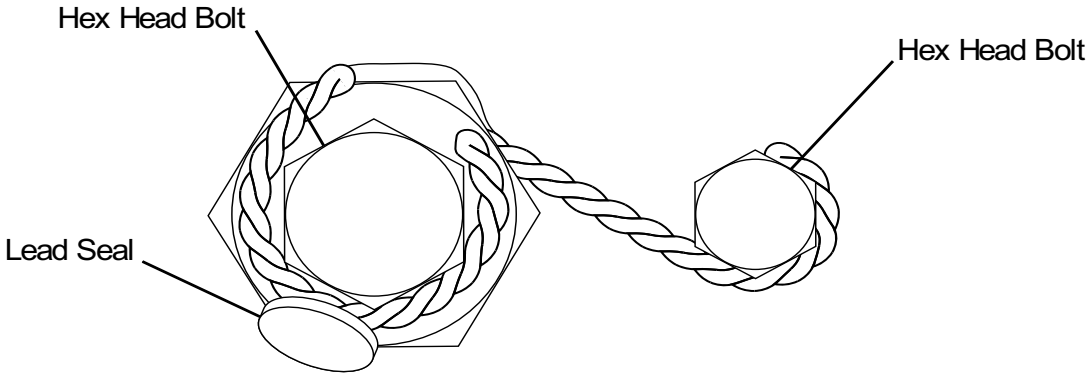
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Attaching Lead Seal

B11790



Example 12

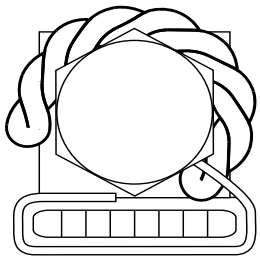


Example 13

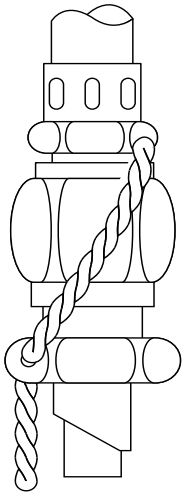
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : Wiring Brackets, Connecting Rods, Rigid Tubes

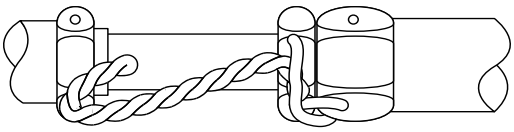
B11791



Example 14



Example 16

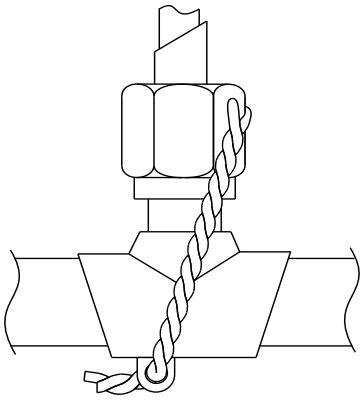


Example 15

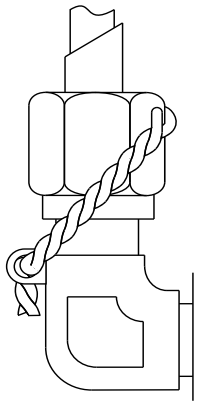
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Fittings Incorporating Wire Lugs

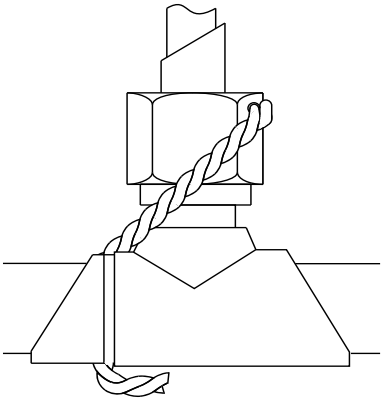
B11792



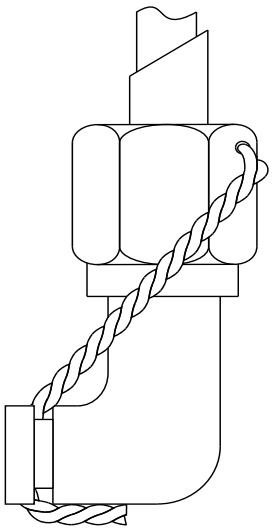
Example 17



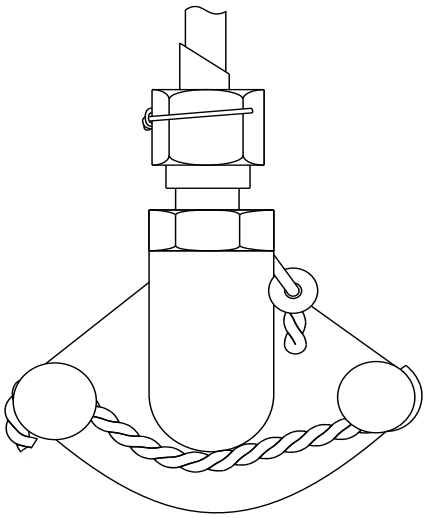
Example 18



Example 19



Example 20

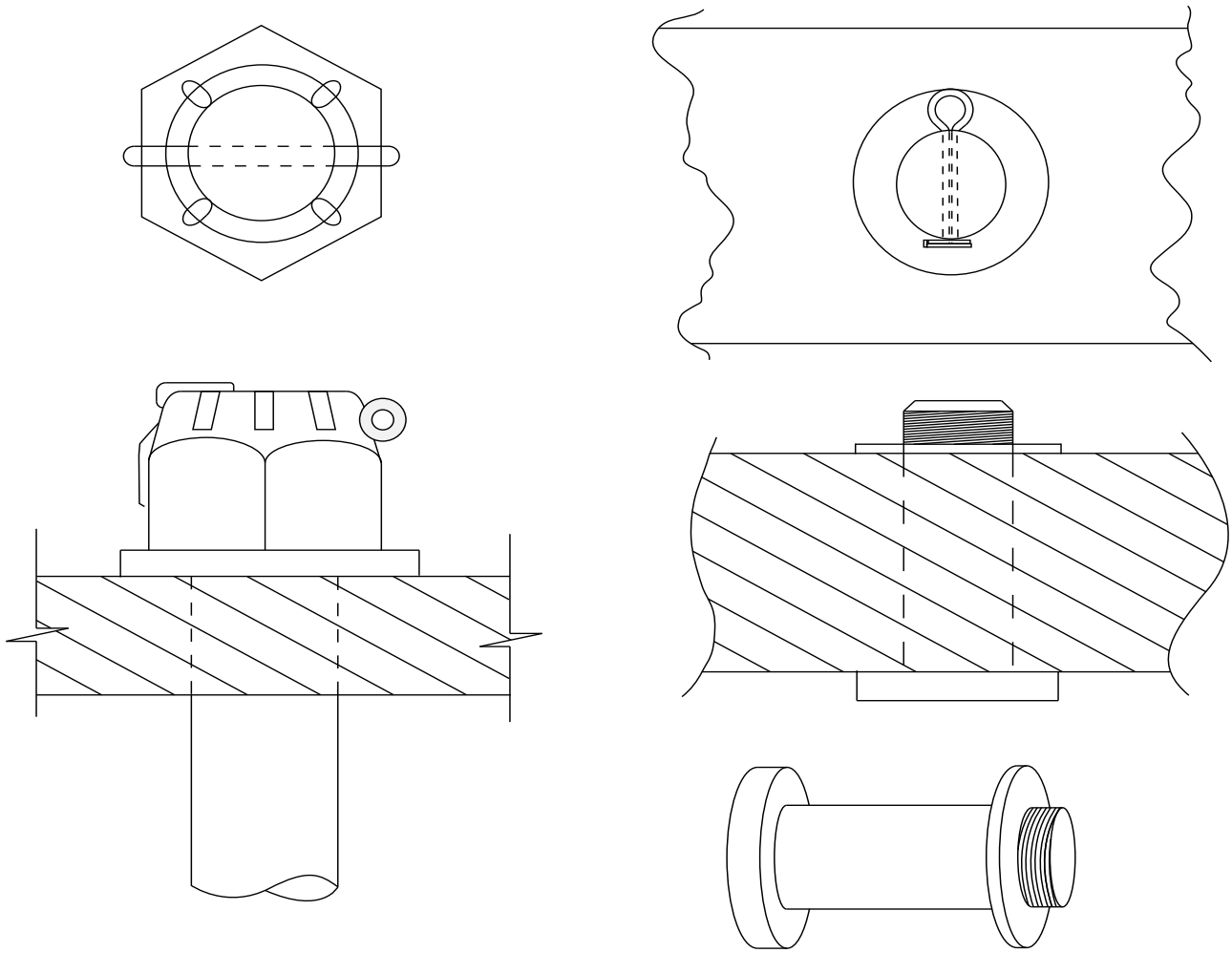


Example 21

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 1 : Securing with Cotter Pins

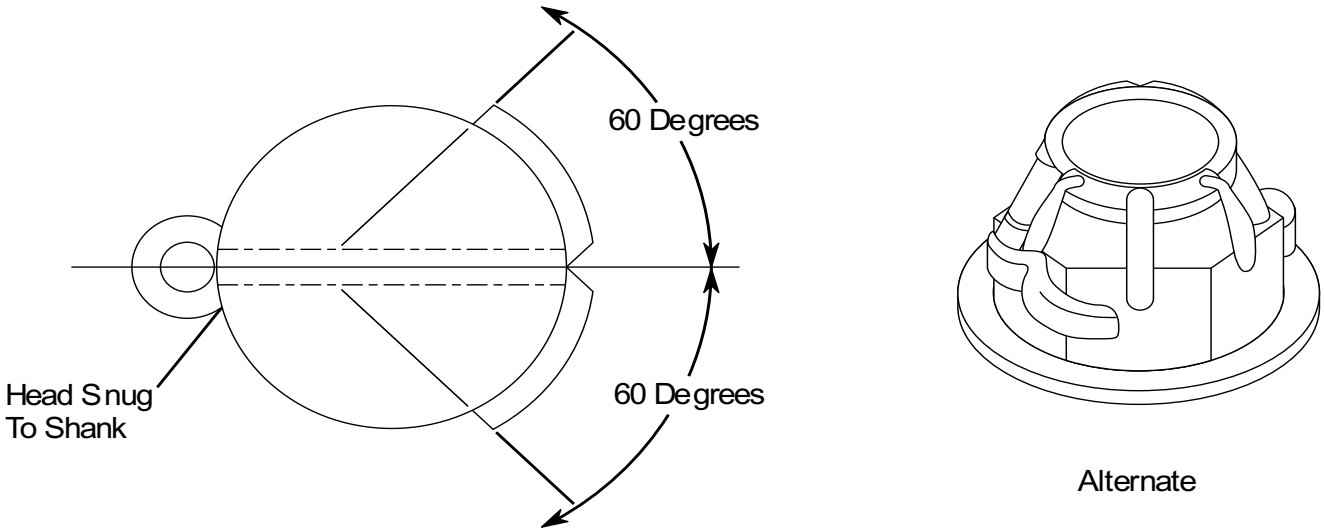
B11793



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 211 : Sheet 1 : Alternate Method for Securing with Cotter Pins

B11794



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CONTROL CABLES AND PULLEYS - MAINTENANCE PRACTICES

1. Control Cable Wire Breakage And Corrosion Limitations

A. Aircraft control cables in the Cessna 300 (LC40-550FG) are fabricated from corrosion-resistant steel wire of flexible-type construction. For example, 1/16 7 X 7 MIL-W-83420/2 and 1/8 inch 7 X 19 MIL-W-83420 cables are used in the rudder control circuit.

(1) **Cable Definitions** - The following cable components are defined in accordance with Military Specifications MIL-W-83420, MIL-C-18375, and MIL-W-87161.

(a) Wire Center - The center of all strands shall be an individual wire and shall be designated as a wire center.

(b) Strand Center or Core - A strand center is a single, straight strand made of preformed wires, similar to the other strands comprising the cable in arrangement and number of wires.

(c) Independent Wire Rope Center (IWRC) 7 by 7 - A cable or wire rope of six strands of seven wires each, twisted or laid around a strand center or core consisting of seven wires.

(2) **Flexible Cables** - Flexible, preformed, corrosion-resistant, Type I, composition B cables, MIL-W-87161, MIL-W-83420, and MIL-C-18375 are manufactured from steel made by the electric-furnace process. These cables are of the 3 by 7, 7 by 7, 7 by 19, or 6 by 19 IWRC construction, according to the diameter. The 3 by 7 cable consists of three strands of seven wires each. There is no core in this construction. The 7 by 7 cable consists of six strands, of seven wires each, laid around a center strand of seven wires. The wires are laid so as to develop a cable that has the greatest bending and wearing properties. The 7 by 7 cable has a length of lay of not more than eight times or less than six times the cable diameter. The 7 by 19 cable consists of six strands laid around a center strand in a clockwise direction. The wires composing the seven individual strands are laid around a center wire in two layers. The center core strand consists of a lay of six wires laid around the central wire in a clockwise direction and a layer of 12 wires laid around this in a clockwise direction. The six outer strands of the cable consist of a layer of six wires laid around the center wire in a counterclockwise direction and a layer of 12 wires laid around this in a counterclockwise direction.

(3) **Cable Replacement** - Replace control cables when they become worn, distorted, corroded, or otherwise damaged. If spare cables are not available, prepare exact duplicates of the damaged cable. Use materials of the same size and quality as the original. Standard swaged cable terminals de lop the full cable strength and may be substituted for the original terminals wherever actical.

(4) **Mechanically Fabricated Cable Assemblies**

(a) **Swage-Type Terminals** - Swage-type terminals, manufactured in accordance with AN, are suitable for use in civil aircraft up to, and including, maximum cable loads. When swaging tools are used, it is important that all the manufacturers' instructions, including "go and no-go" dimensions, be followed in detail to avoid defective and inferior swaging. Observance of all instructions should result in a terminal developing the full-rated strength of the cable. Critical dimensions, both before and after swaging, must be checked.

(b) When swaging terminals onto cable ends, observe the following procedures and refer to Table 201:

1 Cut the cable to the proper length allowing for growth during swaging. Apply a preservative compound to the cable ends before insertion into the terminal barrel.

NOTE: Never solder cable ends to prevent fraying because the presence of the solder will greatly increase the tendency of the cable to pull out of the terminal.

2 Insert the cable into the terminal approximately 1 inch, and bend toward the terminal. Push the cable end entirely into the terminal barrel. The bending actions puts a kink or bend in the cable end and provides enough friction to hold the terminal in place until the swaging operation can be performed. Bending also tends to separate the strands inside the barrel, thereby reducing the strain on them.

Table 201. Straight-Shank Terminal Dimensions

(Cross reference AN to MS: AN-666 to MS 21259, AN-667 to MS 20667, AN-668 to MS 20668, AN-669 to MS 21260.)
Key: A = Cable size (inches) B = Wire strands C = Outside diameter before swaging D = Bore diameter before swaging E = Bore length before swaging F = Swaging length before swaging G = Minimum breaking strength (pounds) after swaging H = Shank diameter after swaging - Note: Use gauges in kit for checking diameters.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

A	B	C	D	E	F	G	H
1/16	7X7	0.160	0.078	1.042	0.969	480	0.138
3/32	7X7	0.218	0.109	1.261	1.188	920	0.190
1/8	7X19	0.250	0.141	1.511	1.438	2,000	0.219
5/32	7X19	0.297	0.172	1.761	1.688	2,800	0.250
3/16	7X19	0.359	0.203	2.011	1.938	4,200	0.313
7/32	7X19	0.427	0.234	2.261	2.188	5,600	0.375
1/4	7X19	0.494	0.265	2.511	2.438	7,000	0.438
9/32	7X19	0.563	0.297	2.761	2.688	8,000	0.500
5/16	7X19	0.635	0.328	3.011	2.938	9,800	0.563
3/8	7X19	0.703	0.390	3.510	3.438	14,400	0.625

3 Accomplish the swaging operation in accordance with the instructions furnished by the manufacturer of the swaging equipment.

4 Inspect the terminal after swaging to determine that it is free from die marks and splits and is not out-of-round. Check for cable slippage in the terminal and for cut or broken wire strands.

5 Using a "go no-go" gauge or a micrometer, check the terminal shank diameter.

(c) **Nicopress Process** - A patented process using copper sleeves may be used up to the full rated strength of the cable when the cable is looped around a thimble.

1 Before undertaking a Nicopress splice, determine the proper tool and sleeve for the cable to be used. Refer to proper references for details on sleeves, tools, and the number of presses required for the various sizes of aircraft cable. The tool must be in good working condition and properly adjusted to ensure a satisfactory splice.

2 To compress a sleeve, have it well-centered in the tool groove with the major axis of the sleeve at right angles to the tool. If the sleeve appears to be out of line after the press is started, open the tool, re-center the sleeve, and complete the press.

(d) Lap Splice - Lap or running splices may also be made with copper oval sleeves. When making such splices, it is usually necessary to use two sleeves to develop the full strength of the cable. The sleeves should be positioned as shown in Figure 201, and the compressions made in the order shown. As in the case of eye splices (refer to Figure 202) it is desirable to have the cable ends extend beyond the sleeves sufficiently to allow for the increased length of the compressed sleeves.

(e) **Terminal Gauge** - To make a satisfactory copper sleeve installation, it is important that the amount of sleeve pressure be kept uniform. The completed sleeves should be checked periodically with the proper gauge. Hold the gauge so that it contacts the major axis of the sleeve. The compressed portion at the center of the sleeve should enter the gauge opening with very little clearance, as shown in Figure 203. If it does not, the tool must be adjusted accordingly.

2. Cable System Inspection

A. Aircraft cable systems are subject to a variety of environmental conditions and deterioration. Wire or strand breakage is easy to visually recognize. Other kinds of deterioration such as wear, corrosion, and/or distortion are not easily seen, therefore, control cables should be removed periodically for a more detailed inspection.

(1) At each annual or 100 hour inspection, all control cables must be inspected for broken wire strands. Any cable assembly that has one broken wire strand located in a critical fatigue area must be replaced.

(2) A critical fatigue area is defined as the working length of a cable where the cable runs over, under, or around a pulley, sleeve, or through a fair-lead; or any section where the cable is flexed, rubbed, or worked in any manner; or any point within 1 foot of a swaged-on fitting.

(3) A swaged-on fitting can be an eye, fork, ball, ball and shank, ball and double shank, threaded stud, threaded stud and turnbuckle, compression sleeve, or any hardware used as a termination or end fitting on the cable. These fittings may be attached by various swaging methods such as rotary swaging, roll swaging, hydraulic pressing, and hand swaging tools. Refer to MIL-T-781. The pressures exerted on the fittings during the swaging process sometimes pinch the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

small wires in the cable. This can cause premature failure of the pinched wires, resulting in broken wires.

(4) Close inspection in these critical fatigue areas must be made by passing a cloth over the area that will snag on broken wires. This will clean the cable for a visual inspection, and detect broken wires if the cloth snags on the cable. Also, a very careful visual inspection must be made since a broken wire will not always protrude or stick out, but may lie in the strand and remain in the position of the helix as it was manufactured. Broken wires of this type may show up as a hairline crack in the wire. If a broken wire of this type is suspected, further inspection with a magnifying glass of 7 power or greater, is recommended. Figure 204 shows a cable with broken wires that was not detected by wiping, but was found during a visual inspection. The damage became readily apparent when the cable was removed and bent as shown in the figure below.

(5) Kinking of wire cable can be avoided if properly handled and installed. A cable taking a spiral shape as the result of unnatural twist causes kinking. One of the most common causes for this twist is improper unreeling and uncoiling. In a kinked cable, strands and wires are out of position, which creates unequal tension and brings excessive wear at this part of the cable. Even though the kink may be straightened so that the damage appears to be slight, the relative adjustment between the strands has been disturbed so that the cable cannot give maximum service and should be replaced. Inspect cables for a popped core or loose strands. Replace any cable that has a popped core or loose strands regardless of wear or broken wires.

(6) External wear patterns will extend along the cable equal to the distance the cable moves at that location and may occur on one side of the cable or on its entire circumference. Replace flexible and non-flexible cables when the individual wires in each strand appear to blend together (outer wires worn 40 to 50 percent).

(7) As wear is taking place on the exterior surface of a cable, the same condition is taking place internally, particularly in the sections of the cable which pass over pulleys and quadrants. This condition is not easily detected unless the strands of the cable are separated. This type of wear is a result of the relative motion between inner wire surfaces. Under certain conditions, the rate of this type of wear can be greater than that occurring on the surface.

(8) Carefully examine any cable for corrosion, when it has a broken wire in a section that is not in contact with a wear-producing airframe component, such as a pulley, fair-lead, etc. If the surface of the cable is corroded, relieve cable tension and carefully force the cable open by reverse twisting, and visually inspect the interior. Corrosion on the interior strands of the cable constitutes failure, and the cable must be replaced. If no internal corrosion is detected, remove loose external rust and corrosion with a clean, dry, coarse-weave rag, or fiber brush. Do not use metallic wool or solvents to clean installed cables. Use of metallic wool will embed dissimilar metal particles in the cables and create further corrosion problems. Solvents will remove internal cable lubricant allowing cable strands to abrade and further corrode. After thorough cleaning, sparingly apply specification MIL-C-16173, grade 4, corrosion-preventive compound to the cable. Do not apply the material so thick that it will interfere with the operation of cables at fair-leads, pulleys, or grooved bellcrank areas.

(9) Examine cable runs for incorrect routing, fraying, twisting, or wear at fair-leads, pulleys, anti-abrasion strips, and guards. Look for interference with adjacent structure, equipment, wiring, plumbing, and other controls. Inspect cable systems for binding, full travel, and security of attaching hardware. Check for slack in the cable system. Actuate the controls, and check for friction or hard movement that are indications that excessive cable tension exists.

NOTE: If the control movement is stiff after maintenance has been performed on the control surfaces, check for parallel cables twisted around each other or cables connected in reverse.

(10) Check swaged terminal reference marks for an indication of cable slippage within the fitting. Inspect the fitting assembly for distortion and/or broken strands at the terminal. Ensure that all bearings and swivel fittings (bolted or pinned) pivot freely to prevent binding and subsequent failure. Check turnbuckles for proper thread exposure and broken or missing safety wires/clips.

(11) Inspect pulleys for roughness, sharp edges, and presence of foreign material embedded in the grooves. Examine pulley bearings to ensure proper lubrication, smooth rotation, and freedom from flat spots, dirt, and paint spray. During the inspection, rotate the pulleys, which only turn through a small arc, to provide a new bearing surface for the cable. Maintain pulley alignment to prevent the cable from riding on the flanges and chafing against guards, covers, or adjacent structure. Check all pulley brackets and guards for damage, alignment, and security.

(12) Various cable system malfunctions may be detected by analyzing pulley conditions. These include such discrepancies as too much tension, misalignment, pulley bearing problems, and size mismatches between cables and pulleys. Examples of these conditions are shown in Figure 205.

(13) Inspect fair-leads for wear, breakage, alignment, cleanliness, and security. Examine cable routing at fair-leads to ensure that deflection angles are no greater than 3 degrees maximum. Determine that all guides and anti-abrasion

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

strips are secure and in good condition.

(14) Examine pressure seals for wear and material deterioration. Seal guards should be positioned to prevent jamming of a pulley in case the pressure seal fails and pieces slide along the cable.

3. Corrosion and Rust Prevention

A. To ensure a satisfactory service life for aircraft control cables, use a cable lubricant to reduce internal friction and prevent corrosion.

B. Coat the cable with rust-preventive oil, and wipe off any excess. Lubrication and corrosion preventive treatment of cables may be effected simultaneously by application of compound MIL-C-16173, grade 4. MIL-C-16173 compound should be brushed, sprayed, or wiped on the cable to the extent it penetrates into the strands and adequately covers the cable surfaces. It will dry "tack free" in 24 hours at 77° F.

4. Cable Maintenance

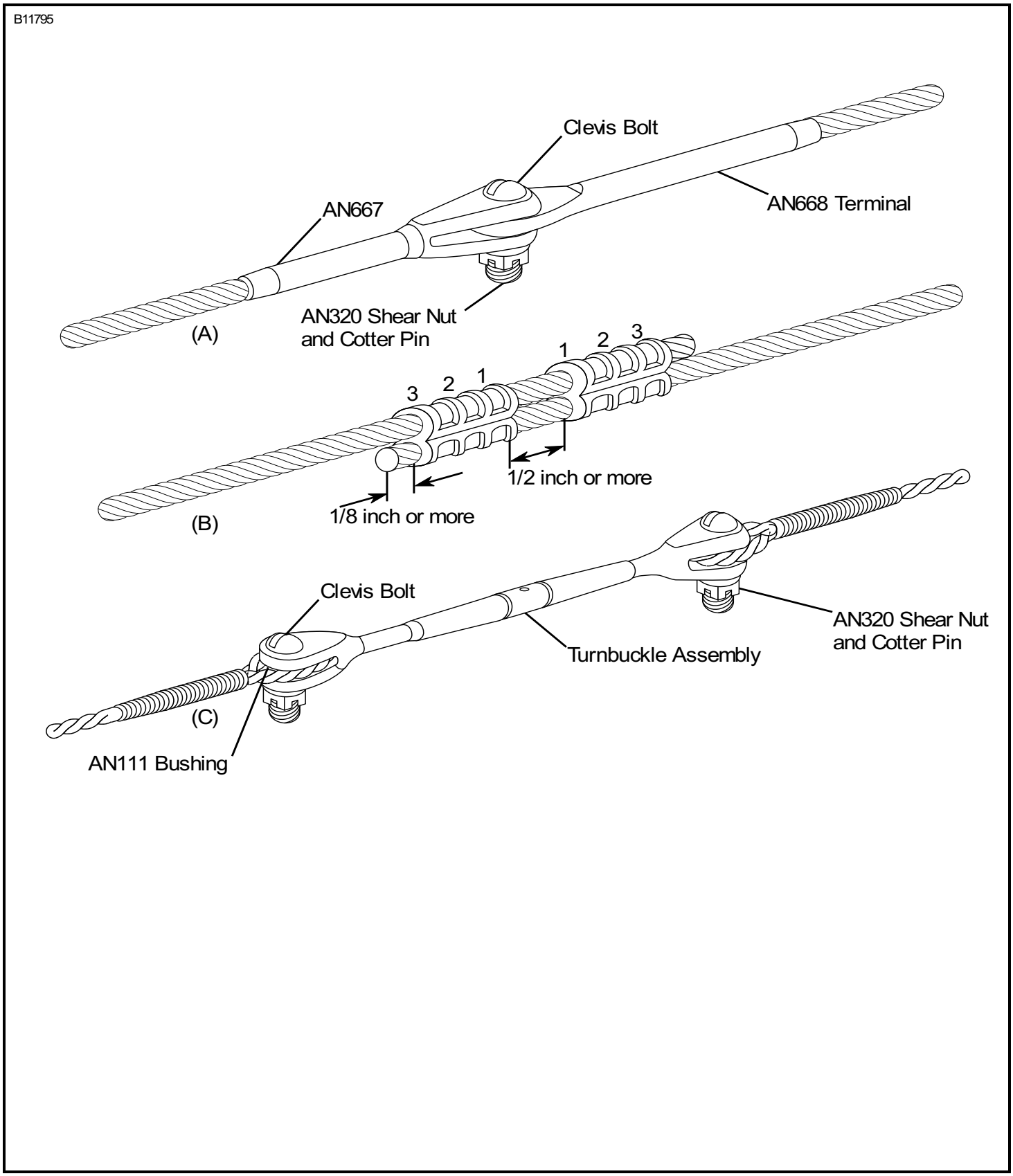
A. Frequent inspections and preservation measures such as rust-prevention treatments, will help to extend cable service life. Where cables pass through fair-leads or over pulleys, remove any accumulated heavy coatings of corrosion-prevention compound. Provide corrosion protection for these cable sections by lubricating with a light coat of grease or general-purpose, low-temperature oil.

5. Cable Tension Adjustment

A. Carefully adjust the control cable tension in accordance with the airframe requirements. If necessary, compensate for extreme surface temperature variations that may be encountered if the aircraft is operated primarily in unusual geographic or climatic conditions such as arctic, arid, or tropical locations. Use rigging pins and gust locks, as necessary, to ensure satisfactory results. At the completion of rigging operations, check turnbuckle adjustment and safetying in accordance with standard practices and information in this chapter.

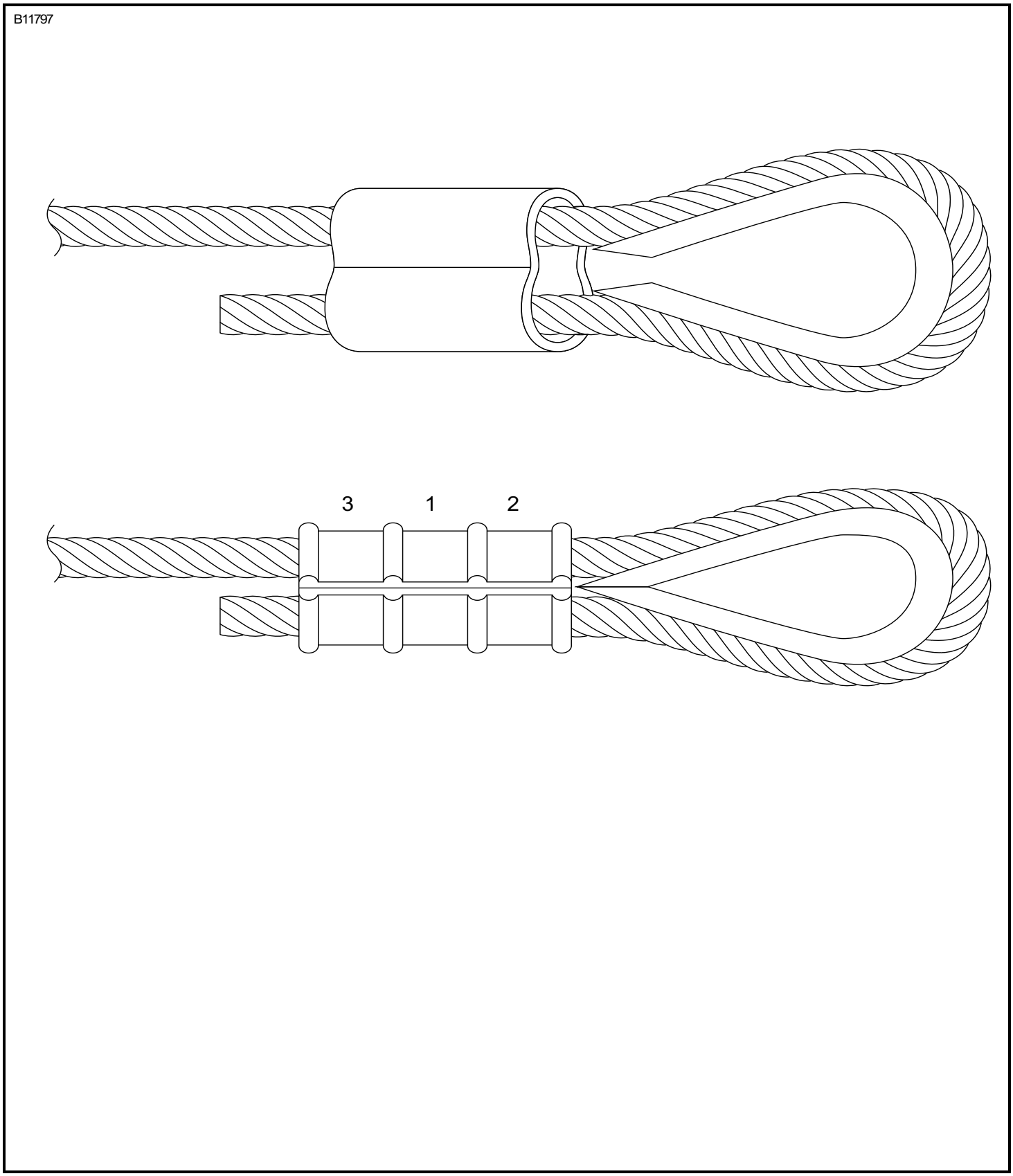
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Lap Splices



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

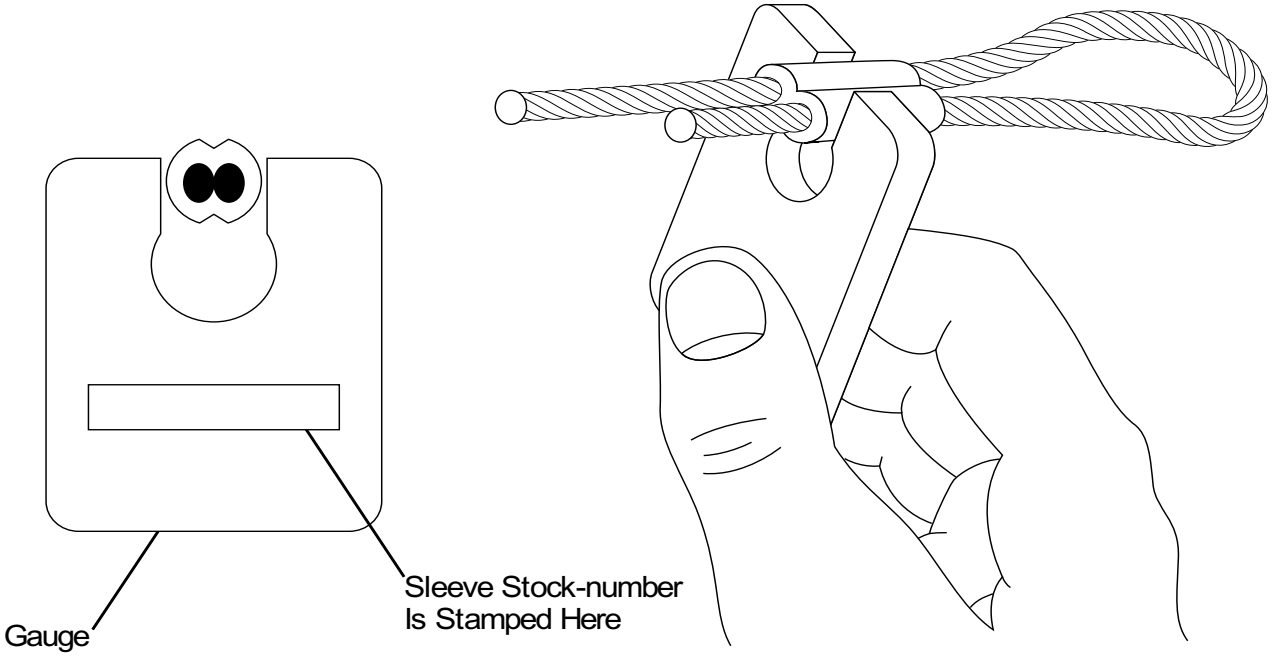
Figure 202 : Sheet 1 : Typical Thimble-Eye Splice



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Typical Terminal Gauge

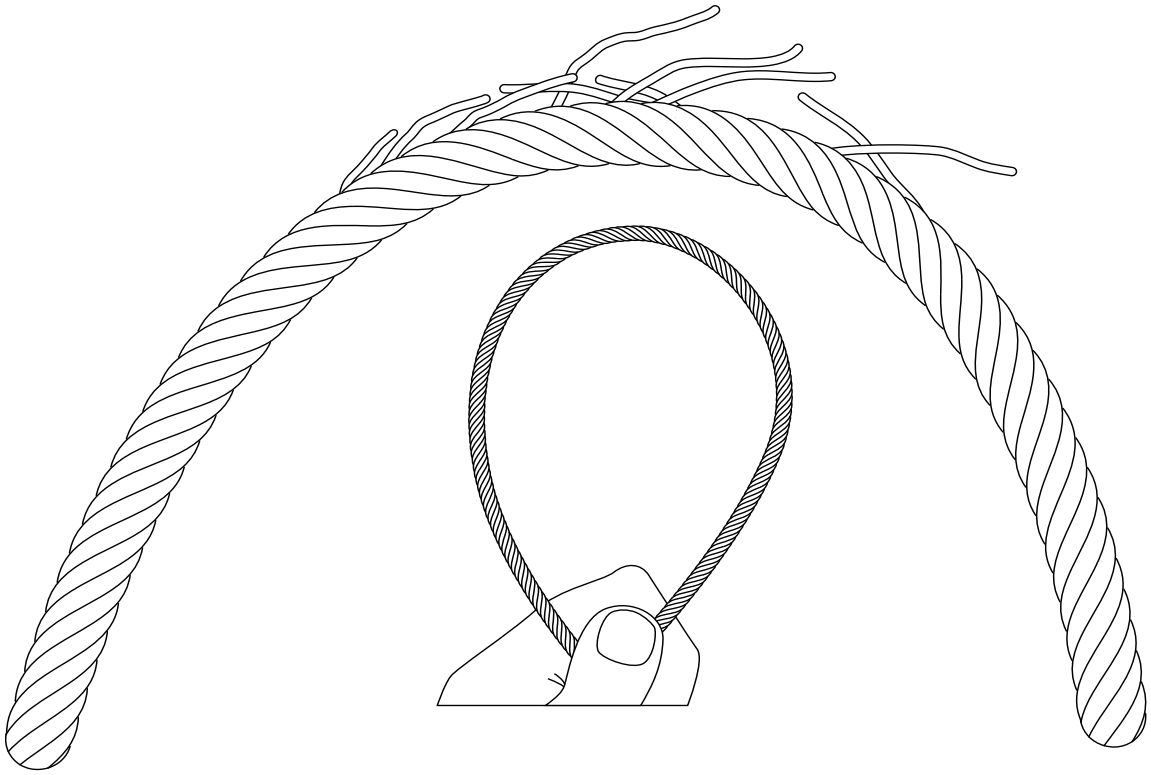
B11798



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

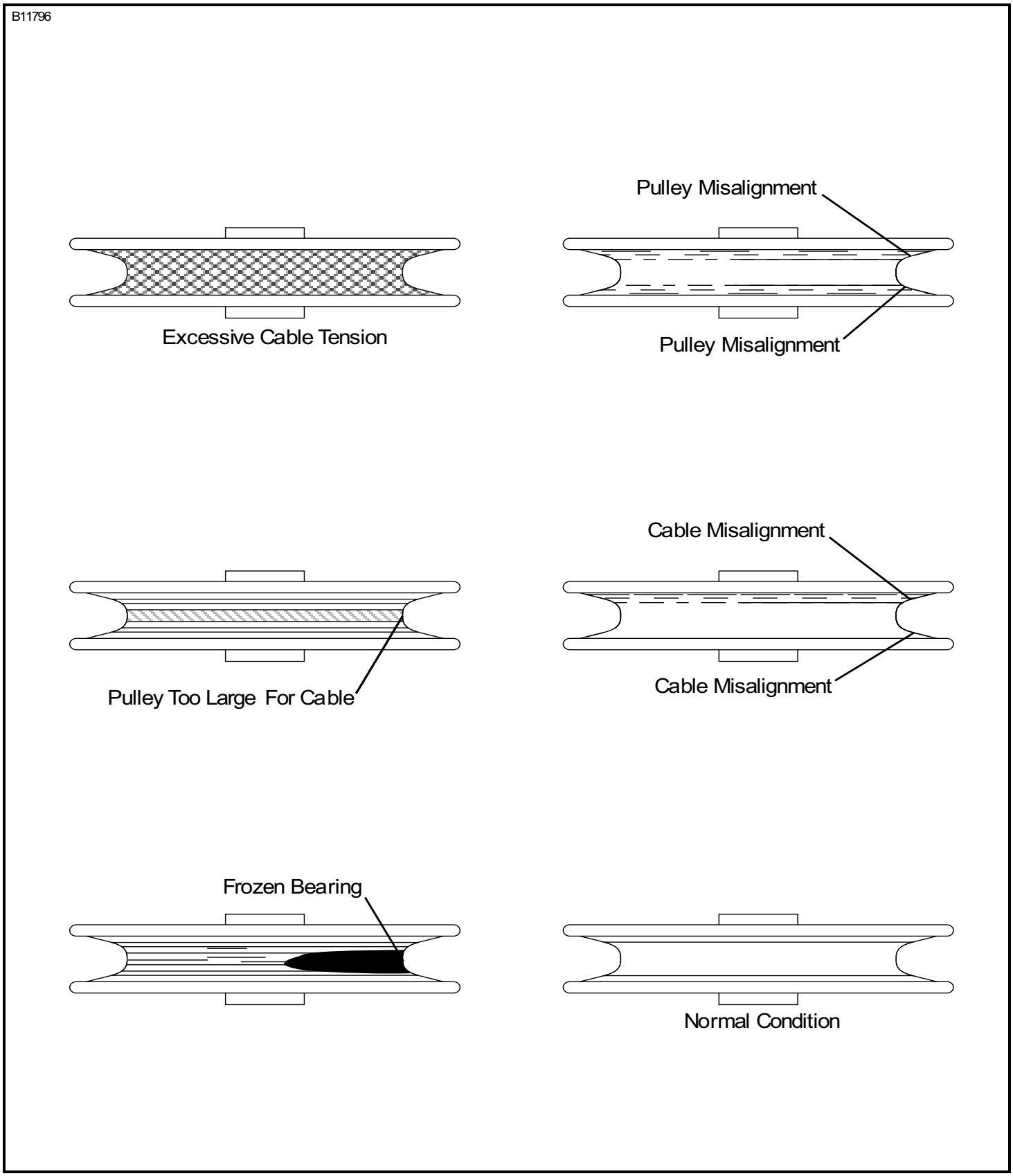
Figure 204 : Sheet 1 : Cable Inspection Technique

B11799



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Pulley Wear Patterns



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STANDARD PRACTICES AIRFRAME - MAINTENANCE PRACTICES

1. Turnbuckles

A. A turnbuckle is a device used in cable systems to provide a means of adjusting tension. Turnbuckles have barrel-shaped sleeves with internal left- and right-hand threads at opposite ends. The cables, with terminals attached, are made to such a length that, when the turnbuckle is adjusted to give the specified cable tension, a sufficient number of threads on the terminal ends are screwed into the barrel to hold the load. The clip-locking turnbuckle and its associated parts are identical to standard AN and MS parts except for a slot grooved on the interior of the barrel and the shanks of the forks, eyes, etc. The clip-locking turnbuckle parts have the following drawing numbers:

- MS21251, turnbuckle body
- MS21252, turnbuckle clevis end
- MS21253, turnbuckle clevis end (for bearing)
- NAS649 and NAS651, turnbuckle clip
- MS21254 and NAS648, turnbuckle eye (for pin)
- MS21255 and NAS647, turnbuckle eye end (for wire rope)
- NAS645 and NAS646, turnbuckle fork
- MS21256, turnbuckle barrel locking clip
- AN130-170, turnbuckle assemblies
- MS21259 and MS21260, terminal, wire rope, stud

NOTE: Turnbuckles showing signs of thread distortion or bending should be replaced.

Turnbuckle ends are designed to provide the specified cable tension on a cable system. A bent turnbuckle would place undesirable stress on the cable, impairing the function of the turnbuckle.

2. Turnbuckle Installation

A. When installing cable system turnbuckles, it is necessary to screw both threaded terminals into the turnbuckle barrel an equal amount. It is essential that turnbuckle terminals be screwed into the barrel so that not more than three threads on the terminal are exposed. On initial installation, the turnbuckle terminals should not be screwed inside the turnbuckle barrel more than four threads.

3. Witness Hole

A. Some manufacturers of turnbuckles incorporate a "witness hole" in the turnbuckle barrel to ensure that the threaded cable terminals are screwed far enough into the barrel. The "witness hole" can be inspected visually or by using a piece of safety wire as a probe.

4. Safety Methods for Turnbuckles

A. Safety all turnbuckles with safety wire using either the double or single-wrap method or with any appropriately approved special safetying device complying with the requirements of FAA Technical Standard Order TSO-C21. The swaged and unswaged turnbuckle assemblies are covered by AN standard drawings. Do not reuse safety wire. Adjust the turnbuckle to the correct cable tension so that no more than three cable threads are exposed on either side of the turnbuckle barrel.

(1) **Double-Wrap Method** - Of the methods using safety wire for safetying turnbuckles, the method described here is preferred, although either of the other methods described is satisfactory. The method of double-wrap safetying is shown in Figure 201.

(a) Use two separate lengths of wire. Run one end of the wire through the hole in the barrel of the turnbuckle, and bend the ends of the wire toward opposite ends of the turnbuckle.

(b) Pass the second length of the wire into the hole in the barrel, and bend the ends along the barrel on the side opposite the first. Spiral the two wires in opposite directions around the barrel to cross each other twice between the center hole and the ends.

(c) Pass the wires at the end of the turnbuckle in opposite directions through the hole in the turnbuckle eyes or between the jaws of the turnbuckle fork, as applicable, laying one wire along the barrel and wrapping the other at least four times around the shank of the turnbuckle and binding the laid wires in place before cutting the wrapped wire off.

(d) Wrap the remaining length of safety wire at least four turns around the shank, and cut it off. Repeat the procedure at the opposite end of the turnbuckle.

(e) When a swaged terminal is being safety wired, pass the ends of both wires through the hole provided in the terminal for this purpose, and wrap both ends around the shank as previously described. If the hole is not large

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

enough to allow passage of both wires, pass the wire through the hole, and loop it over the free end of the other wire, and then wrap both ends around the shank as previously described. Another satisfactory double-wrap method is similar to the previous method, except that the spiraling of the wires is omitted as shown in Figure 201.

(2) **Single-Wrap Method** - The single-wrap methods described in the following paragraphs and as illustrated in Figure 201 are acceptable but are not the equal of the double-wrap methods.

(a) **Single-Wrap (Spiral)** - Pass a single length of wire through the cable eye or fork or through the hole in the swaged terminal at either end of the turnbuckle assembly. Spiral each of the wire ends in opposite directions around the first half of the turnbuckle barrel, so as to cross each other twice. Thread both wire ends through the hole in the middle of the barrel so that the third crossing of wire ends is in the hole. Spiral the two wire ends in opposite directions around the remaining half of the turnbuckle, crossing them twice. Pass one wire end through the cable eye or fork or through the hole in the swaged terminals, in the manner previously described. Wrap both wire ends around the shank at least four turns each, cutting off excess wire. This method is shown in view (C) of Figure 201.

(b) **Single-Wrap** - For the method shown in view (D) of Figure 201, pass one length of wire through the center hole of the turnbuckle, and bend the wire ends toward opposite ends of the turnbuckle. Pass each wire end through the cable eye or fork or through the hole in the swaged terminal, and wrap each wire around the shank for at least four turns, cutting off excess wire. After safetying, no more than three threads of the turnbuckle threaded terminal should be exposed.

5. Secured Safety-Wired Turnbuckles

A. Before securing turnbuckles, threaded terminals should be screwed into the turnbuckle barrel until no more than three threads of either terminal are outside the barrel. After the turnbuckle has been adjusted for proper cable tension, two pieces of safety wire are inserted with half the wire length into the hole in the center of the turnbuckle barrel. The safety wires are bent so that each wire extends half the length of the turnbuckle on top and half on bottom. The ends of the wires are passed through the hole in the turnbuckle eyes or between the jaws of the turnbuckle fork, as applicable. The wires are then bent toward the center of the turnbuckle, and each wire is wrapped around the shank four times, binding the wrapping wires in place as shown in Figure 202.

B. When a swaged terminal is being secured, one wire is passed through the hole in the terminal and is looped over the free end of the other wire and both ends wrapped around the shank. All lock wire used in the safetying of turnbuckles should be carbon steel, corrosion-resistant steel, nickel-chromium iron alloy (Inconel), nickel-copper alloy (Monel), or aluminum alloy. For safety cable diameter of safety wire size and material, refer to Table 201.

C. Care should be exercised when safety wiring, particularly where corrosion will present a problem, because smaller wire sizes tend to crack when twisted.

Table 201. Turnbuckle Safetying Guide

Cable Size	Type of Wrap	Diameter of Safety Wire	Material (Annealed Condition)
1/16	Single	0.040	Copper, brass (NOTE 1)
3/32	Single	0.040	Copper, brass (NOTE 1)
1/8	Single	0.040	Stainless steel, Monel and "K" Monel.
1/8	Double	0.040	Copper, brass (NOTE 1)
1/8	Single	0.057 min.	Copper, brass (NOTE 1)
5/32 and greater	Double	0.040	Stainless steel, Monel and "K" Monel.
5/32 and greater	Single	0.057 min.	Stainless steel, Monel and "K" Monel.
5/32 and greater	Double	0.0512	Copper, brass (NOTE 1)

NOTE 1:

Galvanized or tinned steel, or soft iron wires are also acceptable.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

6. Special Locking Devices

A. Several turnbuckle-locking devices are available for securing turnbuckle barrels such as wire-locking clips. Persons intending to use a special device must ensure that the turnbuckle assembly has been designed to accommodate such devices. A typical unit is shown in Figure 203. When special locking devices are not readily available, the use of safety wire is acceptable.

(1) **Assembling and Securing Clip-Lock Turnbuckles** - Wire clip-locking turnbuckles are assembled and secured in the following ways (refer to Figure 204):

(a) Engage the threads of the turnbuckle barrel with the threads of the cable terminal, and turn the barrel until proper cable tension is reached.

(b) Align the slot in the barrel with the slot in the cable terminal.

(c) Hold the lock clip between the thumb and forefinger at the loop end, and insert the straight end of the clip into the opening formed by the aligned slots. Refer to Table 202.

(d) Bring the hook end of the lock clip over the hole in the center of the turnbuckle barrel, and seat the hook loop into the hole.

(e) Apply pressure to the hook shoulder to engage the hook lip in the turnbuckle barrel and to complete safety locking of one end of the turnbuckle.

NOTE: Repeat the above steps to safety lock the opposite end of the turnbuckle. Either lock clips may be inserted in the same turnbuckle barrel hole or they may be inserted in opposite holes. However, do not reverse-wire locking clips.

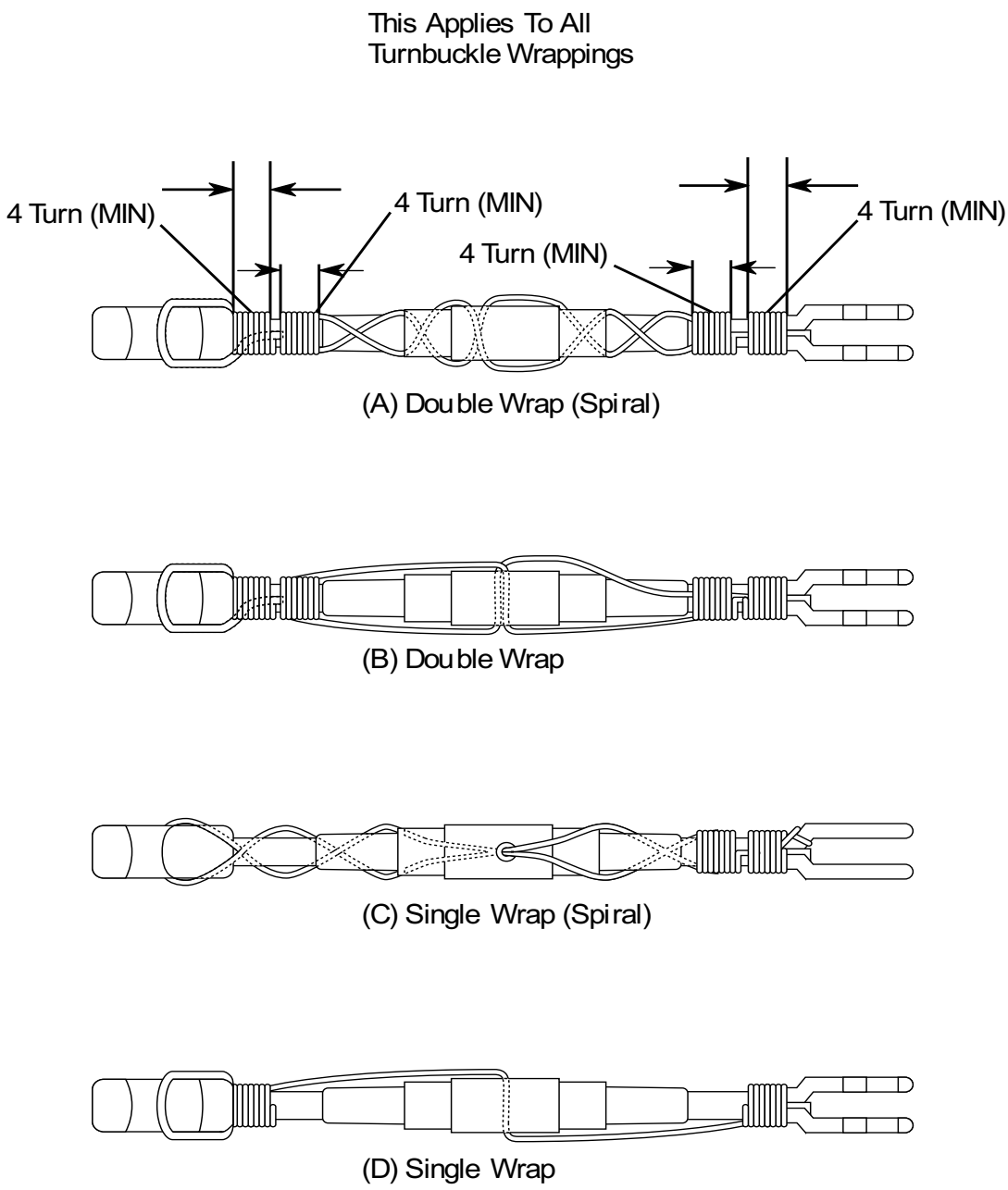
Table 202. Locking-Clip Application

Nominal Cable Diameter	Thread Unf-3	Locking Clip MS21256	Turnbuckle Body MS21251
1/16	No. 6-40	-1	-2S
1/8	1/4-28	-1	-4S
1/8	1/4-28	-2	-4L

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Safetying Turnbuckles

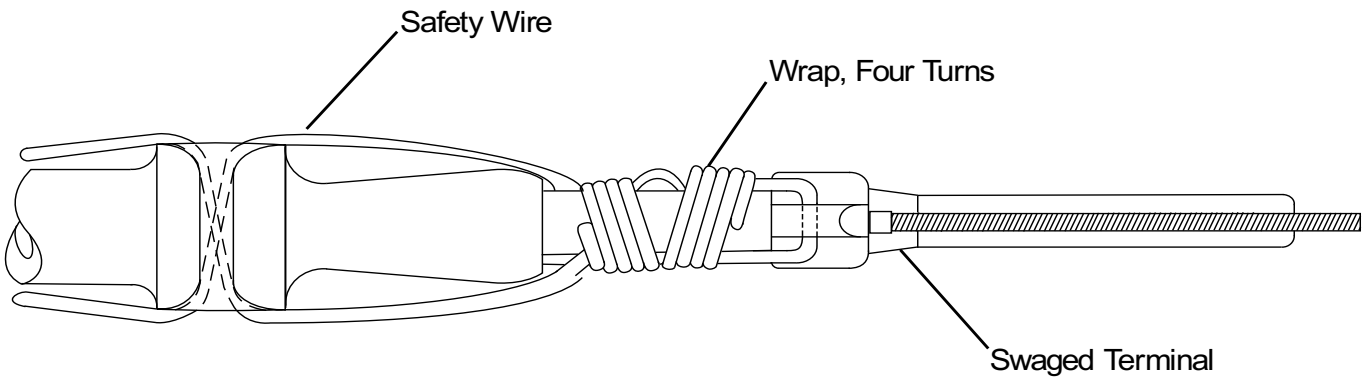
B11800



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

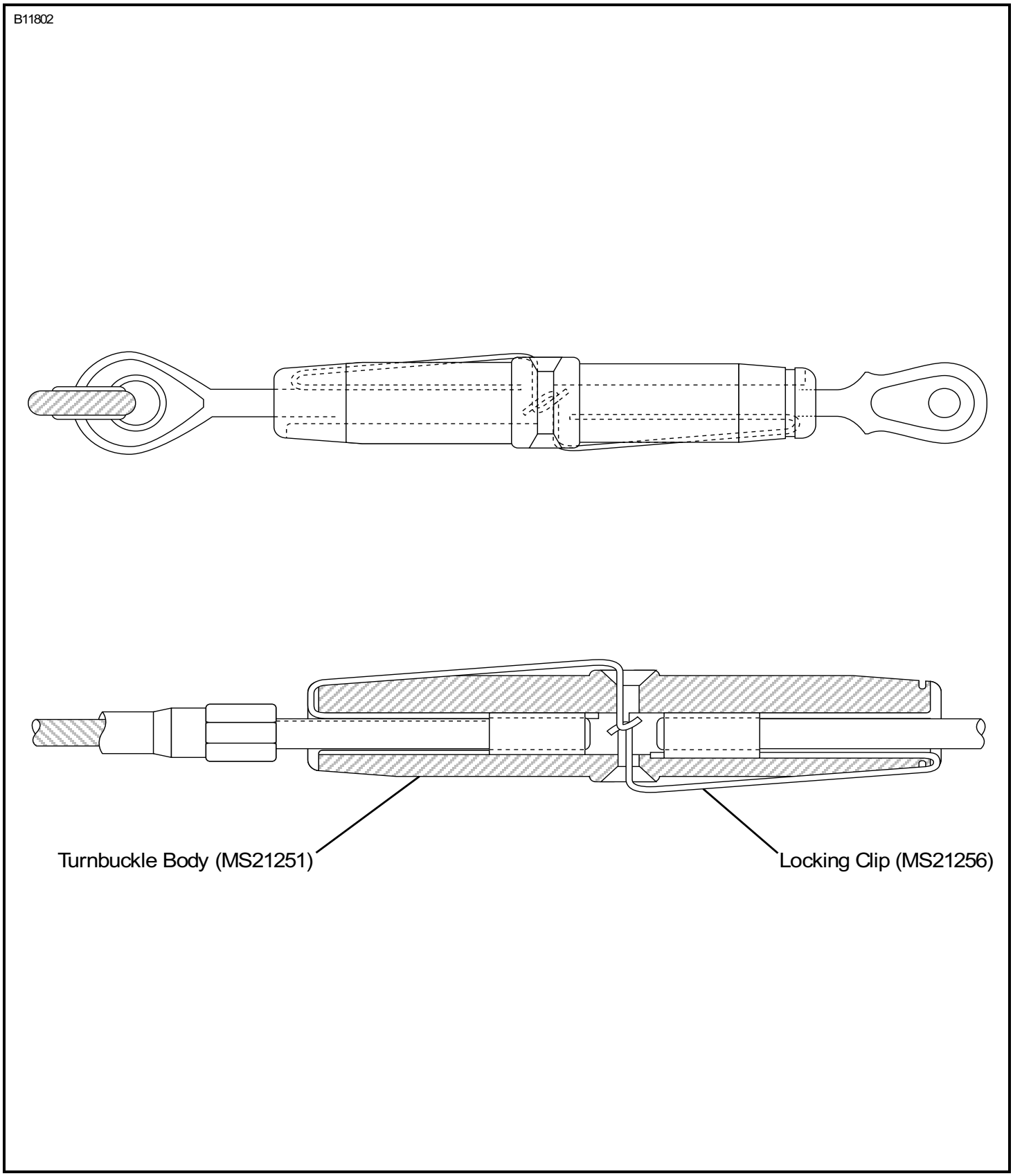
Figure 202 : Sheet 1 : Securing Turnbuckles

B11801



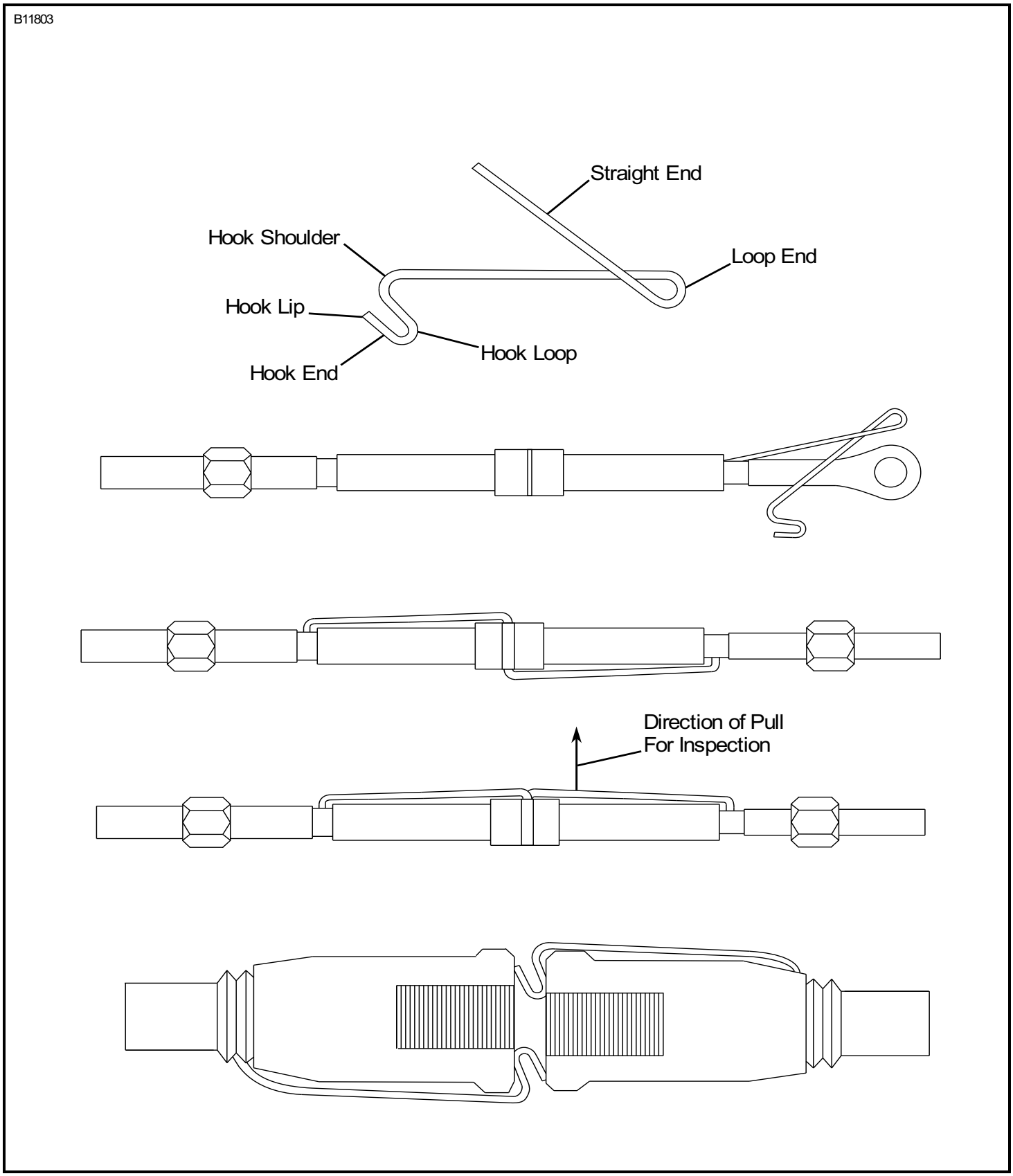
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Clip-Type Locking Device



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Assembling and Securing Clip-Locking Turnbuckles



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SOLVENTS, SEALANTS, AND ADHESIVES - DESCRIPTION AND OPERATION

1. Solvents, Sealants, and Adhesives

A. Many general purpose solvents, sealants, and adhesives are used in the aircraft.

B. Solvents are used for thinning and cleaning. Use of solvents used for painting are covered in Section 51-70-00. MPK and alcohol are used for cleaning of composite parts before bonding and their specific use is described in Chapter 51.

C. Sealants are used for protection, sealing, and thread locking. These items will be specifically called out in specific maintenance manual chapters where their use is required.

D. Adhesives are used in repair and installation. Special purpose adhesives are used for composite repair, composite bonding, upholstery installation, static wick installation, and window installation. Refer to specific maintenance manual chapters for instructions, precautions, and use of these adhesives.

E. Many oils and lubricants are also used.

F. Special purpose cleaners are also listed.

G. Table 1 and Table 2 list these items.

Table 1. Engine and General Purpose Materials

Part Number	Product Description Of Material	Cessna Specification or Vendor
LL100	AVGAS, Gasoline	
Aeroshell	Break-In Oil, Engine, MIL-C-6529 Type II	Aeroshell
Aeroshell	Oil, Engine	Aeroshell
Z24E024	Oil, Red Hydraulic MIL-H-5606	Esco
	Oil, General Purpose, Lubricating MIL-L-7870	
AeroshellMobil	Grease, Wheel Bearing MIL-G-81322	AeroshellMobil
	Antiseize Compound MIL-T-5544	Lubtork
	SAE 10 Oil, Grease Seal Preparation	
Aeroshell 6	Propeller Grease	Aeroshell
	K&N Air Filter Cleaner and Solvent	K&N
	Windex, Glass Cleaner, Instruments and Moving Map Displays	
	P210 Plastic Cleaner, Windows	Sumner Labs
	Permatex	SX519040 or Loctite
RTV133	Silicone Rubber, Black	E.V. Roberts
RTV162	Silicone Sealant, White, (Type V, Class E)	GE
RTV5818	Silicone Rubber Caulk, Clear 400° F	E.V. RobertsGeneral Electric
440014	Sealant, High Pressure	ND Industries
PR 1428	Fuel Tank Access Panel And Fitting Sealant	PRC Courtalds
AC236	Fuel Tank Sealant	AC Tech
	Paint - refer to Section 51-70-00	SX512701
	Zinc Oxide Primer	SX513840
1522	Fire Resistant Paint - refer to Section 51-70-00	SX512701
	Zinc Chromate Primer	

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

	Acetone	
	Alcohol	
	MPK	
325 SOLVENTUN1268	Cleaning Solvent	

Table 2. Special Adhesives, Solvents, and Other Materials

Part Number	Product Description Of Material	Cessna Specification or Vendor
MGS418LMGS418H	Adhesive (Structural), Two Part Epoxy	SX513120
LP-89	Conductive Adhesive, Two Part Epoxy	SX518001Lunar Products
EA9321	Hysol Adhesive, Two Part Epoxy	DexterE.V. Roberts
EA9339	Hysol Adhesive, Two Part Epoxy	DexterE.V. Roberts
1805	Adhesive, Window Adhesive, Two Part	SX535601 Casco Than
1806	Curing Agent, Window Adhesive, Two Part	SX535601 Casco Than
1821	Curing Agent, Window Adhesive, Two Part	SX535601 Casco Than
ADH105P	Adhesive, Upholstery	Keyston
242	Loctite Threadlocker Medium (Blue) Primer N or T	Loctite
262	Loctite Threadlocker (Red) Primer N or T	Loctite
542	Loctite Threadlocker (Brown) Primer N	Loctite
609	Loctite Retaining Compound (Green) Primer T	Loctite
620	Loctite Retaining Compound (Green) Primer N	Loctite
660	Loctite Retaining Compound (Silver) Primer N	Loctite
675	Loctite Retaining Compound (Green) Primer T	Loctite
N	Loctite Primer	Loctite
T	Loctite Primer	Loctite

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LIGHTNING PROTECTION AND STATIC DISSIPATION SYSTEMS - MAINTENANCE PRACTICES

1. Lightning Protection and Static Dissipation Systems

A. The Cessna 300 (LC40-550FG) airframe is protected during lightning strikes by a combination of electrical grounding and metallic mesh over the composite structure. The lightning strike event is very powerful (hundreds of thousands of amps), of short duration (acting like very high frequency electronics), and of a powerful inductive and magnetic nature that can deform very strong conductive elements. Deviations from the approved design may not provide crew or airframe protection.

B. The metallic mesh conducts the currents of a lightning strike from the attachment point to the arc exit point. The requirements of this mesh are dependent on aircraft location.

C. Chapter 51 defines mesh requirements and mesh repair procedures.

D. **SAFE Strips**

(1) The aircraft interior is specially grounded to avoid large potential differences from one point to another during a lightning strike. This protection is accomplished by grounding bars, grounding straps, and Special Aluminum Foil Edging (SAFE) strips.

(2) SAFE strips are thin self adhesive aluminum foil. They are strategically placed in the cockpit under the upholstery and seats on the composite structure. Refer to Figure 201. SAFE strips run across the fuselage from one grounding bar to the other.

(3) SAFE strip Material Requirements:

(a) Adhesive Backed Aluminum Foil P/N 971023 from ALUMAT INC.

(b) MS20470AD4-4 Rivets

(c) AN960-4 Washers

(d) Squeegee for rubbing down SAFE strips

(e) Scissors for cutting SAFE strips

(f) Alcohol

(g) Oil-free Rags

(4) SAFE strips should be replaced or repaired when they are severed across more than one half of the existing width.

(5) SAFE strip repair foil must make contact with the existing foil. This is done by folding over the ends of the repair piece and securing the overlap area that is not secured with the self-adhesive backing of a new overlapping piece. This method is shown in Figure 202. Be sure to adhere to the overlap requirements of 1.0 inch foil to foil contact around the perimeter of the repair.

(6) Clean all surfaces to which SAFE strip material must be applied. Use alcohol and clean, oil-free rags. Wipe surface, turning rag to use a new surface with each wipe. Apply the self-adhesive SAFE strip material by carefully aligning material and rubbing it down with a squeegee. Work slowly and carefully to prevent wrinkles and bubbles. Small wrinkles and bubbles less than 1.0 inch across are acceptable. Large bubbles should be popped with a pin or knife prick and squeegeed down. Cutting out the offending material and replacing it with a suitable patch can repair large wrinkles or creases in the SAFE strip. Be sure to follow the repair guidelines from the previous section.

(7) SAFE strips are grounded to the grounding bars with rivets. Refer to Figure 203. This connection should be inspected. If electrical contact is not confirmed by visual inspection of contact between the washer and SAFE strip, the connection should be removed for replacement. The use of a voltmeter to check the connection will not work. If any connection exists from the SAFE strip and the grounding bar, conductivity will be indicated. The conductivity check does not substantiate the current carrying ability of the connections.

(8) Rivets are MS20470AD4-4 pop type and secure AN960-4 washers against the SAFE strips.

(9) If complete replacement of a SAFE strip is required, the material should be folded over at the ends where contact with the grounding bar is required. This procedure is shown in Figure 204. Installation of rivets and washers complete the electrical contact connection.

(10) SAFE strips run into the footwell. Inspect this SAFE strip connection by visual confirmation of aluminum foil integrity in the contact area. This detail is shown in Figure 205. Note that the SAFE strip material wraps over the edges of the footwell, from the inside surface to the outside, to make contact with the SAFE strip material on the fuselage floor.

E. **Grounding Straps** - Grounding straps and bars are more conventional conductors. They provide a high current carrying

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

capability between major airframe elements. Grounding straps can be found between the engine mount and the fuselage grounding bars, flight control surfaces and wing or stabilizers, gearbox and grounding bar, instrument panel and grounding bar, engine and radio rack, and various avionics components and the radio rack and instrument panel.

(1) Braided Grounding Straps - These are located:

(a) Between the ailerons and wing (one each side)

(b) Between the rudder and vertical stabilizer

(c) Between the fuselage and elevator

(d) Between the gearbox and grounding bar (one each side)

(e) Between the instrument panel and grounding bar (one each side)

(2) Solid Strap Conductors - These are located between the grounding bars and the upper engine mount bolts, one each side.

F. **General Aircraft Conductivity Checks**

(1) The aircraft has nine static wicks. These wicks dissipate the static charge the aircraft develops as it flies through the air. The static charge the aircraft develops is strongly dependent on the atmospheric conditions at the time. Snow is most likely the atmospheric condition that will create the largest static charge. Improper static wick function may show up as a crackling sound from the radio speakers.

(2) Check each static wick mounting pad (nine each) for low resistance to the nose gear or engine bonding strap. Each should measure less than 10 ohms.

(3) The aircraft fuel filler caps and mounting rings should also be grounded to the rest of the airframe. This is especially important to prevent static discharge during refueling.

(4) Check the fuel cap rings for low resistance to the nose gear or engine bonding strap. This value should be 0 to 500 ohms.

2. Inspection and Repair After Lightning Strike

A. In the event of a lightning strike, or suspected lightning strike, inspect the surface of the aircraft for evidence of damage such as bubbled or bumpy paint.

B. Remove paint and bodywork until mesh is exposed.

NOTE: If damage is noted to the composite material, evidenced by brown or darker fibers, contact Cessna for further instructions.

C. Using a 10x magnifying glass isolate the entire damaged area of mesh and a 1 inch square area of damaged mesh within that, evidenced by deformed mesh strands - flat or bulbous in appearance.

D. Count the number of damaged strands in that 1 inch square area and calculate what percentage that is of the entire affected area. If it is less than 2 percent of the total area no mesh repair is necessary. If greater than 2 percent of the total area a mesh repair is necessary.

E. For mesh repairs, overlap affected area 1 inch beyond damaged area with replacement mesh and apply using Jeffco epoxy.

F. Upon completion of repairs or aircraft exterior inspection, bodywork and paint affected areas in accordance with Chapter 51.

G. Inspect all hardware associated with damaged areas for magnetism. If no magnetism is noted, re-use hardware.

H. If hardware is found to be magnetized, inspection of respective hardware locations where hardware contacts mesh is required. Wing attachment hardware contacting mesh must have associated bolt holes inspected for damaged mesh. If mesh around the bolt holes is damaged the affected holes and hardware must be increased one size to restore contact of mesh to hardware for proper lightning protection. Enlarge holes using a 5/16 tapered drill ream.

I. Actuate flight controls to ensure proper operation. If defects are noted, inspect for evidence of arcing on control surface attachments and associated hardware and replace as needed.

J. Remove the circuit breaker panel in accordance with Chapter 25. Remove and replace the avionics bus surge suppressor attached to the front side of the aft circuit breaker panel half.

K. Reinstall the circuit breaker panel and perform the following electrical/avionics checkout for all equipment. If any equipment is not operating properly, contact Cessna for further instructions for repair or replacement of the equipment.

L. Verify compass card accuracy.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

M. Compliance with Teledyne Continental Motors Service Bulletin No. M88-9, for powerplant lightning strike inspection criteria, is recommended.

3. Checkout Description

A. Follow this checkout list to inspect the plane's electrical and avionics equipment after a lightning stirke:

(1) 'Buzz Box'

(a) Connect 'Buzz Box' to aircraft MAGs connecting to:

1 Right MAG sensor wire to center post on right MAG

2 Left MAG sensor wire to center post on left MAG

3 Ground sensor wire to engine ground

NOTE: It may require the prop to be turned clockwise until an audible click can be heard for the MAGs to work.

(b) Verify ignition switch positions:

1 Left

2 Right

3 Both

4 Off

(2) Clear the area around the prop of people and equipment. Energize the starter with the key switch and verify operation and proper direction of rotation of the engine. Prop should rotate clockwise as viewed from the pilots seat.

(3) Verify operation of the Battery switch and orientation of the switch. Check for voltage on the systems bus.

(4) Connect a 14 VDC power supply to the Alternator relay. (Maintain voltage between 11 VDC and 14 VDC for this test.) Turn on the **BATT** and **ALT** switches and verify that the voltage increased when the **ALT** switch was turned to 'ON'. With the **ALT** switch is still in the 'ON' position, verify that the green light on the voltage regulator is illuminated. (Voltage regulator is located on the inside of the firewall, right hand side.)

(5) With the 'ALT' switch on and no external power applied, check for approximately 10- 11 volts on the F-1 terminal of the alternator. Terminal F-2 is grounded.

(6) Energize the avionics master switch and check for voltage on the avionics bus (located on firewall - outside).

(7) Turn on the pitot heat and check for heating at the pitot tube (located under right wing) and a discharge on the ammeter. Do not operate pitot heat for more than two minutes. CAUTION: Use care when touching hot pitot mast.

(8) Turn on the position lights switch and check all 4 bulbs for illumination and proper color orientation (green right side, red left side)

(9) Turn on strobe lights and verify 3-4 flashes per event. Ensure that the left and right wing flashes alternate between the left and right side.

(10) Turn on landing light and verify the inboard light illuminates (the one without a diffuser).

(11) Turn on the taxi light and verify the outboard light with the diffuser illuminates.

(12) Door Operational Checkouts

(a) Close and lock left, right and baggage doors.

(b) Door open light on annunciator should be extinguished.

(c) Open any door and check the flip lights and the step lights stays lit for approximately 10 minutes.

(d) Test the right and baggage doors as described in step 3 above.

(e) With all doors closed and locked, turn on Door Seal Pump Switch, verify pump operation- door seals inflate and pump turns off when seals are full.

(f) Door seal pump should not cycle (on and off) for at least 30 seconds.

(g) Open left door slowly, dump value should relieve all pressure and door opens.

(h) Close door and repeat steps 6 and 7 above for the right side door.

(i) Turn door seal system off, slowly open either door to verify dump valve operation.

(13) Turn on vapor suppression switch and verify low speed operation of the boost pump.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(14) Momentarily move the back-up pump switch to the arm position. Verify that the blue arm light illuminates and the boost pump operates in high speed. The fuel pump annunciator should also light.

(15) Press the primer button and verify high-speed operation of the boost pump.

(16) Verify operation of the engine gauges that can be checked without the engine running:

(a) Fuel level gauge

(b) Man press

(c) Oil temp

(d) Amp gauge (turn on a load, should show discharge)

(17) Check ELT remote switch function (leave the ELT Transmitter in the armed mode). Tune the VHF Com to 121.5 MHz, and listen through the cabin speaker or the headsets. Turn the ELT switch, located on the right hand knee bolster, to the 'ON' position.

NOTE: Per FCC regulations the ELT system should only be checked during the first five (5) minutes of the hour.

(18) Test the static and pitot systems for leak rate and for proper operation of the system.

CAUTION: Do not exceed a rate of climb >2000 feet per minute.

(a) Static system leak rate = _____ fpm @ 1000 feet above field elevation. (Maximum leak rate is 100 fpm @ 1000 feet above field elevation for the static system only.) Raise static system 100 feet above field elevation and hold open the alternate static valve, located on the left side knee bolster (turn to **ALT**), the system should immediately drop to field elevation.

(b) With switch still in **ALT** position, raise Pitot System to 200 kts. Maximum leak rate is 50 kts per minute. Pitot System leak rate = _____ kpm. After testing Pitot System return switch to the **NORM** position.

(19) Ensure the turn coordinator flag is not displayed and listen for the rotor of the gyro to spin-up.

(20) Verify OAT both F and C, and voltage readings using top red button. Using the select and control buttons, verify clock operations and functions. (UT, LT, FT, and ET)

(21) Operate the flap switch and verify that the LED in the knob flashes while the flaps are in transition. Check all three positions. Verify the flashing light goes out once the flaps reach the position indicated on the handle.

(22) Verify operation of trim servos (two axis) for travel, direction of travel, and run them from stop to stop. Ensure trim panel indications agree with external position of the tabs for two axis and that the display properly indicates stop to stop. Verify the operation of the on/off switch. Verify that the Pilot's Trim Switch on the control stick (left side) overrides the Co-pilot Trim Switch on the control stick (right side).

(23) Compass System Check Out for KCS55A System and KI525A HSI

(a) Apply aircraft Battery and Avionics power.

(b) HSI red HDG flag pulls after 2 minutes or less (top left).

(c) Go to Free mode on the KA51B Slaving Controller.

(d) Move CW/CCW switch to CW, compass card moves Clock Wise and HDG flag appear.

(e) Move Slave/Free switch to Slave mode, compass card rotates back to aircraft heading, the +/- meter shows deflection until the HDG flag pulls.

(f) Go back to Free mode on Slaving Controller and drive the compass card to the CCW position, compass card drives Counter Clock Wise and HDG flag appears during movement.

(g) Move the Slave/Free switch to Slave mode, compass card rotates back to aircraft heading, the +/- meter shows deflection until the HDG flag pulls.

(24) Perform initial set-up procedures for the avionics as described in Chapters 22, 23, 25, 31, and 34.

(25) Turn on the Avionics Master Switch and verify the operation of:

(a) Pilot's and Co-pilot's VOR, ILS, and MKR Navigation systems

(b) Transponder system check-out.

(c) Perform GPS, MX20, and Autopilot system installation check-out procedures.

(26) Verify the engine driven vacuum lines are not pinched and have clamps at the termination point behind the instrument

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

panel.

(27) Check the fuel cap rings for low resistance to the nose gear or engine bonding strap, (0 to 500 ohms).

CAUTION: Checking grounds with aircraft power applied will distort resistance reading.

(28) Remove all power from the aircraft. Check each static wick (9 each), for low resistance to the nose gear or engine bonding strap, (less than 10 ohms).

CAUTION: Checking grounds with aircraft power applied will distort resistance reading.

(29) Turn on the cabin fan and check for airflow through the selected vents, defroster and floor.

(30) Activate the hot-cold control on the heater panel and verify the firewall shut-off servo works.

(31) To simulate the engine running disconnect oil pressure switch connecter (aft left side of engine) and short pins A and B together on connector.

(32) Check the annunciators and Aural warning system for operation:

(a) With the Alt Master switch turned on, no light or aural warning heard over speakers or headset:

1 Turn Alt Master to off. ALT light is illuminated on annunciator panel. After 2 seconds "alternator off" is heard over headsets and speaker.

2 Press ACK button and aural warning is canceled.

(b) On center console select left fuel tank:

1 No light on annunciator panel or aural warning is heard over speakers or headset. Fuel Level gage illuminates green LED for tank selected.

2 Turn Fuel selector to off, FUEL VALVE light is illuminated on annunciator panel. After two seconds "fuel valve" is heard over headsets and speaker. No LED is lit on Fuel Level gauge.

3 Press ACK button and aural warning is canceled.

(c) On center console select right fuel tank:

1 No light on annunciator panel or aural warning is heard over speakers or headset. Fuel Level gage illuminates green LED for tank selected.

2 Turn Fuel selector to off, FUEL VALVE light is illuminated on annunciator panel. After two seconds "fuel valve" is heard over headsets and speaker. No LED is lit on Fuel Level gauge.

3 Press ACK button and aural warning is canceled.

(d) On aircraft clock press "Select" button to "ET" mode.

1 Press "Control" button to count down from 0:01:00. When timer reaches zero "Timer at Zero" is heard over headsets and speaker only twice and cancels without pressing the ACK button.

(e) Check that LVAC, RVAC, L LOW FUEL, R LOW FUEL, and DOOR OPEN lights are illuminated on annunciator panel.

(f) Check that OIL light on annunciator panel is off.

(g) Remove jumper on Oil Pressure switch and reconnect connector. OIL light on annunciator panel illuminates.

(h) With the rudder pedals aligned evenly, activate the rudder limiter by pressing Trim Panel Test button and check that the RDR LMTR annunciator light illuminates and an audible click is heard.

(33) SpeedBrake™ Operational Checks

WARNING: Clear the left and right wings of personnel and equipment.

(a) Ensure rudder pedals are aligned evenly and external power is applied >12.4VDC.

(b) Deploy SpeedBrake™ by pressing the **SPDBRK** switch located between the Throttle and Prop levers to the up position.

(c) SpeedBrake™ will deploy and the SPDBRK light on annunciator panel illuminates.

(d) Press the test button on the trim panel; SpeedBrakes™ will retract. Release test button.

(e) Reposition the **SPDBRK** switch to the down position.

(f) Redeploy the SpeedBrakes™ and move the stall vain lift detector to the stall position full up, the SpeedBrakes™ retract.

(g) Reposition the **SPDBRK** switch to the down position.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(34) Check the test switch on the trim panel to operate the following:
  (a) Annunciator panel, all LED's light.
  (b) All trim LED's light.
  (c) Rudder limiter engages.
  (d) All GPS annunciators light.
  (e) Flap switch LED blinks.
  (f) Both Fuel level gauge LEDs illuminate.

(35) Check the speaker for operation.

(36) Check the power point for voltage and verify polarity.

(37) Turn on the position lights and verify that the following devices Dim: fuel level gauge LED's, Trim panel, Flap switch LED. Turn off the position lights and verify this action turns off the interior light dimming system.

(38) Verify all four channels of the dimmer, one channel at a time:
  (a) **UPPER PNL** (panel) lights: Verify Engine and Flight instruments have two bulbs illuminated per instrument. Clock light and compass light are illuminated and no other lights are on.
  (b) **LOWER PNL** (panel) lights: Verify lower panel lights and circuit breaker panel lights are illuminated and no other lights are on.
  (c) **FLOOD** lights: Verify glare shield lights are illuminated and no other lights are on.
  (d) **SPOT** lights: Verify overhead spotlights are illuminated and on other lights are on. With **SPOT** lights 'ON', verify that each lamp turns 'OFF' when using the switch located on the light housing.

NOTE: Interior lights only work with position lights rocker switch in the 'ON' position.

(39) Visually check integrity of all four fuses on the side of the battery box.

(40) Operate the flip lights, front and rear, with the power off and verify correct operation.

(41) Pull all circuit breakers and ensure the labeling agrees with the circuit it supplies by pushing in the circuit breaker. Ensure positive latching of the circuit breaker.

4. Repair of Static Wicks

A. The nine static wicks on the aircraft are located at the tips of the wings, horizontal, outboard trailing edge of the ailerons, outboard trailing edge of the elevator, and the top of the rudder. The rudder static wick is mounted on a threaded stud and bonded electrically and mechanically to the aluminum counterweight at the top of the rudder. The other static wicks are mounted on static wick pads. These pads are bonded electrically and mechanically to the structure, and the static wick is attached with screws to this pad.

B. If the required conductivity is not achieved, these components must be replaced or re-bonded with conductive adhesive.

(1) Conductive Adhesive Material Requirements
  (a) Equipment:
    1 Respirator mask - Commercial
    2 Rubber gloves - Commercial
    3 Sandpaper, 120 and 400 grit - Commercial
    4 Applicator spatula - Commercial
    5 18 oz. mixing container - Commercial
    6 Shop towel - Commercial
  (b) Materials
    1 Conductive Adhesive - SX518001
    2 Acetone, MPK, or Ethyl Acetates - Commercial

C. **Bonding Process** - The following process describes mounting pad and thread rod styles of the static wick mount installations. Follow the steps in the order presented.

(1) **Mounting Pad Static Wick Procedure**
  (a) Mark the location of retainers on the aircraft skin per the corresponding drawing. Do not exceed 1/8 inch

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

between the aft end of the mounting pad and the trailing edge of the appropriate control surface.

(b) Remove paint and primer, if any, from area to be bonded using 120 grit sandpaper. Expose the lightning protection mesh without sanding through the mesh material.

(c) Degrease the aircraft surface and bottom of the retainer with a grease free solvent, such as acetone, MPK, or ethyl acetate. Do not contaminate the cleaned area.

(d) Use either approved conductive adhesive per SX518001:

1 Mix one part LP-89 Part A Resin with one equal part LP-89 Part B Paste Catalyst. Mix thoroughly until a smooth, creamy consistency is reached. Pot life is 30 minutes at 70° F after mixing.

2 Take a premixed cartridge of Eccobond 64C A/B from the freezer. Allow it to thaw at room temperature. Work life is approximately 30 minutes from when the adhesive is removed from the freezer.

(e) Abrade the clean, dry aircraft surface and the bonding surface of the static wick retainer with 200 to 600 grit paper. Do not abrade through the lightning protection mesh of the aircraft. Remove all oxide from the retainer. Dry thoroughly and wipe the surface with a clean towel to remove loose particles.

(f) After removing the oxide, immediately apply a coat of adhesive to the retainer. The time between completion of the sanding process and the application must not exceed 5 minutes.

(g) Upon completion of the previous step, immediately apply the retainer to the aircraft surface. Slightly twist the retainer while applying light pressure, to ensure thorough wetting and to squeeze out excessive adhesive. Once the retainer is in place, do not disturb the bond further. Movement will increase the bond resistance and may weaken the mechanical strength.

(h) Remove excessive adhesive, leaving a fillet of adhesive around the entire edge of the retainer.

(i) Use masking tape to temporarily secure the mounting pad during curing.

(j) Cure the adhesive for a minimum of 24 hours at 70° F. Cure may be accelerated by applying 150° F for one hour.

(k) Ensure that all retainers are secure, with no evidence of cracks in the adhesive fillet between the retainer and the aircraft surface.

(l) After the mounting pad has cured, check the electrical resistance to the lightning mesh with a digital voltmeter as close to the mount pad as possible. The resistance should be 0 to 2.0 ohms.

(2) **Rudder Threaded Rod Static Wick Procedure**

(a) Locate the static wick installation position in the vertical stabilizer counterweight.

(b) Degrease the threaded rod, receptor threads in the rudder counterweight, and the receptor treads in the static wick with a grease-free solvent such as acetone, MPK, or ethyl acetate. Do not contaminate the cleaned area.

(c) Use either approved conductive adhesive per SX518001:

1 Mix one part LP-89 Part A Resin with one equal part LP-89 Part B Paste Catalyst. Mix thoroughly until a smooth, creamy consistency is reached. Pot life is 30 minutes at 70° F after mixing.

2 Take a premixed cartridge of Eccobond 64C A/B from the freezer. Allow it to thaw at room temperature. Work life is approximately 30 minutes from when the adhesive is removed from the freezer.

(d) Place a small amount of adhesive on 0.5 inch of one end of the threaded rod. Install the threaded rod into the stabilizer counterweight, adhesive end first, to a depth of approximately 0.5 inch to the mechanical stop.

(e) After the threaded rod has cured, check the electrical resistance to the counterweight material as close to the threaded rod as possible. Resistance should be 0 to 2.0 ohms.

(f) After the aircraft has been painted, install the static wick as described below. Ensure that the threaded rod is masked for the aircraft paint process.

(g) With a wooden applicator, place adhesive on the first 0.1 inch of the threaded rod above its base, to allow a removable bond to the tip of the static wick.

(h) Insert the static wick onto the threaded rod, and ensure that it threads on the full length to its mechanical stop, allowing contact with the 0.1 inch of adhesive.

(i) Cure the adhesive for a minimum of 24 hours at 70° F. Cure may be accelerated by applying 150° F for 1 hour.

(j) Ensure that the static wick is secure.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

D. **Inspection Procedures** - Visually inspect all retainer installations thoroughly. Ensure that the retainer has no evidence of cracks in the adhesive fillet between the retainer and the aircraft surface. Ensure that all static wicks are secure.

E. **Rework** - If a mounting pad has evidence of cracks in the adhesive fillet that exceed the maximum length criteria, the static wick mounting pad must be removed and re-installed. If the threaded rod-style static wick is not secure, remove, clean, and re-install the static wick threaded rod as per procedure.

F. **Acceptance Criteria**

(1) Adhesive - The adhesive application shall be acceptable if there is a smooth surface fillet between the retainer and the aircraft surface, with no evidence of cracks or unbonded areas in the adhesive of over 0.1 inch in length.

(2) Improper Cure - The adhesive application shall be acceptable if there is no evidence of tackiness in the adhesive after the proper cure time.

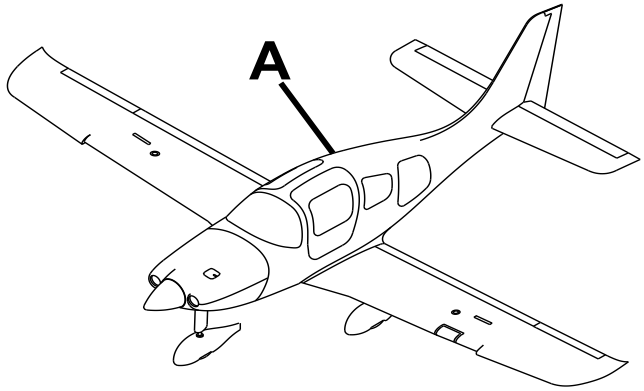
(3) Secure Installation - The static wick mount installation shall be acceptable if there is no evidence of improper bonding of the static wick pad or threaded rod allowing any movement of the static wick or evidence of cracking and tackiness of the adhesive.

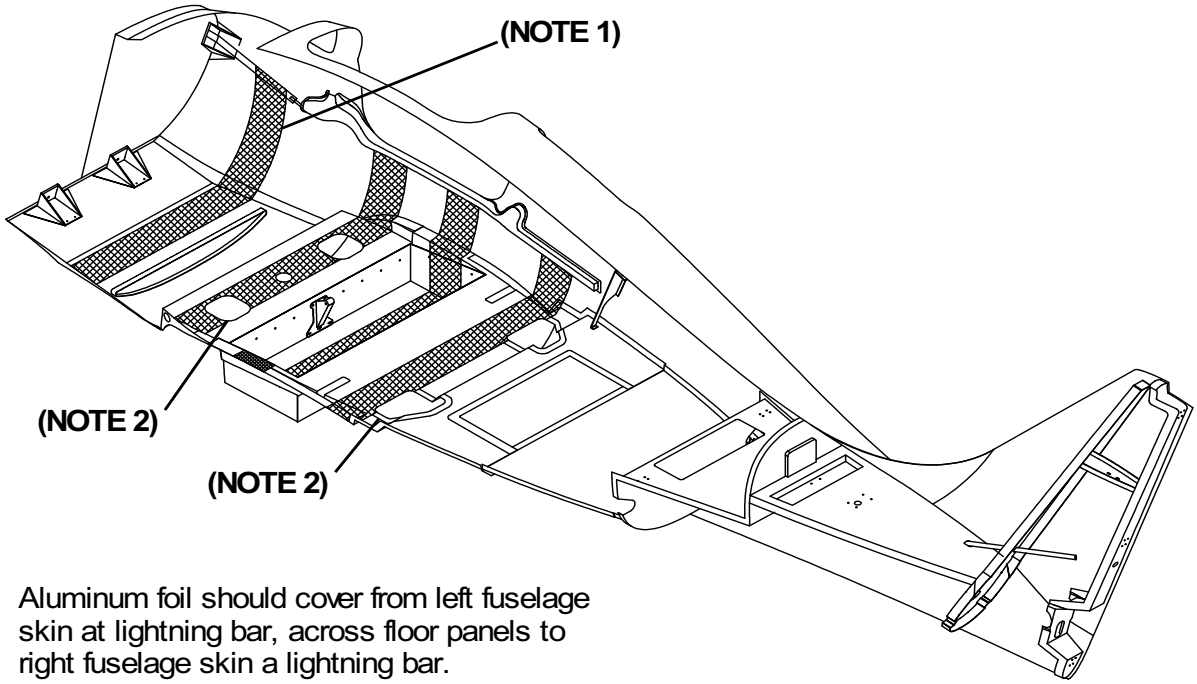
(4) Electrical Resistance - The static wick mount installation shall be acceptable if the electrical resistance of the mounting connection is no more than 2.0 ohms, as measured from the mount to the lightning mesh or counterweight.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Placement of SAFE Strips

B11804





NOTE 1: Aluminum foil should cover from left fuselage skin at lightning bar, across floor panels to right fuselage skin a lightning bar.

NOTE 2: Trim aluminum foil at all cutouts.

DETAIL A

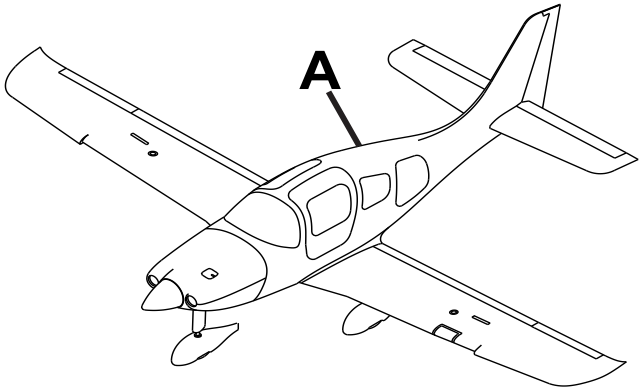


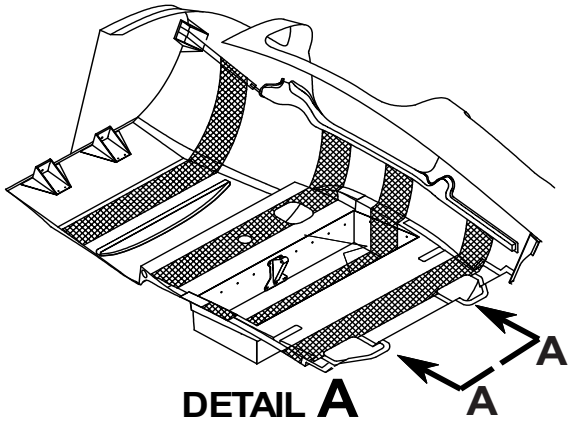
ALA53500000

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

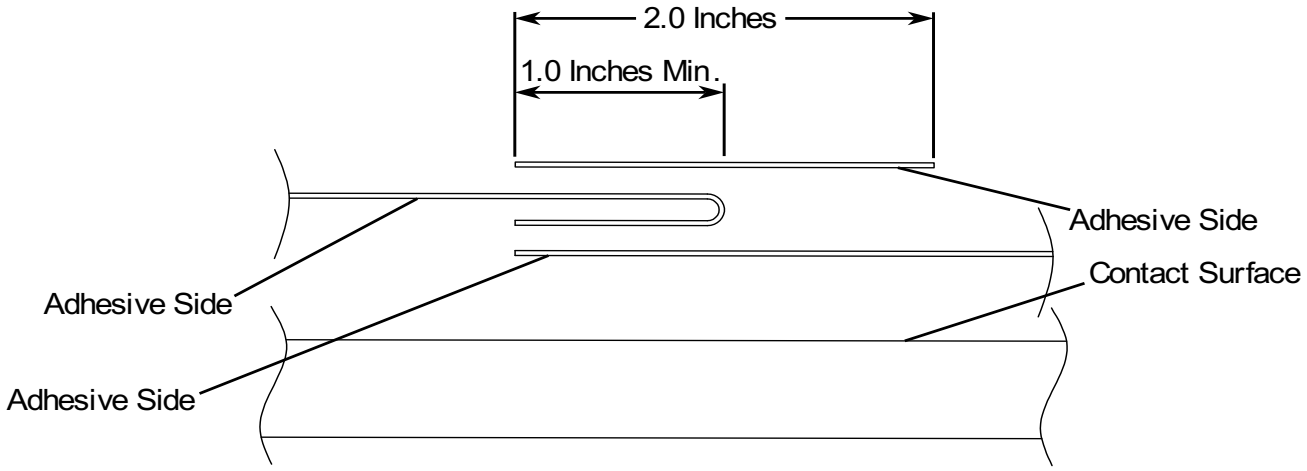
Figure 202 : Sheet 1 : Folding SAFE Strip

B11805





DETAIL A

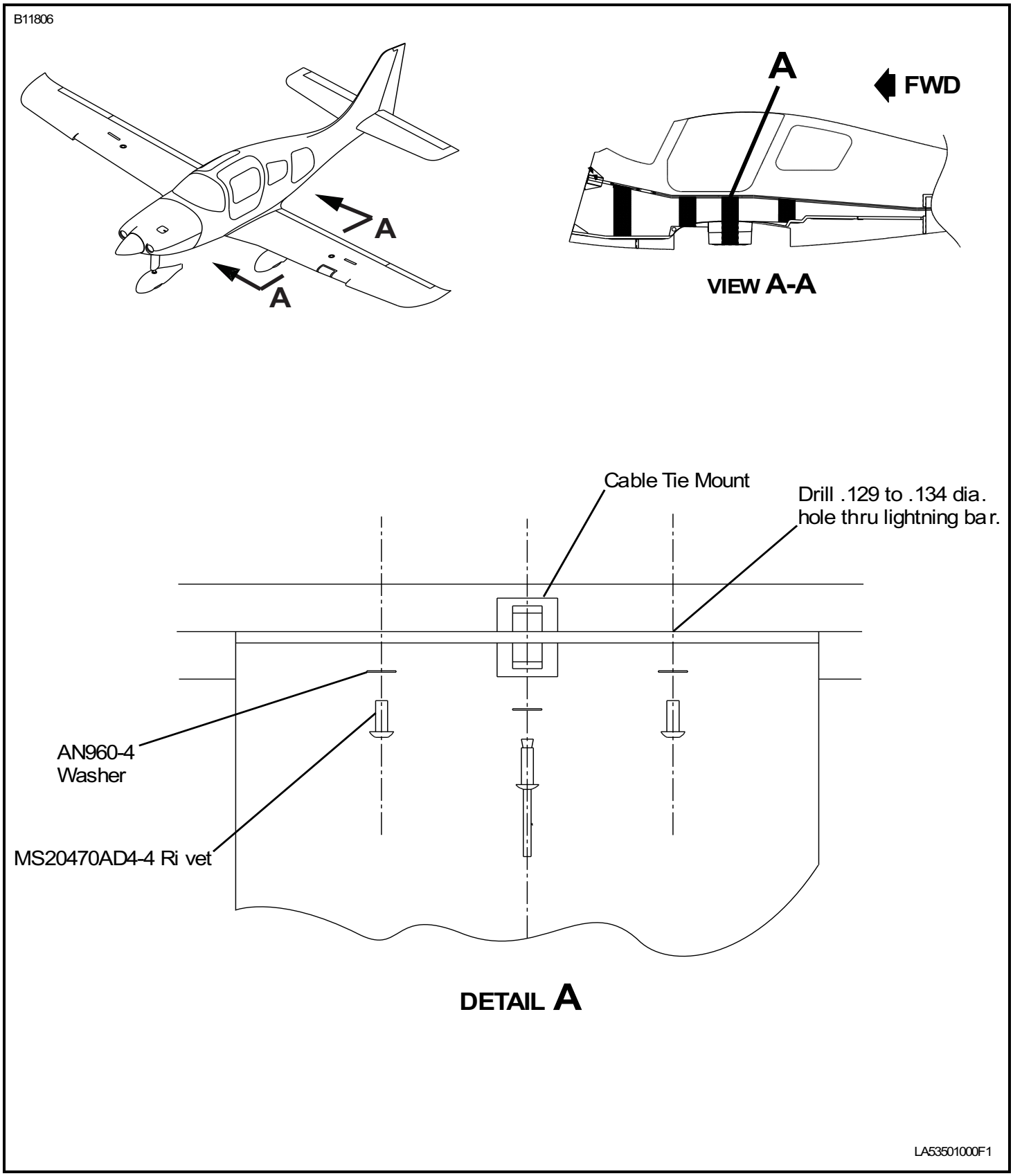


VIEW A-A

ALA53500000
BLB53500000D

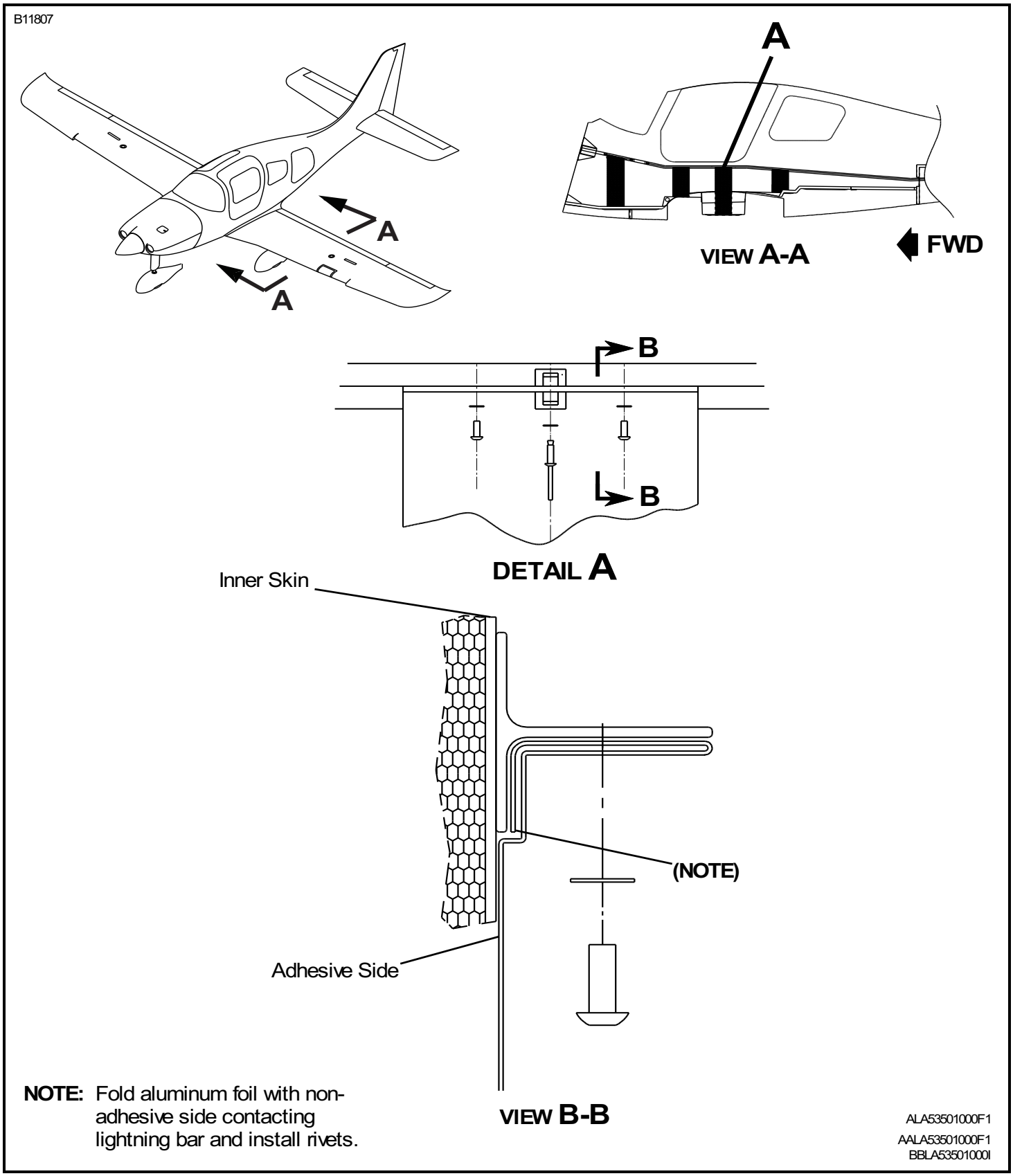
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Grounding SAFE Strip to Grounding Bar



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

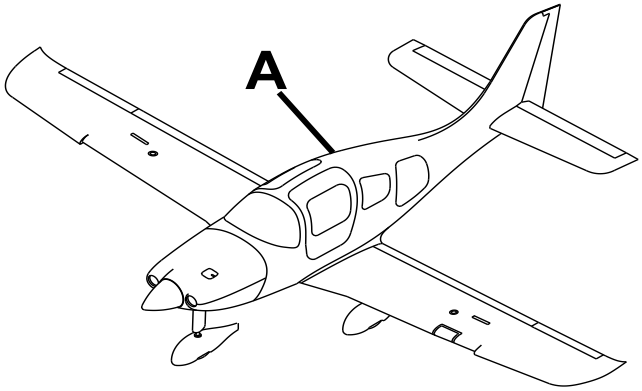
Figure 204 : Sheet 1 : Complete Replacement of SAFE Strip

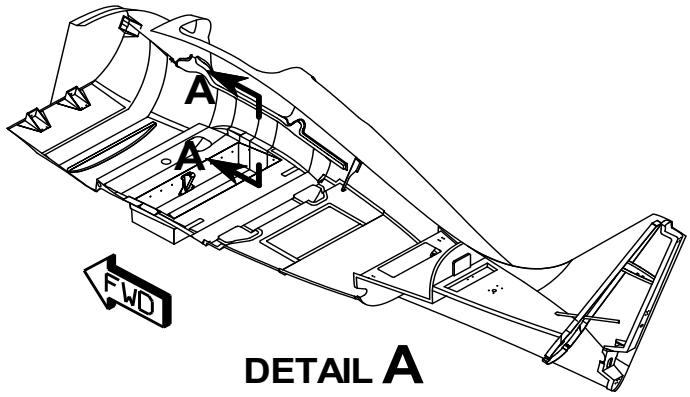


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

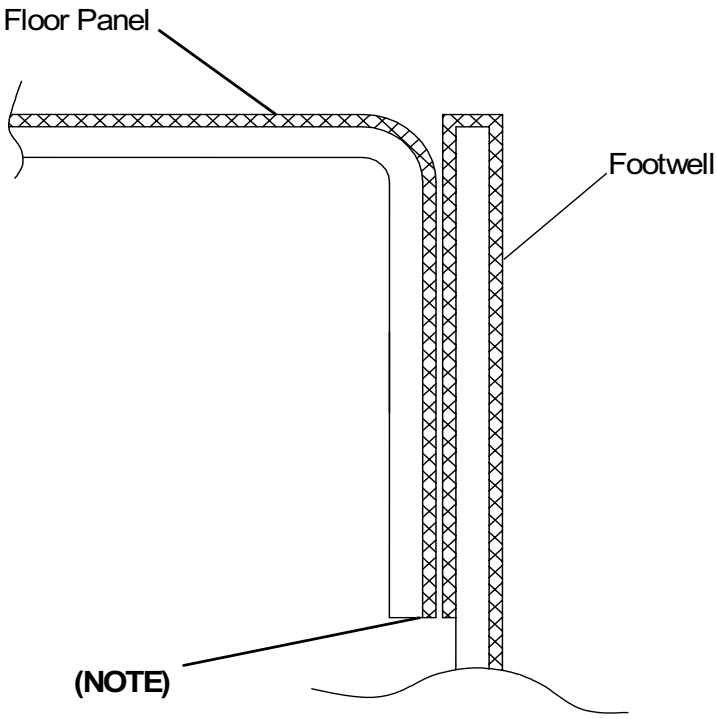
Figure 205 : Sheet 1 :

B11808





DETAIL A



VIEW A-A

NOTE: The ends of the aluminum foil should reach the edge of the floor panel. Right and Left sides are typical.

ALB53500000C1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

REPAIR OF CLICKBOND NUTPLATES - MAINTENANCE PRACTICES

1. Repair of Clickbond Nutplates

A. Clickbond nutplates are a special type of nutplate that is bonded to the surface rather than being riveted to the structure. If a Clickbond nutplate should fail, it can be replaced with another Clickbond nutplate or a riveted nutplate under certain conditions as specified in Table 201. This repair procedure can be used in lieu of specific factory instructions.

Table 201. Permitted Areas of Clickbond or Riveted Nutplate Repair

Clickbond Part Number	Application	Assembly Drawing Number
CB6009CR4-1P	Baggage Net Installation	LA53255000
CB6014CR3-1P	Baggage Net Installation Cowling Instrument Panel Installation	LA53255000 LA53600000 LA53310000
CB6014CR08-1P	Access Panel Installation, Fuselage	LA53650000

(1) **Defect Scenarios**

(a) The nut in the Clickbond nutplate is stripped or damaged.

(b) The bonding of the Clickbond to the surface has failed.

(2) **Repair Procedure No. 1** - Bond a new Clickbond of the same type as a replacement for the one that failed.

(a) Remove the old Clickbond nutplate by prying it off.

(b) Sand the substrate to prepare a smooth surface using 150 grit sandpaper.

(c) Clean the surface with a dry-wipe or clean, pressurized air.

(d) Bond on a new nutplate. Use Clickbond adhesive kit CB92 or adhesive Hysol 9321. Follow manufacturer's instructions.

(3) **Repair Procedure No. 2** - Replace the Clickbond with riveted nutplate.

(a) Sand the adhesive residue down to create an even surface for the nutplate. Take care not to damage the structural material below.

(b) Use a nutplate from Table 202 to determine the proper riveted nutplate replacement.

Table 202. MS Nutplate Replacements for Clickbonds

Clickbond Nutplate	MS Nutplate	Drill Rivet Holes	Rivet Hole Spacing From Center Hole
CB6009CR4-1P	MS21075-4	0.098 inch	0.281 inch
CB6014CR3-1P	MS21075-3	0.098 inch	0.250 inch
CB6014CR08-1P	MS21075-08	0.098 inch	0.234 inch

NOTE: The old Clickbond nutplate can be reused if the nut still has sufficient self-locking friction. Clean and sand the surface on the Clickbond nutplate for good adhesion, and follow the instructions discussed in Repair Procedure No. 1.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SWAGELOK FITTINGS - MAINTENANCE PRACTICES

1. Swagelok Fittings

A. The information in this section is taken from the *Swagelok Tube Fitter's Manual*. The Swagelok manual should be referenced if there is any question about the information presented in this manual. Formal training from Swagelok or Cessna is recommended before using any Swagelok fittings.

B. The Swagelok fittings used in the Cessna aircraft provide a consistent tube connection for both fuel and hydraulic systems without the need for flaring tubing. These flareless, mechanical grip fittings consist of a fitting body, front ferrule, back ferrule, and nut, as seen in Figure 201. The fittings are received from Swagelok pre-assembled and normally ready for use, with the exception being the bulkhead fittings used in some systems and in other specific applications. With the installation of the bulkhead fittings, one end of the fitting must be disassembled to install the fitting and the removed end reassembled prior to installation of the tubing Figure 201 shows the correct orientation of the body, ferrules and nut for proper installation.

C. When installing Swagelok fittings, always maintain the cleanliness of the hose, fittings, and tube interiors. Protect the threads from damage and dust.

D. **Swagelok Fitting Installation**

(1) Visually inspect the fitting to verify that the ferrules are in place and installed correctly as shown in Figure 202 and Figure 203. When look inside the end of the fitting, three lines should be seen.

(2) Insert the tubing into the tube fitting such that the tubing firmly rests on the shoulder of the fitting as shown in Figure 204.

(3) Using a permanent marker, mark the 6 o'clock position on the nut and extend onto the tube for reference as shown in Figure 205. In addition, with the tube fully inserted in the fitting and the nut finger-tight, mark on the tube the intersection between the tube and the nut.

(4) While holding the fitting body with a backup wrench, tighten the nut 1-1/4 turns as shown in Figure 206. *For 1/16 inch, 1/8 inch, and 3/16 inch, 2 mm, 3 mm, and 4 mm fittings, only a 3/4 turn from finger-tight is necessary.*

(5) Verify installation per paragraph e of this section.

E. **Swagelok Fitting Gauging** - After the Swagelok fittings are installed, the design of the fitting allows the installation to be verified using a "go no-go" gauge. This gauge may only be used for standard fitting and unions. For bulkhead fittings and other special fittings the gauge cannot be used because the distance from the body to the nut is variable.

CAUTION: Only use Swagelok gap inspection gauges on Swagelok tube fittings. The gauge will not work properly on other tube fittings.

NOTE: Swagelok gap inspection gauges should not be used after pre-swaging or hydraulic swaging.

NOTE: Swagelok gap inspection gauges should be used only for the initial installation of the fitting and not for re-installation of fittings or installation of pre-made ends.

(1) Figure 207 shows the use of the Swagelok inspection gauge and the indication of a correctly installed fitting. Note that if the gap inspection gauge does not fit between the nut and body hex, the fitting is sufficiently tightened.

(2) Figure 208 shows an improperly installed fitting. Note the gap inspection tool goes into the slot between the nut and the body hex. Additional tightening is required or further investigation may be required.

F. **Swagelok Fittings Retightening (Installing Pre-Swaged Fittings)** - The Swagelok fittings may be disconnected and retightened many times and still provide a reliable, leak-proof seal if the following instructions are followed.

(1) Clean both parts of the fitting including the tubing in the swaged area, and inspect for scratches, burrs, etc. If the tube and sealing area are damaged, replace part. Refer to Figure 209.

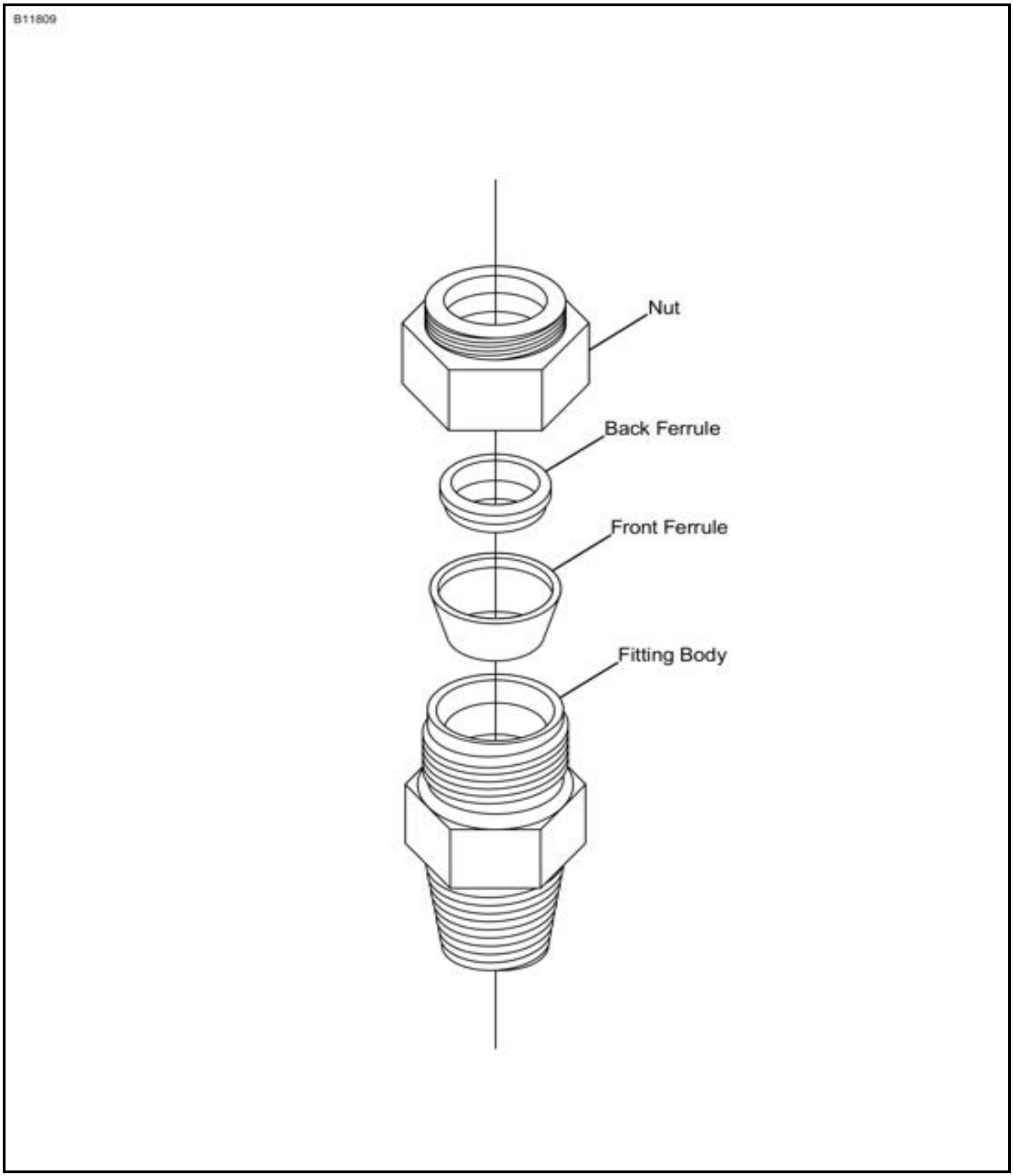
(2) Fully insert the tubing with the pre-swaged ferrules into the fitting body as shown in Figure 210, and finger-tighten the nut onto the fitting body.

(3) Rotate the nut to the original position with a wrench, stopping when an increase in resistance is felt. Tighten slightly past the original position using a wrench. Figure 211 shows a fully tightened fitting.

NOTE: Smaller tubing sizes require less tightening to reach the previously pulled-up position. Larger tubing sizes require more tightening. Wall thickness can also affect the amount of torque required to retighten the fittings.

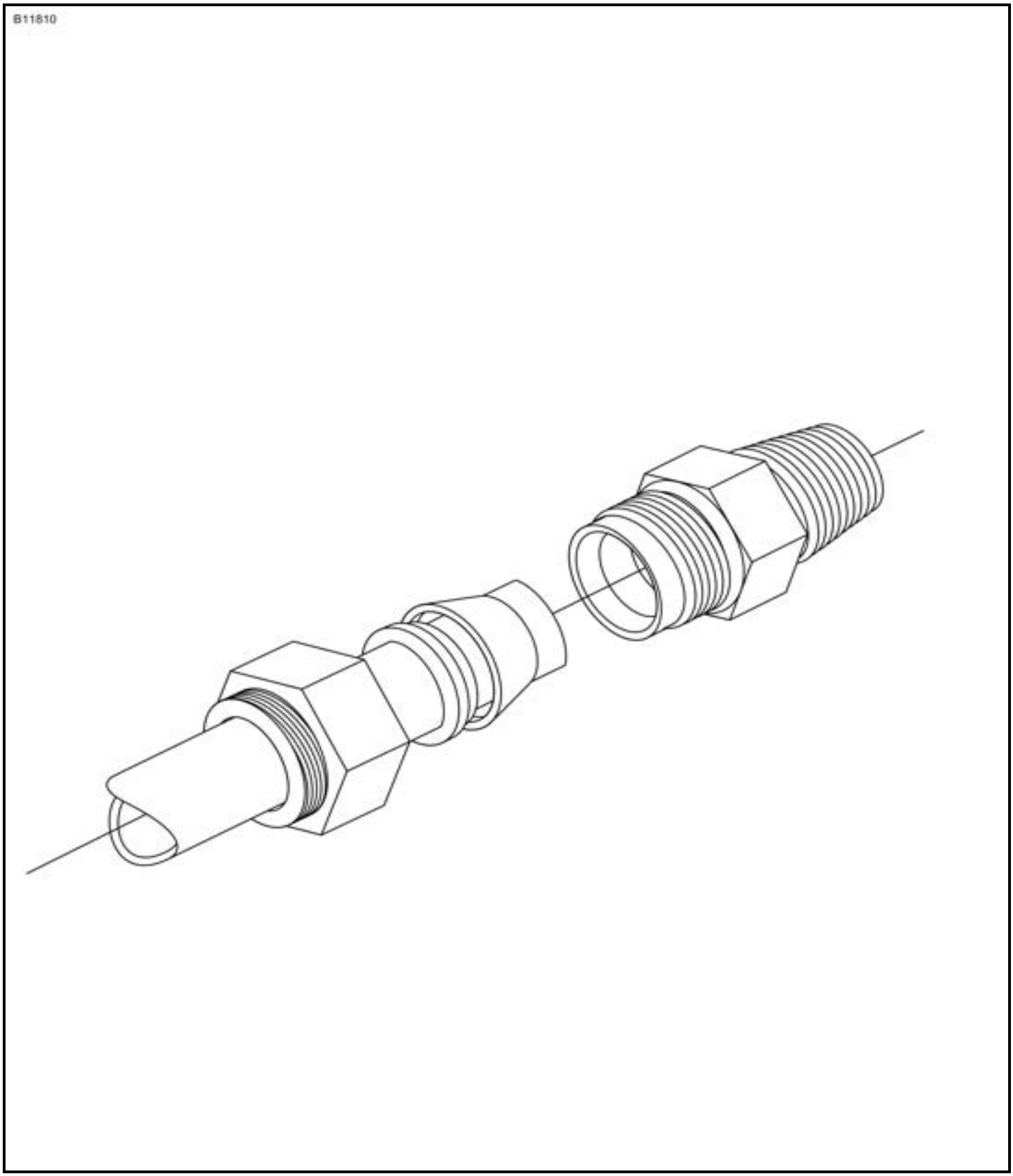
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Swagelok Fitting (Exploded View)



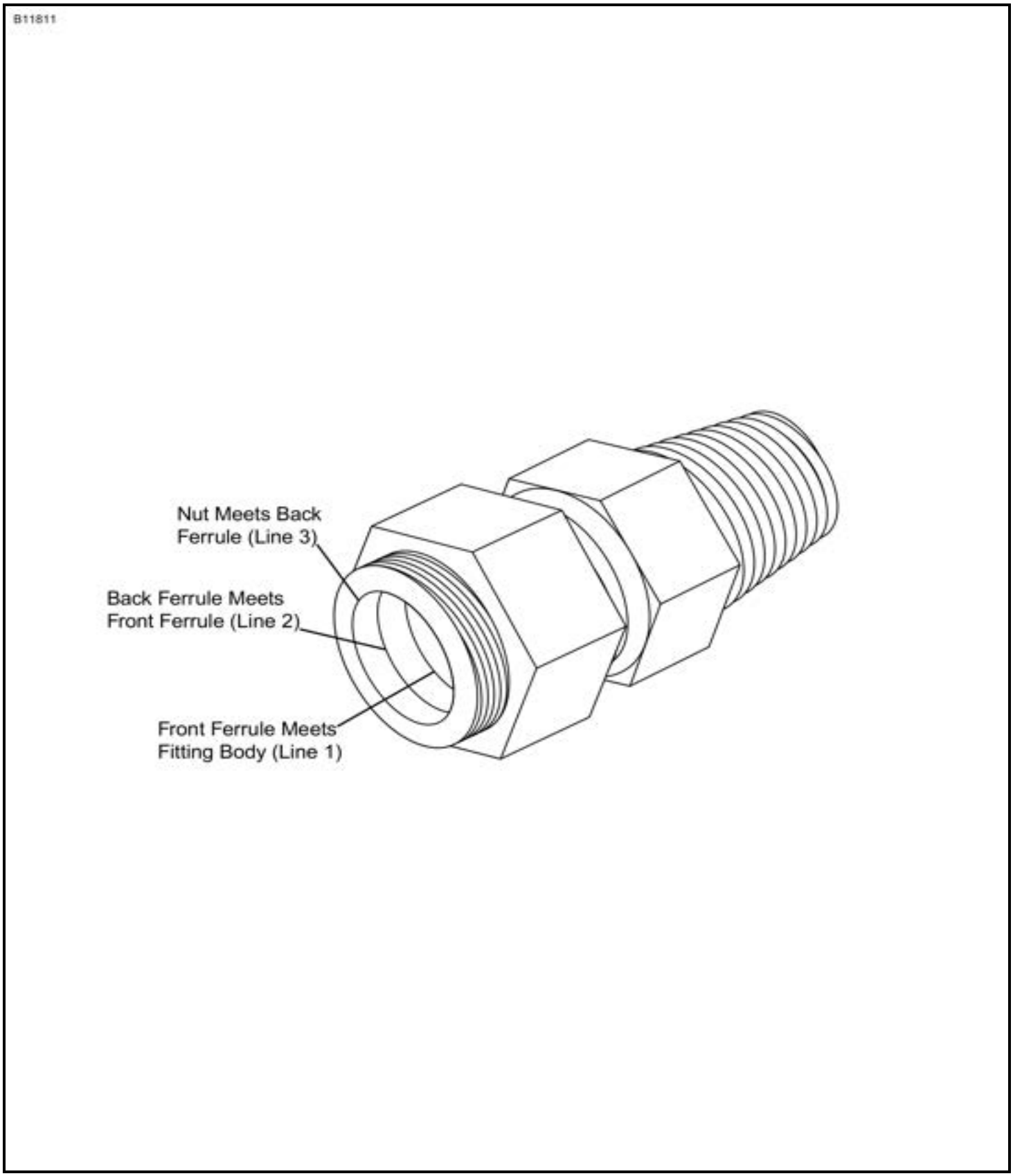
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Proper Ferrule Position



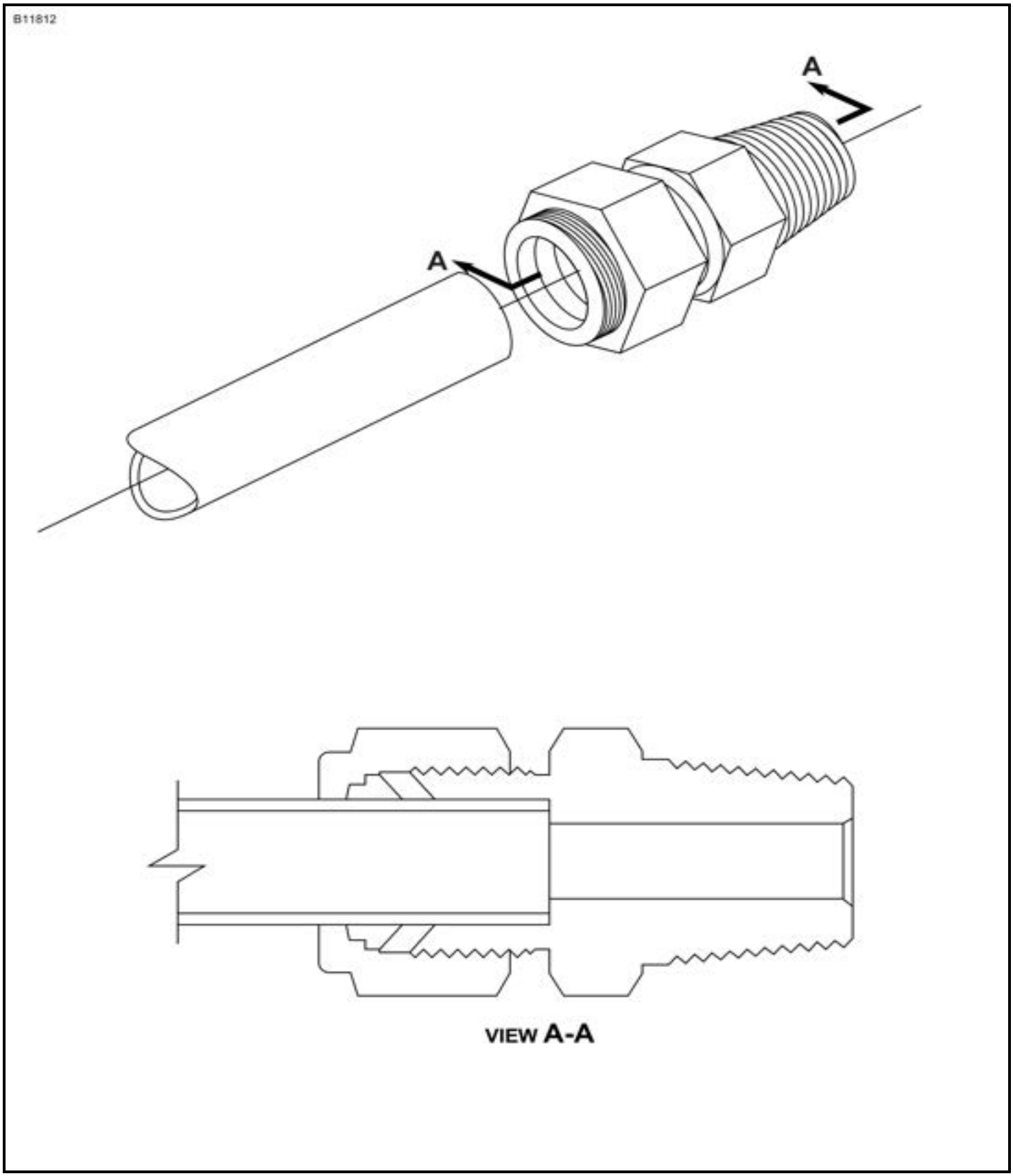
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Swagelok Fitting Visual Inspection



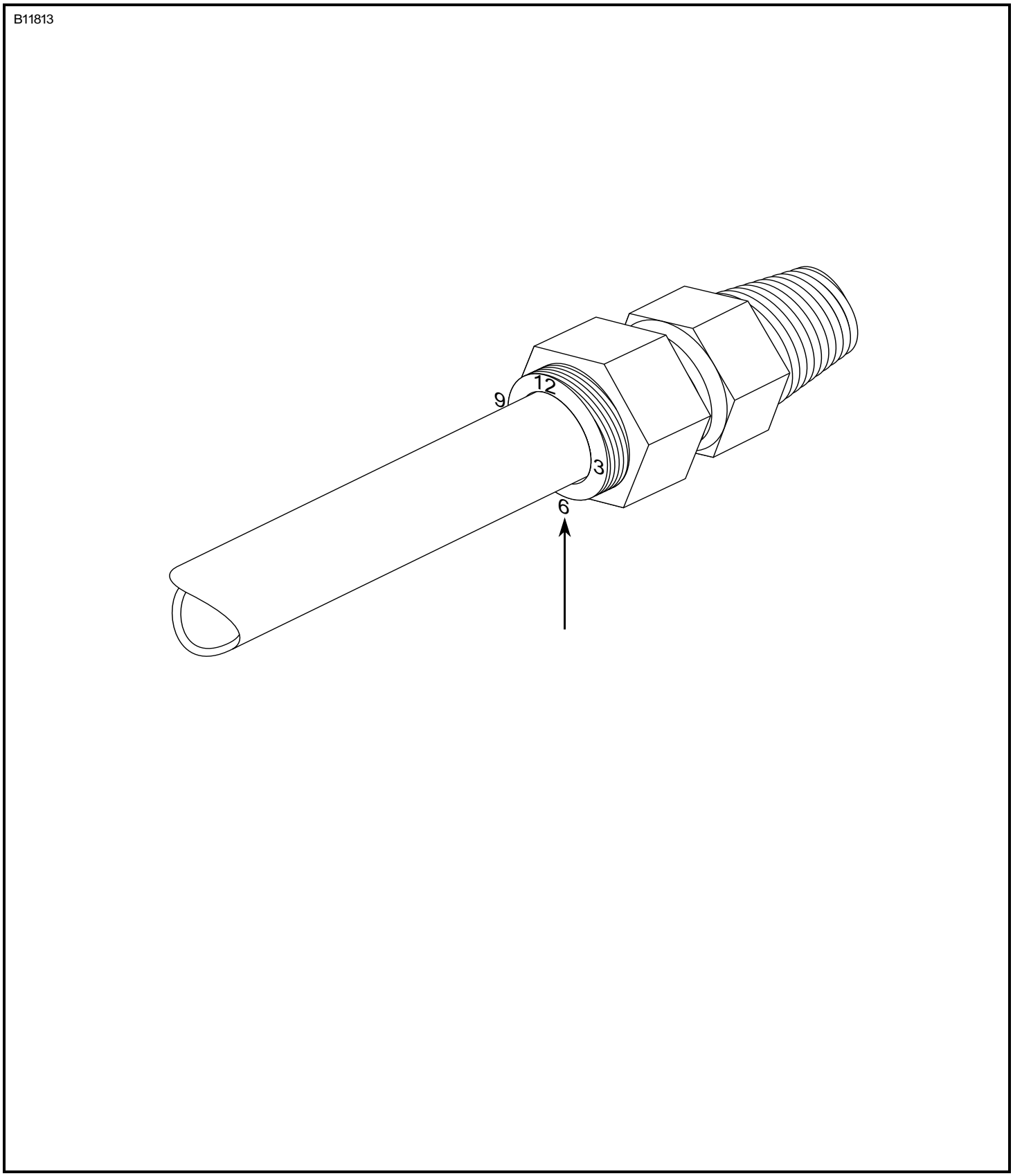
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Fully Insert Tubing into Fitting



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

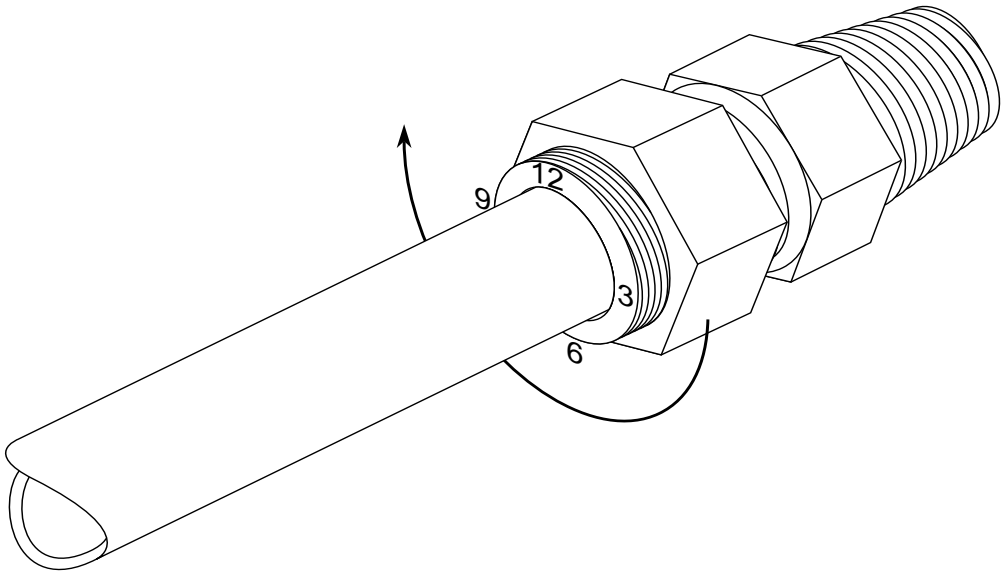
Figure 205 : Sheet 1 : Mark Nut with a Permanent Reference Mark



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Tighten Nut 1-1/4 Turns for New Fittings

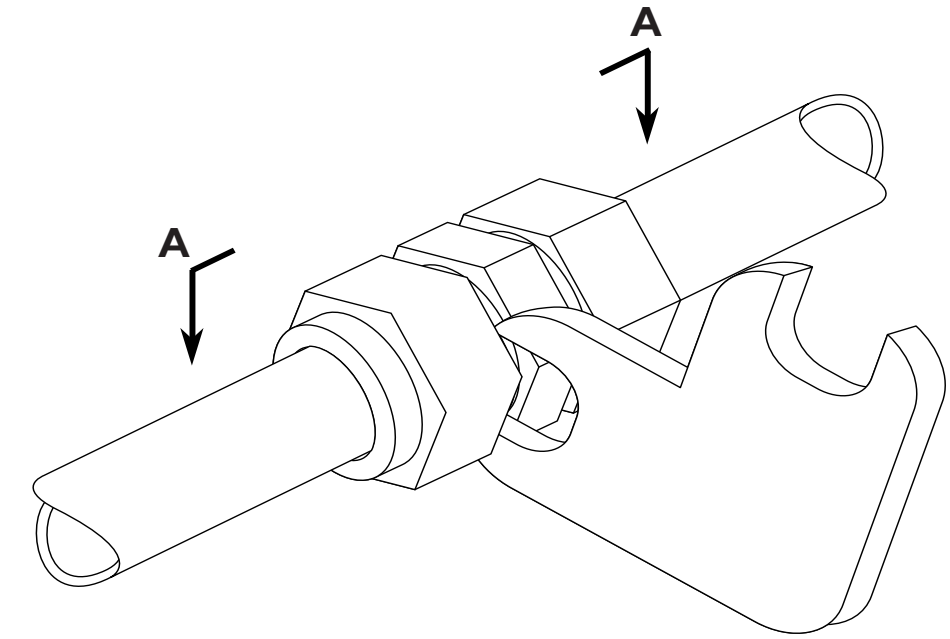
B11814

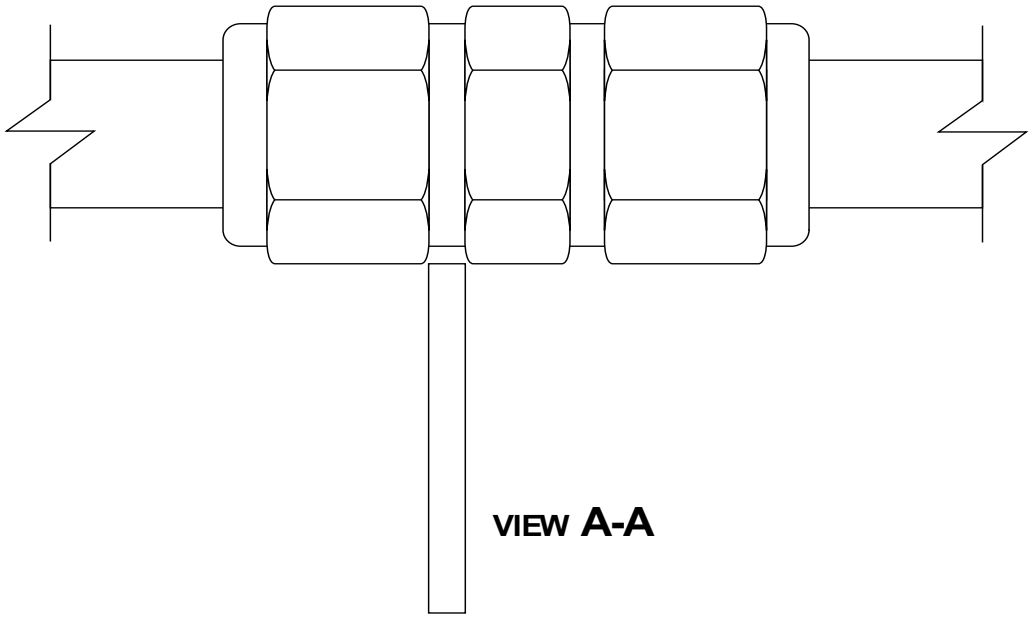


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Insert Swagelok Gauge to Verify Correct Torque of Newly Installed Fitting

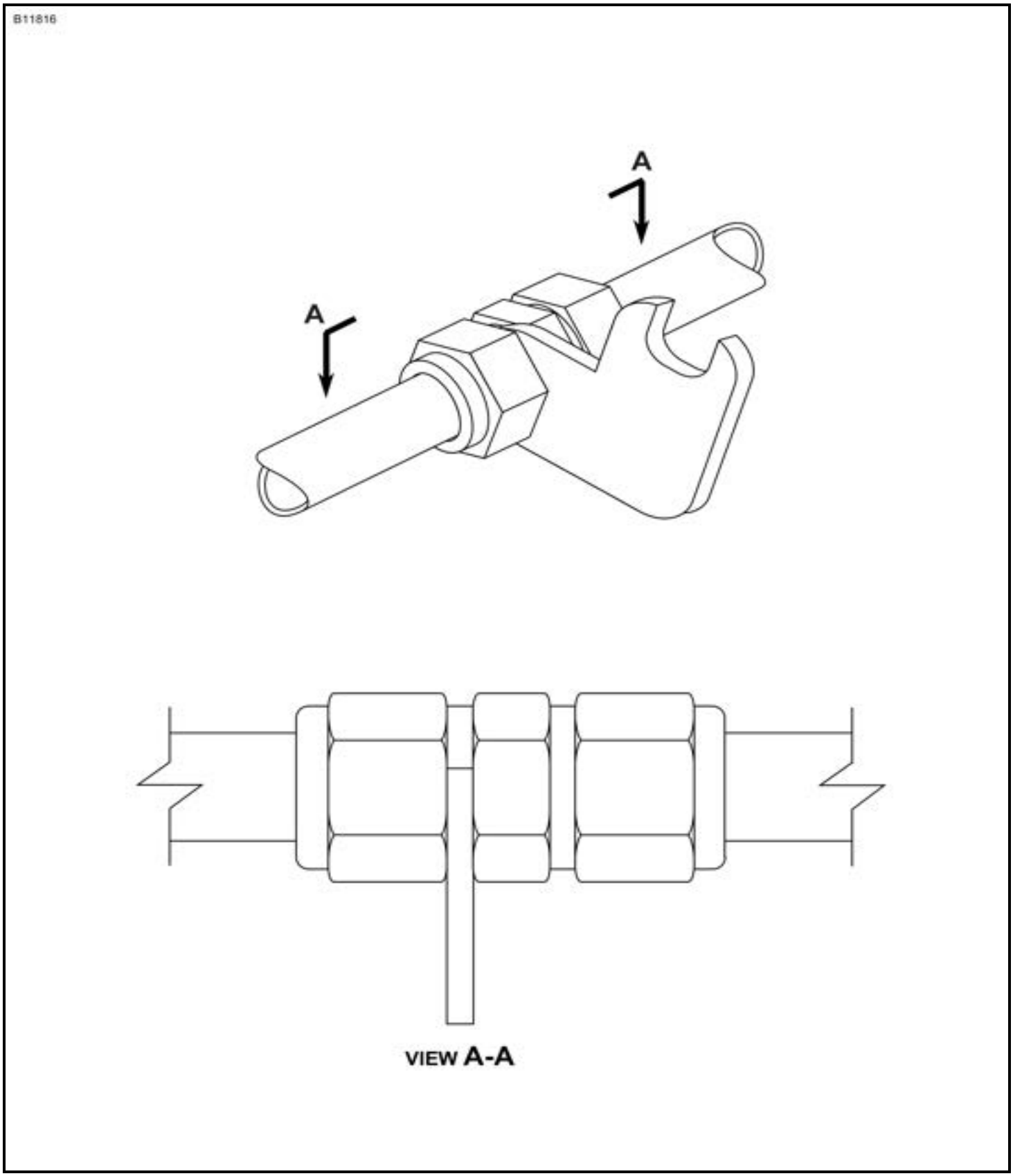
B11815





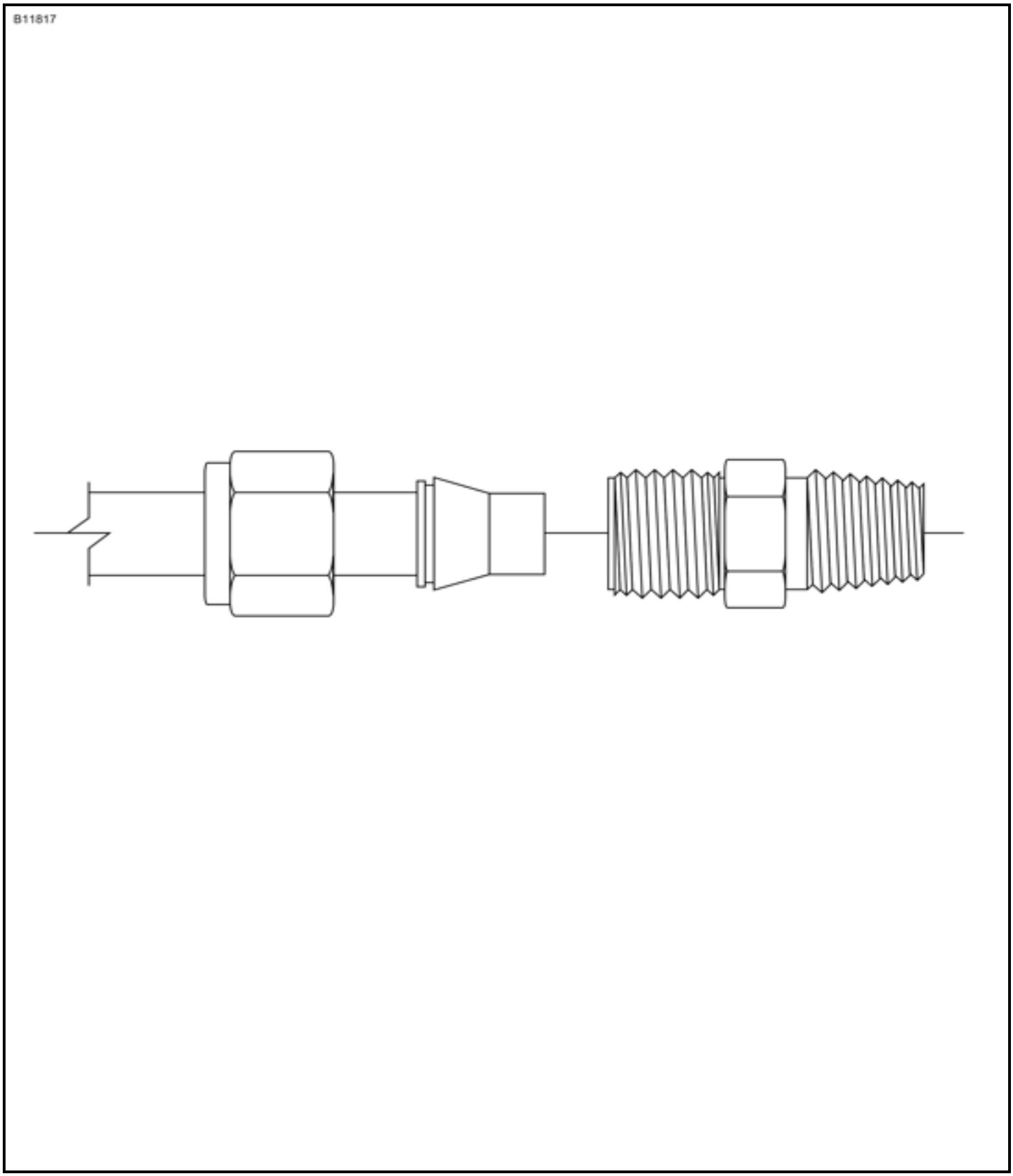
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : Gauge Shows Fitting is Not Correctly Installed and Torqued



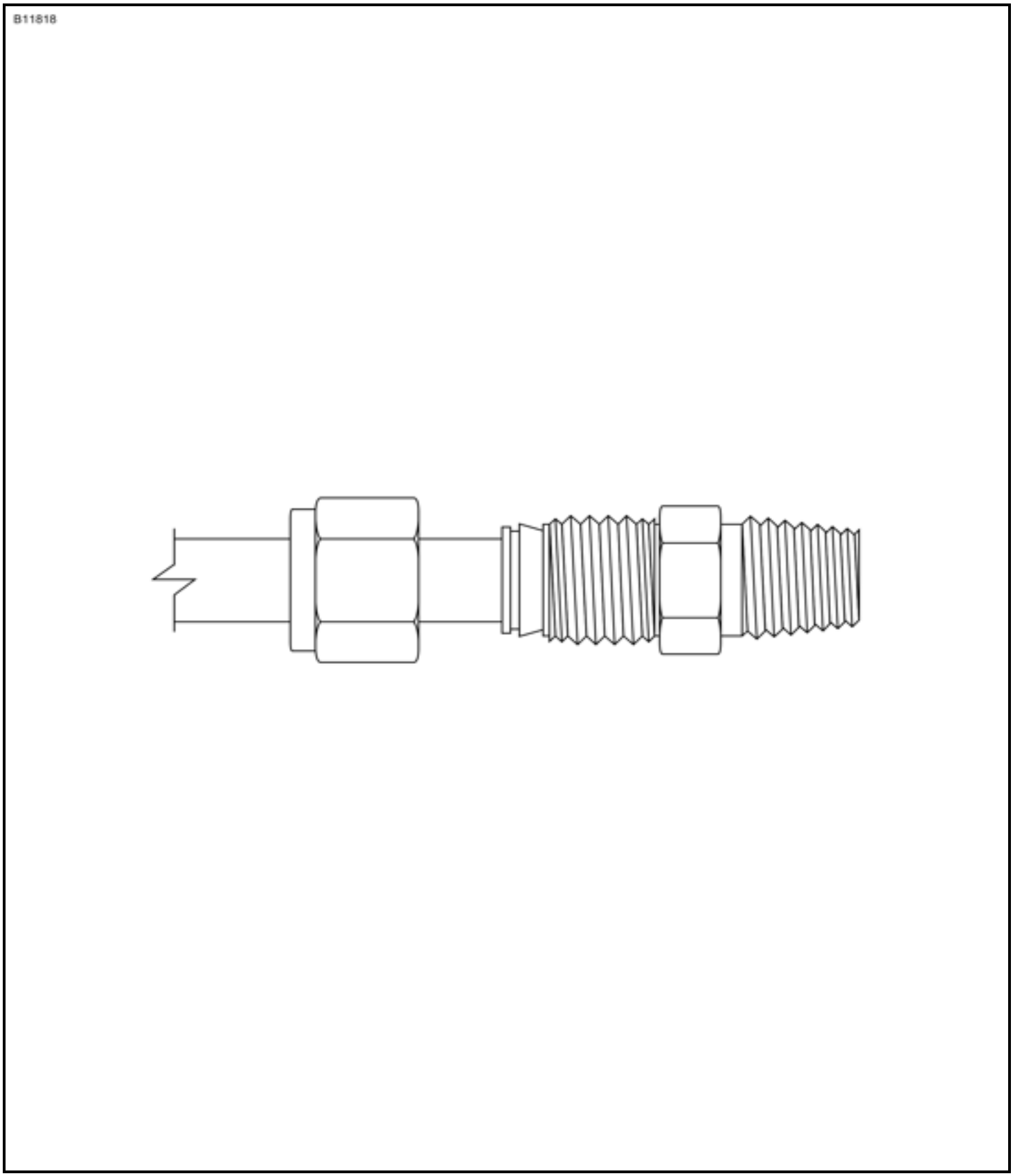
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Disconnected Pre-Swaged Swagelok Fitting



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

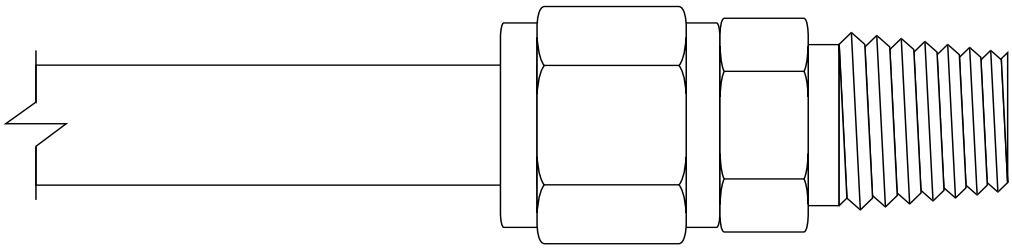
Figure 210 : Sheet 1 : Inserted Pre-Swaged Swagelok Fitting



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 211 : Sheet 1 :

B11819



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

TAP TESTING - DESCRIPTION AND OPERATION

1. General

A. This section contains information needed to complete tap testing procedures on the airplane. Information required to complete inspections of specific locations on the airplane can be found in the applicable section for that area of structure.

2. Inspection Requirements

A. Before the tap test inspection is started, you must comply with the following requirements:

(1) You must have a blunt-ended tap hammer (or equivalent) that weighs 1.0 ounce, +0.3 or -0.3 ounce.

(2) The inspector must be capable of distinguishing and differentiating audible pitch changes produced during the tap test.

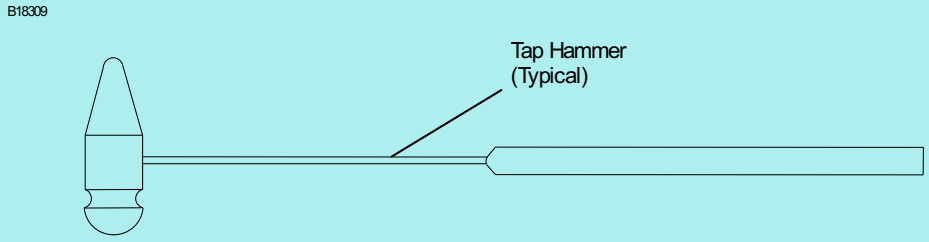
(3) The airplane must be moved to an area free from loud noise produced by traffic, power equipment, aircraft or any other source that would require raised voices for normal conversation.

3. Tap Testing

A. Complete a Tap Test of the applicable structure.

(1) Thoroughly clean and dry the inspection surface to remove any loose dirt, contaminates and grease.

(2) Complete the tap test with the use of a blunt-ended tap hammer or equivalent with a head that weighs 1.0 ounce, +0.3 or -0.3 ounce.



CAUTION: Do not use excessive or aggressive force or a hammer with a sharp edge to strike the surface of the airplane. Structural damage will occur if too much force or a sharp-edged hammer is used to complete the tap test.

(3) Use gentle and consistent force with the tap hammer to lightly tap the surface in each 1-inch^2 area throughout the inspection zone.

(4) Compare similar structures within the inspection zone for changes in the acoustic response pitch.

NOTE: Areas of the fuselage that have structure behind them will have a higher response pitch than areas that do not have structure behind them.

(5) A "flat" or "dead" response pitch is considered unacceptable.

(6) Larger areas that are disbonded or delaminated can cause the tap hammer to rebound to a lower height than it would on intact structure.

(7) Use moderate pressure from your hand or several fingers to push on an area of structure.

(a) A faint "crackling" sound can often be heard if the area has core damage.

(8) Put a mark on damaged areas to indicate the location and size of the area where the damage is found.

(9) Put a mark on any areas where you are uncertain whether damage exists to indicate that the area is suspect. Additional Nondestructive Inspection (NDI) procedures must be completed to evaluate the area more closely.

(10) Cessna recommends that maintenance personnel that complete tap tests be composite repair technicians trained in accordance with SRM standards or certified NDI technicians.

4. Required Chapter 4 Inspection Areas

A. The inspections listed in Chapter 4 require that tap testing be completed in the following areas:

(1) **Fuselage Bonding Seams** - The fuselage halves are split into left and right symmetrical sides and include the areas from the firewall back to and including the vertical stabilizer. The seam extends from centerline to 2 inches on the right side of centerline. The seam tapers to 1.75 inches at approximately FS 240 and tapers again to 1.5 inches at

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

approximately FS 261.5. The upper fuselage bond seam from the top of the windshield to a point 48 inches aft of the top of the windshield is an area of extremely thick ply buildup and can not be effectively tap tested. This area is only to be visually inspected.

(2) **Wing Skin Leading Edge and Trailing Edge Seams** - The wing skin seams are at the leading and trailing edges of the wing. The leading edge seam is 2 inches wide and centered about the leading edge. The trailing edge should be tap tested on the top and bottom of the edge from the edge to 2 inches inboard.

(3) **Wing Skin to Ribs and Spars** - The location of each rib and spar is shown in Section 57-10-00, Location of Spars and Ribs. The top and bottom wing skin at the areas of the ribs and spars should be tap tested.

(4) **Wing Flaps Leading and Trailing Edge Seams** - The flap seams are at the leading and trailing edges of the flap. The leading edge is 1 inch wide and extends 1 inch up from the leading edge chord plane of the flap. Because the bond extends onto core as shown in Figure 1, tap testing is only valid for the first 0.5 inch of the bond. The trailing edge should be tap tested on the top and bottom of the edge from the edge to 1.5 inches forward.

(5) **Aileron Leading and Trailing Edge Seams** - The aileron seams are at the leading and trailing edges of the ailerons. The leading edge seam is 1.0 inch wide starting 1 inch along the surface from the leading edge of the aileron. In the area around the drive hinge attachment pocket, tap test approximately 1.0 inch from the edge of the part to verify the bonding surface. The trailing edge should be tap tested on the top and bottom of the trailing edge from approximately 0.90 inch from the edge to approximately 2.0 inches from the trailing edge as shown in Figure 2.

(6) **Rudder Leading and Trailing Edge Seams** - The rudder seams are at the leading and trailing edges of the rudder. The leading edge seam is the width of the flat leading edge of the rudder. The trailing edge seam should be tested as follows:

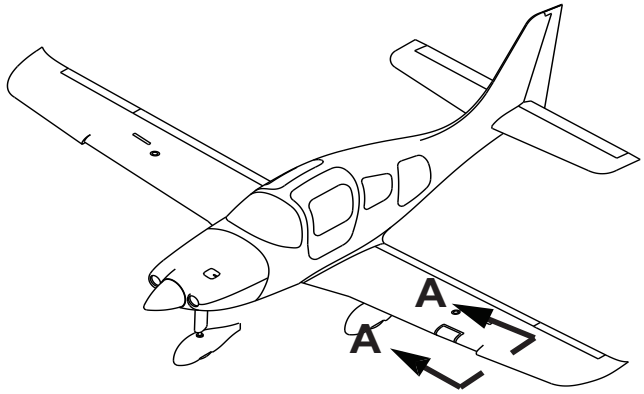
(a) The top 14 inches should be tested by tapping on the right hand side a distance of 1.5 inches inboard from the trailing edge.

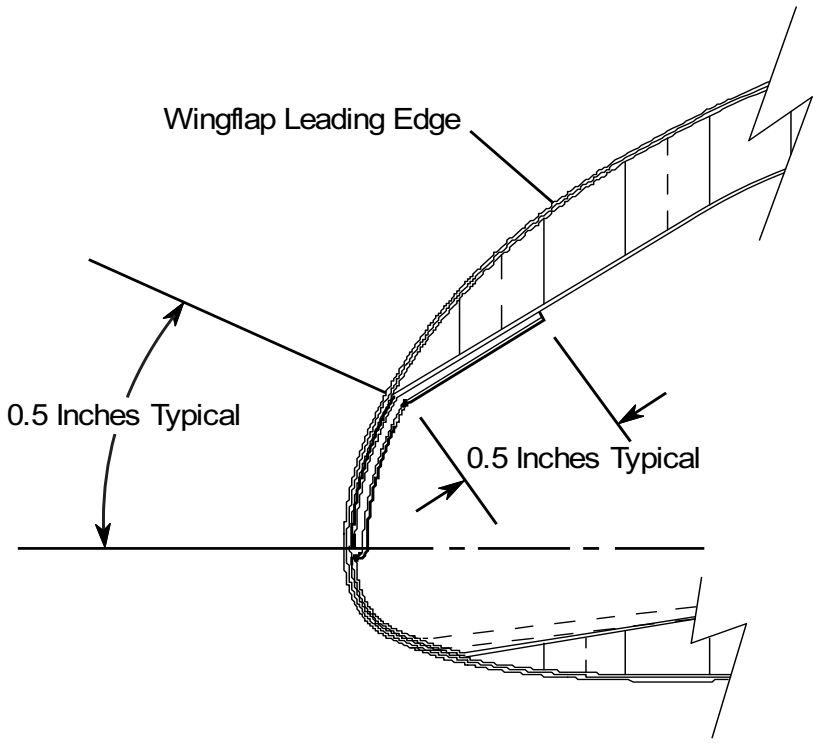
(b) The remainder of the trailing edge should be tested 1.0 inch inboard from the trailing edge. Refer to Figure 3 for areas of tap testing.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Wing Flap Leading Edge Tap Testing Area

B11825



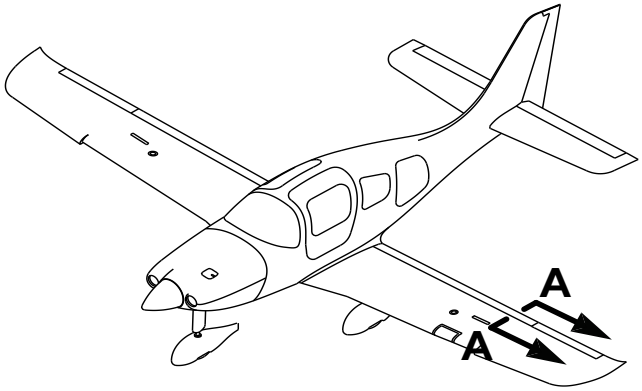


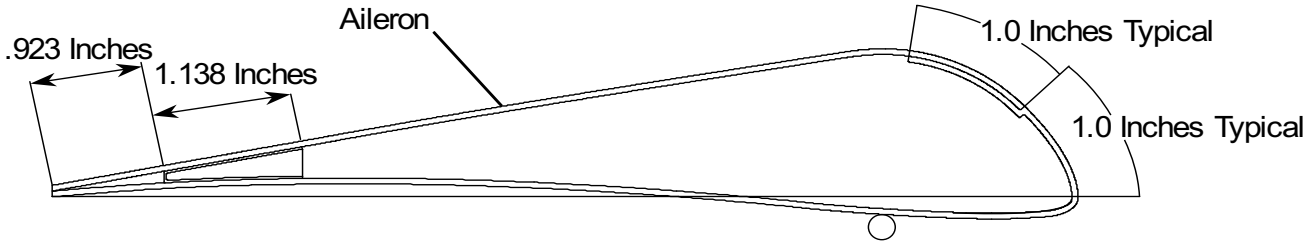
VIEW A-A

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Aileron Tap Test Areas

B11826

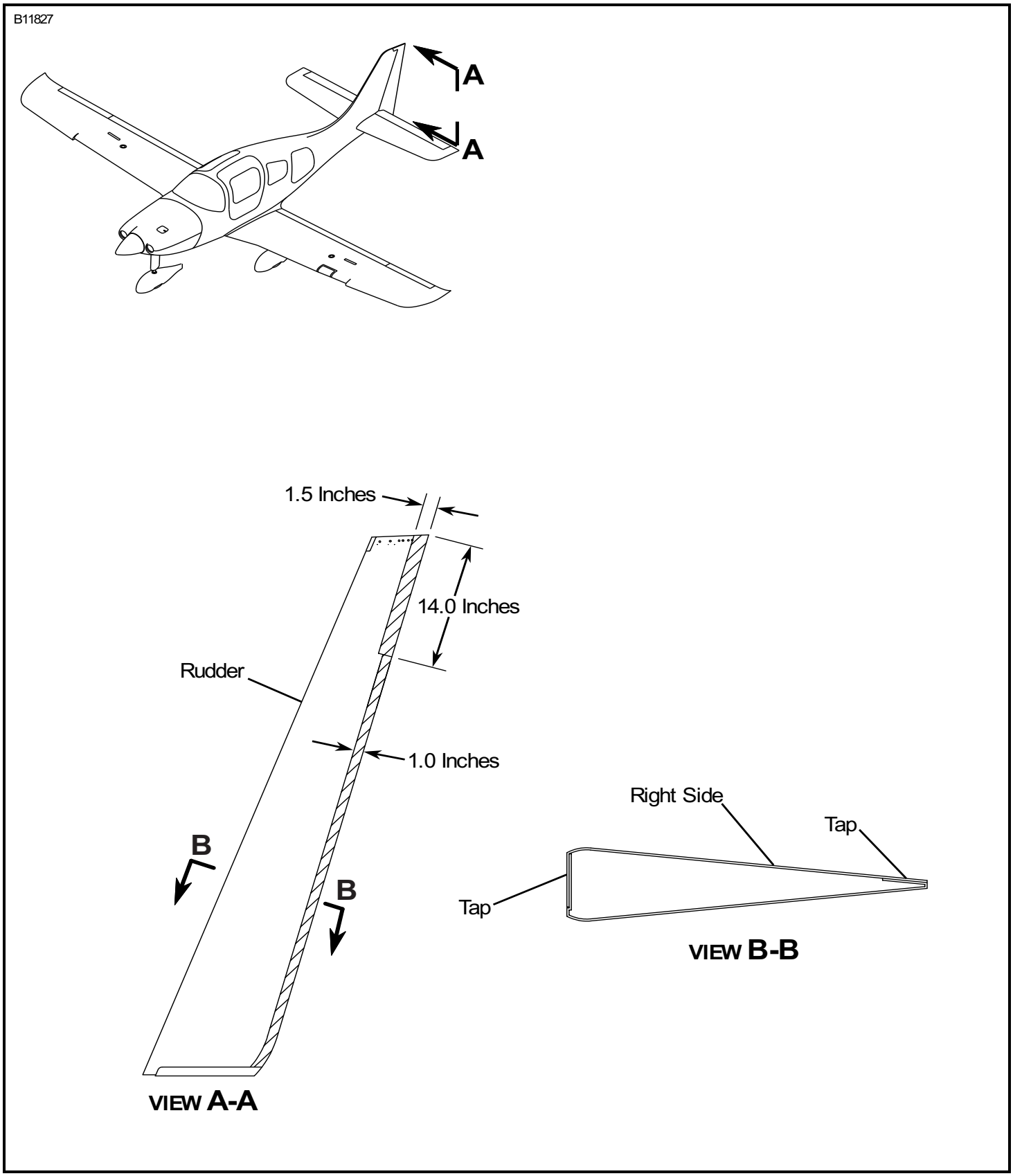




VIEW A-A

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 3 : Sheet 1 : Rudder Tap Test Areas



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STRUCTURAL INSPECTIONS - DESCRIPTION AND OPERATION

1. General

A. This section contains information needed to complete inspections on the structure of the airplane. The procedures given here are the general requirements that must be followed to correctly complete inspections. More specific information relating to the area that is to be inspected can be found in the inspection procedure for each component or area of the airplane.

2. Visual Inspections

A. Equipment.

(1) The following equipment can be used to complete required visual inspections. Not all equipment is required for each inspection and additional tools or equipment can be required for inspections of specific areas of the airplane:

- Flashlight or other light source capable of producing 100 foot-candles at the inspection surface
- Inspection mirror
- Borescope
- Camera or camcorder

B. Personnel.

(1) The following are requirements that the inspector must meet to complete visual inspections of the airplane structure and components:

- Near Vision of 20/25 (Snellen) at 16 inches +1 or -1 inch or equivalent, in at least one eye, natural or corrected
- Capable of distinguishing and differentiating colors
- Familiar with the appearance of visible damage and have training and experience on visual inspection of aircraft structure

C. Access Requirements.

(1) Direct visual examination must be used whenever possible. For areas that are not accessible, the use of a borescope or digital camera or camcorder attached to a pole is recommended.

(2) The examination must be completed at a distance of not more than 24 inches from the surface of the component that is to be inspected.

(3) The examination must be completed at an angle that is within 30 degrees of perpendicular to the surface that is to be inspected.

D. Visual Inspection Procedure.

(1) Clean the inspection surfaces thoroughly to remove all loose materials, dirt, contamination and grease.

(2) Use a towel to dry the inspection surface.

(3) Use a light source held approximately perpendicular to the inspection surface to examine the structure or component.

(4) Use a light source held and an angle of approximately 15 degrees of parallel with the inspection surface to examine the structure or component.

(5) Examine the structure or components for the following:

- Paint that is blistered, swollen, cracked, deformed or missing
- Security of parts or attached components
- Discoloration
- Bucking
- Bulging
- Dents
- Oil-canning
- Wrinkles
- Chafing
- Foreign objects
- Fluid leaks.

(6) Put a mark on any damaged areas that shows the location and type of damage found.

(7) Put a mark on any areas where you are uncertain whether damage exists to indicate that the area is suspect.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

AUTO FLIGHT - GENERAL

1. General (S-Tec 55 Autopilot with Autotrim)

A. **System Overview** - The S-Tec 55 autopilot is a two axis system that controls movement around the pitch and roll axes. Information for movement around the roll axis is obtained from the turn coordinator of the airplane. The roll axis of the System 55 has heading select, VOR/Localizer front and back course intercept and tracking. It is also interfaced with the GPS and Nav system that provides standard autopilot outputs.

B. The System 55 derives pitch axis information from a solid-state absolute pressure transducer mounted under the standby battery and an internal, sensitive accelerometer that provide precise pitch axis altitude hold, automatic/manual glideslope intercept and capture, and vertical speed commands totally independent of the aircraft's artificial horizon gyro or vacuum system. The System 55 autopilot delivers accurate altitude, vertical speed, and vertical acceleration data to the system's pitch computer, regardless of aircraft flight attitude.

2. The System 55 Flight Guidance Programmer/Computer

A. The System 55 Flight Guidance Programmer/Computer serves the function of converting pilot commands to logic signals for the roll and pitch computer functions. As the pilot enters the desired mode by pressing the appropriate mode selector switch, the computer acknowledges the mode, causing the appropriate annunciator to illuminate.

B. The roll computer receives signal inputs from the Directional Gyro or HSI, VOR/LOC and GPS deviation indicators, and the turn coordinator. The roll computer computes roll servo commands for stabilization, turns, radial intercepts, and tracking.

C. The pitch computer receives signal inputs from the altitude pressure transducer; accelerometer; glideslope deviation indicator; and vertical speed modifier control, optional altitude selector/alerter, or altitude/vertical speed selector if installed. The pitch computer computes pitch servo commands for vertical speed, altitude hold, and glide slope intercept and tracking. Sensing for trim annunciation or automatic elevator trim (S-Tec 55) is provided by the pitch servo. Drive for the elevator trim servo is provided by the pitch computer. Refer to Figure 2 for a diagram of the autopilot system.

3. Preflight Self-Test Procedure (S-Tec 55 Autopilot)

A. The System 55 incorporates a self-test that must pass before the autopilot can be engaged. To perform the test, aircraft DC electrical power must be on and the avionics master on. Place the Autopilot Master switch to the on position, and observe that all annunciators of the Programmer/Computer and remote display illuminate for approximately five seconds, then extinguish. When the system is first turned on, the Flight Guidance Programmer/Computer and Annunciator will display all functions as shown in Figure 1. When the self-test is complete, a RDY (ready) annunciation is displayed as shown in Figure 3.

4. Checking the Auto-Trim System (S-Tec 55)

A. With the airplane controls centered, engage the heading and VS modes on the computer, and the heading and VS should annunciate. Push the control stick forward. After about three seconds, the elevator trim should move to a nose up condition. Pull the control stick aft, and after about three seconds, the trim should move to the nose down position. Move the control stick in both the roll and pitch axes to overpower the autopilot servos. The control motions should be smooth, without looseness or free play. Refer to Figure 4 for a drawing of the autopilot disconnect switch (APD).

B. Move the elevator trim switch (hat switch on the control stick) up and down. The autopilot should disengage. The RDY (ready) annunciation will flash, then display a steady indication, and the trim should operate in the commanded direction. (The elevator trim switch will disengage the autopilot only when a pitch mode is engaged.) Re-engage the heading and VS modes, and press the APD switch. The autopilot should disengage. As before, the RDY indication will flash, then annunciate steady. An audible tone should be heard when the autopilot is disconnected.

5. Autopilot Disconnect Switch

A. The autopilot disconnect switch is a spring-loaded rocker switch on the top left side of the pilot’s control stick and is normally operated with the thumb of the left hand. Pressing either the top or the bottom portion of the rocker switch will disengage the autopilot.

NOTE: Operating the elevator trim switch will also disconnect the autopilot.

6. S-Tec 360 Autopilot Altitude Preselect (Optional Equipment)

A. **General Overview** - The S-Tec 360 Autopilot Altitude Preselect (AAP) enhances use of the S-Tec System 55 Autopilot, but is not a required component of the autopilot system. While the S-Tec 360 has a number of special functions like altitude and decision height alerting, the primary features of the AAP is the ability to preselect an assigned or desired altitude. When the altitude command is sent to the autopilot, the airplane will climb or descend at a preset rate to the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

preset altitude and thereafter maintain that altitude.

B. It is important to understand that the S-Tec 360 unit does not control the autopilot. Vertical speed and altitude commands for the autopilot are pre-programmed into the AAP unit but are not commanded until the corresponding functions on the autopilot display unit are engaged. The two primary advantages of the AAP unit are:

(1) The ability to preprogram altitude and climb settings for later execution.

(2) The barometric calibration feature discussed in the next paragraph.

C. Altitude information is obtained from the encoder altimeter of the airplane. The AAP unit has a "baro calibration" feature, which allows the pilot to correct the pressure altitude from the encoder for local pressure variations. Essentially, there are two Kollsman displays in the airplane, the static system altimeter and the S-Tec 360 display unit. If the encoding altimeter is properly calibrated and the pilot routinely updates the altimeter settings of the AAP unit, the autopilot will maintain the correct altitude above sea level.

D. The method of altitude hold is different when using the altitude hold feature of the S-Tec System 55 autopilot. When the altitude hold function is engaged on the autopilot without input from the AAP, the autopilot senses the current atmospheric pressure at the instant altitude hold is engaged, and thereafter, maneuvers the airplane to maintain that pressure. If the airplane flies into a low-pressure area, the autopilot will command the airplane to descend. In this situation, the pilot must use the vertical speed control on the autopilot to compensate for the normal en route and diurnal changes in atmospheric pressure.

E. The S-Tec System 55 Autopilot and 360 AAP both have altitude (ALT) and vertical speed (VS) functions. During the study of the pilot's guide on the following pages, it is important to distinguish which unit the ALT or VS discussion is applicable. If the term **autopilot** is used, this refers to the buttons on the S-Tec System 55 autopilot. If the terms, **Selector**, **Selector Unit**, or **AAP** are used, it refers to the S-Tec 360 unit shown Figure 6. In general, the AAP is used to **select**, **input**, or make altitude and/or vertical speed commands **active**. The autopilot, when **engaged**, executes the commands. Understanding the meaning of a few terms that are used in the S-Tec Pilot's Guide is helpful.

(1) The term **selected altitude** refers to the altitude selected or preset in the AAP Unit for the autopilot to intercept and/or maintain.

(2) The operate mode is the normal state of the S-Tec 360 system. In this mode, preset ALT and VS commands are executed when the pilot engages the corresponding commands on the autopilot. The **Entry Mode** is used to input altitude, or other related settings.

F. **S-Tec 360 System Description** - The S-Tec Liquid Crystal Display (LCD) Altitude and Vertical Speed Selector are designed for use with S-Tec 55 Autopilot. The system is used to pre-select an altitude, a rate of climb, or a rate of descent, which is then performed by the autopilot. In addition, the selector provides an altitude alert mode, a decision height (DH) alert mode, an altitude readout from the encoder, barometric calibration, and a manual mode. This supplemental section provides information on the features and functions of the system and operating instructions for its proper use. A labeled drawing of the display unit is shown in Figure 5.

G. The LCD Altitude and Vertical Speed Selectors are integrated into a single panel-mounted unit, which contains the display, the operating switches, and the computer electronics. The system is designed to interface with the autopilot and the encoder, which provides a standard altitude output in increments of 100 feet.

7. S-Tec 360 Theory Of Operation

A. **Encoder Interface** - The Altitude Selector Computer reads and decodes raw altitude information from the altitude encoder. The uncorrected altitude information is adjusted by changing the setting in the barometric calibration. When the information from the selected altitude matches the corrected decoded altitude information from the encoder, the altitude selector computer signals the autopilot to electrically engage the altitude hold mode of the autopilot.

B. The vertical speed selector provides an electrical output to the autopilot pitch flight guidance computer that is proportional to the amplitude and polarity (direction) of the vertical speed. For example, + 500 FPM climb VS would produce a plus (+) voltage in an amount representing 500 FPM. The autopilot compares the existing vertical speed with the selected vertical speed and maneuvers the airplane to match these signals.

C. **System Diagram** - Figure 6 contains a block display of how the various avionics components function with the S-Tec 360 system.

8. S-Tec 360 Ground Testing

A. **Self-Test** - When power is applied to the system, an internal self-test of the computer electronic elements, the display, annunciators, and the altitude alerter audio tone is conducted. Successful test conclusion is indicated by a display of 29.9

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

in the selector unit. The self-test cycle does not check the encoder for proper operation. However, the preflight check procedures outlined in the Preflight Inspections section below provide a method to determine proper operation of the encoder.

B. **Power Switches** - There are no separate on/off switches for the S-Tec 360 Autopilot Altitude Preselect. The S-Tec 360 is powered when the system and avionics master switches are on. In addition, the Trans-Cal SSD 120 Blind Encoder/Digitizer does not have a power switch. The encoder is turned on by the avionics master switch. There are certain operational limitations of the encoder which are discussed in Section 34-10-00, Blind Altitude Encoder Testing .

C. **Preflight Inspections** - The following preflight procedure provides an operational test of the entire system, including the encoder, the altitude selector, and the autopilot. A successful test is indicated by the autopilot switching from VS Mode to ALT Hold Mode as the selected altitude is matched to field elevation.

(1) System, Autopilot, and Avionics Master Switches - ON

(2) Autopilot ALT Select Button - ON

(3) Altimeter - Set to local altimeter setting or field elevation, as appropriate.

(4) Altitude Selector -

(a) Observe that the self-test cycle is complete. When first powered, the system will display all annunciations for approximately five seconds, ending with an audible tone. Thereafter, the system will display a barometric setting of 29.9 with the barometric annunciator flashing.

(b) Rotate the selector input knob to set barometric setting to the nearest 0.1 inch of Hg (for millibars push on barometric switch).

(c) Push the ALT Switch to display ALT SEL. With the SEL flashing, rotate the selector knob to input an altitude 300 to 400 feet lower or higher than the indicated altitude.

(d) Push the VS Switch to activate VS Selector, rotate the selector switch knob to input desired climb (+) or descent (-) speed.

(e) Push the ALT Switch to access the altitude set mode - ALT SEL will be annunciated.

(5) Autopilot

(a) Engage the HDG Mode.

(b) Simultaneously depress VS and ALT switches on the autopilot, and observe that the VS and ALT annunciators both illuminate.

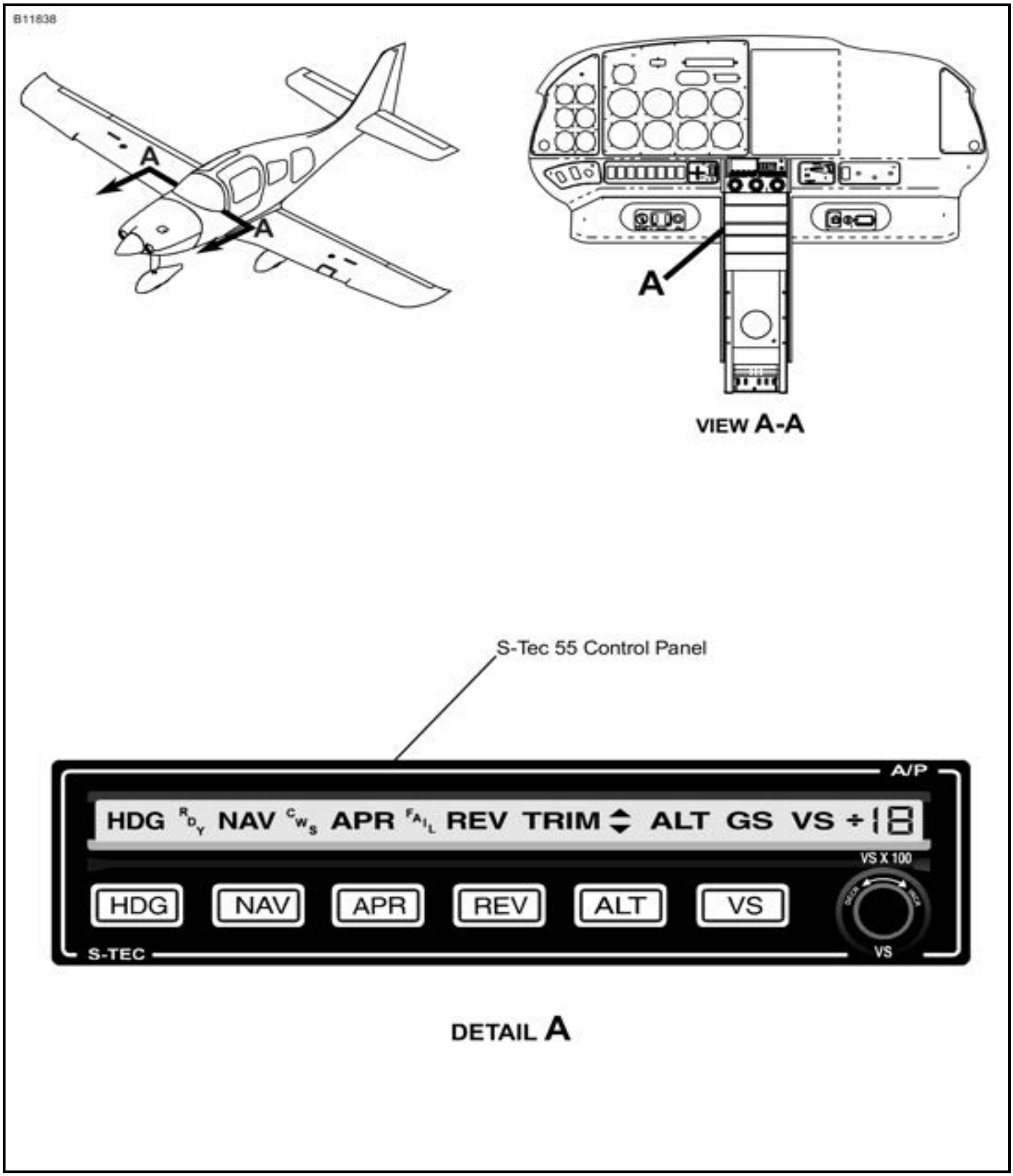
(c) Rotate the altitude selector knob on the AAP unit and change the selected altitude so that it matches the field elevation. The VS annunciation on the autopilot should extinguish when the setting on the altitude selector is within 100 feet of the altitude indicated on the altimeter. Extinguishing of the VS annunciation with the ALT remaining on indicates the altitude hold mode is engaged. If altitude engagement does not occur within 100 feet of indicated altitude, readjust the barometric calibration.

(6) **Disengage Autopilot** - Adjust the altitude selector to the desired cruise altitude and set the vertical speed to an appropriate climb setting for use after takeoff.

(7) **Autopilot Preflight** - Conduct autopilot preflight per the instructions in the *S-Tec System 55 Pilot's Guide*.

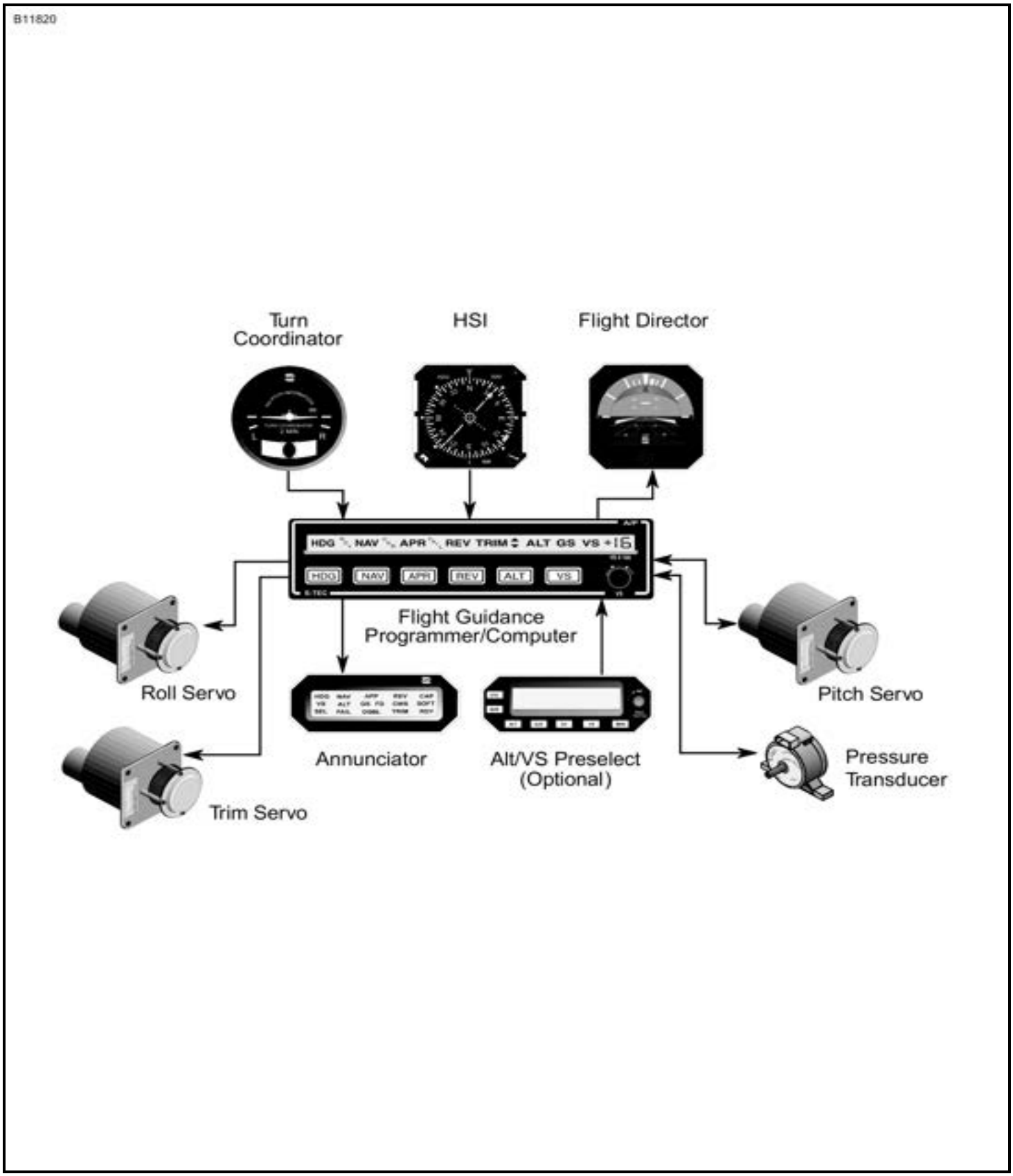
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : S-Tec 55 Control Panel



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

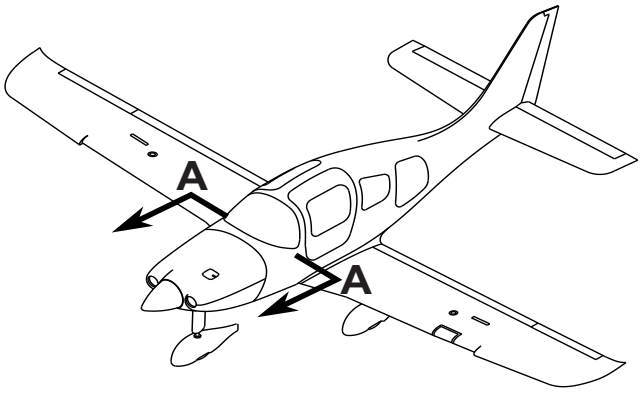
Figure 2 : Sheet 1 : S-Tec 55 Autopilot System

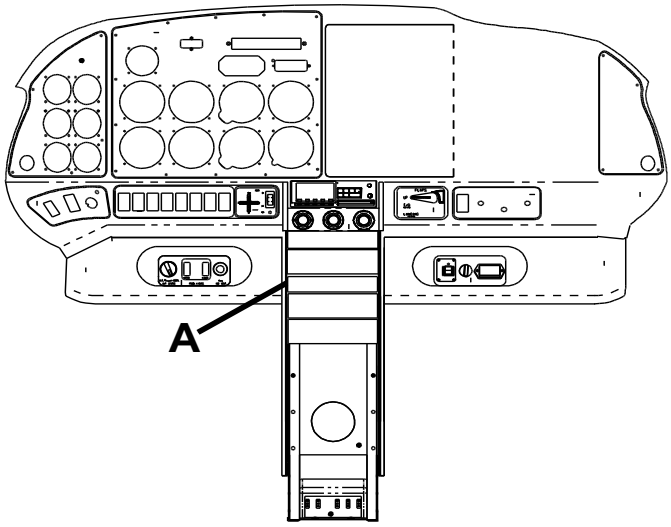


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

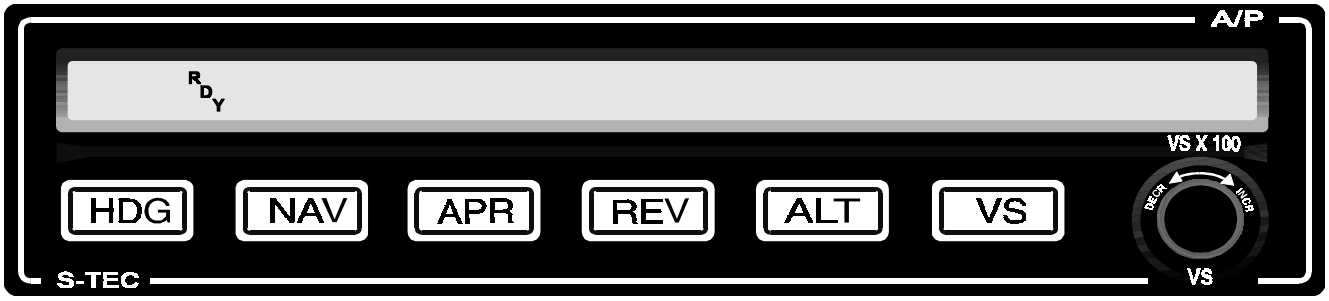
Figure 3 : Sheet 1 : S-Tec 55 Control Panel Indicating Self-Test Complete

B11821





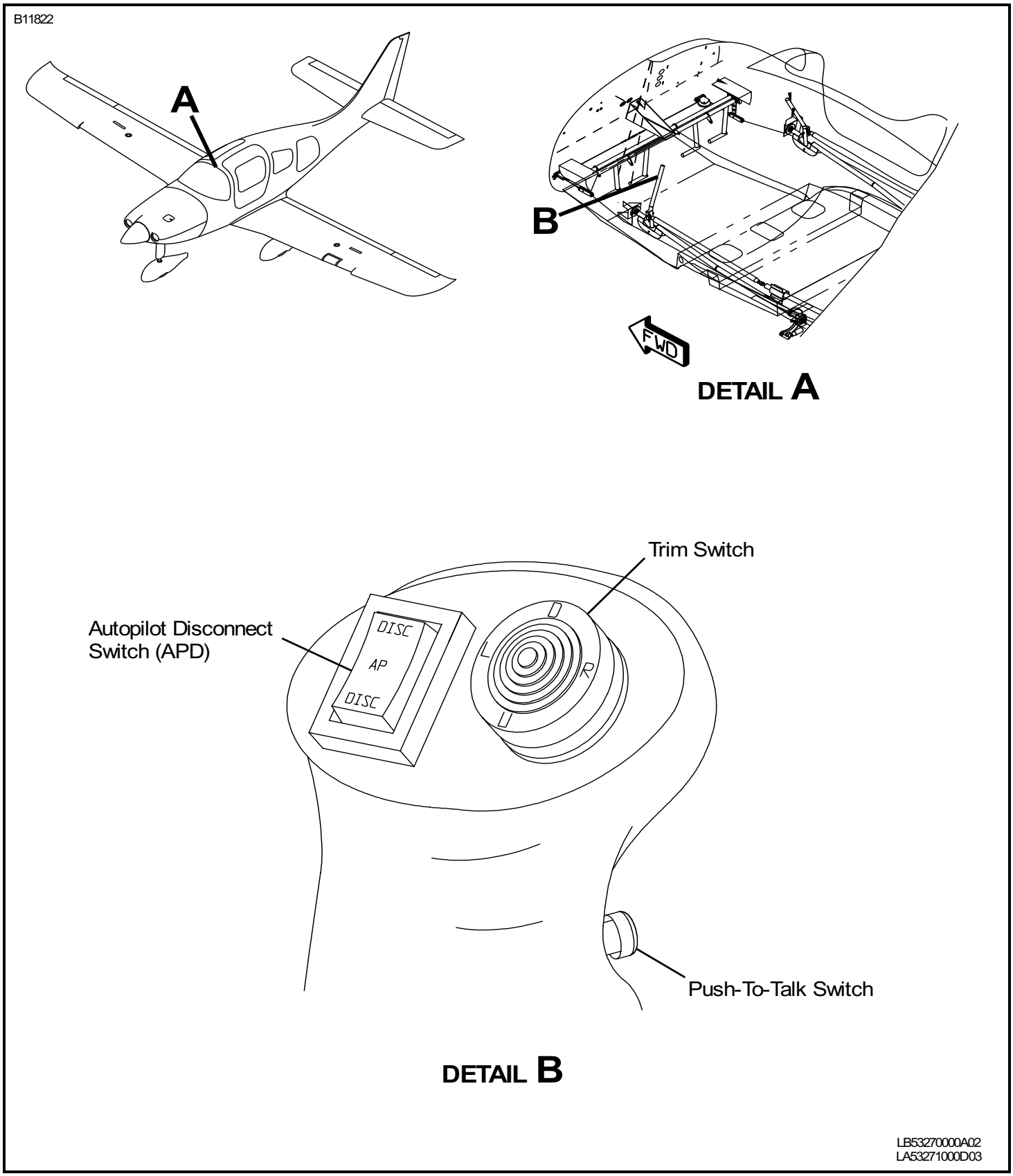
VIEW **A-A**



DETAIL A

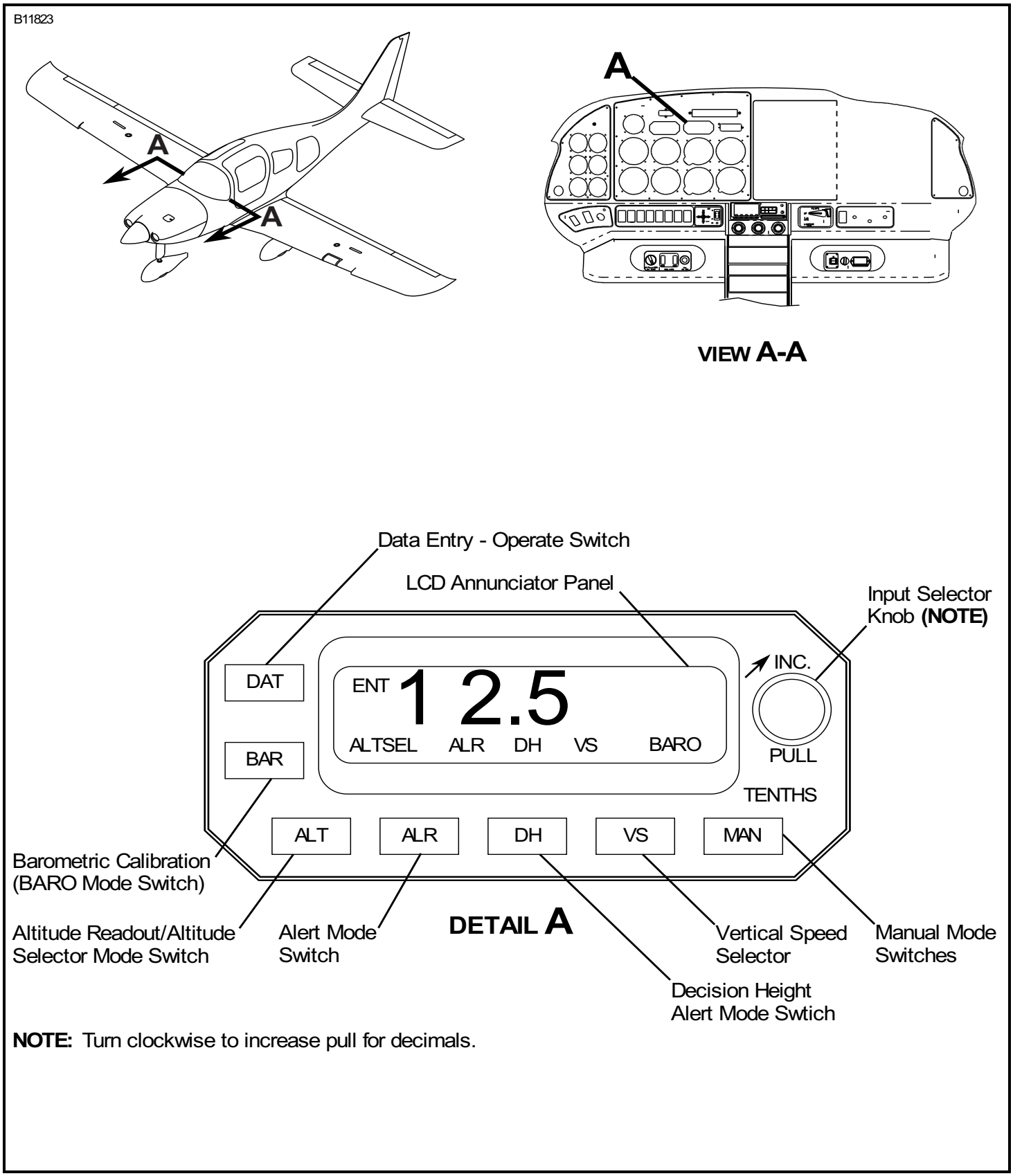
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 4 : Sheet 1 : Autopilot Switches on the Control Stick



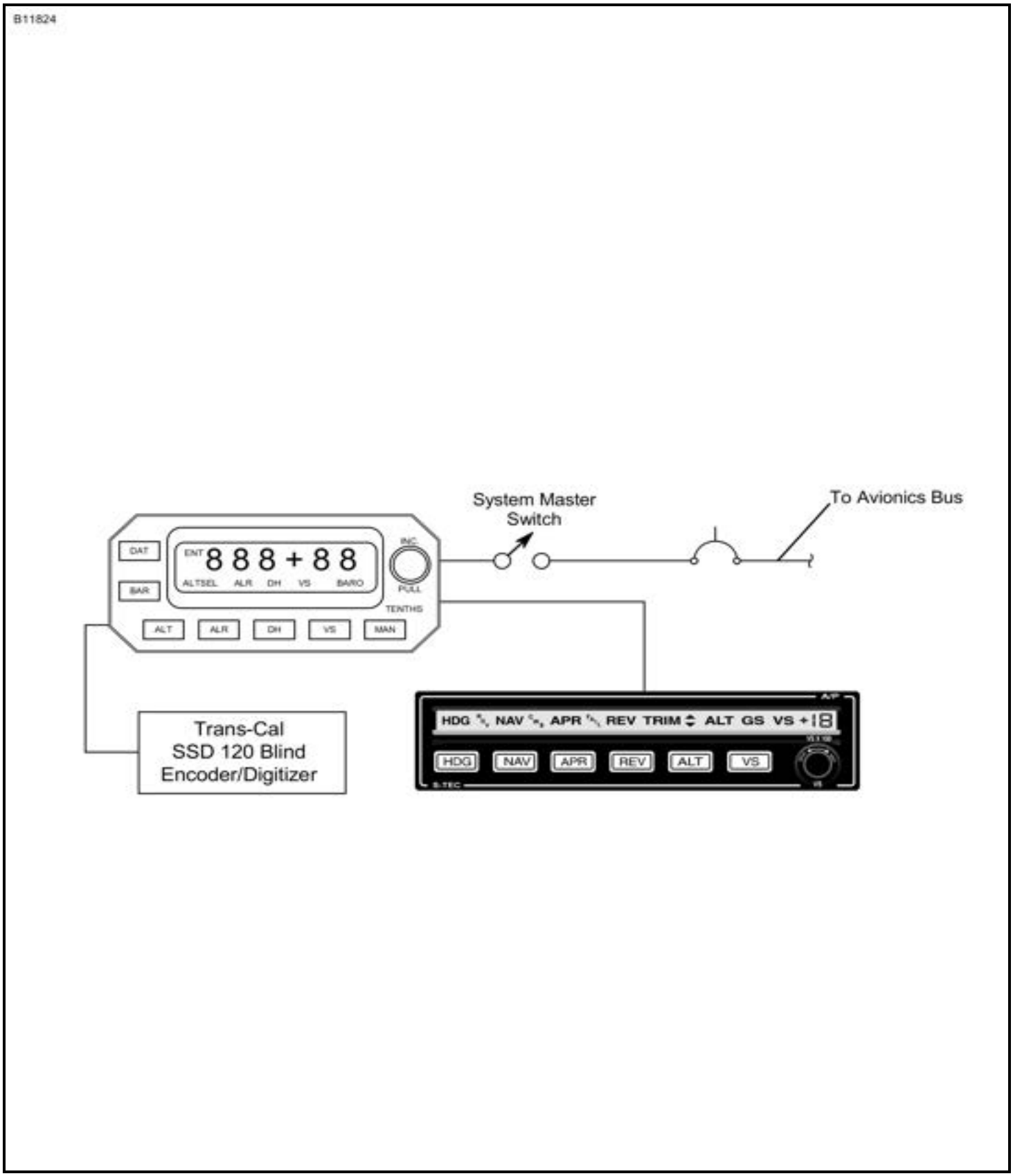
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 5 : Sheet 1 : S-Tec 360 Autopilot Altitude Preselect (AAP)



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 6 : Sheet 1 : Block Diagram of S-Tec 360 System



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (S-TEC CORP) - MAINTENANCE PRACTICES

1. Instructions For Continued Airworthiness (S-Tec Corp.)

A. **Description** - The S-Tec flight control system includes the following items:

(1) Roll servo

(2) Pitch servo

(3) Trim servo (elevator)

B. **Installed Equipment** - Panel or remotely mounted pitch/roll/yaw computers include the following:

(1) Panel mounted controllers, indicators, switches, and breakers

(2) Barometric pressure transducer/static source

C. **Servos** - Servo installations utilize aluminum brackets to secure the servos to the airframe. Attachment to the aircraft primary flight controls and trim systems is accomplished through cable and push rod assemblies.

D. **Controls Operation Information** - Operation of the autopilot system is described in the FAA approved flight manual supplement(s) 891830S, Rev. 1, dated 12-08-99. Specialized controls, annunciation, operation, and interpretation are covered in this required document. This information is also contained in the POH/AFM as well as the *System 55 Autopilot Pilot's Operating Handbook* P/N 8747 – Rev. A, dated 11/97.

E. **Servicing Information** - All servicing of items must be accomplished by approved S-Tec dealers using S-Tec Dealer Maintenance Manuals and S-Tec test equipment. Locations and access to the components are described and depicted in the installation drawings and Installation Manual. The need for removal and replacement of components should be determined by functional checks indicated in the AFM Supplement and the Ground Checks and Flight Adjustment section of Installation Manual, S-Tec P/N ST-852.

F. **Maintenance Instructions** - Condition and/or airworthiness inspections required under FAR Part 43, or other FAA approved programs, should include several items regarding the S-Tec autopilot system installed in the aircraft.

(1) Perform functional checks indicated in the AFM Supplement and the Ground Checks and Flight Adjustment section of Installation Manual (S-Tec P/N ST-852).

(2) Component installations should be checked against the S-Tec Installation Manual, ST-852, to confirm integrity and condition.

(3) In servo installations utilizing bridle cables, tension should be verified against values indicated on the roll/pitch servo installation drawings found in the Bulletin Master Drawing List 921139, dated 12-03-99. Check for frayed or misaligned bridle cables and excess wear or looseness of any associated idler pulleys.

(4) Trim servo installation utilizing push-rod actuation should be inspected for condition.

2. Troubleshooting Information

A. Troubleshooting this equipment should only be accomplished by authorized S-Tec dealers with required test equipment and service data. System function should be determined through functional checks indicated in the AFM Supplement(s) 891830S, Rev. 1, dated 12-08-99 and the Ground Checks and Flight Adjustment section of Installation Manual ST-852.

3. Special Issues

A. **Removal and Replacement Information** - All components can be removed with common tools and practices. Installation of components required for this alteration must be in accordance with the approved data contained in the S-Tec Installation Manual, ST-852.

B. **Diagrams/Special Inspections** - Refer to the S-Tec Installation Manual, ST-852, for all diagrams. There are no special inspection requirements.

C. **Application of Protective Treatments** - Servos and transducers should be removed prior to application of corrosion (or other) treatments. Panel mounted components should not be exposed to these treatments.

D. **Structural Fasteners** - See parts list in the S-Tec Installation Manual, ST-852, for TSO, PMA, and standard hardware information.

E. **Special Tools** - N/A

F. **Overhaul Time Limitations** - N/A

G. **Airworthiness Limitations** - Limitations are listed in the Limitations Section of AFM Supplement(s) 891830S, Rev. 1, dated 12-08-99.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

H. **Revisions** - The S-Tec Service Letter program will be utilized to inform aircraft operators of significant changes to this ICA. Contact S-Tec Corporation at 1-800-USASTEC.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ROLL AND PITCH SERVOS - MAINTENANCE PRACTICES

1. Autopilot Roll Servo

A. General – The autopilot roll servo is located under the flap drive bracket. It is accessed through the wing controls access panel located under the fuselage at the aft end of the wing saddle, near the wing trailing edge. The servo is attached to the bracket at an angle. This angle aligns the servo drive capstan grooves with the bridle cable. The bridle cable is attached to the aileron interconnect pushrod with two saddle assemblies. Refer to Section 27-10-00 for a discussion of the aileron system. Refer to Figure 201 for a picture of the aileron roll servo.

B. **Removal** - The roll servo bridle cable must be detached to remove the roll servo. Remove the MS-21256-1 locking clips from the barrel of the turnbuckle. Detach this cable from both ends by loosening the turnbuckle and removing the clevis pins. Retain the MS20392-2C-11 clevis pin and AN960-10L washer for reuse. A new MS24665-134 cotter pin will be required for reinstallation.

(1) **Bridle Cable Removal and Inspection** - The bridle cable does not have to be removed from the servo drive capstan for most maintenance procedures. Check cable for signs of wear or corrosion. Replace cable assembly if required. Autopilot installation bulletins must be followed for this process.

(2) **Unplug Roll Servo** - Cut the nylon tie used to secure the electrical wiring. Unplug the autopilot roll servo electrical connection at the connector.

(3) **Servo Removal** - The servo is attached to the bracket with four AN3-4A bolts and AN365-1032 nuts with AN960-10 washers. These are located on the corners of the servo attach flange. Three of these bolts can be seen in Figure 201. When the four AN3-4A bolts and AN365-1032 nuts with AN960-10 washers are removed, the servo can be removed.

C. **Servo Installation** - Installation is the reverse of removal.

(1) Adjust bridle cable tension to proper 30±2 lbs. value.

(2) The four AN3-4A bolts and AN365-1032 nuts are torqued 30 to 36 in.-lbs.

(3) Be sure to check cable tension and installation per autopilot installation requirements.

2. Autopilot Pitch Servo

A. **General** - The autopilot pitch servo is located under the baggage bulkhead. It is accessed through the baggage bulkhead access panel located under the upholstery on the hat rack. The servo is attached to a composite bracket mounted at an angle to the fuselage centerline. This angle aligns the servo drive capstan grooves with the bridle cable. The bridle cable is attached to the elevator final drive pushrod with two saddle assemblies. Refer to Figure 202.

B. **Removal of Autopilot Pitch Servo** - The pitch servo bridle cable must be detached to remove the roll servo. Remove the MS-21256-1 locking clips from the barrel of the turnbuckle. Detach this cable from both ends by loosening the turnbuckle and removing the clevis pins. Retain the MS20392-2C-11 clevis pin and AN960-10L washer for reuse. A new MS24665-134 cotter pin will be required for reinstallation.

(1) **Bridle Cable Removal and Inspection** - The bridle cable does not have to be removed from the servo drive capstan for most work. Check cable for signs of wear or corrosion. Replace cable assembly if required. Autopilot installation bulletins must be followed for this process.

(2) **Unplug Pitch Servo** - Cut the nylon tie used to secure the electrical wiring. Unplug the autopilot pitch servo electrical connection at the connector.

(3) **Servo Removal** - The servo is attached to the bracket with two MS24694-S50 flat head screw on the upper two mounting locations and two AN3-4A bolts with AN960- 10 washers on the lower two mounting locations. Each screw is installed into a clip nut (ESNA RM52LHA4972-8-02) attached to the servo mounting flange. These mounting bolts are located on the corners of the servo attach flange, and the bolts can be seen in Figure 202, Sheet 2. Remove the servo.

C. **Servo Installation** - Installation is the reverse of the removal.

(1) Adjust bridle cable tension to proper 30±2 lbs. value.

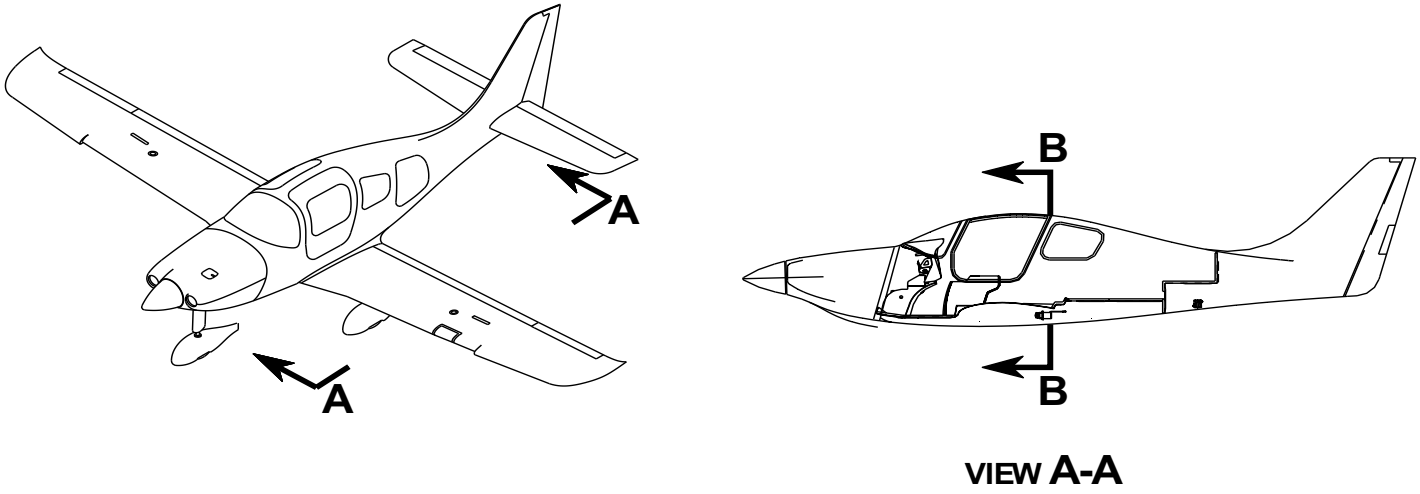
(2) Torque all bolts 30 to 36 in.-lbs.

(3) Be sure to check cable tension and installation per autopilot installation requirements.

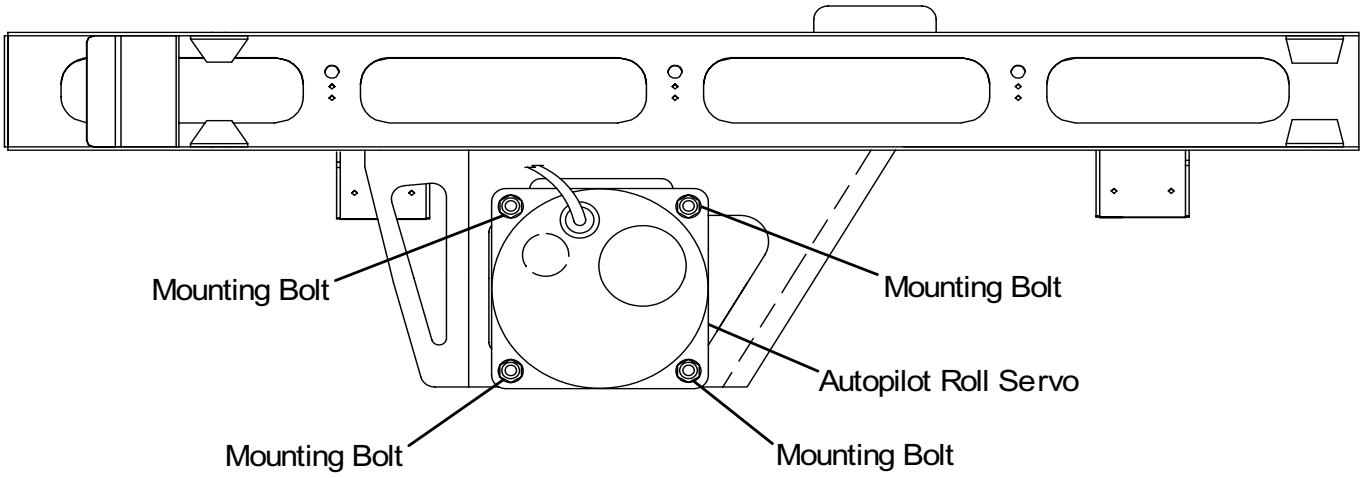
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Autopilot Roll Servo

B11845



VIEW A-A

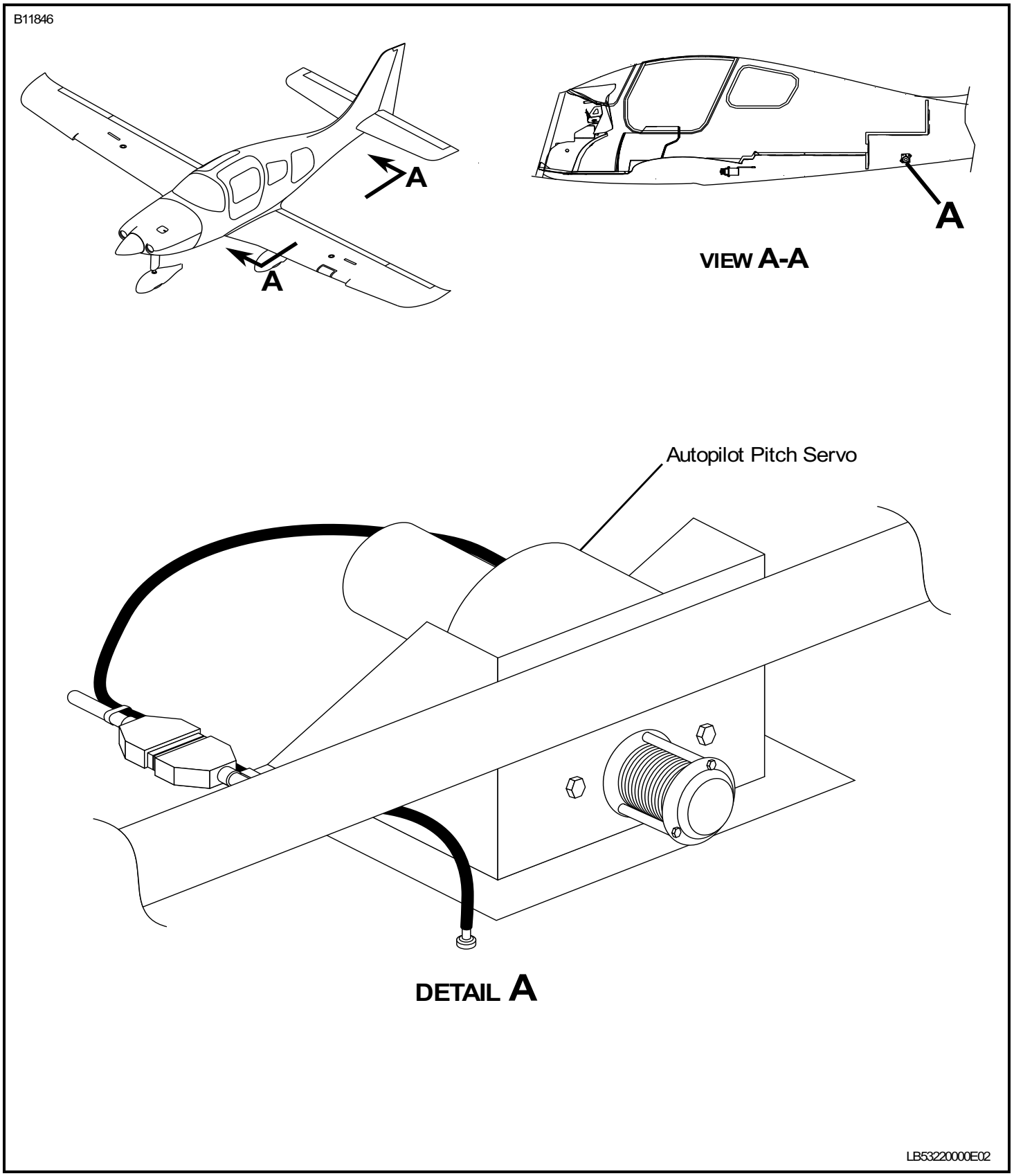


VIEW B-B

LB53220000E02
LB53220000E04

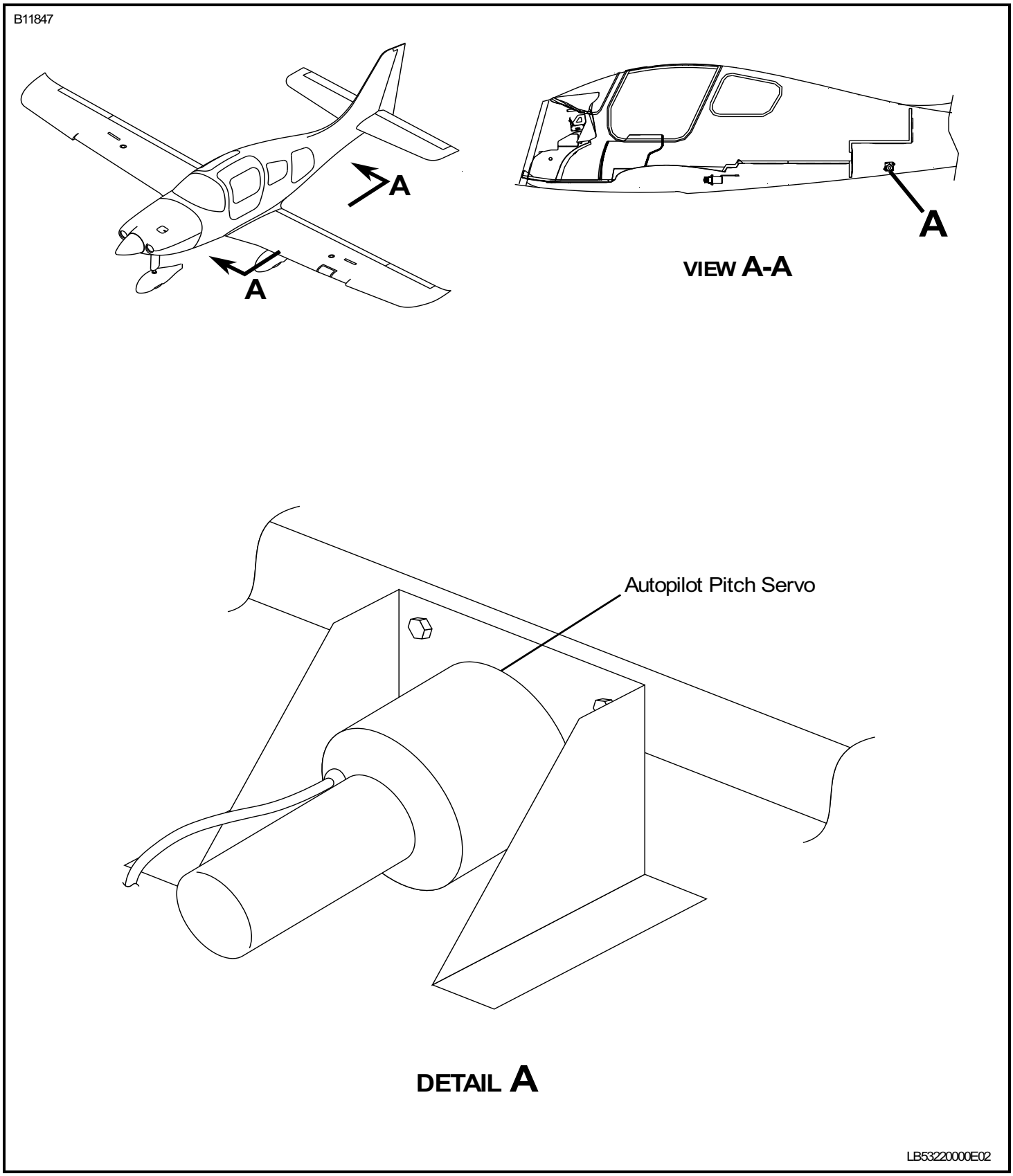
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Autopilot Pitch Servo



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 2 : Autopilot Pitch Servo



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

COMMUNICATIONS - GENERAL

1. General

A. The Cessna 300 (LC40-550FG) utilizes UPS Apollo™ communications systems. There are variations of the aircraft communications and navigation systems; refer to Chapter 34 for navigation system description. Refer to Chapter 34 and the UPSAT manuals for specific information on the actual Nav/Comm hardware. This chapter describes the system of providing communications output to the occupants and protection from precipitation static and lightning. For a specific listing of installed equipment, refer to Section 6, Appendix A, of the POH/AFM.

(1) **Description of Audio Panel** - The Apollo™ SL 15MS Audio Selector Panel/Intercom System (ASPIS) is frequently referred to as the audio panel. The primary purpose of the panel is to control communication and navigation audio selections, intercom functions, and the marker beacons. In addition, the unit has provisions for a stereo entertainment input. The audio panel is located in the top of the radio rack panel assembly.

(2) **Description of Static Discharge System** - During use, the airplane is susceptible to a build-up of static electricity. An accumulated static electrical charge can render radio navigation and communication inoperative. The purpose of the static discharge system is to transfer the electrical charge off the airplane's surface and quietly discharge it into the air.

(3) **Description of Lightning Protection System** - The composite construction of the Cessna 300 has a very high resistance to electricity and very little conductivity. Having a high conductivity is critical to lightning protection because it is important that all parts of the airplane have the same electrical potential. To achieve high conductivity, aluminum and copper mesh was integrated with the composite construction of the airplane. The mesh varies from being 10 to 30 thousandths of an inch below the surface of the paint and encompasses most surfaces of the airplane. Various parts of the airplane are interconnected through use of metal fasteners inserted through several plies of mesh, mesh overlaps, and bonding straps. Refer to Section 20-70-00 for other lightning protection information.

CAUTION: Before any maintenance, removal, or installation of equipment is performed, make sure both the master and avionics switches are in the off position. Failure to do so could result in damage to these instruments.

2. Speech Communications

A. All communication radios are integrated with some form of navigational receiver, and it is impracticable to segregate the discussion of each function in two separate chapters. Accordingly, air-to-ground speech communications are covered in Chapter 34.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

AUDIO COMPONENTS - MAINTENANCE PRACTICES

1. Apollo™ SL15 Audio Panel

A. The SL15 Audio Panel acts as the audio selector for the airplane. The SL15 can switch between three transceivers (Com 1, Com 2, and Com 3) and six receivers (Nav 1, Nav 2, ADF, DME, MKR, and AUX). The SL15 also contains a voice activated intercom system, which allows the pilot, copilot, and passengers of the airplane to communicate among themselves. Refer to Figure 201. The intercom select switch can be set to three modes.

(1) In the "All" mode, the intercom is linked to all four-seat positions; everyone hears radio communications, and everyone hears music from input Entertainment No. 1.

(2) In the "Crew" mode, the pilot and front seat passenger are linked together and can receive radio communications. The rear seat passengers are linked together but cannot hear radio communications or the pilot or front passenger.

(3) In the "Isolate" mode, the pilot hears the radios, but is not connected to the intercom, while the front and rear passengers are on the same intercom loop but cannot hear radio communications.

B. All four headsets are hooked up to the intercom system. A volume knob on the left side of the SL15 controls volume for the headsets.

C. **Removal of SL15 Audio Panel**

(1) Insert a 3/32 inch Allen wrench into the hole on the faceplate. Refer to Figure 201.

(2) Turn the Allen wrench counterclockwise.

(3) The SL15 Audio Amplifier will slide out of the radio rack.

D. **Installation of SL15 Audio Panel**

(1) Install fittings into the back of the SL15.

(2) Slide the SL15 into its slot in the radio rack.

(3) Insert a 3/32 inch Allen wrench into the hole on the faceplate and turn clockwise. Refer to Figure 201.

2. Speaker

A. **Removal of Speaker**

(1) Remove the overhead center panel per instructions inSection 25-30-00, Removal of the FCOLP.

(2) Remove the four screws connecting the stall warning buzzer mounting, speaker, and speaker mounting. Refer to Figure 202.

(3) Remove the stall warning buzzer mounting.

(4) Disconnect the wires.

(5) Pull the speaker from the mounting.

B. **Installation of Speaker**

(1) Put the speaker on the speaker mounting.

(2) Connect the wires.

(3) Place the stall warning buzzer mounting on top of the speaker.

(4) Tighten the four nuts connecting the stall warning buzzer mounting, speaker, and speaker mounting. Refer to Figure 202.

(5) Install the overhead center panel per instructions in Section 25-30-00, Installation of the FCOLP.

3. Push-To-Talk Switch

A. **Location** - Each control stick has a push-to-talk switch located on the forward part of the stick where it is easily accessed by the index finger. Refer to Figure 203. The switch is press-fit into the stick and connected by wire on the inside of the stick assembly.

B. **Description** - The push-to-talk switch is a single-button switch that when pressed, makes a connection required to energize the Comm unit by way of the Audio Panel.

4. Troubleshooting Push-To-Talk Function

A. **Symptom** - Push-to-talk function not working properly. **Probable Cause** - Broken wire or connection.

(1) Locate the defective connection:

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(a) Remove the interior panel covering the control stick.

(b) Locate P-46 (pilot's side) and P-47 (copilot's side), and disconnect the plug.

(2) Using a digital volt ohmmeter (DVOM), check for operation of the push-to-talk function switch. Place one probe on pin 1 and ground the other. The DVOM should show a closed circuit with the switch depressed (less than 2 ohms).

(3) Check the jack side of the connection. Pin 2 should be ground and Pin 1 should be for the audio panel.

(4) If the switch needs to be replaced, cut the tie-wraps at the base of the control stick to allow the switch to be gently pulled out of the wooden handle.

(5) Solder in a new switch, and pull the wires tight at the base of the control stick tube.

(6) Secure the wires with tie-wraps, and check for freedom of movement.

5. Headphone Jacks/Microphone Plugs

A. **Description** - The Cessna 300 (LC40-550FG) is designed to handle both standard headphone/microphone jacks as well as Bose™ Stereo headphone jacks.

B. **Location** - Each seat has a jack plug receptacle.

(1) **Front Seats** - The location of the front seat receptacles are at the lower part of the center console. Refer to Figure 204.

(2) **Rear Seats** - The location of the rear seat receptacles are on the rear seat side panels. Refer to Figure 205.

CAUTION: Bose™ headphones require power, which is supplied by the Bose™ jack. Before removing the intercom jack, ensure the system master switch is in the off position.

C. **Removal of Rear Passenger Intercom Jacks**

(1) To gain access to the backside of the jacks, remove the interior sidewall panel per instructions in Section 25-30-00.

(2) Loosen and remove the jam nuts securing the jacks to the interior panel. Refer to Figure 206.

(3) Label all wires according to where they were connected.

(4) Cut wire near the solder point at each jack.

D. **Installation of Rear Passenger Intercom Jacks**

(1) Remove all traces of old solder from the jacks.

(2) Reconnect and solder the wires to the jacks. Ensure all wires are soldered to the correct pins on the jacks.

(3) Secure the jacks to the sidewall panel using jam nuts.

(4) Install the sidewall panel.

CAUTION: Bose™ headphones require power, which is supplied by the Bose™ jack. Before removing the intercom jack ensure the system master switch is in the off position.

E. **Removal of Pilot/Front Passenger Intercom Jacks/Microphone Plug**

(1) To gain access to the jacks, remove both sides of the center console panels.

(2) Loosen and remove the jam nuts securing the jacks to the interior panel. Refer to Figure 206.

(3) Label all wires according to where they were connected.

(4) Cut wire near the solder point at each jack.

F. **Installation of Pilot/Front Passenger Intercom Jacks/Microphone Plug**

(1) Remove all traces of old solder from jacks.

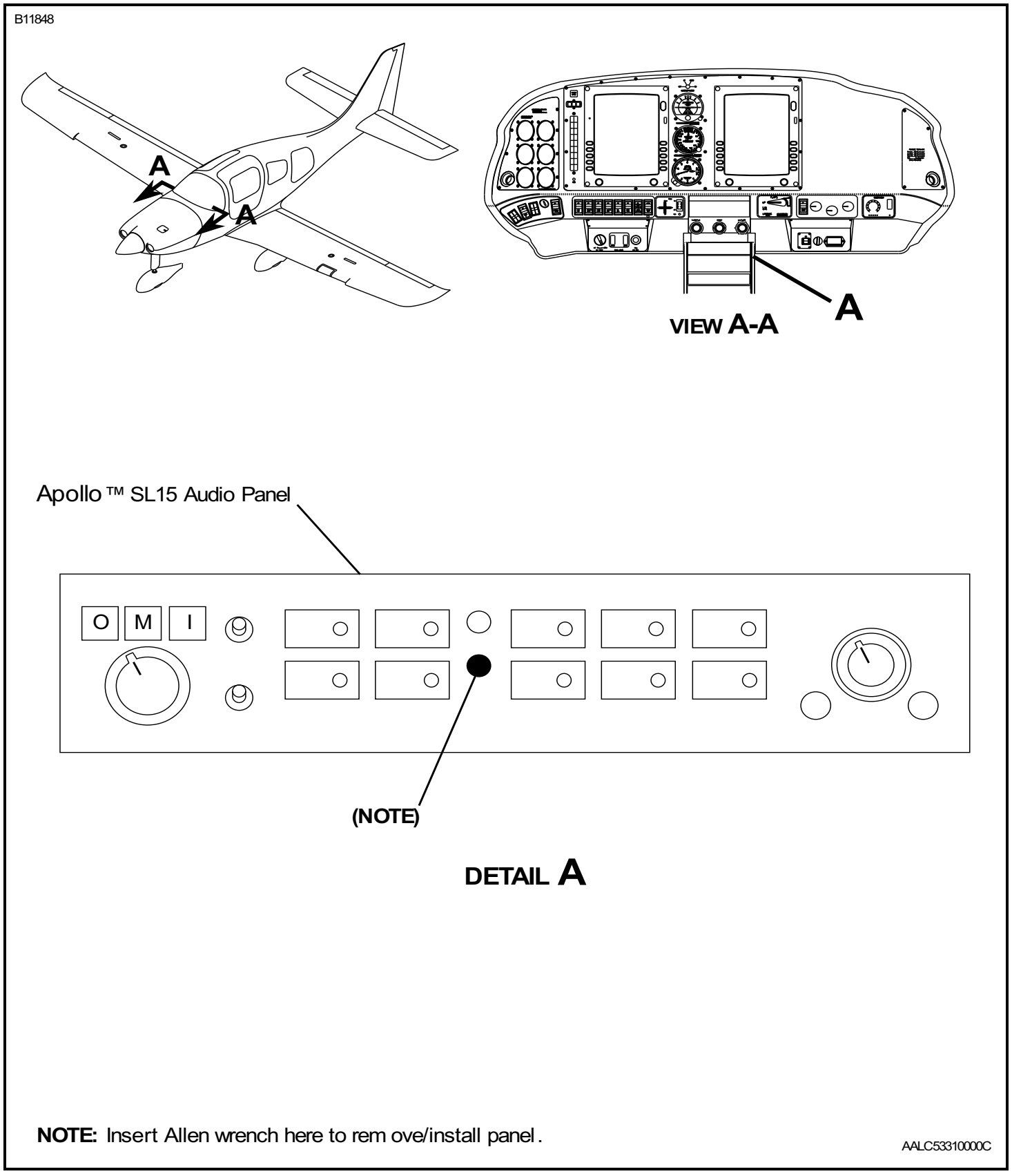
(2) Reconnect and solder wires to the jacks. Ensure all wires are soldered to the correct pins on the jacks.

(3) Secure the jacks to the sidewall panel using jam nuts.

(4) Install the sidewall panel.

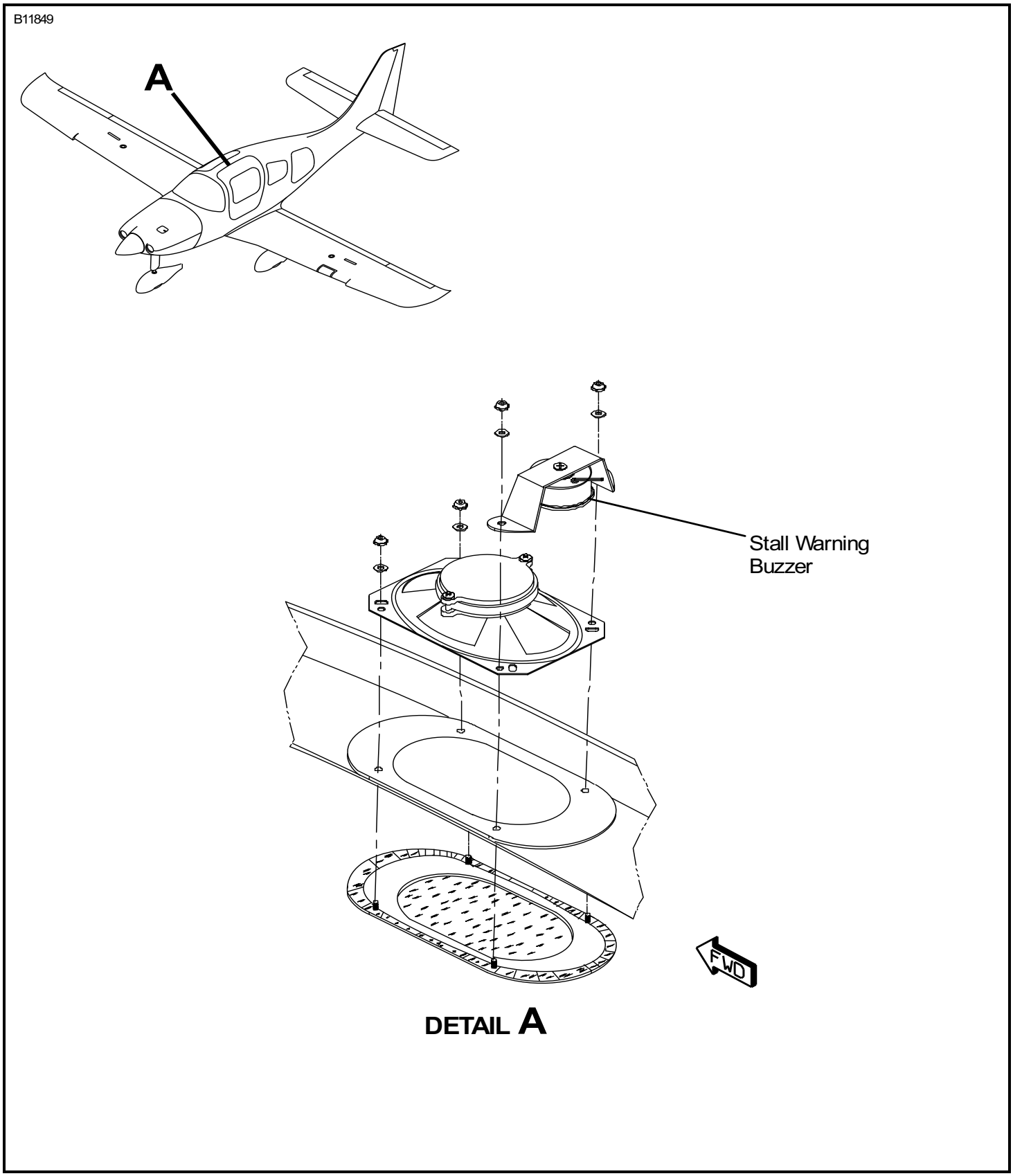
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Audio Panel



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

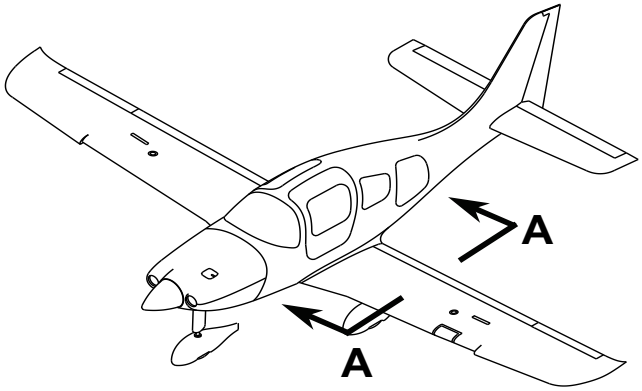
Figure 202 : Sheet 1 : Overhead Speaker Installation

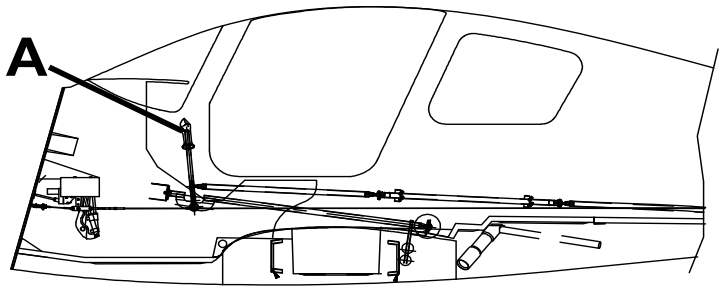


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

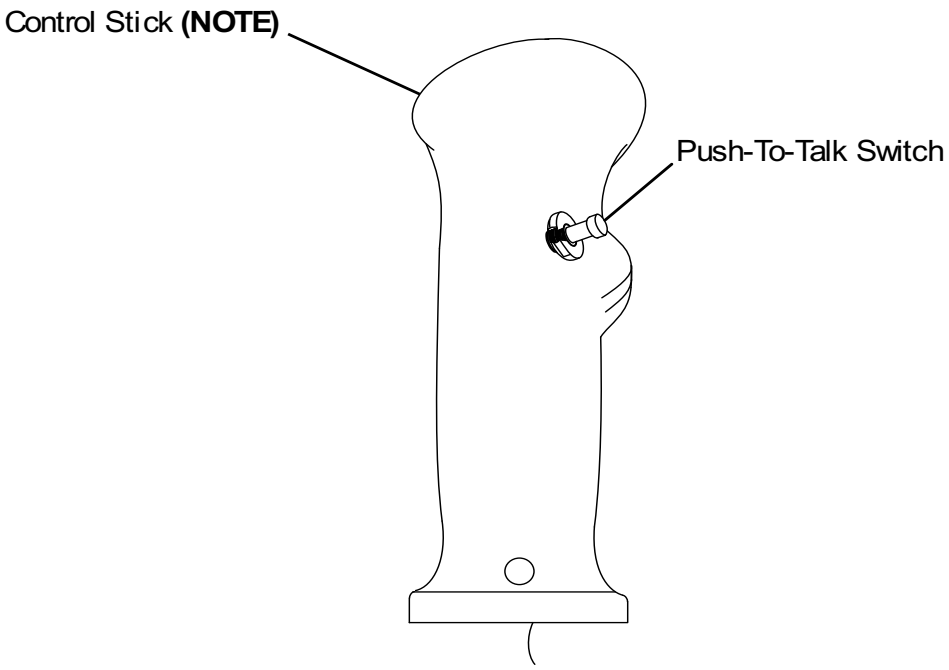
Figure 203 : Sheet 1 : Push-To-Talk Switch Location

B11850





VIEW A-A



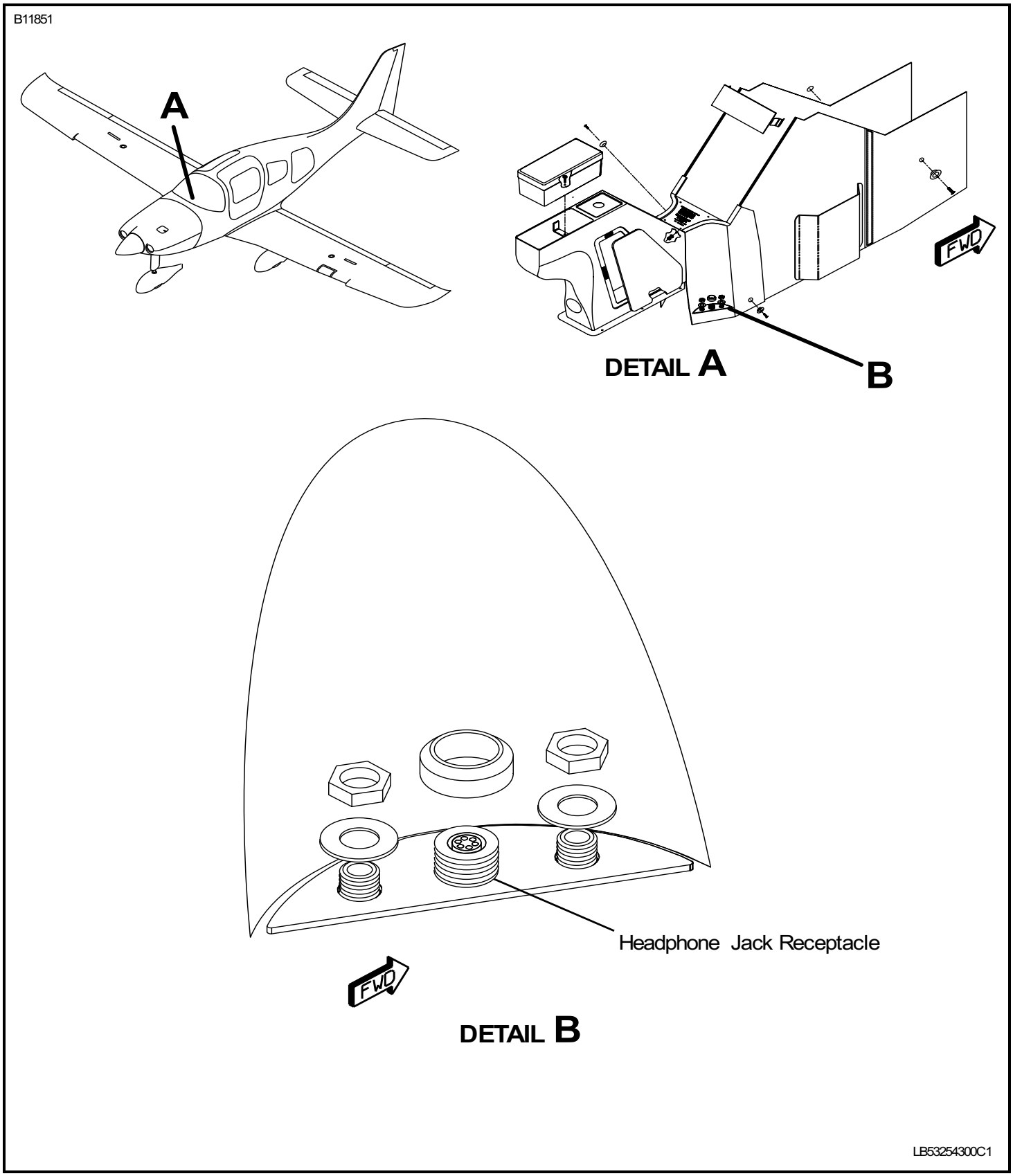
DETAIL A

NOTE: Right side shown, left side similar.

LA53271000F4

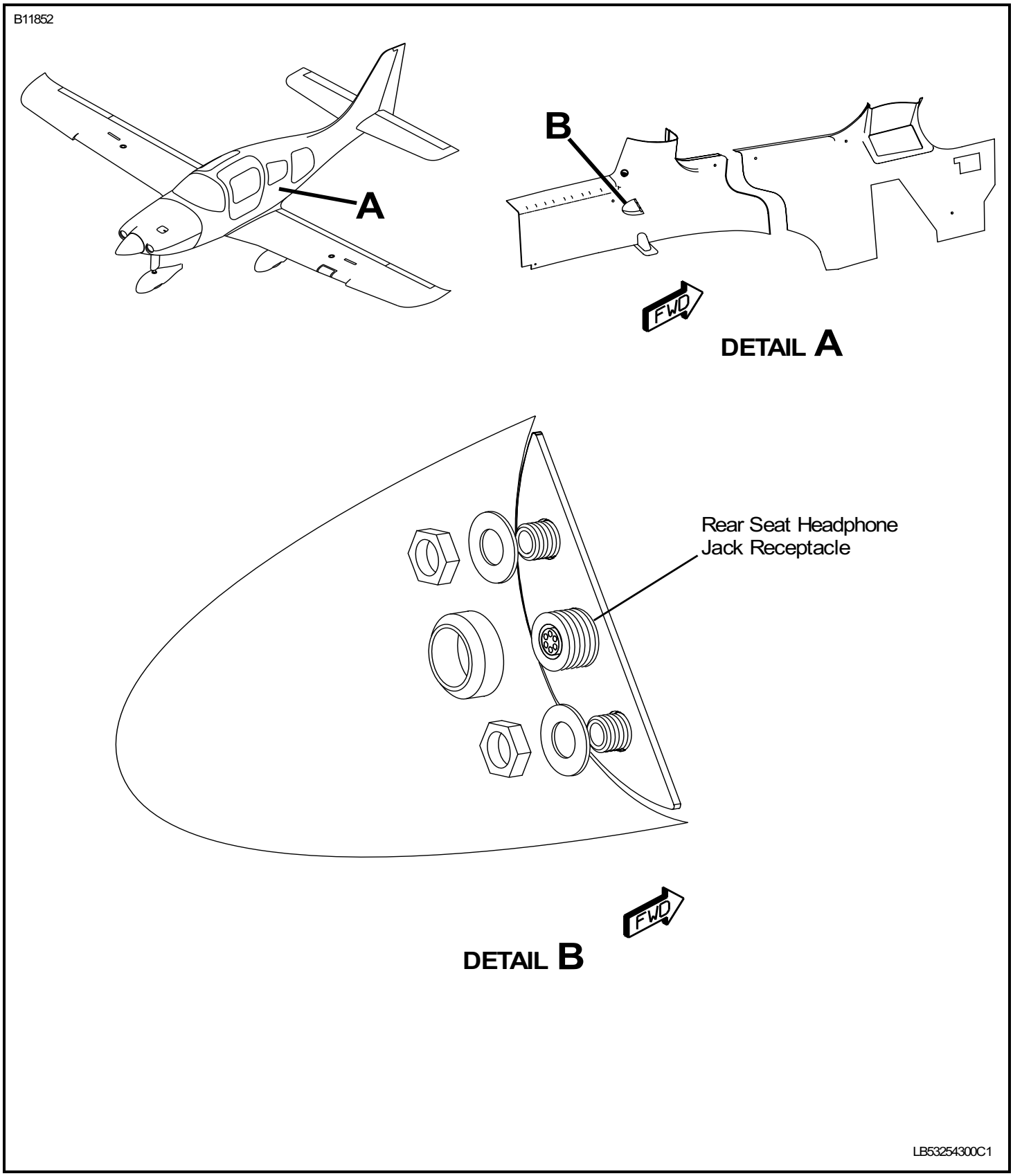
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Front Seat Headphone Jack Receptacle



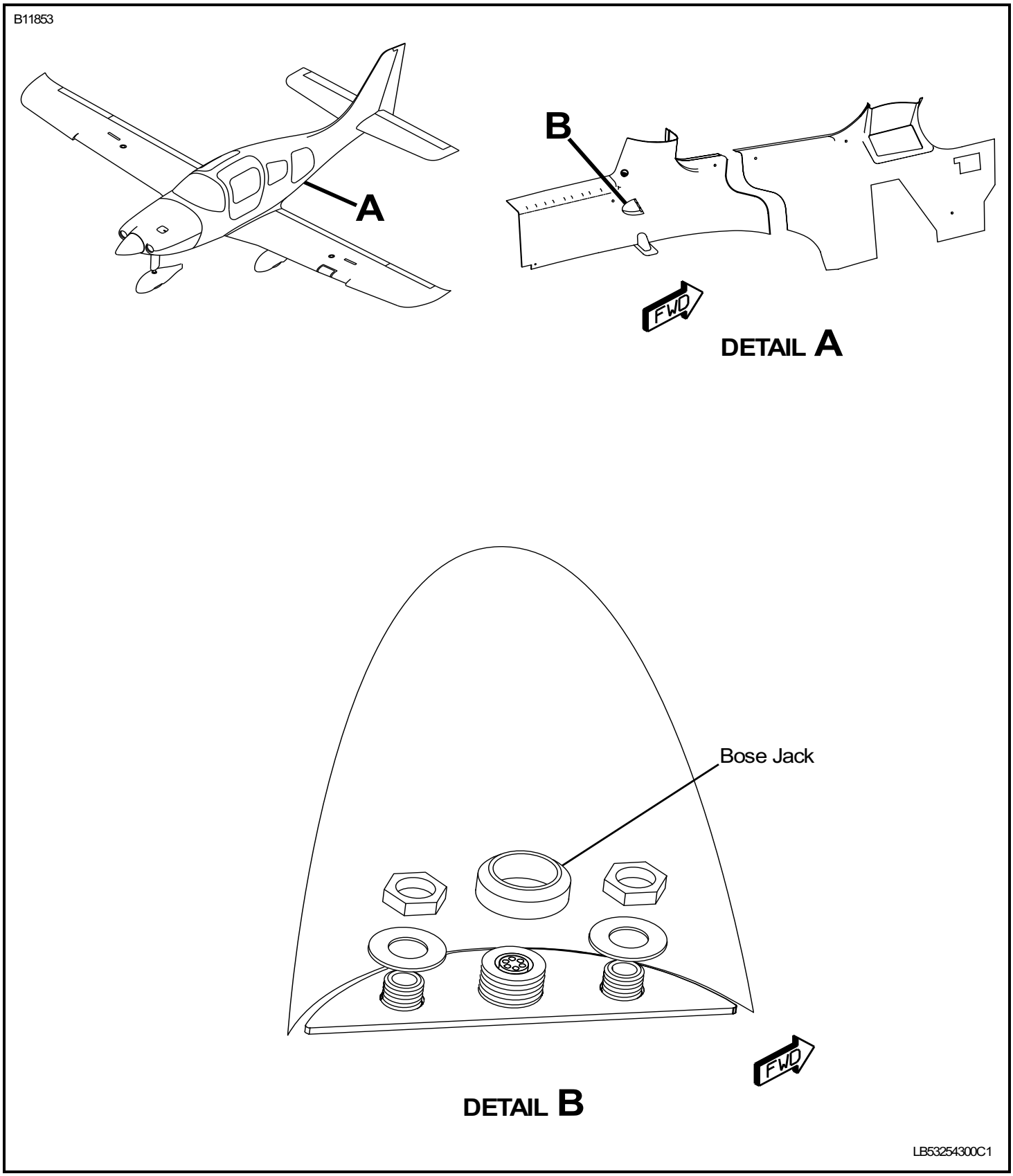
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Rear Seat Headphone Jack Receptacle



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Headphone/Microphone Jack Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STATIC DISCHARGE WICKS - MAINTENANCE PRACTICES

1. Static Discharge Wicks

A. **Detection of a Broken Static Wick** - To check the wick's integrity, hold the trailing edge between the thumb and forefinger, and gently move it left and right approximately 2 inches. If the unit flexes at point A, as shown in Figure 201, the wick is broken and should be replaced.

B. **Removal of Static Wick** (Refer to Section 20-70-00, Repair of Static Wicks, for repair details.)

(1) Unscrew the screw connecting the static wick to its housing.

(2) Remove the static wick from the housing.

CAUTION: When removing and handling a good static wick, do not bend it. The static wick can be broken without obvious exterior indications.

WARNING: If the wicks are removed and not reinstalled before flight, problems with navigation and communication equipment can occur.

NOTE: If the static wick does not slide out after removing the screw, use a pair of pliers and gently pull the static wick from its housing.

C. **Installation of Static Wick** (Refer to Section 20-70-00, Repair of Static Wicks, for repair details.)

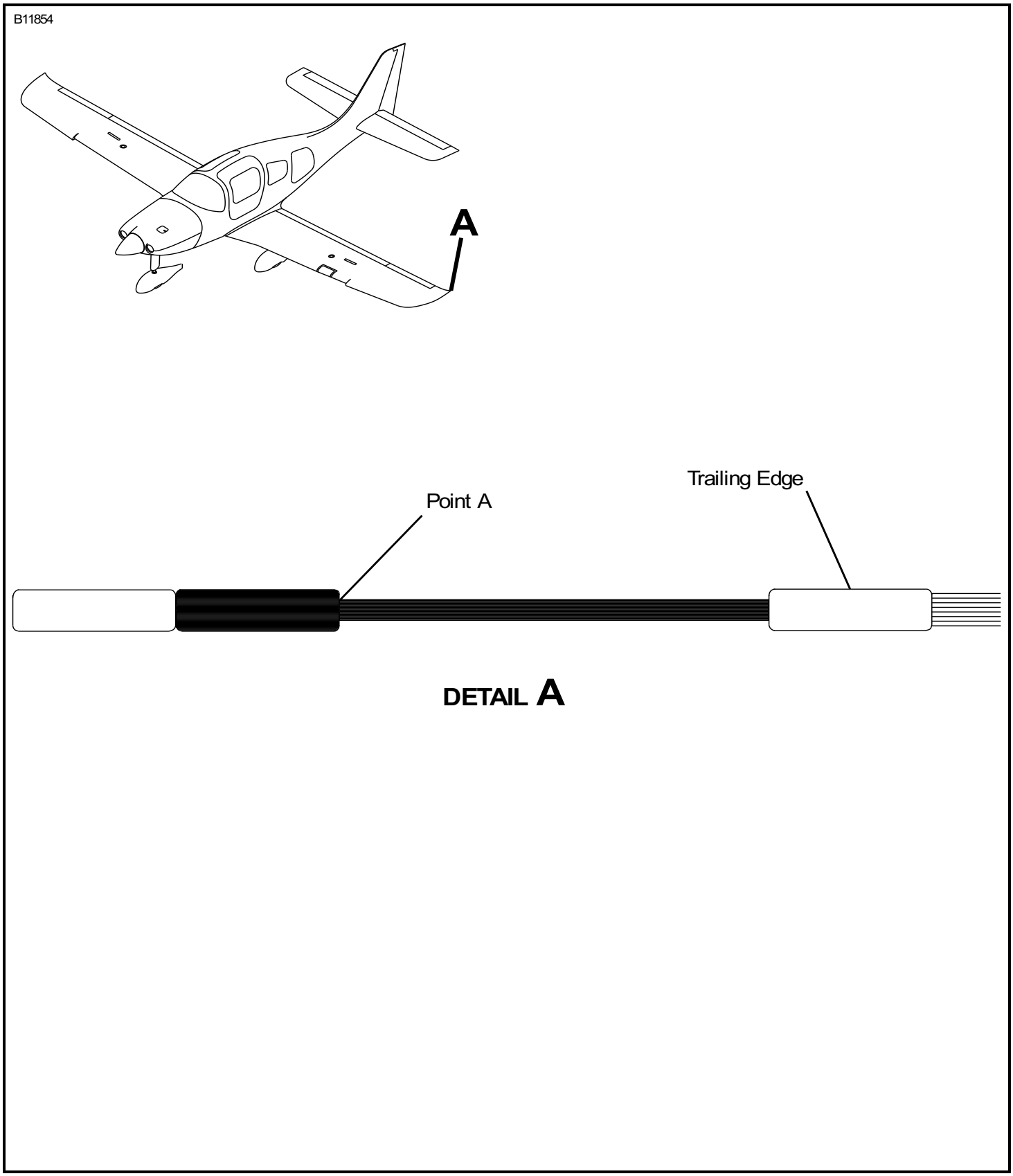
CAUTION: Before installing the static wick, perform the Detection of a Broken Static Wick test in this section. A static wick can be broken without any obvious exterior indications.

(1) To install a static wick place the wick in its housing.

(2) Screw the static wick and its housing together.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Static Wick



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ELECTRICAL POWER - GENERAL

1. Electrical System - General

A. **Electrical Power System** - The airplane electrical system is designed to operate at 14.2 volts. A functional diagram of the electrical system is shown in Figure 1.

(1) A 60-amp alternator (continuous rating) supplies power.

(2) Storage is maintained by a 25 amp-hour (at a 20-amp discharge rate), "maintenance free," sealed, lead-acid battery located in the engine compartment. The battery has a glass mat separator that suspends the electrolyte (sulfuric acid).

(3) The term "normal battery system" is used in this chapter to distinguish it from the standby battery system, which is discussed in the Standby Battery System section.

CAUTION: For extended service life, disconnect the battery to prevent it from being continuously charged by external power when the aircraft is in maintenance.

CAUTION: Do not replace the sealed lead acid battery with a wet lead acid battery.

CAUTION: Never "jump-start" an aircraft that has a "dead" or discharged battery. It takes approximately three hours to recharge a fully discharged battery with the aircraft generating system or external power.

(4) The voltage regulator is designed to maintain voltage to within ±0.4 volts of the normal voltage.

(5) There is an alternator switch in the cockpit area that disconnects the alternator and stops the excitation. A red "Alt Out" light in the annunciator panel illuminates should the alternator become inoperative. At 16 volts, an over-voltage control will stop excitation to the alternator.

(6) The airplane is equipped with a voltmeter that measures bus voltage and an ammeter that measures battery charge or discharge.

B. **Distribution Busses** - The system has four distribution busses: a primary bus, an avionics bus, a battery bus, and a standby bus. Power is supplied to the primary distribution bus when the system master switch is turned on and supplied to the avionics distribution bus when both the system master and avionics master switches are turned on. Items connected to the battery bus bypass the master switch and are powered directly from the battery. The standby bus is connected to a reserve battery and supplies essential power for emergency operations.

2. Standby Battery System – General

A. **Standby Battery System** - The standby battery switch is used in case of total electrical failure. When the standby battery system is activated, electrical power from a standby lithium battery pack is supplied to the turn coordinator, instrument flood bar lights, and wing flaps. Navigation and communications are provided by the UPS Apollo GX-60 Global Position System (GPS) and the 760-channel transceiver (an integrated function of the GPS) in airplanes equipped with the Standard IFR package. If the airplane is equipped with an HSI and flight director, communication and navigation is provided by the UPS Apollo SL-30 Nav/Comm, including power for the HSI. Once the standby system is activated, these items will operate for at least 30 minutes. There is no monitor light to indicate that the system is operating, only the restoration of partial electrical power. The standby battery is located behind the instrument panel on the copilot's side.

B. **Switch Guard** - The standby battery system is activated by breaking the copper wire on the switch guard located on the circuit breaker panel, raising the switch guard, and depressing the push-button switch. The switch contains a locking feature - when it is first engaged, the switch remains in the depressed position until pressed a second time. If the wire is inadvertently broken, replace with copper wire 26 AWG (0.016 inch diameter), and lock the guard over the switch through one hole on the side of the guard. Twist the copper wire at least five times to keep in place.

C. **Replacement** - The standby battery should only be used in case of a total electrical failure and under conditions that require standby power for the safe continuation of the flight. Once the standby system is activated and utilized, the battery pack must be replaced at the conclusion of the flight. In any event, the battery pack must be replaced every five years. The expiration date of the battery is located on the ID plate. Do not break the copper wire to test the system or for any other reason other than during an actual electrical failure. If an unexplained broken sealing wire is observed, inadvertent standby system activation is an important consideration, particularly if the switch is depressed. In either case, battery replacement is recommended.

CAUTION: Before any maintenance, removal, or installation of equipment is performed, make sure both the master and avionics switches are in the off position. Failure to do so could result in damage to these instruments.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

3. Troubleshooting Procedures for the Electrical System

A. **Symptom** - System does not charge or discharge showing on ammeter.

B. **Probable Cause** - Bad alternator, voltage regulator, system short, or the alternator current limiter is open.

C. **Action** - Charging system problems associated with the alternator should be analyzed in the manner of: Pre-Voltage Regulator Checks, Voltage Regulator Checks, and Post Voltage Regulator Checks.

D. **Pre-Voltage Regulator Checks** - Check the alternator switch, voltage regulator circuit breaker, wires, and terminals for contact resistance build-up. Resistance should be less than 0.1 ohms.

E. **Voltage Regulator Check** - Check that there is power coming into and going out of the voltage regulator. The fault/function indicator on the unit is designed to alert the user to the condition of the alternator/voltage regulator.

(1) A red light on the unit, with the master switch on means there is a ground short in the alternator field circuit or the voltage regulator's field control transistor is shorted.

(2) A green steady light on the unit with the engine running means there is power coming out of the voltage regulator, but the alternator field or field wire to the voltage regulator is open.

(3) A green fast flickering light on the unit with the engine running means power input devices (like circuit breaker, switch, etc.), and the field systems are functioning correctly.

(4) A green slow flickering light on the unit with the engine running means the power input devices (like switch, etc.) are defective or have higher than normal resistance.

(5) No light on the unit with the master switch on means that one power input device (like switch, circuit breaker, or wiring) or the voltage regulator is defective.

F. **Post-Voltage Regulator Checks**

(1) Check the alternator by measuring the resistance of the field. Resistance from field to ground on the alternator should be from 3.5 to 5.0 ohms. Check the resistance of the meter leads before measuring field.

(2) Check for "flying" short and other intermittent problems by slowly rotating the alternator while measuring the field resistance. A drop below 3.0 ohms could indicate a bad alternator that might damage the voltage regulator.

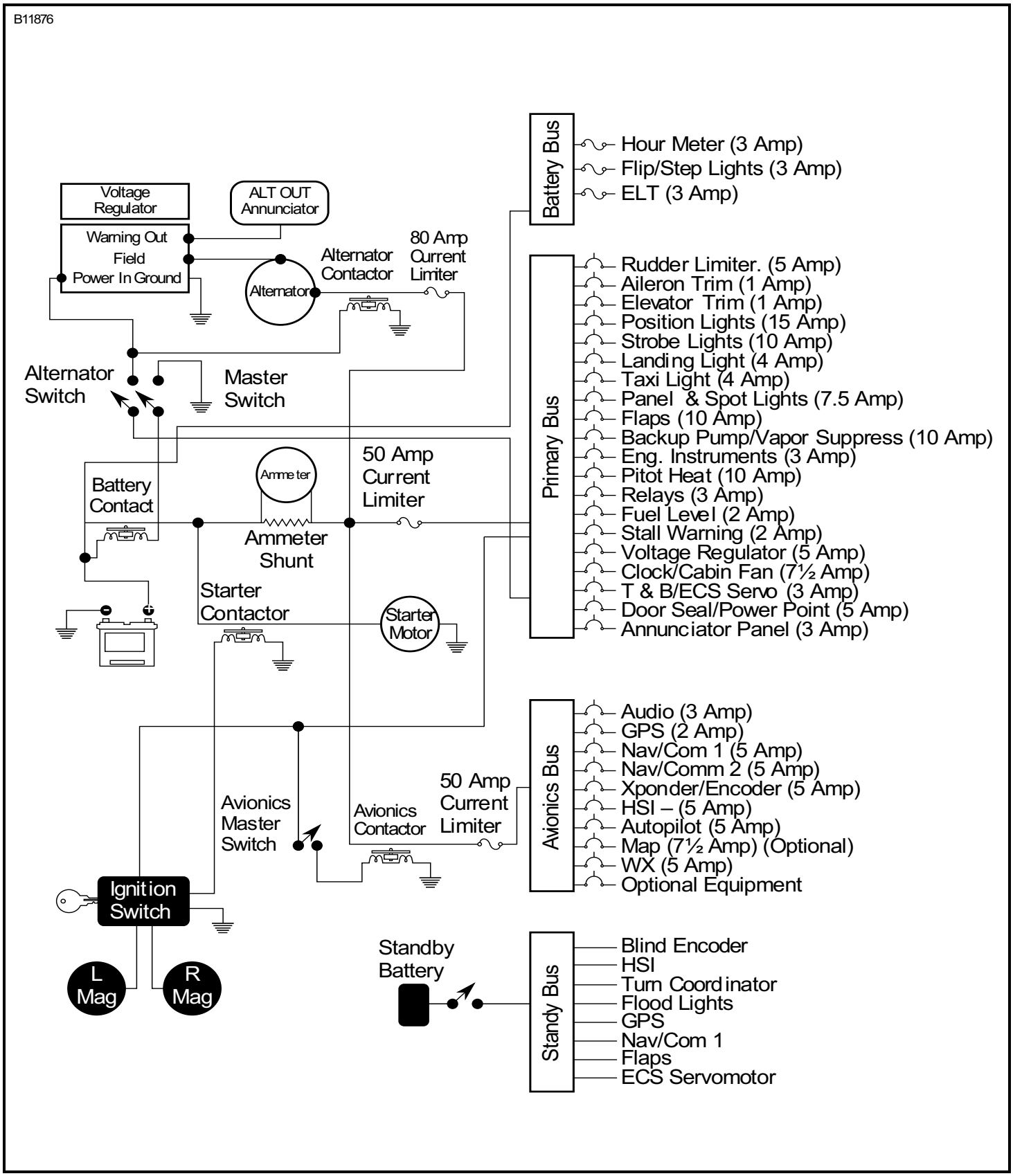
(3) Check the condition of the alternator’s field, terminals, and wires connecting it to the voltage regulator and the aircraft charging system.

(4) Check the battery relay for proper operation and connections.

(5) Check the alternator relay for proper operation and connections.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Electrical System



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

DC GENERATION - MAINTENANCE PRACTICES

1. DC Generation

A. **Alternator Removal** (Refer to Figure 201.)

(1) Disconnect the three connectors attached to the alternator.

(2) Remove the plain washer, lock washer, and nut from the four mounting studs.

(3) Discard the lock washers.

(4) Remove the alternator from the mounting studs.

(5) Remove the gasket from the mounting studs.

B. **Alternator Installation**

(1) Install a new gasket on the alternator.

(2) Install the alternator assembly on the mounting studs with four plain washers, four new lock washers, new gasket, and four plain nuts.

(3) Torque nuts 180 to 220 in.- lbs.

(4) Connect three connectors to the alternator.

C. **Maintenance Procedures for Alternator**

(1) The torque required to slip a new elastomer coupling must be a minimum of 180 in.-lbs. (15 ft.-lbs.) torque measured after 45 degrees of revolution at a rate of 1 to 2 degrees per second. If you can hand-turn the gear relative to the black housing, it is below the requirements, and the coupling assembly must be replaced. Refer to Figure 202.

(2) Slippage must occur at the outside diameter of the elastomer with no damage to the elastomer.

(3) On couplings that have been in service for more than 25 hours, slippage torque must not be less than 140 inch-lbs. (11.7 ft.-lbs.) torque. If you can hand-turn the gear relative to the black housing, it is below the requirements, and the drive hub assembly must be replaced. Refer to Figure 202.

2. DC Indicating Instruments

A. **Ammeter Description of Operation** - The ammeter is located in the engine instrument panel in the center, left position. The ammeter measures the condition of the battery in terms of charging or discharging. The range of the indications runs from +60 amps to -60 amps in 30-amp increments.

B. **Removal of Ammeter**

(1) Remove the engine instrument panel per instructions in Section 25-11-00, Engine Instrument Panel.

(2) Unplug the cable going into the back of the ammeter.

(3) Unscrew the four screws surrounding the ammeter.

C. **Installation of Ammeter**

(1) Put the ammeter in its slot, and screw it into the engine instrument panel.

(2) Plug the cable into the back of the ammeter.

(3) Install the engine panel per instructions in Section 25-11-00, Engine Instrument Panel.

D. **Voltmeter Description of Operation** - The voltmeter is located in the top left corner of the flight instrument panel. This instrument contains three separate indications: a voltage reading, an outside air temperature provided by the top window, and a multi function timepiece in the lower window. Refer to Section 31-00-00, Figure 1 for a drawing of the voltmeter.

E. **Removal of Voltmeter**

(1) Remove the glare shield, and remove the connector installed into the back of the unit.

(2) Unscrew the four screws surrounding the voltmeter, and remove it.

(3) Slide the unit out of the flight instrument panel.

F. **Installation of Voltmeter**

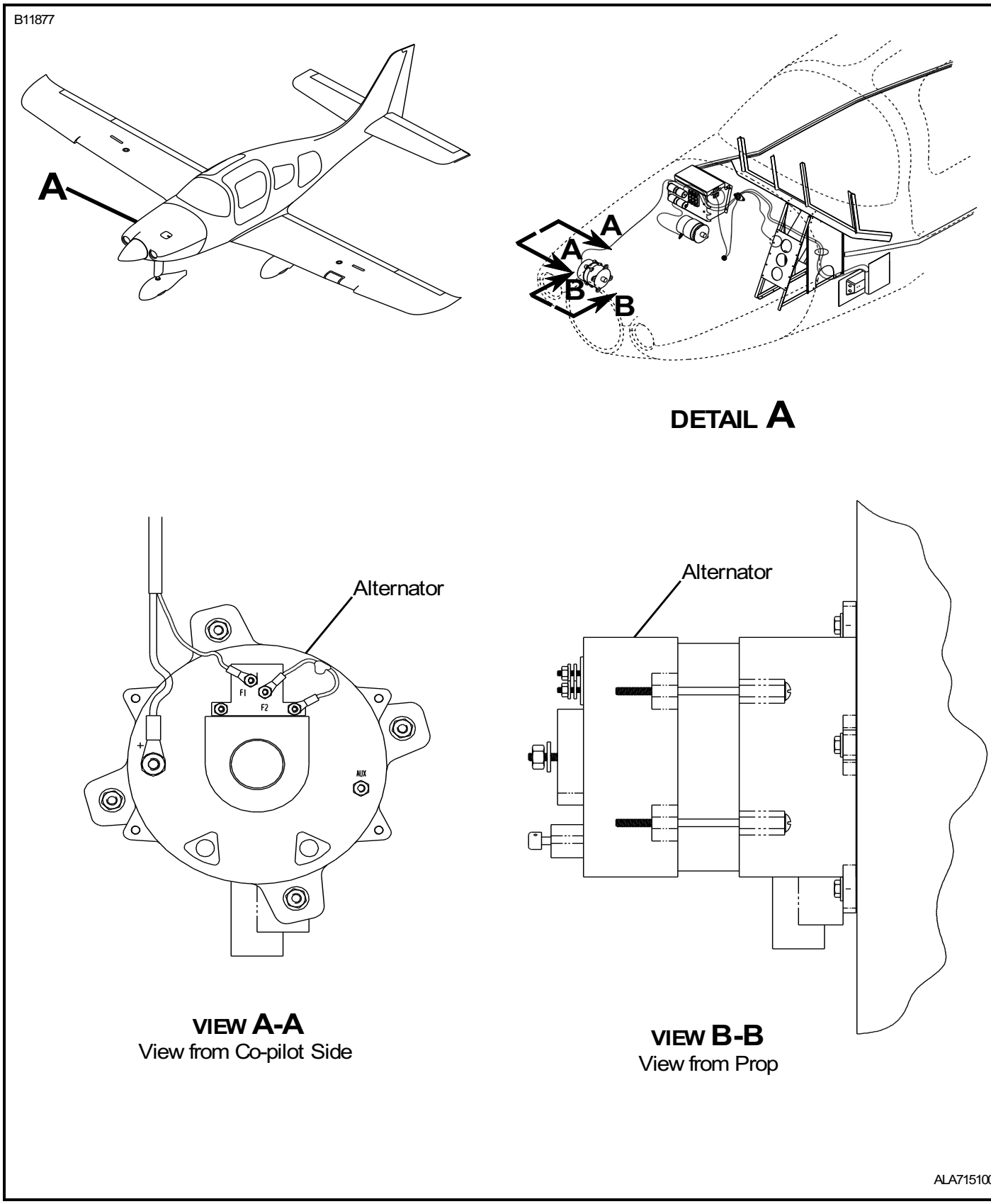
(1) Install the connector into the back of the voltmeter.

(2) Slide the unit into its slot in the flight instrument panel, and screw in the four screws.

(3) Install the glare shield.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

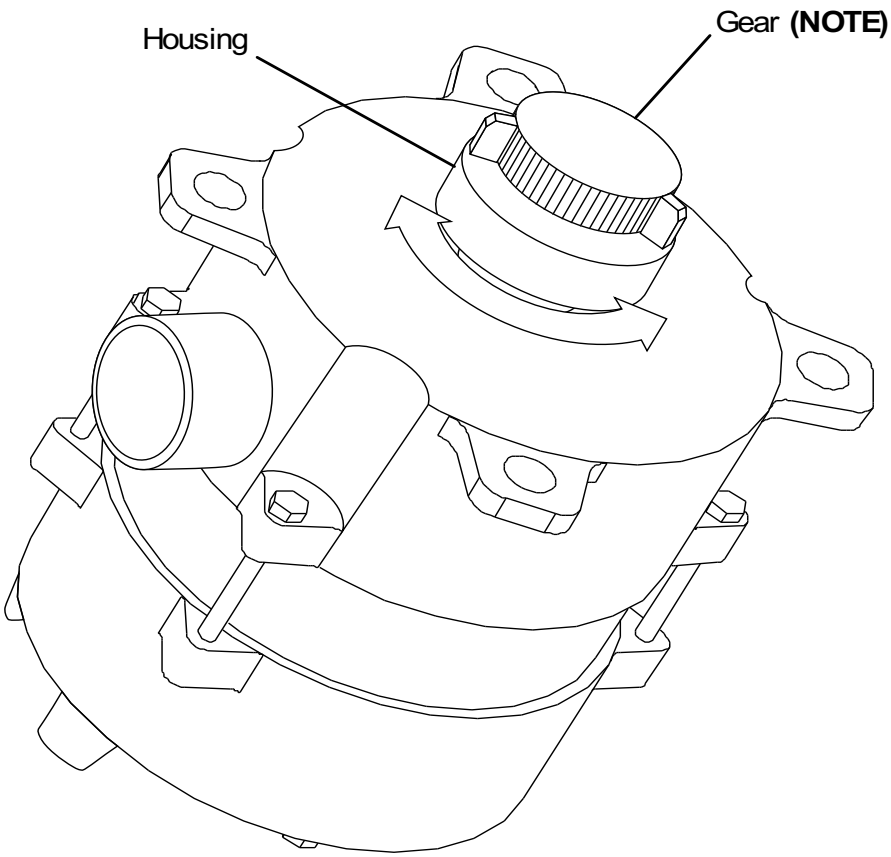
Figure 201 : Sheet 1 : Alternator



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Alternator Drive Hub

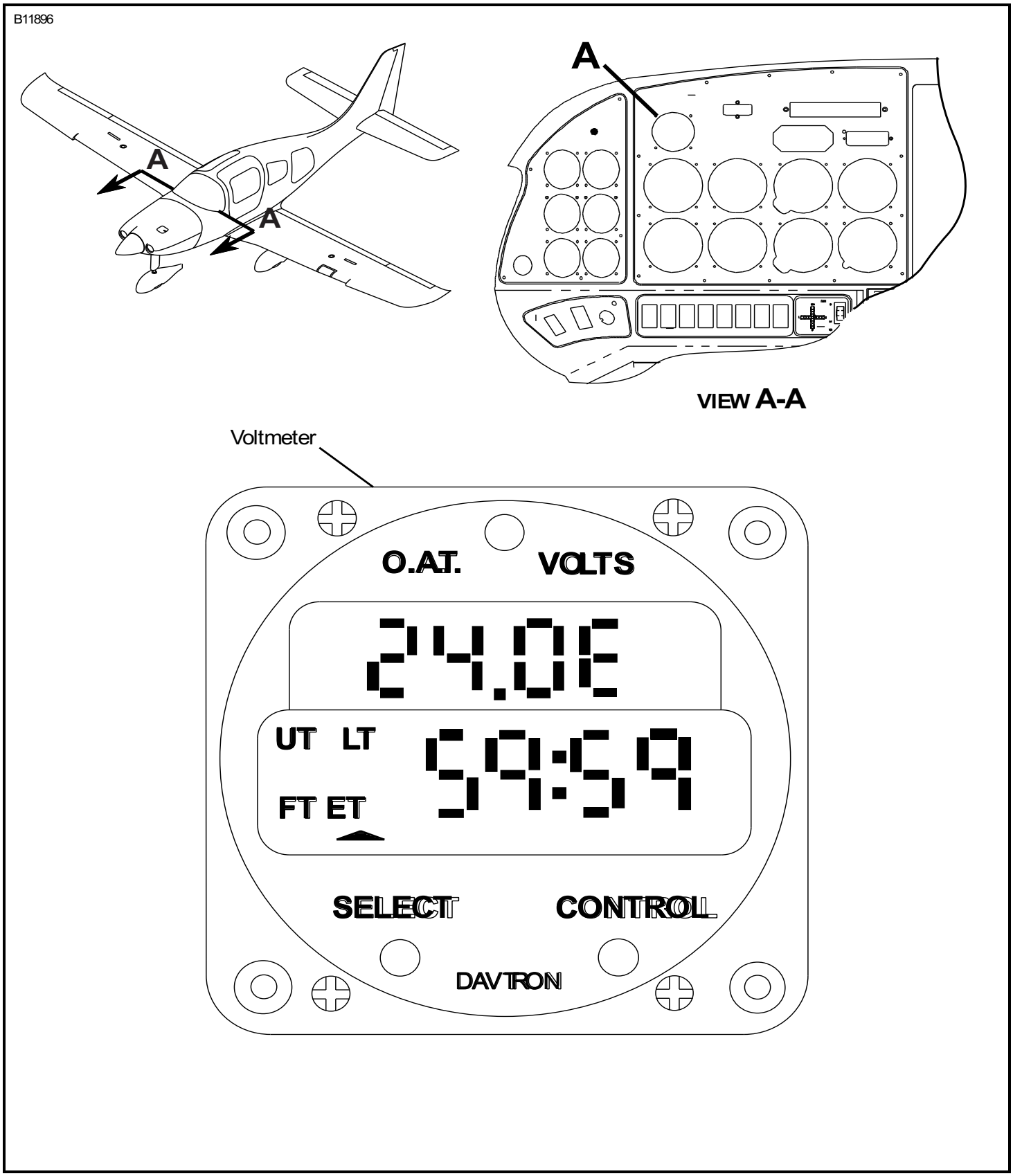
B11878



NOTE: Turn gear while holding housing .

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Voltmeter/OAT/Clock



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

BATTERY - MAINTENANCE PRACTICES

1. Normal Battery System

A. **Applicability** - This procedure is based on the Concorde™ RG-35A battery. Refer to battery manufacturer's instructions for batteries other than the one specified.

B. **Removing Battery** - Refer to Figure 201.

CAUTION: To reduce the chance of personal injury and possible equipment damage, remove the negative wire before removing the positive wire.

(1) Remove the two screws connecting the battery cover plate to the battery housing.

(2) Disconnect the two connectors.

(3) Remove the battery.

C. **Installing Battery**

(1) Place the battery in the battery housing.

WARNING: Failure to reconnect the battery connectors properly could result in reversing the polarity of the battery. Battery terminals face forward when properly installed.

(2) Reconnect the two connectors to the battery as shown in Figure 202.

(3) Install the battery cover plate over the battery, and install two screws.

CAUTION: Do not replace the sealed lead acid battery with a wet lead acid battery.

D. **Test Procedure for Reserve or Emergency Capacity**

(1) Make sure the battery is charged.

(2) With the battery temperature above 59° F, discharge the battery at the 80-85 percent test rate. Refer to FAR 23.1309, 23.1351, and 23.1353(h).

(3) The minimum end point after one hour of the time established for the airframe essential power requirement of discharge must be 9 volts. If the battery fails to deliver the above rated ampere-hour capacity, it has reached its end of life. The battery is no longer considered airworthy and must be replaced.

(4) Allow the battery to cool to room temperature before recharging.

E. **Maintenance Procedures for Battery**

(1) The battery must be boost charged every 90 days when in storage.

(2) Batteries that have not been recharged every 90 days are to be conditioned. First discharge the battery at the test rate. Recharge with a constant current charge at the C/10 rate (1/10 of the C rate amperes) for eighteen hours or until the battery voltage reaches 2.5 volts per cell. Allow the battery to rest for at least one hour and re-test per the Test Procedure section above.

(3) The battery should be recharged when the open circuit voltage is below 2.08 volts per cell.

(4) The battery should be recharged at 1/2 of the C rate with a constant potential (CP) or constant voltage charger regulated at 2.35 volts per cell. The battery is charged when the charge current stabilizes for one hour.

(5) It is recommended the emergency capacity test procedure be performed after twelve months or six hundred hours of operation, whichever comes first. To ensure continued airworthiness, another emergency capacity test should be performed every twelve months or every two hundred hours.

2. Standby Battery System

A. **Removing Standby Battery**

(1) Be sure that checking the push button switch on the circuit breaker panel does not activate the standby battery. If the switch is depressed, then the standby battery has been activated, and the switch must be pushed again to deactivate it.

(2) To access the standby battery, remove the three screws connecting the glare shield to the center console and the four screws holding the right kidney panel to the center console.

(3) Unplug the connector attached to the battery wire. Refer to Figure 203.

(4) Unscrew the two straps holding the battery in place.

(5) Remove the battery.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

B. **Installing Standby Battery**

(1) Put the standby battery in its slot.

(2) Connect the two straps that hold the battery in place.

(3) Screw the straps closed. Refer to Figure 203.

(4) Plug in the connector for the standby battery.

(5) Reinstall the glare shield by installing the three screws. Reinstall the right kidney panel by installing the four screws.

C. **Maintenance Procedures for Standby Battery**

(1) Once the standby system is activated and has been used the battery pack must be replaced at the conclusion of the flight. In any event, the battery pack must be replaced every five years. The expiration date of the battery is located on the ID tag.

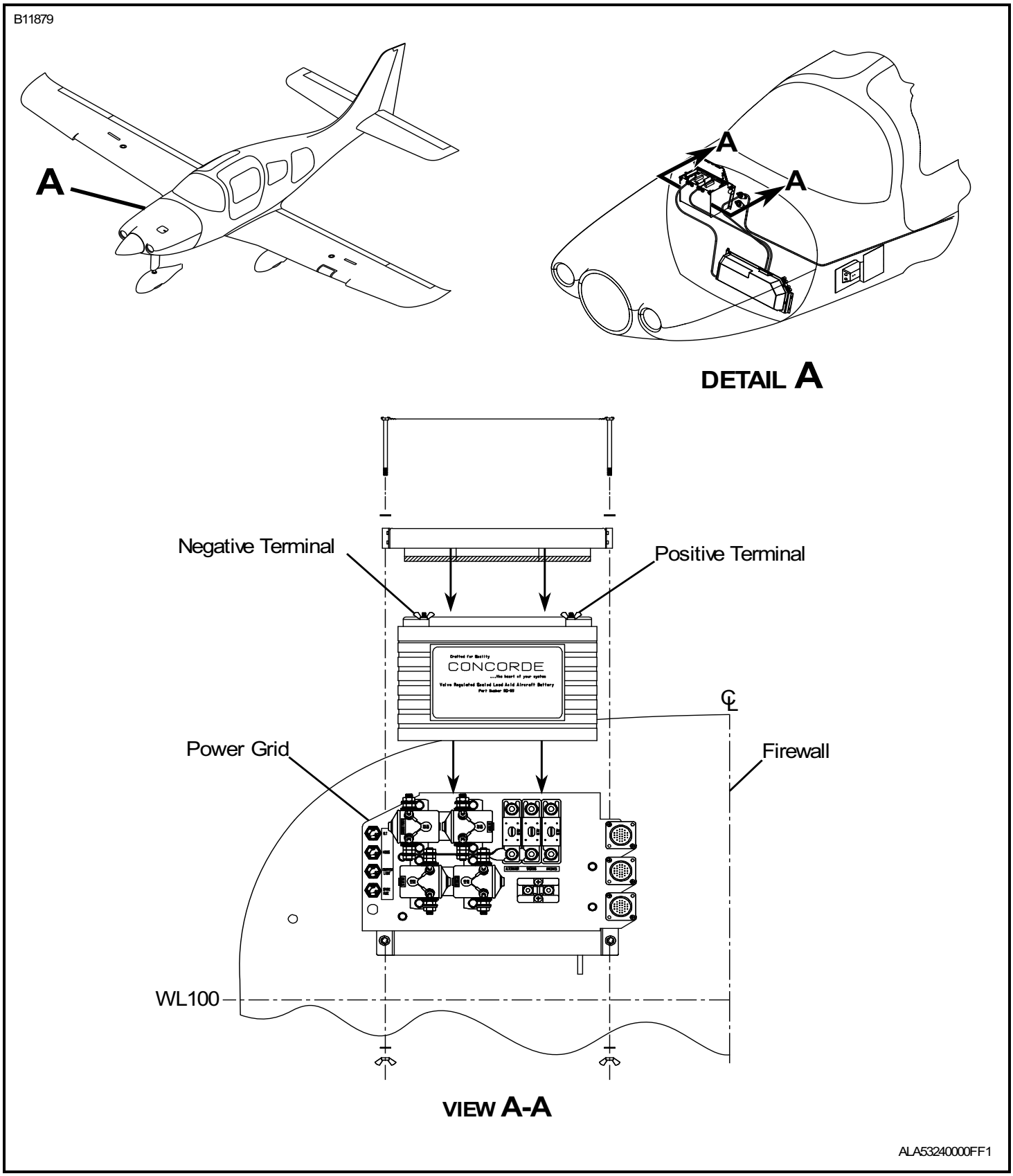
D. **Equipment Operated by the Standby Battery** - Table 201 lists the equipment operated by the standby battery for both the standard and premium IFR packages.

Table 201. Equipment Operated by Standby Battery

Item	Standard IFR Package	Premium IFR Package
HSI		X
Turn Coordinator	X	X
Flood Bar	X	X
GPS/Comm	X	
GPS		X
Nav/Comm No. 1		X
Flaps (and indicator)	X	X
ECS Servo Motor	X	X
Altitude Encoder	X	X
GPS Annunciator	X	X

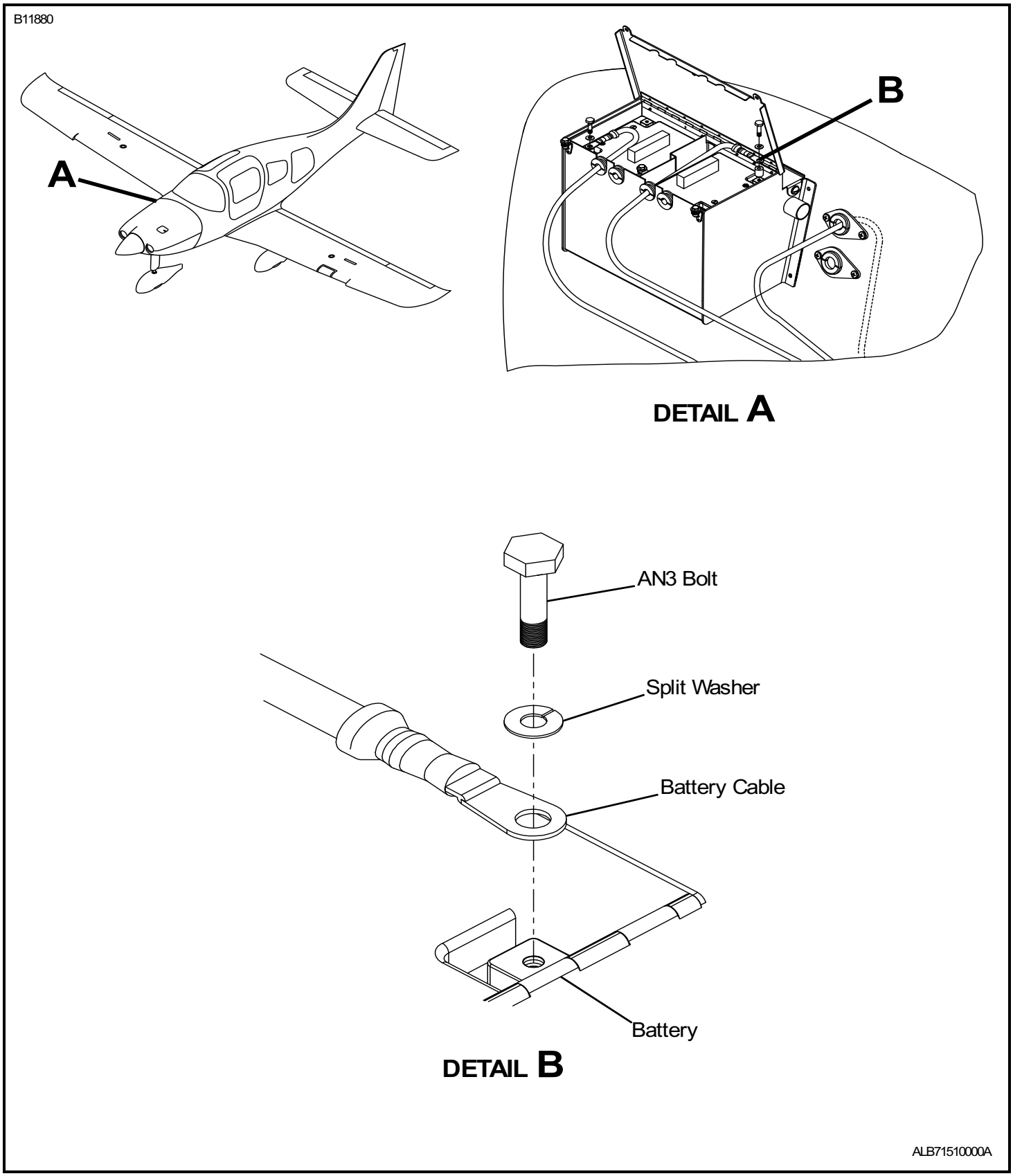
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Battery Installation



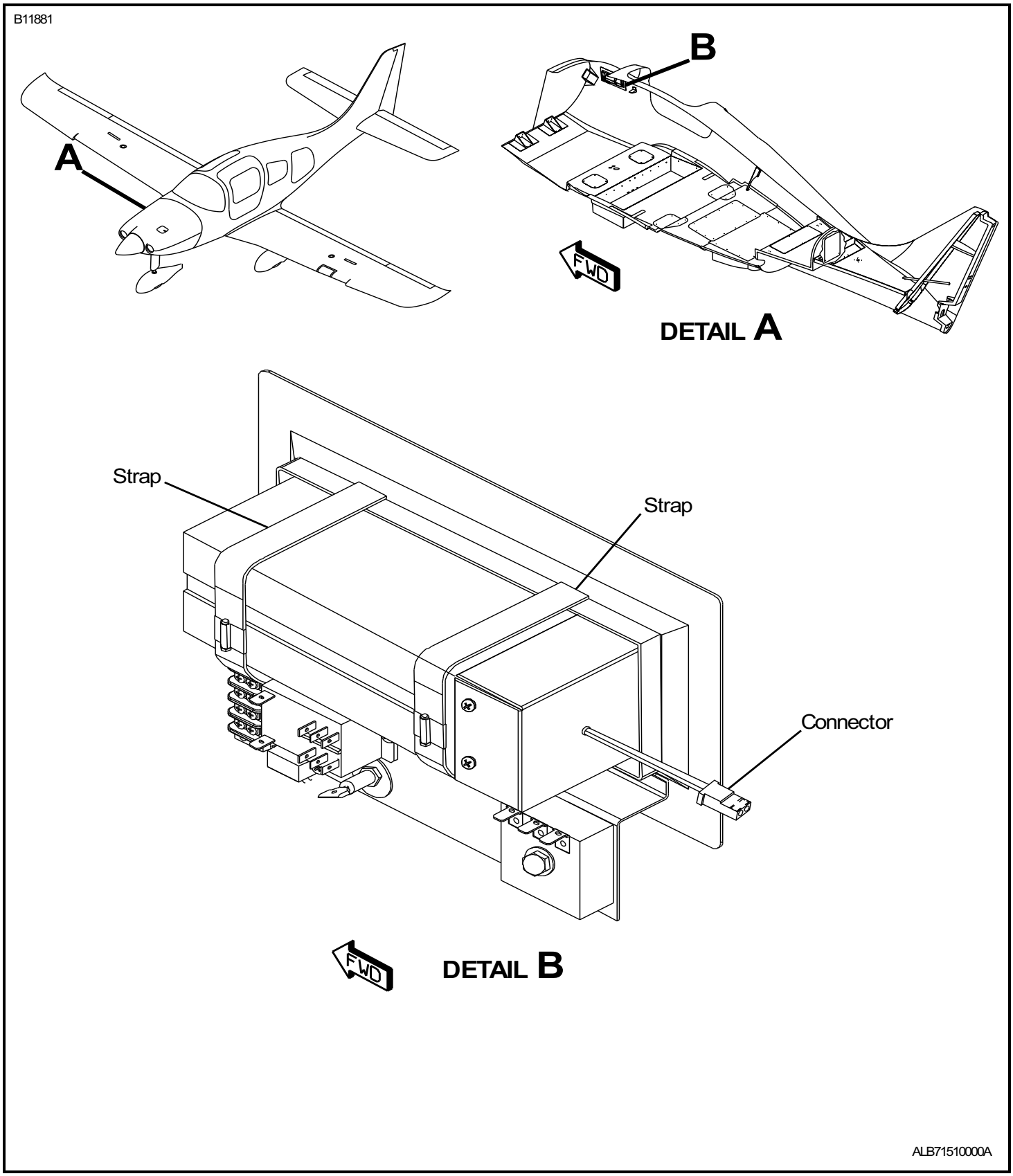
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Battery Cable Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Standby Battery Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

GROUND POWER - MAINTENANCE PRACTICES

1. Ground Power Plug

A. Removal and Replacement of the Ground Plug Relay

(1) Remove the cover from the power grid by removing the two 8-32 pan head screws and washers. Refer to Section 24-35-00, Figure 201.

(2) Verify that the aircraft power is off.

(3) Remove the large power cables and mark the location.

(4) Remove the relay.

(5) Install a new transorb (surge suppressor) on the new relay.

(6) Move the reverse current diode to the new relay.

(7) Reassemble in the reverse order.

B. Removal of the Power Plug Receptacle

(1) Turn the aircraft master switch on and fully extend the flaps.

(2) Turn the aircraft master switch off and placard "Do Not Turn On Power".

(3) Remove the four 8-32 screws attaching the step cover, and remove the cover.

(4) Remove two 1/4-28 screws, washers, and self-locking nuts attaching the receptacle. Refer to Figure 201.

(5) Pull the power plug receptacle down to gain access to the solder joint.

(6) Un-solder with a propane torch adjusted to low.

(7) Re-solder a new plug, and slide the boot over the solder joint.

(8) Reassemble in reverse order. Torque attachment screws 140 to 180 in.-lbs.

C. Ground Power Plug Troubleshooting

(1) If the ground power plug relay will not engage:

(a) The reverse current diode mounted on the relay may be open or have loose connections. Replace the relay or tighten the connections.

(b) The transorb (surge suppressor) is shorted. Replace transorb.

(c) Ground at the power plug or at the engine block is disconnected or loose. Reconnect or tighten the ground.

(d) Contamination in the ground power plug does not allow the connector to go in all the way. Replace plug.

(e) Ground power relay windings are open. Replace relay.

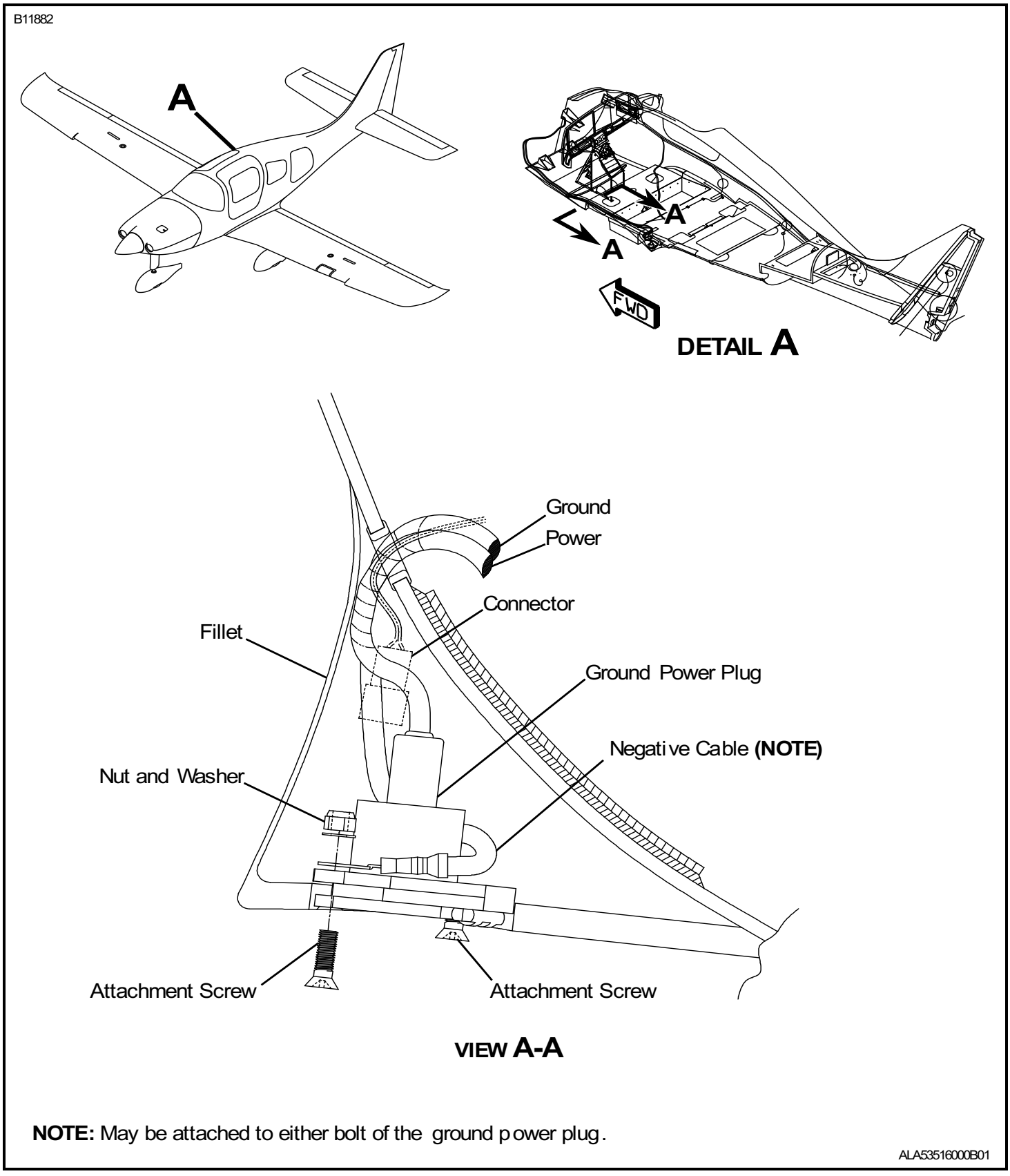
(2) Ground power relay will not disengage:

(a) Relay contacts are welded together internally. Replace relay.

(b) BATT switch is turned on. Turn off BATT switch.

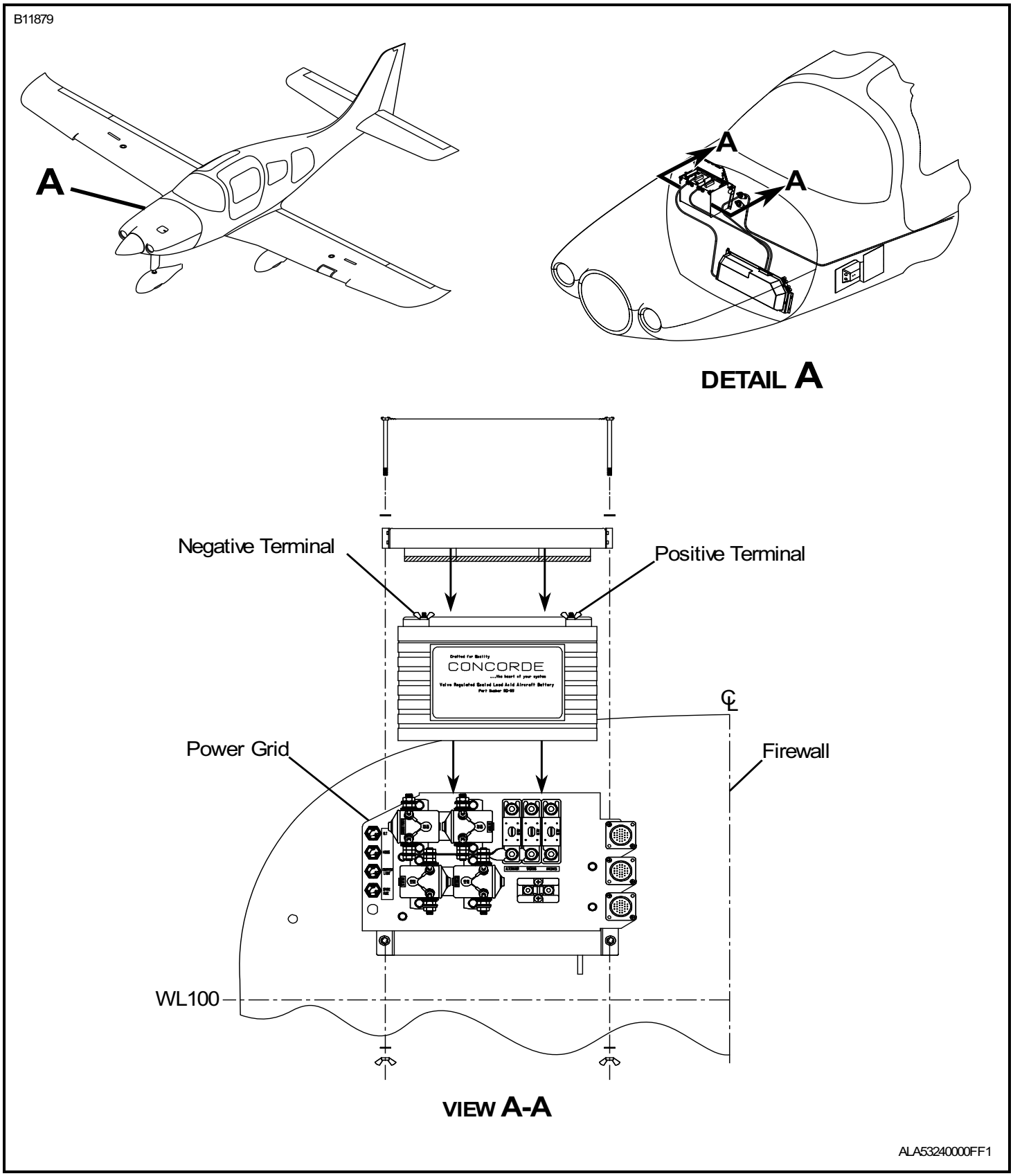
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Ground Power Plug Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Battery Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ELECTRICAL LOAD DISTRIBUTION - MAINTENANCE PRACTICES

1. Electrical Load Distribution

A. Removal of Voltage Regulator

(1) The voltage regulator is attached to a metal plate connected to the inside firewall on the copilot's side. To access the voltage regulator, remove the glare shield.

(2) Unhook the wires connected to the voltage regulator.

(3) Remove the bolt above the voltage regulator, and remove the voltage regulator from its mounting. Refer to Figure 201.

B. Installation of Voltage Regulator

(1) Place the voltage regulator in its mounting.

(2) Screw in three bolts to mount the voltage regulator.

(3) Reconnect the wires to the voltage regulator.

C. Removal of Rocker and Master Switch Panels

(1) Steps for the removal of the rocker and master switch panels can be found in Section 25-11-00.

D. Installation of Rocker and Master Switch Panels

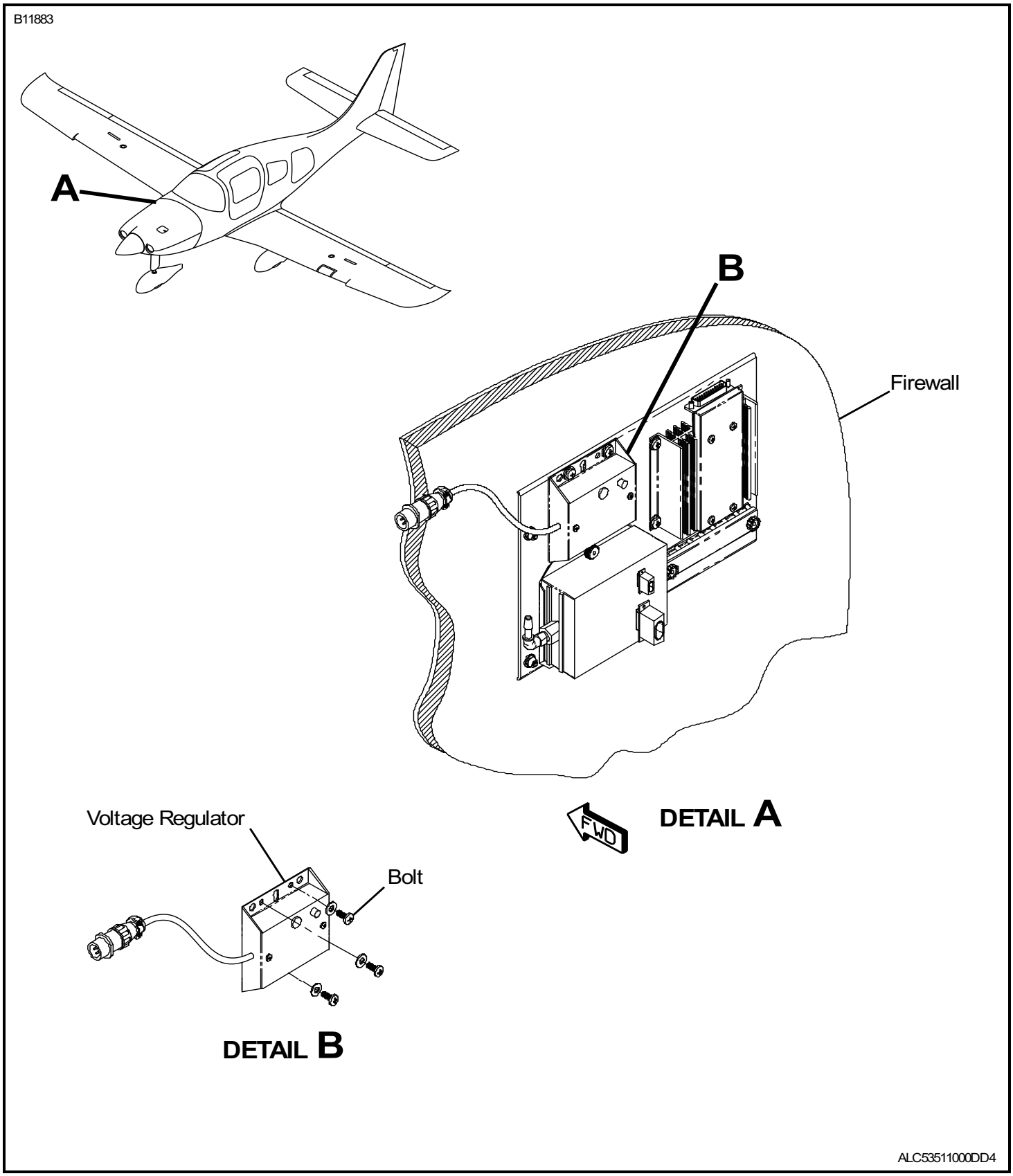
(1) Steps for the installation of the rocker and master switch panels can be found in Section 25-11-00.

2. Circuit Breaker Panel

A. Steps for the removal and installation of the circuit breaker panel can be found in Section 25-11-00, Circuit Breaker Panel.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Voltage Regulator Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

EQUIPMENT AND FURNISHINGS - GENERAL

1. General

A. **Front Seats** - Two individual, adjustable, tubular frame seats provide the front seating for the pilot and passenger. The base of the tubular seat frame is covered with sheet aluminum, and the seat cushions are attached to the aluminum through a series of Velcro strips. The seat backs on the front seats fold forward to permit access to the aft seating area. The seat cushions and seat backs are foam filled and covered with natural leather and ultra-leather. For added protection, both the front and rear seats incorporate a special rigid, energy absorbing foam near the bottom of the cushion. The cushion is designed for the loads applied by a seated passenger, and it is possible to damage the seat if concentrated loads are applied. Care must be taken to avoid stepping on the seats or placing heavy objects on the seat. Care and maintenance of the seats is discussed in Section 12-30-00, Interior Cleaning and Care. The front seats are adjustable fore and aft through a range of approximately 7 inches The adjustment control for the front seats is located below the seat cushion on the left side. To adjust the position of either seat, move the control lever towards the middle until the seat unlocks from the seat track, and adjust the seat to the desired position.

WARNING: Seat cushions are designed to crush to absorb loads in a crash situation. In the event of any incident or accident with a downward force component that results in damage to the aircraft, the seat cushions should be replaced.

B. **Rear Seats** - The rear seats are a split bench-type design and are nonadjustable. The bench seat frame is composite construction and bolted to the interior of the fuselage. The foam-filled seat and seat back cushions are covered with natural leather and ultra-leather and attached to the seat bench with Velcro fasteners. There are two non-locking headrests inserted into the top of the seat back. The headrest can be removed by grasping it on each side and pushing up.

C. **Seat Belts and Shoulder Harnesses** - The seat belts and shoulder harnesses are an integrated three-point restraint type of design. With this type of restraint, the lap belt and diagonal harness are one continuous piece of belt webbing. The webbing is anchored on each side of the seat for the lap belt restraint and then on the side of the fuselage for the harness restraint.

D. **Interior Panels** - Most of the interior panels are covered with ultra-leather and are secured with screws, PEM (Penn Engineering & Manufacturing) studs, Shuler clips, Velcro, or standard clips. When all the fasteners are removed, care must be taken when removing the panel so as not to damage the finish. Care and maintenance of the panels is discussed in Section 12-30-00, Interior Cleaning and Care. The panels are classified according to their location, i.e., forward, middle, aft, center, upper, lower, etc. The following is a brief discussion of each panel and the accompanying abbreviation. Refer to Figure 1.

(1) **Forward and Aft Center Overhead Light Panel (FCOLP and ACOLP)** - This panel is located in the center portion of the main cabin area and contains the electrical lights and speaker.

(2) **Forward Overhead Side Panels Left and Right (FOSPL and FOSPR)** - The forward panels to the left and right of the COLP are referred to as the left and right overhead side panels.

(3) **Aft Overhead Side Panels Left and Right (AOSPL and AOSPR)** - These side panels are just aft of the FOSPL and FOSPR.

(4) **Forward Lower Side Panels Left and Right (FLSPL and FLSPR)** - These panels are located on the left and right side of the airplane and cover each side of the airplane from about the rudder pedals aft to a location near the backrests of the front seats.

(5) **Middle Lower Side Panels Left and Right (MLSPL and MLSPR)** - These panels are located on each side of the airplane, between the front and rear seatbacks.

(6) **Baggage Lower Side Panels Left and Right (BLSPL and BLSPR)** - These panels are located on the left and right side of the baggage compartment, near the floor, and are also referred to as the left and right push-pull tube channel covers.

E. **Engine, Flight Instrument, and Electrical Panels** - The flight instrument panel is located directly in front of the pilot, and the engine instrument panel is to the left of the flight instrument panel, and is canted at about 30 degrees. On the right side of the airplane there is a kidney panel located in an approximate mirrored location in relation to the engine instrument panel. Below the instrument panel are a series of electrical panels, which contain the master switch, rocker switch, trim, flap, and ECS panels. Below the electrical panels are the left and right knee bolsters. Above the instrument panels is the glare shield. Figure 2 shows the location of each panel.

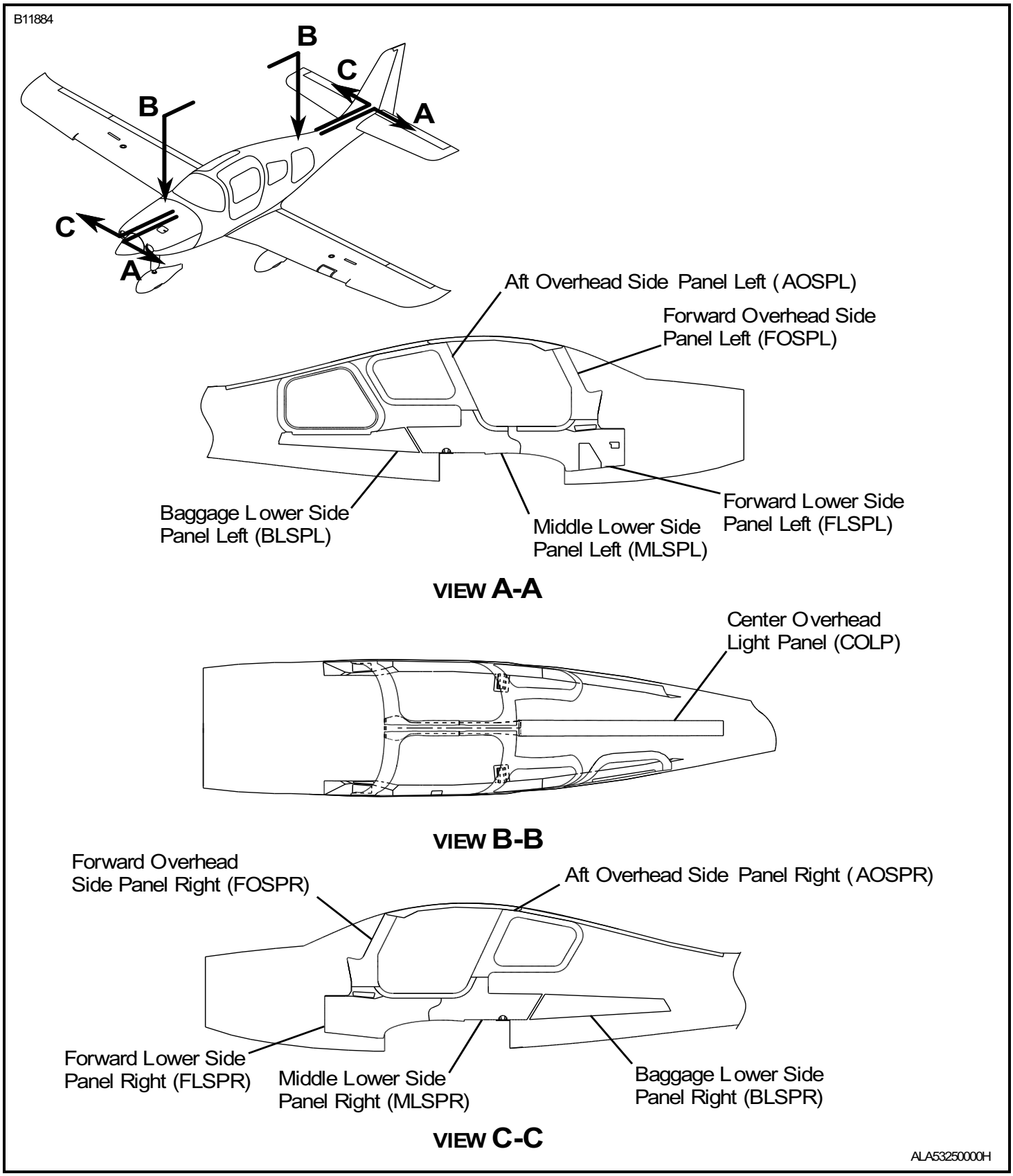
2. General Maintenance

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

A. Performing maintenance on the various components and systems in the airplane will frequently involve the removal of interior panels. Special tools are not needed. Most work can be performed with screw drivers, wrenches, sockets, torque wrenches, and adapters. When using an adapter on a torque wrench, follow the formula in Section 20-05-00 to avoid over-torquing.

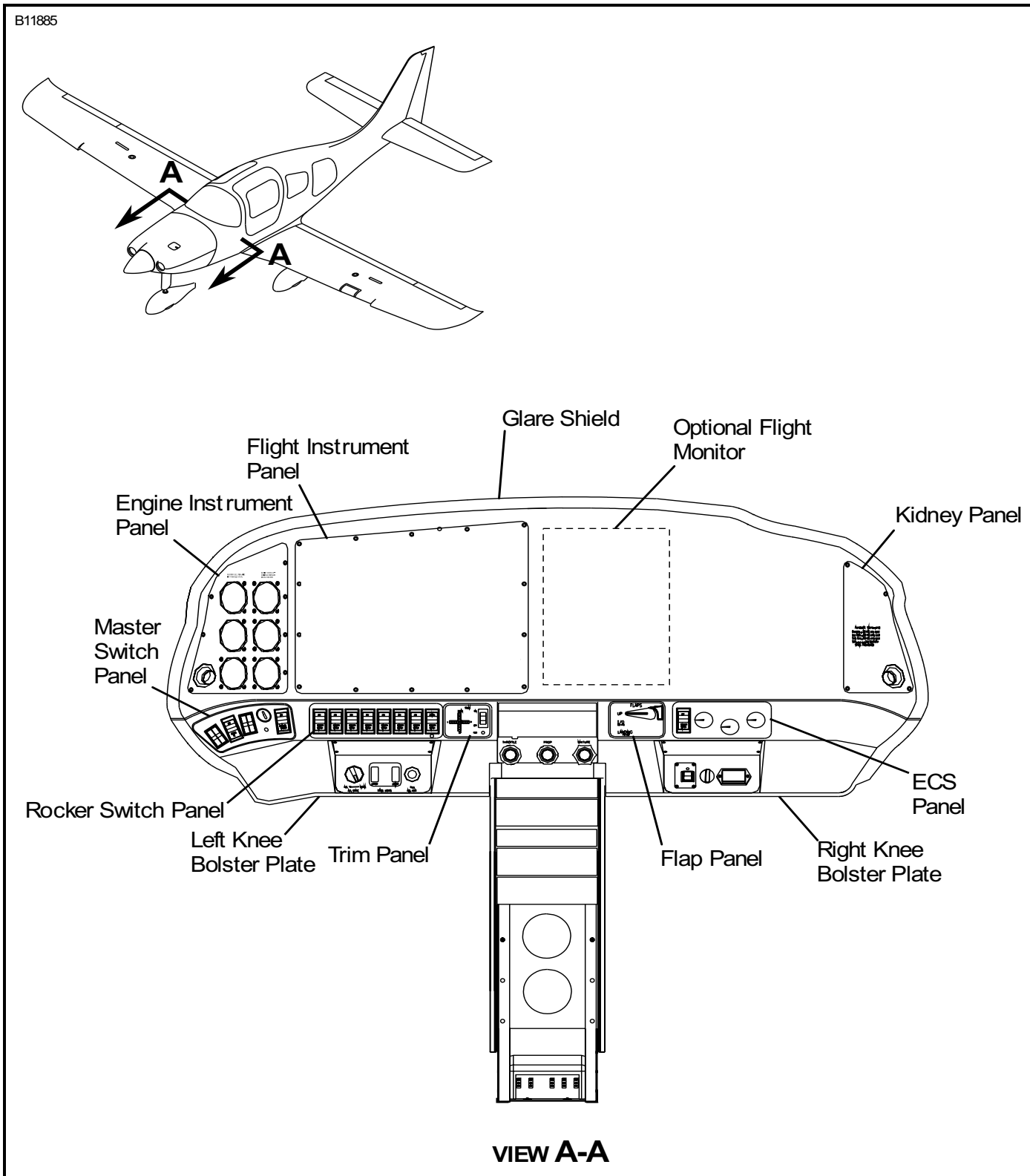
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Interior Panel Locations



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Panel Location



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

AIRPLANE SEATS - MAINTENANCE PRACTICES

1. Removal, Installation, and Adjustment of the Front Seats

A. **Removal of the Front Seats** - The front seat cushions and seatbacks are interchangeable, i.e., the cushions or seatbacks are identical on the pilot's and copilot's side. The following procedure is used to remove the front seats. Refer to Figure 201.

(1) **Cushion** - The front seat bottom cushions are attached to the seat pan with Velcro and are removed by grasping the cushion near its forward base and pulling up on it.

(2) **Seatback** - Removal of the front seatback is accomplished by removing the cotter pin and washer on each side of the seat pan. The clevis pin is captured inside the seat pan and cannot be removed, however, it can be rotated. Use the following steps for removal of the seatback:

(a) Move the seat to the forward position. This is necessary to access the outboard cotter pins.

(b) Remove the left and right cotter pins from their clevises.

(c) Simultaneously, apply an outward pressure (away from the seat pan) on each seatback attachment bracket until the hole in each bracket is free of the clevis.

(d) When each bracket's holes are free from their clevis, gently pull up on the seatback until both brackets are clear of the clevis pins.

NOTE: Once a cotter pin is removed, it must be discarded. Do not reuse a cotter pin on the seat mechanism or on any other part in the airplane.

(3) **Seat Pan** - The seat pan is removed using the following steps.

(a) For S/N 40004 to 40051

1 With the seat cushion removed and the seat in the full forward position, remove the front, left and right 10-32 bolts (10-32 screws may be used on aircraft S/N 40040 to 40051). The self-locking nut under the seat pan is accessible with a box wrench.

2 With the seat in the full aft position, remove the back, left and right 10-32 bolts (or screws).

3 Once all four bolts are removed, the seat can be lifted off the slide rails.

(b) For S/N 40052 and On

1 Slide the seat fully back, and remove the two socket head screws holding the rails to the cabin floor.

2 Slide the seat fully forward, and remove the two socket head screws by inserting an Allen wrench through each of two small holes in the seat pan.

(4) **Alternate Seatback Removal Technique** - It is also permissible to remove the seatback by first removing the four bolts on the seat pan and then removing the seat assembly from the airplane. When the seatback is attached to the seat pan, it is a bit more awkward to maneuver, and care must be take not to damage the interior. However, access to the outboard cotter pins is facilitated.

(5) **Adjusting the Seatback** - The tilt of the seatbacks can be adjusted fore and aft, depending on the position of two course-threaded 3/8-inch bolts located in the aft portion of the seat pan. The bolts are held in place by two jam nuts. To adjust the seat, use the following procedure:

(a) Remove the seat cushion, and move the seatback to the full forward position.

CAUTION: When the seat cushions are installed, they limit the forward travel of the seatback. However, with the cushion removed, the seatback will fold forward until its headrest touches the instrument panel or glare shield. When moving the seatback with the seat cushion removed, hold on to the seatback until it is touching the instrument panel. Do not move the seatback past its center of balance and then release it, because this can cause damage to the seat, glare shield, flight instruments, or flight instrument panel. In addition, when the seatback is resting on the instrument panel or glare shield, ensure no additional pressures are applied to the seatback.

(b) Loosen both jam nuts enough to allow for the anticipated adjustment.

(c) Raise or lower both course-threaded 3/8 inch bolts, depending on whether the seatback is to be adjusted fore or aft. Ensure that the bolts on each side are adjusted an equal number of turns.

WARNING: There is a limitation on the forward tilt of the seat. When adjusting the tilt of the seatback,

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

at least 6-1/2 threads of the course-threaded 3/8 inch bolts must be inserted into the seat pan.

(d) At this point the seat cushion can be installed, and the person for whom the adjustment is being made can test the position of the seatback.

(e) When the seatback is in the desired position, tighten the jam nuts against the base of the seat pan and torque 72 to 84 in.-lbs.

B. **Installation of the Front Seats** - Installation of the front seats and their related parts is performed by reversing steps 1 and 4 of the Front Seat Removal section. During the installation process, remember the following points:

(1) The seatback attachment brackets must be temporarily flexed outward (widened slightly) by applying an outward pressure as they are slipped on to the clevis.

(2) There are four washers for each seatback, two for each seatback attachment bracket. The washers should be positioned on each side of the bracket. To make the bracket sandwich, use the following steps.

(a) Insert one washer over each clevis.

(b) Install the seatback.

(c) Install the second washer over each clevis.

(d) Install the cotter pin.

(e) The bolt on the seat pan should be torqued 30 to 36 in.-lbs.

C. **Seat Slide Rails** - The slide rails, under normal conditions, should last for many years, and the likelihood of replacement is remote. Moreover, access to the removal hardware is difficult and requires significant disassembly. If problems do occur with the slide rails that necessitate removal, contact the manufacturer for specific instructions.

2. Removal and Installation of the Rear Seats and Crossbar

A. **Removal of the Rear Seats and Crossbar** - The rear seat cushions are not interchangeable because of the outboard cutout in each seat. Technically, the rear seatbacks are interchangeable; however, the holes for the quick-release pins may not match perfectly from left to right, and it is recommended that the location of each seatback be tagged before removal. To remove the seats, use the following steps. Refer to Figure 202.

(1) The rear seat bottom cushions are attached to the composite seat bench with Velcro and are removed by grasping the cushion near its forward base and pulling up.

(2) Remove the four quick-release pins from the seatbacks.

(3) Pull the seat forward until the seatback pin bracket is clear of the crossbar, and lift the seatback out of the composite sockets in the floor.

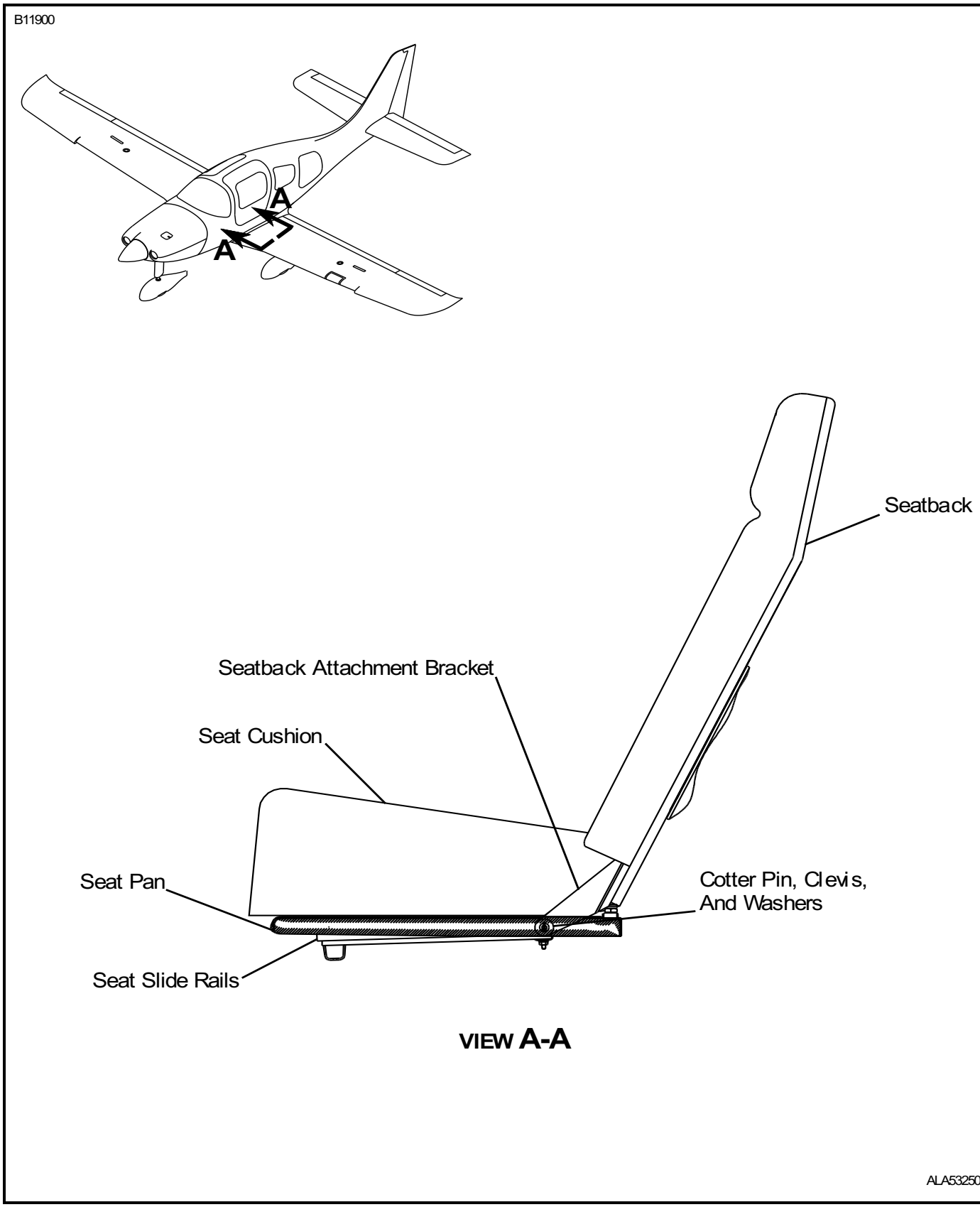
(4) To remove the crossbar, remove the two outboard quick-release pins. If the retention clip affixed to the pin bracket becomes dislodged, reinstall it with the smaller hole on the bottom side of the bracket, the open end of the clip facing outboard, and the body of the clip facing inboard.

B. **Installation of the Rear Seats and Crossbar** - Reverse the Rear Seat Removal procedure for reinstallation of the rear seat seatbacks, cushions, and crossbar.

NOTE: Make sure the flanged bushing is installed from the bottom of the seatback flange.

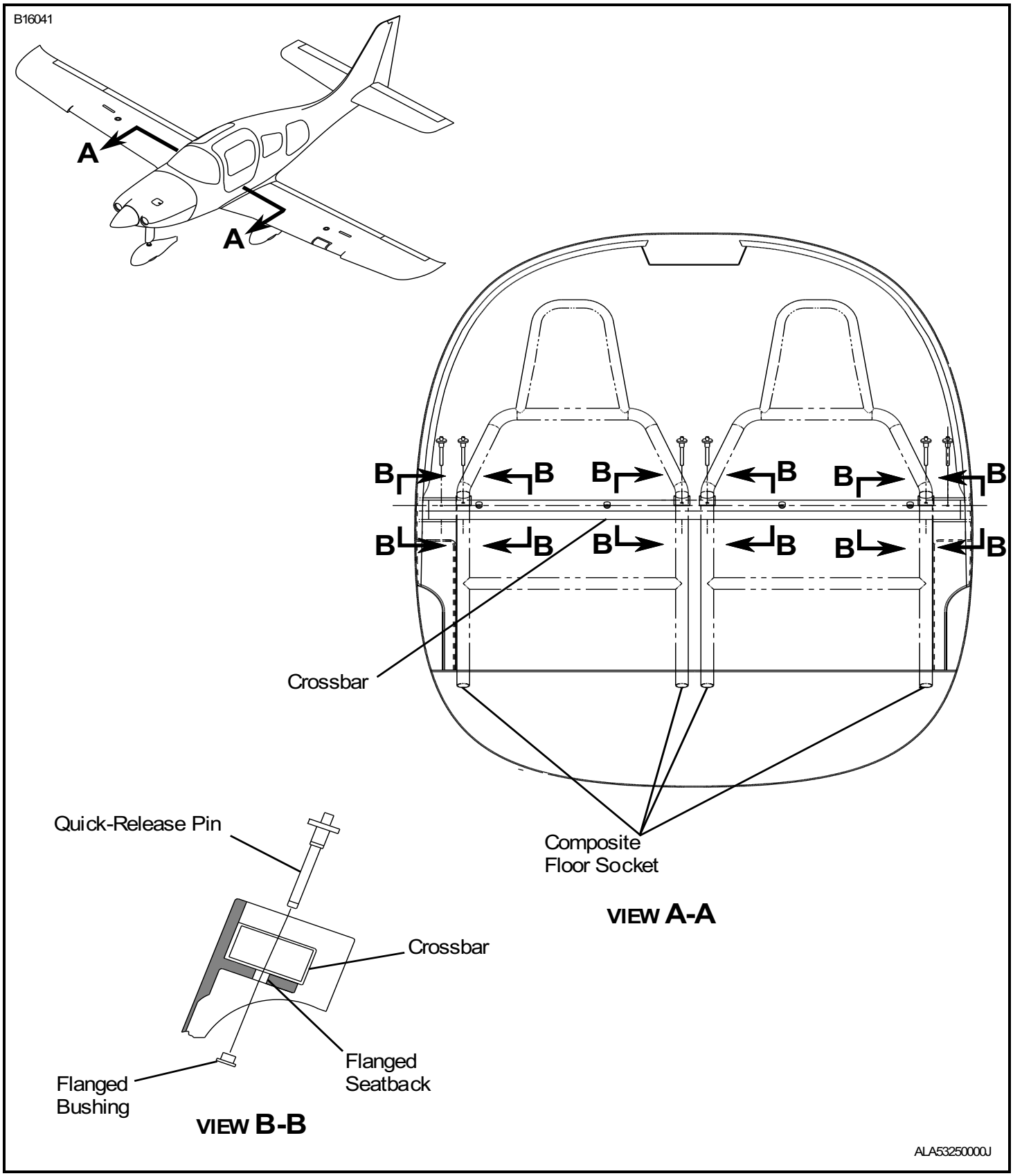
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Front Seat



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Rear Seats



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INSTRUMENT PANELS AND ELECTRICAL PANELS - MAINTENANCE PRACTICES

1. Instrument Panels and Electrical Panels

A. **Flight Items** - This section covers procedures for removal of the following (refer to Section 25-00-00, Figure 2):

(1) Glare Shield and Glare Shield Extension

(2) Engine Instrument Panel

(3) Flight Instrument Panel

(4) Left and Right Knee Bolsters

(5) Kidney Panel

B. **Electrical Panels** - In addition, removal of certain electrical panels are covered in this section. These include:

(1) Circuit Breaker Panel

(2) Master Switch Panel

(3) Rocker Switch Panel

(4) Trim Panel

(5) ECS Panel

(6) Flap Panel

CAUTION: Use a non-magnetic screwdriver when working on or around the instrument or electrical panels, including the glare shield.

2. Glare Shield

A. **Glare Shield Extension** - The removal of the glare shield extension is accomplished by pulling aft on the curved lip of the extension shield until it stops. Using both hands, simultaneously bend the outer edges down on both sides to clear the stops, and then pull free. Installation is the reverse of the above.

B. **Glare Shield Removal and Installation** - Use the following steps to remove and install the glare shield.

(1) Remove the three flat head, 8-32 screws and washers from the top of the panel.

(2) Tilt the glare shield up to gain access to the wiring for the compass and light. Disconnect this wiring.

(3) Slide the glare shield aft out of the clips bonded in the defrost channels at the base of the windshield.

(4) Installation is the reverse of the above. Tighten glare shield screws until snug.

3. Instrument Panel

A. **Removal of Instrument Panel (S/N 40004 to 40079)** - Removal of the instrument panel is a major task and is not likely to ever be needed as access to areas behind the instrument panel can be gained from removing the panels within the instrument panel. The instructions for removal are only for removing the instrument panel when the same panel is to be replaced. If a new instrument panel is required, contact the manufacturer for further instructions. The instrument panel and radio rack should be removed and installed as a unit.

(1) Remove or disconnect all instruments in the instrument panel.

(2) Remove the center console, center overhead console, upper and lower forward side panels, glare shield, and knee bolsters per instructions in Chapter 25.

(3) Disconnect the ventilation tubing to the eyeball vents and main heater control valve per instructions in Chapter 21.

(4) Disconnect the control cables at the throttle quadrant per instructions in Chapter 76.

(5) Remove the 10-32 hex head bolt and washer connecting the knee bolster angle brace to the radio rack (both left and right side) as shown in Figure 210.

(6) Remove the hex head bolt, washer and self-locking nut from the center brace at the top of the instrument panel shown in Figure 201 and Figure 202.

(7) Remove the 10-32 bolt, washers, and nut on the side angle braces on the left and right side of the instrument panel as shown in Figure 201 and Figure 203.

(8) Remove the two 8-32 pan head screws, washers, and nuts attaching the instrument panel to the fuselage mount on both the left and right side. One screw on each side goes through an additional grounding strap and washer. Refer to Figure 204.

(9) Remove the 10, 10-32 hex head bolts and washers attaching the radio rack to the floor, and remove the instrument

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

panel and radio rack from the airplane.

(10) Installation is a direct reversal of removal. Torque bolts attaching the radio rack to the floor 30 to 36 in.-lbs. Torque the fuselage mount nuts 18 to 22 in.-lbs. Torque the side angle brace nuts 72 to 84 in.-lbs. Torque the center brace nut 72 to 84 in.-lbs. Torque the knee bolster angle bolts 30 to 38 in.-lbs.

B. **Removal of Instrument Panel (S/N 40080 and on)** - Removal of the instrument panel is a major task and is not likely to ever be needed as access to areas behind the instrument panel can be gained from removing the panels within the instrument panel. The instructions for removal are only for removing the instrument panel when the same panel is to be replaced. If a new instrument panel is required, contact the manufacturer for further instructions. The instrument panel and radio rack should be removed and installed as a unit.

(1) Remove or disconnect all instruments in the instrument panel.

(2) Remove the center console, center overhead console, upper and lower forward side panels, and glare shield per instructions in Chapter 25.

(3) Disconnect the ventilation tubing to the eyeball vents per Section 21-20-00, Removal of the Eyeball Vent, and main heater control valve per Section 21-40-00, Heater Control Valve Removal.

(4) Disconnect the control cables at the throttle quadrant per instructions in Section 76-10-00, Throttle Cable Removal.

(5) Remove the hex head bolt, washer, and self-locking nut that attach the center brace at the top of the instrument panel to the firewall shown in Figure 205 and Figure 206.

(6) Remove the 8-32 pan head bolt and washer from the threaded insert that attaches the left side brace of the instrument panel to the fuselage as shown in Figure 205 and Figure 207.

(7) Remove the 8-32 pan head bolt and washer from the threaded insert that attaches the right side brace of the instrument panel to the fuselage as shown in Figure 205 and Figure 208.

(8) Remove the two 8-32 pan head screws, washers, and nuts attaching the instrument panel to the fuselage mount on both the left and right side. One screw on each side goes through an additional grounding strap and washer. Refer to Figure 209.

(9) Remove the 10, 10-32 hex head bolts and washers attaching the radio rack to the floor, and remove the instrument panel and radio rack from the airplane.

(10) Installation is a direct reversal of removal. Torque fasteners per Section 20-05-00.

4. Engine Instrument Panel

A. **Removal and Installation** - The engine instrument panel assembly is secured to the instrument panel with six flat head 6-32 screws along the perimeter of the panel. Removal of these screws allows the panel to be tilted forward for access to the instruments. Refer to the appropriate chapter for removal and installation of a specific instrument, control, switch, or light. When installing the engine instrument panel screws, torque 10 to 12 in.-lbs.

5. Flight Instrument Panel

A. **Removal and Installation** - The flight instrument panel is secured to the instrument panel with 14 flat head 4-40 screws along the perimeter of the panel. Removal of these screws allows the panel to be tilted forward for access to the instruments. Refer to the appropriate chapter for removal and installation of a specific instrument, control, switch, or light. When installing the flight instrument panel screws, torque 6 to 8 in.-lbs.

6. Left and Right Knee Bolster

A. **Removal and Installation (S/N 40004 to 40079)** - The knee bolsters are attached to the instrument panel by 2 pan head 8-32 screws with washers and also attached to the support angle above the rudder pedals by two pan head 10-32 screws with washers as shown in Figure 210 and Figure 211. Removal of the screws allows the knee bolsters to drop down for access to the instruments or controls. Refer to the appropriate chapter for removal and installation of a specific instrument, control, switch, or light. When installing the knee bolster screws, torque the 8-32 screws 20 to 25 in.-lbs. in aircraft S/N 40004 to 40014 and 12 to 15 in.-lbs. in aircraft S/N 40015 and on. Torque the 10-32 screws 30 to 36 in.-lbs. Refer also to Figure 212.

B. **Removal and Installation (S/N 40080 and on)** - The knee bolsters are attached to the instrument panel at the top of the instrument panel by four flat-head screws and to the side of the instrument panel with two self-locking nuts and washer that attach to the studs on the knee bolster. Refer to Figure 210. Torque hardware per Section 20-05-00.

7. Kidney Panel

A. **Removal and Installation** - The kidney panel is secured to the instrument panel with four flat head 6-32 screws along the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

perimeter of the panel. Removal of these screws allows the panel to be tilted forward for access behind it. When installing the kidney panel screws, torque 10 to 12 in.-lbs.

8. **Circuit Breaker Panel**

   A. **Removal and Installation** - The circuit breaker panel assembly is secured by flat head 6-32 screws around the perimeter of the panel. Refer to Figure 213. To gain access to these screws, remove the left forward lower side panel first. Refer to the Section 25-30-00, Forward Lower Side Panels. Removal of these screws allows the panel to be rotated out for access to the circuit breakers and wiring. Refer to the appropriate chapter for removal and installation of a specific circuit breaker, switch, or light. When installing the circuit breaker panel screws, torque 10 to 12 in.-lbs.

9. **Master Switch Panel**

   A. **Removal and Installation of the Master Switch Panel** - The master switch panel faceplate has four threaded 6-32 studs that protrude through mating holes into the backside of the instrument panel (refer to Figure 214). Four self-locking 6-32 nuts with washers, accessible from the backside of the instrument panel, screw onto these studs to secure the master switch panel to the instrument panel. Removal of the nuts with washers allows the master switch panel to slide out for access to the switches. Refer to the appropriate chapter for removal and installation of a specific switch or light. Removal of the left knee bolster (refer to the Left and Right Knee Bolster section) makes accessing the nuts securing the master switch panel easier. When installing the master switch panel nuts, torque 7 to 10 in.-lbs.

10. **Rocker Switch Panel**

   A. **Removal and Installation** – The rocker switch panel faceplate has four threaded 6-32 studs that protrude through mating holes into the backside of the instrument panel. Refer to Figure 214. Four self-locking 6-32 nuts with washers, accessible from the backside of the instrument panel, screw onto these studs to secure the rocker switch panel to the instrument panel. Removal of the nuts with washers allows the rocker switch panel to slide out for access to the switches. Refer to the appropriate chapter for removal and installation of a specific switch or light. Removal of the left knee bolster (refer to Left and Right Knee Bolster section) makes accessing the nuts securing the rocker switch panel easier. When installing the rocker switch panel nuts, torque 7 to 10 in.-lbs.

11. **Trim Panel**

   A. **Removal and Installation of Trim Panel** - The trim panel faceplate has four threaded 6-32 studs that protrude through mating holes into the backside of the instrument panel (refer to Figure 214). Four self-locking 6-32 nuts with washers, accessible from the backside of the instrument panel, screw onto these studs to secure the trim panel to the instrument panel. Removal of the nuts with washers allows the trim panel to slide out for access to the trim controls and indicator. Refer to the appropriate chapter for removal, service, and installation of the trim control and indicator. Removal of the left knee bolster (refer to the Left and Right Knee Bolster section) makes accessing the nuts securing the trim panel easier. When installing the trim panel nuts, torque 7 to 10 in.-lbs.

12. **ECS Panel**

   A. **Removal and Installation** - Refer to Section 21-40-00 for removal and installation instructions.

13. **Flap Panel**

   A. **Removal and Installation of Flap Panel** - The flap panel faceplate has four threaded 6-32 studs that protrude through mating holes into the backside of the instrument panel. Refer to Figure 214. Four self-locking 6-32 nuts with washers, accessible from the backside of the instrument panel, screw onto these studs to secure the flap panel to the instrument panel. Removal of the nuts with washers allows the flap panel to slide out for access to the flap controls and indicator. Refer to the appropriate chapter for removal, service, and installation of the flap control and indicator. Removal of the right knee bolster (refer to the Left and Right Knee Bolster section) makes accessing the nuts securing the flap panel easier. When installing the flap panel nuts, torque 7 to 10 in.-lbs.

14. **Annunciator Panel**

   A. **Removal and Installation** - The annunciator panel is secured by two flat head 6-32 screws. Two washers and self-locking nuts, accessible from the backside of the instrument panel, attach onto the screws. To remove the panel, disconnect the electrical connector from the backside of the panel, remove the screws, nuts, and washers, and slide out the panel. Installation is the reverse of removal. Tighten screws snug.

15. **Aural Warning System**

   A. **Removal and Installation of the Acknowledge Switch**

      (1) Remove the glare shield per instructions in the Glare Shield section.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(2) Disconnect the two-pin plug at the back of the switch.

(3) Loosen the nut around the switch in front of the flight instrument panel, and remove the nut, washer, and placard. Refer to Figure 215. The nut on the rear of the flight instrument panel around the switch does not need to be removed in order to remove the switch.

(4) Remove the switch.

(5) Replace with the new switch, and reassemble in reverse order.

B. **Removal and Installation of the Aural Warning Box (S/N 40004 to 40061)**

(1) Remove the center console side panels per instructions in Section 25-12-00, Center Console.

(2) Remove three truss head screws securing the mounting plate to the radio rack. Refer to Figure 216.

(3) Remove the one truss head screw, self-locking nut, and washer that secures the clamp and mounting plate to the radio rack.

(4) Push in the mounting plate, turn, and push out to gain access to the aural warning box.

(5) Loosen the connector screws, and remove the connector.

(6) Remove the four pan head screws, washers, and self-locking nuts securing the aural warning box to the mounting plate.

(7) Replace the aural warning box, and reassemble in reverse order. Torque all screws 10 to 12 in.-lbs.

C. **Removal and Installation of the Aural Warning Box (S/N 40062 and on)**

(1) Remove the center console side panels per instructions in the Section 25-12-00, Center Console.

(2) Remove the four 6-32 pan head screws, and washers if present, and then remove the box. Refer to Figure 217.

(3) Replace the aural warning box, and reassemble in reverse order. Torque per Section 25-10-00, Removal, Installation and Adjustment of the Front Seats.

D. **Aural Warning Troubleshooting**

(1) No Audio Output

(a) Check that the audio panel and the avionics master switch is turned on.

(b) Check that the speaker is connected and is not defective.

(c) Check that the audio panel circuit breaker is not defective.

(d) Check that the connector on the remote aural warning box is not loose.

(e) Check that the ground for the aural warning box is being activated by the oil pressure switch on the engine.

(f) Check that the audio adjustment is turned up high enough on the aural warning box.

(2) No Audio Output from One of the Six Warnings (Except "Door is Open")

(a) Check for a broken wire or a pushed-back pin.

(b) Temporarily ground the input pin for the inoperative channel, and test the aural warning box. You should hear the audio if the oil pressure switch is activated or jumpered.

(3) No Audio Output from the "Door is Open" Warning

(a) If the tachometer is working, check that the wire going to the rear of the tachometer is not broken. Check that the connector does not have a pushed-back pin.

(b) If the tachometer is not working, check the tachometer system per instructions in Section 77-10-00.

(c) Check that the RPM adjustment is within tolerance.

(d) Check for a broken wire or pushed back pin on the aural warning box.

(4) Alarm Will Not Cancel

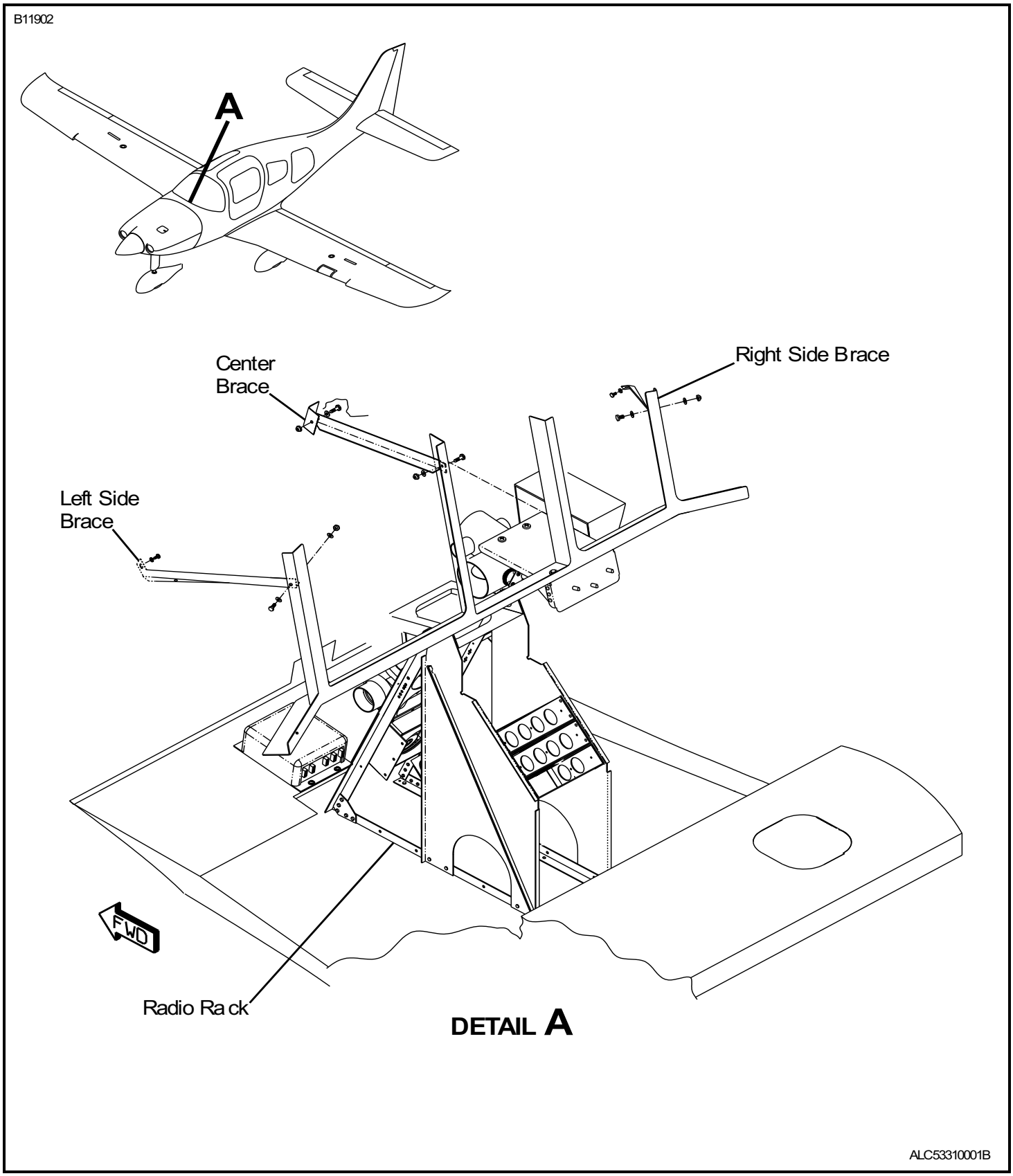
(a) Check that the acknowledge switch is connected.

(b) The acknowledge switch may be defective.

(c) Check for a broken wire or pushed back pin at the connector.

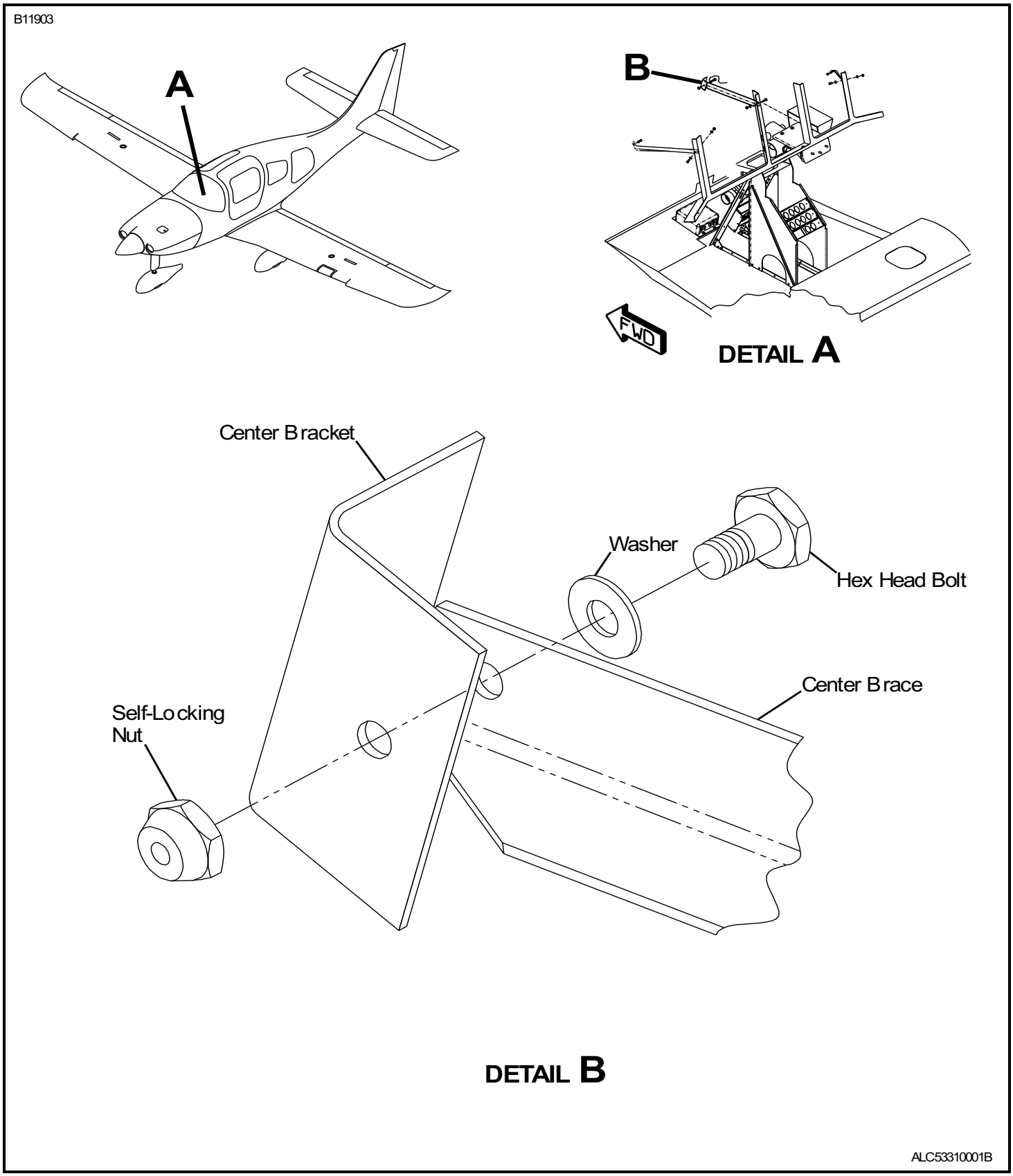
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Instrument Panel Brace Locations



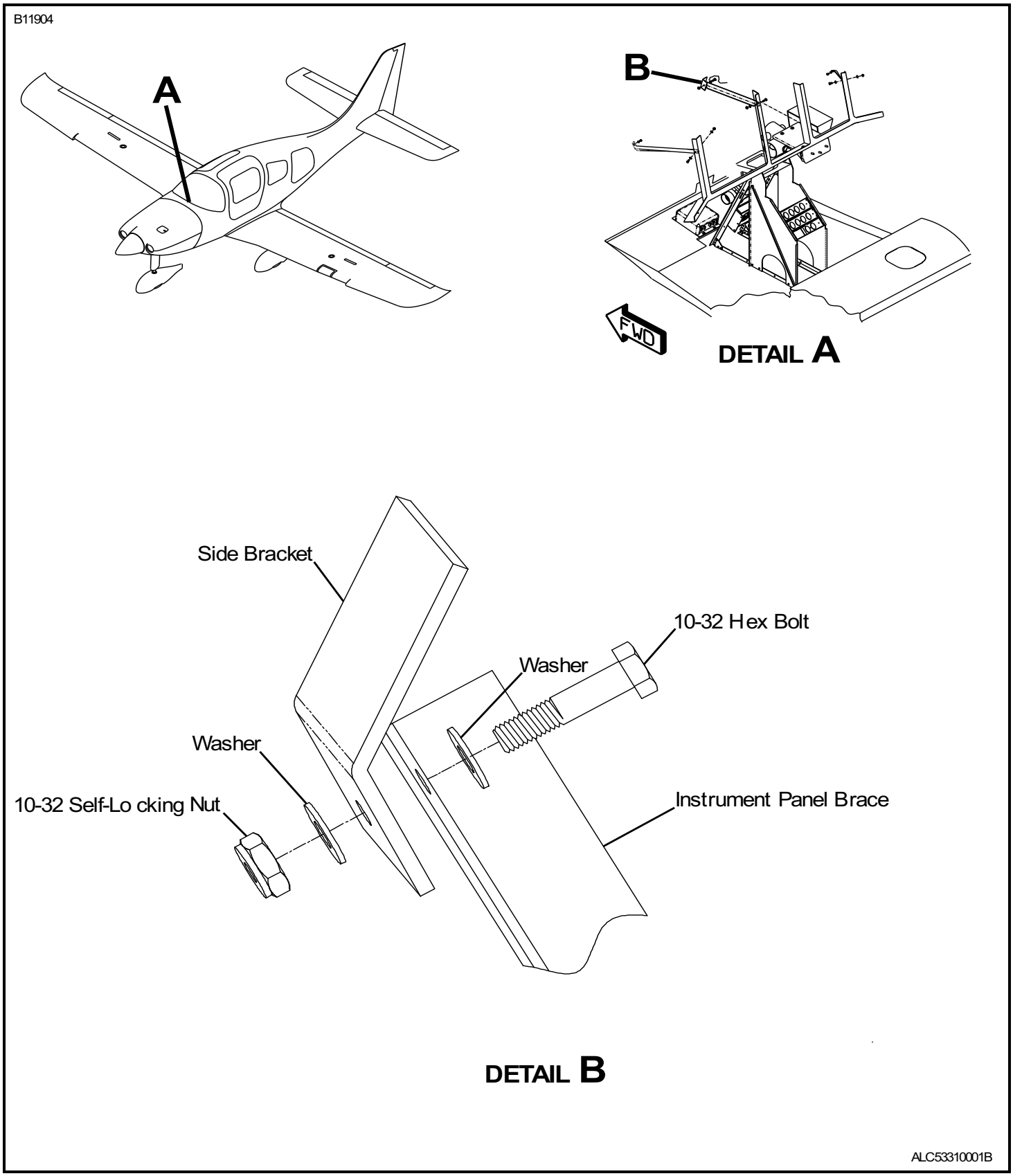
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Instrument Panel Center Brace



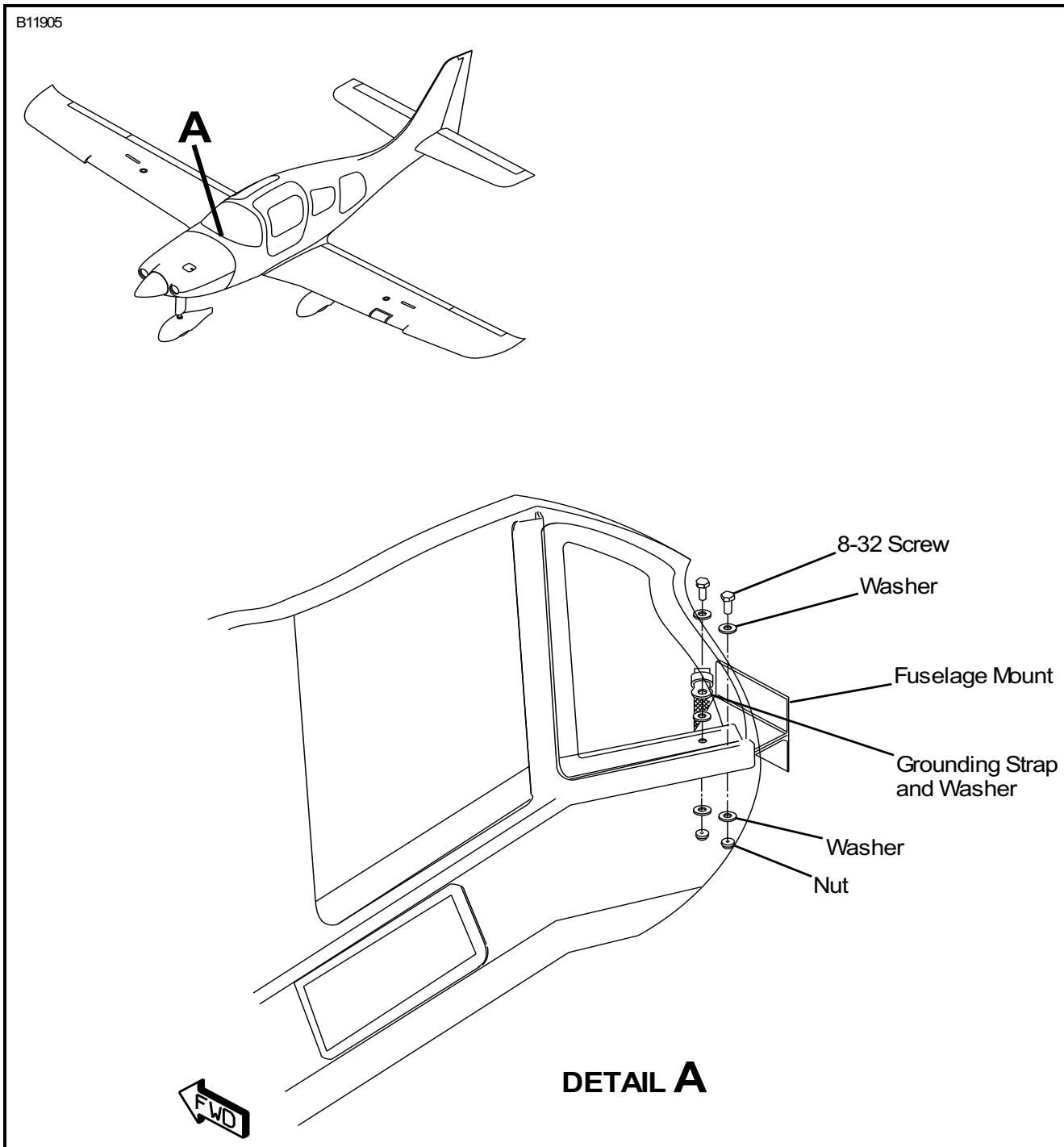
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Top View of Side Bracket (Left Side)



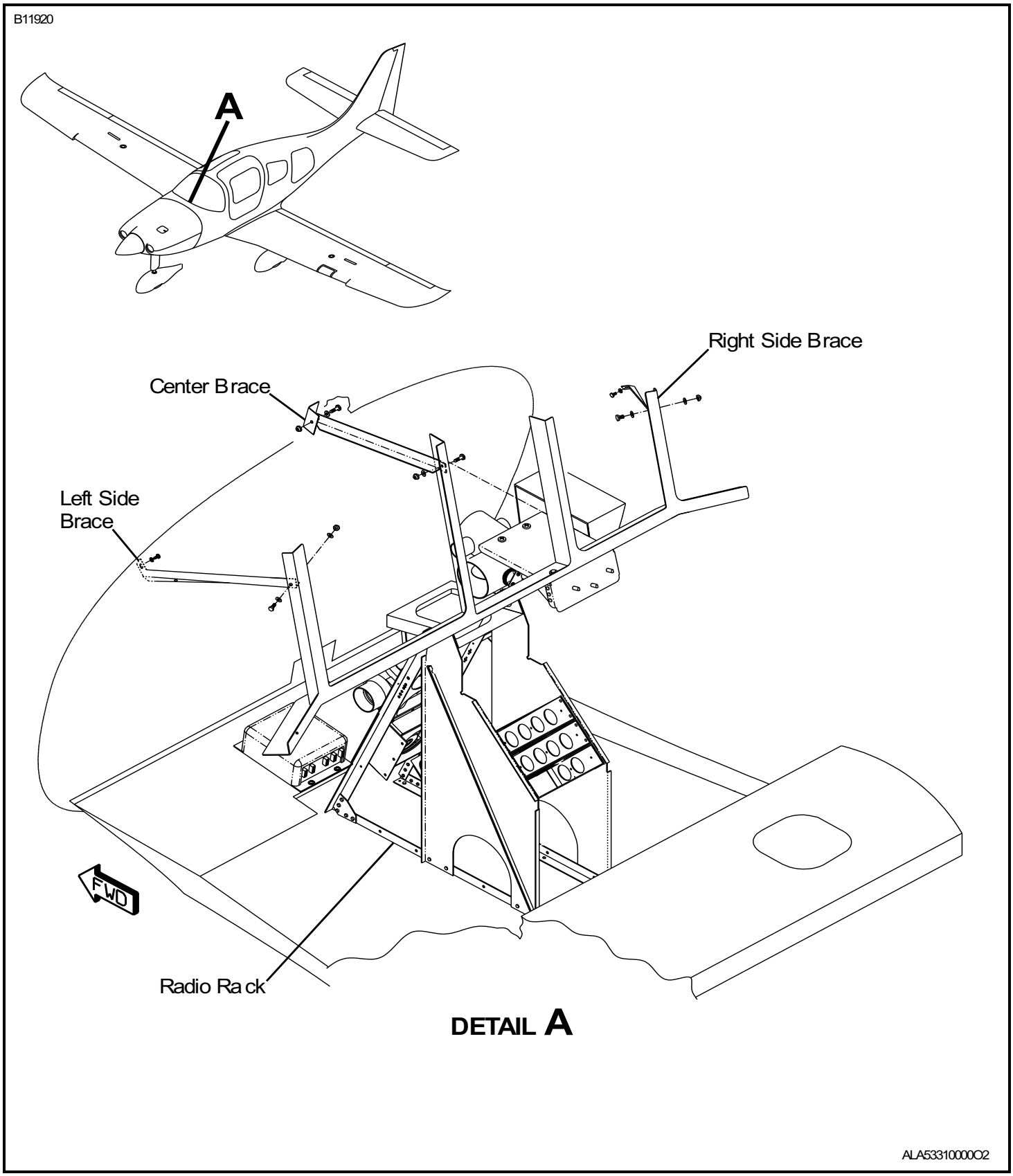
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Instrument Panel Fuselage Mount



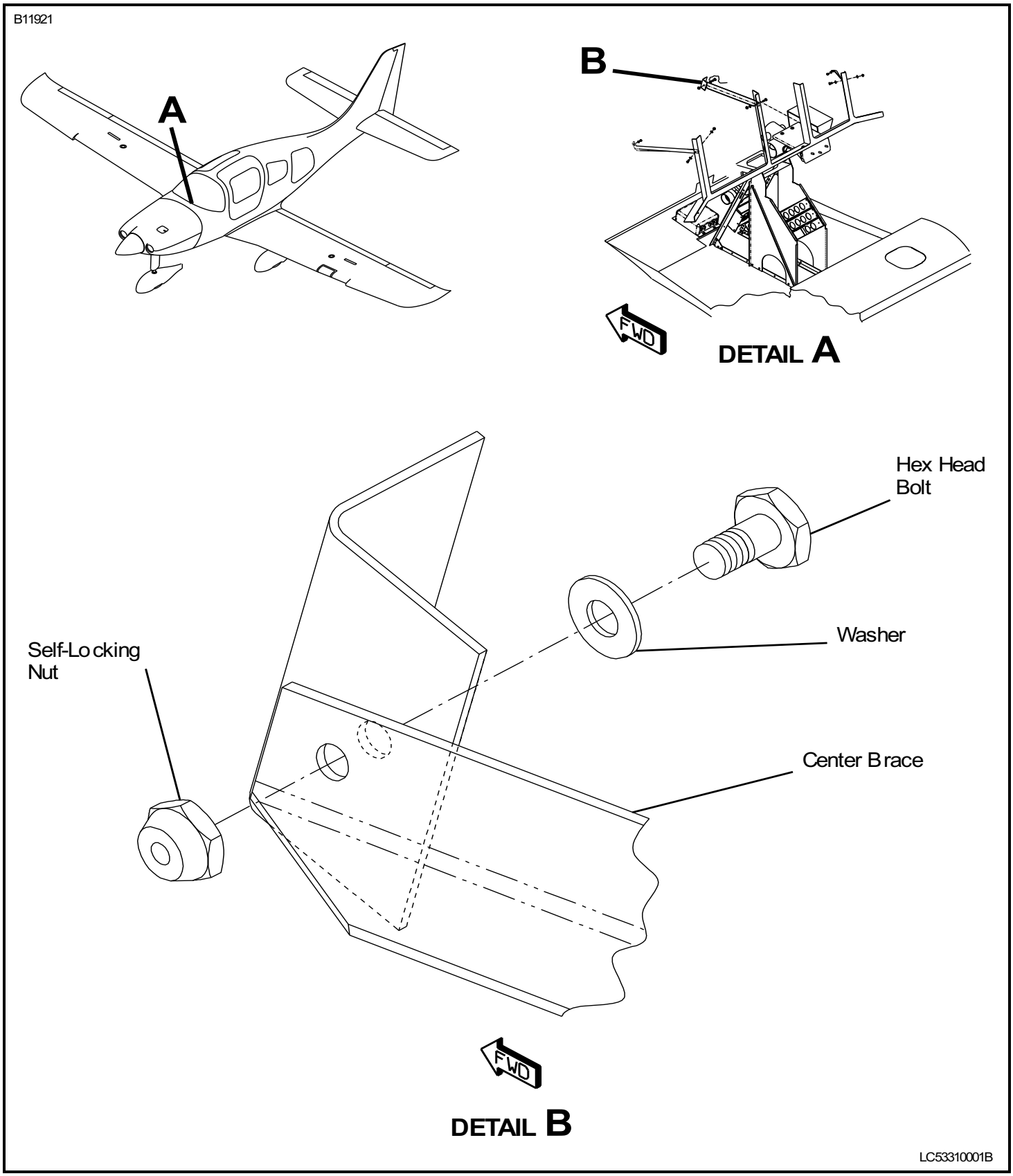
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Instrument Panel Brace Locations



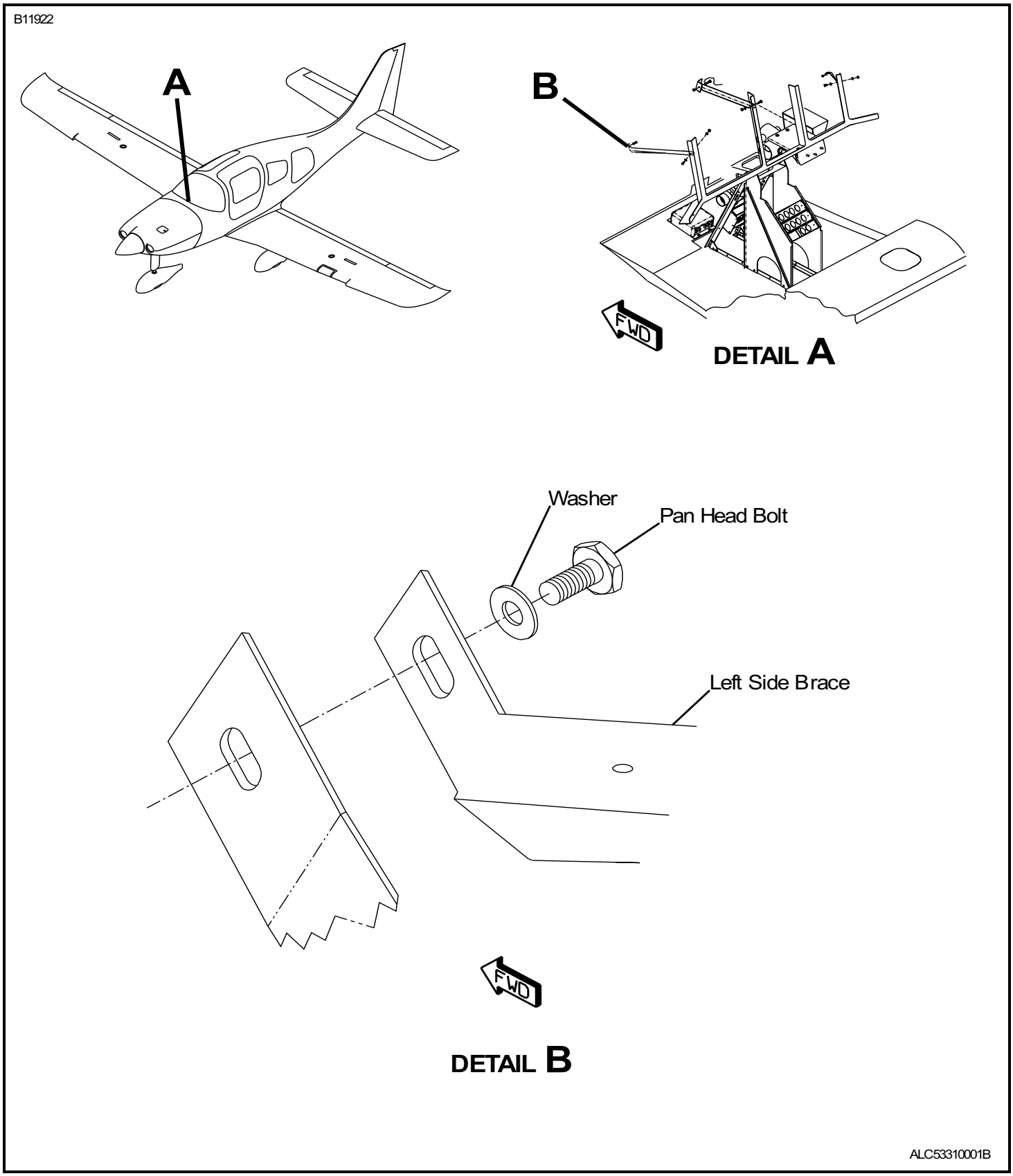
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Instrument Panel Center Brace



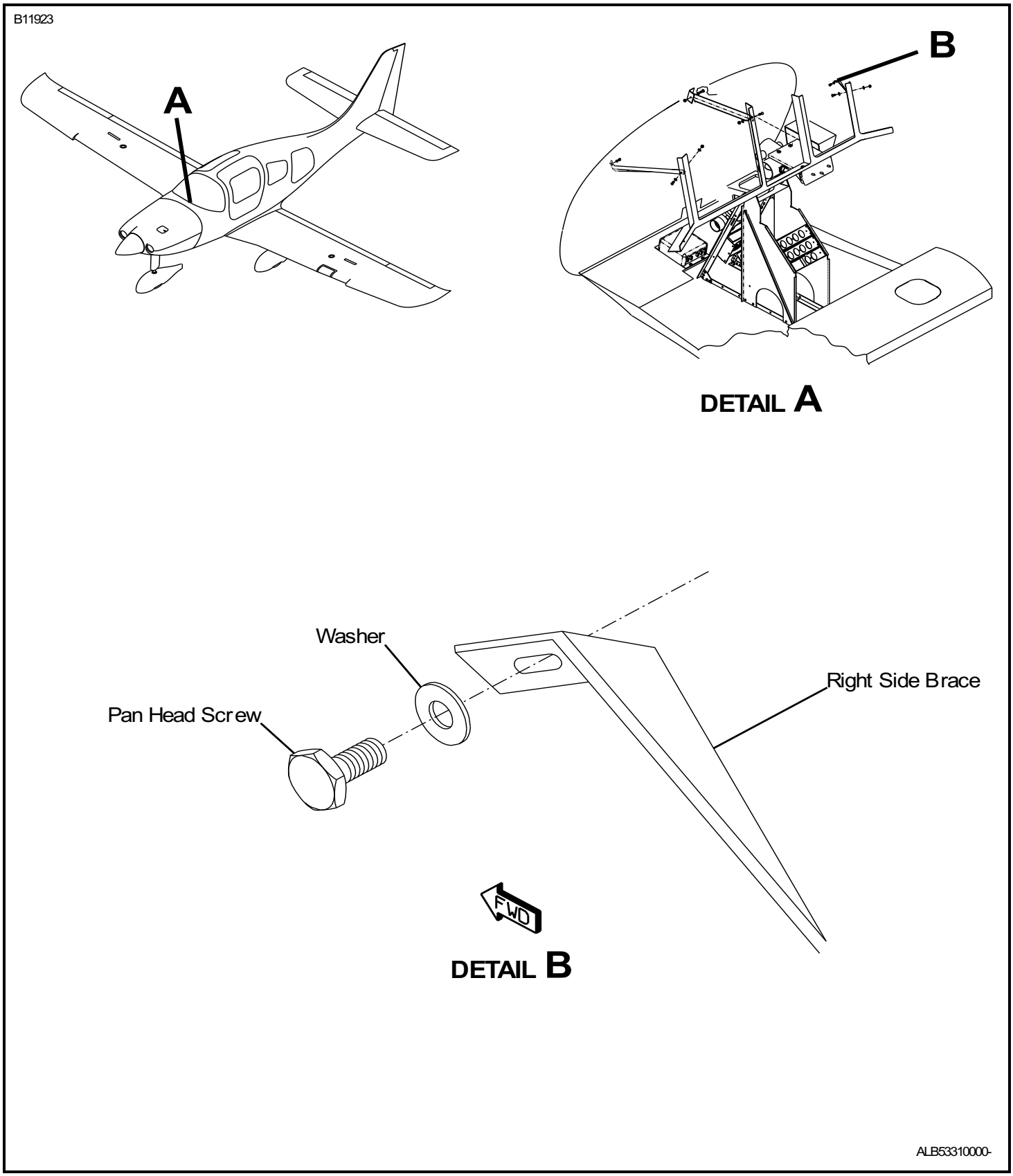
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : View of Left Side Brace



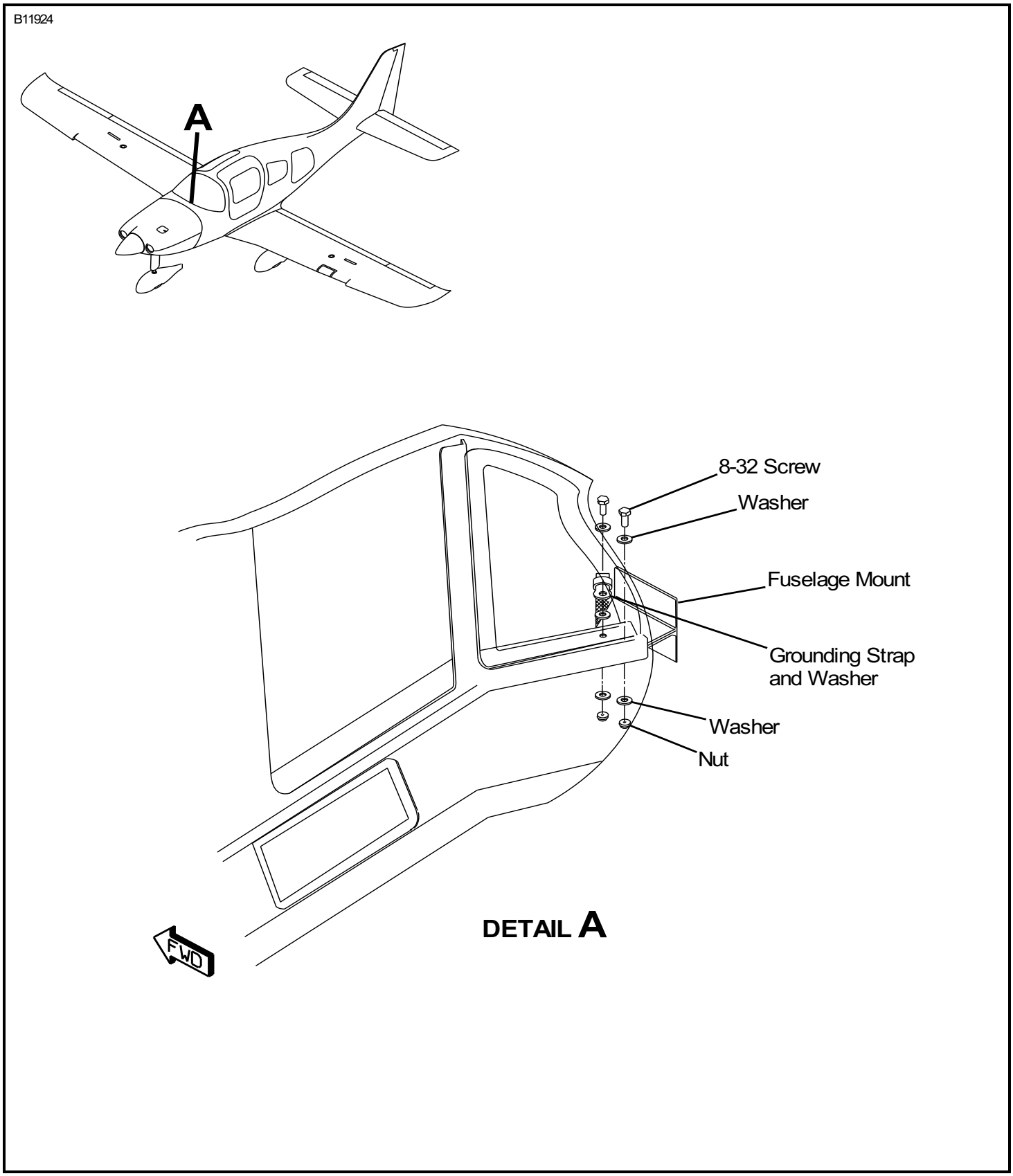
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : View of Right Side Brace



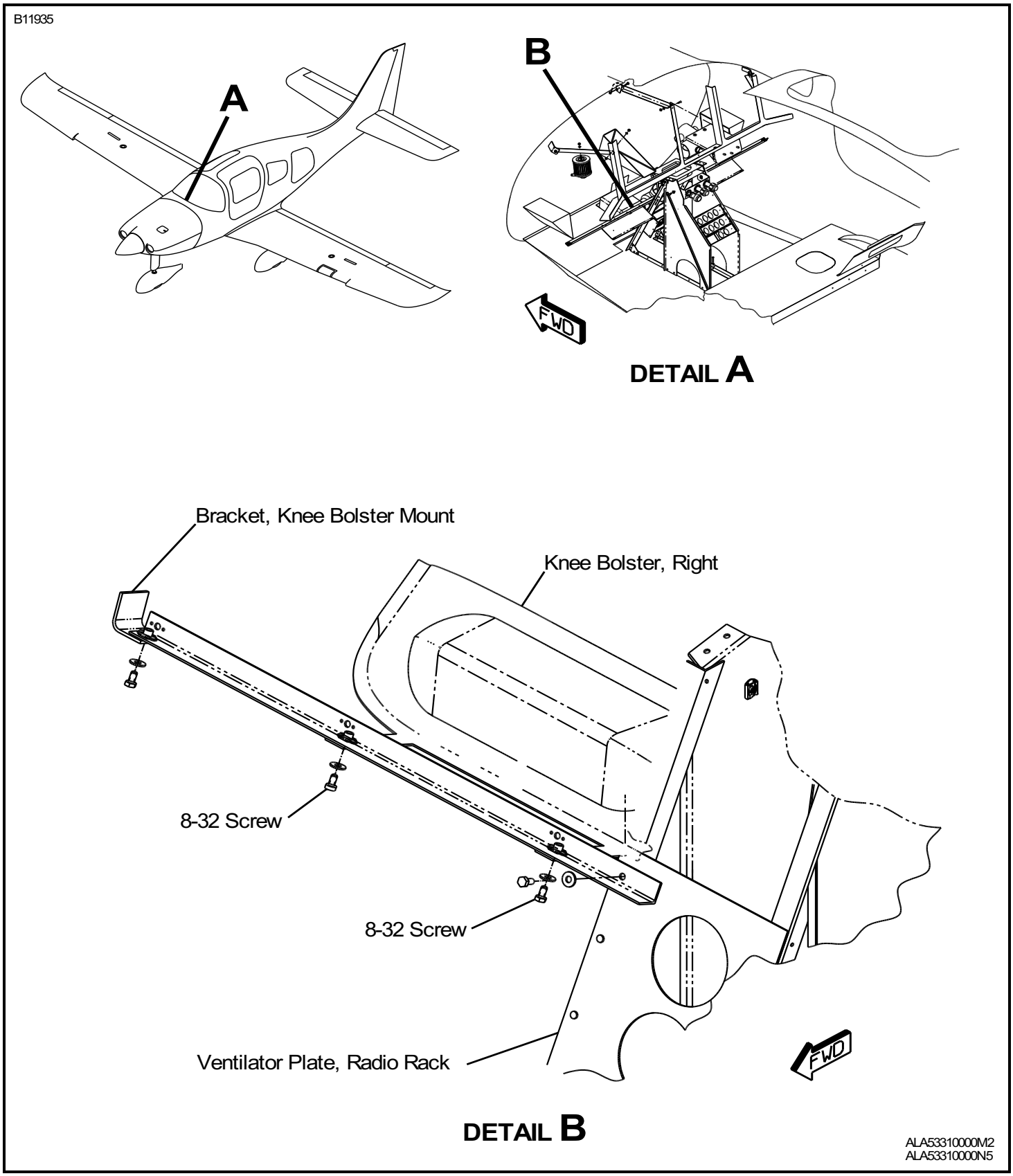
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 :



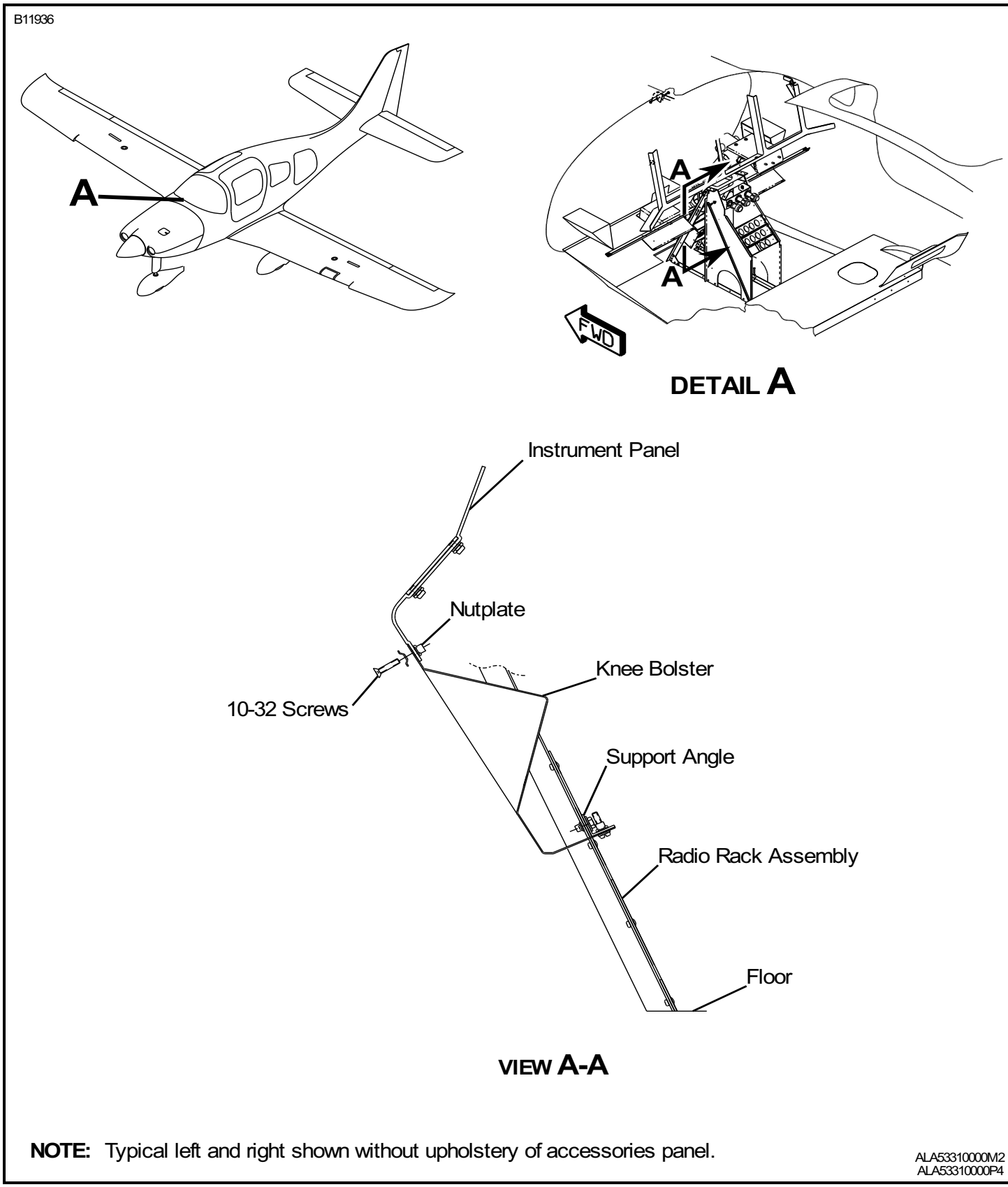
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 210 : Sheet 1 : Knee Bolster to Support Angle Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 211 : Sheet 1 : Knee Bolster to Instrument Panel Attachment

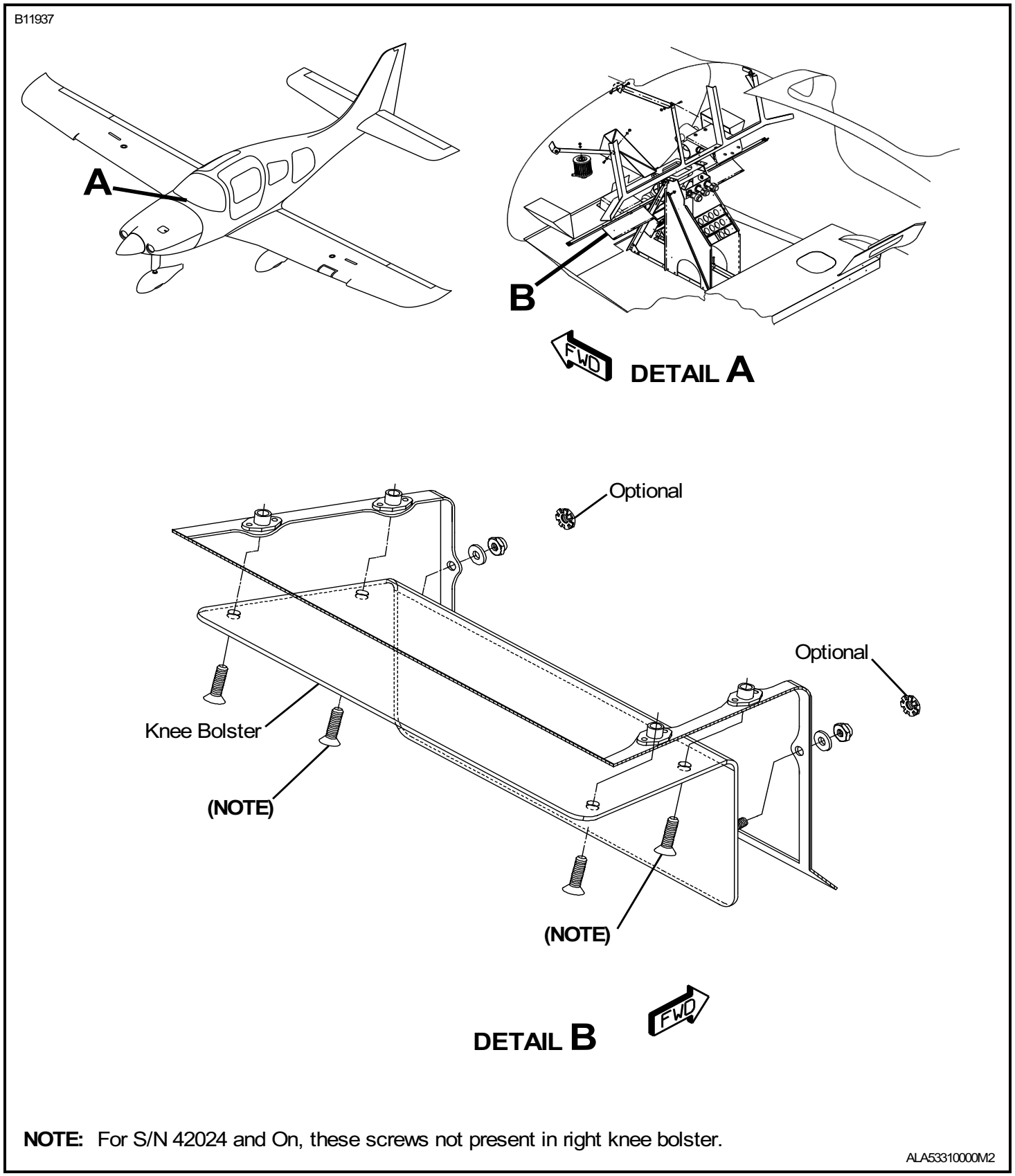


NOTE: Typical left and right shown without upholstery of accessories panel.

ALA53310000M2
ALA53310000P4

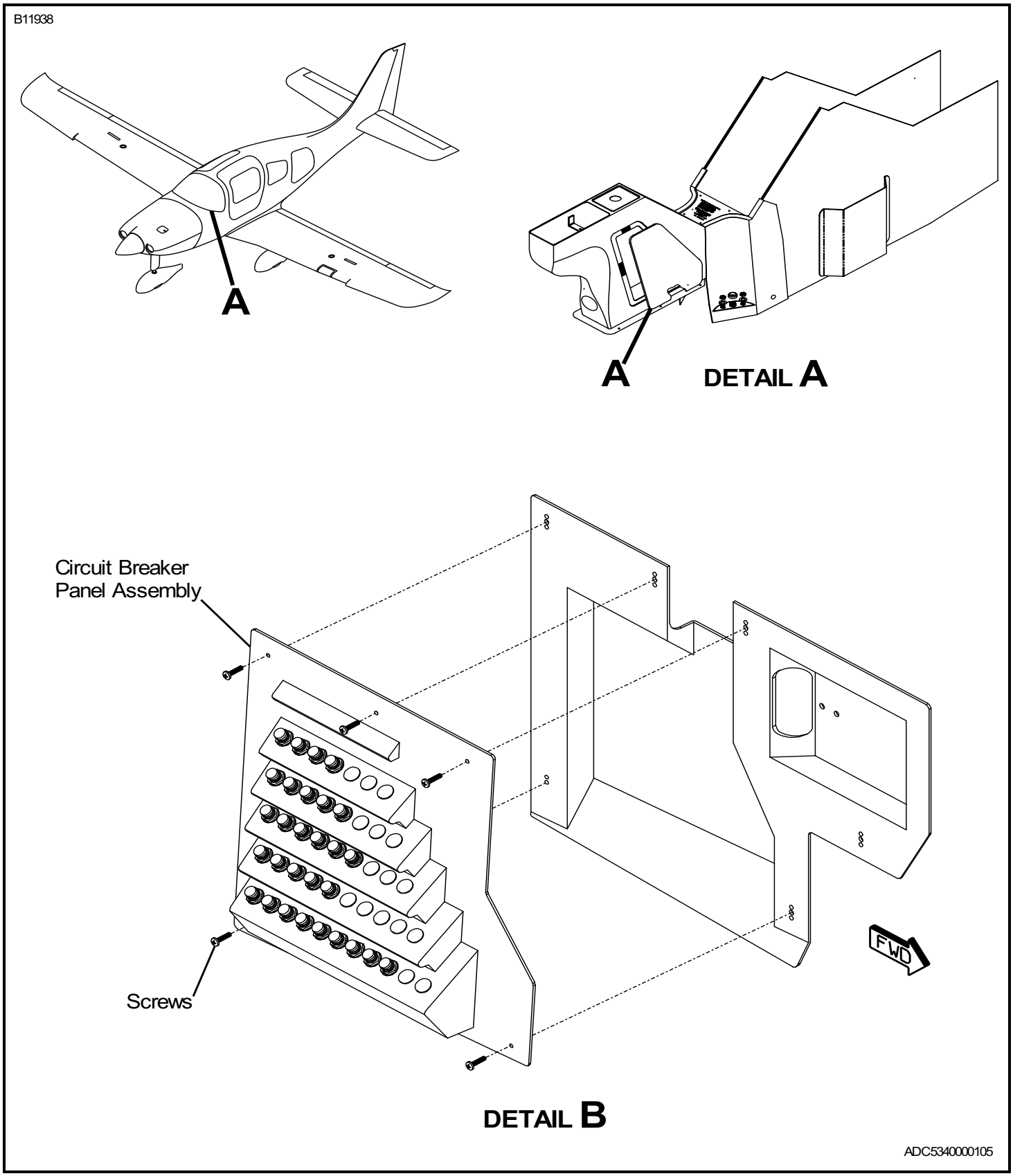
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 212 : Sheet 1 : Knee Bolster to Instrument Panel Attachment (S/N 40080 and on)



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

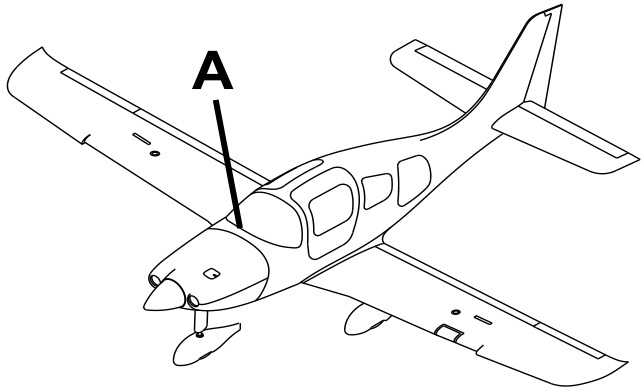
Figure 213 : Sheet 1 : Circuit Breaker Panel

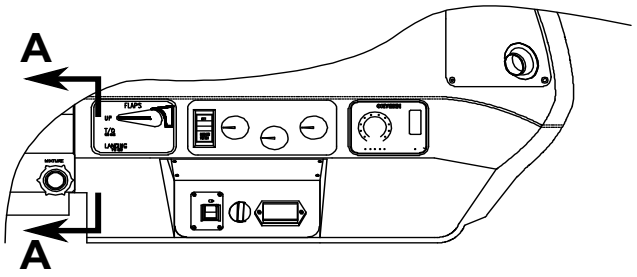


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

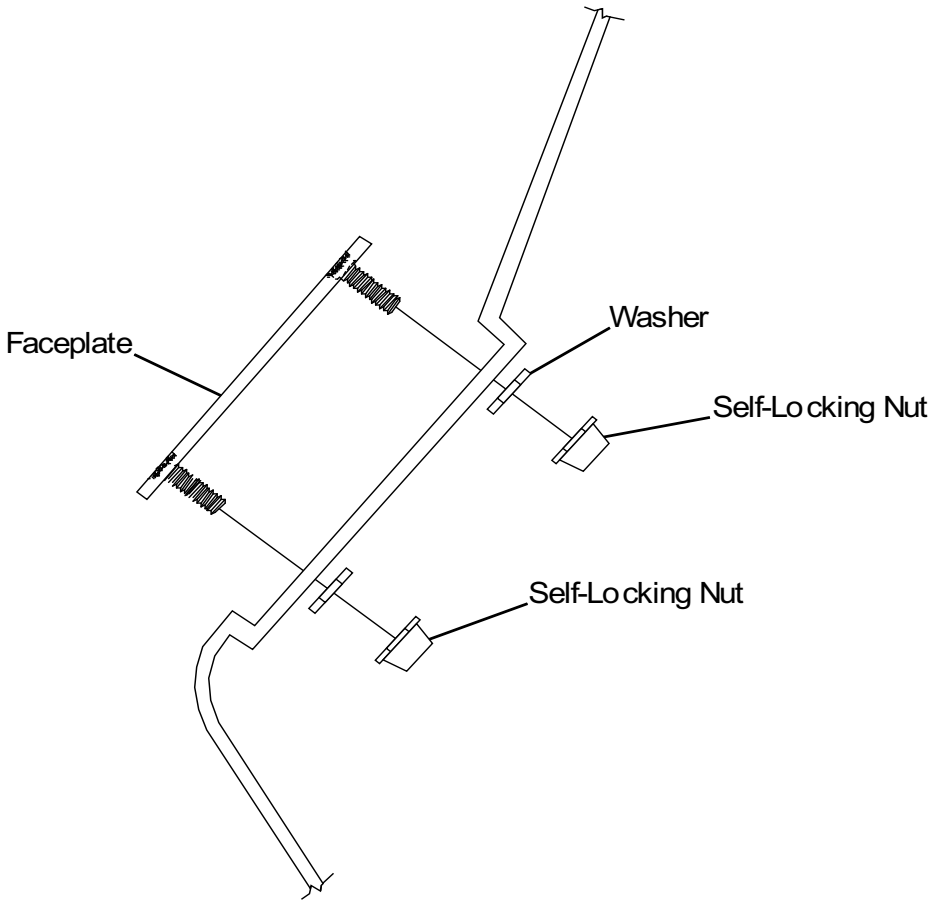
Figure 214 : Sheet 1 : Panel and Faceplate

B11939





DETAIL A

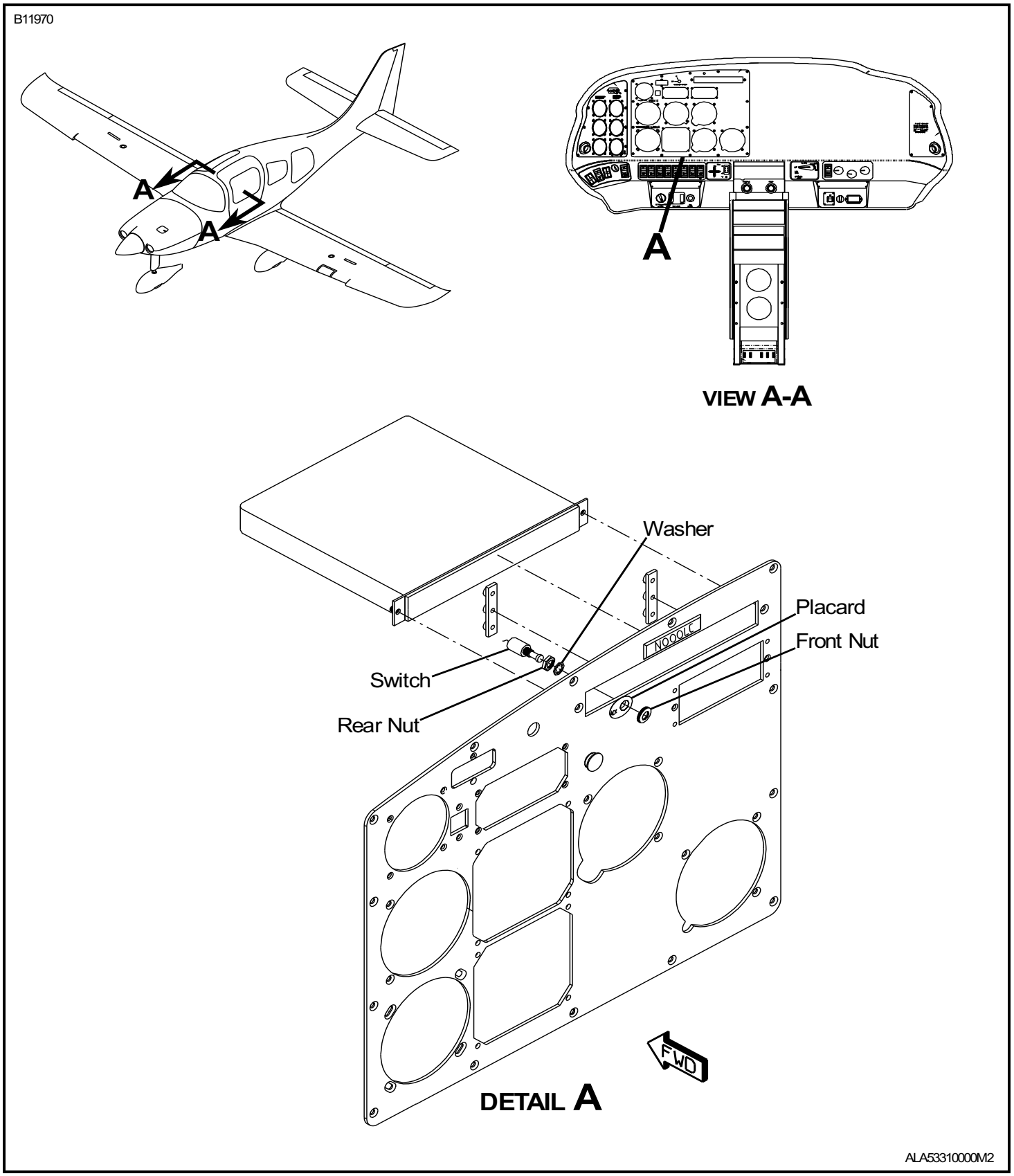


VIEW A-A

ALA53310000P4

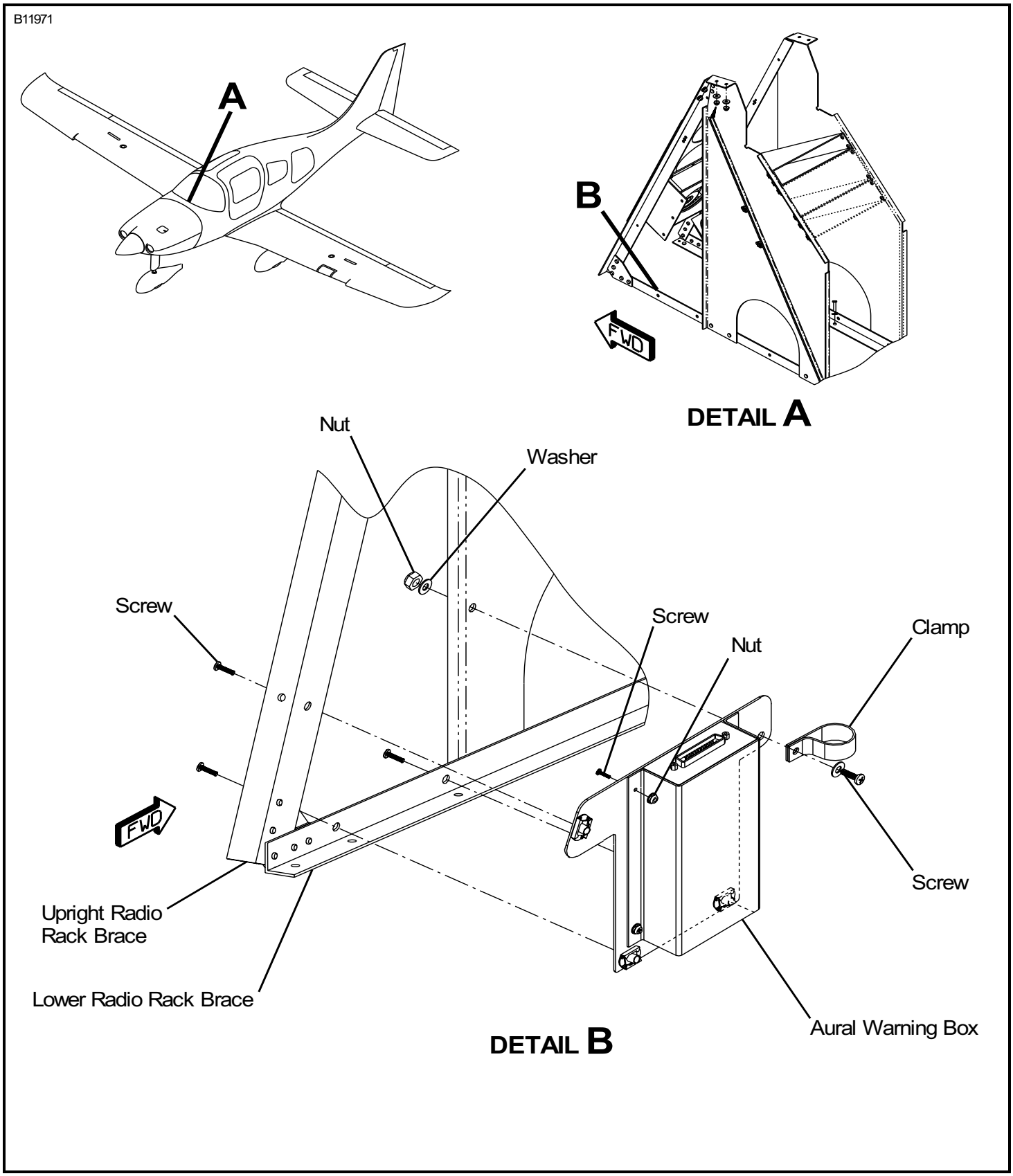
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 215 : Sheet 1 : Acknowledge Switch Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

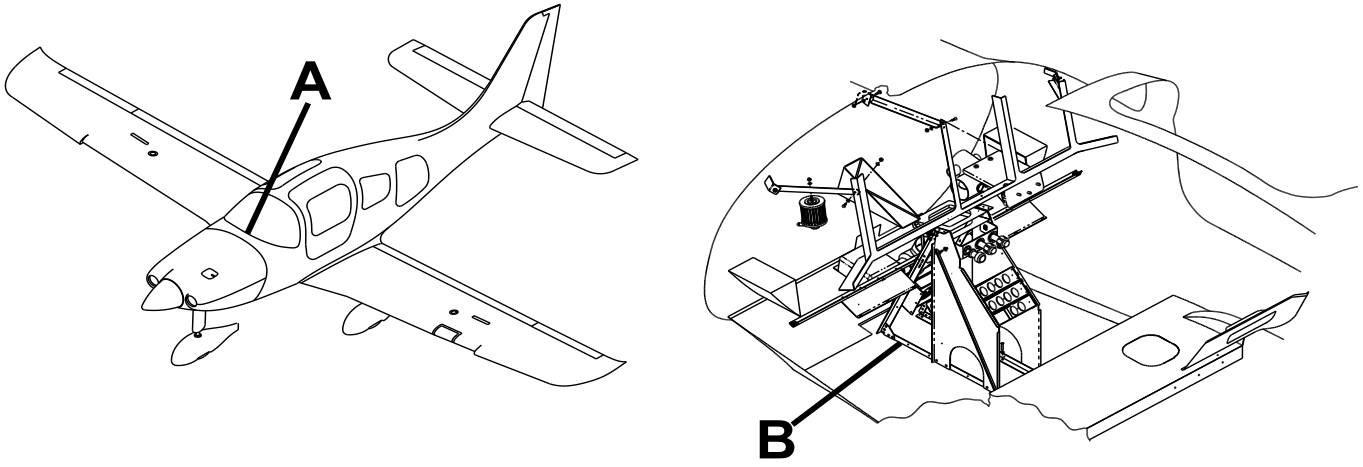
Figure 216 : Sheet 1 : Aural Warning Box Installation (SN 40004 to 40061)



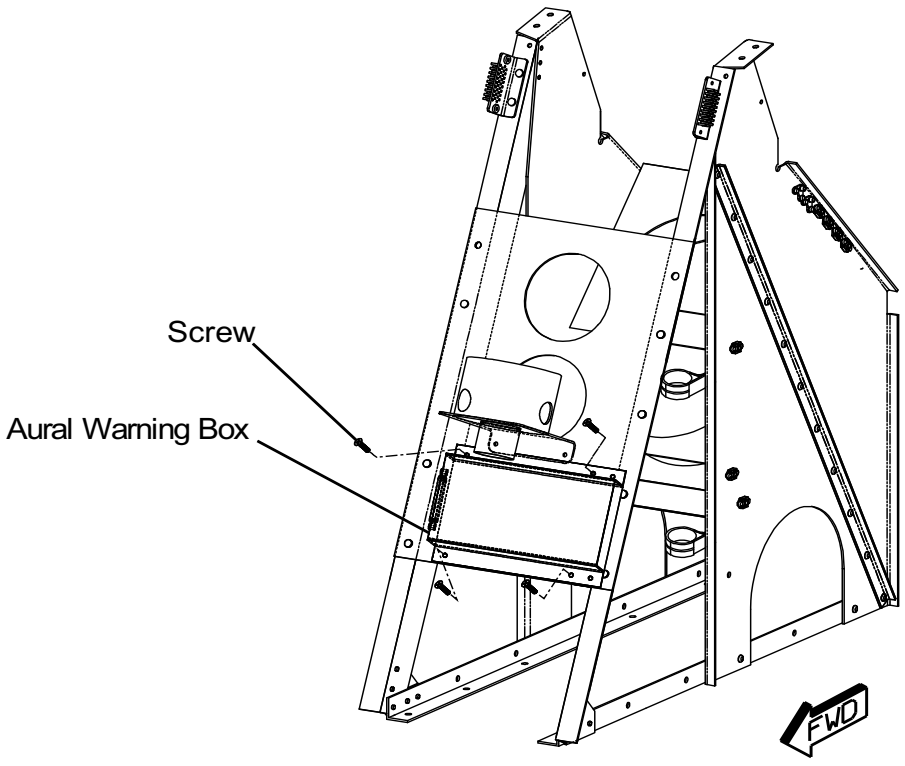
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 217 : Sheet 1 : Aural Warning Box Installation (S/N 40062 and on)

B11972



DETAIL A

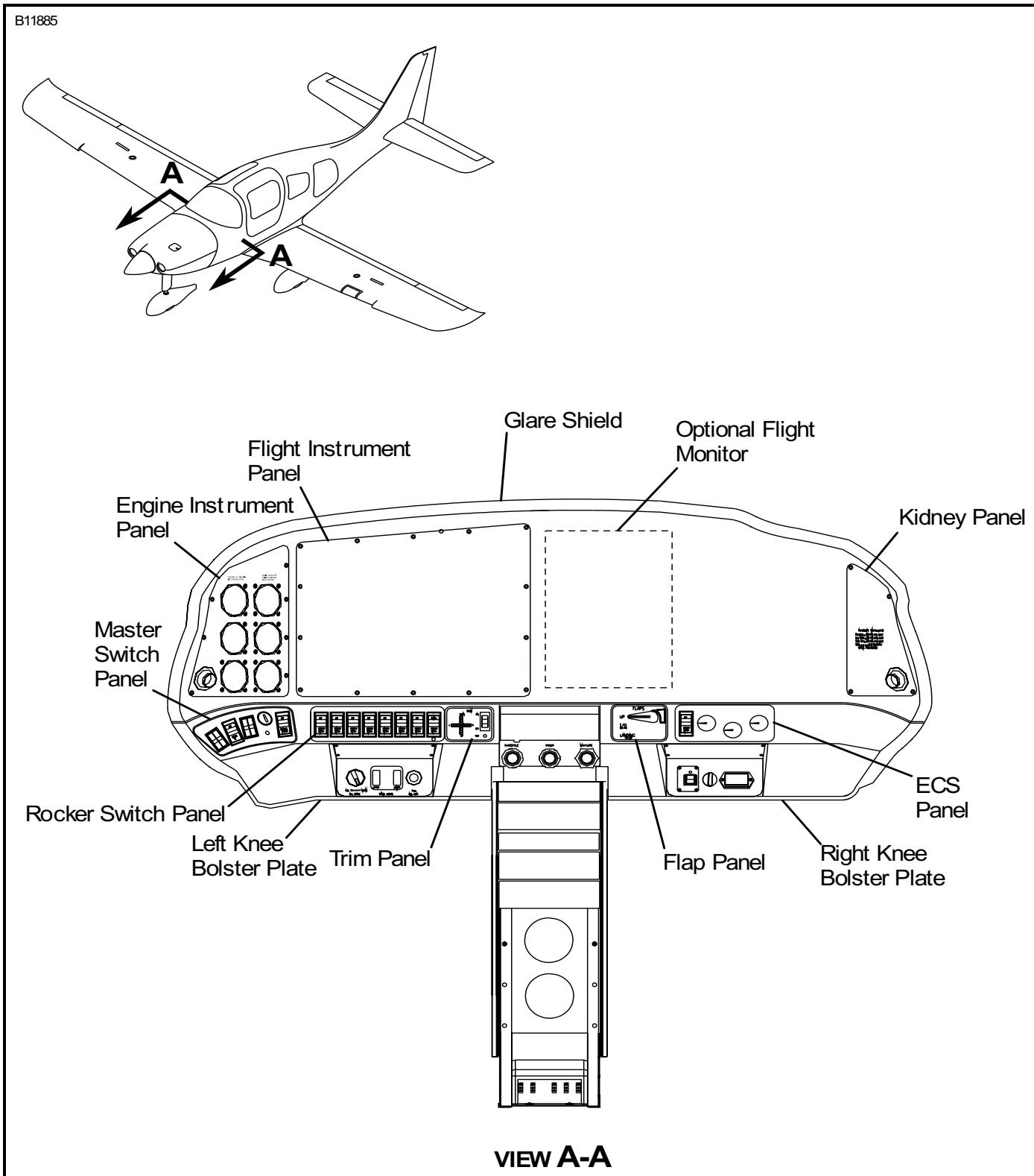


DETAIL B

ALB53312000D2
ALB53312001A41

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : Panel Location



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CENTER CONSOLE - MAINTENANCE PRACTICES

1. Center Console

A. **Removal and Installation of the Center Console** - The center console does not normally have to be removed. An access panel on the right side below the fuel selector is provided for routine inspection and maintenance. In addition, the left and right panels in the footwells may be removed independently of the rest of the console. Refer to Figure 201.

(1) **Armrest Assembly** - The armrest assembly, including pencil box, is attached to the center console with two flat head screws. These screws are visible after the cushion in the bottom of the pencil box is removed. The armrest assembly does not have to be removed to remove the center console.

(2) **Left Side Panel** - The left side panel is attached to the center console by a Shuler clip and to the floor by a screw located in the left footwell near the firewall. Removing the screws allows the panel to slide toward the firewall, disengaging the Shuler clip from the center console. Removal of the left knee bolster may be necessary for added clearance to remove the left side panel on the center console.

(3) **Right Side Panel** - The right side panel is attached to the center console by a Shuler clip and to the floor by a screw located in the right footwell near the firewall. Removing the screws allows the panel to slide toward the firewall, disengaging the Shuler clip from the center console. Removal of the right knee bolster may be necessary for added clearance to remove the right side panel on the center console.

(4) **Access Panel** - The access panel is secured with Velcro and can be removed by lifting at one corner and continuing to lift around the panel. Removal of the right seat cushion (refer to Section 25-10-00, Removal, Installation, and Adjustment of the Front Seats) allows better visibility of the access panel and the inside of the center console.

(5) **Heater Ventilation Tubing** - The heater ventilation can be removed by clipping the tie wraps that hold the tubing to the eyeball vent and sliding the tubing off the eyeball vent. Since the tie wrap is cut (destroyed) during removal, a new tie wrap must be used when reassembling the heater ventilation tubing.

(6) **Fuel Selector** - Refer to Section 28-20-00, Fuel Selector.

(7) **Fuel Selector Knob** - Refer to Section 28-20-00, Fuel Selector Knob.

(8) **Console** - After removing the panels, tubing and fuel selector, use the following steps to remove the console (refer to Figure 201):

(a) Remove the two flat head 10-32 screws located at the aft of the center console under the carpet on each side.

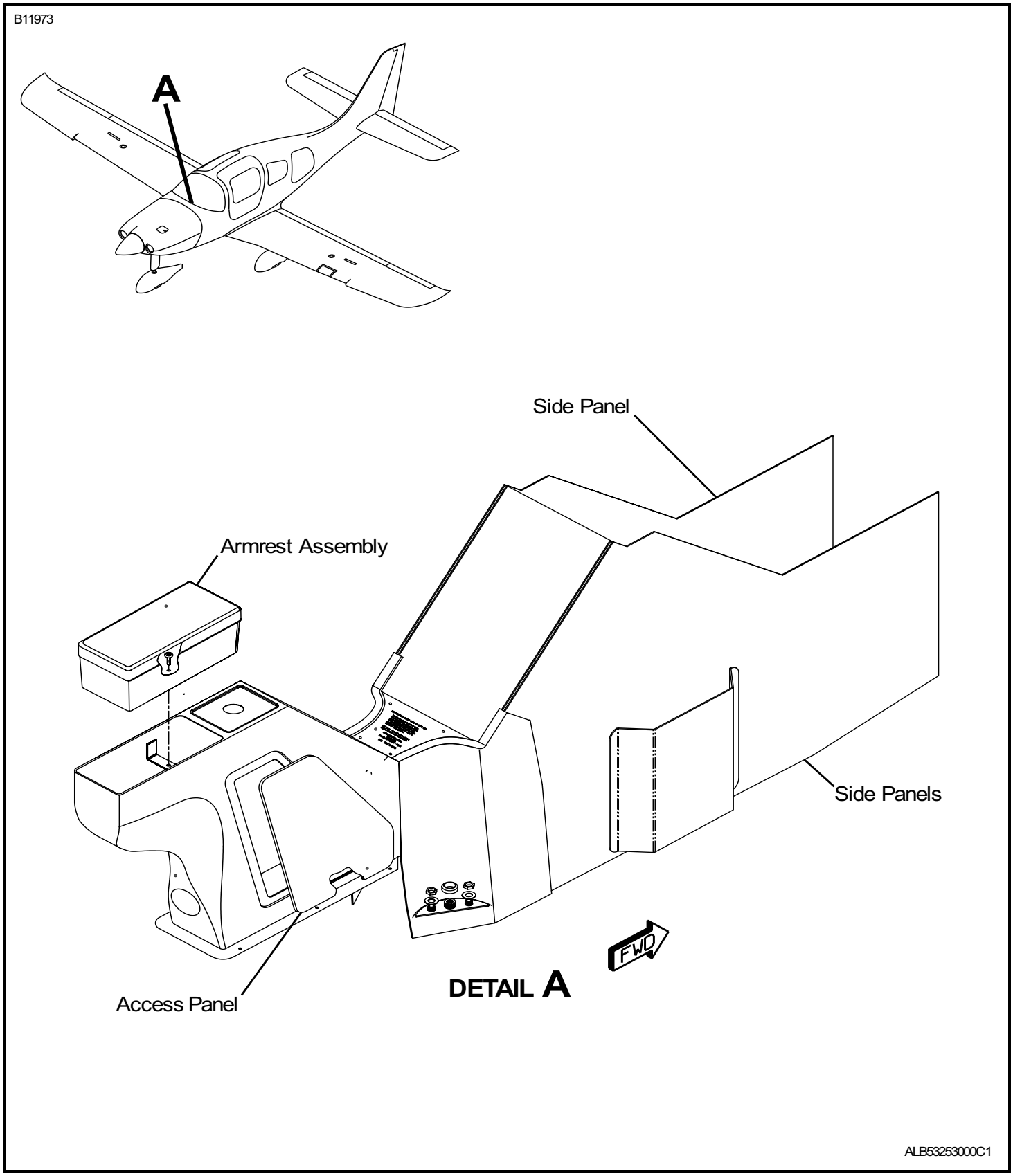
(b) Disconnect the headphone/intercom jacks and microphone plugs. Refer to Section 23-40-00, Headphone Jacks/Microphone Plugs.

(c) Disconnect the FlightMonitor (moving map display) controls, if installed, per instructions in Section 34-60-00, Moving Map Display Removal.

(9) **Assembly and Installation** - To assemble and install the center console, reverse the above procedure.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Center Console



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SEAT BELTS AND RESTRAINTS - MAINTENANCE PRACTICES

1. Seat Belts and Restraints

CAUTION: The seat belts are not interchangeable front to rear or left to right. Properly identify seat belts and shoulder harnesses when removing for correct installation later.

CAUTION: Do not remove the bolts that hold the seat belt bracket (located at the front side panel) to the floor, as these bolts are also used for wing attachment.

NOTE: Once a cotter pin is removed, it must be discarded. Do not reuse a cotter pin on the seat belt retaining bolts or on any other part in the airplane.

A. **Removal of Front Seat Belt and Shoulder Harness**

(1) Detach the lower seat belt mounts, buckle, and lap belt that are attached with 5/16-24 bolts, castellated nuts, cotter pins, and cap plug (on the right side of the center bracket). Removal of the front seat bottom cushions will make accessing these mounts easier (refer to Section 25-10-00, Cushion).

(2) Remove the front shoulder belt guide by unsnapping the guide cover, and remove the 1/4-28 bolt and washer.

(3) After removal of the middle lower side panel (refer to Section 25-30-00, Removal of MLSPL and MLSPR), detach the shoulder belt retractors that are located behind the lower side panels just aft of the front seats. The retractors are attached with four screws, washers, and 10-32 nuts.

B. **Installation of Front Seat Belt and Shoulder Harness** - Installation is the reverse of the above with the following additions:

(1) Torque the 10-32 screws attaching the shoulder belt retractors 30 to 36 in.-lbs.

(2) Torque the 1/4-28 bolts securing the shoulder belt guides to 72 to 84 in.-lbs.

(3) When securing the lower seat belt mount located at aircraft centerline, assemble the 5/16-24 bolts and castellated nuts hand tight until all side play is eliminated. If the notch in the castellated nut does not align with the hole in the 5/16-24 bolt, preventing the cotter pin from being installed, tighten the castellated nut until the next available notch aligns with the hole in the 5/16-24 bolt, then install a new cotter pin. Fill a new MS-3 cap plug half full with Wacker SWS-951 sealant, and install over the nut with the cotter pin.

(4) When securing the lower seat belt mount located at the front side panel, assemble the 5/16-24 bolts and castellated nuts hand tight until all side play is eliminated. If the notch in the castellated nut does not align with the hole in the 5/16-24 bolt, preventing the cotter pin from being installed, back off the castellated nut until the next available notch aligns with the hole in the 5/16-24 bolt. Install a new cotter pin as shown in Figure 201.

C. **Removal of Rear Seat Belt and Shoulder Harness**

(1) Detach the lower seat belt mounts, buckle, and lap belt that are attached with 5/16-24 bolts, castellated nuts, and cotter pins. Removal of the rear seat bottom cushions will make accessing these mounts easier (refer to Section 25-10-00, Removal Of The Rear Seats And Crossbar).

(2) The rear seat shoulder belt retractor is mounted on a stud protruding from the fuselage and held in place with a 3/8-24 self-locking nut and two special washers. Refer to Figure 202. The stud has a recess for a 5/32 Allen wrench so that the stud can be prevented from rotating when removing or installing the self-locking nut.

CAUTION: The stud must be prevented from rotating. Failure to prevent rotation may result in cracked or chipped paint on the exterior of the fuselage at the rear shoulder belt retractor location.

D. **Installation of Rear Seat Belt and Shoulder Harness** - Installation is the reverse of the above with the following additions:

(1) Install the special washers as shown in Figure 202.

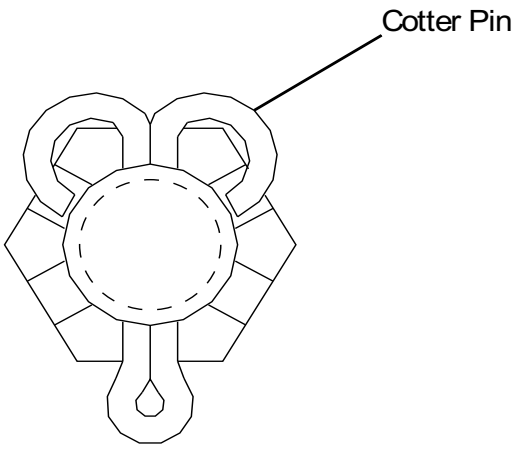
(2) Torque the self-locking nut 140 to 180 in.-lbs. Refer to Caution statement above.

(3) When securing the lower seat belt mounts, assemble the 5/16-24 bolts and castellated nuts hand tight until all side play is eliminated. If the notch in the castellated nut does not align with the hole in the 5/16-24 bolt, preventing the cotter pin from being installed, tighten the castellated nut until the next available notch aligns with the hole in the 5/16-24 bolt, then install a new cotter pin.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Cotter Pin

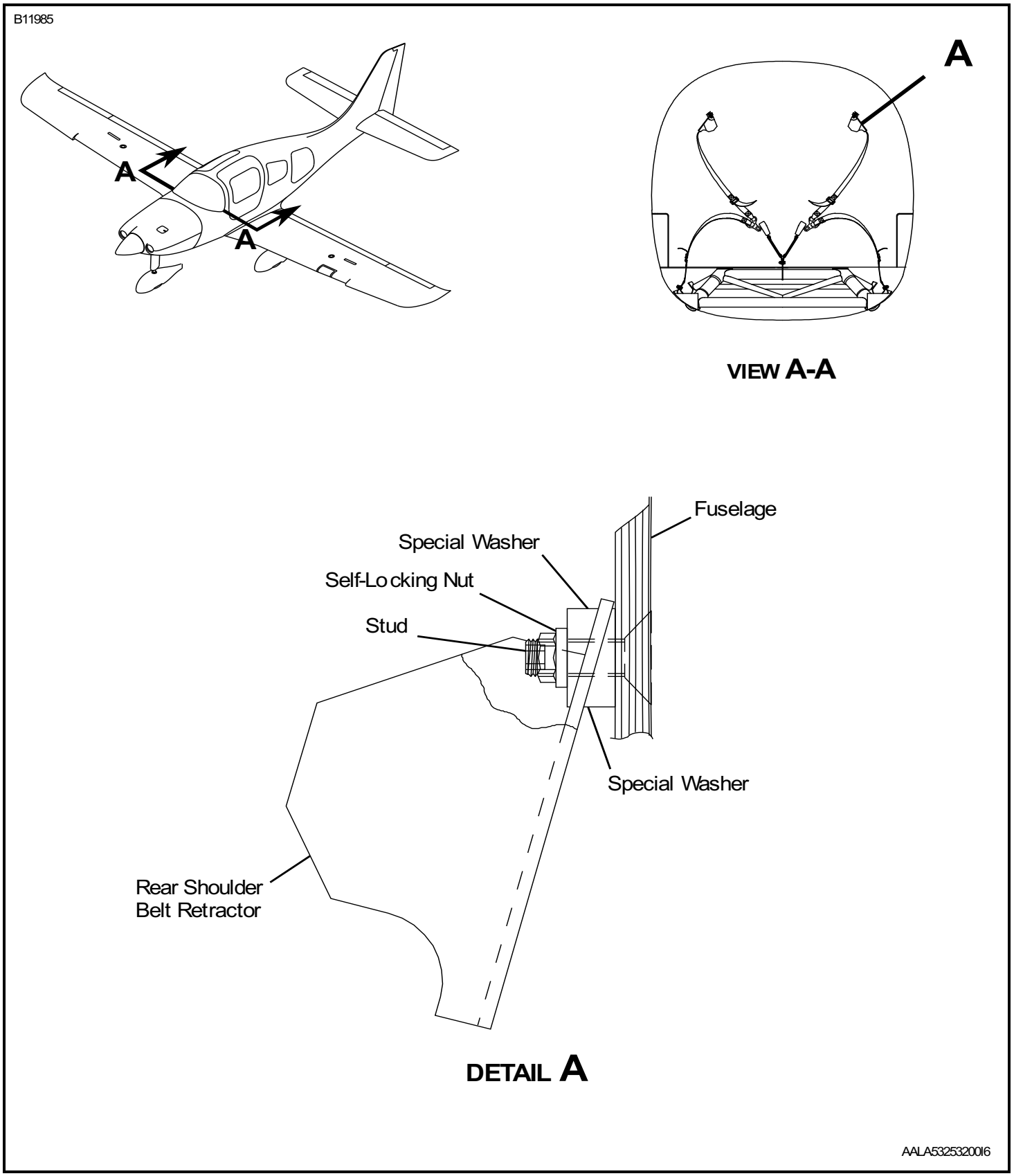
B11974



ALB53253000C1

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Rear Seat Belt Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

DOORS AND SIDE PANELS - MAINTENANCE PRACTICES

1. Doors and Side Panels

A. The Cabin Doors and Baggage Door removal and installation are covered in Section 52-10-00.

B. **Cabin Door Armrest** - The door armrest is attached to the door with three self-locking 8-32 nuts and washers accessible through the bottom of the door. Torque these nuts 20 to 25 in.-lbs. when reinstalling.

C. **Baggage Door Surround** - Removal of the baggage door surround panel is covered in Section 52-10-00.

D. **Baggage Door Interior Panel** - Removal and installation of the baggage door interior panel is covered in Section 52-10-00.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INTERIOR PANELS - MAINTENANCE PRACTICES

1. Forward Center Overhead Light Panel (FCOLP)

A. Removal of FCOLP

(1) Remove the three overhead swivel lights and courtesy light per instructions in Section 33-10-00.

(2) While supporting the forward center overhead light panel, remove the flat head 10-32 screw behind each overhead swivel light and the two flat head screws behind the courtesy light. Refer to Figure 201 .

(3) Lower the forward center overhead light panel, and disconnect the wiring.

(4) **Installation of FCOLP** - Installation is the reverse of the above. Torque the screws 30 to 36 in.-lbs.

2. Aft Center Overhead Light Panel (ACOLP)

A. Removal of ACOLP

(1) Remove the forward center overhead light panel. Refer to the FCOLP section.

(2) Remove the hat rack cushion.

(3) Remove the courtesy light per instructions in Section 33-10-00, Removal of the Interior Courtesy Light.

(4) While supporting the aft center overhead light panel, remove the two flat head 10-32 screws at the forward bracket and the flat head 10-32 screw behind the courtesy light.

(5) Slide the panel forward off the clip located on the rear bulkhead behind the hat rack cushion. Refer to Figure 202.

B. Installation of ACOLP - Installation is the reverse of the above. Torque the screws 30 to 36 in.-lbs.

3. Door Tread

A. Removal of Door Tread (Refer to Figure 203.)

(1) Remove the single flat head 6-32 screw located on the aft end of the door tread, part way up the door opening

(2) Remove the six flat head 10-32 screws located in the lower part of the door opening.

(3) Gently pry the door tread inward until access can be gained to the screws that attach the door tread to the forward lower side panel and middle lower side panel.

(4) Remove the two flat head 6-32 screws connecting the door tread to the forward lower side panel.

(5) Remove the two flat head 6-32 screws connecting the door tread to the middle lower side panel.

B. Installation of Door Tread - Installation is the reverse of removal.

(1) Torque the flat head 6-32 screws 10 to 12 in.-lbs.

(2) Torque the flat head 10-32 screws 30 to 36 in.-lbs.

4. Forward Lower Side Panels, Left (FLSPL) and Right (FLSPR)

A. Removal of FLSPL and FLSPR (Refer to Figure 203.)

(1) Partially remove the door tread per instructions in the Door Tread Removal section, steps 1 through 3.

(2) Detach the FLSP from the door tread per instructions in the Door Tread section.

(3) Remove the screw located at the lower forward end of the panel in the footwell.

(4) Detach the control stick boot from the FLSP. The boot is attached to the panel with Velcro.

B. Installation of FLSPL and FLSPR - Installation is basically the reverse of the above with the following exception to attach the control stick boot to the panel:

(1) Slide the FLSP part way down over the control stick.

(2) With the top of the panel as far inboard as possible against the control stick, reach behind the panel, from the top, and attach the outboard portion of the control stick boot to the panel.

(3) Tilt the lower edge of the panel as far inboard as possible, and reach up under the panel to finish attaching the control stick boot (forward, inboard, and aft) to the panel.

(4) Assure that the panel is not pre-loaded (the panel should not move out after the attachment screws are removed) so if the screw were to loosen, there would be no interference with the rudder controls.

5. Middle Lower Side Panels, Left (MLSPL) and Right (MLSPR)

A. Removal of MLSPL and MLSPR (Refer to Figure 203.)

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(1) Partially remove the door tread per instructions in the Door Tread Removal section, steps 1 through 3.

(2) Detach the MLSP from the door tread per instructions in the Door Tread section.

(3) The MLSP is attached to a bracket under the armrest with Velcro. Pull the panel up and away to detach.

(4) Disconnect the vent by clipping the tie wrap that holds the tubing to the eyeball vent and sliding the tubing off the eyeball vent. Since the tie wrap is cut (destroyed) during removal, a new tie wrap must be used when reassembling the heater ventilation tubing.

(5) Disconnect the headphone/intercom jacks and microphone plugs per instructions in Chapter 23.

B. **Installation of MLSPL and MLSPR** - Installation is the reverse of removal.

6. Forward Overhead Side Panels, Left (FOSPL) and Right (FOSPR)

A. **Removal of FOSPL and FOSPR**

(1) Remove the forward center overhead light panel per instructions in the Forward Center Overhead Light Panel section.

(2) Partially remove the door tread per instructions in the Door Tread Removal section, steps 1 through 3.

(3) For aircraft S/N 40004 to 40010, remove the six flat head 10-32 screws attaching the FOSP to the door joggle.

(4) For aircraft S/N 40011 and on, remove the six flat head 6-32 screws attaching the FOSP to the door joggle.

B. **Installation of FOSPL and FOSPR** - Installation is the reverse of removal. Torque the flat head screws 30 to 36 in.-lbs.

7. Aft Overhead Side Panels, Left (AOSPL) and Right (AOSPR)

A. **Removal of AOSPL and AOSPR**

(1) Remove the FCOLP per instructions in the Forward Center Overhead Light Panel section.

(2) Remove the front shoulder belt guide per instructions in the Removal of Front Seat Belt and Shoulder Harness section.

(3) Remove the rear seat shoulder belt retractor per instructions in the Removal of Rear Seat Belt and Shoulder Harness section.

(4) Partially remove the door tread per instructions in the Door Tread Removal section, steps 1 through 3.

(5) For aircraft S/N 40004 to 40010, remove the five flat head 10-32 screws attaching the AOSP to the door joggle.

(6) For aircraft S/N 40011 and on, remove the five flat head 6-32 screws attaching the AOSP to the door joggle.

(7) Pry the clip loose on the AOSP that attaches the panel to the bracket located about halfway down on the aft side of the rear window.

B. **Installation of AOSPL and AOSPR** - Installation is the reverse of removal. Torque the flat head screws 30 to 36 in.-lbs.

8. Baggage Lower Side Panel, Left (BLSPL) and Right (BLSPR)

A. **Removal of BLSPL and BLSPR**

(1) Remove the two flat head 10-32 screws located on the topside of the baggage lower side panel at the forward and aft end.

(2) Lift the baggage lower side panel straight up off the four locating brackets bonded to the floor.

B. **Installation of BLSPL and BLSPR** - Installation is the reverse of removal. Torque the flat head screws snug.

9. Aileron Torque Arm Cover

A. **Removal of Aileron Torque Arm Cover** (Refer to Figure 204.)

(1) Remove the left or right rear seat bottom cushion as required per instructions in the Removal Of The Rear Seats And Crossbar section.

(2) For aircraft S/N 40004 to 40010, remove the three flat head 6-32 screws.

(3) For aircraft S/N 40011 and on, remove the two flat head 6-32 screws.

B. **Installation of Aileron Torque Arm Cover** - Installation is the reverse of removal. Torque the flat head screws 10 to 12 in.-lbs.

10. Hat Rack Cushion

A. The hat rack cushion is a friction fit against the rear bulkhead. Slip fingers between the cushion and the carpet and pull on the cushion to remove. Push into position to replace. The ELT label must face forward.

11. Hat Rack Carpet

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

A. The hat rack carpet is secured to the hat rack floor by the hat rack baggage net. Remove the hat rack baggage net (refer to the Hat Rack Baggage Net section) to lift out the hat rack carpet.

12. Baggage Floor Carpet

A. **Removal of Baggage Floor Carpet**

(1) Remove the two baggage net cinch strap loops per instructions in the Baggage Net Cinch Strap Loot section.

(2) Remove the four baggage net anchor plates per instructions in the Baggage Net Anchor Plate section.

(3) Remove the left and right baggage lower side panels per instructions in the Baggage Lower Side Panel section.

(4) Remove the hat rack carpet per instructions in the Hat Rack Carpet section.

(5) Remove the rear seat backs per instructions in the Removal Of The Rear Seats And Crossbar section.

(6) Pull up on the carpet to remove.

B. **Installation of Baggage Floor Carpet** - Installation is the reverse of removal.

13. Cargo Compartment

A. **Upper Hat Rack Baggage Net Tie Down Bracket** - The upper hat rack baggage net tie down bracket is attached to the fuselage with a hex head 1/4-28 bolt and washer. Apply Permatex Form-A-Gasket No. 2 to the first two threads on the bolt prior to installation. Torque the hex head bolt 72 to 84 in.-lbs. Locate the bracket with the bent ears forward.

B. **Hat Rack Baggage Net** - The hat rack baggage net is attached to the hat rack shelf with two hex head 1/4-28 bolts and washers. The bolt goes through a spacer to prevent crushing of the carpet foam. Torque the hex head bolt 72 to 84 in.-lbs. Locate the permanently attached baggage net brackets with the bent ears forward.

C. **Baggage Net Cinch Strap Loop** - Each baggage net cinch strap loop is attached to the baggage floor with two pan head 10-32 screws and washers. Torque the pan head screws 30 to 36 in.-lbs. when installing.

D. **Baggage Net** - The baggage net is attached to the floor at each corner with quick release fittings. Lift the locking block, and slide the post and locking block inward to detach.

E. **Baggage Net Anchor Plate** - The four baggage net anchor plates, located in the corners of the cargo compartment, are attached to the floor with two each flat head 10-32 screws. Torque the flat head screws 30 to 36 in.-lbs.

14. Control Sticks

A. **Removal of Control Stick**

(1) Lift the control stick handle up far enough to gain access to the metal collar inside. If necessary, cut the tie-wraps at the base of the stick to release the attaching wires. If difficulty is still encountered, apply a light to moderate amount of heat (such as from a heat gun) to help in the handle removal.

(2) Clean the adhesive from the mating surfaces.

(3) Surface prep the mating surfaces with alcohol, acetone, or equivalent.

(4) Apply a new adhesive (Hysol 9321 or equivalent) to the top and sides of the shaft collar and to the inside wall of the grip, taking care not to allow adhesive to overlap threaded hole.

(5) The set screw for the control stick grip should face generally forward to hide the screw hole from view, but minor adjustments can be made to suit individual pilots.

(6) After functionally testing the grip switches, install a new tie wrap at the base of the stick for continued security of wires.

B. **Control Stick Clearance Inspections** - The following inspections should be done when any maintenance is done to the control stick or if interior panels around the control stick are removed and replaced.

(1) **Inspection No. 1** - While sitting in the left seat, grasp the control stick below the grip, and move it throughout its entire range of travel, i.e., control stop to control stop. Ensure that neither the left of right stick grips make any contact with either of the side panels. If interference is noted, contact the factory immediately.

(2) **Inspection No. 2** - While sitting in the left seat, grasp the left control stick grip normally, and move it to the full left aileron position. Next, while maintaining the full left aileron position, move the stick to the full aft elevator position. Ensure that the left hand does not interfere with the full aft travel of the stick. The left hand may brush the side panel; however, if the left aileron does not move, the clearance is adequate. If interference is noted, contact the factory immediately.

(3) **Inspection No. 3** - While sitting in the right seat, grasp the right control stick grip normally, and move it to the full right aileron position. Next, while maintaining the full right aileron position, move the stick to the full aft elevator position.

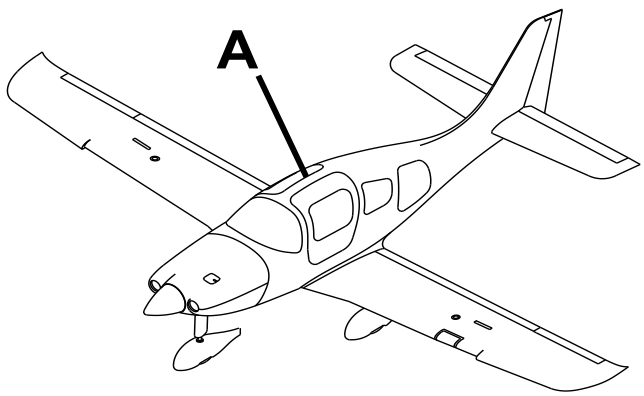
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

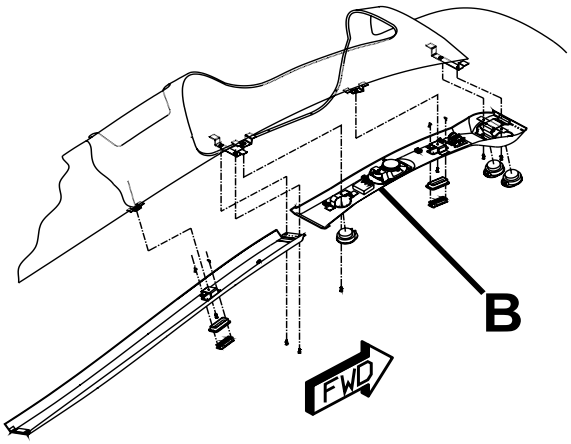
Ensure that the right hand does not interfere with the full aft travel. The right hand may brush the side panel; however, if the right aileron does not move, the clearance is adequate. If interference is noted, contact the factory immediately.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

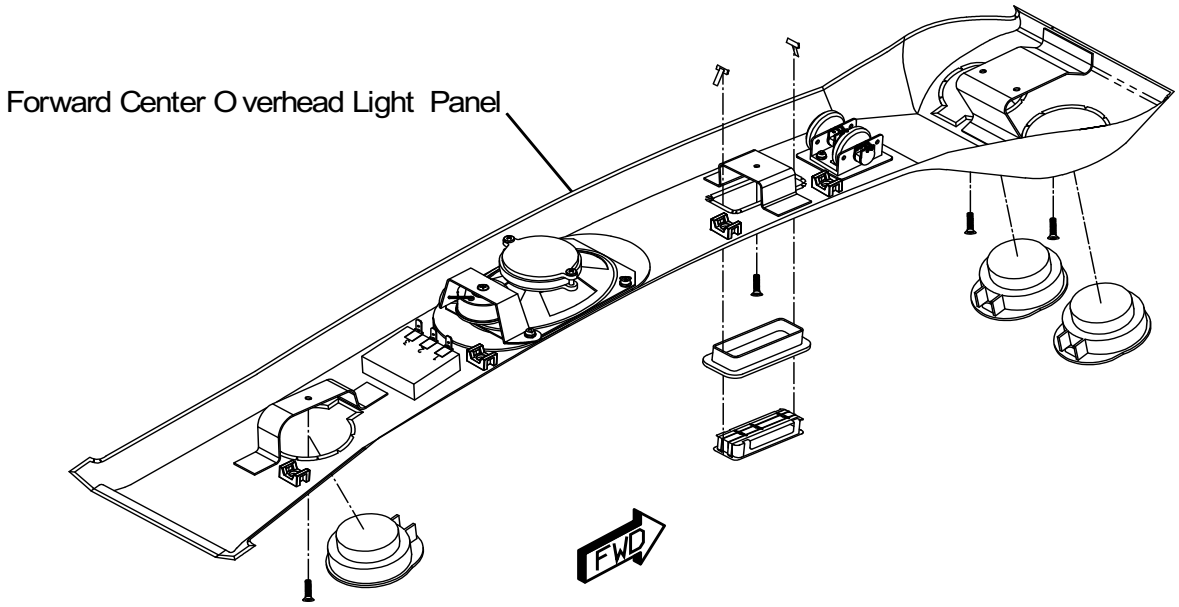
Figure 201 : Sheet 1 : FCOLP

B11986





DETAIL A



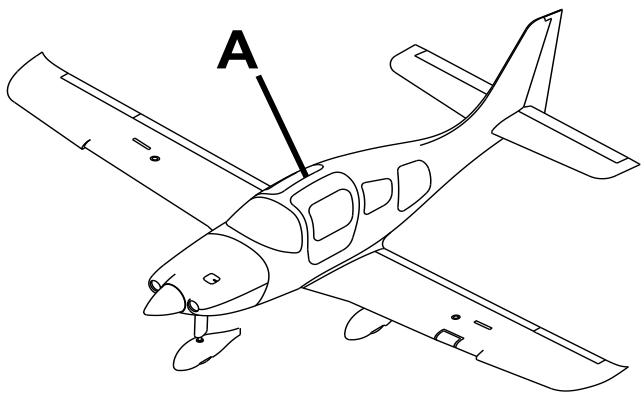
DETAIL B
S/N 40004 to 40010

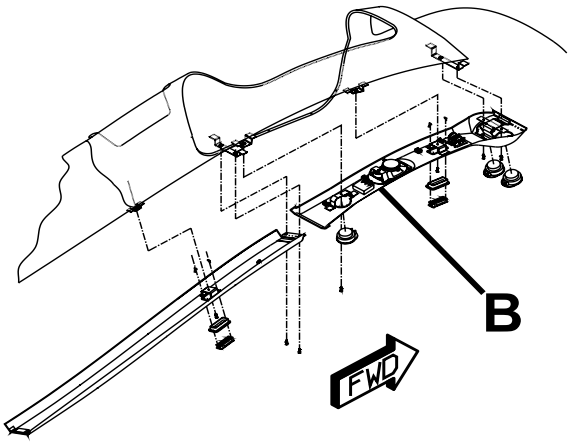
AFA5334200102

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

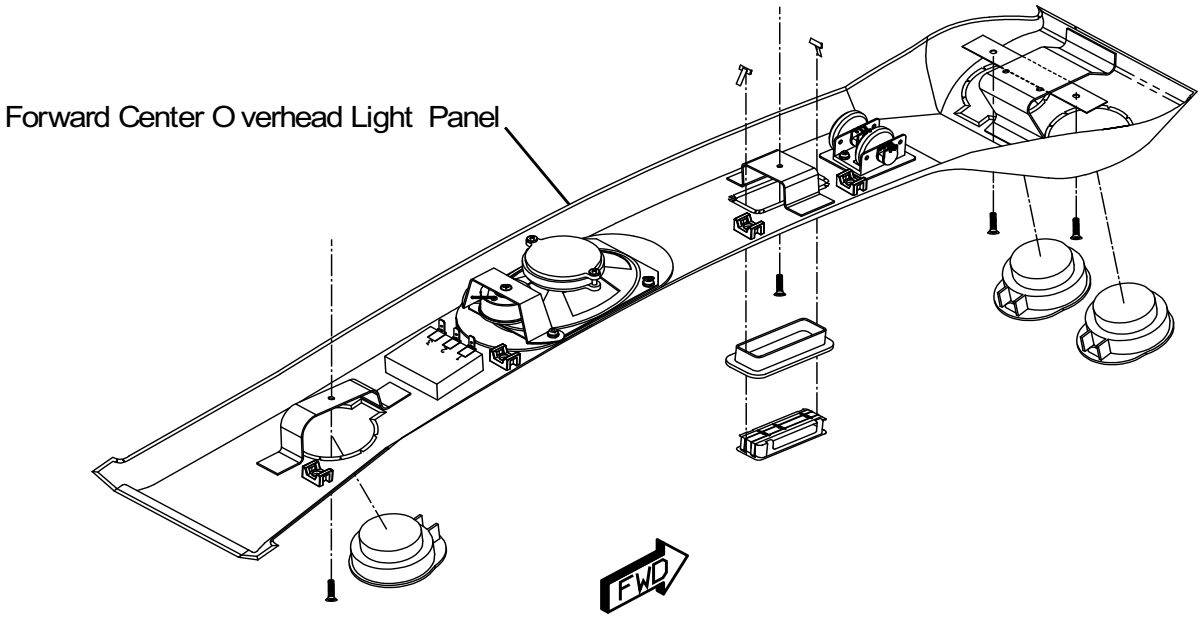
Figure 201 : Sheet 2 : FCOLP

B11987





DETAIL A

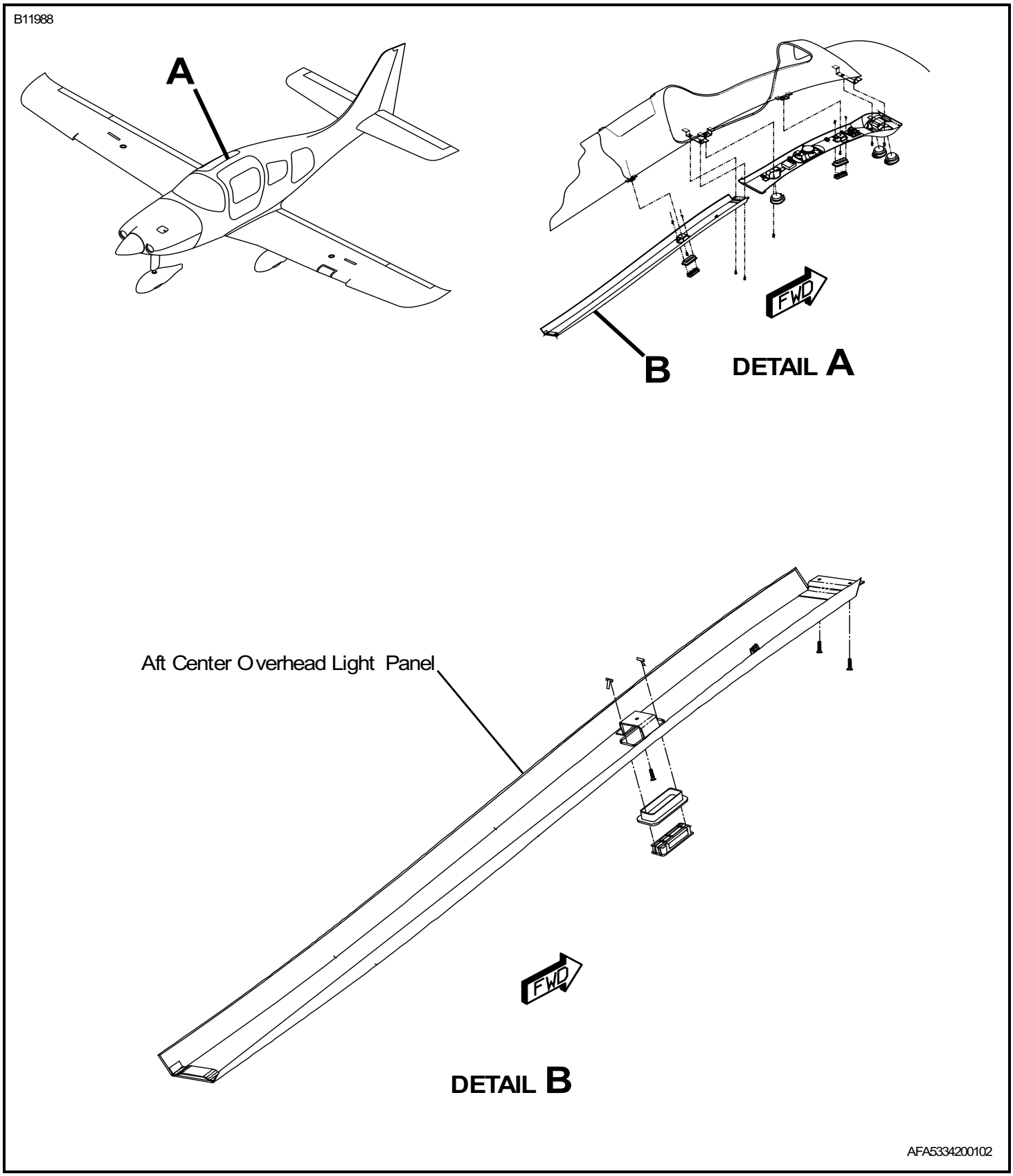


DETAIL B
S/N 40011 and On

AFA5334200102

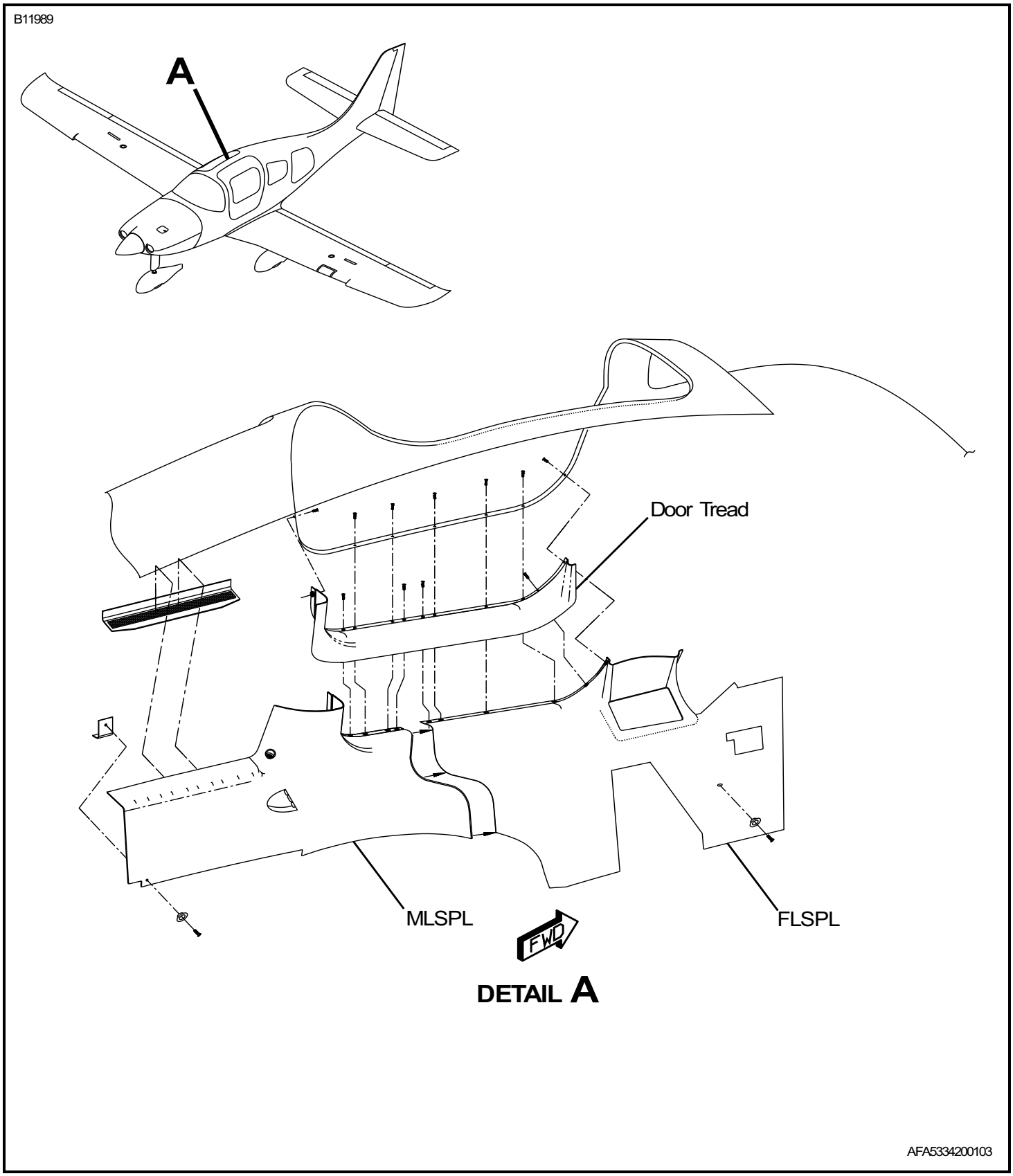
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : ACOLP



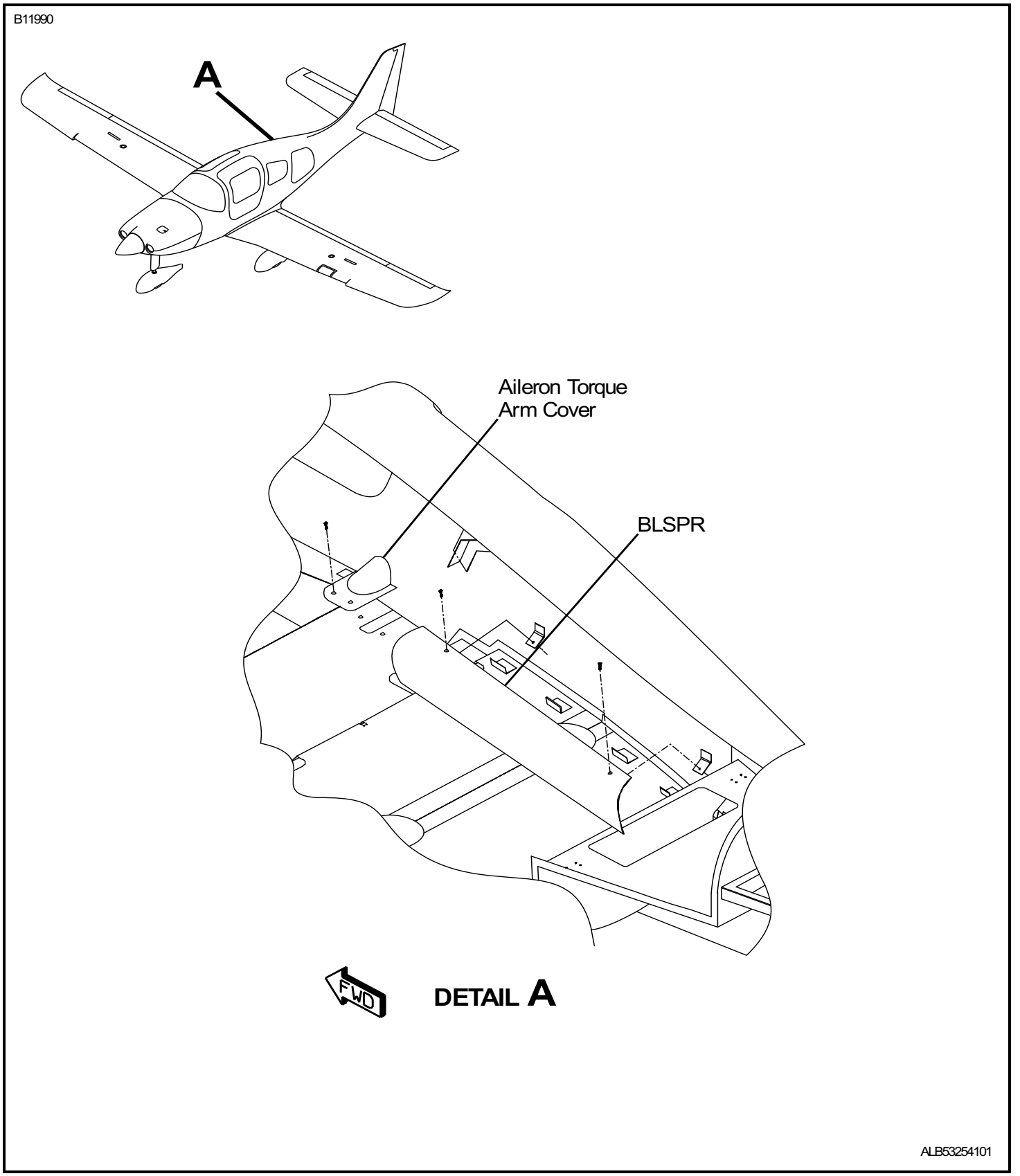
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Door Tread, FLSPL, and MLSPL



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : BLSPR and Aileron Torque Arm Cover



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ACCESS PANELS - MAINTENANCE PRACTICES

1. Forward Wing Saddle Access Panel, Left and Right

A. Removal of Wing Saddle Access Panels

(1) Remove the left or right front seat pan as required per instructions in Section 25-10-00, Removal, Installation, and Adjustment of the Front Seats.

(2) Remove the four truss head 8-32 screws securing the panel to the floor. Refer to Figure 201.

B. **Installation of Wing Saddle Access Panels** - Installation is the reverse of removal. Torque the truss head screws 30 to 36 in.-lbs.

2. Forward Gearbox Access Panel, Left and Right

A. Removal of Forward Gearbox Access Panel

(1) Remove the rear seats per instructions in Section 25-10-00, Removal and Installation of the Rear Seats and Crossbar.

(2) Remove the baggage floor carpet per instructions in the Section 25-30-00, Baggage Floor Carpet.

(3) Remove the four truss head 8-32 screws securing the panel to the floor. Refer to Figure 201.

B. **Installation of Forward Gearbox Access Panel** - Installation is the reverse of removal. Torque the truss head screws 30 to 36 in.-lbs.

3. Aft Cabin Floor Access Panel

A. Removal of Aft Cabin Floor Access Panel

(1) Remove the baggage floor carpet per instructions in Section 25-30-00, Baggage Floor Carpet.

(2) Remove the 13 truss head 8-32 screws securing the panel to the floor. Refer to Figure 201.

B. **Installation of Aft Cabin Floor Access Panel** - Installation is the reverse of removal. Torque the truss head screws 30 to 36 in.-lbs.

4. Elevator Interconnect Access Panel

A. Removal of Elevator Interconnect Access Panel

(1) Remove the hat rack carpet. Refer to the Hat Rack Carpet section.

(2) Remove the 6 truss head 8-32 screws securing the panel to the floor. Refer to Figure 201.

B. **Installation of Elevator Interconnect Access Panel** - Installation is the reverse of removal. Torque the truss head screws 30 to 36 in.-lbs.

5. Electronics Bay Access Panel

A. Removal of Electronics Bay Access Panel

(1) Remove the hat rack cushion. Refer to the Section 25-30-00, Hat Rack Cushion.

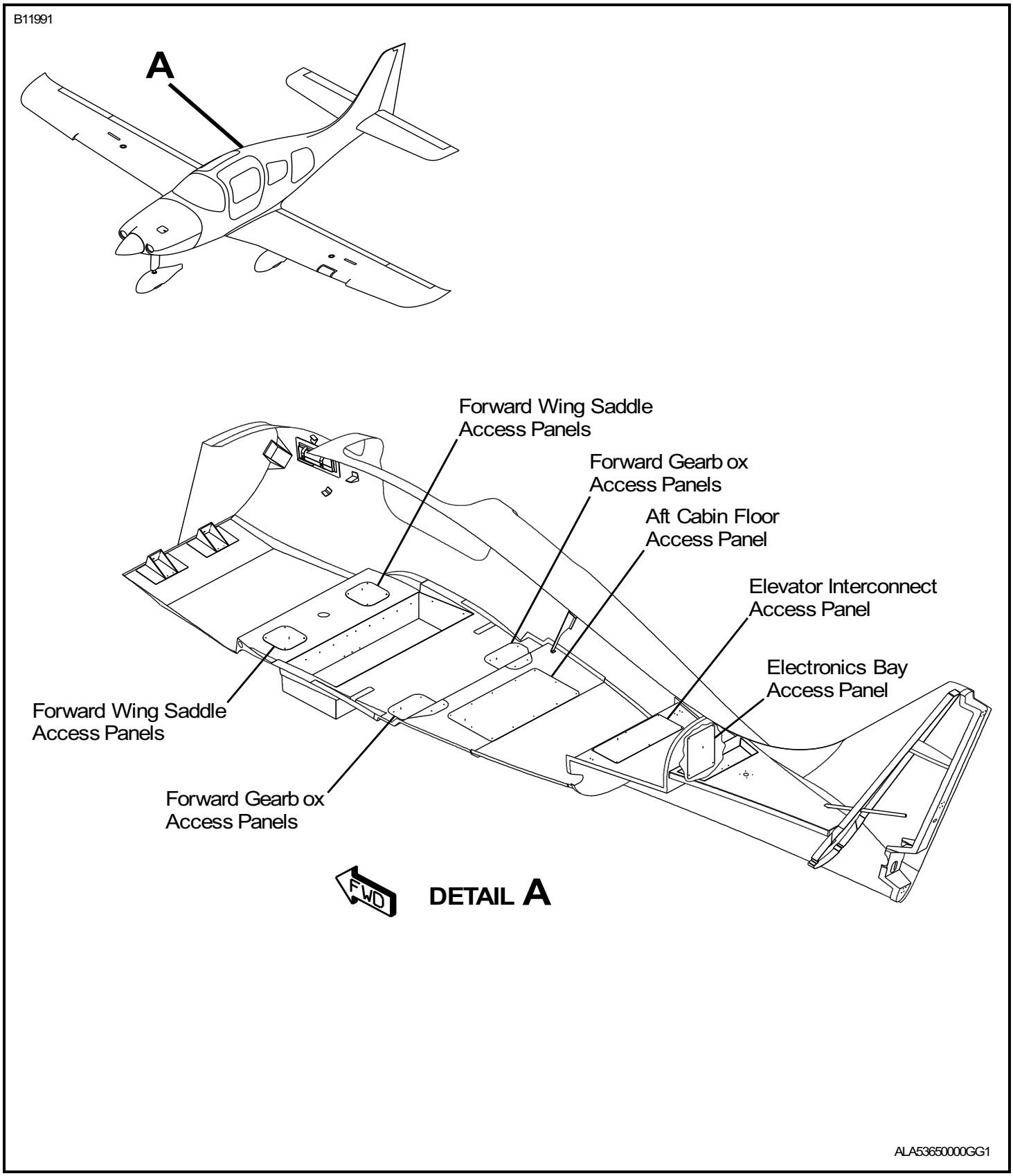
(2) Remove the hat rack carpet. Refer to the Section 25-30-00, Hat Rack Carpet.

(3) Remove the four truss head 8-32 screws securing the electronics bay access panel to the aft bulkhead.

B. **Installation of Electronics Bay Access Panel** - Installation is the reverse of removal. Torque the truss head screws 30 to 36 in.-lbs.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Access Panel Locations



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

EMERGENCY LOCATOR TRANSMITTER (ELT) - MAINTENANCE PRACTICES

1. Emergency Locator Transmitter (ELT)

A. Removal of the ELT

(1) Remove the electronics bay access panel per instructions in Section 25-31-00, Electronics Bay Access Panel.

(2) For the Artex 200 move the ELT switch from the ARM position to the OFF position. The Artex ME406 ELT switch does not have an OFF position.

(3) Disconnect the ELT antenna cable from the ELT.

(4) Disconnect the ELT remote switch cable from the ELT.

(5) Release the ELT retaining buckle, or velcro strap as applicable, to free the transmitter from the mounting bracket.

B. Installation of the ELT

(1) Reattach the transmitter to the mounting bracket using the ELT retaining buckle, or velcro strap, as applicable.

(2) Reconnect the ELT remote switch cable to the ELT.

(3) Reconnect the ELT antenna cable to the ELT.

(4) For the Artex 200, move the ELT switch from the OFF position to the ARM position.

(5) With the ELT switch in the ARM position, make sure the ELT is not transmitting. If the ELT is transmitting:

(a) Reset the Artex 200 by turning the unit OFF, then back to ARM. If the ELT does not reset, turn the unit OFF, remove, and service.

(b) Reset the Artex ME406 by turning the unit ON, then back to ARM.

C. For additional information concerning the emergency locator transmitter, consult the ELT manufacturer’s manual that came with the aircraft, or call the factory.

2. Emergency Locator Transmitter (ELT) Antenna

A. Removal of the ELT Antenna

(1) Remove the electronics bay access panel per instructions in Section 25-31-00, Electronics Bay Access Panel.

(2) For the Artex 200 move the ELT switch from the ARM position to the OFF position. The Artex ME406 ELT switch does not have an OFF position.

(3) Disconnect the antenna cable from the ELT antenna.

(4) Unscrew the antenna mounting nut and washer from the antenna mounting stud (lower part of antenna).

B. Installation of the ELT Antenna

(1) Reattach the antenna mounting nut and washer to the antenna mounting stud (lower part of antenna).

(2) Reconnect the antenna cable to the ELT antenna.

(3) For the Artex 200, move the ELT switch from the OFF position to the ARM position.

(4) With the ELT switch in the ARM position, make sure the ELT is not transmitting. If the ELT is transmitting:

(a) Reset the Artex 200 by turning the unit OFF, then back to ARM. If the ELT does not reset, turn the unit OFF, remove, and service.

(b) Reset the Artex ME406 by turning the unit ON, then back to ARM.

(5) For additional information concerning the ELT antenna, consult the ELT manufacturer's manual that came with the aircraft or call the factory.

C. For additional information concerning the ELT antenna, consult the ELT manufacturer’s manual that came with the aircraft or call the factory.

3. Emergency Locator Transmitter (ELT) Remote Switch

A. If basic instruments only or Avidyne avionics are installed, the ELT remote switch is located in the right knee bolster. If the Garmin G1000 system is installed, the ELT remote switch is located to the right of the MFD.

(1) Removal of the ELT Remote Switch

(a) Remove the right knee bolster per instructions in Section 25-11-00, Left and Right Knee Bolster, or reach under the instrument panel, as applicable.

(b) Disconnect the wiring from the remote switch.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(c) Remove the remote switch by removing the four pan head 4-40 screws that attach through the switch faceplate. The screws are secured with nuts and washers.

(2) **Installation of the ELT Remote Switch** - Installation is the reverse of the above with the following exceptions:

(a) After switch installation, make sure the ELT is not transmitting. If the ELT is transmitting:

- Reset the Artex 200 by turning the unit OFF, then back to ARM. If the ELT does not reset, turn the unit OFF, remove, and service.
- Reset the Artex ME406 by turning the unit ON, then back to ARM.

(3) For additional information concerning the ELT remote switch, consult the ELT manufacturer's manual that came with the aircraft, or call the factory.

4. Emergency Locator Transmitter Battery

A. **Artex 200 ELT**

(1) **Removal of the ELT Battery**

(a) Remove the ELT per instructions in the Emergency Locator Transmitter section.

(b) Remove the eight screws from the top ELT cover using a 3/32 Allen wrench.

(c) Gently pull the circuit board up until the slot with the battery pack wires is above the top of the ELT case.

(d) Unplug the battery from the circuit board.

(e) Lift the battery pack (the large rectangular box with the wires protruding from it as shown in Figure 201) out of the ELT case.

(2) **Inspection and Testing of the ELT Battery**

(a) Inspect the battery pack for leakage or corrosion. Replace with a new battery pack if any is found.

(b) Check the battery pack voltage under load. Replace if the voltage under load is less than 9.0 VDC.

(c) Measure the current drain. The ELT will need to be armed and not transmitting. Measured current should be less than 10 microamps.

(d) Further inspection and testing procedures, if needed, can be found by consulting the ELT manufacturer's manual that came with the aircraft or by calling the factory.

(3) **Installation of the ELT Battery**

(a) Plug the battery into the circuit board.

(b) Route the battery pack wires through the circuit board slot, and push the circuit board back into place.

(c) Route the battery pack wires into the notch in the center divider between the circuit board and the battery pack compartment.

(d) When installing the top cover screws, do not exceed 5 in.-lbs. of torque.

(e) Enter pertinent battery replacement information in the aircraft log book and fill out any other documentation required by local authority.

(f) Reinstall the emergency locator transmitter.

(g) Make sure the ELT is not transmitting. If the ELT is transmitting, reset by turning the switch OFF, then back to ARM. If the ELT does not reset, turn the unit OFF, remove, and service.

B. **Artex ME406 ELT**

(1) **Removal of the ELT Battery**

NOTE: The battery pack contains static sensitive parts, take electrostatic discharge precautions before handling.

(a) Remove the ELT per instructions in the Emergency Locator Transmitter section.

(b) Remove the eight screws from the battery-side cover, refer to Figure 202. Battery pack is identified by the embossed text: "BATTERY ACCESS ON THIS SIDE".

(c) Carefully lift the battery cover (battery pack) away from the ELT and unplug the flex-cable connected to the pack. Do not pull on the flexible portion of the cable - use the rigid section of the flex circuit at the connector as a handle.

(d) Inspect the battery pack and ELT chassis. The battery cells, components and connectors should be free of

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

corrosion. Inspect flex-circuit for broken connections or damage. Ensure the battery housing is free of cracks or other visible damage.

(2) **Installation of the ELT Battery**

(a) Lay the battery pack on the work surface with the batteries facing up.

(b) Install a replacement seal in the slot along the perimeter of the housing.

(c) Leaving the battery as it is, position the ELT over the battery pack with one hand and plug the flex-cable connector into the battery assembly using the other. The cable should not be twisted and the connector should 'click' into place. The battery connector is keyed to prevent incorrect installation.

(d) Mate the ELT to the battery, making sure that the seal is positioned correctly during the process.

(e) Replace the 8 securing screws and torque to 10 - 12 inch-lbs.

(f) Enter pertinent battery replacement information in the aircraft log book and fill out any other documentation required by local authority.

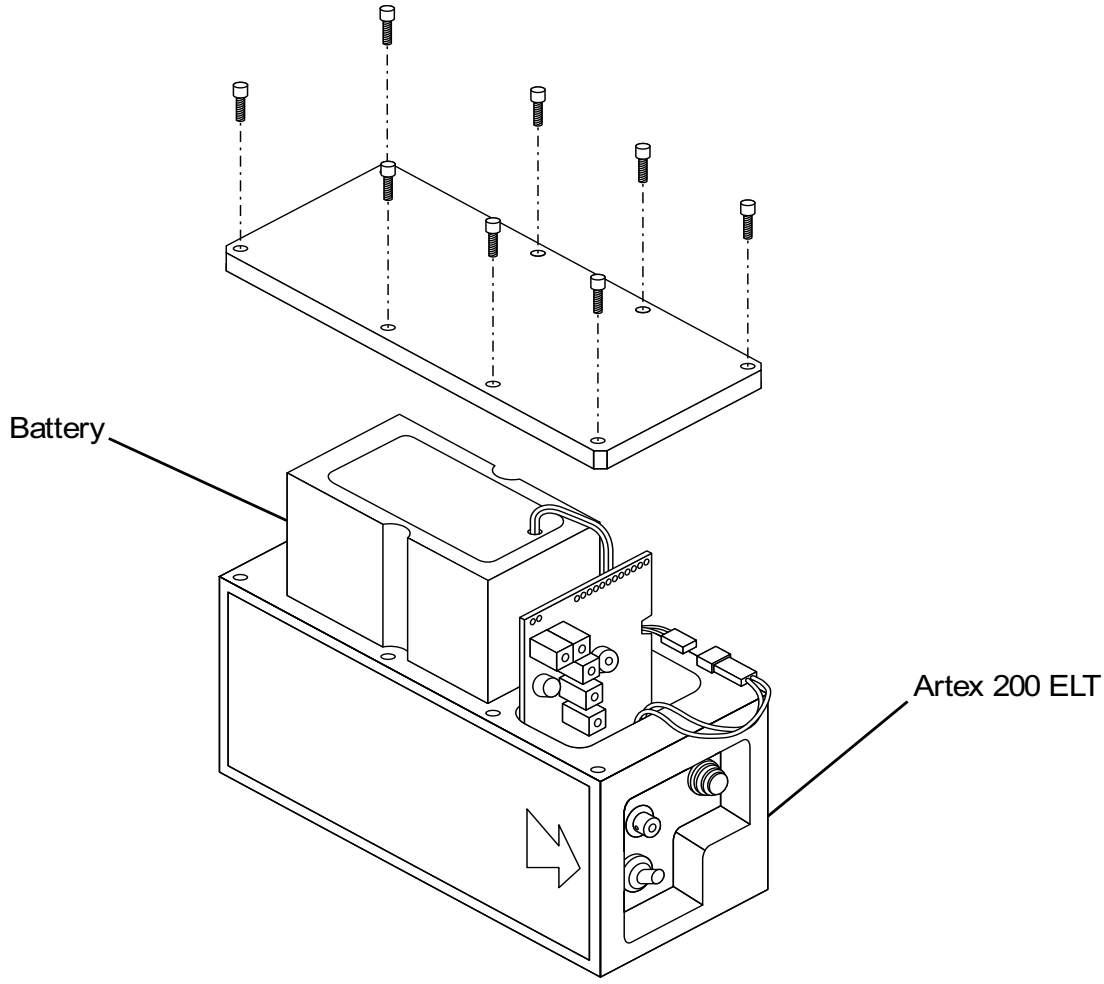
(g) Reinstall the emergency locator transmitter.

(h) Make sure the ELT is not transmitting. If the ELT is transmitting, reset by turning the switch ON, then back to ARM.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

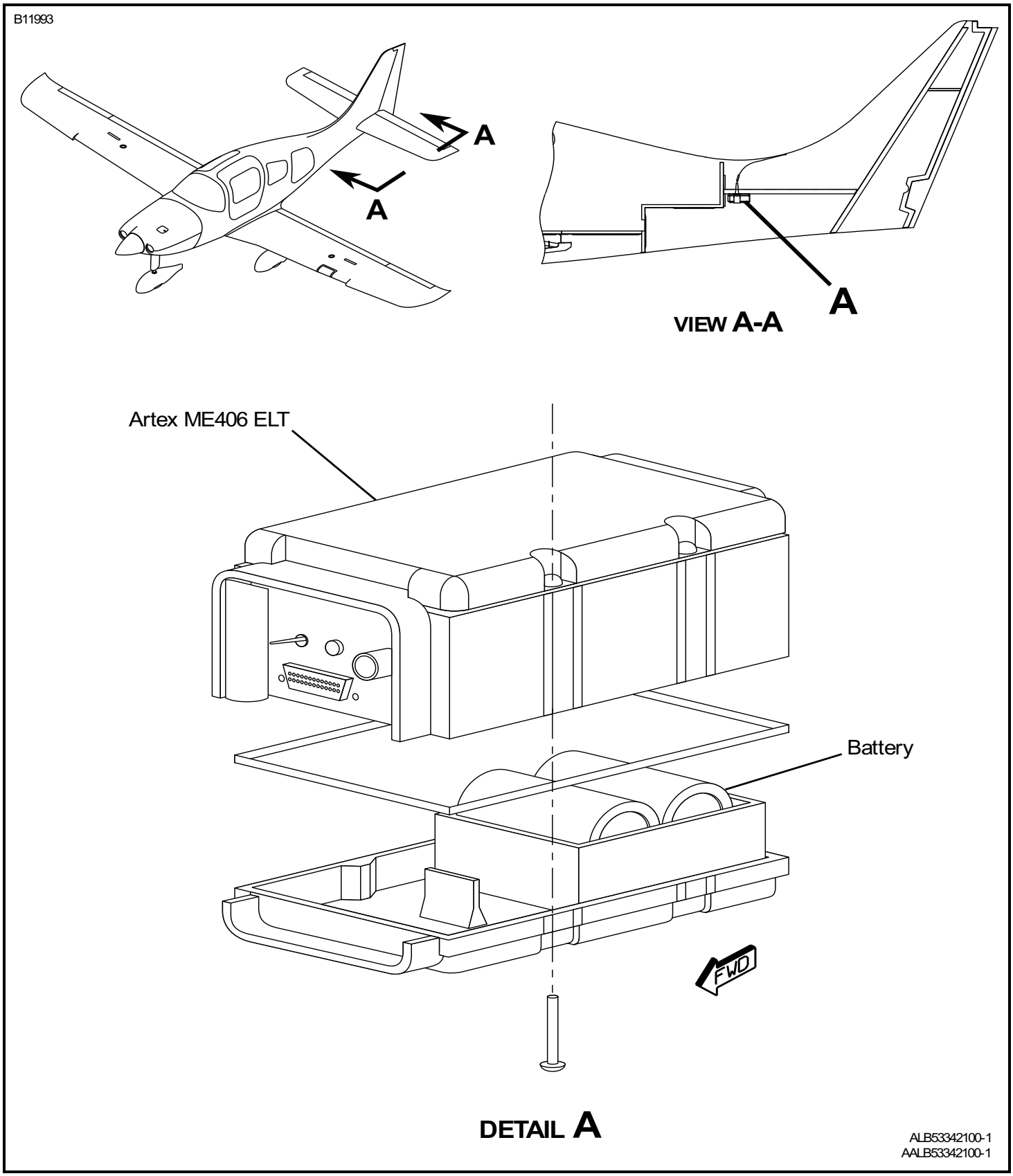
Figure 201 : Sheet 1 : Artex 200 ELT Battery

B11992



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Artex ME406 ELT Battery



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SOUNDPROOFING AND INSULATION - DESCRIPTION AND OPERATION

1. Soundproofing and Insulation

A. Firewall and Footwell

(1) The soundproofing material on the firewall and in the footwells is constructed of fire resistant foam with a permanent adhesive backing. The adhesive backing results in destruction of the material if removed; therefore, the material cannot be repaired, but must be replaced if damaged. However, the entire panel does not have to be replaced. Only the damaged section has to be replaced, provided it can be cleanly removed without damaging the surrounding area. The adhering surfaces must be cleaned before applying a new panel. Method of cleaning and any cleaner used shall be as approved by the factory. Large areas to be covered may be cut into smaller pieces for easier installation. Each panel must be trimmed to fit prior to installation. The precision of installation is critical, as the adhesive is so tenacious it is not possible to reposition afterwards. Avoid adhesive contacting skin. Avoid covering the mountings of maintenance items. Consult the factory if needed.

B. Aft of Doors

(1) The sound proofing material aft of the doors and in the cargo area (headliner and sides) is a one piece, cloth covered, fire resistant foam with a permanent adhesive backing. The adhesive backing results in destruction of the material if removed; therefore, the material cannot be repaired, but must be replaced if damaged. The one-piece design necessitates the removal or partial removal of all of the following interior components prior to stripping off of the old material:

(a) Rear seats. Refer to Section 25-10-00, Removal of the Rear Seats and Crossbar.

(b) Front seat belts. Refer to Section 25-13-00, Removal of Front Seat Belt and Shoulder Harness.

(c) Rear seat belts. Refer to Section 25-13-00, Removal of Front Seat Belt and Shoulder Harness.

(d) Baggage door surround. Refer to Section 52-10-00, Baggage Door Removal and Installation.

(e) Forward center overhead light panel. Refer to Section 25-30-00, Forward Center Overhead Light Panel.

(f) Aft center overhead light panel. Refer to the Section 25-30-00, Aft Center Overhead Light Panel.

(g) Middle lower side panels, left and right. Refer to Section 25-30-00, Middle Lower Side Panels.

(h) Aft overhead side panels, left and right. Refer to Section 25-30-00, Aft Overhead Side Panels.

(i) Baggage lower side panel, left and right. Refer to Section 25-30-00, Baggage Lower Side Panel.

(j) Hat rack cushion. Refer to Section 25-30-00, Hat Rack Cushion.

(k) Hat rack carpet. Refer to Section 25-30-00, Hat Rack Carpet.

(l) Upper hat rack baggage net tie down bracket. Refer to the Section 25-30-00, Upper Hat Rack Baggage Net Tie Down Bracket section.

NOTE: After stripping the old material off, the adhering surfaces must be cleaned with an approved cleaner and method for composite materials before applying the replacement part. The precision of installation is critical, as the adhesive is so tenacious it is not possible to reposition afterwards. Avoid adhesive contacting skin. Avoid covering the mountings of maintenance items. Consult the factory if needed.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

EMERGENCY EXIT HATCHET - MAINTENANCE PRACTICES

1. Emergency Exit Hatchet

A. The emergency exit hatchet is located on the vertical face of the floor under the pilot's seat. The blade of the hatchet points down and is inserted in an aluminum sheath, and the unit is secured with Velcro strips.

B. **Removal of Hatchet and Brackets**

(1) Remove the Velcro strips, and remove the hatchet.

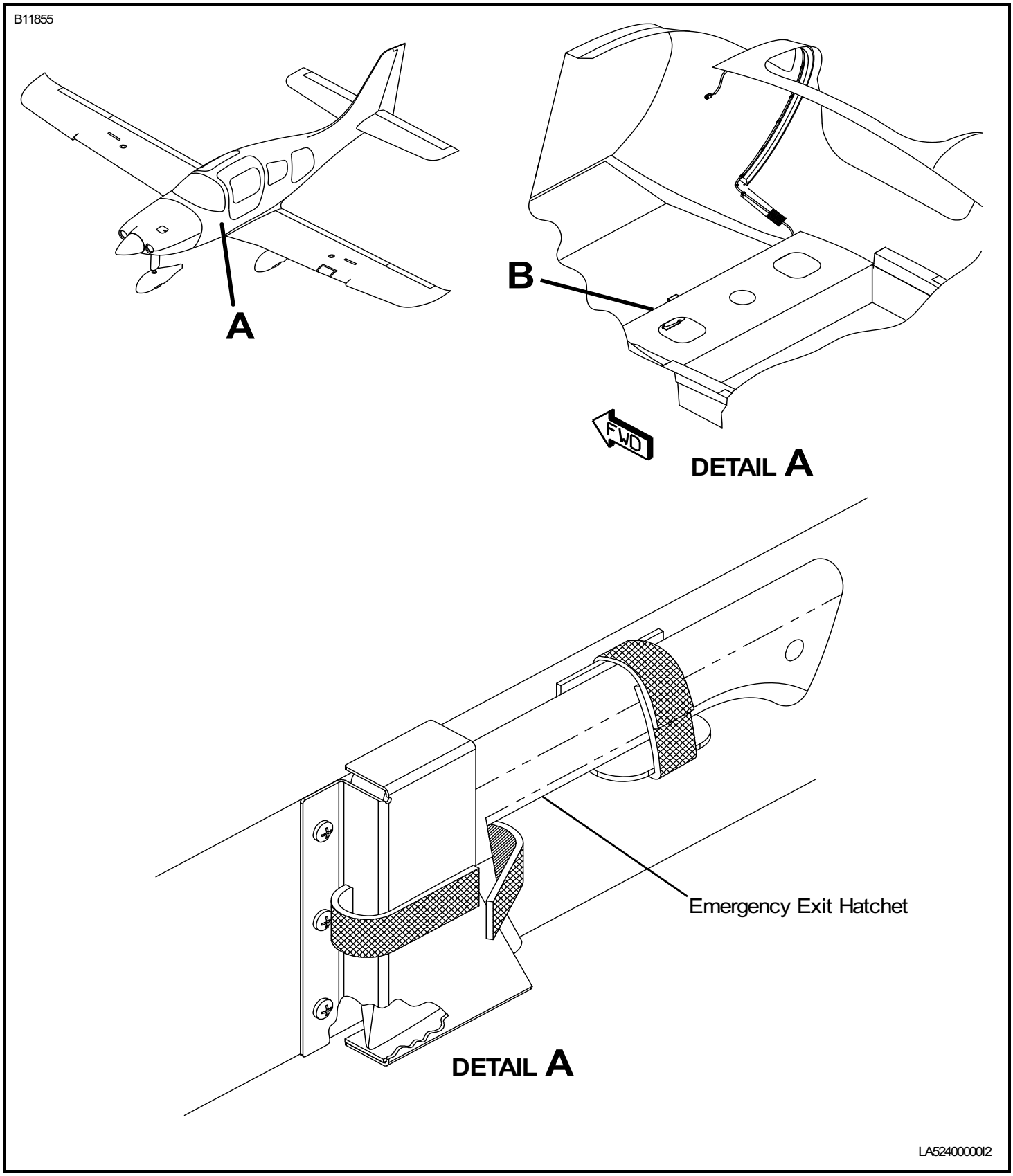
(2) If removal of the brackets is required, remove the two 8-32 flat head screws, washers, and self-locking nuts on the handle bracket.

(3) Remove the three 8-32 flat head screws, washers, and self-locking nuts on the blade bracket.

C. **Installation of Hatchet and Bracket** - Installation is the direct reversal of removal. Torque all screws 20 to 25 in.-lbs. Route the handle Velcro strap behind the bracket and around the handle as shown in Figure 201. Route the blade Velcro strap through the slot and under the blade as shown in Figure 201.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Emergency Exit Hatchet



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

FIRE PROTECTION - MAINTENANCE PRACTICES

1. General - Fire Extinguisher Description and Limitations

A. The airplane fire extinguisher is located below the copilot's seat in a metal bracket and is mounted horizontally. The extinguisher is stored with the top of the unit near the middle of the airplane so that it is accessible from the pilot's seat. Refer to Figure 201.

B. The extinguisher is filled with a 1211/1301 Halon mixture (commonly called Halonaire) that chemically interrupts the combustion chain reaction rather than physically smothering the fire. The hand extinguisher is intended for use on Class B (flammable liquids, oil, grease, etc.) and Class C (energized electrical equipment) type fires.

C. The installed fire extinguisher is an H3R, Inc. Halon blend model 1200. The unit has a 5BC U/L rating and contains 2.5 lbs. of recycled Halon with a 14-16 second discharge time. It has been demonstrated that 2.5 lbs. of extinguishing agent, when totally discharged at one time within the cabin of the airplane during flight, can be safely ventilated from the cabin within an FAA prescribed time period. The ventilation time period is important since Halon has some levels of toxicity. For this reason, using other types of fire extinguishers, with lower U/L ratings, different extinguishing agents, or greater weights of Halon is not approved.

D. **Temperature Limitations** - The fire extinguisher has temperature storage limitations that may need to be considered depending on the operating environment of the airplane. If it is anticipated that the cabin temperature will exceed the extremes shown in the table below, Table 201, the extinguisher must be removed and stored in a more temperate location.

Table 201. Temperature Limits for Fire Extinguisher Storage

Temperature Extremes	Maximum/Minimum Temperatures
Lowest Cabin Temperature	-40° Fahrenheit (-40° Celsius)
Highest Cabin Temperature	120° Fahrenheit (49° Celsius)

2. Inspecting the Charge of the Fire Extinguisher

A. Since the fire extinguisher does not have a pressure gauge to indicate its charge, it must be weighed at the annual or 100 hour inspection intervals to ensure there is an adequate amount of extinguishing agent. The extinguisher unit has a gross weight of 3.33 lbs.±1 ounce when it is installed in the airplane and must be replaced if the gross weight is less than 3.1 lbs. Use the following steps to determine if the fire extinguisher is properly charged.

(1) Remove the extinguisher from the airplane.

(2) Place the unit on a sensitive scale that measures weight within about half an ounce (14 grams).

(3) Verify that the gross weight of the unit is 3.1 lbs. (1420 grams) or more.

B. The variation between the weight of 3.33 pounds and the minimum allowable weight of 3.1 lbs. equates to a difference of 0.23 lb. or almost 105 grams. The fire extinguisher has a calibrated loss and can lose up to 4 grams of agent per year, or 24± grams during the extinguisher's useful six year life. Clearly, a loss of over 105 grams is an indication of a serious problem, and the extinguisher must be replaced

C. In any event, the extinguisher must be replaced after six years in service. It is not cost effective to reclaim the extinguisher's Halon, disassemble and inspect the unit, replace worn or defective parts, and then recharge it.

3. Inspecting the Condition of the Fire Extinguisher

A. Check the following items on the fire extinguisher and then reinstall in the airplane.

(1) Check condition of tamper seal for security.

(2) Check for damage to the discharge lever.

(3) Check condition of the valve nozzle.

(4) Check legibility and security of instructions decal.

(5) Ensure there are no dents or deformation to the cylinder.

(6) Note the extinguisher's gross weight on the 100 hour or annual inspection form.

4. Inspection of the Fire Extinguisher Bracket

A. Inspect the bracket mounting screw holes for evidence of fatigue and pull-through.

B. Inspect the clamp mechanism for evidence of fatigue, and look for bends or crimps in the circular band. Install the extinguisher.

C. Ensure the latching mechanism functions properly. Tug on the extinguisher a few times. The extinguisher should remain in

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

place even when a moderate force is applied. If the extinguisher has a tendency to break out of the bracket when a moderate force is applied to the unit, replacement of the bracket is required.

5. Removal and Installation of the Fire Extinguisher Bracket

A. The fire extinguisher bracket is mounted to the aft side of the footwell on the copilot's side of the airplane. It is attached with two 1/4 - 28 screws, two flat head washers, and two 1/4 - 28 self-locking nuts.

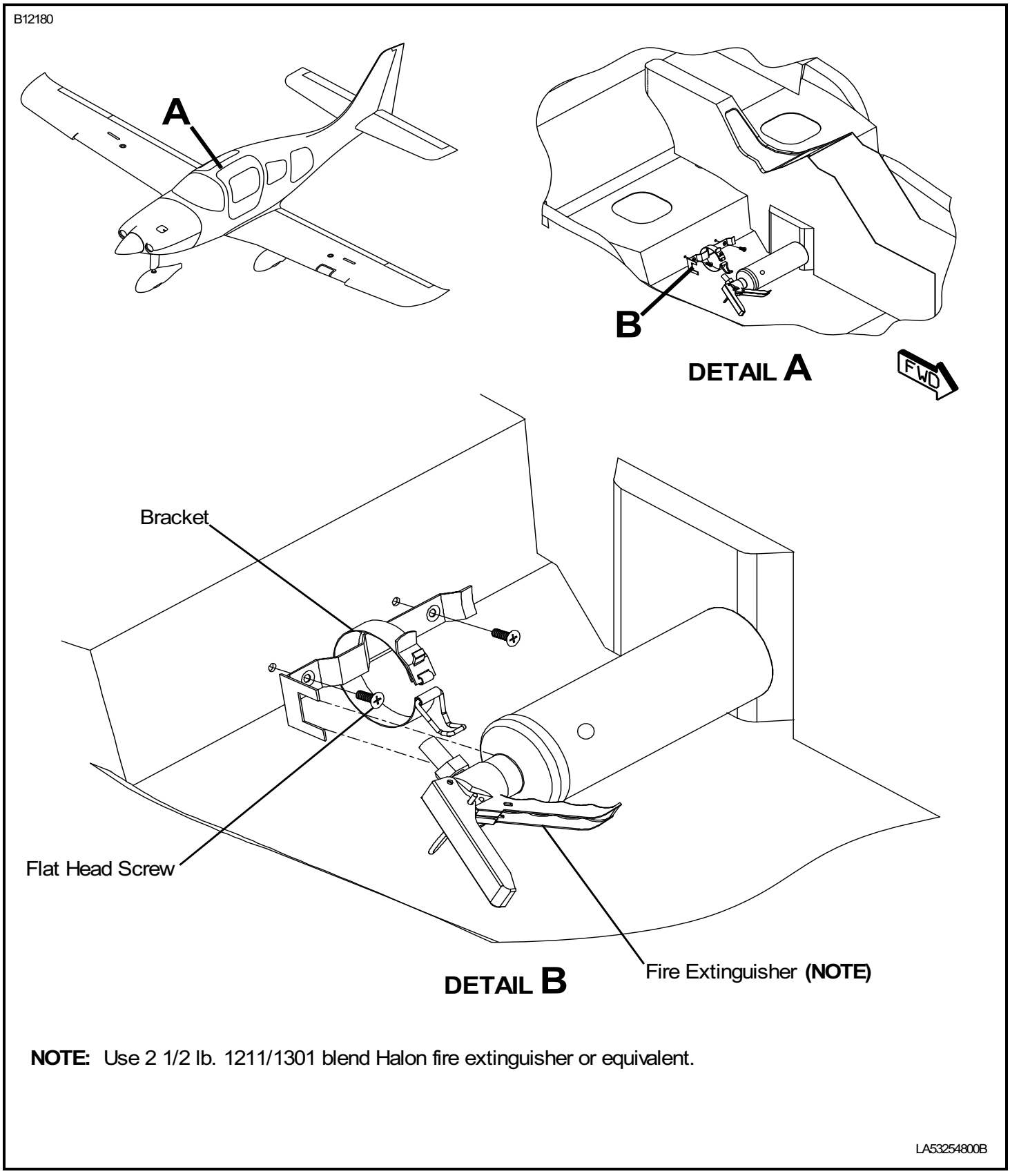
(1) The bracket is mounted by inserting the screws into the countersunk portion of the bracket and then inserting it through the pre-drilled holes in the panel of the footwell. The washer and self-locking nut are applied to the back side of the panel and torqued to 72 in.-lbs.

(2) The bracket is uninstalled by removing the two 1/4 - 28 self-locking nuts and flat head washers on the backside of the mounting panel.

B. Access to the back side of the mounting panel is available from two locations. There is an access panel under the copilot's seat, which requires removal of the seat (Refer to Section 25-10-00, Removal, Installation, and Adjustment of the Front Seats), and an access panel on the underside of the airplane below the copilot's seat. While access is more convenient using the panel under the airplane, the removal and installation of the bracket requires two people.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Fire Extinguisher



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INDICATING/RECORDING SYSTEMS - GENERAL

1. Voltmeter/OAT/Clock - General

A. **Voltmeter/OAT/Clock** - This instrument contains three separate indications. The upper window is dedicated to voltmeter and outside air temperature readings, and the lower window is a multi-function timepiece. Refer to Figure 1 for a drawing of the instrument. There are three control buttons on the face of the indicator. Pressing the top button, labeled O.A.T. and VOLTS, will cycle the reading in the upper Liquid Crystal Display (LCD) from a voltage reading, to an outside air temperature in °F, to an outside air temperature reading in °C. The lower two buttons, labeled SELECT and CONTROL, are for the multi-function clock and are discussed in Section 7 of the POH/AFM.

B. **Digital Clock** - The clock displays four time modes: universal time (UT), sometimes referred to as Greenwich Mean Time (GMT), local time (LT), flight time (FT), and elapsed time (ET). The time mode selected is indicated in the lower digital display window on the left side with a flashing underscore below the selected time mode. In Figure 1 the ET time mode is selected. Pressing the SELECT button several times cycles the display through the four time modes in the order they are listed.

C. **Testing The Clock** - Hold the SELECT button in for three seconds. This will cause the display to read 88:88 with all four modes underscored. When electrical power is first turned on, the top display will indicate the system's voltage, and the clock will display the mode it was in when the electrical power was turned off. When the electrical system of the airplane is not on, the time and other settings such as flight time are held in the memory of the clock by a backup AA battery. The battery has a three-year life, but it must be replaced every two years with a good 1.5 volt battery. Incorrect time and mode readings during power up are indications of an expended or defective backup battery. If temperatures are below -20°F, the numbers in the clock will not appear.

D. **Initial Set-Up**

(1) To Set UT (Universal Time - refer to the note below) use the following instructions:

(a) Press the SEL button one or more times until UT is displayed on the left hand side of the lower window.

(b) Press both the SEL and CTL buttons at the same time to enter the set mode. The tens of hours digit will start flashing.

(c) Press the STL button one or more times to change the tens of hours digit to the correct digit of Universal Time.

NOTE: The times of various events, particularly astronomical and weather phenomena, are often given in "Universal Time" (abbreviated UT) which is sometimes referred to, now colloquially, as "Greenwich Mean Time' (abbreviated GMT). The two terms are often used loosely to refer to time kept on the Greenwich meridian (longitude zero), *five hours ahead of Eastern Standard Time*. Times given in UT are almost always given in terms of a 24 hour clock.

(d) Press the SEL button once to move to the single hour digit, which will start flashing.

(e) Press the CTL button one or more times to change the single hour digit to the correct digit of Universal Time.

(f) Press the CTL button one or more times to change the tens of minutes digit to the correct digit of Universal Time.

(g) Press the SEL button once to move to the single minute digit, which will start flashing.

(h) Press the CTL button one or more times to change the single minute digit to the correct digit of Universal Time.

(i) Press the SEL button to exit the set mode. The lighted annunciator will resume its normal flashing indicating the UT clock is running.

(2) To Set LT (Local Time - refer to the note below) use the following instructions:

(a) Press the SEL button one or more times until LT is displayed on the left hand side of the lower window.

(b) Press both the SEL and CTL buttons at the same time to enter the set mode. The tens of hours digit will start flashing.

(c) Press the CTL button one or more times to change the tens of hours digit to the correct digit of Local Time.

NOTE: Local Time is *eight hours earlier* (PST) or *seven hours earlier* (PDT) than the Universal Time just set.

(d) Press the SEL button once to move to the single hour digit, which will start flashing.

(e) Press the CTL button one or more times to change the single hour digit to the correct digit of Local Time.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(f) Press the SEL button to exit the set mode as the minutes are already synchronized with the UT clock and can not be set in Local Time.

2. Hour Meter - General

A. **Indicating** - Flight time is recorded by an hour meter - most frequently referred to as the *Hobbs*, which is installed in the right knee bolster, next to the ELT remote switch. The instrument is DC powered. DC power for the hour meter bypasses the master switch and will operate with the master switch in the off position, provided sufficient battery power is available. The system is protected by a fuse located in a fuse block next to the battery. The meter will record up to 9999.9 hours. Flight time is measured by either an oil pressure switch or an air switch, depending on which option is installed.

B. **Oil Pressure Switch** - There is an oil pressure switch next to the oil pressure transducer as shown in Section 31-30-00, Figure 201. The switch is closed when oil pressure is introduced to the system. If the battery is adequately charged, a ground is established for the Hobbs (the other side of the Hobbs is powered from the 3 amp fuse on the power grid), and the time the engine is in operation is recorded and displayed on the meter.

C. **Air Switch** - There is an air switch located under the standby battery that activates at 2 inches of Hg or approximately 60 kts. This switch is plumbed into the pitot line for its activation.

NOTE: Both the air switch and the oil pressure switch have to be activated for the Hobbs meter to record time.

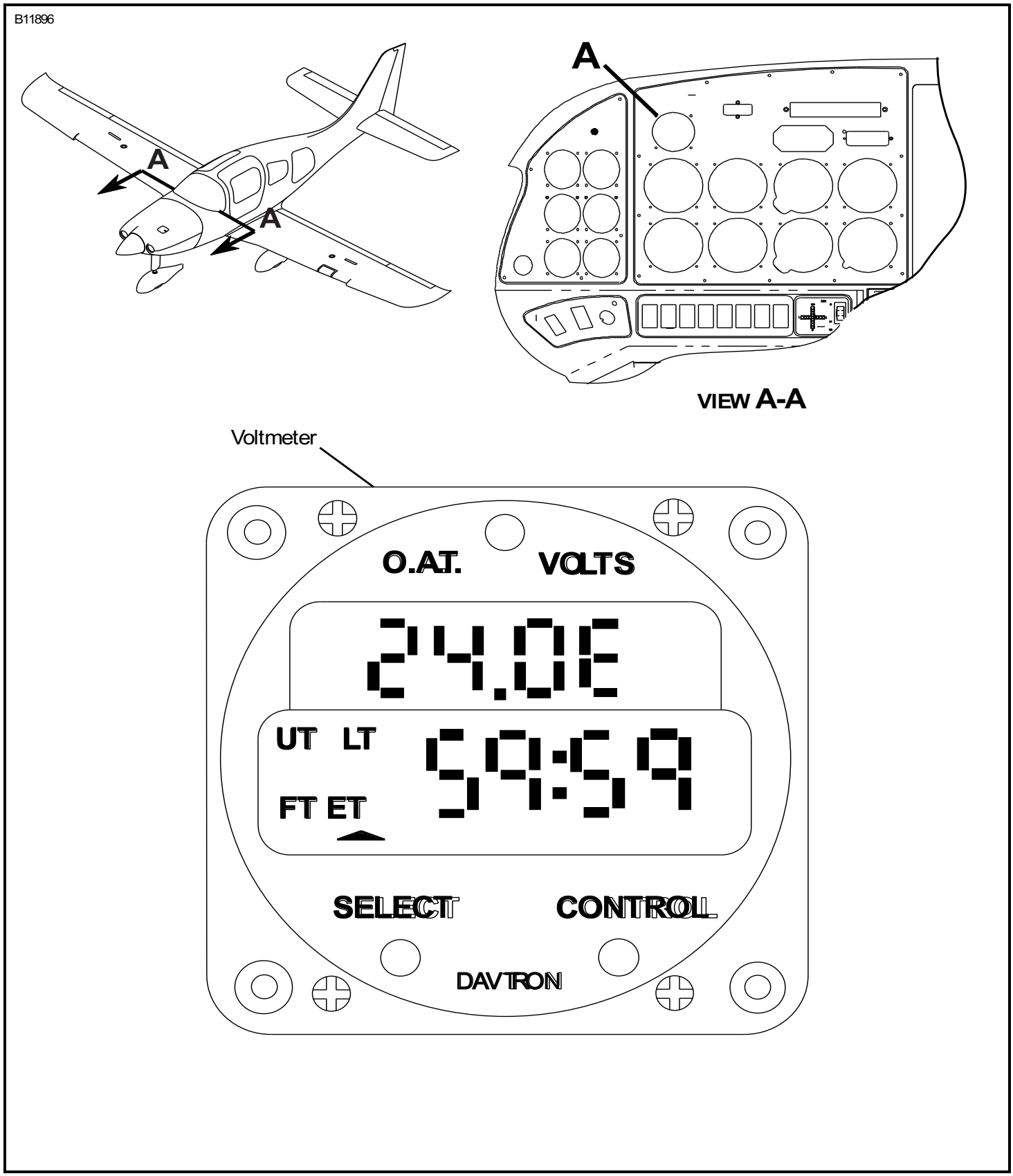
3. Documentation of Hobbs Meter Replacement

A. **Placard** - If a Hobbs meter becomes inoperative, it must be replaced as soon as possible. The time shown on the defective meter plus the best estimate of the additional time in service must be placarded in an area near the Hobbs. For example, if the meter had 627.9 hours when it became inoperative and an additional 2.1 hours of time in service was flown before replacement, then the placarded time would be 630 hours. A statement like *630 hours must is the current Hobbs Meter reading* is an appropriate placard.

B. **Logbooks** -Similar statements like those in the Placard paragraph, along with the date and time of the discrepancy, must be adequately documented in the airframe and engine logbooks.

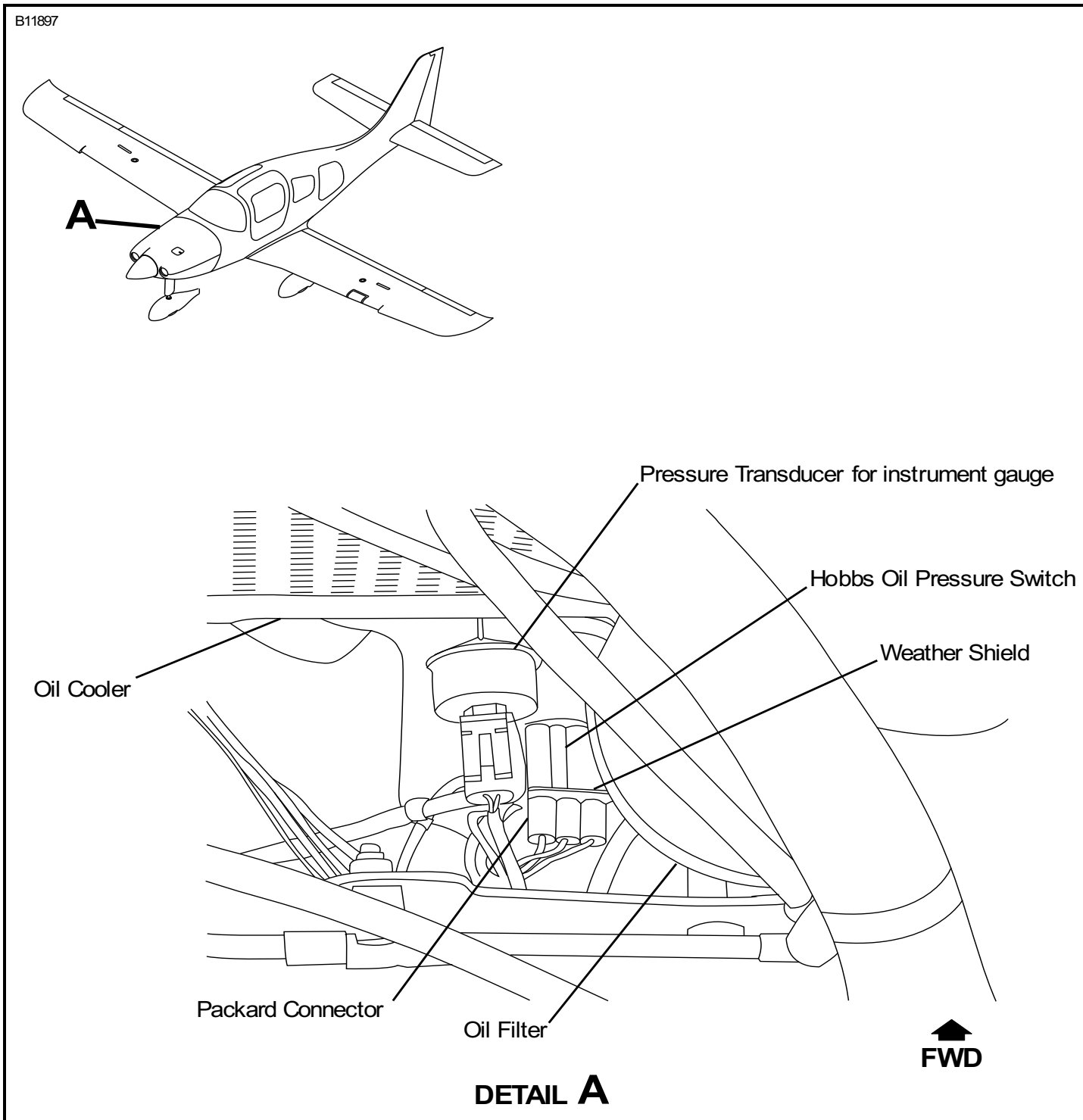
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Voltmeter/OAT/Clock



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Hobbs Oil Pressure Switch



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CLOCK - MAINTENANCE PRACTICES

1. Removal, Installation, and Maintenance of the Clock

A. Removal of the Clock

(1) Remove the glare shield per instructions in Section 25-11-00, and remove the connector installed in the back of the clock.

(2) Unscrew the four panel screws surrounding the clock.

(3) Remove the clock from the backside of the flight instrument panel.

B. Installation of the Clock

(1) Install the connector into the back of the clock.

(2) Align the clock with the screw holes in the flight instrument panel, and install the four screws. The screws should be snug tight.

(3) Reinstall the glare shield.

C. **Maintenance of the Clock** - No special maintenance of the clock is necessary other than the biennial replacement of the backup battery.

NOTE: It is not necessary to remove the clock to replace the backup battery. The clock is in the top portion of the flight instrument panel, and when the glare shield is removed, the AA battery can be accessed.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INDICATING/RECORDING SYSTEMS - MAINTENANCE PRACTICES

1. Removal, Installation, and Maintenance of the Hour Meter

A. Removal of the Hour Meter

(1) Remove the right knee bolster per instructions in Section 25-11-00, Left and Right Knee Bolster.

(2) Remove the connector installed in the back of the hour meter. Be sure to label the location of each wire.

(3) Unscrew the two screws on the back of the knee bolster, and slide the unit out.

B. Installation of the Hour Meter

(1) With the hour meter partially inserted through the hole in the knee bolster, install the connectors (per labeling) into the back of the hour meter.

(2) Slide the unit into its slot flush with the bolster, and install the two screws. The screws should be snug tight.

(3) Reinstall the knee bolster per instructions in Section 25-11-00, Left and Right Knee Bolster.

C. **Hour Meter Maintenance** - No special maintenance of the hour meter is required.

2. Removal and Installation of the Oil Pressure Switch

A. **Switch Removal** - Use the following steps for removal of the oil pressure switch. Refer to Figure 201.

(1) Remove the top engine cowling per instructions in Section 71-10-00.

(2) Remove the Packard electrical plug from the back of the switch.

(3) Use an open-end wrench to screw the 1/8 inch pipe-threaded switch out of the engine case.

B. **Switch Installation** - Use the following steps for installation of the oil pressure switch.

(1) Install the 1/8 inch pipe-thread pressure switch into the engine case. Torque switch 60 to 80 in.-lbs.

(2) Connect the Packard connector to the oil pressure switch. Ensure there is a red weather shield around the Packard switch.

(3) At an oil temperature reading of 75° F or higher, run the engine at about 1700 RPM to pressure test the system.

(4) Shut down the engine and check for oil leaks.

(5) Reinstall the engine cowl.

3. Removal and Installation of the Air Switch

A. Removal of the Air Switch

(1) Remove the glare shield and right side kidney panel per instructions in Section 25-11-00.

(2) Remove the mounting hardware, wires, and pitot line.

(3) Cap the pitot line, and connect the wires together if the aircraft is going to be operated with the switch removed.

B. Installation of the Air Switch

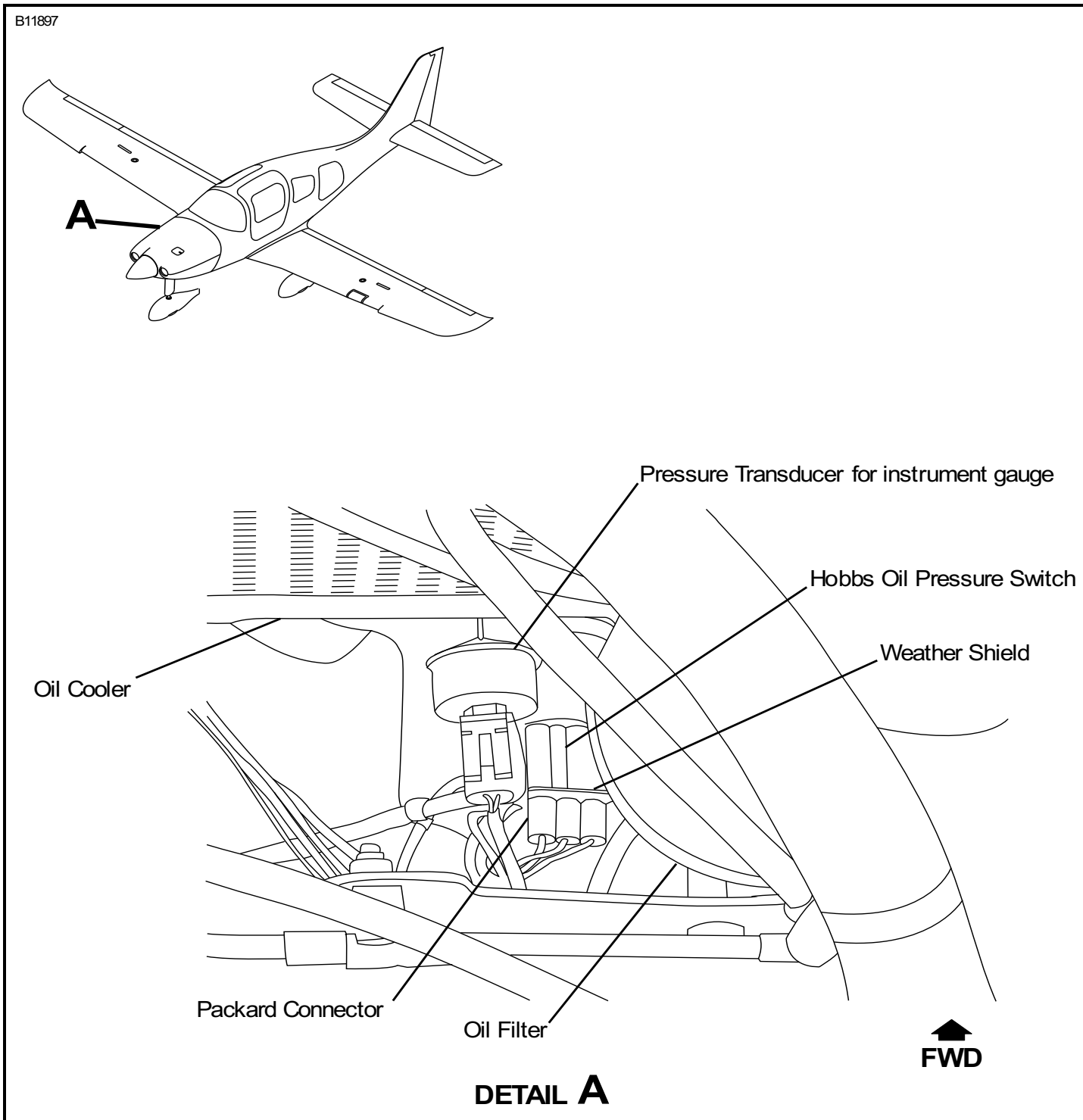
(1) Connect the pitot line, wires (to normally open and common), and mounting hardware.

(2) Test the pitot system for leaks. The system cannot exceed 500 fpm at 1000 feet above field elevation.

(3) Replace the glare shield and kidney panel per instructions in Section 25-11-00.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Hobbs Oil Pressure Switch



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LANDING GEAR AND BRAKES - GENERAL

1. General - Scope And Definition

A. The Cessna 300 (LC40-550FG) has a fixed tricycle landing gear configuration. The main gear is constructed of high strength tubular steel and mounted to the fuselage via a welded steel gearbox. The main gearbox is bolted directly to the fuselage structure. The airplane has brakes located on the main wheels. The brakes are used for steering the airplane via differential braking. The nose gear is an oleo strut which casters for steering purposes. The oleo strut has a self-centering device to lock the nose wheel in a fixed position during flight. Aerodynamic fairings are used on the airplane to cover the landing gear and help reduce drag during flight. This chapter covers the removal and installation of the main gear, nose gear, wheel pants, and fairings. Standard maintenance procedures are also covered.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

MAIN LANDING GEAR - MAINTENANCE PRACTICES

1. Main Landing Gear - General

A. The main landing gear consists of the gearbox (located inside the fuselage), the gear legs, the axle mounting foot, axle, wheel, tire and tube, upper fuselage fairing, gear leg fairing, wheel pant, and wheel pant access panel.

2. Main Gear Wheel Pants and Fairings

A. **Main Gear Wheel Pants and Fairings Removal and Installation** - The removal and installation instructions below are for the left main gear. Removal and installation practices for the right side are typical unless otherwise noted.

(1) Remove the wheel pant access panel from the inside face of the wheel pant by removing the attachment screws.

(2) Remove the screws attaching the leg fairing to the wheel pant.

(3) Remove the two bolts attaching the wheel pant to the support bracket.

(4) Remove the bolt and washer attaching the wheel pant to the standoff shown in Figure 201 and Figure 202.

(5) Slide the wheel pant off by lifting and rotating it to clear the wheel and tire assembly.

(6) Remove the brake caliper per the instructions in the Removal and Installation of the Brake Calipers section.

(7) Jack the left side of the airplane such that adequate clearance is achieved for removing the main gear wheels and leg fairings.

(8) Place a small pan or bucket under the brake caliper, and disconnect the brake line from the brake caliper. The pan will help catch any excess brake fluid that may leak from the brake line once it is removed. Once the brake line is removed, cap the end to prevent any excess brake fluid from draining out of the system.

(9) Remove the main gear axle foot from the gear leg by removing the two AN5-22A bolts and two MS20365-524C all-metal lock nuts (refer to Figure 203) and sliding it straight down along the axis of the gear leg.

(10) Slide the gear leg fairing straight down along the axis of the gear leg to remove it. Jack the airplane as necessary to remove the leg fairing from the leg.

(11) Remove the attachment screws holding the upper leg fairing to the fuselage belly.

(12) Slide the fairing straight down the gear leg to remove it.

(13) Reinstall in the reverse order. Torque all fairing attachment screws 10 to 12 inch-lbs., and torque the MS20365 nuts 140 to 180 inch-lbs.

(14) When installing the standoff and attaching hardware, seat the standoff in the end of the axle on the inside of the wheel pant as shown in Figure 201 and Figure 202. Up to two washers may be glued to the inside of the wheel pant where the pant attaches to the standoff to compensate for the variation in wheel pant size. The washer should not exceed a 1 inch diameter. Use Loctite 243 on the bolt and torque 23 ft.-lbs., using care not to cause compression damage to the pant. Torque two bolts attaching the pant to the support bracket 30 to 36 inch-lbs.

B. **Servicing and Maintenance of the Main Gear Wheel Pants and Fairings** - The main gear wheel pants and fairings are a glass fiber composite construction and do not require any servicing or maintenance. The wheel pants and fairings should be inspected periodically for cracking, chips, etc. and repaired or replaced as necessary. Refer to Chapter 57-10-00 for removal and installation of optional anti-chafe tape. Contact the manufacturer for replacement parts. The interior of the wheel pant should be cleaned of all foreign debris.

3. Main Gear Assembly

A. **Main Gear Assembly Removal and Installation** - Use the following procedures for removal and installation of the main gear assembly.

(1) Remove the main gear wheel pant per the instructions in the Main Gear Wheel Pants and Fairings Removal and Installation section .

(2) Raise the airplane on jacks such that adequate room is achieved for removing the main gear wheel assembly.

(3) Remove the two AN5-22A bolts and two MS20365-524C lock nuts from the main gear axle foot, and slide the wheel assembly straight down along the axis of the gear leg. Refer to Figure 203.

(4) Disassemble the main wheel assembly by removing the cotter pin and axle nut from the outboard end of the axle. Refer to Figure 204.

(5) Remove the wheel from the axle by sliding it straight off.

(6) Cut and remove the lockwire from the upper axle attachment bolts.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(7) Remove the upper and lower axle attachment bolts to disassemble the remaining parts. Note order of assembly for reinstallation.

(8) Remove the access panels from the aft cabin floor to gain access to the upper end of the gear legs.

(9) Remove the gear leg attachment bolt located at the top end of the gearbox.

(10) Remove the gear legs from the gearbox by pulling the leg straight out.

CAUTION: Take care when removing the gear legs so as not to cause nicks, scratches, or other damage to the surface of the leg.

(11) Installation is in the reverse order. Re-safety wire the upper axle attachment bolts prior to installing the wheel.

(12) Torque the gear leg attachment bolt 80 to 85 foot-lbs. Torque the axle attachment bolts 240 to 280 inch-lbs., and torque the axle foot attach bolts 140 to 180 inch-lbs. Rotate the wheel while tightening the axle nut 150 to 200 inch-lbs. to seat the bearing, back off the axle nut to zero torque, tighten the axle nut to 30 to 40 inch-lbs. while rotating the wheel, rotate the axle nut to the nearest slot and cotter pin hole, and install the cotter pin.

(13) Assure that the wheel rotates freely without perceptible play.

B. **Wheel Toe-in and Camber** - During wheel installation it is important to determine the wheel toe-in and camber. Both toe-in and camber should be measured with the aircraft wheels off of the ground. When the gear is correctly installed, the camber will be 8.0 degrees ± 1.0 degree. The camber is the angle from horizontal to the centerline of the axle as shown in Figure 205. If the camber does not meet the specification, contact the factory for instructions.
Wheel toe-in and toe-out is established by inserting a shim between the axle block and spacer, if necessary, as shown in Figure 206. Wheel toe-in and toe-out is the angle between the aircraft center-line and the wheel. Toe-out must be within 0.3 degrees to 1.0 degree. Toe-in must not exceed 1.0 degree at maximum gross weight. There are two different sized shims that may be used to achieve the proper toe-in and toe-out (the shims also affect camber). It is not likely that the shims will need to be changed from what was initially manufactured, however, if the proper toe-in or toe-out is not achieved, contact the manufacturer for the required shim.

C. **Servicing and Maintenance** - The landing gear legs should be inspected every 100 hours or annually. Some of the items to inspect for are scratches, nicks, corrosion, and signs of overstress. Visually inspect the gear legs for straightness. The axles and other components should also be inspected for corrosion, cracks, signs of overstress, and wear. The main gear assembly should fit snugly together with very little, if any, free play.

4. Main Landing Gear Leg Abrasion Repair

A. The main landing gear legs may develop abrasions as a result of rubbing with the landing gear fairing upper rib. Typically, there are two abrasions opposite each other. The abrasions are located 16.0 inches from the upper tip of the gear leg; they are approximately 0.7 inch long and 0.020 inch deep. Refer to Figure 207.

(1) Clean the surface area surrounding the abrasions.

(2) Determine the depth and length of the abrasions. If the abrasion depth and length are greater than 0.020 inch and 1.0 inch respectively, contact Cessna for instructions.

(3) Use Scotch-Brite™ or other equivalent material to blend out nicks, scratches, or cuts at the abrasion area. The repair area must be blended over a distance at least 10 times the depth of the abrasion.

(4) After polishing or blending the abrasion, treat all bare metal with zinc chromate or zinc oxide.

(5) Before installing the repaired main landing gear on the aircraft, contact Cessna for instructions on modifying the main landing gear fairing to prevent future rubbing.

5. Gearbox

A. The main landing gear is attached to the fuselage structure via a welded steel gearbox. The gearbox is bolted directly to the fuselage structure.

(1) **Removal and Installation** - The gearbox is not easily removable from the fuselage due to its location. Should the gearbox need to be removed or replaced, please contact the manufacturer for further instructions.

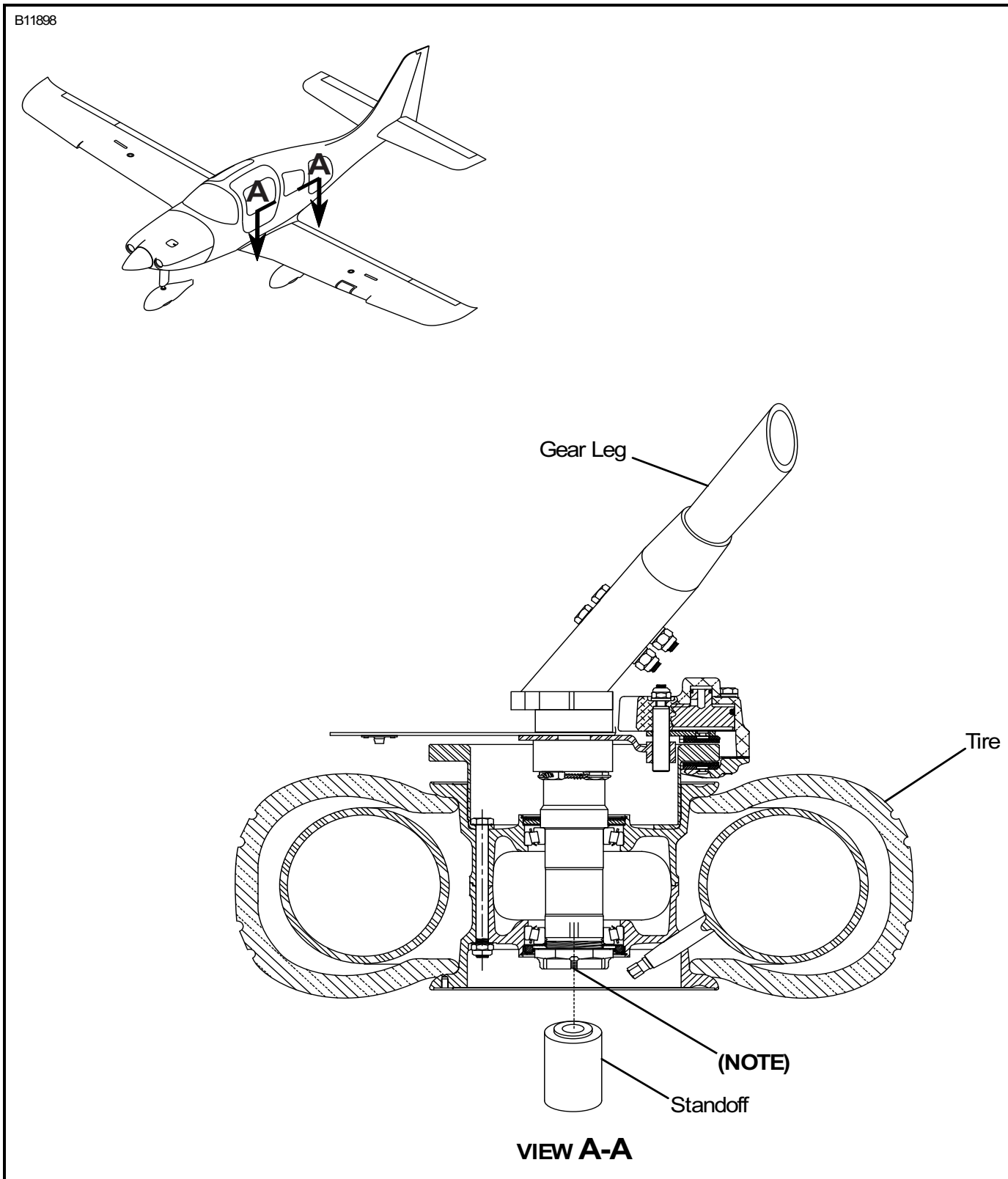
(2) **Servicing and Maintenance** - The gearbox is a major structural component and should be inspected every 100 hours or annually for wear and corrosion. Remove the wheel pants and fairings per the Main Gear Wheel Pants and Fairings Removal and Installation section and remove the gear leg per the Main Gear Assembly Removal and Installation section. Inspect the gear leg sockets of the gearbox for wear and corrosion. If surface corrosion is present, lightly hone the interior diameter of the socket using a cylinder bore hone and light machining oil. A Scotch-Brite™ pad may also be used. After the corrosion has been removed, apply a thin film of machine oil or other surface

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

protectant to help prevent further corrosion. The bushing at the lower end of the socket should also be inspected for excessive wear and replaced if required. When replacing the bushing, P/N 32FS16, thoroughly clean the surface of the socket and install with Loctite 660 retaining compound. Allow the Loctite to fully cure prior to reinstalling the gear leg. Every 3000 hours, the gearbox bolts must be checked for evidence of corrosion. Remove one attachment bolt from each side of the gearbox and check for corrosion. If corrosion is noted, replace all attachment bolts in the gearbox. If no corrosion is noted, replace bolts that were removed and check the torque on all bolts. Torque bolts 40 to 50 inch-lbs.

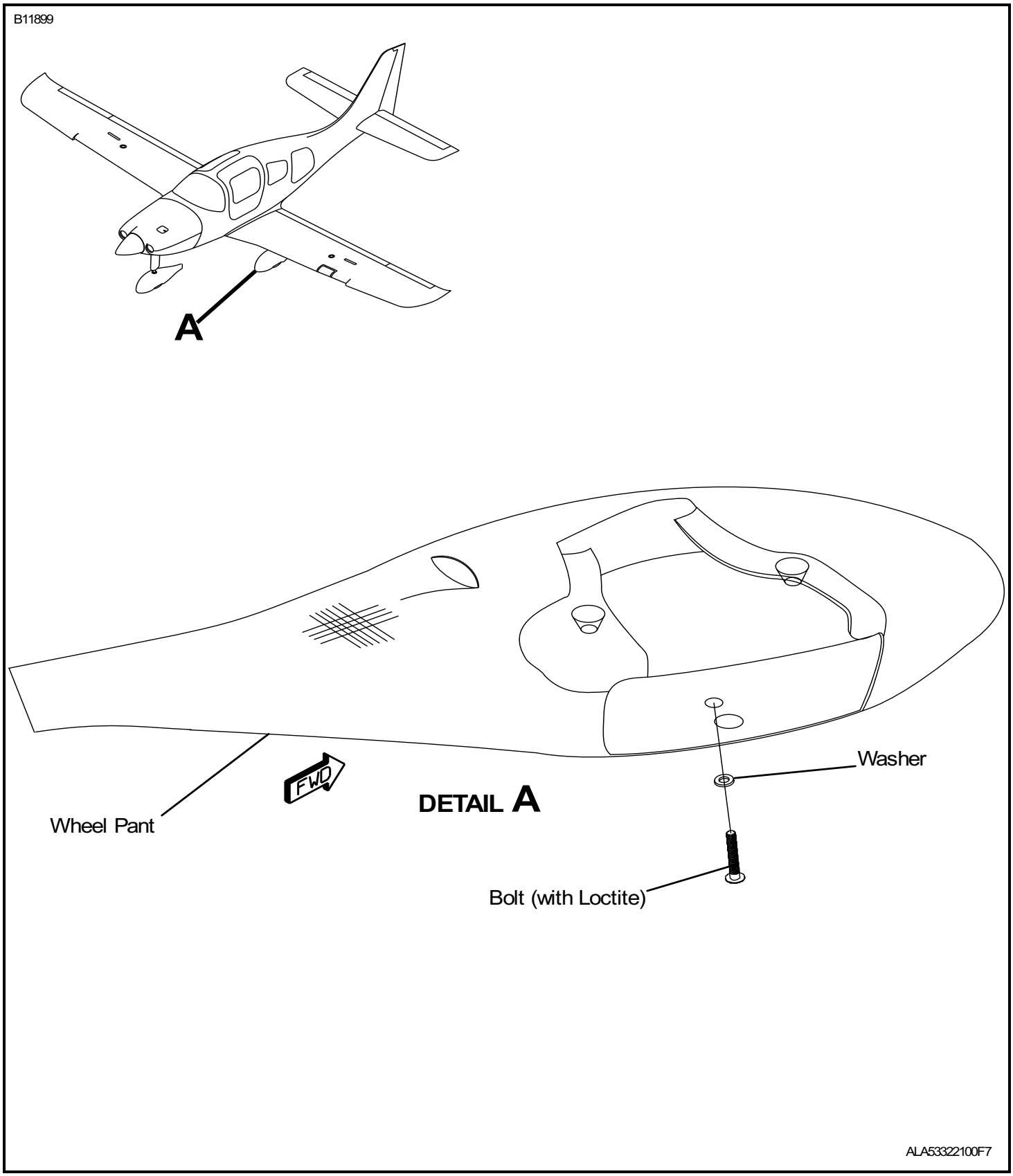
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Wheel Pant Standoff Location



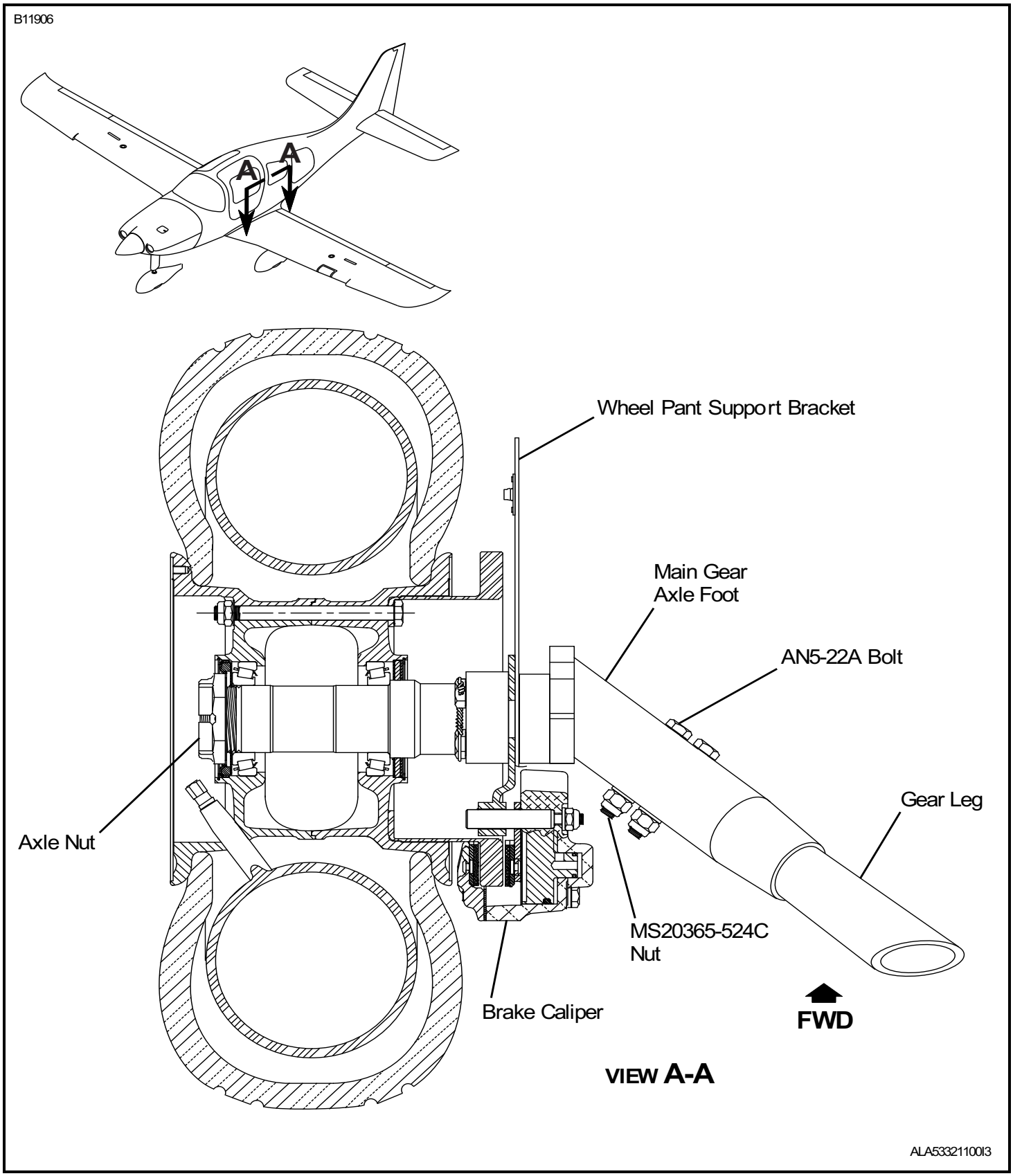
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Hardware Attaching Wheel Pant to Standoff



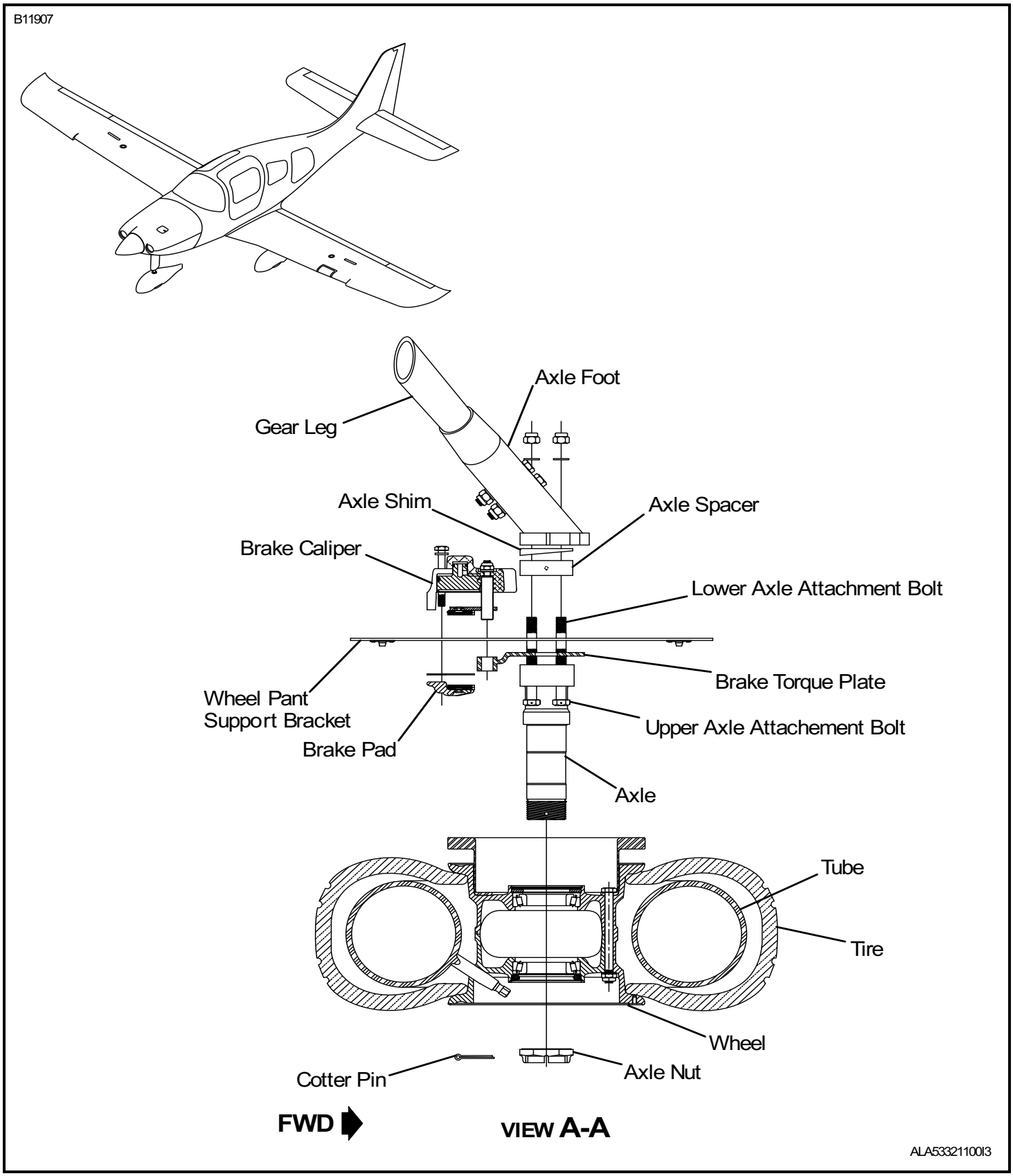
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Main Gear Wheel Assembly



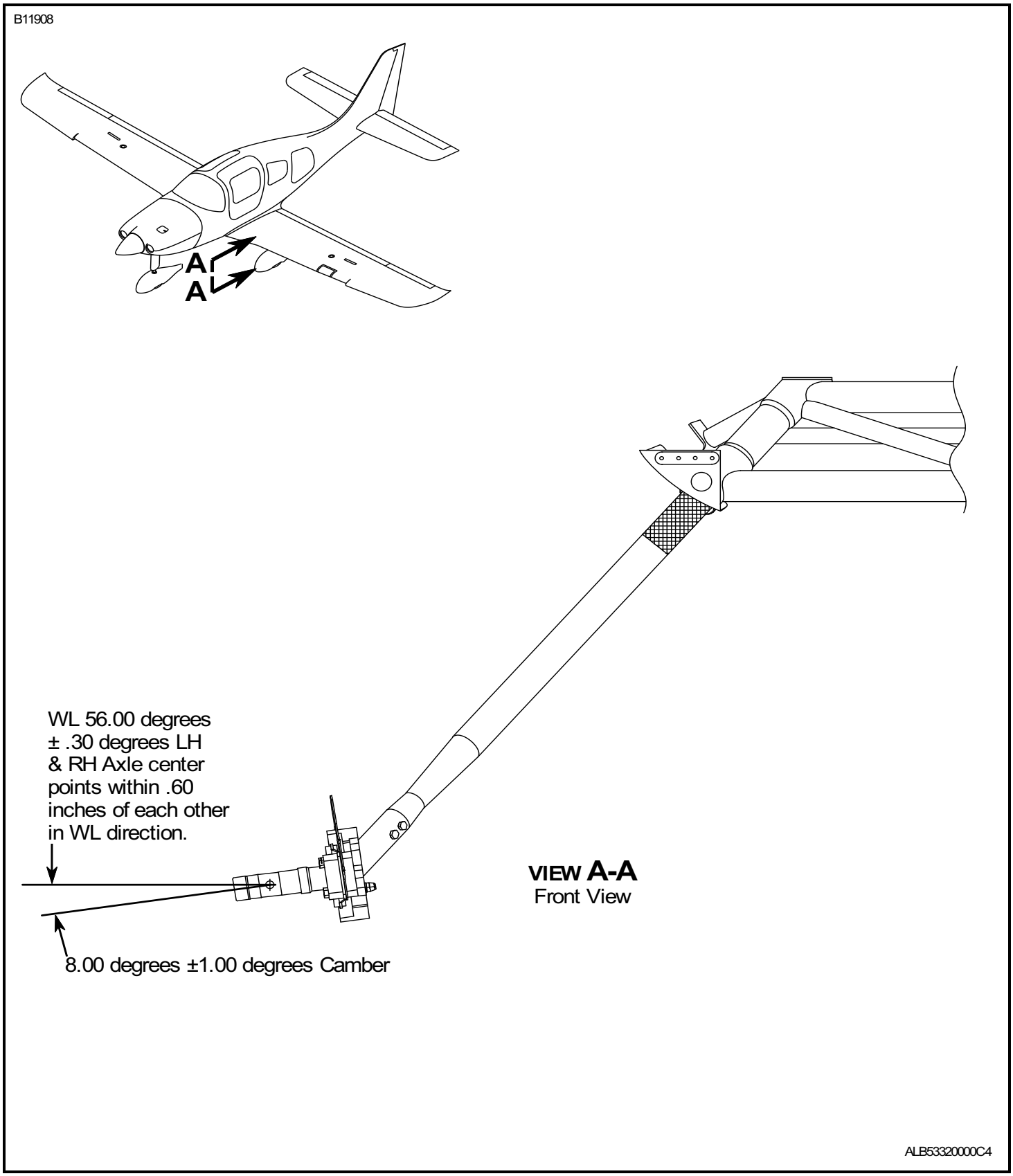
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Main Gear Assembly, Exploded View



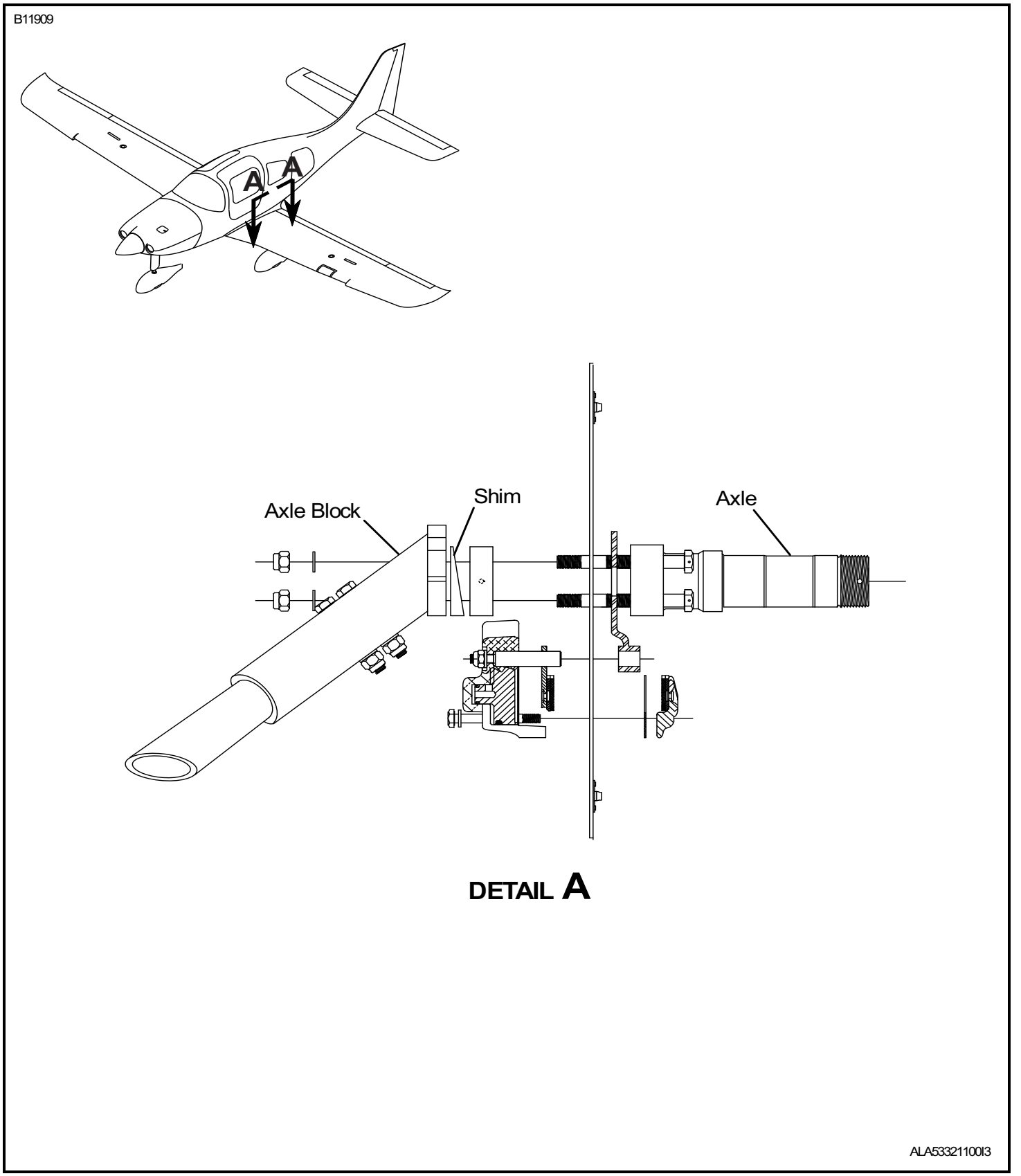
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Camber



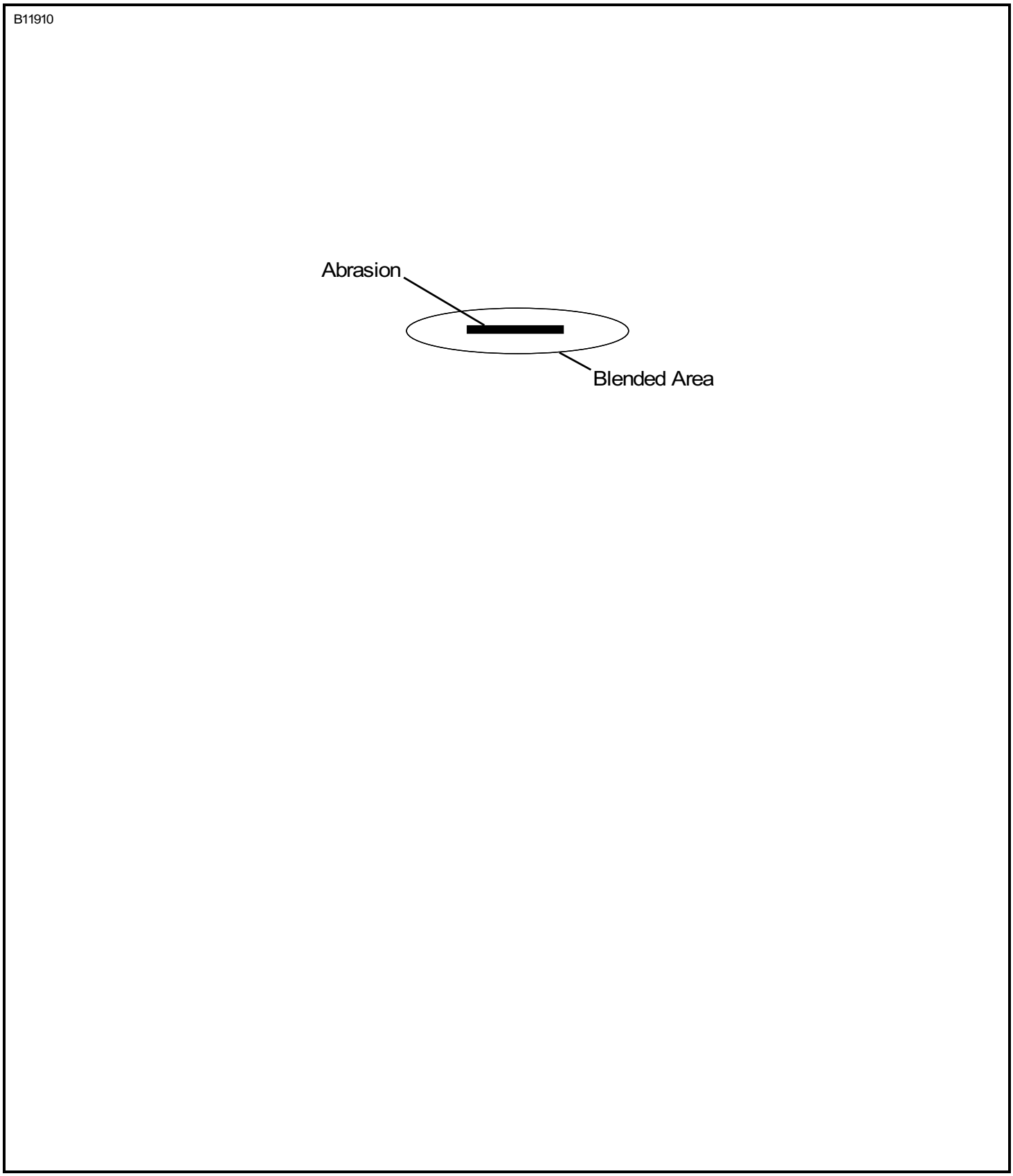
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Wheel Shim for Toe in and Toe out



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Abrasion Repair



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

NOSE LANDING GEAR - MAINTENANCE PRACTICES

1. Nose Gear - General

A. The nose gear is a fixed hydraulic unit that casters freely during taxiing. Turning is accomplished via differential braking and optional rudder assist. Landing loads and shimmy dampening are controlled using hydraulic oil within the strut. Nitrogen gas pressure above the strut piston controls the ride height of the strut and supplies the necessary pressure to lock in the centering cam mechanism. On the ground with the weight of the aircraft bearing down on the nose strut, an internal keyway within the strut slides out from a locking cam making rotational movement possible. The moment the aircraft takes flight and all weight is off the nose gear, gas pressure pushes down on the strut piston moving the keyway into the locking cam and eliminating any ability to caster during flight. During landing the weight of the aircraft overpowers the gas pressure pushing down on the piston and slides the keyway out from the locking cam, allowing full rotational movement of the nose wheel.

2. Nose Gear Wheel Pant and Fairing

A. **Nose Gear Wheel Pant and Fairing Removal and Installation** - Use the following procedures for removal and installation of the nose gear wheel pant and fairing.

(1) Remove the upper and lower engine cowls per instructions in Chapter 71-10-00.

(2) Remove the aft screw attaching the nose strut fairing to the fuselage.

(3) Raise the front of the airplane such that the nose wheel is completely clear of the ground.

(4) Remove the four AN5-12A bolts and washers attaching the nose wheel assembly to the base of the nose strut. Refer to Figure 201.

(5) Remove the four MS21207-6-8 self-tapping screws from the base of the strut fairing, and slide the internal rib straight down and off of the nose strut.

(6) Slide the nose strut fairing straight down and off the nose strut.

(7) Remove the two AN526C1032R8 truss head screws from the top of the wheel pant attaching the wheel pant to the attach bracket. Refer to Figure 202, Sheet 1 and Sheet 2.

(8) Remove the two AN526C1032R10 truss head screws from either side of the wheel pant. Refer to Figure 202, Sheet 1 and Sheet 2.

(9) Remove the nose gear wheel pant from the wheel and fork assembly.

(10) Installation is in the reverse order. Torque all AN526C1032 screws 30 to 36 inch-lbs. Hand tighten the MS21207 screws holding the internal rib to the nose strut fairing. Torque the AN5-12A bolts 140 to 180 inch-lbs.

B. **Nose Gear Wheel Pant and Fairing Servicing and Maintenance** - The nose gear wheel pant and fairing are a glass fiber composite construction and do not require any servicing or maintenance. The wheel pants and fairings should be inspected periodically for cracking, chips, etc. and repaired and replaced as necessary. Contact the manufacturer for replacement parts. The interior of the wheel pant should also be cleaned of all foreign debris. A few owners or operators have reported hairline paint cracking in the area adjacent to the nose wheel tow bar hole. While the paint cracking does not present a structural problem, the visual presentation of the wheel pant may degrade somewhat over several years. The onset of the cracking depends, in part, on the method used to tow the airplane and the frequency of towing. Enlarging the wheel pant hole may mitigate the onset of paint cracking since the tow bar will be less likely to apply a lateral force directly to the wheel pant. To enlarge the wheel pant hole, complete the following instructions.

(1) Remove the nose wheel pant per instructions in this section.

(2) Using a suitable tool (i.e. die grinder or drill with sanding barrel), carefully enlarge the size of the lugholes to 1.25 to 1.30 inches diameter. If necessary, the hole may be enlarged eccentrically to the current hole in the wheel pant to maintain a consistent gap between the tow lug and wheel pant.

(3) Reinstall the nose wheel pant per instructions in this section.

3. Nose Gear Wheel and Fork Assembly

A. **Disassembly - Wheel and Fork Assembly**

(1) Raise the front of the airplane such that the nose wheel is completely clear of the ground.

(2) Remove the four AN5-12A bolts and washers attaching the nose wheel assembly to the base of the nose strut. Refer to Figure 201.

(3) Remove the wheel pant per the instructions in the Nose Gear Wheel Pant And Fairing Removal and Installation

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

section.

(4) Remove the safety wire and the four AN3CH3A bolts, lock washers, and flat washers from the tow bar plates. Remove the plates from the fork. Refer to Figure 203, Sheet 1 and Sheet 2.

(5) Secure the nose wheel assembly in a soft jaw vise or equivalent fixture. Remove the nose wheel axle nut, bolt, and two washers. Using a plastic mallet, gently tap inward on the fork area around the axle bushing areas until the bushings become dislodged from the fork. Remove the bushings, wheel assembly, and axle spacer from the fork. Refer to Figure 203, Sheet 1 and Sheet 2.

B. **Reassembly - Wheel and Fork Assembly**

(1) Secure the nose wheel fork in a soft jaw vise or equivalent fixture with fork legs open and unobstructed.

(2) Insert the axle spacer into the wheel. Install the tire and wheel assembly into the nose wheel fork. Insert the axle bushings into the fork with the axle spacer inserted into the bushings. Refer to Figure 203, Sheet 1 and Sheet 2.

(3) Install the axle bolt, nut, and two washers in reverse order as disassembled, but do not tighten the axle nut. Refer to Figure 203, Sheet 1 and Sheet 2.

(4) With the axle bushings partially installed, check the clearance between the outside diameter of the tire and the edge of the nutplate on the fork. Refer to Figure 204. Clearance must not be less than 0.25 inch If clearance is less than 0.25 inch, replace the 5.00-5, 10 ply tire with one that has an inflated outside diameter of 14.20 inches or less per TSO-C62C.

(5) Rotate the axle bushings so that the flat edges of the bushings are parallel with the edge of the tow bar plates (plates prevent axle bushings from rotating within the fork). If necessary, temporarily install the tow bar plates to the fork to assist alignment of bushings during installation.

(6) Tighten the axle nut until the axle-bushing flanges are fully seated against the outside surface of the fork. If necessary, lightly tap the fork legs outward with a plastic or rubber mallet while tightening the axle bolt. Do not allow bushings to become cocked or jammed. If bushings become hard to install, stop and remove the bushings to check for any possible damage to the bushing or fork bushing holes. Replace all damaged parts. Do not file, grind, polish or sand bushings or fork bushing holes. Do not install a warm bushing into a cold fork. If necessary, place the axle bushings in a freezer for one hour and submerge fork in hot water for ten minutes prior to assembly. Anti-seize compound may be used to help install axle bushings into the fork.

(7) With axle bushings fully installed, tighten nut until all side play is eliminated from wheel bearings, then continue tightening an additional 1/4 turn. The wheel should have a slight drag when the bearings are properly pre-loaded. Verify that the wheel bearings are fully seated by attempting to rock the wheel from left to right. No movement or "play" should be felt.

(8) For aircraft S/N 40004 to S/N 40040, install the tow bar plates onto the fork with four AN3CH3A bolts, lock washers, and flat washers. Torque bolts 30 to 36 inch-lbs. Refer to Figure 203, Sheet 1.

(9) For aircraft S/N 40004 to S/N 40040, install lockwire per MS33540 between the tow bar plate attachment bolts.

(10) For aircraft S/N 40041 and on, torque countersunk screw 30 to 36 inch-lbs., and install the washer and nut on the back side of the fork. Torque the nut 30 to 36 inch-lbs. Refer to Figure 203, Sheet 2.

(11) Install the nose wheel pant over the fork and wheel assembly. Install four AN526C1032 wheel pant to fork attachment screws and washers in reverse order as disassembled. Torque screws 30 to 36 inch-lbs.

C. **Servicing and Maintenance** - The nose wheel assembly does not require any service or maintenance. The nose wheel assembly should be inspected for corrosion and other damage annually or every 100 hours. Damaged parts should be replaced as required. The nose wheel is to be serviced per the procedures outlined in Chapter 12-30-00.

4. Nose Strut

A. The nose gear may be equipped with either the Cessna nose strut or the ESCO nose strut. The Cessna strut nitrogen gas inlet schrader valve is located at the bottom rear of the nose strut. The ESCO strut has "ESCO" clearly labeled and the nitrogen gas inlet schrader valve is located at the upper front of the strut.

NOTE: S/N 40004 to S/N 40017 have an additional keeper plate at the attachment of the nose gear strut and engine.

(1) **Cessna Nose Strut**

(a) **Removal of the Nose Strut**

1 Remove the nose strut fairing per the instructions in the Nose Gear Wheel Pant And Fairing Removal and

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Installation section.

CAUTION: Always wear safety goggles when releasing gas pressure.

2 Remove the valve cap from the strut schrader valve. Using a small flat bladed screwdriver, gently press in on the schrader valve core stem to slowly bleed off nitrogen gas pressure in the strut.

3 Using a felt tip marker, apply an aligning index mark between the engine mount and the strut housing.

4 Remove the bolts, nuts (either castellated or self-locking), and washers connecting the nose strut to the engine mount. Refer to Figure 205.

5 For S/N 40004 to 40017 remove the keeper plate.

6 Using a twisting motion, pull the nose strut straight down and out of the engine mount.

(b) **Installation of Nose Strut**

1 Using a twisting motion, slide the nose strut housing into the engine mount until the housing collar is seated flush against the engine mount tube and index marks are aligned.

2 For S/N 40004 to 40017 install the keeper plate.

3 Install the bolts, nuts, and washers connecting the nose strut to the engine mount in reverse order as disassembled. Refer to Figure 205. Torque nuts 72 to 84 inch- lbs. Install new cotter pins in the castellated nuts.

4 Service the nose strut per the instructions in Chapter 12-30-00.

5 Reinstall the nose strut fairing per the instructions in the Nose Gear Wheel Pant And Fairing Removal and Installation section.

6 Reinstall the nose wheel assembly per the instructions in the Nose Gear Wheel Pant And Fairing Removal and Installation section.

(c) **Servicing and Maintenance**

1 Inspection (every 100 hours or annually)

a The nose gear strut should be inspected for cracks, corrosion, scratches on the strut shaft, fluid leakage, and signs of overstress. The strut attachment to the engine mount should be checked for security. If oil leakage is present at any one of these locations, replacement of the strut is required.

b With the full weight of the aircraft on the nose and main gear inspect the ride height of the nose gear strut. There should be 3 to 4 inch of the chrome strut rod visible between the lower flange and the wiper seal. If ride height is low and no oil leakage is present, recharge the strut per Chapter 12-30-00. Recheck the filler valve and the filler valve gasket for signs of leakage.

c Remove weight off the nose gear to allow rotation of the nose wheel assembly left and right to its full range of rotation. A smooth resistance from the internal hydraulic shimmy damper device should be felt throughout its rotation. If binding is felt during rotation service the strut per Chapter 12-30-00. If the strut has been properly serviced and continues to bind, replacement of the strut is required.

d Rotate the nose gear wheel assembly to one side and remove just enough weight off the nose gear so the strut is fully extended and the wheel assembly is no longer in contact with the floor. If the wheel assembly does not center, in line with the direction of flight, service the strut per Chapter 12-30-00. If the strut has been properly serviced and does not center, replacement of the strut is required.

2 Servicing (every 200 hours or annually) - The strut should be serviced per the instructions in Chapter 12-30-00.

(2) **ESCO Nose Strut**

(a) **Removal of Nose Strut**

1 Remove the nose strut fairing per the instructions in the Nose Gear Wheel Pant And Fairing Removal and Installation section.

2 Remove the valve cap from the strut schrader valve. Using a small flat bladed screwdriver, gently press in on the schrader valve core stem to slowly bleed off nitrogen gas pressure in the strut.

CAUTION: Always wear safety goggles when releasing gas pressure. Apply rags around the schrader valve and a drip pan under the strut to catch any oil that may discharge with the nitrogen gas.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

3 Remove the schrader valve from the strut housing.

4 Using a felt tip marker, apply an aligning index mark between the engine mount and the strut housing.

5 Remove the bolts, nuts (either castellated or self-locking), and washers connecting the nose strut to the engine mount. Refer to Figure 206, Sheet 1 and Sheet 2.

6 For S/N 40004 to 40017 remove the keeper plate.

7 Using a twisting motion, pull the nose strut straight down and out of the engine mount.

(b) **Installation of Nose Strut**

1 Using a twisting motion, slide the nose strut housing into the engine mount until the housing collar is seated flush against the engine mount tube and index marks are aligned.

2 For S/N 40004 to 40017 install the keeper plate.

3 Install bolts, nuts, and washers connecting the nose strut to the engine mount in reverse order as disassembled. Refer to Figure 206, Sheet 1 and Sheet 2. Torque nuts 72 to 84 inch-lbs. Install new cotter pins in the castellated nuts.

4 Screw the schrader valve into the nose strut and torque the valve 150 to 200 inch- lbs.

5 Service the nose strut per the instructions in Chapter 12-30-00.

6 Reinstall the nose strut fairing per the instructions in the Nose Gear Wheel Pant And Fairing Removal and Installation section.

7 Reinstall the nose wheel and wheel pant assembly per the instructions in the Nose Gear Wheel Pant And Fairing Removal and Installation section.

(c) **Servicing and Maintenance**

1 Inspection (every 100 hours or annually)

a The nose gear strut should be inspected for cracks, corrosion, scratches on the strut shaft, fluid leakage, and signs of overstress. The strut attachment to the engine mount should be checked for security. If oil leakage is present at any one of these locations, replacement of the strut is required.

b With the full weight of the aircraft on the nose and main gear inspect the ride height of the nose gear strut. There should be 3 to 4 inches of the chrome strut rod visible between the lower flange and the wiper seal. If ride height is low and no oil leakage is present, recharge the strut per Chapter 12-30-00. Recheck the filler valve and the filler valve gasket for signs of leakage.

c Remove weight off the nose gear to allow rotation of the nose wheel assembly left and right to its full range of rotation. A smooth resistance from the internal hydraulic shimmy damper device should be felt throughout its rotation. If binding is felt during rotation service the strut per Chapter 12-30-00. If the strut has been properly serviced and continues to bind, replacement of the strut is required.

d Rotate the nose gear wheel assembly to one side and remove just enough weight off the nose gear so the strut is fully extended and the wheel assembly is no longer in contact with the floor. If the wheel assembly does not center, in line with the direction of flight, service the strut per Chapter 12-30-00. If the strut has been properly serviced and does not center, replacement of the strut is required.

2 Servicing (every 200 hours or annually) - The strut should be serviced per the instructions in Chapter 12-30-00.

5. Hard Landing Inspection

A. After a hard landing or a landing over maximum landing weight, the aircraft must be inspected for damage in accordance with this section. If any damage is found, it must be repaired prior to the next flight.

(1) Nose Gear - The nose gear strut should be inspected for cracks, scratches on the piston, fluid leakage, and signs of overstress. Check for proper nitrogen pressure in the strut. The strut attachment to the engine mount should be checked for security. If oil leakage is present at any one of these locations, replacement of the strut is required. Inspect the ride height of the nose gear strut. There should be 3 to 4 inches of the chrome strut rod visible between the lower flange and the wiper seal. If ride height is low and no oil leakage is present, recharge the strut per Chapter 12. Recheck the filler valve and the filler valve gasket for signs of leakage.

(2) Main Gear - Inspect the wheel, axle, axle mounting bolts, wheel shims, gear leg, and gear leg attachment bolts to assure there are no broken, bent, or loose parts. The main gear assembly should fit snugly together with very little, if

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

any, free play.

(3) Wheel Toe-in and Camber - Assure that wheel toe-in and camber meets the requirements of the Main Gear Assembly section.

(4) Wheel Pants and Fairings - Visually inspect the main and nose gear wheel pants and fairings for chips, cracks, or other damage.

(5) Gearbox - Determine if the gearbox is bent or broken. With equal pressure and wear on the tires, the aircraft evenly loaded (including fuel), and the aircraft on a level surface, the wings should be level. If a bent or broken gearbox is suspected, contact the manufacturer, and do not fly the aircraft.

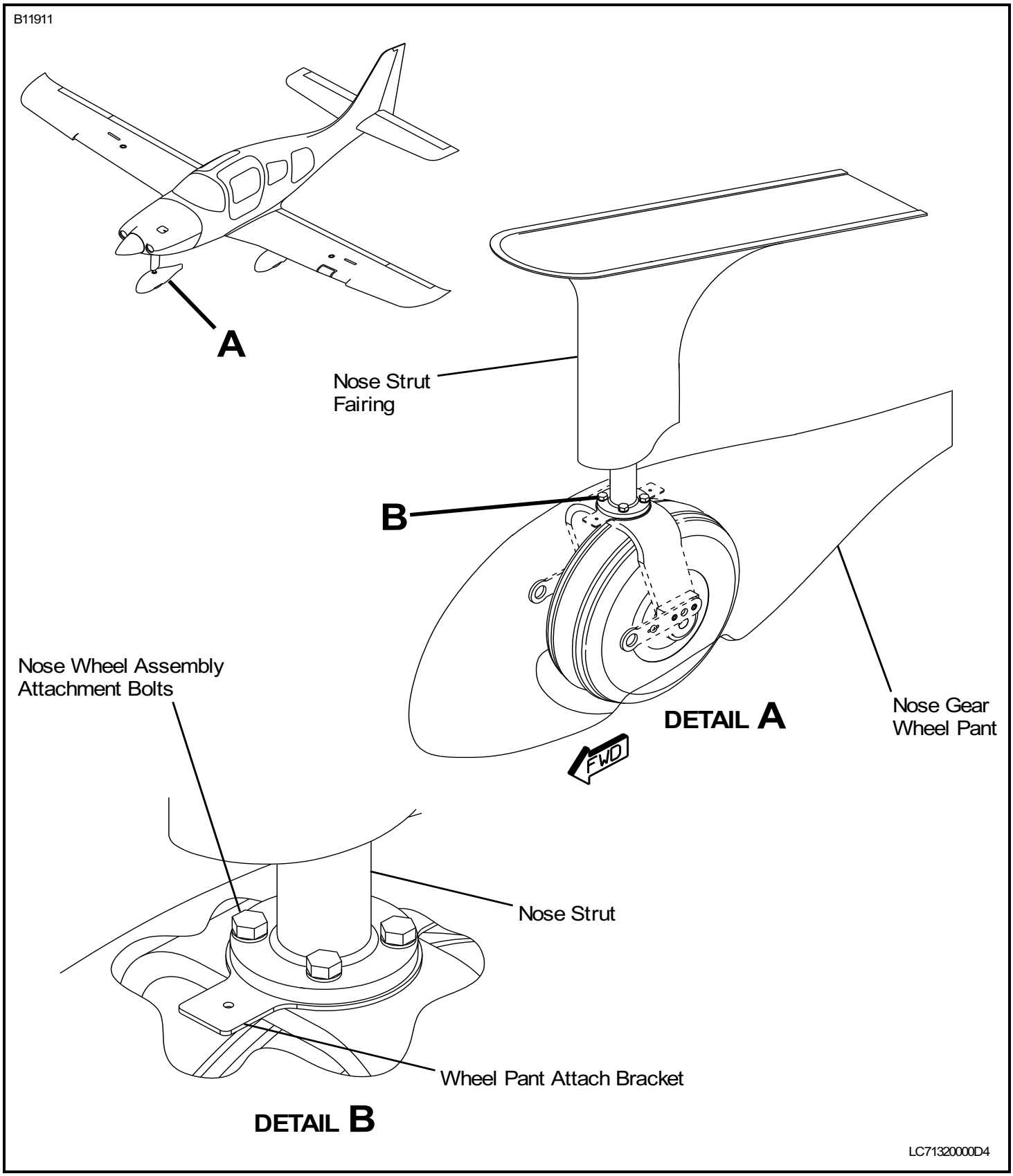
(6) Tires - Visually inspect the tires for cuts, wear, or broken belts.

(7) Engine Mount - Visually inspect the welds on the engine mount using a bright light and magnifying glass.

(8) Propeller - Visually inspect the propeller for nicks or chips.

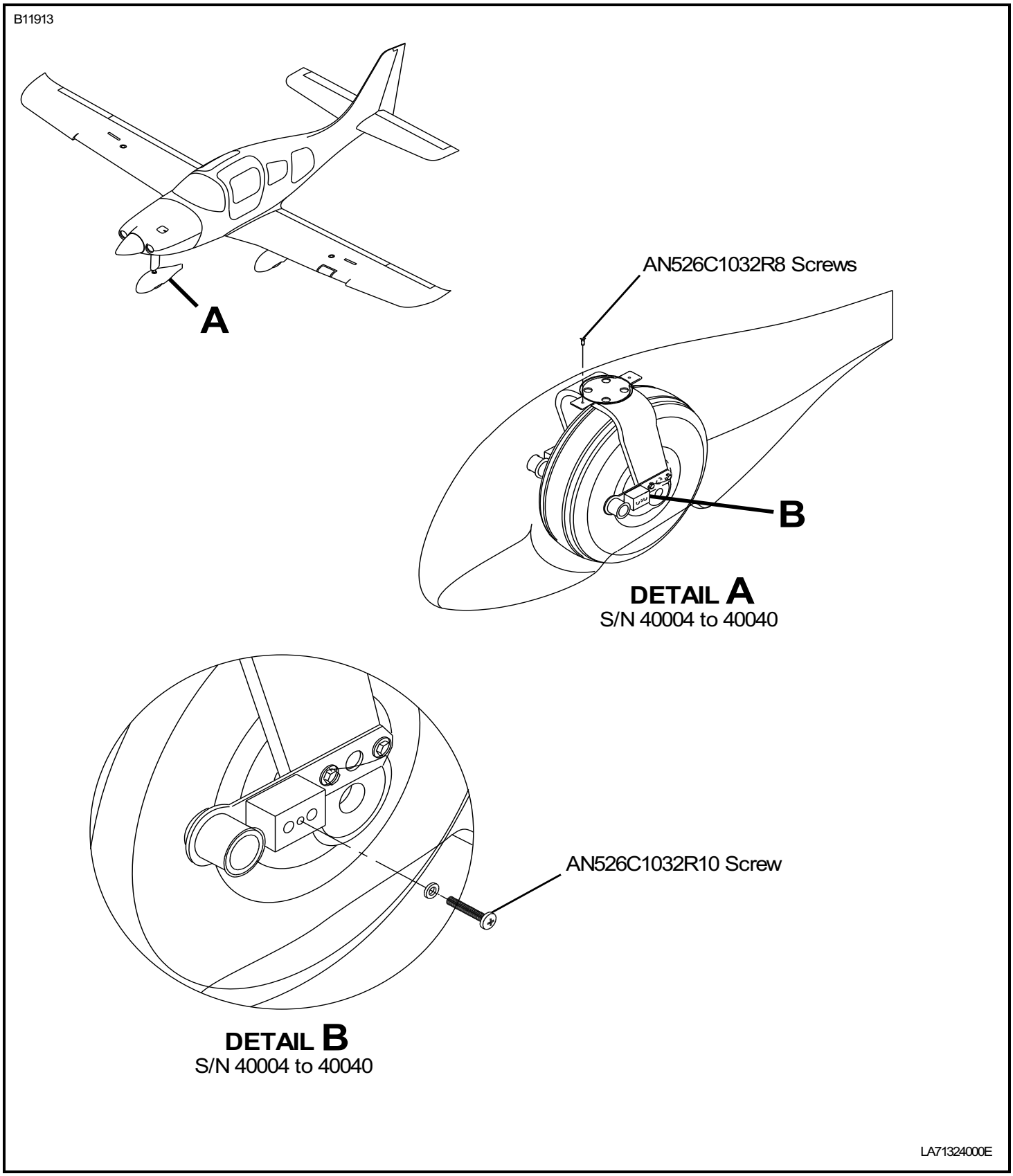
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Nose Wheel Pant and Leg Fairing



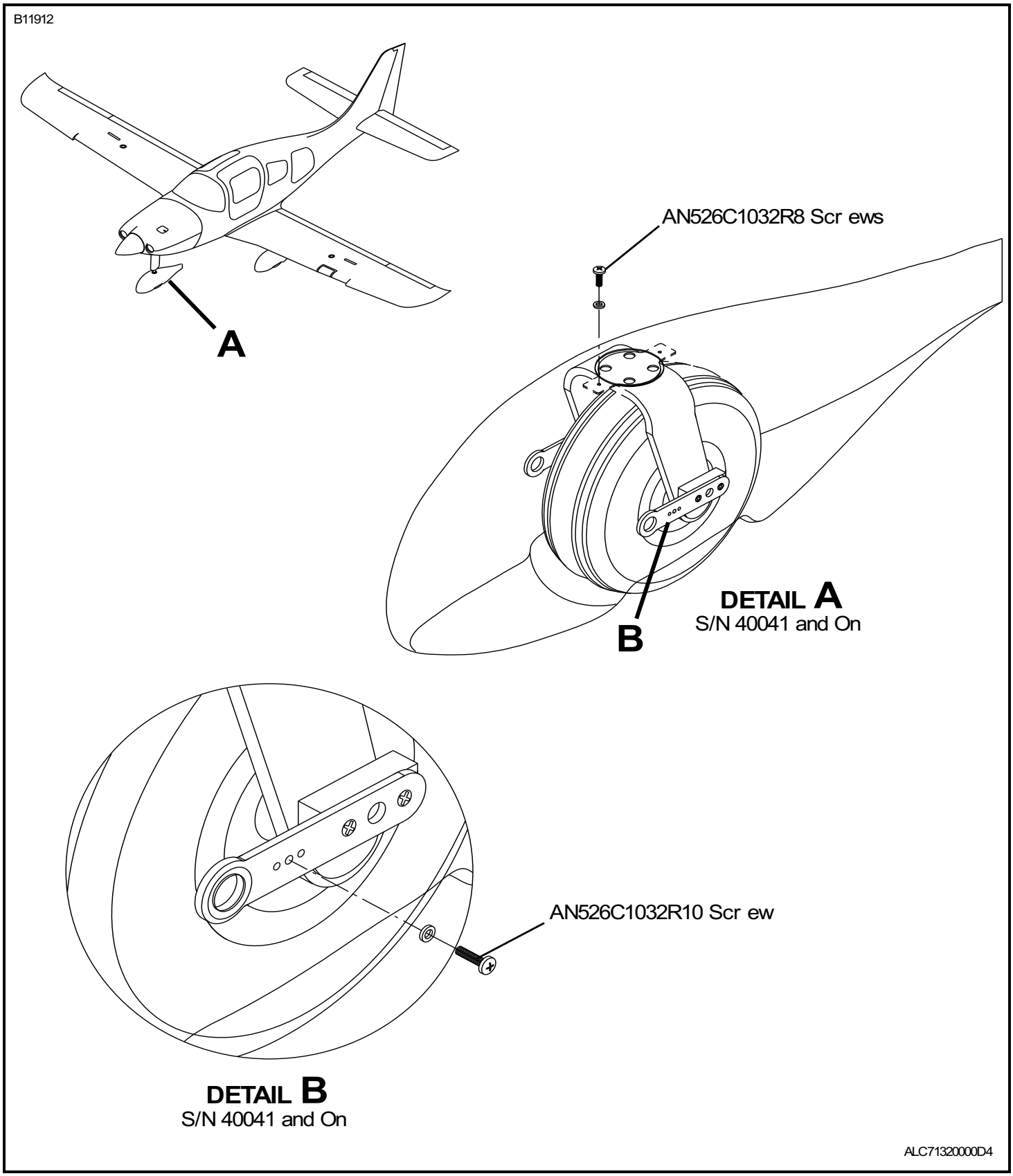
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Wheel Pant Attachment Hardware



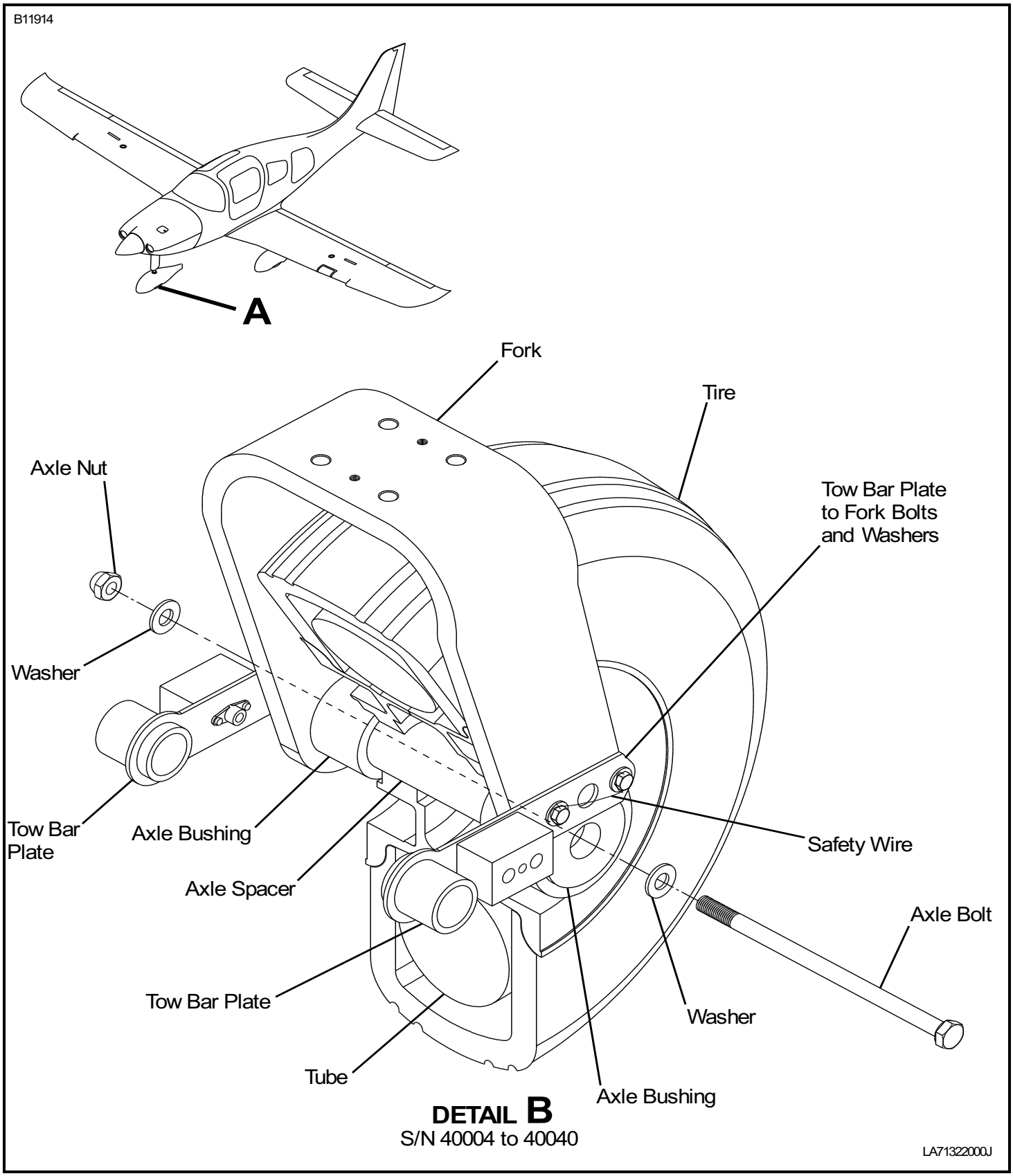
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 2 : Wheel Pant Attachment Hardware



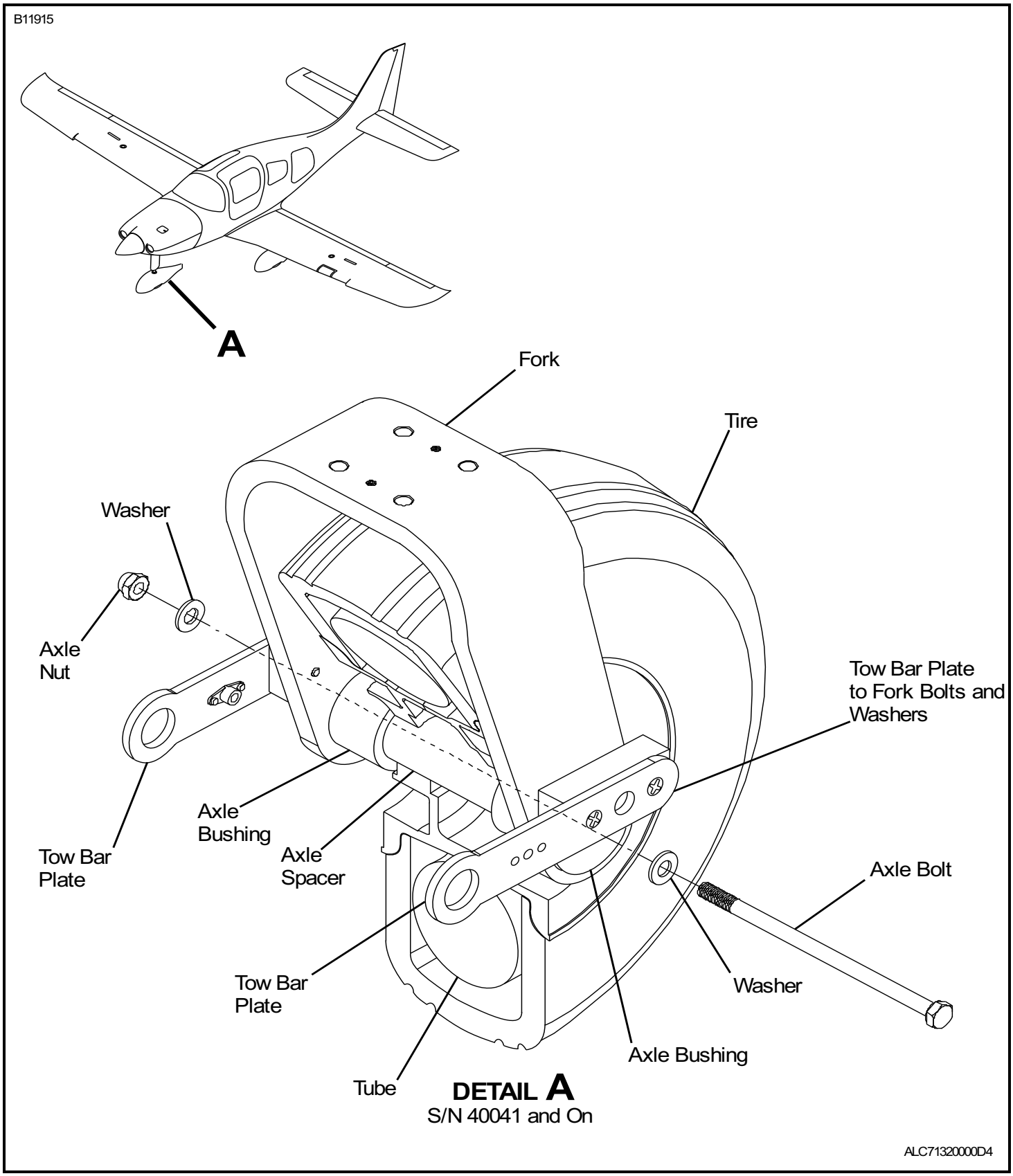
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Nose Gear Wheel and Fork Assembly



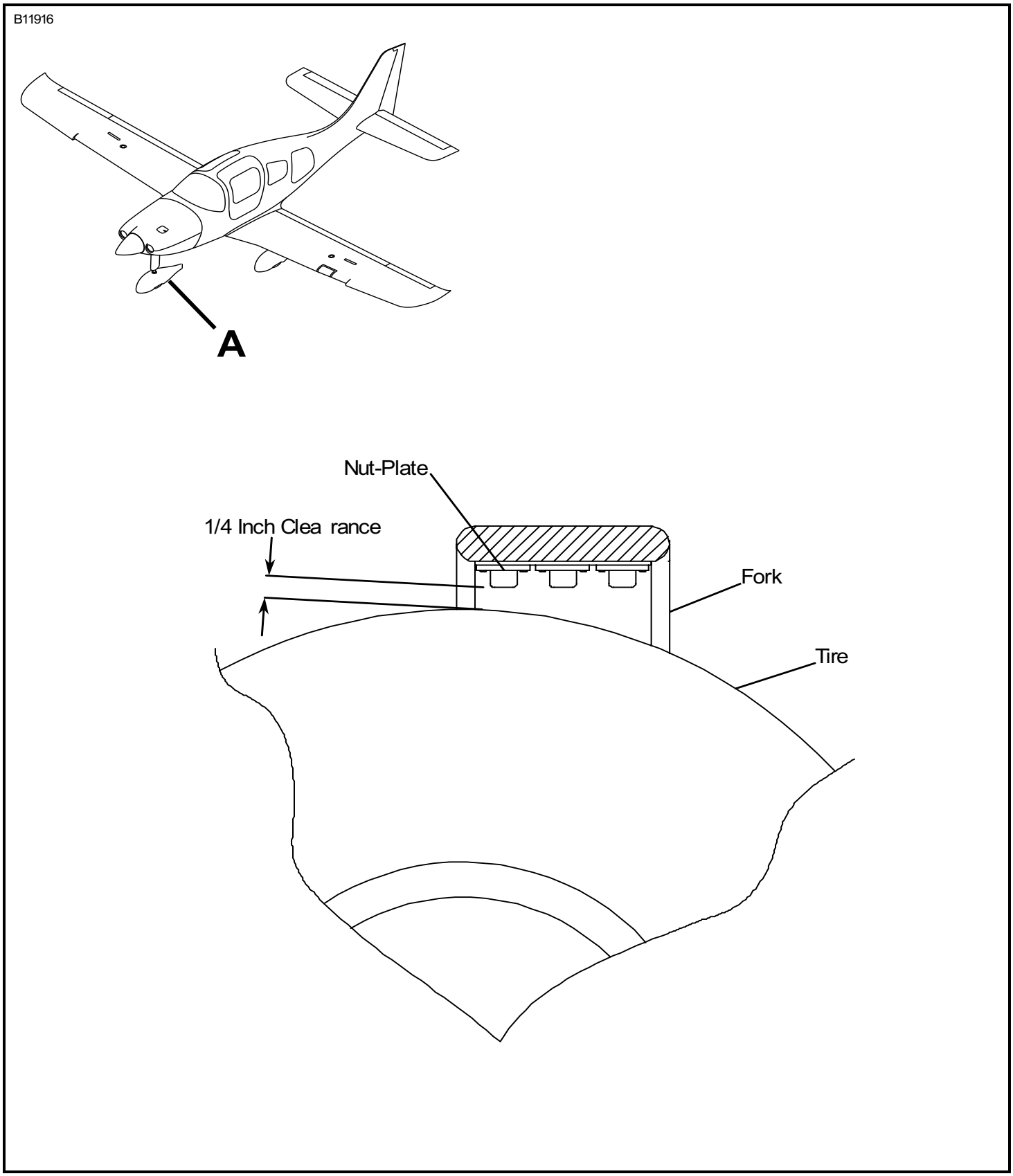
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 2 : Nose Gear Wheel and Fork Assembly



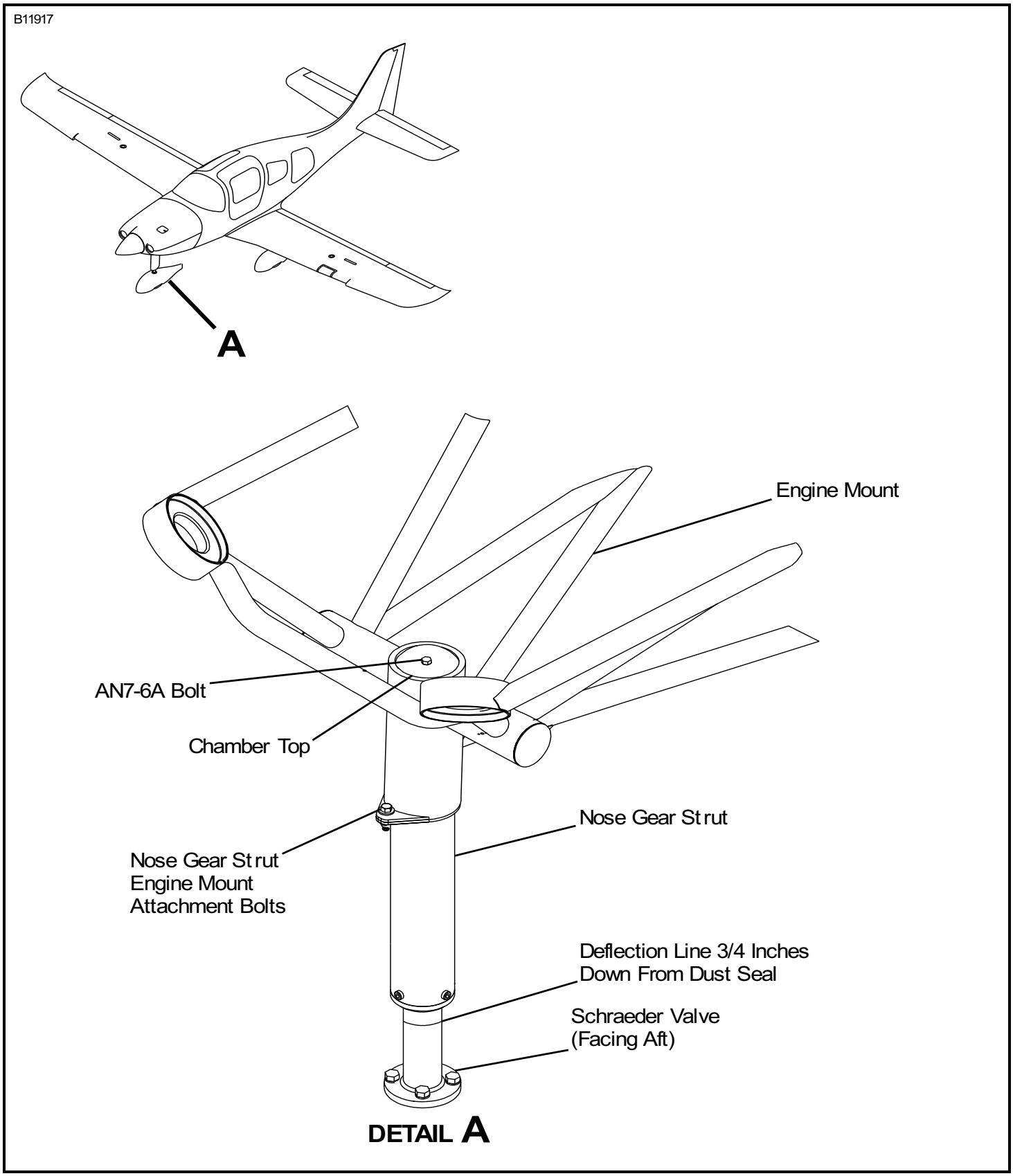
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Minimum Tire Clearance



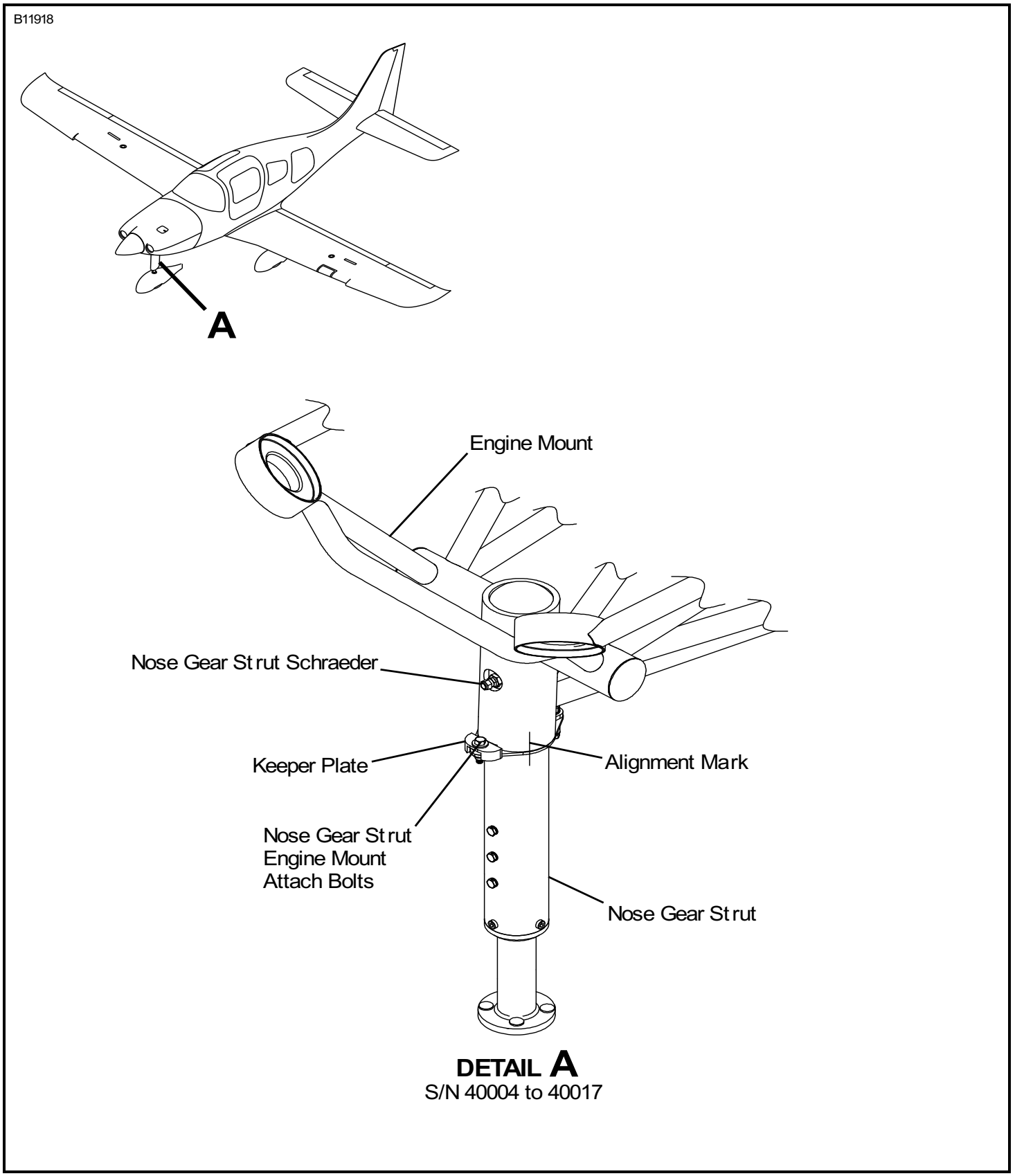
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Cessna Nose Strut Assembly



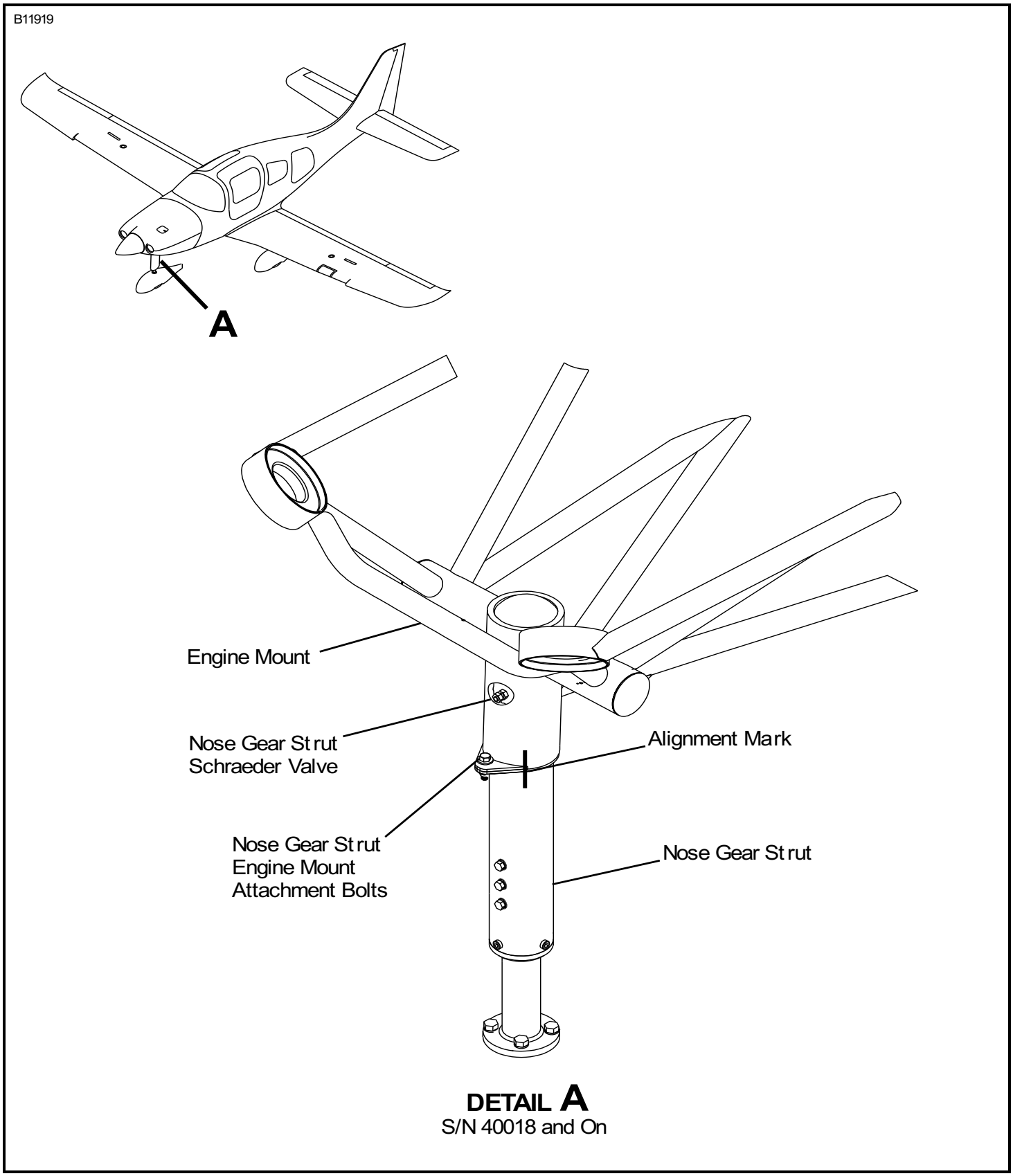
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : ESCO Nose Strut Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 2 : ESCO Nose Strut Assembly



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

WHEELS, TIRES AND BRAKE SYSTEM - MAINTENANCE PRACTICES

1. Wheels, Tires, and Brakes - General

A. The Cessna 300 (LC40-550FG) uses a 5.00-5 nose wheel and a 6.00-6 main wheel. The nose and main wheels are both tube type wheels. The nose wheel uses a 5.00-5 10-ply tire and the main wheel uses a 15x6.00-6 6-ply tire. Wheels and tires are certified under the requirements of TSOC26c, and all replacement parts should be in accordance with the TSO.

2. Wheels, Tires, and Brakes

A. All service and maintenance practices for the main wheels are in accordance with the latest issue of Cleveland Wheels and Brakes Maintenance Manual AWBCMM0001. The manual includes the disassembly and reassembly of the wheel and brake disk, the installation of tires and tubes, and the service and repair of wheel bearings and bearing races. Service and maintenance of the brake calipers and brake master cylinders is also covered in the Cleveland maintenance manual.

3. Brake System

A. The Cessna 300 has dual brakes located on the main gear. The brakes are hydraulically actuated and used for steering (differential braking) as well as stopping.

(1) **Removal and Installation of the Brake Calipers**

(a) Gain access to the brake calipers by removing the main gear wheel pant access panel.

(b) Remove the four bolts from the brake caliper that hold on the brake pads. Pads will drop away from behind the wheel disc.

(c) Slide the brake caliper straight out from the torque plate.

CAUTION: Depressing the brake pedals at this point will push the brake caliper pistons out of the calipers and release brake fluid.

(d) Disconnect the brake line from the brake caliper. Once the brake line is removed, use a plug or cap to seal the end of the brake line to minimize the amount of brake fluid that will drain from the line.

(e) Reinstall the brake calipers in the reverse order. Torque the brake pad attachment bolts per the latest issue of Cleveland Maintenance Manual AWBCMM0001.

(f) Service the brake system per the instruction in the Servicing and Maintenance of the Brake System section.

(2) **Removal and Installation of the Brake Master Cylinders** - The brake master cylinders are located in the cabin. There are four master cylinders, one at each rudder pedal. The brakes are actuated by depressing the rudder pedals, which in turn depresses the brake master cylinders. Use the following procedure for removing and installing the master cylinders.

(a) Remove the main gear wheel pant access panel to gain access to the brake caliper.

(b) Place a small pan or bucket under the brake caliper, and remove the lower bleeder valve.

(c) Depress the rudder pedals several times to facilitate draining of the brake system.

(d) Once the brake system is drained of hydraulic fluid, disconnect the brake lines from the brake master cylinder.

NOTE: Place some rags or a small pan underneath the master cylinder and rudder pedal to catch any excess hydraulic fluid that may still be present in the line.

(e) Remove the cap plug, cotter pins, nuts, washers, and bolts attaching the master cylinder to the rudder pedal and the rudder crossover tube. Refer to Figure 201 and Figure 202.

(f) Install the brake master cylinder in the reverse order. Check all fittings and attachments for security. Fill a new MS-3 cap plug half full with Wacker SWS-951 sealant, and install over the nut with the cotter pin.

(g) After the master cylinder is re-installed, re-fill the brake system with hydraulic fluid, MIL-H-5606, per the instructions in the Servicing and Maintenance of the Brake System section.

(3) **Servicing and Maintenance of the Brake System** - The brake system is a self-contained system and under normal operating conditions should not need any service or maintenance. The system will need to be serviced if the brake calipers or other components are replaced. If the brakes begin to feel "soft", the brake system may have air in the lines and will need to be serviced. The brake system will also need to be serviced if any of the brake lines are disconnected. Servicing the brake system will require the use of a small “garden sprayer” with a modified nozzle or other similar device. The spray nozzle should be replaced with a small section of tubing that can be fitted to the brake caliper bleeder valve. Use the following procedure for bleeding and servicing the brake system.

WARNING: Only service the brake system when the brake calipers are attached to the wheel and disc

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

assembly. If the brake system is pressurized with the caliper unattached to the wheel and disc, the caliper pistons will be pushed out of the caliper.

(a) Place a small bucket or pan under the drain valve located at the rear of the lower engine cowl.

(b) Gain access to the brake caliper by removing the inner wheel pant access panel.

(c) Loosen the bleeder valve located on the bottom of the brake caliper.

(d) Fill the "garden sprayer" with MIL-H-5606 hydraulic fluid, and connect the end to the bleeder valve. Pressurize the sprayer.

(e) Depress the handle to release hydraulic fluid into the brake system.

(f) Depress the brake pedal several times until all air is forced out of the system. When all the air is forced out of the system, the brakes will feel "firm".

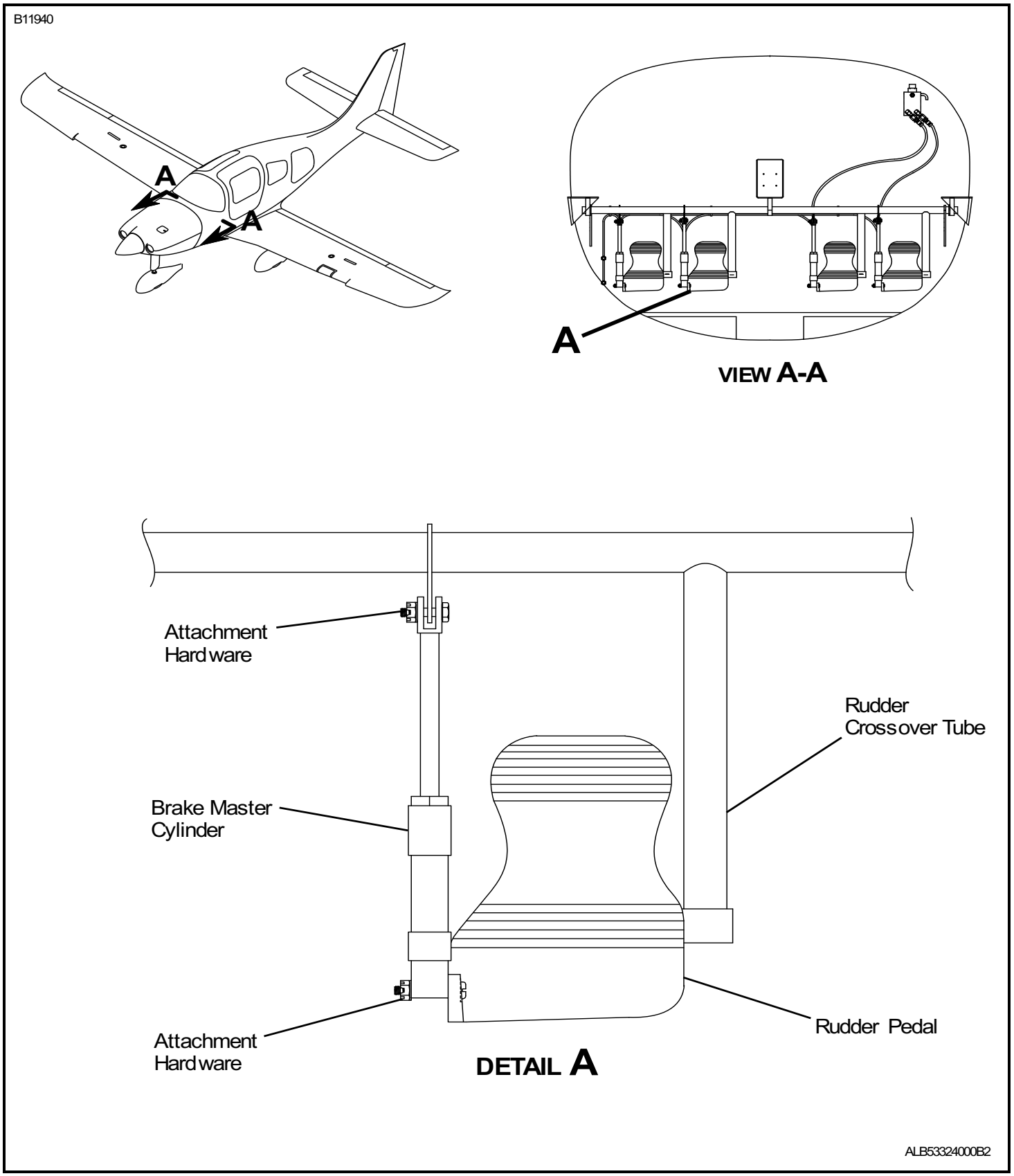
(g) Once the brake system has been serviced, tighten the bleeder valve prior to removing the "sprayer".

(h) Clean any excess brake fluid that may have spilled on or near the brake caliper, wheel, and brake disc.

(i) Reinstall the wheel pant access panel.

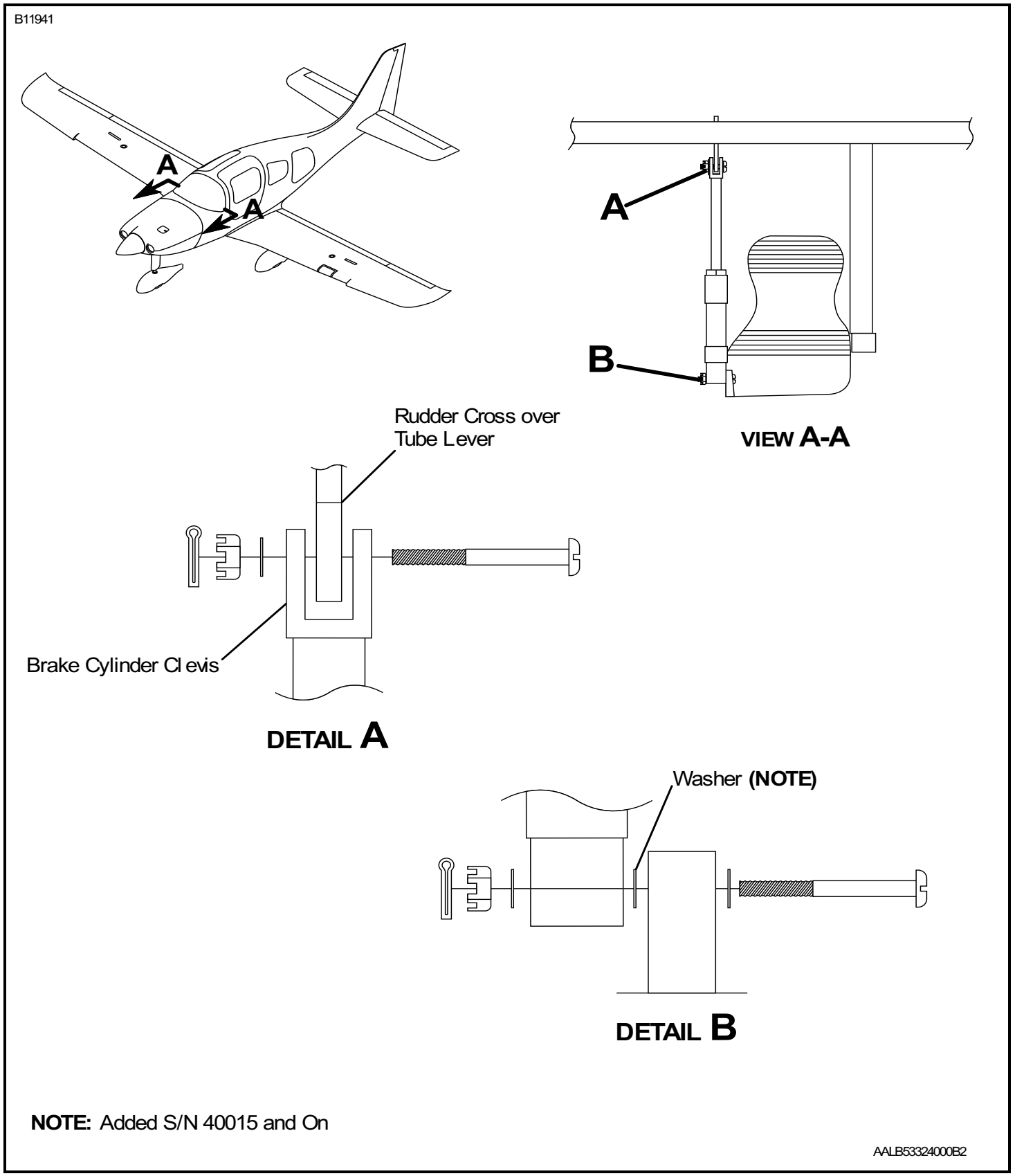
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Rudder Pedal and Brake Master Cylinder Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Rudder Pedal and Brake Master Cylinder Attachment Details



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

PARKING BRAKE - MAINTENANCE PRACTICES

1. The Parking Brake

A. The Cessna 300 uses a parking brake to lock the brakes and prevent the aircraft from rolling. The parking brake is located on the left side of the cabin just forward of the circuit breaker panel.

(1) **Removal and Installation**

(a) Remove the parking brake interior panel per the instructions in Chapter 25.

(b) Drain the hydraulic system per the instructions in Section 32-40-00, Removal and Installation of the Brake Master Cylinders.

(c) Disconnect the brake lines from the parking brake. Place a rag under the brake lines to prevent any excess brake fluid that may still be in the lines from leaking onto the carpet.

(d) Remove the two AN526C1032R24 truss head screws and two NAS1149F0363P washers that attach the parking brake (refer to Figure 201), and slide the brake straight out.

(e) Reinstall the parking brake in the reverse order. Torque the attachment screws 30 to 36 inch-lbs.

(f) Service the brake system per the instructions in the Servicing and Maintenance of the Brake System section.

(2) **Service and Maintenance** - The parking brake is a sealed system and should not need any service or maintenance. The parking brake should be inspected periodically to ensure that it is still functioning properly. Use the following procedure to check if the parking brake is functioning properly.

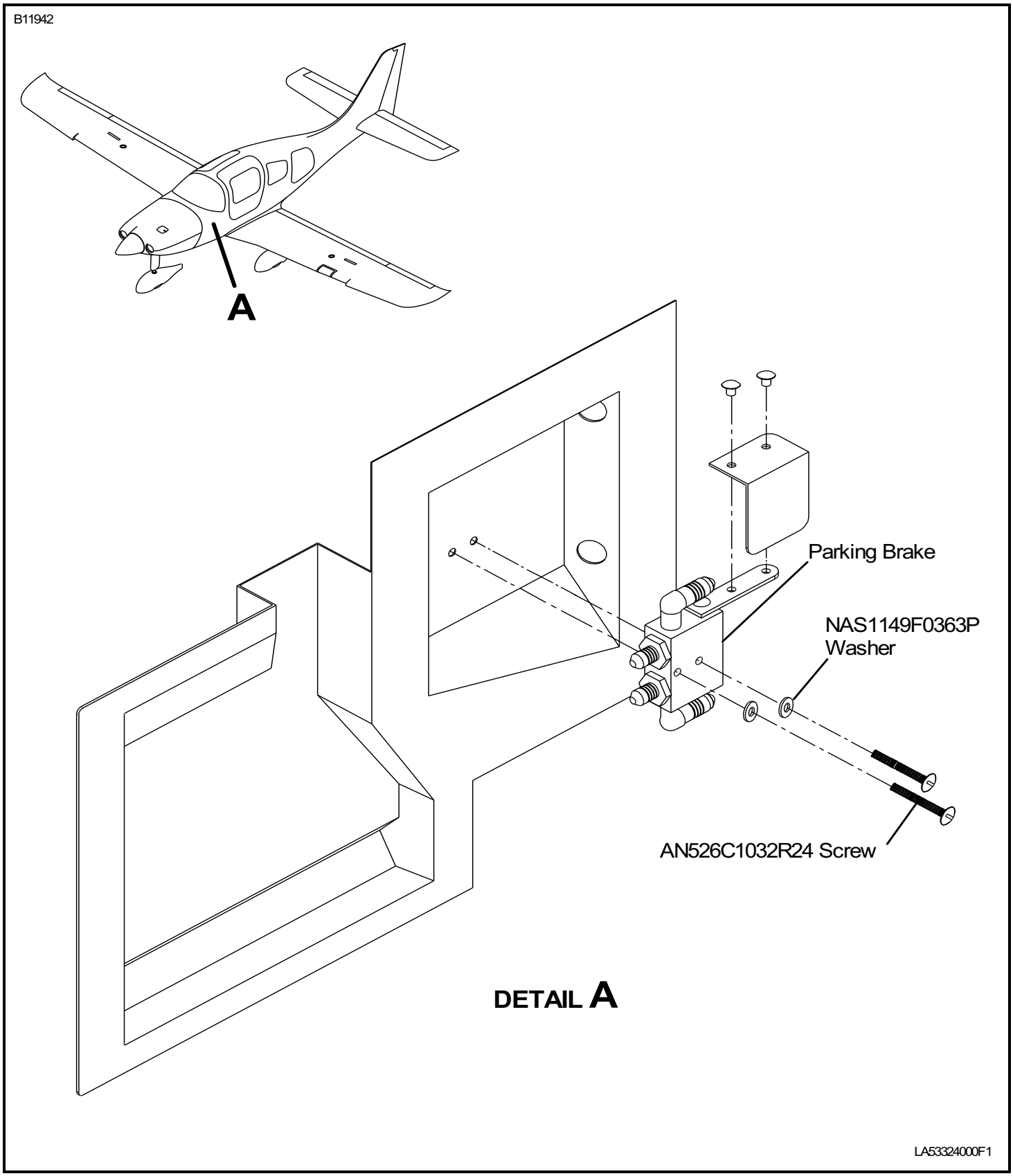
(a) Depress the rudder pedals to actuate the brakes.

(b) While pressing on the rudder pedals, pull the parking brake lever out and towards the pilot’s seat to engage the parking brake and lock the brakes.

(c) Using the tow bar, attempt to pull the airplane forward. If the airplane will not roll or the tires skid, the parking brake is functioning correctly. If the airplane does roll forward with little or no resistance the parking brake should be inspected for proper attachment of the brake lines (refer to Figure 202) and possible service of the parking brake itself. Service of the parking brake is in accordance with the latest issue of Cleveland Maintenance Manual AWMCMM0001.

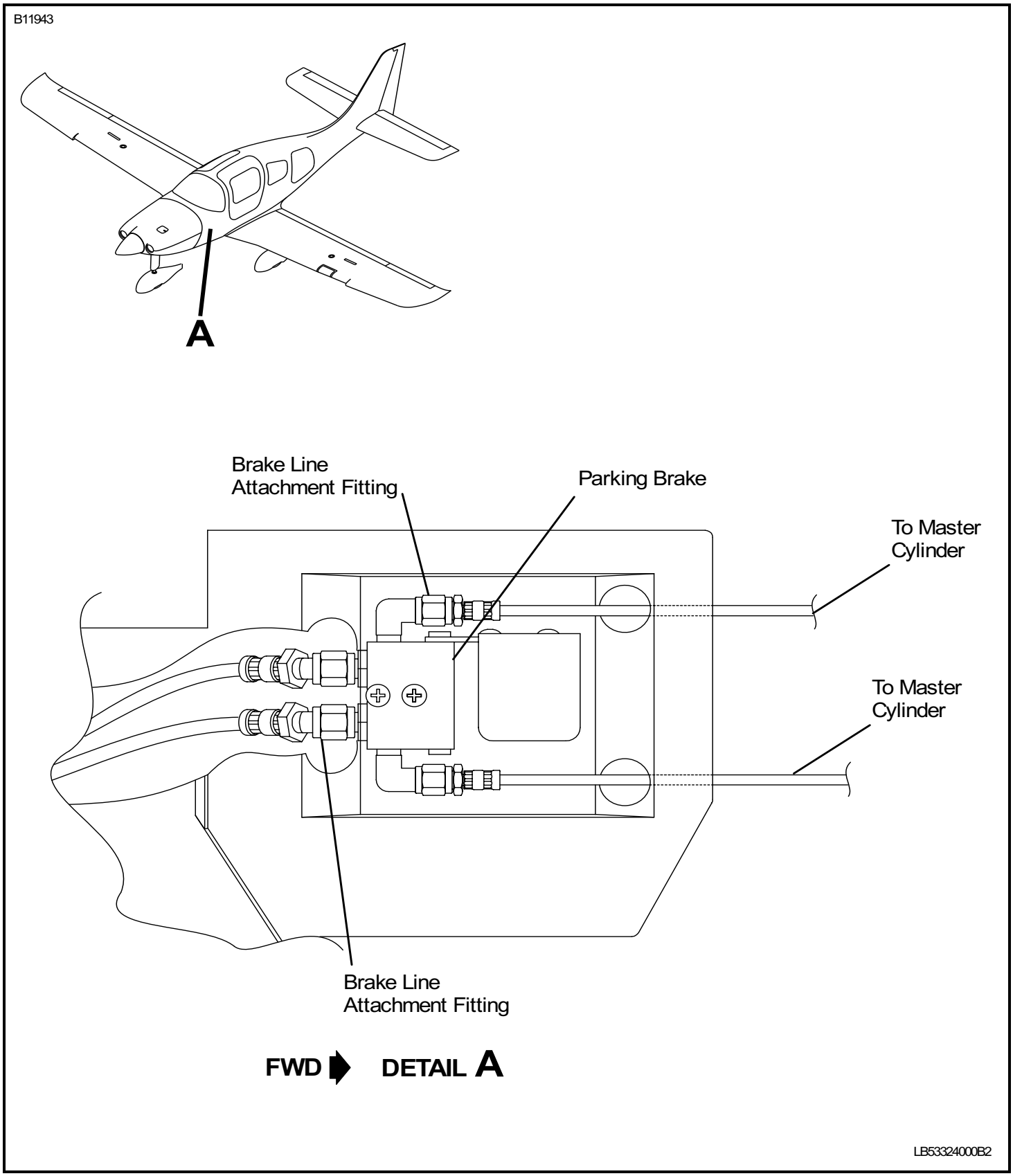
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Parking Brake Installation



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Parking Brake and Brake Line Attachment



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LIGHTING - GENERAL

1. Interior Lighting System - General

A. The interior lighting system of the Cessna 300 is one of the more sophisticated systems available for small airplanes. There are six different lighting systems within the interior of the airplane. For a summary of these lighting systems refer to Table 1. For information about trim, annunciators, and flap position LED's, refer to Chapter 25-11-00. For information about the fuel tank LED's, refer to Chapter 28-40-00.

B. **Flip & Access Lights** - The flip-lights are rectangular shaped fixtures located in the middle of the overhead panel and in the baggage compartment. The lights bypass the system master switch and operate without turning on power to the system. The two fliplights are turned on by rotating or flipping the lens right or left. In the center position, they are used as part of the airplane's access lighting system.

(1) When either main entrance door is unlatched, a switch in the door latching mechanism activates the two flip-lights and the two lights that illuminate each entrance step. The access lights are on a ten-minute timer and turn off automatically unless reset by activating both main door latching mechanisms when all the doors are closed.

(2) This design has two advantageous features. First, opening either of the main cabin doors provides an immediate light source for preflight operations, passenger access, and baggage loading. Second, the flip-lights, when rotated either left or right, serve as emergency lighting in situations which necessitate turning off the master switch. The only disadvantage is that the flip-lights can inadvertently be left on, depleting battery power. To prevent this from happening, ensure the flip-lights are in the centered or flush position when securing the airplane at the end of a flight.

C. **Overhead Reading Lights** - There are three overhead reading lights, two in the front seat and one between the two backseat positions. Each light has its own switch and is on a swivel that can be adjusted to an infinite number of positions. The intensity of these lights is adjusted by moving the left thumb-wheel dimmer switch in the center of the overhead panel, near the windshield. The dimmer has an on-off switch at the extreme aft position of its rotation. Rotating the thumb-wheel forward increases the light intensity. The airplane's position lights must be on for the overhead reading lights to operate.

D. **Instrument Flood Bar** - There is a tube array of color-corrected lights inserted under the glare shield. This indirect light source complements the backlighting in each instrument and facilitates the use of adjustable instruments such as the true airspeed indicator, directional gyro, and navigational instruments. The intensity of the lights can be adjusted by moving the right wheel-type dimmer switch in the center of the overhead panel, near the windshield. The dimmer has an on-off switch at the extreme aft position of its rotation. Rotating the thumb-wheel forward increases the light intensity. The airplane's position lights must be on for the instrument flood bar lights to operate.

E. **Upper Instrument and Engine Panels** - The instruments in the flight and engine instrument panels have backlighting, i.e., a small light within each instrument case that illuminates its dial. The right thumb-wheel switch between the pilot's legs on the knee bolster, controls the dimmer for these lights. The dimmer has an on-off switch at the extreme down position of its rotation. Rotating the thumb-wheel up increases the light intensity. The airplane's position lights must be on for the upper instrument and engine panel lights to operate.

F. **Lower Instrument Panel, Circuit Breaker Panel, and Rocker Switches** - The lower instrument, circuit breaker, and rocker switch panels contain switches and controls that have backlighting. The lighting illuminates the placards on or next to the breaker, switch, or control and the internally lighted engraved rocker switches. The dimmer for these lights is controlled by the left thumb-wheel switch between the pilot’s legs on the knee bolster. The dimmer has an on-off switch at the extreme down position of its rotation. Rotating the thumb-wheel up increases the light intensity.

Table 1. Lighting Systems

LIGHT	LOCATION OF LIGHTS	LOCATION OF SWITCH	REMARKS
Courtesy Lights	Front and rear flip lights in overhead console Exterior lights near the right and left entrance steps	If all doors are latched, flip light is activated by flipping the lens from the neutral position. If a door is unlatched, a switch activates flip lights when the lens is in the neutral position. Step lights are turned on with door switch.	Door switch activates timer that turns off access lights after 10 minutes. Operates with master switch on or off

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Overhead Swivel Lights	Two overhead swivel lights in the front seat area One centered swivel light in the rear seat area	The left thumb wheel dimmer switch is in the overhead panel. Individual switch at each light	Master switch and navigation lights must be on for the system to operate.
Glare Shield Flood Bar	Color corrected flood bar under the glare shield that lights the flight instruments and front panel areas	The right thumb wheel dimmer switch is in the overhead panel.	Master switch and navigation lights must be on for the system to operate. Part of the standby battery system
Upper Instrument Panel	Provides backlighting for engine and flight instruments	The right thumb wheel dimmer switch is in the knee bolster on the pilot's side.	Master switch and navigation lights must be on for the system to operate.
Lower Instrument & Circuit Breaker Panels	Provides backlighting for radios, switches, or placards next to switches, circuit breakers, and controls	Left thumb wheel dimmer switch is in the knee bolster on the pilot's side	Master switch and navigation lights must be on for the system to operate.
Trim, Flaps, Fuel Tank, & Annunciator Panel	The trim position LED's are in the trim panel. The flap position LED's are in the flap panel. The fuel tank LED's are on the fuel quantity gauge. Annunciator LED's are in the annunciator panel.	The day/night and test features for these items are located in the trim panel, just above the engine control.	Master switch and navigation lights must be on for the system to operate.

2. Exterior Lighting System - General

CAUTION: Before any maintenance, removal, or installation of equipment or light bulbs is performed, make sure both the master and avionics switches are in the off position. Before removing the light bulbs, be sure that they have not been in use for several minutes and have cooled sufficiently.

A. **Description of System** - The exterior lighting system includes the position lights, the strobe or anticollision lights, the landing light, and the taxi light. These lights are activated through use of switches in the rocker switch panel. The light system is protected by circuit breakers in the circuit breaker panel.

B. **Position and Anticollision Lights** - The left and right position lights (red and green) are mounted on each wing tip. Each wing position light contains the required aft or rearward projecting white lights. The anticollision lights are on each wing tip and contained within the same light fixture as the position lights.

C. **Taxi and Landing Lights** - The taxi and landing lights are contained in the leading edge of the left wing. The outboard bulb in the light housing is the taxi light that provides a diffused light in the immediate area of the airplane. The inboard bulb is the landing light, which has a spot presentation with a slight downward focus. The taxi and landing lights are sized for continuous duty and can be left on for operations in high-density traffic areas.

3. Troubleshooting Light Problems

A. **Light Bulbs** - As a general rule, light bulbs that have a short life have good accessibility and can be exchanged easily. For example, most engine and flight instrument lights can be changed in 10 to 15 minutes depending on the location of the instrument. Light bulbs that have a long life require more time for access and replacement. A good example is the instrument flood bar and circuit breaker panel lights. These lights have a mean failure cycle of about 2000 hours, which means an airplane might have 12,000 hours (assuming about 15 percent of the flying is at night) before a light will fail.

B. **Check for the easy solution** - If none of the lights in the flood bar work, it is unlikely that all 20 bulbs burned out at the same time. In this situation, there is clearly a problem with the supply to the flood bar, and the problem should be diagnosed from this perspective. Conversely, if the altimeter light is inoperative, but all other flight instrument lights are normal, the problem is probably a light bulb.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

INTERIOR LIGHTING - MAINTENANCE PRACTICES

1. Flight Compartment Lighting

A. **Courtesy Lights (General)** - There are four courtesy lights. Two courtesy lights are located in the airplane's interior on the overhead console, and two are on the airplane's exterior, and are commonly referred to as step lights. The entrance step lights are located above and forward of the steps on both sides of the aircraft, on the underside of the wing-to-fuselage fairing. Each are easily accessible in the event of bulb burnout.

B. **Exterior Courtesy/Step Lights Removal**

(1) Remove the light assembly by gently prying it with a flat-head screwdriver. It should slide out with very little effort. Refer to Figure 201.

(2) Gently pull the step light assembly out of the hole, and unplug it at the connector.

C. **Exterior Courtesy/Step Lights Installation or Replacement**

CAUTION: Before doing any work on a system, ensure that all power and light switches are in the off position and the light that is to be replaced has not been in use for a least five minutes.

(1) Reconnect the connector and feed excess wire into the fuselage.

(2) Insert the light fixture into the hole, and push it in until it is flush with the surface.

(3) The exterior step light bulb is not replaceable. If a light fails, replacement of the whole assembly is required.

D. **Removing the Interior Courtesy Lights**

(1) The interior light housing can be removed by prying it off the panel with a screwdriver. Refer to Figure 202.

(2) Disconnect the three wires to the light housing.

(3) To remove the light bulb, push in the two tabs located to the left and right of the bulb.

(4) Push the bulb out of its slot to remove it.

E. **Installing the Interior Courtesy Lights**

(1) To install the interior light, place a new light bulb in the slot, and push it into place.

(2) Push the housing and the light cover together so that the two tabs click into place.

(3) Reconnect the three wires, and push the housing back into its slot in the panel. Refer to Figure 202.

F. **Troubleshooting the Interior Courtesy Lights**

(1) If the interior courtesy lights are not working, remove the housing from the panel, and make sure that all three wires are connected properly.

(2) Check each light bulb for a failure.

(3) Check the circuit protection for a blown fuse. The courtesy light system is connected directly to the battery (bypasses the master switch), and the fuse block is located next to the battery in the engine compartment. All fuses are labeled.

2. Overhead Swivel Lights

CAUTION: Before doing any work on a system, ensure that all power and light switches are in the off position and the light that is to be replaced has not been in use for a least five minutes.

A. There are three overhead swivel lights. Two are located in the front section of the cabin in the center of the overhead console. The third is located in the rear section of the cabin in the middle of the overhead console. These lights are also referred to as spot lights and map lights. Refer to Figure 202 for the removal and installation of the overhead swivel lights.

B. **Removing the Overhead Swivel Lights**

(1) Remove the eyebrow cover from the swivel light by pulling it out of the light assembly. The eyebrow is pressure fitted into the assembly to limit side glare.

(2) The swivel lights can be removed from the panel by gently prying them with a screwdriver.

(3) Disconnect the two wires to the light housing. Push in the three plastic tabs that hold the light bulb housing together.

(4) To access the light bulb, push down on the housing, and turn it to remove the light bulb cover.

(5) Gently pull the light bulb out of the metal tabs to remove it.

C. **Installing the Overhead Swivel Lights**

(1) To install the swivel light, place a new light bulb in the slot, and gently push it in until the tabs hold the light bulb in

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

place.

(2) Put the cover over the light bulb, push it down, and twist it until the cover and the housing latch together.

(3) Push the housing down into the frame until the three tabs click into place.

(4) Reconnect the two wires to the housing, and push the light back into its mounting hole in the panel.

(5) Reinstall the eyebrow cover.

D. **Troubleshooting the Overhead Swivel Lights**

(1) If the overhead swivel lights are not functioning properly, make sure that both of the wires are hooked up properly.

(2) Check the light bulb to be sure it is not burned out.

(3) Check the light dimmer assembly.

3. Glare Shield Flood Bar

A. The glare shield flood bar is located under the glare shield in the cabin. The flood bar is composed of ten pairs of lights (20 bulbs). Since each light pair is connected in series, the loss of one bulb will disable the pair. If more than two pair of lights burn out, a new flood bar must be installed if the airplane is to be used for IFR operations. Contact the factory for ordering a replacement flood bar assembly.

B. **Flood Bar Inspection/Airplane Restrictions** - With the flood bar turned on, use a mirror to count all the illuminated blue lights. If less than 16 lights are illuminated, then the flood bar must be replaced, or the airplane must be restricted to VFR operations. The flood bar is connected to the standby battery and is an integral component in the airplane's IFR certification. Refer to the minimum equipment list in Appendix A, Section 6, of the POH/AFM.

C. **Removing the Glare Shield Flood Bar**

(1) Remove the glare shield per instructions in Chapter 25-11-00, and place it inverted on a work bench. Use a soft bench and take care not to damage or scratch the compass.

(2) Remove the electrical connector from the compass.

(3) Pull the light tube to break the adhesive from the glare shield.

(4) Clean excess adhesive off the glare shield.

D. **Replacing the Glare Shield Flood Bar**

(1) Glare shield should be inverted on a work bench.

(2) Insert the electrical connector at the compass.

(3) Bond the flood bar to the underside of the glare shield at the front lip with RTV-5818 adhesive.

(4) Use four strips of adhesive 2 inches long. Locate one at each end and two spaced on each side of the center of the flood bar, beginning 3 inches from the center and extending outboard.

(5) Note that the wiring tail must hang from the left (pilot) side of the assembly.

(6) Reinstall the glare shield per instructions in Chapter 25-11-00.

4. Upper Instrument Panel

A. **Field Repair Instrument Lights** - The field repair instrument lights are located in the engine and flight instruments. The upper instrument lights are broken into two groups, (1) flight instruments and (2) engine instruments. Flight instruments include: the air speed indicator, altimeter, vertical speed indicator, turn coordinator, directional gyro, and artificial horizon. Engine instruments include: fuel quantity, manifold pressure/fuel flow, vacuum/ammeter, oil pressure/temperature, and cylinder head/exhaust gas temperature gauges. The magnetic compass is also included with the upper panel discussion.

B. **Factory Repair Instrument Lights** - There are a few flight, engine, and navigational instruments that have sealed lights, i.e., lights that cannot be accessed in the field. These instruments include the flight director, horizontal situation indicator (HSI), navigational indicator (OBS), and the tachometer. The lights in these instruments are designed to last several thousand hours and, under normal conditions, should never require replacement. If a light does become inoperable, and it is confirmed that there is power to the instrument, then the instrument must be removed and sent to an instrument shop for bulb replacement.

C. **Removal and Replacement of Flight Instrument Lights** - These instruments use a light tray for lighting. To change a bulb use the following steps:

(1) Remove the glare shield, and partially remove the instrument panel to gain access to the desired flight instrument. Refer to Chapter 25-11-00 for details.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(2) If necessary, remove the flight instrument panel by removing the screws in the instrument panel.

(3) Unscrew the two screws holding the light tray to the top of the instrument. The whole light tray must be replaced since the bulb is soldered to it. Refer to Figure 203.

(4) Once the light tray is replaced, reverse the above steps for installation of the instrument. The screws holding the instrument to the instrument panel do not have torque values and should be snug tight.

D. **Removal and Replacement of Engine Instrument Lights**

(1) Remove the engine instrument panel per instructions in Chapter 25-11-00.

(2) If necessary, remove the engine instrument by removing the screws in the instrument panel.

(3) To change the light bulb, unscrew the lights on top of the instrument 1/4 turn, and screw in a new light. Refer to Figure 204.

(4) Once the engine instrument light is replaced, reverse the above steps for reinstallation of the instrument. The screws holding the instrument to the instrument panel do not have torque values and should be snug tight.

E. **The Magnetic Compass**

(1) To access the light bulb in the magnetic compass, slide up the access cover on the front of the instrument. Refer to Figure 205. The cover is hinged at a single point on the left side of the compass and rotates counterclockwise around the attachment point. There is a small rivet on the left side, which serves as the latch for the access cover.

(2) Note that the light bulb slides into the light channel with the base of the bulb pointing aft. When closing the access cover with a bulb in the light channel, it works best to gently push on the right side of the cover so that the cutout can slide behind the rivet.

5. Lower Instrument Panel

A. **Lower Instrument Lights** - The lower instrument panel lights include switches in the ignition panel, rocker panel, ECS panel, and circuit breaker panel.

B. **Ignition, Rocker, and ECS Panels** - There are two rocker switches in the ignition panel, eight switches in the rocker panel, and one switch in the ECS panel. The light bulb in these switches is soldered into the unit, which means the switch must be replaced if the bulb in the switch burns out.

C. **Rocker Switch Removal and Installation** - Use the following steps to remove and install a switch. Refer to Figure 206.

(1) Remove the panel per instructions in Chapter 25-11-00.

(2) Identify the rocker switch that is to be removed, and label each wire in relationship to its spade connector.

(3) After each wire is labeled, remove it from the switch.

(4) To remove the switch, push it out from the back of the panel. To do this, simultaneously apply pressure to the top and bottom (usually the thumb and index finger) across the width of the switch to compress the four retaining clips.

(5) Install the switch by compressing the retaining clips and inserting it into the panel.

(6) Connect the wires to the spade connectors, and with the master switch on, test the switch for proper operation.

D. **Circuit Breaker Panel Lights (Overview)** - The circuit breaker panel is located on the left side of the airplane, just forward of the pilot's seat. The panel contains five tiered rows. Above each row is a small overhang that spans the width of the row. For this discussion, the rows are numbered 1-5 from top to bottom. Refer to Figure 207. Within each overhang there are light elements referred to as wheat bulbs, which are epoxied into holes in the overhead row. The number of bulbs in each row depends on the length of the row. Rows 1-3 have two bulbs and rows 4-5 have four. The wheat bulbs are soldered into place in series, in pairs of two. This means that if one bulb in a pair burns out, the other bulb in series will not function.

E. **Removal and Replacement of Circuit Breaker Panel Lighting**

(1) Remove the circuit breaker panel per instructions in Chapter 25-11-00.

(2) Remove the two large bus cables, disconnect the three black connectors, and remove the circuit breaker panel. Be sure to label each cable and connector location before disconnecting it.

(3) To gain access to the bulbs in rows 2-5, remove the required circuit in the row one number lower than the row with the malfunctioning light. For example, if the lights in row three are inoperative, remove the required circuit breakers (for access to the lights) in row two.

(4) Break the burned out light bulb and the companion series bulb out of their epoxied holes, and remove excess epoxy

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

and fragments.

(5) Solder replacement bulbs.

(6) Place each bulb in its hole and, while holding it in, place with a screwdriver, add a BB-sized drop of epoxy on to the bulb and panel, and hold in place for about 30 seconds.

(7) Reconnect all plugs to the circuit breaker panel and, before reinstallation of the panels, turn on the power to the system to check the bulbs for proper operation.

6. Trim, Flaps, Fuel, And Annunciator Led's

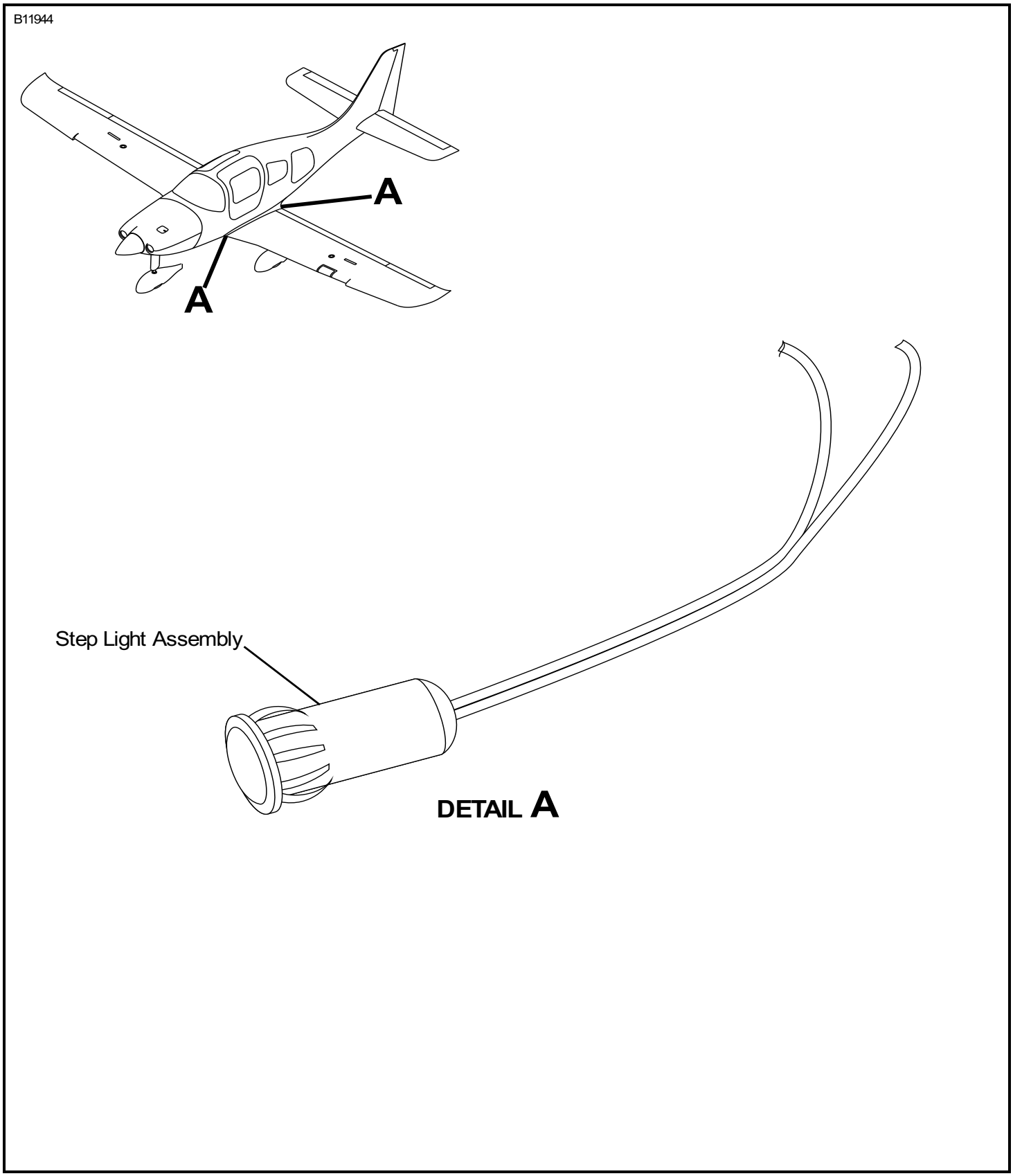
A. The trim, flap, fuel, and annunciator panel LED's are located in the trim and flap panels, the fuel quantity gauge, and the annunciator panel. These LED's are not field repairable. Contact a factory representative for referral to a qualified technician to replace the LED's.

B. **Electroluminescent Lamps (EL) Lighted Panels** - There are four EL panel overlays in the airplane. These include: the ignition panel, trim panel, flap panel, and ECS panel. The EL portion of each panel is AC powered, and through a so-called cool chemical reaction process, illuminates the letters on the panel. The inverter (AC power source) for the flap panel is located on the back of the flap assembly. The inverter for the ignition, trim, and ECS panel is located on the back of the trim assembly. Therefore, if the trim panel inverter fails, all three panels are affected.

C. **Panel Replacement** - The panel overlays are durable, and the light source has a very high mean failure cycle and should be serviceable through four airframe service cycles, or about 12,000 hours. Should a panel fail to function, contact a factory representative for referral to a qualified technician that can replace the overlay or the inverter, depending on the problem. In some instances, particularly for airplanes with a high number of hours, it might be more cost effective to replace the entire panel assembly.

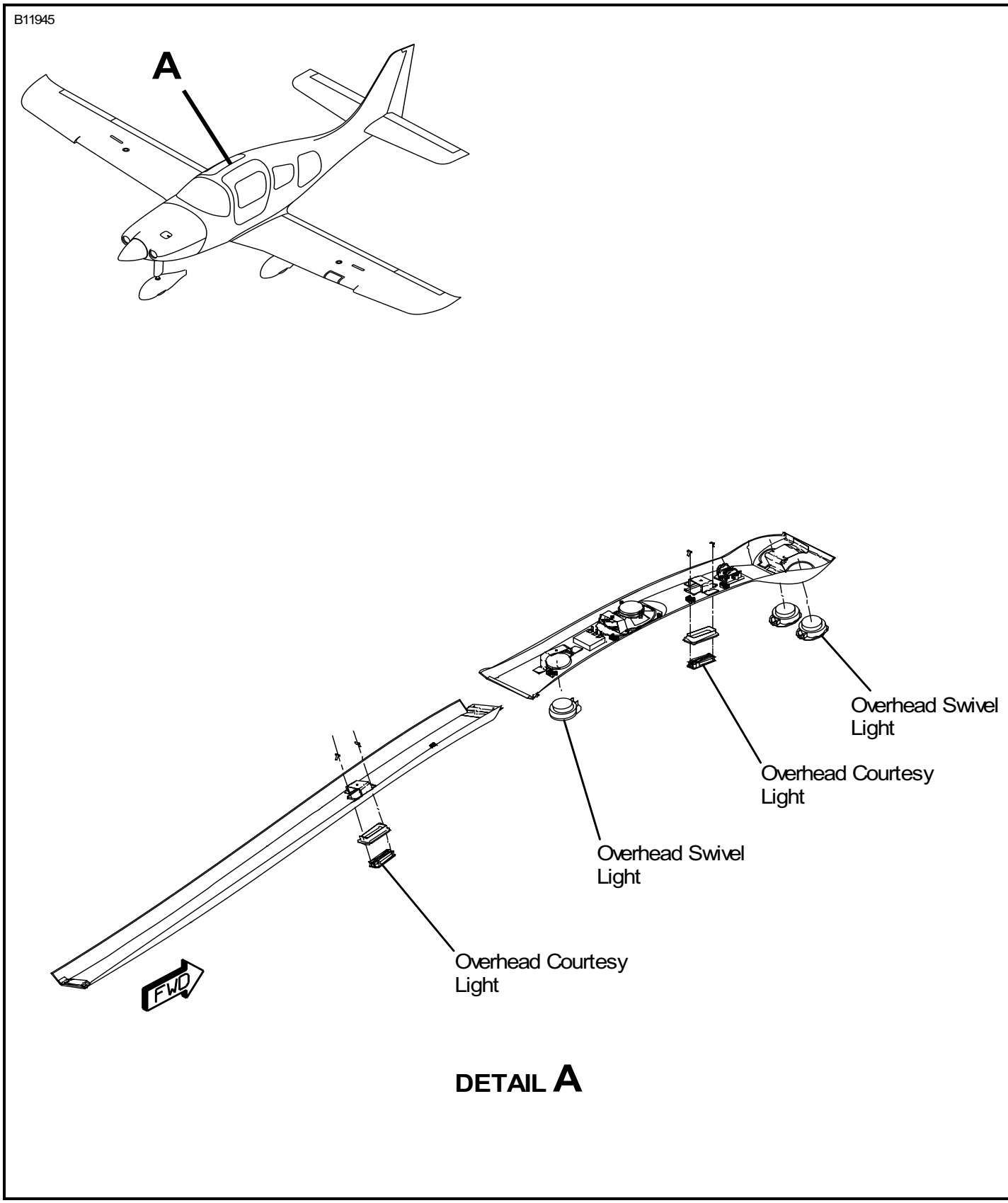
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Step Light Assembly



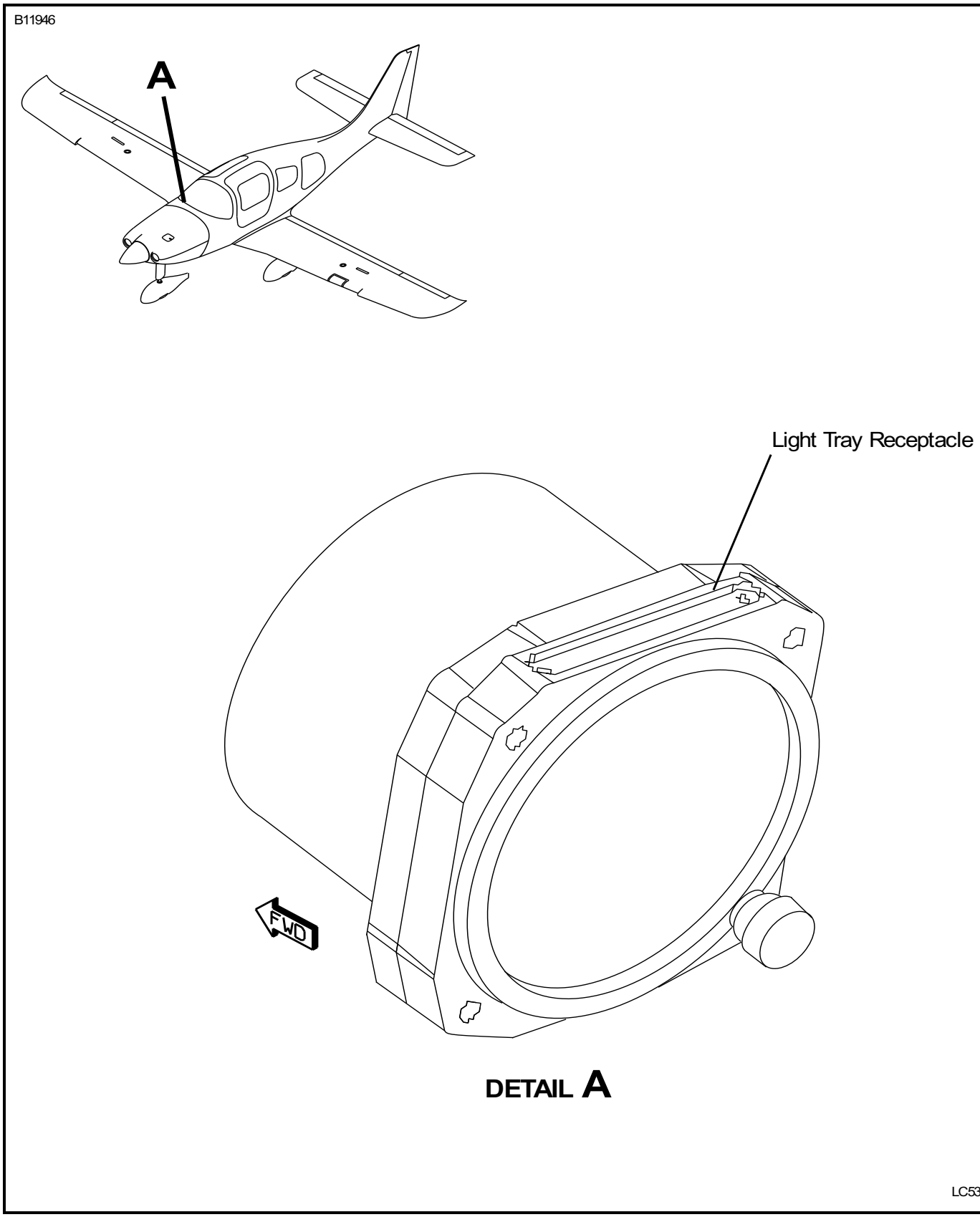
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Overhead Lights



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

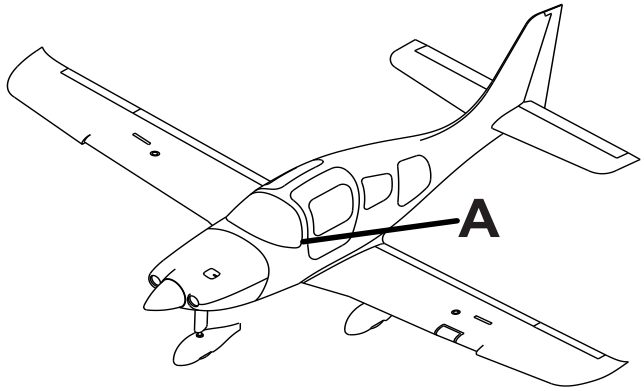
Figure 203 : Sheet 1 : Light Tray-Type of Instrument

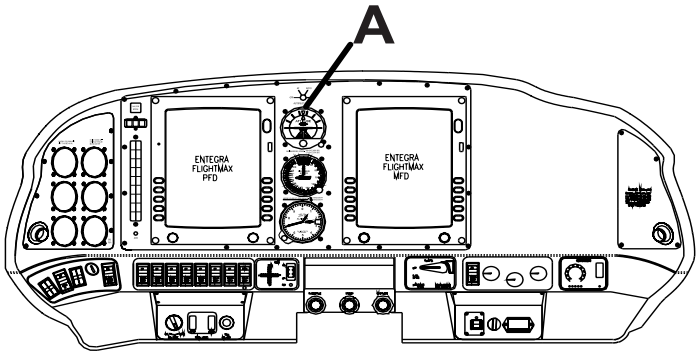


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

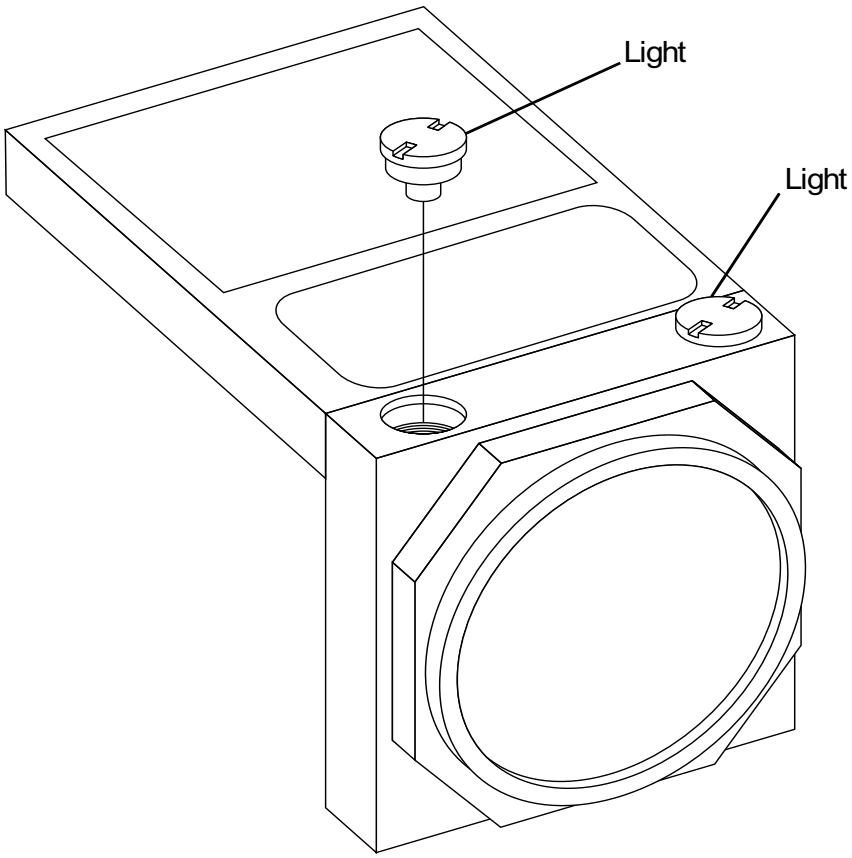
Figure 204 : Sheet 1 : Engine Instrument

B11947





VIEW A-A

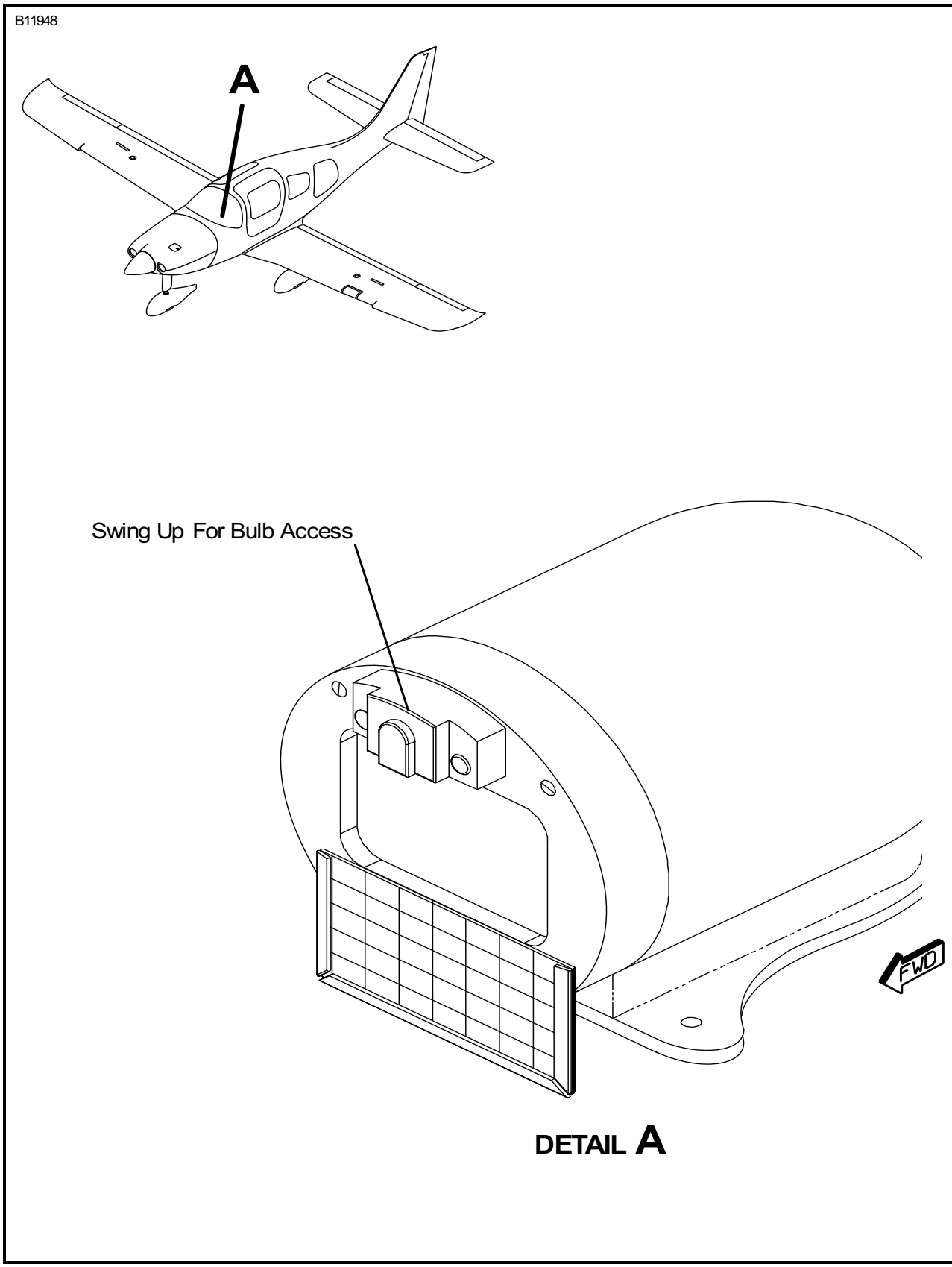




DETAIL A

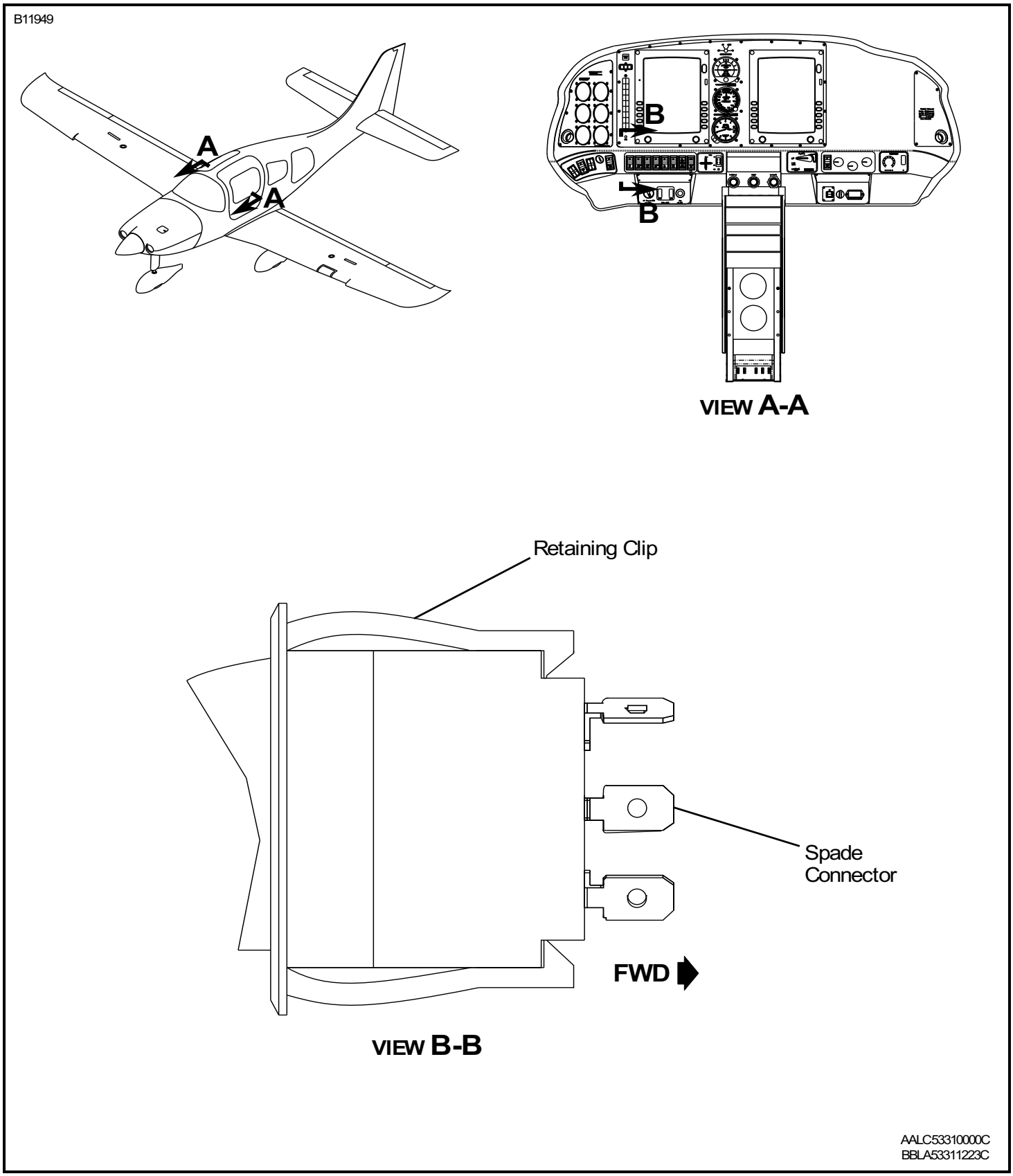
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Compass Light



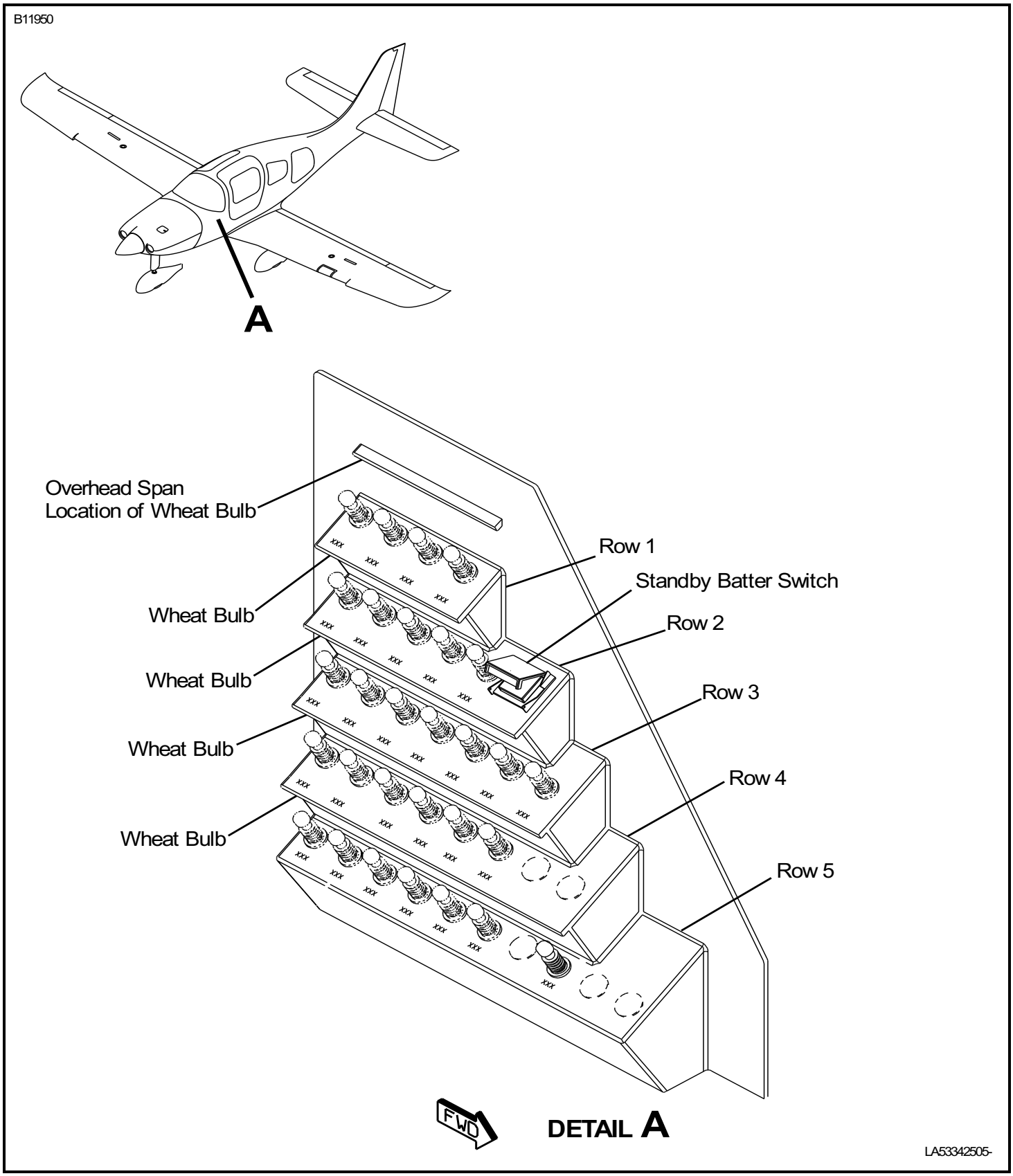
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Rocker Switch



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Circuit Breaker Panel



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STANDBY BATTERY LIGHTING - MAINTENANCE PRACTICES

1. Standby Battery Lighting

A. **Purpose** - The standby battery is used in case of total electrical failure. The standby battery powers certain items when activated. The standby battery is covered in more detail in Section 24-35-00, however, it is mentioned in this chapter because the instrument flood bar is part of the standby battery system.

B. **Lights and Equipment** - When the standby battery system is activated, electrical power from the standby battery powers the flood bar.

C. **General Information on the Standby Battery**

(1) Once the standby system is activated, the items will operate for at least 30 minutes.

(2) Once the standby system is activated and has been used, the battery pack must be replaced at the conclusion of the flight.

(3) In any event, the battery pack must be replaced every five years.

(4) The standby battery is located behind the main console on the passenger's side.

(5) Steps for removal, replacement, ordering, and installation of the standby battery are located in Section 24-35-00.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

EXTERIOR LIGHTING - MAINTENANCE PRACTICES

1. Position Lights

A. There are a total of four position lights located on the airplane. Each wing tip contains a housing that holds a colored lens forward and a clear lens aft. The position light housing also contains the strobe lights. Refer to Figure 201. All four bulbs are clear. The forward lens on the left side is red and the forward lens on the right side is green.

CAUTION: If lights have been in use, use protective gloves when removing hot bulbs.

B. **Removal of Position Light Lamp**

(1) Remove the screws securing the lens shield to the wing tip.

(2) Remove the lens from the position light assembly.

(3) Grasp the lamp, depress slightly, and turn counterclockwise to release and remove the lamp from the bayonet mount.

C. **Installation of Position Light Lamp**

(1) Place the lamp in the bayonet socket, depress, and gently turn clockwise until the lamp seats in the socket.

(2) Position the lens and gasket in place.

(3) Secure the lens by installing the lens shield to the wing tip with screws.

D. **Maintenance of Position Light** - General maintenance is limited to lamp replacement and cleaning of ozone buildup inside the position light lenses. The lenses may be cleaned with dish soap and water using a soft cotton cloth.

2. Strobe Lights

A. The strobe lights are contained in the left and right wing tip in the same housing as the position lights. Refer to Figure 201. The strobe lights and lenses are both clear. Switching the strobe rocker switch to the on position activates the strobe lights. This position supplies power to the to the strobe power supply which alternates the power between the left and right strobe light.

B. **Strobe Tube Assembly Removal (Left or Right)**

(1) Remove the screws securing the lens shield to the wing tip.

(2) Remove the lens from the front of the strobe tube assembly.

CAUTION: If the same strobe tube assembly is to be reinstalled after removal, use protective gloves or a cotton wrap to ensure fingertip oil does not come into contact with the strobe tube assembly.

(3) Carefully pull the strobe light assembly wiring to retrieve the strobe connector (P17/P18) from inside the wing tip. Disconnect the strobe connector.

(4) Remove the strobe tube assembly from the base assembly, and remove from the wing tip.

CAUTION: Use protective gloves or a cotton wrap to ensure fingertip oil does not come into contact with the strobe tube assembly.

C. **Installation of Strobe Tube Assembly**

(1) Position the strobe tube assembly, and connect the strobe connector.

(2) Feed the strobe connector and the strobe light assembly wiring into the wing tip.

(3) Position the spacer, and install the strobe tube assembly to the base assembly.

(4) Position the lens at the strobe tube assembly, and place the ground wire inside of the lens.

(5) Place the lens on the strobe tube assembly.

(6) Secure the lens by installing the lens shield with screws.

D. **Maintenance of Strobe Tube Assembly** - General maintenance is limited to lamp/tube replacement, removal and installation of the strobe light power supply, and cleaning of ozone buildup inside the strobe lenses. The lenses may be cleaned with dish soap and water using a soft cotton cloth.

CAUTION: Use protective gloves or a cotton wrap to ensure fingertip oil does not come into contact with the strobe tube assembly.

E. **Removal of Strobe Power Supply**

(1) Ensure the system master and strobe rocker switches are in the off position.

(2) Remove the center console access panels to access the strobe power supply. Refer to Chapter 25-12-00.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(3) Disconnect the strobe connector and strobe power supply connector. Be sure to label the location of each wire.

(4) Remove the screws securing the strobe power supply to the cabin floor, and disconnect the mode jumper.

(5) Remove the strobe power supply from the airplane.

F. **Installation of Strobe Power Supply**

(1) Position the strobe power supply to the nut plates in the cabin floor.

(2) Secure all required screws.

(3) Connect the ground wire with the screw used to secure the strobe power supply.

(4) Connect the strobe connectors, strobe power supply connector, and mode jumper.

(5) Install the left and right center console access panels.

(6) Set the system master and strobe rocker switches to the on position, and check strobes for proper operation.

3. Landing and Taxi Lights

A. The taxi and landing lights are contained in the leading edge of the left wing. The outboard bulb in the light housing is the taxi light that provides a diffused light in the immediate area of the airplane. The inboard bulb is the landing light, which has a spot presentation with a slight downward focus. Refer to Figure 202 and Figure 203.

CAUTION: The landing and taxi lights become extremely hot in a short period of time. Do not touch the lens or any part of the lights under any circumstances as they can cause serious burns.

CAUTION: Use protective gloves or a cotton wrap to ensure fingertip oil does not come into contact with the landing or taxi light lens.

B. **Landing and Taxi Light Removal**

(1) Remove four screws on top and four screws on bottom of the landing and taxi light shielding.

(2) Remove four screws on each corner of the light.

(3) Pull the light out and disconnect.

C. **Landing and Taxi Light Installation**

(1) Install the light connector.

(2) Place the light in the slot and install four screws.

(3) Reinstall the landing and taxi light shielding with four screws on top and four screws on bottom. Fill the gap between the edge of the joggle and the edge of the shielding with RTV 162 white silicone caulk.

D. **Xenon Landing Light Ballast Removal and Installation** - (Refer to Figure 204)

(1) Remove the nine 6-32 flat head screws from the outboard access panel on the left wing and remove the panel.

(2) Disconnect the electrical connections from the ballast.

(3) Remove the three locknuts and washers holding the ballast to the wing and remove the ballast.

(4) Installation is the reverse of removal. Tighten the nuts hand tight plus 1/4 turn. Apply Permatex #2 or Loctite 222 thread-locker to each screw and install the access panel. Torque the access panel screws 12 to 15 inch-lbs.

4. Taxi and Landing Light Adjustment

CAUTION: The landing and taxi lights become extremely hot in a short period of time. Do not touch the lens or any part of the lights under any circumstances as they can cause serious burns.

A. The taxi and landing lights are aimed in a manner that maximizes coverage for each respective flight operation. Over time, hard landings and rough field operations, to mention a few reasons, may cause the lights to lose their optimum alignment. Since both lights have a 100% duty cycle (can be used 100% of the time), their luminosity is somewhat reduced. For this reason it is important that the lights be kept in proper alignment. The following paragraphs describe the method for checking the alignment of both the taxi and landing lights and, if necessary, procedures for adjusting each lens.

B. Reference Card – To determine how the taxi and landing lights are aimed, a simple reference card must be constructed. The card should be approximately four feet high and six feet wide; corrugated cardboard works quite well and is easy to handle. Draw two horizontal, parallel lines and one vertical line on the cardboard. The horizontal lines are drawn on the 6 foot length and are 25 and 35 inches from the bottom of the card. The vertical line bisects the 6 foot length. The horizontal line 35 inches from the bottom is the taxi light reference, and the horizontal line 25 inches from the bottom is the landing light reference. Please refer to Figure 205, Light Adjustment Reference Card, below for a drawing of the reference card.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

C. **Landing/Taxi Light Cover Removal** - It is best to remove the outer light cover before performing the test to facilitate a more accurate measurement and allow easy access to the adjustment screws for re-aiming both of the lights. The acrylic plastic cover for the light assembly is secured with eight screws, four on the top and four on the bottom. Remove all eight screws, and pull forward on the cover to remove it. If the light lenses are dirty, they should be cleaned at this time.

D. **Ambient Light** - The test must be performed in an area of reduced ambient light such as a hanger with the doors closed and part of the overhead lighting off. Adequate lighting conditions are also available outside about one hour after sunset.

E. **Placement of Reference Card** - Place the reference card in front of the airplane so that the card is 9 feet forward of the landing/taxi lights, and the vertical line on the card is 10 feet, 3 inches to the left (when facing forward) of the propeller spinner tip. Refer to Figure 206.

F. **Checking the Alignment** - Each light is operated and checked separately and should produce the displays discussed below. An approximate representation of the light dispersion patterns are shown in Figure 207.

   (1) Taxi Light - The brightest concentration of the taxi light should focus laterally on the line 35 inches from the bottom and the pattern should be equally dispersed on the left and right side of the vertical line. Towards the edges of the reference card, the concentration will be somewhat above the line on the left side and below the line on the right side.

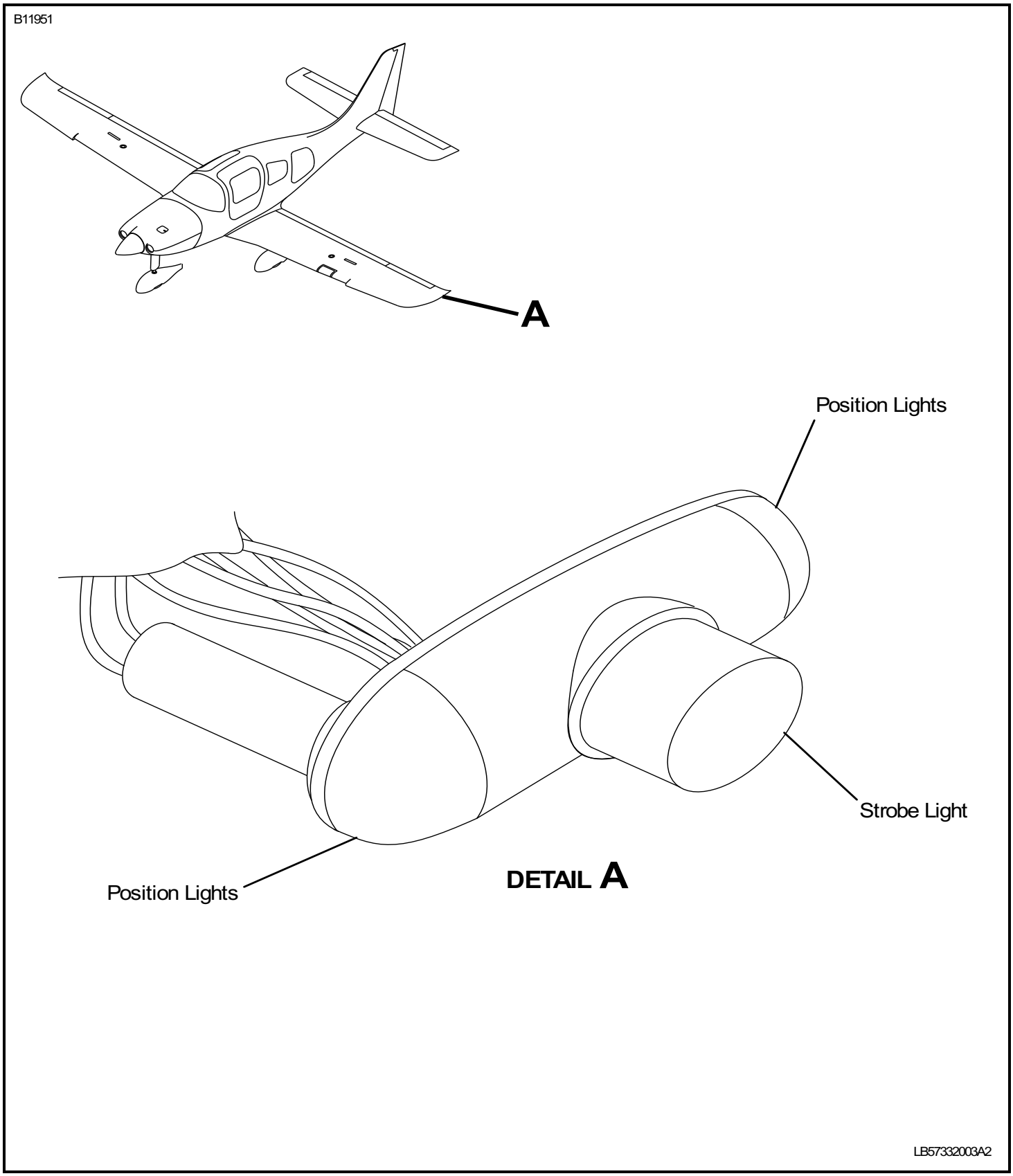
   (2) Landing Light - The center of this light should be focused on the intersection of the vertical line and the line 25 inches from the bottom.

G. **Aiming or Adjusting the Lights** - If the lights are not properly aimed, there are adjustment screws on the face of each lens that can be turned so that each lens is properly aimed. Turning the screw on the face of the lens clockwise will cause the lens to move. The amount of adjustment to each screw is limited by physical stops, so it works best to adjust both sides of the lens in small increments. For example, a full clockwise turn on a right screw should be followed by a full counterclockwise turn on the left screw.

H. **Lens assembly** - Once the lenses are properly aimed, ensure both lights and the master switches are off. Clean the acrylic plastic housing cover, and check the condition of the rubber gasket on the inside edge of the cover. Replace or re-glue the gasket as required. After the lights have cooled sufficiently, install the cover, and tighten the eight screws. Torque screws 10 to 12 inch-lbs.

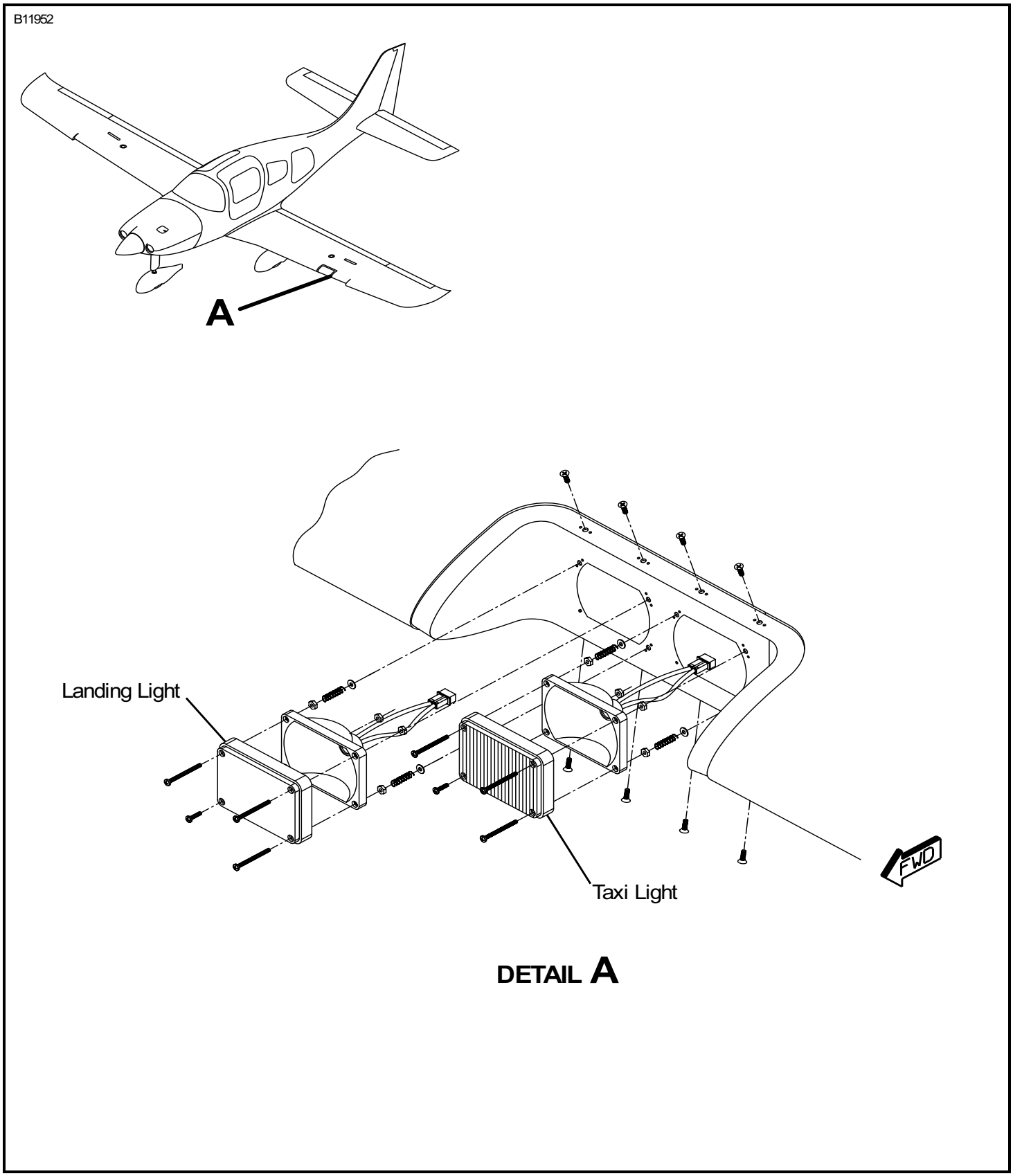
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Position and Strobe Lights



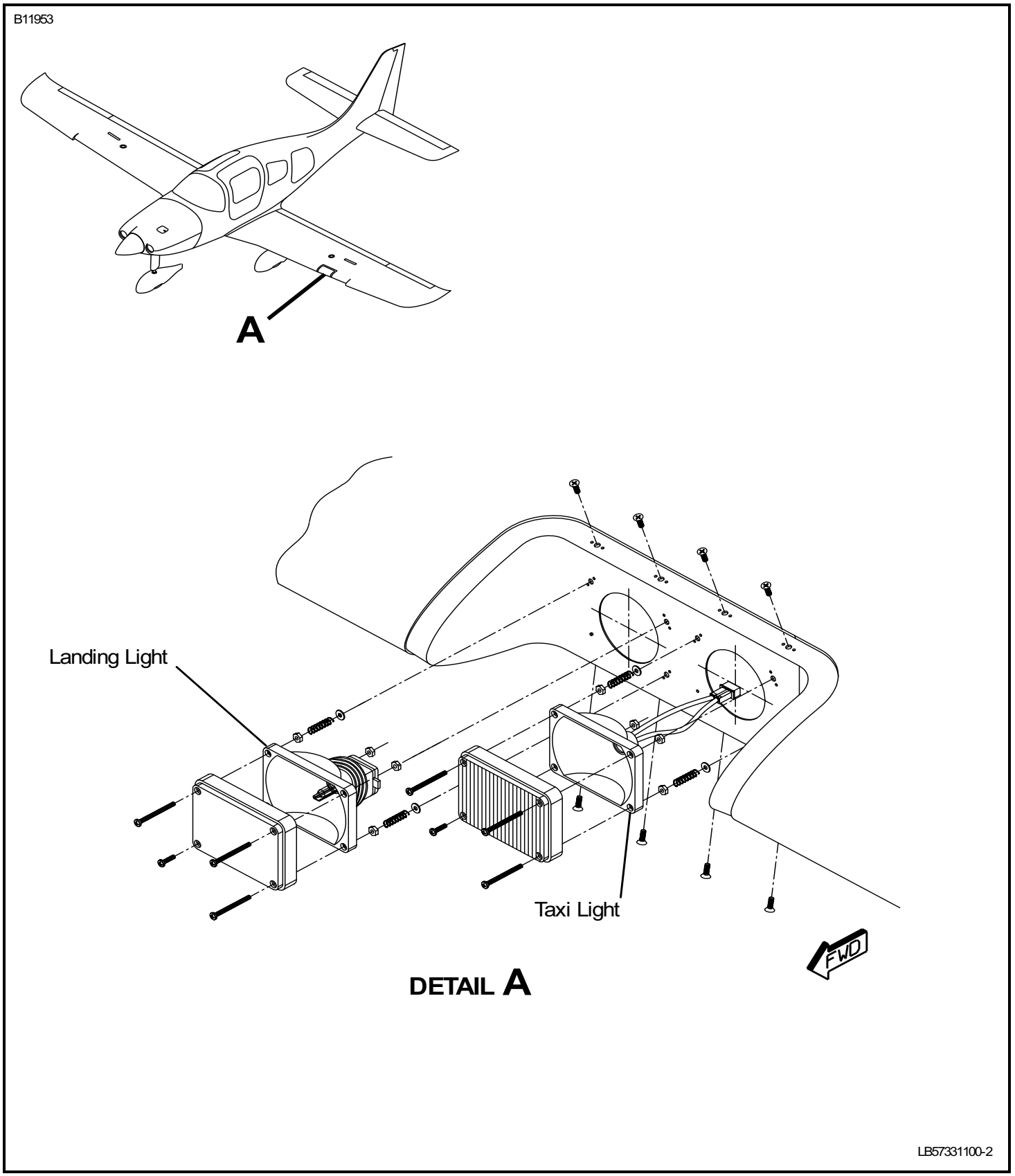
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Landing Light Assembly With Halogen Landing Light



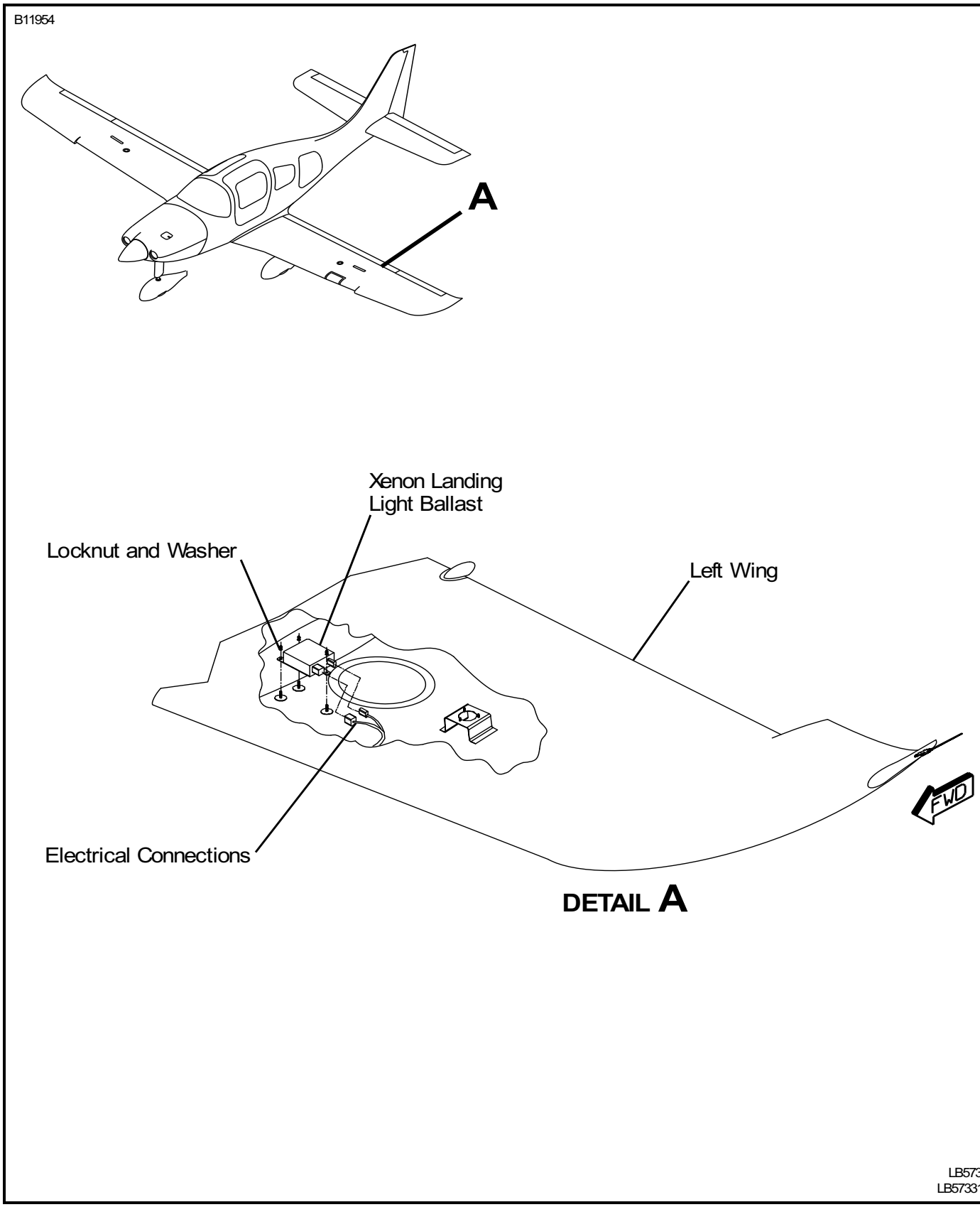
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Landing Light Assembly With Xenon Landing Light



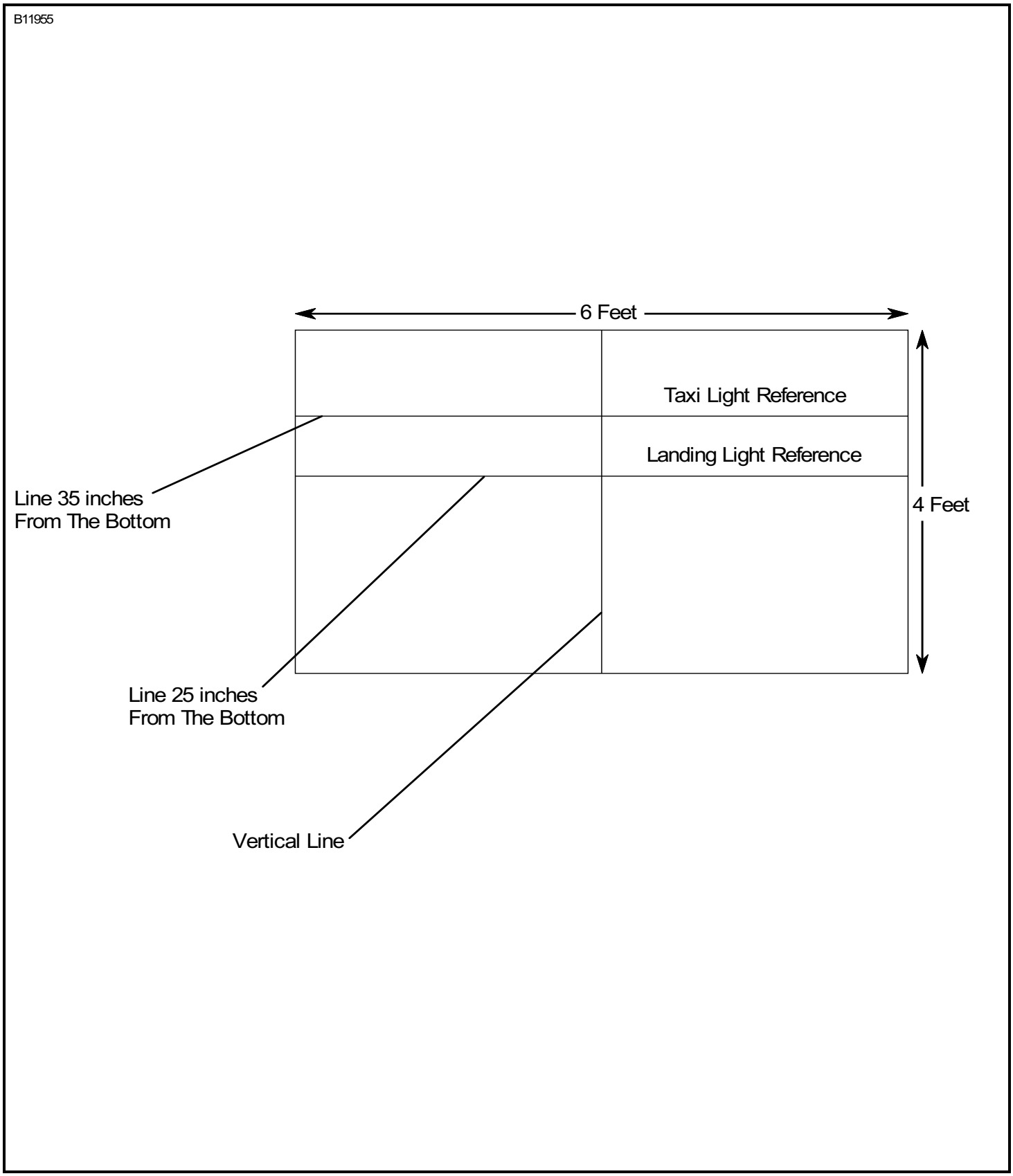
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Xenon Landing Light Ballast



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

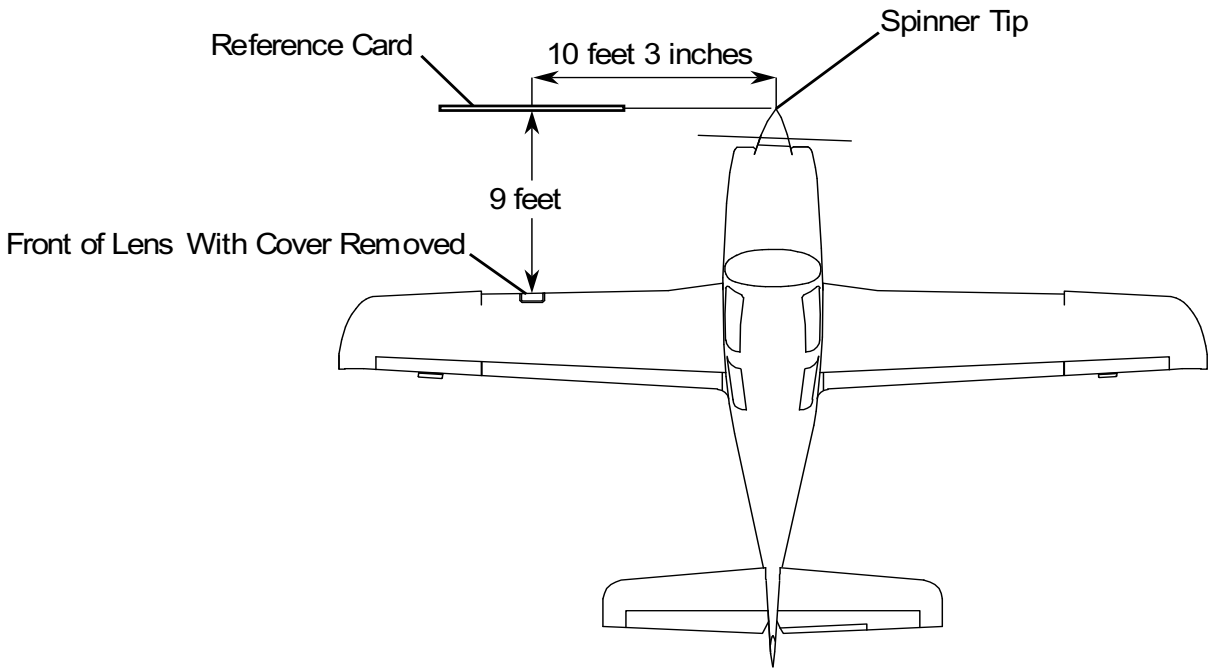
Figure 205 : Sheet 1 : Light Adjustment Reference Card



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Placement of Light Adjustment Reference Card

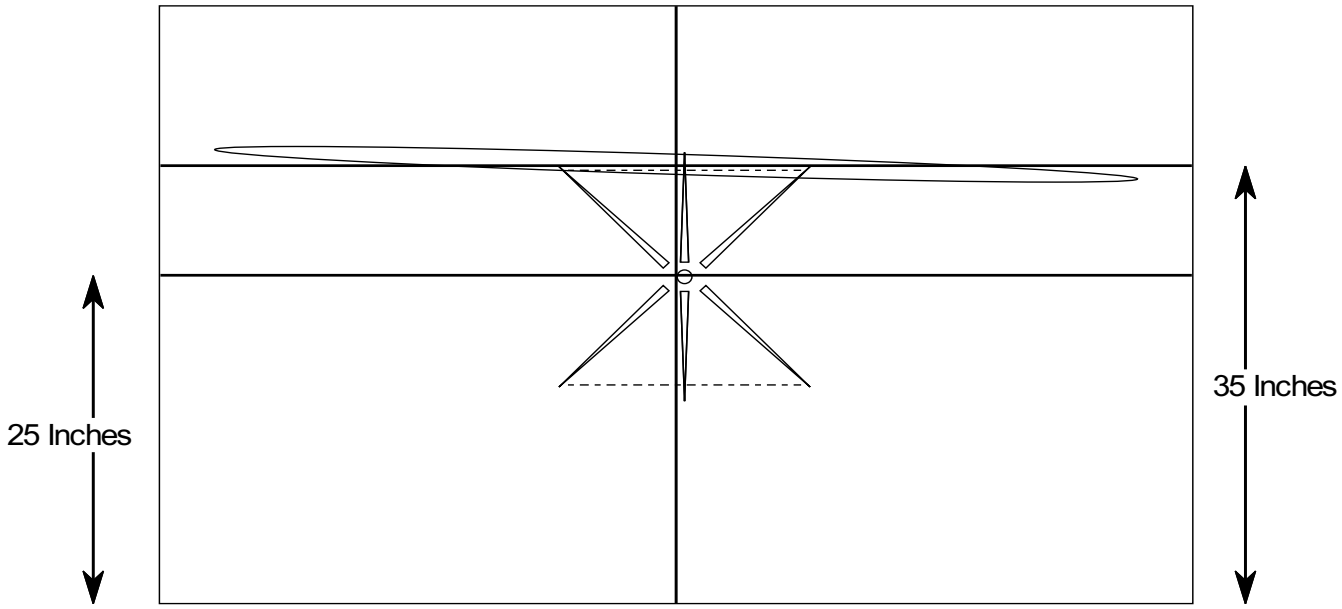
B11956



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Light Adjustment

B11957



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

OXYGEN - GENERAL

1. General

A. There is not a currently approved oxygen system either in or for use in the Cessna 300. Work is in progress for an approved oxygen system. When a system is approved, the appropriate maintenance instructions will be added here as part of a revision.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

VACUUM - GENERAL

1. General

A. **Description of Vacuum System** - Refer to Figure 1. The Cessna 300 (LC40-550FG) is equipped with two engine-driven vacuum pumps. These pumps provide airflow to drive the gyros in the attitude and heading indicators. Air moves over vanes on each gyro and produces a high-speed rotation in excess of 24,000 RPM. In the event that one of the pumps should fail, the other pump will produce sufficient vacuum to operate both instruments. If this happens, a message in the annunciator panel will illuminate to indicate which pump has failed.

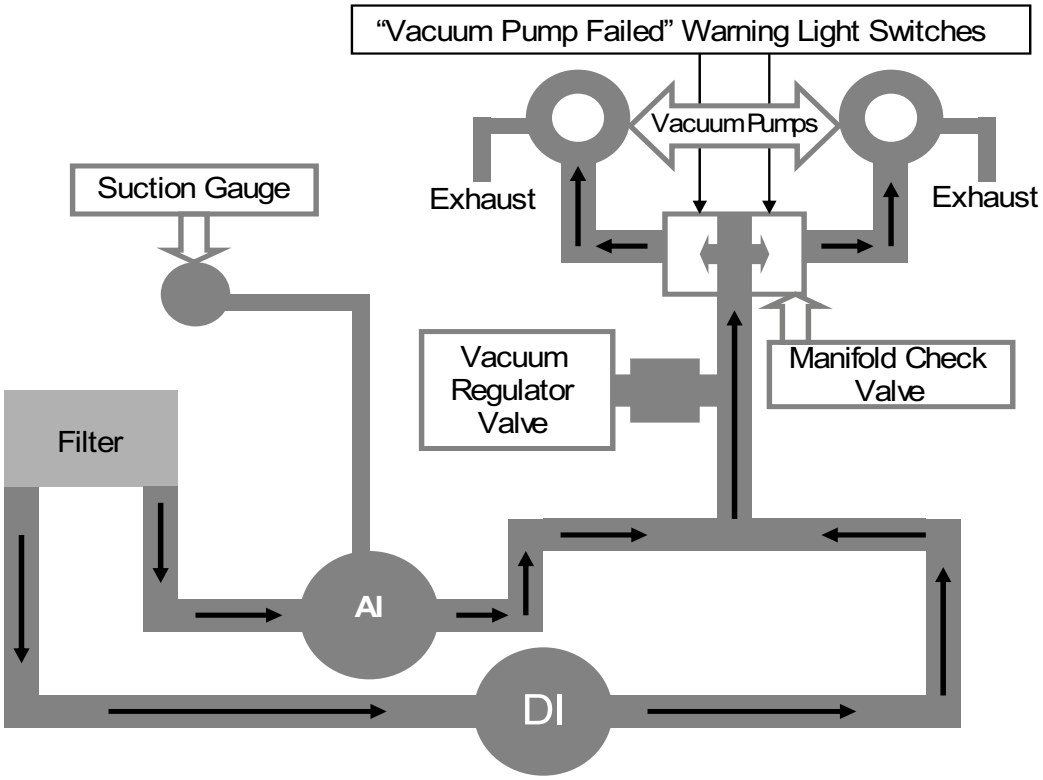
WARNING: As vacuum pumps are critical components, they must be replaced after specific times. Refer to Chapter 05-10-00 for vacuum pump replacement intervals. Before any maintenance, removal, or installation of equipment is performed, ensure both the master and avionics switches are in the off position. Failure to do so could result in injury and damage to the suction gauge and other components in the system.

B. To account for fluctuations within the system, the suction produced by the two engine driven pumps is well in excess of what is required to operate the two gyros. The suction pressure within the system is kept constant by the pressure regulator valve that draws air from an alternate source as necessary to maintain 4.5 to 5.2 inches of Hg of vacuum within the system. If either pump should fail, the manifold shuttle valve closes the line on the failed side ensuring positive flow to the operating side.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Vacuum System

B12073



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

VACUUM - TROUBLESHOOTING

1. Troubleshooting the Vacuum System

WARNING: Before attempting any of the troubleshooting operations, ensure the all ignition system and master switches are off.

A. **Symptom** - Suction gauge is normal, however, gyros do not operate.

(1) **Probable Cause** - Main filter is dirty or wet. The system has vacuum but very little air is moving through the system.

(2) **Action** - Check the main filter. Replace the filter if it is dirty or clogged. Dry out the filter if it is wet.

B. **Symptom** - Vacuum gauge indication is low and gyros function poorly.

(1) **Probable Cause** - Main filter is dirty.

(2) **Action** - Check the filter, and replace if it is dirty or clogged.

C. **Left or Right Vacuum Pump Light Stays Illuminated**

(1) **Probable Cause** - Vacuum pump is inoperative.

(2) **Action** -Determine if the vacuum pump is operative by using the following steps.

(a) Remove the upper cowling.

(b) Locate the shear-shaft on the suspected inoperative vacuum pump.

(c) Move the propeller backwards very slowly while viewing the movement of the shear-shaft. Refer to Figure 101.

(d) If movement of the shear-shaft is not observed, the vacuum pump is inoperative and must be replaced.

NOTE: It is difficult to identify the location for the shear-shaft inspection. To ensure proper diagnosis of a vacuum pump shear-shaft failure, check for movement on the good pump. Once movement is detected on the operative pump, inspect that same location on the inoperative pump.

D. **Symptom** - Left or right annunciator light does not illuminate during press-to-test function.

(1) **Probable Cause** - Annunciator light is defective.

(2) **Action** - Replace bulb in annunciator. Refer to Chapter 37-20-00, Vacuum Pump Annunciators section for instructions.

E. **Symptom** - Left or right annunciator remains illuminated and both vacuum pumps are operating normally.

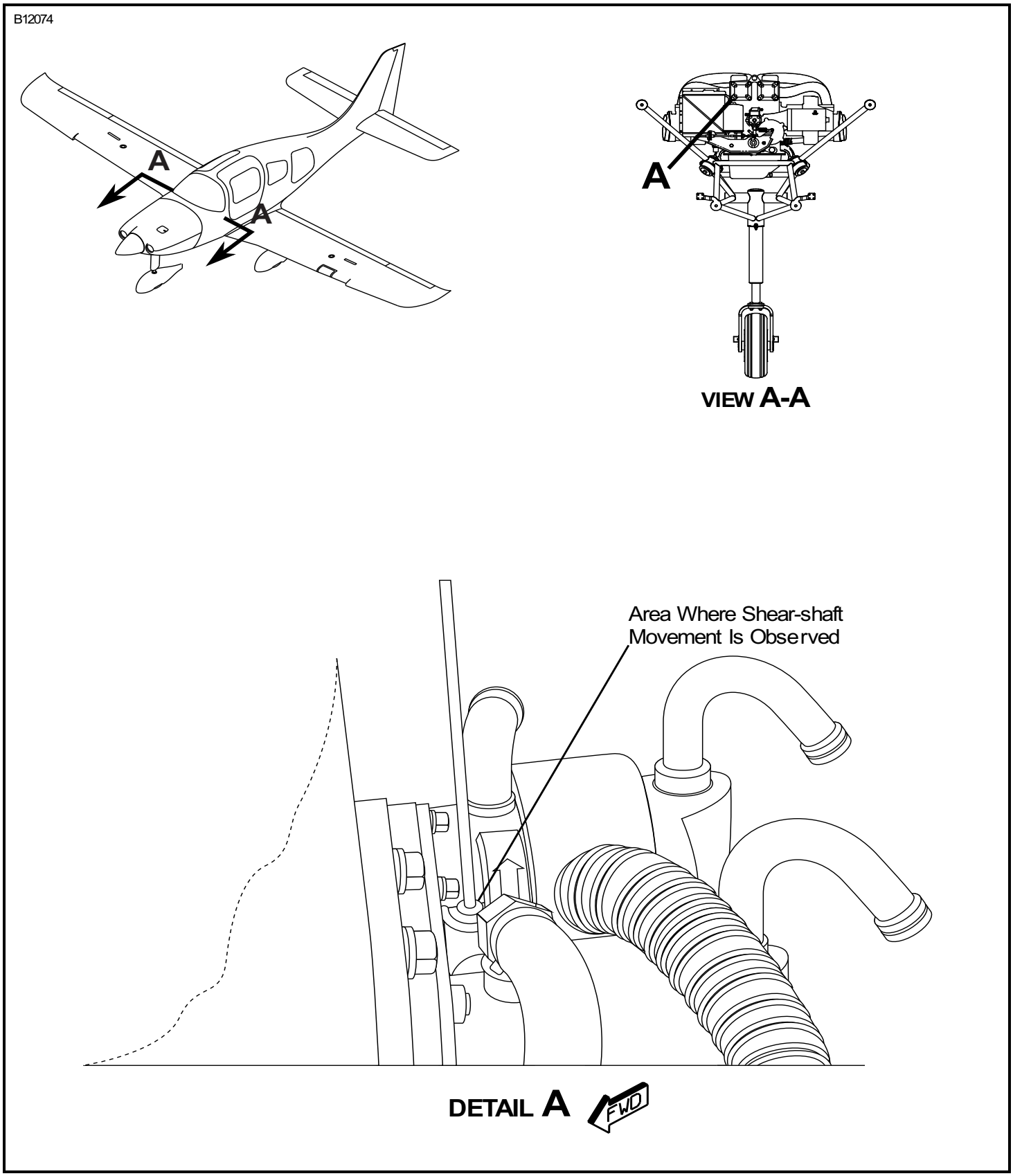
(1) **Probable Cause** - Transducer is faulty.

(2) **Action** - Replace transducer.

(3) **Optional Diagnosis** - Remove the two sets of switch wires from both transducers and then connect the wires from the suspected faulty transducer to the good transducer. After starting the engine, if the light corresponding to the faulty transducer is extinguished, the cause is definitely a bad transducer.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 101 : Sheet 1 : Checking Shear-Shaft Movement



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

VACUUM SYSTEM - MAINTENANCE PRACTICES

1. Distribution of the Vacuum System

A. **Instruments Operated** - The vacuum system operates two instruments: the attitude indicator and the heading indicator. The vacuum system provides airflow over the vanes of the gyros allowing the gyros to rotate. In the **Premium IFR Package**, the vacuum system only supplies suction to the gyro of the flight director. Refer to Chapter 33 for an equipment list. For a listing of installed equipment specific for your airplane, refer to Section 6, Appendix A, of the POH/AFM.

2. Maintenance of the Vacuum System

A. **Engine Cowling** - The top engine cowling must be removed for maintenance on the vacuum system. For specific instructions, refer to Chapter 71-10-00.

B. **Main Filter** - The main filter is located behind the instrument panel and adjacent to the firewall. It is recommended that the filter be replaced every 500 hours or annually, whichever comes first, and at each pump replacement. Refer to the Replacement of Filters section.

C. **Vacuum Pumps** - Refer to Chapter 05-10-00 for specific replacement time limits. In the event of a vacuum pump failure, there is an internal shaft which will shear, thereby effectively disconnecting the vacuum pump from the engine. This is desirable since it prevents damage to parts within the engine.

CAUTION: Never install a pump that has been dropped. The internal parts may be damaged, causing immediate or premature failure.

NOTE: To prevent foreign material from entering the pump, keep pump ports capped until the hoses are attached.

(1) **Removal of Vacuum Pump** - (Refer to Figure 201 and Figure 202.)

(a) Loosen the pump hose-clamps on the red cooling and black supply hoses. Remove both hoses from the pump, and loosen the exhaust and vacuum ports with a 7/16 inch wrench. The ports should be loose enough to remove by hand.

(b) Remove the four attach bolts and eight washers from the 1/4 inch stud that attaches the vacuum pump mounting flange to the engine housing, and remove the pump.

(c) Place the pump on a bench, and remove the loosened exhaust and vacuum ports.

(d) Remove the composite cooling shroud from the vacuum pump. Scrape off the old RTV silicone, if present, from the cooling shroud and vacuum pump.

(e) Remove the gasket and discard. Discard the (AN935-4) split-lock washers.

(2) **Pump Preparation for Installation** - (Refer to Figure 201.)

(a) Place the pump-mounting flange in a jaw vise with the drive coupling downward. Protect the pump-mounting flange with soft metal or wood.

(b) Spray the fitting threads on both ports with silicone, and let dry.

(c) Insert the ports into the new pump and hand-tighten.

(d) Use a 7/16 inch wrench to turn the ports to the desired direction, as shown in Figure 201. Use care not to damage the ports, and do not make more than one turn beyond the hand-tightened position.

(3) **Installation of Vacuum Pump**

(a) Install the cooling shroud around the vacuum pump by spreading the shroud apart.

(b) Adjust the cooling shroud's air supply port to the 11 o'clock position, in relation to the exhaust port (12 o'clock position) This orientation assumes the vacuum pump drive coupling is facing forward. Refer to Figure 202.

(c) Place a small bead of RTV silicone between the seam of the pump and the cooling shroud, around each side of the shroud’s circumference. The purpose of the RTV seal is to minimize the leakage of cooling air for the pump. This step is optional and may be omitted.

(d) Place the vacuum pump and a new gasket in its place on the studs. With AN960-4 flat washers and new AN935-4 split-lock washers, screw on the four AN315-4 nuts. Torque nuts to 70 inch-lbs. Use special care to prevent moving the cooling shroud, if optional sealant has been applied.

(e) Hook the cooling and vacuum hoses to their proper connectors, and tighten the hose clamp snug tight.

(4) **Regulator Filter** - The regulator filter should be replaced every 100 hours. Refer to the Replacement of Filters

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

section.

3. Manifold Shuttle Valve

A. **Manifold Shuttle Valve Removal** - (Refer to Figure 202.)

(1) Unhook three hose clamps connecting the manifold shuttle valve to the vacuum pumps and regulator. Be sure to label each hose's location on the shuttle valve.

(2) Unscrew the four screws attaching wires to the manifold shuttle valve transducers. Be sure to label the left and right side location of the wire pairs. Refer to Figure 203.

(3) Unscrew the two bolts attaching the manifold shuttle valve to the firewall.

B. **Installation of Manifold Shuttle Valve**

(1) Place the manifold shuttle valve in its place, and screw in the two screws attaching the manifold shuttle valve to the firewall. Torque bolts 30 to 40 in.-lbs.

(2) Connect the left and right wire pairs to the manifold shuttle valve transducers. Refer to the Transducers section for information about the transducers and attaching the wires.

(3) Connect the two hoses to their proper fittings, and tighten the hose clamps snug tight.

C. **Maintenance of Manifold Shuttle Valve** - Five years from the date of manufacture or replacement of the shuttle valve, a shuttle valve manifold pressure test (SVMPT) must be completed to verify the proper operation of the unit. Thereafter, until the shuttle valve manifold is replaced, the test must be performed every 12 calendar months. Use the following steps to perform the SVMPT.

(1) Remove the manifold shuttle valve.

(2) Cap one of the inlet fittings.

(3) Connect a hose from a regulated air source to the other inlet fitting of the manifold shuttle valve.

(4) Slowly apply 3 psig of air pressure to the check valve manifold, and verify that the air is released through the discharge fitting. If air is not released through the discharge fitting, replace the check valve manifold.

(5) Disconnect the air source from the inlet fitting, and then reconnect it to the discharge fitting. Remove the cap that was previously installed on the inlet fitting.

(6) Slowly apply 3 psig of air pressure to the check valve manifold, and inspect for leaks at all caps and hose connections. Correct any leaks in the test set-up before proceeding.

(7) With air pressure remaining set at 3 psig, inspect for leaks across the internal check valve by noting any audible leakage out of the inlet fittings or through the rivets on the housing of the check valve manifold. Any audible leakage at either one of these locations is cause for replacement of the check valve manifold.

(8) Remove the air source from the check valve manifold, and repeat the following step with the air source connected to the discharge fitting on the opposite side of the check valve manifold.

(a) With air pressure remaining set at 3 psig, inspect for leaks across the internal check valve by noting any audible leakage out of the inlet fittings or through the rivets on the housing of the check valve manifold. Any audible leakage at either one of these locations is cause for replacement of the check valve manifold.

(9) Reinstall the manifold shuttle valve.

4. Transducers

A. There are two transducers located on top of the shuttle valve. The purpose of the transducers is to annunciate loss of a vacuum pump. When a vacuum pump fails, it ceases to draw air, and all suction is provided by the remaining operative pump. The suction from the good pump closes a flapper door in the shuttle valve, and the system operates through the good pump side. On the failed pump side of the system, the pressure is the same as the ambient pressure. The transducer senses that the pressure is no longer negative and closes a switch that turns on the annunciator light. Refer to Figure 203.

WARNING: The transducer must be installed dry. Do not use Teflon tape or other thread sealants, as these substances have the potential of being induced into the vacuum system, which can cause instrument damage.

B. **Transducer Removal** - Use the following steps to remove and replace a transducer. Refer to Figure 203.

(1) Remove the upper engine cowling per instructions in Chapter 71-10-00.

(2) Disconnect the two wires attached to the transducer.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(3) Before removing the transducer, stabilize the shuttle valve with an open-end wrench. The wrench should be placed on the shuttle valve so that it spans each side near the area of the transducer.

(4) Use a 7/16 in. wrench to unscrew the transducer from the shuttle valve.

C. **Transducer Installation** - To install the transducer, reverse the above steps while keeping the following points in mind.

(1) The transducer must be installed dry. Do not use Teflon tape or other thread sealants.

(2) There are no torque requirements, however, the transducer should be finger-tight and leak free.

(3) The two wires that are to be connected to the transducer are switch wires and do not have a polarity, i.e., a wire can be connected to either terminal. However, each wire must be connected to a terminal.

5. Replacement Of Filters

A. **Main Filter Removal** - The main filter is located between the engine and flight instrument panels, near the top of the panels. The filter should be replaced every 500 hours or annually, whichever comes first and at each pump replacement. To replace the filter, refer to Figure 204, and use the following steps.

(1) Remove the glare shield and flight instrument panel per instructions in Chapter 25-11-00.

(2) Remove the 10-32 nut that is attached to the instrument panel brace. The nut may spin free, or a flat-head, stubby screwdriver may be needed to hold the bolt in a stationary position.

(3) Loosen the band clamps connecting the hose to the filter, and remove the filter.

B. **Main Filter Installation** - The main filter is installed by reversing the steps described above. It works best to connect and tighten the clamps on the hoses before securing the filter to the panel brace. The Y-fitting at the bottom of the filter can be rotated to facilitate access. Torque the 10-32 nut 20 in.-lbs. maximum. The hose clamp should be tight enough to ensure a good seal, but take care not to break the clamp.

C. **Regulator Filter Removal and Replacement** - The regulator filter, which is also referred to as a garter filter, is mounted on the outside of the vacuum regulator. The vacuum regulator is on the cabin side of the firewall, opposite the shuttle valve. The filter fits over the cylindrical portion of the regulator and should be replaced every 100 hours or annually, whichever comes first, and at each pump replacement. To replace the filter, refer to Figure 205, and use the following steps.

(1) Remove the glare shield per instructions in Chapter 25-11-00.

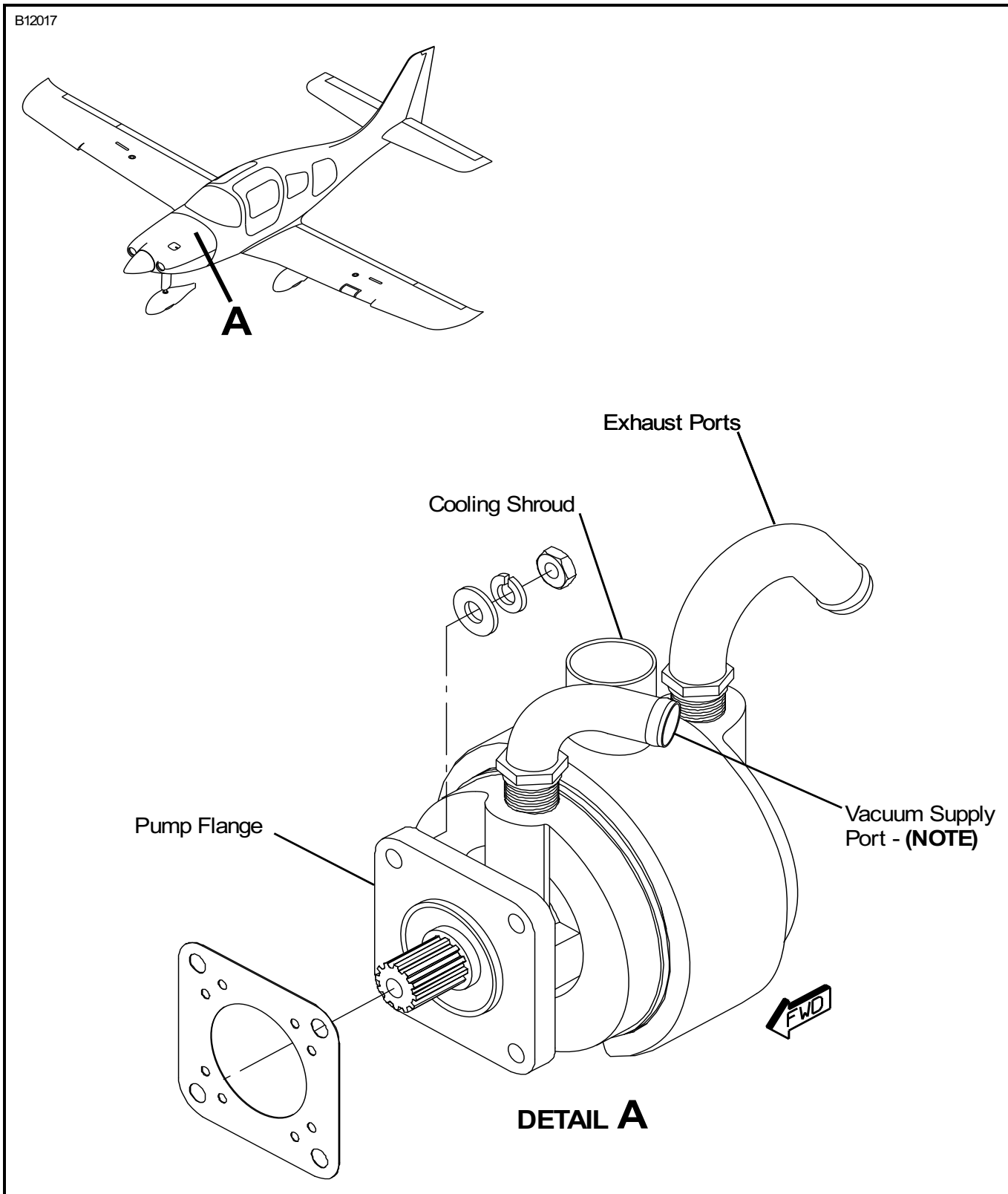
(2) Remove the garter filter from the regulator. It is permissible to tear the filter off since it will be discarded.

(3) Insert the thumb and two or three fingers of the dominate hand into the center of the new filter, and spread it so that its diameter increases.

(4) With the filter spread open, slide it over the regulator. A small amount of extra effort is required to get the filter properly seated in the area between the firewall and regulator.

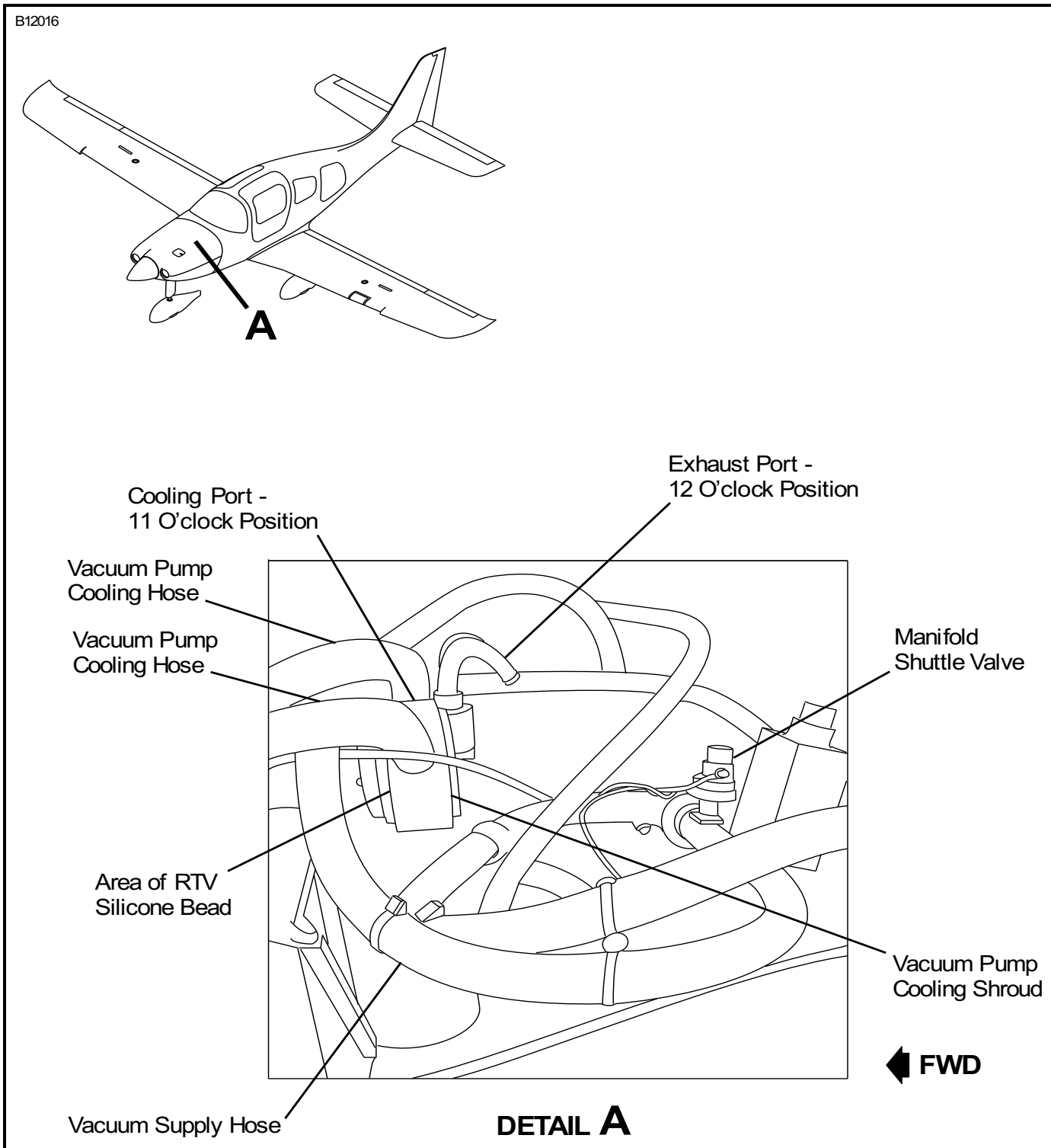
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Vacuum Pump



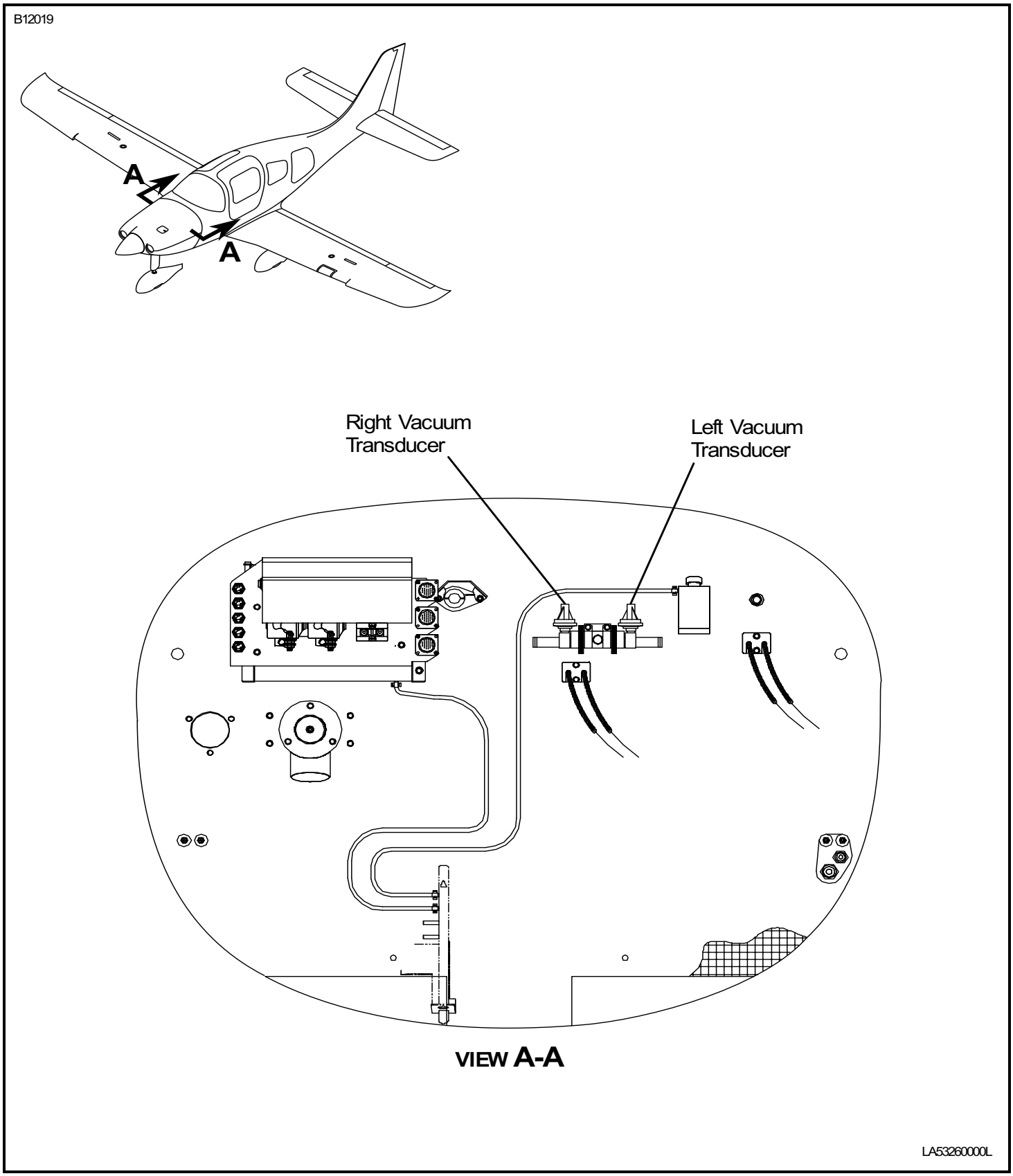
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Vacuum Assembly



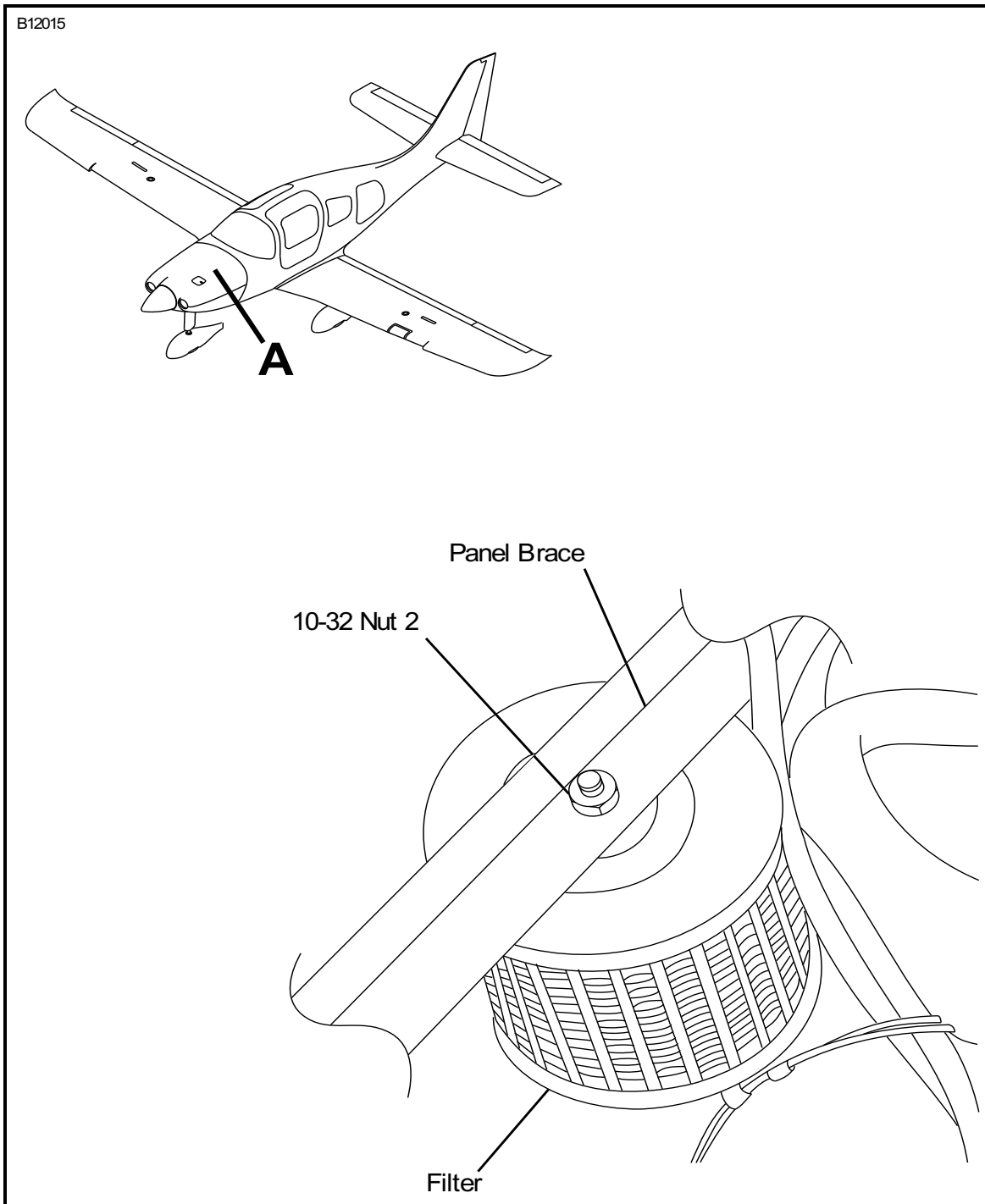
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 203 : Sheet 1 : Vacuum Transducers



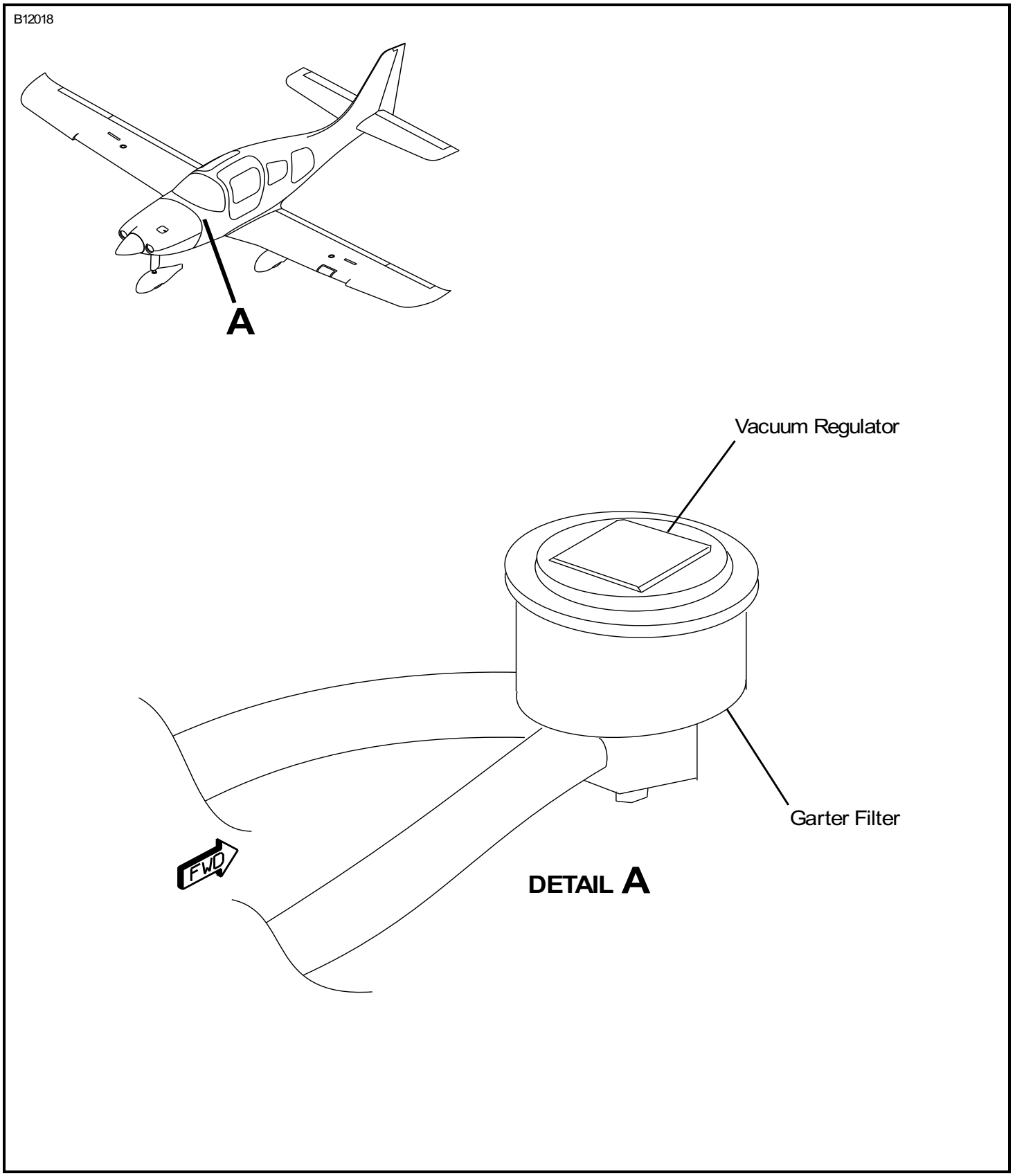
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Filter



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Regulator and Filter



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

SUCTION GAUGE AND VACUUM PUMP ANNUNCIATORS - MAINTENANCE PRACTICES

1. Suction Gauge

A. Removal of Suction Gauge

(1) Remove the engine instrument panel per instructions in Chapter 25-11-00.

(2) Unplug the cable going into the back of the suction gauge.

(3) Remove the hose and clamp.

(4) Unscrew the four screws surrounding the suction gauge.

B. Installation of Suction Gauge

(1) Put the suction gauge in its slot, and screw it into the engine instrument panel. Engine gauge screws have no torque value, however, they should be snug tight.

(2) Install the hose and clamp.

(3) Plug the cable into the back of the suction gauge.

(4) Reinstall the engine panel per instructions in Chapter 25-11-00.

2. Vacuum Pump Annunciators

A. **General** - If either vacuum pump should fail, the failure is noted on the annunciator panel with an amber light indication of either **LVAC** or **RVAC**, respectively. The gyroscopic instruments will operate normally with only one pump, and no change is perceptible on the vacuum gauge. No action is required by the pilot to activate the backup system.

B. **Vacuum Annunciator** - If a vacuum annunciator light does not illuminate when the press-to-test switch on the trim panel is activated, then there is a problem with the LED. Contact a factory representative for referral to a qualified technician to replace the LED's.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

ELECTRICAL PANELS - GENERAL

1. General

A. Because there are a limited number of electrical panels in the airplane, and the topic is interrelated with equipment and furnishings, this subject is covered in Chapter 25-11-00.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STANDARD PRACTICES/STRUCTURES - GENERAL

1. General

A. This chapter covers non-structural repairs that may be performed in the field. Discussion and procedures include:

(1) Repairable Non-Structural Aircraft Parts - A list of the field repairable parts as well as allowable repairs.

(2) Damage Assessment - Damage area classification and determination of allowable repairs.

(3) Repair Methods - Repair methods to be used after damage assessment.

(4) Definitions - Material and procedure terminology definitions.

B. For structural repairs refer to the Cessna LC-550FG Structural Repair Manual (LCSRM).

2. Definitions

A. **Controlled Surface** - For parts covered in this chapter, controlled surface is the exterior surface of the part which is painted or upholstered. During its initial cure at fabrication it sits against the mold surface and subsequently after cure will appear more smooth than the other surface.

B. **Uncontrolled Surface** - For parts covered in this chapter, uncontrolled surface is the interior surface of the part which is not painted or upholstered. During its initial cure at fabrication it is not in contact with the mold surface and subsequently after cure will not appear smooth. For the interior parts mounting hardware may exist on this surface.

C. **GTM** - Grain Transfer Mat. This mat allows the repair to have the same texture as leather or ultra-leather. It is to be made at least 24 hours in advance of the repair using Flexproof Compound and Catalyst.

D. **Chill Bar** - A clean, room temperature piece of metal which will allow a heated surface to be compressed and cooled.

3. Repairable Non-Structural Aircraft Parts

Table 1. Repairable Non-Structural Aircraft Parts

Part Name	Applicable Repairs
Air Conditioner Ducting	Interior Laminate, Bonding
Aileron Fences	Paint, Exterior Laminate, Bonding
Cabin Door Windows	Transparency
Elevator Fairings	Paint, Exterior Laminate, Bonding
Exterior Access Panels	Paint, Exterior Laminate
Glare Shield	Interior Laminate, Upholstery,
Horizontal Stabilizer Gap Seals	Paint, Exterior Laminate, Bonding
Interior Access Panels	Upholstery and Interior Laminate
Interior Panels	Upholstery and Interior Laminate
Landing/Taxi Light Cover	Transparency
Leg Fairings	Paint, Exterior Laminate, Bonding
Nose Fairings	Paint, Exterior Laminate, Bonding
Passenger Light Covers	Paint, Transparency
Passenger Windows	Transparency
Position Light Covers	Paint, Transparency
Speed Buns	Paint, Exterior Laminate, Bonding
Stall Strips	Paint, Exterior Laminate, Bonding
Wheel Pants	Paint, Exterior Laminate, Bonding
Windshield	Transparency
Wing Fillets	Paint, Exterior Laminate, Bonding

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CORROSION SEVERITY MAPS - DESCRIPTION AND OPERATION

1. General

A. This section contains maps that show areas of the world where the potential for corrosion on airplane structures is mild, moderate or severe.

B. Corrosion severity zones are affected by atmospheric and other climatic factors. The maps shown in this section are to be used as guidance when types and frequency of required inspections as well as other maintenance are determined.

CAUTION: Airports that use deicing fluids such as potassium formate or those with chemical properties similar to urea or salt must be classified as severe corrosion environments regardless of how they are classified on the following maps. Failure to follow the severe classification for airplanes that operate in these environments can result in corrosion damage to the airplane.

CAUTION: An airplane that flies into any severe corrosion areas during its operational route will be classified as operating in a severe zone.

(1) For the corrosion severity map for North America, refer to Figure 1.

(2) For the corrosion severity map for South America, refer to Figure 2.

(3) For the corrosion severity map for Africa, refer to Figure 3.

(4) For the corrosion severity map for Asia, refer to Figure 4.

(5) For the corrosion severity map for Europe and Asia Minor, refer to Figure 5.

(6) For the corrosion severity map for the South Pacific region, refer to Figure 6.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : North America Corrosion Severity Map



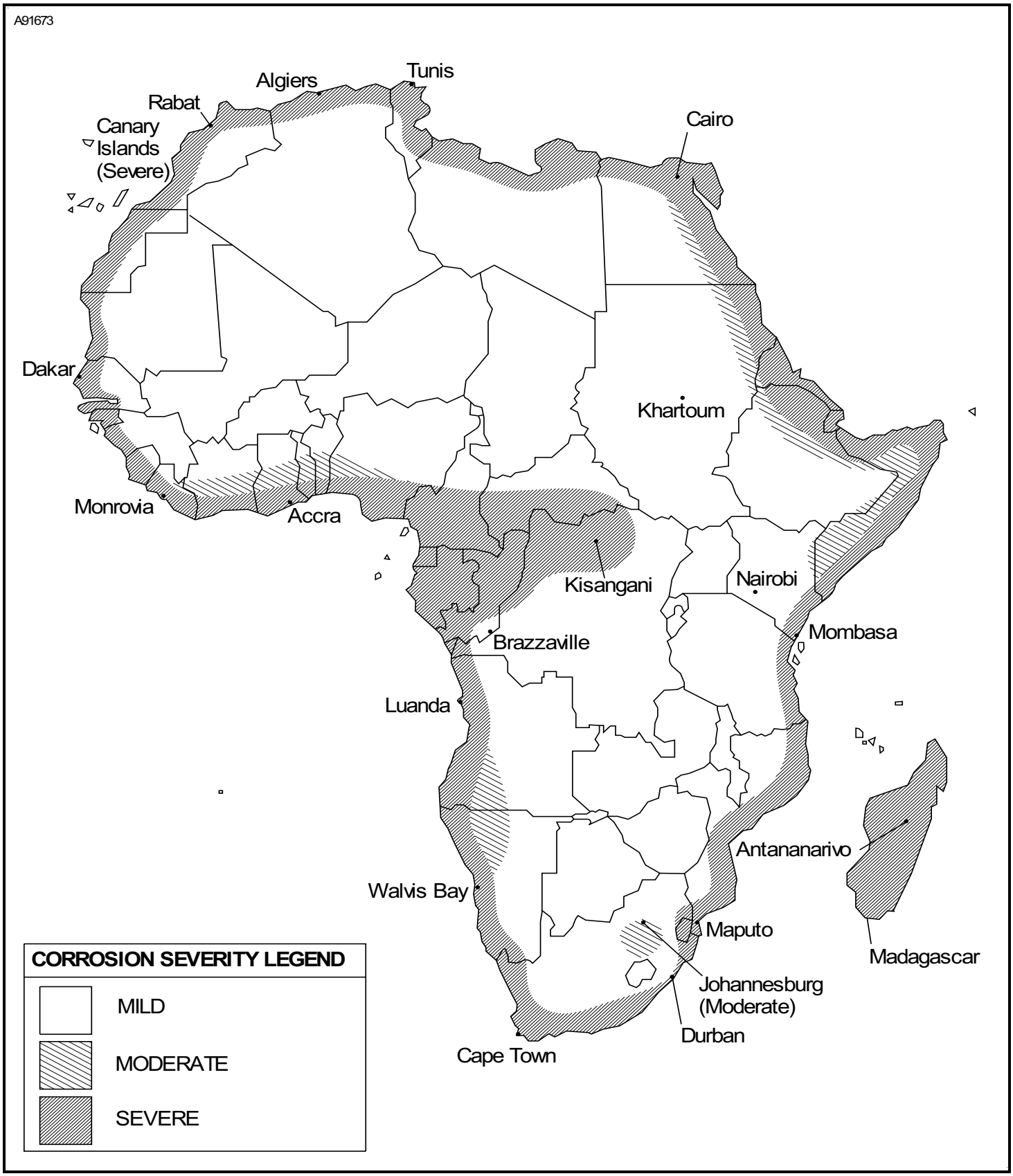
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 2 : Sheet 1 : South America Corrosion Severity Map



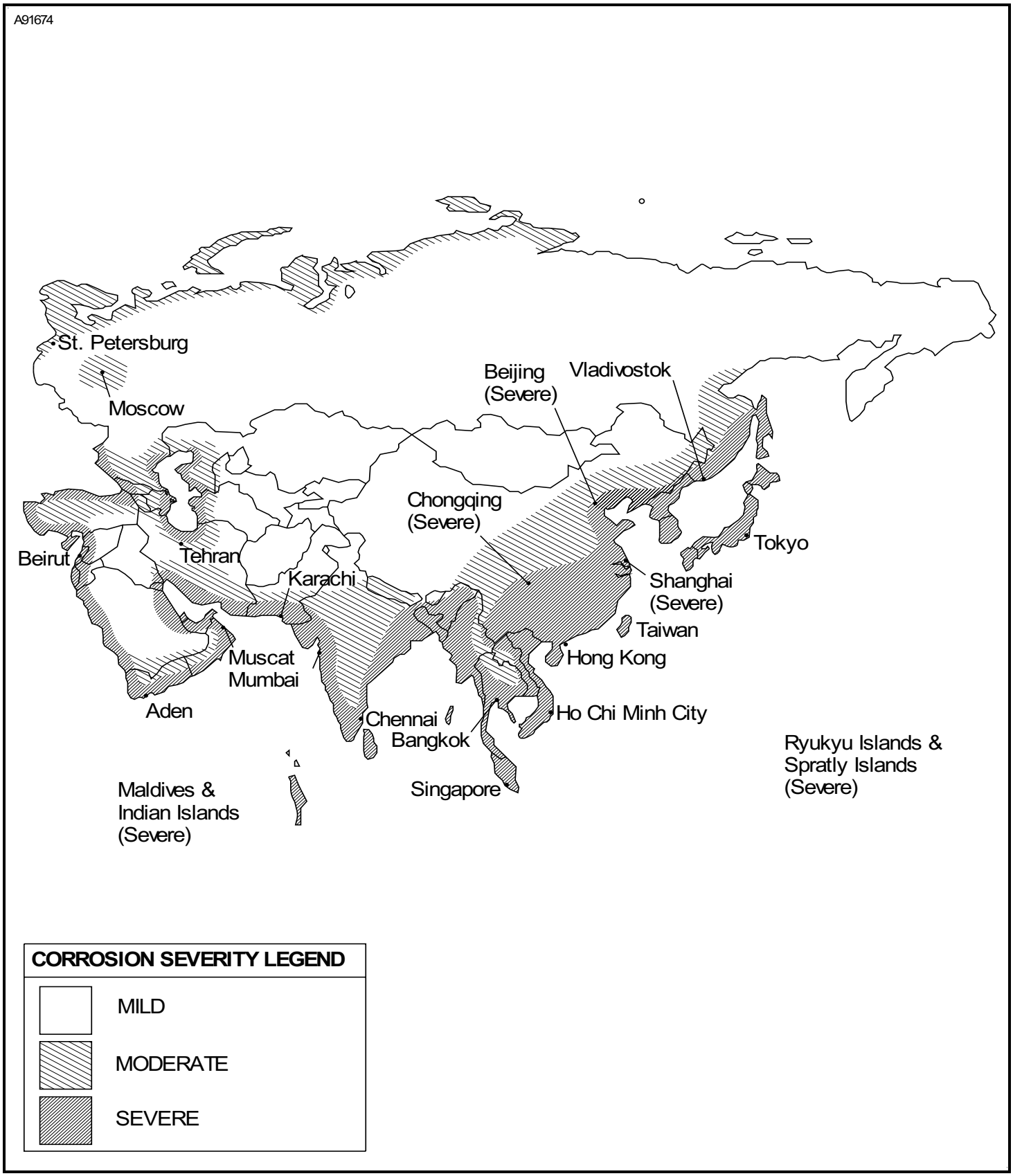
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 3 : Sheet 1 : Africa Corrosion Severity Map



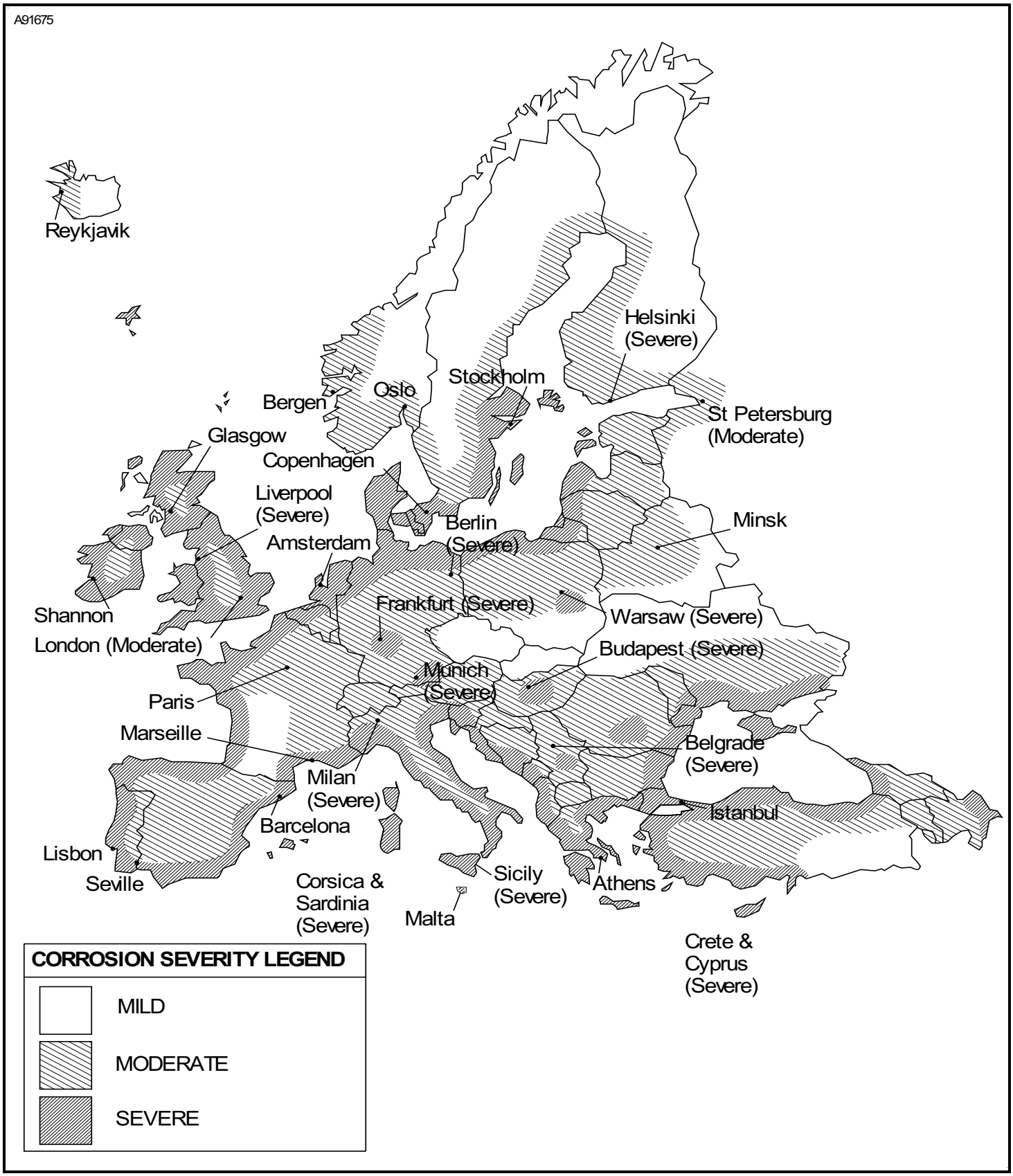
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 4 : Sheet 1 : Asia Corrosion Severity Map



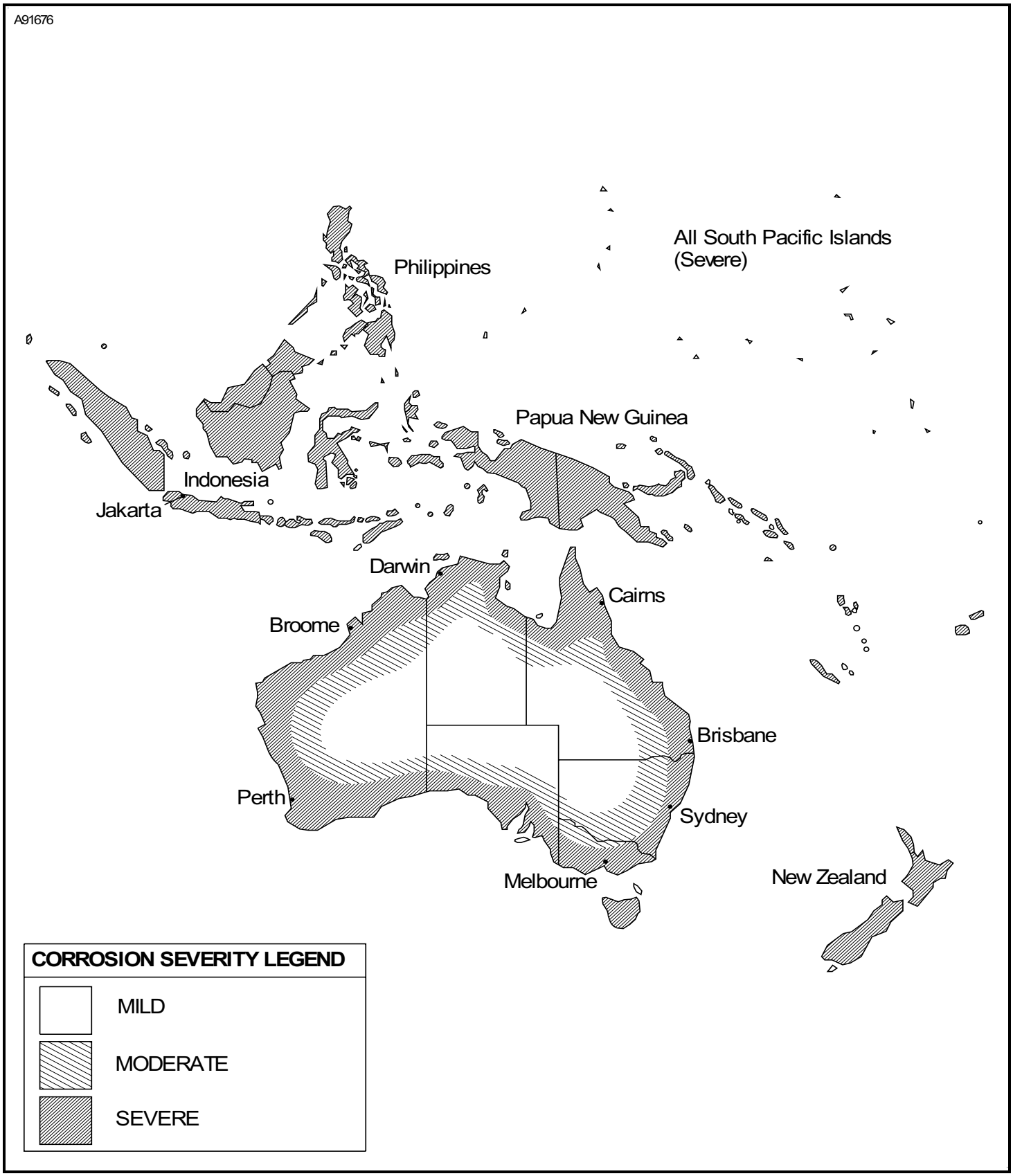
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 5 : Sheet 1 : Europe and Asia Minor Corrosion Severity Map



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 6 : Sheet 1 : South Pacific Corrosion Severity Map



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

DAMAGE ASSESSMENT - DESCRIPTION AND OPERATION

1. Damage Assessment

NOTE: During damage assessment it is possible to come across defects unrelated to the suspect damage being investigated. If you have any concerns, please Contact Cessna Customer Service for a history of dispositions on the part.

A. **Paint Damage** - Classified as damage to a painted surface which has removed paint but not damaged the composite part beneath it.

NOTE: Paint damage can be a sign of other types of damage. For example a crack in the paint in an area where two components are bonded together could indicate bond failure. In these cases it is advised to remove paint and primer to investigate.

B. **Mesh Damage** - To determine whether mesh needs to be repaired, first evaluate which "Zone" of the aircraft the damage is in. Refer to Chapter 51, Paint Repair and Painting. Antenna mounting pads and "covered areas" require separate review. A covered area is an area not exposed to direct lightning attachment. Mesh areas inside a cove, under an access panel, and under a static wick mounting pad, for example, are considered covered areas. Major direction is the greater dimension of a fore-to-aft or left-to-right measurement of the assembly's mesh coverage. Minor direction is the lesser dimension of a fore-to-aft or left-to-right measurement of the assembly's mesh coverage.

(1) **Mesh Damage Not Requiring Repair**

(a) Zone 1 - The loss of mesh not greater than two inches average diameter, not to exceed 4 sq. in. per defect on a surface area. Combined losses not to exceed 10 percent of the minor direction or two inches, whichever is greater.

(b) Zone 2 or 3 - The loss of mesh not greater than three inches average diameter, not to exceed six sq. in. per defect on a surface area. Combined losses not to exceed 10 percent of the minor direction or three inches, whichever is greater.

(c) Antenna Mounting Pad - If greater than 50 percent of the antenna mounting pad area has visible mesh, is somewhat flat, and there is electrical connection to both sides of the fuselage then no repair is necessary.

(d) Covered Area - If greater than 50 percent of the covered area has visible mesh, then no repair is necessary.

(2) **Damage Requiring Repair**

(a) Zones 1, 2, and 3 - Any damage greater than that defined above as damage that does not require repair.

(b) Antenna Mounting Pad

1 If greater than 25 percent, but less than 50 percent, of the antenna mounting pad area has visible mesh, and there is an electrical connection to both sides of the fuselage, then the mesh repair will be limited to the antenna mounting area. Refer to the LCSRM, Chapter 51, Mesh Repair.

2 If less than 25 percent of the antenna mounting pad area has visible mesh, or there is no electrical connection to both sides of the fuselage, a mesh repair with 1 inch overlaps to existing mesh (past the mounting pad area) will be required. Refer to the LCSRM, Chapter 51, Mesh Repair.

(c) Covered Area

1 If greater than 25 percent, but less than 50 percent, of the covered area has visible mesh, then the mesh repair can be limited to the covered area. Refer to the LCSRM, Chapter 51, Mesh Repair.

2 If less than 25 percent of the covered area has visible mesh, a full mesh repair with 1 inch overlaps to existing mesh (past the covered area) will be required. Refer to the LCSRM, Chapter 51, Mesh Repair.

C. **Laminate Damage** - Classified as damage to, or penetration of the fibers of the composite part. The two types of damage repairable through methods in this chapter are as follows:

(1) **Surface Cuts and Abrasions** - Cuts, scratches, and abrasions that extend through the surface resin but not into the first layer of fabric shall be acceptable as is and do not need to be repaired.

(2) **Delamination of Plies** - This is defined as the separation of the plies in the composite part. Visually it will appear as a whitened or cloudy area within the composite part though it is important to note that the resin in the composite part may also appear white. Delamination between several different layers of plies is possible and will be denoted by contrasts in the whitened areas.

(a) If you suspect an area may be delaminated but cannot confirm this visually, perform a Tap Test. Refer to the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

LCSRM, Chapter 51, Structural Composite Repair Guidelines, Non-Destructive Inspection.

(3) **Delamination of Plies around Attachment Holes** - This has the same definition of Delamination of plies (above) but occurs specifically around attachment holes. This is limited to the elevator fairings and interior/exterior access panels of the part.

(4) **Fracture of Plies** - This is defined as damage either occurring to or penetrating the fibers of the composite part. It will appear as a break in the plies where the fibers of the composite part have been compromised. It is common to see the reinforcement fibers of the ply during a fracture.

NOTE: With impact damage to the laminate, it is common to see a fractured area surrounded by an area where delamination of the plies has occurred. In these cases, it is recommended to use the tap test method to locate the areas surrounding the fracture which are delaminated. Refer to the LCSRM, Chapter 51, Structural Composite Repair Guidelines, Non-Destructive Inspection.

D. **Upholstery Damage** - Damage to an upholstered surface which has cut or torn the upholstery but with no damage to the underlying composite structure.

E. **Transparency Damage** - Damage to a transparent surface which causes a scratch, a pit or any other visible deformation. Transparent surfaces include the windshield, windows and the landing/taxi light cover.

F. **Bond Failure** - Damage which exists when two components begin to separate at the bonded surface.

2. Field Repairable Damage

A. **Paint Damage** - Any damage to a painted surface which has not damaged the composite part beneath it shall be acceptable as is and does not need to be repaired. The only consideration for repair will be for cosmetic purposes.

B. **Laminate Damage and Repair Defects** - Damage to non-structural aircraft parts may be repaired in accordance with this chapter. Refer to Table 1, Repairable Non-Structural Aircraft Parts.

Table 1. Repairable Non-Structural Aircraft Parts

Part Name	Applicable Repair
Air Conditioner Ducting	Interior Laminate, Bonding
Aileron Fences	Paint, Exterior Laminate, Bonding
Cabin Door Windows	Transparency
Elevator Fairings	Paint, Exterior Laminate, Bonding
Exterior Access Panels	Paint, Exterior Laminate
Glare Shield	Interior Laminate, Upholstery,
Horizontal Stabilizer Gap Seals	Paint, Exterior Laminate, Bonding
Interior Access Panels	Upholstery and Interior Laminate
Interior Panels	Upholstery and Interior Laminate
Landing/Taxi Light Cover	Transparency
Leg Fairings	Paint, Exterior Laminate, Bonding
Nose Fairings	Paint, Exterior Laminate, Bonding
Passenger Light Covers	Paint, Transparency
Passenger Windows	Transparency
Position Light Covers	Paint, Transparency
Speed Buns	Paint, Exterior Laminate, Bonding
Stall Strips	Paint, Exterior Laminate, Bonding
Wheel Pants	Paint, Exterior Laminate, Bonding
Windshield	Transparency
Wing Fillets	Paint, Exterior Laminate, Bonding

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(1) **Exterior Parts** - Parts with defects that are directly exposed to airflow or experience air loads such as wheel pants, wing fillets, wing and vertical stabilizer access panels, flight control surface access panels, vortex generators, etc., may be repaired in accordance with this Maintenance Manual. Refer to Table 2, Maximum Repairable Defects (Exterior Parts).

Table 2. Maximum Repairable Defects (Exterior Parts)

Defect	Repair Limitations
Bond Failure	Complete disbond is repairable if original bond footprint can be identified.
Delamination or fractures in all other locations	Delaminations with a total defect area that do not exceed 4.0 square inches (2581.0 square millimeters) are repairable in accordance with this Maintenance Manual.
Fractures	Fractures that do not exceed 4.0 inches (102.0 mm) in length are repairable in accordance with this Maintenance Manual.

(2) **Interior Parts** - Parts that are not exposed to the airflow, such as interior paneling and support brackets, cabin air vent ducts, access panels, and glare shield, etc., may be repaired in accordance with this Maintenance Manual. Refer to Table 3, Maximum Repairable Defects (Interior Parts).

Table 3. Maximum Repairable Defects (Interior Parts)

Defect	Repair Limitations
Bond Failure	The defect area is repairable provided the area does not exceed 5 percent of the bonding surface.
Delamination	Delamination is repairable provided the total defect areas do not exceed 5 percent of the total area of the parts.
Fracture	Fractures that do not exceed 4.0 inches (102.0 mm) in length is repairable in accordance with this Maintenance Manual.
Transparency Damage	Damage to a transparent surface which causes a scratch, a pit or any other visible deformation is not allowed.
Upholstery Damage	Damage to a cut or torn upholstered surface is repairable. Verify condition of underlying composite structure.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

CORROSION - DESCRIPTION AND OPERATION

1. General

A. This section will describe corrosion so the maintenance personnel can identify the various types of corrosion and apply corrosion-preventive compound to minimize corrosion activity.

B. Corrosion is the deterioration of a metal by reacting with its environment. Corrosion occurs because most metals have a tendency to return to their natural state.

2. Characteristics of Corrosion

A. Metals corrode by direct chemical or electrochemical reaction with their environment. The following listed steps describe electrochemical reaction.

(1) Electrochemical type of corrosion can best be compared to a battery cell. Four conditions must exist before electrochemical corrosion can occur.

(a) There must be a metal that corrodes and acts as the anode.

(b) There must be a less corrodible metal that acts as the cathode.

(c) There must be a continuous liquid path between the two metals which acts as the electrolyte, usually condensation and salt or other contaminations.

(d) There must be a conductor to carry the flow of electrons from the cathode to the anode. This conductor is usually in the form of a metal-to-metal contact (rivets, bolts, welds, etc.).

(2) The elimination of any one of the four conditions described above will stop the corrosion reaction process.

(3) One of the best ways to eliminate one of the four described conditions is to apply an organic film (such as paint, grease, plastic, etc.) to the surface of the metal affected. This will prevent the electrolyte from connecting the cathode to the anode, and current cannot flow, therefore, preventing corrosion reaction.

(4) At normal atmospheric temperatures, metals do not corrode appreciably without moisture, but the moisture in the air is usually enough to start corrosive action.

(5) The initial rate of corrosion is usually much greater than the rate after a short period of time. This slowing down occurs because of the oxide film that forms on the metal's surface. This film tends to protect the metal underneath.

(6) When components and systems constructed of many different types of metals must perform under various climatic conditions, corrosion becomes a complex problem. The pressure of salts on metal surfaces (from sea coast operation) greatly increases the electrical conductivity of any moisture present and accelerates corrosion.

(7) Other environmental conditions which contribute to corrosion are:

(a) Moisture collecting on dirt particles.

(b) Moisture collecting in crevices between lap joints, around rivets, bolts and screws.

3. Types of Corrosion

A. The common types of corrosion that are encountered in airplane maintenance is described below. In actual practice, it may be difficult to determine the exact type. The reason for this is, that, more than one type may be occurring in the same area, at the same time. However, even though you may not be able to identify the exact type or types you shall be able to determine that there is some kind of corrosion taking place. If impractical to replace assembly or component, contact authorized repair station.

B. Uniform Etch Corrosion

(1) The surface effect produced by most direct chemical attacks (as by acid) is uniform etching of the metal. On a polished surface this type of corrosion is first seen as a general dulling of the surface. If such corrosion is allowed to continue unchecked, the surface becomes rough and possibly frosted in appearance.

C. Pitting or Pin Hole Corrosion

(1) The most common effect of corrosion on aluminum and magnesium alloy parts is called pitting. It is first noticeable as a white or gray powdery deposit, similar to dust, which blotches the surface (refer to Figure 1).

(2) When the deposit is cleaned away, tiny pits can be seen in the surface. Pitting may also occur in other types of metal alloys.

D. Intergranular Corrosion

(1) This type of corrosion attacks the grain boundaries of metals. A highly magnified cross-section of any alloy shows the

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

granular structure of the metal.

(2) This structure consists of quantities of individual grains, and each of these tiny grains has a clearly defined boundary and differs chemically from the metal grain next to it. The adjacent grains of different elements can react with each other as anode and cathode when in contact with an electrolyte. This conductive arrangement causes rapid selective corrosion at the grain boundary, thus destroying the solidity of the metal (refer to Figure 1).

E. Exfoliation Corrosion

(1) Exfoliation is a form of integranular corrosion. It shows itself by "lifting up" the surface grains of a metal by the force of expanding corrosion. This occurs at the grain boundaries just below the surface of the metal.

(2) Exfoliation gives the appearance of sheets of very thin metal separated by corrosion products. This type of corrosion is most often seen on extruded sections. There the grain thicknesses are usually less than in rolled alloy form. Most exfoliation type corrosion is found on aluminum alloy ducting.

F. Galvanic Corrosion

(1) Galvanic corrosion occurs when dissimilar metals are in contact. The contacting of these unlike metals provide an internal circuit. An external circuit is provided by the presence of a buildup of an electrolytic substance between these metals. An example is when aluminum components are attached with steel fasteners.

G. Concentration Cell Corrosion

(1) Concentration cell corrosion occurs when two or more areas of the same metal surface are in contact with different concentrations of the same solution: moist air, water, chemicals, etc.

(2) The general types of concentration cell corrosion are identified as: metal ion cells and oxygen concentration cell (refer to Figure 1).

H. Filiform Corrosion.

(1) Filiform corrosion is a "concentration cell" corrosion process. When a break in the protective coating over aluminum occurs, the oxygen concentration at the back or bottom of the defect is lower than that at its open surface. The oxygen concentration gradient, thus established, causes an electric current flow, and corrosion results. Filiform corrosion results when this happens along the interface between the metal and the protective coating and appears as small worm-like tracks. Filiform corrosion generally starts around fasteners, holes and countersinks and at the edge of sheet metal on the outer surface of the airplane. Filiform corrosion is more prevalent in areas with a warm and damp environment.

(2) To help prevent filiform corrosion development, the airplane should be:

(a) Spray washed at least every two to three weeks (especially in a warm and damp environment).

(b) Waxed with a good grade of water repellent wax to help keep water from accumulating in the skin joints and around countersinks.

NOTE: Wax only clean surfaces. Wax applied over salt deposits will almost guarantee a trapped salt deposit which is capable of accumulating moisture and developing into corrosion.

(c) Keep the airplane hangared to protect it from the atmosphere.

(d) Fly the airplane to promote aeration of the enclosed parts.

(e) Ensure all vent/drain holes are open to ventilate the interior of the airplane.

I. Stress Corrosion Cracking

(1) This corrosion is caused by the simultaneous effects of tensile stress and corrosion. The stress may be internal or applied. Internal stresses are produced by nonuniform shaping during cold working of the metal. These stresses are also created by press and shrink fitting general hardware.

(2) Stresses induced when pieces such as rivets and bolts are formed, are internal stress. These components can crack because of the internal stresses, and this characteristic is aggravated by corrosion. That is why such cracking is called stress corrosion cracking (refer to Figure 1).

J. Fatigue Corrosion

(1) Fatigue corrosion is a special case of stress corrosion caused by the combined effects of cyclic stress and corrosion. An example of this kind of corrosion is unprotected engine bleed air ducts that are exposed to moisture. They are often held in such a way that thermal expansion causes repeated twisting of the duct. This causes metal fatigue and cracks in which corrosion starts.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

4. Corrosion Typical Areas

A. Aluminum appears high in electrochemical series of elements, and its position indicates that it should corrode very easily. However, the formation of a tightly adhering oxide film offers increased resistance under mild corrosive conditions. Most metals in contact with aluminum form couples which undergo galvanic corrosion attack. The alloys of aluminum are subject to pitting, intergranular corrosion, and intergranular stress corrosion cracking.

B. Battery Electrolyte

(1) The battery, battery cover, battery box and adjacent areas (especially areas below the battery box where battery electrolyte may have seeped) are subject to the corrosive action.

(2) If spilled battery electrolyte is neutralized and cleaned up at the same time of spillage, corrosion can be held to a minimum by using a weak boric acid solution to neutralize the potassium hydroxide (battery electrolyte); if boric acid is unavailable flood the area with cold water.

(3) When corrosion appears, refer to the Structural Repair Manual for corrosion removal and treatment.

C. Relief Tube Area and Toilet Area

(1) The accessible areas shall be cleaned and disinfected after each flight (if used). The key to controlling corrosion is cleanliness. The inaccessible areas are protected by sealant. When corrosion appears, refer to the Structural Repair Manual for corrosion removal and treatment.

D. Steel Control Cable

(1) Checking for corrosion on control cables is normally accomplished during the preventative maintenance check. During preventative maintenance, broken wire and wear of the control cable is also checked.

(2) If the surface of the cable is corroded, carefully force the cable open by reverse twisting and visually inspect the interior. Corrosion on the interior strands of the cable constitutes failure and the cable must be replaced. If no internal corrosion is detected, remove loose external rust and corrosion with a clean dry coarse-weave rag or fiber brush.

NOTE: Do not use metallic wools or solvents to clean installed cables. Use of metallic wool will imbed dissimilar metal particles in the cables and create further corrosion. Solvents will remove internal cable lubricant allowing cable strands to abrade and further corrode.

(3) After thorough cleaning of the exterior cable surface, apply a light coat of lubricant (5565450-28) to the external cable surface.

E. Integral Fuel Tanks

(1) The presence of soil, contamination, a brown slimy substance, and pitting type corrosion has been observed in the lower areas of the intergral fuel tanks of certain airplanes. This condition has caused a general degradation of some topcoating and some depolymerization and loosening of sealant materials in lower areas.

(2) The contaminants resembled normal aluminum corrosion products, including a considerable quantity of iron. The brown, slimy deposits proved to be microbial in nature. Examination of the corrosion pits by metallurgical technician indicated the presence of intergranular attacks.

(3) Procedures for removal of surface contamination and corrosion products from integral fuel tanks is described in the Structural Repair Manual.

F. Requirements Peculiar to Faying Surfaces of Airframes, Airframe Parts and Attaching Surfaces of Equipment, Accessories, and Components

(1) When repairs are made on equipment, or when accessories and components are installed, the attaching surfaces of these items shall be protected. The following requirements are peculiar to faying surfaces in airframes, airframe parts, and attaching surfaces of equipment, accessories, and components.

(2) Surfaces of Similar or Dissimilar Metals.

(a) All faying surfaces, seams and lap joints protected by sealant shall have entire faying surface coated with sealant. Excess material squeezed out shall be removed so that a fillet seal remains. Joint areas which could hold water shall be filled or coated with sealant.

(b) Faying surfaces that are to be adhesive bonded shall be treated and processed as specified in the Structural Repair Manual.

(3) Attaching Parts

(a) Attaching parts such as nuts, bushings, spacers, washers, screws, self-tapping screws, self-locking nuts,

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

clamps, etc., do not need to be painted in detail except when dissimilar metals or wood contact are involved in the materials being joined. Such parts shall receive a wet or dry coat of primer.

NOTE: Corrosion inhibiting solid film lubricants, Specification MIL-PRF-46010 and Specification MIL-L-46147, may be used to protect attaching parts from corrosion.

(b) All holes drilled or reworked in aluminum alloys to receive bolts, bushings, screws, rivets and studs shall be treated with Specification MIL-C-81706 material before installation of fastener or bushing.

(c) All holes drilled or reworked in magnesium shall receive a chrome acid pretreatment before installation of bolts, bushings, screws, rivets and studs.

(d) All rivets used to assemble dissimilar metals shall be installed wet with sealant conforming to Specification MIL-PRF-81733.

(4) Close Tolerance Bolts - Close tolerance bolts passing through dissimilar metals shall be coated before installation with a corrosion inhibiting solid film lubricant conforming to Specification MIL-PRF-46010 and/or Specification MIL-L-46147.

(5) Washers - Aluminum alloy washers of suitable design shall be used under machine screws, countersunk fasteners, bolt heads and nuts that would otherwise contact magnesium.

(6) Adjustable Parts - Threads of adjustable parts such as tie rod ends, turnbuckles, etc., shall be protected with solid film lubrication conforming to Specification MIL-PRF-46010 or Specification MIL-L-46147.

(7) Slip Fits - Slip fits shall be assembled using wet primer conforming to Specification MIL-PRF-23377, non-drying zinc chromate paste, or solid film lubricant conforming to Specification MIL-PRF-46010 or Specification MIL-L-46147.

(8) Press Fits - The pressing shall be accomplished with an oil-containing material conforming to Specification MIL-C-11796, Class 3, or Specification MIL-C-16173, Grade 1, or other suitable material that will not induce corrosion.

G. Electrical

(1) Bonding and ground connections shall be as described by the installation procedure.

(2) Potting of Electrical Connectors and Electrical Terminals - Corrosion in electrical systems and resultant failure can often be attributed to moisture and climatic condition. Potting compounds are used to safeguard against moisture.

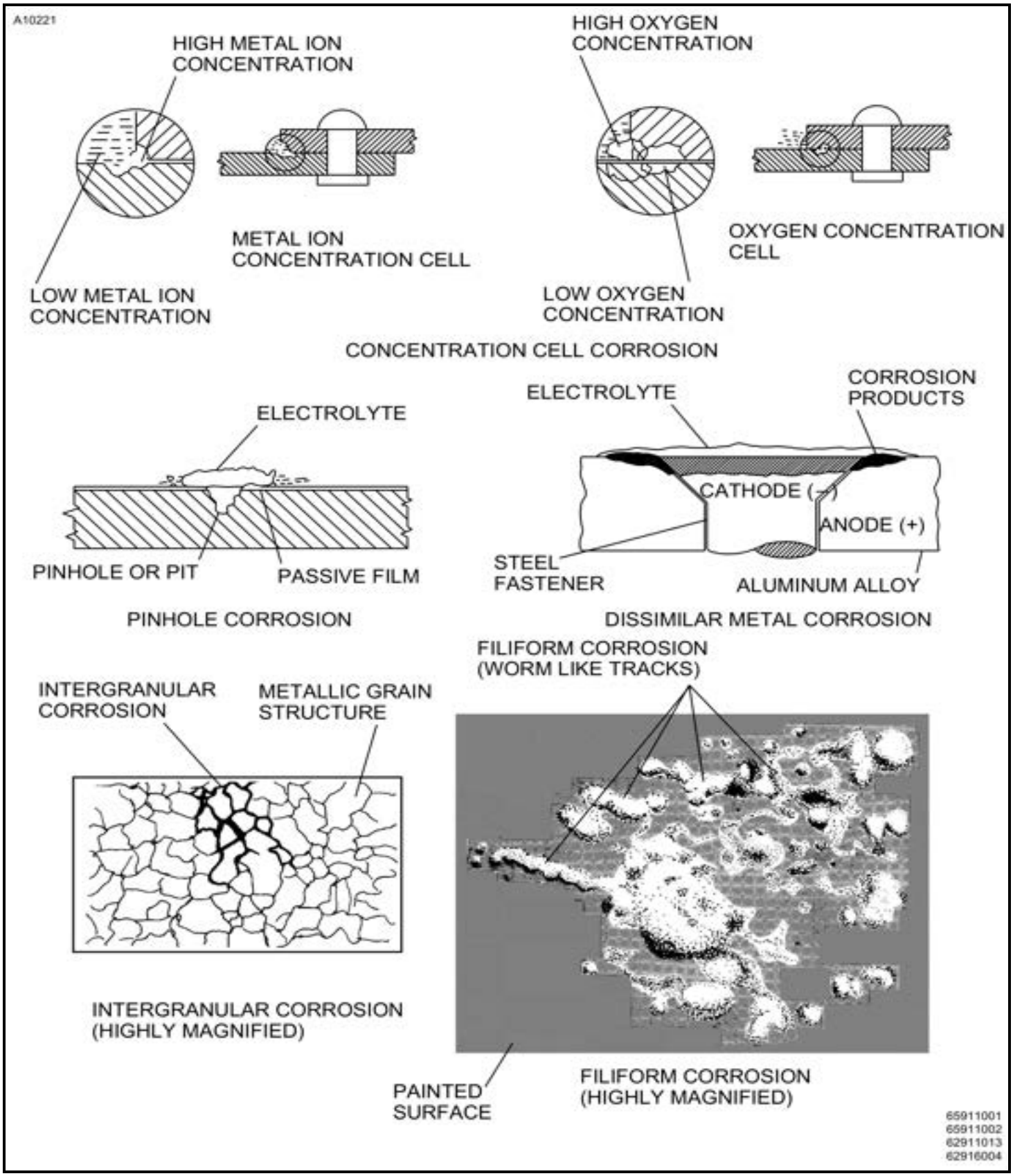
(3) Fungus-Proofing of Electrical and Electronic Equipment - Fungi can create serious problems, as fungi can act as an electrolyte, destroying the resistance of electrical insulating surfaces. Corrosion of metal can be accelerated because of the moisture absorbed by fungi. Moisture and fungus resistant varnish conforms to Specification ASTM D3955 or ASTM D295-58.

H. Corrosion.

(1) Corrosion can be repaired using the same procedures as any other structural repair. Corrosion that does not penetrate the clad material, no greater than 15 percent of skin thickness, can be repaired by blending and polishing. Refer to Model 300, 350 and 400 Structural Repair Manual. Corrosion that is greater than 15 percent of skin thickness can be repaired by patching or replacement of the part. Refer to Structural Repair Manual.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Corrosion



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

PAINT REPAIR AND PAINTING - MAINTENANCE PRACTICES

1. Paint Repair and Painting

A. The paint system used to paint components of certified aircraft by Cessna is described in this section. All approved paints and step by step instructions for applying the paint are included. Specifically addressed are the primer filler used to fill-in void areas and make the surface smooth, primer sealer used to prevent the filler from penetrating through the paint, and the topcoats, both single-stage and two-stage. Safety and quality considerations are also addressed. Required paint thickness and solar absorptive levels for specific zones on the aircraft are included.

(1) **Materials and Equipment** - PPG produces the standard paint products, and Fire Research Laboratories produces the fire resistant paint products. Recommended equipment and paint gun air pressures are listed for both types of paint. To achieve optimum results, mixing ratios can vary (up to 1 percent maximum) to suit equipment.

(2) **Additional Information** - Should more data be required than presented in this document, such as equipment, health and safety issues, air pressures, tinting, touch-up procedures, humidity and altitude considerations, etc., refer to the technical manual for the paint being used and instructions on product containers.

WARNING: Read labels on product containers for latest information on safety, emergency first aid, exhaust ventilation requirements, proper protective equipment or clothing, proper first aid equipment and supplies, and fire extinguisher requirements.

WARNING: Avoid inhalation and direct skin contact of products.

WARNING: Keep paint products away from flame and sparks.

WARNING: Use the appropriate respirators when products are sprayed and when cleaners are applied.

WARNING: Do not remove or cover labels on product containers.

WARNING: Refer to Material Safety Data Sheet (MSDS) for safety, health hazards, recommended protection, emergency first aid, fire extinguisher, etc.

(3) **General Quality Procedures** - The following practices should be incorporated for the highest quality product.

(a) Keep the painted article clean.

(b) Keep the atmosphere free from bugs and dust.

(c) For anodized aluminum omit sealing operation of the anodizing process and avoid contamination by painting as soon as possible after drying the anodized article.

(d) Sand completely and evenly.

(e) Keep room temperature above 60° F (15° C).

(f) Measure all components of the mixture, do not estimate.

(g) Blend mixture thoroughly.

(h) Do not allow more than five minutes before force drying.

(4) **Approved Body Filler** - Body filler is used to fill in and shape large areas such as bonded joints.

(a) Any polyester or epoxy-based body filler may be used as long as the total paint thickness requirements are not exceeded and the filler is non-conductive.

(b) **Procedure** - Manufacturer's instructions for the application of body filler must be followed.

(5) **PPG Paint System (Exterior)**

(a) **Approved PPG Primer Surfacers**

NOTE: The primer surfacer is used to fill in small divots, holes, and cracks for a smooth surface.

1 PPG D822 Corrosion Resistant Primer

(b) **PPG Primer Surfacer Procedure**

1 Bubbles and voids must be opened up, sanded out, filled, and block sanded smooth to surrounding surface.

2 Clean entire joint and bond area with soap and water if necessary.

3 Orbital sand with 240 grit paper. Hand sand all hard to reach areas using 240 grit dry paper.

4 Use a filtered air blow gun to remove sanding dust from corners and cracks.

5 Clean with D837 Spirit Wipe.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

6 Mask for primer application.

7 Mix 3 part D822 with 1 part D823 by volume. Pot life of mixture is 1-1.5 hours at 68° F. It is acceptable to thin up to half volume with D870, D872, or D873 to improve flow and smoothness.

8 Set spray gun to 1.4-1.6 mm, 3-4 bars (45-55 psi) spray pressure, and spray viscosity of 22 secs ZAHN 2 at 68° F (temperature may be changed based on the hardener and thinner being used).

9 Apply mixture into fill areas up to 6 mils maximum dry coat thickness.

10 Allow 1-2 hours to dry at 68° F or 20 to 30 minutes at 140° F. Use a maximum of three coats.

11 Sand after primer has dried, preferably within 12 hours of drying. If sanding after primer has dried more than 12 hours, clean surfaces with D837 Spirit Wipe prior to sanding. Orbital sand major areas with 320 grit or finer sandpaper and hand sand other areas with 400 grit sandpaper. The smoother the sanded finish, the smoother the top coat application.

(c) **Approved PPG Primer Sealers**

NOTE: The primer sealer is used as a wet-on-wet sealer to prevent fillers from penetrating through the paint.

1 PPG D825 2K Tintable Surfacer Base

2 PPG D822 Corrosion Resistant Primer

(d) **PPG Primer Sealer Procedure**

1 Wash surface with soap and water if necessary.

2 Wipe down with D837 Spirit Wipe.

3 Mix per manufacturer's instructions. The following PPG hardener and thinner combinations should be used for the corresponding temperatures found in Table 201.

Table 201. PPG Hardener And Thinner Combinations

Temperature	Hardener	Thinner
Up to 65° F	D803 Fast	D870 Fast Thinner
65° F - 77° F	D841 Medium	D871 Medium Thinner
77° F - 95° F	D861 Slow	D872 Slow Thinner
Over 95° F	D861 Slow	D873 Very Slow Thinner

4 Set spray gun to 1.4-1.6 mm, 4 bars (55 psi) spray pressure, and spray viscosity of 19-22 secs ZAHN 2 at 68° F.

5 Apply mixture up to 2.4 mils maximum dry coat thickness.

6 Allow 5-10 minutes to dry at 68° F between coats. Use a maximum of 2 coats.

7 If rework is necessary dry sand with 360 grit paper or wet sand with 400 grit paper.

NOTE: Pot life for the mixture is 1.5 hours at 68° F.
D825 may be tinted with DG colors if desired.
Coverage is approximately 396 square feet per gallon at 1 mil thickness.

(e) **Approved PPG Topcoats**

NOTE: The topcoat is the last layer in the painting process that contains the color and protects the part. There are three different types of topcoats: single-stage, two-stage, and three-stage. The advantage of using a single-stage is that it is much faster than the two-stage. The two stage, however, is easier to blend and more durable. The three-stage is used for special pearl coats. The needs of the application should be considered when choosing which method to use.

1 PPG DG single-Stage system

2 PPG BC Two-Stage System

3 PPG BC Three-Stage System

(f) **PPG Single-Stage System Procedure**

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

1 Sand after primer has dried, preferably within 12 hours of drying. If sanding after primer has dried more than 12 hours, clean surfaces with D837 Spirit Wipe prior to sanding. Wet-sand with 400-500 grit or finer sandpaper or dry-sand with 360-400 grit or finer sandpaper. The smoother the sanded finish, the smoother the top coat application.

2 Use a filtered air blow gun to remove sanding dust from corners and cracks. Wipe with D837 Spirit Wipe and tack cloth.

3 For two-tone paint application, allow 30 minutes at 68° F before applying masking tape.

4 For the first coat, mix per manufacturer's instructions. The following PPG hardener and thinner combinations should be used for the corresponding temperatures found in Table 202.

Table 202. Hardener And Thinner Combinations

Temperature	Hardener	Thinner
Up to 65° F	D841 Medium	D870 Fast Thinner
65° F - 77° F	D841 Medium	D871 Medium Thinner
77° F - 95° F	D861 Slow	D872 Slow Thinner
Over 95° F	D861 Slow	D873 Very Slow Thinner

NOTE: Pot life for the mixture is 1-3 hours at 68° F.

5 Set spray gun to 1.4-1.6 mm and 3-4 bars (45-55 psi) spray pressure and spray viscosity of 17-20 secs ZAHN 2 at 68° F (temperature may be changed based on the hardener and thinner being used).

6 Apply mixture up to 2.5 mils maximum dry coat thickness. The first coat should be medium wet.

7 Allow 10 minutes to dry at 68°F between coats.

8 For the second coat, mix the same as the first coat. The second coat should be full wet.

9 If DG color needs to be flatted, wet sand with 1200 grit paper or finer.

NOTE: For maximum total paint thickness (including all fillers, primers, and topcoats) refer to the Paint Thickness Zones - Paint Repair and Painting section. Colors must be chosen to meet the solar absorptive levels of the Materials and Equipment - Paint Repair and Painting section.
Coverage is approximately 647 Square feet per gallon at 1 mil thickness.

(g) **PPG Two-Stage System Procedure**

1 Sand after primer has dried, preferably within 12 hours of drying. If sanding after primer has dried more than 12 hours, clean surfaces with D837 Spirit Wipe prior to sanding. Wet-sand with 500-600 grit or finer sandpaper or dry-sand with 400-500 grit or finer sandpaper. The smoother the sanded finish, the smoother the top coat application.

2 Use a filtered air blow gun to remove sanding dust from corners and cracks. Wipe with D837 Spirit Wipe and tack cloth.

3 For the base coat (first stage), mix per manufacturer's instructions. The following PPG thinner should be used for the corresponding temperatures found in Table 203.

Table 203. PPG Base Coat Thinners

Temperature	Thinner
Up to 65° F	D870 Fast Thinner
65° F - 77° F	D871 Medium Thinner
Over 77° F	D872 Slow Thinner

NOTE 1:
There is no pot life for the mixture. Stir well before using.

4 Set spray gun to 1.3-1.5 mm and 3-4 bars (45-55 psi) spray pressure and spray viscosity of 14-20 secs ZAHN 2 at 68° F.

5 Apply mixture up to 1.0 mils maximum dry coat thickness

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

6 Allow 5 to 10 minutes to dry at 68° F between coats (not to exceed 24 hours). Number of coats is 2 medium wet. Allow 30 minutes at 68° F before applying masking tape

NOTE: Coverage is approximately 243 square feet per gallon at 1 mil thickness.

7 For the PPG clear coat (second stage), mix per manufacturer's instructions. The following PPG hardener and thinner combinations should be used for the corresponding temperatures found in Table 204.

Table 204. PPG Clear Coat Hardener and Thinner Combinations

Temperature	Hardener	Thinner
Up to 65° F	D803 Fast	D870 Fast Thinner
65° F - 77° F	D841 Medium	D871 Medium Thinner
Over 77° F	D861 Slow	D872 Slow Thinner

NOTE 1:

The pot life for the mixture is 6 hours at 68° F.

8 Set spray gun to 1.5-1.7 mm and 4 bars (55 psi) spray pressure and spray viscosity of 16-17 secs ZAHN 2 at 68° F.

9 Apply mixture up to 1.0 mils maximum dry coat thickness. Allow 10-15 minutes to dry at 68° F between coats. Number of coats is 1 light and 1 full wet.

NOTE: Coverage is approximately 321 square feet per gallon at 2 mil thickness.
For maximum total paint thickness (including all fillers, primers, and topcoats) refer to the Paint Thickness Zones - Paint Repair and Painting section. Colors must be chosen to meet the solar absorptive levels of the Materials and Equipment - Paint Repair and Painting section

(6) **Sherwin Williams Paint System (Exterior)**

(a) **Approved Sherwin Williams Primer Surfacers**

NOTE: The primer surfacer is used to fill in small divots, holes, and cracks for a smooth surface.

1 Sherwin Williams CM0482300 Primer

(b) **Sherwin Williams Primer Surfacer Procedure**

1 Bubbles and voids must be opened up, sanded out, filled, and block sanded smooth to surrounding surface.

2 Clean entire joint and bond area with soap and water if necessary.

3 Orbital sand with 240 grit paper. Hand sand all hard to reach areas using 240 grit dry paper.

4 Use a filtered air blow gun to remove sanding dust from corners and cracks.

5 Clean with D837 Spirit Wipe.

6 Mask for primer application.

7 Shake primer component for 15 minutes before admixing.

8 Mix 1 part CM0482300 (Epoxy Primer) with 1 part CM0120900 (Epoxy Adduct) by volume.

9 Add the Epoxy Adduct into the primer component.

10 Stir in slowly and allow a 15 minute induction time.

11 Pot life of mixture is 6 hours at 77 °F.

NOTE: It is recommended to filter strain admixed and reduced primer before placing material in containers for spraying.

12 Set spray gun pressures and settings per manufacturer recommendation.

13 Apply in two or three light coats. Allow each coat to flash of until dull before applying the next coat. Apply mixture into fill areas up to 1 to 1.5 mils dry coat thickness.

NOTE: Application of these product systems requires recommended temperature and humidity conditions and film thickness ranges. The material, hangar and aircraft skin temperatures should be no lower than 55F/ 13C before, during and after application.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

NOTE: Coverage is approximately 451 ft per gallon at 1 mil thickness.

14 Allow 4 hours minimum to 24 hours maximum to dry at 75° F or 30 minutes at 140° F before light sanding or adding topcoat.

15 Sand after primer has dried, preferably within 24 hours of drying. If sanding after primer has dried more than 24 hours, clean surfaces with D837 Spirit Wipe prior to sanding. Orbital sand major areas with 320 grit or finer sandpaper and hand sand other areas with 400 grit sandpaper. The smoother the sanded finish, the smoother the top coat application.

(c) **Approved Sherwin Williams Topcoats**

NOTE: The topcoat is the last layer in the painting process that contains the color and protects the part. There are three different types of topcoats: single-stage, two-stage, and three-stage. The advantage of using a single-stage is that it is much faster than the two-stage. The two stage, however, is easier to blend and more durable. The three-stage is used for special pearl coats. The needs of the application should be considered when choosing which method to use.

1 Sherwin Williams Jet Glo Express 840 Series (Single-Stage System)

2 Sherwin Williams Acry-Glo Basecoat Metallic Colors (830 Series) (Two-Stage System)

(d) **Sherwin Williams Single-Stage System Procedure**

1 Sand after primer has dried, preferably within 24 hours of drying. If sanding after primer has dried more than 24 hours, clean surfaces with D837 Spirit Wipe prior to sanding. Wet-sand with 400-500 grit or finer sandpaper or dry-sand with 360-400 grit or finer sandpaper. The smoother the sanded finish, the smoother the top coat application.

2 Make sure that the airplane is correctly grounded.

3 Use a filtered air blow gun to remove sanding dust from corners and cracks.

4 Wipe with D837 Spirit Wipe and tack cloth.

5 For two-tone paint application, allow 30 minutes at 68° F before applying masking tape.

6 Shake color component for 15 minutes before admixing.

7 By volume, mix 2 parts color Sherwin Williams CM0840 series (Y and Z color numbers) with 1 part CM0840081 (hardener) and 1 part activator found in Table 205 (choose appropriate activator per manufacturer recommendation).

8 Add the hardener and activator into the base component.

9 Stir in slowly and allow a 30 minute induction time.

10 Pot life of mixture is 4 hours at 77 °F.

NOTE: It is recommended to filter strain admixed and reduced paint before placing material in containers for spraying.

11 Mix per manufacturers instructions. The following Sherwin Williams activator found in Table 205 should be used with the 2 parts Sherwin Williams CM0840 series (Y and Z color numbers) and 1 part CM0840081 (hardener) for the corresponding temperatures and humidity.

a If force curing use CM0840A01.

Table 205. Activator Temperature/Humidity Combinations

Temperature	Humidity 0 – 65%	Humidity 65% +
60 - 75 °F	CM0840A07	CM0840A05
70 - 85°F	CM0840A05	CM0840A03
80 - 95°F	CM0840A03	CM0840A01
Over 95°F	CM0840A01	CM0840A00

12 The following reducers may be used mixed in as 1 part:

- Slow Reducer – CM0110093
- Medium Reducer – CM0110099

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

- Fast Reducer – CM0110944

13 Set spray gun pressures and settings per manufacturer recommendation.

14 Apply mixture 2 to 3 mils dry coat thickness.

a Best application results are achieved by applying 2 medium wet coats, allowing 30 to 45 minutes 'tack off' period between coats.

15 At 75 degrees and 50% humidity, tack-free time is 3 – 4 hours and tape time is 6 – 8 hours. Maximum time for re-coat is 24 hours. If the dry time between coats exceeds 24, then the surface should be thoroughly abraded.

NOTE: For maximum total paint thickness (including all fillers, primers, and topcoats) refer to the Paint Thickness Zones - Paint Repair and Painting section. Colors must be chosen to meet the solar absorptive levels of the Materials and Equipment - Paint Repair and Painting section.

NOTE: Coverage is approximately 800 - 960 ft per gallon at 1 mil thickness.

(e) **Sherwin Williams Two-Stage System Procedure**

1 Sand after primer has dried, preferably within 24 hours of drying. If sanding after primer has dried more than 24 hours, clean surfaces with D837 Spirit Wipe prior to sanding. Wet-sand with 400-500 grit or finer sandpaper or dry-sand with 360-400 grit or finer sandpaper. The smoother the sanded finish, the smoother the top coat application.

2 Make sure that the airplane is correctly grounded.

3 Use a filtered air blow gun to remove sanding dust from corners and cracks.

4 Wipe with D837 Spirit Wipe and tack cloth.

5 For two-tone paint application, allow 12 hours at 77° F or 3 hours at 120° F before applying masking tape.

6 Shake base component for 10 minutes before admixing.

7 By volume, mix 4 parts Color component with 1 part Hardener (CM0830081), 2 parts Activator/Stabilizer (CM0830991) and 1 part Compliant Reducer (CM0110944).

8 Add the hardener and activator into the base component.

9 Stir in slowly and allow a 30 minute induction time.

10 Pot life of mixture is 4 hours at 77 °F.

NOTE: It is recommended to filter strain admixed and reduced paint before placing material in containers for spraying.

11 Set spray gun pressures and settings per manufacturer recommendation.

12 Apply mixture 2 to 3 mils dry coat thickness.

13 Best application results are achieved by applying 2 medium wet coats, allowing 30 - 45 minutes 'tack off' period between coats.

14 At 77 degrees and 50% humidity, workable pot life is 1.5 hours, tack time is 20 minutes, and tape time is 12 hours. This time can be reduced to 3 hours at 120 degrees . If the dry time between coats exceeds 24 hours, then the surface should be thoroughly abraded.

15 Acry-Glo high solids clear CM0830080 should be applied a minimum of 2-3 hours after within a maximum of 24 hours after applying the metallic or solid color basecoat. If applying the clearcoat to a solid color basecoat that has been allowed to dry longer than 24 hours then the basecoat should be abraded. Abrading metallic basecoats is not recommended; therefore it is important that clear-coating occurs within the 2-24 hour window.

NOTE: For maximum total paint thickness (including all fillers, primers, and topcoats) refer to the Paint Thickness Zones - Paint Repair and Painting section. Colors must be chosen to meet the solar absorptive levels of the Materials and Equipment - Paint Repair and Painting section

NOTE: Coverage is approximately 550 - 640 ft per gallon at 1 mil thickness.

(7) **Fire Resistant Paint** - Ocean Fire Retardants number 477 (2 part) Epoxy is used for fire protection of aluminum and

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

composites. When number 477 Epoxy is exposed to flame, it expands up to form a very dense, insulating, spongy foam crust, which retards heat penetration to the under surface. The following items are applicable to fire resistant paints.

(a) Application over epoxy primer is preferred but not required for best adhesion. Prime per the Section Materials and Equipment - Paint Repair and Painting.

(b) Ensure surface is dry and free of oil or grease.

(c) Mix 8 parts number 477A with 1 part number 477B by volume. Allow 45 to 60 minutes to activate 1 gallon and 30 to 40 minutes to activate 5 gallons at room temperature (70° F).

(d) Reduce mixture after activation with Xylene or Solvent Naphtha at a ratio of 1/2 pint per gallon.

(e) Application method can be by brush, roll, or spray. Airless spray application is the application of choice. Airless spray equipment is preferred with recommended pressure of 2650 psi with a 0.015 to 0.017 inch tip size. Clean equipment with Xylene immediately after application.

(f) With air-less spray, avoid wet film build-ups greater than 10 mils per pass. Rolling produces a pattern that should be brushed out.

(g) Dry film recommended build up is 10 to 12 mils and typically requires two coats minimum, which is a coverage rate of 165 square square feet per gallon. Wet film build up is 23 to 27 mils total. Shelf life is 6 months. Store in a well ventilated area at 40° F to 120° F. Do not store or use in areas with open source of ignition. Flash point is 105° F. VOC maximum is 1.5 lbs. per gallon.

(h) Cure times at 70° F are, dry to recoat - 60 minutes, dry to touch - 4 hours, dry to handle - 24 hours, through cure - 7 days, and maximum cure and hardness takes 2 to 3 weeks. Higher temperatures accelerate speed of cure. Clean up with Xylene

(8) **Paints for Special Components**

(a) **Windows and Windshields** - The window and windshield sashes may be painted black for aesthetic purposes. The painted area will be along the perimeter and will cover 0.5±0.125 inch from the exterior paint. The paint on the exterior of the window must cover the black paint so that no more than 0.25 inches extends past the exterior paint when looking from the outside through the window. The paint and paint procedures used must be in accordance with the Topcoats - Paint Repair and Painting section. A specific paint thickness is not required.

(b) **Landing and Taxi Light Cover** - The landing and taxi light cover must be painted black per Figure 201 (shaded areas indicate paint). The paint and paint procedures used must be in accordance with the Topcoats - Paint Repair and Painting section of this specification. A specific paint thickness is not required.

(c) **Interior Panels** - All interior panels that are required to be painted must be painted in accordance with this section.

1 **Approved Paints**

a VQT DuPont Vinyl Color VQT Custom Match Tan

b PPG Exterior White

c PPG DG9300 Black

d PPG Custom Paint Platinum Silver (number 771 Med. Alum: 355.6, No. 772 Coarse Alum: 492.6, No. 743 Yellow: 494.9, No. 753 White: 496.1, and No. 759 Flattener: 503.2.

e PPG BC40101A Starlight Silver

f Sherwin Williams Jetflex WR (Matterhorn White)

2 **DuPont Paint Procedure**

a Bubbles and voids must be opened up, sanded out, filled, and block sanded smooth to surrounding surface.

b Clean entire joint and bond area with soap and water if necessary.

c Orbital sand with 240 grit paper. Hand sand all hard to reach areas using 240 grit dry paper.

d Use a filtered air blow gun to remove sanding dust from corners and cracks.

e Clean with D837 Spirit Wipe.

f Mask for primer application.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

g Shake paint well before using.

h Set spray gun as follows: for a traditional gun, 25-40 psi spray pressure, for a HVLP gun, 6-8 psi spray pressure. Set spray viscosity of 18-22 secs ZAHN 2.

i Spray until covered evenly.

j Allow 5 minutes to dry between coats. Apply 2-3 coats. Allow 30 minutes to dry.

k A specific paint thickness is not required.

3 **PPG Paint Procedure** - Follow the procedures in the Topcoats - Paint Repair and Painting for PPG paint. A specific paint thickness is not required.

4 **Sherwin Williams Paint Procedure**

a Sand after primer has dried, preferably within 24 hours of drying. If sanding after primer has dried more than 24 hours, clean surfaces with D837 Spirit Wipe prior to sanding. Wet-sand with 400-500 grit or finer sandpaper or dry-sand with 360-400 grit or finer sandpaper. The smoother the sanded finish, the smoother the top coat application.

b Use a filtered air blow gun to remove the sanding dust from the corners and cracks. Wipe with D837 Spirit Wipe and tack cloth. Be sure the aircraft is correctly grounded.

c Shake the base component for 10 minutes. Add up to 25 percent by volume deionized water as a thinner. Stir thoroughly. Initial viscosity, measured using a Gardner Signature #2 Zahn Cup, must be 25 to 30 seconds.

d Set the spray gun pressures and settings per manufacturer recommendation.

e Apply mixture 1.2 to 2.5 mils dry coat thickness in one wet coat.

f Flash for 15 minutes. Dry to touch in 30 minutes.

g Cure may be accelerated by heating to 140°F for 10 minutes. A specific paint thickness is not required.

(9) **Paint Thickness Zones** - Paint thickness must be controlled so the aircraft has proper conductivity to prevent damage from lightning strikes. Figure 202 shows the maximum paint thickness for different zones on the aircraft. Maximum total paint thickness includes all fillers, primers, and topcoats.

(10) **Paint Color Zones** - Paint color zones control exterior paint colors based on solar absorptive levels. Solar absorptive values indicated are for the zones shown in Figure 203 and Figure 204. If colors different than originally on the aircraft and are not listed in Table 206, are to be used in Zone A or B, the absorbtivity must be determined using ASTM E903; only paints that meet the absorbtivity levels may be used. Any paint color lighter than black, using an appropriate paint system specified in this chapter, may be used in Zone C without absorbtivity testing. Approved colors and associated zones are listed in Table 206.

- Zone A - solar absorbtivity less than 0.29 White to Zinc Oxide
- Zone B - solar absorbtivity less than 0.65 Gray to Medium Green, Blue, or Tan
- Zone C - solar absorbtivity less than 0.95 Black

Table 206. Approved Paint Colors

Generic Color	Color Number	Color	Zone
Whites	BC91046A / BC5135	White Diamond Pearl coat over Cessna 300 Standard White (3-stage)	Zones A, B, C
	BC5134A/BC5135A	Bright White Diamond (3-stage)	Zones A, B, C
	BC91046A	Standard Cessna White	Zones A, B, C
	BC 3563	Pearle White (Non Metallic)	Zones A, B, C
	CM0840103	Matterhorn White (Sherwin Williams)	Zones A, B, C
Yellows	BC84903B/BC84904A	Giallo Orion (3-stage)	Zones B and C
	BC4030	Viper Yellow	Zones B and C

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Yellows	A01582	Wildcat Yellow	Zones B and C
	A01629	Chrome Yellow	Zone B and C
Greens	BC5492	Electric Green	Zone C
	MBC46979/BC5135	Get Green Pearl	Zone C
	BC45817B	Hunter Green or PACUSA Green	Zone C
	5534	2001 Honda Clover Green Pearl	Zone C
	402587	2001 Mercedes-Benz Prismatingrun Met	Zone C
	195027	2001 Volvo Sydney Bay Blue Mica	Zone C
	47395	2001 Subaru Spruce Pearl	Zone C
	402374	2001 Volkswagen Green Collection Pearl	Zone C
	5409	2001 General Motors Forest Green Met	Zone C
	904571		Zone C
	6213		Zone C
	B648695	Racing Green	Zone C
	A05861	Green Apple	Zones B and C
	M06394	Everglades Metallic	Zone C
Blues	BC4372	Solar Blue Met	Zone C only
	BC5588	Island Blue Met	Zone C only
	BC18514***A	Light Poly Teal	Zones B and C
	BC5222C	Bright Purple	Zone C only
	BC5223C	Dark Mulberry	Zone C only
	BC4784	Glacier Blue or PACUSA Blue	Zone C only
	190397	2001 Mercedes-Benz Quartz Blue Met	Zone C only
	193775		Zone C only
	BC19598	Navy	Zone C only
	A00241	Colonial Blue	Zones B and C
	M10642	Sapphire Blue Metallic	Zones B and C
	M00085	Blue Metallic #4	Zone C
	M10586	Steel Blue Metallic	Zone C
	M10592	Ocean Blue Metallic	Zone C
	BC74712	Mojave Red	Zone C only
	BC74492C	Pontiac Red	Zone C only
	BC61930C	Prowler Orange	Zone C only
	BC5359	Cranberry Pearl	Zone C only
	902122		Zone C only

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Reds/Oranges	BC61930	Flame Orange	Zone C only
	BC75250	Ferrari Red	Zone C only
	5222		Zone C only
	N06399	Dark Red Metallic	Zone C
	MP06393	Radiant Red Pearl	Zone C
	A00358	Sunfast Red	Zone C
Golds	BC25622A	Pure Gold Radiance	Zones B and C
	BC4138	Gold	Zones B and C
	5584	Gold (brown)	Zones B and C
	5383	Gold	Zones B and C
	BC 4138	Royal Gold	Zones B and C
	M06401	Gold Metallic	Zones B and C
	ME06397	Convoy Gold Effect	Zone C
	M10494	Las Vegas Gold Metallic	Zones B and C
	M10685	Spanish Gold Metallic	Zone C
	ME06395	Autumn Sunburst Effect	Zone C
Silvers	BC4010A	Silver Poly	Zones B and C
	BC35482	Moon Stone	Zones B and C
	BC33896	Aluminum	Zones B and C
	BC4010	Starlight Silver (metallic)	Zone A, B and C
	Custom color (Refer to Note 1)	Cessna Starlight Silver (nonmetallic)	Zone A, B and C
	Custom color (Refer to Note 2)	Cessna Platinum Silver (metallic)	Zone A, B and C
	M10637	Castle Silver	Zones B and C
	M10679	Titanium Metallic	Zones B and C
Blacks/Dark Greys	5559	River Rock Green Mica	Zone C only
	BC9300	Black	Zone C only
	BC5292	Dark Slate Pearl coat (2-stage)	Zone C only
	BC17038	Black	Zone C only
	905384		Zone C only
	BC36447	Viper Steel Gray	Zone C only
	M10492	Charcoal Metallic	Zone C only
	M10683	Phantom Gray Metallic	Zone C only
	M06400	Medium Taupe Metallic	Zones B and C
Others	BC35915	Shale	Zones B and C
	BC 26634	Cream Beige (Non Metallic)	Zone A, B and C
	ME06398	Purple Effect	Zone C
	M06396	Mocha Frost Metallic	Zone C

NOTE 1:

92.9 percent D753, 4.68 percent D740, 2.02 percent D778, .42 percent D779

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

NOTE 2:

15.2 percent D771, 21.0 percent D772, 21.1 percent D743, 21.2 percent D753, 21.5 percent D759

1. **Zone C Paint in a Zone B Area (Wing Tip and Vertical Tail)** - On the wing tip and vertical tail, Zone C paint may be used in a Zone B area provided the surface painted with Zone C paint does not exceed 2 percent of the overall Zone B area. Additionally, Zone C paint can be used as shown in Figure 205.
2. **Zone C Paint in a Zone B Area (Cowl)** - On the Zone B surface of the cowl, Zone C paint can be used to cover the overall area.

2. Non-Structural Laminate Repair

A. **Approved Non-Structural Laminate Repair Materials** - All non-structural laminate repair resin and cloth materials approved for use under this chapter are listed below. Refer to Table 207.

Table 207. Approved Non-Structural Laminate Repair Materials

Approved Non-structural Repair Material	Product Designation	Supplier	Where Used
Adhesive, Dion FR 7704-00 **(NOTE 1)**	P1300010	Cessna Aircraft Company	Interior Laminates (including Panels, Upholstered Panels, and Ventilation Ducts)
Adhesive Kit, Hysol, 3 fluid ounce **(NOTE 2)**	U000700	Cessna Aircraft Company	Bonding only
Adhesive Kit, Jeffco Pack 5, 5 fluid ounce **(NOTE 3)**	U514069S	Cessna Aircraft Company	Exterior Laminates
Glass Fabric **(NOTE 4)**	F441523	Cessna Aircraft Company	Laminate Repair

NOTE 1:

Dion Adhesive is used only for interior repairs.

NOTE 2:

For visual identification purposes, the color of the mixed Hysol resin and adhesive is gray.

NOTE 3:

For visual identification purposes, the color of the mixed Jeffco resin and adhesive is pale yellow.

NOTE 4:

Store away from direct sunlight. No shelf life.

B. The following table lists the repairable non-structural aircraft parts. Refer to Table 208.

Table 208. Repairable Non-Structural Aircraft Parts

Part Name	Applicable Repair
Air Conditioner Ducting	Interior Laminate, Bonding
Aileron Fences	Paint, Exterior Laminate, Bonding
Cabin Door Windows	Transparency
Elevator Fairings	Paint, Exterior Laminate, Bonding
Exterior Access Panels	Paint, Exterior Laminate
Glare Shield	Interior Laminate, Upholstery,
Horizontal Stabilizer Gap Seals	Paint, Exterior Laminate, Bonding
Interior Access Panels	Upholstery, Interior Laminate
Interior Panels	Upholstery, Interior Laminate
Landing/Taxi Light Cover	Transparency
Leg Fairings	Paint, Exterior Laminate, Bonding
Nose Fairings	Paint, Exterior Laminate, Bonding
Passenger Light Covers	Paint, Transparency

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Passenger Windows	Transparency
Position Light Covers	Paint, Transparency
Speed Buns	Paint, Exterior Laminate, Bonding
Stall Strips	Paint, Exterior Laminate, Bonding
Wheel Pants	Paint, Exterior Laminate, Bonding
Windshield	Transparency
Wing Fillets	Paint, Exterior Laminate, Bonding

C. The following table lists the repair guidelines for non-structural aircraft parts. Refer to Table 209.

Table 209. Repair Guidelines for Non-Structural Aircraft Parts

Defects Repair Guidelines		
Defect Type being Repaired	Number of Repair Cloth Plies	Repair Area
Fracture	Same as the number of plies affected during the removal of the defect.	1 - 2 Repair Plies: Defect and area surrounding by 0.5 inch. (12.7 mm) 3 Repair Plies and more: Defect and area surrounding by 1.0 inch (25.4 mm).
Delamination		

D. **Non-Structural Laminate Repair Method**

(1) Determine if damaged non-structural part is allowed to be repaired. Refer to Table 208.

NOTE: Only the parts listed in Table 208 can be repaired using this Non-Structural Laminate Repair Method.

(2) Clean the part to remove oil and dirt prior to repairing damage.

(3) Using 80 grit (P100) or finer aluminum oxide abrasive paper (with an sander or sanding block) remove all paint and primer which surrounds the defect area. Sand in a circular motion to prevent any damage to the underlying laminate.

WARNING: It is not permissible to use any chemical paint strippers as this may damage the composite part.

(4) Use aluminum oxide abrasive paper to remove the entire defect area. If the damage area being repaired is a fracture through all plies it is permissible to leave enough of the damaged area on the part to provide an adequate contour for repair.

(a) If the repair involves 1 to 2 plies, the repair area is the defect and area surrounding by 0.5 inch (12.7 mm).

(b) If the repair involves 3 plies or more, the repair area is the defect and area surrounding by 1.0 inch (25.4 mm).

NOTE: Completely remove all damaged or whitened plies.

(5) If the defect type being repaired is a fracture or delamination, visually determine the number of plies affected.

(a) Lightly apply isopropyl alcohol to the surface of the scarf and allow to dry. As the alcohol dries, rings will appear as translucent lines with no ply orientation being visible. The rings result from how the alcohol dries, one ply at a time.

1 The number of rings will equal the number of plies removed.

(b) To cross check your observation, compare the depth of the area where the defect was removed with an adjacent, undamaged area. Ply thickness on average is 0.010 inch (0.25 mm).

(c) If uncertainty exists, adjust the ply number upwards accordingly.

(6) Surface prepare and scarf the area. Refer to Cessna LC-550FG Structural Repair Manual (LCSRM), 51-20-01, Process and Handling Requirements - Repair Procedures, General Surface Preparation.

NOTE: Use a minimum 0.5 inch (12.7 mm) scarf per ply for glass.

(7) Cut the appropriate number of repair cloth plies. Refer to corresponding to Table 209, Repair Guidelines.

NOTE: The size of the first ply must cover the 'Repair Area'. Refer to Table 209, Repair Guidelines.

NOTE: Repair ply orientation is not critical.

(a) For subsequent cloth plies, decrease the dimension from the preceding ply by the following:

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

1 0.5 inch (12.7 mm) for glass cloth.

(b) Check the fit of the cloth plies by stacking, without resin the cloth plies on top of one another. The largest will be on the bottom, the smallest on top.

1 After checking for fit, remove the cloth plies and lay out individually on a clean, flat surface for resin application.

(8) Repair cloth plies are to be replaced as follows:

(a) The first ply removed during the scarf will be the first ply replaced. (The first ply is the largest.) Refer to Cessna LC-550FG Structural Repair Manual (LCSRM), 51-70-00, Structural Composite Repair Guidelines.

(9) Select and prepare approved and appropriate resin system. Refer to Table 207.

(10) On a work preparation surface, apply resin to repair cloth plies.

(a) Saturate every repair ply with resin separately.

(b) Center and stack the next smaller saturated repair plies on top of one another. Eventually, when completed the stack will contain the largest ply on the bottom, the smallest on top.

1 To prevent delamination, it is recommended that every individual ply is compacted as it is stacked to remove any trapped air.

a Use a gloved hand, squeegee, roller or other appropriate tool to compact the stack to remove trapped air.

2 Add additional resin to the stack as necessary to prevent any dryness.

(11) Transfer the compressed, centered and resin-saturated stack of repair cloth plies from the work preparation surface to the repair.

(12) Apply the stack of repair cloth plies to the surface prepared area.

(a) Compact the repair cloth plies against the original cloth plies.

(b) Smooth out these areas to remove any trapped air.

(c) Add additional resin to the repair as necessary to prevent any dryness.

(13) Place peel ply over repair cloth plies.

(14) Cure the repair. Refer to LCSRM, Chapter 51, Process and Handling Requirements - Repair Procedures for the appropriate resin and related cure instructions.

(15) Perform the bodywork as required to restore part contour.

(16) Apply primer and paint as necessary using appropriate methods. Refer to the applicable model Maintenance Manual, Chapter 51, Paint Repair and Painting.

3. Bond Repair

A. For non-structural parts requiring bonding, refer to the LCSRM, Chapter 51, Structural Composite Parts Repair, Bond Repair Method.

4. Upholstery Repair

A. Approved Materials

Table 210. Approved Leather Repair Materials

Purpose	Material	Supplier
Filler	LFP Compound P01LFP	Flexproof
Primer	Leather Primer P04GRA08	Flexproof
Texture Mats Compound	R Compound T04RCM	Flexproof
Texture Mats Catalyst	R Catalyst T04CT03	Flexproof
Degreaser	Acryliclean DX-330	PPG
Leather	Leather - LL-3821	Douglas Interiors
Ultra Leather	Buff Colored Ultra Leather - 3609	Scalise Marine
Ultra Leather	Papyrus Colored Ultra Leather - 1256	Scalise Marine

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

B. **Grain Transfer Mat Creation**

NOTE: Note: The following repair procedures are not applicable to Oregon Aero High G Seats. For repair procedures applicable to Oregon Aero High G Seats, including upholstery, see the latest revision of EM-01-01 Oregon Aero Engineering Manual, Instructions for Continued Airworthiness.

NOTE: Verify condition of underlying laminate before beginning upholstery repair.

(1) Pour the Texture Mat Compound on a clean surface until the puddle is about 2.5 inches in diameter.

(2) Pour a few drops of an approved interior paint into the middle of the Compound.

(3) Pour a few drops of the Texture Mat Catalyst into the paint in the middle of the Compound.

(4) Mix Catalyst and Paint with the compound. Even distribution of the paint in the mix will signify an even equal distribution of the Catalyst and Compound.

(5) Take a scrap piece of leather or ultra leather (dependent on what type of upholstery repair you will be performing and clean with degreaser.

(6) Using masking tape, tape an area off measuring 2.5 inches x 4.0 inches.

(7) Spread the mixture evenly onto your taped off area until it is between 1/32 and 1/16 of an inch thick.

(8) Peel off the tape from the leather/ultra leather.

(9) Let the compound sit for at least 24 hours prior to removal from the leather/ultra leather.

C. **Repair Method**

(1) Clean damaged and surrounding area by 1.0 inch with degreaser.

(2) Using a q-tip saturate the discrepancy and area 1/8 inch surrounding damage with primer for leather. Primer must be dry (use heat gun as necessary) prior to proceeding to next step.

(3) Clean GTM with alcohol and allow to dry before proceeding.

(4) Fill discrepant area with filler.

(5) Heat GTM to 200 degrees with heat gun (GTM will begin to smoke when this temperature is reached). Apply GTM to discrepant area with pressure for 15 seconds. Gently peel away GTM from area of repair.

(6) Using a chill bar press down on the area of repair to flatten and cool it.

(7) Heat and cool repeatedly as necessary until area of repair is smooth to touch and you can see the outline of the grain in the repair area.

(8) Apply primer with a q-tip to all areas where filler was applied (this area should have a duller color than the leather).

(9) Paint over area where primer was applied. Apply one coat at a time, drying as necessary with heat gun. If paint gets too hot it will boil.

(10) Clean GTM with alcohol and allow it to dry before proceeding.

(11) Heat GTM to allow it to imprint and flatten to paint. Do not heat GTM as excessively as prior. Apply heat gun for no more than 15 seconds at a time. If too much heat is applied to GTM the paint will boil or adhere to the GTM.

(12) Apply GTM to painted area with pressure from the Chill Bar.

(13) If any holes which allow for attachment of the interior panels were repaired and the area of the hole has been compromised it is recommended a soldering iron/gun is used to restore the full area of the hole.

(14) Using an approved interior paint, paint the repair to match the color of the surrounding area.

5. Transparency Repair

A. **Approved Materials**

(1) Novus No. 1 Plastic Clean and Shine (For general cleaning)

(2) Novus No. 2 Fine Scratch Remover (For fine scratches)

(3) Novus No. 3 Heavy Scratch Remover (For heavy scratches)

(4) Summer Laboratories 210® Plastic Cleaner and Polish (For general cleaning)

(5) 100 percent cotton flannel polishing cloths

(6) 3M™ Adhesive remover Citrus Base 6040-6042 (for general cleaning)

B. **General Cleaning Procedures** - Never do anything that will scratch the surface of the acrylic plastic. The following points

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

for cleaning and caring for the transparencies will ensure no further damage occurs to the transparency during repair.

(1) First, when cleaning any transparency, remove rings and watches as they can cause deep scratches. In this vein, long sleeve shirts must be turned up a few rolls to hide exposed buttons.

(2) If the transparency does not have built-up dirt and bugs on the surfaces, but rather has finger prints and/or dust, Novus No. 1 can be applied directly per product specific application instructions. Summer Laboratories 210® can also be used for this purpose per product specific application instructions.

(3) It is necessary to removing bugs and/or heavy accumulations of dirt, avoid touching the surface. If possible, remove most of the dirt by flushing the windows and windshield with water and a mild dish soap mixture. Allow the accumulation of dirt and/or bugs to soak for a few minutes. If rubbing is required, a bare hand is best. When all the debris on the surface of the window is loosened, apply a second water flush, dry with a 100 percent cotton cloth, and apply Novus No. 1 per product specific application instructions.

(4) The above steps and products may not remove all substances, since they are intended primarily for dirt and smudges. To remove difficult items such as tape residue, oil, and grease, the safest solvents are 100 percent mineral spirits or kerosene. Some alcohols are safe, such as isopropyl alcohol.

(5) The best polishing cloth is the softest cotton available. One hundred percent cotton flannel is ideal and available in yard goods stores. Never use any type of paper product or synthetic material. In particular, never use shop rags or shop towels. Be sure the polishing cloth is clean and dry. Reserve polishing cloths should be stored in a plastic bag or airtight container to limit dirt accumulation. Do not reuse soiled polishing cloths until they are properly laundered.

(6) Small scratches, the type that can be seen but cannot be felt with a fingernail, should be treated with Novus 2. First, clean the transparency per the following instructions (if necessary), and then follow product specific application instructions for using Novus No. 2.

(a) If the transparency does not have built-up dirt and bugs on the surfaces, but rather has finger prints and/or dust, Novus No. 1 can be applied directly per product specific application instructions. Summer Laboratories 210® can also be used for this purpose per product specific application instructions.

(b) It is necessary to removing bugs and/or heavy accumulations of dirt, avoid touching the surface. If possible, remove most of the dirt by flushing the windows and windshield with water and a mild dish soap mixture. Allow the accumulation of dirt and/or bugs to soak for a few minutes. If rubbing is required, a bare hand is best. When all the debris on the surface of the window is loosened, apply a second water flush, dry with a 100 percent cotton cloth, and apply Novus No. 1 per product specific application instructions.

(c) The above steps and products may not remove all substances, since they are intended primarily for dirt and smudges. To remove difficult items such as tape residue, oil, and grease, the safest solvents are 100 percent mineral spirits or kerosene. Some alcohols are safe, such as isopropyl alcohol.

(7) If after using Novus No. 2, scratches are still visible, apply Novus No. 3 per product specific application instructions.

(8) Scratches of greater magnitude (those that can be felt with a fingernail) require the use of high abrasives and removal of some of the window's surface around the greatest depth of the scratch. This procedure requires considerable expertise and the scratch may not be correctable. Repair of transparencies with a scratch depth of approximately .005 of an inch or greater (the depth at which you will be able to feel it with your finger nail) must be referred to your Cessna Service Station.

CAUTION: Do not use anything containing ammonia, aromatic solvents like methyl n-propyl ketone, acetone, lacquer thinner, paint stripper, gasoline, benzene, alcohol, anti-ice fluid, hydraulic fluid, fire extinguisher solutions, or window cleaner on the acrylic transparency surfaces. The use of these substances may cause the surface to craze.

C. **Specific Application Instructions**

(1) **Novus No. 1**

(a) If the surface is extremely dirty, apply Novus No. 1 liberally and wipe using long, sweeping strokes. Do not use pressure at this time or large dirt particles may scratch the plastic. If there are heavy accumulations of bugs and built-up dirt, follow the cleansing instructions of the General Cleaning Procedures.

(b) Shake well before using.

(c) Re-apply Novus No. 1. Polish using short, circular strokes with a clean portion of the cloth.

(d) When surface is thoroughly clean and uniformly covered, buff to a slippery glaze with a clean portion of the cloth. Surfaces buffed to a high glaze are more resistant to dust and future scratching.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

(2) **Novus No. 2**

(a) Observe condition of the surface to be treated. The deeper the scratches, the greater the pressure required to remove them. If the surface is dirty, clean with Novus No.1 before applying Novus No. 2.

(b) Apply Novus No. 2 liberally. Using a clean, soft cloth, polish with a firm back and- forth motion at right angles to the scratches. Keep the cloth saturated with polish at all times.

(c) Shake well before using.

(d) When the worst scratches have been polished out, reapply Novus No.2 uniformly in a circular motion to the entire surface using short, circular strokes and light pressure. Allow to dry to a light haze.

(e) Using a clean portion of the cloth, buff the surface to a slippery glaze using firm, short strokes. This procedure is imperative in achieving the best results.

(f) For heavy scratches, multiple applications of Novus No. 2 or application of Novus No. 3 may be required. Follow with Novus No. 1 for best results.

(3) **Novus No. 3**

(a) Remove surface dirt and dust with Novus No. 1.

(b) Shake well before using.

(c) Apply Novus No. 3 liberally. Using a clean, soft cloth, polish with a firm back and forth motion at right angles to the scratches. Keep the cloth saturated with polish at all times.

(d) Continue polishing until only fine scratches remain. Using cloth, remove all remaining polish, this is very important!

(e) Using a clean cloth, apply Novus No. 2 in a circular motion uniformly to entire surface. Polish using light pressure until Novus No. 2 dries to a light haze.

(f) Using a clean portion of the cloth, buff the surface clean. Follow with Novus No. 1 for best results.

(4) **Summer Laboratories 210 (Plastic Cleaner and Polish)**

(a) This cleaner is dispensed from an aerosol can and ideal for light and quick cleaning jobs.

(b) Shake the can well before using.

(c) Spray a light coat of 210® Cleaner/Polish across the surface of the transparency.

(d) With a soft clean cloth, wipe and buff the surface until it is dry.

(5) **3MTM Adhesive remover Citrus Base 6040-6042**

(a) This cleaner is dispensed from an aerosol can and ideal for light and quick cleaning jobs.

(b) Thoroughly coat adhesive residue/paint over-spray.

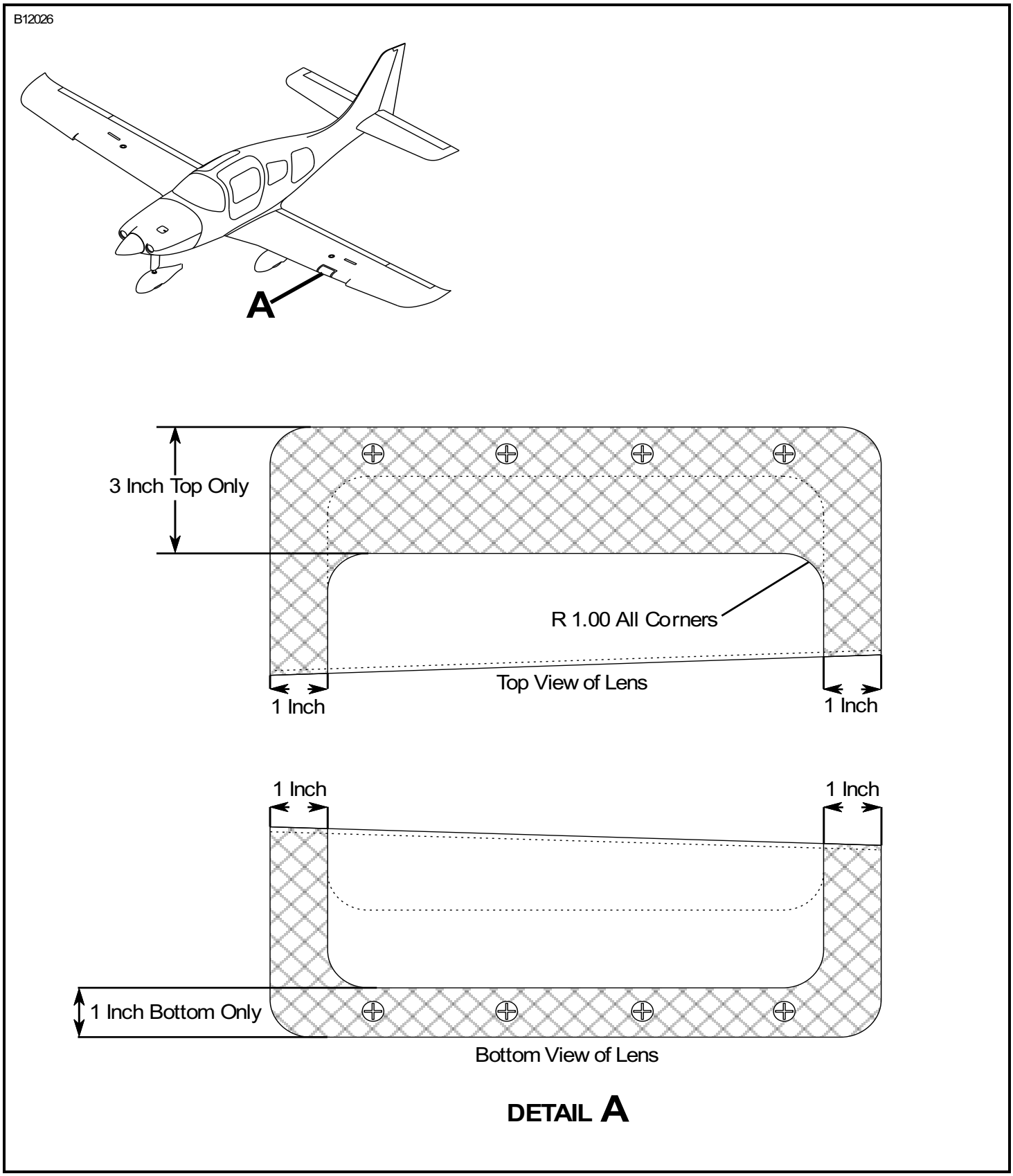
(c) Wait at least 5 minutes for product completely penetrate and loosen adhesive or paint.

(d) Use a soft clean cloth to clean adhesive residue or paint.

(e) Repeat process if necessary.

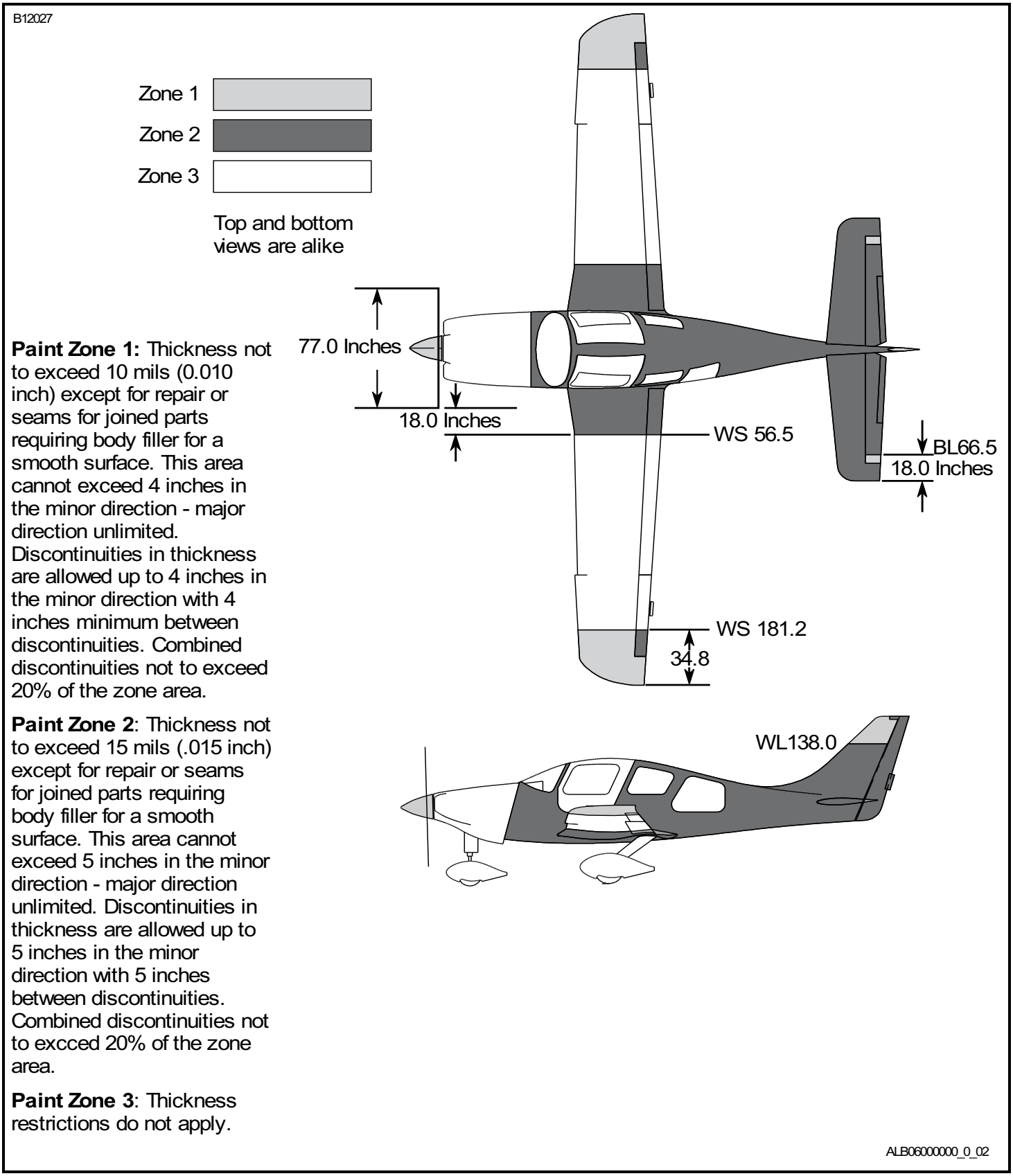
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Landing and Taxi Light Paint Areas



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Paint Thickness Zones



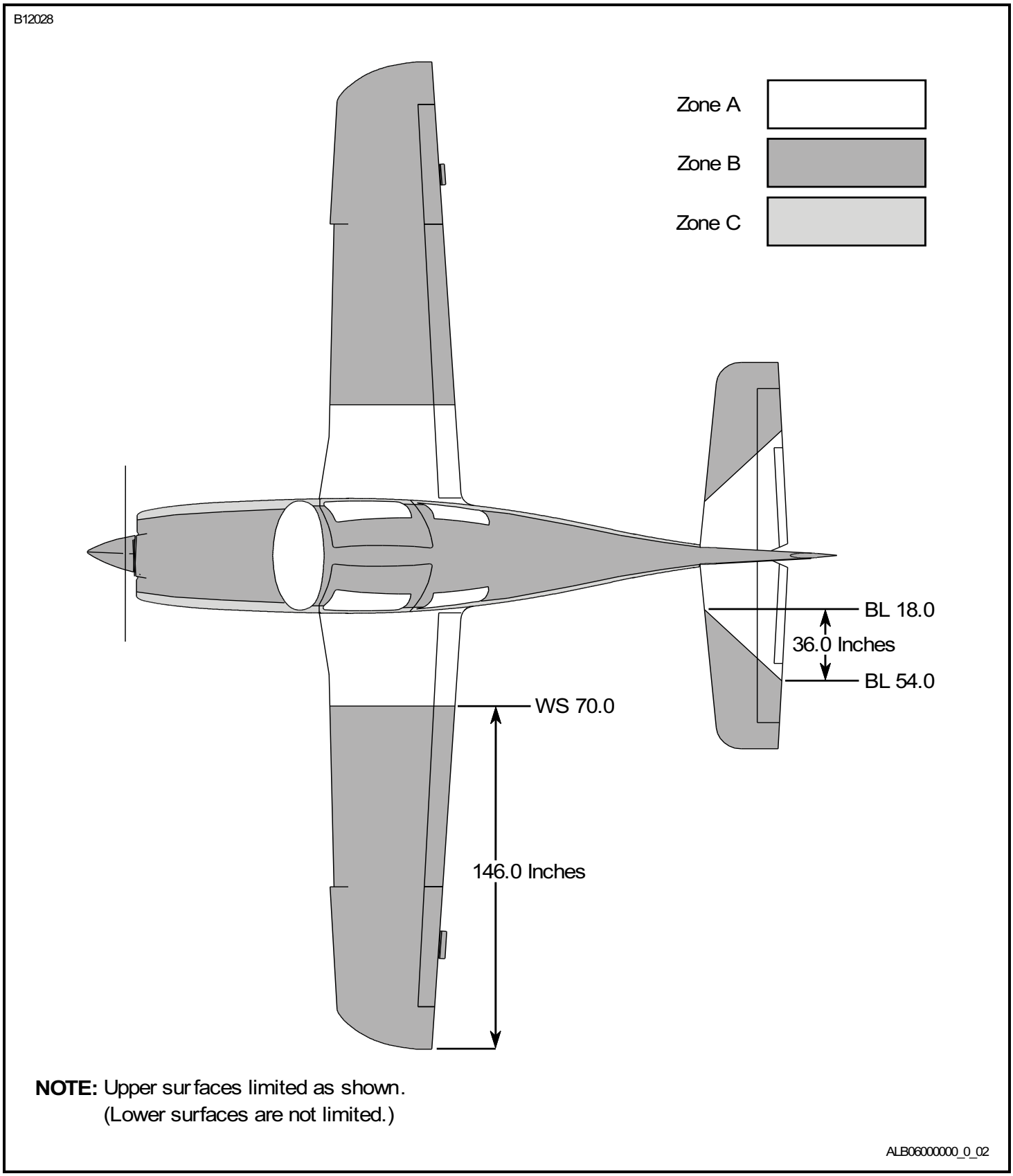
Paint Zone 1: Thickness not to exceed 10 mils (0.010 inch) except for repair or seams for joined parts requiring body filler for a smooth surface. This area cannot exceed 4 inches in the minor direction - major direction unlimited. Discontinuities in thickness are allowed up to 4 inches in the minor direction with 4 inches minimum between discontinuities. Combined discontinuities not to exceed 20% of the zone area.

Paint Zone 2: Thickness not to exceed 15 mils (.015 inch) except for repair or seams for joined parts requiring body filler for a smooth surface. This area cannot exceed 5 inches in the minor direction - major direction unlimited. Discontinuities in thickness are allowed up to 5 inches in the minor direction with 5 inches between discontinuities. Combined discontinuities not to excced 20% of the zone area.

Paint Zone 3: Thickness restrictions do not apply.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

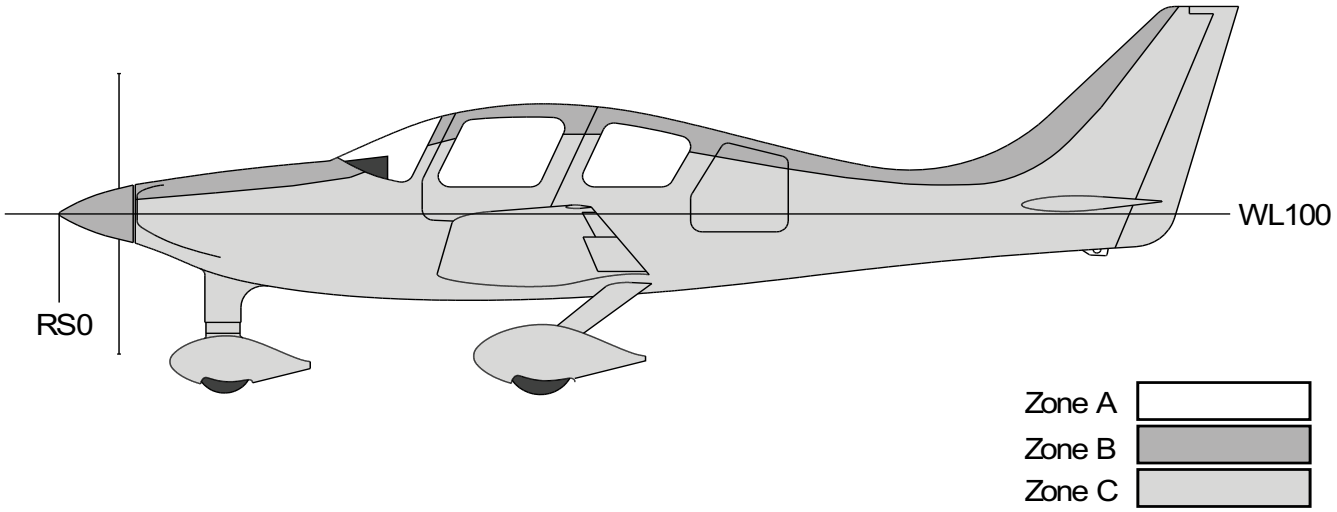
Figure 203 : Sheet 1 : Paint Color Zones for UV and Temperature



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 204 : Sheet 1 : Paint Color Zones for UV and Temperature (Side View)

B12029



Paint Demarcation Locations - Zone B to Zone C

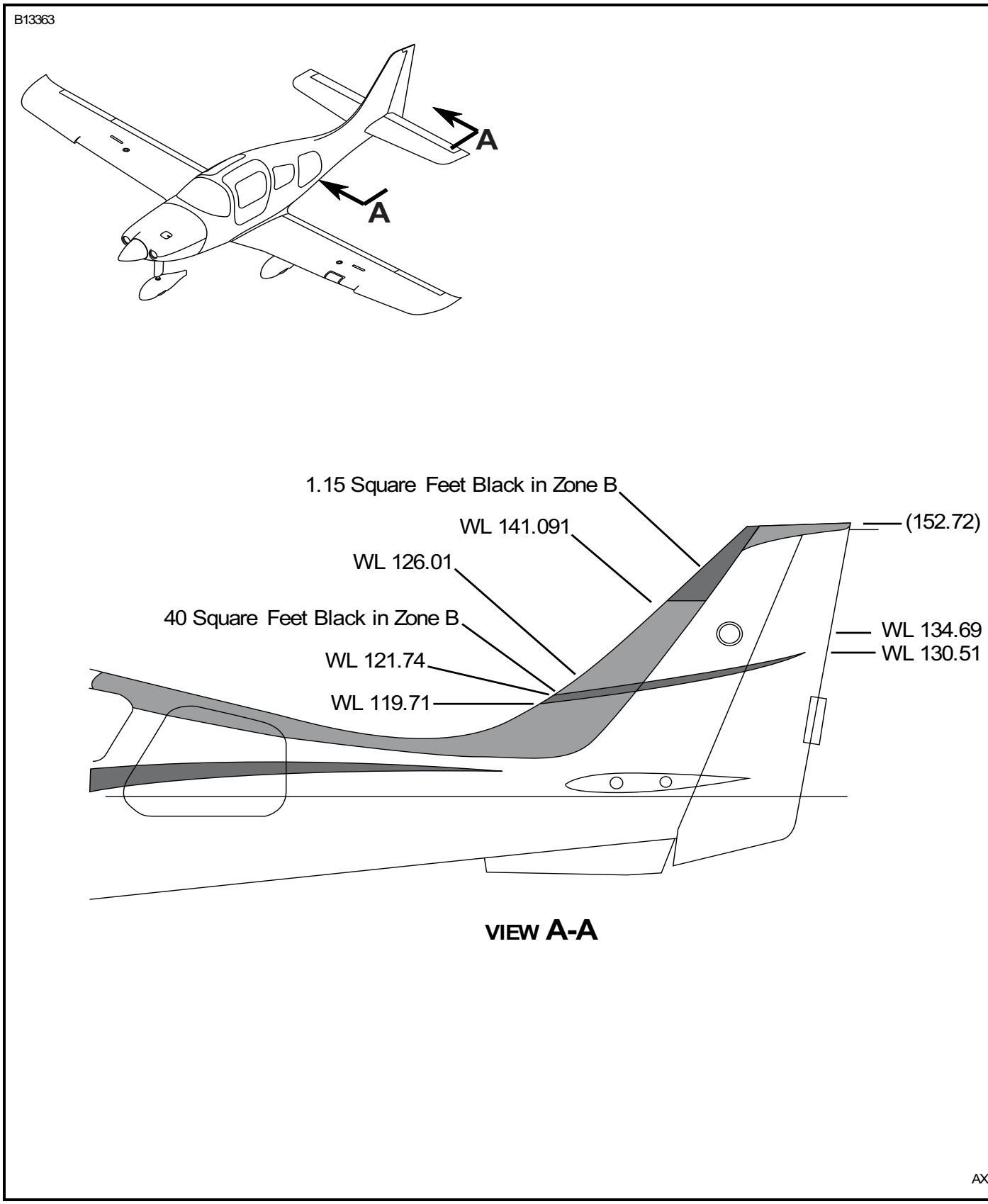
Waterline Station	WL103.5	WL104.2	WL105.2	WL106.4	WL107.9	WL109.6	WL117.7	WL119.0	WL122.4
Reference Station	RS20	RS30	RS40	RS50	RS60	RS70	RS95	RS100	RS130

Waterline Station	WL122.1	119.4	WL117.1	WL114.9	WL113.0	WL111.4	WL110.1	WL109.0	WL108.2
Reference Station	RS140	RS160	RS170	RS180	RS190	RS200	RS210	RS220	RS230

Waterline Station	WL107.7	WL110.0	WL120.6	WL135.2	WL149.7
Reference Station	RS240	RS250	RS260	RS270	RS280

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Zone C Paint in a Zone B Area



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

STABILIZERS - GENERAL

1. General – Scope and Definition

A. The Cessna 300 (LC40-550FG) empennage assembly consists of a horizontal and vertical stabilizer. The vertical stabilizer is an integral part of the fuselage. The horizontal stabilizer is a two-piece unit that is fully removable for service and maintenance. The horizontal stabilizer is of a carbon fiber composite construction. The internal structure consists of two ribs that run the full length of the stabilizer chord line at their respective stations and two shear webs: one between the two ribs and one that is outboard of the outboard rib. The horizontal stabilizer is attached to the vertical stabilizer via two high-strength steel tubes and two locking pins. The elevator and rudder are also of a carbon fiber composite construction. The elevator has an electrically actuated trim tab located on the right side. The elevator is attached to the horizontal stabilizer with two piano hinges. The rudder has a fixed trim tab located mid-span along the trailing edge and is attached to the vertical closeout at three locations. Both the elevator and rudder have balance weights installed for stabilization during flight.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

HORIZONTAL STABILIZER - MAINTENANCE PRACTICES

1. Horizontal Stabilizer

A. The left and right sides of the horizontal stabilizer structure consist of an inboard rib, an outboard rib, an inboard shear web, and an outboard shear web, as shown in Figure 201. The ribs and shear webs are a pre-molded carbon composite material. The inboard and outboard ribs contain bushings for the horizontal tubes. The bushings are pre-installed in the ribs.

2. Horizontal Stabilizer Removal and Installation

CAUTION: Removal of the horizontal stabilizer may require more than one individual due to its size and relatively tight fit.

A. Use the following procedure to remove the horizontal stabilizer:

(1) Remove the rudder and elevator per the instructions in Chapter 27.

(2) Remove the two AN526C1032R8 screws and two NAS1149F0332P (AN960-10L) washers attaching the locking pin to the aft face of the horizontal stabilizer.

(3) Using a pair of vice grips or similar tool, pull the locking pin, part number LA55702003, straight aft out of the horizontal stabilizer.

CAUTION: Take care not to bend the locking pin while removing it. If the pin becomes bent, installation will be difficult, if not impossible.

(4) Remove the horizontal stabilizer by gently rocking it fore and aft while sliding it straight outboard from the fuselage until the horizontal tubes are free of the outboard rib and bushings. Once the tubes are free of the outboard rib, the horizontal stabilizer will slide freely until the end of the tubes contact the inboard rib and bushings. Again, gently rock the stabilizer fore and aft to clear the inboard bushings.

WARNING: Take care not to rock the stabilizer too hard and cause undue stress on the internal ribs and bushings, as this may cause the bushings to break loose. Should the bushings break loose, contact the manufacturer for further instructions.

(5) Reinstall the horizontal stabilizer sides in the reverse order. When reinserting the locking pin, take care not to bend it, as installation will become difficult or impossible. Should the locking pin become bent and impossible to install, contact the manufacturer for a replacement. Torque the locking pin attachment screws 30 to 36 inches-lbs.

3. Maintenance Practices

A. Regular maintenance of the horizontal stabilizer is not required. The holes in the trailing edge for the elevator hinge attachment screws should be inspected occasionally for wear. The horizontal tubes do not require maintenance.

4. Detection Procedures for Delamination and Latent Damage

A. Due to its composite construction, the horizontal stabilizer should be inspected for delamination and latent damage per the procedures outlined in Chapter 51. The horizontal stabilizer does not have any access panels and needs to be removed in order to inspect the internal structure. Follow the instructions outlined in this chapter for removal of the horizontal stabilizer. Common inspection tools that may be used are mirrors, bore scopes, etc.

5. Inspection of Horizontal Tubes

A. The horizontal tubes should be inspected per the procedures outlined in Chapter 53-70-00.

6. Paint Schemes

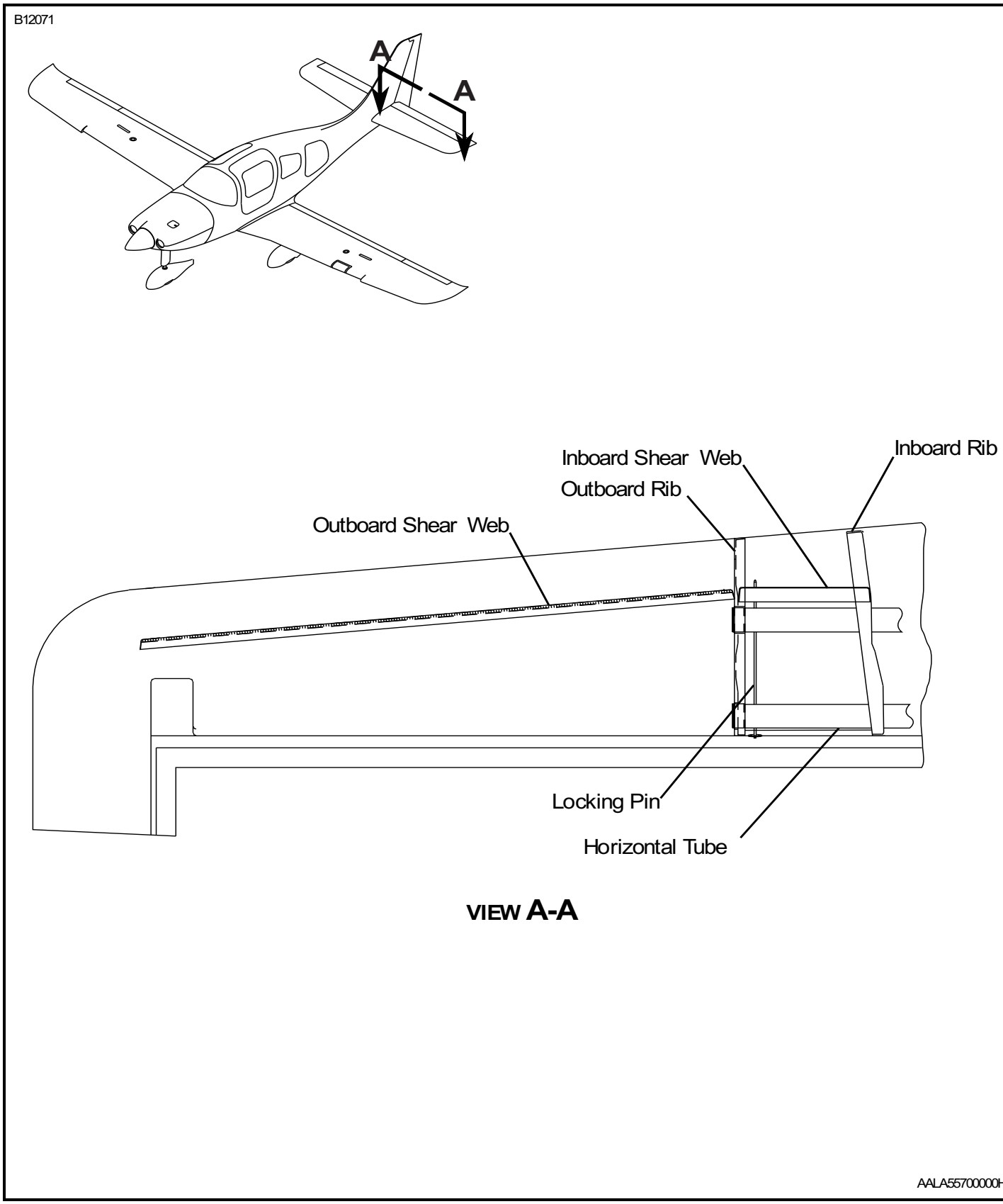
A. The horizontal stabilizer is to be painted in accordance with instructions in Chapter 51-70-00.

7. Leading Edge Tape

A. Optional leading edge anti-chafe tape may be added to the aircraft. The anti-chafe tape is 1 inch wide, adhesive-backed, clear, urethane tape that prevents pitting and wear on the leading edges of the horizontal surfaces. To apply the tape, thoroughly clean the leading edges using isopropyl alcohol. The 1 inch wide tape should be centered along the leading edge of the surface. The tape should end at the beginning of the horizontal stabilizer tip curve. Use a rubber scraper/squeegee as required to smooth the tape and remove air bubbles from underneath the tape. To remove the tape, slowly pull the tape back on itself, and clean the surface with isopropyl alcohol. The anti-chafe tape should be inspected at each 100 hour or annual inspection to ensure that it is not peeling up and is properly attached.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Horizontal Stabilizer Internal Structure



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

WINDOWS - GENERAL

1. General

A. The procedures for the removal and installation of cabin door windows, passenger windows, and the windshield are in the LC-550FG Structural Repair Manual. Care of the windows is covered in Chapter 12.

(1) Windshield and Windows - The proper care of the windshield and windows (sometimes referred to as transparencies) is one of the more important exterior care items on the airplane and often the least understood. Refer to the Transparency Repair section of Chapter 51-70-00 for approved cleaning materials and procedures.

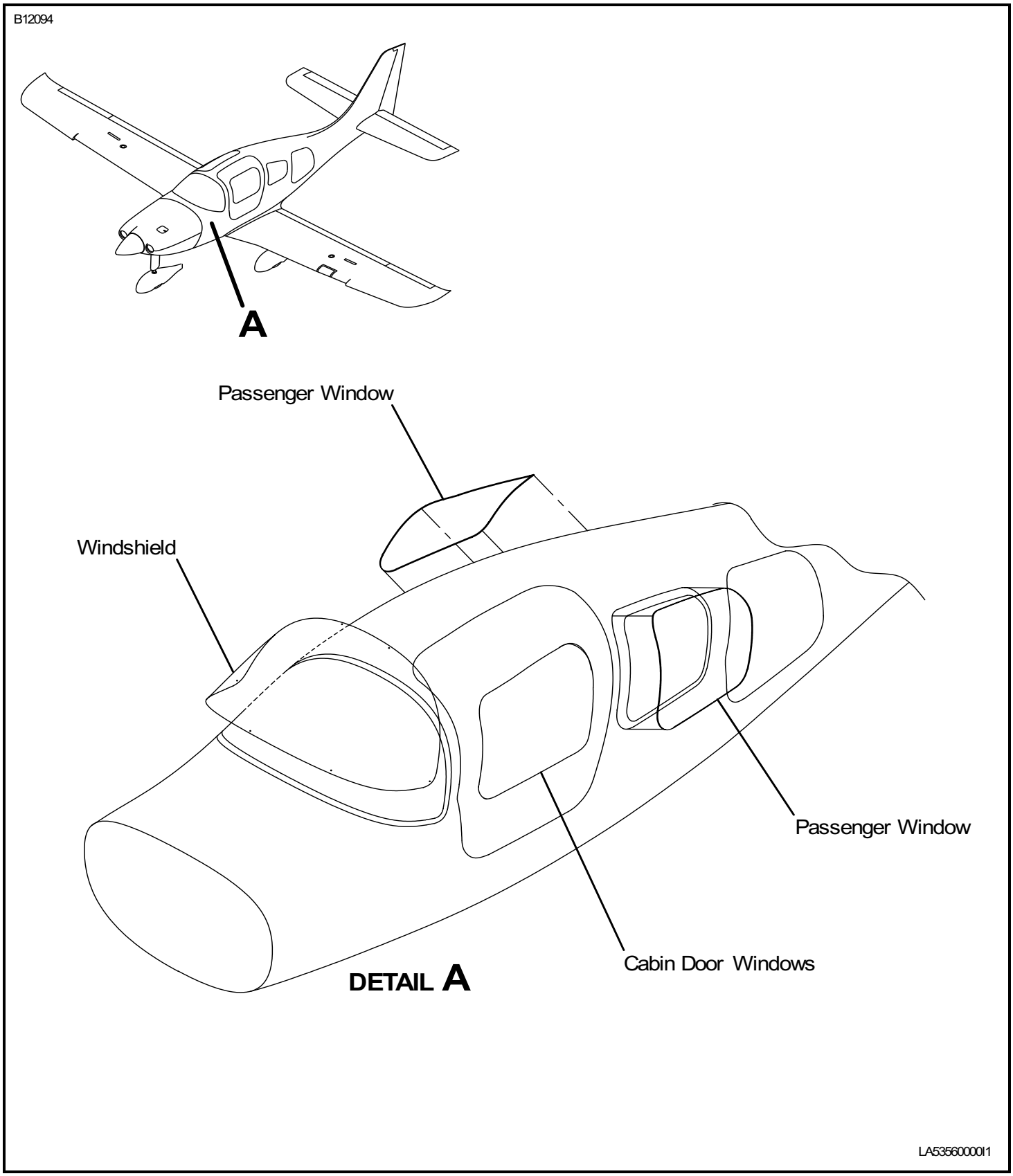
CAUTION: Do not use anything containing ammonia, aromatic solvents like methyl n-propyl ketone, acetone, lacquer thinner, paint stripper, gasoline, benzene, alcohol, anti-ice fluid, hydraulic fluid, fire extinguisher solutions, or window cleaner on the acrylic window surfaces. The use of these substances may cause the surface to craze.

2. Overview Of Window Locations

A. Figure 1 shows all of the windows on the airplane.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 1 : Sheet 1 : Aircraft Windows



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

WING - GENERAL

1. General Wing Overview

A. The one-piece wing of the Cessna 300 (LC40-550FG) is composite in construction, utilizing both carbon and fiberglass components bonded together using structural adhesive. Attachment to the fuselage is provided by a bolted saddle joint between the wing and the fuselage at the wing to fuselage intersection using a total of 28 bolts, 14 on each side; except S/N 40055 and on which use 30 bolts, 15 on each side. The primary wing structure includes the upper and lower wing skins, two redundant full span spars, and ribs. Additional structure includes bellcrank brackets attached to the aft spar, flap and aileron hinges, and the flap and aileron control surfaces. Both of the continuous spars run from WS 198.0 on the left to WS 198.0 on the right. The forward spar is located at FS 105.7, and the aft spar is located at FS 128.8. The fuselage attachment is bolted through root ribs located between BL 20 and BL 24 on both the left and right sides, in front, between, and aft of the spars. Ribs located at WS 46 and WS 145 bind the fuel tank between the forward and aft spars. In the center of the fuel tank is an additional rib at WS 96 that also works as a fuel tank baffle. The aileron and flap control rods run behind the aft spar and through the aft ribs at WS 66.5, WS 105.5, and WS 151.0. On the right wing, a rib is located at WS 151.0, and the left wing has a joggle for the landing and taxi lights.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

WING - MAINTENANCE PRACTICES

1. Procedures for Installation and Removal of the Wing

A. The major wing subassembly is removable from the fuselage subassembly, as are the ailerons and flaps. For the removal and installation of the wing, a wing cradle is required. The cradle is required to support the wing below the root ribs and should be placed approximately mid-span to prevent tipping of the wing with only the center cradle. Additional supports are required for the fuselage when the fuselage mounted main landing gear is removed to aid in the removal of the wing. Refer to Figure 201.

CAUTION: The removal and installation of the wing requires the use of a cradle. Additional support is recommended for the wing approximately mid-span. An additional cradle is required for the fuselage when the fuselage mounted main gear is removed to aid in the removal or installation of the wing.

2. Wing Removal

A. Drain all the fuel from the aircraft. This includes both wing tanks, fuel lines in the wings and fuselage, and the sumps and gascolator. When draining/de-fueling the aircraft, fire precautions should be taken and the process performed in a ventilated area. Refer to Chapter 12-00-00 for detailed instructions.

B. Remove static wicks to prevent damaging them during the process of removing the wing.

C. Remove the front and aft seats, side interior panels below the doors, carpeting, rear seat footwell, and wing belly panels. Refer to Chapter 25-30-00 for detailed instructions.

D. Disconnect and remove the aileron crossover tube (located in the aft wing belly access opening) from the aileron torque tubes. Disconnecting the roll servo of the autopilot may be necessary if installed. Refer to Chapter 27-10-00 for detailed instructions.

E. Disconnect the aileron control rods from the aileron torque tubes. Refer to Chapter 27-10-00 for detailed instructions.

F. It is recommended that the flap and aileron control surfaces be removed to prevent damaging them during the removal process. Refer to Chapter 27-10-00 for detailed instructions.

G. Disconnect all fuselage to wing wiring. Note that primary wiring bundles are located along the side of the fuselage next to the front passenger seat.

H. Disconnect all antenna wiring in the wing belly section of the wing and pull the wiring into the fuselage. Note that any wire ties must be removed prior to pulling the cables.

I. Disconnect the pitot lines between the wing and the fuselage. Refer to Chapter 34-10-00 for detailed instructions.

J. Disconnect the fuel feed and return lines from the fuselage to the wing. Refer to Chapter 28-20-00 for detailed instructions.

K. Support the wing and fuselage using cradles.

L. Remove the main landing gear, wheel pants, fairings, and landing gear panels per instructions in Chapter 32-10-00.

M. For aircraft S/N 40004 to S/N 40054, with the wing and fuselage supported and all lines, wiring, and controls disconnected, remove the 28 bolts from the wing to fuselage attachment. Note any non-standard or customized washers or spacers must be marked and used upon installing the wing. Refer to Figure 202, Sheet 1.

N. For aircraft S/N 40055 and on, with the wing and fuselage supported and all lines, wiring, and controls disconnected, remove the 30 bolts from the wing to fuselage attachment. Note any non-standard or customized washers or spacers must be marked and used upon installing the wing. Refer to Figure 202, Sheet 2.

O. After removing all bolts, nuts, and washers, carefully lower the wing and remove from the fuselage.

NOTE: The hardware removed from the wing to fuselage attachment may be specific to an individual aircraft. This includes, but is not limited to: the washers and spacers if modified from standard hardware and the front seat belt attachments. It is recommended to number and label all the wing attachment bolts, washers, and spacers, for reassembly. Bolts may not be reused but should be labeled so that replacement bolts of identical length to the original may be used.

3. Wing Installation

WARNING: Contact the factory for wing installation instructions if installing a new replacement wing, a wing from a different aircraft, or a wing that has a modified/repaired wing attachment area that affects the contour of the wing or fuselage.

A. Wing installation is a direct reversal of the removal when the wing being installed was the same as the one removed from

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

the same aircraft. Bolts are to be replaced with new bolts when installing the wing. Bolts as shown in Figure 204 number 1, are a standard AN4-xxA, Aircraft Undrilled Machined Bolts (125 ksi). Note the use of large area washers on the fuselage and the mounting of the forward seatbelt attachment. Length of each bolt varies from aircraft to aircraft, and replacement bolts should be the same as those removed. Torque values for the bolts and hardware installation are shown in Figure 203 and Figure 204. Figure 205 shows the installation of the bolt, nut, and washer for the center hole of the lap belt bracket. Remove and repair any corrosion on existing hardware prior to installation per this manual. For aircraft S/N 40014 and on, RTV 5818 silicone caulk may be applied to the exterior mating edges between the wing and fuselage (fore and aft), the wing strake, and the fuselage after the wing is attached to provide a seal against vapor, oil spray, etc.

CAUTION: When installing a wing, the bolts must be replaced with new standard AN4- xxA, Aircraft Undrilled Machined Bolts (125 ksi) of the same length as those removed when the wing was removed. No threads should be below the edge of the composite structure when installed. No threads of the nut should contact the unthreaded shank of the bolt.

4. Main Wing Structure

A. The one-piece wing of the Cessna 300 is a bonded composite structure providing a strong and aerodynamically clean structure. On the upper wing surface are two fuel filler caps (refer to Figure 206), and on the lower surface are various joggles and 14 access panels for inspection, maintenance, and repair of the wing structure and systems. Refer to Figure 207.The primary load carrying structure is comprised of the upper and lower wings skins made of epoxy/fiberglass and honeycomb core. Bonded to the skins are the wing spars made also of epoxy/fiberglass with honeycomb core with additional use of carbon for the spar caps. All ribs are made from epoxy/fiberglass and do not have core.

5. Location of Spars and Ribs

A. Figure 208, Sheet 1 and Sheet 2 show the wing station (WS) and fuselage station (FS) of all the primary wing structure.

(1) The two C-section spars are full span between WS 198.6 and WS 198.6 with the shear web of the spars at FS 105.7 and FS 128.8 for the front and aft spar respectively. Both spars are 2.5 inches wide and face inward to the center of the wing.

(2) The root ribs include two ribs forward of the forward spar, two center ribs between the forward and aft spars, and the aft root ribs aft of the aft spar. These root ribs provide the structure through which the wing to fuselage bolts pass.

(3) The leading edge of the wing has one rib on the right wing only at WS 151.0 with a 1 inch wide bonding flange facing inboard. In addition, the inboard strakes also have ribs just outboard of the fuselage.

(4) There are three center ribs in each wing located at WS 46.0, WS 91.0, and WS 145.0 with the 1.0 inch wide flanges all facing inboard. The ribs at WS 46.0 and WS 145.0 are the inboard and outboard closeouts for the integral fuel tanks. The center rib at WS 91.0 is also the anti-slosh baffle for the fuel tank.

(5) Along the aft section behind the aft spar are three ribs in addition to the aft root rib. In aircraft S/N 40004 to S/N 40029, these ribs are located at WS 66.4, WS 105.6, and WS 151.0. In aircraft S/N 40030 and on, these ribs are located at WS 67.0, WS 105.6, and WS 151.0. These ribs provide additional structure for the flap and aileron attachment hinges.

6. Location of Inspection Covers (Access Panels)

A. The wing of the Cessna 300 is equipped with two fuel filler caps on the upper wing surface and 16 access panels on the lower wing surface.The access panels are described below, and their locations are shown in Figure 209 Lower Wing Surface Access Panel Locations. There are no wing access panels on the upper surface of the wing. Refer to Figure 208, Sheet 1 and Sheet 2 for approximate station locations of the access panels.

CAUTION: The inboard and outboard fuel bay access panels (Items 5 and 6 in Figure 209) are sealed using PRC-1428 fuel tank access door sealant. Special care must be taken during the removal and installation of these panels due to the wet-wing design of the Cessna 300. Prior to opening of the fuel tanks, de-fuel the aircraft and follow the procedures in Chapter 28 of this manual.

7. Detection Procedures For Delamination And Latent Damage

A. Field detection of delamination and latent damage is accomplished primarily by visual inspection. Additional detection methods include tap-testing, ultrasonic inspection, or other approved methods. Areas where the structure is bonded or where there is a change in the composite lay-up will be apparent during tap-testing, or equivalent inspection method.

(1) Other common names for tap-testing are: coin tap, ring-tap, and metallic ring test.

(2) In general, composite honeycomb structures can be inspected using a tap test as done on metal bonded honeycomb. Use of this method can quickly determine if additional inspection is required.

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

B. The Cessna 300 is designed to allow for a certain amount of beyond visual damage (BVD) that is difficult to detect except with non-destructive inspection (NDI) methods as described above. Any depression, dents, cracks, gouging, scratches, or scoring that are visible must be investigated for structural damage.

(1) Depressions, Dents, and Scratches may indicate more serious damage below the paint. A minimum of a tap-test must be performed to determine if damage has been done to the structure underneath. If damage is suspected, sanding down through the paint and primer to the lightning mesh should be performed for a more in-depth inspection. See Chapter 51 for classification and repair.

(2) Scoring, Cracking, and Gouging are an indication of damage to the structure and must be inspected, classified, and repaired per Chapter 51 of this manual.

8. Paint Schemes

WARNING: The Cessna 300 lightning protection is dependent on paint type and thickness. Only approved paints and paint colors may be used. Paint thickness and locations are also controlled. Paint in accordance with instructions in Chapter 51.

WARNING: The composite construction of the Cessna 300 requires ultraviolet protection in the paint for protection of the composite structure. The topcoat applied to the external aircraft structure provides this protection. When repainting, use only paints approved in Chapter 51.

WARNING: The 175°F operating temperature limit does limit the use of dark colors on certain areas of the aircraft. Colors must meet the specifications in Chapter 51.

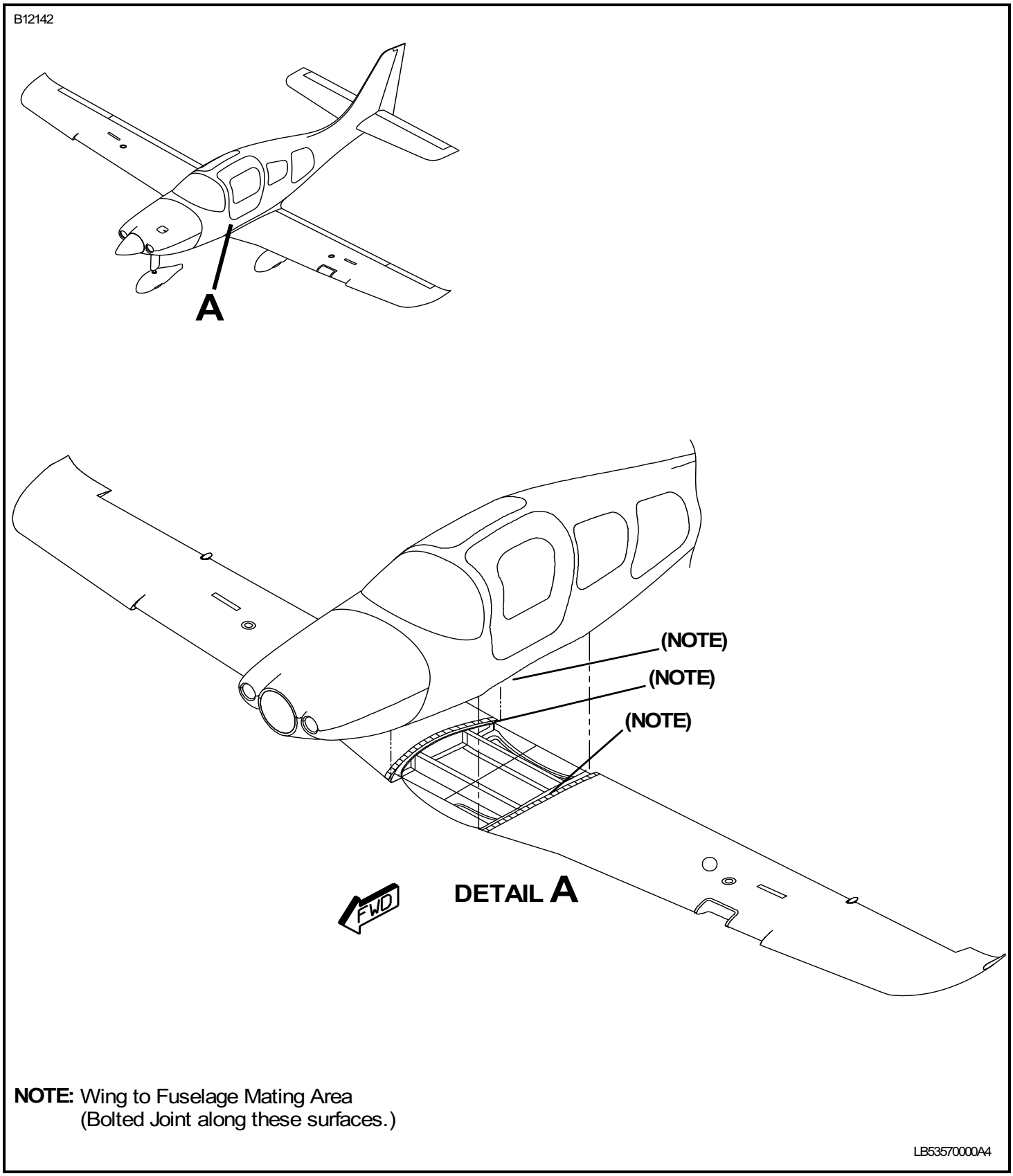
A. All re-painting must be done in accordance with the instructions in Chapter 51.

9. Leading Edge Tape

A. Optional leading edge anti-chafe tape may be added to the wings, horizontal stabilizer, vertical stabilizer, cowling near the latch, door tread, tow bar attachment point, wheel pants, gear leg fairings, and the landing light lens.. The anti-chafe tape is either a 1 inch wide strip or of a shape and size as required; it is adhesive-backed, clear, urethane tape that prevents pitting and wear on the leading edges. To apply the tape, thoroughly clean the leading edges using isopropyl alcohol. The 1 inch wide tape should be centered along the leading edge of the surface. The tape should end at the beginning of the wing tip curve and may not be installed over the stall strips or landing light joggle. Use a rubber scraper/squeegee as required to smooth the tape and remove air bubbles from underneath the tape. To remove the tape, slowly pull the tape back on itself and clean surface with isopropyl alcohol. The anti-chafe tape should be inspected at each 100 hr. or annual inspection to ensure that it is not peeling up and is properly attached.

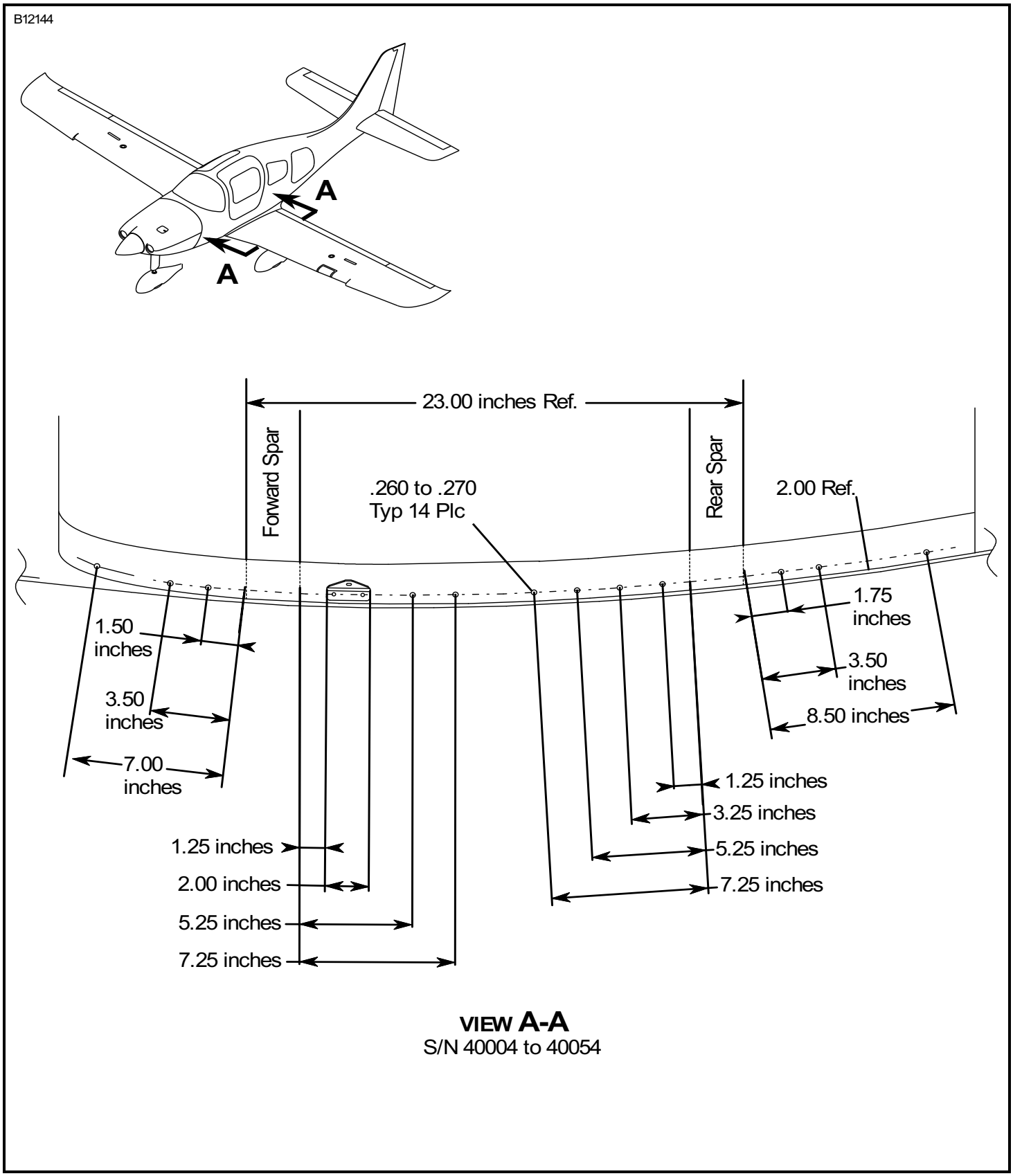
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 201 : Sheet 1 : Wing Fuselage Attachment



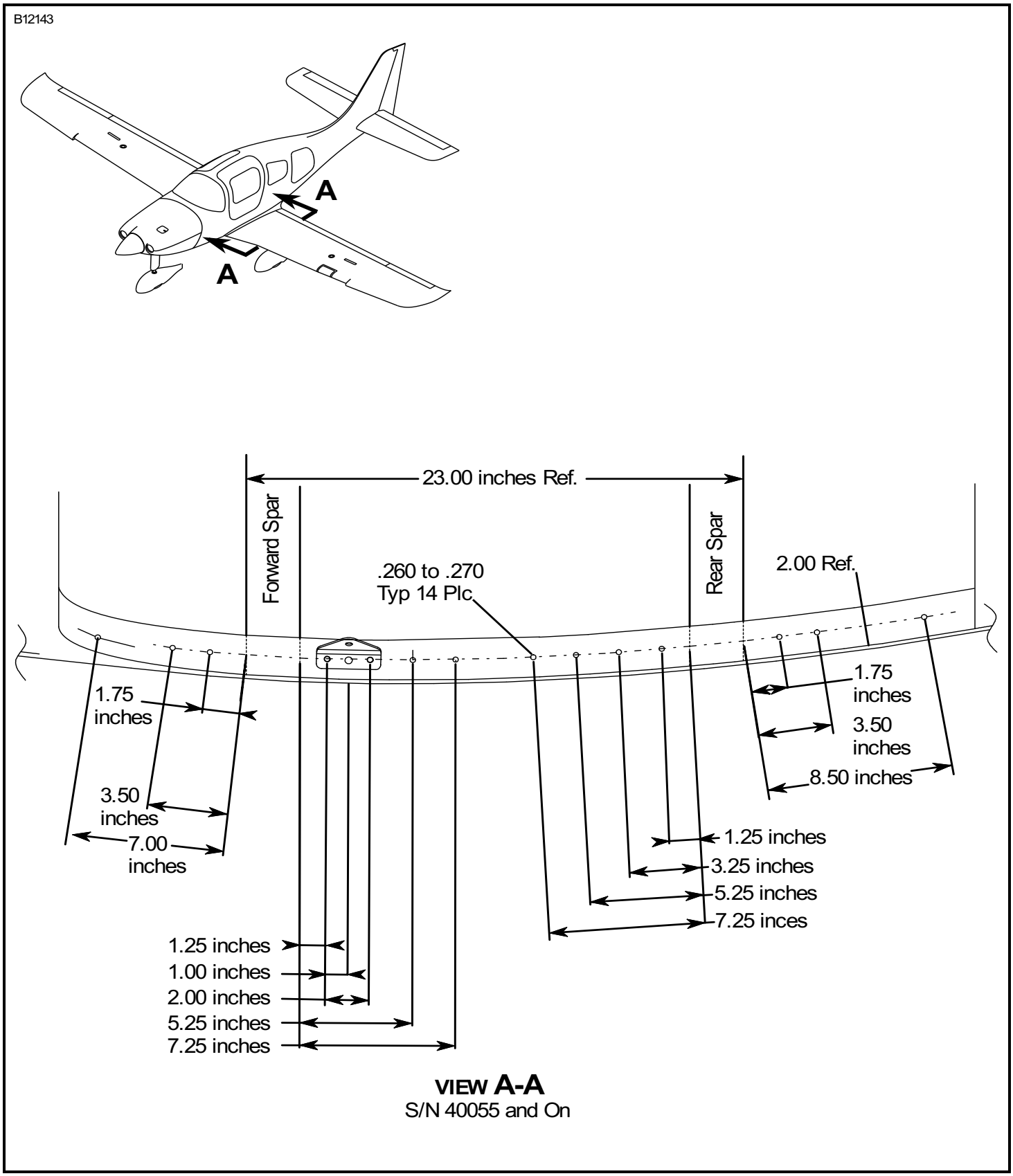
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 202 : Sheet 1 : Wing to Fuselage Attachment Bolt Locations



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

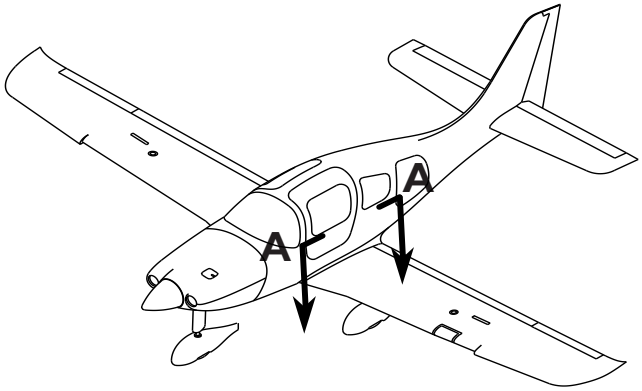
Figure 202 : Sheet 2 : Wing to Fuselage Attachment Bolt Locations

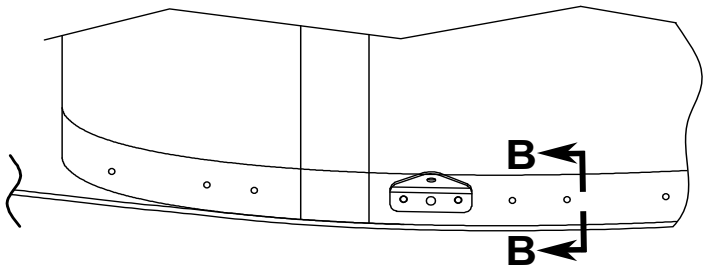


Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

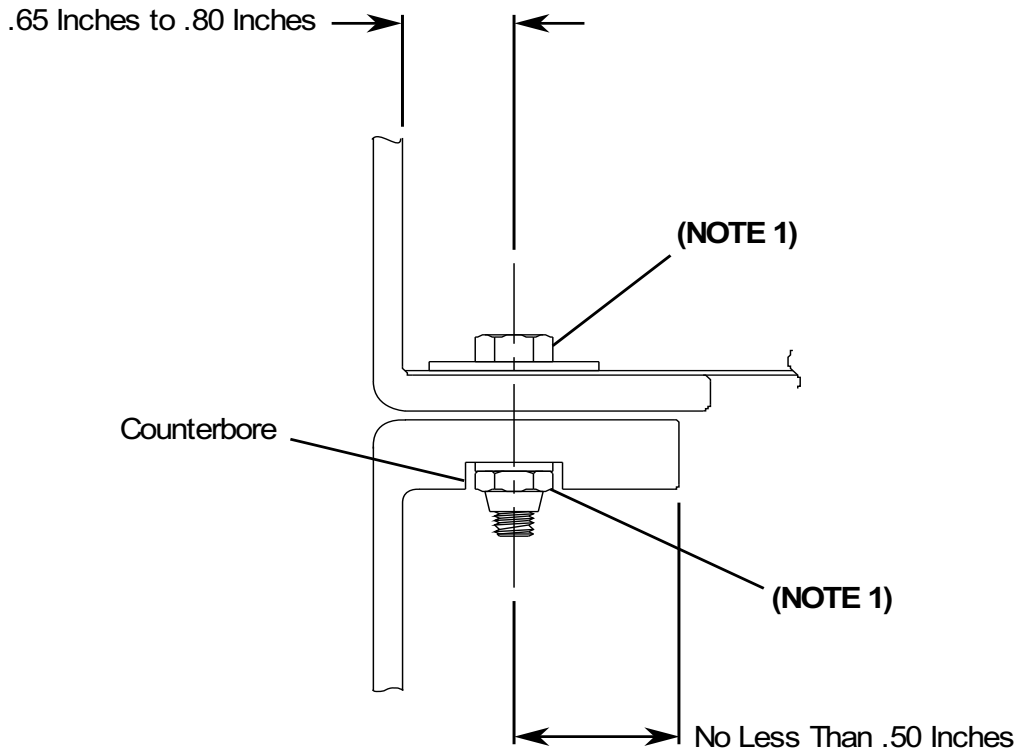
Figure 203 : Sheet 1 : Wing to Fuselage Attachment Bolt

B12160





VIEW A-A



VIEW B-B

UP INBD

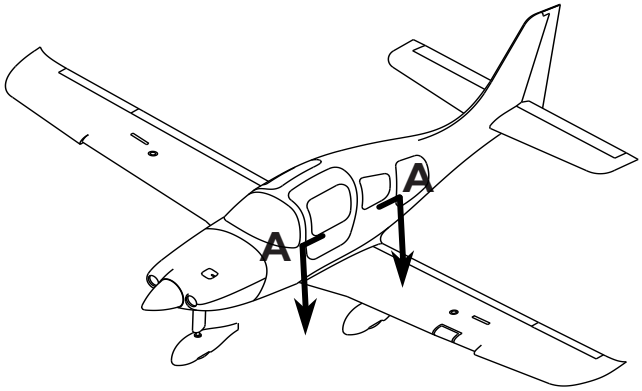
NOTE 1: Torque nuts 72 to 84 lbs.-in. Where nuts are not accessible, torque bolt heads 79 to 92 lbs.-in.
NOTE 2: Tolerance on all dimensions is ±0.10 Inches.

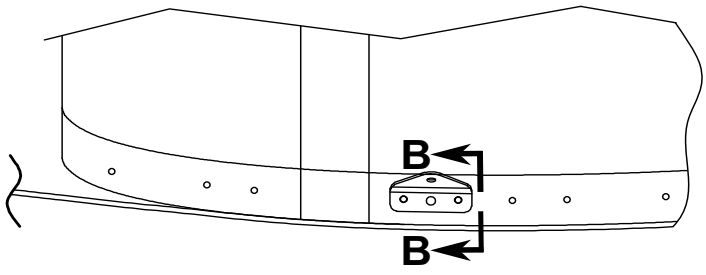
AALA53570000M4
BBLA53570000M4

Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

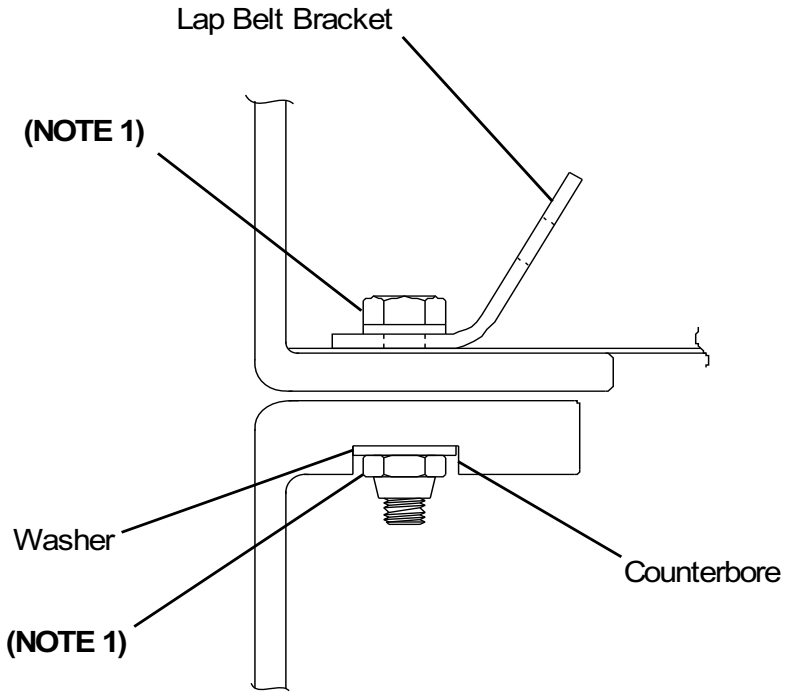
Figure 204 : Sheet 1 : Wing to Fuselage Attachment Bolt with Lap Belt Bracket

B12161





VIEW A-A



Seat Belt (Lap) Installation

VIEW B-B

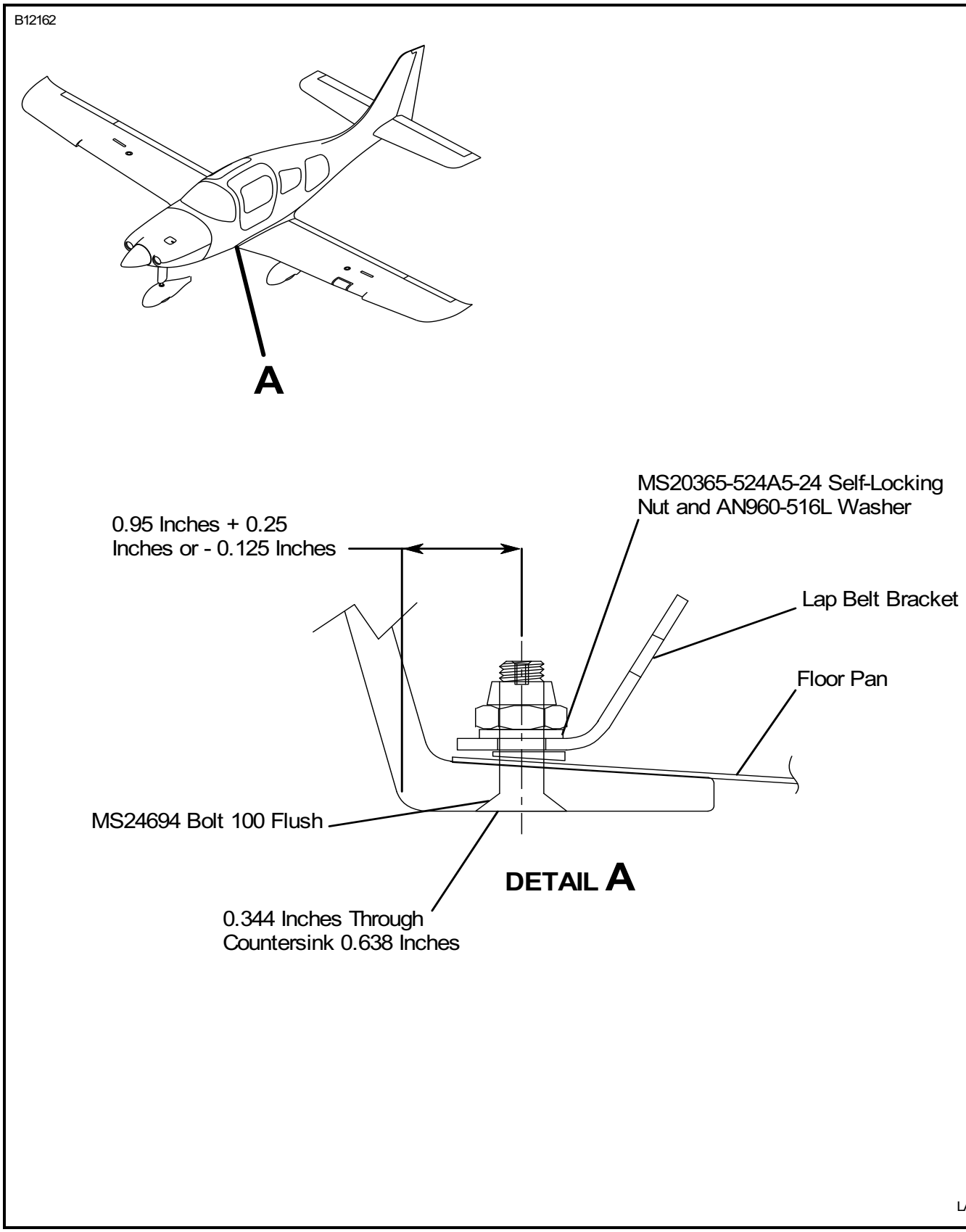
UP INBD

NOTE 1: Torque nuts 72 to 84 lbs.-in. Where nuts are not accessible, torque bolt heads 79 to 92 lbs.-in.
NOTE 2: Tolerance on all dimensions is ±0.10 Inches.

AALA53570000M4
BBLA53570000M4

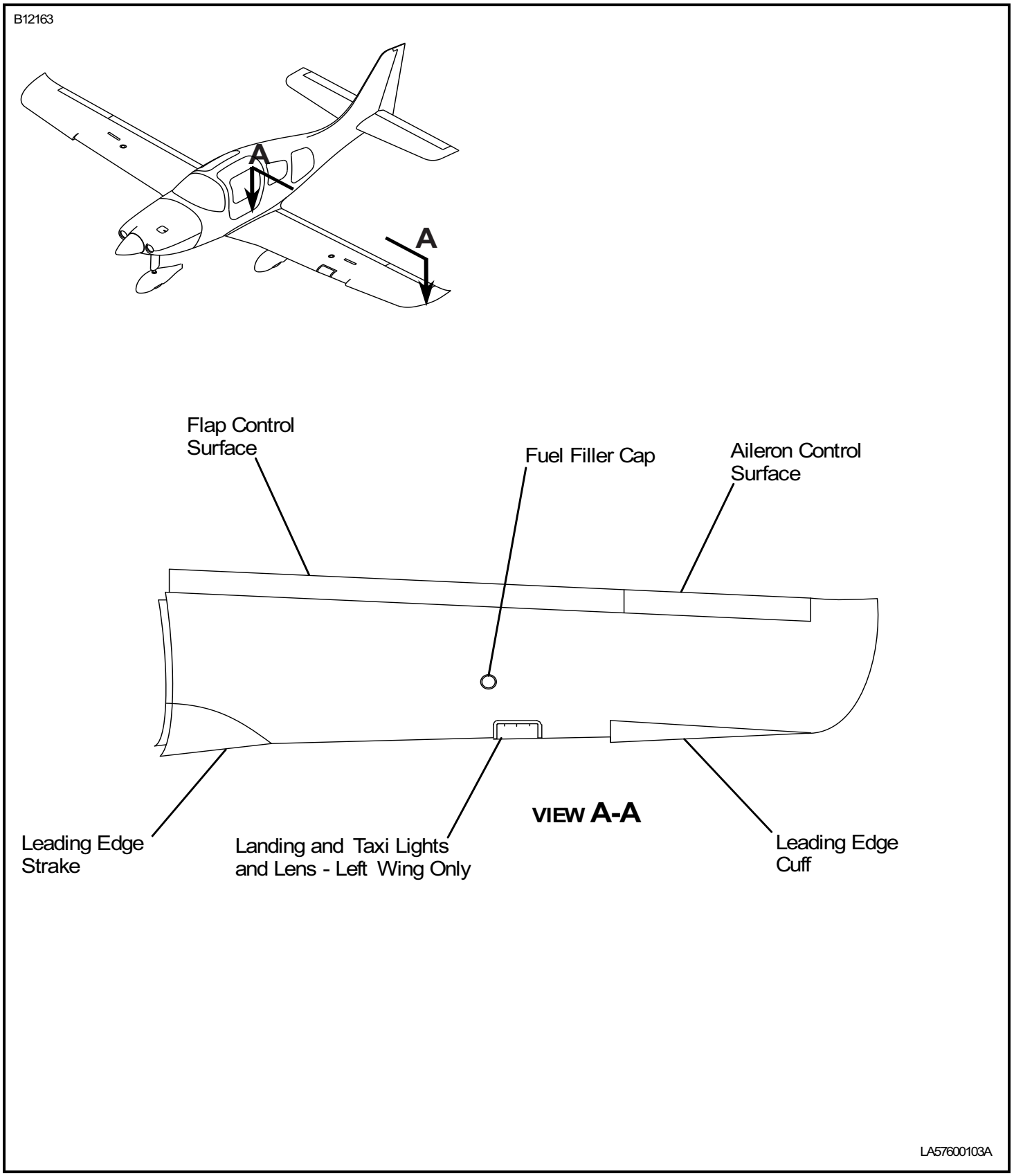
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 205 : Sheet 1 : Bolt and Lap Belt Bracket Attachment



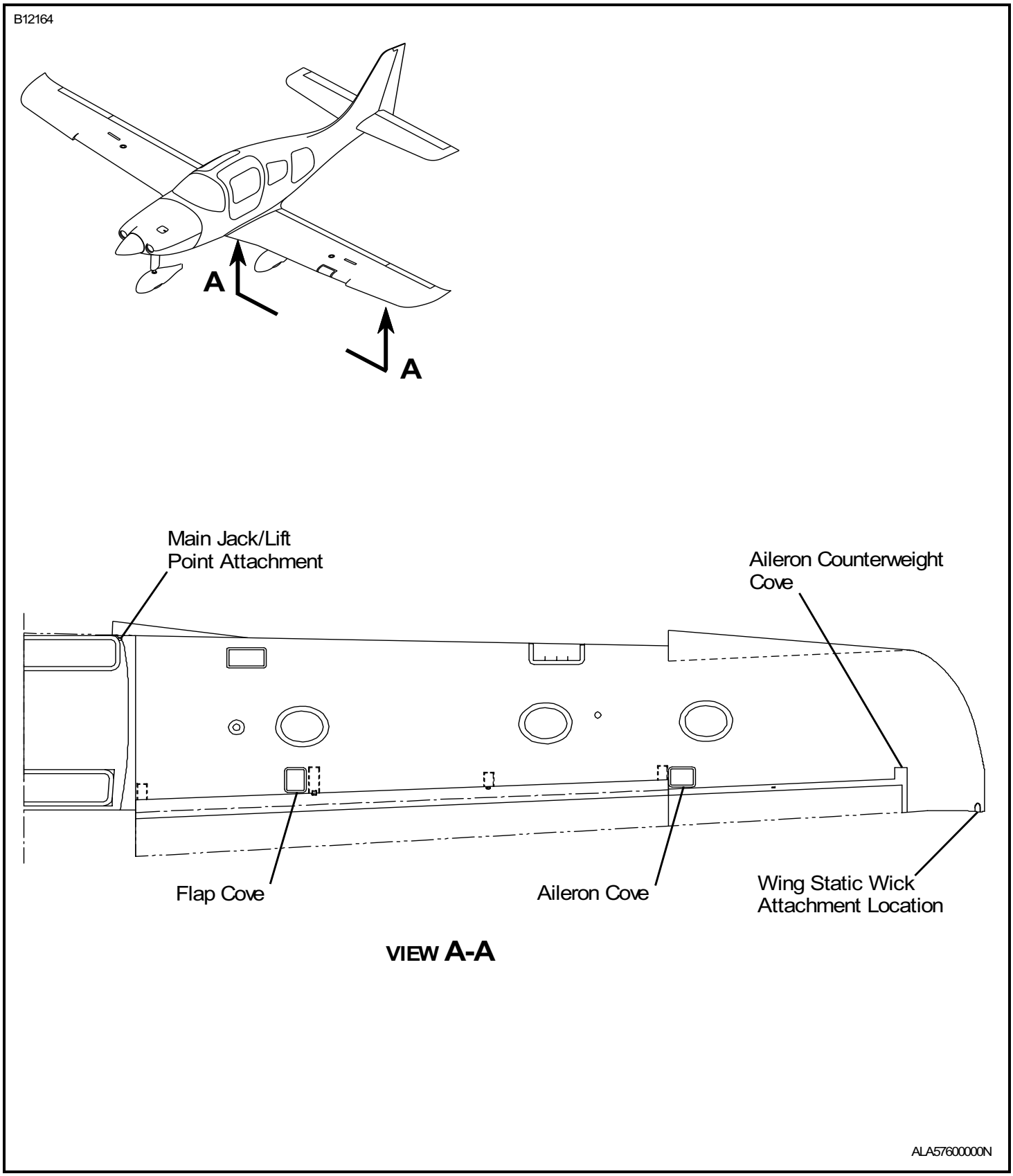
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 206 : Sheet 1 : Upper Wing Surface Key Components (Left Wing Shown)



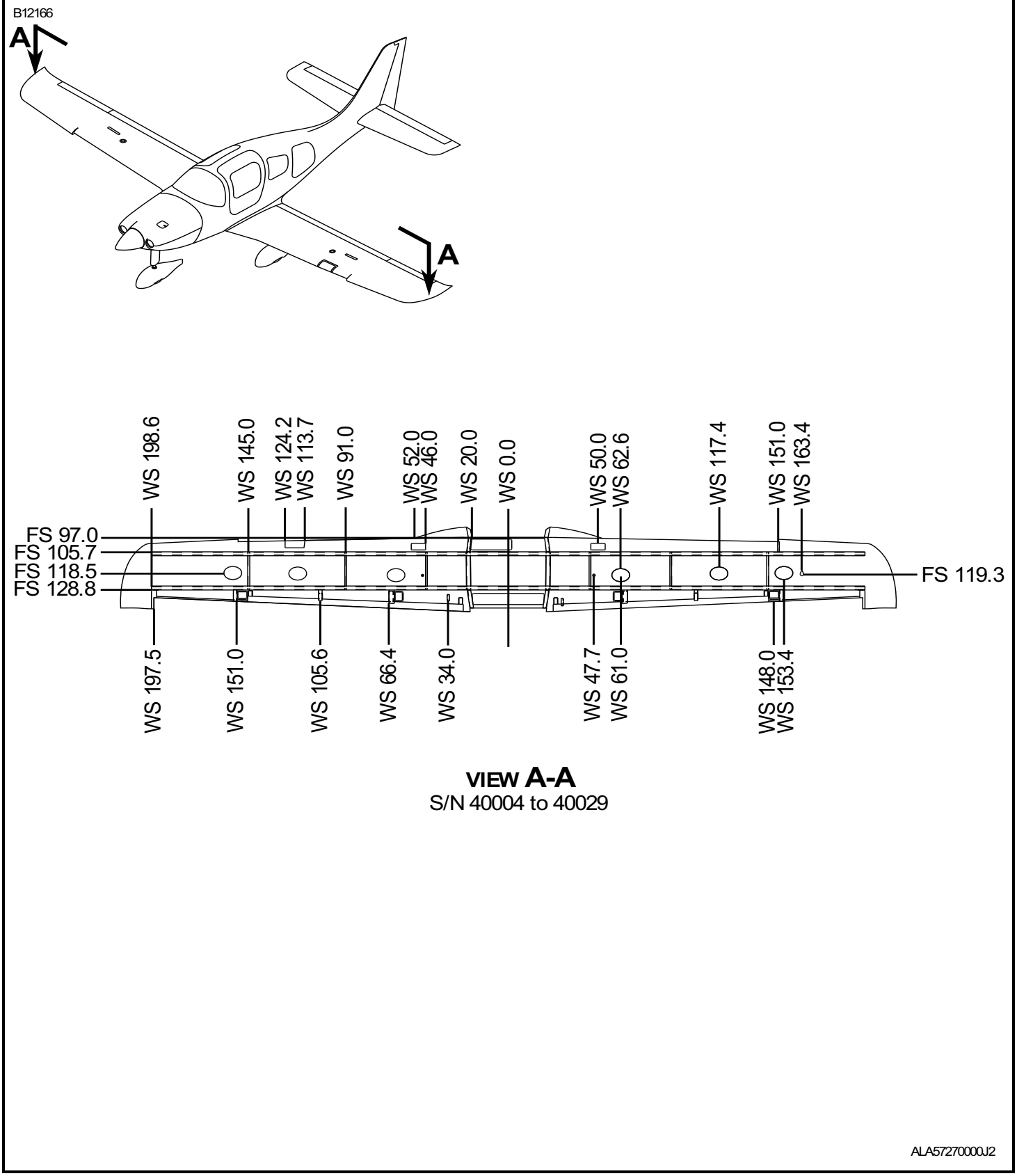
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 207 : Sheet 1 : Lower Wing Surface Key Components (Left Wing Shown)



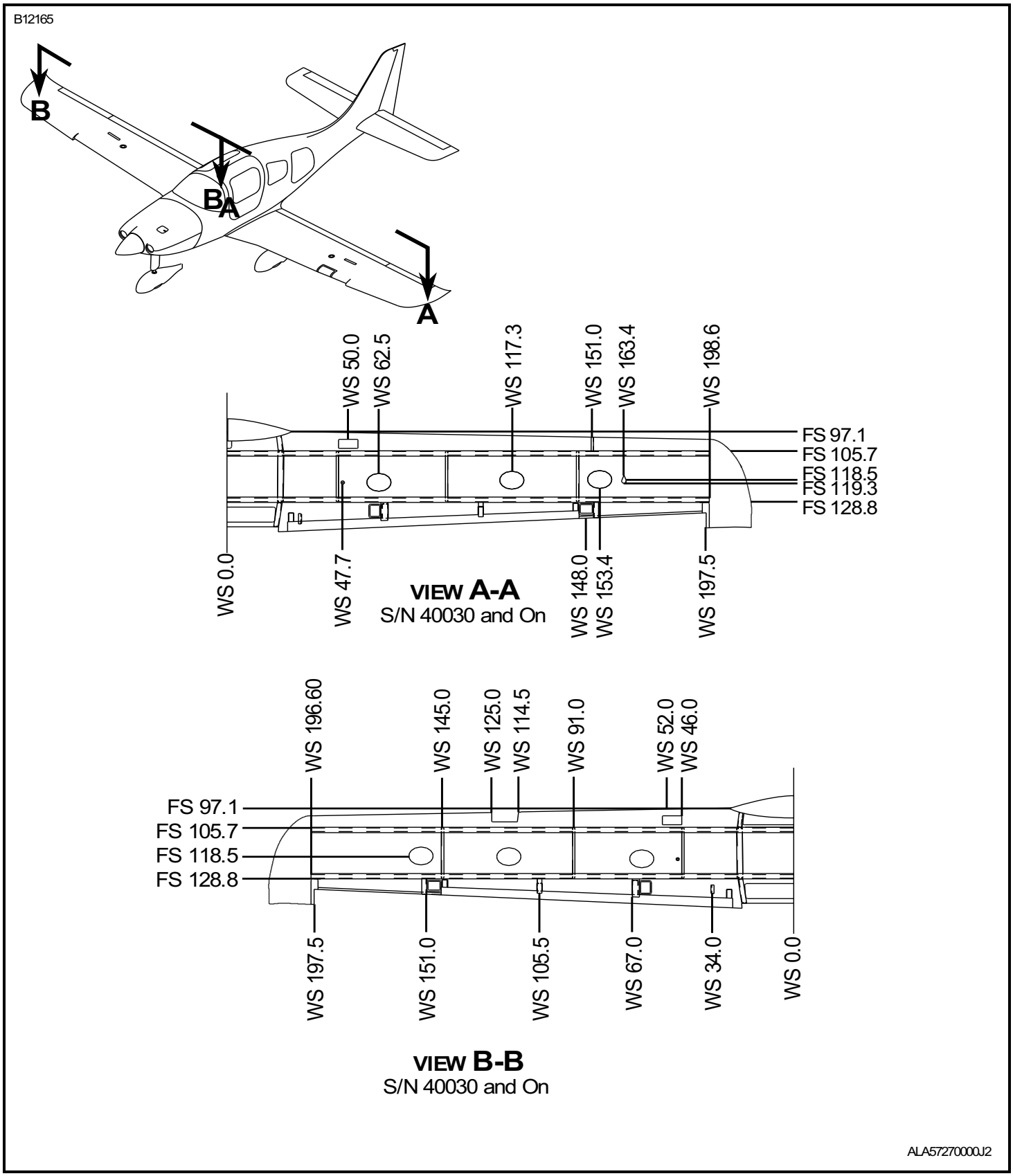
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 1 : Wing Structure



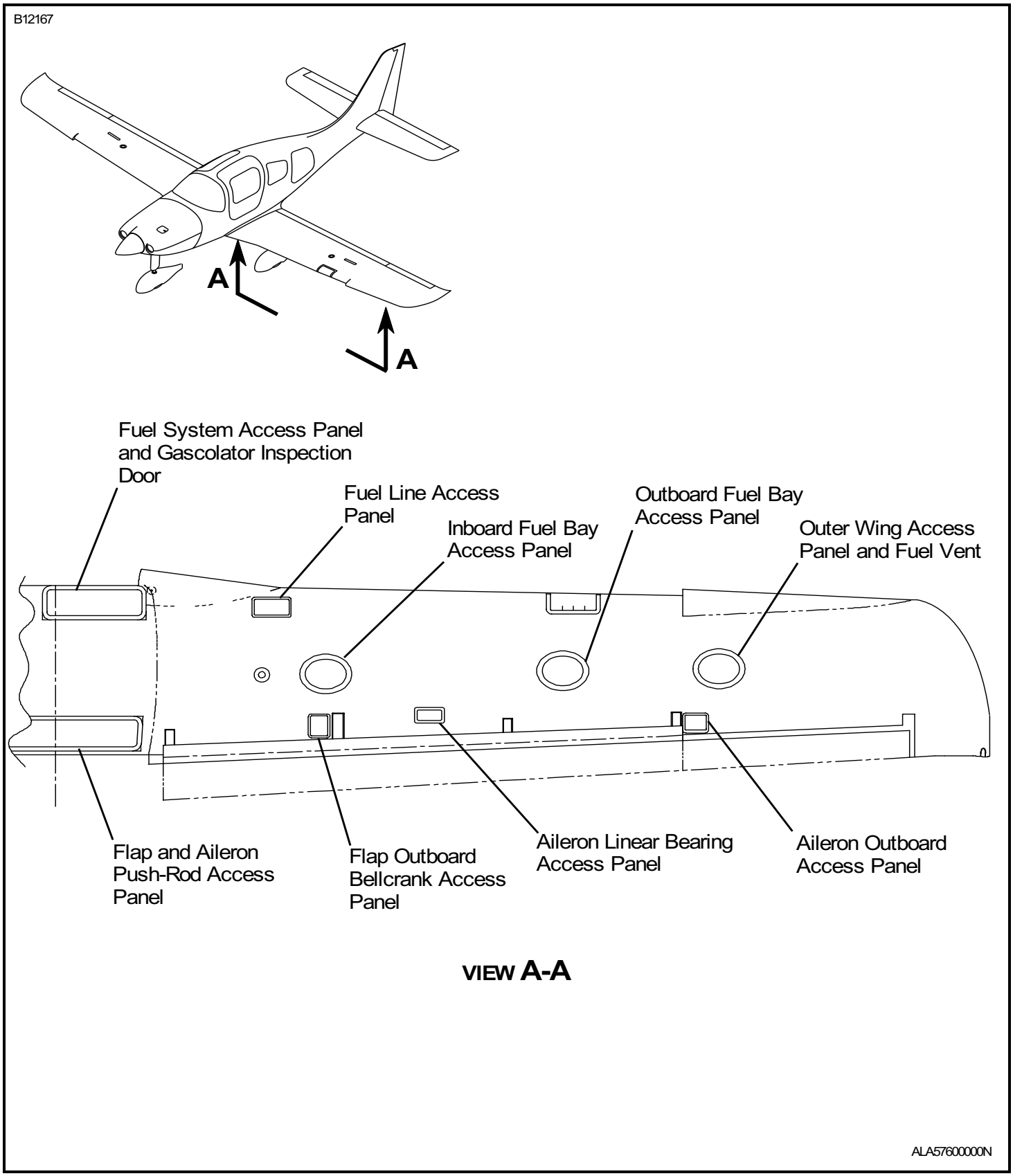
Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 208 : Sheet 2 : Wing Structure



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.

Figure 209 : Sheet 1 : Lower Wing Surface Access Panel Locations



Copyright © Textron Aviation Inc.
Retain printed data for historical reference only. For future maintenance, use only current data.