

WINGS - GENERAL

1. Scope

- A. This chapter provides instructions on wing removal and installation. Information and repair procedures beyond the scope of this chapter can be found in the Single Engine Models 172, 182, 206 and T206 1996 and On Structural Repair Manual.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following listed items:

NAME	NUMBER	MANUFACTURER	USE
Grease	MIL-G-21164	E/M Corporation Highway 52 N.W. Box 2200 West Lafayette, IN 47906	To lubricate wing attach fittings and bolts upon reinstallation.
Polyurethane Tape	P840306	3M 3M Center Minneapolis, MN 55144	To eliminate chafing of wing struts from strut fairings.

3. Definition

- A. This chapter contains a single section on wing removal, installation and adjustment.

WINGS AND WING STRUTS - MAINTENANCE PRACTICES

1. Description and Operation

WARNING: Some right wings have a spar cap of 0.100 inches thick, and are not to be used on increased weight STC's (such as float planes).

- A. Each metal wing is a semicantilever, semimonocoque type, with two main spars and suitable ribs for the attachment of the skin. Panels are riveted to ribs, spars and stringers to complete the structure. An all metal, piano hinged aileron, flap and detachable wing tip are mounted on each wing assembly. Each wing also incorporates an integral fuel bay located between the two spars at the inboard portion of the wing. Each wing is supported in position by a single lift strut. It consists of a streamlined tube riveted to two end fittings for attachment at the wing and at the fuselage.
- B. For a skeletal view of the wing assembly, refer to Chapter 6, [Airplane Stations - Description and Operation](#).

2. Wing and Strut Removal/Installation

- A. Remove the Wing and Strut (Refer to [Figure 201](#)).

CAUTION: The wing must be supported with a sling or a maintenance stand when the fasteners are loosened. If a sling or stand is not available, a minimum of four people must be used to handle the wing.

- (1) Remove the fairings from the wing and fuselage intersection.
- (2) Remove the inspection plates as required to allow for disconnection of all the electrical, mechanical and fuel connections.
- (3) Drain the fuel. Refer to Chapter 12, [Fuel - Servicing](#).
- (4) Disconnect the electrical wires at the wing root disconnects.
- (5) Disconnect the fuel lines at the wing root.
- (6) Disconnect the pitot tube on the left wing. Refer to Chapter 34, [Pitot And Static Systems - Maintenance Practices](#).
- (7) Disconnect the fresh air distribution duct at the wing root.
- (8) Disconnect the aileron cables at the aileron bell crank. Refer to Chapter 27, [Aileron Control System - Maintenance Practices](#).

NOTE: For easier routing of cables, attach a guide wire to each cable before it is pulled free from the wing. Disconnect the cable from the guide wire, leaving the guide wire routed through the wing. The guide wire will be attached to the cable during installation and used to pull the cable into position.

- (9) Remove the cabin headliner to get access to the flap cables at the turnbuckle. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
- (10) Disconnect the flap cables at the turnbuckle and pull cables into wing root area. Refer to Chapter 27, [Flap Control System - Maintenance Practices](#).

NOTE: For easier routing of cables, attach a guide wire to each cable before it is pulled free from the wing. Disconnect the cable from the guide wire, leaving the guide wire routed through the wing. The guide wire will be attached to the cable during installation and used to pull the cable into position.

- (11) Remove the screws from the strut fairings.
- (12) Move the fairings toward the center of the strut.
- (13) Support the wing at the outboard end.
- (14) Remove the strut-to-wing attach bolt and the strut-to-fuselage attach bolt.
- (15) Remove the strut from the wing and fuselage.
- (16) Tape the flaps in a streamlined position to prevent flap movement during handling.
- (17) Mark position of the wing attachment eccentric bushings in relationship to the fittings. The bushings are used to rig out wing heaviness.

NOTE: Wings must be rigged at installation if bushings are not marked.

- (18) Remove the nuts, washers, bushings and bolts attaching the wing spars to the fuselage.

NOTE: It may be necessary to rock the wings slightly and/or to use a long drift punch to remove attaching bolts.

- (19) Remove the wing and lay it on a padded stand.

- B. Install the Wing and Strut (Refer to [Figure 201](#)).

CAUTION: Do not lubricate the threads of the bolts.

- (1) Lightly lubricate the wing attach bolts and holes with MIL-G-21164 grease before installing bolts.
- (2) Hold the wing in position and install the bolts, bushings, washers and nuts attaching the wing spars to the fuselage fittings. Make sure eccentric bushings are positioned as marked.
- (3) Torque the front wing spar bolts 290 to 410 inch-pounds.
- (4) Torque the rear wing spar bolts 450 to 500 inch-pounds.
- (5) Install the 0.38 inch seal around strut with 0.12 inch gap on lower surface.
- (6) Install the bolts, spacers and nuts to attach the upper and lower ends of the wing strut to the wing and fuselage fittings.
- (7) Route the flap cables using the guide wires.
- (8) Connect the flap cables at the turnbuckle above the headliner. Refer to Chapter 27, [Flap Control System - Maintenance Practices](#).
- (9) Route the aileron cables using the guide wires.
- (10) Connect the aileron cable at the aileron bell crank. Refer to Chapter 27, [Aileron Control System - Maintenance Practices](#).
- (11) Connect the fresh air distribution at wing root.
- (12) Connect the pitot tube. Refer to Chapter 34, [Pitot And Static Systems - Maintenance Practices](#).
- (13) Connect the fuel lines at the wing root.
- (14) Connect the electrical wires at the wing root.
- (15) Complete a leak check of the pitot tube. Refer to Chapter 34, [Pitot And Static Systems - Maintenance Practices](#).
- (16) Remove the tape from the flaps.
- (17) Rig the flap system. Refer to Chapter 27, [Flap Control System - Maintenance Practices](#).
- (18) Rig the aileron system. Refer to Chapter 27, [Aileron Control System - Maintenance Practices](#).
- (19) Fuel the wing bay. Refer to Chapter 12, [Fuel Servicing](#).
- (20) Check the operation of the fuel quantity system. Refer to Chapter 28, [Fuel Storage and Distribution - Maintenance Practices](#).
- (21) Install the wing root fairings.
- (22) Install the cabin headliner. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

3. Adjustment (Correcting Wing Heavy Conditions)

NOTE: If considerable control wheel pressure is required to keep the wings level in normal flight, a “wing heavy” condition exists and can be corrected by the following procedure.

A. Adjustment Procedures (Refer to [Figure 201](#)).

CAUTION: The eccentric cams must be adjusted after all flight control systems have been adjusted and rigged.

- (1) If necessary, rig the flight controls. Refer to Chapter 27, [Flight Controls - General](#).
- (2) Remove the wing fairing strip from the heavy side of the airplane.

CAUTION: Make sure you rotate the eccentric bushings together. If you rotate just one, you will destroy the alignment between the off-center bolt holes in the bushings. A nonalignment of a bolt will result in a force on the bolt which will damage the hole in the wing spar.

- (3) Loosen the aft wing spar nuts and rotate eccentric bushings simultaneously until the bushings are positioned with the thick side of the eccentrics up.

NOTE: This will lower the trailing edge of the wing, and decrease wing heaviness by increasing angle of incidence of the wing.

- (4) Torque the front wing spar bolts 290 to 410 inch-pounds.
- (5) Torque the rear wing spar bolts 450 to 500 inch-pounds.
- (6) Install the fairing strip.
- (7) Test fly the airplane.

CAUTION: Make sure the eccentric bushings are rotated simultaneously. Rotating them separately will destroy the alignment between the off-center bolt holes in the bushings, thus exerting a shearing

force on the bolt, with possible damage to the hole in the wing spar.

- (a) If the wing heavy condition continues, remove the fairing strip on the lighter wing, loosen the nut and rotate the eccentric bushings simultaneously until the bushings are positioned with the thick side of the eccentrics down.

NOTE: This will raise the trailing edge of the wing, thus increasing wing heaviness to balance heaviness in the opposite wing.

- (8) Torque the rear wing spar bolts 450 to 500 inch-pounds.
- (9) Install fairing strip and repeat flight test.

4. Strut Damage and Repair Criteria

CAUTION: If the strut is severely dented, cracked or deformed, it must be replaced.

A. Damage Caused by the Strut Fairings.

NOTE: The following procedures are applicable only to the specific areas of the strut.

- (1) The strut must be replaced if a groove is more than 0.010 inch in depth and is less than 0.75 inch from a rivet center.
- (2) The strut must be replaced if a groove is more than 0.75 inch from a rivet center and the groove depth is more than 0.025 inch.
- (3) If groove depth is less than 0.025 inch and is more than 0.75 inch from a rivet center, the strut must be repaired. tapering gradually to the original surface and burnishing out to a smooth finish.
 - (a) Blend and smooth the surface area of the groove. Make sure not to remove any more material from the groove.
 - (b) Check the area using a dye penetrant to make sure there are no cracks.
 - (c) Apply Alodine and repaint the area.

B. Damage Caused by the Cabin Door.

NOTE: The following applies to the wing struts with grooves worn in the lower trailing edge. This type of damage can occur with cabin door usage with a missing or incorrectly adjusted door stop. A incorrectly adjusted door stop allows the door to hit against the aft edge of the strut at the lower end.

- (1) The strut must be replaced if a groove is deeper than 50 percent of the original material thickness.
- (2) Repair the strut if a groove is less than 50 percent of the original material thickness.
 - (a) Blend and smooth the surrounding surface area of the groove. Make sure not to remove any more material from the groove.
 - (b) Check the area using a dye penetrant to make sure there are no cracks.
 - (c) Apply Alodine and repaint the area.
 - (d) Rig the door to prevent door from rubbing the strut tube.

5. Wing Tip Removal/Installation

A. Remove the Wing Tip (Refer to [Figure 202](#)).

- (1) Remove the wing tip.
- (2) Remove the strobe light and the navigation light ground straps to power supply.
- (3) Disconnect the navigation lights electrical connector.
- (4) Disconnect the strobe lights electrical connector.
- (5) Remove wing tip from wing.

B. Install the Wing Tip (Refer to [Figure 202](#)).

- (1) Connect the strobe lights electrical connector.
- (2) Connect the navigation lights electrical connector.
- (3) Move the wing tip into position over the wing tip rib. Make sure the existing holes in the wing tip align with the attach holes in the wing skin/rib nutplates.
- (4) Make a curved spacer from phenolic or aluminum which is 0.01 inch to 0.03 inch thick and is 1.0 inch to 2.0 inches in length. Make sure it matches the contour of the leading edge.
- (5) Install the spacer at the leading edge of the wing between the skin and the inside contour of the wing tip.
- (6) Start at the aft of the tip and work forward, attach the wing tip to wing using screws.

- (7) When all screws are installed, remove the spacer to leave a gap of 0.01 inch to 0.03 inch between the skin and the inside contour of the wing tip.

Figure 201 : Sheet 1 : Wing and Strut Installation

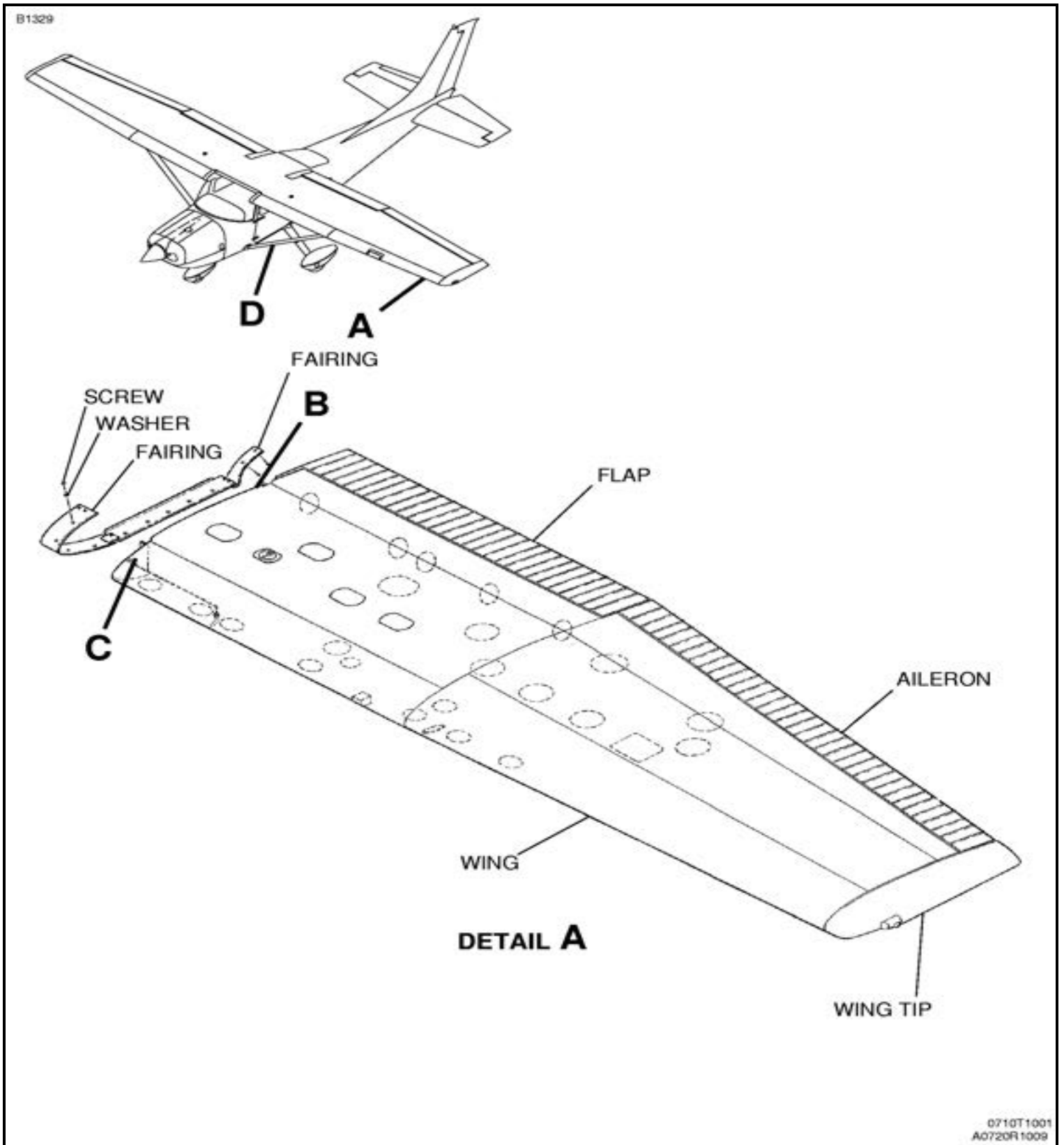


Figure 201 : Sheet 2 : Wing and Strut Installation

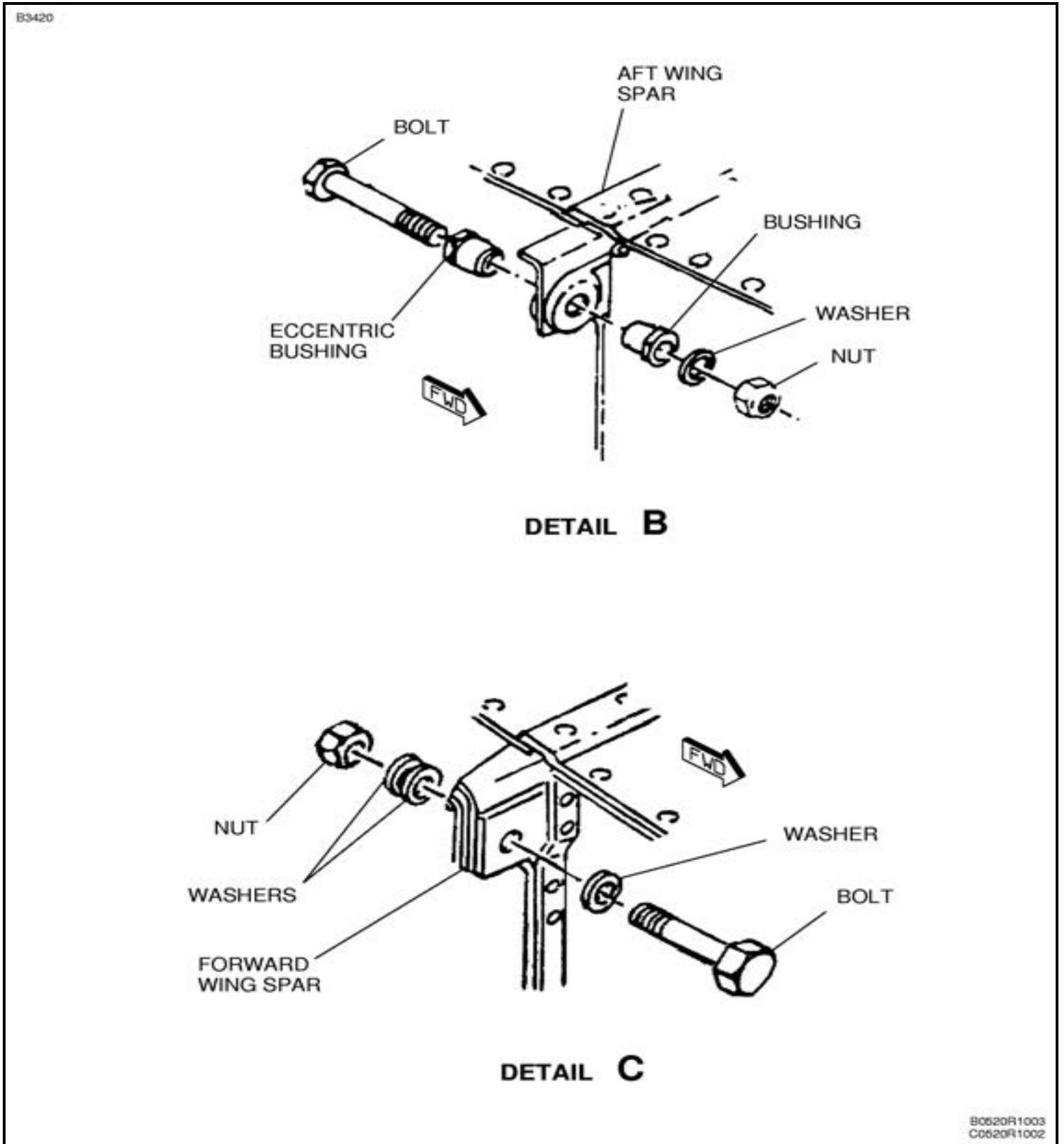


Figure 201 : Sheet 3 : Wing and Strut Installation

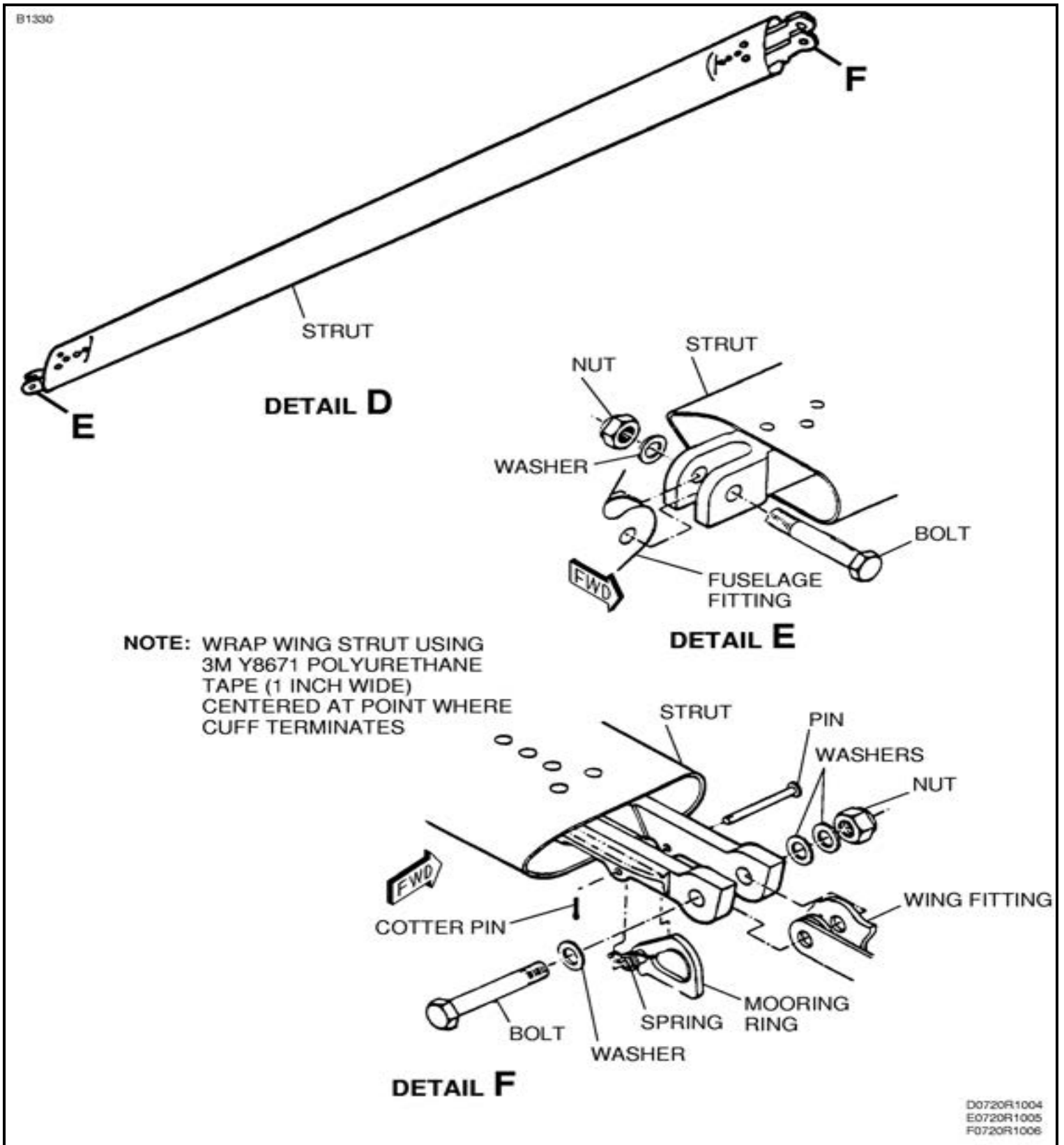
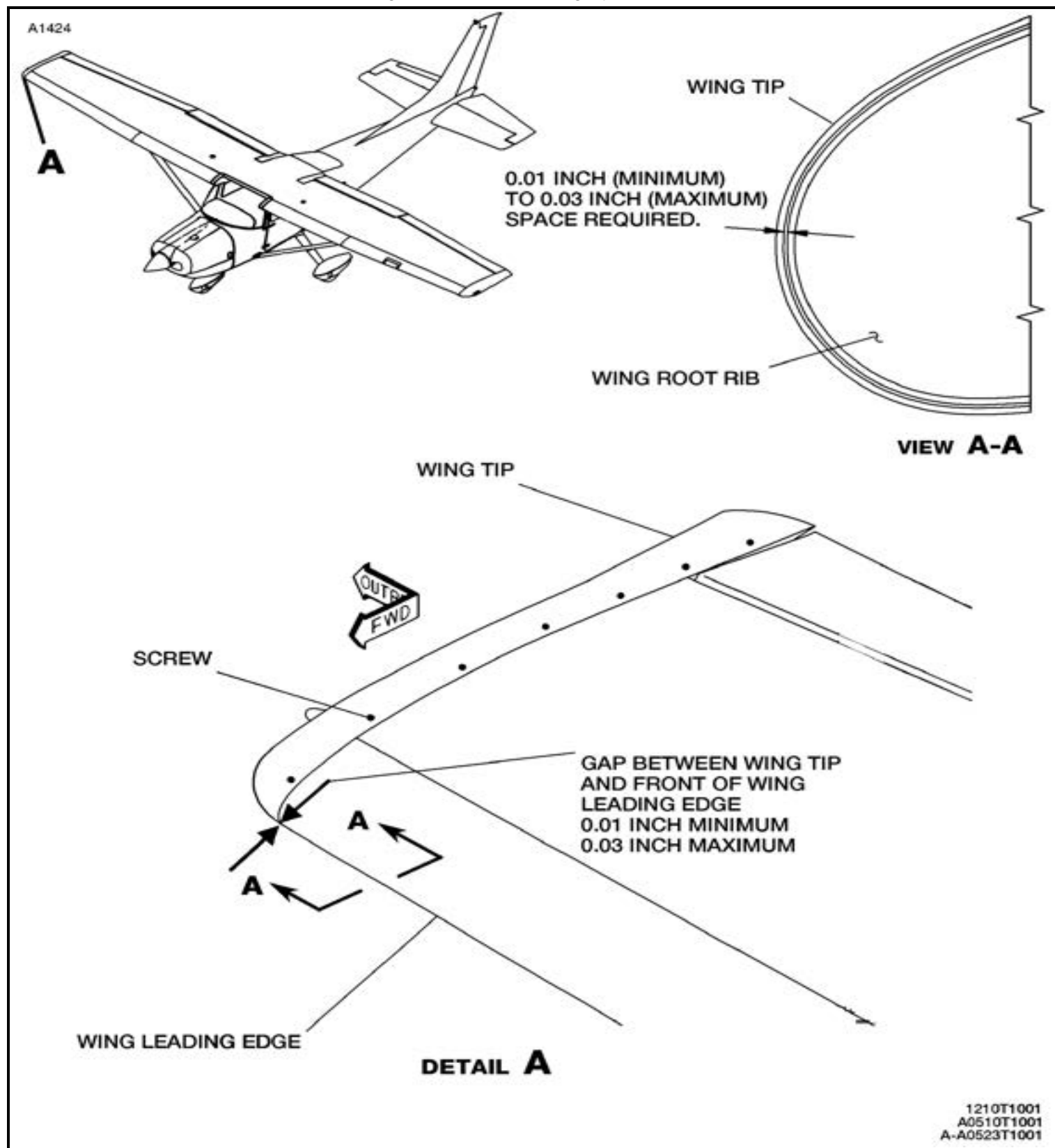


Figure 202 : Sheet 1 : Wing Tip Installation



PROPELLER - GENERAL

1. Scope

- A. This chapter contains information for removal and installation of the propeller and propeller governor, and adjustment and rigging procedures for the propeller governor.

PROPELLER - MAINTENANCE PRACTICES

McCauley

1. General

- A. The airplane is equipped with a two or three bladed, constant-speed, metal propeller. Maintenance practices consist of removal and installation of the propeller and spinner. For additional information, troubleshooting, adjustments, and maintenance procedures not addressed in this section, see the applicable McCauley Service Manual. Refer to Introduction, [List of Manufacturers Technical Publications](#).

2. Propeller and Spinner Removal and Installation

- A. Remove Propeller and Spinner (Refer to [Figure 201](#)).

(1) Remove all power from airplane.

WARNING: Exercise care when working with the propeller. Always treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller. Ensure magneto switch is in the OFF position before turning propeller.

WARNING: Ensure magneto is grounded before turning propeller.

(2) Remove twelve screws and washers securing spinner to spinner bulkhead assembly.

(3) Remove spinner, spinner support, and shims from prop cylinder.

NOTE: Note number of shims for use during reinstallation of spinner.

(4) Remove cowl assemblies as required to gain access to propeller mounting bolts.

NOTE: If equipped with prop deice system, remove brush block assembly before removing propeller, to prevent possible brush damage.

(5) Cut safety wire from mounting bolts.

(6) Remove mounting bolts as follows:

(a) Evenly back off mounting bolts approximately 0.25 of an inch (6.35 mm).

(b) Pull propeller assembly forward, taking up the 0.25 inch (6.35 mm) provided by backing off mounting bolts.

NOTE: As the propeller assembly is separated from the engine crankshaft, oil will drain from the propeller and engine crankshaft cavities.

(c) Continue evenly backing off the mounting bolts and pulling the propeller assembly forward, 0.25 inch (6.35 mm) at a time, until all bolts are completely removed.

(7) Remove propeller assembly and O-Ring from engine prop shaft.

- B. Install Propeller and Spinner (Refer to [Figure 201](#)).

WARNING: Exercise care when working with the propeller. Always treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller. Ensure magneto switch is in the OFF position before turning propeller.

WARNING: Ensure magneto is grounded before turning propeller.

(1) Clean mating surfaces of propeller assembly, spinner bulkhead assembly, engine prop shaft and mating surfaces.

(2) Apply film of MIL-L-7711 lubricant, or equivalent, to new O-Ring and engine prop shaft.

(3) Install new O-Ring.

(4) Carefully slide propeller assembly onto engine prop shaft and align propeller assembly to engine and secure with mounting bolts.

(5) Torque mounting bolts incrementally in a crossing pattern to 60 foot-lbs, +5 or -5 foot-lbs (660-780 in-lbs).

(6) Safety wire mounting bolts in sets of two or three bolts. Refer to Chapter 20, [Safetying - Maintenance Practices](#).

(7) Position shims, spinner support, and spinner on prop cylinder.

(8) Lightly press spinner snugly against spinner support and check alignment of mounting holes in spinner with holes in spinner bulkhead assembly.

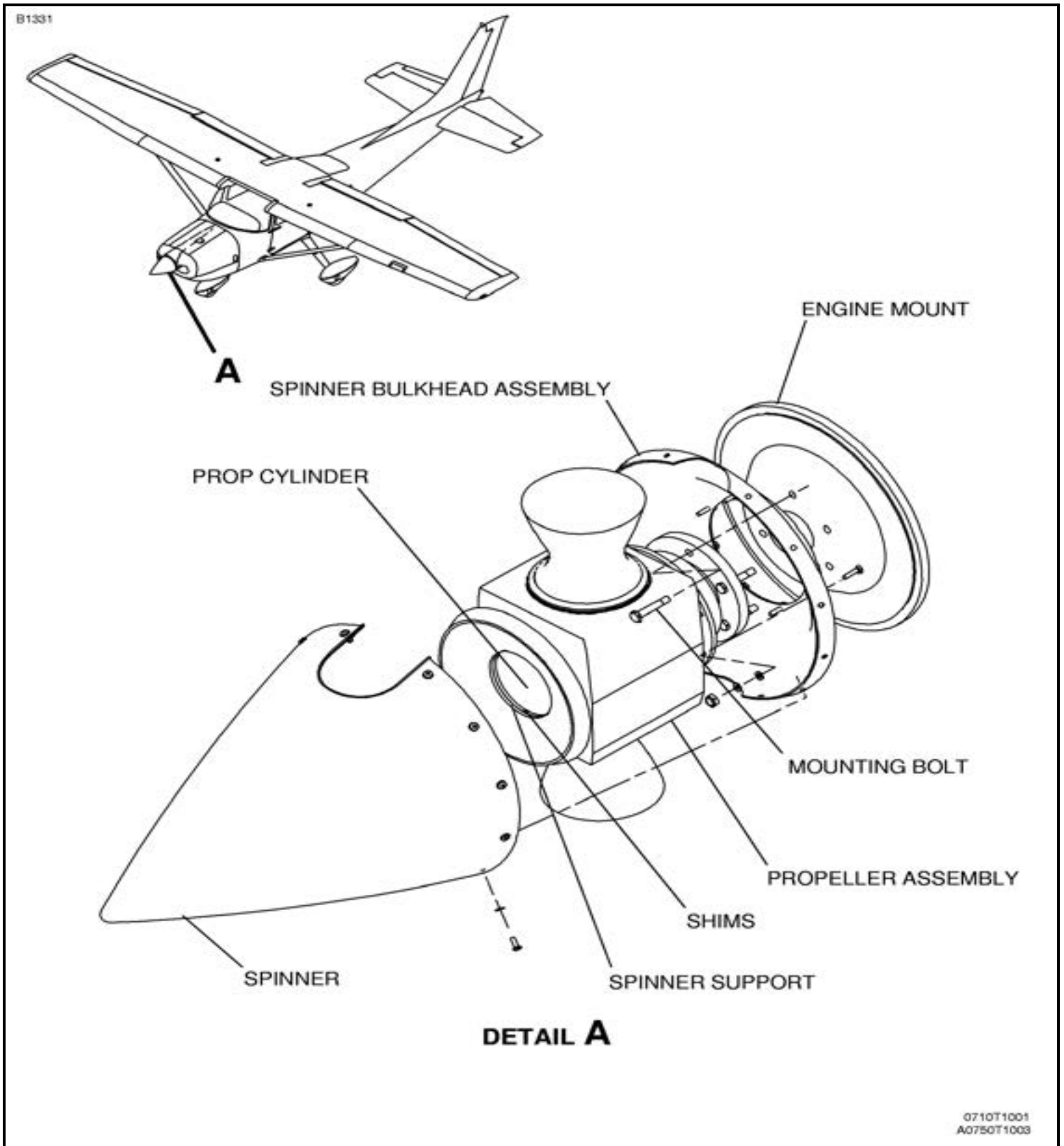
NOTE: Without increasing pressure on spinner, the mounting holes in spinner need to be positioned approximated 0.050 inch (1.27 mm) forward of the true center of holes in spinner bulkhead assembly.

- (a) Add or remove shims as required to position spinner mounting holes 0.050 inch (1.27 mm) forward of holes in spinner bulkhead assembly.
- (9) Push hard on spinner until spinner mounting holes are aligned with the spinner bulkhead assembly holes and install four (4) screws and washers equally spaced around circumference of spinner.

NOTE: Use only the number of shims that will allow just enough alignment for screws to be installed while pushing hard against spinner.

- (10) Relax force against spinner and install remaining screws and washers. Tighten all screws uniformly around spinner.
- (11) Install cowl assemblies.
- (12) Check engine oil and service as needed.

Figure 201 : Sheet 1 : Propeller and Spinner Installation



PROPELLER GOVERNOR - MAINTENANCE PRACTICES

McCauley

1. General

- A. The propeller governor is a single-acting, centrifugal type, which boosts oil pressure from the engine and directs it to the propeller where the oil is used to increase blade pitch. The governor is installed on the forward, upper left side of the engine.
- B. Maintenance practices consist of removal and installation of the propeller governor, high RPM stop adjustment, and rigging of the governor control. For additional information, troubleshooting, adjustments, and maintenance procedures not addressed in this section, refer to the applicable McCauley Service Manual.

2. Propeller Governor Removal/Installation

- A. Remove the Propeller Governor (Refer to [Figure 201](#)).

- (1) Remove all power from airplane.

WARNING: Treat the propeller as if the ignition switch were on. Do not stand or allow anyone to stand in the arc of the propeller. Make sure the magneto switch is set to the OFF position before turning propeller.

- (2) Remove cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

- (3) Remove the cotter pin, nut, washers, and bolt attaching the control cable to the control arm.

NOTE: Identify washers and position of washers for use when reconnecting control cable to control arm.

- (4) Loosen the screws attaching the control cable to the control cable bracket.

- (5) Remove the control cable from the bracket restraint.

- (6) Remove the nuts and washers attaching the propeller governor to the engine.

- (7) Remove the propeller governor and gasket.

- B. Install the Propeller Governor (Refer to [Figure 201](#)).

- (1) Clean the smooth surfaces of propeller governor and engine mounting surface.

- (2) Install a new mount gasket.

WARNING: Treat the propeller as if the ignition switch were on. Do not stand or allow anyone to stand in the arc of the propeller. Make sure the magneto switch is set to the OFF position before turning propeller.

WARNING: Make sure you ground the magneto before you turn the propeller.

CAUTION: Do not force the spline engagement. Rotate the crankshaft slightly and the splines will mesh smoothly when properly aligned.

- (3) Position the propeller governor and attach to the engine with the washers and nuts.

- (a) If required, rotate the crankshaft to properly align the propeller governor and the engine splines.

- (4) Install the control cable in the bracket restraint and tighten the screws.

- (5) Attach the control cable to the control arm with the bolt, washers, and nut.

- (a) Torque the nut to 30 inch-pounds.

CAUTION: Do not exceed 50 inch-pounds.

- (b) Continue to torque the nut past 30 inch-pounds until the cotter pin hole lines up with castellations in the nut.

- (c) Install a new cotter pin.

- (6) Rig the governor control. Refer to governor control rigging.

- (7) Install cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

3. High RPM Stop Screw Adjustment

WARNING: Treat the propeller as if the ignition switch is set to on. Do not stand or allow anyone to stand in the arc of the propeller. Make sure the magneto switch is set to the OFF position before turning propeller.

WARNING: Make sure you ground the magneto before you turn the propeller.

- A. Adjust the High RPM Stop Screw (Refer to [Figure 201](#)).

- (1) Remove the cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

- (2) Cut and discard the safety wire from high RPM stop screw.

- (3) Loosen the high RPM stop screw lock nut.

- (4) Turn the high RPM stop screw in (clockwise) for decrease in RPM or out (counterclockwise) to increase maximum RPM. One complete turn will cause a change of approximately 25 RPM.

NOTE: Due to climate conditions, field elevation, low pitch propeller blade angle, and other factors, the engine may not reach rated RPM on the ground. It may be necessary to readjust the governor high RPM stop screw after test flying to obtain maximum rated RPM when airborne.

- (5) Torque the lock nut to 8 to 12 inch-pounds.
- (6) Adjust the propeller governor control as necessary to maintain full travel. Make sure the governor control arm contacts the high RPM stop screw in both the maximum and minimum settings (bottomed out against both high and low pitch stops). Make sure a cushion exists at both positions of control arm travel. Refer to governor control rigging.
- (7) Safety wire high RPM stop screw. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (8) Install cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).
- (9) Test and operate the governor and propeller combination.

4. Propeller Control Cable

- A. Remove the Propeller Control Cable (Refer to [Figure 201](#)).

- (1) Remove the upper cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).
- (2) Remove the cotter pin, nut, washers, and bolt attaching the control cable to the control arm. Discard the cotter pin.
- (3) Remove the control cable rod end.
- (4) Remove the nuts and bolts attaching the clamp bracket and pull control cable out of the grommet on the engine baffle
- (5) Remove the control cable nut and washer at the firewall.
- (6) Pull control cable aft through firewall.
- (7) Remove the nut and washer from the control cable.
- (8) Remove the nut and washer on the forward side of the instrument panel from control cable while pulling control cable from the instrument panel.

- B. Install the Propeller Control Cable (Refer to [Figure 201](#)).

- (1) Route the control cable through the instrument panel.
- (2) Route control cable through firewall and install the instrument panel washer nut.
- (3) Install firewall washer and nut.
- (4) Route cable through grommet in engine baffle.
- (5) Attach the clamp bracket on the control cable.
- (6) Rig governor control. Refer to Governor Control Rigging.
- (7) Install cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

5. Governor Control Rigging

WARNING: Treat the propeller as if the ignition switch is set to on. Do not stand or allow anyone to stand in the arc of the propeller. Make sure the magneto switch is set to the OFF position before turning propeller.

NOTE: The result of rigging of the governor control is full travel of the governor control arm (bottomed out against both high and low pitch stops), with some cushion at both ends of the control travel.

- A. Rig the Governor Control (Refer to [Figure 201](#)).

- (1) Remove the cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).
- (2) Remove the cotter pin, nut, washers, and bolt attaching the control cable to the control arm.
 - (a) Identify the washers and position of washers for attaching the control cable to the control arm.
- (3) Set the governor control in the cockpit to full forward. Pull the governor control back approximately 0.125 inch and lock in this position.

NOTE: This allows cushion which will make sure there is full contact with the governor high RPM stop screw.
- (4) Set the governor control arm against the high RPM stop screw.
- (5) Loosen the jamnuts on the control cable rod end.

- (6) Adjust rod end to align with control arm.
 - (a) Make sure the threads engage during adjustments. If necessary, adjust the position of the control cable in the control cable bracket restraint to achieve proper alignment and for threads to engage.
- (7) Attach the control cable to the control arm with the bolt, washers, and nut.
 - (a) Torque the nut to 30 inch-pounds.
CAUTION: Do not exceed 50 inch-pounds.
 - (b) Continue to torque the nut past 30 inch-pounds until the cotter pin hole lines up with castellations in the nut.
 - (c) Install a new cotter pin.
- (8) Tighten the loose jamnuts on the control cable rod end.
- (9) Operate the propeller control to make sure the governor control arm has full travel and contacts stop in both directions with proper cushion.
- (10) Install the cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

Figure 201 : Sheet 1 : Propeller Governor Installation

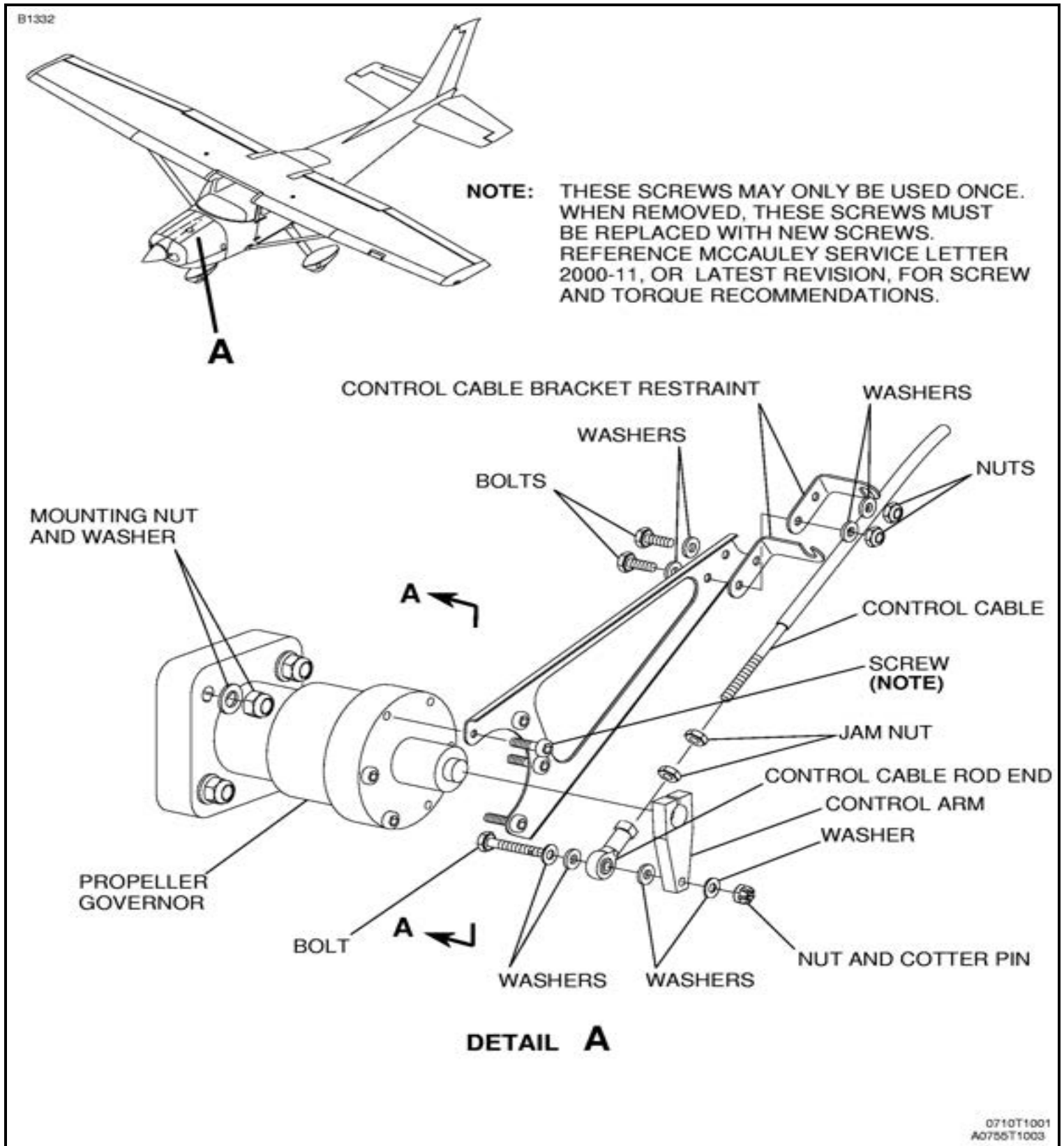
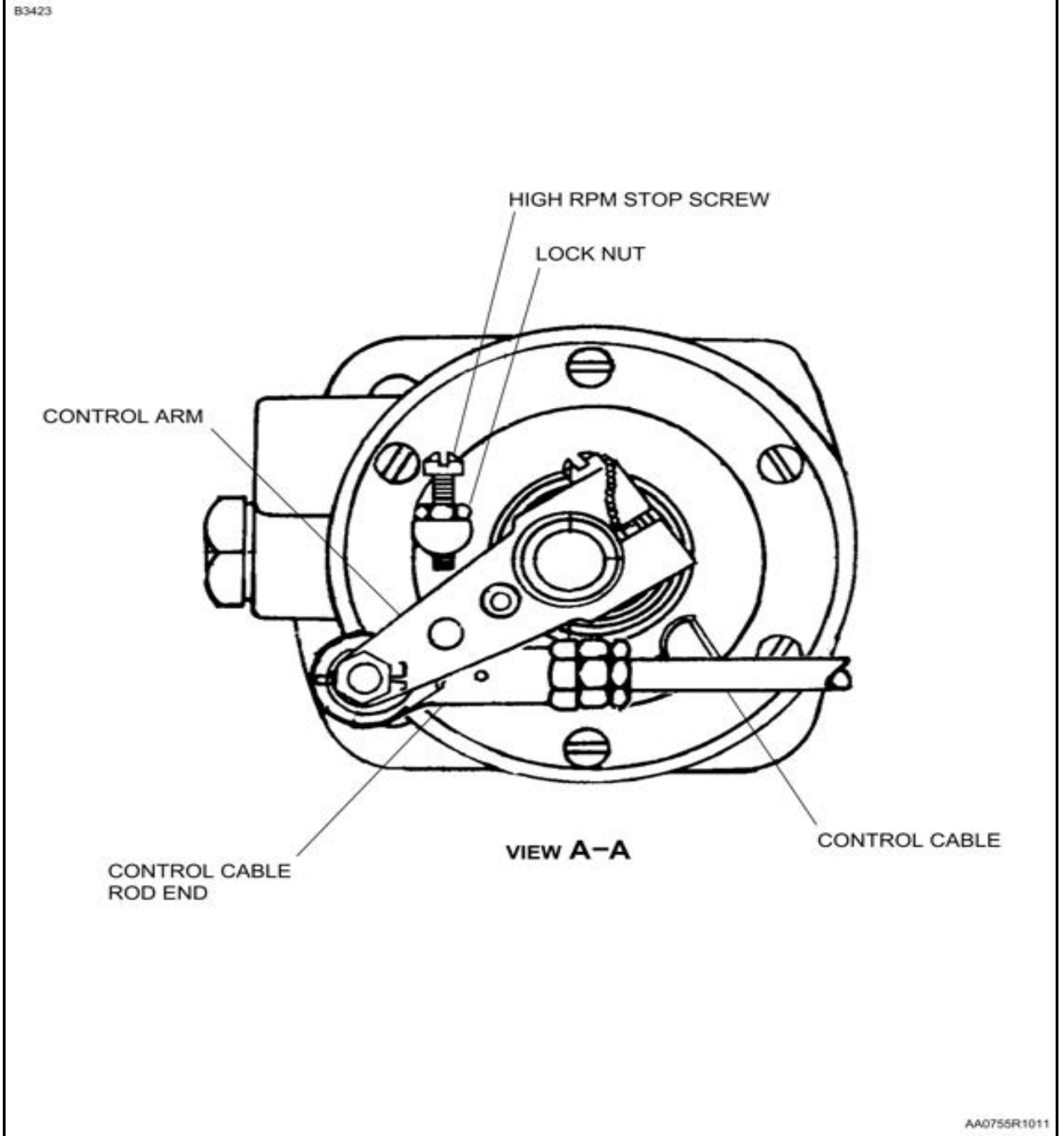


Figure 201 : Sheet 2 : Propeller Governor Installation



ENGINE FUEL AND CONTROL - GENERAL

1. Scope

- A. This chapter provides information on the fuel injection system used for the IO-540 AB1A5 engine. Information beyond the scope of this chapter can be found in [Chapter 28, Fuel - General](#) and in various publications which are listed in Introduction - List of Manufacturers Technical Publications.

2. Definition

- A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.
 - (1) The section on fuel injection covers procedures used to troubleshoot and maintain the fuel injection system.
 - (2) The section on fuel flow indicator covers procedures used to maintain the indicating portion of the system.

FUEL INJECTION SYSTEM - DESCRIPTION AND OPERATION

1. General

- A. This section covers the RSA Fuel Injection system used on the IO-540-AB1A5 and the TIO-540-AK1A engines. For a schematic of the fuel injection system, refer to [Figure 1](#).

2. Description

- A. The fuel injection system is a low pressure, multinozzle, continuous flow system which injects raw fuel into the engine cylinder heads. The injection system is based on the principle of measuring engine air consumption to control fuel flow. More airflow through the venturi will result in more fuel being delivered to the engine, and less airflow through the venturi results in a decreased flow of fuel to engine.
- B. System components consist of the fuel/air control unit, the fuel distribution valve (flow divider), injection nozzles (6 total) and lines used to connect the components. A description of the components is as follows:
- (1) Fuel/Air Control Unit - The fuel/air control unit, also known as the 'servo regulator,' is located on the underside of the engine and integrates the functions of measuring airflow and controlling fuel flow. The control unit consists of an airflow sensing system, a regulator section and a fuel metering section.
 - (2) Fuel Distribution Valve - The fuel distribution valve, also known as a 'spider' or a flow divider, is located on top of the engine and serves to distribute fuel evenly to the cylinders once it has been regulated by the fuel/air control unit. Also attached to the fuel distribution valve is a rigid line which feeds into a pressure transducer. This transducer measures fuel pressure and translates that reading into fuel flow at the cockpit indicator.
 - (3) Injection Nozzles - Each cylinder contains an injection nozzle, also known as an air bleed nozzle or a fuel injector. This nozzle incorporates a calibrated jet that determines, in conjunction with fuel pressure, the fuel flow entering each cylinder. Fuel entering the nozzle is discharged through the jet into an ambient air pressure chamber within the nozzle assembly. This nozzle assembly also contains a calibrated opening which is vented to the atmosphere, and allows fuel to be dispersed into the intake portion of the cylinder in an atomized, cone shaped pattern.

3. Operation

- A. Fuel is stored in the wing tanks and is delivered to the fuel injection system via a series of lines, valves and pumps. From the engine driven fuel pump, fuel enters the fuel/air control unit, passes through the fuel distribution valve, and is routed to individual injection nozzles at each cylinder.

NOTE: For a schematic of the entire fuel system, refer to [Chapter 28, Fuel Storage and Distribution - Description and Operation, Figure 1](#).

- B. The heart of the injection system is the fuel/air control unit, which occupies the position ordinarily used by the carburetor at the engine intake manifold inlet. The fuel/air control unit is comprised of an integrated airflow sensing system, a regulator section and a fuel metering section. Operation of the fuel injection system is based on the principle of measuring airflow and using the airflow signal to operate a servo valve. The accurately regulated fuel pressure established by the servo valve, when applied across the fuel control system, makes fuel flow proportional to airflow.
- (1) The airflow sensing system consists of a throttle body which houses the air throttle valve, the venturi, servo valve and fuel control unit. The differential pressure between impact air and the venturi throat pressure is a measurement of the velocity of the air entering the engine. These pressures are vented through drilled channels in the throttle body to both sides of an air diaphragm and create a force across the diaphragm. A change in air throttle position or a change in engine speed will change the air velocity, which in turn changes the force across the air diaphragm.
 - (2) The regulator section contains the air diaphragm, mentioned in the preceding paragraph, and a fuel diaphragm. Fuel inlet pressure is applied to one side of the fuel diaphragm. The other side of the fuel diaphragm is exposed to fuel that has passed through the metering jet (metered fuel pressure). The differential pressure across the fuel diaphragm is referred to as the fuel metering force.
 - (a) The air metering force applied to the air diaphragm is transmitted through the regulator stem and tends to move the ball valve in the opening direction. The fuel metering force across the fuel diaphragm acts to oppose the air metering force and tends to close the ball valve. Because the air forces are very low in the idle range, a constant head idle spring is provided to maintain an adequate fuel metering force at low RPM.
 - (b) As the air metering force increases, the spring compresses until the spring retainer touches the air diaphragm and acts as a solid member. The constant effort spring produces a force which provides a smooth transfer from idle to low power cruise operation. Whenever the air metering, fuel metering and spring forces are balanced, the ball valve maintains a fixed position.

- (3) The fuel metering section is contained within the throttle body casting and consists of an inlet fuel screen, a rotary idle valve and a rotary mixture valve. Both idle speed (closed throttle position) and idle mixture (relationship between throttle position and idle valve position) may be adjusted externally to meet individual engine requirements.
 - (a) The idle valve is connected to the throttle valve by means of an external adjustable link. The idle valve controls fuel flow through the low speed range of operation and is adjustable to obtain good idling characteristics without affecting fuel metering in the high power range.
 - (b) The mixture control valve gives full rich mixture on one stop and a progressively leaner mixture as it is moved toward idle cutoff. The full rich stop defines sea level requirements and the mixture control provides for altitude leaning.

Figure 1 : Sheet 1 : Fuel Injection System Schematic

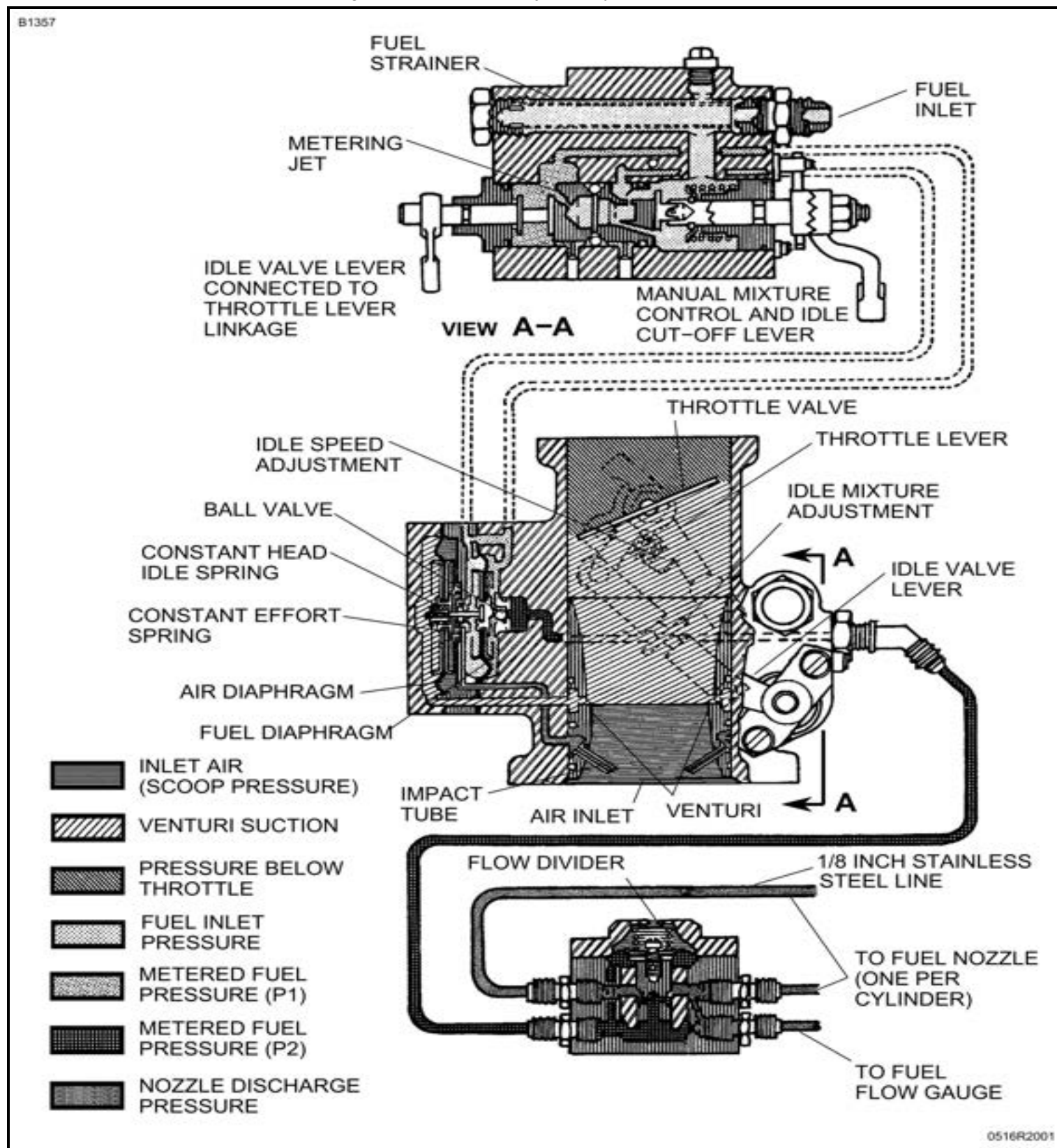


Figure 1 : Sheet 1 : Fuel System Schematic

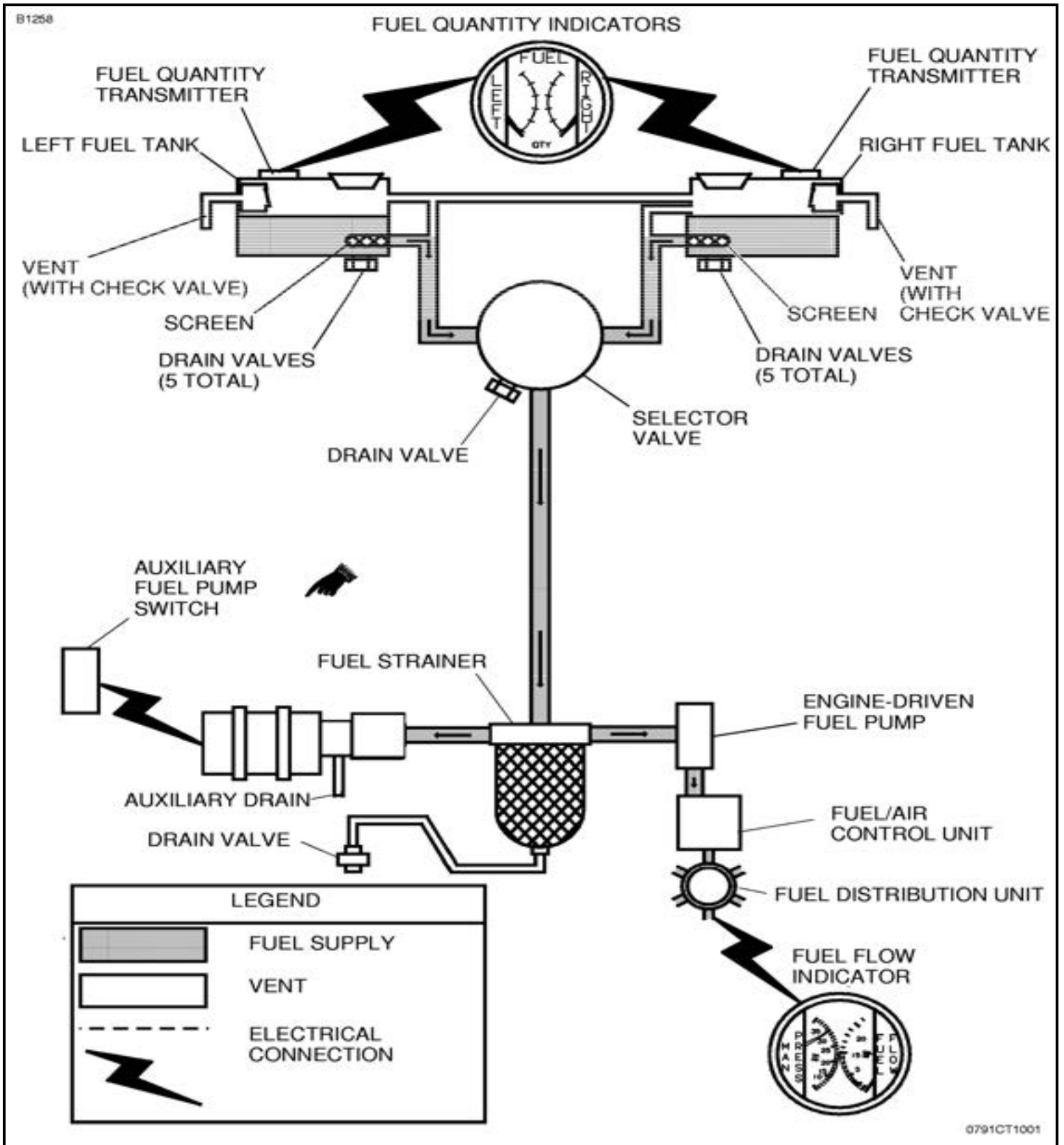
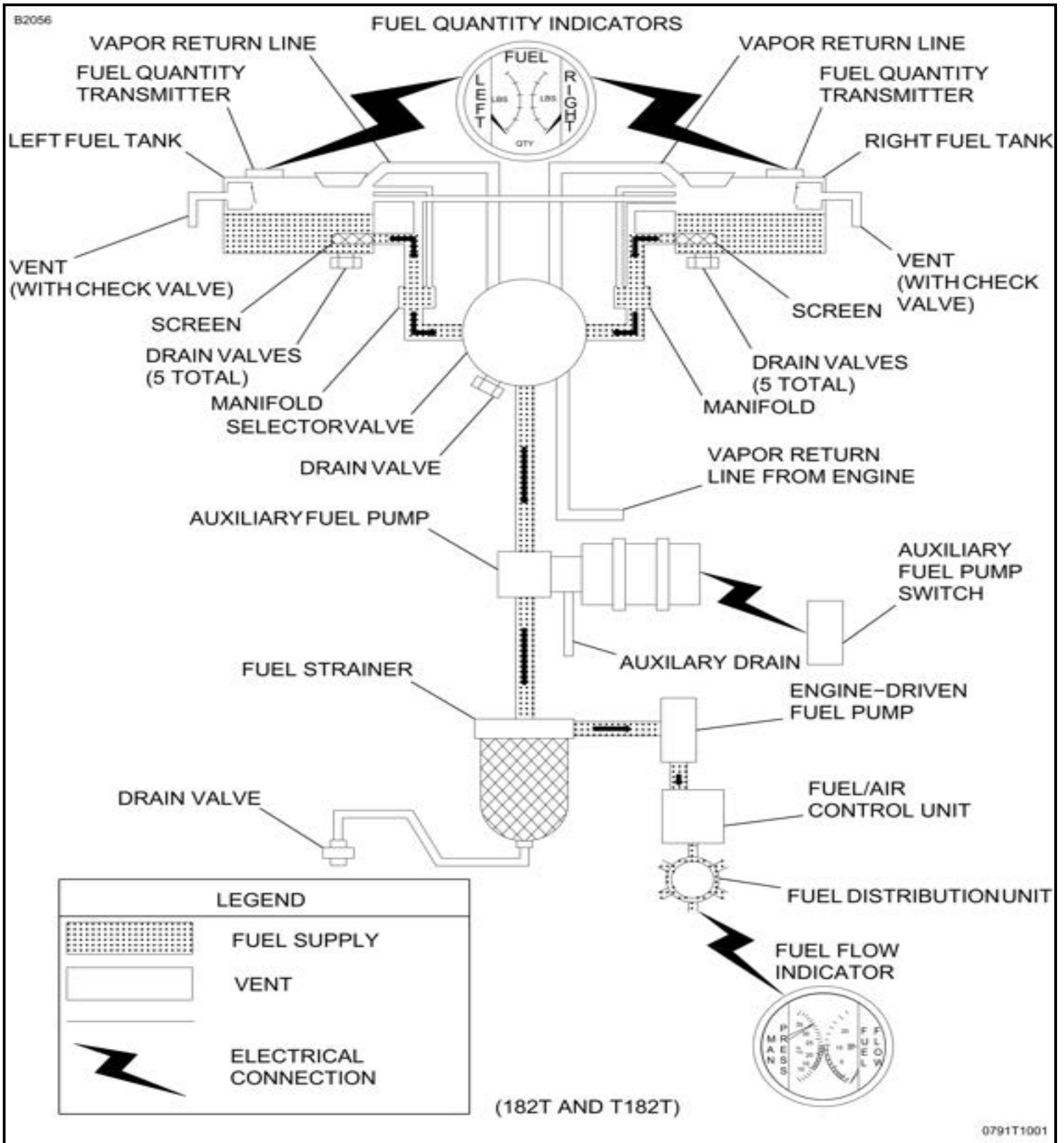


Figure 1 : Sheet 2 : Fuel System Schematic



FUEL INJECTION SYSTEM - TROUBLESHOOTING

1. General

A. This section gives troubleshooting information for the fuel injection system.

2. Fuel Injection System Troubleshooting

A. Do the troubleshooting procedures if the problem is on the chart. Refer to [Table 101](#).

Table 101. Fuel Injection System Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
HIGH FUEL FLOW READING.	Plugged nozzle if the high fuel flow reading is combined with a loss of power, roughness, or if you cannot set the idle mixture easily.	Remove and clean the nozzles. Soak the nozzles in Hoppes #9 Gun cleaning solvent for 20 minutes. Rinse the nozzles in a Stoddard solvent. Blow dry the nozzles. Do a check of the system for contamination.
	Faulty gage or pressure transducer. (Non-NAV 3 or non-turbo)	Use a mechanical gage and make sure the transducer pressure indication is correct. Replace the gage or pressure transducer as necessary.
UNSATISFACTORY FUEL CUTOFF.	Incorrect installation of the aircraft linkage to the mixture control.	Adjust the linkage.
	Mixture valve leaks.	Refer to the servo mixture valve RS-16.
ENGINE WILL NOT INCREASE TO THE NECESSARY RPM.	Contamination in the air chamber.	Refer to Precision Airmotive Corporation service information letter RS-40.
ROUGH IDLE.	Small air leaks in the induction system through loose intake pipes.	Do a check of the clamps and connectors. Repair leaks as necessary.
	Large air leaks in the induction system.	Repair leaks as necessary.
	Fuel hose fittings loose.	Tighten the fittings.
	Fuel vaporizes in the fuel lines or distributor. Found only in high ambient temperature conditions or after a long operation at a low RPM setting.	<u>Keep temperatures low:</u> Avoid long ground runs. <u>During a hot engine restart:</u> Operate the engine at 1,200 - 1,500 for several minutes to reduce residual heat in the engine compartment.
LOW TAKEOFF FUEL FLOW.	Faulty gage or pressure transducer. (Non-NAV 3 or non-turbo)	Use a mechanical gage and make sure the transducer pressure indication is correct. Replace the gage or pressure transducer as necessary.
	Contamination in the flow divider.	Clean the flow divider.
	Fuel pump pressure is not correctly adjusted.	Adjust the fuel pump pressure.
ENGINE IS DIFFICULT TO START.	Incorrect starting procedure.	Refer to the Pilot's Operating Handbook.
	Flooded engine.	Crank the engine to clear it with the throttle open and the mixture in the IDLE/CUTOFF position.
	Throttle valve is opened too far.	Open the throttle to approximately 800 RPM.

ENGINE OPERATES ROUGH.	A prime that is not sufficient (usually combined with a backfire).	Increase the quantity of priming.
	Too rich or too lean mixture.	Adjust the mixture control. If the mixture is too rich, the engine will run smoothly when leaned. If the mixture is too lean, the engine will run smoothly when the mixture is enriched. Adjust idle mixture to give a 10 - 50 PRM rise at idle.
NO FUEL FLOW INDICATION DURING PRIME	Plugged nozzle(s) (usually combined with high takeoff fuel flow). (Non-NAV 3 or non-turbo)	Remove and clean the nozzles. Soak the nozzles in a Hoppes #9 Gun cleaning solvent for 20 minutes. Rinse the nozzles with a Stoddard solvent. Blow dry the nozzles. Do a check of the system for contamination.
	Air leak in the induction system.	Do a check for leaks.
	Air leak in the fuel line from the fuel tank to the servo.	Do a check for the leak. Connect clear tubing between the servo and the flow divider and look for air bubbles. Find and correct the source of the leak. This can include the boost pump, the engine-driven pump, or any hose or line connection.
	Flow divider sticks.	Do an inspection of the flow divider. Clean the flow divider.
	Flow divider sticks.	Send to repair station.

FUEL INJECTION SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This section gives instructions for removal and installation, adjustment, and cleaning of components in the fuel injection system. For more maintenance information, refer to the applicable fuel injection component maintenance manuals which are listed in the Introduction - List of Manufacturers Technical Publications.

2. Precautions

- A. Obey these general precautions and rules when you refuel, defuel, clean the fuel tank, repair, assemble or disassemble system components, and do electrical system tests and repairs on the airplane fuel system.
 - (1) Put covers or caps on all disconnected hoses, lines, and fittings to prevent residual fuel drainage, thread damage, or entry of dirt or unwanted material into the fuel system.
 - (2) When the fuel system is opened, use the fuel boost pump to flush the system with 1/2 gallon of fuel at the inlet of the servo and flow divider.
 - (3) When you work on fuel injection system, keep all parts clean and free from contamination.

3. Fuel/Air Control Unit Removal/Installation

- A. Remove the Fuel/Air Control Unit.
 - (1) Put the cockpit-mounted FUEL SELECTOR valve in the OFF position.
 - (2) Remove the lower cowl. Refer to Chapter 71, [Cowl - Maintenance Practices](#).
 - (3) Remove the clamp that attaches the induction air elbow to the inlet adaptor.
 - (4) Disconnect the fuel inlet and outlet lines from the control unit.
 - (5) Remove the mixture and throttle control linkages from the control unit. Record the number and position of the washers for installation.
 - (6) Cut the safety wire at the base of the control unit. Remove the bolts that attach the inlet adaptor and throttle cable bracket to the base of the control unit.
 - (7) Remove the nuts, lock washers, and flat washers that attach the control unit to the oil sump. Put a cover on the engine intake opening and put the control unit in a sealed, clean environment to prevent the collection of unwanted particles in the unit.
- B. Install the Fuel/Air Control Unit.
 - (1) Remove the engine intake cover from the sump area.
 - (2) Install the control unit to the sump using washers, lock washers, and a nut.
 - (3) Install the inlet adaptor and throttle cable bracket to the base of the control unit. Safety the bolts with wire.
 - (4) Connect the mixture and throttle control linkages to the control unit. Make sure that all washers are in the correct position and that the cotter pins are installed where necessary.
 - (5) Connect the fuel inlet and outlet lines to the control unit.
 - (6) Attach the induction air elbow to the inlet adaptor using the clamp.
 - (7) Install the lower cowl. Refer to Chapter 71, [Cowl - Maintenance Practices](#).
 - (8) Put the cockpit-mounted FUEL SELECTOR valve in the ON position.

4. Fuel Distribution Valve Removal/Installation

- A. Remove the Fuel Distribution Valve.
 - (1) Remove the upper cowl. Refer to Chapter 71, [Cowl - Maintenance Practices](#).
 - (2) Disconnect all the lines from the fuel distribution valve.
 - (3) Remove the nuts, bolts, washers, and spacers that attach the fuel distribution valve to the engine case.
- B. Install the Fuel Distribution Valve.
 - (1) Attach the fuel distribution valve to the engine case using the nuts, bolts, washers, and spacers.
 - (2) Install all the lines to the fuel distribution valve.
 - (3) Install the upper cowl. Refer to Chapter 71, [Cowl - Maintenance Practices](#).

5. Injection Nozzles Removal/Installation

NOTE: The nozzles have two pieces. Make sure that the nozzle inserts stay with the nozzle bodies and that the nozzles are installed in the same cylinder from which they were removed.

- A. Remove the Injection Nozzles.
 - (1) Remove the upper cowl. Refer to Chapter 71, [Cowl - Maintenance Practices](#).
 - (2) Remove the rigid fuel lines from the individual nozzles.
 - (3) Remove the nozzles from the cylinders.

- B. Install the Injection Nozzles.

CAUTION: Use only fuel-soluble lubricants (such as engine oil) on the nozzle threads during installation.

- (1) Attach the nozzles to the intake cylinders. Torque the nozzles to between 55 and 60 inch-pounds (between 6.2 and 6.8 N.m).
- (2) Connect the rigid fuel lines to the nozzles.
- (3) Install the upper cowl. Refer to Chapter 71, [Cowl - Maintenance Practices](#).

6. Injection Nozzle Flow Test

- A. Check the Injection Nozzles For Blockages.
 - (1) If you think that a nozzle is blocked, disconnect the injector lines from the nozzles.
 - (2) Seal the nozzles with clean valve stem caps to protect the nozzles from contamination during removal.
 - (3) Remove the nozzles. Refer to [Injection Nozzles Removal/Installation](#).
 - (4) Pull the injector lines up and make sure that the lines are not kinked.
 - (5) Install the nozzles back into the lines.
 - (6) Let the fuel flow into clear containers (bottles with graduations are recommended) using the auxiliary fuel pump and examine the nozzle discharge pattern.
 - (7) When the mixture control is put in the full rich position, the nozzles must make a pencil-stream pattern. The nozzles must also release the same amount of fuel in each cylinder. If you see an unusual flow pattern, or see that the amount of fuel in each container is different, the nozzles must be cleaned. Refer to [Injector Nozzle Cleaning](#).
 - (8) After cleaning the nozzles, install clean valve stem caps for protection. After cleaning the nozzles, it is recommended that they be installed into the injector lines and that a nozzle flow test is done to make sure that the nozzles are clean.
 - (9) After a successful flow test, install the flow caps and install the nozzles in the cylinders.
 - (10) Remove the flow caps and connect the injector lines to the nozzles.

7. Idle Speed and Mixture Adjustment

- A. Adjustment Procedures (Refer to [Figure 201](#)).

WARNING: During the adjustment procedure, stay away from the propeller and/or propeller blast to prevent possible injury or death.

NOTE: For additional information in conjunction with procedures below, refer to the Precision Airmotive Service Letter SIL RS-67.

- (1) Make sure that the alternate air door is in the closed position during this adjustment.
- (2) Operate the engine until the oil temperature increases to 150°F (65°C).
 - NOTE:** It may not be possible to get an oil temperature of 150°F (65°C) at cooler ambient temperatures. In that condition, it will be necessary to set the idle speed and mixture at a lower temperature.
- (3) With the mixture control in the full rich position, set the idle speed to 650 RPM, +25 or -25 RPM.
- (4) Set the throttle to approximately 1800 RPM and immediately return it to idle. The idle speed should be approximately the same as set above.
- (5) Adjust the fuel mixture control by rotating the knob counterclockwise, toward lean, quickly for approximately one inch, then very slowly until the peak RPM is obtained and the engine speed starts to drop off.
 - (a) When the engine speed first starts to increase, you will see a slight rise in RPM.

NOTE: Do not mistake this as the total RPM rise.

- (b) Continue the slow rotation movement of the mixture control until you will see or sense a drop in the engine RPM.

- (c) The maximum RPM before the drop in engine RPM is the total RPM rise which indicates the mixture strength at the engine idle speed.
- (6) If the rise is less than 10 RPM it is necessary to enrichen the fuel mixture.
- (7) If the rise is more than 50 RPM it is necessary to lean the fuel mixture.
NOTE: To aid in the adjustment of the fuel mixture, the clevis on the fuel servo has an L (lean) and R (rich) stamp on it to indicate the direction that the thumb wheel should be moved to enrichen the fuel mixture and increase the RPM rise. If you turn the thumb wheel in the opposite direction you will lean the fuel mixture and decrease the RPM rise.
- (8) Adjust the thumb wheel to set a rise 10 to 50 RPM.
- (9) If the adjustment thumb wheel bottoms out on the blocks, center it as follows:
 - (a) Measure the distance between the two blocks.
 - (b) Disconnect the spring from the linkage pin.
 - (c) Remove the cotter pin, linkage pin, wave washer, and flat washer.
 - (d) Turn the block and adjustment screw until the adjusting thumb wheel is centered.
 - (e) The distance between the blocks should measure the same as above.
 - (f) Install the linkage pin, flat washer, wave washer, cotter pin, and spring.
- (10) After each adjustment is made, the engine speed must be increased to approximately 1800 RPM and held for approximately 10 to 15 seconds to clean the spark plugs and clear the cylinders of excess fuel.
- (11) Put throttle in idle position.
- (12) Repeat the procedure until you get the desired RPM rate change at idle.
NOTE: If the mixture was excessively rich or lean when this procedure was started the engine speed will require readjustment as the fuel mixture is adjusted to the desired value. Set the idle speed to the specified RPM after the mixture has been set to get the 10 to 50 RPM rise a lean condition.
- (13) Operate the engine to full throttle and back to idle to make sure that the setting has not changed.
NOTE: Small changes in the idle speed and RPM are permitted. Find the cause of any large variations in RPM.

8. Injector Nozzle Cleaning

- A. The injector nozzles must be cleaned at time intervals given in Chapter 5, [Inspection Time Limits](#).
- B. Clean the Injector Nozzles.
 - (1) Remove the nozzles from the engine.
 - (2) Examine the nozzles carefully for signs of varnish buildup and/or dirty screens.
 - (3) Soak the nozzles in Methyl Ethyl Ketone, Hopps #9 gun cleaner, or other solvent to remove all contamination and varnish from the nozzle. Some particles of contamination that cannot be cleaned with other methods can be cleaned with ultrasonic cleaning methods.
 - (4) Dry the nozzles using compressed shop air at no more than 30 PSI. Blow the air through the nozzle in the direction opposite of the fuel flow.

9. Fuel Strainer Cleaning

- A. The fuel strainer must be cleaned at time intervals given in Chapter 5, [Inspection Time Limits](#).
- B. Clean the Fuel Strainer ([Refer to Figure 201](#)).
 - (1) Remove the fuel inlet line to get access to the fuel strainer.
 - (2) Remove and clean the fuel strainer with unleaded gasoline or Stoddard solvent.
 - (3) Install the fuel strainer in the control unit with new O-rings.
 - (4) Install the fuel inlet line.

10. Air Throttle Shaft Lubrication

- A. The air throttle shaft must be lubricated at time intervals given in Chapter 5, [Inspection Time Limits](#).
- B. To lubricate the air throttle shaft, apply a drop of engine oil to the ends of the air throttle shaft. Make sure that the oil can flow into the throttle shaft bushings.

11. Engine Driven Fuel Pump Pressure Setting (T182)

- A. Set the pressure of the engine driven fuel pump (T182) (Refer to [Figure 202](#)).
- (1) Install a fuel pressure gage between the fuel-injection pump outlet and fuel-injection servo inlet.
 - (a) Make sure the gage is vented to ambient atmospheric air pressure.
 - (2) Start and operate the engine to increase the oil temperature to 150° F.
 - (3) Operate the engine at maximum continuous power, 32 inches MAP, 2400 RPM, and record the fuel pump pressure. The fuel pump pressure specification is between 32 and 36 psi at maximum continuous power.
 - (4) If the fuel pump pressure is not in the specification pressure range, stop the engine and turn the fuel pressure adjusting screw until the pressure is between 32 and 36 psi.

WARNING: Stop the engine during the fuel pump pressure adjustment, and start it again to measure fuel pressure. Operation of the engine during the fuel pump pressure adjustment can cause injury.
 - (5) Remove safety wire on the locknut. Loosen the locknut and turn the adjusting screw to set the fuel pressure to the required discharge pressure.
 - (a) Turn the adjusting screw clockwise to increase the pressure or counterclockwise to decrease the pressure.
 - (6) Start the engine and do a check of the fuel pressure.
 - (7) After the correct pressure has been set, hold the adjusting screw with a screwdriver and tighten the locknut to 23 to 30 inch-pounds (2.6 to 3.4 Nm) of torque.
 - (8) Make sure the pressure setting has not changed after the locknut has been tightened to the correct torque.
 - (9) Install safety wire on the locknut. Refer to Chapter 20, [Safetying - Maintenance Practices](#).

Figure 201 : Sheet 1 : Idle and Mixture Adjustment

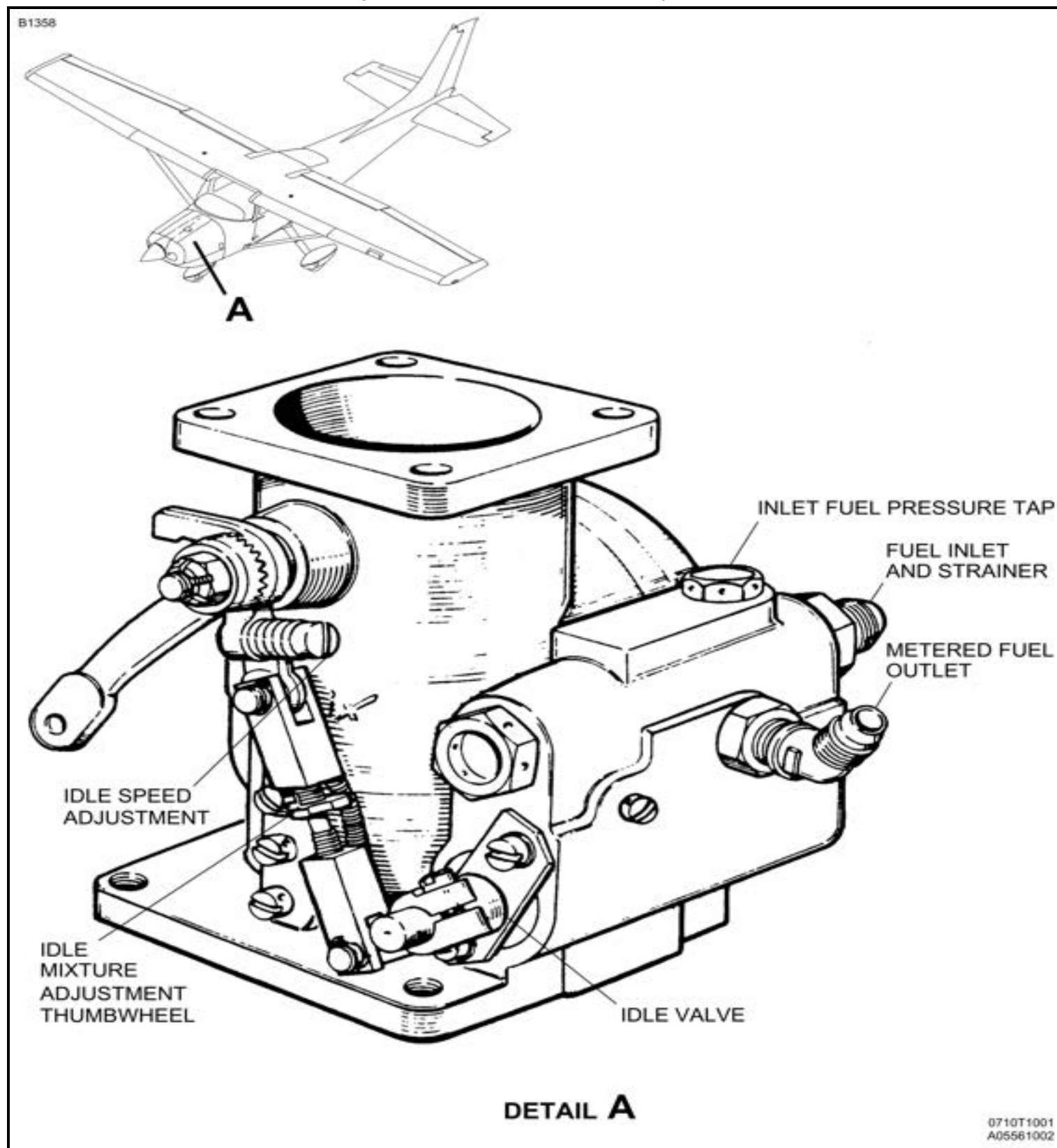
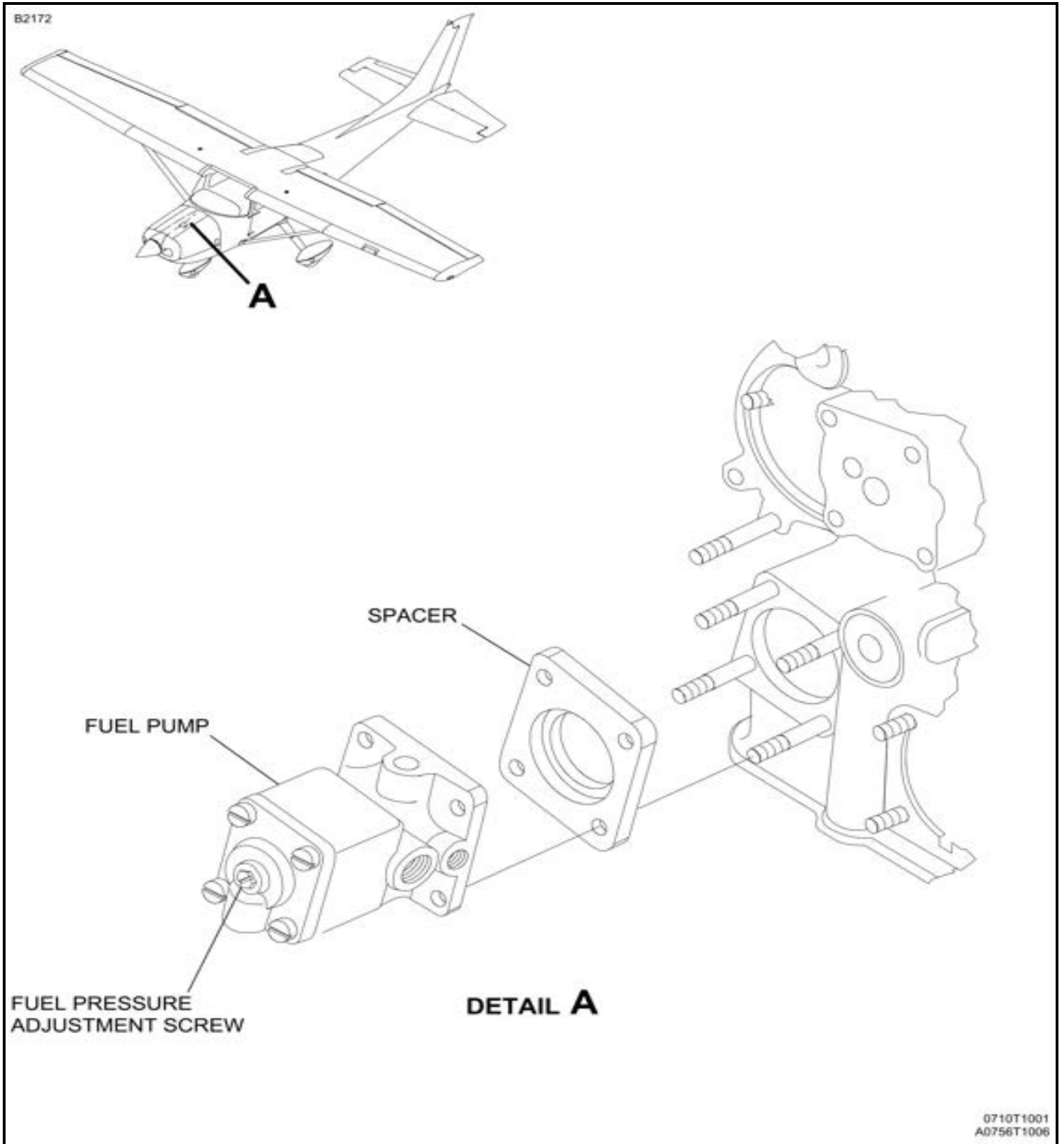


Figure 202 : Sheet 1 : Engine-Driven Fuel Pump Pressure Setting (T182)



FUEL FLOW INDICATOR - MAINTENANCE PRACTICES

1. General

- A. Engine fuel flow is measured by use of an engine compartment mounted transducer and a cockpit mounted indicator. Components of the system include the fuel flow transducer (UN006), the cockpit mounted manifold pressure/fuel flow gauge (EI015), wiring to connect the two electrical components and rigid fuel line running from the fuel distribution valve to the transducer.
- B. Maintenance is limited to removal and installation of the components.

2. EGT/Fuel Flow Gauge Removal/Installation

NOTE: The Fuel flow gauge is incorporated on the right half of the dual function EGT/fuel flow gauge (EI015), mounted on the left side of the instrument panel.

- A. Remove Fuel Flow Gauge (EI015).
 - (1) Ensure all electrical power to airplane is off.
 - (2) Remove screws securing gauge to instrument panel.
 - (3) Carefully withdraw gauge from bottom side of instrument panel and disconnect electrical connector JI033 from gauge.
- B. Install Fuel Flow Gauge (EI015).
 - (1) Connect electrical connector JI033 to gauge.
 - (2) Install gauge in instrument panel using screws.
 - (3) Restore electrical power to airplane and ensure gauge is connected and functioning properly.

3. Transducer and Line Removal/Installation (Airplanes without Garmin G1000)

- A. Remove Transducer UN006 (Refer to [Figure 201](#)).
 - (1) Ensure all electrical power to airplane is off.
 - (2) Remove upper cowling. Refer to [Chapter 71, Cowling - Maintenance Practices](#).
 - (3) Disconnect electrical connector JN001 from fuel flow transducer.
 - (4) Disconnect rigid line leading from fuel distribution valve to transducer.
 - (5) Remove transducer from baffle.
- B. Install Transducer UN006 (Refer to [Figure 201](#)).
 - (1) Install fuel flow transducer to baffle.
 - (2) Connect rigid line leading from fuel distribution valve to transducer.
 - (3) Connect electrical connector JN001 to fuel flow transducer.
 - (4) Reinstall upper cowling. Refer to [Chapter 71, Cowling - Maintenance Practices](#).
 - (5) Restore electrical power to airplane and ensure gauge is connected and functioning properly.

4. Fuel Flow Transducer Removal/Installation (Airplanes with Garmin G1000)

- A. Remove the Transducer (Refer to [Figure 202](#)).
 - (1) Make sure the electrical power to the airplane is off.
 - (2) Remove the upper cowl. Refer to [Chapter 71, Cowling - Maintenance Practices](#).
 - (3) Disconnect the electrical connector from the electrical connector for the fuel flow transducer.
 - (4) Disconnect the fuel hoses from the transducer.
 - (a) Put caps and plugs on the transducer and fuel hose fittings.
 - (5) Remove the screws that attach the transducer to the bracket assembly.
 - (a) Remove the transducer from the bracket assembly.
- B. Install the Transducer (Refer to [Figure 202](#)).
 - (1) Put the fuel flow transducer in its position on the bracket assembly.

NOTE: Make sure that the arrow on the transducer shows the correct direction of flow.

 - (a) Install the screws.
 - (2) Remove the caps and the plugs from the transducer and the fuel hoses.

- (3) Connect the fuel hoses to the transducer.
- (4) Connect the electrical connector to the electrical connector for the fuel flow transducer.
- (5) Examine the transducer and the fuel hoses for leaks during engine run.
 - (a) Make sure the fuel flow indicator on the Garmin Display Units show the correct fuel flow.
- (6) Install the upper cowl. Refer to Chapter 71, [Cowling - Maintenance Practices](#).

Figure 201 : Sheet 1 : Fuel Flow Indicating Installation

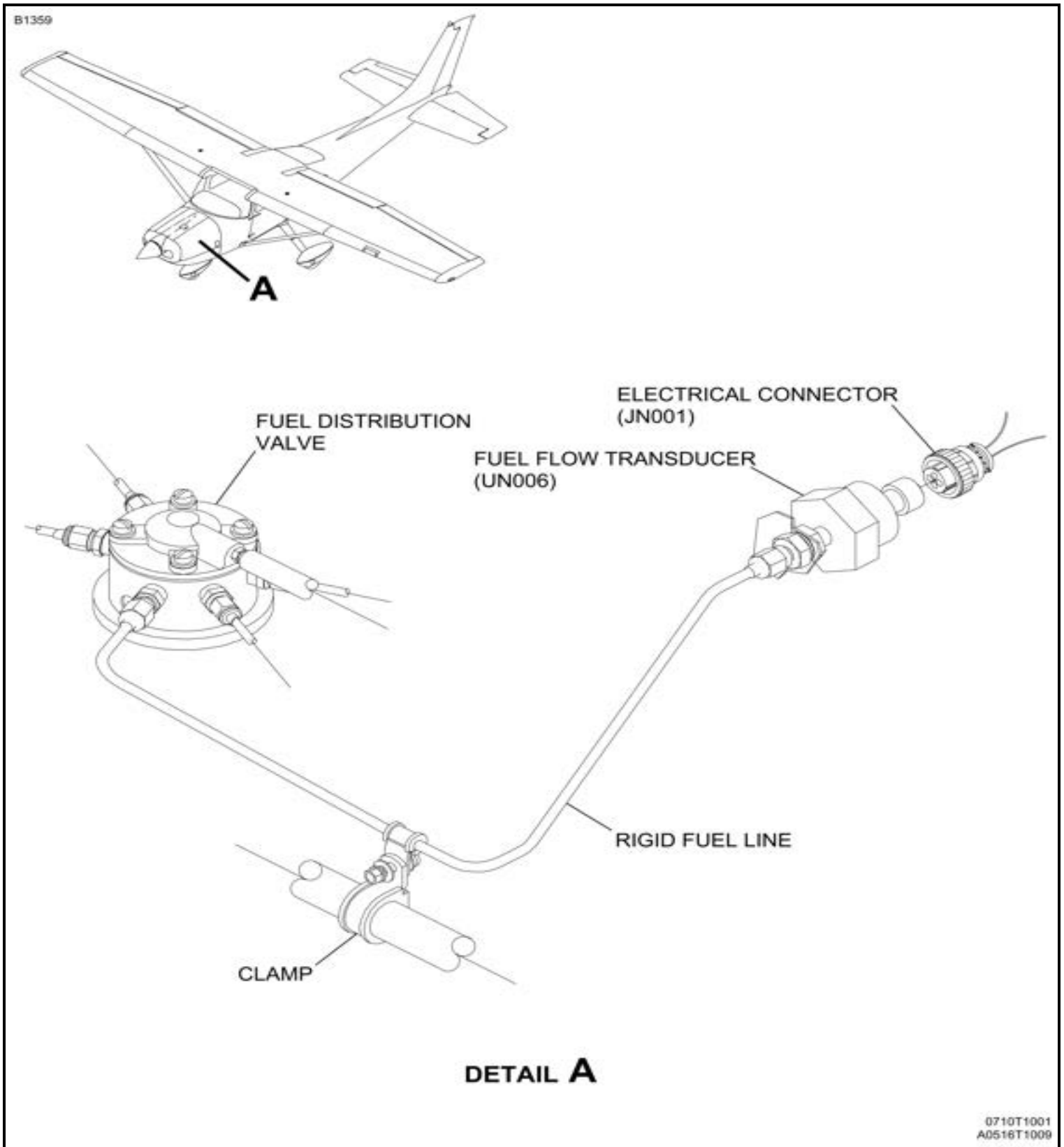
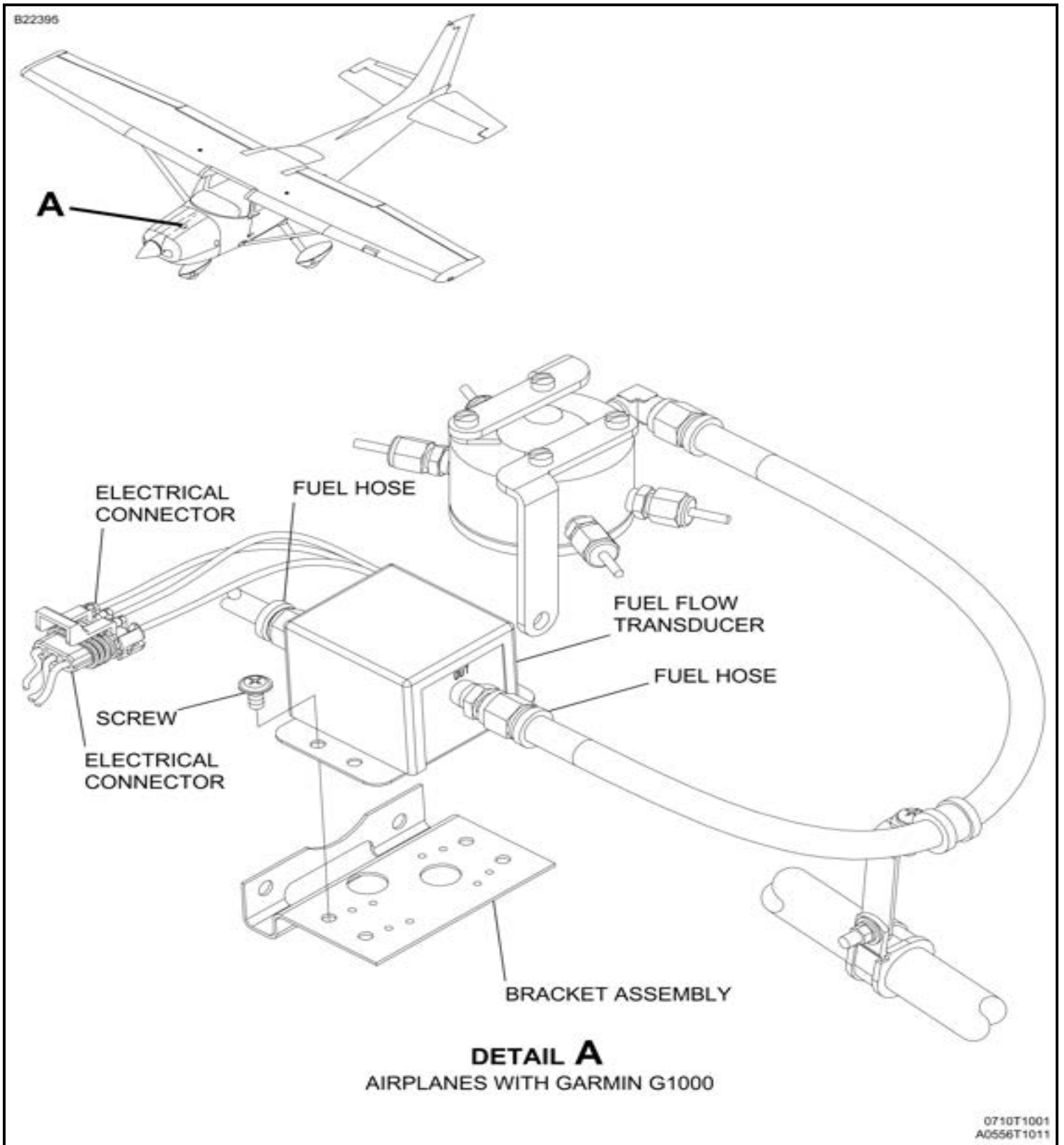


Figure 202 : Sheet 1 : Fuel Flow Transducer Installation



ENGINE CONTROLS - GENERAL

1. Scope

- A. This chapter describes those controls used to regulate engine power.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following item:

NAME	NUMBER	MANUFACTURER	USE
Sealant	Pro-Seal 700	Cortaulds Aerospace 5426 San Fernando Rd. Glendale, CA 91209	Firewall Sealing

3. Definition

- A. This Chapter is divided into sections to aid maintenance technicians in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief description of the sections follows:
- (1) The section on throttle control describes the throttle handle, cable and linkage.
 - (2) The section on fuel mixture control describes the mixture handle, cable and linkage.
 - (3) Both sections include removal/installation, rigging and inspection requirements.

THROTTLE CONTROL - MAINTENANCE PRACTICES

Lycoming

1. General

- A. The throttle control is a push-pull type that has a knurled friction knob, which prevents unwanted movement of the control caused by vibration. The ball bearing type rod end on the throttle is attached to the engine with an already-drilled steel AN bolt, castellated nut, and cotter pin. Make sure that you do not use Aluminum AN bolts to attach the rod end to the engine.

NOTE: Steel AN bolts without an already-drilled shank are identified with an "A" suffix (AN3-6A). A steel bolt of the same size, with the shank drilled for castellated nut and cotter pin, is identified as AN3-6. Aluminum AN bolts are not used to attach the rod end to the engine.

- B. When you adjust the throttle control, make sure that the throttle control slides smoothly through the full range of travel, that it locks tightly with the friction lock, and that the throttle arm operates through its full range of travel. Do not lubricate the throttle control. If the throttle control does not move freely, replace it.
- C. When you disconnect the engine controls, make sure that you monitor the exact position, size, and number of parts used. Then you can connect the engine controls correctly.

2. Throttle Control Removal/Installation

- A. Throttle Control Removal (Refer to [Figure 201](#)).

(1) Remove the engine cowl. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

(2) Remove the cotter pin, castellated nut, bolt, and washers that attach the throttle control rod end to the fuel/air control unit throttle arm. Discard the cotter pin.

(3) Remove the rod end and the jam nut from the throttle control.

(4) Remove the clamp that attaches the throttle control to the engine mount.

(5) Remove the throttle control jam nut and the lock washer from the forward side of the firewall.

(6) In the cockpit, loosen the throttle control jam nuts and the lock washers from the forward side of the instrument panel and the aft side of the firewall.

(7) Carefully pull the throttle control through the firewall and the instrument panel as you remove the lock washers and the jam nuts, and remove it from the airplane.

- B. Throttle Control Installation (Refer to [Figure 201](#)).

(1) In the cockpit, carefully pull the throttle control through the instrument panel and then place the lock washers and the jam nuts over the throttle control.

(2) Pull the throttle control through the firewall and position the throttle control in the instrument panel.

(3) Attach the throttle control to the instrument panel with the jam nut and the lock washer at the instrument panel.

(4) Position the lock washer and the lock nut on the throttle control on the aft side of the firewall.

(5) In the engine compartment, put the lock washer and the jam nut over the throttle control and attach it to the firewall.

(6) Install the jam nut and the rod end on the throttle control.

(7) Attach the throttle control rod end to the fuel/air control unit throttle arm with the bolt, washers, castellated nut, and new cotter pin.

(8) Attach the throttle control to the engine mount with the clamp.

(9) Make sure that the routing of the throttle control is the same as when you removed it.

(10) Make sure that the throttle control moves freely.

(11) Make sure that no preload occurs from an incorrectly-small bend radius.

(12) Adjust the throttle control as necessary. Refer to [Throttle Control Adjustment/Test](#).

(13) Install the engine cowl. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

3. Throttle Control Adjustment/Test

- A. Throttle Control Check (Refer to [Figure 201](#)).

(1) Pull the throttle control knob full out and make sure that the idle stop on the throttle body makes contact.

(2) Push the throttle control knob full in and check that the full power stop on the throttle body makes contact.

(3) Do a check to make sure that the throttle has no less than 0.125-inch (3.18 mm) and no more than 0.25-inch (6.35 mm)

cushion at each stop.

- (4) Work the throttle control in and out until you can make sure that it moves freely.

B. Throttle Control Adjustment (Refer to [Figure 201](#)).

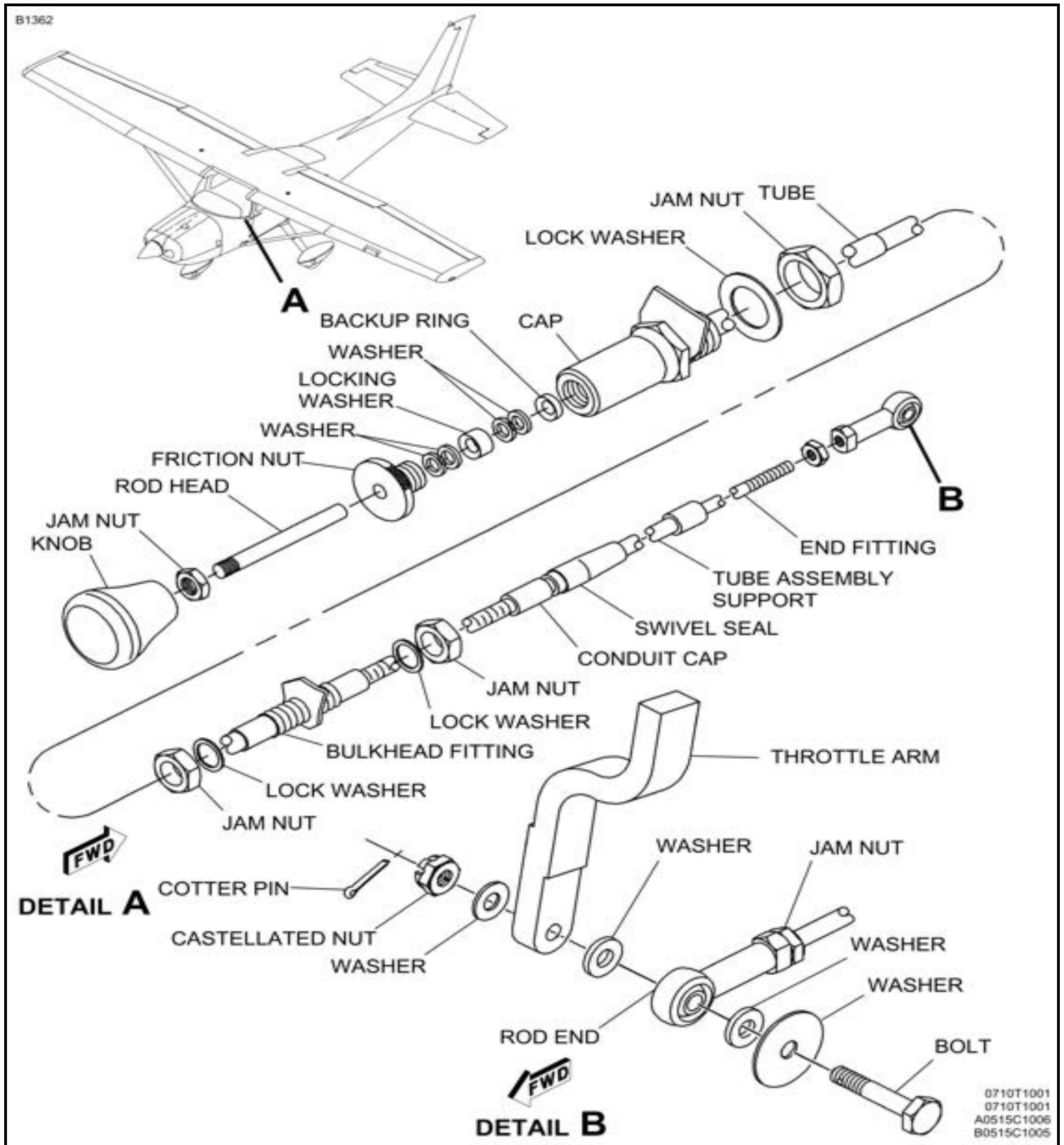
- (1) Disconnect the throttle control rod end from the throttle arm.
- (2) Loosen the jam nut and adjust the throttle control rod end to get the necessary adjustment.
- (3) Tighten the jam nut.
- (4) Connect the throttle control rod end to the throttle arm. Torque the nut to 30 inch pounds and then continue to tighten the nut until the cotter pin hole aligns with the castellations in the nut. Do not torque the nut to more than 50 inch pounds.
- (5) Install the cotter pin.

4. Throttle Control Inspection/Check

A. Throttle Control Inspection

- (1) Do a check of the throttle control attachment to the throttle body. Make sure that the bolt, castellated nut, cotter pin, rod end, and rod end jam nut are correctly attached and in good condition.
- (2) Do a check of the rod end witness hole for proper rod end engagement with the throttle control.
- (3) Make sure that the throttle control moves smoothly through the full range of travel.
- (4) Make sure that the throttle control locks correctly and tightly with the friction lock.
- (5) Make sure that the throttle arm operates correctly through the full range of travel.

Figure 201 : Sheet 1 : Throttle Control Installation



FUEL MIXTURE CONTROL - MAINTENANCE PRACTICES

Lycoming

1. General

- A. The mixture control is a push-pull type that has a knurled friction knob, which prevents unwanted movement of the control caused by vibration. The ball bearing type rod end on the throttle is attached to the engine with an already-drilled steel AN bolt, castellated nut, and cotter pin. Make sure that you do not use Aluminum AN bolts to attach the rod end to the engine.

NOTE: Steel AN bolts with an undrilled shank are identified with an 'A' suffix (AN3-6A). A steel bolt of the same size, with the shank drilled for castellated nut and cotter pin is identified as AN3-6. Aluminum bolts and undrilled bolts must not be used in this application.

- B. When you adjust the fuel mixture control, make sure that the fuel mixture control slides smoothly throughout the full range of travel, that it adjusts through the full vernier range, and that the mixture arm operates through the full range of travel. Do not lubricate the fuel mixture control. If the fuel mixture control does not move freely, replace it.
- C. When you disconnect the engine controls, make sure that you monitor the exact position, size, and number of parts used. Then you can connect the engine controls correctly.

2. Fuel Mixture Control Removal/Installation

- A. Fuel Mixture Control Removal (Refer to [Figure 201](#)).

(1) Remove the engine cowl. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

(2) Remove the cotter pin, nut, bolt, and washers that attach the mixture control rod end to the fuel/air control unit mixture arm. Discard the cotter pin.

(3) Remove the rod end, nut, and jam nut from the fuel mixture control.

(4) Remove the clamp that attaches the fuel mixture control to the mixture control bracket.

(5) Remove the fuel mixture control nut and the washer from the forward side of the firewall.

(6) In the cockpit, remove the fuel mixture control nuts and the washers from the forward side of the instrument panel and the aft side of the firewall.

(7) Carefully pull the fuel mixture control through the firewall and the instrument panel nuts and washers, and remove it from the airplane.

- B. Fuel Mixture Control Installation (Refer to [Figure 201](#)).

(1) In the cockpit, carefully pull the fuel mixture control through the instrument panel, and then place the washers and the nuts over the fuel mixture control.

(2) Pull the fuel mixture control through the firewall.

(3) Tighten the nut against the washer at the instrument panel to attach the fuel mixture control to the instrument panel.

(4) Position the washer and the nut on the fuel mixture control on the aft side of the firewall.

(5) In the engine compartment, put the washer and the nut over the fuel mixture and attach it to the firewall.

(6) Install the jam nut, nut, and rod end on the fuel mixture control and tighten.

(7) Attach the mixture control rod end to the fuel/air control unit mixture arm with the bolt, washers, and nut.

(8) Torque the nut to 30 inch pounds and then continue to tighten the nut until the cotter pin hole aligns with the castellations in the nut. Do not torque the nut to more than 50 inch pounds.

(9) Install the cotter pin.

(10) Attach the fuel mixture control to the mixture control bracket with the clamp.

(11) Make sure that the routing of the fuel mixture control is the same as when you removed it.

(12) Make sure that the throttle control moves freely.

(13) Make sure that no preload occurs from an incorrectly small bend radius.

(14) Adjust the mixture control as necessary. Refer to [Fuel Mixture Control Adjustment/Test](#).

(15) Install the engine cowl. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

3. Fuel Mixture Control Adjustment/Test

- A. Fuel Mixture Control Check.

(1) Push the fuel mixture control full in and make sure that the mixture arm on the fuel/air control unit is fully open (rich).

- (2) Pull the fuel mixture control full out and make sure that the mixture arm on the fuel/air control unit is fully closed (lean).
- (3) Do a check to make sure that the fuel mixture control has no less than 0.125-inch (3.18 mm) and no more than 0.25-inch (6.35 mm) cushion at each stop.
- (4) Work the fuel mixture control in and out until you can make sure that it moves freely.

B. Fuel Mixture Control Adjustment

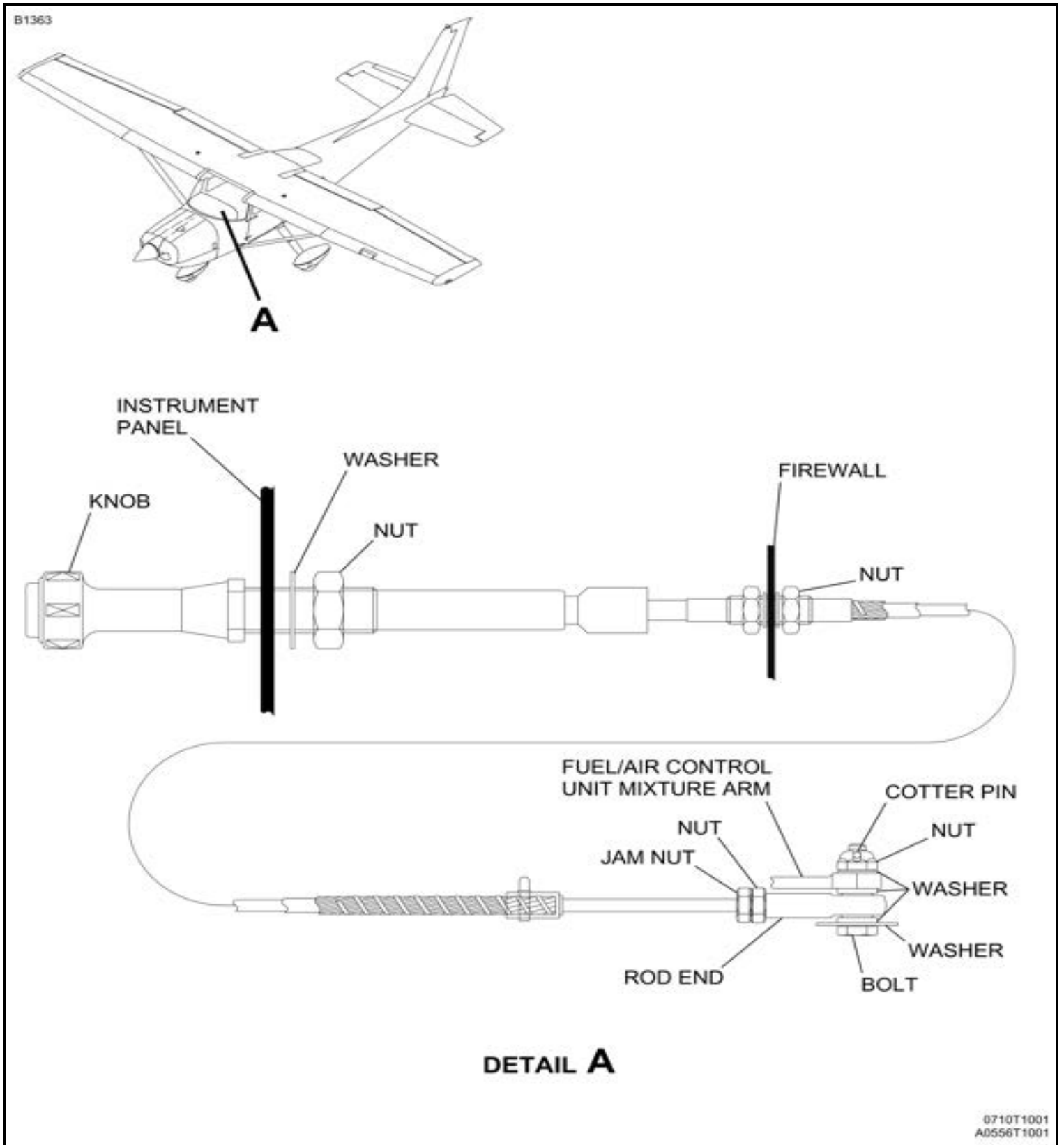
- (1) Disconnect the fuel mixture control rod end from the fuel/air control unit.
- (2) Loosen jam nut and adjust rod end to obtain desired setting. The witness hole in the rod end must be covered with the mixture cable threads.
- (3) Tighten the jam nut.
- (4) Connect rod end to throttle body. If necessary, you can reposition the mixture control housing in the mixture control bracket clamp.
 - (a) Torque the nut to 30 inch pounds and then continue to tighten the nut until the cotter pin hole aligns with the castellations in the nut.
 - (b) Do not torque the nut to more than 50 inch pounds.
- (5) Install the cotter pin.

4. Fuel Mixture Control Inspection/Check

A. Fuel Mixture Control Inspection

- (1) Do a check of the fuel mixture control attachment to the throttle body. Make sure that the bolt, castellated nut, cotter pin, and rod end are correctly attached and in good condition. The witness hole in the rod end must be covered with the mixture cable threads.
- (2) Make sure that the fuel mixture control moves smoothly through the full range of travel.
- (3) Make sure that the fuel mixture arm operates correctly through the full range of travel.
- (4) Make sure that the fuel mixture control adjusts through the full vernier range.

Figure 201 : Sheet 1 : Fuel Mixture Control



ENGINE INDICATING - GENERAL

1. Scope

- A. This chapter tells how the components are used to measure and show engine output.

2. Definition

- A. The sections divided in this chapter help the maintenance technicians to find information. Refer the Table of Contents to further help locate the applicable subject.
 - (1) The section about the tachometer tells how the engine RPM is measured.
 - (2) The section on the engine temperature system tells how the engine temperature is monitored and measured.

TACHOMETER - MAINTENANCE PRACTICES

Lycoming

1. Description and Operation

- A. On airplanes with standard avionics, the engine speed (RPM) is measured by an indicator found in the cockpit. The tachometer maintenance practices give removal and installation procedures for the tachometer and drive cable.
- B. On airplanes with Garmin G1000, the engine speed (RPM) is measured by the tachometer sending unit and changed to an electrical signal. The Garmin Control Display Units (CDU) display the engine speed. The tachometer maintenance practices give removal and installation procedures for the tachometer sending unit.

2. Tachometer and Drive Cable Removal/Installation

NOTE: Airplanes without Garmin G1000 have a tachometer and drive cable.

- A. Remove Tachometer and Drive Cable (Refer to [Figure 201](#)).
 - (1) On backside of instrument panel, disconnect drive cable from tachometer.
 - (2) Disconnect electrical connector (J1014) from backside of tachometer.
 - (3) Remove screws securing tachometer to instrument panel and remove tachometer.
 - (4) Remove upper engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).
 - (5) Disconnect drive cable at rear of accessory case.
 - (6) Remove two screws securing firewall shield to firewall.
 - (7) Withdraw drive cable through firewall.
- B. Install Tachometer and Drive Cable (Refer to [Figure 201](#)).
 - (1) Install drive cable through firewall.

NOTE: Apply a layer of sealant (Dapco 2100) to the firewall through which the drive cable passes.
 - (2) Connect drive cable to accessory case housing.
 - (3) Install firewall shield to firewall using screws.
 - (4) Install tachometer to instrument panel using four screws.
 - (5) Connect electrical connector (J1014) to tachometer.
 - (6) Connect drive cable to backside of tachometer.
 - (7) Reinstall upper engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

3. Tachometer Sending Unit Removal/Installation

NOTE: Airplanes with Garmin G1000 have a tachometer sending unit.

- A. Remove the Tachometer Sending Unit (Refer to [Figure 202](#)).
 - (1) Make sure the MASTER switch is in the off position.
 - (2) Remove the top cowl. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).
 - (3) Disconnect the electrical connector (PN025).
 - (4) Loosen the knurled nut.
 - (5) Remove the tachometer sending unit from the airplane.
- B. Install the Tachometer Sending Unit (Refer to [Figure 202](#)).
 - (1) Put the tachometer sending unit in position on the airplane.
 - (2) Tighten the knurled nut with your hand.
 - (3) Use a marker to make the index marks on the knurled nut and engine threaded boss.
 - (4) Use an applicable tool to tighten the knurled nut until the index marks mismatch by 0.125 to 0.25 inch (3.175 to 6.35 mm).
 - (a) Apply the torque seal between the knurled nut and engine threaded boss.
 - (5) Connect the electrical connector (PN025).

NOTE: If irregular tachometer indications have occurred, the use of Stabilant 22 contact enhancer on the electrical connector (PN025) can possibly decrease the occurrence of these indications.
 - (6) Install the side cowl. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

Figure 201 : Sheet 1 : Tachometer Installation

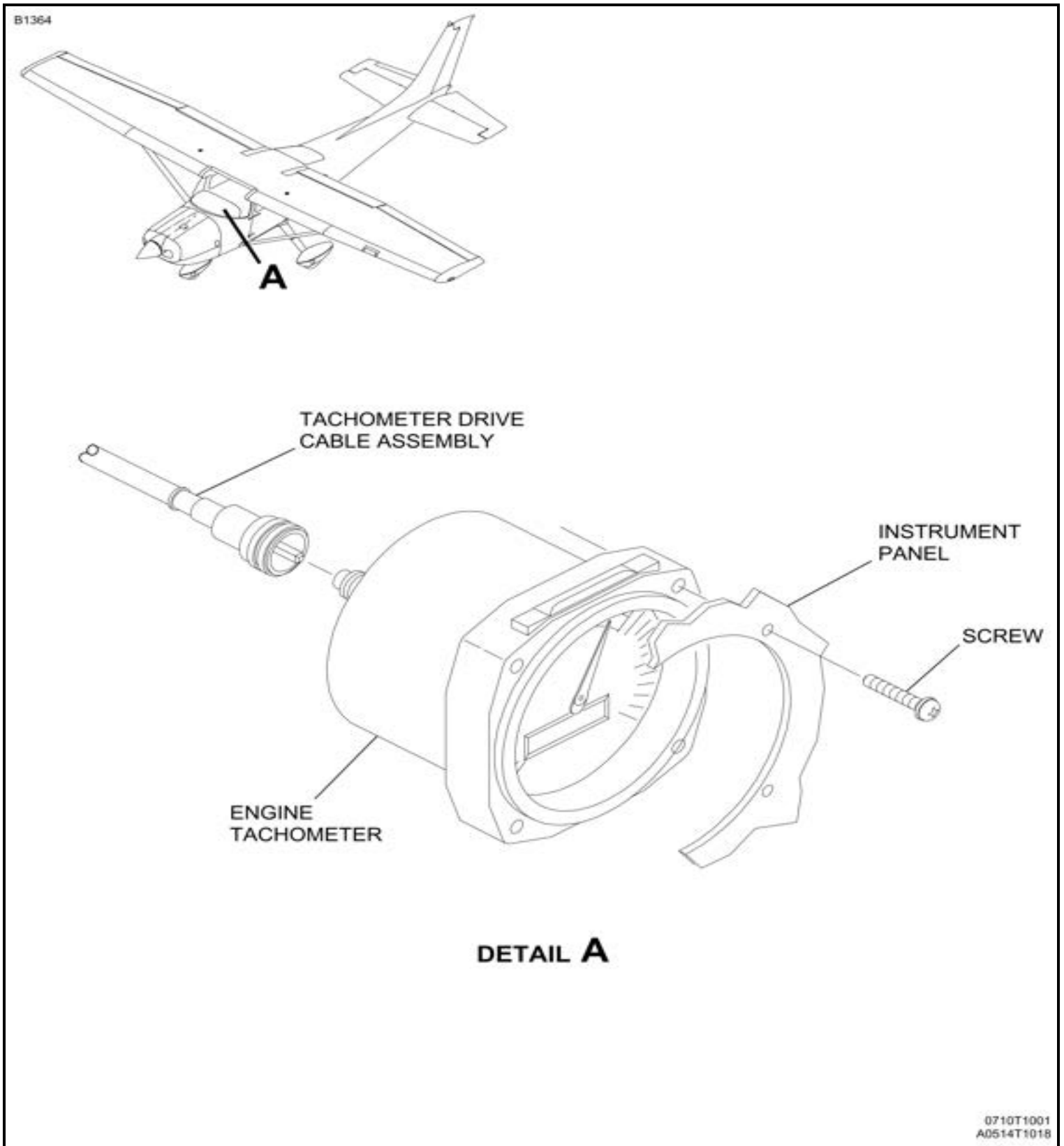
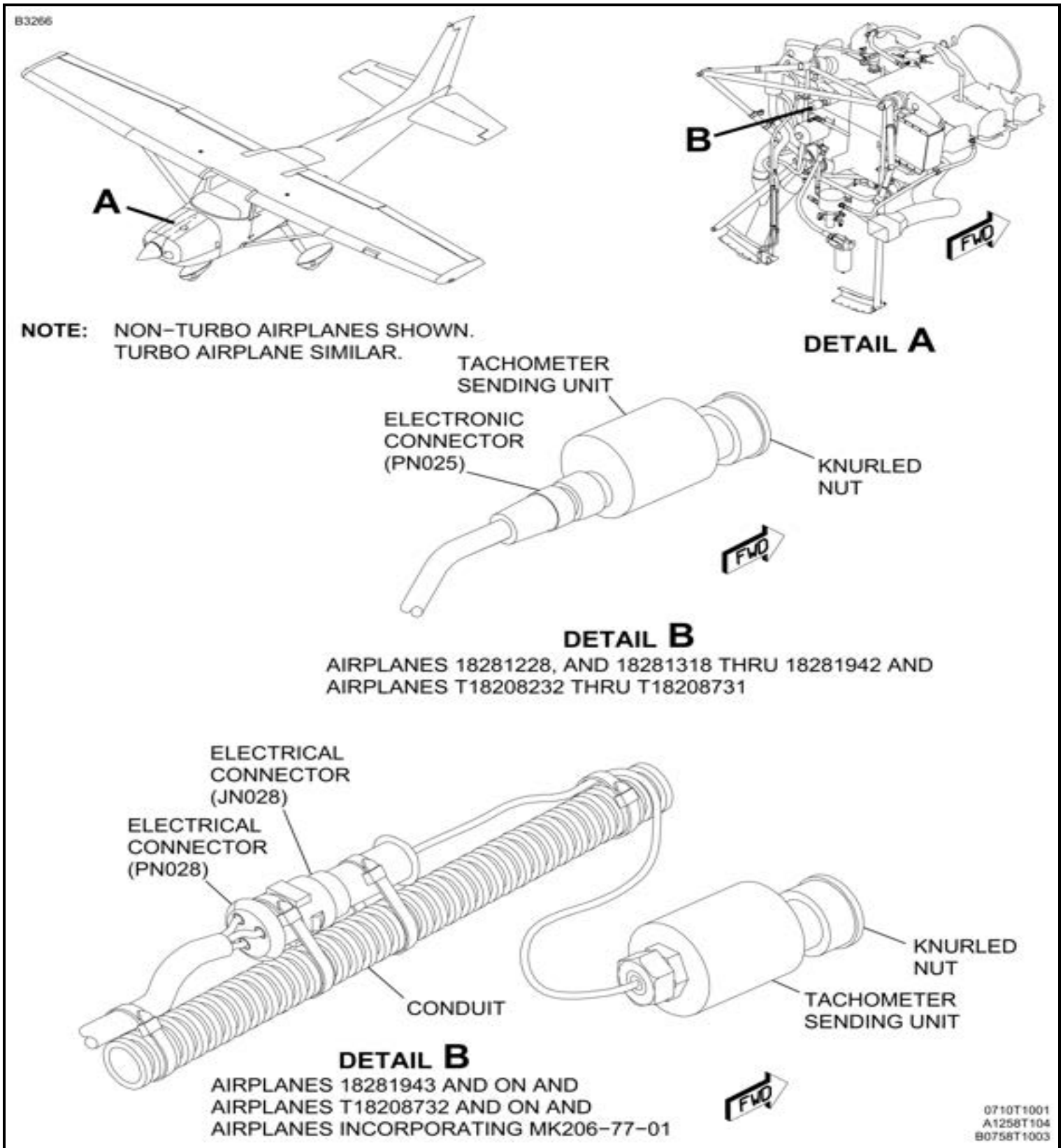


Figure 202 : Sheet 1 : Tachometer Sending Unit Installation



ENGINE TEMPERATURE - DESCRIPTION AND OPERATION**1. Description**

- A. The section that follows has removal and installation procedures for the system which will show different temperatures in the engine. The system that shows the temperature for the engine includes the indicators and probes for the Cylinder Head Temperature (CHT), Exhaust Gas Temperature (EGT) for the non-turbo airplanes, and the Turbine Inlet Temperature (TIT) for airplanes with a turbo engine.

2. Operation

- A. Non-Turbocharged Airplanes.
 - (1) On the non-turbocharged airplanes, the EGT system is used to measure the temperature of the exhaust gas. The measurement gives an indication of the fuel/air mixture for the pilot. The system has one indicator installed in the instrument panel, which gives the two functions that show the EGT and CHT information. A probe installed in the exhaust and a probe installed in a cylinder, send the temperature information to the TIT/CHT indicator. On airplanes with Garmin G1000, each cylinder has EGT and CHT probes.
- B. Turbocharged Airplanes.
 - (1) On turbocharged airplanes, the TIT system is used to measure temperature of the exhaust gas as it enters the turbine. The measurement gives an indication of the fuel/air mixture for the pilot. The system has one indicator installed in the instrument panel, which gives two functions that show the TIT and CHT information. A probe installed in the turbine inlet and a probe installed in a cylinder, send the temperature information to the TIT/CHT indicator. On airplanes with Garmin G1000, each cylinder has EGT and CHT probes.

ENGINE TEMPERATURE - MAINTENANCE PRACTICES

Lycoming

1. General

- A. Maintenance of the engine temperature system includes the removal and installation of the different components.

2. EGT/CHT Indicator Removal/Installation

NOTE: The procedures that follow are for airplanes without Garmin G1000.

- A. Remove the EGT/CHT Indicator (Refer to [Figure 201](#)).
- (1) Set the ALT/BAT MASTER switch to the off position.
 - (2) Remove the outboard pilot panel. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (3) Disconnect the plug connector (JI017) from the rear of the indicator.
 - (4) Remove the indicator from the instrument panel.
- B. Install the EGT/CHT Indicator (Refer to [Figure 201](#)).
- (1) Install the indicator in the instrument panel.
 - (2) Connect the plug connector (JI017) to the rear of the indicator.
 - (3) Install the outboard pilot panel. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (4) Set the ALT/BAT MASTER switch to the ON position.
 - (5) Make sure the EGT/CHT Indicator light operates correctly.

3. TIT/CHT Indicator Removal/Installation

NOTE: The procedures that follow are for airplanes without Garmin G1000.

- A. Remove the TIT/CHT Indicator (Refer to [Figure 201](#)).
- (1) Set the ALT/BAT MASTER switch to the off position.
 - (2) Remove the outboard pilot panel. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (3) Disconnect the plug connector (JI018) from the rear of the indicator.
 - (4) Remove the indicator from the instrument panel.
- B. Install the TIT/CHT Indicator (Refer to [Figure 201](#)).
- (1) Install the indicator in the instrument panel.
 - (2) Connect the plug connector (JI018) to the rear of the indicator.
 - (3) Install the outboard pilot panel. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (4) Set the ALT/BAT MASTER switch to the ON position.
 - (5) Make sure the TIT/CHT Indicator light operates correctly.

4. EGT Probe Removal/Installation

- A. Remove The EGT Probe (Refer to [Figure 202](#) or [Figure 203](#)).

NOTE: The EGT probe is welded to the clamp.

NOTE: Airplanes with the Garmin G1000 have an EGT probe at each cylinder. Removal and installation of the EGT probes are typical.

- (1) Remove the engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\)- Maintenance Practices](#).

CAUTION: Make sure the exhaust system and engine are cool before the probes are removed.

- (2) Disconnect the electrical connectors.
 - (3) Cut and remove the safety wire from the EGT probe clamp and screw.
 - (4) Loosen the clamp screw.
 - (5) Remove the clamp with the attached probe from the exhaust pipe.
- B. Install the EGT Probe (Refer to [Figure 202](#) or [Figure 203](#)).
- (1) Attach the clamp with the EGT probe to the exhaust pipe.
 - (2) Tighten the screw for the clamp
 - (3) Attach safety wire to the EGT probe clamp and screw.

- (4) Connect the electrical connectors.
- (5) Attach the connectors together with a tie strap.
- (6) Install the engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\)- Maintenance Practices](#).
- (7) Make sure the EGT operates correctly. Refer to the Pilot's Operating Handbook.

5. EGT Probe Lead Wire Repair

A. EGT Probe Lead Wire Repair.

- (1) Remove the screws to separate the EGT terminal connector housing.
- (2) Cut the broken wire to a good termination.
- (3) Make both wires the same length.
- (4) Remove the insulation to get 1/4 inch of good wire strands.
- (5) Replace the terminal connector housing if it is damaged.
- (6) Wrap the wire around the terminal screws and tighten the screws.
 - (a) Make sure to keep the original polarity (red wire to the alumel (negative) terminal, yellow wire to the chromel (positive) terminal).
- (7) Make sure the strain relief bracket is installed.

CAUTION: Damage to the lead wire can occur because of engine movement during startup and shutdown if there is not sufficient length in the lead wire.

- (8) Make sure the lead wire has sufficient length.
- (9) Do an operational check of the EGT indication on the ground.

6. TIT Probe Removal/Installation

A. Remove the TIT Probe (Refer to [Figure 204](#)).

- (1) Remove the engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\)- Maintenance Practices](#).

CAUTION: Make sure the exhaust system and engine are cool before the probes are removed.

- (2) Disconnect the electrical connectors.
- (3) Remove the TIT probe from the turbine inlet.

B. Install the TIT Probe (Refer to [Figure 204](#)).

- (1) Install the TIT probe to the turbine inlet.
- (2) Connect the electrical connectors.
- (3) Attach the connectors together with a tie strap.
- (4) Install the engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\)- Maintenance Practices](#).
- (5) Make sure the TIT operates correctly. Refer to the Pilot's Operating Handbook.

7. CHT Probe Removal/Installation

NOTE: The CHT probes use a bayonet style connector.

A. Remove the CHT Probe (Refer to [Figure 202](#) or [Figure 203](#)).

NOTE: Airplanes with the Garmin G1000 have a CHT probe at each cylinder. Removal and installation of the CHT probes is typical.

- (1) Remove the engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\)- Maintenance Practices](#).

CAUTION: Make sure the exhaust system and engine are cool before the probes are removed.

- (2) Remove the terminal nut.
- (3) Disconnect the terminal from the CHT probe.
- (4) Turn the CHT probe to remove from the cylinder head.

B. Install the CHT Probe (Refer to [Figure 202](#) or [Figure 203](#)).

- (1) Install the CHT probe into the cylinder head.
- (2) Connect the terminal on the CHT probe.
- (3) Install the terminal nut.

- (4) Install the engine cowling. Refer to Chapter 71, [Cowl \(Lycoming\)- Maintenance Practices](#).
- (5) Make sure the CHT operates correctly. Refer to the Pilot's Operating Handbook.

Figure 201 : Sheet 1 : EGT/TIT/CHT Indicator Removal/Installation

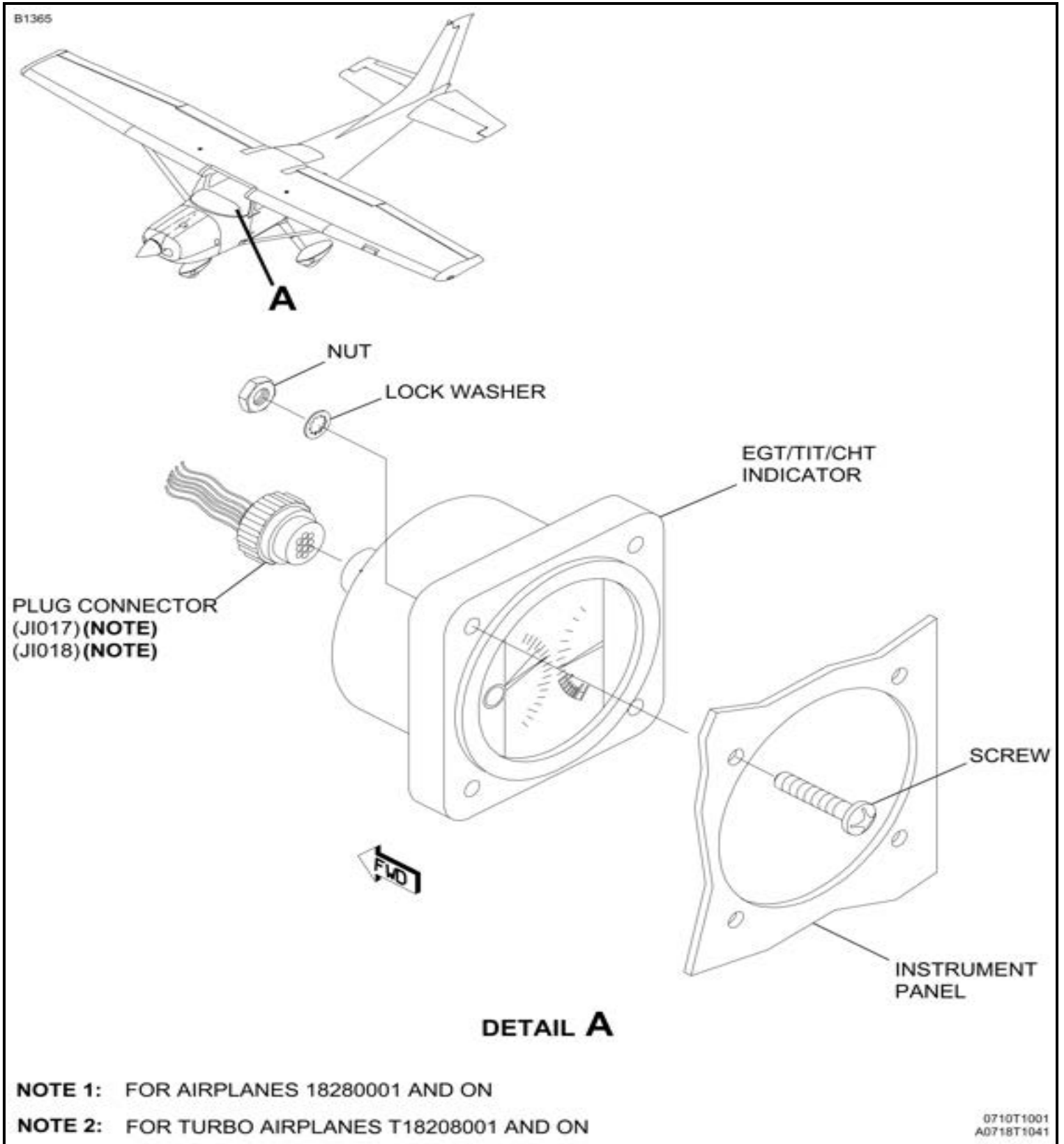


Figure 202 : Sheet 1 : EGT/CHT Probe Location (182S)

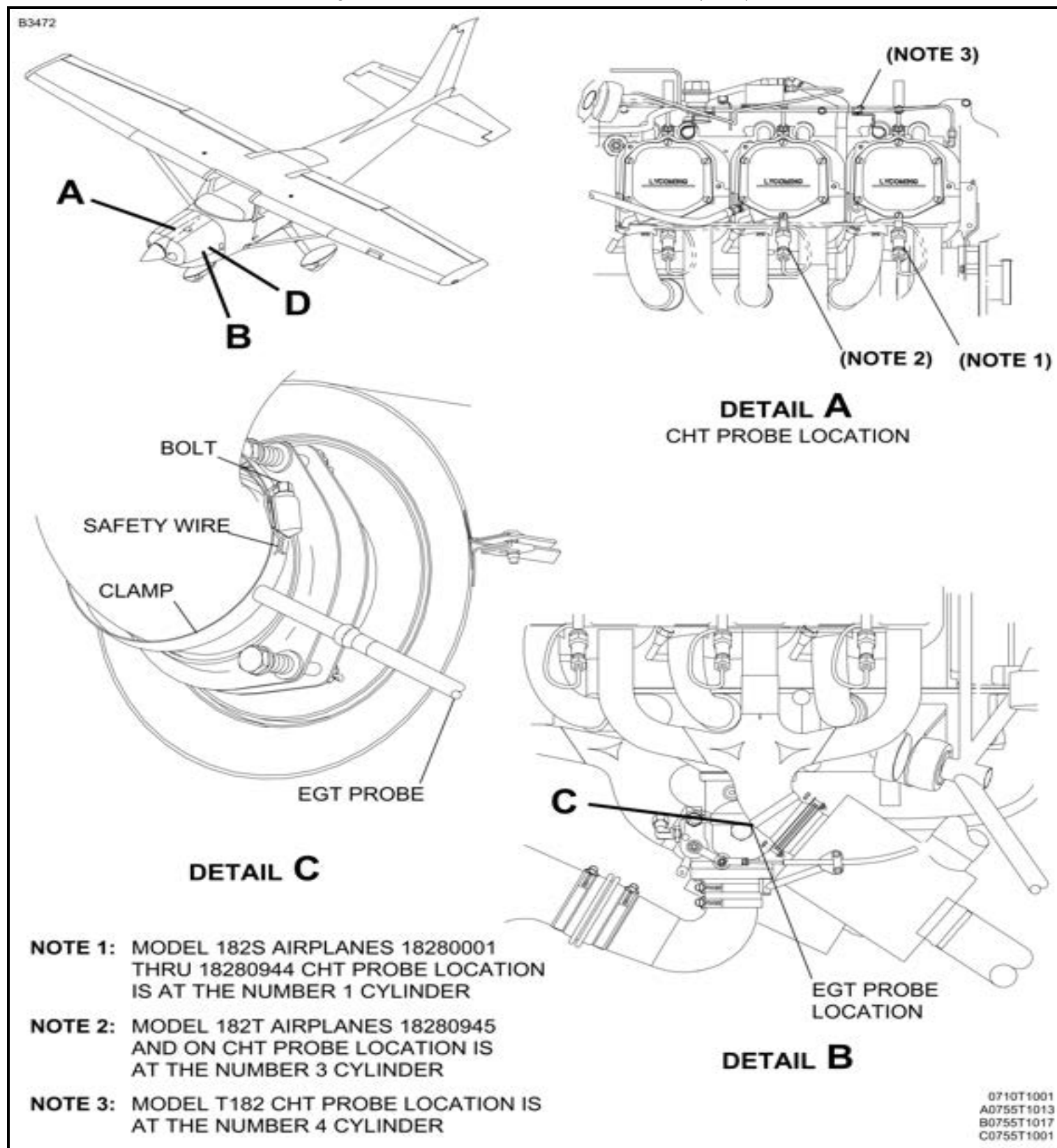


Figure 203 : Sheet 1 : EGT/CHT Probe Location (182T)

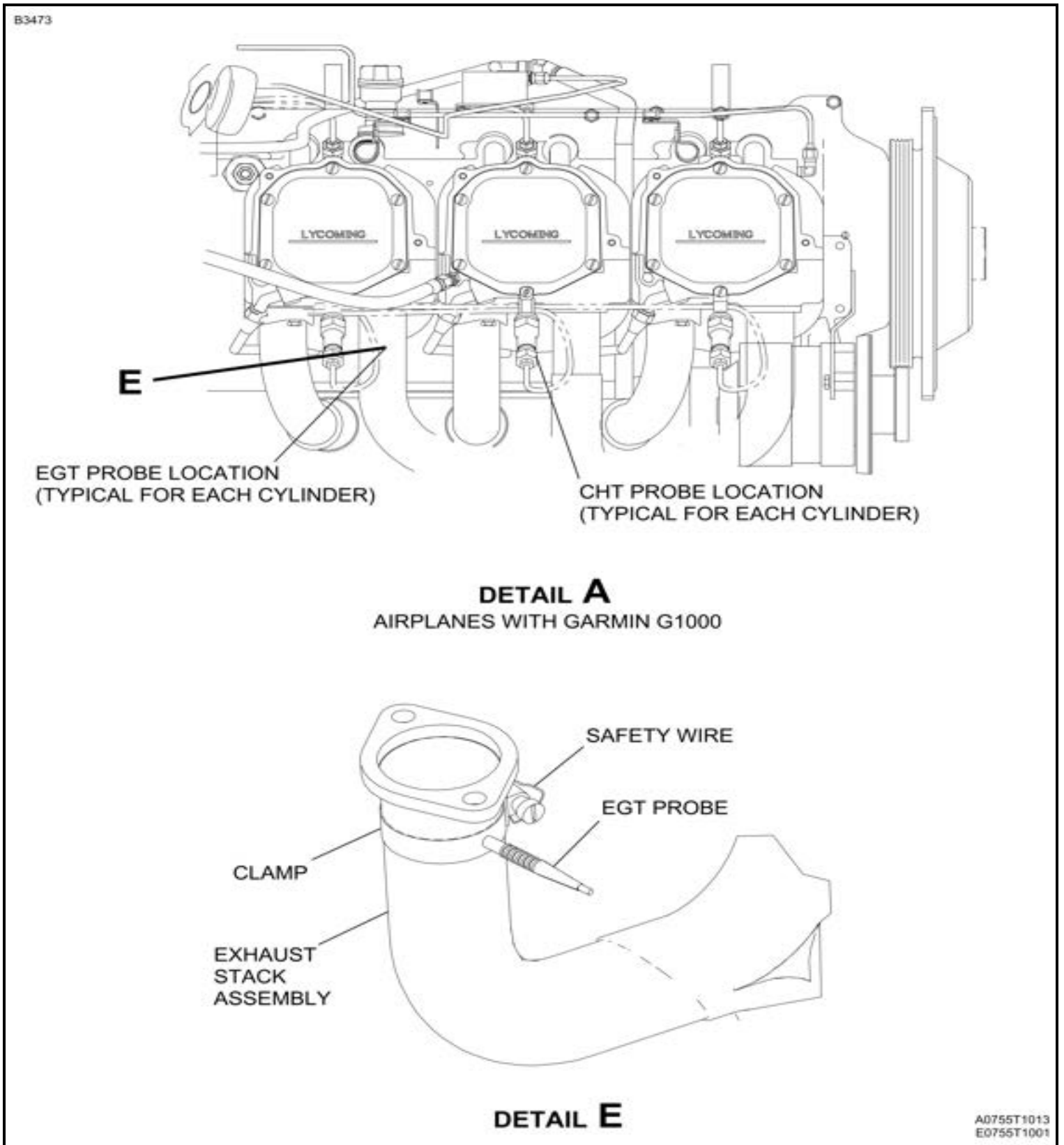
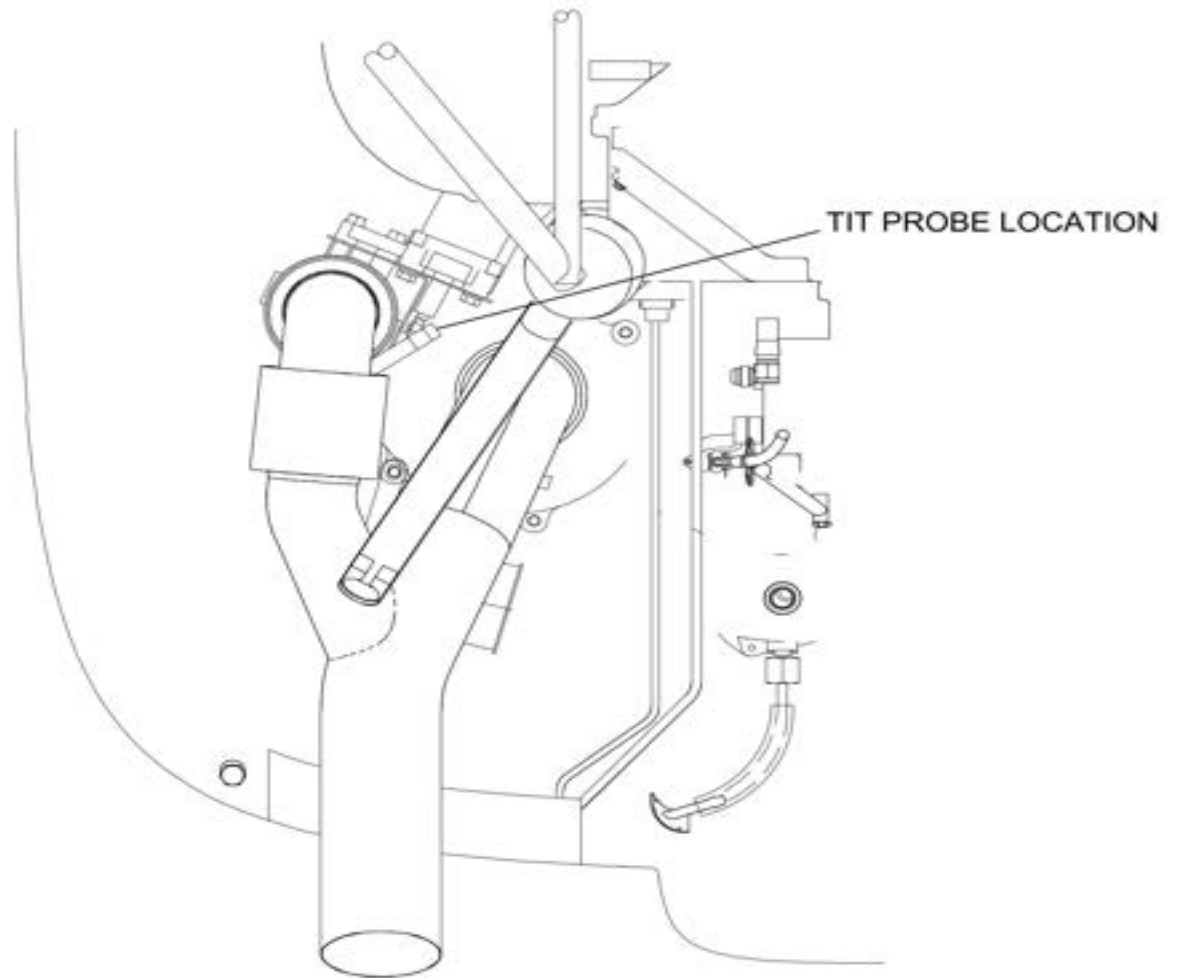


Figure 204 : Sheet 1 : TIT/CHT Probe Location (T182)

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DETAIL D
T182 AIRPLANES

D0755T1016

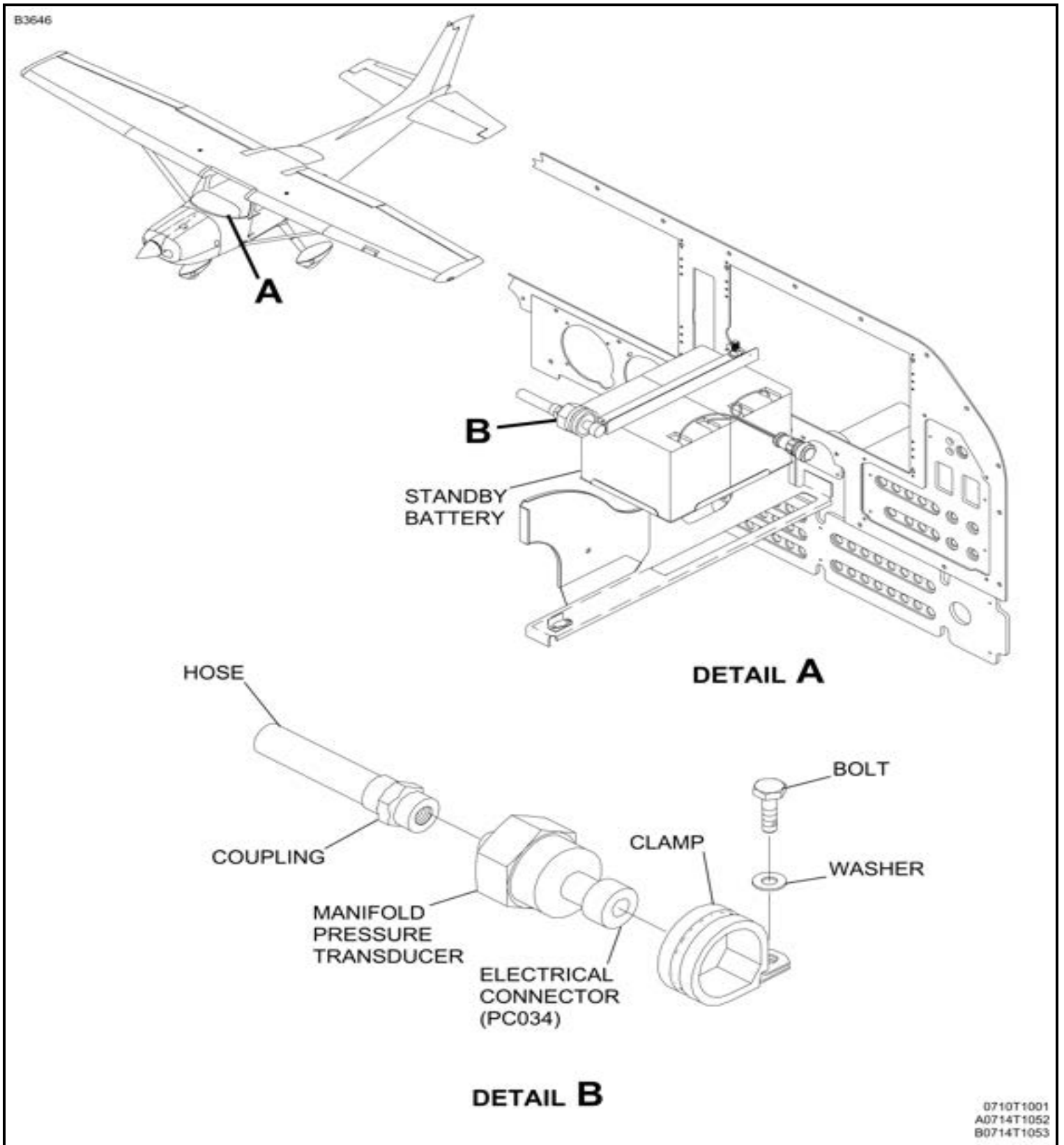
MANIFOLD PRESSURE TRANSDUCER - MAINTENANCE PRACTICES

Lycoming

1. Manifold Pressure Transducer Removal/Installation

- A. Remove the Manifold Pressure Transducer (Refer to [Figure 201](#)).
 - (1) Remove the PFD. Refer to Chapter 34, [Control Display Unit - Maintenance Practices](#).
 - (2) Remove the bolt, washer and clamp that hold the manifold pressure transducer in position.
 - (3) Disconnect the pressure line and electrical connector.
 - (4) Remove the manifold pressure transducer.
- B. Install the Manifold Pressure Transducer (Refer to [Figure 201](#)).
 - (1) Connect the pressure line and electrical connector.
 - (2) Put the manifold pressure transducer in position.
 - (3) Install the bolt, washer and clamp that hold the manifold pressure transducer in position.
 - (4) Install the PFD. Refer to Chapter 34, [Control Display Unit - Maintenance Practices](#).

Figure 201 : Sheet 1 : Manifold Pressure Transducer Installation



GEA 71 ENGINE/AIRFRAME UNIT - MAINTENANCE PRACTICES

1. Description and Operation

- A. The GEA 71 Engine/Airframe Unit is a microprocessor Line Replaceable Unit (LRU). It is used to monitor sensor inputs and operate annunciator outputs for the airframe and engine systems.
- B. The GEA 71 is an interface for different sensors on the airplane and gives airframe and engine information through a digital interface to the GIA 63 Integrated Avionics Units (IAUs). The GIA 63's are then an interface with the GDU 1040 Primary Flight Display (PFD) and Multi-Function Display (MFD). Typically, the MFD gives engine information while the PFD gives airframe alerts from the GEA 71. Engine and airframe information is also shown on the PFD and/or MFD, while the system is in the reversionary mode.
- C. The PFD and MFD displays operate as the user for the GEA 71. All configuration adjustments are controlled by software adjustments through the MFD and PFD displays.

2. General

- A. The maintenance procedures that follow are for the removal and installation of the engine/airframe unit.

3. GEA 71 Engine/Airframe Unit Removal/Installation

- A. Engine/Airframe Unit Removal (Refer to [Figure 201](#)).
 - (1) Put the AVIONICS MASTER switch in the off position.
 - (2) Remove the MFD. Refer to Chapter 34, [Control Display Unit - Maintenance Practices](#).
 - (3) Remove the screws that attach the engine/airframe unit to the structure.
 - (4) Remove the engine/airframe unit from the airplane.
- B. Engine/Airframe Unit Installation (Refer to [Figure 203](#)).
 - (1) Put the engine/airframe unit in position.
 - (2) Attach the engine/airframe unit to the structure with the screws.
 - (3) Install the MFD. Refer to Chapter 34, [Control Display Unit - Maintenance Practices](#).
 - (4) If applicable, put the AVIONICS MASTER switch in the ON position.
 - (5) Do a check to make sure the engine/airframe unit operates correctly. Refer to the Garmin G1000 Line Maintenance Manual.

Figure 201 : Sheet 1 : Forward Avionics Equipment Installation

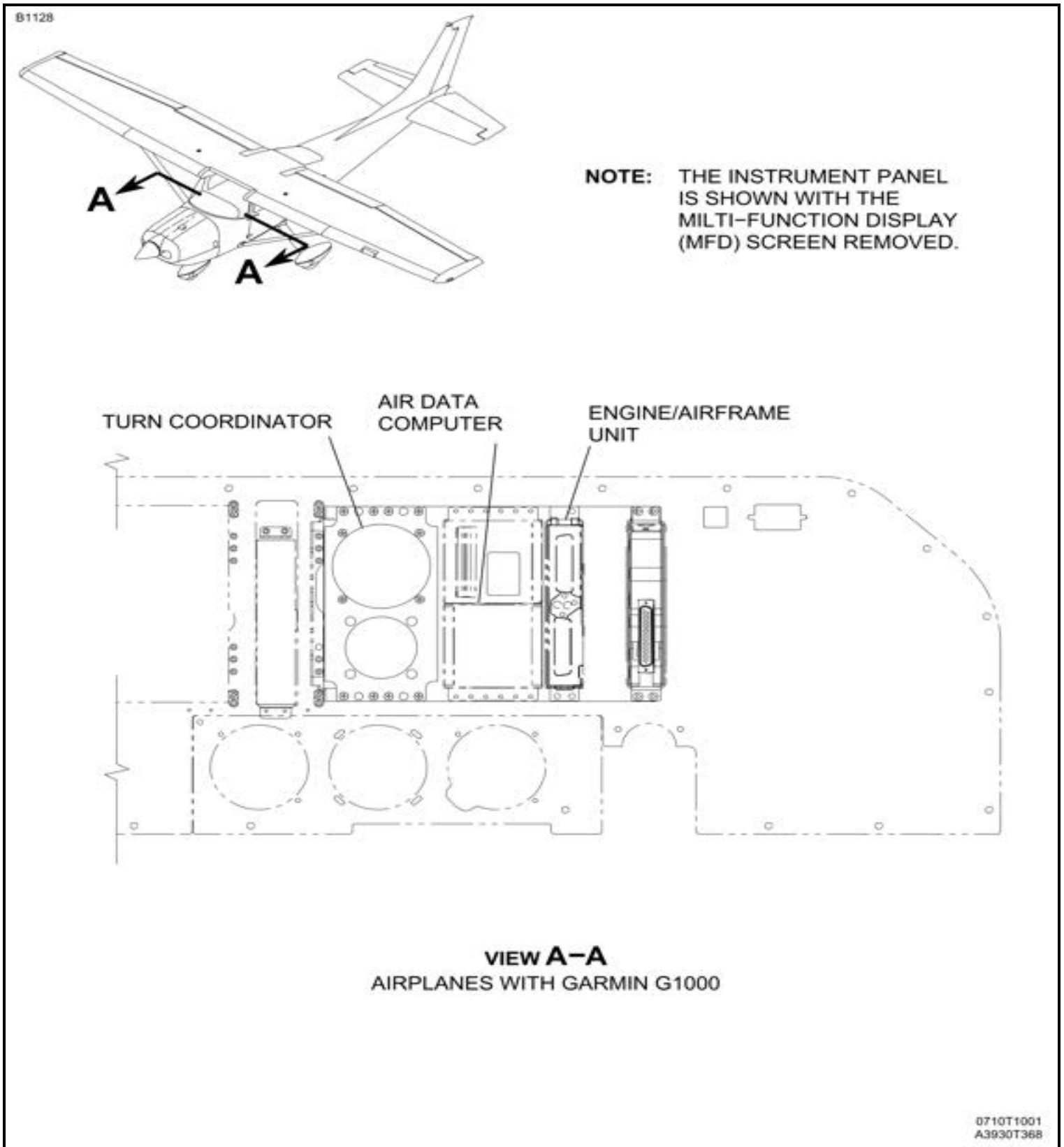
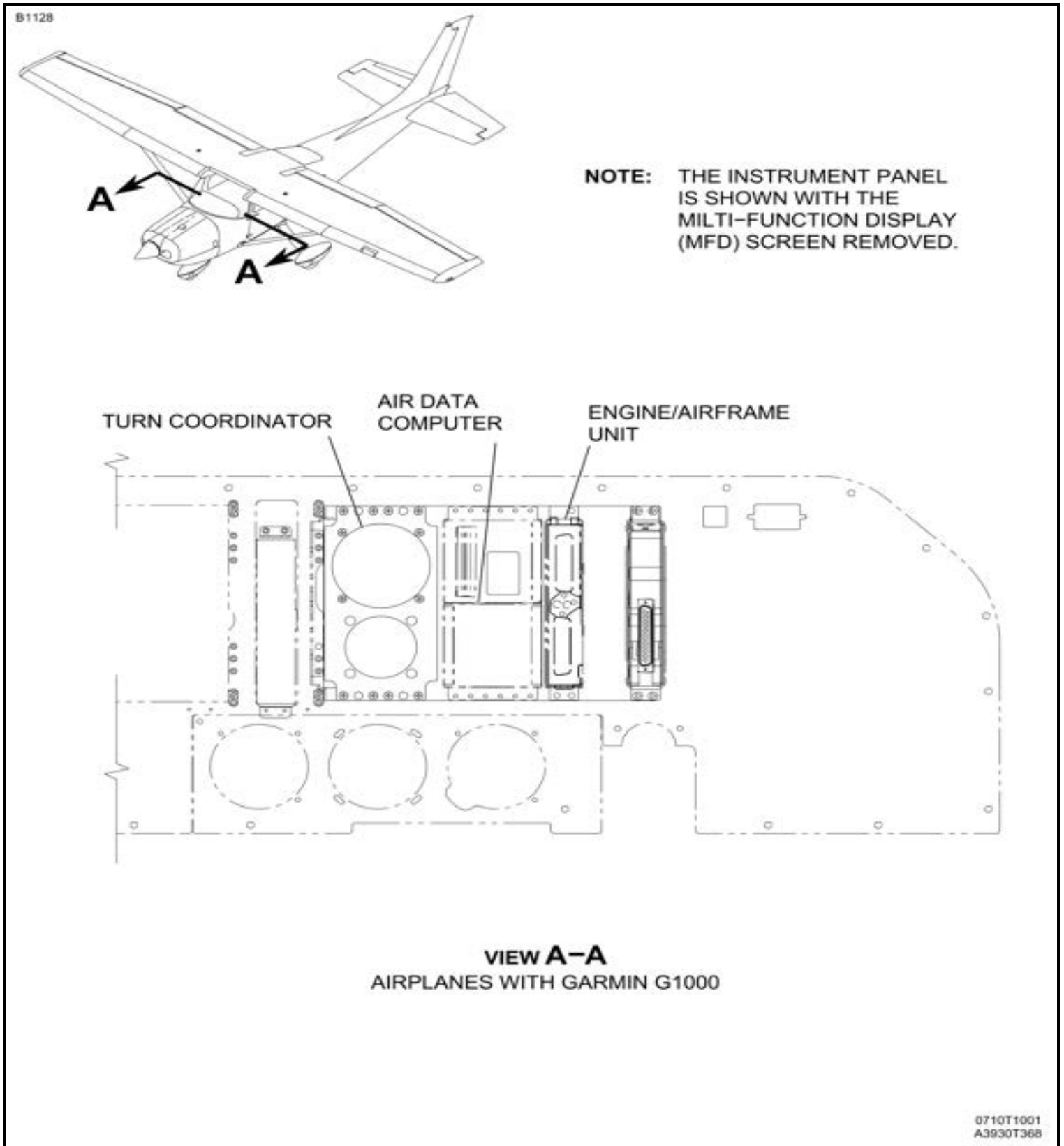


Figure 203 : Sheet 1 : Turn Coordinator Installation (Airplanes with Garmin G1000)



OIL - GENERAL

1. Scope

- A. This chapter provides maintenance instructions for those components which distribute oil and which indicate oil condition. For information beyond the scope of this material, refer to appropriate Textron Lycoming Operator's and Overhaul Manuals, and to Chapter 71, [Engine - Troubleshooting](#).

2. Definition

- A. This chapter is divided into sections to assist maintenance personnel in locating specific information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.
 - (1) The section on distribution provides information on removal and installation of the external oil cooler.
 - (2) The section on indicating provides information on indicators, transducers and switches used to indicate oil temperature and pressure.

OIL COOLER - MAINTENANCE PRACTICES

Lycoming

1. General

- A. This section provides maintenance instructions for removal and installation of the externally mounted oil cooler.

2. Oil Cooler Removal/Installation

- A. Remove Oil Cooler (Refer to [Figure 201](#)).

- (1) Remove upper cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).
- (2) Label and disconnect inlet and outlet hoses leading into oil cooler.
- (3) Remove bolts, washers and spacers securing oil cooler to back of engine baffles.

- B. Install Oil Cooler (Refer to [Figure 201](#)).

- (1) Secure oil cooler and hose clamp to rear of engine baffles using bolts, spacers and washers.
- (2) Attach inlet and outlet hoses to oil cooler.
- (3) Install upper cowling. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

Figure 201 : Sheet 1 : Oil Cooler Installation

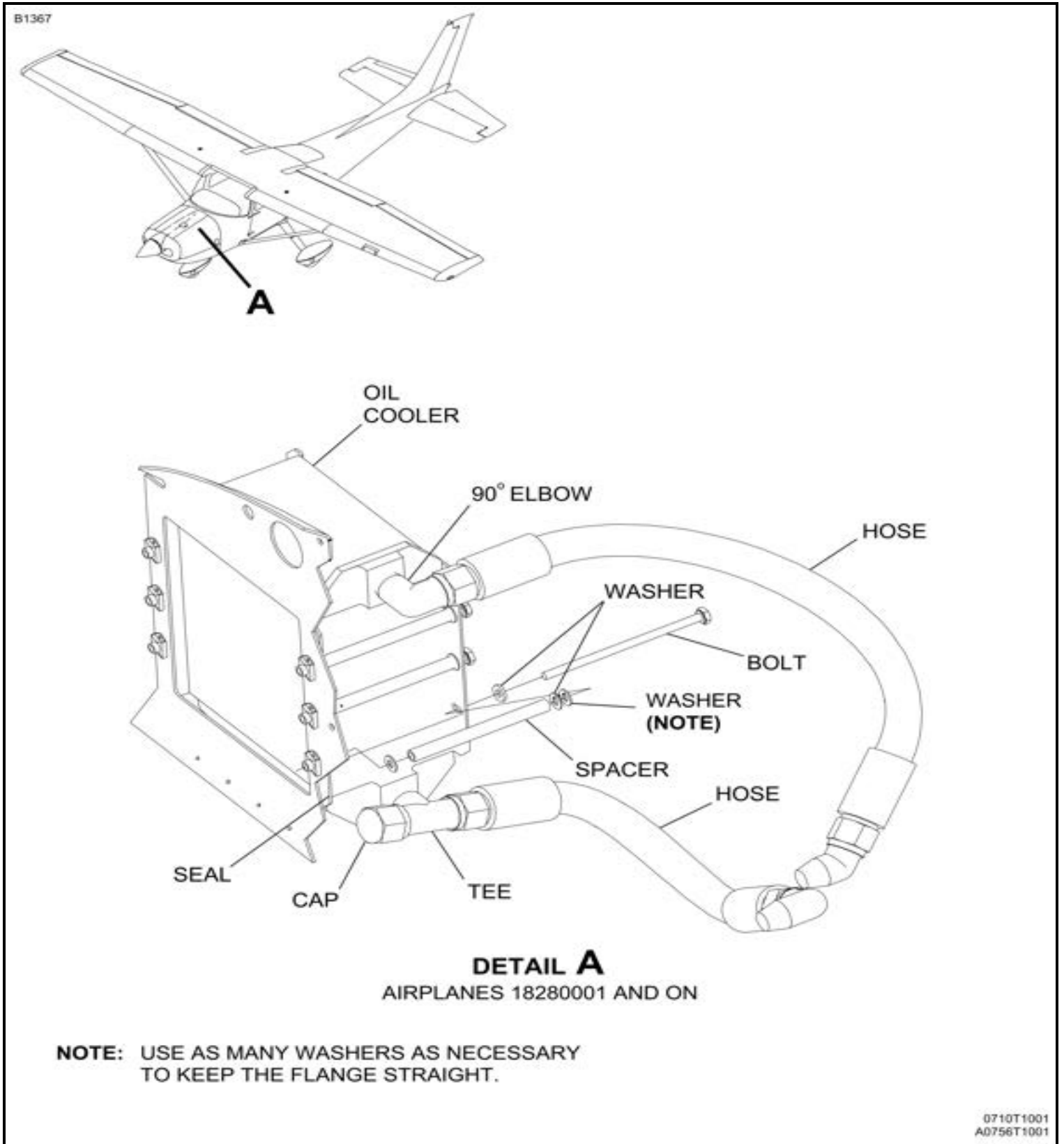
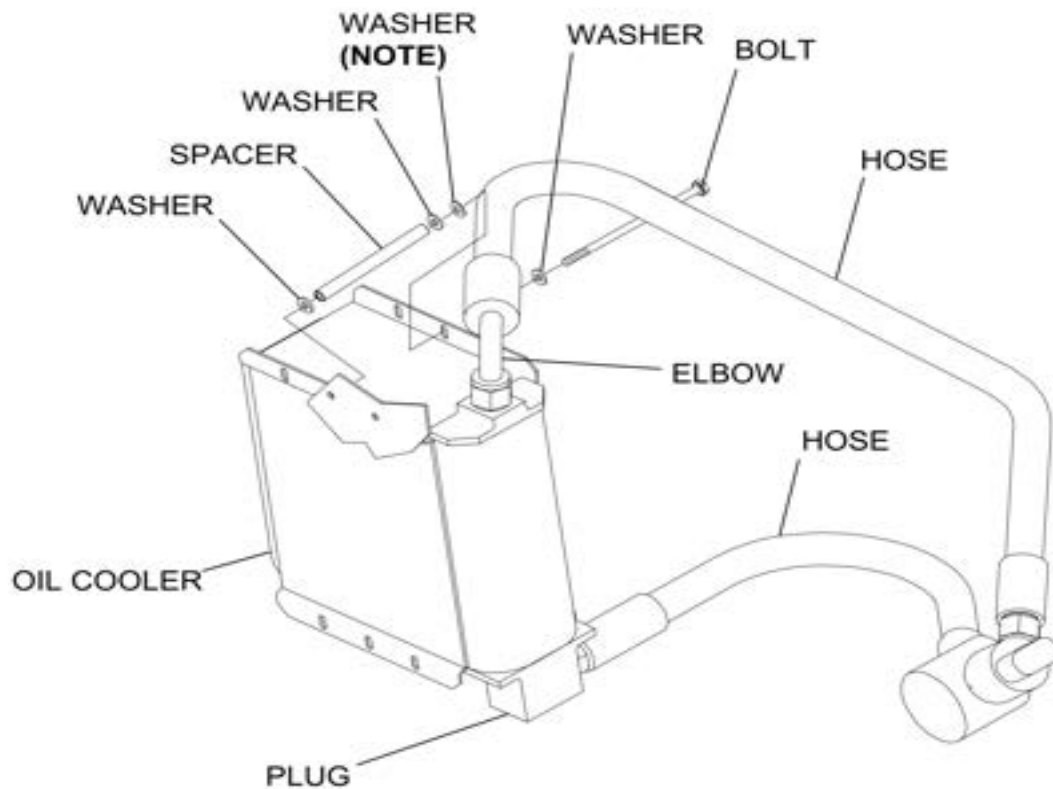


Figure 201 : Sheet 2 : Oil Cooler Installation



DETAIL A
AIRPLANES T18208001 AND ON

NOTE: USE AS MANY WASHERS AS NECESSARY
TO KEEP THE FLANGE STRAIGHT.

A0756T1001

AIR/OIL SEPARATOR ASSEMBLY - MAINTENANCE PRACTICES

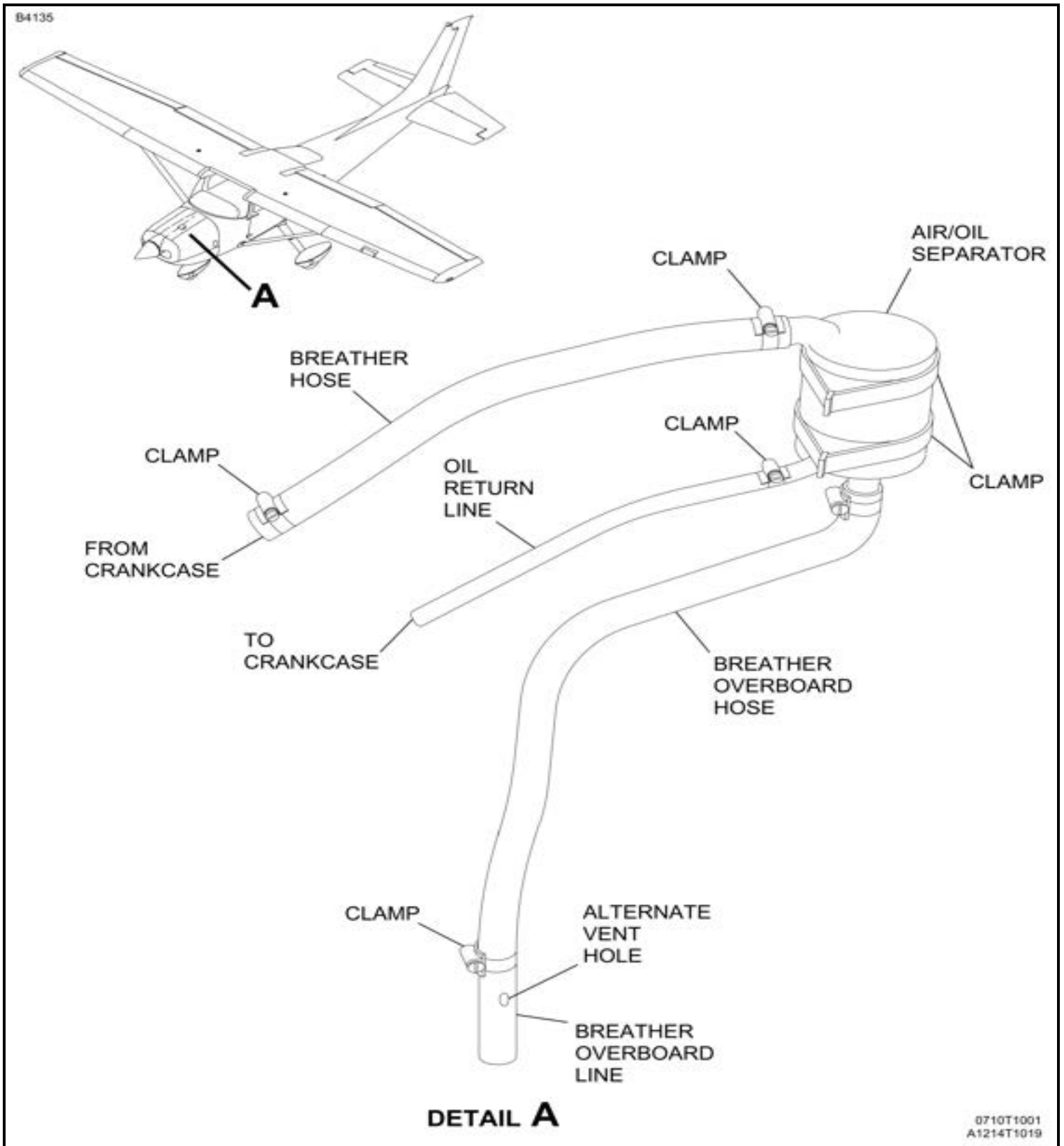
1. General

- A. Turbocharged airplanes have an air/oil separator assembly installed in the breather system. During engine operation, air pressure collects in the crankcase and it is necessary to release that pressure. The air/oil separator removes oil from the air before it is released through the breather overboard line. After the air/oil separator removes the oil from the air, the oil is put back in the crankcase where it is used again. The separator assembly has three hoses. One connects the separator to the crankcase breather line, one connects the separator to the crankcase oil return line, and one connects the separator to the breather overboard line.

2. Air/Oil Separator Assembly Removal and Installation

- A. Air/Oil Separator Assembly Removal. Refer to [Figure 201](#).
- (1) Remove the upper cowling to get access to the engine compartment. Refer to Chapter 71, [Cowls - Maintenance Practices](#).
 - (2) Turn the screws on the clamps that connect the hoses to the air/oil separator counterclockwise to loosen them.
 - (3) Disconnect the hoses from the oil breather.
 - (4) Turn the screws on the clamps that connect the air/oil separator to the engine baffle counterclockwise to loosen them.
 - (5) Remove the air/oil separator from the airplane.
- B. Air/Oil Separator Assembly Installation. Refer to [Figure 201](#).
- (1) Put the air/oil separator in the clamps that attach it to the engine baffle.
 - (2) Turn the screws on the clamps that connect the air/oil separator to the engine clockwise to tighten them.
 - (3) Connect the hoses to the air/oil separator.
 - (4) Turn the screws on the clamps that connect the hoses to the air/oil separator clockwise to tighten them.
 - (5) Install the upper cowling. Refer to Chapter 71, [Cowls - Maintenance Practices](#).

Figure 201 : Sheet 1 : Air/Oil Separator Assembly Installation



OIL PRESSURE INDICATORS - MAINTENANCE PRACTICES

1. Description and Operation

- A. Oil pressure is measured at two distinct points on the engine and provides both indicator readings and low oil pressure annunciation.
 - (1) The oil pressure indicator system is comprised of an oil pressure line, a transducer and a cockpit mounted combination pressure/temperature indicator. Oil for the system is tapped at the upper right side of the case. This oil is routed, via rigid line, to a transducer mounted on the rear baffle area. This transducer produces an electrical signal which is routed to the cockpit mounted oil pressure/oil temperature indicator.
 - (2) The low oil pressure annunciation system is comprised of a pressure switch and associated wiring. The switch is mounted on the upper right rear of the engine block. It is configured so that when oil pressure is below 20 PSI, a ground is supplied to the instrument panel mounted annunciator. This causes the OIL PRESS light to illuminate on the annunciator. When oil pressure is greater than 20 PSI, the ground switches to the hobbs meter, activating the meter and extinguishing the OIL PRESS light.

2. Oil Pressure Indicator and Transducer Removal/Installation

- A. Remove Oil Pressure Indicator (Refer to [Figure 201](#)).
 - (1) Ensure electrical power to airplane is off.
 - (2) Remove screws securing indicator to instrument panel.
 - (3) Unscrew electrical connector from backside of indicator.
 - (4) Carefully withdraw indicator from backside of instrument panel.
- B. Install Oil Pressure Indicator (Refer to [Figure 201](#)).
 - (1) Connect electrical connector to backside of indicator.
 - (2) Position indicator to instrument panel.
 - (3) Secure to panel using screws.
- C. Remove Transducer (Refer to [Figure 201](#)).
 - (1) Remove upper cowling. Refer to Chapter 71, [Cowls - Maintenance Practices](#).
 - (2) Disconnect oil pressure line at transducer.
 - (3) Disconnect electrical connector from transducer.
 - (4) Remove nut securing transducer to rear of baffle and remove transducer.
- D. Install Transducer (Refer to [Figure 201](#)).
 - (1) Install transducer to rear baffle and secure using nut.
 - (2) Connect electrical connector to transducer.
 - (3) Connect oil line at transducer.
 - (4) Reinstall upper cowling. Refer to Chapter 71, [Cowls - Maintenance Practices](#).

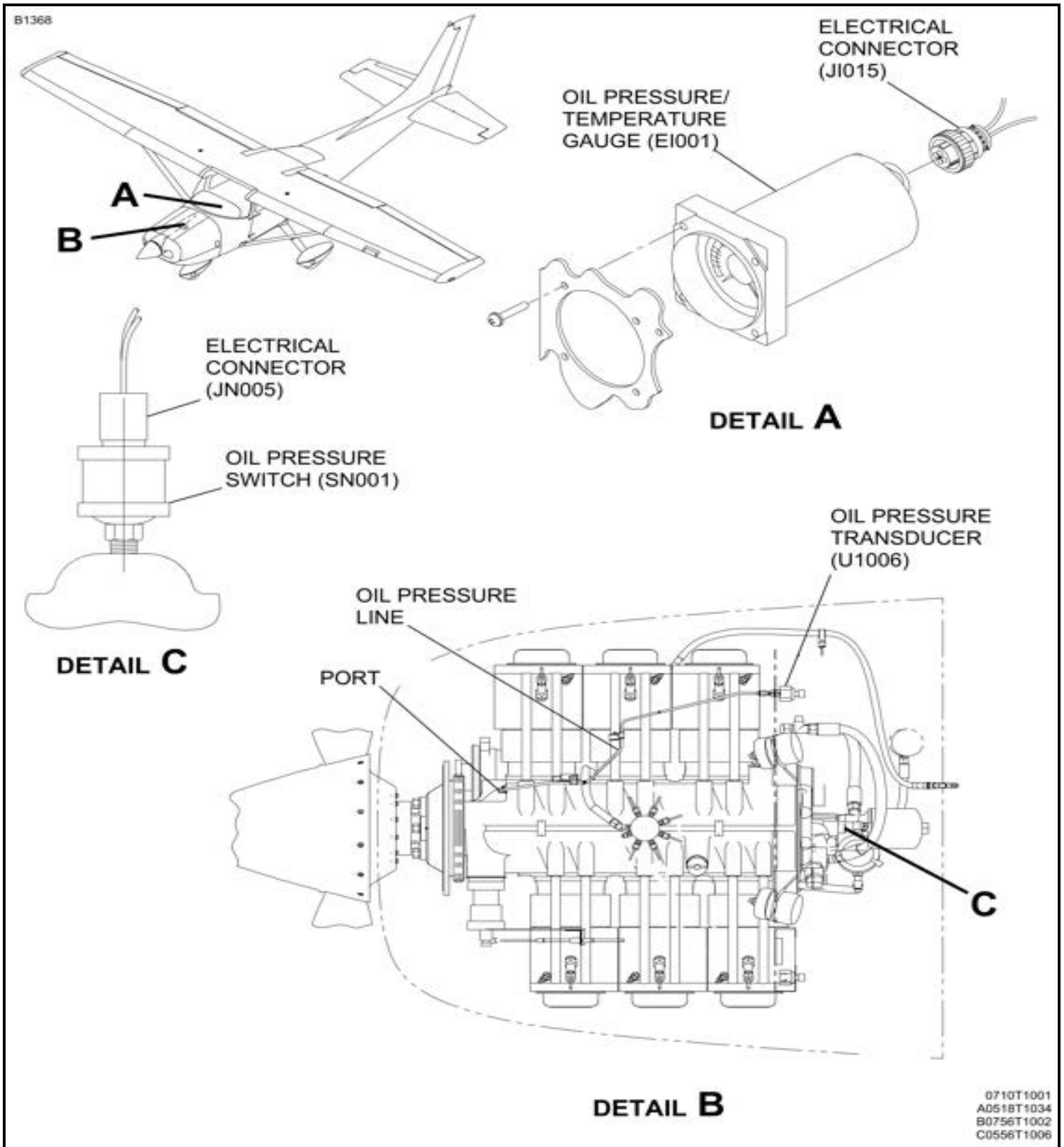
3. Low Oil Pressure Switch Removal/Installation

- A. Remove Switch (Refer to [Figure 201](#)).
 - (1) Ensure electrical power to airplane is off.
 - (2) Remove upper cowling. Refer to Chapter 71, [Cowls - Maintenance Practices](#).
 - (3) Disconnect electrical connector from switch.
 - (4) Unscrew switch from engine block.
- B. Install Switch (Refer to [Figure 201](#)).
 - (1) Using U544006 sealant (or equivalent) on threads, hand tighten new switch.
CAUTION: Do not use Teflon tape.
CAUTION: Clean any sealer or other debris from the switch fitting before installation. Ensure foreign material is removed and clear of the pressure hole in the end of the switch fitting.
 - (2) Use a 7/16 inch wrench to tighten switch approximately 1 to 1 1/2 turns (not to exceed 60 inch pounds) beyond hand tight.
CAUTION: Do not use excessive torque on plastic switch connection housing when hand tightening.

CAUTION: Use only the hex fitting to final tighten. Excessive torque will damage the switch. Do not round the corners of the hex fitting.

- (3) Connect electrical connector to switch.
- (4) Reinstall upper cowling. Refer to Chapter 71, [Cowls - Maintenance Practices](#).

Figure 201 : Sheet 1 : Oil Pressure Indication Installation



OIL TEMPERATURE INDICATOR - MAINTENANCE PRACTICES

1. Description and Operation

- A. The oil temperature system consists of a sending unit, a combination oil temperature/oil pressure indicator and wire connecting the two components. Oil temperature is measured in the accessory case area and provides cockpit readings in °F.

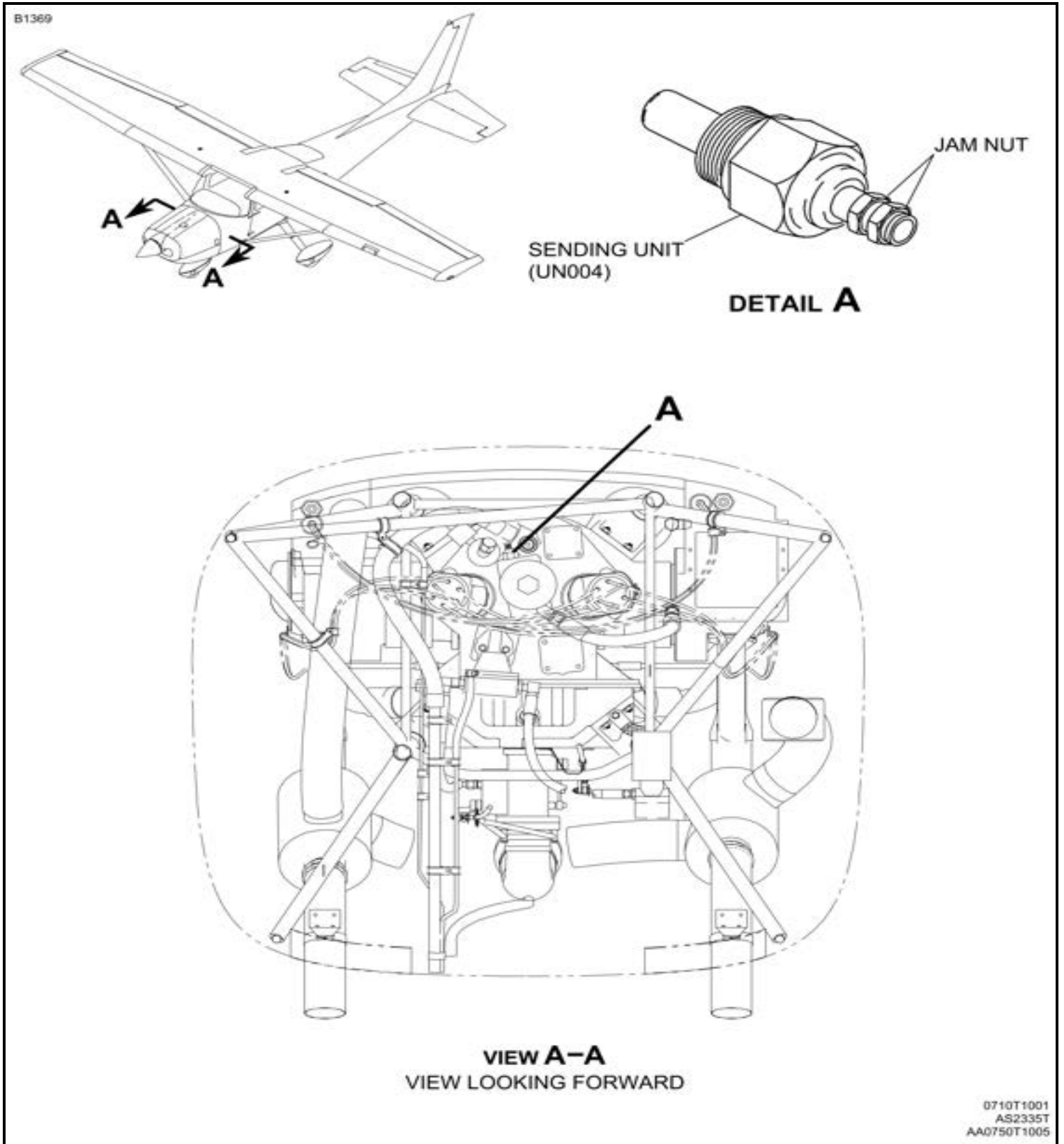
2. Sending Unit Removal/Installation

- A. Remove Sending Unit (Refer to [Figure 201](#)).
 - (1) Remove upper engine cowling. Refer to Chapter 71, [Cowls - Maintenance Practices](#).
 - (2) Disconnect ring terminal wiring at sending unit.
 - (3) Loosen and remove sending unit from accessory case.
- B. Install Sending Unit (Refer to [Figure 201](#)).
 - (1) Reinstall sending unit to accessory case.
 - (2) Attach ring terminal wire to sending unit. Torque jamnut to 20 Inch Pounds, maximum.
 - (3) Install upper engine cowling. Refer to Chapter 71, [Cowls - Maintenance Practices](#).

3. Pressure Indicator Removal/Installation

- A. For removal and installation of the Oil Temperature/Oil Pressure Indicator, refer to [Oil Pressure Indicators - Maintenance Practices](#).

Figure 201 : Sheet 1 : Oil Temperature Installation



TIME LIMITS/MAINTENANCE CHECKS

1. Scope

- A. This chapter provides the time limits and maintenance checks for the Model 182 airplanes. It is divided into several sections, each with a specific purpose toward providing information necessary to establish inspection criteria.
- B. Chapter 4 of this manual is FAA approved and issued separately from the maintenance manual. Some inspection interval and life limit requirements of Chapter 4 possibly will not agree with the current Chapter 5. When there is a conflict between the two chapters, Chapter 4 requirements must always be followed. Chapter 5 requirements will be made to agree with Chapter 4 at the next revision to the manual.
- C. Inspection Operation Documents that begin with the letter "M" are those inspections found in Chapter 4. These were added because there can be no grace period for these inspections.

2. Inspection Requirements

- A. As required by U.S. Federal Aviation Regulations, all civil aircraft of U.S. registry must undergo a complete inspection (annual) each twelve calendar months. In addition to the required annual inspection, aircraft operated commercially (for hire) must have a complete inspection every 100 hours of operation.
- B. Compliance with the regulations is accomplished using one of three methods:
 - (1) **Traditional (Annual/100 Hour) inspection program** which utilizes 14 CFR 43, Appendix D (scope and detail) to inspect the airplane. In addition, Cessna recommends certain components or items be inspected at 50 hour intervals. These inspection items are listed in Inspection Time Intervals, Section 5-10-01.
 - (2) **Progressive Care inspection program** which allows the work load to be divided into smaller operations that can be accomplished in a shorter time period. This method is detailed in Progressive Care Program, Section 5-12-00. If the Progressive Care inspection program will be used in lieu of the Traditional (Annual/100 Hour) inspection program, the local FAA FSDO must approve the program before it is adopted in accordance with 14 CFR 91. 409(d). International operators must gain approval from their local airworthiness authority to utilize the Progressive Care inspection program.
 - (3) **PhaseCard inspection program** which is geared toward high-utilization flight operations (approximately 600 or more flight hours per year). This system utilizes 50-hour intervals (Phase 1 and Phase 2) to inspect high-usage systems and components. At 12 months or 600 flight hours, whichever occurs first, the airplane undergoes a complete (Phase 3) inspection. PhaseCard Inspection programs can be ordered through Cessna Customer Care, Dept. 569, P.O. Box 7706, Wichita, KS 67277, Phone (316) 517-5800, Fax (316) 517-7271.

3. Inspection Program Selection

- A. The selection of an inspection program (Annual, Progressive Care or PhaseCard) is primarily based on owner/operator preferences, whether an airplane is flown for hire, and numbers of hours flown during the year.

4. Description

- A. Listed below is a brief description and intended purpose of each section of this chapter. For detailed information related to each particular inspection program, refer to the specific section within this chapter.
- B. Section 5-00-00, Time Limits/Maintenance Checks - General. This section provides a general overview of inspection requirements.
- C. Section 5-10-01, Inspection Time Intervals. The primary purpose of this section is to provide a central location for inspection time intervals. This section may also be utilized in conjunction with 14 CFR Part 43 to provide greater detail on inspection criteria when performing Annual/100 Hour inspections.
- D. Section 5-11-00, Component Time Limits. This section provides a list of components which are life- or time-limited. Although these components are not listed in any of Cessna's inspection programs, they must be considered and included in whatever inspection program is used.
- E. Section 5-12-00, Progressive Care Program. This section outlines the progressive inspection program. The program is divided into four primary operations which cover all inspection requirements up through the 200-hour interval inspection items. The remaining operations cover inspections which are at intervals other than what the four primary operations cover. Refer to the Progressive Care Program section for a more detailed description of the Progressive Care Program.

5. General Inspection Terms and Guidelines

NOTE: When inspections criteria are required, these criteria are spelled out in the text. If more detailed instructions are required for an inspection, these instructions will refer to the appropriate locations (supplier publications and/or the maintenance manual).

- A. Definitions of terms used through the inspection programs are as follows:
- (1) ON CONDITION is defined as the necessary inspections and/or checks to determine that a malfunction or failure of the component will not occur prior to the next scheduled inspection.
 - (2) CONDITION is defined as inspection for (but not limited to) cleanliness, cracks, deformation, corrosion, wear, and loose or missing fasteners.
 - (3) SECURITY is defined as an inspection for looseness of fasteners and fastener securing devices such as safety wire, cotter pins and self-locking nuts.
- B. During Inspections, use the following general guidelines:
- (1) MOVABLE PARTS: Inspect for lubrication, servicing, security of attachment, binding, excessive wear, safetying, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing, and tension.
 - (2) FLUID LINES AND HOSES: Inspect for leaks, cracks, bulging, collapsed, twisted, dents, kinks, chafing, proper radius, security, discoloration, bleaching, deterioration, and proper routing; rubber hoses for hardness or flexibility and metal lines for corrosion.
 - (3) METAL PARTS: Inspect for security of attachment, cracks, metal distortion, and heat deterioration.
 - (4) WIRING: Inspect for security, chafing, burning, arcing, defective insulation, loose or broken terminals, heat deterioration, and corroded terminals.

CAUTION: Torque values listed in this manual are not to be used for checking tightness of installed parts during service.

- (5) STRUCTURAL FASTENERS: Inspect for correct torque in accordance with applicable torque values. Refer to Chapter 20, [Torque Data - Maintenance Practices](#), during installation or when visual inspection indicates the need for a torque check.
 - (6) FILTERS, SCREENS, AND FLUIDS: Inspect for cleanliness and the need for replacement at specified intervals.
 - (7) A system check (operation or function) that requires electrical power, must be performed using 28.5 Volts, +0.25 or -1.00 Volts, bus voltage. This will make sure that all components are operating at their operational voltage.
- C. Supplemental Inspection Document (SID) and Corrosion Prevention and Control Program (CPCP) Inspection Requirements
- (1) Two types of inspection requirements are available based on operating usage and two additional types of inspections are available based on operating environment.
 - (a) Operating Usage
 - 1 Severe Usage Environment
 - a If the average flight length is less than 30 minutes, then you must use the SEVERE inspection time limits.
 - b If the airplane has been engaged in operations at low altitudes such as pipeline patrol, fish or game spotting, aerial applications, police patrol, sightseeing, livestock management, etc. more than 30% of its life you must use the SEVERE inspection time limits.
 - 2 Typical Usage Environment
 - a If no requirement of the Severe Usage Environment applies, the TYPICAL usage environment applies and should be used.
 - (b) Operating Environment
 - 1 Severe Corrosion Environment
 - a If the airplane is operating more than 30% of the time in a zone shown as severe on the corrosion severity maps in located in Chapter 51, [Corrosion - Description and Operation](#), then the SEVERE CORROSION environment time limits apply.
 - 2 Mild or Moderate Corrosion Environment
 - a If the airplane is not classified as operating in a Severe Corrosion Environment, then the MILD/MODERATE CORROSION environment time limits apply.
 - (2) After the operating usage and the operating environment are determined, make a logbook entry that states which inspection schedules (TYPICAL or SEVERE operating usage and MILD/MODERATE or SEVERE operating environment) are being used.
- D. Airplane file.

- (1) Miscellaneous data, information, and licenses are a part of the airplane file. Check that the following documents are up-to-date and in accordance with current Federal Aviation Regulations. Most of the items listed are required by the Federal Aviation Regulations. Since the regulations of other nations may require other documents and data, owners of airplanes operated outside the United States should check with their own aviation officials to determine their individual requirements.
 - (a) To be displayed in the airplane at all times:
 - 1 Standard Airworthiness Certificate (FAA Form 8100-2).
 - 2 Aircraft Registration Certificate (FAA Form 8050-3).
 - 3 Aircraft Radio Station License (Federal Communication Commission Form 556 if transmitter is installed).
 - (b) To be carried in the airplane at all times:
 - 1 Weight and Balance Data Sheets and associated papers (all copies of the Repair and Alteration Form, FAA Form 337, are applicable).
 - 2 Equipment List.
 - 3 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
 - (c) To be made available upon request:
 - 1 Airplane, Engine and Propeller Logbooks.

INSPECTION TIME INTERVALS

1. General

- A. The primary purpose of this section is to provide for inspection time intervals. The section 5-10-01 may be utilized in conjunction with 14 CFR Part 43 inspection scope and detail, but is not intended to be utilized as the primary checklist for inspection of the airplane.

NOTE: The inspection guidelines contained in this section are not intended to be all inclusive, for no such charts can replace the good judgment of certified airframe and powerplant mechanics in performance of their duties. As the one primarily responsible for the airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the airplane.

2. Procedure

- A. A complete airplane inspection includes all inspection items as required by 14 CFR 43, Appendix D, Scope and Detail of annual/100 hour inspections. The chart provided in this section should be used to augment the inspection.
- B. The Component Time Limits section (5-11-00) should be checked in conjunction with this inspection to ensure proper overhaul and replacement requirements are accomplished at the specified times.
- C. The intervals shown are recommended intervals at which items are to be inspected based on normal usage under average environmental conditions. Airplanes operated in extremely humid areas (tropics), or in exceptionally cold, damp climates, etc., may need more frequent inspections for wear, corrosion, and lubrication. Under these adverse conditions, perform periodic inspections in compliance with this chart at more frequent intervals until the operator can set his own inspection periods based on field experience.
- (1) The 14 CFR Part 91 operator's inspection intervals shall not deviate from the inspection time limits shown in this manual except as provided below: (Refer to 14 CFR 91.409)
- (a) The aircraft can only exceed its inspection point up to ten hours if the aircraft is enroute to a facility to have the inspection completed.
 - (b) In the event of late compliance of any operation scheduled, the next operation in sequence retains a due point from the time the late operation was originally scheduled (reschedule if late).
 - (c) In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next phase due point may remain where originally set.
 - (d) In the event of early compliance on any operation scheduled, that occurs more than 10 hours ahead of schedule, the next phase due point must be rescheduled to establish a new due point from the time of early accomplishment.

3. Inspection Terms and Guidelines

- A. For inspection terms and guidelines, refer to Chapter 5, [Time Limits/Maintenance Checks - General](#).

4. Chart Legend

- A. Each page of the inspection listed in Inspection Time Limits, section 5-10-01 contains the following five columns:
- (1) REVISION STATUS - This column provides the date that a given item was added, deleted or revised. A blank entry in this column indicates no change since the original issue of this manual.
 - (2) INSPECTION ITEM CODE NUMBER - This column lists a six-digit number permanently assigned to a scheduled maintenance item. A given inspection item code number will never change and will not be reused in the event the scheduled maintenance item is deleted.
 - (3) TASK - This column gives a short description of the inspection and/or servicing procedures. Where a more detailed description of the procedure is necessary, a reference will be made to another selection found in the maintenance manual or a specific reference to a supplier publication. If a task does not refer to a specific model and/or system, then the inspection and/or servicing procedure applies to all equivalent models and/or systems in the airplane.
 - (4) INTERVAL - This column lists the frequency of inspection in alphabetic coded form. The legend for the alpha code is listed below.
 - (5) OPERATION - The Progressive Care inspection program allows the work load to be divided into smaller operations that can be accomplished in a shorter time period. This program is detailed in section 5-12-00, which is the Progressive Care Program.
 - (6) ZONE - This column locates the components within a specific zone. For a breakdown of how the airplane is zoned, refer to Chapter 6, [Airplane Zoning - Description and Operation](#).

- B. Inspection requirements for the engine and propeller are supplied by the component manufacturer. To make sure that the latest inspection requirements given by the manufacturer are done, refer to and do the requirements at the intervals published by the component manufacturer.

INTERVAL	OPERATION	INTERVAL
A.	1, 2, 3, 4	Every 50 hours.
B.	1, 2, 3, 4	Every 100 hours.
C.	1, 2, 3, 4	Every 200 hours.
D.	5	Every 400 hours or 1 year, whichever occurs first.
E.	6	(Not Currently Used) First 100 hours and each 500 hours thereafter.
F.	7	(Not Currently Used) Every 600 hours or 1 year, whichever occurs first.
G.	8	(Not Currently Used) Every 1000 hours or 3 years, whichever occurs first.
H.	9	Every 500 hours.
I.	10	Every 1000 hours.
J.	11	Every 2 years.
K.	12	(Not Currently Used) Beginning five years from the date of the manufacture, you must make sure of the serviceability of the components every twelve months. Refer to Airborne Air and Fuel Products Service Letter Number 39A or latest revision.
L.	13	(Not Currently Used) Every 50 hours or 4 months, whichever comes first.
M.	14	Every 2 years, or any time components are added or removed which have the potential to affect the magnetic accuracy and/or variation of the compass calibration, or any time the accuracy of the compass is in question.
N.	15	Every 2000 hours.
O.	16	Every 1000 hours or 1 year, whichever occurs first.
P.	17	Every 12 calendar months.
Q.	18	Every 6 years.
R.	19	Every 12 years.
S.	20	Every 1 year.
T.	21	Every 3 years.
U.		(Not Currently Used)
V.	22	Beginning five years from the date of the manufacture, you must make sure of the serviceability of the components every twelve months. Refer to Airborne Air and Fuel Products Service Letter Number 39A or latest revision.
W.	23	Every 100 hours or every one year, whichever occurs first.
X.	24	Every 100 hours, every annual inspection, every overhaul, and any time fuel lines or clamps are serviced, removed or replaced.
Y.	25	First 600 hours and as defined by the manufacturer thereafter.
Z.	26	Every 1000 hours or 3 years, whichever occurs first.
AA.	27	Operation 27 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 12 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program, for additional information concerning repeat Corrosion Program Inspection intervals.
AB.	28	Operation 28 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 24 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.

AC.	29	Operation 29 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 36 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
AD.	30	Operation 30 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 48 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
AE.	31	Operation 31 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 60 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
AF.	32	Operation 32 gives the Supplemental Inspection Document items that are to be examined after the first 1,000 hours of operation or 3 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 3 years, whichever occurs first, after the initial inspection has been accomplished.
AG.	33	Operation 33 gives the Supplemental Inspection Document items that are to be examined after the first 2,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 2,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
AH.	34	Operation 34 gives the Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 10 years, whichever occurs first. The inspection is to be repeated every 500 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
AI.	35	Operation 35 gives the Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
AJ.	36	Operation 36 gives the Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 3,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
AK.	37	Operation 37 gives the Supplemental Inspection Document items that are to be examined after the first 10,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated every 3,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
AL.	38	Operation 38 gives the Supplemental Inspection Document items that are to be examined after the first 10,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated at every engine overhaul, after the initial inspection has been accomplished.
AM.	39	Operation 39 gives the Supplemental Inspection Document items that are to be examined after the first 5 years. The inspection is to be repeated every 5 years, after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
AN.	40	Operation 40 gives the Supplemental Inspection Document items that are to be examined after the first 10 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.

AO.	41	Operation 41 gives the Supplemental Inspection Document items that are to be examined after the first 20 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
AP.	42	Operation 42 gives the Supplemental Inspection Document items that are to be examined after the first 25 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
AQ.	43	Operation 43 gives the Supplemental Inspection Document items that are to be examined after the first 3 years. The inspection is to be repeated every 3 years, after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
AR.	44	Operation 44 gives the Supplemental Inspection Document items that are to be examined after the first 5 years. The inspection is to be repeated every 5 years, after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
AS.	45	Operation 45 gives the Supplemental Inspection Document items that are to be examined after the first 10 years. The inspection is to be repeated every 5 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
AT.	46	Operation 46 gives the Supplemental Inspection Document items that are to be examined after the first 15 years. The inspection is to be repeated every 3 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
AU.	47	Operation 47 gives the Supplemental Inspection Document items that are to be examined after the first 15 years. The inspection is to be repeated every 5 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
AV.	48	Operation 48 gives the Supplemental Inspection Document items that are to be examined after the first 12,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated every 2,000 hours of operation or 10 years, whichever occurs first, after the initial inspection has been accomplished, for airplanes operating in a typical usage environment.
AW.	49	Operation 49 gives the Supplemental Inspection Document items that are to be examined after the first 6,000 hours of operation or 10 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished, for airplanes operating in a severe usage environment.
AX.	50	Operation 50 gives the Initial inspection within the first 100 hours of operation, then repeat every 600 hours of operation or 12 months, whichever occurs first.

INSPECTION TIME LIMITS

1. Inspection Items

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Revised Jul 1/12	050001	Inspect aircraft records to verify that all SID Inspections have been complied with as scheduled.	W	05-12-23	All
Revised Mar 1/05	110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	B	05-12-01	ALL
Deleted Mar 1/04	112101				
Deleted Mar 1/04	113101				
	212001	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	D	05-12-05	211
Revised Mar 1/05	212002	Primary Flight Display (PFD) Fan, Multi-Function Display (MFD) Fan, Deck Skin Fan, and Remote Avionics Cooling Fan - Operational Check. Refer to Chapter 21, Avionics Cooling - Maintenance Practices.	W	05-12-23	220, 225
	214001	Cold and Hot Air Hoses - Check condition, routing, and security.	B	05-12-02	120
Revised Dec 1/98	214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	B	05-12-01	211
Revised Jun 1/00	214003	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	B	05-12-01	211
Revised Apr 1/20	221001	Autopilot Rigging - Refer to Autopilot - Maintenance Practices.	O	05-12-16	610
Revised Dec 1/98	221002	Autopilot Servo Capstan Assemblies. Check slip-clutch torque settings. Refer to Autopilot - Maintenance Practices.	O	05-12-16	610
Revised Dec 1/98	221003	Autopilot Servo Actuators. Inspect for evidence of corrosion and or buildup of dirt or other particulate matter which may interfere with servo operation. Refer to Autopilot - Maintenance Practices.	O	05-12-16	610
	231001	Communication Antennas and Cables - Inspect for security of attachment, connection, and condition.	C	05-12-03	210
	235001	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.	C	05-12-01	211
Revised Aug 4/03	235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, Communication - Maintenance Practices.	B	05-12-01	222, 223

Revised Oct 1/15	242001	Lycoming Engine, Alternator and Mounting Bracket - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	A	05-12-01	120
Revised Oct 1/15	242002	Lycoming Engine, Alternator Electrical Connections - Check condition and security. Check for cracks on the shank of terminals connected to alternator BAT and GND connection posts. Make sure the terminals are not bent or under mechanical stress caused by the routing of the attached wire. Make sure the field wire connector on 95 amp. Alternators is secure and firmly latched.	A	05-12-01	120
	243001	Main Battery - Examine the general condition and security. Complete a check of the level of electrolyte on non-sealed type batteries. Refer to Chapter 12, Battery - Servicing.	B	05-12-02	310
Revised Jan 2/06	243002	Main Battery Box and Cables - Clean and remove any corrosion. Examine the cables for routing, support, and security of the connections.	B	05-12-02	310
	243003	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	C	05-12-01	210
	243004	External Power Receptacle and Power Cables - Inspect for condition and security.	C	05-12-02	120
Revised Mar 31/23	243005	Avionics Standby Battery - Complete the Standby Battery Capacity Test. Refer to Chapter 24, Standby Battery - Maintenance Practices.	S	05-12-20	220
Added Mar 31/23	243006	Garmin GI 275 Standby Battery (If Installed) - Complete the Garmin GI 275 Standby Battery Run Down Test. Refer to Chapter 24, Garmin GI 275 Standby Battery - Maintenance Practices.	S	05-12-20	225
	246001	Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.	C	05-12-01	222
Revised Jun 1/00	246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	B	05-12-01	222
Revised Jul 3/06	246003	Alternator Control Unit - Complete the Over-voltage Protection Circuit Test. Refer to Chapter 24, Alternator Control Unit.	J	05-12-11	222
Revised Mar 1/05	246101	Essential and Crossfeed Bus Diodes - Check for proper operation. Complete the Essential and Crossfeed Bus Diode Inspection. Refer to Chapter 24, Essential and Crossfeed Bus Diodes - Maintenance Practices.	S	05-12-20	224

Revised Jul 3/06	251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	B	05-12-01	211
	251002	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Inspect seat rails for cracks.	B	05-12-02	230
	251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	B	05-12-01	211
Revised Mar 1/09	251102	AMSAFE Aviation Inflatable Restraint (AAIR) - Examine the restraint for dirt, frayed edges, unserviceable stitching, loose connections, and other wear. Refer to Chapter 25, Inflatable Restraint System - Maintenance Practices, and do the Inflatable Restraint Inspection and the AMSAFE Aviation Inflatable Restraint (AAIR) System Adjustment/Test.	S	05-12-20	211
	252201	Upholstery, Headliner, Trim, and Carpeting - Check condition and security.	D	05-12-05	211
Revised Mar 1/04	256001	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with 14 CFR Part 91.207.	B	05-12-01	310
Revised Oct 1/23	262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date. (Applicable to Halon and Non-Halon Fire Extinguishers)	B	05-12-01	230
Revised Oct 1/23	262002	Cockpit Mounted Fire Extinguisher - Weigh bottle. Bottle must be serviced by qualified individual if the weight of the extinguishing agent is not within the values listed on the servicing placard of the bottle. (Only applicable to Halon Fire Extinguisher)	P	05-12-17	211
Revised Oct 1/23	262003	Cockpit Mounted Fire Extinguishers - Perform hydrostatic test. The hydrostatic test shall be at twelve-year intervals based on initial servicing or date of last hydrostatic test. (Only applicable to Halon Fire Extinguisher)	R	05-12-19	211
Revised Oct 1/23	262004	Cockpit Mounted Fire Extinguishers - Empty, inspect for damage, and recharge. (Only applicable to Halon Fire Extinguisher)	Q	05-12-18	211

Added Oct 1/23	262005	Non-Halon Fire Extinguisher Discard (If Installed) - R Discard bottle after 12 years from the date of manufacture. (Only applicable to Non-Halon Fire Extinguishers)		05-12-19	211
Added Oct 1/23	262006	Non-Halon Fire Extinguisher Weight Check (If J Installed) - Weigh bottle. Refer to fire extinguisher placard. (Only applicable to Non-Halon Fire Extinguishers).		05-12-11	211
	271001	Aileron Controls - Check freedom of movement B and proper operation through full travel.		05-12-01	520, 620
Revised Jul 1/12	271002	Ailerons and Cables - Check operation and C security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.		05-12-03	210, 510, 520, 610, 620
	271003	Aileron Structure, Control Rods, Hinges, Balance B Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.		05-12-01	520, 620
	271004	Ailerons and Hinges - Check condition, security, B and operation		05-12-01	520, 620
	271005	Control Wheel Lock - Check general condition C and operation.		05-12-01	222
Revised Dec 1/98	271006	Control Linkage - Inspect pulleys, cables, C bearings, and turnbuckles for condition and security.		05-12-01	222, 223
Revised Jul 1/12	271007	Aileron. 1. Check aileron travel and cable tension. AX 2. Check aileron cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.		05-12-50	210, 510, 520, 610, 620
	272001	Rudder - Check internal surfaces for corrosion, C condition of fasteners, and balance weight attachment.		05-12-03	340
Revised Jun 1/00	272002	Rudder - Inspect the rudder skins for cracks and B loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.		05-12-01	340
Revised Dec 1/98	272003	Rudder, Tips, Hinges, Stops, Clips and Cable B Attachment - Check condition, security, and operation.		05-12-01	340
	272004	Rudder Pedals and Linkage - Check for general C condition, proper rigging, and operation. Check for security of attachment.		05-12-01	230
Revised Dec 1/98	272005	Rudder Control - Check freedom of movement B and proper operation through full travel. Check rudder stops for damage and security.		05-12-01	340

Revised Jul 1/12	272006	Inspect rudder pedal torque tube and cable attachment arms. Refer to 5-14-01, Supplemental Inspection Document 27-20-01, for inspection procedure.	AK	05-12-37	210, 211
Revised Jul 1/12	272007	Rudder structure. Make sure you inspect these areas: 1. Skin. 2. Forward and aft spars at hinge locations. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AB	05-12-28	340
Revised Jul 1/12	272008	Rudder. 1. Check rudder travel and cable tension. 2. Check rudder cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	AX	05-12-50	210, 310, 340
Added Sep 1/16	272010	Rudder Control System - Inspect pulleys, cables, sprockets, bearings, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	B	05-12-01	340
Revised Dec 1/98	273001	Elevator Control - Check freedom of movement and proper operation through full travel.	B	05-12-01	222, 223
Revised Jun 1/00	273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	B	05-12-01	222, 223
Revised Dec 1/98	273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	B	05-12-01	320, 330
Revised Dec 1/98	273004	Elevator Downspring - Check structure, bolts, linkage, bell crank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	B	05-12-01	310
Revised Jul 1/12	273005	Elevator. 1. Check elevator travel and cable tension. 2. Check elevator cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	AX	05-12-50	210, 310, 320, 330
	273101	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	B	05-12-01	224, 240, 310

Revised Jun 1/00	273102	Elevator Trim Control and Indicator - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition and security. Check electric trim controls for operation as applicable. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety	C	05-12-01	224, 240, 310
	273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	B	05-12-01	224
Revised Jul 3/06	273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	B	05-12-01	320
Deleted Dec 1/98	273105				
	273106	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	C	05-12-01	240
Revised Jul 3/06	273107	Elevator Trim Tab Actuator - Remove, clean, examine, and lubricate the actuator. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.	Z	05-12-26	320
Revised Jul 1/12	273108	Elevator trim system. 1. Inspect elevator trim brackets and actuator support brackets. 2. Inspect pulleys, attaching structure and fasteners. Refer to Section 5-14-02, Supplemental Inspection Document 27-30-01, for inspection procedures.	AF	05-12-32	320, 330
Revised Jul 1/12	273109	Elevator Trim. 1. Check elevator trim travel and cable tension. 2. Check elevator trim cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	AX	05-12-50	210, 310, 320, 330
Revised Jul 1/12	273110	Elevator trim system. Make sure you inspect these areas: 1. Elevator trim brackets. 2. Actuator support brackets and bearings. 3. Pulleys and attaching structure. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Do not apply LPS-3 Heavy Duty Rust Inhibitor on hinge bearing.	AB	05-12-28	320, 330
Revised Dec 1/98	275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	B	05-12-01	510, 610
	275002	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	C	05-12-01	221

	275003	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	C	05-12-03	510, 610
	275004	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	C	05-12-03	510, 610
Revised Dec 1/98	275005	Flap Motor, Actuator, and Limit Switches - Check wiring and terminals for condition and security. Check actuator for condition and security.	C	05-12-03	610
Revised Dec 1/98	275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12-21-03.	B	05-12-01	610
Revised Jul 1/12	275007	Flaps. 1. Check flap travel cable tension and travel time. 2. Check flap cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	AX	05-12-50	210, 510, 610
	282001	Fuel System - Inspect plumbing and components for mounting and security.	B	05-12-01	510, 610
Revised Dec 1/98	282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	B	05-12-01	510, 610
Revised Jun 1/00	282003	Fuel Selector Valve - Check controls for detent in each position, security of attachment, and for proper placarding.	B	05-12-01	224
Revised Dec 1/98	282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	B	05-12-01	510, 610
Deleted Aug 4/03	282005				
	282006	Fuel Selector - Using quick drain, ensure no contamination exists.	B	05-12-01	224
	282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	B	05-12-01	510, 610
Deleted Mar 1/09	282008				
Revised Jan 2/06	282009	Integral Fuel Bays - Drain the fuel (Refer to Chapter 12, Fuel - Servicing) and purge tanks (Refer to the Single Engine Structural Repair Manual, 1996 and On). Complete an inspection of the tank interior and outlet screens and remove any foreign object debris. Complete an inspection of the tank interior surfaces for sealant deterioration and corrosion (especially in the sump areas).	I	05-12-10	510, 610

Revised Jun 1/00	282010	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security.	B	05-12-02	120
Revised Jul 1/10	284001	Fuel Quantity Indication System Check (Airplanes without Garmin G1000) - Examine for damage and correct installation. Complete a Fuel Quantity Calibration and Check. Refer to Chapter 28, Fuel Quantity Indication System - Adjustment/Test.	Z	05-12-26	220, 510, 610
Revised Jul 1/10	284002	Fuel Quantity Indication System Check (Airplanes with Garmin G1000) - Examine for damage and correct installation. Complete a Fuel Quantity System Check. Refer to Chapter 28, Fuel Quantity Indication System - Adjustment/Test.	Z	05-12-26	220, 510, 610
	311001	Instruments - Check general condition and markings for legibility.	B	05-12-01	220
Deleted Mar 1/05	311002				
	311003	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	C	05-12-01	220
Revised Mar 1/09	321001	Main Landing Gear Wheel Fairings and Brake Fairings - Check for cracks, dents, condition of paint, and correct scraper clearance.	B	05-12-02	721,722
Revised Jul 1/12	321002	Main Gear Spring Assemblies - Examine for cracks, dents, corrosion, condition of paint or other damage. Examine for chips, scratches, or other damage that lets corrosion get to the steel spring. Examine the axles for condition and security.	B	05-12-02	721, 722
	321003	Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	B	05-12-02	721, 722
Revised Jul 1/12	321004	This inspection is for mild/moderate corrosion environment. Inspect main landing gear tubular spring for rust or damage to finish. Refer to Section 5-14-03, Supplemental Inspection Document 32-13-01, for inspection procedure.	AO	05-12-41	721, 722
Revised Jul 1/12	321005	This interval is for severe corrosion environment. Inspect main landing gear tubular spring for rust or damage to finish. Refer to Section 5-14-03, Supplemental Inspection Document 32-13-01, for inspection procedure.	AS	05-12-45	721, 722
Revised Jul 1/12	321006	Inspect main landing gear fittings and attachment of the fittings to the bulkheads. Refer to Section 5-14-04, Supplemental Inspection Document 32-13-02, for inspection procedure.	AI	05-12-35	210, 721, 722

	322001	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	B	05-12-02	720
	322002	Nose Landing Gear Wheel Fairings - Check for cracks, dents, and condition of paint.	B	05-12-02	720
	322003	Nose Gear Fork - Inspect for cracks, general condition, and security of attachment.	C	05-12-04	720
	322004	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	B	05-12-02	720
Revised Jul 1/12	322005	Inspect nose landing gear torque links, bolts, bushings and nose landing gear fork. Refer to Section 5-14-05, Supplemental Inspection Document 32-20-01, for inspection procedure.	AJ	05-12-36	720
Revised Jul 1/12	322006	Nose gear trunnion, steering assembly, torque link assembly, nose gear fork and axle. Make sure you inspect these areas: 1. Nose gear trunnion surface. 2. Steering collar and steering collar attach bolt. 3. Torque link, torque link attach pin and attach bolt. 4. Nose gear fork. 5. Nose gear axle. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AC	05-12-29	720
Revised Jul 1/12	322007	Nose gear trunnion, torque link assembly and nose gear fork. Make sure you inspect these areas: 1. Nose gear trunnion upper and lower inner bore surface and bearing. 2. Torque link bolt and attach pin inner bore surface. 3. Nose gear fork lug inner bore surface. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AC	05-12-29	720
Revised Jul 1/12	322008	Nose landing gear outer barrel assembly. Make sure you inspect these areas: 1. Outer barrel assembly. 2. Upper strut end and lower collar assembly. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: do not apply LPS-3 Heavy-Duty Rust Inhibitor to the sliding surfaces of the oleo strut.	AC	05-12-29	720
	324001	Brakes - Test toe brakes and parking brake for proper operation.	B	05-12-02	230

Revised Dec 1/98	324002	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake. Refer to Chapter 12-13-00 for servicing instructions.	B	05-12-02	224, 230
	324003	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	D	05-12-05	721, 722
	324004	Tires - Check tread wear and general condition. Check for proper inflation.	B	05-12-02	720, 721, 722
	324005	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	B	05-12-02	721, 722
Revised Dec 1/98	324006	Wheel Bearings - Clean, inspect and lube.	B	05-12-04	720, 721, 722
Revised Jul 1/12	324007	Main landing gear axle assembly. Make sure you inspect these areas: 1. Main gear axle and attach bolts. 2. Wheel halves. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Do not apply LPS-3 Heavy-Duty Rust Inhibitor to the bearing. NOTE: Coordinate with tire change.	AC	05-12-29	721, 722
Revised Jul 1/12	324101	Nose gear axle assembly. Make sure you inspect these areas: 1. Nose gear axle and attach bolt. 2. Wheel halves. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Disassemble the nose gear strut to get access. NOTE: Do not apply LPS-3 Heavy-Duty Rust Inhibitor to the sliding surfaces of the oleo strut. NOTE: Coordinate with tire change.	AE	05-12-31	720
	325001	Nose Gear Steering Mechanism - Check for wear, C security, and proper rigging.	C	05-12-04	720
	331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	B	05-12-01	220, 211, 221
	334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	B	05-12-01	340, 520, 620

Added Oct 1/15	334201	LED Landing, Taxi and Recognition Lights - Check for condition of the lenses and security of attachment. Complete the LED Landing, Taxi and Recognition Light System Test. Refer to Chapter 33, Landing/Taxi Lights - Maintenance Practices (LED). Refer to Pilots Operating Handbook Kinds Of Operations Equipment List for minimum number of LED's that are required to be operational.	B	05-12-01	520, 620
	341101	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	C	05-12-03	210
Revised Jul 3/06	341102	Pitot and Static System - Examine in accordance with 14 CFR Part 91.411.	J	05-12-11	220
Revised Oct 1/15	341103	182 and T182, Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	A	05-12-01	510
Added Sep 1/16	341801	Complete the Safe Flight SCc AOA System Ground Functional Test.	P	05-12-17	610
	342101	Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.	C	05-12-01	225
Revised Dec 1/98	342102	Magnetic Compass - Calibrate.	M	05-12-14	220
Revised Dec 1/98	345001	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, GPS, Transponder, Compass System, Multi- function Display, and Primary Flight Display) and Remote Mounted Avionics Components. Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.	C	05-12-01	225
	345002	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.	C	05-12-01	225
	345003	Navigation Indicators, Controls, and Components - Inspect for condition and security.	C	05-12-01	220, 225
	345004	Navigation Antennas and Cables - Inspect for security of attachment, connection, and condition.	C	05-12-01	310
Revised Nov 1/00	351001	Oxygen System (if applicable) - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.	C	05-12-01	211
Revised Nov 1/00	351002	Oxygen Cylinder (if applicable) - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.	T	05-12-21	211
	371001	Vacuum System - Inspect for condition and security.	B	05-12-02	120
	371002	Vacuum Pumps - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	B	05-12-02	120

	371003	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	B	05-12-02	120
Revised Dec 1/98	371004	Gyro Filter - Inspect for damage, deterioration and contamination. Clean or replace if required.	B	05-12-02	120
Deleted Aug 4/03	371005				
Revised Jan 2/06	371006	Vacuum Manifold Check Valve - Complete a check for proper operation. (Only airplanes with dual vacuum pumps and Airborne manifolds. Refer to the Airborne Air & Fuel Products Service Letter Number 39A or latest revision, and in accordance with SB02-37-04.) Refer to Chapter 37, Vacuum System - Maintenance Practices for the removal and installation of the check valve.	V	05-12-22	120
Revised Jan 2/06	371007	Do an inspection of the wear indicator ports on the vacuum pumps described in Tempest Service Letter 004.	Y	05-12-25	120
	521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	B	05-12-01	210
Revised Jul 1/12	521002	Passenger/Crew door retention system. Make sure you inspect these areas: 1. Bell cranks. 2. Pushrods. 3. Handle. 4. Pin retention. 5. Pins. 6. Lockplates and guides. 7. Hinges. 8. Internal door framing. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information). Note: Remove interior panels for access.	AD	05-12-30	210
	531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	B	05-12-01	210
	531002	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc. Check cowl shock mounts for condition and security.	C	05-12-02	120
	531003	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.	C	05-12-01	211
Revised Jul 1/12	531004	This interval is for mild/moderate corrosion environment. Inspect the carry-thru spar area, door post bulkhead attach fittings and spar channel. Refer to Section 5-14-06, Supplemental Inspection Document 53-11-01, for inspection procedure.	AP	05-12-42	210
Revised Jul 1/12	531005	This interval is for severe corrosion environment. Inspect the carry-thru spar area, door post bulkhead attach fittings and spar channel. Refer to Section 5-14-06, Supplemental Inspection Document 53-11-01, for inspection procedure.	AT	05-12-46	210

Revised Jul 1/12	531006	This interval is for mild/moderate corrosion environment. Inspect forward doorpost and surrounding structure. Refer to Section 5-14-07, Supplemental Inspection Document 53-12-01, for inspection procedure.	AV	05-12-48	210
Revised Jul 1/12	531007	This interval is for severe corrosion environment. Inspect forward doorpost and surrounding structure. Refer to Section 5-14-07, Supplemental Inspection Document 53-12-01, for inspection procedure.	AW	05-12-49	210
Revised Jul 1/12	531008	Inspect firewall structure. Refer to Section 5-14-08, Supplemental Inspection Document 53-12-02, for inspection procedure.	AG	05-12-33	210
Revised Jul 1/12	531009	This interval is for mild/moderate corrosion environment. Inspect the cabin interior skin panels, frames and stringers. Refer to Section 5-14-09, Supplemental Inspection Document 53-30-01, for inspection procedure.	AP	05-12-42	210, 211
Revised Jul 1/12	531010	This interval is for severe corrosion environment. Inspect the cabin interior skin panels, frames and stringers. Refer to Section 5-14-09, Supplemental Inspection Document 53-30-01, for inspection procedure.	AU	05-12-47	210, 211
Revised Jul 1/12	531011	This interval is for mild/moderate corrosion environment. Inspect seat rails for corrosion. Refer to Section 5-14-10, Supplemental Inspection Document 53-47-01, for inspection procedure.	AN	05-12-40	210
Revised Jul 1/12	531012	This interval is for severe corrosion environment. Inspect seat rails for corrosion. Refer to Section 5-14-10, Supplemental Inspection Document 53-47-01, for inspection procedure.	AR	05-12-44	210, 211
Revised Jul 1/12	531013	Fuselage lower internal structure beneath the floor panels. Make sure you inspect these areas: 1. Cabin structure under floorboards. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AE	05-12-31	210, 211
Revised Jul 1/12	531014	Fuselage internal structure in upper fuselage. Make sure you inspect these areas: 1. Cabin bulkhead corners. 2. Fuselage skin. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AE	05-12-31	210
Revised Jul 1/12	531015	Areas of the cabin structure. Make sure you inspect these areas: 1. Firewall. 2. Firewall attachments. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AE	05-12-31	210

Revised Jul 1/12	531016	Areas of the cabin structure for the passenger/crew door. Make sure you inspect these areas: 1. Door frames. 2. Door hinges. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AD	05-12-30	210
Revised Jul 1/12	531017	Areas of the cabin structure. Make sure you inspect these areas: 1. Cabin door forward and aft frames. 2. Window frames with emphasis at stringers and channel assemblies from aft of door frame to aft bulkhead. 3. Seat attachment structure. 4. Aft Cabin Bulkhead. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AE	05-12-31	210
Revised Dec 1/98	551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	B	05-12-01	320, 330
Revised Dec 1/98	551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	B	05-12-01	320, 330
Revised Jul 1/12	551003	Inspect horizontal stabilizer and elevator, including spars, ribs, hinge bolts, hinge bearings, attach fittings and torque tube. Refer to Section 5-14-11, Supplemental Inspection Document 55-10-01, for inspection procedures.	AK	05-12-37	320, 330
Revised Jul 1/12	551004	Rudder attachments. Make sure you inspect these areas: 1. Hinge brackets. 2. Hinge bolts. 3. Hinge bearings. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Do not apply LPS-3 Heavy Duty Rust Inhibitor on hinge bearing.	AB	05-12-28	340
Revised Jul 1/12	551005	Horizontal stabilizer structure. Make sure you inspect these areas: 1. Stabilizer attachment to the tailcone bulkhead. 2. Front and rear spars. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AE	05-12-31	320, 330
Revised Dec 1/98	553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	B	05-12-01	340
Revised Dec 1/98	553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	B	05-12-01	340

Revised Jul 1/12	553003	Inspect vertical stabilizer and rudder, including spars, ribs, hinge bolts, hinge bearings and attach fittings. Refer to Section 5-14-12, Supplemental Inspection Document 55-30-01, for inspection procedure.	AK	05-12-37	310, 340
Revised Jul 1/12	553004	Vertical stabilizer structure. Make sure you inspect AE these areas: 1. Forward spar attachment to tailcone bulkhead. 2. Aft spar attachment to lower stabilizer spar. 3. Front and rear spars. 4. Rear spar rudder hinges. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).		05-12-31	310, 340
	561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	B	05-12-01	210
	571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	B	05-12-01	510, 520, 610, 620
	571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	B	05-12-01	510, 610
	571003	Wing Access Plates - Check for damage and security of installation.	C	05-12-03	510, 520, 610, 620
	571004	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorquing as required.	C	05-12-03	510, 520, 610, 620
	571005	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	C	05-12-03	510, 520, 610, 620
Revised Jul 1/12	571006	This interval is for typical usage environment. 1. Inspect inboard wing structure for damage and working rivets. 2. Inspect flap actuator support structure. Refer to Section 5-14-13, Supplemental Inspection Document 57-11-01, for inspection procedure.	AV	05-12-48	510, 610
Revised Jul 1/12	571007	This interval is for severe usage environment. 1. Inspect inboard wing structure for damage and working rivets. 2. Inspect flap actuator support structure. Refer to Section 5-14-13, Supplemental Inspection Document 57-11-01, for inspection procedure.	AW	05-12-49	510, 610
Revised Jul 1/12	571008	This interval is for mild/moderate corrosion environment. Inspect wing for corrosion and missing or loose fasteners. Refer to Section 5-14-14, Supplemental Inspection Document 57-11-02, for inspection procedure.	AP	05-12-42	510, 520, 610, 620
Revised Jul 1/12	571009	This interval is for severe corrosion environment. Inspect wing for corrosion and missing or loose fasteners. Refer to Section 5-14-14, Supplemental Inspection Document 57-11-02, for inspection procedure.	AU	05-12-47	510, 520, 610, 620

Revised Jul 1/12	571010	This interval is for mild/moderate corrosion environment. Inspect wing splice joint at strut attach. Refer to Section 5-14-15, Supplemental Inspection Document 57-11-03, for inspection procedure.	AP	05-12-42	510, 610
Revised Jul 1/12	571011	This interval is for severe usage environment. Inspect wing splice joint at strut attach. Refer to Section 5-14-15, Supplemental Inspection Document 57-11-03, for inspection procedure.	AU	05-12-47	510, 610
Revised Jul 1/12	571012	This interval is for mild/moderate corrosion environment. Inspect wing root rib. Refer to Section 5-14-16, Supplemental Inspection Document 57-12-01, for inspection procedure.	AM	05-12-39	510, 610
Revised Jul 1/12	571013	This interval is for severe corrosion environment. Inspect wing root rib. Refer to Section 5-14-16, Supplemental Inspection Document 57-12-01, for inspection procedure.	AQ	05-12-43	510, 610
Revised Jul 1/12	571014	This interval is for typical usage environment. Inspect wing strut and strut tube. Refer to Section 5-14-17, Supplemental Inspection Document 57-40-01, for inspection procedure.	AV	05-12-48	510, 610
Revised Jul 1/12	571015	This interval is for severe usage environment. Inspect wing strut and strut tube. Refer to Section 5-14-17, Supplemental Inspection Document 57-40-01, for inspection procedure.	AW	05-12-49	510, 610
Revised Jul 1/12	571016	Inspect aileron hinges, hinge bolts, hinge bearings and hinge and pushrod attach fittings. Refer to Section 5-14-18, Supplemental Inspection Document 57-51-01, for inspection procedure.	AH	05-12-34	520, 620
Revised Jul 1/12	571017	This interval is for mild/moderate corrosion environment. Inspect flap tracks for corrosion. Refer to Section 5-14-19, Supplemental Inspection Document 57-53-01, for inspection procedure.	AO	05-12-41	510, 610
Revised Jul 1/12	571018	This interval is for severe corrosion environment. Inspect flap tracks for corrosion. Refer to Section 5-14-19, Supplemental Inspection Document 57-53-01, for inspection procedure.	AS	05-12-45	510, 610
Revised Jul 1/12	571019	Wing structure internal. Make sure you inspect these areas: 1. Main spar upper and lower carry-thru fittings. 2. Main spar upper and lower caps. 3. Main spar web. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AA	05-12-27	510, 520, 610, 620
Revised Jul 1/12	571020	Wing structure internal. Make sure you inspect these areas: 1. Wing front spar and lower spar caps. 2. Upper and lower wing attach spar fittings. 3. Wing lower skins. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AE	05-12-31	510, 520, 610, 620

Revised Jul 1/12	571021	Wing structure external. Make sure you inspect these areas: 1. Skin with emphasis at skin overlaps and under access panels. 2. Rear spar upper and lower caps. 3. Rear spar web. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	AE	05-12-31	510, 520, 610, 620
Revised Jul 1/12	571022	Aileron attachments. Make sure you inspect these areas: 1. Aileron hinges. 2. Hinge bolts. 3. Hinge bearings. 4. Hinge and pushrod support structure. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Do not apply LPS-3 Heavy Duty Rust Inhibitor on hinge bearing.	AB	05-12-28	520, 620
Revised Oct 1/15	611001	McCauley Propeller, Spinner - Check general condition and attachment.	A	05-12-01	110
Revised Oct 1/15	611002	McCauley Propeller, Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	B	05-12-02	110
Revised Oct 1/15	611003	McCauley Propeller, Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	A	05-12-01	110
Revised Oct 1/15	611004	McCauley Propeller, Hub - Check general condition.	C	05-12-02	110
Revised Oct 1/15	611005	McCauley Propeller, Mounting - Check for security of installation.	A	05-12-01	110
Revised Oct 1/15	611006	McCauley Propeller, Mounting Bolts - Inspect mounting bolts and safety wire for signs of looseness. Retorque mounting bolts as required.	C	05-12-02	110
Revised Oct 1/15	611007	McCauley Propeller, Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	A	05-12-01	110
Revised Oct 1/15	612001	McCauley Propeller, Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	A	05-12-01	110
Revised Oct 1/15	612002	McCauley Propeller, Governor and Control - Check for security and operation of controls. Maximum linear freeplay is 0.050 inch.	C	05-12-02	110
Deleted Oct 1/15	612003				
Revised Oct 1/15	710001	Lycoming Engine, Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	A	05-12-01	120

Revised Oct 1/15	710002	Lycoming Engine, Turbocharger (if applicable) - Examine the turbocharger for burned areas, bulges, or cracks. Use a flashlight and mirror in the tailpipe to examine the turbine for coking, carbonization, oil deposits, and turbine impellers for damage.	C	05-12-02	120
Revised Oct 1/15	711001	Lycoming Engine, Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	A	05-12-01	120
	712001	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.	C	05-12-02	120
Revised Jul 1/12	712002	Inspect tubular engine mount. Refer to Section 5- 14-20, Supplemental Inspection Document 71-20- 01, for inspection procedure.	AL	05-12-38	120
Revised Jul 1/12	712003	Engine support structure. Make sure you inspect these areas: 1. Engine truss. Pay particular attention in the vicinity of the welds. NOTE: Corrosion Prevention and Control Program Inspection item (refer to Section 5-30-00 for additional inspection information).	AA	05-12-27	120
Revised Oct 1/15	716001	Lycoming Engine, Alternate Induction Air System - Check for obstructions, operation, and security.	A	05-12-01	120
Revised Sep 1/16	716002	Lycoming Engine, Induction System - Remove the duct that is between the filter box and the induction air elbow, refer to Chapter 71, Air Induction System - Maintenance Practices. Make sure the duct support wire is correctly placed, there are no loose, or broken cords and the fabric is not torn. Install an operable duct and make sure there is 0.25 inch (6.35 mm) of wire and cord under the clamps that attach the duct to the filter box and elbow. Make sure the clamps, tubes, and duct is correctly installed and make sure there are no leaks.	A	05-12-01	120
Revised Jun 1/00	716003	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.	B	05-12-02	120

Revised Oct 1/15	716004	Lycoming Engine, Induction Air Filter - Remove and clean. Inspect for damage and service.	A	05-12-01	120
Added Oct 1/15	716005	Lycoming Engine, Induction System - Make sure the duct support wire (if applicable) is secured correctly. Refer to Chapter 71, Air Induction System - Maintenance Practices.	A	05-12-01	120
Revised Oct 1/15	720000	Lycoming Engine, Fuel line (Stainless steel tube assembly) and support clamp inspection and installation. Refer to Lycoming Service Bulletin Number 342E or later version.	X	05-12-24	120
Revised Oct 1/15	722001	Lycoming Engine - Inspect engine for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	A	05-12-01	120
Revised Oct 1/15	722002	Lycoming Engine, Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	B	05-12-02	120
Revised Oct 1/15	722003	Lycoming Engine, Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	A	05-12-01	120
Revised Oct 1/15	723001	Lycoming Engine, Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	B	05-12-02	120
	723002	Engine Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.	C	05-12-02	120
Revised Oct 1/15	723003	Lycoming Engine, Engine Baffles and Seals - Check condition and security of attachment.	A	05-12-01	120
Revised Oct 1/15	723004	Lycoming Engine, Cylinder Compression - Complete a differential compression test. If there is weak cylinder compression, refer to Chapter 71, Engine - Troubleshooting, for further procedures.	B	05-12-02	120
Revised Oct 1/15	730001	Lycoming Engine, Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	B	05-12-02	120
Revised Oct 1/15	730002	Lycoming Engine, Fuel Injection System - Check system for security and condition. Clean fuel inlet screen, check and clean injection nozzles and screens (if evidence of contamination is found), and lubricate air throttle shaft.	B	05-12-02	120
Revised Oct 1/15	730003	Lycoming Engine, Idle and Mixture - Run the airplane engine to determine satisfactory performance. If required, adjust the idle rpm and fuel mixture. Refer to Chapter 73, Fuel Injection Systems - Maintenance Practices.	B	05-12-02	120

Revised Oct 1/15	741001	Lycoming Engine, Magnetos - Examine the external condition and for correct installation and condition of the electrical leads. Complete a check of the engine timing (external timing). Refer to Chapter 74, Ignition System - Maintenance Practices.	B	05-12-02	120
Revised Oct 1/15	741002	Lycoming Engine, Magnetos - Clean, examine, and adjust as necessary. Do the 500-hour inspection in accordance with the Slick 4300/6300 Series Magneto Maintenance and Overhaul Manual.	H	05-12-09	120
Revised Oct 1/15	742001	Lycoming Engine, Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	B	05-12-02	120
Revised Oct 1/15	742002	Lycoming Engine, Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	B	05-12-02	120
Revised Oct 1/15	743001	Lycoming Engine, Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	B	05-12-02	120
Revised Oct 1/15	743002	Lycoming Engine, Inspect and lubricate ACS brand ignition switch. Refer to Chapter 74, Ignition System - Maintenance Practices.	N	05-12-15	224
Revised Oct 1/15	761001	Lycoming Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check to make sure the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	B	05-12-01	120, 225
Revised Oct 1/15	781001	Lycoming Engine, Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	A	05-12-01	120
Revised Oct 1/15	781002	Lycoming Engine, Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	A	05-12-01	120
Revised Oct 1/15	791001	Lycoming Engine - Drain engine oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin # 480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	A	05-12-01	120

Revised Oct 1/15	792001	Lycoming Engine, Oil Cooler - Check for obstructions, leaks, and security of attachment.	A	05-12-01	120
Revised Jun 1/00	801001	Starter and Electrical Connections - Check security and condition of starter, electrical connection, and cable.	B	05-12-02	120
Revised Oct 1/15	801002	Lycoming Engine, Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	A	05-12-01	120

COMPONENT TIME LIMITS**1. General**

- A. Most components given in Chapter 5 are examined as shown elsewhere in this chapter and repaired, overhauled, or replaced as necessary. Some components have a time or life limit and must be overhauled or replaced on or before the specified limit. This is not applicable for Chapter 4 items.
- B. **Items that are underlined are Chapter 4, Airworthiness Limitations requirements. Refer to Chapter 4, Airworthiness Limitations for additional information.**
- C. The terms overhaul and replacement as used within this section are defined as follows:
 - (1) Overhaul - Overhaul the item as given in 14 CFR 43.2 or replace it.
 - (2) Replacement - Replace the item with a new item or a serviceable item that is within its service life and time limits or has been rebuilt as given in 14 CFR 43.2.
- D. This section (5-11-00) gives a list of items which must be overhauled or replaced at specific time limits. Cessna-Supplied Replacement Time Limits shows those items which Cessna has found necessary to overhaul or replace at specific time limits. Supplier-Supplied Replacement Time Limits shows component time limits which have been given by an outside supplier for their products. In addition to these time limits, the components shown in this section are also examined at regular time intervals given in the Inspection Time Intervals section. If necessary, based on service use and inspection results, these components can be overhauled or replaced before their time limit is reached.

2. Cessna-Supplied Replacement Time Limits

- A. Electrical Power (Chapter 24)
 - (1) For airplanes equipped with the NAV III, Garmin G1000 Avionics System only:
 - (a) S3443-1-1 Avionics Switch - Replace every 500 hours of operation.
- B. Equipment/Furnishings (Chapter 25)
 - (1) 504516-401-XXXX Restraint System, Pilot's Left Hand or Right Hand Auto Adjust - Replace every 10 years.
 - (2) 504851-401-XXXX Restraint System, Pilot's Left Hand or Right Hand Manual Adjust - Replace every 10 years.
 - (3) 504516-403-XXXX Restraint System, Aft Bench Left Hand or Right Hand Auto Adjust - Replace every 10 years.
 - (4) 504851-403-XXXX Restraint System, Aft Bench Left Hand or Right Hand Manual Adjust - Replace every 10 years.
 - (5) 2000031-09-201 Restraint Assembly, Pilot's Seat - Replace every 10 years.
 - (6) 2000031-10-201 Restraint Assembly, Copilot's Seat - Replace every 10 years.
 - (7) 2000031-11-201 Restraint Assembly, Right Rear Seat - Replace every 10 years.
 - (8) 2000031-12-201 Restraint Assembly, Left Rear Seat - Replace every 10 years.
- C. Flight Controls (Chapter 27)
 - (1) 1260074-1 Trim Tab Actuator - Replace the trim tab actuators when the free play cannot be kept in limits by the adjustment or replacement of the rod ends, rod end bolts, screw assembly, and the lubrication of the trim tab actuator.
 - (2) 1260074-7 Trim Tab Actuator (with dual axis autopilot) - Replace the trim tab actuators when the free play cannot be kept in limits by the adjustment or replacement of the rod ends, rod end bolts, screw assembly, and the lubrication of the trim tab actuator.
- D. Fuel (Chapter 28)
 - (1) S1495 or S51 Fuel Hoses - Replace every 7 years.
- E. Lights (Chapter 33)
 - (1) Position Light Assembly (Part Number 01-0771011-04 and 01-0771015-07,-08) - Replace every 10,000 hours.
- F. Oxygen (Chapter 35)
 - (1) 020N0002-1 Passenger Mask - Replace after 200 hours of use.
 - (2) 020N0005-1 Pilot Microphone Mask - Replace after 500 hours of use.
 - (3) 020N0001-1 Oxyimizer Cannula - Replace after 200 hours of use.
- G. Vacuum (Chapter 37)
 - (1) C294502-0201 Gyro Filter - Replace at 600 hours.
- H. Propeller (Chapter 61)

- (1) Propeller Control Cable - Replace at engine TBO.

I. Powerplant (Chapter 71)

- (1) Engine Compartment Flexible Fluid-Carrying Teflon Hoses (Cessna-Installed), Except Drain Hoses - Replace every 10 years or at the engine overhaul, whichever occurs first.

NOTE: This life limit is intended not to let flexible, fluid-carrying Teflon hoses in a deteriorated or damaged condition stay in service. Replace the flexible, fluid-carrying Teflon hoses in the engine compartment (Cessna-installed only) every 10 years or at the engine overhaul, whichever occurs first. This does not include drain hoses. Serviceable hoses which are beyond these limits must be put on order immediately and replaced within 30 days after the new hose is received from Cessna.

- (2) Engine Compartment Drain Hoses - Replace on condition.
- (3) Engine Flexible Hoses (Textron Lycoming Installed) - Refer to latest Textron Lycoming Engine Service Bulletins.
- (4) P198290, P106150 Air Filter - Replace every 500 hours or if the condition of the part shows the need for replacement.
- (5) CA3717 Air Filter - Replace every 100 hours or if the condition of the part shows the need for replacement.
- (6) Mixture and Throttle Cables - Replace at every engine TBO.
- (7) 6298 Air Shutoff Control Cable – Replace at every engine TBO.
- (8) 31B22207 Engine Starter - Replace at every engine TBO.
- (9) Engine Shock Mounts - Replace at every engine TBO or if the condition of the part shows the need for replacement.

J. Chapter 79 (Oil)

- (1) Oil Pressure Switch (Part Number 83278) - Replace every 3000 hours.

3. Supplier-Supplied Replacement Time Limits

A. Chapter 25 (Equipment/Furnishings)

- (1) 2020-0 Pointer ELT Battery - Refer to 14 CFR 91.207 for battery replacement time limits.
- (2) 508358-409 and 508358-421 AMSAFE Aviation Inflatable Restraint (AAIR) Forward and Aft Electronics Module Assemblies (EMA) - Remove and return the forward and aft EMA's to AMSAFE Aviation after seven years from the manufacture date. The expiration of the service life, that is the total sum of storage life and installation life, must not be more than seven years from the manufacture date. Only the manufacturer can renew the EMA's.
- (3) 508792-401 and 508794-401 Pilot's, Copilot's, Left Passenger's, and Right Passenger's AMSAFE Aviation Inflatable Restraint (AAIR) Inflator Assemblies – Remove and replace each 508792-401 or 508794-401 inflator assembly after twelve years from the date of manufacture. The date of manufacture is found on the gas cylinder, or can be calculated from the EXP. DATE found on the gas cylinder. (For additional information refer to AMSAFE service bulletin SB507592-401-25-01.)
- (4) 512847-401 Pilot's, Copilot's, Left Passenger's, and Right Passenger's AMSAFE Aviation Inflatable Restraint (AAIR) Inflator Assemblies – Remove and replace the 512847-401 inflator assemblies after ten years from the date of manufacture. The date of manufacture is found on the gas cylinder.
- (5) 452-201-[X] Remote Mounted CO Detector - Replace 7 years.

B. Chapter 28 (Fuel)

- (1) Dukes Model 5100 Electric Fuel Pump - Replace at 10 Years if not overhauled.
- (2) Weldon Model A8185-B and A-8160-D Electric Fuel Pump - Replace at 10 Years if not overhauled.

C. Chapter 35 (Oxygen)

- (1) 804882-33 Oxygen Bottle- Replace at 15 years.

D. Chapter 37 (Vacuum)

- (1) 1H5-25 Vacuum Manifold - Refer to Airborne Air & Fuel Product Reference Memo No. 39 or the latest revision for replacement time limits.
- (2) Aero Accessories Vacuum Manifolds Models AA1H25 and AA1H5-25A - Refer to Tempest Service Letter SL-006 or the latest revision for replacement time limits.
- (3) B3-5-1 or ARB3-5-1 Regulator Valve Filter - Replace at 100 hours.
- (4) Dry Vacuum Pump - Replace the engine-driven vacuum pump, if it does not have a wear indicator, every 500 hours of operation, or replace the pump at the vacuum pump manufacturer's recommended inspection and replacement interval,

whichever occurs first. For vacuum pumps with a wear indicator, replace the pump at the manufacturer's recommended inspection and replacement interval for that vacuum pump.

- (5) Airborne 350 Vacuum Pump Coupling - Replace every 6 years.

E. Chapter 61 (Propeller)

- (1) McCauley Propeller - Refer to the latest revision of McCauley Service Bulletin 137 for the overhaul time limits.
- (2) McCauley Propeller, C161031-0119 Propeller Governor - Any governor damaged by a propeller blade strike, propeller or engine lightning strike, engine detonation, oil contamination, or sudden engine stop must not be returned to service. All such parts must be repaired or overhauled. Refer to McCauley Service Bulletin 215C or latest revision.

F. Chapter 71 (Powerplant)

- (1) IO-540-AB1A5 and TI0540-AK1A Engine - Refer to Textron/Lycoming Service Instruction S.I. 1009AU or latest revision for time limits.
- (2) CH48110 Engine Oil Filter - Refer to Textron/Lycoming Service Instructions S.I. 1492D, S.I. 1267C, and Service Bulletin SB.480E, or latest revisions.

G. Chapter 74 (Ignition)

- (1) 6351 Slick Magnetos - Refer to Slick Service Bulletin SB2-80C, or latest revision, for time limits.

PROGRESSIVE CARE PROGRAM

1. General

NOTE: The inspection charts contained within the Progressive Care Program are not intended to be all-inclusive, for no such charts can replace the good judgment of a certified airframe and powerplant mechanic in performance of his or her duties. As the one primarily responsible for the airworthiness of the airplane, the owner or operator must select only qualified personnel to maintain the airplane.

- A. The program is divided into four primary operations (operations 1 thru 4) which cover all 50-hour, 100-hour, and 200-hour inspection requirements. The other operations include all of the inspection requirements due at other intervals.
- B. The inspection program is divided into the progressive inspection operations.
- C. Inspection Operation documents that begin with the letter "M" are those inspections that match those found in the Chapter 4, Airworthiness Limitations. These are added because there is no grace period for these inspections.

Operation 1 -	Has all 50-hour inspection items, and the 100- or 200-hour inspection items contained in the fuselage area.
Operation 2 -	Has all 50-hour inspection items, and the 100- or 200-hour inspection items contained in the engine compartment area.
Operation 3 -	Has all 50-hour inspection items, and the 100- or 200-hour inspection items contained in the wing.
Operation 4 -	Has all 50-hour inspection items, and the 100- or 200-hour inspection items contained in the landing gear.
Operation 5 -	Has all 400-hour or 1-year inspection items, whichever occur first.
Operation 6 -	(Not Currently Used) Has all items that must have an inspection at the first 100 hours, and each 500 hours after.
Operation 7 -	(Not Currently Used) Has all 600-hour or 1-year inspection items, whichever occur first.
Operation 8 -	(Not Currently Used) Has all 1000-hour or 3-year inspection items, whichever occur first.
Operation 9 -	Has all 500-hour inspection items.
Operation 10 -	Has all 1000-hour inspection items.
Operation 11 -	Has all 2-year inspection items.
Operation 12 -	(Not Currently Used) Has all items that must have an inspection at the first 5 years, and each 12 months after, until replacement at 10 years.
Operation 13 -	(Not Currently Used) Has all 50-hour or 4-month inspection items, whichever occur first.
Operation 14 -	Has all 2-year inspection items, or inspections of components that are added or removed with the potential to change the magnetic accuracy and/or variation of the compass calibration, or any time the accuracy of the compass is in question.
Operation 15 -	Has all 2000-hour inspection items.
Operation 16 -	Has all 1000-hour or 1-year inspection items, whichever occur first.
Operation 17 -	Has all 12-month inspection items.
Operation 18 -	Has all 6-year inspection items.
Operation 19 -	Has all 12-year inspection items.
Operation 20 -	Has all 1-year inspection items.
Operation 21 -	Has all 3-year inspection items.
Operation 22 -	Has all 5-year inspection items from the date of manufacture. Serviceability of the components must be examined each 12 months. Refer to Airborne Air and Fuel Products Service Letter Number 39A or latest revision.
Operation 23 -	Has all 100-hour or 1-year inspection items, whichever occur first.
Operation 24 -	Every 100 hours, every annual inspection, every overhaul, and any time fuel lines or clamps are serviced, removed or replaced.
Operation 25 -	First 600 hours and as defined by the manufacturer thereafter.

- Operation 26 - Every 1000 hours or 3 years, whichever occurs first.
- Operation 27 - Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 12 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program, for additional information concerning repeat Corrosion Program Inspection intervals.
- Operation 28 - Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 24 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- Operation 29 - Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 36 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- Operation 30 - Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 48 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- Operation 31 - Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 60 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- Operation 32 - Supplemental Inspection Document items that are to be examined after the first 1,000 hours of operation or 3 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 3 years, whichever occurs first, after the initial inspection has been accomplished.
- Operation 33 - Supplemental Inspection Document items that are to be examined after the first 2,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 2,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- Operation 34 - Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 10 years, whichever occurs first. The inspection is to be repeated every 500 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- Operation 35 - Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- Operation 36 - Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 3,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- Operation 37 - Supplemental Inspection Document items that are to be examined after the first 10,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated every 3,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- Operation 38 - Supplemental Inspection Document items that are to be examined after the first 10,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated at every engine overhaul, after the initial inspection has been accomplished.
- Operation 39 - Supplemental Inspection Document items that are to be examined after the first 5 years. The inspection is to be repeated every 5 years, after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
- Operation 40 - Supplemental Inspection Document items that are to be examined after the first 10 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
- Operation 41 - Supplemental Inspection Document items that are to be examined after the first 20 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
- Operation 42 - Supplemental Inspection Document items that are to be examined after the first 25 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.

Operation 43 -	Supplemental Inspection Document items that are to be examined after the first 3 years. The inspection is to be repeated every 3 years, after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
Operation 44 -	Supplemental Inspection Document items that are to be examined after the first 5 years. The inspection is to be repeated every 5 years, after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
Operation 45 -	Supplemental Inspection Document items that are to be examined after the first 10 years. The inspection is to be repeated every 5 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
Operation 46 -	Supplemental Inspection Document items that are to be examined after the first 15 years. The inspection is to be repeated every 3 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
Operation 47 -	Supplemental Inspection Document items that are to be examined after the first 15 years. The inspection is to be repeated every 5 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
Operation 48 -	Supplemental Inspection Document items that are to be examined after the first 12,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated every 2,000 hours of operation or 10 years, whichever occurs first, after the initial inspection has been accomplished, for airplanes operating in a typical usage environment.
Operation 49 -	Supplemental Inspection Document items that are to be examined after the first 6,000 hours of operation or 10 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished, for airplanes operating in a severe usage environment.
Operation 50 -	First 100 hours of operation, then repeat every 600 hours of operation or 12 months, whichever occurs first.

2. Procedure

- A. A FULL AIRPLANE INSPECTION includes all 50-, 100-, and 200-hour inspection items plus those Inspection Items contained in other operations which are due at the specified time.
- B. The Component Time Limits Section (5-11-00) must be read at each inspection interval to make sure that the correct overhaul and replacement requirements are done at the specified times.
- C. The Inspection Operations have been developed based on normal usage under average environmental conditions. Airplanes operated in extremely humid areas (tropics), or in exceptionally cold, damp climates, etc., may need more frequent inspections for wear, corrosion, and lubrication. Under these adverse conditions, do the periodic inspections in compliance with the Inspection Operations at more frequent intervals until the operator can set his own inspection periods based on field experience. The operator's inspection intervals must not deviate from the inspection time limits shown in this manual except as given below:

- (1) The Progressive inspections are performed in the following order once an aircraft is placed on the Progressive care program in lieu of the Traditional (annual/100 Hour) inspection program.
 - (a) Inspection Operation 1 is due 50 hours time in service after the aircraft is placed on the Progressive Care Program.
 - (b) Inspection Operation 2 is due 100 hours time in service after the aircraft is placed on the Progressive Care Program.
 - (c) Inspection Operation 3 is due 150 hours time in service after the aircraft is placed on the Progressive Care Program.
 - (d) Inspection Operation 4 is due 200 hours time in service after the aircraft is placed on the Progressive Care Program.
 - (e) The inspection operation cycle (Inspection Operation 1, Inspection Operation 2, Inspection Operation 3 and Inspection Operation 4) will repeat again 50 hours time in service after Inspection Operation 4 was completed.
- (2) Each inspection interval can be extended by 10 hours (if time-controlled), or by 30 days (if date-controlled) or can be performed early at any time prior to the regular interval as provided below:
 - (a) In the event of late compliance of any operation scheduled, the next operation in sequence keeps a due point from the time the late operation was originally scheduled.
 - (b) In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next

phase due point can stay where originally set.

- (c) In the event of early compliance of any operation scheduled, that occurs more than 10 hours ahead of schedule, the next operation due point must be rescheduled to establish a new due point from the time of early compliance.

3. Inspection Terms and Guidelines

- A. For inspection terms and guidelines, refer to [Time Limits/Maintenance Checks - General](#).

INSPECTION OPERATION 1

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 1 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the fuselage area. Items from other areas are included to meet their required time interval. The Progressive inspections are performed in the following order once an aircraft is placed on the Progressive care program in lieu of the Traditional (Annual/100 Hour) inspection program: (1.) Inspection Operation 1 is due 50 hours time in service after the aircraft is placed on the Progressive Care Program. (2.) The inspection operation cycle (Inspection Operation 1, Inspection Operation 2, Inspection Operation 3 and Inspection Operation 4) will repeat again 50 hours time in service after Inspection Operation 4 was completed.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	ALL			
214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	211			
214003	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	211			
235001	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.	211			
235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, Communication - Maintenance Practices.	222, 223			

242001	Lycoming Engine, Alternator and Mounting Bracket - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120
242002	Lycoming Engine, Alternator Electrical Connections - Check condition and security. Check for cracks on the shank of terminals connected to alternator BAT and GND connection posts. Make sure the terminals are not bent or under mechanical stress caused by the routing of the attached wire. Make sure the field wire connector on 95 amp. Alternators is secure and firmly latched.	120
243003	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	210
246001	Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.	222
246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	222
251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	211
251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	211
256001	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with 14 CFR Part 91.207.	310
262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date. (Applicable to Halon and Non-Halon Fire Extinguishers)	230
271001	Aileron Controls - Check freedom of movement and proper operation through full travel.	520, 620
271003	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	520, 620
271004	Ailerons and Hinges - Check condition, security, and operation	520, 620

271005	Control Wheel Lock - Check general condition and operation.	222
271006	Control Linkage - Inspect pulleys, cables, bearings, and turnbuckles for condition and security.	222, 223
272002	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	340
272003	Rudder, Tips, Hinges, Stops, Clips and Cable Attachment - Check condition, security, and operation.	340
272004	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.	230
272005	Rudder Control - Check freedom of movement and proper operation through full travel. Check rudder stops for damage and security.	340
272010	Rudder Control System - Inspect pulleys, cables, sprockets, bearings, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	340
273001	Elevator Control - Check freedom of movement and proper operation through full travel.	222, 223
273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	222, 223
273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	320, 330
273004	Elevator Downspring - Check structure, bolts, linkage, bell crank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	310
273101	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	224, 240, 310

273102	Elevator Trim Control and Indicator - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition and security. Check electric trim controls for operation as applicable. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety	224, 240, 310
273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	224
273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	320
273106	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	240
275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	510, 610
275002	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	221
275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12-21-03.	610
282001	Fuel System - Inspect plumbing and components for mounting and security.	510, 610
282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	510, 610
282003	Fuel Selector Valve - Check controls for detent in each position, security of attachment, and for proper placarding.	224
282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	510, 610
282006	Fuel Selector - Using quick drain, ensure no contamination exists.	224
282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	510, 610

311001	Instruments - Check general condition and markings for legibility.	220
311003	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	
331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	220, 211, 221
334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	340, 520, 620
334201	LED Landing, Taxi and Recognition Lights - Check for condition of the lenses and security of attachment. Complete the LED Landing, Taxi and Recognition Light System Test. Refer to Chapter 33, Landing/Taxi Lights - Maintenance Practices (LED). Refer to Pilots Operating Handbook Kinds Of Operations Equipment List for minimum number of LED's that are required to be operational.	520, 620
341103	182 and T182, Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510
342101	Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.	225
345001	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, GPS, Transponder, Compass System, Multi-function Display, and Primary Flight Display) and Remote Mounted Avionics Components. Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.	225
345002	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.	225
345003	Navigation Indicators, Controls, and Components - Inspect for condition and security.	220, 225
345004	Navigation Antennas and Cables - Inspect for security of attachment, connection, and condition.	310
351001	Oxygen System (if applicable) - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.	211
521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210

531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	210
531003	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.	211
551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	320, 330
551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	320, 330
553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	340
553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	340
561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210
571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	510, 520, 610, 620
571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	510, 610
611001	McCauley Propeller, Spinner - Check general condition and attachment.	110
611003	McCauley Propeller, Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110
611005	McCauley Propeller, Mounting - Check for security of installation.	110
611007	McCauley Propeller, Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110
612001	McCauley Propeller, Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110

710001	Lycoming Engine, Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	120
711001	Lycoming Engine, Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	120
716001	Lycoming Engine, Alternate Induction Air System - Check for obstructions, operation, and security.	120
716002	Lycoming Engine, Induction System - Remove the duct that is between the filter box and the induction air elbow, refer to Chapter 71, Air Induction System - Maintenance Practices. Make sure the duct support wire is correctly placed, there are no loose, or broken cords and the fabric is not torn. Install an operable duct and make sure there is 0.25 inch (6.35 mm) of wire and cord under the clamps that attach the duct to the filter box and elbow. Make sure the clamps, tubes, and duct is correctly installed and make sure there are no leaks.	120
716004	Lycoming Engine, Induction Air Filter - Remove and clean. Inspect for damage and service.	120
716005	Lycoming Engine, Induction System - Make sure the duct support wire (if applicable) is secured correctly. Refer to Chapter 71, Air Induction System - Maintenance Practices.	120
722001	Lycoming Engine - Inspect engine for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120
722003	Lycoming Engine, Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120
723003	Lycoming Engine, Engine Baffles and Seals - Check condition and security of attachment.	120
761001	Lycoming Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check to make sure the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225

781001	Lycoming Engine, Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120
781002	Lycoming Engine, Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120
791001	Lycoming Engine - Drain engine oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin # 480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	120
792001	Lycoming Engine, Oil Cooler - Check for obstructions, leaks, and security of attachment.	120
801002	Lycoming Engine, Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120
*** End of Operation 1 Inspection Items ***		

INSPECTION OPERATION 2

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 2 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the engine compartment. Items from other areas are included to meet their required time interval. The Progressive inspections are performed in the following order once an aircraft is placed on the Progressive care program in lieu of the Traditional (Annual/100 Hour) inspection program. (1) Inspection Operation 2 is due 100 hours time in service after the aircraft is placed on the Progressive Care Program. (2) The inspection operation cycle (Inspection Operation 1, Inspection Operation 2, Inspection Operation 3 and Inspection Operation 4) will repeat again 50 hours time in service after Inspection Operation 4 was completed.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	ALL			
214001	Cold and Hot Air Hoses - Check condition, routing, and security.	120			
242001	Lycoming Engine, Alternator and Mounting Bracket - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120			
242002	Lycoming Engine, Alternator Electrical Connections - Check condition and security. Check for cracks on the shank of terminals connected to alternator BAT and GND connection posts. Make sure the terminals are not bent or under mechanical stress caused by the routing of the attached wire. Make sure the field wire connector on 95 amp. Alternators is secure and firmly latched.	120			

243001	Main Battery - Examine the general condition and security. Complete a check of the level of electrolyte on non-sealed type batteries. Refer to Chapter 12, Battery - Servicing.	310
243002	Main Battery Box and Cables - Clean and remove any corrosion. Examine the cables for routing, support, and security of the connections.	310
243004	External Power Receptacle and Power Cables - Inspect for condition and security.	120
251002	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Inspect seat rails for cracks.	230
282010	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security.	120
321001	Main Landing Gear Wheel Fairings and Brake Fairings - Check for cracks, dents, condition of paint, and correct scraper clearance.	721,722
321002	Main Gear Spring Assemblies - Examine for cracks, dents, corrosion, condition of paint or other damage. Examine for chips, scratches, or other damage that lets corrosion get to the steel spring. Examine the axles for condition and security.	721, 722
321003	Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	721, 722
322001	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	720
322002	Nose Landing Gear Wheel Fairings - Check for cracks, dents, and condition of paint.	720
322004	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	720
324001	Brakes - Test toe brakes and parking brake for proper operation.	230
324002	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake. Refer to Chapter 12-13-00 for servicing instructions.	224, 230

324004	Tires - Check tread wear and general condition. Check for proper inflation.	720, 721, 722
324005	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	721, 722
341103	182 and T182, Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510
371001	Vacuum System - Inspect for condition and security.	120
371002	Vacuum Pumps - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	120
371003	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	120
371004	Gyro Filter - Inspect for damage, deterioration and contamination. Clean or replace if required.	120
531002	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc. Check cowl shock mounts for condition and security.	120
611001	McCauley Propeller, Spinner - Check general condition and attachment.	110
611002	McCauley Propeller, Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	110
611003	McCauley Propeller, Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110
611004	McCauley Propeller, Hub - Check general condition.	110
611005	McCauley Propeller, Mounting - Check for security of installation.	110
611006	McCauley Propeller, Mounting Bolts - Inspect mounting bolts and safety wire for signs of looseness. Retorque mounting bolts as required.	110
611007	McCauley Propeller, Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110
612001	McCauley Propeller, Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110

612002 McCauley Propeller, Governor and Control - Check for security 110
and operation of controls. Maximum linear freeplay is 0.050 inch.

710001 Lycoming Engine, Turbocharger (if applicable) - Inspect 120
turbocharger mounting brackets, ducting, linkage, and attaching
parts for general condition, leakage or damage, and security of
attachment. Check waste gate, actuator, controller, oil and vent
lines, overboost relief valve, and compressor housing for
leakage, apparent damage, security of attachment, and
evidence of wear. Check waste gate return spring for condition
and security.

710002 Lycoming Engine, Turbocharger (if applicable) - Examine the 120
turbocharger for burned areas, bulges, or cracks. Use a
flashlight and mirror in the tailpipe to examine the turbine for
coking, carbonization, oil deposits, and turbine impellers for
damage.

711001 Lycoming Engine, Cowling and Cowl Flaps - Inspect for cracks, 120
dents, other damage and security of cowl fasteners. Check cowl
flaps for condition, security, and operation. Check cowl flap
controls for freedom of movement through full travel.

712001 Engine Shock Mounts, Engine Mount Structure, and Ground 120
Straps - Check condition, security, and alignment.

716001 Lycoming Engine, Alternate Induction Air System - Check for 120
obstructions, operation, and security.

716002 Lycoming Engine, Induction System - Remove the duct that is 120
between the filter box and the induction air elbow, refer to
Chapter 71, Air Induction System - Maintenance Practices.
Make sure the duct support wire is correctly placed, there are no
loose, or broken cords and the fabric is not torn. Install an
operable duct and make sure there is 0.25 inch (6.35 mm) of
wire and cord under the clamps that attach the duct to the filter
box and elbow. Make sure the clamps, tubes, and duct is
correctly installed and make sure there are no leaks.

716003 Induction Airbox, Valves, Doors, and Controls - Remove air filter 120
and inspect hinges, doors, seals, and attaching parts for wear
and security. Check operation.

716004 Lycoming Engine, Induction Air Filter - Remove and clean. 120
Inspect for damage and service.

716005 Lycoming Engine, Induction System - Make sure the duct 120
support wire (if applicable) is secured correctly. Refer to Chapter
71, Air Induction System - Maintenance Practices.

722001	Lycoming Engine - Inspect engine for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120
722002	Lycoming Engine, Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	120
722003	Lycoming Engine, Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120
723001	Lycoming Engine, Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	120
723002	Engine Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.	120
723003	Lycoming Engine, Engine Baffles and Seals - Check condition and security of attachment.	120
723004	Lycoming Engine, Cylinder Compression - Complete a differential compression test. If there is weak cylinder compression, refer to Chapter 71, Engine - Troubleshooting, for further procedures.	120
730001	Lycoming Engine, Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	120
730002	Lycoming Engine, Fuel Injection System - Check system for security and condition. Clean fuel inlet screen, check and clean injection nozzles and screens (if evidence of contamination is found), and lubricate air throttle shaft.	120
730003	Lycoming Engine, Idle and Mixture - Run the airplane engine to determine satisfactory performance. If required, adjust the idle rpm and fuel mixture. Refer to Chapter 73, Fuel Injection Systems - Maintenance Practices.	120
741001	Lycoming Engine, Magnetos - Examine the external condition and for correct installation and condition of the electrical leads. Complete a check of the engine timing (external timing). Refer to Chapter 74, Ignition System - Maintenance Practices.	120
742001	Lycoming Engine, Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	120

742002	Lycoming Engine, Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	120
743001	Lycoming Engine, Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	120
761001	Lycoming Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check to make sure the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225
781001	Lycoming Engine, Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120
781002	Lycoming Engine, Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120
791001	Lycoming Engine - Drain engine oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin # 480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	120
792001	Lycoming Engine, Oil Cooler - Check for obstructions, leaks, and security of attachment.	120
801001	Starter and Electrical Connections - Check security and condition of starter, electrical connection, and cable.	120
801002	Lycoming Engine, Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120
*** End of Operation 2 Inspection Items ***		

INSPECTION OPERATION 3

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 3 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the wing. Items from other areas are included to meet their required time interval. The Progressive inspections are performed in the following order once an aircraft is placed on the Progressive care program in lieu of the Traditional (Annual/100 Hour) inspection program. (1) Inspection Operation 3 is due 150 hours time in service after the aircraft is placed on the Progressive Care Program. (2) The inspection operation cycle (Inspection Operation 1, Inspection Operation 2, Inspection Operation 3 and Inspection Operation 4) will repeat again 50 hours time in service after Inspection Operation 4 was completed.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	ALL			
214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	211			
231001	Communication Antennas and Cables - Inspect for security of attachment, connection, and condition.	210			
235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, Communication - Maintenance Practices.	222, 223			
242001	Lycoming Engine, Alternator and Mounting Bracket - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120			

242002	Lycoming Engine, Alternator Electrical Connections - Check condition and security. Check for cracks on the shank of terminals connected to alternator BAT and GND connection posts. Make sure the terminals are not bent or under mechanical stress caused by the routing of the attached wire. Make sure the field wire connector on 95 amp. Alternators is secure and firmly latched.	120
246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	222
251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	211
251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	211
256001	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with 14 CFR Part 91.207.	310
262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date. (Applicable to Halon and Non-Halon Fire Extinguishers)	230
271001	Aileron Controls - Check freedom of movement and proper operation through full travel.	520, 620
271002	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.	210, 510, 520, 610, 620
271003	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	520, 620
271004	Ailerons and Hinges - Check condition, security, and operation	520, 620

272001	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.	340
272002	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	340
272003	Rudder, Tips, Hinges, Stops, Clips and Cable Attachment - Check condition, security, and operation.	340
272005	Rudder Control - Check freedom of movement and proper operation through full travel. Check rudder stops for damage and security.	340
272010	Rudder Control System - Inspect pulleys, cables, sprockets, bearings, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	340
273001	Elevator Control - Check freedom of movement and proper operation through full travel.	222, 223
273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety	222, 223
273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	320, 330
273004	Elevator Downspring - Check structure, bolts, linkage, bell crank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	310
273101	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	224, 240, 310
273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	224

273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	320
275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	510, 610
275003	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	510, 610
275004	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	510, 610
275005	Flap Motor, Actuator, and Limit Switches - Check wiring and terminals for condition and security. Check actuator for condition and security.	610
275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12-21-03.	610
282001	Fuel System - Inspect plumbing and components for mounting and security.	510, 610
282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	510, 610
282003	Fuel Selector Valve - Check controls for detent in each position, security of attachment, and for proper placarding.	224
282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	510, 610
282006	Fuel Selector - Using quick drain, ensure no contamination exists.	224
282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	510, 610
311001	Instruments - Check general condition and markings for legibility.	220
331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	220, 211, 221

334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	340, 520, 620
334201	LED Landing, Taxi and Recognition Lights - Check for condition of the lenses and security of attachment. Complete the LED Landing, Taxi and Recognition Light System Test. Refer to Chapter 33, Landing/Taxi Lights - Maintenance Practices (LED). Refer to Pilots Operating Handbook Kinds Of Operations Equipment List for minimum number of LED's that are required to be operational.	520, 620
341101	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	210
341103	182 and T182, Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510
521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210
531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	210
551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	320, 330
551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	320, 330
553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	340
553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	340
561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210
571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	510, 520, 610, 620

571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	510, 610
571003	Wing Access Plates - Check for damage and security of installation.	510, 520, 610, 620
571004	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.	510, 520, 610, 620
571005	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	510, 520, 610, 620
611001	McCauley Propeller, Spinner - Check general condition and attachment.	110
611003	McCauley Propeller, Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110
611005	McCauley Propeller, Mounting - Check for security of installation.	110
611007	McCauley Propeller, Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110
612001	McCauley Propeller, Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110
710001	Lycoming Engine, Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	120
711001	Lycoming Engine, Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	120
716001	Lycoming Engine, Alternate Induction Air System - Check for obstructions, operation, and security.	120

716002	Lycoming Engine, Induction System - Remove the duct that is between the filter box and the induction air elbow, refer to Chapter 71, Air Induction System - Maintenance Practices. Make sure the duct support wire is correctly placed, there are no loose, or broken cords and the fabric is not torn. Install an operable duct and make sure there is 0.25 inch (6.35 mm) of wire and cord under the clamps that attach the duct to the filter box and elbow. Make sure the clamps, tubes, and duct is correctly installed and make sure there are no leaks.	120
716004	Lycoming Engine, Induction Air Filter - Remove and clean. Inspect for damage and service.	120
716005	Lycoming Engine, Induction System - Make sure the duct support wire (if applicable) is secured correctly. Refer to Chapter 71, Air Induction System - Maintenance Practices.	120
722001	Lycoming Engine - Inspect engine for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120
722003	Lycoming Engine, Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120
723003	Lycoming Engine, Engine Baffles and Seals - Check condition and security of attachment.	120
761001	Lycoming Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check to make sure the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225
781001	Lycoming Engine, Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120
781002	Lycoming Engine, Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120

791001 Lycoming Engine - Drain engine oil sump and oil cooler. Check 120
for metal particles or foreign material in filter, on sump drain
plug, and on engine suction screen. Refer to Textron Lycoming
Service Bulletin # 480C or latest revision. Replace filter, and
refill with recommended grade aviation oil.

792001 Lycoming Engine, Oil Cooler - Check for obstructions, leaks, 120
and security of attachment.

801002 Lycoming Engine, Bendix Drive Starter Assembly - Clean and 120
lubricate starter drive assembly.

*** End of Operation 3 Inspection Items ***

INSPECTION OPERATION 4

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 4 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the landing gear. Items from other areas are included to meet their required time interval. The Progressive inspections are performed in the following order once an aircraft is placed on the Progressive care program in lieu of the Traditional (Annual/100 Hour) inspection program: (1) Inspection Operation 4 is due 200 hours time in service after the aircraft is placed on the Progressive Care Program. (2) The inspection operation cycle (Inspection Operation 1, Inspection Operation 2, Inspection Operation 3 and Inspection Operation 4) will repeat again 50 hours time in service after Inspection Operation 4 was completed.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	ALL			
214001	Cold and Hot Air Hoses - Check condition, routing, and security.	120			
242001	Lycoming Engine, Alternator and Mounting Bracket - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120			
242002	Lycoming Engine, Alternator Electrical Connections - Check condition and security. Check for cracks on the shank of terminals connected to alternator BAT and GND connection posts. Make sure the terminals are not bent or under mechanical stress caused by the routing of the attached wire. Make sure the field wire connector on 95 amp. Alternators is secure and firmly latched.	120			

243001	Main Battery - Examine the general condition and security. Complete a check of the level of electrolyte. Refer to Chapter 12, Battery - Servicing.	310
243002	Main Battery Box and Cables - Clean and remove any corrosion. Examine the cables for routing, support, and security of the connections.	310
251002	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Inspect seat rails for cracks.	230
282010	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security.	120
321001	Main Landing Gear Wheel Fairings and Brake Fairings - Check for cracks, dents, condition of paint, and correct scraper clearance.	721, 722
321002	Main Gear Spring Assemblies - Examine for cracks, dents, corrosion, condition of paint or other damage. Examine for chips, scratches, or other damage that lets corrosion get to the steel spring. Examine the axles for condition and security.	721, 722
321003	Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	721, 722
322001	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	720
322002	Nose Landing Gear Wheel Fairings - Check for cracks, dents, and condition of paint.	720
322003	Nose Gear Fork - Inspect for cracks, general condition, and security of attachment.	720
322004	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	720
324001	Brakes - Test toe brakes and parking brake for proper operation.	230
324002	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake. Refer to Chapter 12-13-00 for servicing instructions.	224, 230

324004	Tires - Check tread wear and general condition. Check for proper inflation.	720, 721, 722
324005	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	721, 722
324006	Wheel Bearings - Clean, inspect and lube.	720, 721, 722
325001	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.	720
341103	182 and T182, Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510
371001	Vacuum System - Inspect for condition and security.	120
371002	Vacuum Pumps - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	120
371003	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	120
371004	Gyro Filter - Inspect for damage, deterioration and contamination. Clean or replace if required.	120
611001	McCauley Propeller, Spinner - Check general condition and attachment.	110
611002	McCauley Propeller, Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	110
611003	McCauley Propeller, Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110
611005	McCauley Propeller, Mounting - Check for security of installation.	110
611007	McCauley Propeller, Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110
612001	McCauley Propeller, Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110

710001	Lycoming Engine, Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	120
711001	Lycoming Engine, Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	120
716001	Lycoming Engine, Alternate Induction Air System - Check for obstructions, operation, and security.	120
716002	Lycoming Engine, Induction System - Remove the duct that is between the filter box and the induction air elbow, refer to Chapter 71, Air Induction System - Maintenance Practices. Make sure the duct support wire is correctly placed, there are no loose, or broken cords and the fabric is not torn. Install an operable duct and make sure there is 0.25 inch (6.35 mm) of wire and cord under the clamps that attach the duct to the filter box and elbow. Make sure the clamps, tubes, and duct is correctly installed and make sure there are no leaks.	120
716003	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.	120
716004	Lycoming Engine, Induction Air Filter - Remove and clean. Inspect for damage and service.	120
716005	Lycoming Engine, Induction System - Make sure the duct support wire (if applicable) is secured correctly. Refer to Chapter 71, Air Induction System - Maintenance Practices.	120
722001	Lycoming Engine - Inspect engine for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120
722002	Lycoming Engine, Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	120
722003	Lycoming Engine, Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120

723001	Lycoming Engine, Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	120
723003	Lycoming Engine, Engine Baffles and Seals - Check condition and security of attachment.	120
723004	Lycoming Engine, Cylinder Compression - Complete a differential compression test. If there is weak cylinder compression, refer to Chapter 71, Engine - Troubleshooting, for further procedures.	120
730001	Lycoming Engine, Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	120
730002	Lycoming Engine, Fuel Injection System - Check system for security and condition. Clean fuel inlet screen, check and clean injection nozzles and screens (if evidence of contamination is found), and lubricate air throttle shaft.	120
730003	Lycoming Engine, Idle and Mixture - Run the airplane engine to determine satisfactory performance. If required, adjust the idle rpm and fuel mixture. Refer to Chapter 73, Fuel Injection Systems - Maintenance Practices.	120
741001	Lycoming Engine, Magnetos - Examine the external condition and for correct installation and condition of the electrical leads. Complete a check of the engine timing (external timing). Refer to Chapter 74, Ignition System - Maintenance Practices.	120
742001	Lycoming Engine, Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	120
742002	Lycoming Engine, Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	120
743001	Lycoming Engine, Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	120
761001	Lycoming Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check to make sure the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225

781001	Lycoming Engine, Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120
781002	Lycoming Engine, Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120
791001	Lycoming Engine - Drain engine oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin # 480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	120
792001	Lycoming Engine, Oil Cooler - Check for obstructions, leaks, and security of attachment.	120
801001	Starter and Electrical Connections - Check security and condition of starter, electrical connection, and cable.	120
801002	Lycoming Engine, Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120

*** End of Operation 4 Inspection Items ***

INSPECTION OPERATION 5

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 5 gives a list of item(s), which are completed every 400 hours or 1 year, whichever occurs first.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
212001	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	211			
252201	Upholstery, Headliner, Trim, and Carpeting - Check condition and security.	211			
324003	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	721, 722			
*** End of Operation 5 Inspection Items ***					

PROGRESSIVE CARE

1. Operation 6

THERE ARE CURRENTLY NO PROGRESSIVE CARE OPERATIONS CONTAINED IN THIS SECTION.

PROGRESSIVE CARE

1. Operation 8

THERE ARE CURRENTLY NO PROGRESSIVE CARE OPERATIONS CONTAINED IN THIS SECTION.

INSPECTION OPERATION 9

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 9 gives a list of item(s), which are completed every 500 hours.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

741002	Lycoming Engine, Magnetos - Clean, examine, and adjust as necessary. Do the 500-hour inspection in accordance with the Slick 4300/6300 Series Magneto Maintenance and Overhaul Manual.	120			

*** End of Operation 9 Inspection Items ***

INSPECTION OPERATION 10

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 10 gives a list of item(s), which are completed every 1000 hours.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
282009	Integral Fuel Bays - Drain the fuel (Refer to Chapter 12, Fuel - Servicing) and purge tanks (Refer to the Single Engine Structural Repair Manual, 1996 and On). Complete an inspection of the tank interior and outlet screens and remove any foreign object debris. Complete an inspection of the tank interior surfaces for sealant deterioration and corrosion (especially in the sump areas).	510, 610			
*** End of Operation 10 Inspection Items ***					

INSPECTION OPERATION 11

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 11 gives a list of item(s), which are completed every 2 years.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

246003	Alternator Control Unit - Complete the Over-voltage Protection Circuit Test. Refer to Chapter 24, Alternator Control Unit.	222			

262006	Non-Halon Fire Extinguisher Weight Check (If Installed) - Weigh bottle. Refer to fire extinguisher placard. (Only applicable to Non-Halon Fire Extinguishers).	211			

341102	Pitot and Static System - Examine in accordance with 14 CFR Part 91.411.	220			

*** End of Operation 11 Inspection Items ***

PROGRESSIVE CARE

1. Operation 13

THERE ARE CURRENTLY NO PROGRESSIVE CARE OPERATIONS CONTAINED IN THIS SECTION.

INSPECTION OPERATION 14

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 14 gives a list of item(s), which are completed every 2 years, or anytime components are added or removed from the airplane which have the potential to affect the magnetic accuracy and/or variation of the compass calibration, or anytime the accuracy of the compass is in question.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
342102	Magnetic Compass - Calibrate.	220			
*** End of Operation 14 Inspection Items ***					

INSPECTION OPERATION 15

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 15 gives a list of item(s), which are completed every 2000 hours.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

743002	Lycoming Engine, Inspect and lubricate ACS brand ignition switch. Refer to Chapter 74, Ignition System - Maintenance Practices.	224			

*** End of Operation 15 Inspection Items ***

INSPECTION OPERATION 16

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 16 gives a list of item(s), which are completed every 1000 hours or 1 year, whichever occurs first.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

221001	Autopilot Rigging - Refer to Autopilot - Maintenance Practices.	610			
221002	Autopilot Servo Capstan Assemblies. Check slip-clutch torque settings. Refer to Autopilot - Maintenance Practices.	610			
221003	Autopilot Servo Actuators. Inspect for evidence of corrosion and or buildup of dirt or other particulate matter which may interfere with servo operation. Refer to Autopilot - Maintenance Practices.	610			
*** End of Operation 16 Inspection Items ***					

INSPECTION OPERATION 17

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 17 gives a list of item(s), which are completed every 12 calendar months.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

262002	Cockpit Mounted Fire Extinguisher - Weigh bottle. Bottle must be serviced by qualified individual if the weight of the extinguishing agent is not within the values listed on the servicing placard of the bottle. (Only applicable to Halon Fire Extinguisher)	211			

341801	Complete the Safe Flight SCc AOA System Ground Functional Test.	610			

*** End of Operation 17 Inspection Items ***

INSPECTION OPERATION 18

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 18 gives a list of item(s), which are completed every 6 years.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

262004	Cockpit Mounted Fire Extinguishers - Empty, inspect for damage, and recharge. (Only applicable to Halon Fire Extinguisher)	211			

*** End of Operation 18 Inspection Items ***

INSPECTION OPERATION 19

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 19 gives a list of item(s), which are completed every 12 years.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

262003	Cockpit Mounted Fire Extinguishers - Perform hydrostatic test. The hydrostatic test shall be at twelve-year intervals based on initial servicing or date of last hydrostatic test. (Only applicable to Halon Fire Extinguisher)	211			

262005	Non-Halon Fire Extinguisher Discard (If Installed) - Discard bottle after 12 years from the date of manufacture. (Only applicable to Non-Halon Fire Extinguishers)	211			

*** End of Operation 19 Inspection Items ***

INSPECTION OPERATION 20

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 20 gives a list of item(s), which are completed every 1 year.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
243005	Avionics Standby Battery - Complete the Standby Battery Capacity Test. Refer to Chapter 24, Standby Battery - Maintenance Practices.	220			
243006	Garmin GI 275 Standby Battery (If Installed) - Complete the Garmin GI 275 Standby Battery Run Down Test. Refer to Chapter 24, Garmin GI 275 Standby Battery - Maintenance Practices.	225			
246101	Essential and Crossfeed Bus Diodes - Check for proper operation. Complete the Essential and Crossfeed Bus Diode Inspection. Refer to Chapter 24, Essential and Crossfeed Bus Diodes - Maintenance Practices.	224			
251102	AMSAFE Aviation Inflatable Restraint (AAIR) - Examine the restraint for dirt, frayed edges, unserviceable stitching, loose connections, and other wear. Refer to Chapter 25, Inflatable Restraint System - Maintenance Practices, and do the Inflatable Restraint Inspection and the AMSAFE Aviation Inflatable Restraint (AAIR) System Adjustment/Test.	211			
*** End of Operation 20 Inspection Items ***					

INSPECTION OPERATION 21

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 21 gives a list of item(s), which are completed every 3 years.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
351002	Oxygen Cylinder (if applicable) - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.	211			
*** End of Operation 21 Inspection Items ***					

INSPECTION OPERATION 22

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 22 gives a list of item(s), which are completed beginning five years from the date of the manufacture, you must make sure of the serviceability of the components every twelve months. Refer to Airborne Air and Fuel Products Service Letter Number 39A or latest revision.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
371006	Vacuum Manifold Check Valve - Complete a check for proper operation. (Only airplanes with dual vacuum pumps and Airborne manifolds. Refer to the Airborne Air & Fuel Products Service Letter Number 39A or latest revision, and in accordance with SB02-37-04.) Refer to Chapter 37, Vacuum System - Maintenance Practices for the removal and installation of the check valve.	120			
*** End of Operation 22 Inspection Items ***					

INSPECTION OPERATION 23

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 23 gives a list of item(s), which are completed every 100 hours or every one year, whichever occurs first.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
050001	Inspect aircraft records to verify that all SID Inspections have been complied with as scheduled.	All			
212002	Primary Flight Display (PFD) Fan, Multi-Function Display (MFD) Fan, Deck Skin Fan, and Remote Avionics Cooling Fan - Operational Check. Refer to Chapter 21, Avionics Cooling - Maintenance Practices.	220, 225			
*** End of Operation 23 Inspection Items ***					

INSPECTION OPERATION 24

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 24 gives a list of item(s), which are completed every 100 hours, every annual inspection, every overhaul, and any time fuel lines or clamps are serviced, removed, or replaced.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

720000	Lycoming Engine, Fuel line (Stainless steel tube assembly) and support clamp inspection and installation. Refer to Lycoming Service Bulletin Number 342E or later version.	120			

*** End of Operation 24 Inspection Items ***

INSPECTION OPERATION 25

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 25 gives a list of item(s), which are completed the first 600 hours and as defined by the manufacturer thereafter
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
371007	Do an inspection of the wear indicator ports on the vacuum pumps described in Tempest Service Letter 004.	120			
*** End of Operation 25 Inspection Items ***					

INSPECTION OPERATION 26

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 26 gives a list of item(s), which are completed every 1000 hours or 3 years, whichever occurs first.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

273107	Elevator Trim Tab Actuator - Remove, clean, examine, and lubricate the actuator. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.	320			

284001	Fuel Quantity Indication System Check (Airplanes without Garmin G1000) - Examine for damage and correct installation. Complete a Fuel Quantity Calibration and Check. Refer to Chapter 28, Fuel Quantity Indication System - Adjustment/Test.	220, 510, 610			

284002	Fuel Quantity Indication System Check (Airplanes with Garmin G1000) - Examine for damage and correct installation. Complete a Fuel Quantity System Check. Refer to Chapter 28, Fuel Quantity Indication System - Adjustment/Test.	220, 510, 610			

*** End of Operation 26 Inspection Items ***

INSPECTION OPERATION 27

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 27 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 12 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program, for additional information concerning repeat Corrosion Program Inspection intervals.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

571019	Wing structure internal. Make sure you inspect these areas: 1. Main spar upper and lower carry-thru fittings. 2. Main spar upper and lower caps. 3. Main spar web. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	510, 520, 610, 620			

712003	Engine support structure. Make sure you inspect these areas: 1. Engine truss. Pay particular attention in the vicinity of the welds. NOTE: Corrosion Prevention and Control Program Inspection item (refer to Section 5-30-00 for additional inspection information).	120			

*** End of Operation 27 Inspection Items ***

INSPECTION OPERATION 28

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 28 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 24 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

272007	Rudder structure. Make sure you inspect these areas: 1. Skin. 2. Forward and aft spars at hinge locations. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information).	340			

273110	Elevator trim system. Make sure you inspect these areas: 1. Elevator trim brackets. 2. Actuator support brackets and bearings. 3. Pulleys and attaching structure. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Do not apply LPS-3 Heavy Duty Rust Inhibitor on hinge bearing.	320, 330			

551004	Rudder attachments. Make sure you inspect these areas: 1. Hinge brackets. 2. Hinge bolts. 3. Hinge bearings. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Do not apply LPS-3 Heavy Duty Rust Inhibitor on hinge bearing.	340			

571022	Aileron attachments. Make sure you inspect these areas: 1. Aileron hinges. 2. Hinge bolts. 3. Hinge bearings. 4. Hinge and pushrod support structure. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Do not apply LPS-3 Heavy Duty Rust Inhibitor on hinge bearing.	520, 620

*** End of Operation 28 Inspection Items ***

INSPECTION OPERATION 29

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 29 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 36 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

322006	Nose gear trunnion, steering assembly, torque link assembly, nose gear fork and axle. Make sure you inspect these areas: 1. Nose gear trunnion surface. 2. Steering collar and steering collar attach bolt. 3. Torque link, torque link attach pin and attach bolt. 4. Nose gear fork. 5. Nose gear axle. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information).	720			

322007	Nose gear trunnion, torque link assembly and nose gear fork. Make sure you inspect these areas: 1. Nose gear trunnion upper and lower inner bore surface and bearing. 2. Torque link bolt and attach pin inner bore surface. 3. Nose gear fork lug inner bore surface. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information).	720			

322008	Nose landing gear outer barrel assembly. Make sure you inspect these areas: 1. Outer barrel assembly. 2. Upper strut end and lower collar assembly. NOTE: Corrosion Prevention and Control Inspection Item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: do not apply LPS-3 Heavy-Duty Rust Inhibitor to the sliding surfaces of the oleo strut.	720			

324007 Main landing gear axle assembly. Make sure you inspect these 721, 722
areas: 1. Main gear axle and attach bolts. 2. Wheel halves.
NOTE: Corrosion Prevention and Control Program Inspection
item (baseline interval, refer to Section 5-30-00 for additional
inspection information). NOTE: Do not apply LPS-3 Heavy-Duty
Rust Inhibitor to the bearing. NOTE: Coordinate with tire change.

*** End of Operation 29 Inspection Items ***

INSPECTION OPERATION 30

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 30 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 48 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

521002	Passenger/Crew door retention system. Make sure you inspect these areas: 1. Bell cranks. 2. Pushrods. 3. Handle. 4. Pin retention. 5. Pins. 6. Lockplates and guides. 7. Hinges. 8. Internal door framing. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information). Note: Remove interior panels for access.	210			

531016	Areas of the cabin structure for the passenger/crew door. Make sure you inspect these areas: 1. Door frames. 2. Door hinges. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	210			

*** End of Operation 30 Inspection Items ***

INSPECTION OPERATION 31

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 31 gives the Corrosion Prevention and Control Program Inspections (Baseline Program) items that are to be examined every 60 months. Refer to Section 5-30-00, Corrosion Prevention and Control Program for additional information concerning repeat Corrosion Program Inspection intervals.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

324101	Nose gear axle assembly. Make sure you inspect these areas: 1. Nose gear axle and attach bolt. 2. Wheel halves. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information). NOTE: Disassemble the nose gear strut to get access. NOTE: Do not apply LPS-3 Heavy-Duty Rust Inhibitor to the sliding surfaces of the oleo strut. NOTE: Coordinate with tire change.	720			

531013	Fuselage lower internal structure beneath the floor panels. Make sure you inspect these areas: 1. Cabin structure under floorboards. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	210, 211			

531014	Fuselage internal structure in upper fuselage. Make sure you inspect these areas: 1. Cabin bulkhead corners. 2. Fuselage skin. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	210			

531015	Areas of the cabin structure. Make sure you inspect these areas: 210 1. Firewall. 2. Firewall attachments. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	
531017	Areas of the cabin structure. Make sure you inspect these areas: 210 1. Cabin door forward and aft frames. 2. Window frames with emphasis at stringers and channel assemblies from aft of door frame to aft bulkhead. 3. Seat attachment structure. 4. Aft Cabin Bulkhead. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	
551005	Horizontal stabilizer structure. Make sure you inspect these areas: 1. Stabilizer attachment to the tailcone bulkhead. 2. Front and rear spars. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	320, 330
553004	Vertical stabilizer structure. Make sure you inspect these areas: 1. Forward spar attachment to tailcone bulkhead. 2. Aft spar attachment to lower stabilizer spar. 3. Front and rear spars. 4. Rear spar rudder hinges. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	310, 340
571020	Wing structure internal. Make sure you inspect these areas: 1. Wing front spar and lower spar caps. 2. Upper and lower wing attach spar fittings. 3. Wing lower skins. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	510, 520, 610, 620
571021	Wing structure external. Make sure you inspect these areas: 1. Skin with emphasis at skin overlaps and under access panels. 2. Rear spar upper and lower caps. 3. Rear spar web. NOTE: Corrosion Prevention and Control Program Inspection item (baseline interval, refer to Section 5-30-00 for additional inspection information).	510, 520, 610, 620

*** End of Operation 31 Inspection Items ***

INSPECTION OPERATION 32

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 32 gives the Supplemental Inspection Document items that are to be examined after the first 1,000 hours of operation or 3 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 3 years, whichever occurs first, after the initial inspection has been accomplished.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

273108	Elevator trim system. 1. Inspect elevator trim brackets and actuator support brackets. 2. Inspect pulleys, attaching structure and fasteners. Refer to Section 5-14-02, Supplemental Inspection Document 27-30-01, for inspection procedures.	320, 330			

*** End of Operation 32 Inspection Items ***

INSPECTION OPERATION 33

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 33 gives the Supplemental Inspection Document items that are to be examined after the first 2,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 2,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

531008	Inspect firewall structure. Refer to Section 5-14-08, Supplemental Inspection Document 53-12-02, for inspection procedure.	210			

*** End of Operation 33 Inspection Items ***

INSPECTION OPERATION 34

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 34 gives the Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 10 years, whichever occurs first. The inspection is to be repeated every 500 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

571016	Inspect aileron hinges, hinge bolts, hinge bearings and hinge and pushrod attach fittings. Refer to Section 5-14-18, Supplemental Inspection Document 57-51-01, for inspection procedure.	520, 620			

*** End of Operation 34 Inspection Items ***

INSPECTION OPERATION 35

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 35 gives the Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

321006	Inspect main landing gear fittings and attachment of the fittings to 210, 721, 722 the bulkheads. Refer to Section 5-14-04, Supplemental Inspection Document 32-13-02, for inspection procedure.				

*** End of Operation 35 Inspection Items ***

INSPECTION OPERATION 36

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description
- A. Operation 36 gives the Supplemental Inspection Document items that are to be examined after the first 3,000 hours of operation or 5 years, whichever occurs first. The inspection is to be repeated every 3,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.
2. General Inspection Criteria
- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

322005	Inspect nose landing gear torque links, bolts, bushings and nose landing gear fork. Refer to Section 5-14-05, Supplemental Inspection Document 32-20-01, for inspection procedure.	720			

*** End of Operation 36 Inspection Items ***

INSPECTION OPERATION 37

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 37 gives the Supplemental Inspection Document items that are to be examined after the first 10,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated every 3,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

272006	Inspect rudder pedal torque tube and cable attachment arms. Refer to 5-14-01, Supplemental Inspection Document 27-20-01, for inspection procedure.	210, 211			

551003	Inspect horizontal stabilizer and elevator, including spars, ribs, hinge bolts, hinge bearings, attach fittings and torque tube. Refer to Section 5-14-11, Supplemental Inspection Document 55-10- 01, for inspection procedures.	320, 330			

553003	Inspect vertical stabilizer and rudder, including spars, ribs, hinge bolts, hinge bearings and attach fittings. Refer to Section 5-14- 12, Supplemental Inspection Document 55-30-01, for inspection procedure.	310, 340			

*** End of Operation 37 Inspection Items ***

INSPECTION OPERATION 38

Date:

Registration Number:

Serial Number:

Total Time:

1. Description

A. Operation 38 gives the Supplemental Inspection Document items that are to be examined after the first 10,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated at every engine overhaul, after the initial inspection has been accomplished.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
712002	Inspect tubular engine mount. Refer to Section 5-14-20, Supplemental Inspection Document 71-20-01, for inspection procedure.	120			
*** End of Operation 38 Inspection Items ***					

INSPECTION OPERATION 39

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 39 gives the Supplemental Inspection Document items that are to be examined after the first 5 years. The inspection is to be repeated every 5 years, after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

571012	This interval is for mild/moderate corrosion environment. Inspect wing root rib. Refer to Section 5-14-16, Supplemental Inspection Document 57-12-01, for inspection procedure.	510, 610			

*** End of Operation 39 Inspection Items ***

INSPECTION OPERATION 40				
Date:				
Registration Number:				
Serial Number:				
Total Time:				
1. Description				
A. Operation 40 gives the Supplemental Inspection Document items that are to be examined after the first 10 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment. B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual. C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.				
2. General Inspection Criteria				
A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance. B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service. C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.				
ITEM CODE NUMBER	TASK	ZONE	MECH	INSP REMARKS
531011	This interval is for mild/moderate corrosion environment. Inspect seat rails for corrosion. Refer to Section 5-14-10, Supplemental Inspection Document 53-47-01, for inspection procedure.	210		
*** End of Operation 40 Inspection Items ***				

INSPECTION OPERATION 41

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 41 gives the Supplemental Inspection Document items that are to be examined after the first 20 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

321004	This inspection is for mild/moderate corrosion environment. Inspect main landing gear tubular spring for rust or damage to finish. Refer to Section 5-14-03, Supplemental Inspection Document 32-13-01, for inspection procedure.	721, 722			

571017	This interval is for mild/moderate corrosion environment. Inspect flap tracks for corrosion. Refer to Section 5-14-19, Supplemental Inspection Document 57-53-01, for inspection procedure.	510, 610			

*** End of Operation 41 Inspection Items ***

INSPECTION OPERATION 42

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 42 gives the Supplemental Inspection Document items that are to be examined after the first 25 years. The inspection is to be repeated every 10 years after the initial inspection has been accomplished, for airplanes operating in a mild or moderate corrosion environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

531004	This interval is for mild/moderate corrosion environment. Inspect the carry-thru spar area, door post bulkhead attach fittings and spar channel. Refer to Section 5-14-06, Supplemental Inspection Document 53-11-01, for inspection procedure.	210			

531009	This interval is for mild/moderate corrosion environment. Inspect the cabin interior skin panels, frames and stringers. Refer to Section 5-14-09, Supplemental Inspection Document 53-30-01, for inspection procedure.	210, 211			

571008	This interval is for mild/moderate corrosion environment. Inspect wing for corrosion and missing or loose fasteners. Refer to Section 5-14-14, Supplemental Inspection Document 57-11-02, for inspection procedure.	510, 520, 610, 620			

571010	This interval is for mild/moderate corrosion environment. Inspect wing splice joint at strut attach. Refer to Section 5-14-15, Supplemental Inspection Document 57-11-03, for inspection procedure.	510, 610			

*** End of Operation 42 Inspection Items ***

INSPECTION OPERATION 43

Date:

Registration Number:

Serial Number:

Total Time:

1. Description

A. Operation 43 gives the Supplemental Inspection Document items that are to be examined after the first 3 years. The inspection is to be repeated every 3 years, after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
571013	This interval is for severe corrosion environment. Inspect wing root rib. Refer to Section 5-14-16, Supplemental Inspection Document 57-12-01, for inspection procedure.	510, 610			
*** End of Operation 43 Inspection Items ***					

INSPECTION OPERATION 44

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 44 gives the Supplemental Inspection Document items that are to be examined after the first 5 years. The inspection is to be repeated every 5 years, after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

531012	This interval is for severe corrosion environment. Inspect seat rails for corrosion. Refer to Section 5-14-10, Supplemental Inspection Document 53-47-01, for inspection procedure.	210, 211			

*** End of Operation 44 Inspection Items ***

INSPECTION OPERATION 45

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 45 gives the Supplemental Inspection Document items that are to be examined after the first 10 years. The inspection is to be repeated every 5 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

321005	This interval is for severe corrosion environment. Inspect main landing gear tubular spring for rust or damage to finish. Refer to Section 5-14-03, Supplemental Inspection Document 32-13-01, for inspection procedure.	721, 722			

571018	This interval is for severe corrosion environment. Inspect flap tracks for corrosion. Refer to Section 5-14-19, Supplemental Inspection Document 57-53-01, for inspection procedure.	510, 610			

*** End of Operation 45 Inspection Items ***

INSPECTION OPERATION 46				
Date:				
Registration Number:				
Serial Number:				
Total Time:				
1. Description				
A. Operation 46 gives the Supplemental Inspection Document items that are to be examined after the first 15 years. The inspection is to be repeated every 3 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment. B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual. C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.				
2. General Inspection Criteria				
A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance. B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service. C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.				
ITEM CODE NUMBER	TASK	ZONE	MECH	INSP REMARKS
531005	This interval is for severe corrosion environment. Inspect the carry-thru spar area, door post bulkhead attach fittings and spar channel. Refer to Section 5-14-06, Supplemental Inspection Document 53-11-01, for inspection procedure.	210		
*** End of Operation 46 Inspection Items ***				

INSPECTION OPERATION 47

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 47 gives the Supplemental Inspection Document items that are to be examined after the first 15 years. The inspection is to be repeated every 5 years after the initial inspection has been accomplished, for airplanes operating in a severe corrosion environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

531010	This interval is for severe corrosion environment. Inspect the cabin interior skin panels, frames and stringers. Refer to Section 5-14-09, Supplemental Inspection Document 53-30-01, for inspection procedure.	210, 211			

571009	This interval is for severe corrosion environment. Inspect wing for corrosion and missing or loose fasteners. Refer to Section 5-14-14, Supplemental Inspection Document 57-11-02, for inspection procedure.	510, 520, 610, 620			

571011	This interval is for severe usage environment. Inspect wing splice joint at strut attach. Refer to Section 5-14-15, Supplemental Inspection Document 57-11-03, for inspection procedure.	510, 610			

*** End of Operation 47 Inspection Items ***

INSPECTION OPERATION 48

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 48 gives the Supplemental Inspection Document items that are to be examined after the first 12,000 hours of operation or 20 years, whichever occurs first. The inspection is to be repeated every 2,000 hours of operation or 10 years, whichever occurs first, after the initial inspection has been accomplished, for airplanes operating in a typical usage environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

531006	This interval is for mild/moderate corrosion environment. Inspect forward doorpost and surrounding structure. Refer to Section 5-14-07, Supplemental Inspection Document 53-12-01, for inspection procedure.	210			

571006	This interval is for typical usage environment. 1. Inspect inboard wing structure for damage and working rivets. 2. Inspect flap actuator support structure. Refer to Section 5-14-13, Supplemental Inspection Document 57-11-01, for inspection procedure.	510, 610			

571014	This interval is for typical usage environment. Inspect wing strut and strut tube. Refer to Section 5-14-17, Supplemental Inspection Document 57-40-01, for inspection procedure.	510, 610			

*** End of Operation 48 Inspection Items ***

INSPECTION OPERATION 49

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 49 gives the Supplemental Inspection Document items that are to be examined after the first 6,000 hours of operation or 10 years, whichever occurs first. The inspection is to be repeated every 1,000 hours of operation or 5 years, whichever occurs first, after the initial inspection has been accomplished, for airplanes operating in a severe usage environment.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS

531007	This interval is for severe corrosion environment. Inspect forward doorpost and surrounding structure. Refer to Section 5-14-07, Supplemental Inspection Document 53-12-01, for inspection procedure.	210			

571007	This interval is for severe usage environment. 1. Inspect inboard wing structure for damage and working rivets. 2. Inspect flap actuator support structure. Refer to Section 5-14-13, Supplemental Inspection Document 57-11-01, for inspection procedure.	510, 610			

571015	This interval is for severe usage environment. Inspect wing strut and strut tube. Refer to Section 5-14-17, Supplemental Inspection Document 57-40-01, for inspection procedure.	510, 610			

*** End of Operation 49 Inspection Items ***

INSPECTION OPERATION 50

Date: _____
Registration Number: _____
Serial Number: _____
Total Time: _____

1. Description

- A. Operation 50 gives the Initial inspection within the first 100 hours of operation, then repeat every 600 hours of operation or 12 months, whichever occurs first.
- B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.
- C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

- A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.
- B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.
- C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
271007	Aileron. 1. Check aileron travel and cable tension. 2. Check aileron cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	210, 510, 520, 610, 620			
272008	Rudder. 1. Check rudder travel and cable tension. 2. Check rudder cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	210, 310, 340			
273005	Elevator. 1. Check elevator travel and cable tension. 2. Check elevator cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	210, 310, 320, 330			
273109	Elevator Trim. 1. Check elevator trim travel and cable tension. 2. Check elevator trim cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	210, 310, 320, 330			
275007	Flaps. 1. Check flap travel cable tension and travel time. 2. Check flap cable system, control cables and pulleys, in accordance with the flight cable inspection procedures in Section 5-20-01, Expanded Maintenance, Control Cables.	210, 510, 610			

*** End of Operation 50 Inspection Items ***

SUPPLEMENTAL INSPECTION DOCUMENT

1. Supplemental Inspection Document

A. Introduction

- (1) The Supplemental Structural Inspection Program for the Cessna Model 182 airplane is based on the affected Model 182 airplane current usage, testing and inspection methods. A practical state-of-the-art inspection program is established for each Principle Structural Element (PSE). A PSE is that structure whose failure, if it remained undetected, could lead to the loss of the airplane. Selection of a PSE is influenced by the susceptibility of a structural area, part or element to fatigue, corrosion, stress corrosion or accidental damage.
- (2) The Supplemental Structural Inspection Program was developed through the combined efforts of Cessna Aircraft Company, operators of affected 182 model series airplanes and the FAA. The inspection program consists of the current structural maintenance inspection, plus supplemental inspections, as required, for continued airworthiness of the airplane as years of service are accumulated. The current inspection program is considered to be adequate in detecting corrosion and accidental damage. The emphasis of the Supplemental Structural Inspection Program is to detect fatigue damage whose probability increases with time.
- (3) Since fatigue damage increases at an increasing rate with increasing crack length, earlier detection and repair minimizes the damage and the magnitude of the repair.
- (4) **The Supplemental Structural Inspection Program is valid for Model 182 airplanes with less than 30,000 flight hours. Beyond this, continued airworthiness of the airplane can no longer be assured. Retirement of this airframe is recommended when 30,000 flight hours has been accumulated.**

B. Function

- (1) The function of the Supplemental Structural Inspection Program is to find damage from fatigue, overload or corrosion through the use of the Nondestructive Inspections (NDI) and visual inspections. This Supplemental Inspection Document (SID) is only for primary and secondary airframe components. Engine, electrical items and primary and secondary systems are not included in this document. A list is included to show the requirements for the SID program for primary and secondary airframe components.
 - (a) The airplane has been maintained in accordance with Cessna's recommendations or the equivalent.
 - (b) If the SID is for a specific part or component, you must examine and evaluate the surrounding area of the parts and equipment. If problems are found outside these areas, report them to Cessna Aircraft Company on a reporting form. Changes can then be made to SID program, if necessary.
 - (c) The inspections presented in the SID apply to all Model 182 airplanes. The inspection intervals presented are for unmodified airplanes. Airplanes that have been modified to alter the airplane's design, gross weight or performance may need to be inspected more frequently. Examples of common STCs, which will require modified inspection intervals, include non-Cessna wing extensions, winglets, speed brakes, STOL conversions, vortex generators, tip tanks, under wing tanks and nonstandard engines. The owner and/or maintenance organization should contact the STC holder(s) or modification originator for obtaining new FAA-approved inspection criteria.
- (2) A Corrosion Prevention and Control Program (CPCP) should be established for each airplane. Details of the CPCP are contained in Section 5-30-00 of this manual.

2. Principal Structural Elements

A. Principal Structural Elements Description

- (1) An airplane component is classified as a Principal Structural Element (PSE) if:
 - (a) The component contributes significantly to carrying flight and ground loads.
 - (b) If the component fails, it can result in a catastrophic failure of the airframe.
- (2) The monitoring of these PSE's is the main focus of this Supplemental Structural Inspection Program.
- (3) Typical examples of PSE's, taken from FAA Advisory Circular 25.571, are shown in [Table 1](#).

Table 1. Typical Examples of Principal Structural Elements

Wing and Empennage:

Control surfaces, flaps and their mechanical systems and attachments (hinges, tracks and fittings)

Primary fittings

Principal splices

Skin or reinforcement around cutouts or discontinuities

Skin-stringer combinations

Spar caps

Spar webs

Fuselage:

Circumferential frames and adjacent skin

Door frames

Pilot window posts

Bulkheads

Skin and single frame or stiffener element around a cutout

Skin and/or skin splices under circumferential loads

Skin or skin splices under fore and aft loads

Skin around a cutout

Skin and stiffener combinations under fore-and-aft loads

Door skins, frames and latches

Window frames

Landing Gear and Attachments

Engine Support Structure and Mounts

B. Selection Criteria

(1) The factors used to find the PSE's in this document include:

(a) Service Experience

1 Multiple sources of information were used to find the service discrepancies.

a Cessna Service Bulletins and Service Information Letters issued to repair common service discrepancies were examined.

b FAA Service Difficulty Records and Foreign certification agency Service Difficulty Records were examined.

2 Existing analyses were reviewed to identify components in areas that may have exhibited the potential for additional inspection requirements.

3 A review of test results applicable to the design was made to identify the critical areas of the PSE's.

4 The data collected was also used to find a component's susceptibility to corrosion or accidental damage as well as its inspectability.

3. Usage

A. Aircraft Usage

(1) Aircraft usage data for the SID program is based on the evaluation of the in-service utilization of the aircraft. This data was used to develop the representative fatigue loads spectra. Operational data for development of the Supplemental Structural Inspection Program was obtained from surveys of aircraft operators.

(2) Usage for spectra determination is defined in terms of a single flight representing typical average in-service utilization of the aircraft. This usage reflects the typical in-service flight variation of flight length, takeoff gross weight, payload and fuel.

(3) The flight is defined in detail in terms of a flight profile. The profile identifies the gross weight, payload, fuel, altitude, speed, distance etc., required to define the pertinent flight and ground parameters needed to develop the fatigue loads. The flight is then divided into operational segments, where each segment represents the average values of the parameters (speed, payload, fuel etc.) that are used to calculate the loads spectrum.

B. Stress Spectrum.

(1) A fatigue loads spectrum, in terms of gross area stress, was developed for each PSE to be analyzed based on the usage-flight profiles. The spectrum represents the following loading environments: flight loads (gust and maneuver), landing impact, taxi loads and ground-air-ground cycles. The resulting spectrum is a representative flight-by-flight, cycle-by-cycle

loading sequence that reflects the appropriate and significant airplane response characteristics.

- (2) After reviewing the aircraft usage data and the way in which the surveyed aircraft were flown, two sets of stress spectra were developed. The first flight profile represents typical usage, while the second profile represents severe usage, as described in Paragraph 3 D. below.

C. Fatigue Assessment

- (1) The fatigue assessment provides the basis for establishing inspection frequency requirements for each PSE. The evaluation includes a determination of the probable location and modes of damage and is based on analytical results, available test data and service experience. In the analysis, particular attention is given to potential structural condition areas associated with aging aircraft. Examples include:
 - (a) large areas of structure working at the same stress level, which could develop widespread fatigue damage;
 - (b) a number of small (less than detectable size) adjacent cracks suddenly joining into a long crack (e.g. as in a line of rivet holes);
 - (c) redistribution of load from adjacent failing or failed parts causing accelerated damage of nearby parts (i.e., the "domino" effect); and
 - (d) concurrent failure of multiple load path structure (e.g. crack arrest structure).
- (2) Initial inspections of a particular area of structure are based on fatigue analytical results. For locations with long fatigue the maximum initial inspection was limited to 12,000 flight hours.

D. Classification for Types of Operation

- (1) The severity of the operation environment needs to be identified to determine the correct inspection program.
 - (a) You must first find the category of your airplane's operation based on average flight length.
 - (b) You must also find the number of hours and number of landings on the airplane, then find the average flight length based on the formula found below.

$$\text{Average Flight Length} = \text{Number of Flight Hours} / \text{Number of Flights}$$
- (2) If the average flight length is less than 30 minutes, then you must use the SEVERE inspection time limits. For airplanes with an average flight length greater than thirty minutes, you must find the severity of the operating environment.
- (3) Airplanes which have engaged in operations at low altitudes such as pipeline patrol, fish or game spotting, aerial applications, police patrol, sightseeing, livestock management etc. more than 30% of its life must use the SEVERE inspection time limits.
- (4) For all other operating environments, inspections should be conducted using the TYPICAL Inspection Time Limits.

E. Corrosion Severity

- (1) Prior to conducting the initial corrosion inspection, determine where the airplane has resided throughout its life. If the airplane has resided in a severe corrosion environment for 30% or more of the years to the initial inspection (refer to maps in Section 5-30-01), use the severe inspection time, otherwise use the mild/moderate inspection time.
- (2) Prior to conducting a repetitive corrosion inspection, determine where the airplane has resided since the last inspection. If the airplane has resided in a severe environment for 30% or more of the years since the last inspection, use the severe inspection time, otherwise use the mild/moderate inspection time.

4. Reporting - Communications

A. Discrepancies

- (1) For the SID to continue to stay applicable, it is necessary to have a free flow of information between the operator, the FAA and Cessna Aircraft Company. The important information about the inspection results, repairs and modifications done must be supplied to Cessna Aircraft Company in order to assess the effectiveness of the recommended inspection procedures and inspection intervals.
- (2) Also, the operator's inspections and reports can find items not included in the SID before. These items will be examined by Cessna Aircraft Company and will be added to the SID for all of the operators, if applicable.
- (3) Cessna Customer Service has a system to collect the reports. The applicable forms are included in this document. Copies of these forms are also available from a Cessna Service Station or Cessna Field Service Engineer.

B. Discrepancy Reporting

- (1) Discrepancy reporting is essential to provide for adjusting the inspection thresholds and the repeat times as well as adding or deleting PSE's. It may be possible to improve the inspection methods, repairs and modifications involving the

PSE's based on the data reported.

- (2) All cracks, multiple cut off fasteners and corrosion found during the inspection must be reported to Cessna Aircraft Company within ten days. The PSE inspection results are to be reported on a form as shown on the pages that follow.

C. Send the [Discrepancy Form](#)

- (1) Send all available data, which includes forms, repairs, photographs, sketches etc., to Cessna Maintenance Engineering. Refer to the [Introduction - How to Get Customer Assistance](#).

NOTE: This system does not replace the normal channels to send information for items not included in the SID.

D. Cessna Aircraft Company Follow-Up Action

- (1) All SID reports will be examined to find if any of the steps are necessary:
 - (a) Complete a check of the effect on the structural or operational condition.
 - (b) Complete a check of other high-time airplanes to find if a service bulletin shall be issued.
 - (c) Find if a reinforcement is required.
 - (d) Change the SID if required.

5. Inspection Methods

A very important part of the SID program is selecting and evaluating state-of-the-art nondestructive inspection (NDI) methods applicable to each PSE.

Potential NDI methods were selected and evaluated on the basis of crack orientation, part thickness and accessibility. Inspection reliability depends on size of the inspection task, human factors (such as qualifications of the inspector), equipment reliability and physical access. Visual, fluorescent, liquid penetrant, eddy current and magnetic particle methods are used. A complete description of the methods are presented in Section 5-13-01, "Nondestructive Inspection Methods and Requirements."

6. Related Documents

A. Existing Inspections, Modifications and Repair Documents

- (1) Cessna has a number of documents that are useful to maintaining continued airworthiness of airplanes.
 - (a) Cessna Model 182 Service Manual (P/N 182SMM).
 - (b) Cessna Model 182 Illustrated Parts Catalogs (P/N 182SPC).
 - (c) Cessna Single Engine Service Information Letters and Service Bulletin Summaries.
 - (d) Cessna Service Newsletters and Newsletter Summaries.

B. For information regarding these documents, contact Cessna Maintenance Engineering. Refer to the [Introduction - How to Get Customer Assistance](#)

7. Applicability/Limitations

A. This SID is applicable to the Cessna Model 182 airplanes, Serial Numbers 18280001 and On and T18208001 and On.

B. STC Modifications

- (1) The Cessna Model 182 airplanes can have modifications that were done by STCs by other organizations without Cessna Engineering approval. The inspection intervals given in this SID are for unchanged airplanes.
- (2) Airplanes that have been modified to alter the airplane design, gross weight or airplane performance may need to be inspected more frequently. Examples of common STC's not covered by this SID document include non-Cessna wing extensions, winglets, speed brakes, STOL conversions, vortex generators, tip tanks, under wing tanks and nonstandard engines. The owner and/or maintenance organization should contact the STC holder(s) or modification originator for obtaining new FAA approved inspection criteria.

C. The SID inspection times are based on total airframe hours OR calendar times in service. If a specific airframe component has been replaced, the component is to be inspected, based on total component hours or calendar time requirements. However, any attachment structure that was not replaced when the component was replaced must be inspected, based on the total airframe hours or calendar time requirements. Inspections are due at the lessor of specified flight hours or calendar time. The inspections must be completed by August 31, 2014.

8. PSE DETAILS

A. Details

- (1) This section contains the important instructions selected by the rationale process described in Section 2, Principal

Structural Elements. Those items are considered important for continued airworthiness of the Model 182 airplane.

B. PSE Data Sheets

A data sheet for each PSE is provided in Section 5-14-XX - Supplemental Inspection Documents. Each data sheet contains the following:

- (1) Supplemental Inspection Number
- (2) Title
- (3) Effectivity
- (4) Inspection Compliance
- (5) Initial Inspection Interval(s)
- (6) Repeat Inspection Interval(s)
- (7) Purpose
- (8) Inspection Instructions
- (9) Access/Location/Zone
- (10) Detectable Crack Size
- (11) Inspection Procedure
- (12) Repair/Modification
- (13) Comments

NOTE: Accomplishment of SID inspections does not in any way replace preflight inspections, good maintenance practices or maintenance and inspections specified in the applicable Model 182 Service Manual.

NOTE: Inspection intervals are given in both hour and calendar time. After the completion of each initial SID inspection, repeat inspections may be completed based on hour time if the Corrosion Prevention and Control Program (CPCP) in Section 5-30-00 is included in the airplane maintenance program.

C. Repairs, Alterations and Modifications (RAM)

- (1) Repairs, alterations and modifications (RAM) made to PSE's may affect the inspection times and methods presented in the SID. The flowchart in [Figure 1](#) can be used to determine if a new assessment and FAA approved supplemental inspections are required.
- (2) Repairs may be made in accordance with applicable chapters of the Single Engine Structural Repair Manual or the REPAIR/MODIFICATION Section of the SID.
- (3) Repairs not covered by the recommendations in these documents may be coordinated with Cessna Customer Service at telephone 316-517-5800 / FAX 316-517-7271.

A25373

DISCREPANCY REPORT

SID NO: _____ AIRPLANE LOCATION: _____ S/N OF AIRPLANE: _____

INSPECTION CONDUCTED: Date _____ Airplane Total Hours _____ Cycles _____

Component Total Hours _____ Cycles _____

OWNER NAME _____ OWNER PHONE NUMBER _____

OWNER ADDRESS _____

SERVICE HISTORY:

INSPECTION METHOD/LIMITS:

ACCESS REQUIRED:

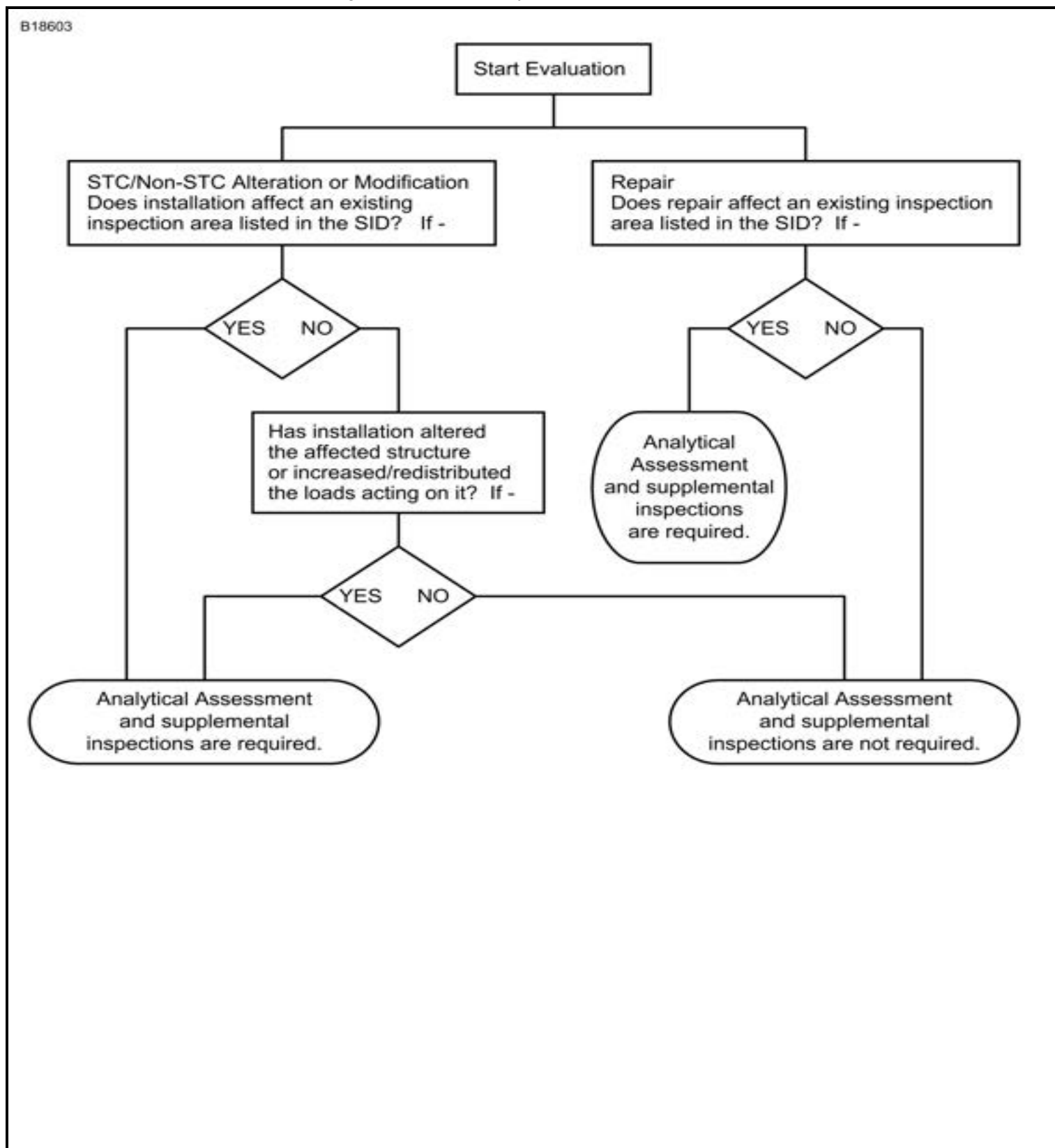
REPAIR DESCRIPTION:

COMMENTS:

Enclose all available data including photos, sketches, etc., to:

Textron Aviation
Attn: SID Program
Maintenance Engineering
Dept 753
2121 S Hoover Road
Wichita KS 67209
FAX 316-517-7271

Figure 1 : Sheet 1 : Analytical Assessment Flowchart



NONDESTRUCTIVE INSPECTION METHODS AND REQUIREMENTS

1. GENERAL REQUIREMENTS

A. General

- (1) Facilities performing nondestructive inspections described in this section must hold a valid FAA Repair Station Certificate with the appropriate rating in the applicable method of nondestructive testing.
- (2) Personnel performing NDT must be qualified and certified to a recognized standard in AC65-31A and comply with all recommendations. The minimum certification is "Level 1 Special" as described in 8.c.(1).
- (3) Organizations and personnel that operate under the jurisdiction of a foreign government must use the applicable documentation issued by their regulatory agency to comply with the above requirements.

B. Reporting Results

- (1) Use the Discrepancy Report Form found in 5-13-00, [Supplemental Inspection Document](#), Section 4, Reporting, to report crack(s) that are found in an inspection. If a part is rejected, refer to the Model 182 Maintenance Manual for information to replace the part or repair the part. If a repair for crack(s) is required (for a repair not available in the Model 182 Maintenance Manual), contact Cessna Customer Service for possible repair instructions or replace the part.
 - (a) Type of discontinuity.
 - (b) Location of the discontinuity.
 - (c) Discontinuity size.
 - (d) Discontinuity orientation or direction.

2. EDDY CURRENT INSPECTION

A. General

- (1) Eddy current inspection is effective for the detection of surface and subsurface cracks in most metals. You do this through induction of eddy currents into the part. These eddy currents will alter the magnetic field around the probe. Changes to the magnetic field are monitored and then interpreted.
- (2) You can do eddy current inspection on airplane parts or assemblies where the inspection area is accessible for contact by the eddy current probe. An important use of eddy current inspection is to find cracks caused by corrosion and stress. A second important use is measurement of electrical conductivity.

B. Surface Inspection

(1) General

- (a) This is a general procedure for the eddy current method used to find surface discontinuities. This should be used along with specific instructions for inspection in the procedure that referred to this section.

(2) Instrument Parameters

- (a) The following equipment was used to develop the inspection procedures referred to in this manual. Alternative equipment may be used if it has the same sensitivity. Refer to the guidelines in this section for more information on equipment parameters.

NAME	NUMBER	MANUFACTURER
Eddy Current Instrument	Nortec 2000	Olympus NDT Phone: 781-419-3900 Web: http://www.olympusndt.com VM Products
Surface Eddy Current Probe with 1/8 inch coil (NOTE 1)	VM202RAF-6	VM Products, Inc. Phone: (253) 841-2939 Web: http://www.vmproducts.net
Combined Aluminum Surface and Bolthole Eddy Current Reference Standard (NOTE 2)	VM89A	VM Products, Inc.
Combined Steel Surface and Bolthole Eddy Current Reference Standard (NOTE 2)	VM89S	VM Products, Inc.

Combined Stainless Steel Surface and Bolthole VM89SS
Eddy Current Reference Standard (NOTE 2)

VM Products, Inc.

NOTE 1:

The style and length of the surface probe will vary with the inspection situation.

NOTE 2:

Be sure that the reference standard has the necessary hole size for bolthole inspections. If used only for surface eddy current inspection, it is not necessary that the reference standard have holes. This part number was included to allow the use of a single reference standard for both surface and bolthole eddy current inspection. The reference standard material (aluminum, steel, stainless steel) will vary with the material for inspection.

(b) Instrument Sensitivity

- 1 Some inspection procedures need instruments that give both phase and amplitude information on a storage cathode ray tube for impedance plane analysis. Impedance plane instruments can be used as an alternative for metered instruments. Metered instruments must not be used as an alternative for impedance plane instruments where the ability to show phase information is necessary.
- 2 Eddy current instruments with a meter display can be used for surface eddy current inspection.
- 3 The instrument must have a repeatable signal response which has a signal to noise ratio of more than 3 to 1. Impedance plane instruments must have the resolution to show a signal within the guidelines shown in [Figure 1](#) and [Figure 2](#).

B18604

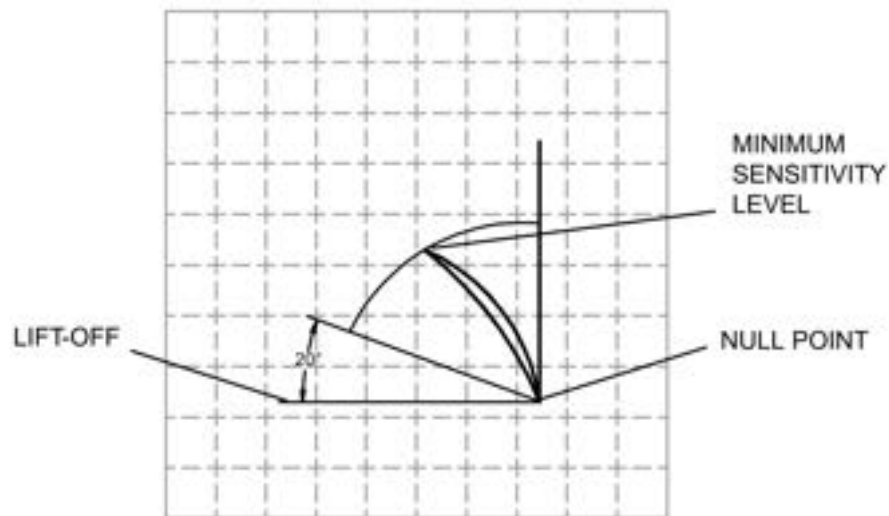
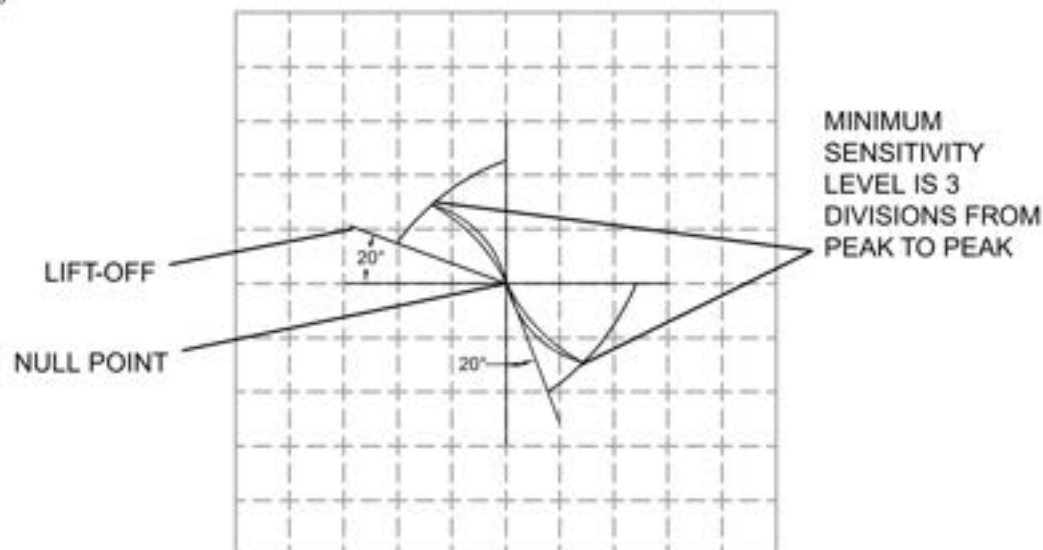


Figure 1

B18605

*Figure 2*

- 4 The functional performance of the eddy current instrument must be verified at an interval of not more than a year.
- (c) Probe Sensitivity
- 1 The probe may have an absolute or differential coil arrangement.
 - 2 The probe may be shielded or unshielded. A shielded probe is normally recommended.
 - 3 The probe must have an operating frequency that has the necessary test sensitivity and depth of penetration. For an aluminum part, the frequency should be approximately 200 kHz. For a steel part, the frequency should be 500 to 800 kHz. For a titanium part, the frequency should be 1.0 to 2.0 MHz.
- NOTE:** Instrument frequency may need adjustment for the instrument and probe combination used.
- 4 Smaller coil diameters are better for crack detection. A coil diameter of 0.125 inch (3.175 mm) is normally used.
 - 5 For crack detection, the coil will usually contain a ferrite core and external shield.
 - 6 The probe must not give responses from handling pressures, scanning or normal operating pressure variations on the sensing coil which cause the signal to noise ratio to be less than 3 to 1.
 - 7 Teflon tape may be used to decrease the wear on the eddy current probe coil. If Teflon tape is used, make sure the instrument calibration is correct.
- (3) Reference Standards
- (a) Nonferrous reference standards should be of an alloy having the same major base metal, basic temper and the approximate electrical conductivity of the material for inspection. Refer to [Figure 3](#).
 - (b) Reference standards must have a minimum surface finish of 150 RHR or RMS 165.
 - (c) The reference standard must have an EDM notch on the surface of no more than 0.020 inch (0.508 mm) deep.
 - (d) The dimensional accuracy of notches must have documentation and be traceable to the National Institute of Standards and Technology (NIST) or applicable foreign agency.
 - (e) In some cases a specially fabricated reference standard will be necessary to simulate part geometry, configuration and the specific discontinuity location. Artificial discontinuities may be used in the reference standard. If a procedure specifies a reference standard made by Cessna Aircraft Company, replacement with a different standard is not allowed.
- (4) Surface Condition
- (a) The surface finish of the area for inspection must be 150 RHR or RMS 165 or finer. If the surface finish interferes with the ability to do the inspection, it should be smoothed or removed. Refer to the applicable Model 182 Maintenance Manual for approved methods.

- (b) The area for inspection must be free of dirt, grease, oil, or other contamination.
 - (c) You must have good contact between the probe and the part unless otherwise stated in the specific procedure. Mildly corroded parts must be cleaned lightly with emery cloth. Heavily corroded or painted parts must be lightly abraded and cleaned locally in the area where the inspection will be done.
- (5) Instrument Standardization
- (a) The instrument must be set up and operated in accordance with this procedure and the manufacturer's instructions.
 - (b) Before you begin the inspection, standardize instrument using the appropriate reference standard. Accuracy must be checked at intervals necessary to maintain consistency during continuous use and at the end of the inspection. Verify the accuracy, if any part of the system is replaced or if any calibrated control settings are changed.
 - (c) A 0.020 inch (0.508 mm) deep surface notch or smaller must be used for calibration unless otherwise specified. A typical eddy current surface reference standard with EDM notch depths of 0.010 inch, 0.020 inch, and 0.040 inch (0.254 mm, 0.508 mm, 1.016 mm) is shown in Figure 3.
 - (d) Put the surface probe on the reference standard away from the notch.
 - (e) Set the null point.
 - (f) Lift the surface probe from the reference standard and monitor the display for the lift-off response.
 - (g) Adjust the display until the lift-off response goes horizontal and to the left of the null point.
 - (h) Put the surface probe on the reference standard and move it across the notch.
 - (i) Adjust the instrument to get a minimum separation of three major screen divisions between the null point and the applicable reference notch. The signal from a differential probe should be considered peak to peak.

NOTE: This adjustment is used to set the sensitivity of the inspection. It is not intended as accept or reject criteria.

NOTE: Filters may be used to improve the signal to noise ratio.

- (6) Inspection
- (a) It may be necessary to randomly null the instrument on the airplane in the area for inspection to adjust the display for differences between the reference standard and the airplane.
 - (b) Whenever possible, the area of inspection must be examined in two different directions that are 90 degrees to each other.
 - (c) Examine the inspection area at index steps that are no more than the width of the eddy current test coil. You can do a scan of a part edge as long as the response from edge effect does not hide the calibration notch response. Do not examine areas where edge effect is more than the calibration notch signal. Another inspection method should be used if the edge effect can hide the calibration notch response.
 - (d) Whenever possible, a fillet or radius should be examined both transverse and parallel to the axis of the radius. Examine the edge of the fillet or radius transverse to the axis of the radius.
 - (e) For the best inspection sensitivity, sealant must be removed from around fasteners. This will allow you to put the surface eddy current probe closer to the edge of the fastener.
 - (f) If no guidance is given as to where to examine the part, do an inspection of all part surfaces that you have access to. Make sure to thoroughly examine radii, corners, edges, and areas immediately next to fasteners.
- (7) Interpretation
- (a) If an indication is found, carefully repeat the inspection in the opposite direction of probe movement to make sure of the indication. If the indication is still there, carefully monitor the amount of probe movement or rotation needed to cause the response to move off maximum indication response.
 - (b) Unless otherwise specified, you must reject a part with a crack.
 - (c) The end of a crack is found with the 50 percent method. Move the probe slowly across the end of the crack until a point is reached where the crack signal amplitude has been reduced by 50%. The center of the probe coil is considered to be the end of the crack.
 - (d) Refer to the General Requirements section for information on how to report inspection results.

C. Bolthole Inspection

(1) Description

- (a) This is a general procedure for the use of the eddy current method to find discontinuities within holes. This should be used along with specific instructions for inspection in the procedure that referred to this section.
- (2) Instrument Parameters
- (a) The following equipment was used to develop the inspection procedures referred to in this manual. Alternative equipment may be used if it has the same sensitivity. Refer to the guidelines in this section for more information on equipment parameters.

NAME	NUMBER	MANUFACTURER
Eddy Current Instrument	Nortec 2000	Olympus NDT Phone: 781-419-3900 Web: http://www.olympusndt.com
Bolthole Eddy Current Probe with 1/8 inch coil (NOTE 1)	VM101BS-X/XX	VM Products, Inc. Phone: 253-841-2939 Web: http://www.vmproducts.net
Combined Aluminum Surface and Bolthole Eddy Current Reference Standard (NOTE 2)	VM 89A	VM Products, Inc.
Combined Steel Surface and Bolthole Eddy Current Reference Standard (NOTE 2)	VM89S	VM Products, Inc.
Combined Stainless Steel Surface and Bolthole Eddy Current Reference Standard (NOTE 2)	VM89SS	VM Products, Inc.

NOTE 1:

Bolthole probe diameter and lengths will vary with the inspection situation.

NOTE 2:

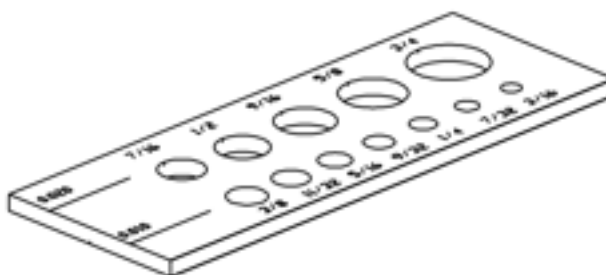
Be sure that the reference standard has the necessary hole size for the bolthole inspection. The reference standard material (aluminum, steel, stainless steel) will vary with the material of the hole for inspection.

- (b) Instrument Sensitivity
- 1 Some inspection procedures need instruments that give both phase and amplitude information on a storage cathode ray tube for impedance plane analysis. Impedance plane instruments can be used as an alternative for metered instruments. Metered instruments must not be used as an alternative for impedance plane instruments where the ability to show phase information is necessary.
 - 2 Eddy current instruments with a meter display are allowed for bolthole eddy current inspection.
 - 3 The instrument must have a repeatable signal response which has a signal to noise ratio of more than 3 to 1. Impedance plane instruments must have the resolution to show a signal within the guidelines shown in [Figure 1](#) and [Figure 2](#).
 - 4 The functional performance of the eddy current instrument must be verified at an interval of not more than a year.
- (c) Probe Sensitivity
- 1 The probe may have an absolute or differential coil arrangement.
 - 2 The probe may be shielded or unshielded. A shielded probe is normally recommended.
 - 3 The probe must have an operating frequency that has the necessary test sensitivity and depth of penetration. For an aluminum part, the frequency should be approximately 200 kHz. For a steel part, the frequency should be 500 to 800 kHz. For a titanium part, the frequency should be 1.0 to 2.0 MHz.
- NOTE: Instrument frequency may need adjustment for the instrument and probe combination used.**
- 4 Smaller coil diameters are better for crack detection. A coil diameter of 0.125 inch (3.175 mm) is normally used.
 - 5 For crack detection, the coil will usually contain a ferrite core and external shield.
 - 6 The probe must not give responses from handling pressures, scanning or normal operating pressure variations on the sensing coil which cause the signal to noise ratio to be less than 3 to 1.
 - 7 Teflon tape may be used to decrease the wear on the eddy current probe coil. If Teflon tape is used, make sure the instrument calibration is correct.

(3) Reference Standard

- (a) Nonferrous reference standards should be of an alloy having the same major base metal, basic temper and the approximate electrical conductivity of the material for inspection. Refer to [Figure 3](#).
- (b) Reference standards must have a minimum surface finish of 150 RHR or RMS 165.
- (c) The reference standard must have a corner notch no larger than 0.050 inch x 0.050 inch (0.127 mm x 0.127 mm) long.
- (d) The dimensional accuracy of notches must have documentation and be traceable to the National Institute of Standards and Technology (NIST) or applicable foreign agency.
- (e) In some cases a specially fabricated reference standard will be necessary to simulate part geometry, configuration, and/or the specific discontinuity location. Artificial discontinuities may be used in the reference standard. If a procedure specifies a reference standard made by Cessna Aircraft Company, replacement with a different standard is not allowed.

B18607

*Figure 3*

(4) Inspection Considerations

(a) Surface Condition

- 1 The surface finish of the area for inspection must be 150 RHR or RMS 165 or finer.
- 2 The areas for inspection must be free of dirt, grease, oil, or other contamination.
- 3 You must have good contact between the probe and the part unless otherwise stated in the specific procedure. Mildly corroded parts must be cleaned lightly with emery cloth. Heavily corroded or painted parts must be lightly abraded and cleaned locally in the area on which the probe will be done.

- (b) Bolthole eddy current inspection of holes with a bushing installed is not recommended. The inspection will examine the condition of the bushing and not the structure underneath. If a bushing cannot be removed, it is recommended to do a surface eddy current inspection at either end of the hole around the edge of the bushing.

(5) Instrument Standardization

- (a) The instrument must be set up and operated in accordance with this procedure and the manufacturer's instructions.
- (b) Before you begin the inspection, standardize instrument using the appropriate reference standard. Accuracy must be checked at intervals necessary to maintain consistency during continuous use and at the end of the inspection. Verify the accuracy, if any part of the system is replaced or if any calibrated control settings are changed.
- (c) A corner notch no larger than 0.050 inch x 0.050 inch (0.127 mm x 0.127 mm) must be used for calibration unless otherwise specified. A typical eddy current bolthole reference standard is shown in [Figure 3](#).
- (d) Put the bolthole probe into the applicable hole with the coil turned away from the notch in the hole.
- (e) Set the null point.
- (f) Remove the bolthole probe from the hole and monitor the display for the lift-off response.
- (g) Adjust the display until the lift-off response goes horizontal and to the left of the null point.
- (h) Put the bolthole probe into the applicable hole and rotate it so the coil moves across the notch in the hole.
- (i) Adjust the instrument to get a minimum separation of three major screen divisions between the null point and the applicable reference notch. The signal from a differential probe should be considered peak to peak.

NOTE: This adjustment is used to set the sensitivity of the inspection. It is not intended as accept or

reject criteria.**NOTE: Filters may be used to improve the signal to noise ratio.****(6) Inspection**

- (a) When the inspection procedure does not show the depths where the scans are made for a manual probe, the following general procedure is used.
 - 1 Put the probe into the hole for inspection and find the near edge of the hole. This is the point when the signal is 50% between that for an in-air condition and that fully into the hole. Record the distance between the center of the probe coil and the edge of the probe guide.
 - 2 Move the probe through the hole until the signal indicates that the probe is beyond the far edge of the hole. Locate this edge of the hole as in step 1. Record the distance between the center of the probe coil and the edge of the probe guide.
 - 3 To find the edge of a layer, slowly push the probe through the hole. The response to a layer interface will look similar to that of a crack indication. The difference is that the interface will be seen through 360° of the hole. Measure the distance between the center of the probe coil and the edge of the probe guide when the signal from the interface has been maximized.
 - 4 Use the measurements to find the thickness of the hole and each layer.
 - 5 Examine the hole at a depth of 0.070 inch (1.778 mm) from either edge of the hole, if thickness allows. Also examine the hole at index steps of 0.070 inch (1.778 mm) through the hole. If multiple layers are present in the hole, the inspection parameters must be applied to each layer. If the hole depth or layer depth is less than 0.150 inch (3.810 mm) thick, examine the hole at the center of the depth.
- (b) Carefully examine each hole at the applicable depths. Examine the entire circumference of the hole at each depth.
- (c) It may be necessary to null the instrument on the airplane in the hole for inspection to adjust the display for differences between the reference standard and the airplane.

(7) Interpretation

- (a) If an indication is found, carefully repeat the inspection in the opposite direction to make sure of the indication. If the indication is still there, carefully monitor the amount of probe movement or rotation needed to cause the instrument to move off maximum indication response.
- (b) When the eddy current probe is over the center over a crack, the signal will be at maximum and any movement of the probe will cause the signal to begin returning to the normal signal. Corrosion pits, foreign material, and out-of-round holes can cause an instrument response for 20° to 30° of both hole probe rotation before the indication begins to return to the normal signal.
- (c) Unless otherwise specified, you must reject a part with a crack.
- (d) Refer to the General Requirements section for information on how to report inspection results.

D. Conductivity Testing**(1) General**

- (a) Conductivity testing is effective to find the material properties of aluminum structures. This is done through induction of eddy currents into the part. The eddy currents will alter the magnetic field around the probe. Data are taken and compared to approved ranges for the material tested.
- (b) Other materials or geometric changes in the area can influence the conductivity output of the instrument. Therefore, you must have the applicable material specification and engineering drawing.
- (c) A typical use is to define material properties following heat application. Examples of such situations include: structure heated by an engine or APU, fire damage, and lightning strike.
- (d) This is a general procedure to find the conductivity of aluminum structures. This procedure is used along with the applicable material specification and structural engineering drawings to decide whether the conductivity values are in an approved range.

(2) Instrument Parameters

- (a) The following equipment was used to develop the inspection procedures referred to in this manual. Alternative equipment may be used if it has the same sensitivity. Refer to the guidelines in this section for more information on equipment parameters.

NAME	NUMBER	MANUFACTURER
Portable Conductivity Tester	Autosigma 3000	GE Sensing & Inspection Technologies 1 Neumann Way, MD J4 Cincinnati, Ohio 45215 Web: http://www.geinspectiontechnologies.com

- (b) Inspection Frequency: The instrument must have an operating frequency of 60 kHz.

NOTE: Cessna conductivity information is based on an instrument frequency of 60 kHz. Use of a frequency other than 60 kHz will cause differences in the conductivity reading when compared to the 60 kHz value on thinner material.

- (c) Instrument Accuracy: The instrument must be an eddy current instrument that can show the conductivity of aluminum alloys as a percentage of the International Annealed Copper Standard (% IACS). It must have an accuracy of at least +1.0% IACS or - 1.0% IACS through electrically nonconducting films and coatings up to a minimum of 0.003 inch (0.076 mm) thick.
- (d) Instrument Sensitivity: The instrument must be sensitive enough to show changes of a minimum of 0.5% IACS over the conductivity range of the aluminum alloys for inspection.
- (e) Probe: The probe must have a flat contact surface. The contact surface diameter must not be larger than 0.500 inch (12.700 mm).
- (f) To test the lift-off compensation of the probe:
- 1 Put the probe on a bare standard.
 - 2 Put a nonconducting flat shim of 0.003 inch (0.076 mm) thick between the probe and the standard.
 - 3 The difference in the two values must not exceed 0.5% IACS.
- (g) The functional performance of the conductivity instrument must be verified at the intervals defined by the controlling specification or the manufacturer's recommendation, whichever is less.

(3) Calibration Reference Standards

- (a) Each instrument must have a minimum of two aluminum alloy instrument conductivity standards. Their values must be:
- 1 One in the range of 25 to 32% IACS.
 - 2 One in the range of 38 to 62% IACS.
- (b) There must be a minimum difference of 10% IACS between the standard for the low end of the range and that for the high end of the range. The conductivity values of the low and the high reference standard must be beyond the expected range of conductivity of the material for inspection.
- (c) The instrument conductivity standards must be certified to be accurate within +0.85% IACS to -0.85% IACS by the comparison method to the laboratory conductivity standards. Use the ASTM B193 procedure in a system per ISO 10012-1 ANSI/NCSL Z540-1 or equivalent foreign documentation.

(4) Inspection Considerations

- (a) Temperature: Do not do tests until the temperature of the probe, the standards, and the part or material has been allowed to equalize. The temperatures must stay equalized and constant throughout the test within 5.4 °F (3 °C) of each other.
- (b) Material Surface Condition
- 1 The surface finish of the area for inspection must be 150 RHR or RMS 165 or finer.
 - 2 The areas for inspection must be free of dirt, grease, oil, or other contamination.
 - 3 Conductivity measurements may be made through anodize, chemical film, primer, paint, or other nonconducting coatings, if the thickness of these coatings are no more than 0.003 inch (0.076 mm). Coatings with thickness more than this must be removed before conductivity testing.
 - 4 On concave surfaces, a curvature radius of no less than 10 inches is needed. On convex surfaces, a curvature radius of no less than 3 inches can be tested without use of correction factors.
 - 5 The surface of the part must be no smaller than the outside diameter of the probe. The coil must be put in the center on all parts whose dimensions approach this limitation.

(5) Instrument Calibration

- (a) The instrument must be set up and operated in accordance with this procedure and the manufacturer's instructions.
- (b) Each time the conductivity instrument is used, it must be set up with the instrument conductivity standards before data are taken and checked again at 15 minute intervals during continuous operation. Check calibration at the end of the test.
- (c) If the instrument is found to be out of calibration, all measurements taken since the last calibration must be done again.

(6) Inspection

- (a) The purpose of the inspection is to collect information to permit the responsible engineering activity to find the material properties in the affected area.

NOTE: Since conductivity values are affected by variations in material properties, material stacking and geometry, conductivity values alone must not be used to decide to accept the affected area without reference to the applicable material specifications and engineering drawings.

(b) Visual Inspection

- 1 Visually examine the area for indications of possible heat damage. Some signs include paint or metal discoloration and bubbled or peeled paint.
- 2 Note the location and describe the affected area. This description will be used along with the conductivity values to decide the part disposition. If photographs are used to describe the area, take the picture before you do the conductivity test.

(c) Eddy Current Conductivity Inspection

- 1 Clean the area for inspection with methods specified in the Model 182 Maintenance Manual. Remove all dirt, grit, soot, and other debris that will not allow the probe to have good contact with the structure.
- 2 Set up the instrument within the general conductivity range of aluminum structures with the reference standards.
- 3 After the visual inspection, make a reference point. If there is visual evidence of possible heat damage, make the reference point at the center of the area that appears to have been the most affected. If there is no visual evidence of possible heat damage, make the reference point at the center of the area for inspection. The reference point should be approximately in the center of the area of interest.

NOTE: A detailed map is needed of the inspection area to include dimensions to locate the reference point and enough information to allow the responsible engineering activity to find the sites of the conductivity data.

- 4 The total area for inspection and the distance between data points will vary with the situation.
 - a It is recommended that the distance between data points be no larger than 1.0 inch (25.400 mm).
 - b If the visual evidence or the conductivity values suggest rapid changes in severity, the distance between data points should be decreased.
 - c It is recommended that the total area for inspection should be larger than the area of visual evidence by a minimum of 2.0 inches (50.800 mm).
 - d If the conductivity values continue to change, the area of inspection should be expanded until values remain fairly constant to ensure complete coverage of the area.
- 5 Locate the reference point at the corner of a square, refer to Figure 4. Take conductivity values working away from the reference point in the increments and distance found in Step 4. Enough information should be included along with the conductivity values so a person unfamiliar with the inspection can find the data point.

NOTE: Structural considerations may not allow the test points to follow the pattern of Figure 4. It is up to the inspector to decide on a pattern that best works with the area for inspection.

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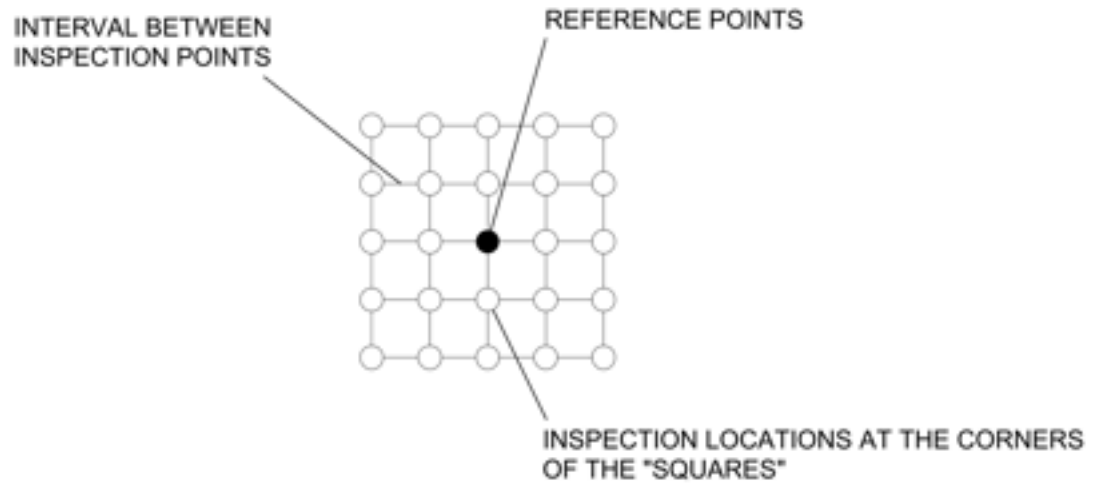


Figure 4

(7) Reporting Results

- (a) Use the Discrepancy Report Form in Section 5-13-00 to report inspection results. All written descriptions should include enough information so that someone not involved in the inspection may interpret the results. Give this information:

1 Location of the affected area.

- 2 A visual description of the affected area.
- 3 Location of the reference point and the relative location and interval between conductivity data points.
- 4 A map of the area with the conductivity values on it.

3. PENETRANT INSPECTION

A. General

- (1) Penetrant inspection is used to find small cracks or discontinuities open to the surface of the part. Penetrant inspection can be used on most parts or assemblies where the surface is accessible for inspection. The condition of the surface of the inspection area is important to the inspection. The surface must be cleaned of all paint and other surface contamination.
- (2) The penetrant is a liquid that can get into surface openings. A typical penetrant inspection uses four basic steps.
 - (a) The penetrant is put on the surface and allowed to stay for a period of time to let the penetrant get into the surface openings.
 - (b) The penetrant on the surface is removed.
 - (c) A developer is used. The purpose of the developer is to pull the penetrant that is left in the surface openings back onto the surface. It also improves the contrast between the indication and the background. This makes indications of discontinuities or cracks more visible.
 - (d) Interpretation happens. The area for inspection is examined for penetrant on the surface and the cause of the penetrant indication found.

B. Materials and Equipment

- (1) The following equipment was used to develop the inspection procedures referred to in this manual. Alternative equipment may be used if it has the same sensitivity. Refer to the guidelines in this section for more information on equipment parameters.

NAME	NUMBER	MANUFACTURER
Fluorescent Penetrant	ZL-27A	Magnaflux Corp. 3624 W. Lake Ave. Glenview, IL 60026 Phone: 847 657-5300 Web: http://www.magnaflux.com
Penetrant Cleaner/Remover	SKC-S	Magnaflux Corp.
Developer	ZP-9F	Magnaflux Corp.
Portable Ultraviolet Light	ZB-23A	Magnaflux Corp.
Light Meter	DSE-2000A	Spectronics Corp. 956 Brush Hollow Road Westbury, New York 11590 Phone: 800 274-8888 Web: http://www.spectroline.com/

- (2) Penetrant materials are defined by specific classification per SAE AMS 2644. Materials must meet at minimum the classification listed. This list assumes the use of a portable penetrant inspection kit. If other penetrant inspection equipment is used, refer to industry standard ASTM E 1417 (Standard Practice for Liquid Penetrant Testing) or an equivalent specification for other information on materials and inspection quality instructions.
 - (a) Type 1 (Fluorescent Penetrant)
 - (b) Level 3 (Penetrant sensitivity)
 - (c) Method C (Solvent Removable Penetrant)
 - (d) Form d (Nonaqueous Type 1 Fluorescent, Solvent Based Developer)
 - (e) Class 2 (Non-halogenated Solvent Removers)

NOTE: Do not use Type 2 (Visible Dye Penetrant) on this airplane or components. If Type 2 penetrant was previously used for this inspection, penetrant is no longer an approved method of inspection.

Another NDT method such as eddy current must be used to do the inspection.

- (3) Only materials approved in the most recent revision of QPL-AMS2644 (Qualified Products List of Products Qualified under SAE Aerospace Material Specification AMS 2644 Inspection Materials, Penetrant) or an equivalent specification may be used for penetrant inspection. All materials must be from the same family group. Do not interchange or mix penetrant cleaners, penetrant materials or developers from different manufacturers.

CAUTION: Components intended for use in liquid oxygen systems must be examined with special penetrants designated as lox usage penetrants. These are compatible with a liquid oxygen environment. Reaction between a liquid oxygen environment and penetrant not designed for use in that environment can cause explosion and fire.

C. Lighting Requirements

- (1) Do the penetrant inspection in a darkened area where the background intensity of the white light is no more than 2 foot candles. If inspection is done on the airplane, the area must be darkened as much as practical for inspection.
- (2) Ultraviolet lights must operate in the range of 320 to 380 nanometers to maximize penetrant fluorescence. The ultraviolet light intensity must be a minimum of 1000 microWatts per square centimeter with the light held 15 inches (381 mm) from the light meter. Let the ultraviolet light warm up for a minimum of 10 minutes before use.
- (3) Measure the ultraviolet and ambient white light intensities before each inspection with a calibrated light meter.

D. Inspection

(1) Before Inspection

- (a) The penetrant materials and the area for inspection must stay at a temperature between 40 °F and 125 °F (4 °C to 52 °C) throughout the inspection process.
- (b) Do the tests needed in the Lighting Requirements section.
- (c) Prepare the part or assembly surface for the inspection. Paint must be removed from the surface to let the penetrant get into surface openings. The area must also be clean, dry and free of dirt, grease, oil, or other contamination.

NOTE: Cleaning materials and methods must be approved for use by the applicable Cessna Aircraft Maintenance Manual, Structural Repair Manual, or Component Maintenance Manual.

NOTE: Mechanical methods to clean and remove paint should be avoided when practical. Take care to avoid filing in or sealing the entrance to a surface discontinuity when using mechanical methods to clean or remove paint. Mechanical methods can result a rough surface condition which can cause non-relevant indications.

(2) Apply the Penetrant

- (a) Put the penetrant on the part or assembly surface with a brush or swab. Be sure to completely cover the area.
- (b) Leave the penetrant on the surface for a minimum of 15 minutes if the temperature is at least 50 °F (10 °C). Leave the penetrant on the surface for a minimum of 25 minutes if the temperature is less than 50 °F (10 °C).
- (c) The maximum dwell time should not be more than one hour except for special circumstances.
- (d) Do not let the penetrant to dry on the surface. If the penetrant has dried, completely remove it and process the part again from the start.

(3) Penetrant Removal

- (a) Wipe the unwanted penetrant from the surface with a clean dry lint-free cloth.
- (b) Dampen a clean lint free cloth with penetrant cleaner.

CAUTION: Do not use the penetrant cleaner directly on the surface of the part or assembly. Do not saturate the cloth used to clean the area with the penetrant cleaner. This may remove penetrant from discontinuities.

- (c) Blot the area with the cloth to remove the unwanted penetrant.

NOTE: Do not use the same dampened cloth more than one time. This could cause penetrant removed the first time to be put back on the surface with the second use of the cloth. This could cause non-relevant indications.

- (d) Examine the area with the ultraviolet light to make sure that the penetrant has been removed from the surface.
- (e) If the penetrant is not sufficiently removed from the surface, repeat these steps until the surface penetrant is removed.

- (4) Apply Developer
 - (a) Be sure the part or assembly is dry.
 - (b) Put the developer on the surface. The best results happen when there is a very thin coat of developer on the surface. You should be able to barely see the color of the part or assembly through the developer.
 - (c) If you use a dry powder developer,
 - 1 Thoroughly dust the part or assembly with the developer.
 - 2 Gently blow off the extra powder.
 - (d) If you use a nonaqueous wet developer,
 - 1 Thoroughly shake the can to be sure that the solid particles in the developer do not settle to the bottom of the liquid.
 - 2 Spray a thin coat of developer on the surface.

NOTE: Take care not to use too much developer. If the developer puddles or begins to drip across the surface, the part or assembly must be processed again from the start.
 - (e) The developer must be allowed to stay on the surface for a minimum of 10 minutes before interpretation of the results. If the developer dwell time exceeds two hours, the part or assembly must be processed again from the beginning.
- (5) Interpretation
 - (a) Interpretation must happen in the lighting conditions described in the Lighting Parameters section.
 - (b) The inspector must not wear darkened or light sensitive eye wear. These lenses can reduce the amount of fluorescence you see.
 - (c) The inspector must enter the darkened area and remain there for a minimum of 1 minute before interpretation to allow the eyes to adapt to the darkened conditions.
 - (d) Examine the part or assembly with the ultraviolet light.
 - 1 Examine the surface with an 8X magnifier or more to show indications not visible with normal vision.
 - 2 A surface opening will be shown by a fluorescent indication.
 - 3 A crack will show as a fluorescent line. It will be sharp when it first becomes visible.
 - 4 Monitor indications that become visible during the developer dwell time. This will show the nature of the discontinuity. The amount of penetrant from the discontinuity will give some information as to the size.
 - 5 An indication from a deep discontinuity will become visible again if the area is blotted clean and developer put on again.
- (6) After Inspection
 - (a) Clean the part and inspection area to remove the developer and penetrant.
 - (b) Refer to the General Requirements section for information on how to report inspection results.

4. MAGNETIC PARTICLE INSPECTION

A. General

- (1) Magnetic particle inspection is a nondestructive inspection method to show surface and near-surface discontinuities in parts made of magnetic materials. Alloys that contain a high percentage of iron and can be magnetized make up the ferromagnetic class of metals. Some types of steel may not have sufficient magnet properties to do a successful inspection.

NOTE: Magnetic particle inspection cannot be used to examine nonmagnetic parts or parts with weak magnet properties.
- (2) The magnetic particle inspection uses three basic steps.
 - (a) Create a suitable magnetic field in the part.
 - (b) Put the magnetic particles on the part.
 - (c) Examine the area for inspection for magnetic particle patterns on the surface and decide on the cause of the patterns.

B. Materials and Equipment

- (1) The following equipment was used to develop the inspection procedures referred to in this manual. Alternative equipment may be used if it has the same sensitivity. Refer to the guidelines in this section for more information on equipment

parameters.

NAME	NUMBER	MANUFACTURER
Electromagnetic Yoke	DA-200	Parker Research Corp. 2642 Enterprise Rd. W Clearwater, FL 33528 Phone: 800 525-3935 Web: http://www.parkreshcorp.com/
Fluorescent Magnetic Particle Bath	14AM (Aerosol Can)	Magnaflux Corp. 3624 W. Lake Ave. Glenview, IL 60026 Phone: 847 657-5300 Web: http://www.magnaflux.com
Magnetic Field Strength Indicator	Magnaglo 2480	Magnaflux Corp.
Portable Ultraviolet Light	ZB-23A	Magnaflux Corp.
Light Meter	DSE-2000A	Spectronics Corp. 956 Brush Hollow Road Westbury, New York 11590 Phone: 800 274-8888 Web: http://www.spectroline.com/

- (2) Fluorescent magnetic particles have a high sensitivity and the ability to show small fatigue cracks. Visible or dry magnetic particles do not have the needed sensitivity.

CAUTION: Do not use visible or dry magnetic particles for inspection of airplanes or components.

- (3) Refer to industry specifications ASTM E1444, Standard Practice for Magnetic Particle Examination, and ASTM E 709, Standard Guide for Magnetic Particle Examination, or an equivalent specification for requirements for magnetic particle inspection materials and equipment.

- (4) Permanent magnets must not be used. The intensity of the magnetic field cannot be adjusted for inspection conditions.

CAUTION: Do not use permanent magnets for inspection of airplanes or components.

- (5) Contact prods must not be used. Localized heating or arcing at the prod can damage parts.

CAUTION: Do not use contact prods for inspection of airplanes or components.

- (6) Refer to ASTM E 1444, ASTM E 709, or equivalent documentation for instructions to do magnetic particle inspections. This section assumes the use of a portable magnetic particle system. The use of stationary magnetic particle inspection equipment is allowed. Stationary equipment must show that it can meet the inspection sensitivity requirements and is maintained correctly. Refer to the specifications in the Equipment Quality Control section.

C. Lighting Requirements

- (1) Do the magnetic particle inspection in a darkened area where the background intensity of the white light is no more than 2 foot candles. If inspection is done on the airplane, the area must be darkened as much as practical for inspection.
- (2) Ultraviolet lights must operate in the range of 320 to 380 nanometers to maximize penetrant fluorescence. The ultraviolet light intensity must be a minimum of 1000 microWatts per square centimeter with the light held 15 inches (381 mm) from the light meter. Let the ultraviolet light warm up for a minimum of 10 minutes before use.
- (3) Measure the ultraviolet and ambient white light intensities before each inspection with a calibrated light meter.

D. Equipment Quality Control

- (1) Refer to ASTM E 1444, ASTM E 709, or equivalent documentation for instructions for the quality control of magnetic particle materials and equipment. This section assumes use of an electromagnetic yoke.
- (2) Dead Weight Check
 - (a) The electromagnetic yoke must be able to lift 10 pounds while on AC current and with the legs spaced 2 to 6 inches apart.
 - (b) While on DC current, the electromagnetic yoke must be able to lift either 30 pounds with the legs spaced 2 to 4 inches apart or 50 pounds with the legs spaced 4 to 6 inches apart.

E. Inspection

- (1) This section assumes the use of a portable magnetic particle system.
- (2) Unless otherwise specified, inspection coverage should be 100% of the part surfaces.

NOTE: Be aware of objects near the area of the inspection. Other parts may become magnetized during the inspection process. Be aware of the location of airplane systems that may be sensitive to magnetic fields in the area of the inspection.
- (3) Before Inspection
 - (a) Do the tests needed in the Equipment Quality Control section.
 - (b) Do the tests needed in the Lighting Requirements section.
 - (c) Prepare the part or assembly surface for the inspection. The area must be clean, dry and free of dirt, grease, oil, or other contamination. Magnetic particle inspection can be done through thin layers of paint. If the paint is thick enough to cause interference with the inspection, the paint must be removed. It is recommended to remove paint if more than 0.003 inch thick.

NOTE: Cleaning materials and methods must be approved for use by the applicable Cessna Aircraft Maintenance Manual, Structural Repair Manual, or Component Maintenance Manual.

NOTE: Mechanical methods to clean and remove paint should be avoided when practical. Take care to avoid filing in or sealing the entrance to a surface discontinuity when using mechanical methods to clean or remove paint. Mechanical methods can result a rough surface condition which can cause non-relevant indications.
- (4) Create the magnetic field.
 - (a) Electric current passes through the yoke to create a magnetic field between the legs of the yoke.
 - 1 A discontinuity that is perpendicular to a line directly between the legs of the yoke has the highest probability for detection.
 - 2 There are two types of electrical current. Direct current (DC) is better able to find discontinuities deeper in the part. Alternating current (AC) is more sensitive to discontinuities on the surface of the part. Alternating current is preferred for this inspection.
 - (b) Position the legs on opposite ends of the part along a line perpendicular to the expected direction of the discontinuity.

NOTE: It may take several inspections in several directions to find discontinuities that are oriented in different directions.

NOTE: Experience with magnetic particle inspection is necessary to find the amount of magnetic flux necessary to show discontinuities.
 - (c) Spray the magnetic particles on the part.
 - (d) Energize the electromagnetic yoke for a minimum of 1 second.
 - (e) Test the magnetic field with the field indicator, Hall effect meter or equivalent equipment. Quality Indicators such as a Pie Gauge or shim can be used to show the strength of the magnetic field. Most quality indicators will need the magnetic particles to be put on the part surface to show magnetic field strength.
 - 1 If the field strength is not sufficient, small discontinuities might be missed. Repeat these steps with more magnetization.
 - 2 If the field strength is too large, discontinuities might be hidden behind non-relevant fluorescent indications. Demagnetize the part and then repeat these steps with decreased magnetization.

NOTE: If the strength of the magnetization cannot be adjusted on the electromagnetic yoke, adjust the distance between the legs to adjust the strength of the magnetic field. Put the legs closer together to increase the magnetic field. Put the legs farther apart to decrease the magnetic field.
 - (f) Allow 30 seconds for the magnetic particles to collect at discontinuities. With wet magnetic particles, if practical, tilt the part to allow the magnetic particles to flow across the expected direction of the discontinuity.
- (5) Interpretation
 - (a) Interpretation must happen in the lighting conditions described in the Lighting Parameters section.
 - (b) The inspector must not wear darkened or light sensitive eye wear. These lenses can reduce the amount of

fluorescence you see.

- (c) The inspector must enter the darkened area and remain there for a minimum of 1 minute before interpretation to allow the eyes to adapt to the darkened conditions.
- (d) Examine the part or assembly with the ultraviolet light.
 - 1 A leakage field will be shown by a fluorescent pattern of the magnetic particles. This is called an indication.
 - 2 An indication caused by a discontinuity on the part surface will be a sharp, distinct pattern.
 - 3 An indication caused by a subsurface discontinuity will usually be broader and fuzzier compared to an indication of a surface discontinuity.
 - 4 Be aware that indications which are not relevant to the inspection may be caused by surface conditions or geometry.
- (6) Demagnetize Part
 - (a) Unless otherwise specified, demagnetize the part after the inspection.
 - 1 Put the electromagnetic yoke on AC current setting and the magnetic field strength to maximum.

NOTE: AC current is preferred, but DC current may be needed for increased penetration into the part.
 - 2 Space the legs of the electromagnetic yoke to allow the part to pass between them.
 - 3 Put the part between the legs of the electromagnetic yoke.
 - 4 Energize the yoke with a magnetic field higher than that used for the inspection. Do not allow the part to touch the legs of the electromagnetic yoke.
 - 5 Pull the electromagnetic yoke away from the part.
 - 6 De-energize the electromagnetic yoke when about 2 feet from the part.
 - 7 Test the remaining magnetic field in the part with the field indicator, Hall effect meter or equivalent equipment.
 - 8 If the remaining magnetic field in the part is no more than 3 Gauss, the part is considered demagnetized. If more than 3 Gauss, repeat the demagnetization procedure.
- (7) After Inspection
 - (a) Refer to the General Requirements section for information on how to report inspection results.
 - (b) Completely remove the magnetic particles from the part or assembly.
 - (c) Reapply any protective coatings to the part to prevent corrosion.

NOTE: Materials and methods must be approved for use by the applicable Cessna Aircraft Maintenance Manual, Structural Repair Manual or Component Maintenance Manual.

5. ULTRASONIC THICKNESS TESTING

A. General

- (1) A common application for ultrasonic inspection is to find material thickness. The instrument will measure the time-of-flight of the ultrasonic wave through the part. This procedure will show you how to find the thickness of metal after removal of corrosion or a blending procedure.

B. Equipment

- (1) The following equipment was used to develop the inspection procedures referred to in this manual. Alternative equipment may be used if it has the same sensitivity. Refer to the guidelines in this section for more information on equipment parameters.

NAME	NUMBER	MANUFACTURER
Ultrasonic Thickness Gage (with A-scan ability)	25 Multiplus	Olympus NDT Phone: 781-419-3900 Web: http://www.olympusndt.com
20 MHz Ultrasonic Transducer, 0.125 inch diameter	M208	Olympus NDT
Sonopen, 15 MHz, 0.125 inch diameter	V260-SM	Olympus NDT

Couplant (Water Based)

Ultrage II

Sonotech, Inc.
774 Marine Drive
Bellingham, WA 98225
Phone: 360-671-9121
Web: <http://www.sonotech-inc.com/>

- (2) Instrument
 - (a) The expected material thickness must be within the measurement range of the instrument.
 - (b) The instrument resolution must be a minimum of 0.001 inch (0.0254 mm).
 - (c) It is recommended that the instrument have an A-scan display. This will let the operator monitor the interaction between the signal and the gating of the instrument.
- (3) Transducer
 - (a) The transducer must have a diameter of no more than 0.375 inch (9.525 mm) and a delay line.
 - (b) The recommended frequency is 5 to 10 MHz for material 0.5 inch (12.700 mm) thick or more and 10 to 20 MHz for material less than 0.5 inch (12.700 mm) thick.
- (4) Reference Standard
 - (a) The reference standard must be of the same base alloy as the metal for measurement.
 - (b) Gage material can be used for a reference standard. It should be as close as practical to the alloy and temper of the material for test.

NOTE: When gage material is used; mechanically measure the thickness of the material.
 - (c) The reference standard must have enough thickness range that one step will be thinner and one step thicker than the expected thickness range of the material.

C. Calibration

- (1) Set up the instrument with the manufacturer's instructions.
- (2) Choose steps on the reference standard for the calibration. It is recommended that there is a step between the chosen steps.

NOTE: It is important that the expected material thickness be between the range of the steps chosen on the reference standard.
- (3) Calibrate the instrument on the chosen steps of the reference standard. If there are any steps between the calibration steps, use them to make sure of the calibration.

D. Inspection

- (1) The area must be clean and free of grease, dirt, corrosion or other material that may affect the inspection.
- (2) Examine the area for inspection. Record material thickness to the nearest 0.001 inch.
- (3) Take enough measurements that the minimum thickness is found in the blended area.
- (4) If possible, take a measurement in an adjacent area to get a nominal thickness.
- (5) Refer to the General Requirements section for information on how to report inspection results.

E. After Inspection

- (1) Refer to the General Requirements section for information on how to report inspection results.
- (2) Clean any couplant off the area.

6. VISUAL INSPECTION

A. General

- (1) Visual inspection is the most common form of airplane inspection. Visual inspection can find a wide variety of component and material surface discontinuities, such as cracks, corrosion, contamination, surface finish, weld joints, solder connections, and adhesive disbonds. The results of a visual inspection may be improved with the use of applicable combinations of magnifying instruments, borescopes, light sources, video scanners, and other devices. The use of optical aids for visual inspection is recommended. Optical aids magnify discontinuities that cannot be seen by the unaided eye and also allow inspection in inaccessible areas.
- (2) Personnel that do visual inspection tasks do not need to have certification in nondestructive inspection.

B. Visual Aids

- (1) Structure and components that must be routinely examined are sometimes difficult to access. Visual inspection aids such as a powerful flashlight, a mirror with a ball joint, and a 10 power magnifying glass are needed for the inspection.
- (2) Flashlights used for visual inspection should be suitable for industrial use and, where applicable, safety approved for use in hazardous atmospheres such as airplane fuel tanks. These characteristics should be considered when selecting a flashlight: foot-candle rating; explosive atmosphere rating; beam spread (adjustable, spot, or flood); efficiency (battery usage rate); brightness after extended use; and rechargeable or standard batteries. Inspection flashlights are available in several different bulb brightness levels:
 - (a) Standard incandescent (for long-battery life).
 - (b) Krypton (for 70% more light than standard bulbs).
 - (c) Halogen (for up to 100% more light than standard bulbs).
 - (d) Xenon (for over 100% more light than standard bulbs)
- (3) An inspection mirror is used to view an area that is not in the normal line of sight. The mirror should be of the applicable size to easily see the component and a swivel joint tight enough to keep its position.
- (4) A single converging lens is often referred to as a simple magnifier. Magnification of a single lens can be found by the equation $M = 10/f$. In this equation, "M" is the magnification, "f" is the focal length of the lens in inches, and "10" is a constant that represents the average minimum distance at which objects can be distinctly seen by the unaided eye. For example, a lens with a focal length of 5 inches has a magnification of 2, or is said to be a two-power lens. A 10-power magnifier is needed for inspection.
- (5) Borescopes
 - (a) These instruments are long, tubular, precision optical instruments with built-in illumination, designed to allow remote visual inspection of otherwise inaccessible areas. The tube, which can be rigid or flexible with a wide variety of lengths and diameters, provides the necessary optical connection between the viewing end and an objective lens at the distant or distal tip of the borescope.
 - (b) Optical Designs. Typical designs for the optical connection between the borescope viewing end and the distal tip are:
 - 1 A rigid tube with a series of relay lenses;
 - 2 A flexible or rigid tube with a bundle of optical fibers; and
 - 3 A flexible or rigid tube with wiring that carries the image signal from a Charge Couple Device (CCD) imaging sensor at the distal tip.

NOTE: Instruments used as an aid for visual inspection must be capable of resolving four line pairs per mm (4lp/mm).
 - (c) These designs can have either fixed or adjustable focus of the objective lens at the distal tip. The distal tip may also have prisms and mirrors that define the direction and field of view. A fiber optic light guide with white light is generally used in the illumination system. Some long borescopes use light-emitting diodes at the distal tip for illumination.

C. Visual Inspection Procedures

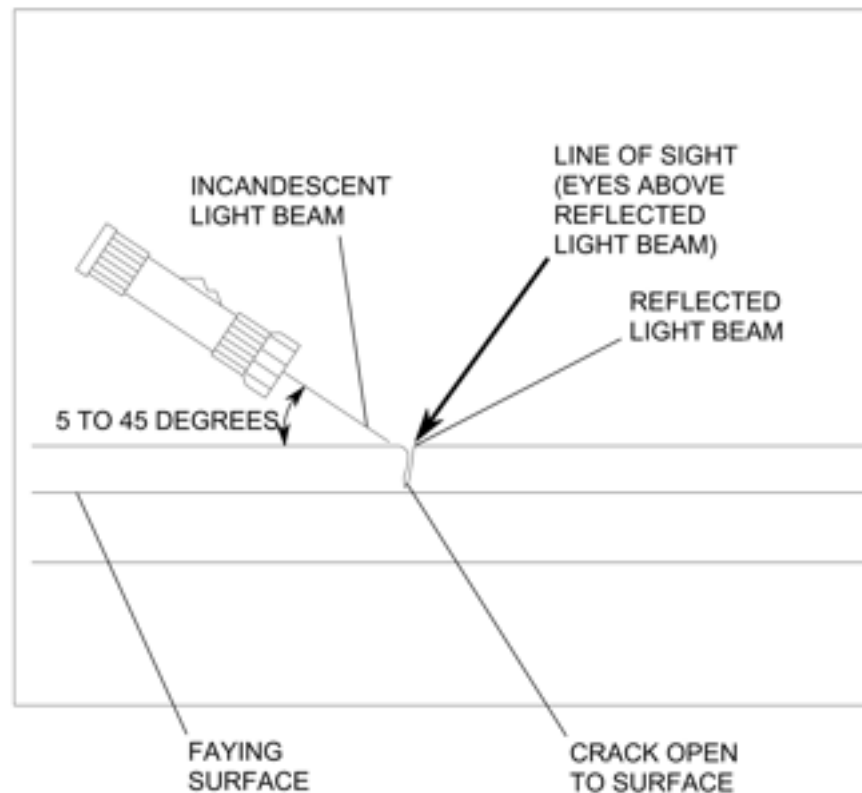
- (1) Factors That Can Affect Inspection
 - (a) Lighting. Get sufficient lighting for the part or area. Do not look into glare to do the inspection.
 - (b) Comfort. The comfort (temperature, wind, rain, etc.) of the inspector can be a factor in visual inspection reliability.
 - (c) Noise. Noise levels are important. Too much noise reduces concentration, creates tension, and prevents effective communication. All these factors will increase the chance of errors.
 - (d) Inspection Area Access. Ease of access to the inspection area has been found to be of major importance in reliable visual inspection. Access includes that into an inspection position (primary access) and to do the visual inspection (secondary access). Poor access can affect the interpretation of discontinuities, decisions, motivation, and attitude.
- (2) Preliminary Inspection. Do a preliminary inspection of the general area for foreign objects, deformed or missing fasteners, security of parts, corrosion, and damage. If the location is not easy to access, use visual aids such as a mirror or borescope.
- (3) Corrosion. Remove, but do not do a treatment of any corrosion found during preliminary inspection. Do a treatment of corrosion found after the entire visual inspection is complete.

NOTE: If you leave corrosion in place or do a treatment of the corrosion before inspection, it may hide

other discontinuities.

- (4) Clean. After the preliminary inspection, clean the areas or surface of the parts for inspection. Do not remove the protective finish from the part.
- (5) Inspection. Carefully examine the area for discontinuities, with optical aids as needed. An inspector normally should have available applicable measuring devices, a flashlight, and a mirror.
 - (a) Surface cracks. Refer to [Figure 5](#). To look for surface cracks with a flashlight:
 - 1 Point the light beam toward the face with between a 5° and 45° angle to the surface. Refer to [Figure 5](#).
 - 2 Do not point the light beam at an angle such that the reflected light beam shines directly into the eyes.
 - 3 Keep the eyes above the reflected light beam. Measure the size of any cracks found with the light beam at right angles to the crack and trace the length.

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Figure 5

- 4 Use a 10-power magnifier to make sure of a suspected crack.
- (b) Hardware and Fasteners. Examine rivets, bolts, and other hardware for looseness, integrity, proper size and fit, and corrosion. Dished, cracked, or missing rivet heads and loose rivets should be identified and recorded.
- (c) Control Systems. Examine cables, control rods, rod ends, fairleads, pulleys, and all other items for integrity, structural soundness, and corrosion.
- (d) Visual Inspection for Corrosion. Inspection of an airplane for corrosion follows a systematic pattern.
 - 1 Clues. The airplane is initially observed for clues about the care with which it has been maintained.
 - 2 Locations. Examine likely corrosion sites. These include galleys and food service areas, lavatories, bilges, tank drains, and fastenings. When debris is found, it should be examined for iron oxide and the characteristically white powdery aluminum hydride. Biological contamination (mold, algae), which may feel greasy or slippery, frequently causes corrosion since it changes the acidity of any moisture it contains. Caulking and sealing compounds should be examined for good bond since corrosion can get under such materials. Nutplates should be examined for corrosion under them. Tap tests should be done often and the cause of any dull sounding areas found. The omission of fuel additives by some fuel vendors can increase the deterioration of fuel tanks on a

small airplane. In such cases, it is necessary to drain tanks and examine them with lighted borescopes or other aids. Flight and control surfaces are difficult to inspect since access is difficult. Extensive use of aids is recommended for such locations.

NOTE: **The use of a center punch or awl to indent a surface should be used with care, since awl or center punch pricks can cause fatigue cracks.**

- 3 Sites. Careful detailed inspection of corrosion sites is then done to measure the amount of corrosion. You may need to remove skin panels or other measures to further measure the damage.
- (e) Disbonds. Many airplanes have adhesive bond panels. These may have disbonds and adhesive failures. Remember that, in adhesively bonded structures, evidence of corrosion can signal the loss of bond integrity. A good example of this condition is the pillowing which appears behind rivets. If the structure is bonded as well as riveted, the bond may be damaged where pillowing exists.
- (f) Painted Surfaces. Examine painted surfaces for chipped, missing, loose or blistered paint and for signs of corrosion.
- (g) Other surface discontinuities. Look for other surface discontinuities, such as discoloration from overheating; buckled, bulged, or dented skin; cracked, chafed, split, or dented tubing; chafed electrical wiring; delamination of composites; and damaged protective finishes.

LISTING OF SUPPLEMENTAL INSPECTIONS

1. Supplemental Inspection Procedures

- A. Each of the supplemental inspections listed in this section has the instructions to do each Nondestructive Testing procedure needed.
- B. Procedure
 - (1) Each 5-14-XX section has the details of the inspection and if needed, a reference to the Nondestructive Testing procedure for that inspection.
 - (2) The supplemental inspections that reference a Nondestructive Testing procedure will refer to 5-13-01 document for the details of the procedure.
 - (3) The supplemental inspection numbers in the list below agree with the number for the Nondestructive Testing procedure, if applicable.
- C. If an airplane has exceeded the inspection limits given, the inspection must be done before August 31, 2014. Inspections in subsequent revisions to the SID shall be accomplished in accordance with the requirements of the revised inspection.
- D. Service Information Letters/Service Bulletins
 - (1) In addition to this manual, the following service information will be required to complete the SID inspections (5-14-XX document sections).

Bulletin	Title	Associated Service Kit
SB98-55-03	Horizontal Stabilizer Forward Inboard Rib to Spar Gap Inspection (for units 18280001 thru 18280167)	
SB99-53-01	Firewall Doubler Inspection and Engine Cowl Shock Mount Installation (for units 18280001 thru 18280463)	
SB00-27-01	Lower Forward Elevator Control Cable Pulley Brackets Inspection (for units 18280001 thru 18280508)	
SB02-55-01	Elevator Rivet Installation (for units 18280001 thru 18281097 and T18208002 thru T18208136)	
SB04-27-01	Elevator Rivet Inspection (for units 18280835 thru 18281210, 18281212 thru 18281221, 18281223 thru 18281228, 18281231, 18281234, T18208001 thru T18208199, T18208201, T18208205 and T18208206)	
SB04-53-03	Forward Door Post Bulkhead Washer Inspection (for units 18280001 thru 18281424 and T18208001 thru T18208309)	
SB05-53-02	Tunnel Bulkhead Rivet Inspection (for units 18280001 thru 18281499 and T18208001 thru T18208352)	
SB06-53-01	Fuselage Stringer Rivet Inspection (for units 18281695, 18281702, 18281705, 18281723 thru 18281774 and T18208483 thru T18208508)	

2. Supplemental Inspections

DETAILS FOUND IN SECTION 5-14- XX	SUPPLEMENTAL INSPECTION NUMBER	TITLE			INSPECTION COMPLIANCE (See Note 1)		INSPECTION OPERATION
					INITIAL	REPEAT	
5-14-01	27-20-01	Rudder Pedal Tube Inspection		Torque	10,000 Hours or 20 Years	3,000 Hours or 5 Years	37
5-14-02	27-30-01	Elevator Bracket Bracket Inspection	Trim and Structure	Pulley Actuator	1,000 Hours or 3 Years	1,000 Hours or 3 Years	32

5-14-03	32-13-01	Main Landing Gear Tubular Spring Corrosion Inspection	MILD/MODERATE 20 Years SEVERE 10 Years	MILD/MODERATE 10 Years SEVERE 5 Years	41 45
5-14-04	32-13-02	Main Landing Gear Fittings Inspection	3,000 Hours or 5 Years	1,000 Hours or 5 Years	35
5-14-05	32-20-01	Nose Gear Torque Link & Fork Inspection	3,000 Hours or 5 Years	3,000 Hours or 5 Years	36
5-14-06	53-11-01	Carry-Thru Structure Corrosion Inspection	MILD/MODERATE 25 Years SEVERE 15 Years	MILD/MODERATE 10 Years SEVERE 3 Years	42 46
5-14-07	53-12-01	Fuselage Forward Doorpost Inspection	TYPICAL 12,000 Hours or 20 Years SEVERE 6,000 Hours or 10 Years	TYPICAL 2,000 Hours or 10 Years SEVERE 1,000 Hours 5 Years	48 49
5-14-08	53-12-02	Firewall Inspection	2,000 Hours or 5 Years	2,000 Hours or 5 Years	33
5-14-09	53-30-01	Fuselage Interior Skin Panels Corrosion Inspection	MILD/MODERATE 25 Years SEVERE 15 Years	MILD/MODERATE 10 Years SEVERE 5 Years	42 47
5-14-10	53-47-01	Seat Rails & Seat Rail Structure Corrosion Inspection	MILD/MODERATE 10 Years SEVERE 5 Years	MILD/MODERATE 10 Years SEVERE 5 Years	40 44
5-14-11	55-10-01	Horizontal Stabilizer, Elevators and Attachments Inspection	10,000 Hours or 20 Years	3,000 Hours or 5 Years	37
5-14-12	55-30-01	Vertical Stabilizer, Rudder and Attachments Inspection	10,000 Hours or 20 Years	3,000 Hours or 5 Years	37
5-14-13	57-11-01	Wing Structure Inspection	TYPICAL 12,000 Hours or 20 Years SEVERE 6,000 Hours or 10 Years	TYPICAL 2,000 Hours or 10 Years SEVERE 1,000 Hours or 5 Years	48 49
5-14-14	57-11-02	Wing Structure Corrosion Inspection	MILD/MODERATE 25 Years SEVERE 15 Years	MILD/MODERATE 10 Years SEVERE 5 Years	42 47
5-14-15	57-11-03	Wing Splice Joint at Strut Attach Inspection	MILD/MODERATE 25 Years SEVERE 15 Years	MILD/MODERATE 10 Years SEVERE 5 Years	42 47
5-14-16	57-12-01	Wing Root Rib Corrosion Inspection	MILD/MODERATE 5 Years SEVERE 3 Years	MILD/MODERATE 5 Years SEVERE 3 Years	39 43
5-14-17	57-40-01	Strut and Strut Wing Attachment Inspection	TYPICAL 12,000 Hours or 20 Years SEVERE 6,000 Hours or 10 Years	TYPICAL 2,000 Hours or 10 Years SEVERE 1,000 Hours or 5 Years	48 49
5-14-18	57-51-01	Aileron Support Structure Inspection	3,000 Hours or 10 Years	500 Hours or 5 Years	34

5-14-19	57-53-01	Flap Tracks and Attachments Inspection	MILD/MODERATE 20 Years	MILD/MODERATE 10 Years	41
			SEVERE 10 Years	SEVERE 5 Years	45
5-14-20	71-20-01	Engine Mount Inspection	10,000 Hours or 20 Years	At Engine Overhaul	38

NOTE 1:

Time limits for the INITIAL inspections are set by either flight hours or calendar time, whichever occurs first. Except for Section 5-14-20, Supplemental Inspection Document 71-20-01, corresponding calendar inspection times are per REPEAT flight hour or calendar time specified whichever occurs first. Corrosion Prevention and Control Program (CPCP) remain calendar time based. If the INITIAL inspection has been completed, and a CPCP is in effect, then REPEAT inspections are based entirely on flight hours.

SUPPLEMENTAL INSPECTION NUMBER: 27-20-01

1. TITLE:

Rudder Pedal Torque Tube Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE: INITIAL	10,000 Hours or	20 Years (NOTE)
REPEAT	3,000 Hours or	5 Years (NOTE)

NOTE: Refer to Note 1, Section 5-14-00.

3. PURPOSE

To verify integrity of the rudder pedal torque tube assembly.

4. INSPECTION INSTRUCTIONS

- A. For airplane serial numbers 18280001 thru 18281499 and T18208001 thru T18208352, check the airplane maintenance records to verify that SB05-53-02 has been complied with. If not, complete the compliance requirements of SB05-53-02 with this inspection.
- B. Do an inspection of the rudder pedal torque tubes for corrosion or cracking and cable and pedal attachment arms for wear, cracks or weld failures, refer to [Figure 1](#),.
 - (1) Clean area before inspecting if grime or debris is present.
- C. Inspect the rudder bar support brackets for cracks at the bend radii in the mounting flange.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Fuselage, Near Forward Firewall

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION PROCEDURE

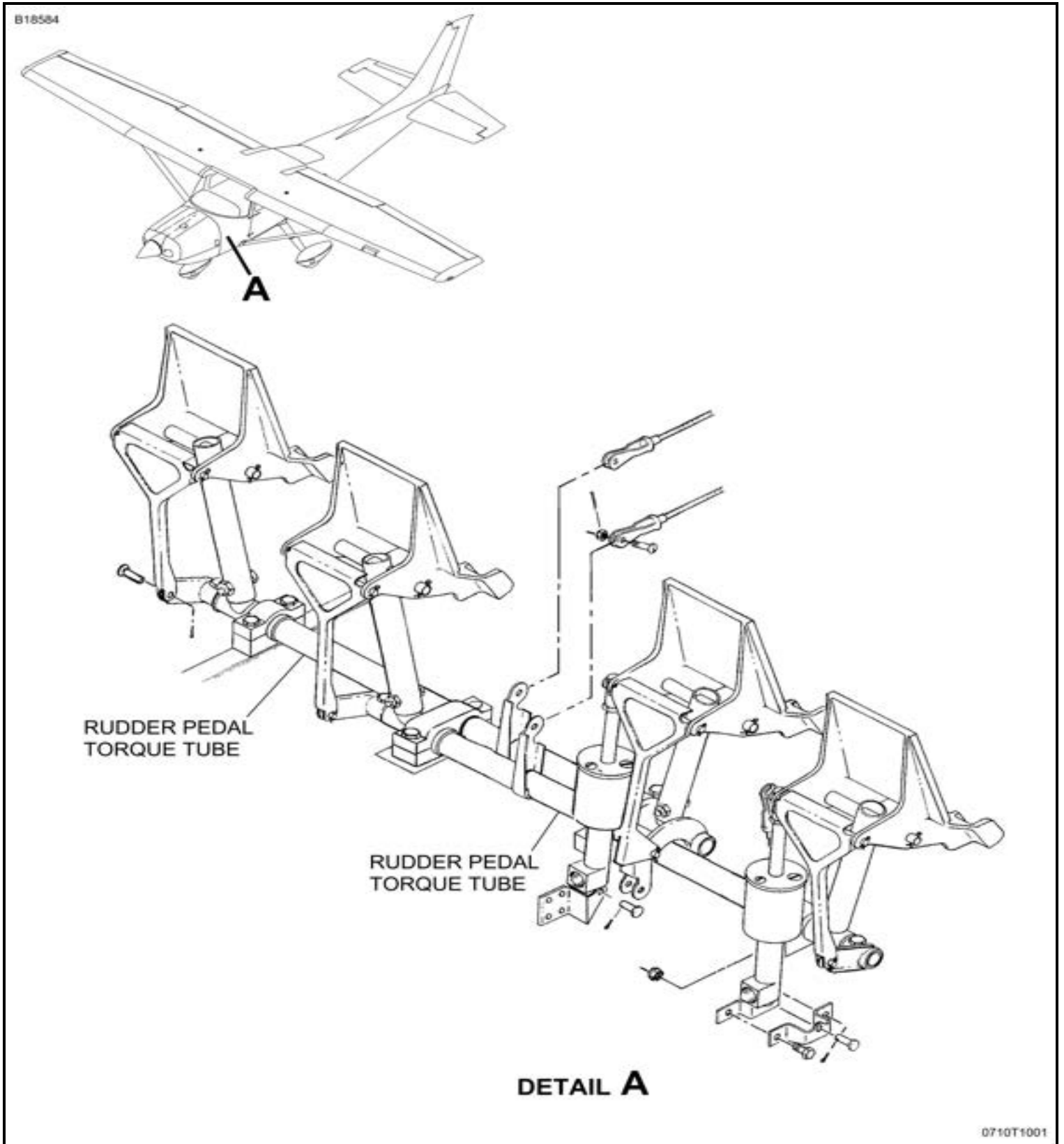
Visual

7. REPAIR/MODIFICATION

Typical failures occur at or close to welds in the rudder bar. At the time of manufacture, the rudder bar is not heat treated after welding, it can be rewelded and used without subsequent heat treatment. Examine the rewelded area after welding for any new or additional cracking. Make repairs in accordance with Chapter 51 (Standard Practices - Structures) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Chapter 51 with Cessna Customer Service prior to beginning the repair.

8. COMMENTS

Figure 1 : Sheet 1 : Rudder Pedal Torque Tube Inspection



SUPPLEMENTAL INSPECTION NUMBER: 27-30-01

1. TITLE:

Elevator Trim Pulley Bracket and Actuator Bracket Structure Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE: INITIAL	1,000 Hours or	3 Years
REPEAT	1,000Hours or	3 Years

NOTE: Coordinate this inspection with the trim tab actuator overhaul.

3. PURPOSE

To verify the integrity of the elevator trim pulley brackets and the actuator support brackets.

4. INSPECTION INSTRUCTIONS

- A. For airplane serial numbers 18280835 thru 18281210, 18281212 thru 18281221, 18281223 thru 18281228, 18281231, and 18281234, T18208001 thru T18208199, T18208201, T18208205 and T18208206, check the airplane maintenance records to verify that SB04-27-01 has been complied with. If not, compliance with SB04-27-01 is required with this inspection.
- B. Remove the panel in the horizontal stabilizer to get access to the trim tab actuator support hardware. Refer to [Figure 1](#) and the applicable sections of this manual.
- C. Remove seats, floor covering and floor inspection panels as necessary to inspect elevator trim pulley brackets and actuator support brackets for cracks, corrosion and bent flanges. Straighten bent flanges and check for any cracking, using at least a 4x power magnifying glass and a bright light.
 - (1) Clean area before inspecting if grime or debris is present.
- D. Inspect the actuator sprocket and groove pins for integrity.
- E. Inspect all pulleys for wear, flat spots and freedom of rotation.
- F. Inspect all fasteners and attaching structure for integrity.
- G. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Stabilizer

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

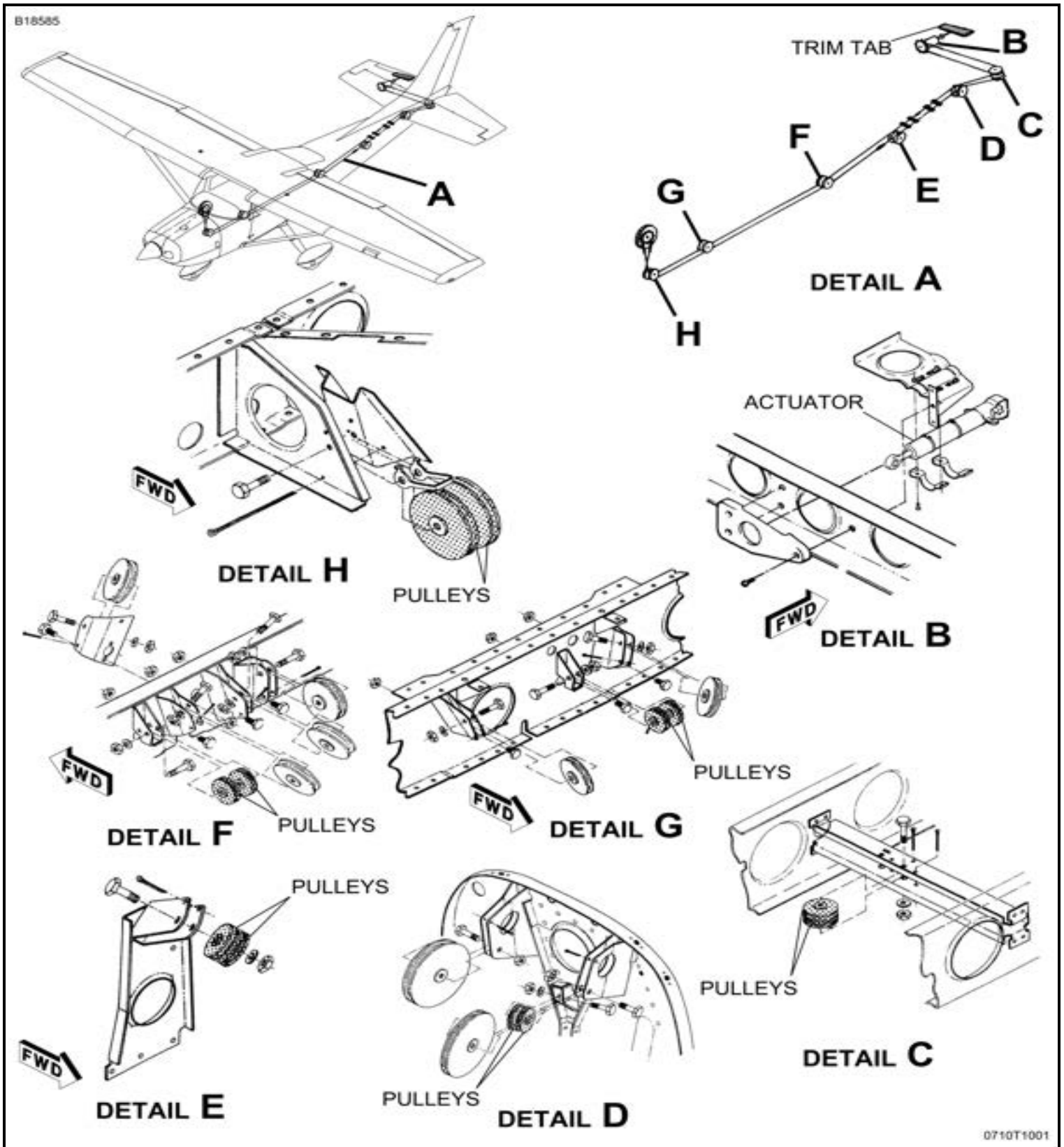
Visual

7. REPAIR/MODIFICATION

Replace any cracked or excessively corroded (10% or more of the material thickness is missing in the corroded section) brackets. Replace excessively worn, flat spotted or stiff pulleys. Straighten bent pulley brackets and actuator brackets with finger pressure and recheck for cracking. Replace any loose or sheared fasteners/pins. Make repairs in accordance with applicable Chapter(s) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Single Engine Structural Repair Manual with Cessna Customer Service prior to beginning the repair.

8. COMMENTS

Figure 1 : Sheet 1 : Elevator Trim Pulley Bracket and Actuator Bracket Structure Inspection



SUPPLEMENTAL INSPECTION NUMBER: 32-13-01

1. TITLE:

Main Landing Gear Tubular Spring Corrosion Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

CORROSION SEVERITY	INSPECTION COMPLIANCE	
MILD/MODERATE:	INITIAL	20 Years (NOTE)
	REPEAT	10 Years (NOTE)
SEVERE:	INITIAL	10 Years (NOTE)
	REPEAT	5 Years (NOTE)

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To ensure corrosion protection of main landing gear tubular spring.

4. INSPECTION INSTRUCTIONS

A. Remove the landing gear fairing, refer to the applicable sections of this manual.

B. Refer to Figure 1, do an inspection of the main landing gear tubular spring for worn or chipped paint. If corrosion (rust) is present, remove the rust from the gear in accordance with the Repair/Modification Section below.

NOTE: The main landing gear springs are made from high strength steel that is shot peened the full circumference and full length along the outer diameter to increase the fatigue life of the part. If the protective layer of paint is chipped or worn away, corrosion (rust) is likely to occur.

(1) Clean area before inspecting if grime or debris is present.

C. If the finish is worn or chipped, refinish the landing gear springs.

D. Inspect the area under and around the entry step attachment for corrosion.

E. Inspect the axle attach holes for corrosion.

(1) Clean area before inspecting if grime or debris is present.

F. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION/ZONE

Main Gear Section

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

Visual and Ultrasonic Thickness Test

7. REPAIR/MODIFICATION

A. If corrosion has developed on the tubular spring landing gear, it must be removed before refinishing. The recommended procedure to remove corrosion is by hand sanding, using a fine grained sandpaper.

NOTE: Do not use an aluminum grit sandpaper on a ferrous (steel) part.

B. Sand with 180 or finer grit abrasive cloth, to produce a diameter-to-depth ratio of about 10:1.

(1) To determine the depth of repaired area after removing the corrosion, use a straight edge and feeler gages. If the repaired corrosion pit or wear area is deeper than 0.008 inch, contact Cessna Customer Service for repair/replacement instructions.

C. Refinish sanded areas.

(1) Solvent Wipe.

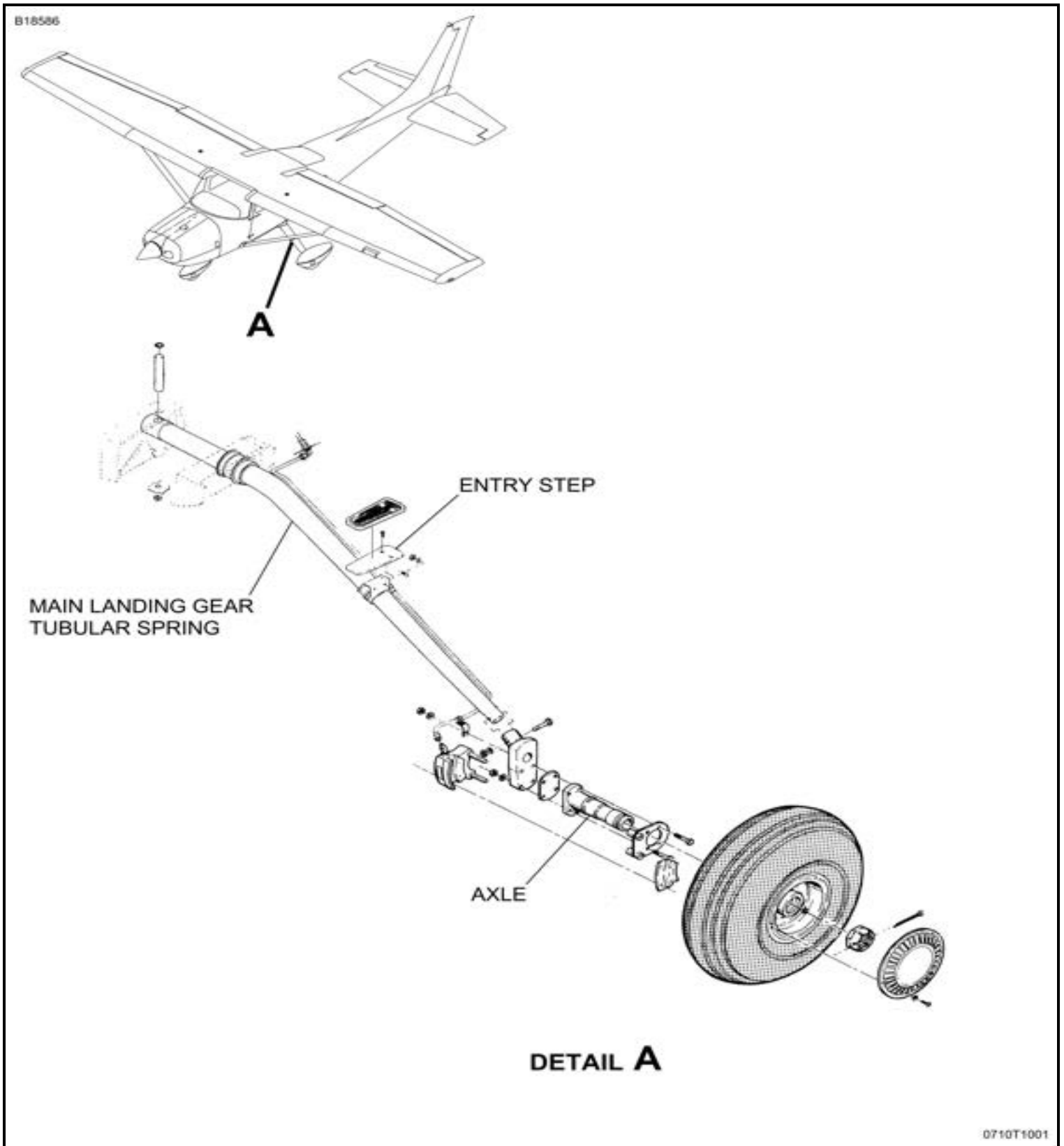
(a) Wipe off excess oil, grease or dirt from the surface to be cleaned.

(b) Apply solvent to a clean cloth, preferably by pouring solvent onto cloth from a safety can or other approved, labeled

- container. The cloth must be well saturated, but not dripping.
- (c) Wipe surface with the moistened cloth as necessary to dissolve or loosen soil. Work a small enough area so the surface being cleaned remains wet.
 - (d) Immediately wipe the surface with a clean, dry cloth, while the solvent is still wet. Do not allow the surface to evaporate dry.
 - (e) Do steps (b) through (d) again until there is no discoloration on the drying cloth.
- (2) Apply corrosion resistant primer in accordance with Corrosion-Resistant Primer MIL-PRF-23377G or later.
- (a) Mix and apply in accordance with the manufacturer's instructions.
 - (b) Apply the mixture with a wet cross coat to yield a dry film thickness of 0.6 to 0.8 mils.
 - (c) Allow to air dry for two to four hours.
 - (d) Apply the topcoat within 24 hours.
- (3) Apply Polyurethane Enamel Topcoat to landing gear tubular spring.
- (a) Mix and apply in accordance with the manufacturer's instructions.
 - (b) Apply mixture with a wet cross coat to produce a dry film thickness of 1.5-2.0 mils.
 - (c) Allow to air dry in accordance with the paint manufacturer's instructions.

8. COMMENTS

Figure 1 : Sheet 1 : Main Landing Gear Tubular Spring Corrosion Inspection



SUPPLEMENTAL INSPECTION NUMBER: 32-13-02

1. TITLE:

Main Landing Gear Fittings Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE:	INITIAL	3,000 Hours or	5 Years (NOTE)
	REPEAT	1,000 Hours or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To ensure structural integrity of the main landing gear fittings.

4. INSPECTION INSTRUCTIONS

- A. Remove the seats, carpet and inspection panels as required to get access to the main landing gear bulkhead fittings, refer to the applicable sections of this manual.
- B. Inspect the outboard main landing gear fittings for cracking. Pay particular attention to the area directly above the forward and aft edges of the landing gear spring and the attachment of the fittings to the bulkheads.
 - (1) Clean the area before inspecting if grime or debris is present.
- C. Inspect the inboard main landing gear fittings for cracking. Pay particular attention to the area directly below the landing gear spring attachment and the attachment of the fittings to the bulkheads.
 - (1) Clean area before inspecting if grime or debris is present.
- D. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION/ZONE

Main Gear Support

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

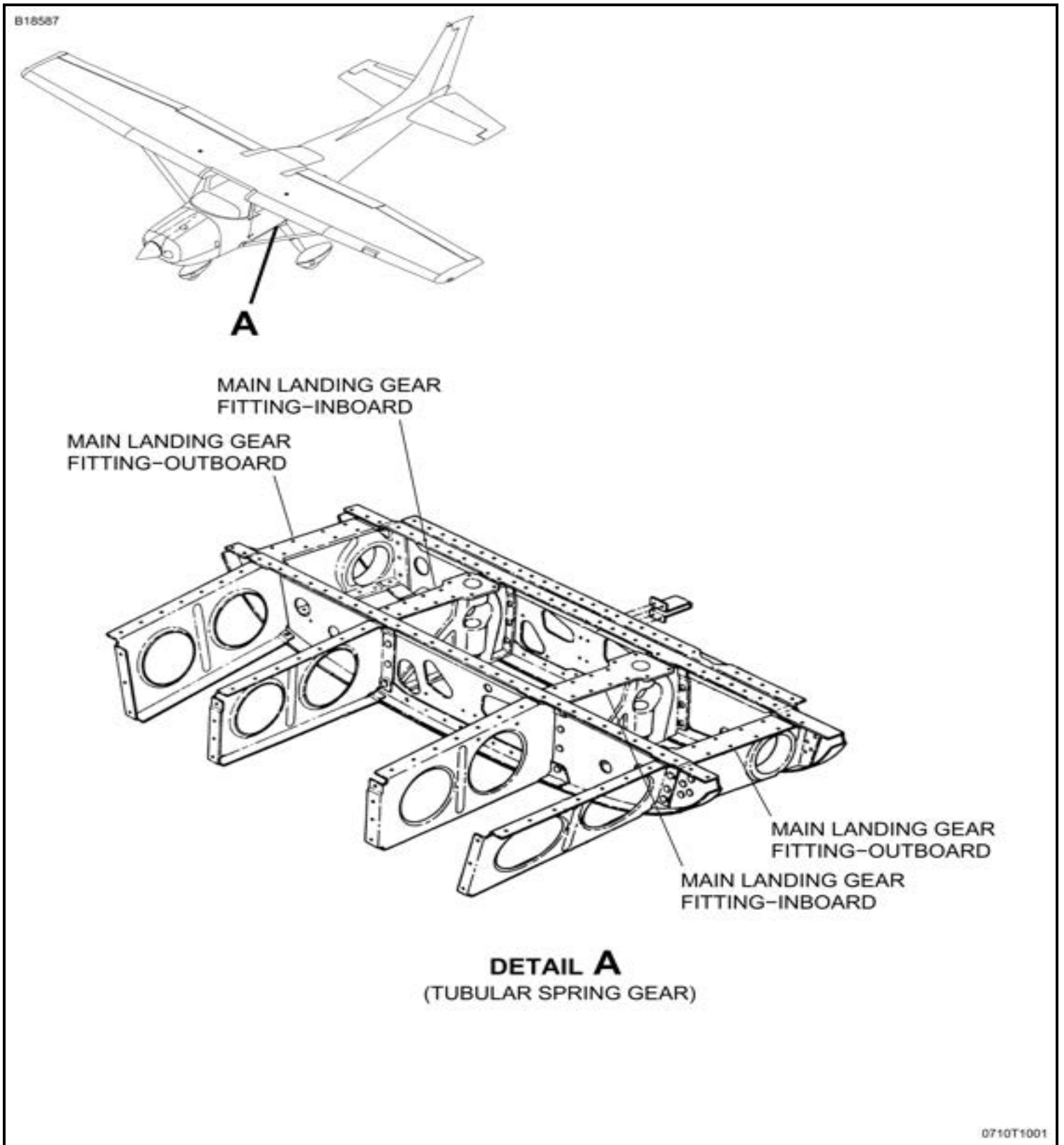
Visual

7. REPAIR/MODIFICATION

- A. Refer to [Figure 1](#). Main landing gear fittings are contained between two wrap-around bulkheads which physically contain the bulkheads even after the attach fasteners are removed. A recommended method to replace main landing gear fittings is to support the airplane to maintain alignment during rework, remove the floorboard just forward of the forward main gear bulkhead, remove the four longerons forward of the forward main landing gear bulkhead and then slide the forward main landing gear bulkhead forward to disengage it from the fittings. Since the attach holes will be reused to reinstall the parts, remove rivets carefully to avoid excessively enlarging rivet holes. After the fittings are installed, reinstall the removed parts in reverse order. Make repairs in accordance with applicable Chapter(s) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Single Engine Structural Repair Manual with Cessna Customer Service prior to beginning the repair.

8. COMMENTS

Figure 1 : Sheet 1 : Main Landing Gear Fittings Inspection



SUPPLEMENTAL INSPECTION NUMBER: 32-20-01

1. TITLE:

Nose Gear Torque Link and Fork Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE:	INITIAL	3,000 Hours or	5 Years (NOTE)
	REPEAT	3,000 Hours or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To ensure structural integrity of the nose gear torque link and nose gear fork.

4. INSPECTION INSTRUCTIONS

- A. Deflate the strut, refer to the applicable sections of this manual.
- B. Remove the torque link bolts one at a time in accordance with this manual and [Figure 1](#).
- C. Inspect for bent or worn bolts. Install serviceable bolts after inspection is complete.
 - (1) Clean the area before inspecting if grime or debris is present.
- D. Inspect the torque links for cracks.
 - (1) Clean area before inspecting if grime or debris is present.
 - (2) Pay particular attention around the bolt attach holes and forged ribs for cracks.
 - (3) Confirm any suspected cracks with surface eddy current. Refer to Section 5-13-01 Non-destructive Inspection Methods and Requirements, Eddy Current Inspection - Surface Inspection, for additional instructions.
- E. Inspect the center torque link bushings for excessive wear or deformation. Maximum new clearance between the NAS bushings in the mid joint upper torque link lug (ID = 0.1900 to 0.1915 in.) and the bolt (OD = 0.1885 to 0.1894 in.) is 0.0030 in. A clearance of 0.006 in. is the maximum wear limit.
 - (1) Clean area before inspecting if grime or debris is present.
- F. Inspect the upper and lower joint torque link bushings for excessive wear or deformation. As the bolt clamps up on the spacer, the wear is to be measured between the NAS bushing and the spacer. Maximum new clearance between the NAS bushings in the torque link (ID = 0.3750 to 0.3765 in.) and the spacer (OD = 0.3744 to 0.3750 in.) is 0.0021 in. A clearance of 0.006 in. is the maximum wear limit.
 - (1) Clean the area before inspecting if grime or debris is present.
- G. Inspect the nose gear fork for cracking along the forging parting line.
 - (1) Clean the area before inspecting if grime or debris is present.
- H. Install the bolts.
- I. Service the nose gear strut, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Nose Gear Section

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

Visual and Surface Eddy Current to confirm any suspected cracks.

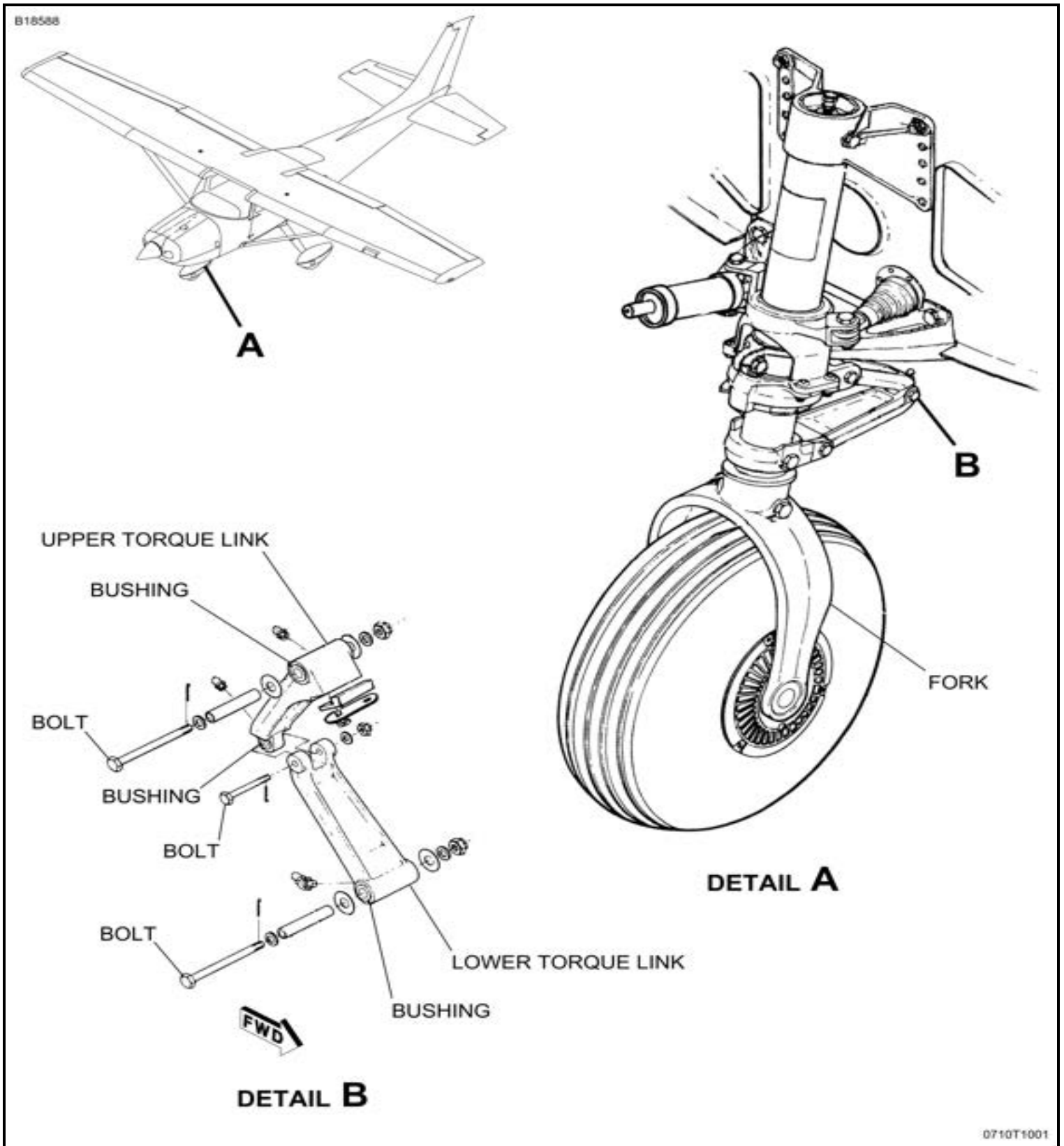
7. REPAIR/MODIFICATION

Replace bent bolts, replace worn bolts and bushings with new parts, if the wear limits have been exceeded. A cracked fork or torque link is not repairable and must be replaced. Make repairs in accordance with the applicable Chapter(s) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Single Engine Structural Repair Manual with Cessna

Customer Service prior to beginning the repair.

8. COMMENTS

Figure 1 : Sheet 1 : Main Landing Gear Fittings Inspection



SUPPLEMENTAL INSPECTION NUMBER: 53-11-01

1. TITLE:

Carry-Thru Structure Corrosion Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

CORROSION SEVERITY		INSPECTION COMPLIANCE	
MILD/MODERATE:	INITIAL	25 Years (NOTE)	
	REPEAT	10 Years (NOTE)	
SEVERE:	INITIAL	15 Years (NOTE)	
	REPEAT	3 Years (NOTE)	

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To ensure structural integrity of the carry-thru spar structure.

4. INSPECTION INSTRUCTIONS

- Remove headliner and interior items necessary to gain access to the front and rear carry-thru structure, refer to the applicable sections of this manual.
- Refer to Figure 1, do a visual inspection of the front spar carry-thru area for loose or missing rivets or corrosion, especially between the spar channel and reinforcement, between the spar channel and upholstery retainer and between door post bulkhead attachment fittings and the spar channel.
 - Clean area before inspecting if grime or debris is present.
- Visually inspect rear spar carry-thru area for loose or missing rivets or corrosion, especially between the door post bulkhead attachment fittings and the spar channel.
 - Clean area before inspecting if grime or debris is present.
- Inspect for corrosion at the wing attachment fittings, lugs, and spar blocks.
 - Clean area before inspecting if grime or debris is present.
- Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Cabin Interior Section	Not Allowed

6. INSPECTION METHOD

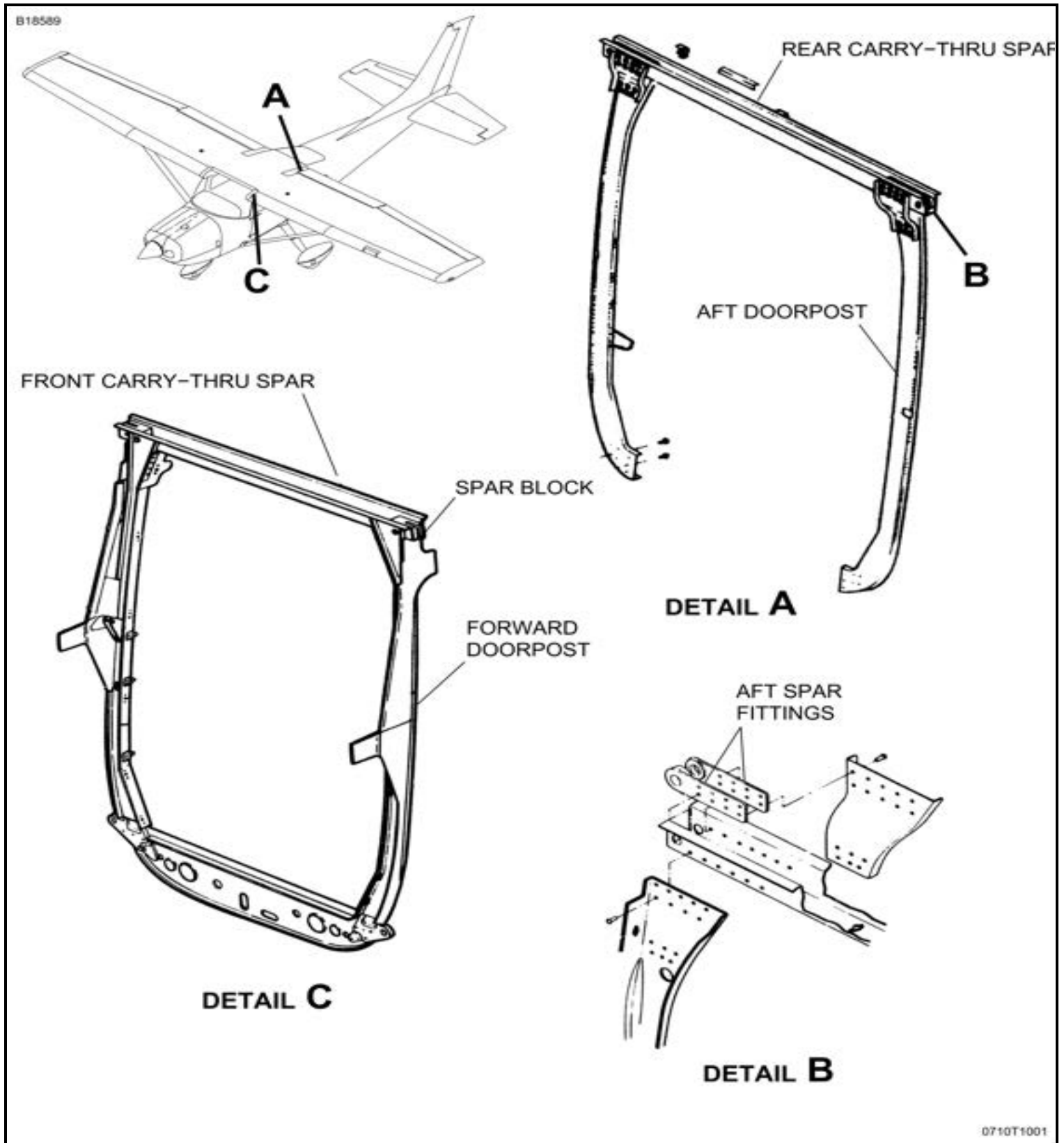
Visual

7. REPAIR/MODIFICATION

- Clean any corrosion products. The recommended procedure to remove corrosion is by hand sanding, using a fine grained sandpaper.
- Sand with 180 or finer grit abrasive cloth, to produce a diameter-to-depth ratio of about 10:1.
 - To determine the depth of repaired area after removing the corrosion, use ultrasonic inspection methods to determine the thickness of the material after removing the corrosion. If the thickness of the material is less than 90% of uncorroded/original material, contact Cessna Customer Service for repair/replacement instructions.
- Apply corrosion protection.

8. COMMENTS

Figure 1 : Sheet 1 : Carry-Thru Structure Corrosion Inspection



SUPPLEMENTAL INSPECTION NUMBER: 53-12-01

1. TITLE

Fuselage Forward Doorpost Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

TYPICAL:	INITIAL	12,000 Hours or	20 Years (NOTE)
	REPEAT	2,000 Hours or	10 years (NOTE)
SEVERE:	INITIAL	6,000 Hours or	10 Years (NOTE)
	REPEAT	1,000 Hours or	5 years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To verify the integrity of the fuselage lower forward doorpost.

4. INSPECTION INSTRUCTIONS

- A. For airplanes 18280001 thru 18281424 and T18208001 thru T18208309, check the airplane maintenance records to verify that SB04-53-03 has been complied with. If not, compliance with SB04-53-03 is required with this inspection.
- B. Remove the interior of the airplane as required to get access to the lower end of the left and right forward doorpost bulkheads, refer to the applicable sections of this manual.
- C. Remove floorboard inspection covers in areas fore and aft of the doorposts. The critical inspection area must be fully exposed.
- D. Using a flashlight and inspection mirror, visually inspect the area at the intersection of the doorpost and the forward doorpost bulkhead. Look for cracks that follow the bottom contour of the wing strut support fitting. Refer to [Figure 1](#).
 - (1) Clean area before inspecting if grime or debris is present.
- E. Visually inspect the door post area for cracks where the cabin door lower hinges attach to the door posts.
 - (1) Clean area before inspecting if grime or debris is present.
- F. Visually inspect the strut fitting area for evidence of corrosion.
 - (1) Clean area before inspecting if grime or debris is present.
- G. If the airplane has been equipped with a fuel step, then visually inspect the fuselage skin under the fuel step for cracks.
- H. If evidence of corrosion is found, cracks are suspected or the compliance time limit of this inspection has been exceeded, then conduct a surface eddy current inspection of the bulkhead around the strut attach fitting. Refer to Section 5-13-01 Nondestructive Inspection Methods and Requirements, Eddy Current Inspection – Surface Inspection, for additional instructions.
- I. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Cabin

DETECTABLE CRACK SIZE

Not Applicable

6. INSPECTION METHOD

Visual with Eddy Current if needed.

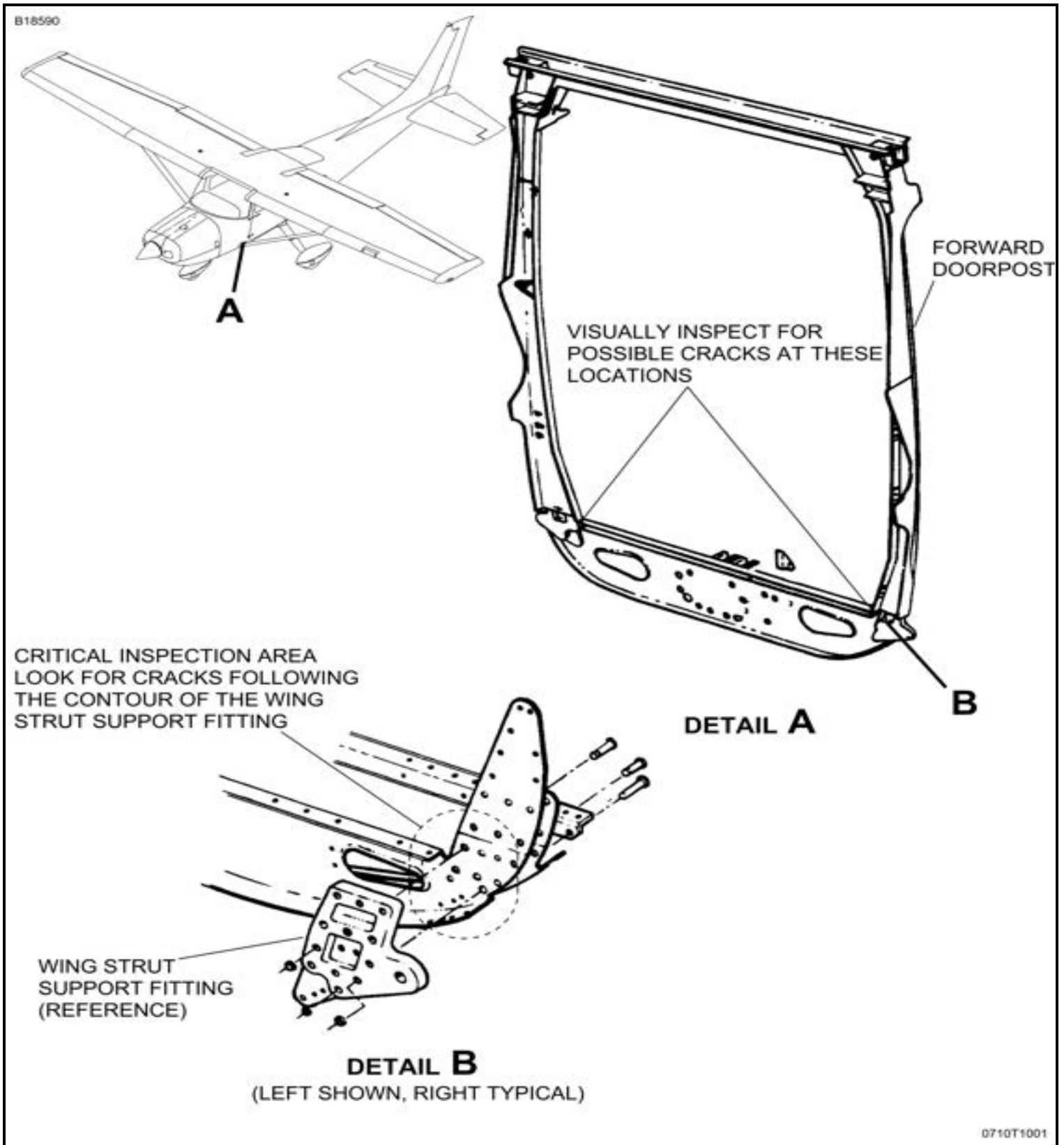
7. REPAIR/MODIFICATION

- A. If corrosion is found, remove the corrosion by lightly sanding the corroded area, taking care to remove as little material as necessary to completely remove corrosion and remaining pits in the fitting or bulkhead.
- B. Buff out the sanding marks.
- C. Measure the remaining bulkhead thickness. If more than 10% of bulkhead material has been removed from the local area, the area must be repaired or replaced.
- D. Clean and prime sanded areas.

- E. Damaged bulkheads may be repaired. Coordinate any repair needed with Cessna Customer Service prior to beginning the repair.
- F. Replace any strut support fitting that has a crack indication.

8. COMMENTS

Figure 1 : Sheet 1 : Fuselage Forward Doorpost Inspection



SUPPLEMENTAL INSPECTION NUMBER: 53-12-02

1. TITLE:

Firewall Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE:	INITIAL	2,000 Hours	or	5 Years (NOTE)
	REPEAT	2,000 Hours	or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To ensure structural integrity of the firewall.

4. INSPECTION INSTRUCTIONS

- A. For applicable airplane serial numbers, check the airplane maintenance records to verify that SB99-53-01 has been accomplished. If not, comply with SB99-53-01 concurrent with this inspection.
NOTE: Airplanes affected by SB99-53-01 will be within the following airplane serial number range: 18280001 thru 18280463, but not all airplanes within this range will be affected by SB99-53-01.
- B. Disconnect all electrical power from the airplane.
- C. Remove the upper and lower cowlings from the airplane, refer to the applicable sections of this manual.
- D. Refer Figure 1. Visually inspect around each engine cowling shock mount bracket (2 places) for cracking on forward and aft side of the firewall.
 - (1) Clean the area before inspecting if grime or debris is present.
- E. Visually inspect around each engine mount attach bracket for cracking on the forward side of the firewall.
 - (1) Clean the area before inspecting if grime or debris is present.
- F. Visually inspect for missing or loose fasteners in the structure, especially around the engine mount attach brackets and attachment of lower forward cabin skin to the firewall.
- G. Inspect firewall for wrinkles, cracks, sheared rivets or other signs of damage or wear.
- H. Install the items that were removed to accomplish this inspection and connect the electrical power, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Under Cowl

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

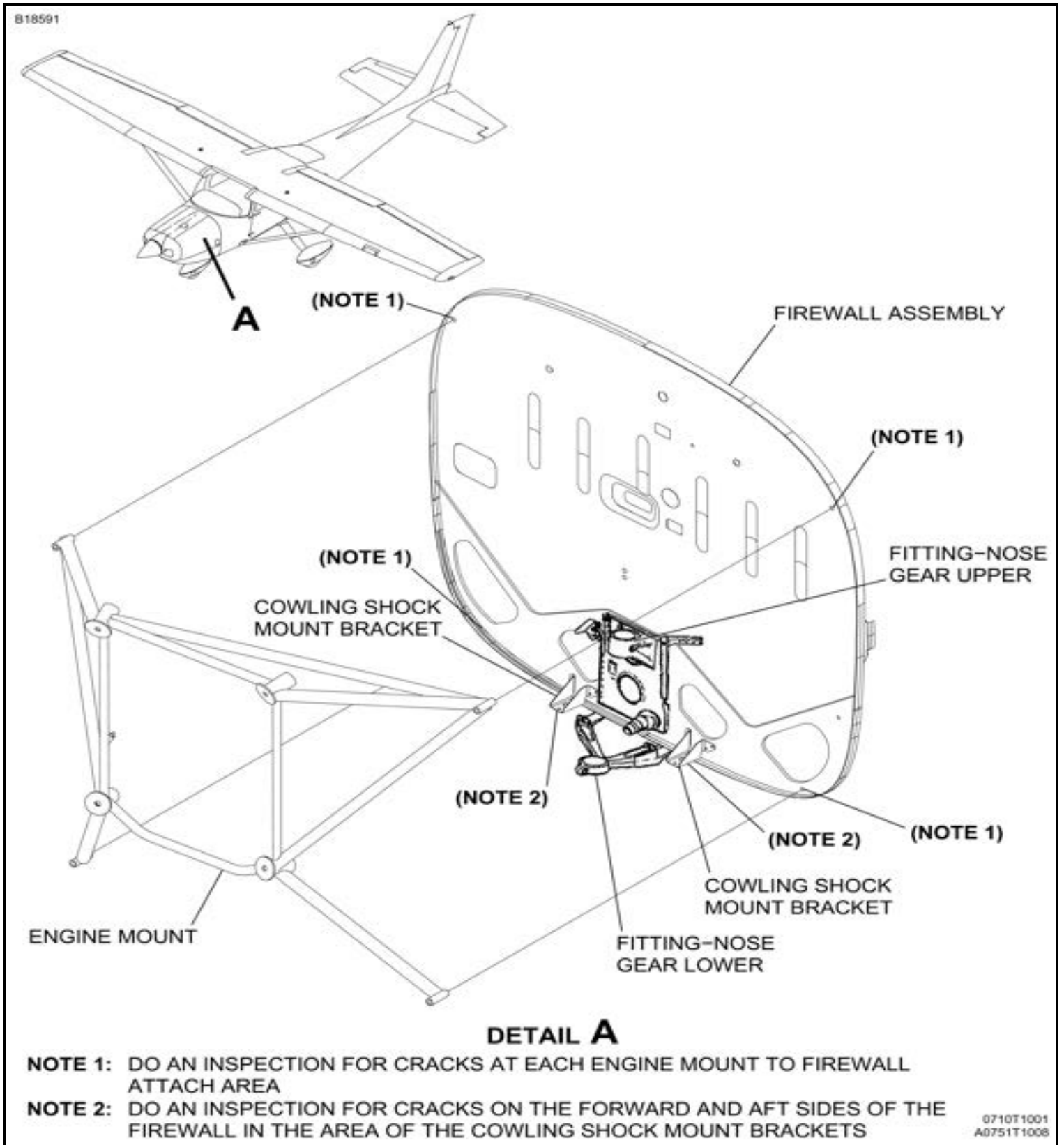
Visual

7. REPAIR/MODIFICATION

If a crack is found in the firewall, the firewall shall be repaired or replaced, as required prior to flight. Make repairs in accordance with applicable Chapter(s) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Single Engine Structural Repair Manual with Cessna Customer Service prior to beginning the repair.

8. COMMENTS

Figure 1 : Sheet 1 : Firewall Inspection



SUPPLEMENTAL INSPECTION NUMBER: 53-30-01

1. TITLE

Fuselage Interior Skin Panels Corrosion Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

CORROSION SEVERITY		INSPECTION COMPLIANCE	
MILD/MODERATE:	INITIAL		25 Years (NOTE)
	REPEAT		10 Years (NOTE)
SEVERE:	INITIAL		15 Years (NOTE)
	REPEAT		5 Years (NOTE)

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To verify the integrity of the cabin skins, stringers and frames under and around sound deadening material.

4. INSPECTION INSTRUCTIONS

- A. For airplane serial numbers 18281695, 18281702, 18281705, 18281723 thru 18281774 and T18208483 thru T18208508, check the airplane maintenance records to verify that SB06-53-01 has been complied with. If not, compliance with SB06-53-01 is required with this inspection.
- B. Remove the interior of the airplane to gain access to inside surface of the skins, stringers and frames. Remove sound dampening material. Refer to the applicable sections of this manual for removal procedures.
- C. Visually inspect skin panels for corrosion. Particular attention should be given to inspection of panels below windows, belly and other areas where moisture could enter or accumulate.
 - (1) Clean area before inspecting if grime or debris is present.
- D. Inspect interior of door skins and structure for corrosion.
- E. Inspect frames and stringers for corrosion.
- F. Inspect cabin windows for integrity of bond to preclude entry of water into cabin.
- G. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Fuselage Interior	Not Applicable

6. INSPECTION METHOD

Visual and Ultrasonic Thickness Test

7. REPAIR/MODIFICATION

- A. If corrosion is found, remove corrosion by lightly sanding corroded area, taking care to remove as little material as necessary to completely remove corrosion and remaining pits in skin.
- B. Buff out sanding marks.
- C. Assess remaining skin, stringer or frame thickness to determine maximum material removed. An ultrasonic thickness test can be used for this.
 - (1) If more than 0.004 inch of skin material has been removed from the local area, the area must be repaired or replaced.
 - (2) If more than 10% of stringer or frame material has been removed from the local area, the area must be repaired or replaced.
- D. Clean and prime sanded areas.
- E. Sound deadening material is for acoustic attenuation and may be replaced or omitted at owner's option.

8. COMMENTS

SUPPLEMENTAL INSPECTION NUMBER: 53-47-01

1. TITLE

Seat Rails and Seat Rail Structure Corrosion Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

CORROSION SEVERITY		INSPECTION COMPLIANCE	
MILD/MODERATE:	INITIAL	10 Years (NOTE)	
	REPEAT	10 Years (NOTE)	
SEVERE:	INITIAL	5 Years (NOTE)	
	REPEAT	5 Years (NOTE)	

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To verify the integrity of the seat rails.

4. INSPECTION INSTRUCTIONS

- A. Remove the seats and floor covering as necessary to gain sufficient access to inspect the seat rails and the seat rail base, refer to the applicable sections of this manual.
- B. Visually inspect seat rails for corrosion.
 - (1) If adhesive, grime or debris is present, clean area to inspect around base.
- C. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Cabin Interior	N/A

6. INSPECTION METHOD

Visual

7. REPAIR/MODIFICATION

- A. If corrosion is found, repair in accordance with the following.
 - (1) Clean and lightly sand corroded area to remove surface damage and pits.
 - (2) Buff out scratch marks.
 - (3) Reinspect area and assess amount of material removed.
 - (a) If thickness of flange has been reduced by 10% or more, rail must be replaced.
 - (b) A local flange reduction of 20% of thickness is acceptable where confined to one side of extrusion, provided that the reduced area does not coincide with both seat pin hole and fastener hole.
 - (c) If thickness of web is reduced by 10% or more, rail must be replaced.
 - (d) If local web reduction of 20% exceeds 1" in length, rail must be replaced.
 - (e) If bulb is reduced in thickness at seat pin hole by 5% or more, rail must be replaced.
 - (f) If bulb is reduced by more than 10% at areas between holes, rail must be replaced.
 - (4) Brush coat sanded areas with alodine.
- B. Reinstall seat and check for proper operation. If removed material on bulb interferes with proper operation of seat, replace rail.
- C. For extensive damage or conditions not addressed, contact Cessna Customer Service prior to beginning the repair.

8. COMMENTS

SUPPLEMENTAL INSPECTION NUMBER: 55-10-01

1. TITLE:

Horizontal Stabilizer, Elevators and Attachments Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE:	INITIAL	10,000 Hours or	20 Years (NOTE)
	REPEAT	3,000 Hours or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To inspect horizontal stabilizer, elevator and attachments for signs of damage, fatigue or deterioration.

4. INSPECTION INSTRUCTIONS

- A. For applicable airplanes, check the airplane maintenance records to verify that Service Bulletins SB02-55-01, SB98-55-03 and SB04-27-01 have been complied with. If one or more of these service bulletins has not been complied with but is applicable to the airplane being inspected, compliance is required with this inspection.
- B. Remove all of the horizontal stabilizer and elevator access panels, including the stinger and vertical stabilizer to horizontal stabilizer fairings. Refer to [Figure 1](#) and the applicable sections of this manual.
- C. Visually inspect the stabilizer and elevator for condition, cracks and security; hinge bolts, hinge bearings for condition and security; bearings for freedom of rotation; attach fittings for evidence of damage, wear, failed fasteners and security.
 - (1) Clean the area before inspecting if grime or debris is present.
- D. Visually inspect the torque tube for corrosion and rivet security. Pay particular attention to the flange riveted onto the torque tube near the airplane centerline for corrosion.
 - (1) Clean the area before inspecting if grime or debris is present.
- E. Visually inspect the forward and aft stabilizer and elevator spars, ribs and attach fittings for cracks, corrosion, loose fasteners, elongated fastener attach holes and deterioration. Pay particular attention to the skins at the location where stringers pass through ribs and at the leading edge skin close to the fuselage. Apply finger pressure at the stringer intersection or the rib to spar juncture to check for free play indicating a broken rib. Visually inspect the forward stabilizer attachment bulkhead for cracks.
 - (1) Clean area before inspecting if grime or debris is present.
- F. If corrosion or a frozen bearing is found, conduct a surface eddy current inspection for cracks of each elevator hinge attach fitting. Refer to Section 5-13-01, [Nondestructive Inspection Methods and Requirements](#), Eddy Current Inspection – Surface Inspection, for additional instructions. The inspection is for the aluminum structure outside of the bearing, make sure the instrument is set for aluminum before beginning this inspection.
- G. Visually inspect the trailing edge portion of the elevator for indications of cracks, corrosion or deterioration. Visually inspect the attachment of the trim tab horn to the trim tab.
- H. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Horizontal Stabilizer

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

Visual with Eddy Current if required

7. REPAIR/MODIFICATION

Replace damaged bolts and nuts. Replace damaged fittings and small parts. Replace damaged or loose rivets. Hinge bearings are prepacked with grease, which will eventually oxidize and harden after years of service. Several applications of penetrating oil will help free up a stiff bearing. It is the owner/operator option to replace stiff bearings. Make repairs in accordance with the

applicable Chapter(s) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Single Engine Structural Repair Manual with Cessna Customer Service prior to beginning the repair.

8. COMMENTS

Coordinate this inspection with SID 55-30-01, Vertical Stabilizer, Rudder and Attachments Inspection.

Figure 1 : Sheet 1 : Horizontal Stabilizer, Elevators and Attachments Inspection

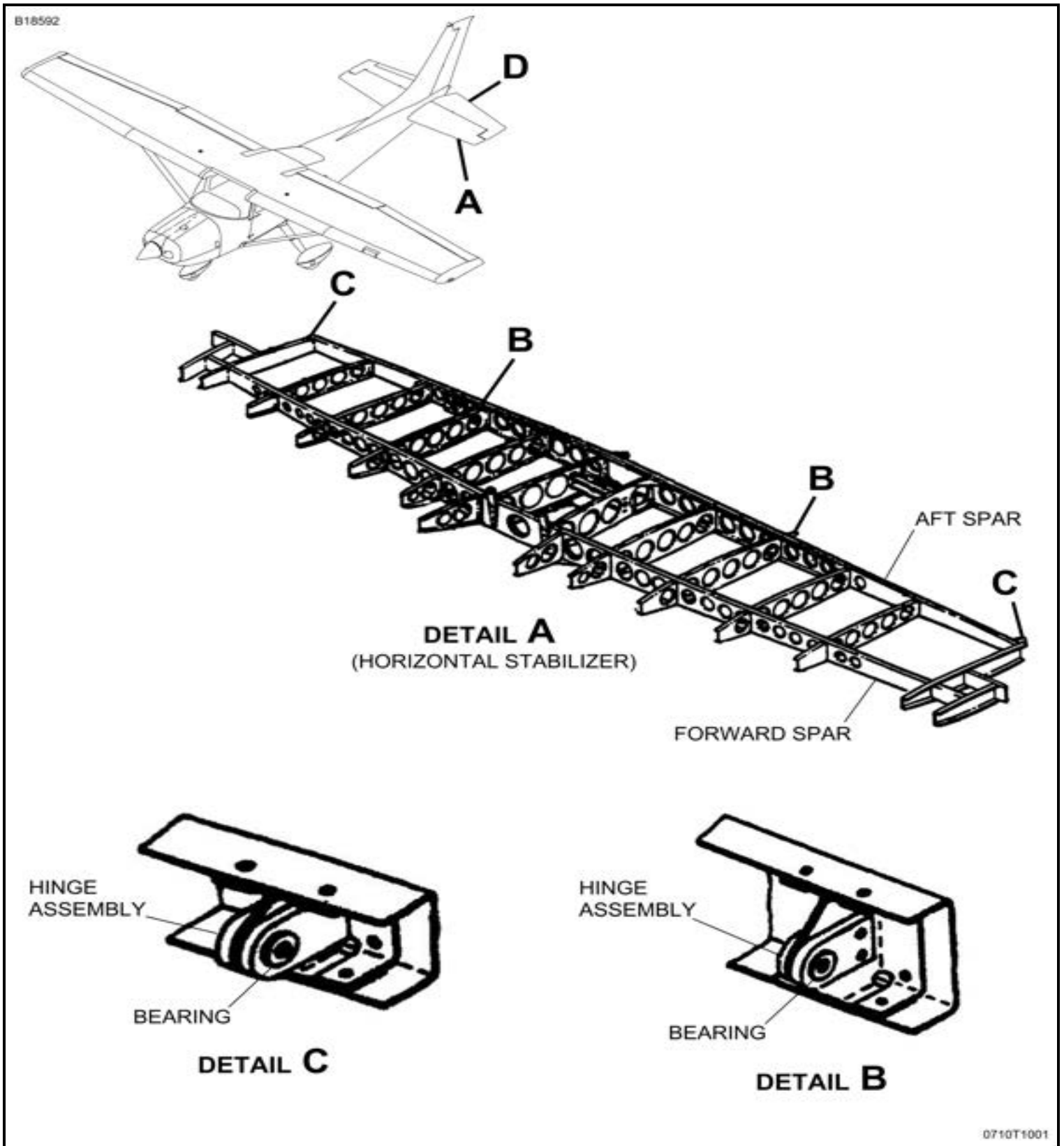
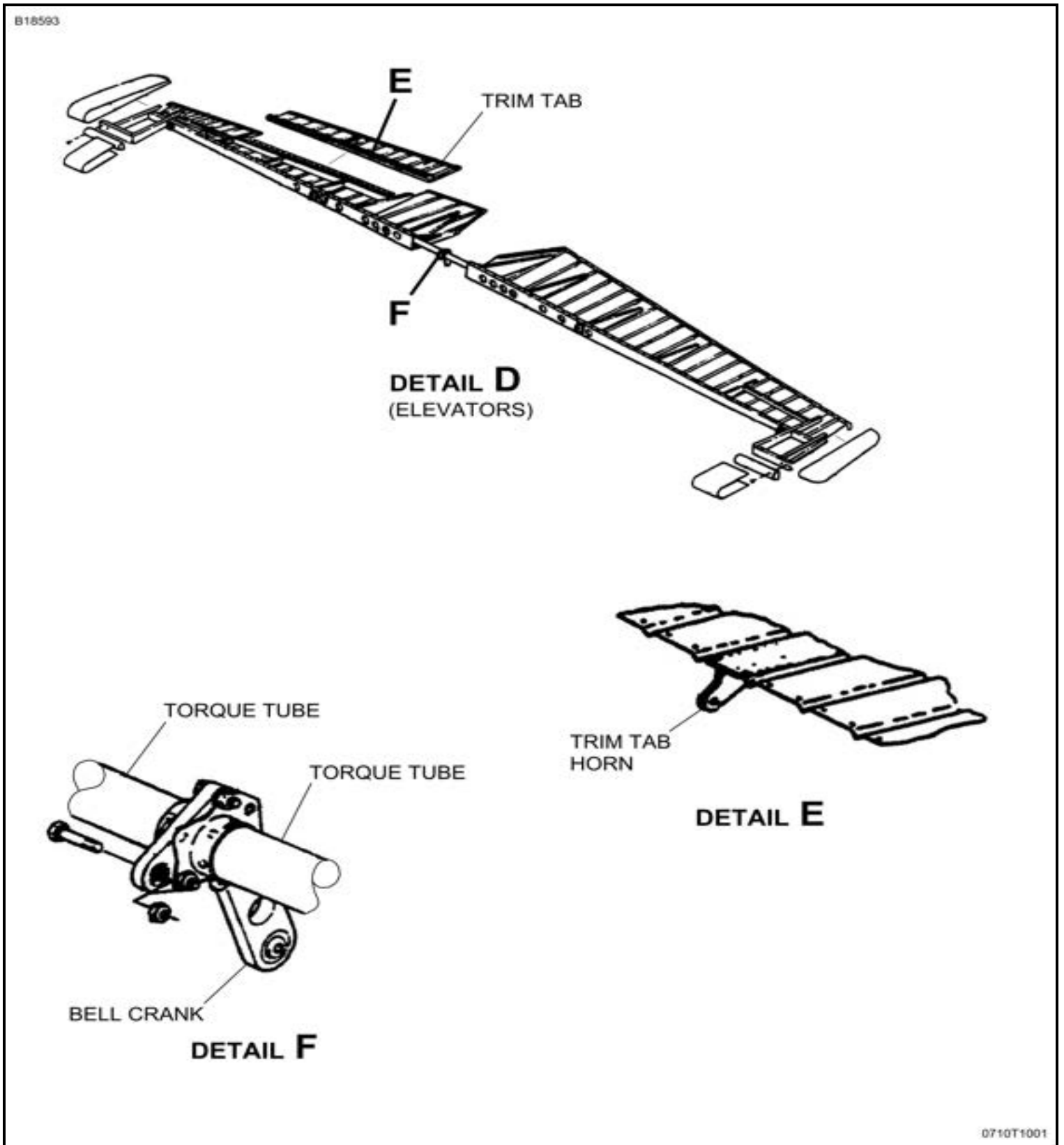


Figure 1 : Sheet 2 : Horizontal Stabilizer, Elevators and Attachments Inspection



SUPPLEMENTAL INSPECTION NUMBER: 55-30-01

1. TITLE:

Vertical Stabilizer, Rudder and Attachments Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE:	INITIAL	10,000 Hours or	20 Years (NOTE)
	REPEAT	3,000 Hours or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To inspect the vertical stabilizer, rudder and attachments for signs of damage, cracks or deterioration.

4. INSPECTION INSTRUCTIONS

- A. Remove the rudder from the airplane and remove all of the vertical stabilizer access panels, refer to the applicable sections of this manual.
- B. Refer to [Figure 1](#), visually inspect the vertical stabilizer and rudder for condition, cracks and security; rudder hinges for condition, cracks and security; hinge bolts, hinge bearings for condition and security; bearings for freedom of rotation; attach fittings for evidence of damage, wear, failed fasteners and security.
 - (1) Clean the area before inspecting if grime or debris is present.
- C. Use a borescope, inspect the forward and aft areas of the vertical stabilizer and rudder spars, ribs and attach fittings for cracks, corrosion, loose fasteners, elongated fastener attach holes and deterioration. Visually inspect the forward and aft vertical stabilizer attach fittings for loose fittings and cracks.
 - (1) Clean area before inspecting if grime or debris is present.
- D. Inspect rudder for deterioration resulting from fatigue, wear, overload, wind damage and corrosion.
 - (1) Clean area before inspecting if grime or debris is present.
- E. Inspect skins, spars and ribs for cracks, corrosion and working fasteners. Pay particular attention to the skins at the location where stringers pass through ribs. Apply finger pressure at the intersection to check for free play indicating a broken rib.
- F. If corrosion or a frozen bearing is found in 4.B above, replace the rudder hinge or conduct a surface eddy current inspection for cracks of each rudder hinge attach fitting. Refer to Section 5-13-01 [Nondestructive Inspection Methods and Requirements](#), Eddy Current Inspection – Surface Inspection, for additional instructions. The inspection is for the aluminum structure outside of the bearing, so set the instrument for aluminum.
- G. Install the rudder and all previously removed access panels, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Vertical Stabilizer, Rudder and Stabilizer Attachment

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

Visual with Eddy Current if required

7. REPAIR/MODIFICATION

Replace damaged bolts and nuts. Replace damaged fittings and small parts. Replace damaged or loose rivets. Hinge bearings are prepacked with grease, which will eventually oxidize and harden after years of service. Several applications of penetrating oil will help free up a stiff bearing. It is the owner/operators option to replace stiff bearings. Make repairs in accordance with the applicable Chapter(s) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Single Engine Structural Repair Manual with Cessna Customer Service prior to beginning the repair.

8. COMMENTS

Coordinate this inspection with SID 55-10-01, Horizontal Stabilizer, Elevators & Attachments Inspection.

Figure 1 : Sheet 1 : Vertical Stabilizer, Rudder and Attachments Inspection

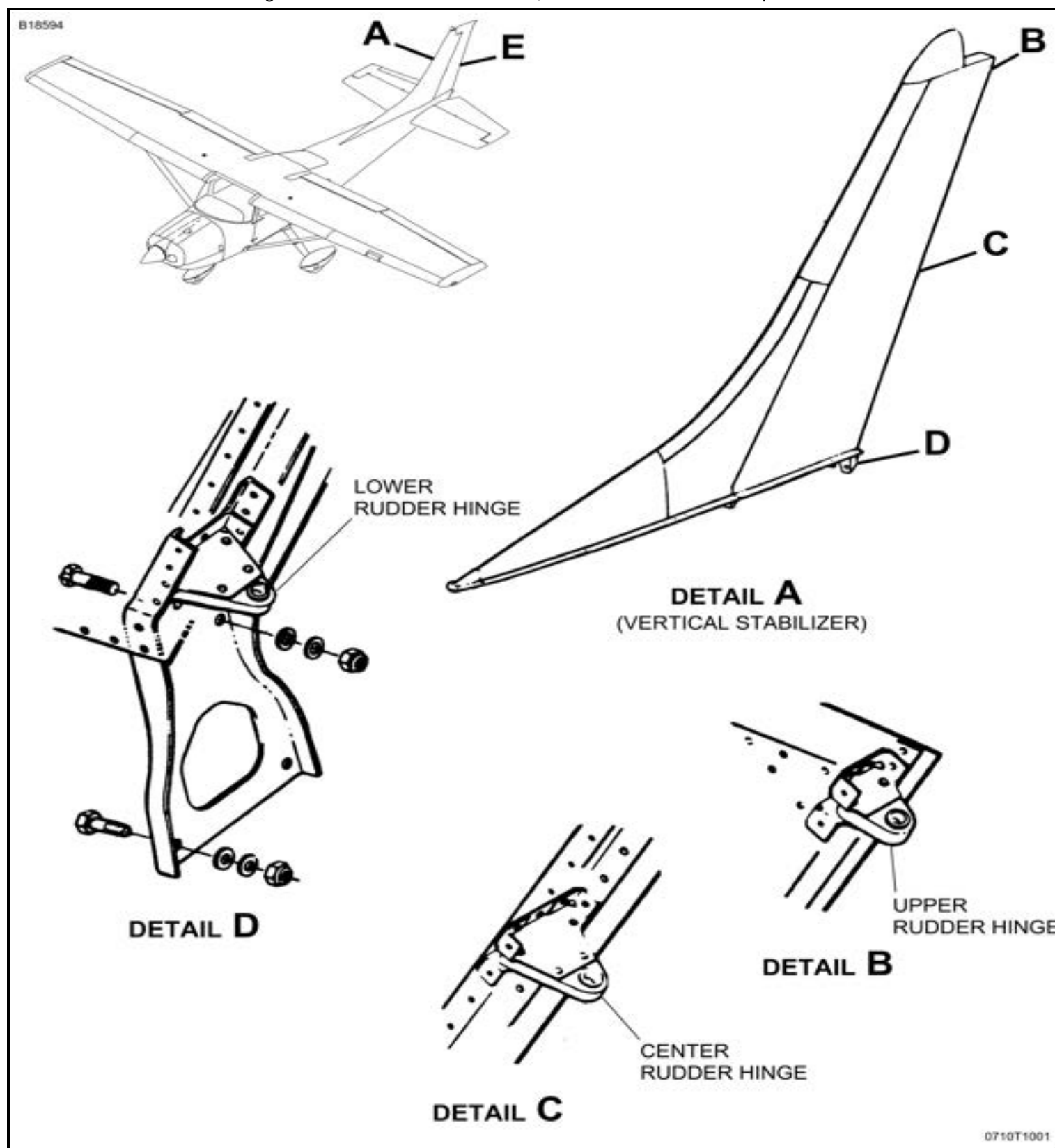
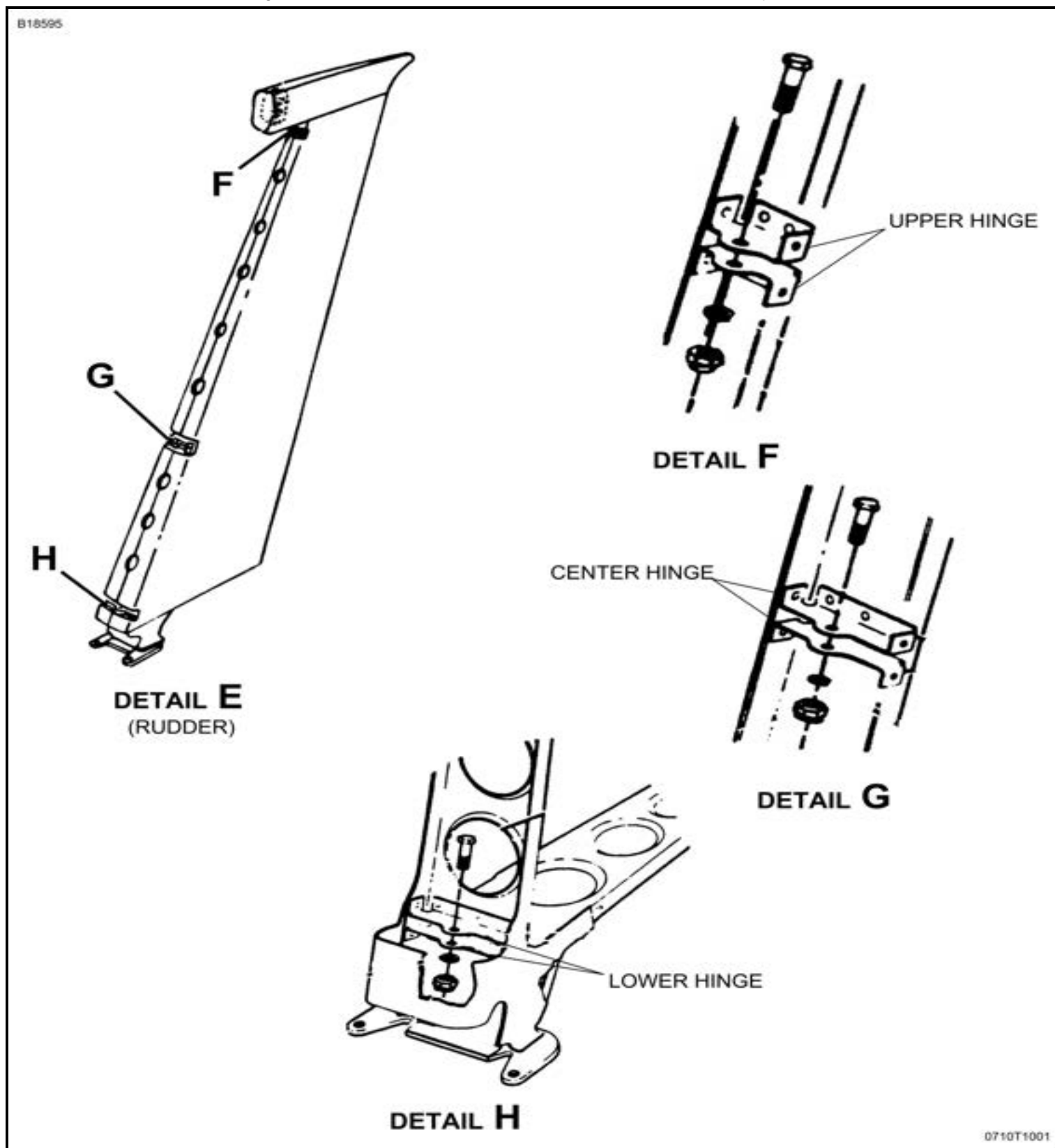


Figure 1 : Sheet 2 : Vertical Stabilizer, Rudder and Attachments Inspection



SUPPLEMENTAL INSPECTION NUMBER: 57-11-01

1. TITLE:

Wing Structure Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

TYPICAL:	INITIAL	12,000 Hours or	20 Years (NOTE)
	REPEAT	2,000 Hours or	10 Years (NOTE)
SEVERE:	INITIAL	6,000 Hours or	10 Years (NOTE)
	REPEAT	1,000 Hours or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To ensure the structural integrity of the wing structure.

4. INSPECTION INSTRUCTIONS

- A. Remove all wing access panels, fairings and the wing tips from the wings, refer to the applicable sections of this manual.
- B. Visual Inspection
 - (1) Clean the area before inspecting if grime or debris is present.
 - (2) Visually inspect the wing structure for damage, corroded or cracked parts. Use a borescope or magnifying glass where required.
 - (a) Pay particular attention to the wing attach area. Visually inspect both the fuselage and wing where the wing attaches to the carry-thru spar in the fuselage.
 - (b) Visually inspect for working rivets at the inboard portion of the main wing spar.

NOTE: Working rivets will have a trail of black dust downwind from the fastener. The dust is oxidized aluminum produced by the fastener moving in the hole.
 - (c) Visually inspect for working Hi-shear rivets at the inboard spar fittings on the main wing spar.
 - (d) Pay particular attention to the trailing edge ribs and the span wise segments supporting the flap actuator or flap bell cranks.
 - (3) If the flight hours meet or exceed the inspection compliance hours (above), proceed to Detailed Inspection below.
 - (4) If crack(s) or corrosion is found at the wing attach fittings, proceed to the Detailed Inspection below.
 - (5) If no crack(s) or corrosion is found and the airplane flight hours are below the inspection compliance hours of this inspection, install the access panels, fairings and wing tips, refer to the 182 Maintenance Manual. Inspection is complete.
- C. Detailed Inspection
 - (1) Support the wing outboard of the strut while removing the attach bolts.
 - (2) Remove the wing front spar attach bolts. Visually inspect the holes on the wing and fuselage sides of the fittings and surrounding area for corrosion.
 - (a) Pay particular attention to potential corrosion in the fitting inside the fuselage front carry-thru spar. Refer [Figure 1](#).
 - (b) Conduct a bolt hole eddy current inspection of the front spar attach fittings. Refer to Section 5-13-01, [Nondestructive Inspection Methods and Requirements](#), Eddy Current Inspection – Bolt Hole Inspection, for additional instructions. The hole size is 0.50 inches in diameter.

NOTE: With the front spar in position, there are three segments through the hole. There is a fabrication joint in the center segment (wing side), so expect a crack-like indication at about 2:00 and 10:00 o'clock positions. Indications caused by the fabrication joint are not a cause for rejection.
 - (c) Install the front spar attach bolt.

- (3) Remove the wing rear spar attach bolts. Mark the location of the indexing slot in the heads of both eccentric bushings. Remove the bushings. Visually inspect the holes on the wing and fuselage sides of the fittings and surrounding area for corrosion.
 - (a) Pay particular attention to potential corrosion in the fitting inside the rear carry-thru spar. Refer to [Figure 1](#)
 - (b) Conduct a bolt hole eddy current inspection of the rear spar attach fittings. Refer to Section 5-13-01, [Nondestructive Inspection Methods and Requirements](#), Eddy Current Inspection – Bolt Hole Inspection, for additional instructions. The hole size is 0.687 inches in diameter.
 - (c) Install the bushings in the spar in the same orientation as they were when removed.
 - (d) Install the rear spar attach bolt.
- (4) Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Wing Attach Points

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

Visual, Eddy Current, Borescope, Magnifying Glass

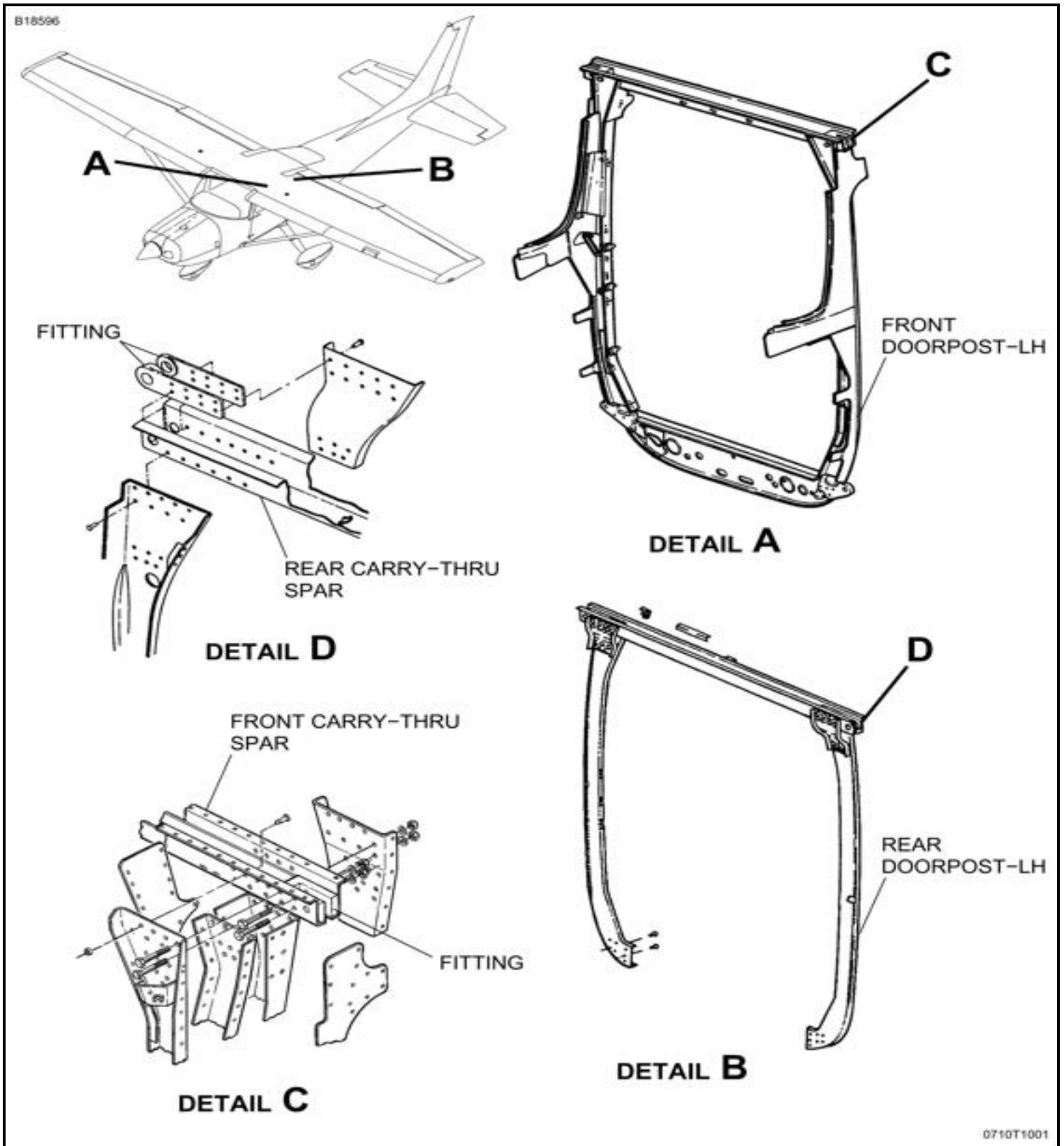
7. REPAIR/MODIFICATION

Replace cracked or excessively corroded parts. If corrosion is present, it must be removed before refinishing. Contact Customer Service for assistance prior to beginning the repair if the disassembly exceeds the repair facilities experience or capability.

8. COMMENTS

Coordinate this inspection with SID 57-40-01, Strut and Strut Wing Attach Inspection.

Figure 1 : Sheet 1 : Wing Structure Inspection



SUPPLEMENTAL INSPECTION NUMBER: 57-11-02

1. TITLE:

Wing Structure Corrosion Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

CORROSION SEVERITY	INSPECTION COMPLIANCE	
MILD/MODERATE:	INITIAL	25 Years (NOTE)
	REPEAT	10 Years (NOTE)
SEVERE:	INITIAL	15 Years (NOTE)
	REPEAT	5 Years (NOTE)

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To ensure corrosion protection of the wing structure.

4. INSPECTION INSTRUCTIONS

- A. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.
- B. Remove all of the wing access panels, fairings and the wing tips from the wings.
 - (1) Clean the area before inspecting if grime or debris is present.
- C. Visually inspect throughout the wing sections for corrosion or traces of corrosion products through the access panels and wing tips.
- D. Visually inspect for open fastener holes or loose rivets in the structure. Open fastener holes are an indication that a rivet has corroded and has departed the airplane.
- E. Use a borescope to inspect all inaccessible areas.
 - (1) Some additional areas can be reached by threading the borescope probe through lightening holes in the trailing edge ahead of the flap and aileron.
 - (2) During the borescope inspection, pay particular attention to rivet butts and flanges containing rivets.
- F. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION/ZONE	DETECTABLE CRACK SIZE
Wing	Not Allowed

6. INSPECTION METHOD

Visual, Borescope

7. REPAIR/MODIFICATION

- A. If corrosion is present, it must be removed before refinishing. The recommended procedure to remove corrosion is by hand sanding, using a fine grained sandpaper.

NOTE: Particularly if corrosion is detected using a borescope, significant disassembly may be required to remove corrosion and to refinish and repair surfaces. Contact Cessna Customer Service for assistance prior to beginning the repair if the disassembly exceeds the repair facilities experience or capability.
- B. Sand with 180 or finer grit abrasive cloth, to produce a diameter-to-depth ratio of about 10:1.
 - (1) To determine the depth of repaired area after removing the corrosion, use ultrasonic inspection methods to determine the thickness of the material after removing the corrosion. If the thickness of the material is less than 90% of uncorroded or new material, contact Cessna Customer Service for repair/replacement instructions.
- C. Refinish sanded areas.
 - (1) Solvent Wipe.

- (a) Wipe off excess oil, grease, or dirt from the surface to be cleaned.
 - (b) Apply solvent to a clean cloth, preferably by pouring solvent onto cloth from a safety can or other approved, labeled container. The cloth must be well saturated, but not dripping.
 - (c) Wipe surface with the moistened cloth as necessary to dissolve or loosen soil. Work a small enough area so the surface being cleaned remains wet.
 - (d) Immediately wipe the surface with a clean, dry cloth, while the solvent is still wet. Do not allow the surface to evaporate dry.
 - (e) Do steps (b) through (d) again until there is no discoloration on the drying cloth.
- (2) Apply corrosion primer in accordance with Corrosion-Resistant Primer MIL-PRF-23377G or later.
- (a) Mix and apply in accordance with the manufacturer's instructions.
 - (b) Apply mixture with a wet cross coat to yield a dry film thickness of 0.6 to 0.8 mils.
 - (c) Allow to air dry for two to four hours.

8. COMMENTS

SUPPLEMENTAL INSPECTION NUMBER: 57-11-03

1. TITLE

Wing Splice Joint at Strut Attach Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

MILD/MODERATE:	INITIAL	25 Years (NOTE)
	REPEAT	10 years (NOTE)
SEVERE:	INITIAL	15 Years (NOTE)
	REPEAT	5 years (NOTE)

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To ensure structural integrity of the wing splice joint at strut attach location.

4. INSPECTION INSTRUCTIONS

- A. Remove the four access panels inboard and outboard of the wing strut attach fitting to gain access to the forward and aft side of the wing strut attachment, refer to the applicable sections of this manual.
- B. Do a visual inspection for corrosion at the edge of the upper and lower spar caps and the edge of the splice doublers. Refer to Figure 1. In addition, confirm the spar splice does not have bulging, resulting from corrosion, and does not have missing or loose fasteners.
- C. If any of these conditions are confirmed, conduct an Ultrasonic Thickness Test on the area to determine if the doubler and/or spar thickness has been reduced in thickness from corrosion. Refer to Section 5-13-01, [Nondestructive Inspection Methods and Requirements](#), Ultrasonic Thickness Testing. If testing indicates the thickness varies by more than 0.004 inch in any area, contact Cessna Customer Service for additional instructions.
- D. If corrosion is not found, install the removed access panels, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Wing Forward Spar

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

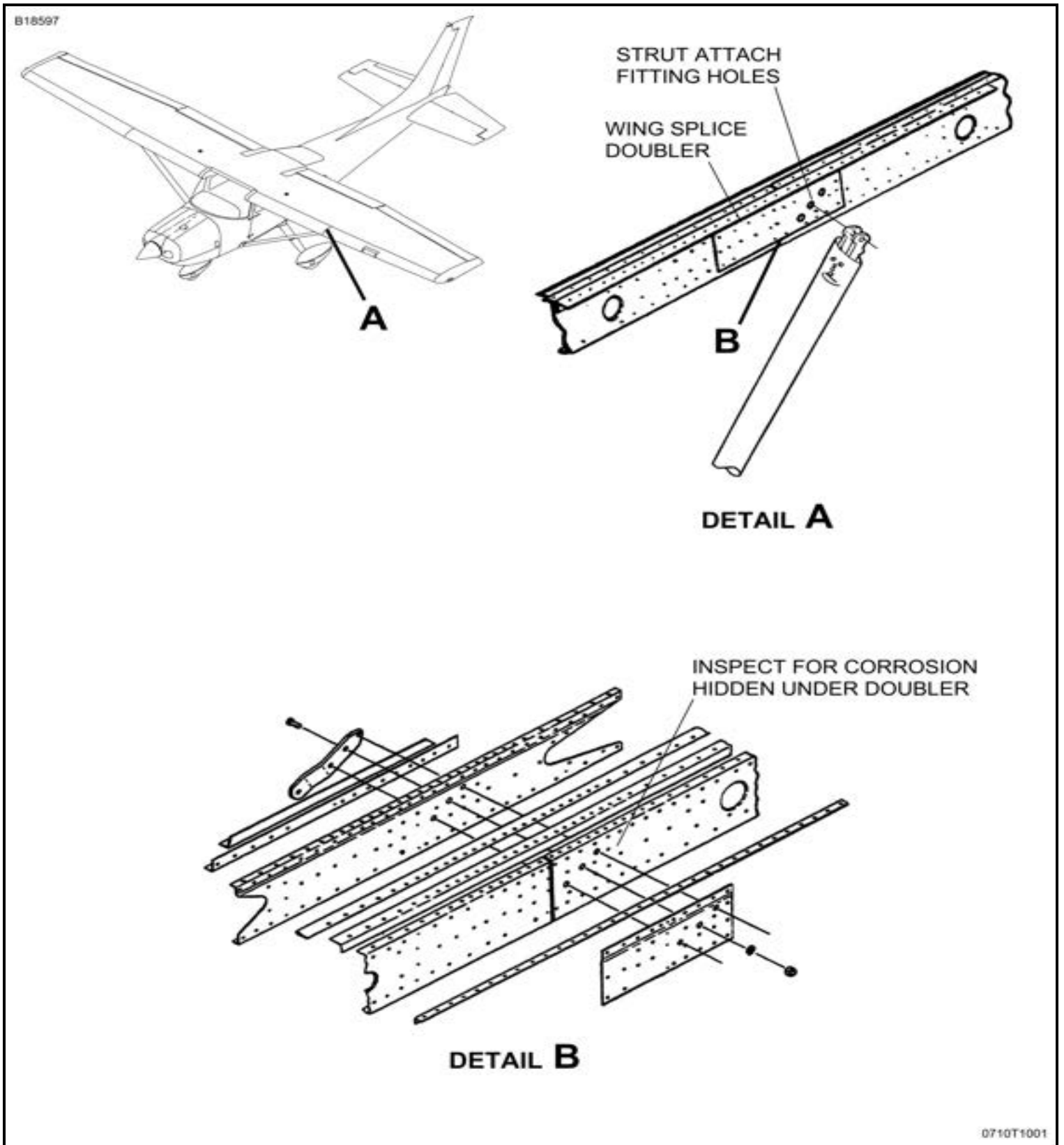
Visual/Ultrasonic Thickness

7. REPAIR/MODIFICATION

Replace any cracked parts. If corroded, sand area lightly to remove corrosion. If more than 10% of the thickness has been removed in any one area, replace the part.

8. COMMENTS

Figure 1 : Sheet 1 : Wing Splice Joint At Strut Attach Inspection



SUPPLEMENTAL INSPECTION NUMBER: 57-12-01

1. TITLE:

Wing Root Rib Corrosion Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

CORROSION SEVERITY		INSPECTION COMPLIANCE	
MILD/MODERATE:	INITIAL		5 Years (NOTE)
	REPEAT		5 Years (NOTE)
SEVERE:	INITIAL		3 Years (NOTE)
	REPEAT		3 Years (NOTE)

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To ensure structural integrity of the root rib structure.

4. INSPECTION INSTRUCTIONS

- A. Remove the wing to fuselage fairing, refer to the applicable sections of this manual.
- B. Visually inspect inboard side of root ribs at WS 23.62 for corrosion.
 - (1) Clean area before inspecting if grime or debris is present.
- C. Remove the inspection cover if fitted, outboard of WS 23.62.
- D. Visually inspect outboard side of root ribs at WS 23.62 for corrosion.
 - (1) Clean area before inspecting if grime or debris is present.
- E. Repair any corroded areas in accordance with the Repair/Modification Section of this inspection document.
- F. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Root Rib	Not Allowed

6. INSPECTION METHOD

Visual

7. REPAIR/MODIFICATION

- A. If corroded, sand corroded area lightly to remove corrosion. If corrosion is found on the outboard side of the rib, it may be necessary to provide additional access in the leading edge skin. Contact Cessna Customer Service for instructions for cut and repair.
- B. Clean area thoroughly to assess remaining thickness.
- C. If more than 20% of the thickness has been removed in any area, replace the rib. Up to 20% is acceptable if confined to an area of 2 inches or less in length and less than one square inch in area.
- D. Brush coat sanded areas with alodine.

8. COMMENTS

SUPPLEMENTAL INSPECTION NUMBER: 57-40-01

1. TITLE:

Strut and Strut Wing Attachment Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

TYPICAL:	INITIAL	12,000 Hours or	20 Years (NOTE)
	REPEAT	2,000 Hours or	10 Years (NOTE)
SEVERE:	INITIAL	6,000 Hours or	10 Years (NOTE)
	REPEAT	1,000 Hours or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To verify the integrity of the strut and strut attachment fitting to the wing.

4. INSPECTION INSTRUCTIONS

- A. Remove the wing strut upper and lower fairings, refer to [Figure 1](#) and refer to the applicable sections of this manual.
- B. If the flight hours meet or exceed the inspection compliance hours of this supplemental inspection, proceed to Detailed Attach Fitting Inspection.
 - (1) Visually inspect the strut attachment fittings for cracks or corrosion.
 - (a) Clean area before inspecting if grime or debris is present.
 - (b) If crack(s) or corrosion is found, proceed to the Detailed Attach Fitting Inspection.
 - (2) Visually inspect the strut tube for cracks or corrosion.
 - (a) Clean the area before inspecting if grime or debris is present.
 - (b) If crack(s) or corrosion is found, proceed to the Detailed Attach Fitting Inspection.
 - (3) If no crack(s) or corrosion is found, refer to the 182 Maintenance Manual and install the fairings. The inspection is complete.
- C. Detailed Attach Fitting Inspection.
 - (1) Support the wing to minimize the load on the strut to wing attach bolt.
 - (2) Remove the upper strut attach bolt and lower the strut to a support.
 - (3) Remove the lower attach bolt and remove the strut.
 - (4) Visually examine the strut tube for cracks or corrosion.
 - (5) Visually inspect the strut attachment fittings for corrosion.
 - (6) Inspect using Eddy current for cracks radiating from the wing and fuselage attach holes in the wing strut end fitting.
 - (7) Install the strut, refer to the applicable sections of this manual for strut installation instructions.
 - (a) Install the strut lower attachment to the fuselage attach fitting.
 - (b) Install the strut upper attachment to the wing attach fitting.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Wing Strut

DETECTABLE CRACK SIZE

Not Applicable

6. INSPECTION METHOD

Visual and Eddy Current

7. REPAIR/MODIFICATION

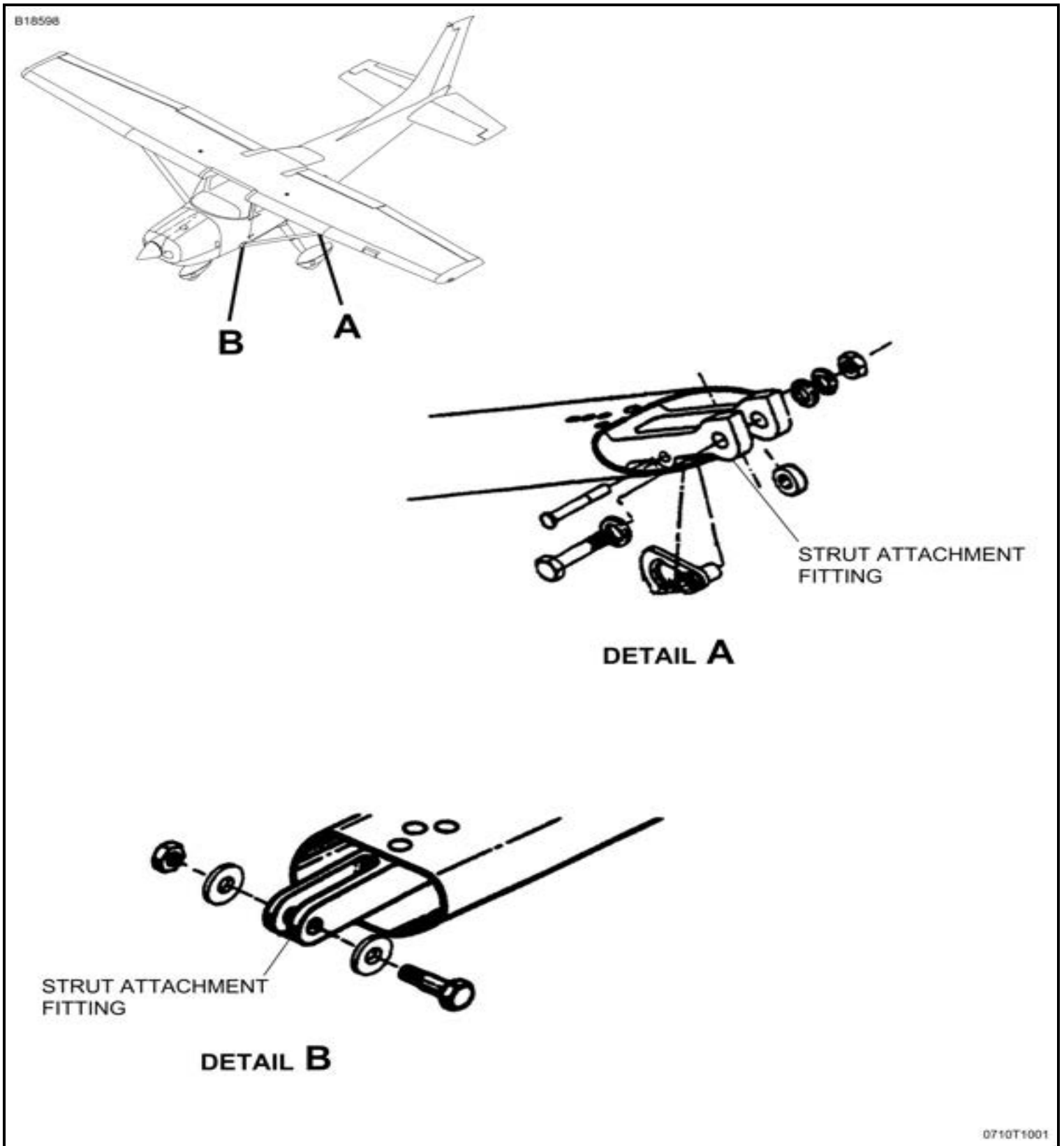
- A. If corrosion is found, remove corrosion by lightly sanding corroded area, taking care to remove as little material as necessary to

completely remove corrosion. If the material thickness is less than 90% of the uncorroded section, then replace the affected part.

- B. Buff out sanding marks.
- C. Corrosion or damage to attachment holes will require specialized rework. Contact Cessna Customer Service for rework of corroded or damaged attachment holes.
- D. Clean and prime sanded areas.

8. COMMENTS

Figure 1 : Sheet 1 : Strut and Strut Wing Attachment Inspection



SUPPLEMENTAL INSPECTION NUMBER: 57-51-01

1. TITLE:

Aileron Support Structure Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

INSPECTION COMPLIANCE

ALL USAGE:	INITIAL	3,000 Hours or	10 Years (NOTE)
	REPEAT	500 Hours or	5 Years (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To ensure structural integrity of the Aileron Support Structure.

4. INSPECTION INSTRUCTIONS

- A. Remove the ailerons, refer to the applicable sections of this manual.
 - (1) Clean area before inspecting if grime or debris is present.
- B. Visually inspect the aileron hinges for condition, cracks and security. Pay particular attention to the hinge pin segment "knuckle" area as shown in [Figure 1](#).
- C. Visually inspect the pushrod attach fittings for evidence of damage, wear, failed fasteners and security.
- D. Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Wings

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

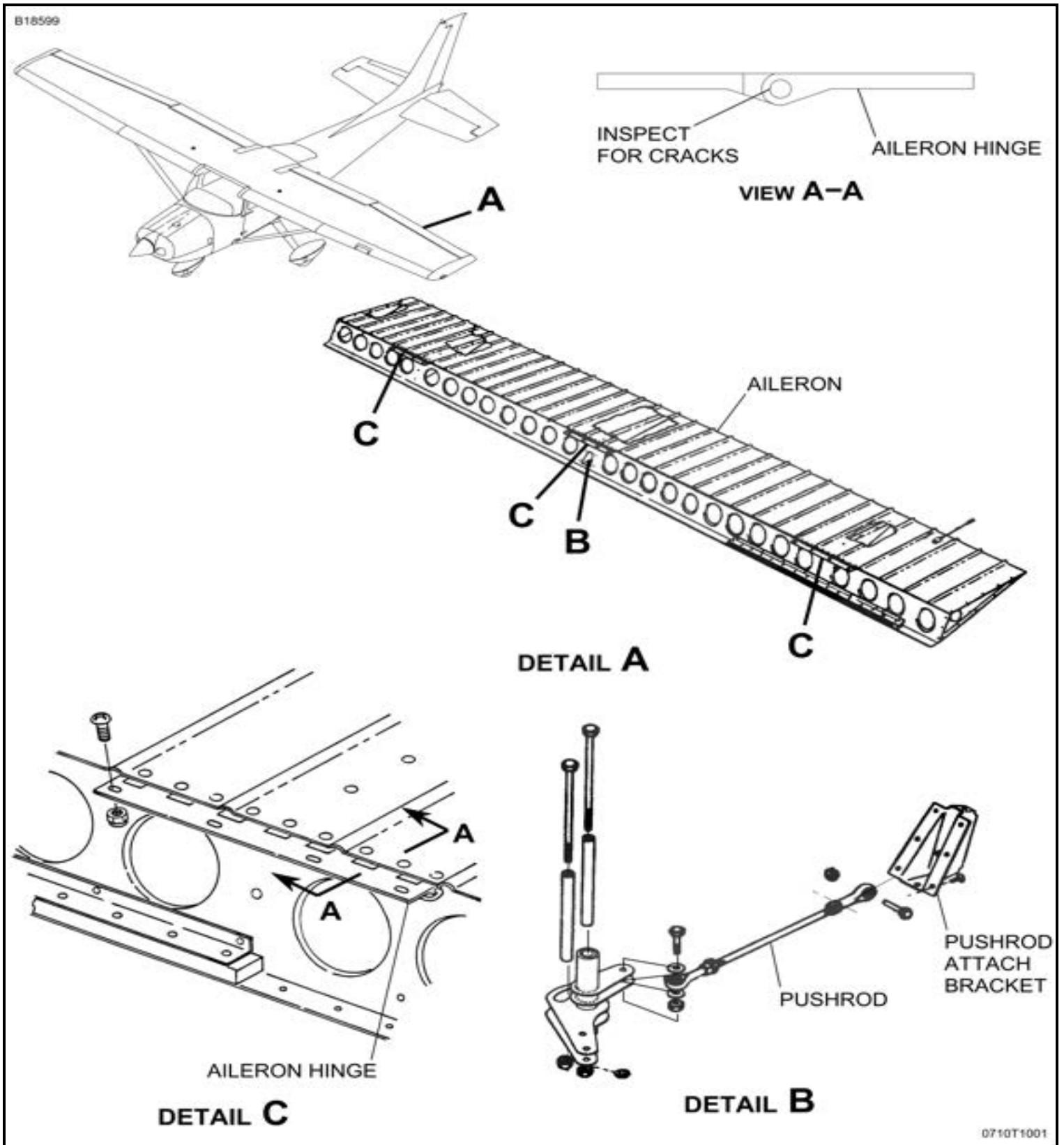
Visual

7. REPAIR/MODIFICATION

Replace any damaged or cracked hinges. Replace damaged or worn hinge pins.

8. COMMENTS

Figure 1 : Sheet 1 : Strut and Strut Wing Attachment Inspection



SUPPLEMENTAL INSPECTION NUMBER: 57-53-01

1. TITLE

Flap Tracks and Attachments Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On

CORROSION SEVERITY		INSPECTION COMPLIANCE	
MILD/MODERATE:	INITIAL	20 Years (NOTE)	
	REPEAT	10 Years (NOTE)	
SEVERE:	INITIAL	10 Years (NOTE)	
	REPEAT	5 Years (NOTE)	

NOTE:

Refer to Chapter 51, Corrosion - Description and Operation and associated maps to determine corrosion severity.

3. PURPOSE

To ensure the integrity of the flap tracks.

4. INSPECTION INSTRUCTIONS

- A. Do a visual inspection of the inboard and outboard flap tracks for exfoliation corrosion, particularly along exterior edges and edges of roller tracks, refer to [Figure 1](#).
 - (1) Clean area before inspecting if grime or debris is present.
- B. Visually inspect the flap track rib assembly, attachment brackets and angles for condition, cracks, loose rivets and security.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Flap Tracks	Not Allowed

6. INSPECTION METHOD

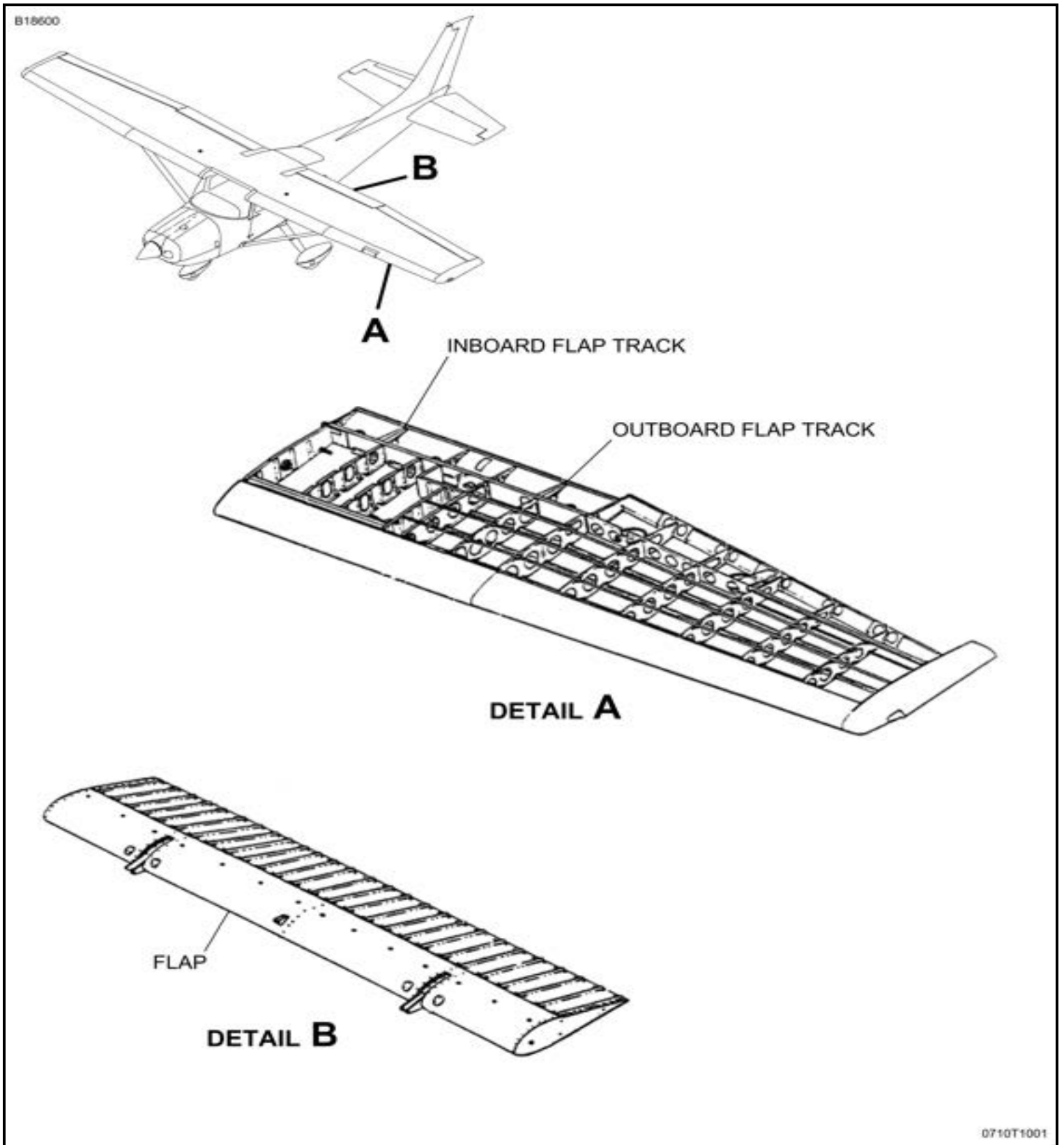
Visual

7. REPAIR/MODIFICATION

Replace damaged or loose rivets. Replace damaged flap tracks or attachments.

8. COMMENTS

Figure 1 : Sheet 1 : Flap Tracks and Attachments Inspection



SUPPLEMENTAL INSPECTION NUMBER: 71-20-01

1. TITLE:

Engine Mount Inspection

2. EFFECTIVITY

18280001 and On, T18208001 and On, J18200001 and On

INSPECTION COMPLIANCE

ALL USAGE:	INITIAL	10,000 Hours or	20 Years (NOTE)
	REPEAT		At Engine Overhaul (NOTE)

NOTE:

Refer to Note 1, Section 5-14-00.

3. PURPOSE

To ensure structural integrity of the engine mount.

4. INSPECTION INSTRUCTIONS

- Remove cowl, engine and sufficient accessories to allow removal of the tubular engine mount, refer to the applicable sections of this manual.
- Clean area before inspecting if grime or debris is present.
- Refer to [Figure 1](#), conduct a visual inspection for cracks in the welds of the tubular engine mount and within three inches on either side of the welds. Use a bright light and magnifier of 7X or greater power to aid in inspection.
- If rust is found, cracks are suspected, or if the airplane has exceeded the flight hour compliance time listed above, remove the tubular engine mount. Conduct a magnetic particle inspection of these areas. Refer to Section 5-13-01, Nondestructive Inspection Methods and Requirements, Magnetic Particle Inspection, for additional instructions.
- Install the items that were removed to accomplish this inspection, refer to the applicable sections of this manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION

Under Cowl

DETECTABLE CRACK SIZE

Not Allowed

6. INSPECTION METHOD

Visual and Magnetic Particle

7. REPAIR/MODIFICATION

Repair any cracks by welding. Prior to welding, locate either a drive pin or a hole welded shut in the tube to be welded. Open the hole prior to welding. After welding, while the welded area is still hot, introduce 3cc of unboiled Linseed oil or 6cc of corrosion preventative compound conforming to MIL-PRF-81309, through the hole and reseal it using the same method as was used in the original fabrication. The engine mount is not heat treated after fabrication, so no processing after welding is required. Make repairs in accordance with the applicable Chapter(s) of the Single Engine Structural Repair Manual. Coordinate any repair not available in Single Engine Structural Repair Manual with Cessna Customer Service prior to beginning the repair.

8. COMMENTS

This is a complex and involved inspection. It is recommended that the inspection be coordinated with an engine overhaul, even if the time does not exactly agree with the inspection hours of this supplemental inspection. Recurring inspections will be satisfied by inspections at engine overhaul.

Figure 1 : Sheet 1 : Engine Mount Inspection

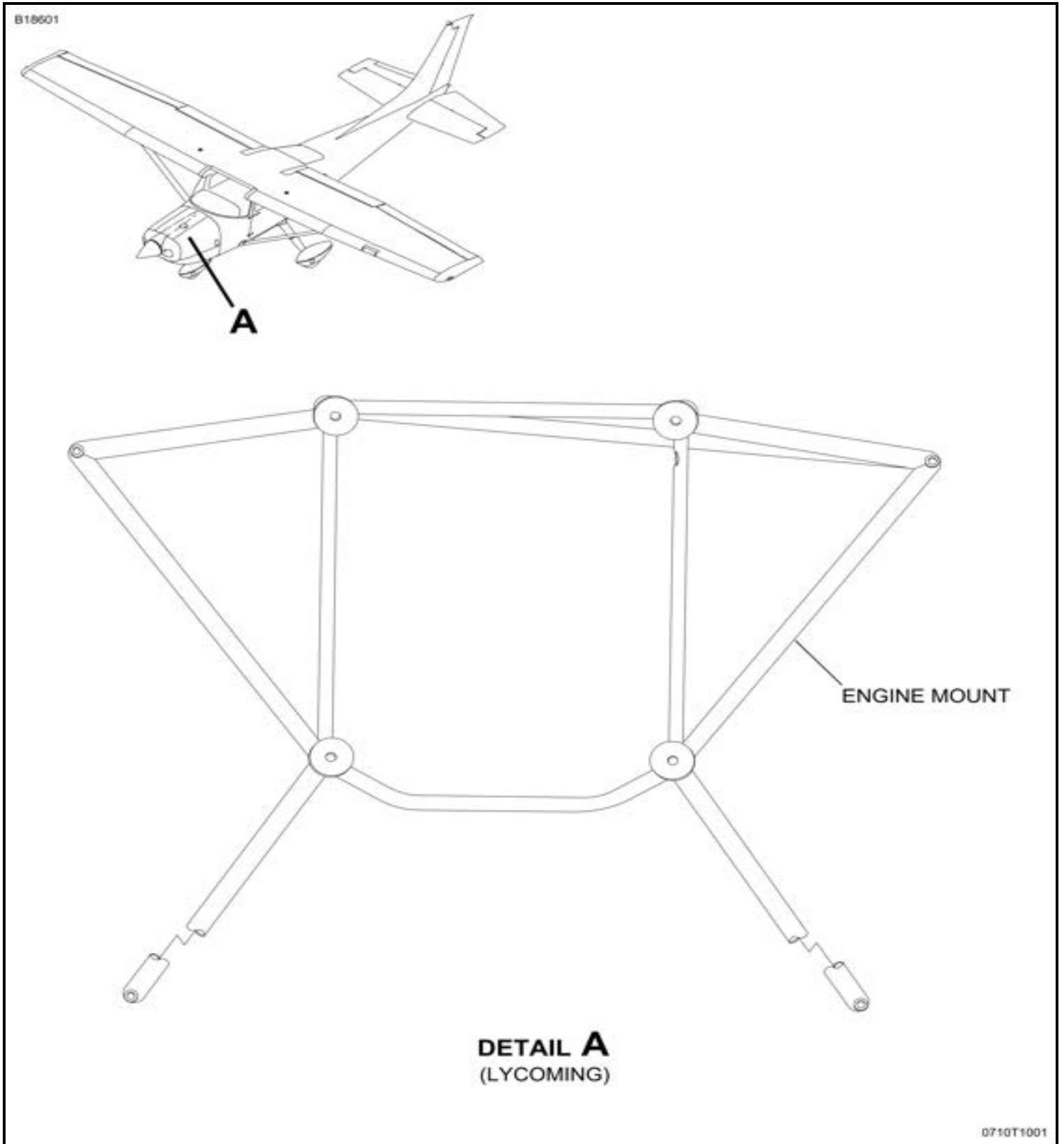
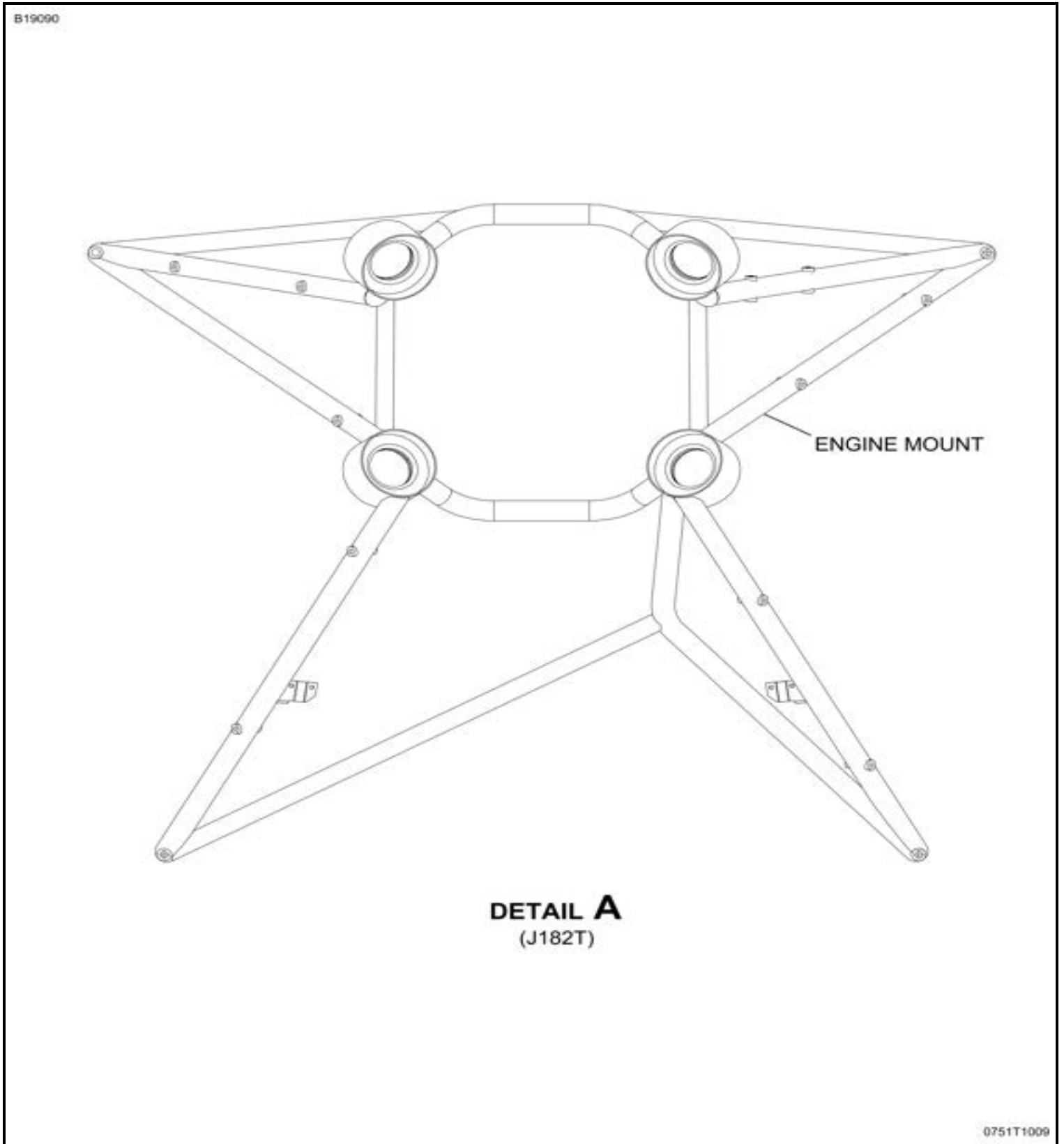


Figure 1 : Sheet 2 : Engine Mount Inspection



EXPANDED MAINTENANCE**1. Control Cables**

- A. The chromium nickel steel wire is helically twisted into strands and the strands laid about other strands forming the flexible steel cable. The diameter of the cable is determined by the number of wires and the number of strands in the cable.

(1) Construction of Cables

- (a) Cable diameter, 1/32 inch, 3 by 7 construction - Cable of this construction shall consist of three strands of seven wires each. There shall be no core in this construction. The cable shall have a length of lay of not more than eight times nor less than five times the nominal cable diameter.
- (b) Cable diameter, 1/16 inch and 3/32 inch, 7 by 7 construction - Cable of this construction shall consist of six strands of seven wires each, laid around a core strand of seven wires. The cable shall have a length of lay of not more than eight times nor less than six times the nominal cable diameter.
- (c) Cable diameter, 1/8 inch through 3/8 inch, 7 by 19 construction - Cable of this construction shall consist of six strands laid around a core strand. The wire composing the seven individual strands shall be laid around a central wire in two layers. The single core strand shall consist of a layer of 6 wires laid around the central wire in a right direction and a layer of 12 wires laid around the 7 wire strand in a right direction. The 6 outer strands of the cable shall consist of a layer of 6 wires laid around the central wire in a left direction and a layer of 12 wires laid around the 7 wire strand in a left direction.
- (d) Lubrication - A pressure type friction preventative compound, having noncorrosive properties, is applied during construction as follows:
 - Friction preventative compound is continuously applied to each wire as it is formed into a strand so that each wire is completely coated.
 - Friction preventative compound is continuously applied to each strand as it is formed into a cable so that each strand is completely coated.
- (e) Definitions - The following definitions pertain to flexible steel cable:
 - Wire - Each individual cylindrical steel rod or thread shall be designated as a wire.
 - Strand - Each group of wires helically twisted or laid together shall be designated as a strand.
 - Cable - A group of strands helically twisted or laid about a central core shall be designated as a cable. The strands and the core shall act as a unit.
 - Diameter - The diameter of cable is the diameter of the circumscribing circle.
 - Wire Center - The center of all strands shall be an individual wire and shall be designated as a wire center.
 - Strand Core - A strand core shall consist of a single straight strand made of preformed wires, similar to the other strands comprising the cable in arrangement and number of wires.
 - Preformed Type - Cable consisting of wires and strands shaped, prior to fabrication of the cable, to conform to the form or curvature which they take in the finished cable, shall be designated as preformed types.
 - Lay or Twist - The helical form taken by the wires in the strand and by the strands in the cable is characterized as the lay or twist of the strand or cable respectively. In a right lay, the wires or strands are in the same direction as the thread on a right screw and for a left lay, they are in the opposite direction.
 - Pitch (or length of lay) - The distances, parallel to the axis of the strand or cable, in which a wire or strand makes one complete turn about the axis, is designated as the pitch (or length of lay) of the strand or cable respectively.

B. Inspection of Cable System

NOTE: For tools and equipment used in checking and rigging, refer to the appropriate sections of the applicable Model 172 Service Manual.

(1) Routing

- (a) Examine cable runs for incorrect routing, fraying and twisting. Look for interference with adjacent structure, equipment, wiring, plumbing and other controls.
- (b) Check cable movement for binding and full travel. Observe cables for slack when moving the corresponding controls.

(2) Cable Fittings

- (a) Check swaged fitting reference marks for an indication of cable slippage within the fitting. Inspect the fitting for distortion, cracks and broken wires at the fitting.

- (b) Check turnbuckles for proper thread exposure. Also, check turnbuckle locking clip or safety wire.
- (3) Inspection of Control Cable.
- (a) The control cable assemblies are subjected to a variety of environmental conditions and forms of deterioration that ultimately may be easy to recognize as wire/strand breakage or the not-so-readily visible types of corrosion and/or distortion. The following data will aid in detecting an unserviceable cable condition:
- (b) Broken Wire
- 1 Examine cables for broken wires by passing a cloth along the length of the cable. This will detect broken wires, if the cloth snags on the cable. Critical areas for wire breakage are those sections of the cable which pass through fairleads, across rub blocks and around pulleys. If no snags are found, then no further inspection is required. If snags are found or broken wires are suspected, then a more detailed inspection is necessary, which requires that the cable be bent in a loop to confirm the broken wires. Refer to [Figure 1](#) for an example. Loosen or remove the cable to allow it to be bent in a loop as shown. Refer to [Table 1](#) for bend diameter criteria. While rotating cable, inspect the bent area for broken wires.

Table 1. Loop and Coil Diameter Criteria

Cable Diameter	Smallest Allowable Loop Diameter (Loop Test)	Smallest Allowable Inside Diameter of Coil (Cable Storage)
1/32 Inch	1.6 Inch	4.7 Inch
1/16 Inch	3.2 Inch	9.4 inch
3/32 Inch	4.7 Inch	14.1 Inch
1/8 Inch	6.3 Inch	18.8 Inch
5/32 Inch	7.9 Inch	23.5 Inch
3/16 Inch	9.4 Inch	28.2 Inch

- 2 Wire breakage criteria for the cables in the flap, aileron, rudder and elevator systems are as follows:
 - a Individual broken wires are acceptable in primary and secondary control cables at random locations when there are no more than six broken wires in any given 10-inch (0.254 m) cable length.
 - 3 Corrosion
 - a Carefully examine any cable for corrosion that has a broken wire in a section not in contact with wear producing airframe components, such as pulleys, fairleads, rub blocks etc. It may be necessary to remove and bend the cable to properly inspect it for internal strand corrosion, as this condition is usually not evident on the outer surface of the cable. Replace cable if internal corrosion is found. For description of control cable corrosion, refer to Chapter 51, [Corrosion - Description and Operation](#), Steel Control Cables.
 - b Areas conducive to cable corrosion are below the refreshment center, in the wheel well and in the tailcone. Also, if a cable has been wiped clean of its corrosion preventative lubricant and metal-brightened, the cable must be examined closely for corrosion.
- (4) Pulleys
- (a) Inspection of Pulleys
- 1 Inspect pulleys for roughness, sharp edges and presence of foreign material embedded in the grooves. Examine pulley bushings or bearings to ensure smooth rotation, freedom from flat spots and foreign material.
 - 2 Periodically rotate pulleys, which turn through a small arc, to provide a new bearing surface for the cable.
 - 3 Check pulley alignment. Check pulley brackets and guards for damage, alignment and security. Various failures of the cable system may be detected by analyzing pulley conditions. Refer to [Figure 1](#) for pulley wear patterns; these include such discrepancies as too much tension, misalignment, pulley bearing problems and size mismatch between cable and pulley.
- (5) Cable Storage
- (a) Cable assemblies shall be stored straight or in a coil. When stored in coil form, the coil inside diameter shall not be less than 150 times the cable diameter or bent in a radius of not less than 75 times the cable diameter. Refer to [Table 1](#) for coil diameter criteria. Coils shall not be flattened, twisted or folded during storage. Storage requirements shall

apply until the cable is installed in its normal position in the airplane. If only a part of the cable is installed in an assembly, cable storage requirements apply to the uninstalled portion of the cable.

(6) Flight Control Cable Inspection

(a) General Information

WARNING: If the flight control cable system(s) are removed, disconnected or cable section(s) are replaced, make sure that all rigging, travel checks, cable tensions and control surface checks are done in accordance with the procedures in the appropriate section for the affected flight control system.

NOTE: Flight control cable inspections are normally performed without removing or disconnecting any part of the flight control system. However, it may be necessary to derig or remove the cable to get access to the entire cable.

(b) Cable Inspection Procedure

- 1 Each flight control cable must be visually inspected along its entire length for evidence of broken wires, corrosion, fraying or other damage. Visual inspection may be via direct sight, mirror and flashlight or borescope.
- 2 Visually check for proper routing along entire length of cable. Make sure that cables, pulleys, attaching sectors and bell cranks are free and clear of structure and other components.

NOTE: Some systems use rub blocks, it is permissible for control cables to rub against these blocks.
- 3 Each flight control cable will be physically inspected, by passing a cloth along the entire cable. Pay particular attention at all pulley, fairlead, bulkhead seal locations and other locations where the cable may be subject to chafing or wear.

NOTE: It may be necessary to have a second person move the flight control system being inspected to ensure that the entire cable run in an affected area is checked.
- 4 Any flight control cable which snags the cloth due to broken wires is to be slackened (if not previously slackened) and a loop test performed to identify number and location of individual broken wires (refer to Inspection of Control Cable). Wire breakage criteria is as follows for all cable systems:
 - a Individual broken wires are acceptable in any cable provided that no more than three individual wires are broken in any given ten-inch (0.254 m) cable length. If number of individual broken wires cannot be determined, cable is to be rejected. Any amount of cable or wire wear is acceptable, provided the individual broken wire criteria is met.
 - b Reject any cable if corrosion is found which appears to have penetrated into interior of cable. If extent of corrosion cannot be determined, cable is to be rejected.
- 5 Inspect all cable termination fittings (clevises, turnbuckles, anchors, swagged balls etc.) for security of installation, proper hardware and evidence of damage.
 - a All turnbuckles are required to be secured. Safety wire or prefabricated clips are acceptable.
- 6 Inspect cable pulleys.
 - a Inspect all pulleys for security of installation, evidence of damage and freedom of rotation.
 - b Pulleys which do not rotate with normal cable movement due to internal bearing failure are to be rejected.
 - c Pulleys with grooving etc., due to normal in-service use, are deemed serviceable, as long as overall function is not impaired.
- 7 Restore cable system as required following cable teardown (if performed).
 - a Tension tasks and other tasks specific to individual systems are described under applicable individual tasks.
 - b Any flight control cable system which has been torn down requires a flight control rigging check prior to release of airplane for flight.

Figure 1 : Sheet 1 : Cable Broken Wires and Pulley Wear Patterns

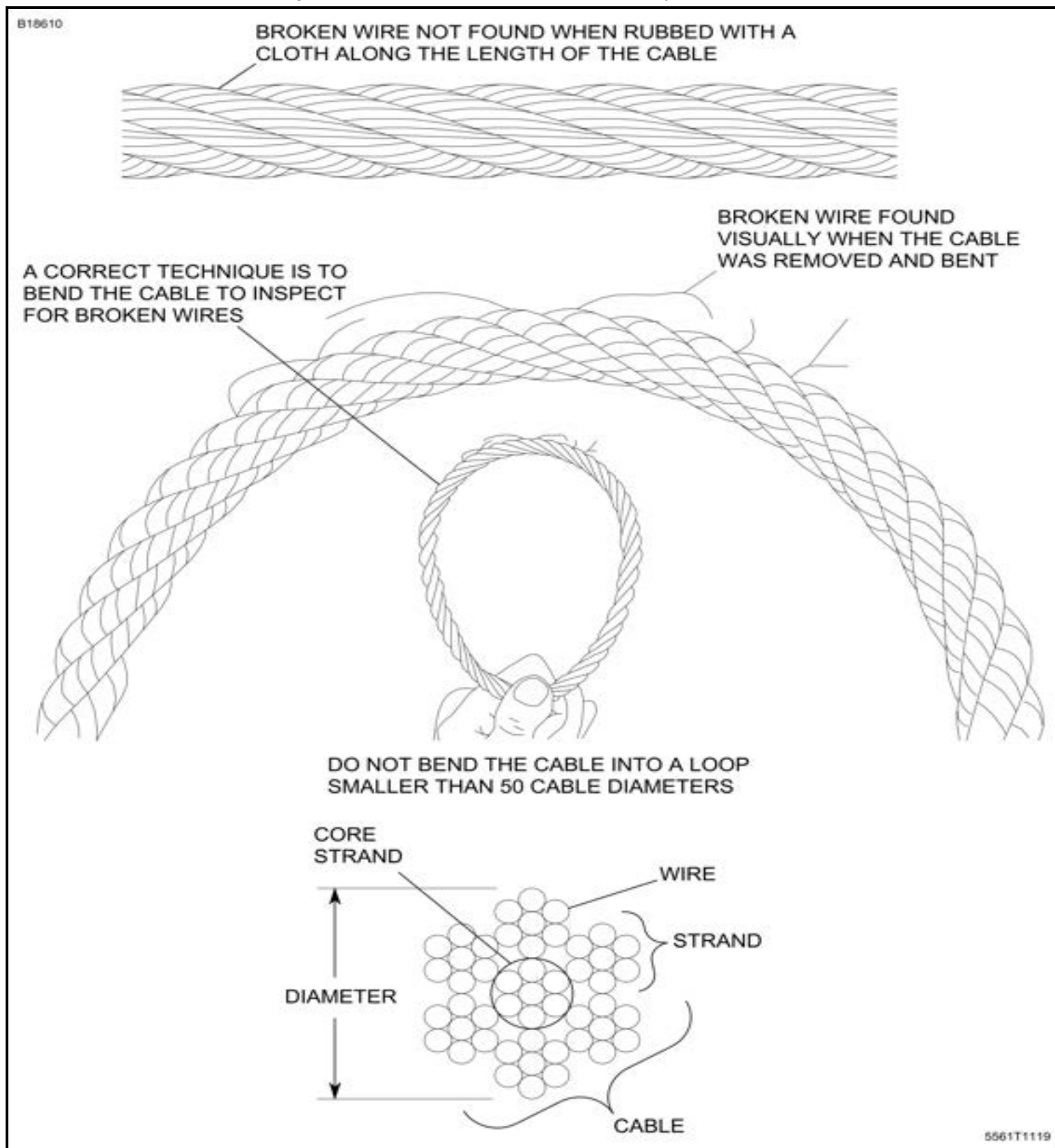
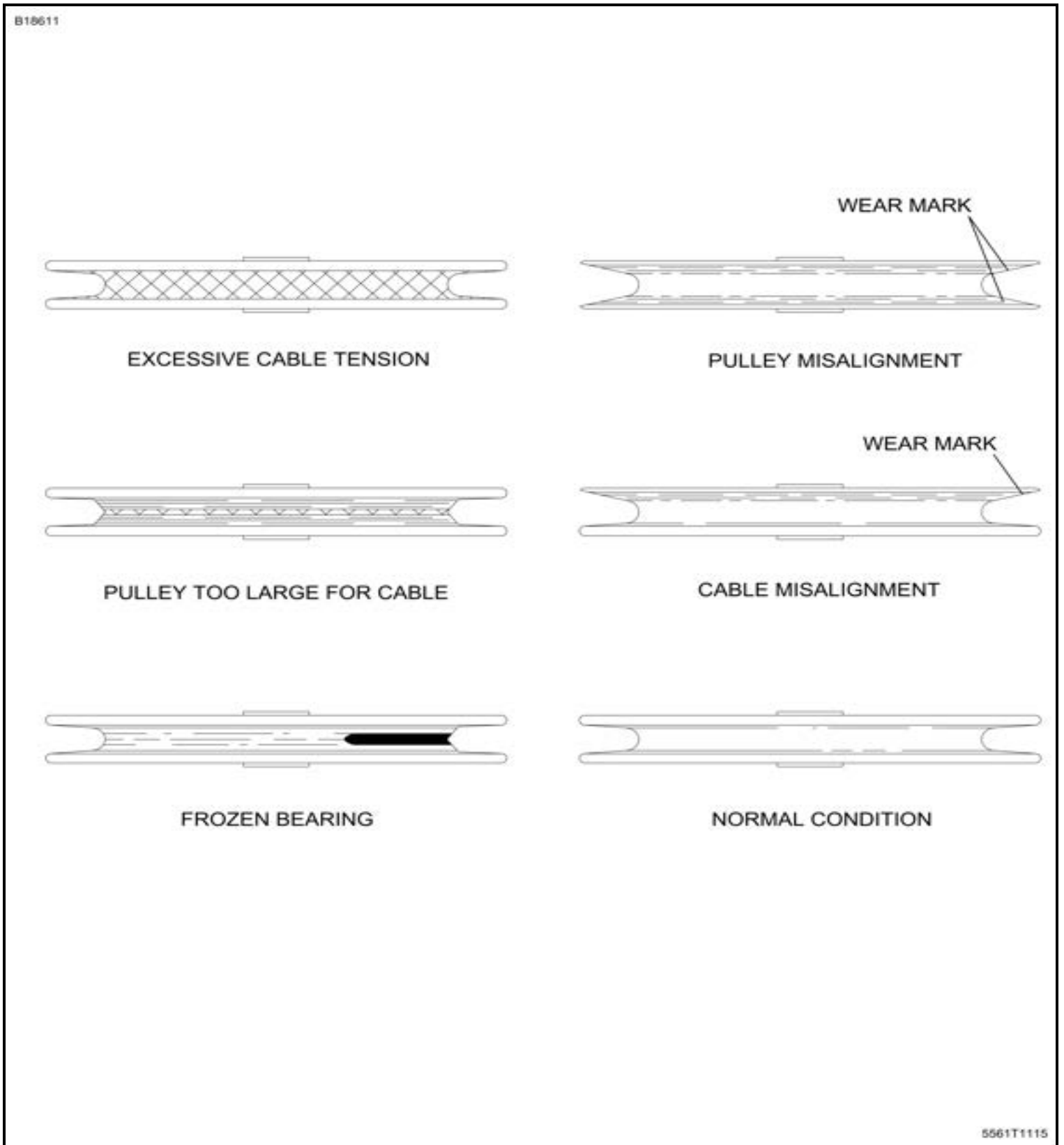


Figure 1 : Sheet 2 : Cable Broken Wires and Pulley Wear Patterns



CORROSION PREVENTION AND CONTROL PROGRAM

1. Introduction

- A. As the airplane ages, corrosion occurs more often, while, at the same time, other types of damage such as fatigue cracks occur. Corrosion can cause damage to the airplane's structural integrity and if it is not controlled, the airframe will carry less load than what is necessary for continued airworthiness.
 - (1) To help prevent this, Cessna started a Corrosion Prevention and Control Program (CPCP). A CPCP is a system to control the corrosion in the airplane's primary structure. It is not the function of the CPCP to stop all of the corrosion conditions, but to control the corrosion to a level that the airplane's continued airworthiness is not put in risk.
- B. Complete the initial CPCP inspection in conjunction with the first SID inspection.

2. Corrosion Prevention and Control Program Objective

- A. The objective of the CPCP is to help to prevent or control the corrosion so that it does not cause a risk to the continued airworthiness of the airplane.

3. Corrosion Prevention and Control Program Function

- A. The function of this document is to give the minimum procedures necessary to control the corrosion so that the continued airworthiness is not put in risk. The CPCP consists of a Corrosion Program Inspection number, the area where the inspection will be done, specified corrosion levels and the compliance time. The CPCP also includes procedures to let Cessna Aircraft Company and the regulatory authorities know of the findings and the data associated with Level 2 and Level 3 corrosion. This includes the actions that were done to decrease possible corrosion in the future to Level 1.
- B. Maintenance or inspection programs need to include a good quality CPCP. The level of corrosion identified on the Principal Structural Elements (PSEs) and other structure listed in the Baseline Program will help make sure the CPCP provides good corrosion protection.

NOTE: A good quality program is one that will control all structural corrosion at Level 1 or better.

- C. Corrosion Program Levels.

NOTE: In this manual the corrosion inspection tasks are referred to as the corrosion program inspection.

- (1) Level 1 Corrosion.
 - (a) Corrosion damage occurring between successive inspection tasks, that is local and can be reworked or blended out with the allowable limit.
 - (b) Local corrosion damage that exceeds the allowable limit but can be attributed to an event not typical of the operator's usage or other airplanes in the same fleet (e.g., mercury spill).
 - (c) Operator experience has demonstrated only light corrosion between each successive corrosion task inspection; the latest corrosion inspection task results in rework or blend out that exceeds the allowable limit.
- (2) Level 2 Corrosion.
 - (a) Level 2 corrosion occurs between two successive corrosion inspection tasks that requires a single rework or blend-out that exceeds the allowable limit. A finding of Level 2 corrosion requires repair, reinforcement or complete or partial replacement of the applicable structure.
- (3) Level 3 Corrosion.
 - (a) Level 3 corrosion occurs during the first or subsequent accomplishments of a corrosion inspection task that the operator determines to be an urgent airworthiness concern.

4. References

- A. This is a list of references for the Corrosion Prevention and Control Program.
 - (1) FAA Advisory Circular AC120-CPCP, Development and Implementation of Corrosion Prevention and Control Program
 - (2) FAA Advisory Circular AC43-4A, Corrosion Control for Aircraft
 - (3) Cessna Illustrated Parts Catalogs - part number 182SPC.
 - (4) Cessna Maintenance Manual - part number 182SMM.

5. Control Prevention and Control Program Application

- A. The Corrosion Prevention and Control Program gives the information required for each corrosion inspection. Maintenance personnel must fully know about corrosion control. The regulatory agency will give approval and monitor the CPCP for each airplane.

- (1) The CPCP procedures apply to all airplanes that have exceeded the inspection interval for each location on the airplane. Refer to the Glossary and the Baseline Program.
 - (a) Cessna Aircraft Company recommends that the CPCP be done first on older airplanes and areas that need greater changes to the maintenance procedures to meet the necessary corrosion prevention and control requirements.
- (2) Maintenance programs must include corrosion prevention and control procedures that limit corrosion to Level 1 or better on all Principal Structural Elements (PSEs) and other structure specified in the Baseline Program. If the current maintenance program includes corrosion control procedures in an inspection area and there is a report to show that corrosion is always controlled to Level 1 or better, the current inspection program can be used.
 - (a) The Baseline Program is not always sufficient if the airplane is operated in high humidity (severe) environments, has a corrosive cargo leakage or has had an unsatisfactory maintenance or repair. When this occurs, make adjustments to the Baseline Program until the corrosion is controlled to Level 1 or better. Refer to Chapter 51, [Corrosion - Description and Operation](#), and Chapter 51, Corrosion, [Corrosion Severity Maps](#), to determine the severity of potential corrosion.
- (3) The CPCP consists of the corrosion inspection applied at a specified interval and, at times, a corrosion inspection interval can be listed in a Service Bulletin. For the CPCP to be applied, remove all systems, equipment and interior furnishings that prevent sufficient inspection of the structure. A nondestructive test (NDI) or a visual inspection can be necessary after some items are removed if there is an indication of hidden corrosion such as skin deformation, corrosion under splices or corrosion under fittings. Refer to the Baseline Program.
- (4) The corrosion rate can change between different airplanes. This can be a result of different environments the airplane operates in, flight missions, payloads, maintenance practices (for example more than one owner), variation in rate of protective finish or coating wear.
 - (a) Some airplanes that operate under equivalent environments and maintenance practices can be able to extend the inspection intervals if a sufficient number of inspections do not show indications of corrosion in that area. Refer to the Glossary.
- (5) Later design and/or production changes done as a result of corrosion conditions can delay the start of corrosion. Operators that have done corrosion-related Service Bulletins or the improved procedures listed in the Corrosion Program Inspection can use that specified inspection interval. Unless the instructions tell you differently, the requirements given in this document apply to all airplanes.
- (6) Another system has been added to report all Level 2 and Level 3 corrosion conditions identified during the second and each subsequent CPCP inspection. This information will be reviewed by Cessna Aircraft Company to make sure the Baseline Program is sufficient and to change it as necessary.

6. Baseline Program

- A. The Baseline Program is part of the Corrosion Prevention and Control Program (CPCP). It is divided into Basic Task and Inspection Interval. In this manual the Basic Tasks are referred to as the Corrosion Program Inspection. In this manual, the Baseline Program has been incorporated into the [Inspection Time Limits](#), and [Inspection Operation 27](#), [Inspection Operation 28](#), [Inspection Operation 29](#), and [Inspection Operation 30](#) [Inspection Operation 31](#). This program is to be used on all airplanes without an approved CPCP. Those who currently have a CPCP that does not control corrosion to Level 1 or better must make adjustments to the areas given in the Baseline Program.
- B. Typical Airplane Zone Corrosion Program Inspection Procedures.
 - (1) Remove all the equipment and airplane interior (for example the insulation, covers and, upholstery) as necessary to do the corrosion inspection.
 - (2) Clean the areas given in the corrosion inspection before you inspect them.
 - (3) Do a visual inspection of all of the Principal Structural Elements (PSEs) and other structure given in the corrosion inspection for corrosion, cracking and deformation.
 - (a) Carefully examine the areas that show that corrosion has occurred before.

NOTE: [Areas that need a careful inspection are given in the corrosion inspection.](#)
 - (b) Nondestructive testing inspections or visual inspections can be needed after some disassembly if the inspection shows a bulge in the skin, corrosion under the splices or corrosion under fittings. Hidden corrosion will almost always be worse when fully exposed.
 - (4) Remove all of the corrosion, examine the damage and repair or replace the damaged structure.

- (a) Apply a protective finish where it is required.
- (b) Clean or replace the ferrous metal fasteners with oxidation.
- (5) Remove blockages of foreign object debris so that the holes and clearances between parts can drain.
- (6) For bare metal on any surface of the airplane, apply fuel and corrosion resistant primer MIL-PRF-23377.
 - (a) Apply a polyurethane topcoat paint to the exterior painted surface. Refer to the manufacturer's procedures.
- (7) Apply compounds that will replace water and prevent corrosion.
 - (a) Apply one layer of LPS-3 Heavy-Duty Rust Inhibitor or equivalent, that will soak into the fayed surfaces to replace water and prevent corrosion.
 - 1 Do Not Apply Compound to Displace Water and Prevent Corrosion to These Areas or Items:
 - a Oxygen System Lines and Components
 - b Cables, Pulleys and Trim Tab Pushrod
 - c Plastics, Elastomers
 - d Lubricated Nylon and Teflon Surfaces (Greased Joints, Sealed Bearings and Grommets)
 - e Adjacent to Tears and Holes in Insulation (Not Waterproof)
 - f Areas with Electrical Arc Potential, Wiring
 - g Interior Upholstery Panels (Changes the Flammability Properties)
 - h Pitot Tubes
 - i Fuel Caps
 - j Tie-Down Lugs
 - k Chrome Items (handles, locks)
 - l Stall Warning Detector
- (8) Install the dry insulation blankets.
- (9) Install the equipment and airplane interior that was removed to do the corrosion inspection.

7. Baseline Program Implementation

- A. The Baseline Program is divided into specific inspection areas and zone locations. The inspection areas and zone locations apply to all airplanes. Refer to Chapter 6, [Airplane Zoning - Description and Operation](#) for an illustration of the airplane zone locations.

8. Reporting System

- A. Corrosion Prevention and Control Program Reporting System (Refer to [Figure 1](#)).
 - (1) The Corrosion Prevention and Control Program (CPCP) includes a system to report to Cessna Aircraft Company data that will show that the Baseline Program is sufficient and, if necessary, make changes.
 - (2) At the start of the second Corrosion Program Inspection of each area, report all Level 2 and Level 3 Corrosion results that are listed in the Baseline Program to Cessna Maintenance Engineering. Send the Control Prevention and Control Program Damage Reporting Form to Cessna Maintenance Engineering. Refer to the [Introduction - How to Get Customer Assistance](#).

9. Periodic Review

- A. Use the Service Difficulty Reporting System to report all Level 2 and Level 3 Corrosion results to the FAA and to Cessna Aircraft Company. All corrosion reports received by Cessna Aircraft Company will be reviewed to determine if the Baseline Program is adequate.

10. Corrosion Related Airworthiness Directives

- A. Safety-related corrosion conditions transmitted by a Service Bulletin can be mandated by an Airworthiness Directive (AD). Airworthiness Directives can be found on the FAA website: www.faa.gov.

11. Appendix A - Development Of The Baseline Program

- A. The Corrosion Prevention and Control Program Baseline Program
 - (1) The function of the Corrosion Prevention and Control Program (CPCP) is to give the minimum procedures necessary to prevent and control corrosion so that continued airworthiness is not at risk. The Principal Structural Elements (PSE's) are areas where the CPCP applies.

- (2) The CPCP Baseline Program consists of a Corrosion Program Inspection (CPI) and an inspection time. Each inspection is to be done in an airplane zone.
- (3) The corrosion reports that are sent to Cessna Aircraft Company and data from the FAA Service Difficulty Records were used to identify the inspection areas of the Baseline Program. When more than one incident of corrosion was identified at a specified location, an inspection was included for that location in the Baseline Program.
- (4) When corrosion was found once, the data was examined to find if the corrosion was caused by one specified occurrence or if other airplanes could have corrosion in the same location. If the corrosion is not linked to one specific occurrence, the inspection should be added to the Baseline Program.
- (5) The inspection interval was specified by the duration and corrosion severity.

12. Appendix B - Procedures For Recording Inspection Results

A. Record the Inspection Results.

- (1) It is not an FAA mandatory procedure to record the CPCP results, but Cessna Aircraft Company recommends that records be kept to assist in program adjustments when necessary. The inspection of records will make sure the identification, repeat inspections and level of corrosion are monitored. The data can identify whether there is more or less corrosion at repeat intervals. The data can also be used to approve increased or decreased inspection intervals.

13. Appendix C - Guidelines

A. Glossary.

- (1) The following additional information clarifies the previous sections of this document. Refer to [Figure 2](#).

B. Glossary of General Descriptions.

WORD	GENERAL DESCRIPTION
Allowable Limit	The allowable limit is the maximum amount of material (usually expressed in material thickness) that may be removed or blended out without affecting the ultimate design strength capability of the structural member. Allowable limits may be established by the design approval holder. The FAA (or applicable regulatory authority) may also establish allowable limits. The design approval holder normally publishes allowable limits in the Structural Repair Manual or in Service Bulletins.
Baseline Program	A Baseline Program is a CPCP developed for a specific model airplane. The design approval holder typically develops the Baseline Program. However, it may be developed by a group of operators who intend to use it in developing their individual CPCP. It contains the corrosion program inspection, an implementation threshold and a repeat interval for the procedure accomplishment in each area or zone.
Basic Task	Refer to Corrosion Program Inspection.
Corrosion Program Inspection (CPI)	The Corrosion Program Inspection (CPI) is a specific and fundamental set of work elements that should be performed repetitively in all task areas or zones to successfully control corrosion. The contents of the CPI may vary depending upon the specific requirements in an airplane area or zone. The CPI is developed to protect the primary structure of the airplane.
Corrosion (Metal)	The physical deterioration of metals caused by a reaction to an adverse environment.
Corrosion Prevention and Control Program (CPCP)	A Corrosion Prevention and Control Program is a comprehensive and systematic approach to controlling corrosion such that the load carrying capability of an airplane structure is not degraded below a level necessary to maintain airworthiness. It contains the corrosion program inspections, a definition of corrosion levels, implementation thresholds, a repeat interval for task accomplishment in each area or zone and specific procedures that apply if corrosion damage exceeds Level 1 in any area or zone.
Design Approval Holder	The design approval holder is either the type certificate holder for the aircraft or the supplemental type certificate holder.
Inspection Area	The inspection area is a region of airplane structure to which one or more CPIs are assigned. The inspection area may also be referred to as a Zone.
Inspection Interval	The inspection interval is the calendar time between the accomplishment of successive corrosion inspection tasks for a Task Area or Zone.

Level 1 Corrosion	Level 1 Corrosion is one or more of the items that follow: 1. Corrosion damage occurring between successive inspections, that is local and can be reworked or blended out within the allowable limit. 2. Local corrosion damage that exceeds the allowable limit but can be attributed to an event not typical of the operator's usage or other airplanes in the same fleet (e.g., mercury spill). 3. Operator experience has demonstrated only light corrosion between each successive corrosion task inspection; the latest corrosion inspection task results in rework or blend out that exceeds the allowable limit.
Level 2 Corrosion	Level 2 corrosion occurs between two successive corrosion inspection tasks that requires a single rework or blend-out that exceeds the allowable limit. A finding of Level 2 corrosion requires repair, reinforcement or complete or partial replacement of the applicable structure.
Level 3 Corrosion	Level 3 corrosion occurs during the first or subsequent accomplishments of a corrosion inspection task that the operator determines to be an urgent airworthiness concern. NOTE: If Level 3 corrosion is determined at the implementation threshold or any repeat inspection, it should be reported. Any corrosion that is more than the maximum acceptable to the design approval holder or the FAA (or applicable regulatory authority) must be reported in accordance with current regulations. This determination should be conducted jointly with the design approval holder.
Light Corrosion	Light corrosion is corrosion damage so slight that removal and blendout over multiple repeat intervals (RI) may be accomplished before material loss exceeds the allowable limit.
Local Corrosion	Generally, local corrosion is corrosion of a skin or web (wing, fuselage, empennage or strut) that does not exceed one frame, stringer or stiffener bay. Local corrosion is typically limited to a single frame, chord, stringer or stiffener or the corrosion of more than one frame, chord, stringer or stiffener where no corrosion exists on two adjacent members on each side of the corroded member.
Principal Structural Element (PSE)	A PSE is an element that contributes significantly to carrying flight, ground or pressurization loads and whose integrity is essential in maintaining the overall structural integrity of the airplane.
Task Area	Refer to Inspection Area.
Urgent Airworthiness Concern	An urgent airworthiness concern is damage that could jeopardize continued safe operation of any airplane. An urgent airworthiness concern typically requires correction before the next flight and expeditious action to inspect the other airplanes in the operator's fleet.
Widespread Corrosion	Widespread corrosion is corrosion of two or more adjacent skin or web bays (a web bay is defined by frame, stringer or stiffener spacing). Or, widespread corrosion is corrosion of two or more adjacent frames, chords, stringers or stiffeners. Or, widespread corrosion is corrosion of a frame, chord, stringer or stiffener and an adjacent skin or web bay.
Zone	Refer to Inspection Area.

14. Corrosion Prevention Materials

A. Approved Corrosion Preventative Compounds.

Table 1. Corrosion Preventative Compounds

Name	Part Number	Manufacturer	Application Areas
Cor-Ban 23 NOTE 1	U074098	Cessna Service Parts and Programs. 7121 Southwest Blvd, Wichita, KS 67215	To assist in protecting airplanes from corrosion.
Cor-Ban 35	U074100	Cessna Service Parts and Programs.	To assist in protecting airplanes from corrosion.

ARDROX AV-8 NOTE 1	-	Commercially Available	To assist in protecting airplanes from corrosion.
ARDROX AV-15	-	Commercially Available	To assist in protecting airplanes from corrosion.
Corrosion X		Commercially Available	To assist in protecting airplanes from corrosion.
Extreme Simple green or equivalent NOTE 2	-	Commercially Available	To be used for cleaning.
MPK (Methyl Propyl Ketone)	-	Commercially Available	To be used for cleaning.

NOTE 1:

Use Cor-Ban 23 or ARDOX AV-8 in areas where a high penetration of corrosion inhibiting compound is necessary.

NOTE 2:

Do not use any Simple Green products other than Extreme Simple Green, as some have been found to be corrosive to some parts of the airplane structure.

15. Tools and Equipment

NOTE: You can use equivalent alternatives for the items that follow:

Table 2. Tools and Equipment

Name	Part Number	Manufacturer	Use
Formit Extension Tube	-	Zip-Chem Products	To spray the corrosion inhibit compound in aerosol form.
HVLP Spray Gun	MF-3100 Microflex	AirVerter., 10630 Riggs Hill Road, Suite S, Jessup, Maryland 20794-9425 USA Phone: 1.800.937.4857	To spray the corrosion inhibit compound in aerosol form.
Respirator (Half Face)	-	Commercially Available	For respiratory protection
Aluminum Foil	-	Commercially Available	For masking the adjacent parts in the vicinity of corrosion inhibiting compound application area.
Paint Masking Tape	-	Commercially Available	For masking the adjacent parts in the vicinity of corrosion inhibiting compound application area.
Formit-18 Fan	-	Cessna Service Parts and Programs. 7121 Southwest Blvd, Wichita, KS 67215	To be used for spray application
Boroscope	-	Commercially Available	To access the inspection area
Magnifying Glass	-	Commercially Available	To inspect the corrosion area.

16. Corrosion Inspections and Detection Methods**A. Typical Inspection Methods.**

- (1) Remove all equipment or components that can interfere with your ability to clearly view the inspection area.

NOTE: In some areas it may be necessary to use equipment such as a borescope to see the inspection area.

- (2) Fully clean the inspection area before starting the inspection.
- (3) Carefully examine the inspection area for any indication of corrosion. Refer to Chapter 51, [Corrosion - Description And Operation](#), for additional information on the common indications that corrosion has occurred.
 - (a) Special attention should be given to inspection areas that have had corrosion repairs in the past.

- (b) Nondestructive testing can be necessary after some disassembly if the inspection shows a bulge in the skin or corrosion below structural splices or fittings.

CAUTION: Remove only the minimum amount of material to completely remove the corrosion. Removal of too much material can result in additional repairs and rework.

- (4) Remove all of the corrosion from the structure or component.

NOTE: A magnifying glass can be a valuable tool to use to make sure all the corrosion has been removed.

17. Corrosion Evaluation and Classification

- A. Complete an Initial Corrosion Damage Assessment.

- (1) For classification of corrosion damage, refer to Determination of the Corrosion Levels.

- B. Measure the Depth of Corrosion Damage.

- (1) You can remove a small area of corrosion with a MPK wipe.
 (2) Use a dial depth gage or similar tool to measure the depth of the corrosion damage.
 (3) If you find that the corrosion exceeds allowable limits during corrosion evaluation, contact Cessna Customer Support for further instructions.

18. Application of Corrosion Preventative Compounds

- A. Detection of previously applied compounds.

- (1) Visually determine if the corrosion is in an area that has corrosion preventative compounds previously applied. Refer to Chapter 51, [Corrosion - Description And Operation](#), for additional information.

- B. Surface/Area Preparation

- (1) Cleaning

WARNING: Always use the proper level of Personal Protective Equipment when using cleaning compounds. Personnel Injury or death may occur.

CAUTION: Use Extreme Simple Green or approved equivalent to clean the corrosion inhibiting compound application area.

CAUTION: Prevent the direct contact of cleaner or rinse water spray on wheel bearings or lubrication bearings.

- (a) Clean the surfaces where the corrosion inhibiting compound will be applied as follows:

- 1 Use a handheld sprayer to apply the cleaner.
- 2 Make sure that the cleaner pressure is less than 100 psi (12065.83 kPa).
- 3 Apply a full layer of the cleaner to the area where the corrosion inhibiting compound will be applied.
- 4 Let the cleaner stay on the area for 5-10 minutes.
- 5 Scrub the area with a soft-bristled brush (non-metallic).
- 6 If necessary, apply the cleaner again to keep the surface wet.
- 7 Rinse the surface with reverse osmosis or de-ionized water.
- 8 Make sure that the water pressure is less than 100 psi (12065.83 kPa).
- 9 Let the corrosion area fully dry.

NOTE: If the surface dries before the rinse, apply the cleaner again.

NOTE: Do not apply corrosion inhibiting compound to a wet surface.

- (2) Masking

NOTE: It is not necessary to apply masking tape to aluminium or stainless steel tubes, plastics, sealants, adhesives, placards, and rubber before the corrosion inhibiting compound is applied.

- (a) Put paint mask paper or plastic on windows, light ramps, brakes, tires, and adjacent areas of possible over-spray.
 (b) Put an aluminum foil or paint masking tape on the following parts or assemblies, if they are in the area where the corrosion inhibiting compound will be applied.

- 1 Landing Gear Components
- 2 Actuator Components

- 3 Movable Mechanical Components
- 4 Electrical Components (wires, switches and sensors etc.)
- 5 Seals
- 6 Bleed Air Lines

C. Methods of Application

WARNING: Always use the proper level of Personal Protective Equipment when you use cleaning compounds. Personnel Injury or death can occur.

NOTE: Refer to the manufacturer's specifications for the proper application temperature.

- (1) Use a spray gun if the corrosion inhibiting compound is in a bulk resin form.
- (2) If necessary, you can use an extension tube with a spray gun to keep the over-spray to a minimum.
- (3) Apply the corrosion inhibiting compound in one full wet layer.

NOTE: The applied area of corrosion inhibiting compound will show as a light yellow or amber color.

- (4) If you find a sag or drip mark in the compound, use the MPK (Methyl Propyl Ketone) to clean the sag or drip from the airplane. After you clean the area, apply the corrosion inhibiting compound.
- (5) If you use Cor-Ban 23 or ARDROX AV-8 for the corrosion treatment, make sure that the wet layer thickness is between 1 to 2 mils.
- (6) If you use Cor-Ban 35 or ARDROX AV-15 for the corrosion treatment, make sure that the wet layer thickness is between 2 to 3 mils.
- (7) If you use Corrosion X for the corrosion treatment, make sure that the wet layer thickness is between 2 to 3 mils.
- (8) Let the wet layer dry for two to three hours to become tack-free.

NOTE: The airplane must stay in the paint facility until tack-free.

NOTE: The minimum cure temperature must not be below 50° F (10° C).

- (9) Remove the masks from around the corrosion inhibiting compound application area.
- (10) Visually examine the oleos, actuators, control cables, pulleys, and electrical or mechanical switches for signs of overspray.
 - (a) If you find signs of over-spray or a penetration of the corrosion inhibiting compound, clean the area with MPK.
- (11) Let the applied corrosion inhibiting compound layer cure indoors or outdoors after it become tack-free.
- (12) Discard the aerosol extension tube used during the application.

NOTE: Use the extension tube one-time only.

- (13) Discard the used mask materials and remaining corrosion inhibiting compounds.

19. Application Of The Corrosion Program Inspection

NOTE: In this manual the Basic Tasks are referred to as the Corrosion Program Inspection (CPI).

A. Typical Airplane Zone Corrosion Program Inspection Procedures.

- (1) Remove all of the equipment and airplane interior (for example, the insulation, upper upholstery panel and lower upholstery panel) as necessary to do the corrosion inspection.
- (2) Clean the areas given in the corrosion inspection before you inspect them.
- (3) Do a visual inspection of all of the Principal Structural Elements (PSE's) and other structure given in the corrosion inspection for corrosion, cracking and deformation.
 - (a) Carefully examine the areas that show that corrosion has occurred before.

NOTE: Areas that need a careful inspection are given in the corrosion inspection.
 - (b) Nondestructive testing inspections or visual inspections can be needed after some disassembly if the inspection shows a bulge in the skin, corrosion under the splices or corrosion under fittings.
- (4) Remove all of the corrosion, examine the damage and repair or replace the damaged structure.
 - (a) Apply a protective finish where it is required. Refer to Chapter 20, [Interior and Exterior Finish - Cleaning and Painting](#).
 - (b) Clean or replace the ferrous metal fasteners with oxidation.
- (5) Remove blockages of foreign object debris so that the holes and clearances between parts can drain.
- (6) For bare metal on any surface of the airplane, apply fuel and corrosion resistant primer MIL-PRF-23377.

- (a) Apply a polyurethane topcoat paint to the exterior painted surface. Refer to the manufacturer's procedures.
- (7) Apply compounds that will displace water and prevent corrosion. Refer to [Application of Corrosion Preventative Compounds](#).
- (a) Apply one layer of LPS-3 Heavy-Duty Rust Inhibitor or equivalent, that will soak into the fayed surfaces to replace water and prevent corrosion.
 - 1 Do Not Apply Compound to Displace Water and Prevent Corrosion to These Areas or Items:
 - a Oxygen System Lines and Components
 - b Cables, Pulleys and Trim Tab Pushrod
 - c Plastics, Elastomers
 - d Lubricated Nylon and Teflon Surfaces (Greased Joints, Sealed Bearings and Grommets)
 - e Adjacent to Tears and Holes in Insulation (Not Waterproof)
 - f Areas with Electrical Arc Potential, Wiring
 - g Interior Upholstery Panels (Changes the Flammability Properties)
 - h Pitot Tubes
 - i Fuel Caps
 - j Tie-Down Lugs
 - k Chrome Items (handles, locks)
 - l Stall Warning Detector
- (8) Install the dry insulation blankets.
- (9) Install the equipment and airplane interior (for example the upper upholstery panel and lower upholstery panel) that was removed to do the corrosion inspection.

20. Determination of the Corrosion Levels

A. Find the Corrosion Levels, refer to [Figure 3](#).

- (1) Corrosion found on a structure when you use the Corrosion Program and Corrosion Prevention (CPCP) Baseline Program will help find the extent of the corrosion.
- (2) The second and subsequent inspections will find how well the CPCP program has been prepared or if there is a need to make adjustments to the Baseline Program.
- (3) A good quality CPCP is one that controls corrosion to Level 1 or better.
- (4) If Level 2 corrosion is found during the second or subsequent inspection, you must do something to decrease the future corrosion to Level 1 or better.
- (5) If Level 3 corrosion is found, you must also do something to decrease the future corrosion to Level 1. Also, a plan to find or prevent Level 3 corrosion in the same area on other airplanes must be added to the CPCP.
- (6) All the corrosion that you can repair in the allowable damage limits, (less than 10 percent of the part thickness) is Level 1 corrosion.
- (7) If all corrosion is Level 1, the CPCP is correctly prepared.
- (8) If you must reinforce or replace the part because of corrosion, the corrosion is Level 2.
- (9) If the part is not airworthy because of the corrosion, you must do an analysis to find out if the corrosion is Level 3.
- (10) The chart found in this section will help find the level of the corrosion.
- (11) The probability that the same problem will occur on another airplane is dependent on several factors such as: past maintenance history, operating environment, years in service, inspectability of the corroded area and the cause of the problem.

21. Level 2 Corrosion Findings

- A. All Level 2 corrosion that is more than the rework limits of the approved repair procedures must be reported to Cessna Aircraft Company. Cessna Aircraft Company engineering will do an analysis to make sure the corrosion is not an urgent airworthiness concern.
- B. When doing the analysis, Cessna Aircraft Company will consider:
 - (1) Can the cause of the corrosion be identified, such as a chemical spill or protective finish breakdown?

- (2) Has the same level of corrosion been found on other airplanes?
- (3) Are the corrosion protection procedures applied during manufacture the same for earlier and later models?
- (4) Age of the corroded airplane compared to others checked.
- (5) Is the maintenance history different from the other airplanes in the fleet?

22. Typical Actions That Follow the Determination of the Corrosion Level.

- A. If corrosion is found, find the corrosion level, then do the necessary steps for a specific inspection.
- B. If Level 1 corrosion is found during the first CPCP inspection.
 - (1) Repair the structure. Contact Cessna Aircraft Company for an approved repair procedure.
 - (2) Continue with the Baseline Program.
 - (a) Optional: Document the results of the inspection for use in validating program compliance.
- C. If Level 2 corrosion is found during the first CPCP inspection.
 - (1) Repair the structure. Contact Cessna Aircraft Company for an approved repair procedure.
 - (2) Report the details of the corrosion you see to Cessna Aircraft Company and the FAA (or applicable regulatory authority).
 - (3) Continue to use the Baseline Program but check the corroded area carefully when you do a subsequent CPCP inspection.
 - (4) It is recommended that you record the results of the inspection to show compliance with the program.
- D. If Level 3 corrosion is found during the first CPCP inspection.
 - (1) Immediately contact Cessna Aircraft Company and the FAA (or applicable regulatory authority) of the corrosion you found. Refer to Reporting System.
 - (2) Give sufficient information to make sure that the condition is a possible urgent airworthiness concern for your fleet. Get assistance from Cessna Customer Service to develop a plan of action.
 - (3) Apply the corrosion program inspection, which includes the repair of the structure. Contact Cessna Aircraft Company for an approved repair procedure.
 - (4) Do a report that has the information of the findings. Refer to Corrosion Prevention And Control Program Reporting System - Description And Operation.
 - (5) Continue with the Baseline Program and other steps of procedure required by the FAA (or applicable regulatory authority). Examine this area carefully during future inspections.
- E. If no corrosion is found during the second or subsequent CPCP inspection:
 - (1) Continue with the current Corrosion Prevention and Control Program. No adjustment of the current program is required.
 - (2) It is recommended that you record the results of the inspection for a possible increase of the corrosion inspection interval.
- F. If Level 1 corrosion is found on the second or subsequent CPCP inspection:
 - (1) Do the corrosion program inspection, which includes the repair of the structure. Contact Cessna Aircraft Company for an approved repair procedure.
 - (2) Continue with the Baseline Program.
 - (3) No adjustment of the existing program is required.
 - (4) It is recommended that you record the corrosion inspection number and the results of the inspection to show that the program was complied with.
- G. If Level 2 corrosion is found on the second or subsequent CPCP inspection:
 - (1) Repair the structure. Contact Cessna Aircraft Company for an approved repair procedure.
 - (2) Do a report that shows the information about the corrosion and send it to Cessna Aircraft Company and the FAA (or applicable regulatory authority).
 - (3) If corrosion damage required the removal of material just beyond the allowable limits (within 10 percent), complete a check of the other airplanes in the fleet before you change your aircraft's maintenance program.
 - (a) If the corrosion is typical of Level 2, use the fleet data to find what changes are required to control corrosion to Level 1 or better.
 - (b) If fleet damage is typically Level 1, examine the corroded area during subsequent inspections on all affected airplanes.

(c) Make changes to your aircraft's maintenance program if the typical corrosion becomes Level 2.

- (4) Further evaluation by Cessna Aircraft Company is recommended for Level 2 corrosion findings that are well beyond the allowable limits and there is an airworthiness concern in which prompt action is required.

NOTE: The airworthiness concern is because of the possibility to have similar but more severe corrosion on any other airplane in the operator's fleet prior to the next scheduled inspection of that area.

- (5) Find the action required to control the corrosion to a Level 1 or better, between future successive inspections. These can include the items that follow:

- (a) A structural modification, such as additional drainage.
- (b) Improvements to the corrosion prevention and control inspections, such as more care and attention to corrosion removal, reapplication of protective finish, drainage path clearance.
- (c) Decrease the inspection interval for additional airplanes that go into the program.

- (6) Send a plan of corrective action to the FAA (or applicable regulatory authority) for approval and to Cessna Aircraft Company as needed.

- (7) Use the approved plan of action.

H. If Level 3 corrosion is found on the second or subsequent CPCP inspection:

- (1) Contact Cessna Aircraft Company and the FAA (or applicable regulatory authority) about the corrosion that was found.
- (2) Send a plan to examine the same area on other affected airplanes in the operator's fleet.
- (3) Apply the corrosion program inspection, which includes the repair of the structure. Contact Cessna Aircraft Company for an approved repair procedure.

I. Find the action needed to control the corrosion finding to Level 1 or better, between future successive inspections. These can include any or all of the following:

- (1) A structural modification, such as additional drainage.
- (2) Improvements to the corrosion prevention and control inspections, such as more care and attention to corrosion removal, reapplication of protective finish, drainage path clearance.
- (3) A decrease in the inspection interval for additional airplanes entering the program.

J. Send a plan of corrective action to the FAA (or applicable regulator authority) for approval and Cessna Aircraft Company as needed.

K. Use the approved plan of action.

L. It is recommended that you give the details of the findings to Cessna Aircraft Company.

23. Factors Influencing Corrosion Occurrences

A. If you find Level 2 or Level 3 corrosion, when you think about how to change your CPCP, think about the list that follows.

- (1) Is there a presence of LPS-3 Heavy-Duty Rust Inhibitor?
- (2) Is there a presence or condition of protective finish?
- (3) What was the length of time since the last inspection and/or application of corrosion inhibiting compound?
- (4) Was there inadequate clean-up/removal of corrosion prior to application of corrosion inhibiting compound, during previous maintenance of the area?
- (5) Are the moisture drains blocked or is there inadequate drainage?
- (6) What was the environment, the time of exposure to the environment and the use of the airplane?
- (7) Was there a variation in past maintenance history and or use of the airplanes in the operator's fleet?
- (8) Were there variations in the production build standard in the operator's fleet?

24. Reporting

A. The minimum requirements to prevent or control the corrosion in the Corrosion Prevention and Control Program (CPCP) were made on the best information, knowledge and experience available at the time. As this experience and knowledge increases, the CPCP's intervals will be changed as necessary. A reporting system for this is in Section 8.

- (1) You must contact the Cessna Aircraft Company about all Level 2 or 3 corrosion of the structure that is on the list in the Baseline Program that is found during the second and subsequent corrosion program inspections. Refer to Reporting System.

NOTE: You do not have to contact the Cessna Aircraft Company about corrosion that is found on structure that is not on the list in the Baseline Program, for example the secondary structure.

25. Program Implementation

- A. When a CPCP is started it is important to do the items that follow:
- (1) Start inspections at the recommended interval following the completion of the first SID inspection.
 - (2) Once the corrosion program inspection (CPI) is started, repeat the subsequent applications of the CPI at the recommended interval for each CPI.
 - (3) You can start a CPCP on the basis of individual CPIs or groups of CPIs.
 - (4) Cessna Aircraft Company highly recommends to start all of the CPIs as soon as possible. This is the most cost effective way to prevent or control corrosion.

Figure 1 : Sheet 1 : Corrosion Prevention and Control Program Damage Report Form

B18620

CORROSION PREVENTION AND CONTROL PROGRAM DAMAGE REPORT FORM

To:
Textron Aviation
Attn: CPCP Program
Maintenance Engineering
Dept 753, 2121 S Hoover Road
Wichita, KS 67209
Phone Number: (316) 517-5800

From:

Facility _____
Address _____

Phone No. _____

Airplane Serial No. _____
Utilization/Year (Hrs) _____
Total Time In Service (Hrs) _____
Registration No. _____
Total Landings/Cycles _____
Fax No. _____

Corrosion Inspection Number _____
Interval (Years) Since Last Inspection _____

Level Of Corrosion: ☐ LEVEL 2 ☐ LOCAL
☐ LEVEL 3 ☐ WIDESPREAD

DAMAGED PART NAME: ☐ LONGERON/STRINGER ☐ SKIN
☐ FRAME ☐ DOUBLER
☐ BRACKET/SHEAR TIE ☐ RIB
☐ CHORD ☐ BULKHEAD
☐ WEB ☐ FITTING
☐ OTHER _____

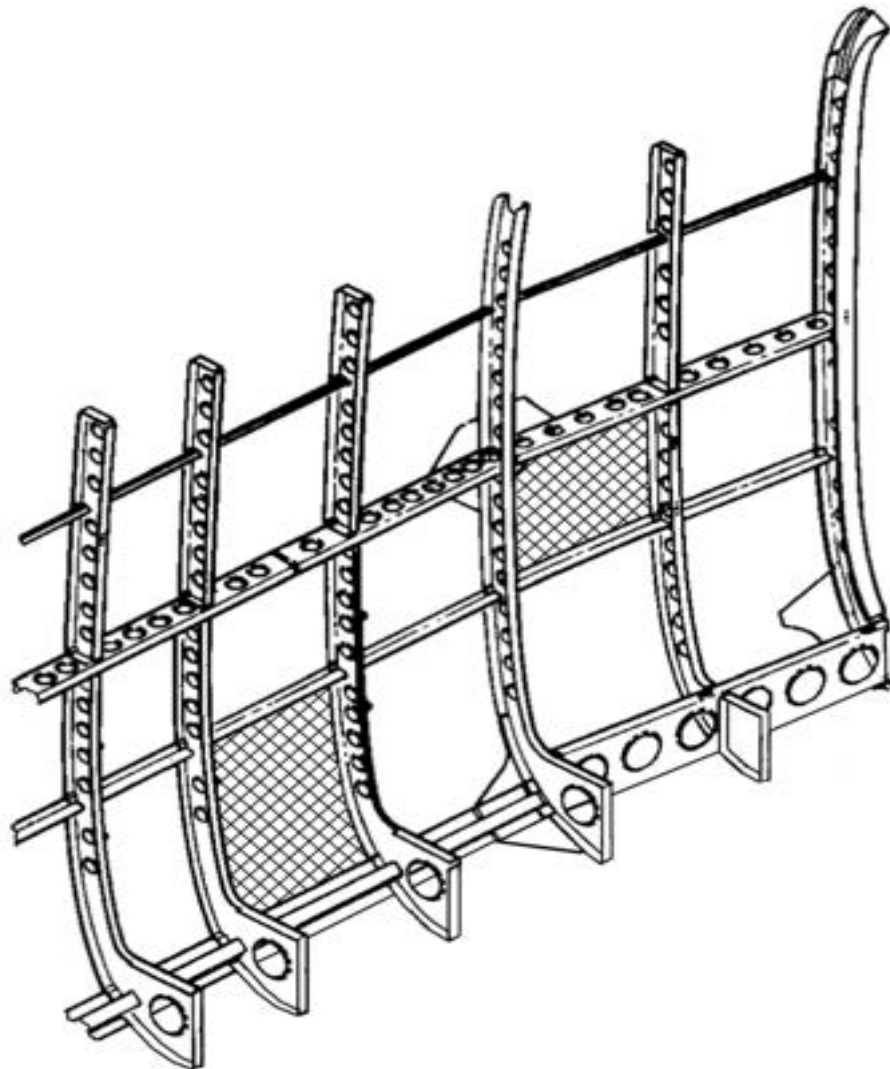
LOCATION OF DAMAGE: ZONES
STA _____ TO STA _____
WL _____ TO WL _____
BL _____ TO BL _____

CAUSE OF DAMAGE: ☐ ENVIRONMENT ☐ INTERNAL LEAKAGE
☐ CHEMICAL SPILL ☐ LAVATORY SPILL
☐ BLOCKED DRAIN ☐ WET INSULATION BLANKET
☐ UNKNOWN

ADDITIONAL DESCRIPTION OF DAMAGED AREA _____

Figure 2 : Sheet 1 : Corrosion Location

B18616



LOCAL CORROSION
(CORROSION FOUND IN NON-ADJACENT AREAS OF THE SKIN PANELS)

Figure 2 : Sheet 2 : Corrosion Location

B18617

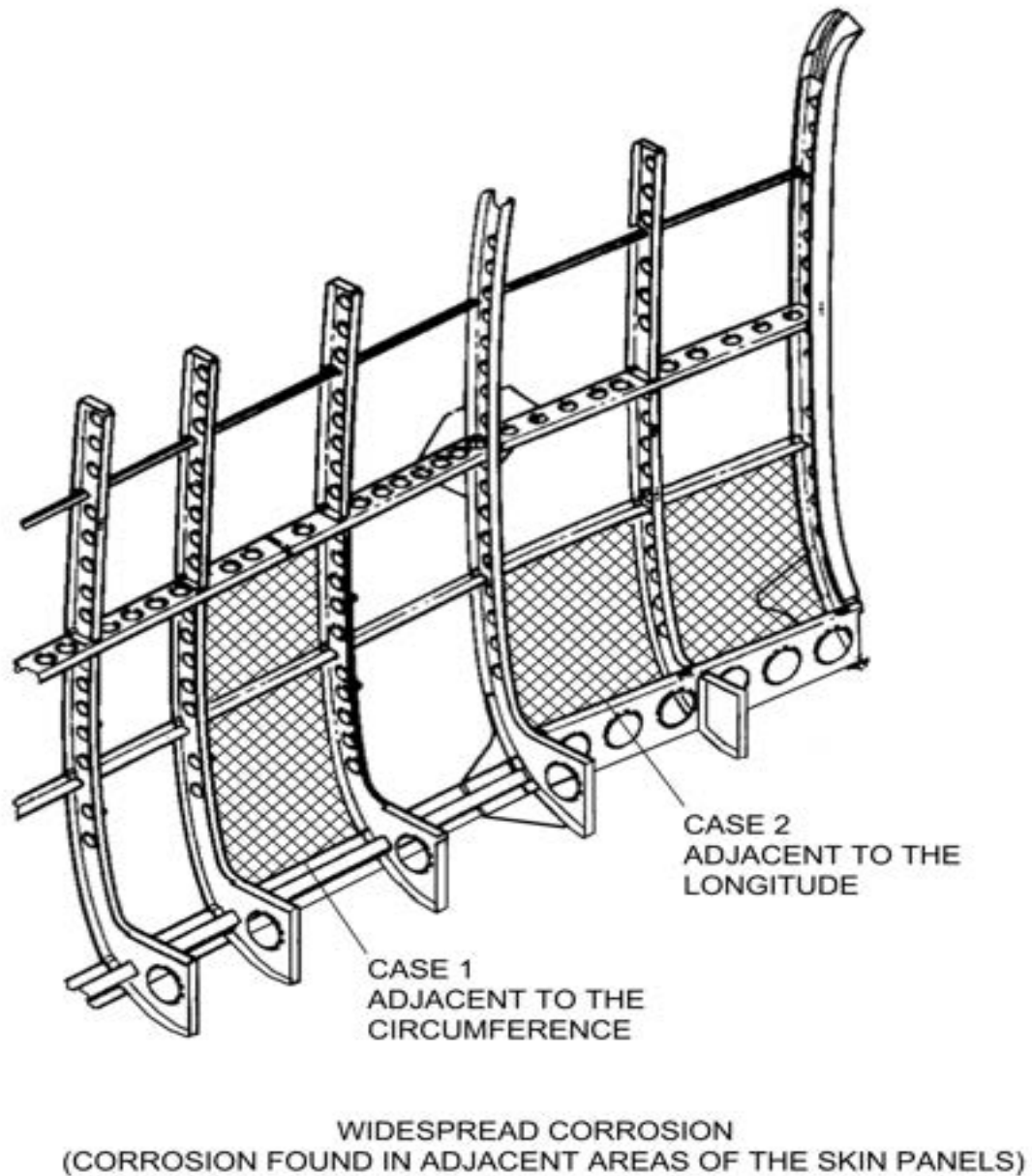
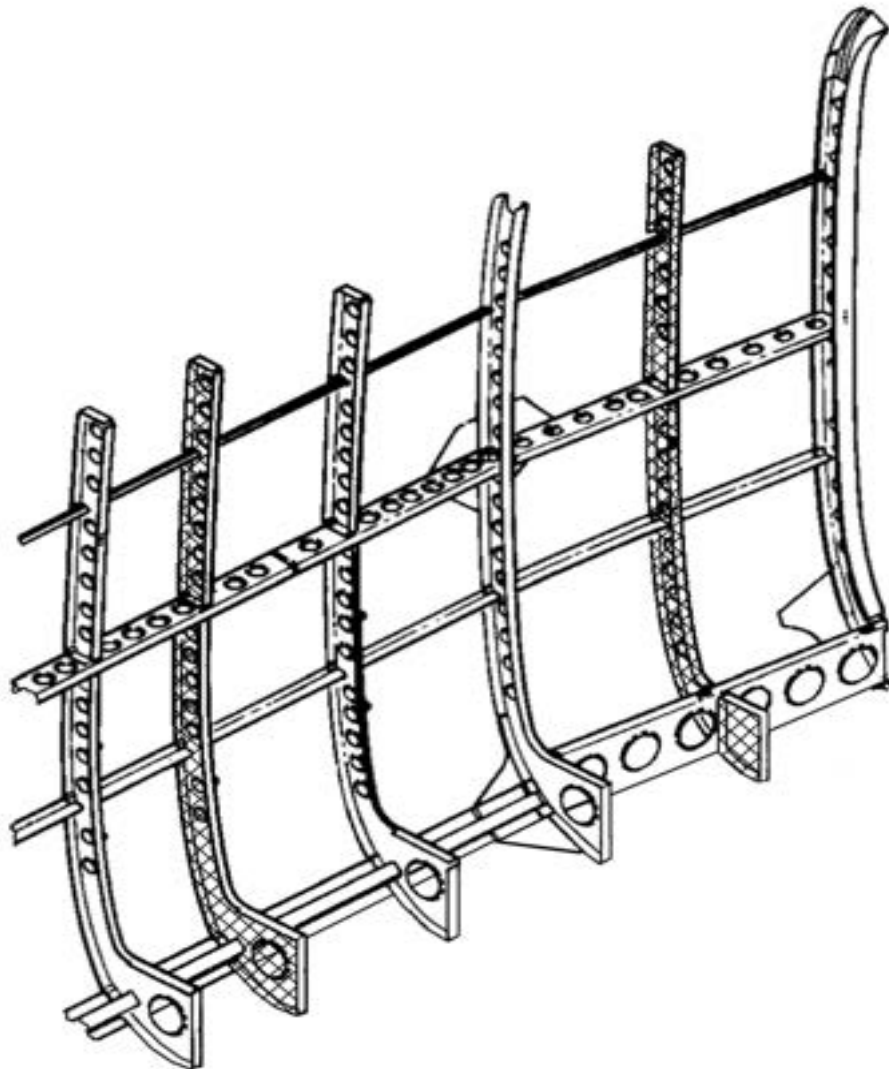


Figure 2 : Sheet 3 : Corrosion Location

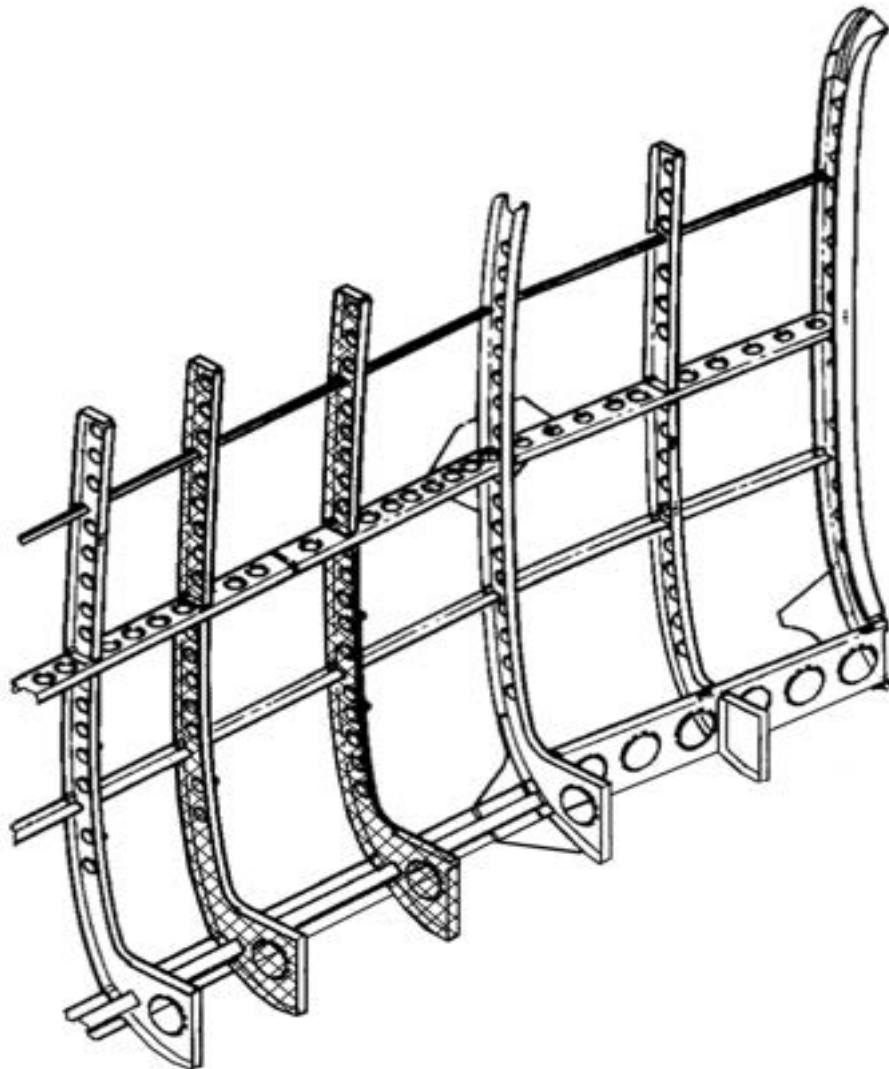
B18618



LOCAL CORROSION
(CORROSION FOUND IN NON-ADJACENT FRAMES)

Figure 2 : Sheet 4 : Corrosion Location

B18619



WIDESPREAD CORROSION
(CORROSION FOUND IN ADJACENT FRAMES)

Figure 3 : Sheet 1 : Corrosion Level Determination Chart

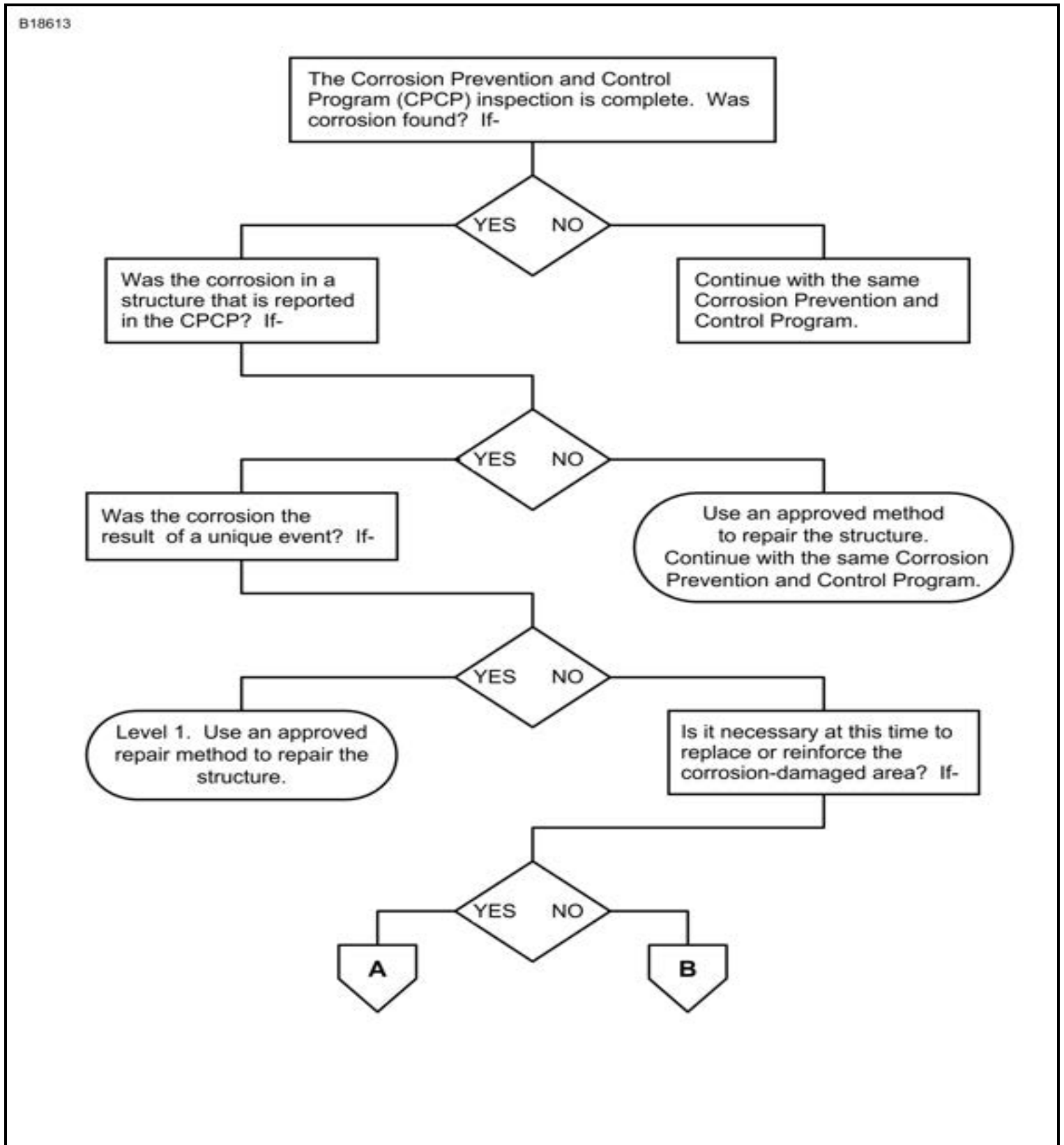


Figure 3 : Sheet 2 : Corrosion Level Determination Chart

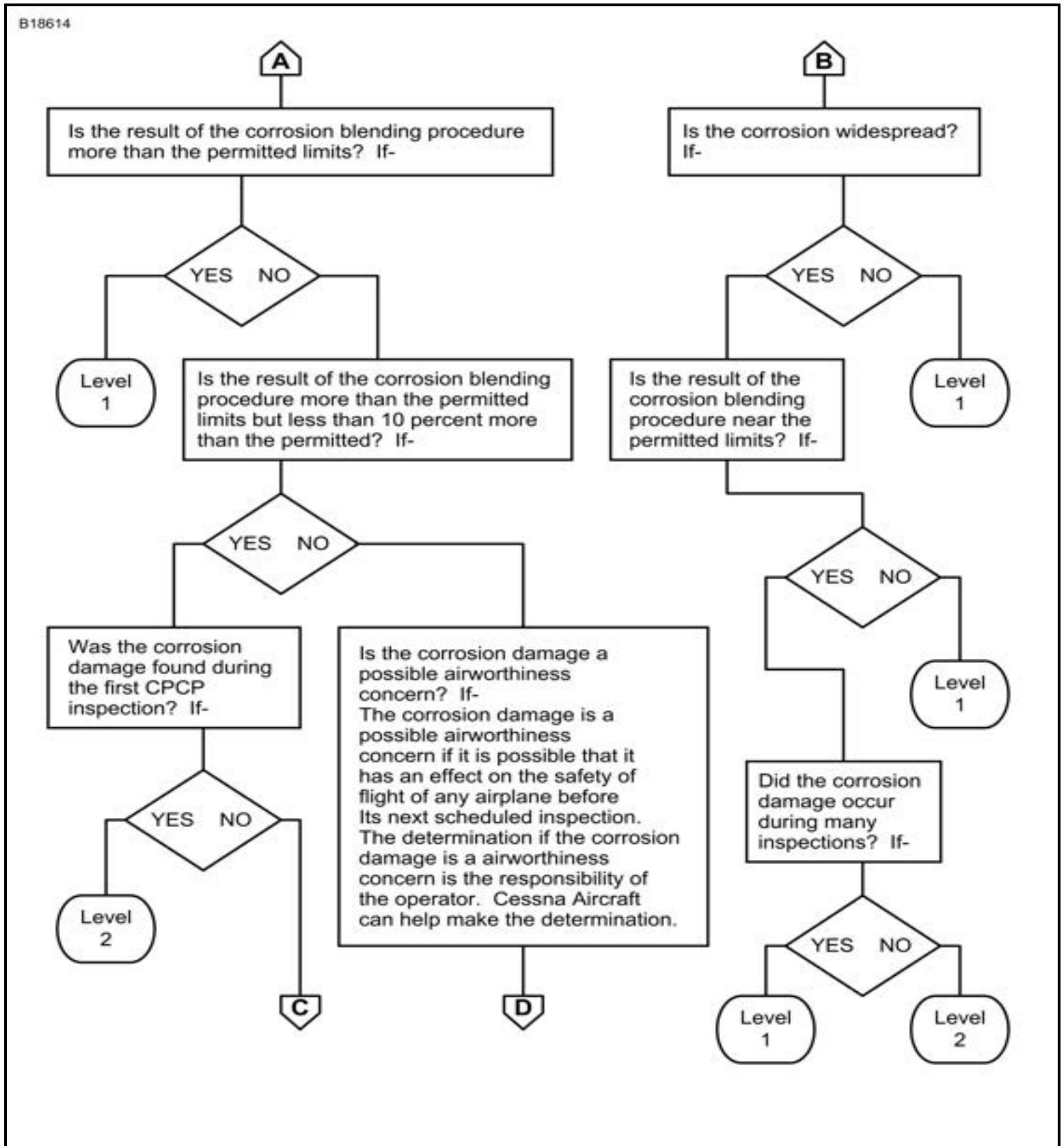
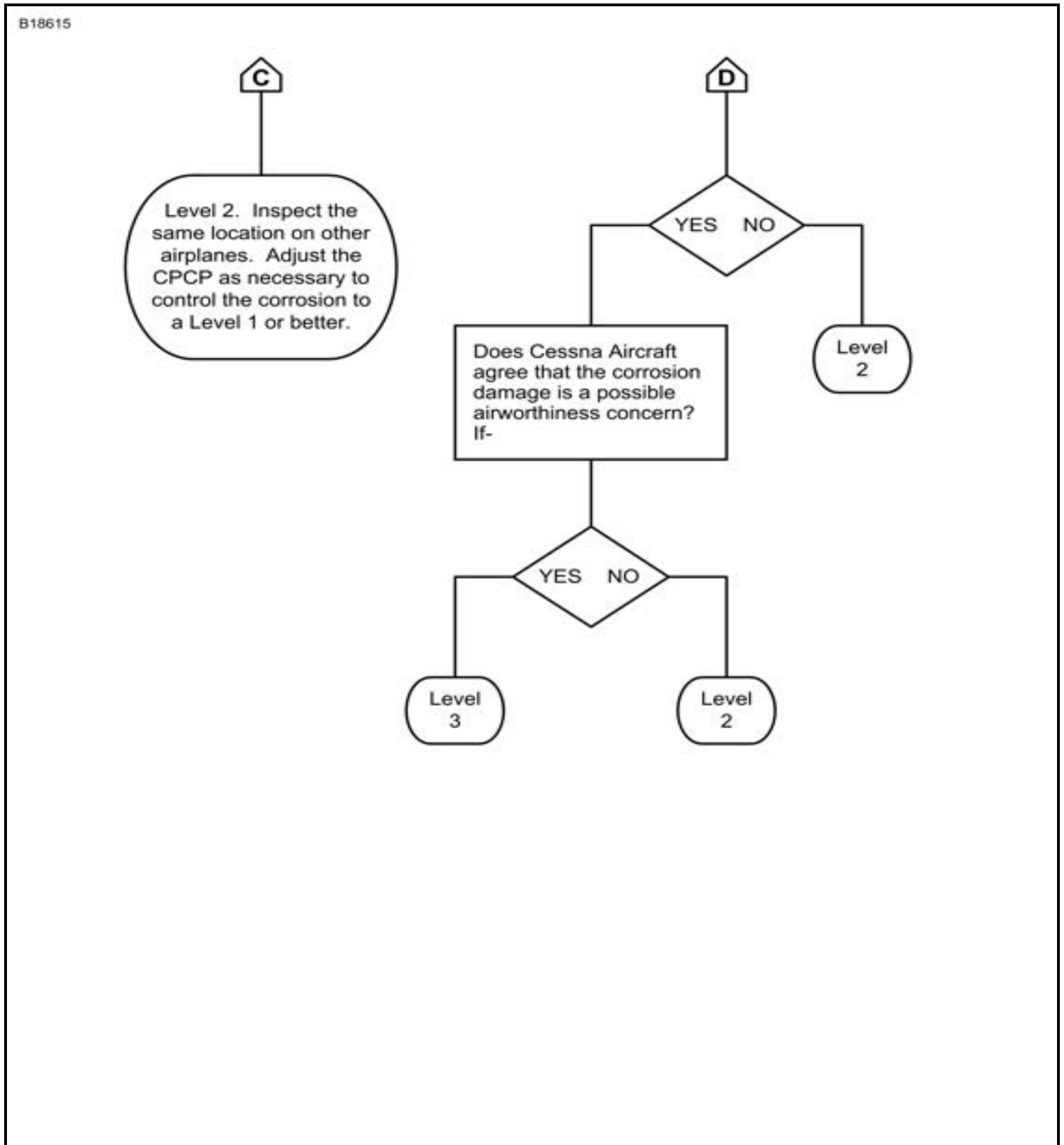


Figure 3 : Sheet 3 : Corrosion Level Determination Chart



UNSCHEDULED MAINTENANCE CHECKS

1. General

- A. During operation, the airplane can have forces put on it that makes completion of unscheduled maintenance necessary. Unscheduled maintenance includes the items that follow:
 - (1) Hard landings.
 - (2) Overspeed.
 - (3) Extreme turbulence or extreme maneuvers.
 - (4) Towing with a large fuel unbalance or high drag/side loads due to ground handling.
 - (5) Lightning strikes.
- B. When the flight crew gives a report of any of these conditions, complete a visual inspection of the airframe and specific inspections of components and areas involved.
- C. Do the inspections to find and examine the damage in local areas of visible damage, and in the structure and components adjacent to the area of damage.
- D. If foreign object damage (FOD) is found, complete a visual inspection of the airplane before the airplane is returned to service.

2. Unscheduled Maintenance Checks Defined and Areas of Inspection

- A. Hard/Overweight Landings.
 - (1) A hard landing is any landing made when the sink rate is more than the permitted sink rate limit. An overweight landing is any landing made when the gross weight is more than the maximum gross landing weight given in the approved Pilot's Operating Handbook.
NOTE: If the hard/overweight landing also has high drag/side loads, more checks are necessary.
 - (2) Hard or overweight landing check.
 - (a) Landing gear.
 - 1 Main gear struts - Examine for correct attachment and permanent set.
 - 2 Main gear attachments and supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
 - 3 Nose gear trunnion supports and attaching structure - Examine for loose or unserviceable fasteners and signs of structural damage.
 - 4 Nose gear attachments and supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
 - 5 Nose gear strut - Remove and disassemble strut and examine for internal damage.
 - (b) Wings.
 - 1 Wing surface and lift strut - Examine the skin for buckles, loose or unserviceable fasteners, and fuel leaks. Examine the attach fittings for security.
 - 2 Trailing edge - Examine for any deformation that stops the normal flap operation.
- B. Overspeed
 - (1) The airplane was flown at a speed more than the maximum design speed.
 - (a) Fuselage
 - 1 Windshield and Windows - Examine for buckling, dents, loose or unserviceable fasteners, and signs of structural damage.
 - 2 All hinged doors - Examine the hinges, hinge attach points, latches and attachments, and skins for deformation and signs of structural damage.
 - (b) Cowling
 - 1 Skins - Examine for buckling, cracks, loose or unserviceable fasteners, and signs of structural damage.
 - (c) Stabilizers
 - 1 Stabilizers - Examine the skins, hinges and attachments, movable surfaces, mass balance weights, and the structure for cracks, dents, buckling, loose or unserviceable fasteners, and signs of structural damage.
 - (d) Wings

- 1 Flaps - Examine the skin for buckling, cracks, loose or unserviceable fasteners, attachments, and signs of structural damage.
 - 2 Fillets and fairings - Examine for buckling, dents, cracks, and loose or unserviceable fasteners.
- (2) The airplane was flown at a speed more than the speed limit of the flaps.
- NOTE:** Inspections due to transient overspeed events that occur in normal flight (no high G maneuvers, gusts, etc.) may be deferred to the next regularly scheduled inspection.
- (a) Wings/Flaps
- 1 Wings - Examine the skin for buckling, cracks, loose or unserviceable fasteners, attachments, and signs of structural damage.
 - 2 Flaps - Examine the skin for buckling, cracks, loose or unserviceable fasteners, attachments, and signs of structural damage. Examine the flap tracks for cracks, loose or unserviceable fasteners, structural damage and any indication of binding.
 - 3 Flaps - Check flaps for freedom of movement and operation.

C. Extreme Turbulence or Extreme Maneuvers.

- (1) Extreme turbulence is caused by atmospheric conditions that produce dangerous quantities of stress on the airplane. Extreme maneuvers are any maneuvers that do not stay within the limits given in the Pilot's Operating Handbook.
- (2) Extreme turbulence and/or maneuvers checks.
 - (a) Stabilizers.
 - 1 Horizontal stabilizer hinge fittings, actuator fittings, and stabilizer center section - Examine for loose or unserviceable fasteners and signs of structural damage.
 - 2 Vertical stabilizer - Examine the vertical stabilizer for signs of structural damage, skin buckles, loose or unserviceable fasteners, and damage to the hinges and actuator fittings.
 - 3 Elevator and rudder balance weight supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
 - (b) Wing.
 - 1 Wing to body strut fittings and supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
 - 2 Trailing Edge - Examine for any deformation that stops the normal operation of the flap and aileron.

D. Lightning Strike.

- (1) If the airplane is flown through an electrically charged region of the atmosphere, it can be struck by an electrical discharge moving from cloud to cloud or from cloud to ground. During a lightning strike, the current goes into the airplane at one point and comes out of another, usually at opposite extremities. The wing tips, nose and tail sections are the areas where damage is most likely to occur. You can find burns and/or erosion of small surface areas of the skin and structure during inspection. In most cases, the damage is easily seen. In some cases, however, a lightning strike can cause damage that is not easily seen. The function of the lightning strike inspection is to find any damage to the airplane before it is returned to service.
- (2) Lightning strike check. As the checks that follow are performed, complete the [Lightning Strike/Static Discharge Incident Reporting Form](#) and return it to Cessna Customer Care Dept. 569, Cessna Aircraft Company, P.O. Box 7706, Wichita, KS. 67277-7706. If there are components listed on the form that are not applicable to your airplane, please write "Not Applicable" in the space provided.
 - (a) Communications.
 - 1 Antennas - Examine all antennas for burns or erosion. If you find damage, complete the functional test of the communication system.
 - (b) Navigation.
 - 1 Glideslope antenna - Examine for burning and pitting. If damage is found, complete a functional check of the glideslope system.
 - 2 Compass - The compass is serviceable if the corrected heading is within plus or minus 10 degrees of the heading shown by the remote compass system. Remove, repair, or replace the compass if the indication is not within the tolerance limits.

- (c) Fuselage.
 - 1 Skin - Examine the surface of the fuselage skin for signs of damage.
 - 2 Tailcone - Examine the tailcone and static dischargers for damage.
- (d) Stabilizers.
 - 1 Examine the surfaces of the stabilizers for signs of damage.
- (e) Wings.
 - 1 Skins - Examine the skin for burns and erosion.
 - 2 Wing tips - Examine the wing tips for burns and pits.
 - 3 Flight surfaces and hinging mechanisms - Examine for burns and pits.
- (f) Propeller.
 - 1 Propeller - Examine the propeller for indications of burns or arcing on the blades and/or hub. If there are signs of damage remove the propeller from service and have it examined at an authorized repair station.
- (g) Powerplant.
 - 1 Engine - Refer to the engine manufacturer's overhaul manual for inspection procedures.

E. Foreign Object Damage.

- (1) Foreign object damage (FOD) is damage to the airplane caused by a bird strike or by any other foreign object while operating the airplane on the ground or in normal flight. Tools, bolts, nuts, washers, rivets, rags or pieces of safety-wire left in the aircraft during maintenance operations can also cause damage. The function of the foreign object damage inspection is to find any damage before the airplane is repaired or returned to service.
- (2) Use caution to prevent unwanted objects from hitting the airplane during towing and at all times when the airplane is not in service.
- (3) The aerodynamic cleanliness level (degree of surface smoothness), has an effect on the performance of the airplane. It is important to keep a high level of cleanliness.
- (4) Normal operation or careless maintenance operations can cause contour distortion of the aerodynamic surface. Careless maintenance operations can also cause distortion to the doors and access panels. Be careful when you work with these items.
- (5) Foreign object damage check.
 - (a) Landing gear.
 - 1 Fairings - Examine for dents, cracks, misalignment, and signs of structural damage.
 - (b) Fuselage.
 - 1 Skin - Examine the forward and belly areas for dents, punctures, cracks, and signs of structural damage.
 - (c) Cowling.
 - 1 Skins - Examine for dents, punctures, loose or unserviceable fasteners, cracks, and signs of structural damage.
 - (d) Stabilizers.
 - 1 Leading edge skins - Examine for dents, cracks, scratches, and signs of structural damage.
 - (e) Windows.
 - 1 Windshield - Examine for pits, scratches, and cracks.
 - (f) Wings.
 - 1 Leading edge skins - Examine for dents, cracks, punctures, and signs of structural damage.
 - (g) Engine.
 - 1 Propeller - Examine the propeller for nicks, bends, cracks, and worn areas on the blades.

F. High Drag/Side Loads Due To Ground Handling.

- (1) A high drag/side load condition occurs when the airplane skids or overruns the prepared surface and goes onto an unprepared surface. It also includes landings that are short of the prepared surface, or landings which involve the damage of tires or skids on a runway to the extent that the safety of the airplane is in question. This includes takeoff and landings or unusual taxi conditions.

- (2) High drag/side loads due to ground handling check.
- (a) Landing gear.
- 1 Main gear and fairings - Examine for loose or unserviceable fasteners, buckling, cracks, and signs of structural damage.
 - 2 Nose gear and fairing - Examine for loose or unserviceable fasteners, cracks, loose steering cable tension, buckling, and signs of structural damage.
- (b) Wings.
- 1 Wing to fuselage attach fittings and attaching structure - Examine for loose or unserviceable fasteners and signs of structural damage.

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LIGHTNING STRIKE/STATIC DISCHARGE INCIDENT REPORTING FORM Part 1

1. Flight Crew must complete Part 1.

NOTE: Entire report must be filled out following any lightning strike incident. If lightning strike is discovered after the fact, complete as much of report as possible. File form immediately following incident. Attach additional sheet(s) to provide complete description.

- A. Flight Information:
Flight Number _____ Strike Date _____ Model _____ Unit/Serial Number _____
Altitude _____ ft Airspeed _____ knots Geographical Location _____
- B. Airplane Orientation:
Takeoff _____ Climb _____ Cruise _____ Descent _____
Approach _____ Other _____
- C. At time of Strike, aircraft was:
Above Clouds _____ Within Clouds _____ Below Ceiling _____
- D. Precipitation at Strike:
Rain _____ Sleet _____ Hail _____ Snow _____ None _____
- E. Lightning in Vicinity:
Before _____ After _____ None _____
- F. Static in Comm/Nav
Before _____ After _____ None _____
- G. Was St. Elmo's fire (bluish electrical discharge or corona) visible before strike?
Yes _____ No _____
- H. Interference (I) or Outage (O) report. Check all the following which apply, and list affected systems, such as dimming of cabin lights, total system outage, etc.
- | | | |
|--------------------|---------|---------|
| Engines | I _____ | O _____ |
| Navigation | I _____ | O _____ |
| Communication | I _____ | O _____ |
| Flight Instruments | I _____ | O _____ |
| Flight Control | I _____ | O _____ |
| AC Power System | I _____ | O _____ |

DC Power System

I

O

I. Additional comments and descriptions:

Part 1 completed by: _____ Date _____ Phone _____

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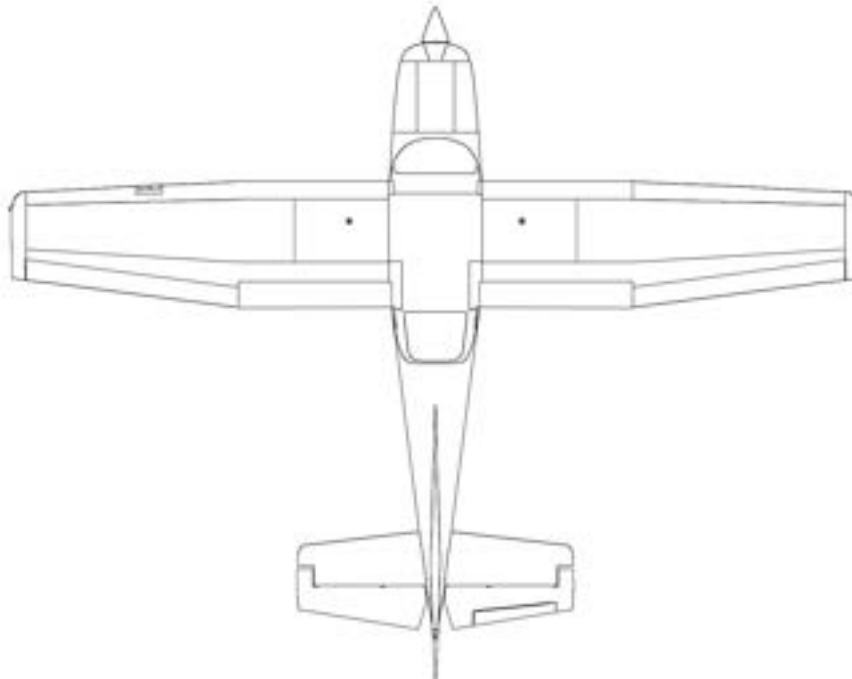
LIGHTNING STRIKE/STATIC DISCHARGE INCIDENT REPORTING FORM Part 2

1. Ground Crew must complete Part 2.

NOTE: Attach additional sheet(s) to provide complete description. Photos and sketches of damage are recommended and must be itemized and referenced in their description.

NOTE: If damage is severe, please report the lightning strike as soon as possible. Inspection by Cessna Engineering Representative(s) may be required.

- A. List any sweeping points, such as burn marks, divots, etc., and skin penetrations on airplane skin believed to be the result of the lightning strike. Itemize and reference location(s) of damage on drawing provided. Indicate top, bottom, left or right.



- B. Describe damage to structure and external components caused by previously mentioned damage points. In the case of skin penetration(s), indicate hole diameter(s). List all damage to radome and any other composite structure, such as fairings, control surfaces, etc. If lightning diverter strips are damaged, include lightning diverter strip location(s) on radome. For damage to composite structure, paint thickness must be included in description.
- C. List any damage to avionics and electrical components believed to be the result of the lightning

strike, including damaged wiring, disengaged circuit breakers, etc. Include manufacturer, model number and serial number of damaged units where applicable.

- D. Estimate cost of repair.
- E. Mention severity of damage (light, moderate, heavy).
- F. Additional comments and descriptions:

Part 2 completed by: _____ Date _____ Phone _____

SERVICING - GENERAL

1. Scope

- A. This chapter provides instructions for the replenishment of fluids, scheduled and unscheduled servicing applicable to the entire airplane. Personnel shall observe safety precautions pertaining to the individual servicing application.

2. Definition

- A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief description of each section follows.
 - (1) The section on replenishing is subdivided into categories to group servicing information, such as, systems requiring hydraulic fluid or compressed gas. A brief description of the subdivision subjects follows.
 - (a) Replenishing charts for the liquids most commonly used to service the airplane are grouped together to aid maintenance personnel in servicing.
 - (b) The subdivision of fuel and oil provides maintenance personnel with general servicing procedures. Safety precautions and servicing procedures required by federal and local regulations may supersede the procedures described.
 - (c) The subject on hydraulic fluid servicing provides servicing procedures for the airplane hydraulic brake system, nose gear shimmy damper and nose gear strut.
 - (d) The remaining subject subdivisions provide service information on either a system, an assembly or a component.
 - (2) The section on scheduled servicing includes lubrication information, external cleaning and internal cleaning. The section is subdivided to provide individual system, assembly or component service information.

REPLENISHING - DESCRIPTION AND OPERATION

1. General

A. This section provides maintenance personnel with servicing information for replenishing fuel and oil.

2. Description

A. For an illustration of service points located on the airplane, refer to [Figure 1](#). This illustration may be used in conjunction with replenishing tables to aid maintenance technicians in servicing the airplane.

B. The following tables are provided to establish replenishment capacities of various systems:

- (1) Fuel Capacity ([Table 1](#))
- (2) Approved Fuels ([Table 2](#))
- (3) Engine Oil Capacity ([Table 3](#))

3. Fuel Capacity Table

A. The following table lists airplane fuel capacity.

WARNING: Only aviation grade fuels are approved for use.

Table 1. Fuel Capacity

	TANK	U.S.
Fuel Capacity		92.0 Gallons
Usable Fuel		88.0 Gallons

4. Approved Fuel Table

A. The following table lists approved fuels for use in the airplane.

Table 2. Approved Fuels

TYPE OF FUEL	SPECIFICATION	COLOR
100 LL	ASTM-D910	Blue
100	ASTM-D910	Green

For other fuels that can be used in Russia, refer to Lycoming Service Instruction No. 1070M (or subsequently approved Lycoming Service Instruction revision).

5. Engine Oil Capacity Table

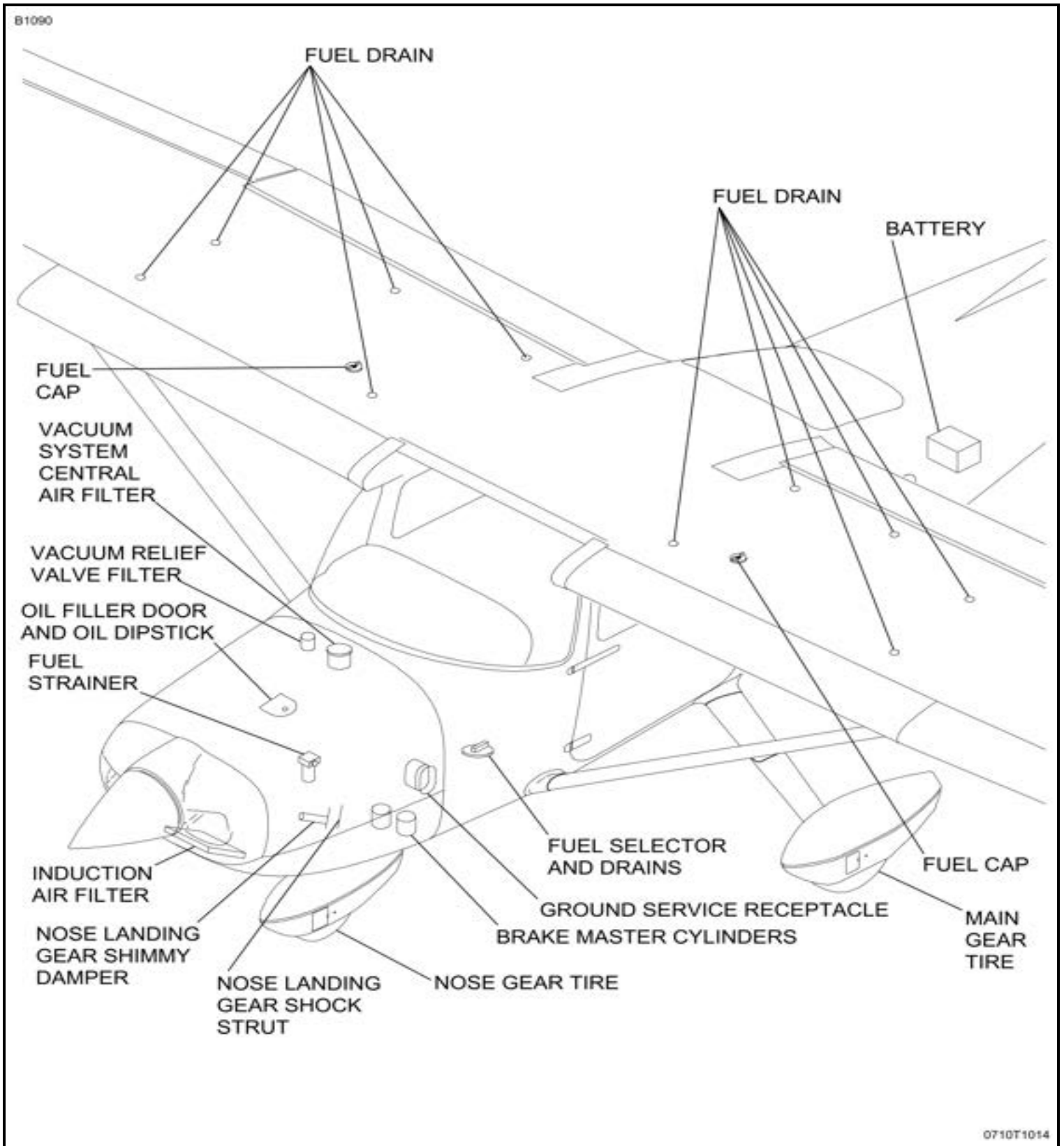
A. The following table lists oil capacity for the airplane.

WARNING: The U.S. Environmental Protection Agency advises mechanics and other workers who handle oil to minimize skin contact with used oil and promptly remove used oil from skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

Table 3. Engine Oil Capacity

SYSTEMS	U.S. Quarts
Engine Oil (total with filter, oil cooler and cooler hoses)	13.0 quarts

Figure 1 : Sheet 1 : Airplane Service Points



NOSE LANDING GEAR SHOCK STRUT - SERVICING

1. General

- A. It is necessary to examine the nose gear shock strut at intervals to make sure the strut is filled with hydraulic fluid and is inflated to the correct air pressure. This procedure only gives instructions to fill the nose gear shock strut and to service the nose gear shock strut. For procedures to disassemble and repair, refer to Chapter 32, [Nose Landing Gear - Maintenance Practices](#).

2. Shock Strut Servicing Procedures

- A. Service the nose gear shock strut as follows:
- (1) Remove the air valve cap and release all air.
 - (2) Remove the air valve housing assembly.
 - (3) Compress the strut fully until the strut's bottom fork touches the top barrel housing.
 - (4) Examine the hydraulic fluid level and add fluid as necessary.
NOTE: Fluid used must agree with specification MIL-PRF-5606.
 - (a) Make sure the hydraulic fluid level is at the bottom of the air valve installation hole.
 - (5) Fully extend the strut.
 - (6) Install the air valve housing assembly.
 - (7) With strut fully extended and the nose wheel off of the ground, inflate the strut to 55 to 60 PSI.

NOTE: The nose landing gear shock strut will use only minimum service. Strut extension pressure must be kept at 55 to 60 PSI. Use a clean, lint-free cloth soaked with MIL-PRF-5606 or kerosene to clean the machined surfaces of dirt and dust.

NOSE LANDING GEAR SHIMMY DAMPER - SERVICING

1. General

- A. The nose gear shimmy damper (on airplanes that do not have the Lord Shimmy Damper) contains a compensating mechanism in the hollow piston rod. This is for thermal expansion and contraction of the hydraulic fluid in the damper. The shimmy damper must be filled fully with hydraulic fluid and be free of air. Before the servicing of the shimmy damper, make sure that the compensating piston is at the bottom in the piston rod. To disassemble the shimmy damper, refer to Chapter 32, [Nose Gear - Maintenance Practices](#).
- B. The nose gear shimmy damper (on airplanes with the Lord Shimmy Damper) uses rubber with a lubricant to absorb nose wheel vibration. The damper piston shaft is attached to a stationary part, and the housing is attached to the nosewheel steering torque arm assembly, which moves as the nosewheel turns, causing relative motion between the damper shaft and the housing.

2. Shimmy Damper Servicing (For airplanes that do not have the Lord Shimmy Damper)

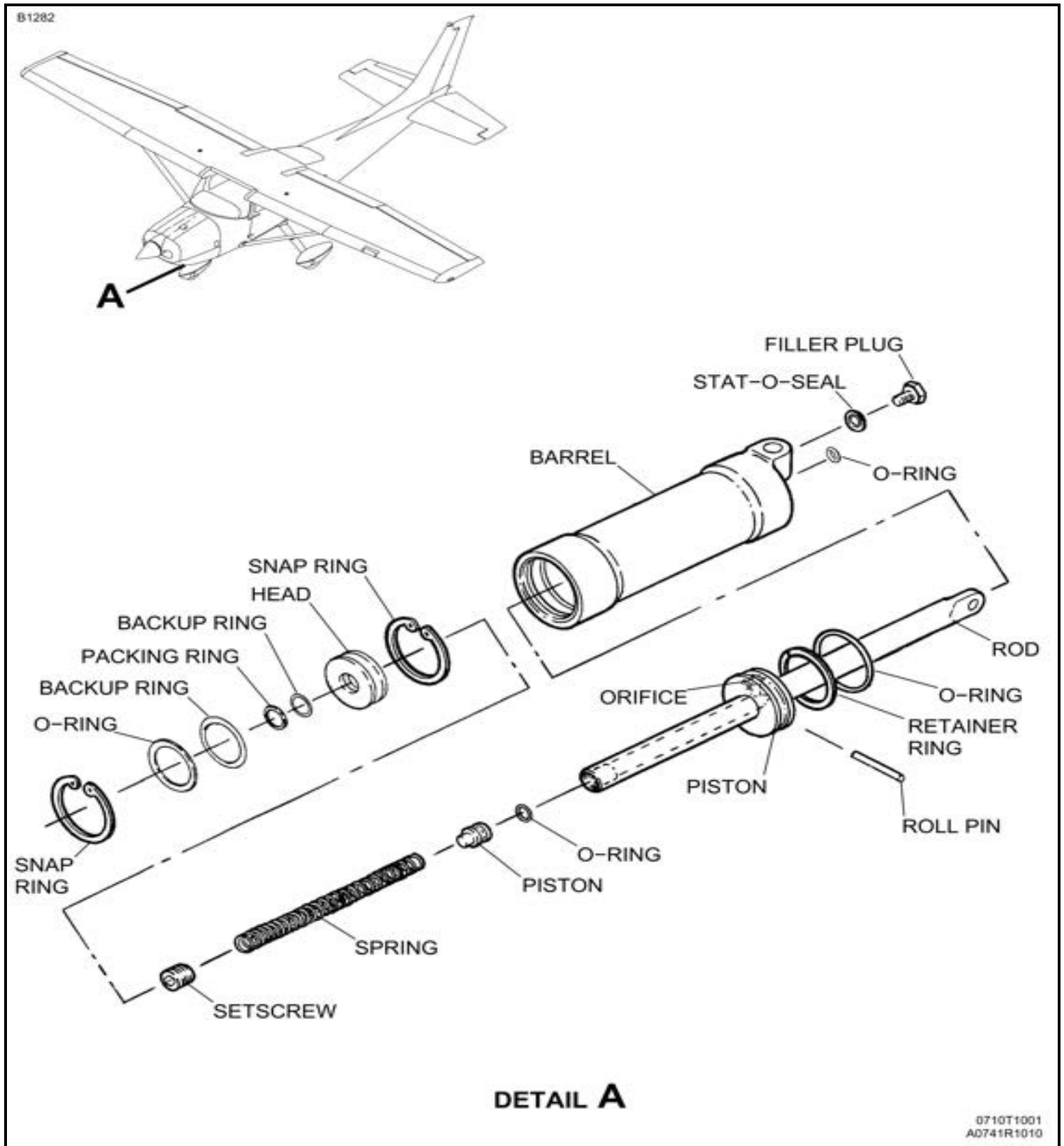
- A. Do the servicing of the shimmy damper as follows (Refer to [Figure 301](#)).
 - (1) Remove the shimmy damper from the airplane. Refer to Chapter 32, [Nose Landing Gear - Maintenance Practices](#).
 - (2) Hold the shimmy damper in a vertical position with the filler plug pointed up.
 - (3) Loosen the filler plug to drain the unwanted fluid.
 - (4) Let the spring go to the bottom of the floating piston in the shimmy damper rod.
 - (5) When the flow of the fluid stops, put a length of rigid wire through the bleed air hole in the setscrew which is found at the end of the piston rod until the rigid wire touches the floating piston.
 - (6) Insert the wire to the depth of 3.81 inches (95.25 mm).
NOTE: If the wire insertion is less than 3.81 inches (95.25 mm), the floating piston will not move freely in the shaft.
 - (a) Use the rigid wire to release the floating piston.
 - (b) If the floating piston cannot be released with the rigid wire, you must replace the rod assembly and the piston.
 - (7) Make sure that the floating piston is at the bottom.
 - (8) Move the damper rod to put the piston at the end of the barrel which is opposite of the filler plug.
CAUTION: Dirt and dust can cut the seals in the barrel. Use a clean, lint-free cloth soaked with MIL-PRF-5606 hydraulic fluid or kerosene to keep the machined surfaces clean.
 - (9) Remove the filler plug and fill the shimmy damper with hydraulic fluid.
 - (a) To fill the shimmy damper, make sure the shimmy damper and MIL-PRF-5606 hydraulic fluid are at 70°F to 80°F (21°C to 26°C).
 - (b) Keep the shimmy damper and the visual parts of the piston shaft clean from dirt and dust.
 - (10) Install the filler plug and clean the damper in cleaning agent.
 - (11) Dry the damper with a clean cloth.
 - (12) Install the damper on the airplane. Refer to Chapter 32, [Nose Landing Gear - Maintenance Practices](#).

3. Shimmy Damper Servicing (On Airplanes with the Lord Shimmy Damper)

- A. Lord Shimmy Dampers do not need special servicing. However, you must lubricate the nose wheel shimmy damper pivots with general purpose oil MIL-L-7870.
- B. Keep the shimmy damper clean.
 - (1) Clean the shimmy damper with a clean, lint-free cloth to prevent the collection of dust and grit.
 - (2) Make sure that the part of the damper piston shaft that you can see is always clean.
 - (3) Clean the machined surfaces of the shimmy damper with a clean, lint-free cloth to prevent the collection of dust and dust.
- C. If necessary, exercise a shimmy damper before installation.
 - (1) If a shimmy damper has been in storage for a long period, make sure that it moves freely before you install it.
CAUTION: Make sure that you do not push or pull on the shaft of the shimmy damper after it has reached its limit in either the up or the down position. If you continue to push a fully compressed, bottomed-out shaft, you can cause damage to the shimmy damper. If you continue to pull on a fully extended shaft, you can cause damage to the shimmy damper.

- (2) If the shimmy damper does not move freely, push and pull the shaft through complete cycles until it does move freely. When the shimmy damper shaft has come to its limit of travel up and down as you push and pull, make sure that you do not continue to push or pull it beyond that limit of travel.

Figure 301 : Sheet 1 : Shimmy Damper Servicing



HYDRAULIC BRAKES - SERVICING

1. General

- A. Complete the brake master cylinders servicing as specified in the time intervals set in Chapter 5, [Inspection Time Limits](#).
- B. Brake master cylinders are found on the rudder pedals and are filled with MIL-PRF-5606 hydraulic fluid. To fill and bleed the brake system, refer to Chapter 32, [Brakes - Maintenance Practices](#).

FUEL AND ENGINE OIL - DESCRIPTION AND OPERATION

1. General

- A. This section provides servicing procedures for the fuel and engine oil system. It is subdivided as follows:
 - (1) The fuel system section includes procedures for adding fuel, defueling the airplane and mixing anti-icing additives to the fuel.
 - (2) The engine oil section includes procedures for checking, adding and changing engine oil.

2. Fuel Precautions

- A. Safety Precautions.
 - (1) The safety precautions on fueling and defueling may be superseded by local directives. However, following is a typical list of precautions.
 - (a) Ground, by designated grounding cables, the fueling and/or defueling vehicle to the airplane. Also, a static ground device shall contact the fueling or defueling vehicle and ground.
 - (b) Fire fighting equipment shall be immediately available.
 - (c) Wear proper clothing.
 - 1 Do not wear clothing that has a tendency to generate static electricity, such as, nylon or synthetic fabrics.
 - 2 Do not wear metal taps on shoes when working in areas where fuel fumes may accumulate at ground level.
 - (d) The airplane shall be in a designated fuel loading or unloading area.
 - (e) High wattage, pulse transmitting avionics equipment shall not be operated in the immediate vicinity.
- B. Maintenance Precautions.
 - (1) Use designated equipment for fuel loading and unloading to prevent contamination.
 - (2) Use proper procedures when adding fuel inhibitors.
 - (3) Use specified type of fuel.

3. Oil Precautions

- A. Maintenance Precautions.
 - (1) Use proper servicing procedures; do not overfill, do not mix manufacturers brands of oil.

FUEL - SERVICING**1. General****A. Fuel Tanks.**

- (1) Each wing has a fuel tank. You can find the fuel tanks between the forward and aft spars that extend from WS 23.62 to WS 85.96. You must fill the fuel tanks immediately after each flight to decrease the amount of condensation that can be produced in the tanks and fuel lines. A fuel filler cap that vents is found on top of each wing to fuel and defuel each fuel tank.

B. Fuel Drains.

- (1) Fuel drains are at various places throughout the fuel system, and are used to collect fuel samples for analysis. To collect fuel samples, you put a fuel sample cup up to the valve and push up on the valve with the rod on the cup.

NOTE: For detailed description and maintenance practices related to the fuel system, refer to [Chapter 28, Fuel - General](#).

2. Safety and Maintenance Precautions**A. Safety Precautions.**

WARNING: Keep fire fighting equipment available for all fuel system service procedures. To prevent accidental disconnection of a ground wire, you must use two ground wires from the tiedown rings on the airplane attached to approved ground stakes. Make sure the battery switch is turned off, unless otherwise specified.

- (1) Connect an electrical ground.
 - (a) Ground the airplane with two ground wires. Connect the wires from the tie-down rings to the ground stakes.
 - (b) Ground the vehicle (or hose cart) to the same ground stakes as the airplane.
 - (c) Ground the vehicle (or hose cart) to the airplane.
 - (d) Ground the refuel nozzle to the airplane.
- (2) Make sure the equipment to fight fires is available.
- (3) Do not wear clothes such as nylon or synthetic fabrics that can make static electricity.
- (4) Do not wear metal taps on shoes.
- (5) The airplane must be in a designated fuel loading/unloading area.
- (6) High wattage, pulse transmitted avionics equipment must not be operated in the area when you fill or drain the fuel.

B. Maintenance Precautions.

- (1) Use approved equipment to fill or remove fuel to prevent contamination.
- (2) Use the authorized type of fuel and anti-ice additive. It is very important that the correct anti-ice additive mix procedures be followed. Incorrect mixture of the fuel and anti-ice additive will cause damage to the interior finish of the fuel tank, which increases corrosion.
- (3) Use an authorized type of fuel and anti-ice additive.
- (4) When you fuel the airplane, make sure you do not mix the fuel with the anti-ice additive and the fuel without the anti-ice additive.

3. Fuel Servicing**A. Fuel Fill Procedures.**

CAUTION: Make sure that the correct grade and type of fuel is used to service the airplane. Refer to Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for a list of approved fuels.

- (1) Electrically ground airplane and vehicle. Refer to the [Safety and Maintenance Precautions](#).
- (2) Make sure that the battery switch is turned to OFF.
- (3) Put a protective mat around the fuel filler area and remove the fuel filler caps.
- (4) Fuel the airplane with the correct grade of aviation fuel.
- (5) Install the filler caps. Wipe up the excess fuel from the wing area.
- (6) Remove the equipment that you used to ground the airplane.

B. Fuel Removal Procedures.

- (1) Electrically ground the airplane and the vehicle.
- (2) Make sure that the battery switch is turned to OFF.
- (3) Remove the fuel filler caps.
- (4) Put the defueling nozzle into the fuel bay and begin to defuel.
- (5) Remove as much fuel as possible with the defuel nozzle.
- (6) Remove the drain valves from the bottom of the fuel tank and drain the remaining fuel.
- (7) Remove grounding equipment.

4. Fuel Additive (DiEGME) Precautions

WARNING: MIL-I-85470 anti-ice additive is toxic. It is dangerous to health when breathed and/or absorbed into the skin. When you service fuel with the anti-ice additive in an unventilated area, use applicable personal protective equipment such as eye goggles/shield, respirator with organic vapor cartridges, non-absorbing gloves and additional skin protection from spraying or splashing anti-ice additive. If anti-ice additive enters the eyes, flush with water and contact a physician immediately.

WARNING: Anti-icing additives that contain DiEGME are harmful if inhaled, swallowed, or absorbed through the skin and will cause eye irritation. DiEGME is also combustible. Before you use this material, refer to all of the safety information on the container.

CAUTION: It is extremely important to mix anti-ice additives with fuel correctly, because more concentration than recommended can cause damage to the fuel tanks, such as deterioration of protective primer and sealants and damage to O-rings and seals in the fuel system and engine compounds. Use only equipment that is recommended by the manufacturer to make sure that you get the correct proportion when you blend the anti-ice additives with the fuel.

CAUTION: Do not let the concentrated anti-ice additive come in contact with the airplane finish or fuel cell, as it can cause damage.

- A. When you service fuel with anti-icing additives that contain Diethylene glycol monomethyl ether (DiEGME, MIL-I-85470), remember that they are harmful if inhaled, swallowed, or absorbed through the skin, and will cause eye irritation. Also, they are combustible. Before you use this material, refer to all safety information on the container.
- B. DiEGME is toxic under sustained exposure environments. When inhaled, DiEGME is primarily a central nervous system depressant, although various animal studies have revealed that acute inhalation overexposure may cause kidney injury. The primary symptoms of inhalation overexposure in confined or poorly ventilated areas include headache, drowsiness, blurred vision, weakness, lack of coordination, tremor, unconsciousness, and even death. When ingested (swallowed) in massive doses, DiEGME is reported to exhibit a narcotic action, but at lower dosage levels, death is delayed and is accompanied by lung edema (excessive serious fluid in lungs), slight liver injury and marked kidney injury. DiEGME is only mildly irritating to the eyes and skin; however, it can be readily absorbed through the skin in toxic amounts. Symptoms of overexposure due to skin absorption are essentially the same as those outlined for inhalation.
- C. In the event DiEGME contact is experienced, the following emergency and first aid procedures should be used.
 - (1) If DiEGME is inhaled, remove person to fresh air. If the person is not breathing, give artificial respiration, preferably mouth-to-mouth; however, if breathing is difficult, administer oxygen. Always call a physician.
 - (2) If ingested (swallowed), drink large quantities of water. Then induce vomiting by placing a finger far back into the throat. Contact a physician immediately. If vomiting cannot be induced, take victim immediately to the hospital or a physician. If victim is unconscious or in convulsions, take victim immediately to the hospital or a physician. Do not induce vomiting or give anything by mouth to an unconscious person.
 - (3) If eye or skin contact is experienced, flush with plenty of water (use soap and water for skin) for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Thoroughly wash contaminated clothing and shoes before reuse.
- D. Additional antistatic and biocidal protection may be provided using approved products. Refer to the Tools, Equipment and Materials section for approved manufacturers. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for concentration levels of these products.

5. Fuel Additive Procedures

- A. Strict adherence to recommended preflight draining instructions will eliminate any free water accumulations from the tank sumps. While small amounts of water may still remain in solution in the gasoline, it will normally be consumed and go unnoticed

in the operation of the engine.

- B. One exception to this can be encountered when operating under the combined effect of: 1) use of certain fuels, with 2) high humidity conditions on the ground 3) followed by flight at high altitude and low temperature. Under these unusual conditions small amounts of water in solution can precipitate from the fuel stream and freeze in sufficient quantities to induce partial icing of the engine fuel system.
- C. While these conditions are quite rare and will not normally pose a problem to owners and operators, they do exist in certain areas of the world and consequently must be dealt with, when encountered.
- D. Therefore, to alleviate the possibility of fuel icing occurring under these unusual conditions, it is acceptable to add isopropyl alcohol or Diethylene glycol monomethyl ether (DiEGME) compound to the fuel supply.
- E. The introduction of alcohol or DiEGME compound into the fuel gives two distinct effects: 1) it absorbs the dissolved water from the gasoline and 2) alcohol has a freezing temperature depressant effect.
- F. Alcohol which meets specification MIL-F-5566 or Federal Specification TT-I-735 and has a maximum water content not exceeding 0.4 percent by volume, may be used. If used, it is to be blended with the fuel in a concentration of 1% by volume. Concentrations greater than 1% are not recommended since they can be detrimental to fuel tank materials.
- G. The manner in which the alcohol is added to the fuel is significant because alcohol is most effective when it is completely dissolved in the fuel. To ensure proper mixing, the following is recommended:
 - (1) For best results the alcohol should be added during the fueling operation by pouring the alcohol directly on the fuel stream issuing from the fueling nozzle.
 - (2) An alternate method that may be used is to premix the complete alcohol dosage with some fuel in a separate clean container (approximately 2 to 3 gallon capacity) and then transfer this mixture to the tank prior to the fuel operation.
- H. Diethylene glycol monomethyl ether (DiEGME) compound in compliance with MIL-I-85470, if used, must be carefully mixed. Refer to Pilot's Operating Handbook And FAA Approved Airplane Flight Manual for fuel/DiEGME mixing ratios.
- I. Prolonged storage of the airplane will result in a water buildup in the fuel which "leeches out" the additive. An indication of this is when an excessive amount of water accumulates in the fuel tank sumps. The concentration can be checked using a concentration tester. It is imperative that the technical manual for the tester be followed explicitly when checking the additive concentration.

ENGINE OIL - SERVICING Lycoming

1. General

A. This section provides instructions to examine and change the engine oil.

2. Oil Change Intervals

NOTE: An inspection of the filter can aid in the detection of premature engine wear. Refer to Lycoming Service Bulletin 480F or latest revision.

A. Oil Change Intervals.

- (1) Airplanes are delivered from the factory with aviation grade mineral oil conforming to SAE J1966. During the first 25 hours of engine operation, it may be necessary to add oil. Use an aviation grade mineral oil of the recommended viscosity conforming to SAE J1966. After the first 25 hours, drain the engine oil and change the filter. Fill the oil sump with aviation grade mineral oil of the recommended viscosity, conforming to SAE J1966. Use it until a total of 50 hours of engine operation has occurred or oil consumption has stabilized. Then the sump must be drained and ashless dispersant oil conforming to SAE J1899, must be added to the engine.

NOTE: The turbocharged engines use only ashless dispersant oil conforming to SAE J1899, even during the engine break-in period.

- (2) For other engine change intervals, refer to Chapter 5, [Inspection Time Limits](#).

3. Checking Engine Oil

A. Engine Oil Checking Procedures. Refer to Chapter 71, Engine - Description and Operation, [Figure 1](#).

- (1) Five to ten minutes after the engine has been stopped, exam the engine oil with the dipstick . The airplane must be in a level position as much as possible for the best indication.
- (2) Open the engine oil door on the upper cowling.
- (3) Remove the dipstick from the engine and wipe down with a clean cloth.
- (4) Insert the dip stick fully and remove.
- (5) Exam the oil level on the dipstick.
- (6) If the oil is low, add the correct quantity and viscosity of aviation grade engine oil.

NOTE: The airplane may be operating with SAE J1966 (straight mineral oil) during the initial break-in period or after an overhaul. After the break-in period, use a ashless dispersant oil conforming to SAE J1899. Make sure the proper oil type is used when servicing the engine.

- (7) Insert the dipstick in the filler tube and do a check for correct seating.
- (8) Close the engine oil door.

4. Changing Engine Oil

A. Oil Changing Procedures. Refer to Chapter 71, [Figure 1](#) Engine - Description and Operation.

NOTE: The nose of the airplane must be raised slightly for more positive draining of any sludge which may have collected in the engine oil sump.

- (1) Operate engine until oil temperature is at a normal operating temperature.

NOTE: Normal operating temperature is within the green arc of the oil temperature gage. The engine oil must be drained while the engine is still warm.

- (2) Shut off engine and remove the upper and lower cowling to get access to the oil drain plug and external oil filter. Refer to Chapter 71, [Cowl \(Lycoming\) - Maintenance Practices](#).

WARNING: Avoid skin contact with engine oil. Any engine oil that inadvertently gets on the skin should be immediately removed.

- (3) Remove and discard the wire from the drain plug.
- (4) Remove the drain plug and let the oil drain into an applicable container.
- (5) After the engine oil has drained, install and safety the drain plug with wire. Refer to the Lycoming SSP-1776 Table of Limits or latest revision, for torque requirements and refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (6) Remove the suction screen from the oil sump.

- (a) Do an inspection for metal particles.
 - 1 If metal content is shown, keep the material for identification. Additional investigation will be required to determine the source of the metal and possible need for corrective maintenance. Refer to Lycoming SB480F (or latest revision) and contact a Textron Lycoming representative.
- (b) Install the suction screen with a new gasket. Refer to the Lycoming SSP-1776 Table of Limits or latest revision, for torque requirements.
- (c) Safety the suction screen with wire. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (7) Remove the external oil filter.
 - (a) Open the filter can and check the oil from the filter for signs of metal in the filter.
 - (b) Carefully remove and unfold the paper element. Examine the material in the filter.
 - 1 If metal content is shown, keep the material for identification. Additional investigation will be required to determine the source of the metal and possible need for corrective maintenance. Refer to Lycoming SB480F and contact a Textron Lycoming representative.
 - (c) Install a new external oil filter.
 - (d) Safety the oil filter with wire. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (8) Fill the engine oil sump through the filler tube. Use the correct grade and quantity of oil. Refer to [Replenishing - Description and Operation](#) for oil quantity. Refer to the applicable Model 182 POH for the correct grade of oil.
- (9) Install the dipstick and make sure proper seating on the filler tube.
- (10) Operate the engine until the normal operating temperature is reached.
- (11) Shut down the engine and do a leak check.

Figure 1 : Sheet 1 : Engine Installation

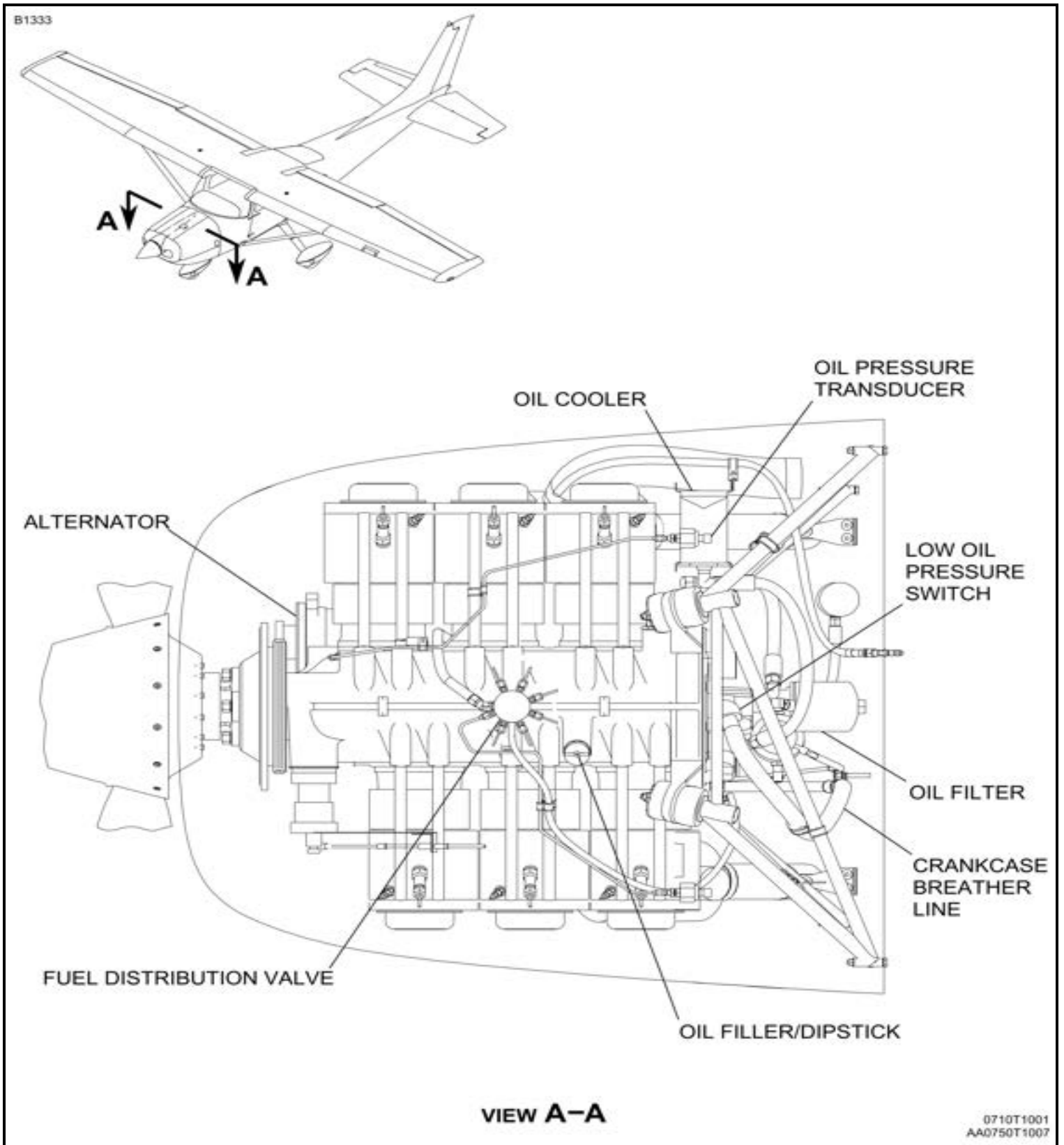


Figure 1 : Sheet 2 : Engine Installation

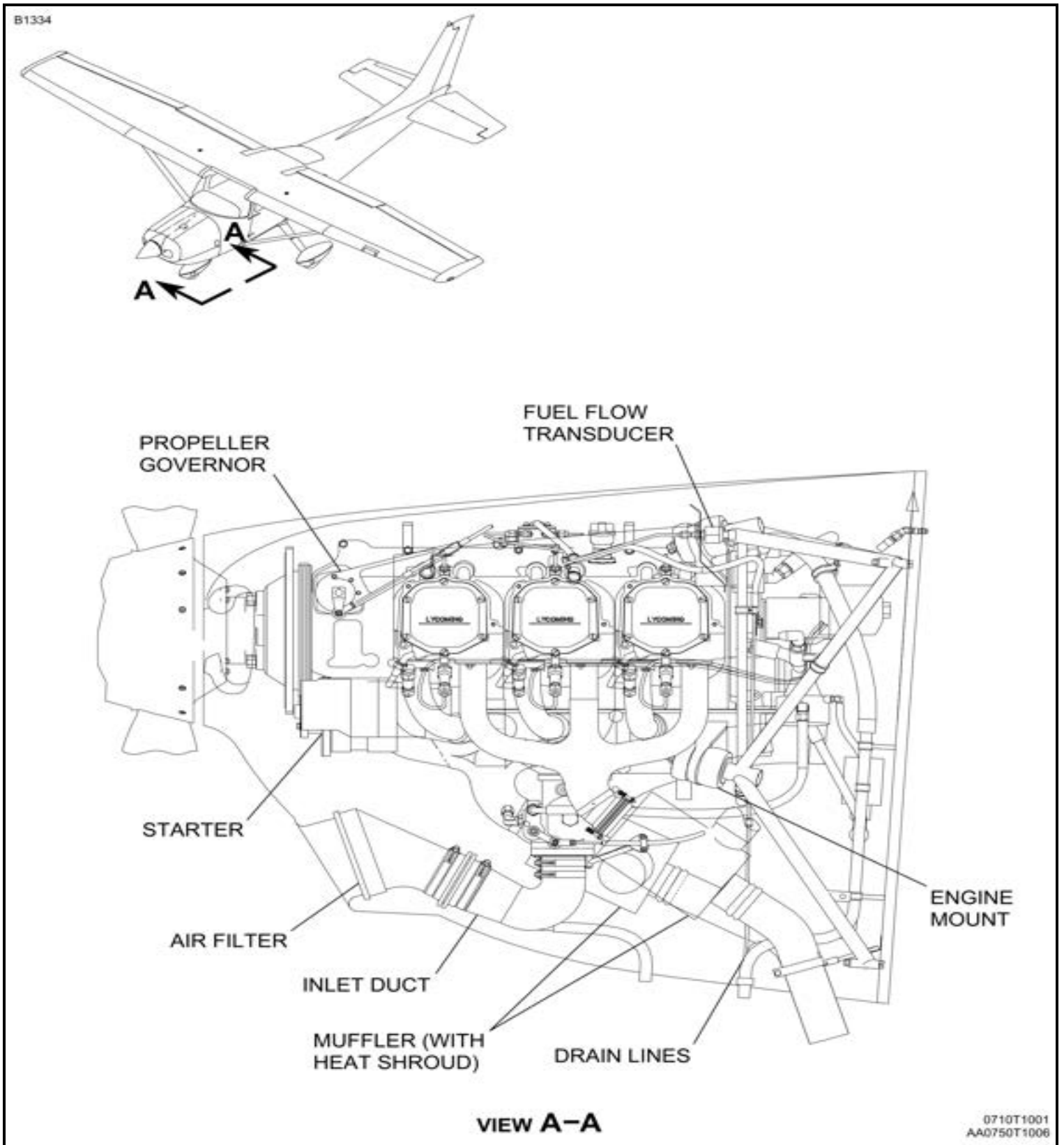


Figure 1 : Sheet 3 : Engine Installation

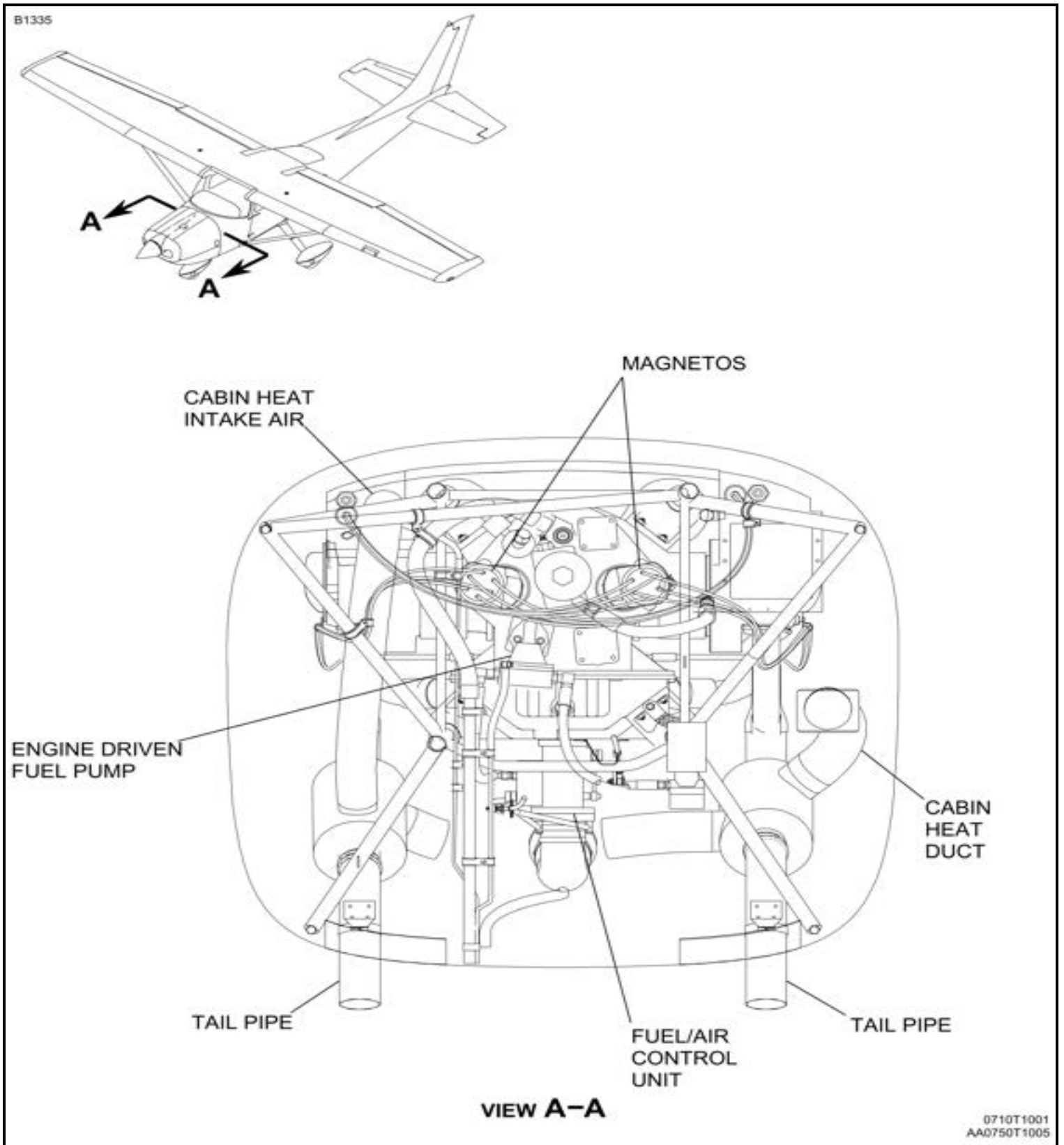


Figure 1 : Sheet 4 : Engine Installation

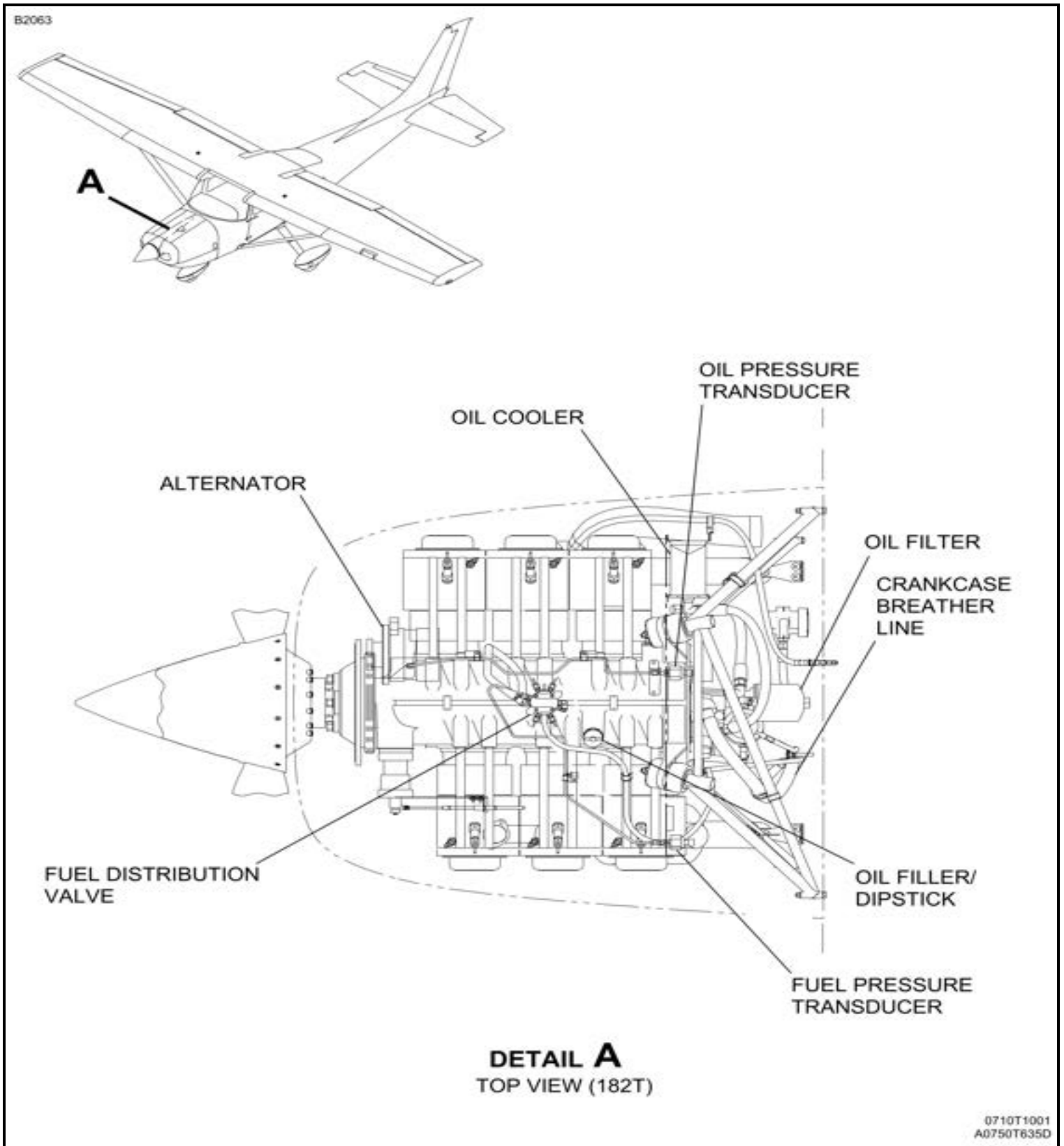


Figure 1 : Sheet 5 : Engine Installation

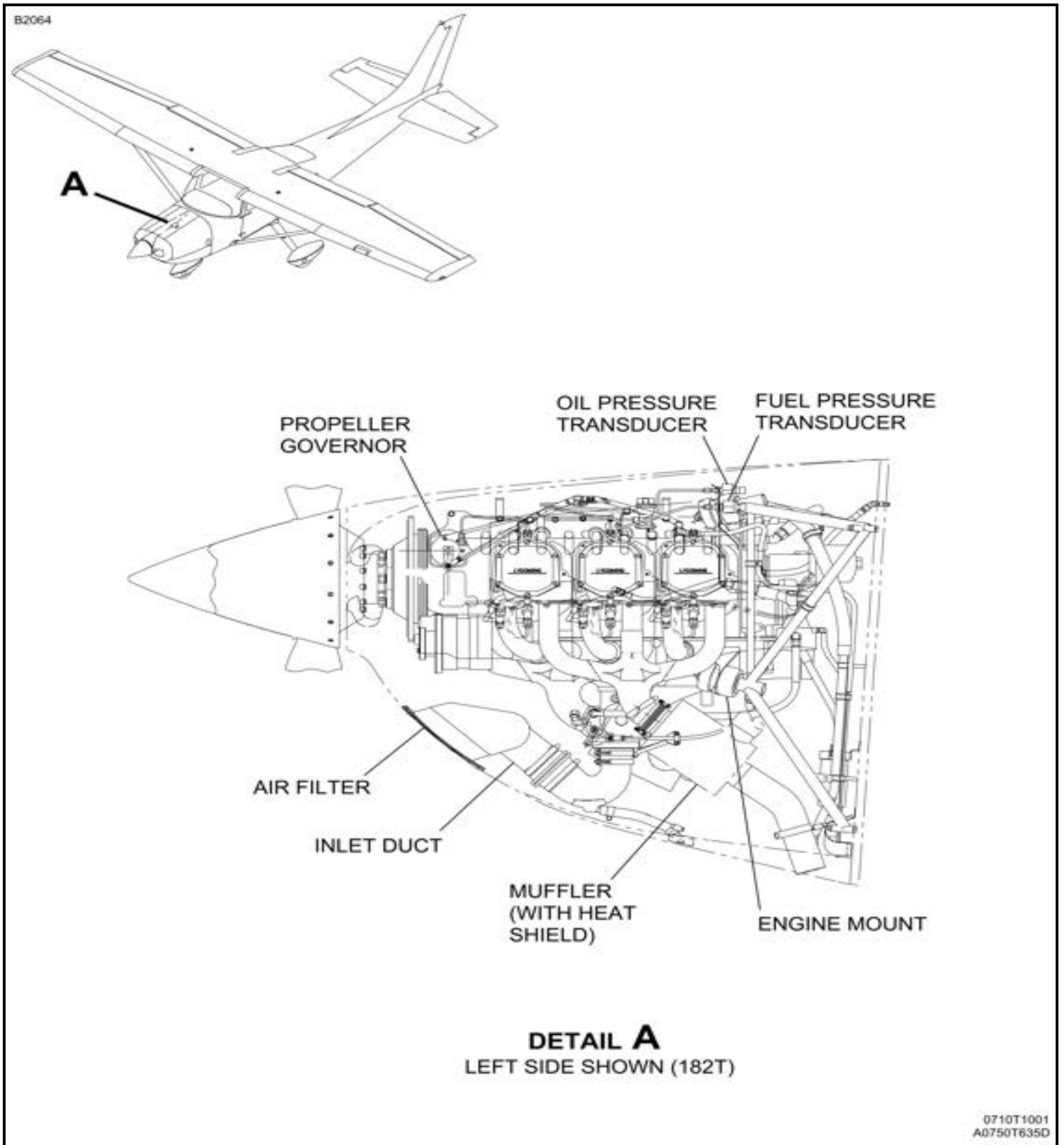


Figure 1 : Sheet 6 : Engine Installation

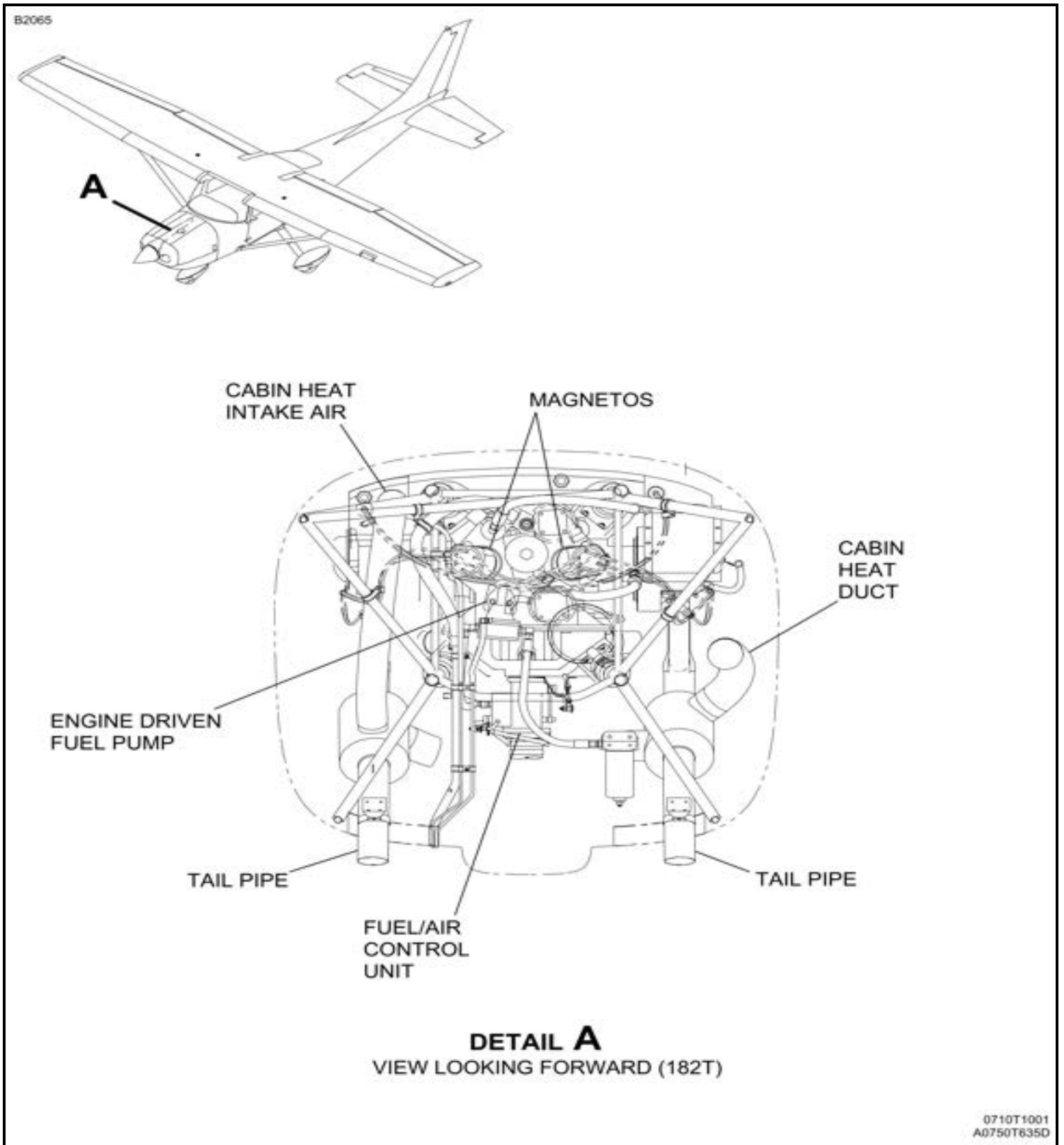


Figure 1 : Sheet 7 : Engine Installation

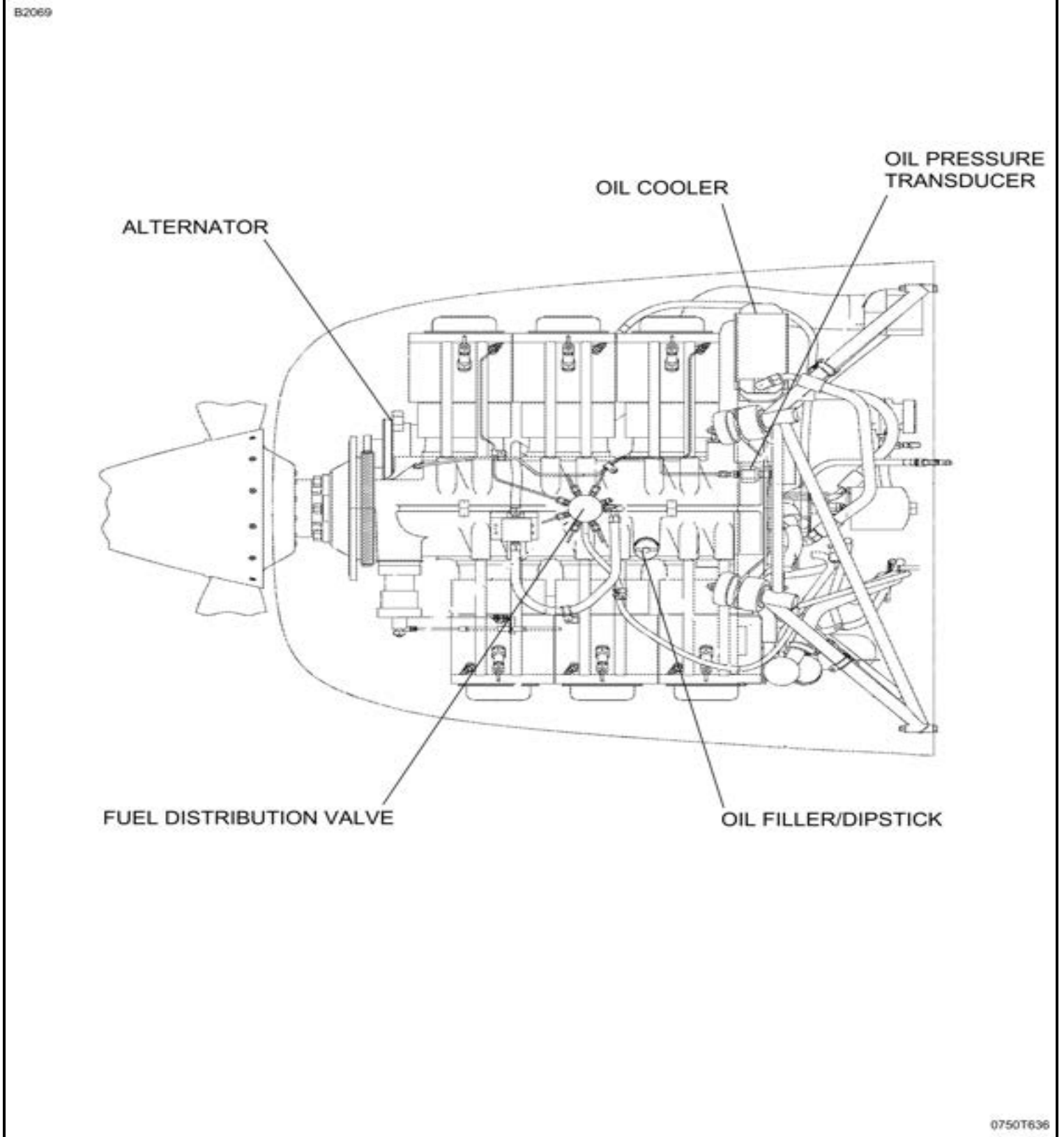
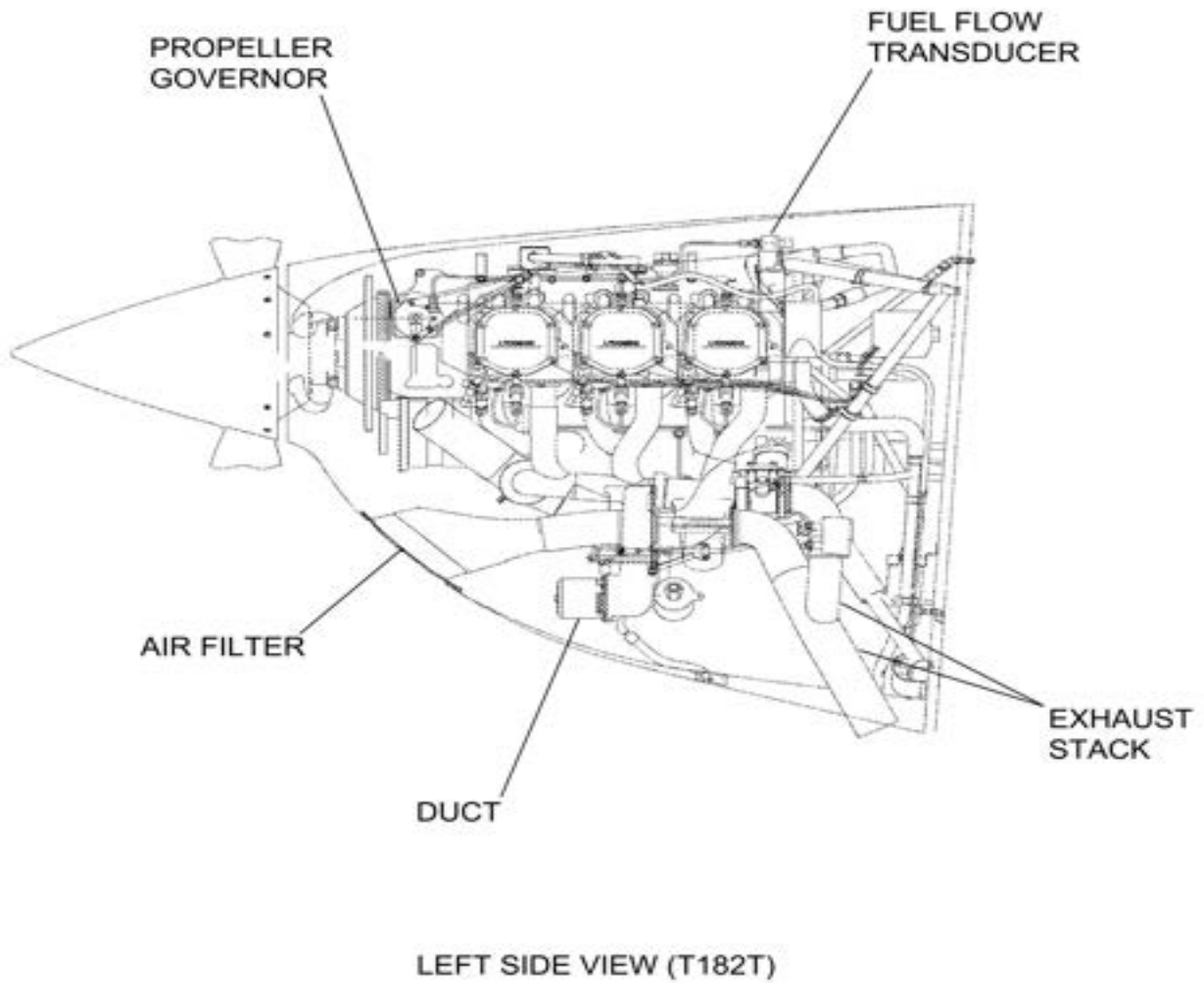


Figure 1 : Sheet 8 : Engine Installation

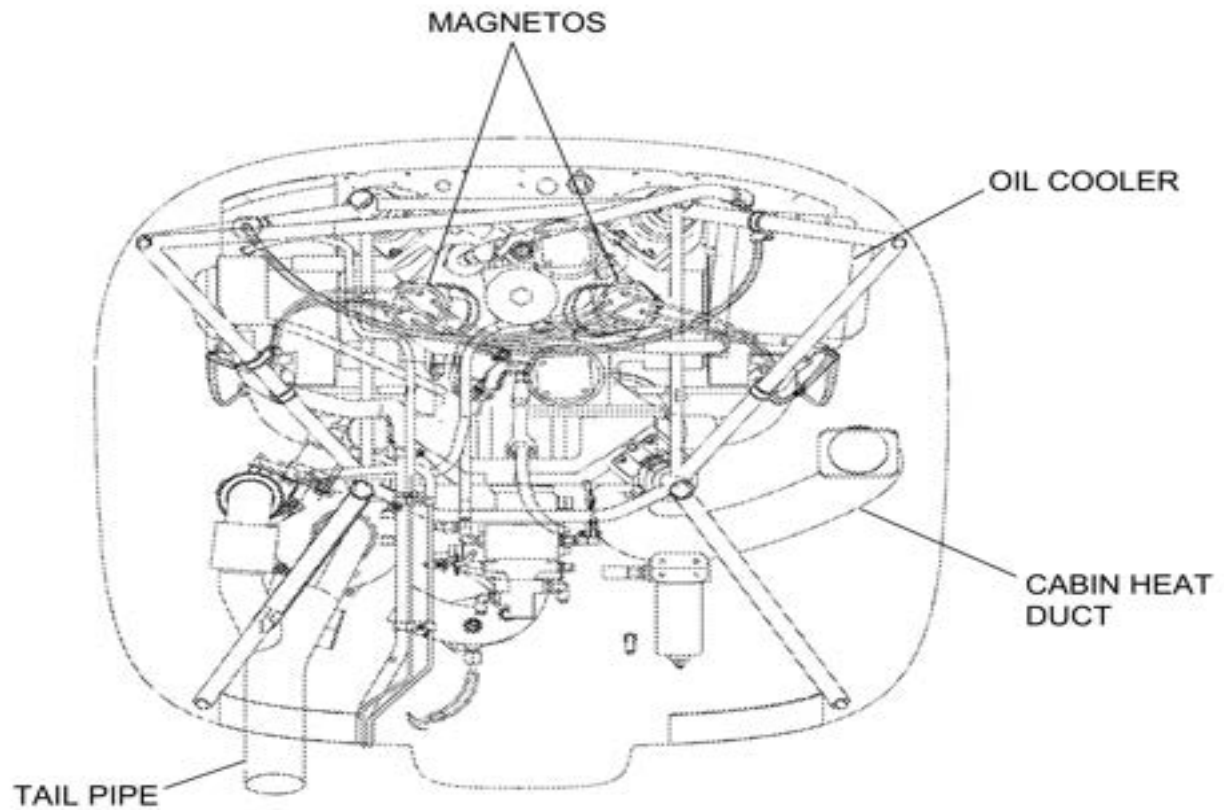
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Figure 1 : Sheet 9 : Engine Installation

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VIEW LOOKING FORWARD (T182T)

0750T636

INDUCTION AIR FILTER - SERVICING

1. General

- A. The induction air filter keeps dust and dirt from entering the induction system. The value of maintaining the air filter in a good clean condition can never be overstressed. More engine wear is caused through the use of a dirty or damaged air filter than is generally believed. The frequency with which the filter should be removed, inspected, and cleaned will be determined primarily by airplane operating conditions. Under extremely dusty conditions, daily servicing of the filter may be required.

2. Air Filter Servicing

- A. The CA3717 Induction Air Filter should be serviced at 50 hours, is life limited and must be replaced at 100 hours. The P198290 Induction Air Filter should be serviced at 50 hours, is life limited and must be replaced at 500 hours. (Refer to [Chapter 5, Inspection Time Limits](#).)

B. Servicing Procedures.

- (1) To service the CA3717 Air filter:

- Remove filter from airplane. If damaged or split, replace filter. If filter is in serviceable condition, proceed with following steps.
- Clean filter by blowing with compressed air from direction opposite of normal air flow.
- Ensure air box is clean and free of debris before installing filter.
- Install filter at entrance to air box.

- (2) To service the P198290 Air filter:

- (a) Remove the filter from the airplane.

NOTE: Use care to prevent damage to filter element when cleaning filter with compressed air.

- Clean filter by blowing with compressed air (not over 100 psi) from direction opposite of normal air flow. Arrows on filter case indicate direction of normal air flow.
- Check bonding of the paper pleats to the face screen. The bonding holds the paper pleats in place and if broken, the pleats are free to shift which can impair filtration. A face screen that is loose or gapping away from the paper pleats is indicative of broken bonding and is cause to replace the filter element.

CAUTION: Do not use solvent or cleaning fluids to wash filter. Use only a water and household detergent solution when washing the filter.

- (d) After cleaning as outlined in step "b", the filter may be washed, if necessary, in a solution of warm water and a mild household detergent. A cold water solution may be used.

NOTE: The filter assembly may be cleaned with compressed air a maximum of 30 times or it may be washed a maximum of 20 times. A new filter must be installed after using 500 hours of engine operating time or one year, whichever should occur first. However, a new filter must be installed anytime the existing filter is damaged. A damaged filter may have sharp or broken edges in the filtering panels which would allow unfiltered air to enter the induction system. Any filter that appears doubtful, shall have a new filter installed in its place.

- (e) After washing, rinse filter with clear water until rinse water draining from the filter is clear. Allow water to drain from filter and dry with compressed air (not over 100 psi).

NOTE: The filtering panels of the filter may become distorted when wet, but they will return to their original shape when dry.

- Be sure airbox is clean, and inspect filter. If filter is damaged, a new filter must be installed.
- Install filter at entrance to airbox with gasket on aft face of filter frame and with flow arrows on filter frame pointed in the correct (normal air flow) direction.

VACUUM SYSTEM FILTERS - SERVICING

1. General

- A. The vacuum system contains two filters which require occasional servicing. The vacuum system central air filter is located behind the instrument panel, and the vacuum system relief valve filter is located in the engine compartment.

NOTE: Smoking in cabin will significantly decrease the vacuum system central air filter life. If air filter becomes sufficiently clogged to cause suction gage readings to drop below 4.6 in.Hg, air filter must be replaced regardless of time remaining until inspection/replacement.

2. Central Air Filter Servicing

- A. The central air filter should be serviced using time intervals set forth in [Chapter 5, Inspection Time Limits](#).
B. Servicing Procedures (Refer to [Figure 301](#)).

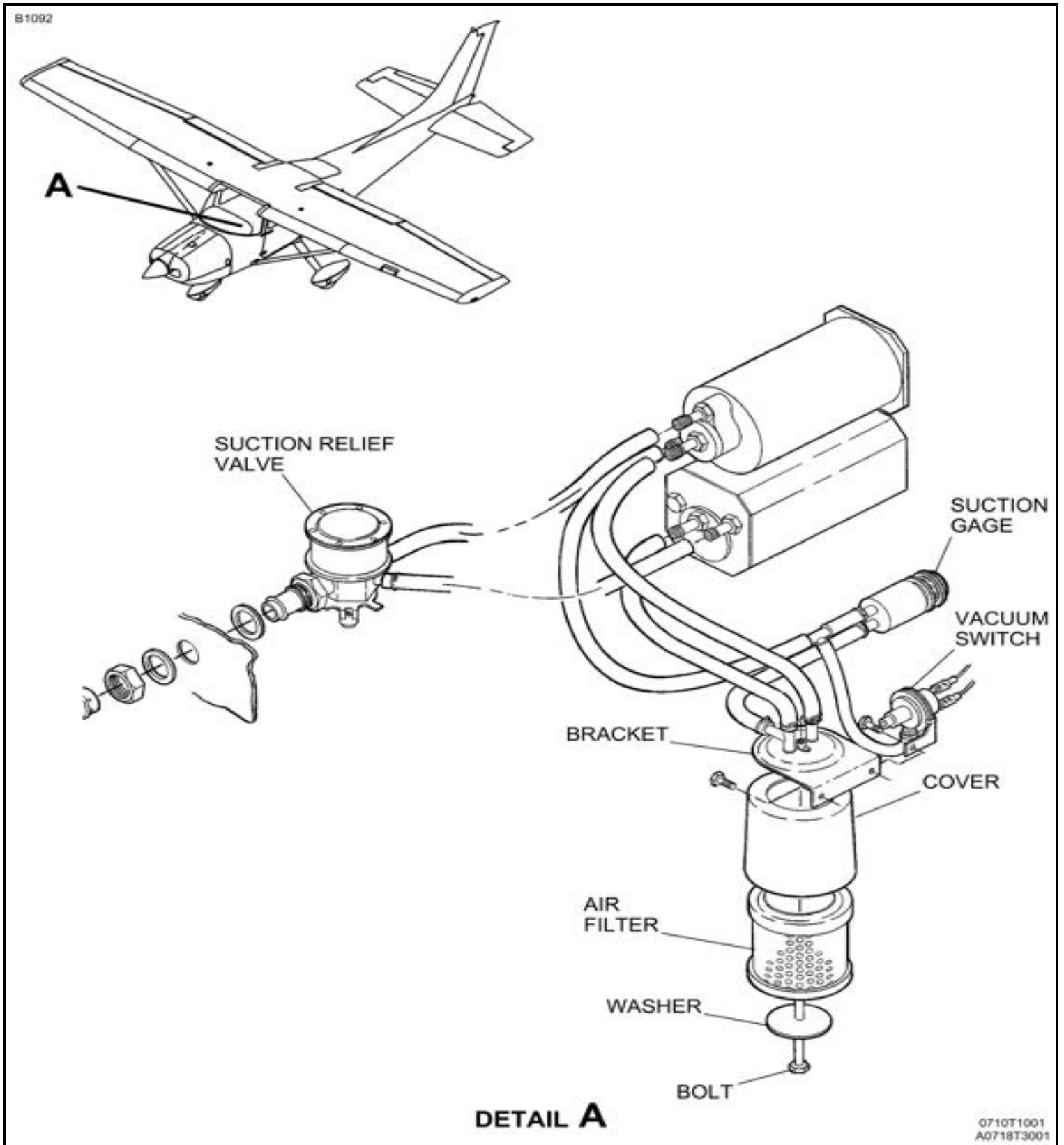
CAUTION: Do not operate the vacuum system with air filter removed or with a vacuum line disconnected. Particles or dust or other foreign matter may enter the system and damage the vacuum operated instruments.

- (1) Locate air filter forward of instrument panel.
- (2) Remove bolt and washer securing air filter to cover.
- (3) Check for damage, deterioration and contamination. Clean (or replace) as required.
- (4) Install air filter in cover and secure using bolt and washer.

3. Vacuum System Relief Valve Filter

- A. The relief valve filter should be serviced using time intervals set forth in [Chapter 5, Inspection Time Limits](#).

Figure 301 : Sheet 1 : Vacuum System Air Filter - Servicing



BATTERY - SERVICING

1. General

- A. This procedure provides instructions for servicing the aircraft main battery. For testing, charging and maintenance on the battery, refer to [Chapter 24, Battery - Maintenance Practices](#). The flooded type contains separate cell vent caps to allow internal servicing and the sealed type does not allow internal servicing.

2. Battery Servicing- Flooded Type

- A. The battery should be serviced according to time limits set forth in [Chapter 5, Inspection Time Limits](#).
- B. Battery servicing involves adding distilled water to maintain the electrolyte even with the horizontal baffle plate at the bottom of the filler holes, checking the battery cable connections, and neutralizing and cleaning off any spilled electrolyte or corrosion. Use bicarbonate of soda (baking soda) and water to neutralize electrolyte or corrosion. Follow with a thorough flushing with a wire brush, then coat with petroleum jelly before connecting. The battery box should also be checked and cleaned if any corrosion is noted. Distilled water, not acid or "rejuvenators" should be used to maintain electrolyte level. Inspect the battery in accordance with time limits spelled out in [Chapter 5, Inspection Time Limits](#).

3. Battery Servicing- Sealed Type

- A. The sealed type battery does not allow for servicing of the electrolyte level.
- B. Battery servicing involves checking the battery cable connections and neutralizing and cleaning off any corrosion. Use bicarbonate of soda (baking soda) and water to neutralize and clean corrosion. Follow up by scrubbing the connections with a wire brush, then coat with petroleum jelly before connecting. The battery box should also be checked and cleaned if any corrosion is noted. Inspect the battery in accordance with time limits spelled out in [Chapter 5, Inspection Time Limits](#).

TIRES - SERVICING

1. General

- A. Servicing the tire by maintaining correct inflation pressure is the most important job in any tire preventative maintenance program. Improper inflation pressure causes uneven tread wear.
- (1) Under inflation, indicated by excessive wear in the shoulder area, is particularly damaging. It increases the chance of bruising sidewalls and shoulders against rim flanges. In addition, it shortens tire life by permitting excessive heat buildup.
 - (2) Over inflation is indicated by excessive wear in the center of the tire. This condition reduces traction, increases tire growth and makes treads more susceptible to cutting.

2. Safety Precautions and Notes

- A. Safety Precautions.
- (1) Tire should be allowed to cool before attempting to service.
WARNING: The tendency of a bursting tire is to rupture along the bead. Standing in any position in front of either bead area could cause injury if the tire should burst.
 - (2) Personnel should stand at a 90-degree angle to the axle along the centerline of the tire during servicing.
CAUTION: Applying a tire sealant to the tire may cause wheel corrosion.
 - (3) The use of tire sealant is not recommended.
- B. Notes.
- (1) A tube type tire that has been freshly mounted and installed should be closely monitored during the first week of operation, ideally before every takeoff. Air trapped between the tire and the tube at the time of mounting could seep out under the bead, through sidewall vents or around the valve stem, resulting in an under inflated assembly.
 - (2) The initial stretch or growth of a tire results in a pressure drop after mounting. Consequently, tires should not be placed in service until they have been inflated a minimum of 12 hours, pressures rechecked, and tires reinflated if necessary.
 - (3) Inaccurate tire pressure gages are a major cause of improper inflation pressures. Ensure gages used are accurate.

3. Tire Servicing

- A. Check tire pressure regularly.
- (1) Tire pressure should be checked when tire is cold (at least 2 or 3 hours after flight) on a regular basis. Tire pressure should be checked prior to each flight when practical.
 - (2) When checking tire pressure, examine tires for wear, cuts, and bruises. Remove oil, grease and mud from tires with soap and water.
- B. Use recommended tire pressure. Consult the [table](#) below.
- NOTE: Recommended tire pressures should be maintained, especially in cold weather. Any drop in temperature of the air inside a tire causes a corresponding drop in air pressure.**

Main Gear Tire Type:	Pressure
6.00 x 6, 6-ply rated tire	42 PSI (2895 pa)
Nose Gear Tire Type:	
5.00 x 5, 6-ply rated tire	49 PSI(3378 pa)

4. Cold Weather Servicing

- A. Cold Weather Servicing.
- (1) Check tires for excessive deflation.
NOTE: Tire air pressure will decrease somewhat as the temperature drops, but excessive deflation could indicate cold weather leakage at the air valve. Avoid unnecessary pressure checks.
 - (2) If it is necessary to pressure check tires in cold climates, always apply heat to air valves and surrounding areas before unseating valves.
 - (3) Continue application of heat during reinflation to ensure air valve seal flexibility when valve closes.
 - (4) Do not allow tires to stand in snow soaked with fuel, or on fuel covered ramp areas.
 - (5) If tires become frozen to parking ramp, use hot air or water to melt ice bond before attempting to move airplane.

SCHEDULED SERVICING - DESCRIPTION AND OPERATION

1. General

- A. This section provides instructions necessary to carry out scheduled servicing as well as internal/external cleaning. It also includes instructions for lubricating specific points identified in periodic inspection and/or preventive maintenance programs. This section does not include lubrication procedures required for the accomplishment of maintenance practices.

2. Description

- A. This section is subdivided to provide maintenance personnel with charts, text and illustrations to prevent confusion. Also included in this section is a [table](#) containing a list of lubricants.
 - (1) The subdivisions are separated according to airplane systems. This aids maintenance personnel in locating service information.

LUBRICANTS - DESCRIPTION AND OPERATION

1. General

- A. This section is designed to assist the operator in selecting recommended lubricants. For best results and continued trouble free service, use clean and approved lubricants.
- B. For a list of recommended lubricants, refer to [Recommended Lubricants Table](#).

2. Lubrication Service Notes

- A. Lubricant Application.

NOTE: If you service the airplane with a grease type that differs from the grease type from the previous service, or if you do not know the grease type for the previous service, you must do the applicable Grease Type Changeover procedure.

- (1) Cleanliness is essential to good lubrication. Lubricants and dispensing equipment must be kept clean. Use only one lubricant in a grease gun or oil can.
- (2) Store lubricants in a protected area. Containers should be closed at all times when not in use.
- (3) Wipe grease fittings and areas to be lubricated with clean, dry cloths before lubricating.
- (4) When lubricating bearings which are vented, force grease into fitting until old grease is extruded.
- (5) After any lubrication, clean excess lubricant from all but actual working parts.
- (6) All sealed or prepacked antifriction bearings are lubricated with grease by the manufacturer and require no further lubrication.
- (7) Friction bearings of the porous, sintered- type are prelubricated. An occasional squirt can oiling of such bearings with general purpose oil (MIL-L-7870) extends its service life.
- (8) Lubricate unsealed pulley bearings, rod ends, pivot end hinge points and any other friction point obviously needing lubrication, with general purpose oil (MIL-L- 7870).
- (9) Paraffin wax rubbed on seat rails will ease sliding the seats fore and aft.
- (10) Do not lubricate roller chains or cables except under sea coast conditions. Wipe with a clean, dry cloth.
- (11) All piano hinges may be lubricated using (PG) powered graphite (SS-G-659) when assembly is installed.
- (12) Lubricate door latching mechanism with MIL-G-81322 general purpose grease, applied sparingly to friction points, if binding occurs. No lubrication is recommended on the rotary clutch.

3. Definition of "As Needed"

- A. In the following sections, time requirements for lubrication are presented in one of two formats. When specific time intervals for lubrication exist, those intervals are defined in Chapter 5, Inspection Time Limits. When no time limit has been established, lubrication is on an "as needed" basis. This leaves much of the decision making process in the hands of the airframe and powerplant mechanic, who has been trained to make these types of decisions.
- B. In an effort to standardize the decision making process, the following guidelines may be considered to determine if a component needs lubrication. Any one of the following conditions would indicate a need for lubrication, and may additionally indicate the need for inspection:
 - (1) A visual inspection which indicates dirt or wear residue near the movement contact area.
 - (2) An audible inspection which indicates squeaks, grinding or other abnormal sounds.
 - (3) A tactile (touch and feel) inspection which indicates jerky or restricted movement throughout portions of the travel range.

4. Recommended Lubricants Table

NOTE: Equivalent substitutes may be used for the following items:

Table 1. Recommended Lubricants

SYMBOL	PROCUREMENT SPECIFICATION	LUBRICANT DESCRIPTION	PRODUCT PART NUMBER	SUPPLIER
GR Note 1	MIL-G-81322	Grease, wide temperature range.	Mobil grease 28	Mobil Oil Corp. 150 E. 42nd Street New York, NY 10017

			Royco 22C	Royal Lubricants Co., Inc. River Road East Hanover, NJ 07936
			Aeroshell grease 22	Shell Oil Co. One Shell Plaza Houston, TX 77001
GH	MIL-G-23827	Grease, aircraft and instrument, gear and actuator screw.	Southwest Grease 16215	Southwest Petro- Chem, Inc. Division - Witco 1400 S. Harrison Olathe, KS 66061
			Aeroshell grease 7	Shell Oil Co.
			Royco 27A	Royal Lubricants Co., Inc.
			Supermil grease No. A72832	Amoco Oil Co. 200 East Randolph Dr. Chicago, IL 60601
			Braycote 6275	Burmah-Castrol, Inc. Bray Products Div. 16815 Von Karman Ave. Irving, CA 92714
			Castrollease A1	Burmah-Castrol, Inc.
			TG-11900 low temp grease EP	Southwest Petro-Chem, Inc.
			Brayco 885	Brumah-Castrol, Inc.
OG	MIL-L-7870	Oil, general purpose	Royco 363	Royal Lubricants Co., Inc.
			Petrotect 7870A	Penreco 106 South Main Street Butler, PA 16001
			Windsor lube L-1018	Anderson Oil & Chemical Co., Inc. Portland, CT 06480
			Octoil 70	Octagon Process, Inc. 596 River Road Edgewater, NJ 07020
PL	VV-P-236	Petrolatum technical		Available Commercially
PG	SS-G-659	Powdered Graphite		Available Commercially

GL	MIL-G-21164	High and Low Temperature Grease	Everlube 211-G Moly Grease	E/M Corporation Highway 52 N.W. Box 2200 West Lafayette, IN 47906
GP	NONE	Number 10 weight, nondetergent oil	Royco 64	Royal Lubricants Co., Inc. Available Commercially
OL	VV-L-800	Light Oil		Available Commercially
		Grease, general purpose	U000992	Cessna Aircraft Co. 1 Cessna Blvd. Wichita, Ks 67277-7704

	SAE AMS3058	Grease, Wheel Bearing	NYCO GN 3058 (See CAUTION and NOTE 1)	NYCO Paris, France
	SAE AMS3058	Grease, Wheel Bearing	Aeroshell Grease 58 (See CAUTION and NOTE 1)	Shell Aviation London, United Kingdom

CAUTION:

Do not mix NYCO GN 3058 or Aeroshell Grease 58 with MIL-PRF-81322 aviation bearing greases. Mixture could break the thickener structure of the grease and cause damage to the wheel bearing components.

NOTE 1:

NYCO GN 3058 and Aeroshell Grease 58 are high-performance greases specified to SAE AMS3058. They are lithium-based with exceptional corrosion resistance and comparable properties to Exxon Mobil Aviation Grease SHC 100. These greases are acceptable alternatives to the MIL-PRF-81322 bearing greases.

5. Grease Type Changeover Procedure

NOTE: You must do the applicable grease type changeover procedure before you lubricate the airplane with a grease approved to a different specification type, or produced by a different manufacturer.

- A. Do the Main Landing Gear Wheel Bearing Grease Type Changeover procedure (Refer to Chapter 32, Main Landing Gear Wheel and Axle, 32-40-00 Figure 202, Sheet 1).
 - (1) Remove the Main Landing Gear Wheels from the airplane. Refer to the removal/installation procedure in Chapter 32, Main Landing Gear Wheel and Axle - Maintenance Practices.
 - (2) Disassemble the Main Wheel. Refer to the disassembly/assembly procedure in Chapter 32, Main Landing Gear Wheel and Axle - Maintenance Practices.
 - (3) Remove the old grease from the components. Refer to Chapter 20, General Solvents/Cleaners - Maintenance Practices.

CAUTION: Make sure all components are free of the old grease before you apply the new grease type. If you mix aviation bearing greases, a break down of the grease structure could occur and cause damage to the wheel bearing.

 - (4) Assemble the Main Wheel. Refer to the disassembly/assembly procedure in Chapter 32, Main Landing Gear Wheel and Axle - Maintenance Practices.
- B. Do the Nose Landing Gear Wheel Bearing Grease Type Changeover procedure (Refer to Chapter 32, Nose Landing Gear Wheel, 32-41-00 Figure 201, Sheet 1).
 - (1) Remove the Nose Landing Gear Wheel from the airplane. Refer to the removal/installation procedure in Chapter 32, Nose Landing Gear Wheel - Maintenance Practices.

(2) Disassemble the Nose Wheel. Refer to the disassembly/assembly procedure in Chapter 32, [Nose Landing Gear Wheel - Maintenance Practices](#).

(3) Remove the old grease from the components. Refer to Chapter 20, [General Solvents/Cleaners - Maintenance Practices](#).

CAUTION: Make sure all components are free of the old grease before you apply the new grease type. If you mix aviation bearing greases, a break down of the grease structure could occur and cause damage to the wheel bearing.

(4) Assemble the Nose Wheel. Refer to the disassembly/assembly procedure in Chapter 32, [Nose Landing Gear Wheel - Maintenance Practices](#).

Figure 202 : Sheet 1 : Main Wheel Assembly

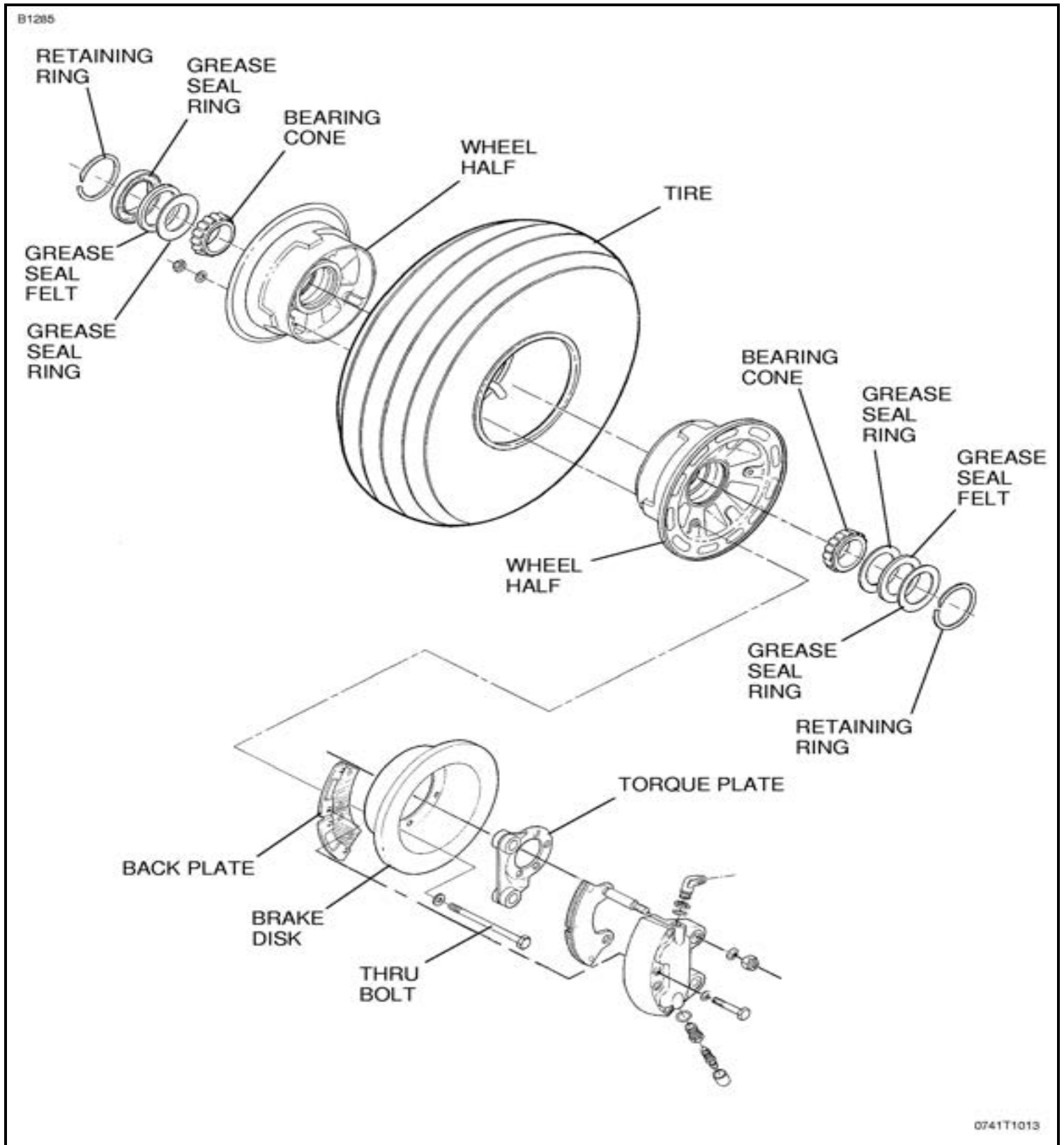


Figure 201 : Sheet 1 : Nose Landing Gear Wheel Installation

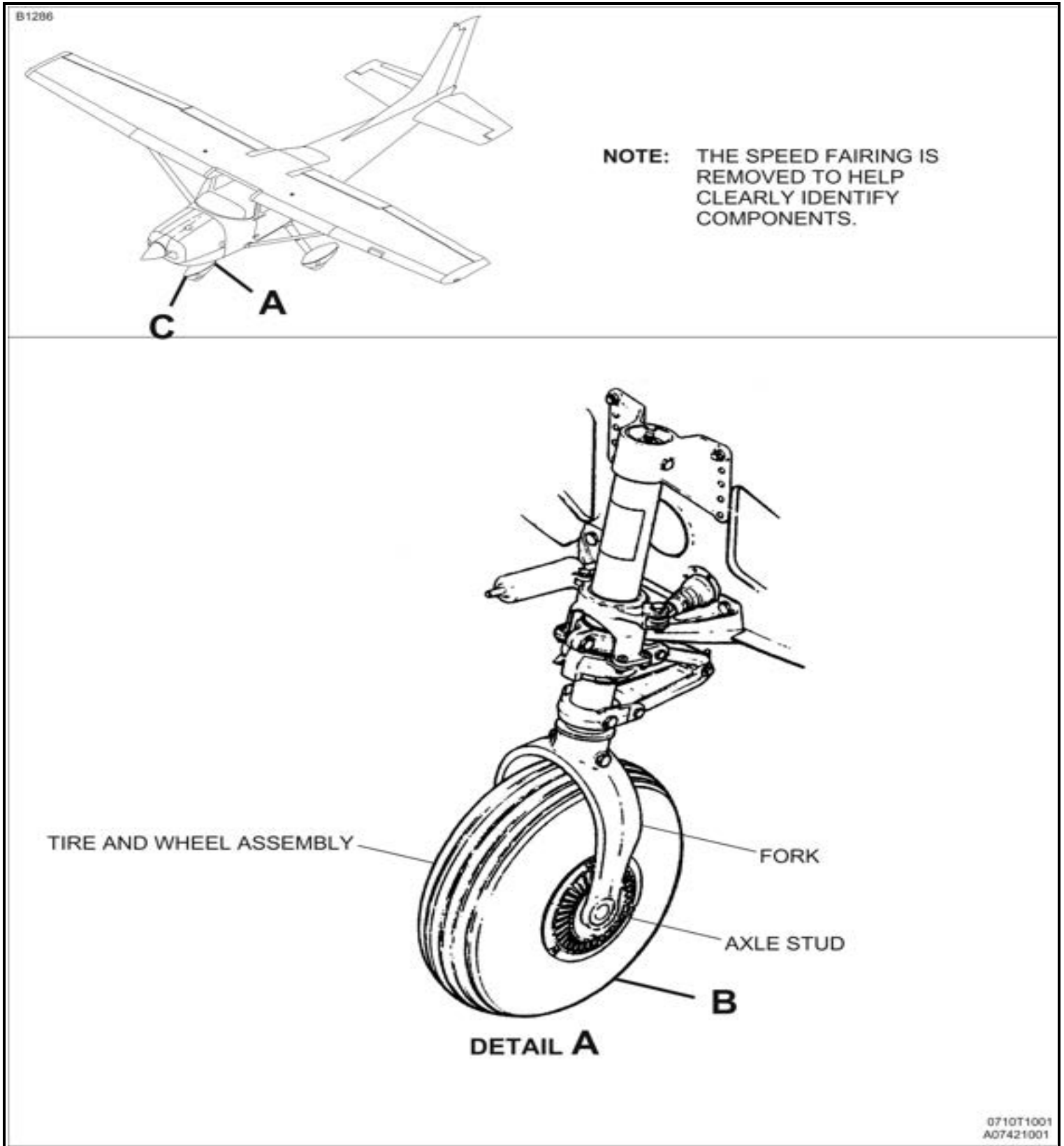


Figure 201 : Sheet 2 : Nose Landing Gear Wheel Installation

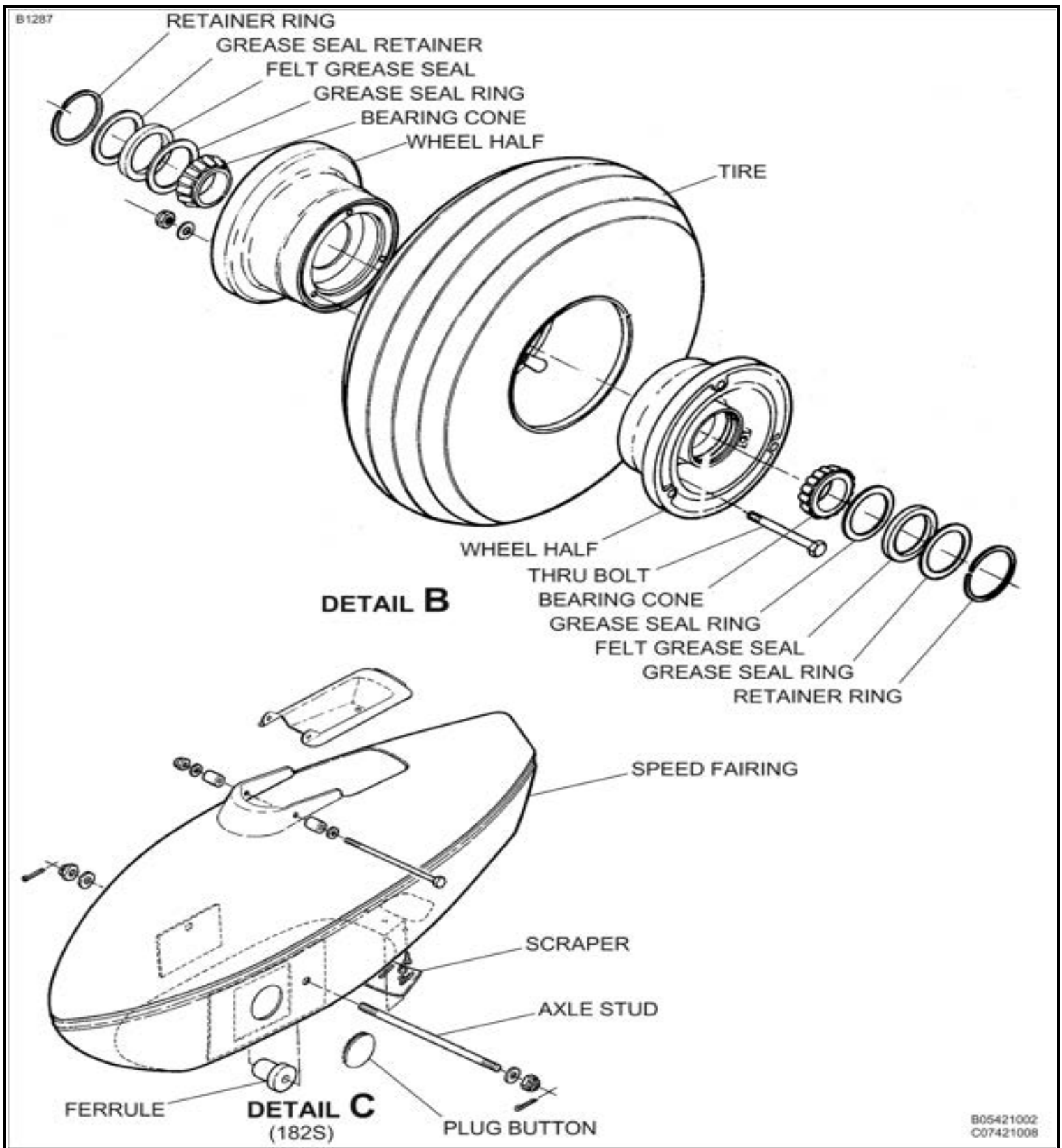
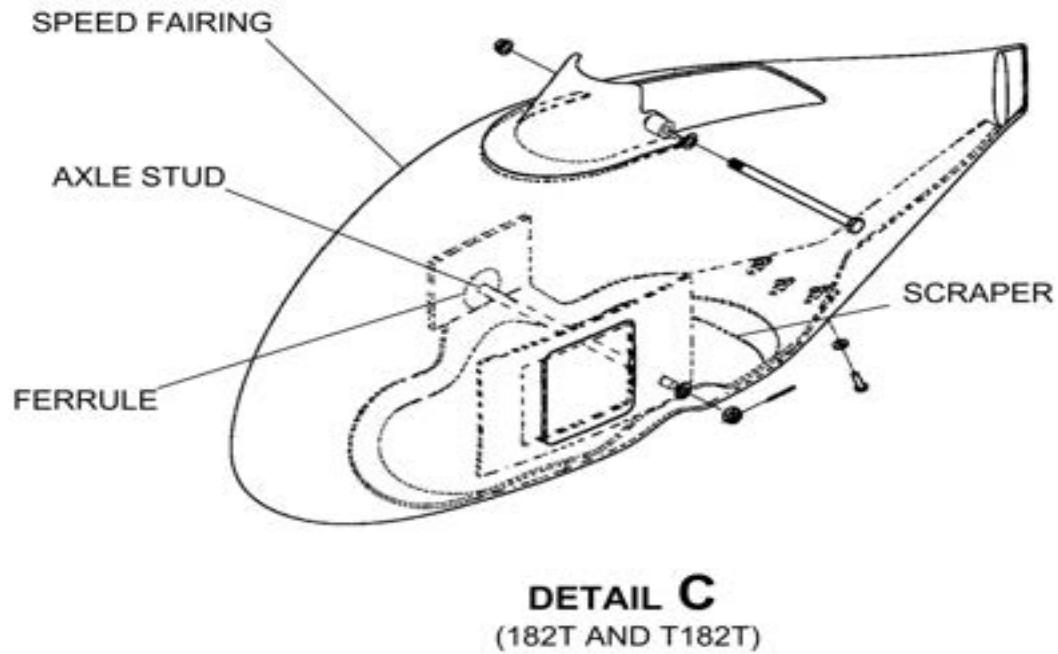


Figure 201 : Sheet 3 : Nose Landing Gear Wheel Installation



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BATTERY TERMINALS - SERVICING

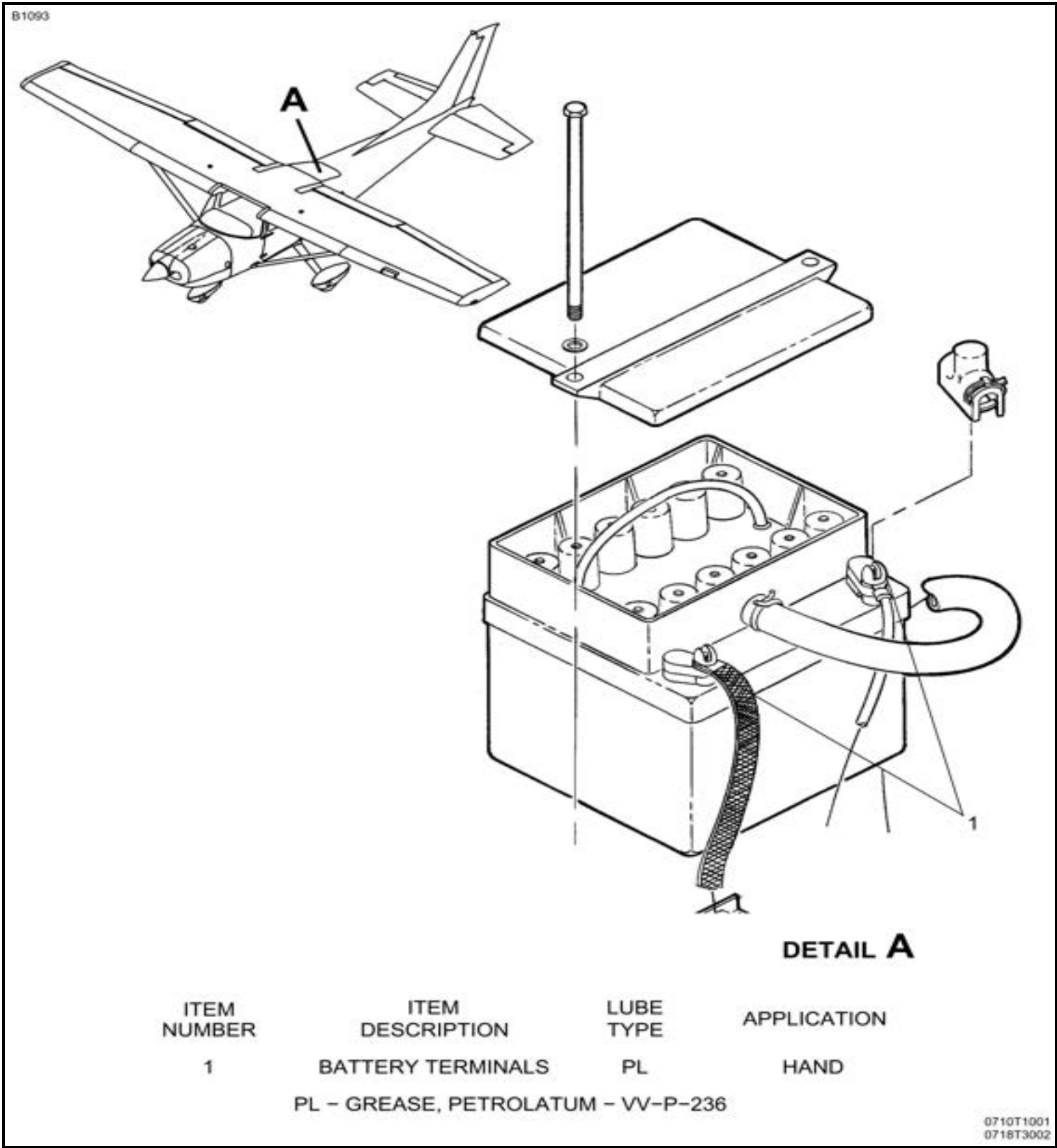
1. General

- A. It is recommended the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Battery Terminal Lubrication

- A. Battery terminals should be lubricated when cables are installed to terminals.
- B. Refer to [Figure 301](#) for lubrication requirements of the battery terminals.

Figure 301 : Sheet 1 : Battery Terminals Lubrication



LANDING GEAR AND PARKING BRAKE - SERVICING

1. General

- A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Wheel Bearing Lubrication

- A. Wheel bearings should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#).

WARNING: When cleaning wheel bearings, use low-pressure shop air to dry bearings. Do not spin bearing cones with compressed air. Dry bearings without lubrication may explode at high rpm.

- B. Refer to [Figure 301](#) for lubrication requirements of the wheel bearings.

3. Nose Gear Torque Link Lubrication

- A. Nose gear torque links should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#).
- B. Refer to [Figure 301](#) for lubrication requirements of the nose gear torque links.

4. Shimmy Dampener Pivots Lubrication

- A. Shimmy dampener pivots should be lubricated on an “as needed” basis and when assembled or installed.
- B. Refer to [Figure 301](#) for lubrication requirements of the shimmy dampener pivots.

5. Steering System Needle Bearing Lubrication

- A. Steering system needle bearings should be lubricated on an “as needed” basis and when assembled or installed.
- B. Refer to [Figure 301](#) for lubrication requirements of the steering system needle bearings.

6. Nose Gear Steering Pushrods Lubrication

- A. Nose gear steering pushrods should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#).
- B. Refer to [Figure 301](#) for lubrication requirements of the nose gear steering pushrods.

7. Parking Brake Handle Shaft Lubrication

- A. The parking brake handle shaft should be lubricated on an “as needed” basis and when assembled or installed.
- B. Refer to [Figure 302](#) for lubrication requirements of the parking brake handle shaft.

Figure 301 : Sheet 1 : Landing Gear Lubrication

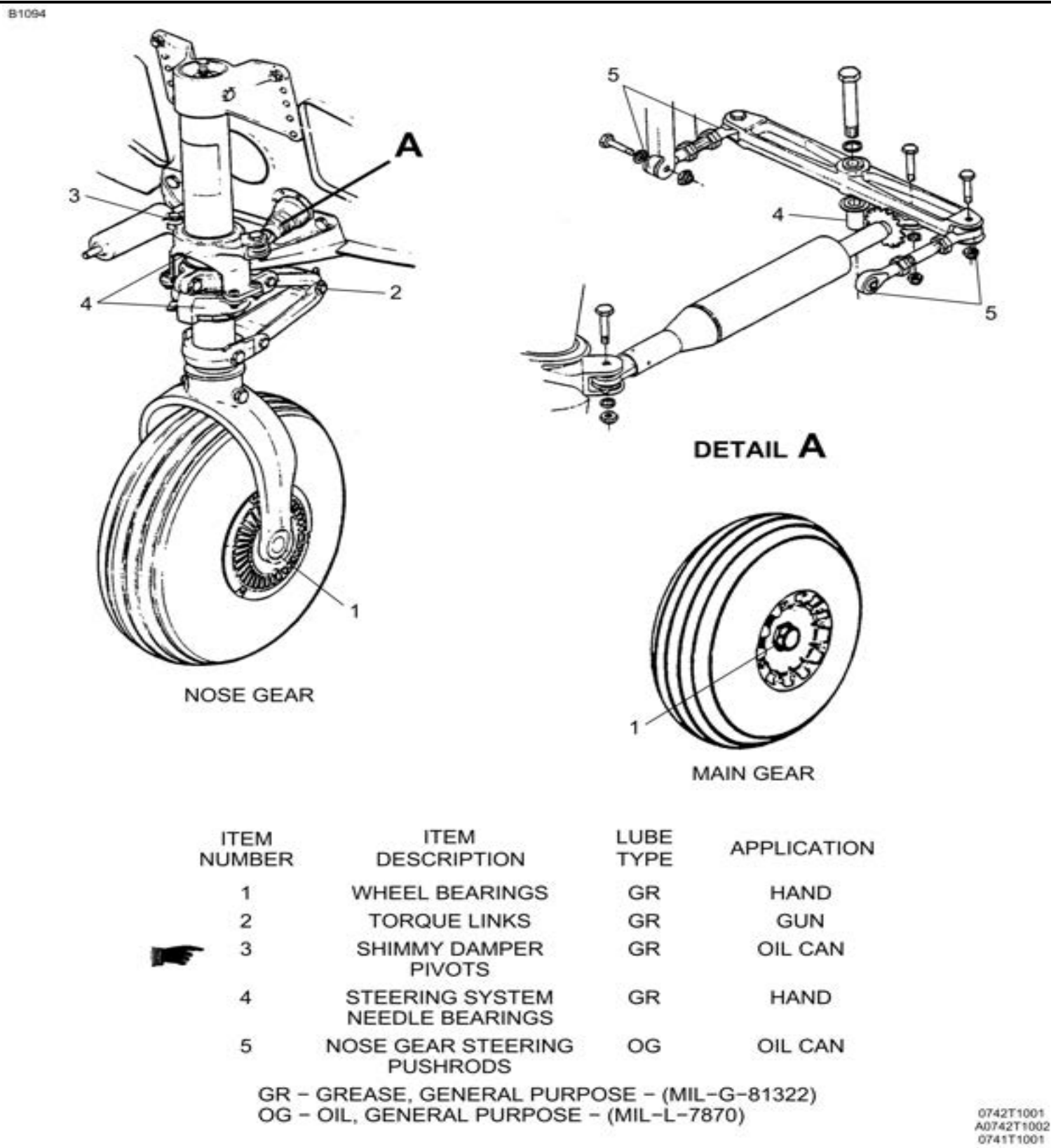
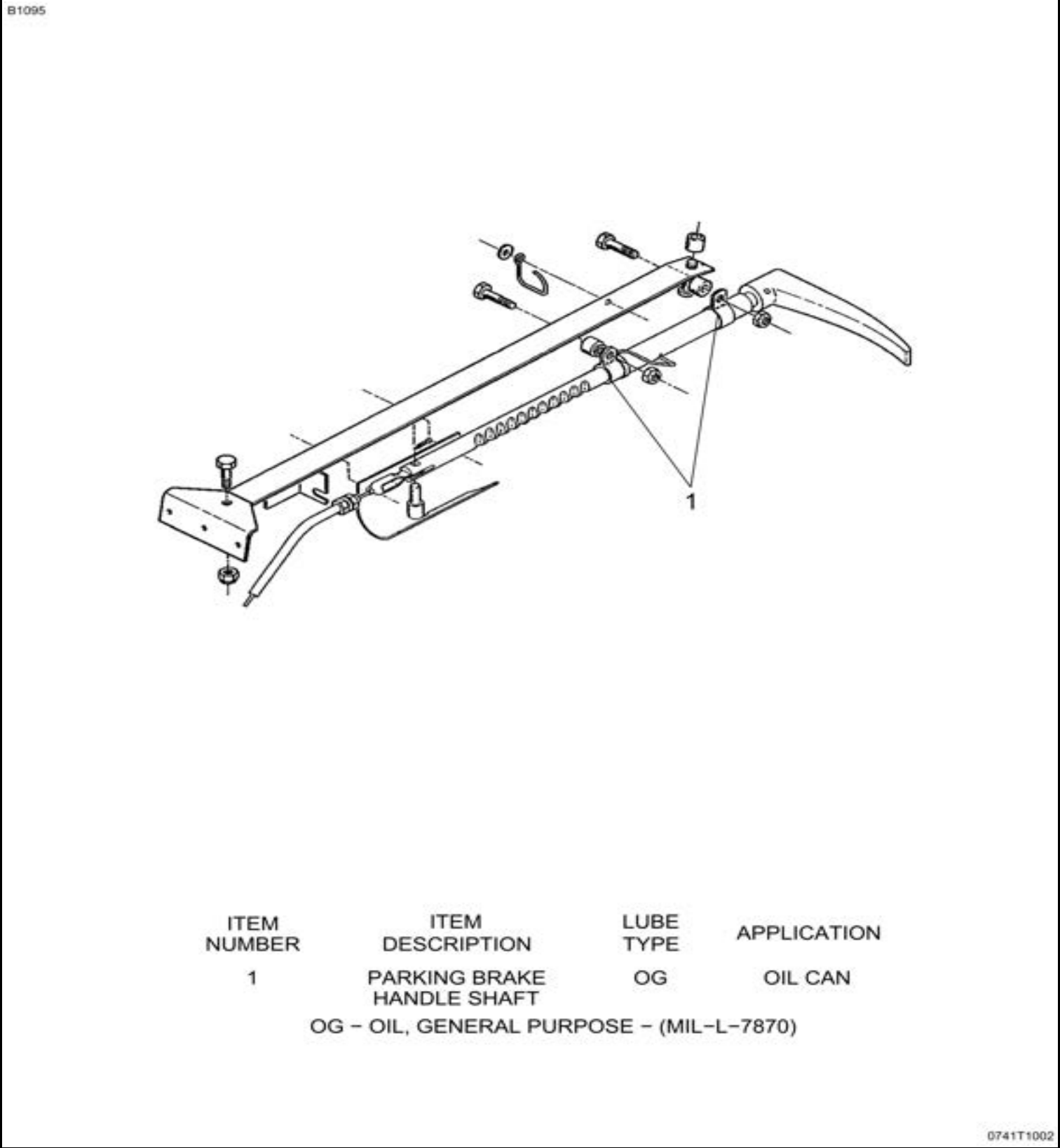


Figure 302 : Sheet 1 : Parking Brake Handle Shaft Lubrication



FLIGHT CONTROLS - SERVICING

1. General

- A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Aileron System Lubrication

- A. Bearings in the control column should be lubricated on an “as needed” basis and when assembled or installed.
- B. Piano hinges on the ailerons should be lubricated on an “as needed” basis and when assembled or installed.
- C. Needle bearings on the aileron bellcrank should be lubricated on an “as needed” basis and when assembled or installed.
- D. Rod end bearings on the aileron bellcrank should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#).
- E. Refer to [Figure 301](#) for lubrication requirements of the aileron system.

3. Flap System Lubrication

- A. Flap motor screw jack threads should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#). To lubricate the jack screw, operate flaps to full down position, clean screw threads with solvent rag, and dry with compressed air, and lubricate per [Figure 302](#).

NOTE: It is not necessary to remove actuator from airplane to clean or lubricate threads.

- B. Needle bearings should be lubricated on an “as needed” basis and when assembled or installed.
- C. Refer to [Figure 302](#) for lubrication requirements of the flap system.

4. Elevator System Lubrication

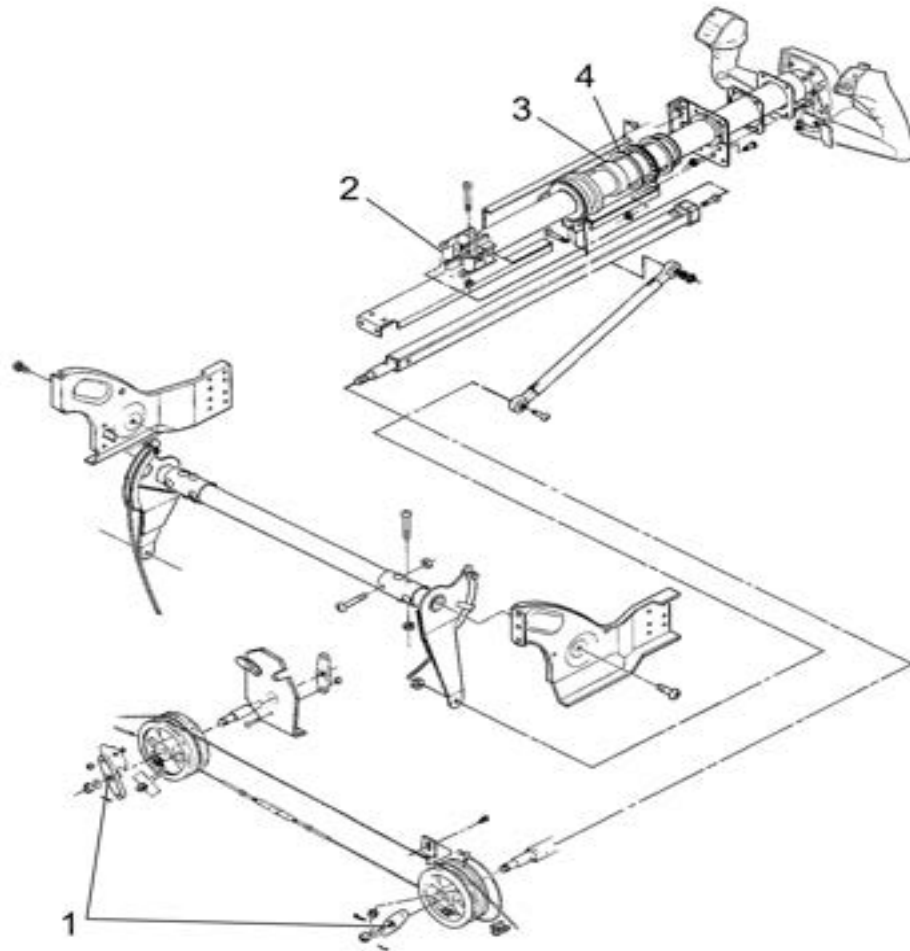
- A. Bearings in the trim wheel controls should be lubricated on an “as needed” basis and when assembled or installed.
- B. The elevator down spring link rub strip should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#).
- C. Trim tab piano hinges should be lubricated on an “as needed” basis and when assembled or installed.
- D. The trim tab actuator should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#).
- E. Refer to [Figure 303](#) for lubrication requirements of the elevator system.

5. Rudder System Lubrication

- A. The rudder bar bearing block halves should be lubricated on an “as needed” basis and when assembled or installed.
- B. The oilite bearings in the rudder bar ends and linkage point pivots should be lubricated using time intervals set forth in [Chapter 5, Inspection Time Limits](#).
- C. Refer to [Figure 304](#) for lubrication requirements of the rudder system.

Figure 301 : Sheet 1 : Aileron System Lubrication

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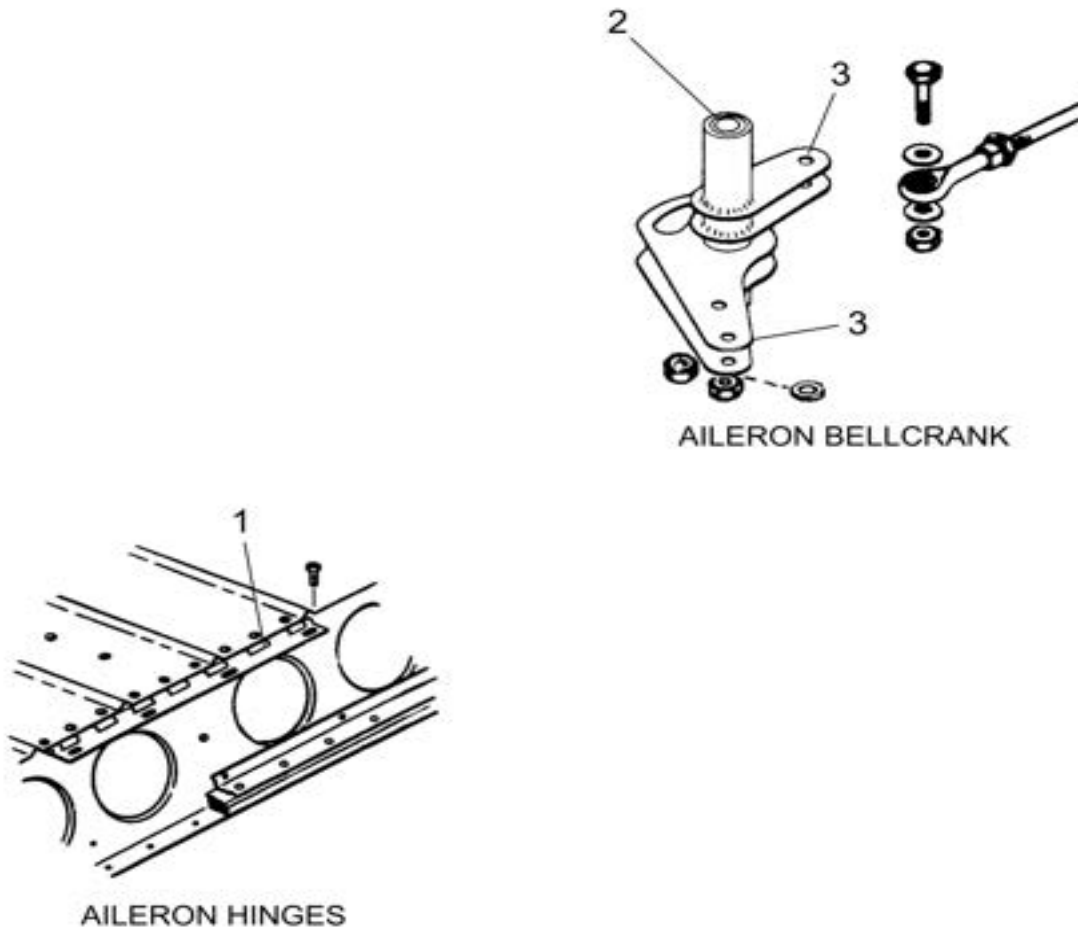
ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	NEEDLE BEARINGS	GR	HAND
2	NEEDLE BEARING ROLLERS	GR	HAND
3	NEEDLE BEARING	GR	HAND
4	THRUST BEARING	GR	HAND

GR - GREASE, GENERAL PURPOSE - (MIL-G-81322)

0724T1001

Figure 301 : Sheet 2 : Aileron System Lubrication

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ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	AILERON PIANO HINGES	PG	SYRINGE
2	BELLCRANK NEEDLE BEARINGS	GR	HAND
3	ROD END BEARINGS	OG	OIL CAN

PG - POWDERED GRAPHITE (SS-G-659)
GR - GREASE, GENERAL PURPOSE - (MIL-G-81322)
OG - OIL, GENERAL PURPOSE - (MIL-L-7870)

0724T1002
0724T1003

Figure 302 : Sheet 1 : Flap System Lubrication

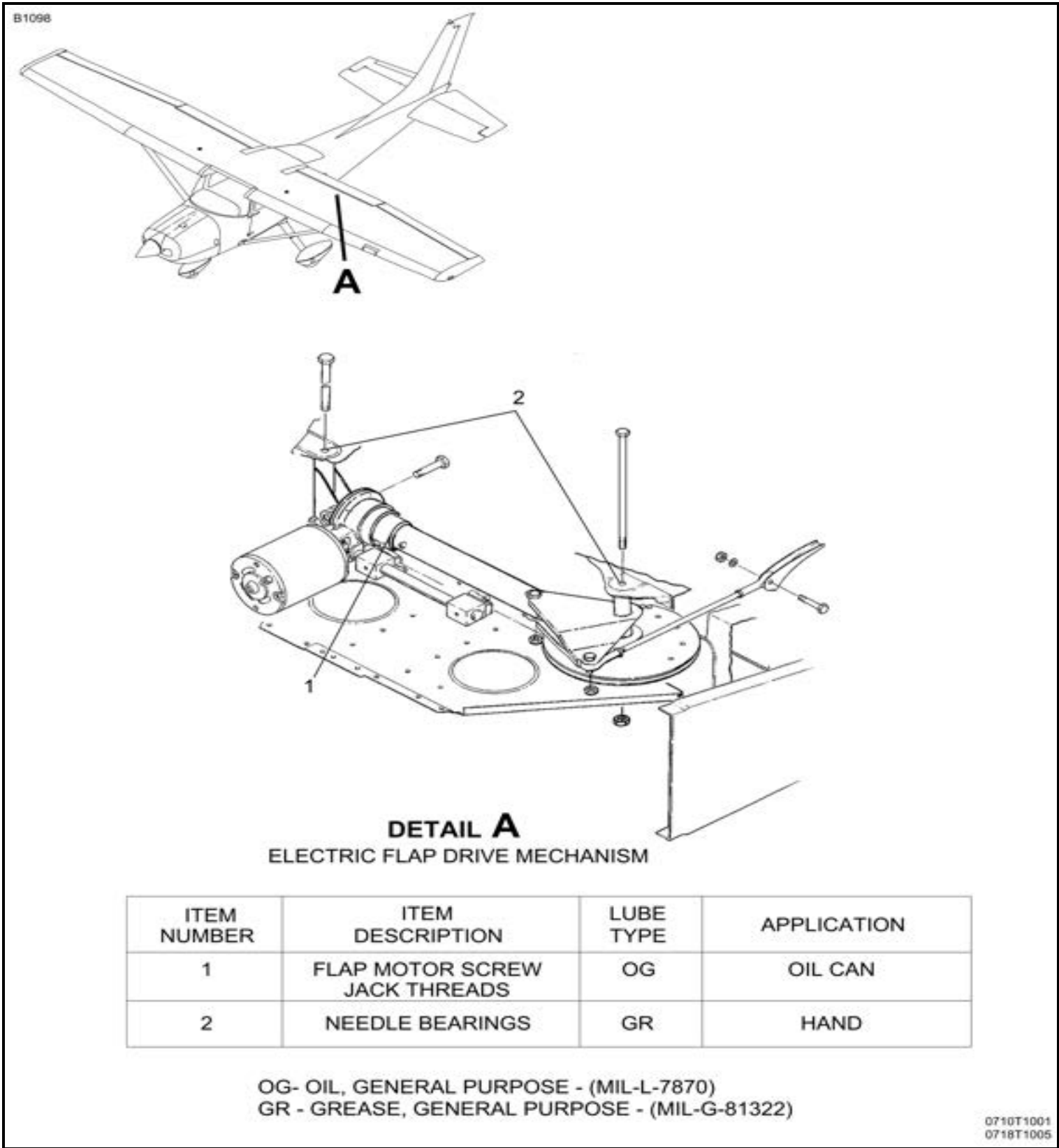


Figure 303 : Sheet 1 : Elevator System Lubrication

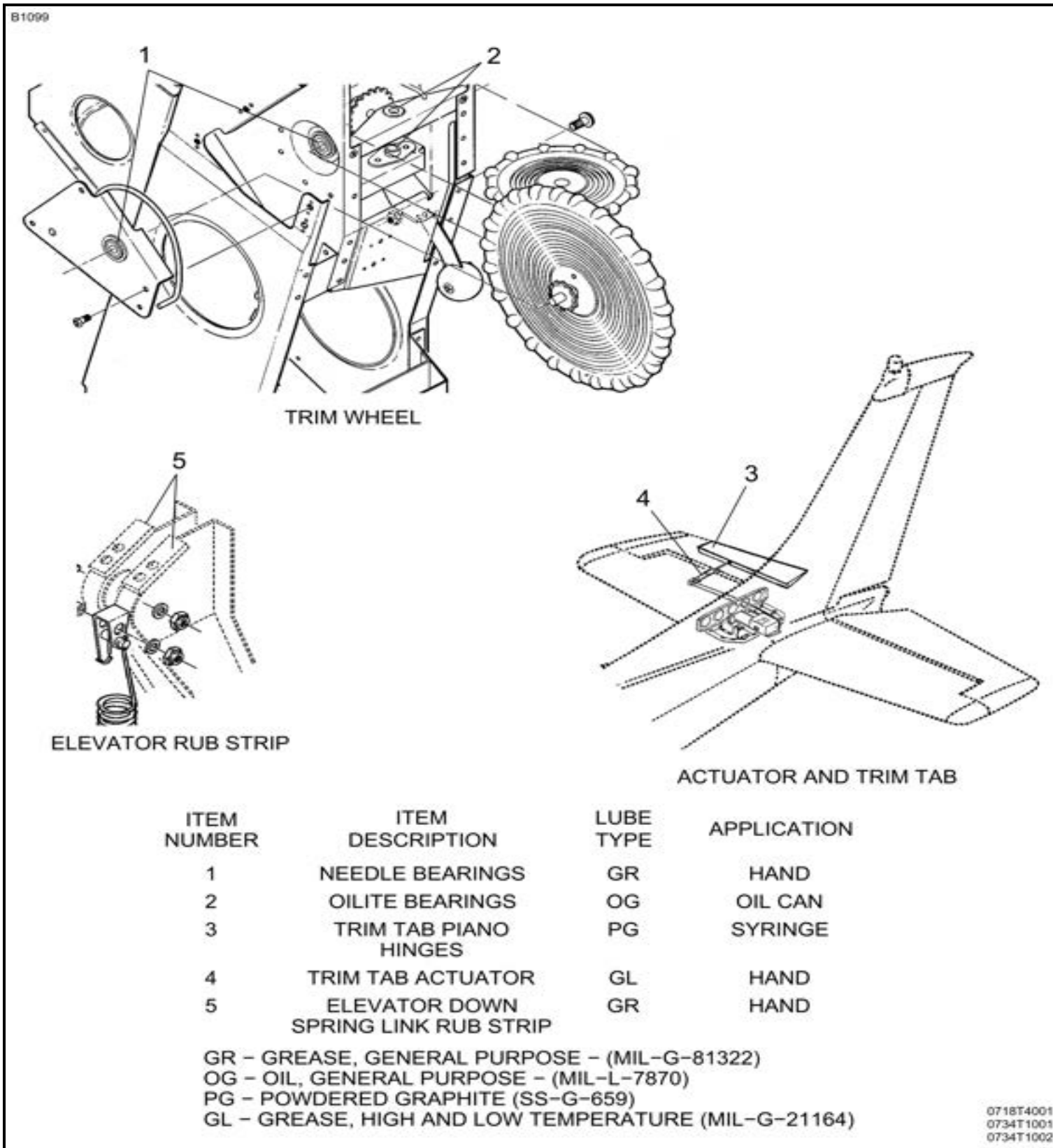
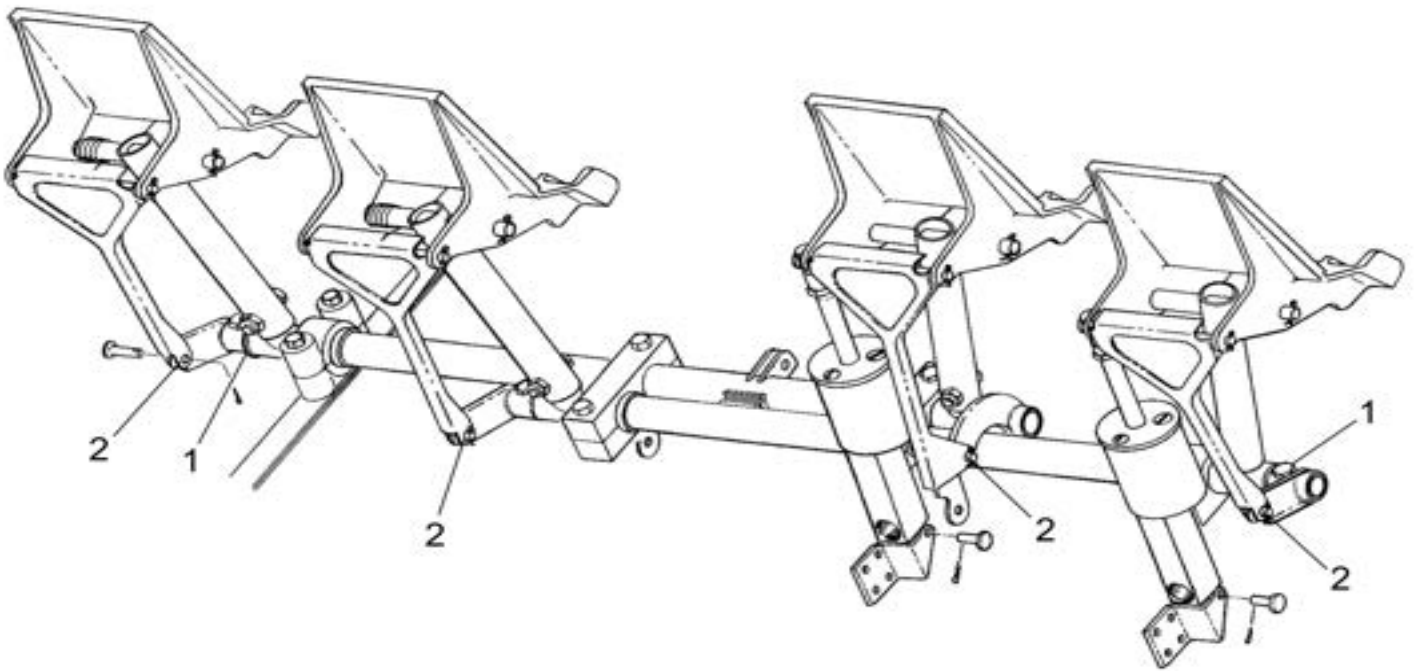


Figure 304 : Sheet 1 : Rudder Pedals Lubrication

B1100



ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	OILITE BEARING (RUDDER BAR ENDS)	OG	OIL CAN
2	ALL LINKAGE PIVOT POINTS	OG	OIL CAN

OG - OIL, GENERAL PURPOSE - (MIL-L-7870)

0562T2002

ENGINE CONTROL CABLES - SERVICING

1. General

- A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Engine Control Cables Lubrication

- A. All housed, pull-type, push-pull or vernier controls should have each outer housing lightly lubricated internally with VV-L-800 General Purpose Lube Oil.

HEATING AND VENTILATION CONTROL CABLES - SERVICING

1. General

- A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Heating And Ventilation Control Cables Lubrication

- A. All housed, pull-type, push-pull or vernier controls should have each outer housing lightly lubricated internally with VV-L-800 General Purpose Lube Oil.

AIRPLANE EXTERIOR - CLEANING/PAINTING

1. General

- A. The airplane must be cleaned frequently to keep the external surface in good condition and to prevent corrosion. The painted area of the airplane must be polished at intervals to remove chalking paint and to make sure that it has a smooth, glossy finish.
- B. Use water and detergent when you clean the external surface of the airplane.

2. Precautions

- A. Obey all manufacturer instructions, warnings, and cautions about all cleaning agents and solvent compounds.
- B. Do not use silicone-based wax to polish the external surface of the airplane. Silicone-based wax, especially if buffed to a high shine, can help to cause the buildup of P-static.
- C. Do not park or keep the airplane in an area where it can come into direct contact with fluid or vapors from methanol, denatured alcohol, gasoline, benzene, xylene, methyl-propyl ketone, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaners, paint strippers, or other types of solvents.
- D. Do not leave sun visors against the windshield when not in use. The reflected heat from these items increases the temperature on the windshield. If solar screens are installed on the inside of the airplane, make sure that they are the silver, reflective type.
- E. Do not use a power drill motor or other powered device to clean, polish, or apply wax to surfaces.

3. Preventive Maintenance

- A. Keep all surfaces of the windshield and the windows clean.
- B. If necessary, apply wax to acrylic surfaces.
- C. Put a cover over all surfaces while the airplane is painted, the engine is cleaned, or other procedure is done that uses any type of solvent or chemical. [Table 701](#) gives approved protective coatings to prevent solvent damage.

Table 701. Approved Protective Coatings

NAME	NUMBER	MANUFACTURER	USE
Spray	MIL-C-6799, Type 1, Class II	Commercially Available	Gives surfaces protection from solvents.
Masking Paper	WPL-3	Champion Intl. Corp. Forest Product Division 7785 Bay Meadows Way Jacksonville, FL 32256	Gives surfaces protection from solvents.
Poly-Spotstick	SXN	Champion Intl. Corp.	Gives surfaces protection from solvents.
Protex 40		Mask Off Company 345 Marie Avenue Monrovia, CA	Gives surfaces protection from solvents.

4. Windshield and Window Cleaners

CAUTION: Do not use methanol, gasoline, denatured alcohol, benzene, xylene, acetone, carbon tetrachloride, fire extinguisher fluid, deicer fluid, lacquer thinner, or commercial or household glass window cleaner when you clean the windshield and windows of the airplane. These solvents will cause damage to the plastic.

Table 702. Windshield and Window Cleaners/Polishers

NAME	NUMBER	MANUFACTURER	USE
Mild soap or detergent (household type without abrasives)		Commercially Available	Cleans windshields and windows.

Aliphatic Naphtha Type II	Federal Specification TT-N-95	Commercially Available	Removes deposits which cannot be removed with mild soap solution on acrylic windshields and windows.
Turtle Wax (paste)		Commercially Available	Gives protection to acrylic windshields and windows.
Permatex Plastic Cleaner No. 403D	Federal Specification P-P-560	Permatex Company, Inc. Kansas City, KS 66115	Gives protection to acrylic windshields and windows.
Soft cloth (cotton flannel or cotton terry cloth)		Commercially Available	Applies and removes wax and cleaning agents.

NOTE: Equivalent substitutes can be used for the items given in Table 702.

5. Cleaning Windshield and Windows

CAUTION: Obey all the correct procedures when you touch and clean the windshield and windows of the airplane. If you do not obey the correct procedures, you can easily cause damage to the windshield and windows.

CAUTION: Do not use methanol, gasoline, denatured alcohol, benzene, xylene, acetone, carbon tetrachloride, fire extinguisher fluid, deicer fluid, lacquer thinner, or commercial or household glass window cleaner when you clean the windshield and windows of the airplane. These solvents will cause damage to the plastic.

- A. Refer to Table 702 for cleaning materials.
- B. Windshield Cleaning Procedures.
 - (1) Put the airplane inside a hanger or in a shaded area and let the surface of the airplane cool.
 - (2) Let clean water flow over the surface of the windshield. Use bare hands with no jewelry to feel and rub away any dirt or abrasive materials.
 - (3) Use a mild soap or detergent (such as dishwashing liquid) in water to clean the surface of the windshield. Use bare hands to rub the solution over the surface. A clean cloth can be used to apply the soap solution to the surface, but you must be very careful to prevent scratches.
 - (4) On acrylic windshields and windows only, if the windshield and windows are still dirty after they are cleaned with a mild detergent, use Type II aliphatic naphtha as a cleaning agent. Apply the agent only with a soft, clean cloth. Make sure that the cloth is frequently folded to avoid scratching the windshield with any abrasive particles.
 - (5) Flush the surface with clean water and dry with a clean cloth.

6. Waxing and Polishing Windshield and Windows

CAUTION: Do not use rain repellent on acrylic surfaces because it can cause damage.

NOTE: Windshields and windows must be cleaned before you apply wax. When you apply and remove wax and cleaning agents, use a soft, clean cloth.

- A. Refer to Table 702 for polishing materials.
- B. Hand polishing wax (or other materials that meet Federal Specification P-P-560) must be applied to acrylic surfaces. The wax has an index of refraction almost the same as transparent acrylic and masks any scratches on the windshield surface.

7. Aluminum Surfaces

- A. The aluminum surfaces of the airplane can be cleaned with water to remove dirt and can be cleaned with non-alkaline grease solvents to remove oil and/or grease. Household detergent soap powders are good cleaners, but must be used carefully, since some of them are strongly alkaline. Many good aluminum cleaners, polishes, and waxes are available from commercial suppliers of airplane products.

8. Painted External Surfaces

- A. The painted surfaces of the airplane can be cleaned with water and mild soap, followed by a rinse with water and dried with cloths or a chamois. Abrasive soaps or detergents which can cause corrosion or scratches must not be used. Remove oil and grease with a cloth that is moist with Stoddard solvent.

NOTE: For more information on the external paint finish, refer to Chapter 20, Interior and Exterior Finish - Cleaning/Painting.

- B. To seal any small surface chips or scratches and give protection from corrosion, you must regularly apply wax to the airplane with a good automotive wax, in accordance with the manufacturer's instructions. If the airplane is operated in a seacoast area or other salt water environment, it must be cleaned and wax must be applied more frequently to make sure that the surface has sufficient protection. Special care must be taken to seal around rivet heads and skin laps, which are the areas more susceptible to corrosion. A thicker layer of wax on the leading edges of the wings and tail and on the cowl nose cap and propeller spinner will help decrease the abrasion found in these areas. A new layer of wax will be necessary after you clean the airplane with soap solutions or after chemical deicing operations.

9. Cleaning the Engine and Engine Compartment

A. Notes and Precautions.

- (1) Clean the engine and engine accessories during each 100-hour inspection to remove oil, grease, salt corrosion, or other contamination that can conceal component problems. Also, clean regularly to help prevent engine problems.

WARNING: Put on protective devices (rubber gloves, aprons, face shields, etc.) and work only in a well-ventilated area when you use solvents and cleaning agents. These materials and their fumes are poisonous.

WARNING: Do not smoke or have an open flame within 100 feet of the work area because it can cause a fire. Many solvents and cleaning agents are very flammable. Make sure that sufficient fire and safety equipment are available.

NOTE: If you use compressed air to apply solvent or to dry components, adjust the pressure to the lowest possible setting.

- (2) Use a stiff-bristle brush as an alternative to a steel brush if cleaning agents do not remove unwanted grease and contamination while flushing the area.

B. Cleaning Procedures.

- (1) Remove the engine cowl.
(2) Carefully put a cover on the coupling area between the vacuum pump and the engine drive shaft so no cleaning agent or solvent can touch the coupling or seal.
(3) Put a cover on the open end of the vacuum discharge tube.
(4) If the engine has salt or corrosive chemical contamination, first flush the engine compartment with clean water.

WARNING: Do not use gasoline or other flammable materials to clean the engine compartment. If used, these materials can cause a fire.

WARNING: Do not try to clean an engine that is hot or in operation. This can cause a fire, serious injury, or death. Always stop the engine and let the engine cool before cleaning.

CAUTION: Do not let cleaning agents or water touch the openings on the starter, magnetos, alternator, or vacuum pump. This can cause damage to these engine components.

- (5) Apply the solvent or cleaning agent to the engine compartment. The solutions that follow (or their equivalent) can be used to satisfactorily clean the engine compartment:
(a) Stoddard Solvent (Specification P-D-680, Type II).
(b) Water alkaline detergent cleaner (MIL-C-25769 mixed 1 part cleaner, with 2 to 3 parts water and 8 to 12 parts Stoddard Solvent).
(c) Solvent-based emulsion cleaner (MIL-C-4361 mixed 1 part cleaner with 3 parts Stoddard Solvent).
(6) After you apply the cleaning agent or solvent, flush the engine compartment with clean warm water.

NOTE: Cleaning agents must not be left on engine components for an extended period of time. Failure to remove them can cause damage to the components and cause more corrosion. For example, solvents and cleaning agents can easily cause damage to neoprene seals and silicone fire sleeves.

- (7) Fully dry the engine and engine accessories with compressed air.
(8) Remove the cover from the coupling area.
(9) Remove the cover from the vacuum discharge tube.
(10) If necessary, the engine cowl can be cleaned with the same cleaning agents, then flushed with water and dried with a soft, clean cloth. After you clean the engine, lubricate all the control arms and moving parts, as necessary.
(11) Install the engine cowl.

WARNING: Make sure that the magneto switches are off, the throttle is closed, the mixture control is in the idle cutoff position, and the airplane is stable before you turn the propeller by hand. Do not stay within the arc of the propeller blades while you turn the propeller. If the engine accidentally starts, the propeller blades can cause serious injury or death.

(12) Before you start the engine, turn the propeller by hand a minimum of four full revolutions.

10. Propeller

- A. Rub clean, lightweight oil onto the propeller with a soft, clean cloth to remove grass and bug stains. In salt water areas, the oil will also help prevent corrosion of the propeller.

11. Tires and Wheels

- A. Remove oil, grease, and mud from the tires and wheels with soap and water.

12. Stabilizer Abrasion Boots

- A. Stabilizer abrasion boots must be cleaned and examined regularly. Keep the boots clean and free from oil, grease, and other solvents which can cause damage to the rubber.

INTERIOR - CLEANING/PAINTING

1. General

A. This section recommends different types of cleaning materials and cleaning procedures for the interior of the airplane.

WARNING: Do these cleaning operations in an area with good airflow. Use the applicable safety precautions for each cleaning material that you use.

2. Interior Cleaning Materials

NOTE: Equivalent substitutes can be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Protectant	Son-Of-A-Gun	Commercially available	To protect and shine interior components (excluding fabric materials).
All-Purpose Cleaner	Fantastik	Commercially available	For general purpose cleaning of interior components.
Aliphatic Naphtha	TT-N-94	Commercially available	To remove tar, asphalt, and similar materials from interior components.
Rug Shampoo		Commercially available	To clean carpet.
Perchloroethylene Cleaning Solvent		Commercially available	To spot clean carpet and seats.
Household Ammonia		Commercially available	To clean seat fabric.
Household Vinegar		Commercially available	To clean seat fabric.
Rubbing Alcohol		Commercially available	To clean seat fabric.
Ivory Liquid (white or colorless)		Commercially available	To clean seat fabric.
Detergent	Cheer	Commercially available	To clean seat fabric.

3. Cleaning Interior Panels

A. Clean interior panels (headliners, sidewalls, door panels, and similar surfaces) with mild detergent solutions or premixed commercial cleaners. Remove stubborn deposits with aliphatic naphtha. Make sure that cleaners are compatible with the interior of the airplane. If in doubt, apply a small amount of cleaner to an inconspicuous place and test for reaction and fading.

4. Cleaning Carpet

A. The carpet is made of a polypropylene weave combined with a fire-retardant backing. The polypropylene provides inherent stain-resistant qualities and normally requires only a minimal amount of maintenance.

B. If the carpet is soiled, it can be cleaned with commercially-available carpet cleaning products.

5. Cleaning Seats

A. The seats are made of a flame-retardant Trevira polyester fiber and have inherent fire-retardant and stain-resistant properties. Seats must be vacuumed and cleaned on a regular basis to keep their appearance. Spills and stains must be blotted up immediately and the fabric cleaned as soon as possible.

B. Table 701 gives instructions for specific stain removal. The table has two columns. The first column lists the stain and the second column lists the method and sequence of cleaning. For example, remove coffee and tea stains with processes 2, 4, 5, and 1. First, apply the ingredients in process 2 (dishwashing liquid with warm water) to the stain. Then apply the ingredients in process 4 (vinegar and water) to the stain. The third step is process 5 (laundry powder and warm water followed by blotting). Then apply process 1 (dry cleaning solvent applied to the stain) to finish the stain removal of coffee or tea stains.

Table 701. Methods To Clean Trevira Fabric on Seats

STAIN	PROCESS AND SEQUENCE	STAIN	PROCESS AND SEQUENCE

Antacid (Maalox)	1	Infant Formula	2,1
Betadine (Iodine)	2,3,4,6	Ink (ball point)	8
Blood *	2,3,5	Motor Oil	1,2,3,4
Catsup	2,3,5	Mud	2,1
Chewing Gum	7,1,2	Petroleum Jelly	1,2
Chocolate Syrup	5,1	Pepto Bismol	6,1
Coffee/Tea	2,4,5,1	Urine	2,3,4
Cola	2,3,4	Suntan Lotion	1,2
Cough Syrup	2	Shoe Polish	1,2,3
Egg	2,3,5,1	Vomit	2,3,4,5
Grape Drink	2,3,4,5	Wax	7,1
Ice Cream	2,3,4,5,1	Wine	2,3,4

- Process 1 - Apply a small amount of dry cleaning solvent to the stain. Do not smoke or use near open flame. Make sure that there is good airflow in the area when you clean.
- Process 2 - Mix one teaspoon of white or colorless dishwashing liquid with a cup of lukewarm water.
- Process 3 - Mix one tablespoon of household ammonia with half a cup of water.
- Process 4 - Mix one part household vinegar with two parts water.
- Process 5 - Mix a solution of laundry powder with water and allow to remain on stain. Follow label directions. Rinse with warm water and blot dry.
- Process 6 - Mix one part household bleach with nine parts water. Apply with dropper to stain. Rinse with water and blot dry.
- Process 7 - Chill area with an ice cube wrapped in a plastic bag. Crack gum or wax off surface of fabric.
- Process 8 - Apply a small amount of rubbing alcohol to ink stain and blot to remove ink. Continue until ink is removed.

NOTE: * All solutions must be cool when applied, or heat from the solutions will set the stain.

6. Cleaning the GDU 1040 Display Lens

NOTE: The Primary Flight Display (PFD) and Multi-Function Display (MFD) are the GDU 1040 displays in airplanes with Garmin G1000.

CAUTION: If possible, do not touch the GDU 1040 display lens. The lens has a layer of anti-reflective material which is very sensitive to skin oils, waxes, and abrasive cleaners.

CAUTION: Do not use cleaners that contain ammonia. Ammonia will cause damage to the anti-reflective material.

A. Clean the GDU 1040 Display Lens.

- (1) To clean the lens, use a clean, lint-free cloth and an eyeglass lens cleaner that is specified as safe for anti-reflective material.

7. Deck Skin Cover Removal/Installation

A. Tools, Equipment and Materials

NAME	NUMBER	MANUFACTURER	USE
Toluene	A-A-59107D	Commercially Available	Use as a solvent or thinner for organic coatings, various resins, and chlorinated rubber. Also used to dilute cellulose lacquers and dopes.
Methyl n-Propyl Ketone (MPK)	CAS No. 107-87-9	Commercially Available	Use as a cleaner, solvent or thinner for organic coatings.

JetFlex WR	CMFS034	The Sherwin Williams Company 2578 Walkden Avenue Cheektowaga, NY 14225-4378	Use as a Soft Touch Coating.
Mankiewicz Soft Coating	404-78-000 (clear with 450 Hardener and 62 Thinner	Mankiewicz Coatings, LLC 115 Whitesett Street Greenville, SC 29601	Use as a Soft Touch Coating.
HVLP Spray Equipment		Commercially Available	Use to apply Soft Touch Coating.

NOTE: Other semi-gloss or flat gloss coatings such as Acry Glo AS Series (Sherwin Williams) are acceptable for the color coat.

B. Preparation

- (1) Set the airplane in a well-ventilated and clean area.
- (2) Ground the airplane. Refer to Chapter 10, [Storage - Description and Operation](#).
- (3) Carefully mask off and protect all interior equipment, panels, furniture, structures, windows, and the airplane windshield. Refer to Chapter 12, [Airplane Interior - Cleaning/Painting](#).
- (4) Carefully mask off and protect all exterior equipment, panels, structures, windows, and the airplane windshield. Refer to Chapter 12, [Airplane Exterior - Cleaning/Painting](#).

WARNING: Use safety precautions when using flammable materials during the cleaning and painting procedures.

WARNING: Use only approved solvents and cleaning materials.

- (5) Remove the cabin doors. Refer to Chapter 52, [Cabin Doors - Maintenance Practices](#).
- (6) Remove the windshield. Refer to Chapter 56, [Windshield - Maintenance Practices](#).

C. Deck Skin Cover Removal

- (1) Remove the Deck Skin Cover. Refer to [Figure 701](#).
 - (a) Carefully remove the existing deck skin cover by doing the following:

CAUTION: Do not have direct contact with or vapors of Methanol, Denatured Alcohol, Gasoline, Benzene, Xylene, Methyl N-Propyl Ketone, Acetone, Carbon Tetrachloride, Lacquer Thinners, paint strippers, commercial or household window cleaning sprays on airplane windshields, windows or acrylic materials.

- 1 Lift the deck skin cover and pull the cover away from the deck skin.
- 2 Start at the edge and use a clean wiping cloth to carefully apply Toluene or Methyl Propyl Ketone (MPK) solvent per CSFS039 to loosen and remove the deck skin adhesive. Refer to Chapter 20, [General Solvents/Cleaners - Maintenance Practices](#).

NOTE: Do not saturate the wiping cloth until the solvent drips.

NOTE: Do not dip the wiping cloth into an open solvent container. This will contaminate the solvent.

CAUTION: Acrylic windshields and windows are easily damaged by improper handling and cleaning techniques.

- 3 Use a plastic scraper to gradually remove the adhesive, if necessary.

NOTE: Work in a small area, so that the surface being cleaned remains wet.
- 4 If the surface dries before the adhesive is removed, apply more solvent and clean again.
- 5 Wipe the area being cleaned with a clean dry cloth. Do not allow the surface to evaporate dry.
- 6 Carefully remove small surface defects such as dirt, dust, and scratches by blending with 120 or 150 grit sandpaper.

NOTE: If the clear surface coating of the aluminum of the deck skin has been scratched or removed, it will need to be chemically pretreated and to be primed. Refer to Chapter 20,

Interior and Exterior Finish - Cleaning/Painting.

- (b) Remove all dust, lint, chips, and shavings with a vacuum cleaner.

D. Deck Skin Paint Installation

- (1) Install the Deck Skin paint. Refer to [Figure 701](#).

- (a) Mix the coating material. Follow the manufacturer's instructions, noting induction time and pot time.

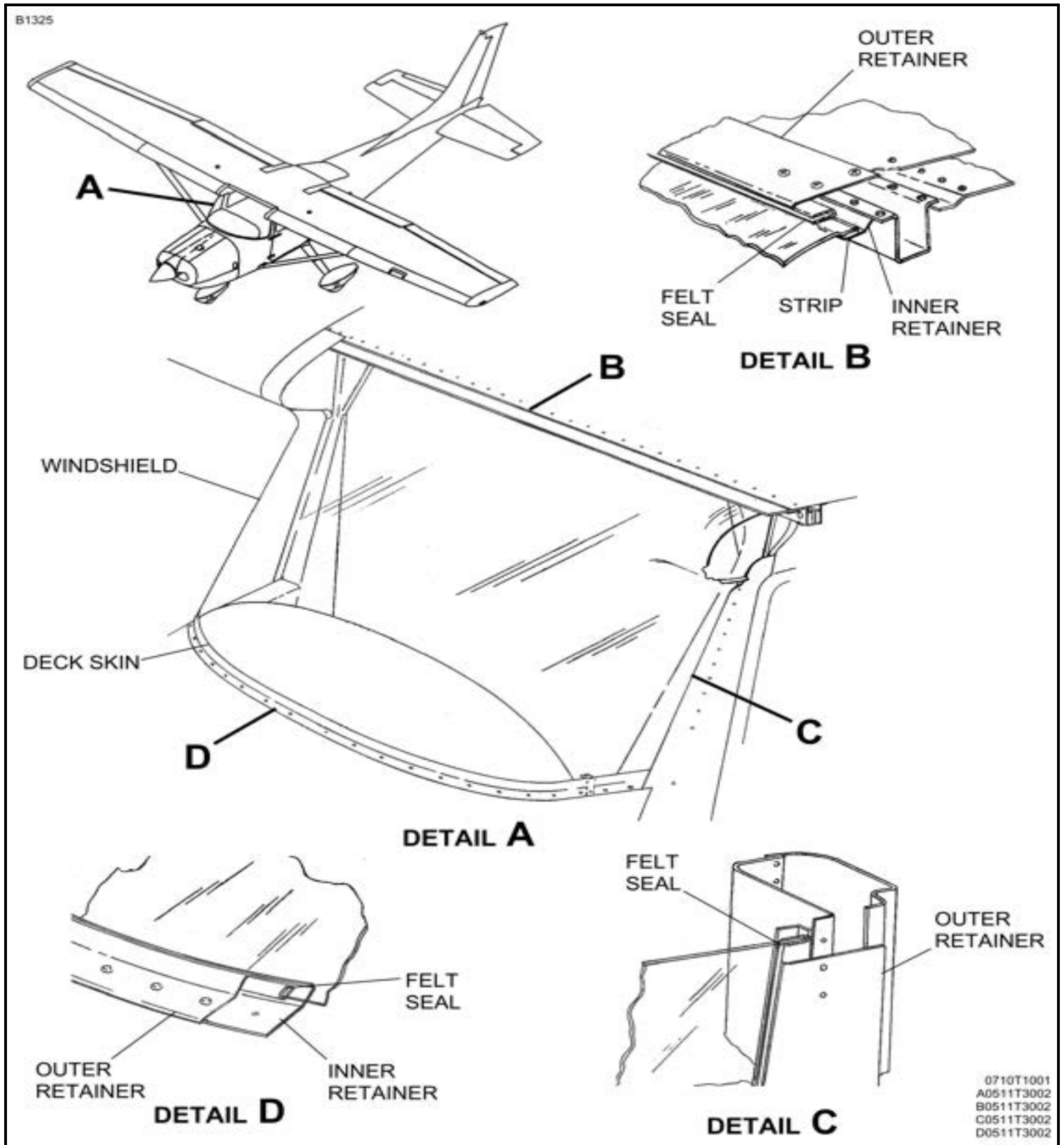
WARNING: Use safety precautions when mixing painting materials.

- (b) Apply the Soft Touch Coating, using approved materials in the Tools, Equipment and Materials table above, and the manufacturer's instructions.
 - (c) Let the deck skin paint dry. Refer to the manufacturer's instructions.

NOTE: **JetFlex WR dry paint thickness should be 0.0012 inch (1.2 mils) to 0.002 inch (2.0 mils).**
 Mankiewicz Soft Coating 404-78 dry paint thickness should be 0.001 inch (1.0 mils) to 0.0015
 inch (1.5 mils)

- (d) Install the windshield. Refer to Chapter 56, [Windshield - Maintenance Practices](#).
 - (e) Install the cabin doors. Refer to Chapter 52, [Cabin Doors - Maintenance Practices](#).
 - (f) Remove all protective masking from interior and exterior equipment, panels, furniture, structures, windows, and the windshield.

Figure 701 : Sheet 1 : Deck Skin Cover Removal/Installation



UNSCHEDULED SERVICING - DESCRIPTION AND OPERATION

1. General

- A. This section gives procedures and recommendations for normally unscheduled servicing.
- B. Instructions are given in the Cold Soak procedures for operation of the airplane during very cold temperatures.

NOTE: During operation at outside air temperatures below International Standard Atmosphere (ISA) Standard, the engine can develop more than its rated power at normal-rated RPM. This occurs more at lower altitudes.

2. Extreme Weather Maintenance

- A. Seacoast and Humid areas.
 - (1) In salt water areas, special care should be taken to keep engine, accessories, and airframe clean to help prevent oxidation.
 - (2) In humid areas, fuel and oil should be checked frequently and drained of condensation to prevent corrosion.

3. Ground Power Receptacle

- A. Connect to 24-volt DC, negative ground power unit with a maximum output of 28.8 volts, for cold weather starting, and lengthy ground maintenance of the airplane electrical equipment, with exception of electronic equipment. Refer to Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for engine starting instructions with auxiliary power.

NOTE: The ground power receptacle circuit incorporates a polarity reversal protection. Power from the external power source will flow only if the ground service plug is connected correctly to the airplane.

4. Cold Soak

- A. If extended exposure to cold weather is expected, refer to this procedure to prepare the airplane for cold soak. If the airplane has cold soaked for more than two hours at temperatures colder than -10 °C (14 °F), refer to this procedure and the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual to prepare the airplane for flight.
 - (1) Cold temperatures have an effect on control cable tension. Refer to Chapter 27, [Aileron Control System - Maintenance Practices](#), [Rudder Control System - Maintenance Practices](#), [Elevator Control System - Maintenance Practices](#), [Elevator Trim Control - Maintenance Practices](#), and [Flap Control System - Maintenance Practices](#) for flight control cable tensions.
 - (2) For information on lubrication and greasing of moving parts, refer to Chapter 12, [Lubricants - Description and Operation](#).
 - (3) Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for the correct engine oil viscosity.
 - (4) Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for additional information on procedures for operation of the airplane in cold temperatures.

- B. The engine must be preheated before an engine start when exposed to very cold temperatures. Preheat the engine as follows:
 - (1) Direct warm air into the engine cooling inlets behind the propeller.

CAUTION: Do not use air with a temperature of more than 120 °C (248 °F) when you preheat the engine. Air with a temperature of more than 120 °C (248 °F) can do damage to the exterior paint of the airplane.

- (2) Make sure that the temperature of the warm air is no more than 120 °C (248 °F).

WARNING: Never bring open flames near the airplane. Use of a heater with an open flame to preheat the engine can cause damage to the airplane and injury to personnel.

- (3) Do not use a heater with open flames to supply the warm air to preheat the engine.
 - (4) Preheat the engine before an engine start if the engine temperature is less than -6 °C (20 °F).
 - (5) When the temperature is less than 0 °C (32 °F), preheat the engine to more than 0 °C (32 °F) before you start the engine again after an engine start and stop.

NOTE: When the temperature is less than 0 °C (32 °F), water from combustion can freeze to the engine spark plugs if the engine does not continue to operate after it is started. This will prevent the engine from starting again.

- C. The Garmin GDU 1040 PFD/MFD requires warm-up time when exposed to very cold temperatures.
 - (1) A warm-up time of up to 30 minutes is necessary when the GDU is exposed to down to -40 °C (-40 °F) for an extended period.
 - (2) A warm-up time of up to 15 minutes is necessary when the GDU is exposed to down to -30 °C (-22 °F) for an extended period.

- D. Before takeoff, preheat the airplane cabin to more than -30 °C (-22 °F) for correct operation of the standby altimeter.

NOTE: If there is no warning that an instrument is not operating correctly, all other instruments will operate continuously until at the minimum temperature of the airplane.

FLIGHT CONTROLS - GENERAL

1. General

- A. This chapter provides maintenance of components which furnish a means of manually controlling the flight attitude characteristics of the airplane, including flaps.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Tensiometer	T52002101	Pacific Scientific Electro Kinetics Div. 402 E. Guitierrez St. Santa Barbara, CA 93102	To measure and obtain cable tension.
Inclinometer	SE716	Cessna Aircraft Company Cessna Parts Distribution Department 701, CPD 25800 East Pawnee Road Wichita, KS 67218-5590	To measure control surface travel.
Polyurethane Tape	Y8671	3M 3M Center Minneapolis, MN 55144	To prevent flap chafing.
Loctite	242	Loctite Corp. 705 N. Mountain Rd. Newington, CT 06111	For aileron system bolt installation.

3. Definition

- A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.
- (1) The aileron section provides information on control wheels, cables, linkage and aileron assemblies.
 - (2) The rudder section provides information on rudder pedals, cables, linkage and rudder assembly.
 - (3) The elevator section provides information on control column, cables, linkage and elevator assemblies.
 - (4) The flap section provides information on the flap actuator, cables, linkage, and the flap assemblies.
 - (5) Refer to Chapter 34, for the [Stall Warning System](#) and the [Optional Angle of Attack System](#).

AILERON CONTROL SYSTEM - TROUBLESHOOTING

1. General

- A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to [Figure 101](#).

Figure 101 : Sheet 1 : Aileron System Troubleshooting Chart

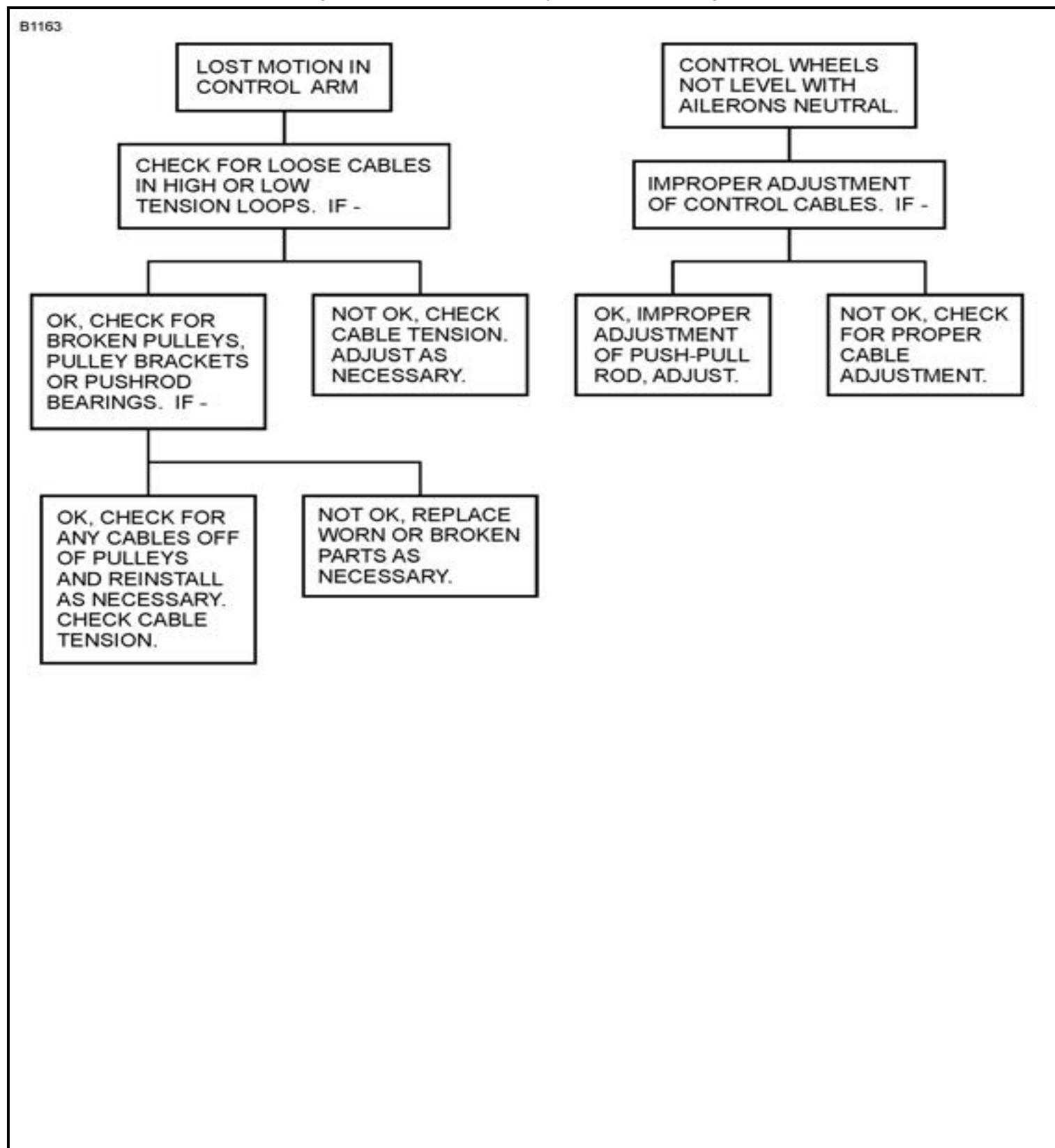
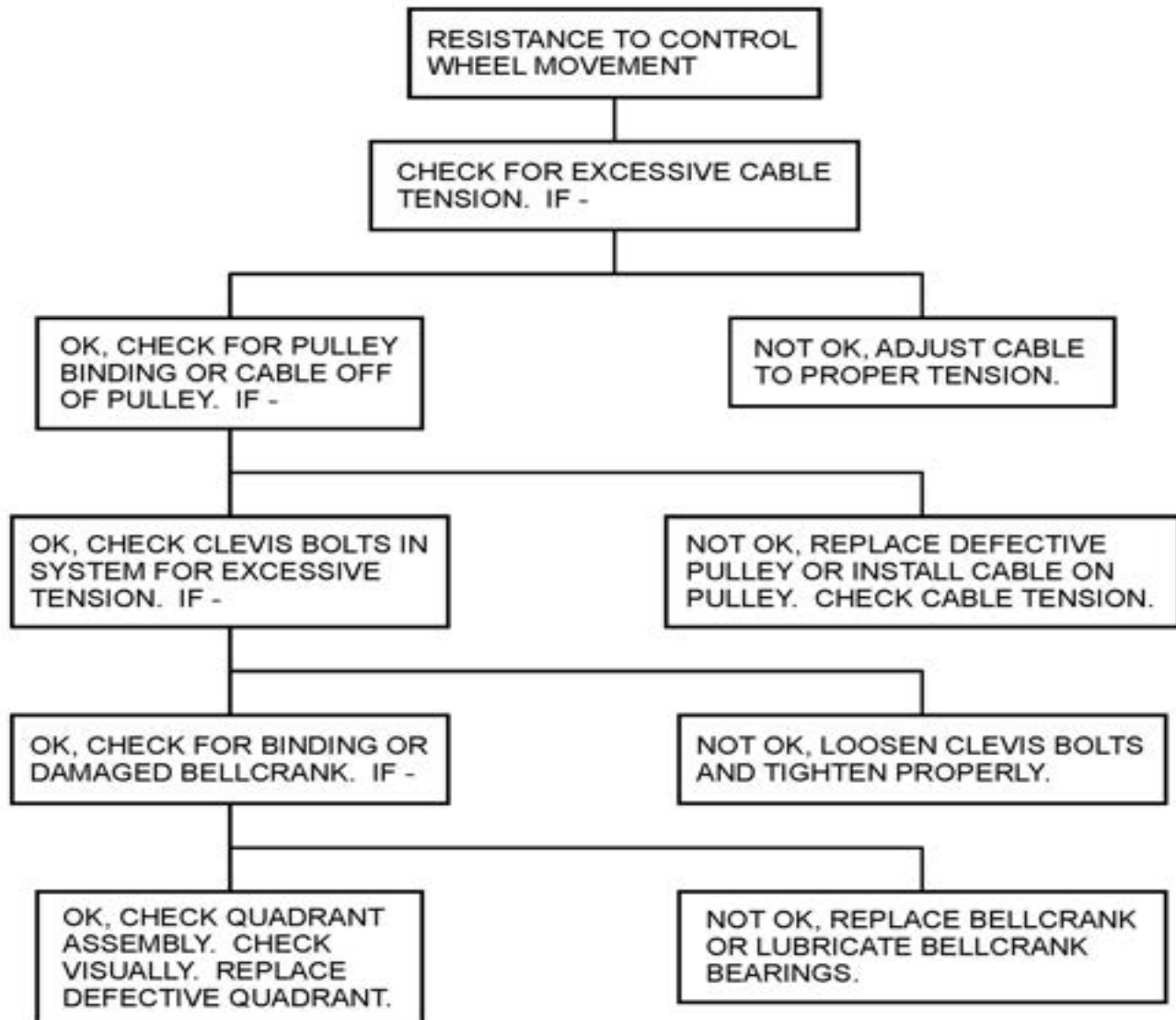


Figure 101 : Sheet 2 : Aileron System Troubleshooting Chart

B1164



AILERON CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

- A. The ailerons receive the input from the pilot or copilot control wheel. The torque tubes, bearings, cable quadrants, pulleys, cables, bell cranks, and pushrods help to supply the input to the ailerons.
- B. When you turn the control wheel, the four bearing roller assemblies on the end of the control wheel tube turn. This turns a square control tube assembly inside of and extending from the control wheel tube. Attached to the square tube is a quadrant that operates the aileron system. The aileron system is controlled by the two control wheels. The interconnect cables, turnbuckle, and adjustment terminals give synchronized control to the two control wheels. The forward end of the square control tube is installed in a bearing block on the firewall. It rotates with the control wheel and does not move in a fore-and-aft direction.
- C. As the control wheel moves in a fore-and-aft direction, the four bearing roller assemblies on the end of the control wheel tube decrease the friction. Bearings in the sleeve assembly let the control wheel tube turn. The sleeve assembly is attached to the control wheel tube by a sleeve and a retaining ring. The sleeve moves in a fore-and-aft direction with the control wheel tube. The movement lets the push-pull tube attached to the sleeve assembly operate an elevator arm assembly. One elevator cable is attached to the elevator arm assembly. A torque tube connects one arm assembly to the other arm assembly on the opposite end of the torque tube, where the other elevator cable is attached. The pilot and copilot control wheels are both linked to the aileron and elevator control systems when dual controls are installed.

2. Control Wheel Removal/Installation

NOTE: The pilot and copilot control wheel removal/installation procedures are typical.

- A. Control Wheel Removal (Refer to [Figure 201](#)).
 - (1) Disconnect the electrical connector from the control wheel.
 - (2) Remove the screws that attach the control wheel to the control tube.
 - (3) Remove the control wheel.
- B. Control Wheel Installation (Refer to [Figure 201](#)).
 - (1) Attach the control wheel to the control tube with the screws.
 - (2) Connect the electrical connector to the control wheel.

3. Pilot Control Column Removal/Installation

NOTE: The pilot and copilot control column removal/installation procedures are typical.

- A. Control Column Removal (Refer to [Figure 201](#) and/or [Figure 202](#) as applicable).
 - (1) Remove the control wheel. Refer to [Control Wheel Removal/Installation](#).
 - (2) For Airplane serial numbers 18282312 and On and T18209056 and On and J18200001 and On. Airplane serial numbers 18280001 thru 18282311 and T18208001 thru T18209055 that are in compliance with Cessna Service Bulletin SEB-27-01, or latest revision, do the steps that follow:
 - (a) If installed, remove the control wheel gust lock from the pilot's control column.
 - (b) Make sure that the elevators are at the fully down position and that the ailerons are at the neutral position.
 - (c) Remove and discard the safety wire from the screw that attaches the glide plug. Refer to [Figure 202](#).
 - (3) For Airplane serial numbers 18280001 thru 18282311 and T18208001 thru T18209055 that are not in compliance with Cessna Service Bulletin SEB-27-01 the screw that attaches the glide plug to the control tube assembly does not have safety wire installed do the steps that follow:
 - (4) Remove the screw that attaches the glide plug to the control tube assembly.
 - (a) Remove the plug and glide assembly.

NOTE: Some airplanes do not have the glide plug installed.
 - (5) Disconnect the push-pull tube at the sleeve assembly.
 - (6) Remove the screws from the collar at the instrument panel.
 - (7) Remove the pilot's center instrument panel/components or the copilot's instrument panel/components as necessary. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (8) To help remove the control wheel tube, or the control tube assembly, remove the snap ring from its locking groove to permit more movement of the sleeve assembly.
 - (9) Carefully pull the control wheel tube aft and work it out through the instrument panel.

- (10) Remove the access plates [520AB and 620AB](#). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (11) Remove the safety clips from the turnbuckles at the direct cable, and loosen the tension.
- (12) Remove and discard the safety wire from the turnbuckle at the interconnect cable, and loosen the tension.
- (13) Remove and discard the safety wire from the roll pin in the quadrant and the control tube assembly.
- (14) Remove the roll pin installed in the quadrant and the control tube assembly.
- (15) Remove the cotter pin, nut, and washer from the center of the bearing block assembly.
NOTE: The control tube goes through the center of the bearing block assembly.
- (16) Carefully pull the control tube assembly in the aft direction.
- (17) Remove the quadrant.

B. Control Column Installation (Refer to [Figure 201](#) and/or [Figure 202](#) as applicable).

NOTE: If the control tube assembly was not removed, go to step 3.B.(4).

- (1) Install the control tube assembly through the instrument panel.
- (2) Install the control tube assembly through the quadrant and the firewall.
- (3) Install the roll pin through the quadrant and the control tube assembly.
- (4) Safety the roll pin with wire. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (5) Install the washer, locknut, and cotter pin to the control tube assembly that goes through the bearing block on the forward side of the firewall. There must be 0.03- inch minimum clearance between the bearing block and the nut after they are tightened.
- (6) Install the snap ring to the sleeve assembly.
- (7) Attach the push-pull tube to the sleeve assembly.
- (8) Install the pilot's center instrument panel/components or copilots instrument panel/components as necessary. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
- (9) For Airplane serial numbers 18282312 and On and T18209056 and On and J18200001 and On. Airplane serial numbers 18280001 thru 18282311 and T18208001 thru T18209055 that are in compliance with Cessna Service Bulletin SEB-27-01, refer to [Figure 202](#) and do the steps that follow:
 - (a) Cut a section of 0.020 steel safety wire to approximately 24 inches in length.
 - (b) Put one end of the safety wire through the large diameter hole and through the gap between the square tube and the stake nut support, and pull the two ends of the safety wire aft until they come together aft of the square tube.
 - Make sure that you install the safety wire through the large diameter hole and not through one of the 0.25-inch diameter holes for the gust lock.
 - If the square tube is installed with the large diameter hole on the top surface of the square tube, make sure that the safety wire goes through the gap between the right side of the square tube and the stake nut support.
 - If the square tube is installed with the large diameter hole on the bottom surface of the square tube, make sure that the safety wire goes through the gap between the left side of the square tube and the stake nut support.

NOTE: The square tube may be installed with the large diameter hole on the top surface or on the bottom surface of the square tube.

- (c) At the corner (on the outer diameter) of the aft end of the square tube, begin to twist the two parts of the safety wire together until the twisted section is approximately one inch in length. Make sure that you do not twist the safety wire on the end surface of the square tube.

NOTE: On some installations, the square tube is not centered in the control tube. As you install the screw, to make it easier to align the hole in the plug with the screw hole in the square tube, you can use one hand to move the control tube left, right, up, or down as applicable.

- Make sure that you install the glide with one of the troughs between the lobes turned straight up.
 - As you do the installation, make sure that you keep the safety wire in the trough between two of the lobes of the glide.
- (d) Tighten the glide screw until there is no lateral free play in the control column between the glide and the outer control tube and there is no friction through the full range of travel of the control column.
 - To make sure that there is no friction, move the control column forward and aft through the full range of travel

- while you adjust the glide screw.
 - As you move the control column, make sure that the orientation of the glide stays the same.
 - If the glide configuration on the airplane does not include a plug, tighten the glide screw until the glide fits snugly against the square tube.
- (e) Finish the installation of the safety wire through the head of the glide screw. (Refer to Chapter 20, [Safetying - Maintenance Practices](#).)
- (10) For Airplane serial numbers 18280001 thru 18282311 and T18208001 thru T18209055 that are not in compliance with Cessna Service Bulletin SEB-27-01 do the steps that follow:
- NOTE:** For airplanes that are not in compliance with Cessna Service Bulletin SEB-27-01 the screw that attaches the glide plug to the control tube assembly does not have safety wire installed.
- (11) Put the glide and glide plug in its correct position in the control column.
- (a) Apply Loctite 242 to the screw threads.
- (b) Install the screw that attaches the glide and plug to the control tube assembly.
- NOTE:** Some airplanes do not have the glide plug installed.
- (12) Install the control wheel. Refer to [Control Wheel Removal/Installation](#).
- (13) Install the access plates [520AB](#) and [620AB](#). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (14) Rig the aileron control system. Refer to the Adjustment/Test.

4. Aileron Removal/Installation

- A. Aileron Removal (Refer to [Figure 201](#)).
- (1) Disconnect the aileron pushrod at the aileron.
 - (2) Disconnect the electrical bonding straps.
 - (3) Remove the screws and the nuts that attach the aileron hinges to the trailing edge of the wing.
 - (4) Carefully pull the aileron out and down to slide the hinges from under the wing skin and the auxiliary spar reinforcements.
- B. Aileron Installation (Refer to [Figure 201](#)).
- (1) Put the aileron hinges between the skin and the auxiliary spar reinforcements.
 - (2) Install the screws and the nuts that attach the hinges to the trailing edge of the wing.
 - (3) Connect the electrical bonding straps.
 - (4) Attach the aileron pushrod to the aileron.
 - (5) Check the aileron travel. Refer to the Adjustment/Test.

5. Aileron Bell Crank Removal/Installation

NOTE: The left and the right aileron bell crank removal/installation is typical.

- A. Aileron Bell Crank Removal (Refer to [Figure 201](#)).
- (1) Remove the access plates [520AB](#), [520BB](#), [620AB](#), and [620BB](#) located inboard of the bell crank on the bottom of each wing. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (2) Remove the safety clip from the turnbuckle at the carry-thru cable.
 - (3) Loosen the control cable tension at the turnbuckle.
 - (4) Disconnect the control cables from the bell crank.
 - (5) Remove the safety clip from the turnbuckle at the direct cable.
 - (6) Loosen the control cable tension at the turnbuckle.
 - (7) Disconnect the control cables from the bell crank.
 - (8) Disconnect the aileron pushrod at the bell crank.
 - (9) Remove the nuts, washers, and bolts from the bell crank stop bushing and from the bell crank-to-wing structure.
 - (10) Remove the bell crank through the access opening. Make sure that the bearing bushing is not dropped from the bell crank.
- CAUTION:** Use tape on the open ends of the bell crank to prevent dust and dirt from going into the bell crank needle bearings.
- (11) Use brass washers as shims between the lower end of the bell crank and the wing structure. Keep the shims.

B. Aileron Bell Crank Installation (Refer to [Figure 201](#)).

- (1) Install the bell crank to the structure. Make sure that the bushings are in the correct position.
- (2) Install the brass washers between the lower end of the bell crank and the wing channel to remove unwanted clearance.
- (3) Install the bell crank pivot bolt.
- (4) Put the bell crank stop-bushing in position and install the bolt.
- (5) Attach the aileron pushrod to the bell crank.
- (6) Attach the control cables to the bell crank. Make sure that the spacers and the bushings are correctly installed.
- (7) Rig the aileron system. Refer to the Adjustment/Test.
- (8) Install the safety clips on the turnbuckles. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (9) Install the access plates [520AB](#), [520BB](#), [620AB](#), and [620BB](#). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

6. Adjustment/Test

A. Rig the Aileron Cables (Refer to [Figure 201](#), [Figure 203](#), and [Figure 204](#)).

- (1) Remove the safety clips and loosen the tension from the turnbuckles at the direct and the carry-thru cables at the bell cranks in the wings.
- (2) Disconnect the push-pull rods at the bell cranks.
- (3) Remove the safety clip from the turnbuckle at the interconnect cable.
- (4) Adjust tension on the interconnect cable to 40 pounds, +10 or -10 pounds (177.93 N, +44.48 or -44.48 N) at 70°F (21°C). Refer to the Charts in [Figure 203](#) for the correct tensions at other temperatures.
- (5) Put the control wheels in a level position and tape a bar across both control wheels to hold them in position.
- (6) Adjust the direct and carry-thru cable turnbuckles to center the position of the bell crank stop bushings in the slots. The tension on the carry-thru cable must be 40 pounds, +10 or -10 pounds (177.93 N, +44.48 or -44.48 N) at 70°F (21°C). Refer to the Charts in [Figure 203](#) for the correct tensions at other temperatures. Disregard the tension on the direct cables.
- (7) Adjust the push-pull rods at each aileron until the ailerons are neutral with reference to trailing edge of wing flaps. Make sure that the wing flaps are in the full UP position when you make this adjustment.
- (8) With the ailerons in the neutral position (streamlined), mount an inclinometer on the trailing edge of one aileron and set it to 0 degrees.
- (9) Remove the bar from the control wheels. If travel is not within limits, readjust push-pull rods and cables as necessary.
- (10) Check the aileron travel which must be 20 degrees +2 or -2 degrees up and 15 degrees, +2 or -2 degrees down.
- (11) Make sure that the safety clips are correctly installed in all turnbuckles. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (12) Make sure that the cables and the cable guards are correctly installed, all jam nuts are tight, and all items removed for access are installed.

Figure 201 : Sheet 1 : Aileron Control System Installation

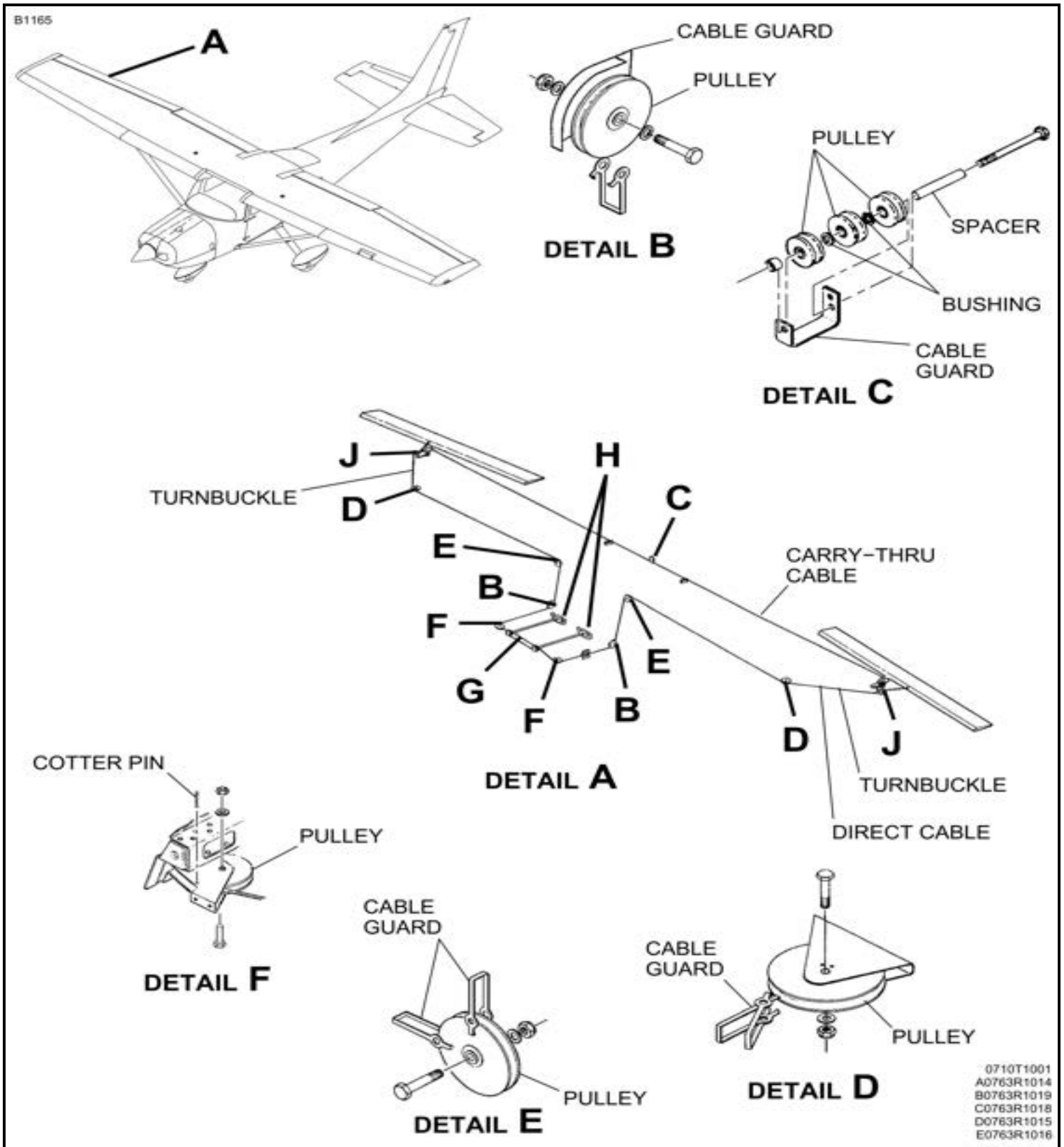
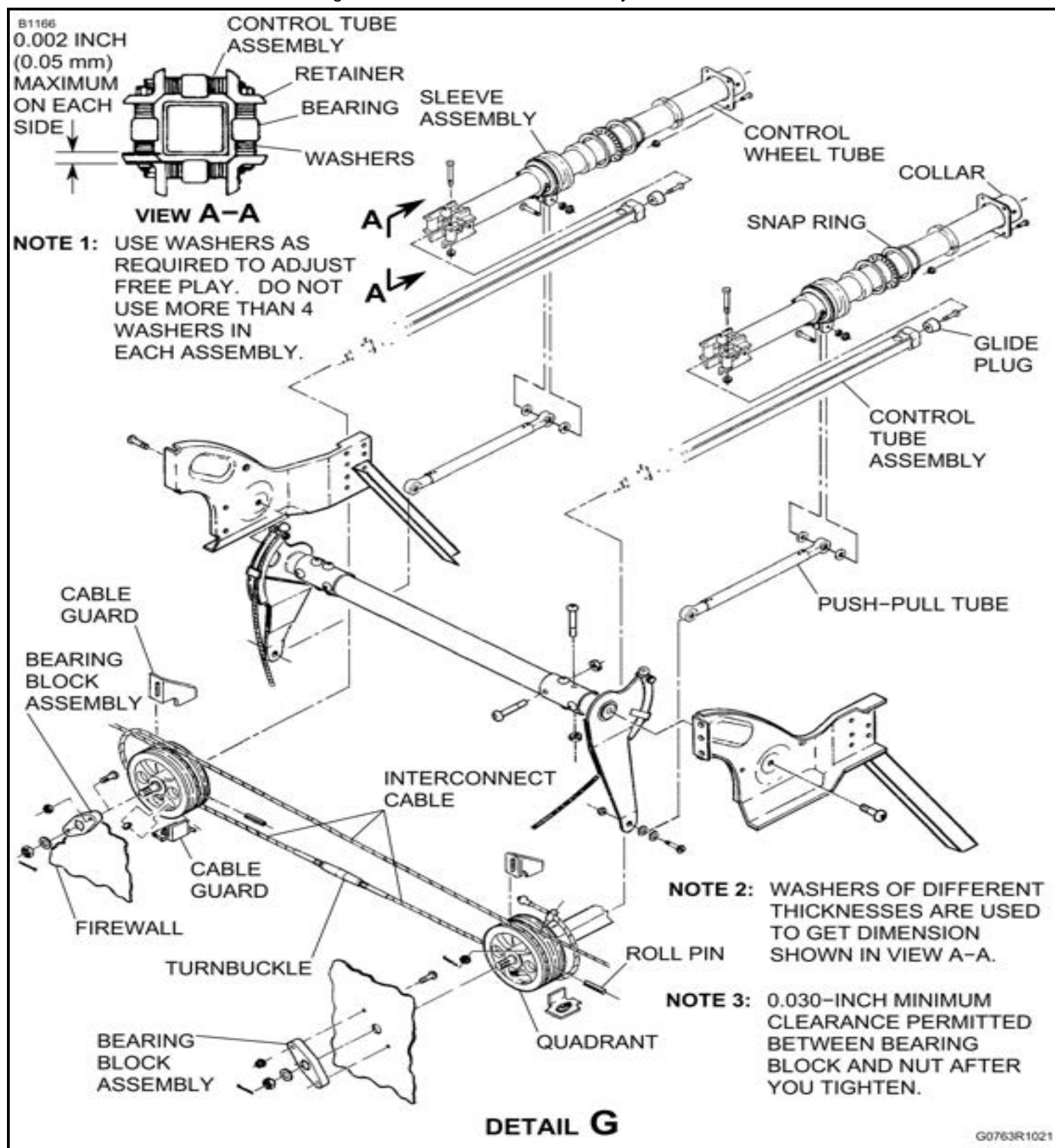


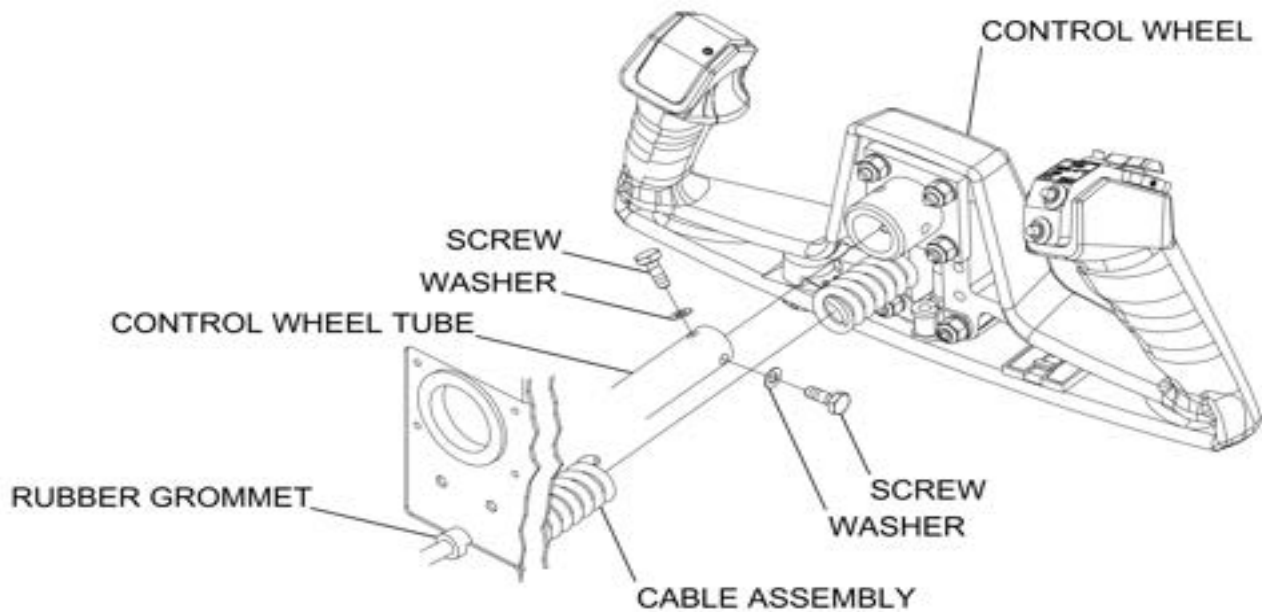
Figure 201 : Sheet 2 : Aileron Control System Installation



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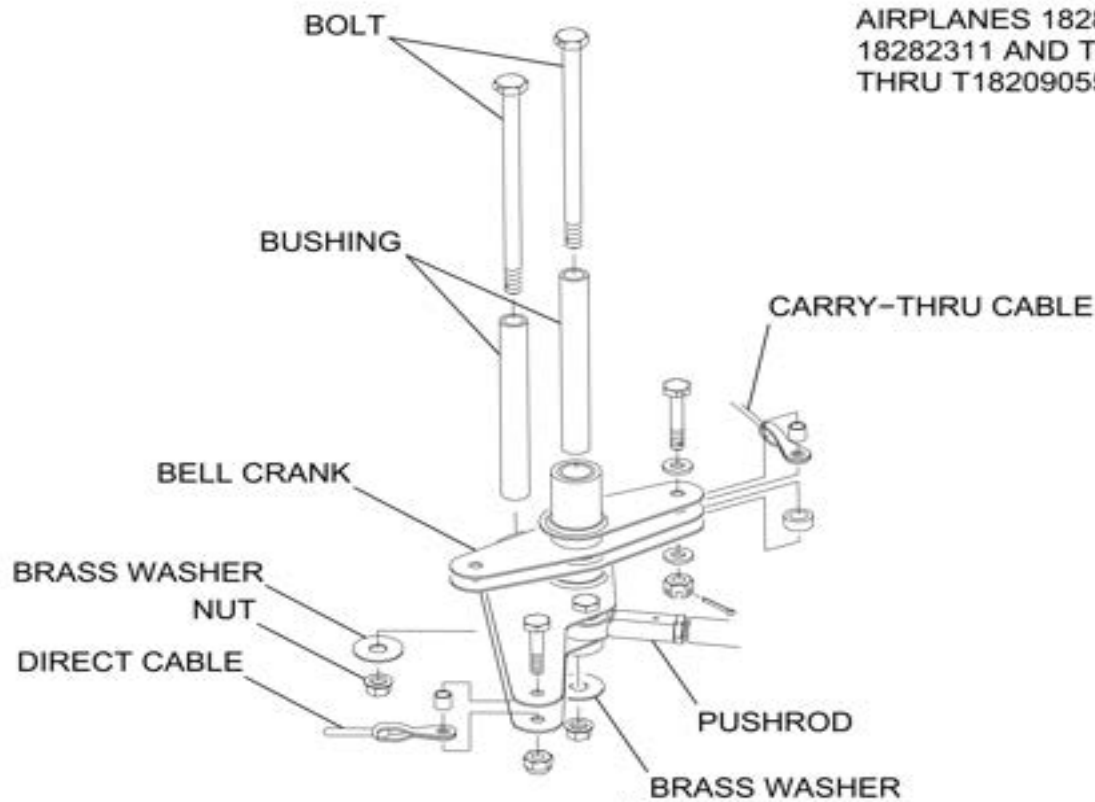
Figure 201 : Sheet 3 : Aileron Control System Installation

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DETAIL H

AIRPLANES 18280001 THRU
18282311 AND T18208001
THRU T18209055

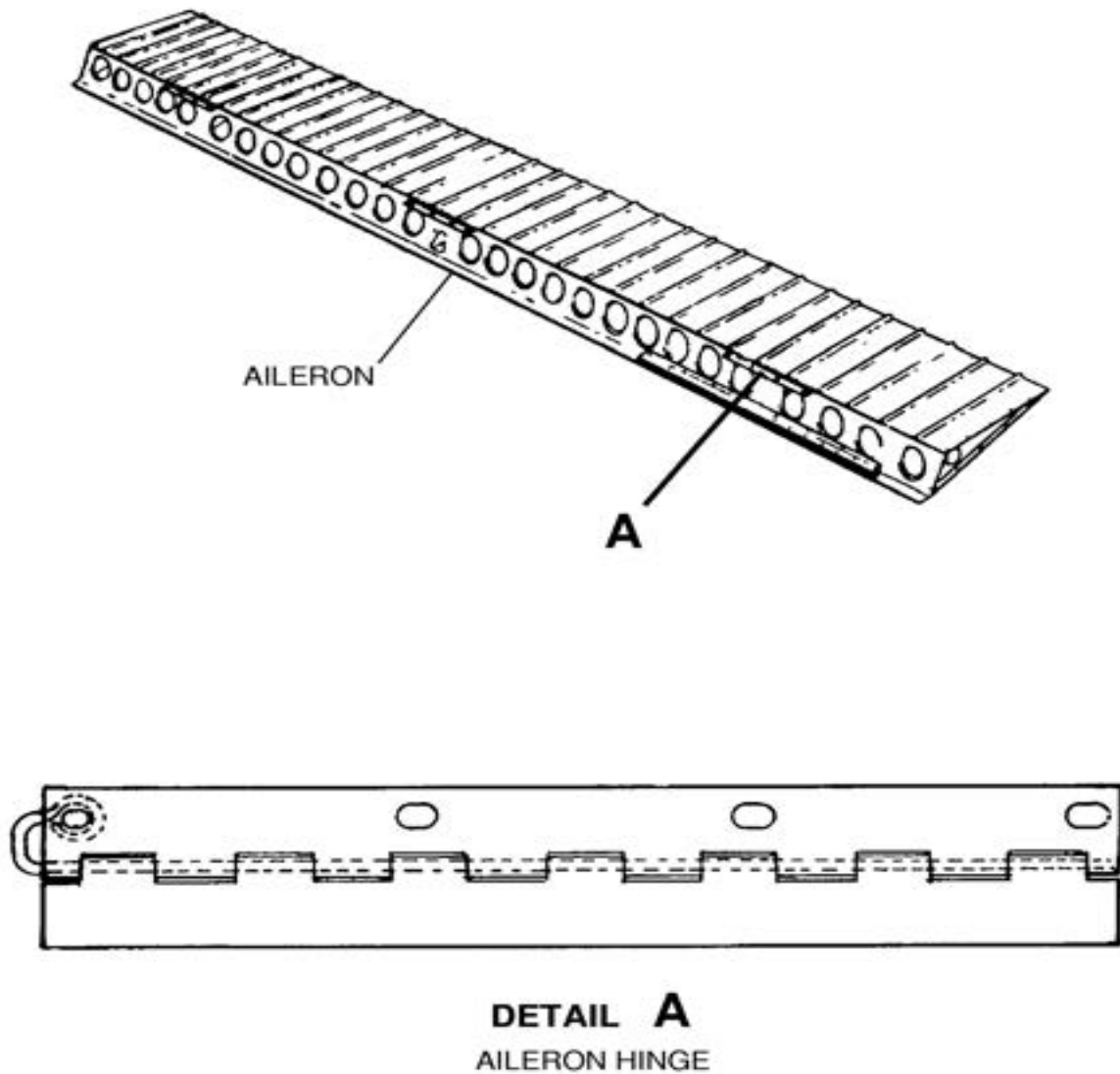


DETAIL J

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J0763T1012

Figure 201 : Sheet 4 : Aileron Control System Installation

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A05611015

Figure 202 : Sheet 1 : Control Column Glide Assembly Installation

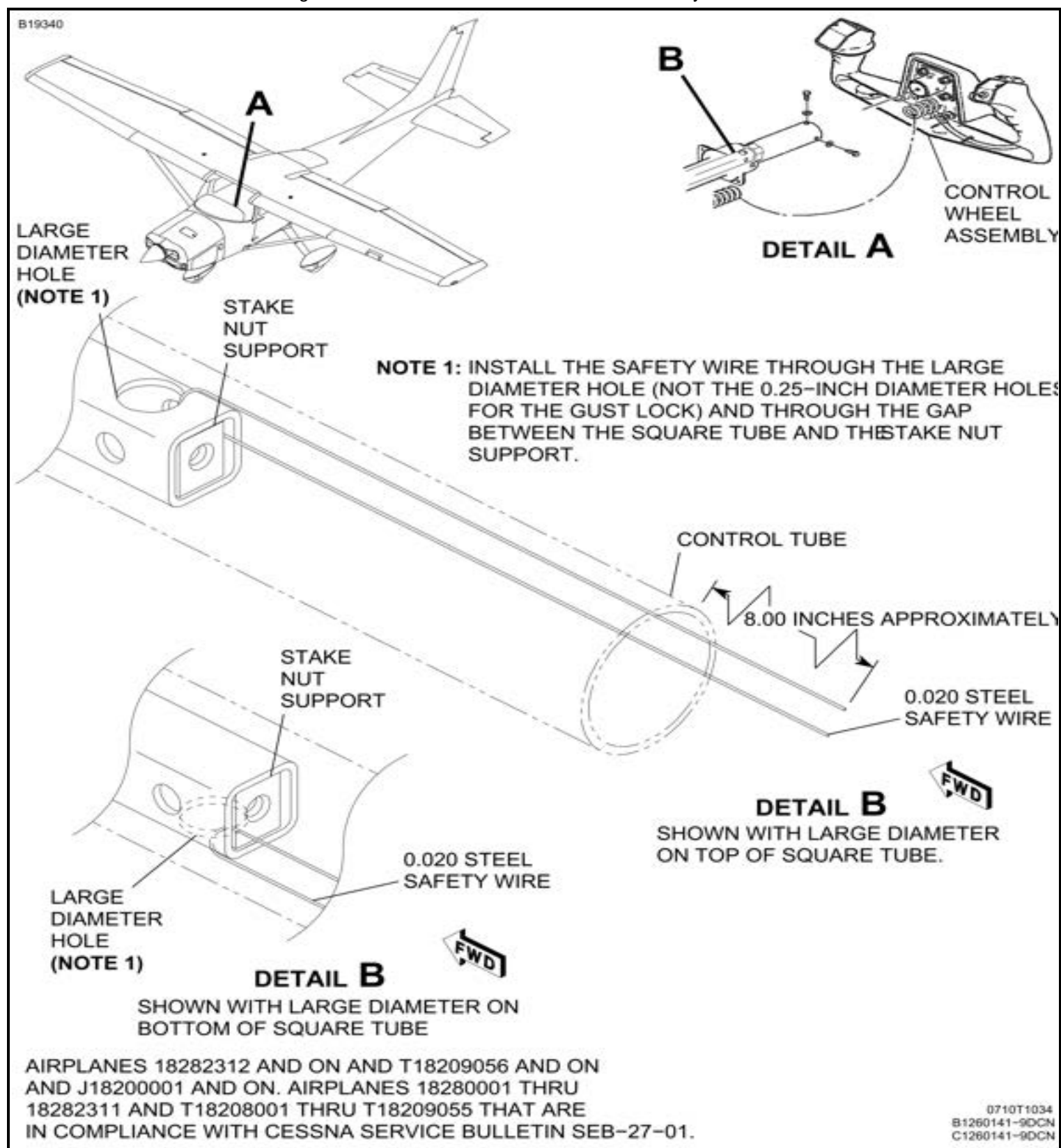


Figure 202 : Sheet 2 : Control Column Glide Assembly Installation

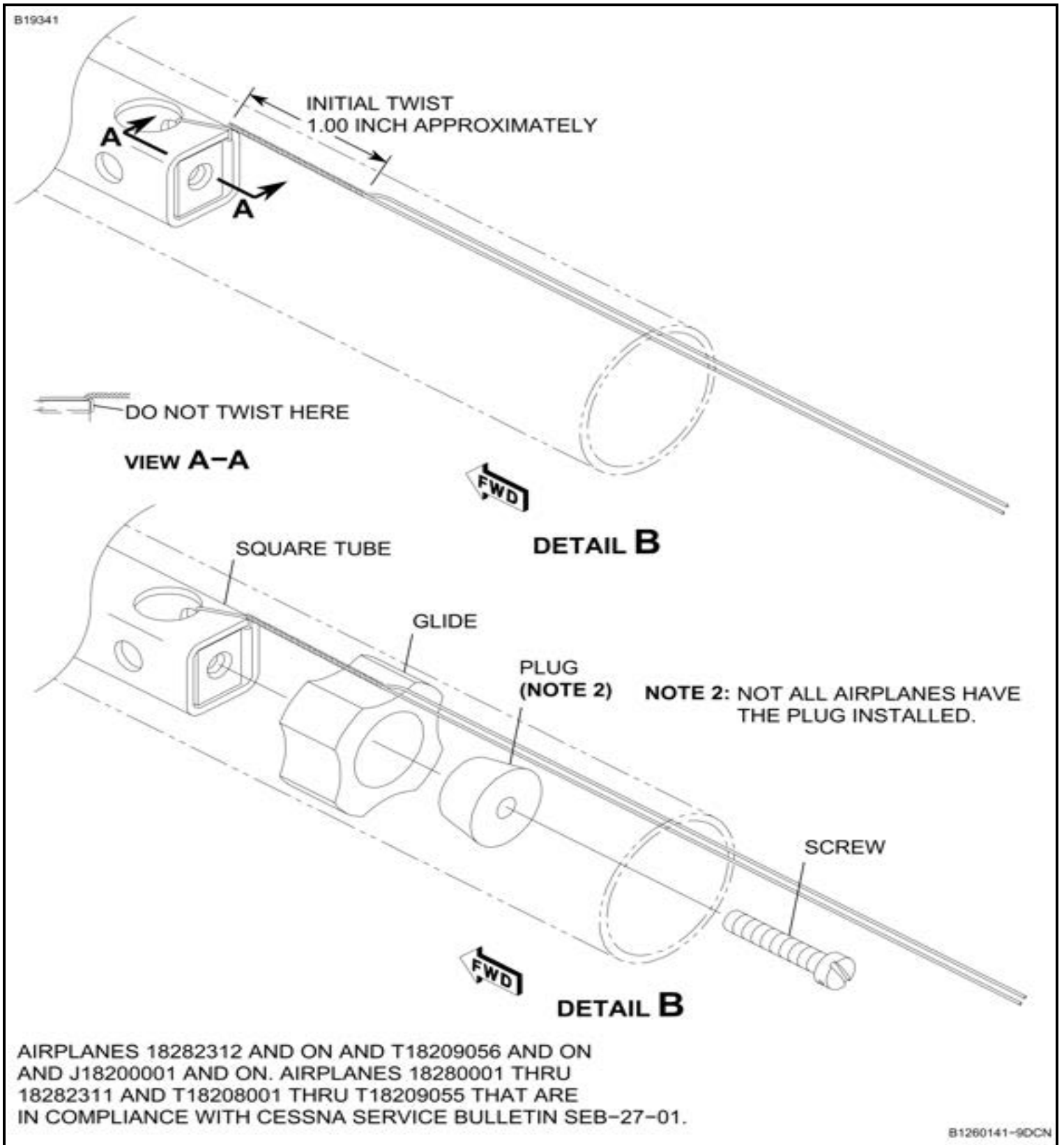


Figure 202 : Sheet 3 : Control Column Glide Assembly Installation

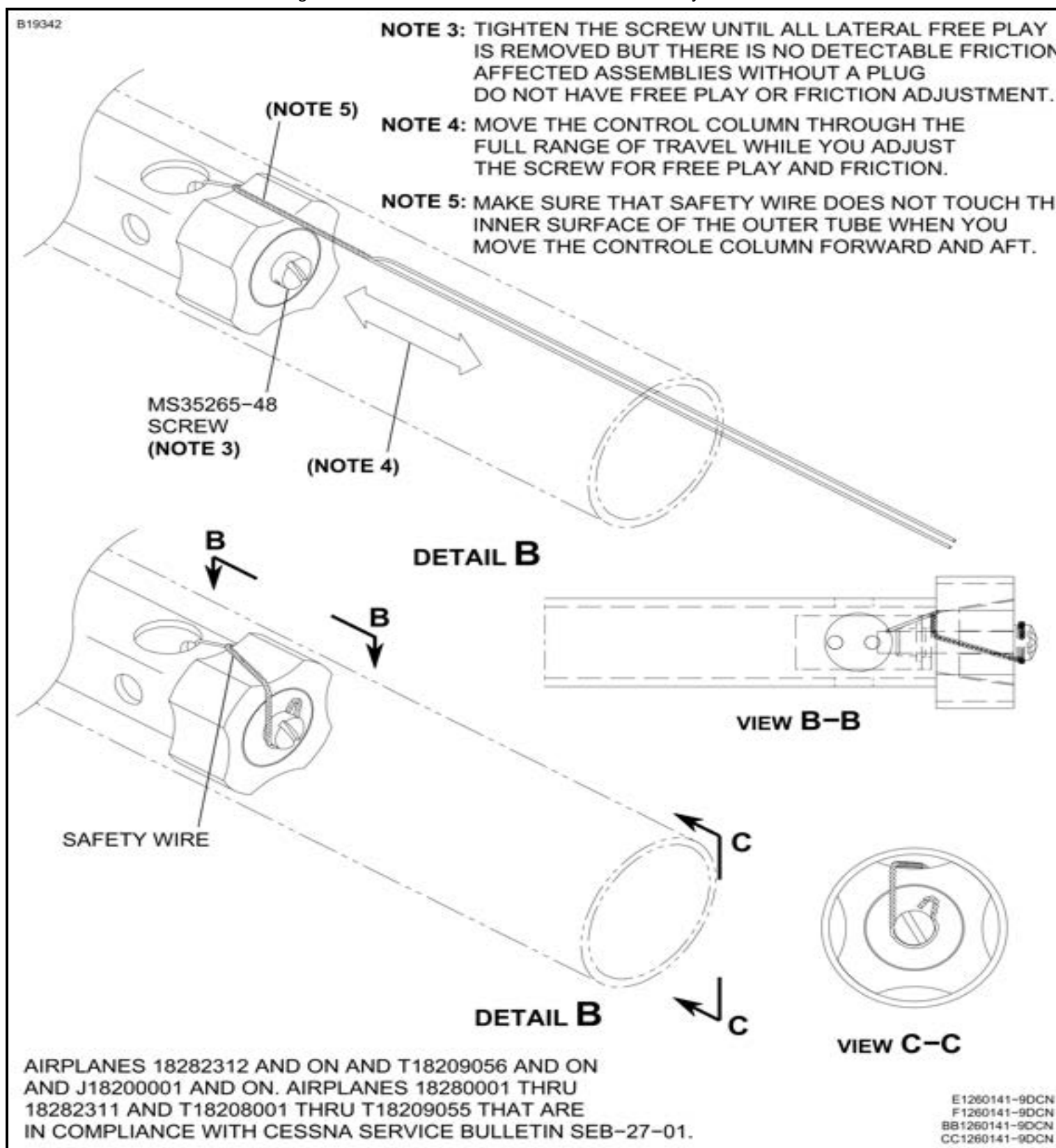
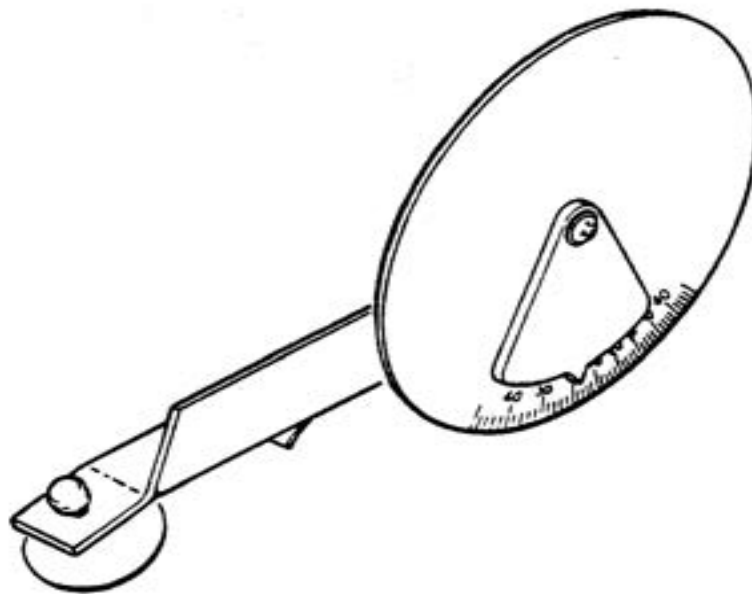


Figure 203 : Sheet 1 : Inclinator for Measuring Control Surface Travel

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Figure 204 : Sheet 1 : Aileron Cable Tension

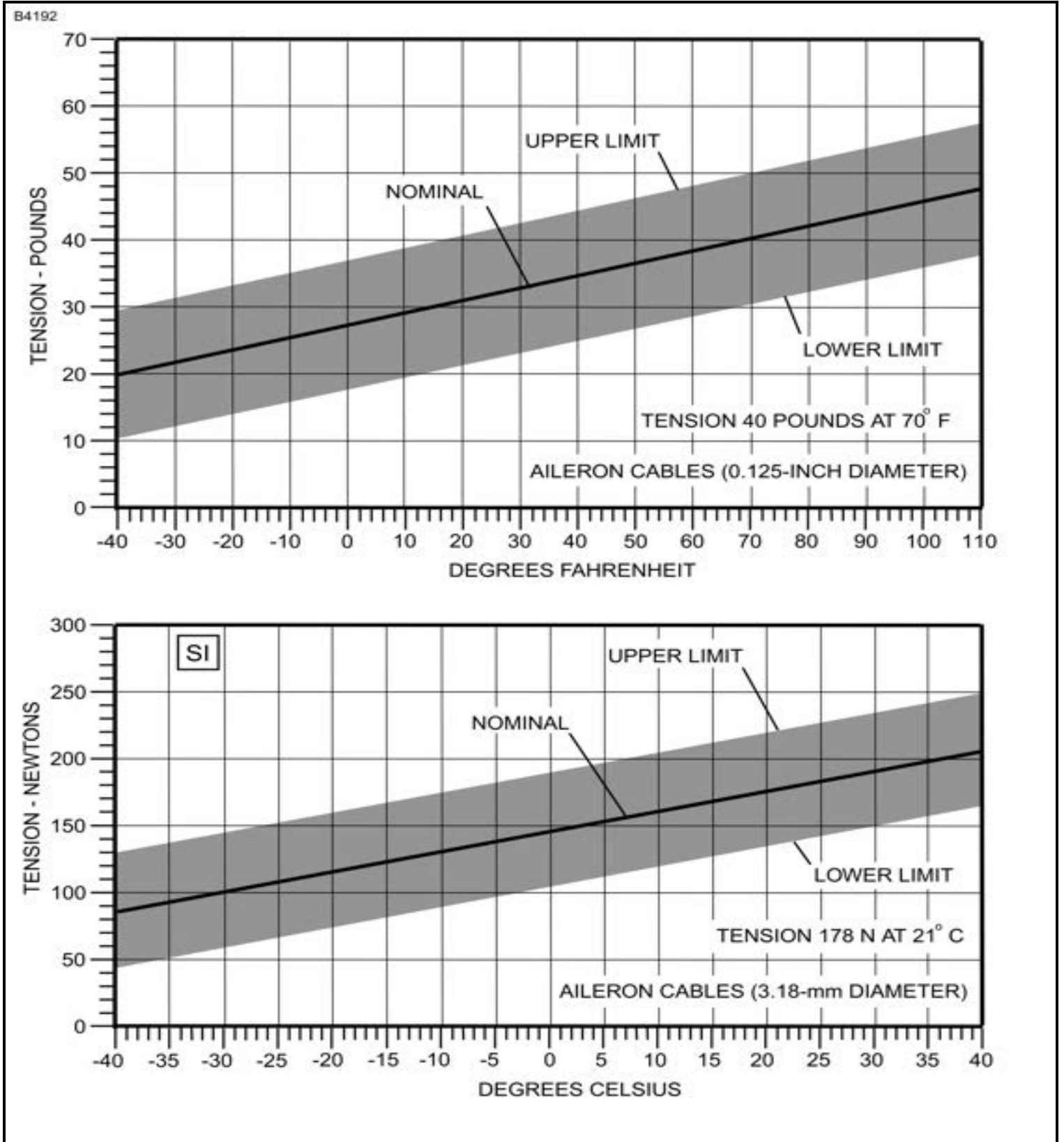


Figure 3 : Sheet 1 : Wing Access Panels

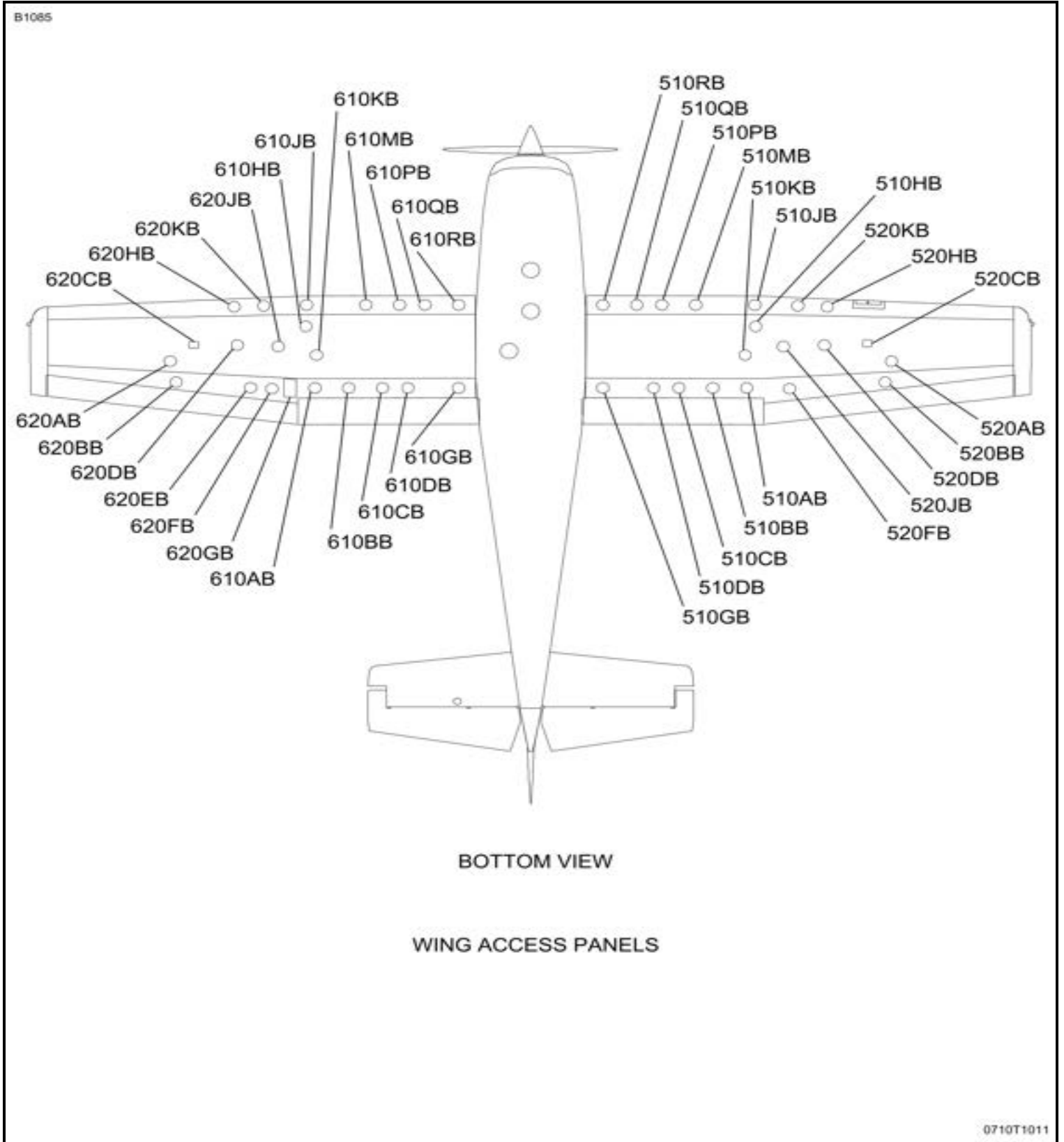
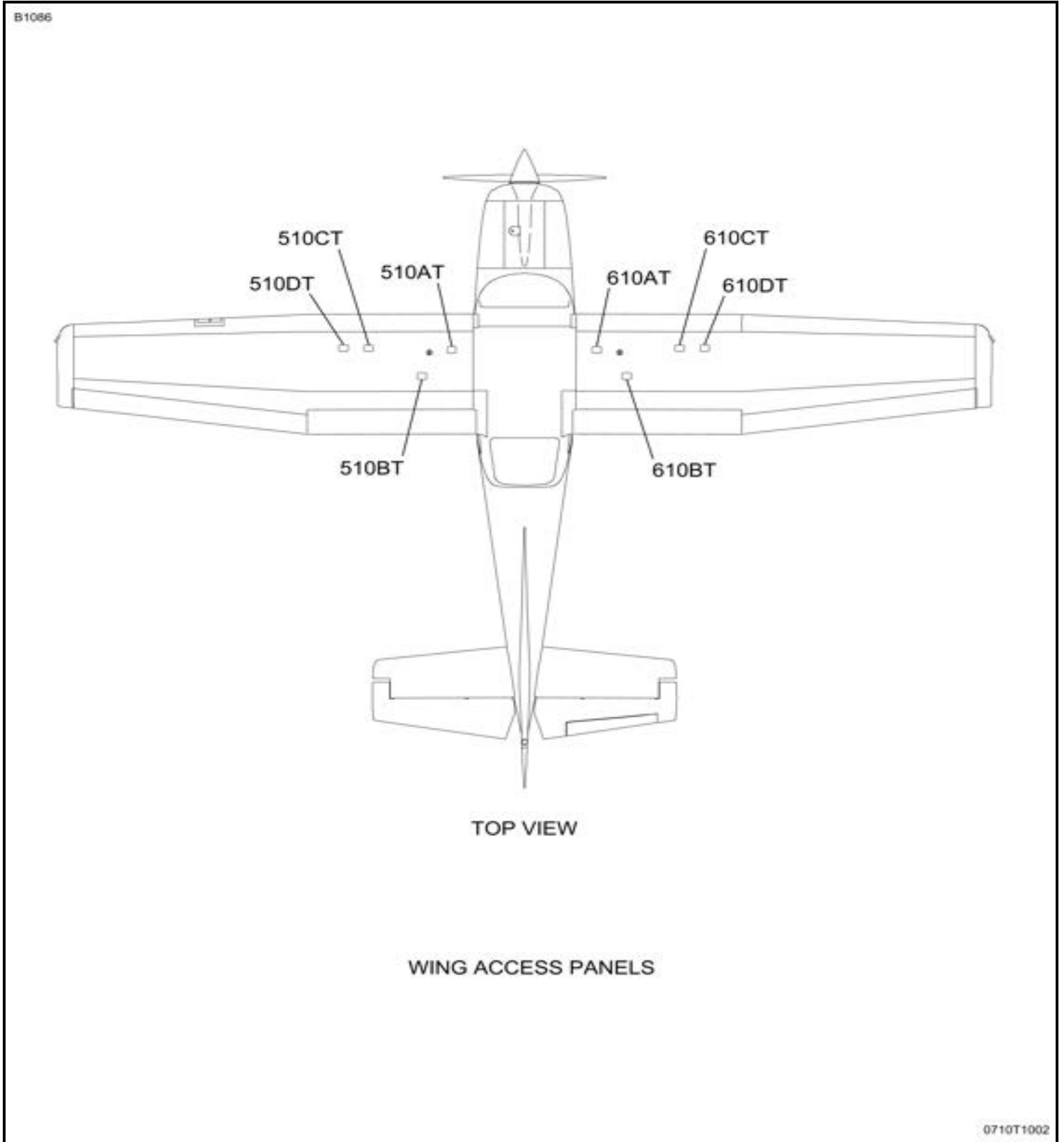


Figure 3 : Sheet 2 : Wing Access Panels



RUDDER CONTROL SYSTEM - TROUBLESHOOTING

1. General

- A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to [Figure 101](#).

Figure 101 : Sheet 1 : Rudder System Troubleshooting Chart

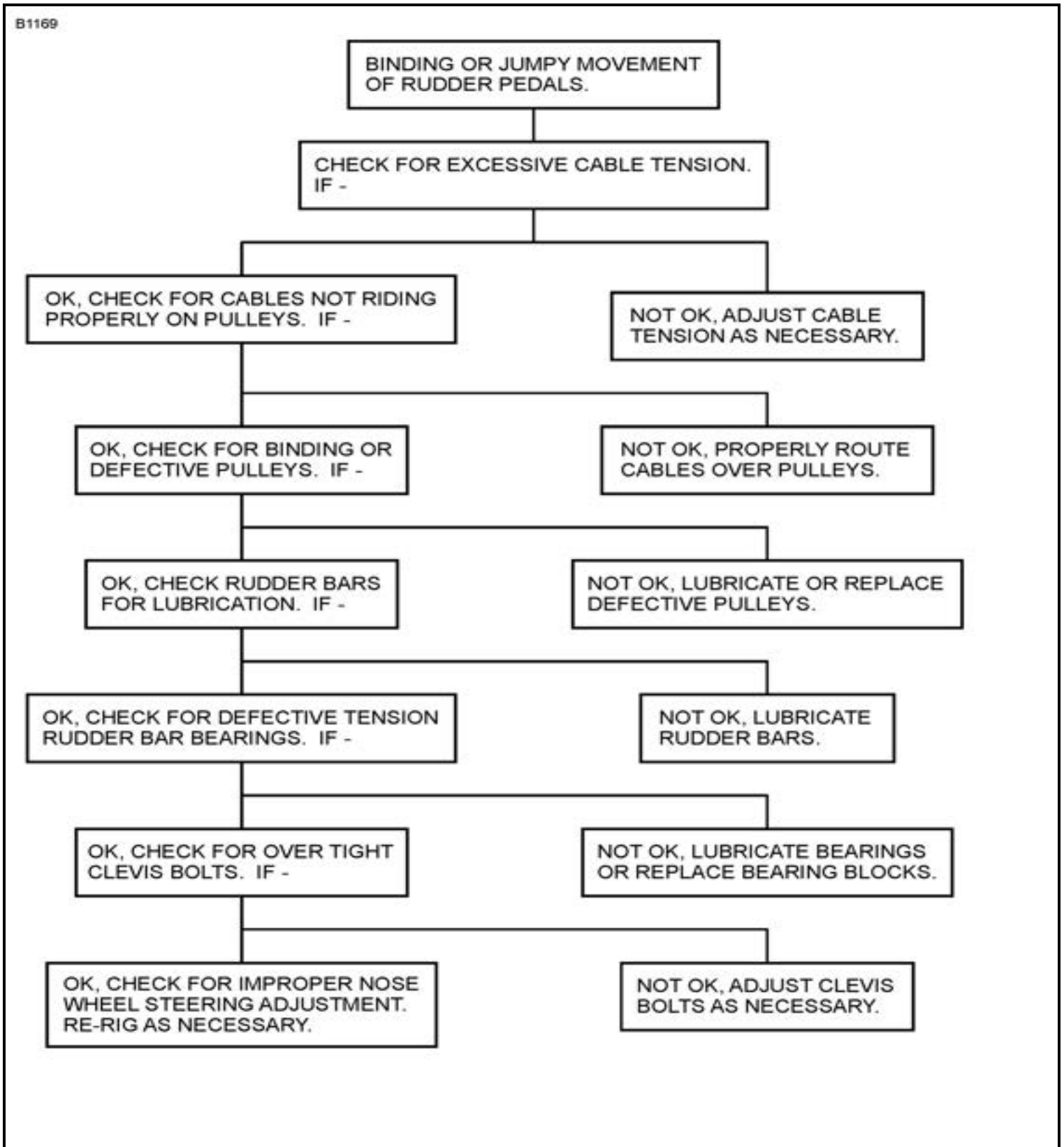


Figure 101 : Sheet 2 : Rudder System Troubleshooting Chart

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RUDDER DOES NOT
RESPOND TO
PEDAL MOVEMENT.

CHECK FOR BROKEN OR
DISCONNECTED CABLE,
REPLACE OR CONNECT
CABLE.

LOST MOTION BETWEEN
RUDDER PEDALS AND
RUDDER.

CHECK FOR INSUFFICIENT
CABLE TENSION. ADJUST
CABLE TENSION AS NECESSARY.

RUDDER CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

- A. Conventional rudder pedals control the rudder and the nose wheel steering. The rudder control system has rudder pedals, torque tubes, bearings, a centering bungee, bell crank, cables, and pulleys, all of which link the pedals to the rudder and the nose wheel steering.

2. Rudder Pedal Assembly Removal/Installation

- A. Rudder Pedal Assembly Removal (Refer to [Figure 201](#)).
- (1) Remove the crew seats. Refer to Chapter 25, [Front Seats and Rails - Maintenance Practices](#).
 - (2) Remove the pedestal cover, carpet, and rudder shield assemblies. Refer to Chapter 25, [Equipment/Furnishings - General](#).
 - (3) Disconnect the master cylinders at the pilot rudder pedals.
 - (4) Disconnect the parking brake cables at the master cylinders.
 - (5) Remove the rudder pedals and the brake links.
 - (6) Remove the fairings ([340AL and 340AR](#)) for access to the rudder cable turnbuckles. Refer to Chapter 6, [Access/Inspection Plates - Description and Operation](#).
 - (7) Remove the safety clips from the turnbuckles and relieve cable tension.
 - (8) Disconnect the right forward and the left forward cables from the rudder bar arms.
 - (9) Disconnect the nose gear steering pushrods from the rudder bar arms.
 - (10) Remove the bolts that attach the bearing blocks and the rudder bars that are found under the instrument panel.
 - (11) Remove the bearing blocks and the rudder bars.

NOTE: The two inboard bearing blocks have clearance holes for the rudder bars at one end and a bearing hole at the other. Label these bearing blocks for reference when you install them.

- B. Rudder Pedal Assembly Installation (Refer to [Figure 201](#)).
- (1) Lubricate the rudder bar assemblies. Refer to [Chapter 12, Flight Controls - Lubrication](#).
 - (2) Position the rudder bars in the area below the instrument panel and attach the bearing blocks with the bolts.
 - (3) Connect the nose gear steering pushrods to the rudder bar arms.
 - (4) Connect the left forward and the right forward cables to the rudder bar arms.
 - (5) Install the rudder pedals and the brake links.
 - (6) Connect the parking brake cables at the master cylinders.
 - (7) Connect the master cylinders at the pilot rudder pedals.
 - (8) Rig the rudder system. Refer to [Rudder Control Adjustment/Test](#).
 - (9) Install the safety clips.
 - (10) Install the crew seats. Refer to Chapter 25, [Front Seats and Rails - Maintenance Practices](#).
 - (11) Install the pedestal cover, carpet, and rudder shield assemblies. Refer to Chapter 25, [Equipment/Furnishings - General](#).
 - (12) Install the fairings ([340AL and 340AR](#)). Refer to Chapter 6, [Access/Inspection Plates - Description and Operation](#).

3. Rudder Removal/Installation

- A. Rudder Removal (Refer to [Figure 201](#)).
- (1) Remove the stinger.
 - (2) Disconnect the tail navigation light quick-disconnect (JV001) at the bottom of the rudder.
 - (3) Remove the fairing from the two sides of the vertical fin.
 - (4) Remove the safety wire from the turnbuckles.
 - (5) Loosen the turnbuckles to remove cable tension.
 - (6) Disconnect the cables from the rudder bell crank.
 - (7) With the rudder supported, remove the hinge bolts.
 - (8) Remove the electrical bonding strap.
 - (9) Carefully lift the rudder away from the vertical fin.

B. Rudder Installation (Refer to [Figure 201](#)).

- (1) With the rudder supported, install the hinge bolts to attach the rudder to the vertical fin.
- (2) Install the electrical bonding strap.
- (3) Torque the nuts to 50 to 70 inch pounds plus free running torque.
- (4) Connect the cables to the rudder bell crank. Do not tighten too much. Make sure that the terminal (clevis) pivots freely.
- (5) Rig the rudder system.
- (6) Safety the turnbuckles with wire.
- (7) Lubricate the system. Refer to [Chapter 12, Flight Controls - Lubrication](#).
- (8) Connect the tail navigation light quick-disconnect (JV001) at the bottom of the rudder.
- (9) Install the stinger.

4. Rudder Control Cables Removal/Installation

A. Rudder Cables Removal (Refer to [Figure 201](#)).

- (1) Remove the seats, carpet, and baggage wall. Refer to Chapter 25, [Equipment/Furnishings - General](#).
- (2) Remove the rudder shield assemblies and the plates ([231AB](#), [231BB](#), [231DB](#), [231EB](#), [231HB](#), [231JB](#), and [310AR](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (3) Remove the fairings ([340AL](#) and [340AR](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (4) Remove the safety clips from the turnbuckles and relieve cable tension.
- (5) Disconnect the left and the right rudder cables from the rudder bell crank.
- (6) Disconnect the left and the right rudder cables from the rudder bar arms.
- (7) Remove the pulleys and the cable guards as necessary to remove the cables.

NOTE: To ease the routing of the cables, you can attach a length of wire to the end of the cable before you remove it from the airplane. Leave the wire in place, routed through the structure. Then attach the cable the wire to install and pull the cable into position.

- (8) Remove the rudder cables.

B. Rudder Cables Installation (Refer to [Figure 201](#)).

- (1) If installed, attach the cables to the wires and pull the cables through the airplane structure.
- (2) Attach the left and the right rudder cables to the rudder bell crank.
- (3) Attach the left and the right rudder cables to the rudder bar arms.
- (4) Install the pulleys and the pulley guards. Make sure that the cables are in the pulley grooves before you install the cable guards.
- (5) Rig the rudder system. Refer to [Rudder Control Adjustment/Test](#).
- (6) Install the rudder shield assemblies and the plates ([231AB](#), [231BB](#), [231DB](#), [231EB](#), [231HB](#), [231JB](#), and [310AR](#)), that you removed for access. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (7) Install the seats, carpet, and baggage wall. Refer to Chapter 25, [Equipment/Furnishings - General](#).
- (8) Install the fairings ([340AL](#) and [340AR](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

5. Rudder Control Adjustment/Test

A. Rig Rudder Controls (Refer to [Figure 201](#), [Figure 202](#), and [Figure 203](#)).

- (1) Remove the stinger ([310DB](#)) for access to the rudder stop bolts. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (2) Adjust the rudder stop bolts to get 24 degrees, +0 or -1 degree, measured parallel to the water line, and 27 degrees 13 minutes, +0 or -1 degree, measured perpendicular to the hinge line.
- (3) Tighten the jam nuts.
- (4) Remove the crew seats. Refer to Chapter 25, [Front Seats and Rails- Maintenance Practices](#).
- (5) Remove the pedestal cover, carpet, and rudder shield assemblies. Refer to Chapter 25, [Equipment/Furnishings - General](#).
- (6) Loosen the idler sprocket and disengage the chain from the forward trim shaft sprocket and the steering bungee sprocket.
- (7) Disconnect the steering bungee adjustable rod end from the bell crank.

- (8) Remove the fairings (340AL and 340AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (9) Remove the safety clips from the left and the right rudder cable turnbuckles and relieve cable tension.
- (10) Clamp the rudder pedals in the neutral position and adjust the push-pull rods to center the bell crank.

NOTE: The bell crank is centered when the bolts in each end are the same distance from the bulkhead just forward of the bell crank.

- (11) Tighten the jam nuts.
- (12) Keep the rudder pedals in the neutral position and adjust the turnbuckles on the left and the right rudder cables. The correct tension adjustment is 30 pounds, +10 or -10 pounds (133.45 N, +44.48 or -44.48 N) at 70 °F (21 °C) with the rudder offset one degree to the right. Refer to Figure 203 for the correct tensions at other temperatures.

NOTE: When the rudder is offset one degree to the right, this is 5/16 inch at the lower trailing edge from the neutral position of the rudder.

- (13) Install the safety clips on the rudder cable turnbuckles.
- (14) Check the rudder travel. (Refer to Figure 202).
 - (a) Find the neutral position of the rudder.
 - 1 Clamp a straightedge on each side of the fin and the rudder.
 - 2 Block the trailing edge of the rudder at half of the distance between the straightedges.
 - 3 Tape a length of soft wire to the stinger to let it bend to index at the lower corner of the rudder trailing edge.
 - 4 With a soft lead pencil, mark the rudder at the at the soft wire indexing point (neutral).
 - (b) Remove the straightedges and the blocks.
 - (c) Hold the rudder against the right and then the left rudder stop.
 - (d) In the two directions of travel, measure the distance from the pointer to the pencil mark on the rudder. The distance should be between 8.12 inches and 8.72 inches (206.25 mm and 221.49 mm).

- (15) Rig rudder trim system. Refer to Rudder Trim Adjustment/Test.

NOTE: The rudder control system, rudder trim control system, and nosewheel steering system are connected. Adjustments to one of these systems have an effect on the others. The rudder control system must be correctly rigged before you rig the rudder trim and the nosewheel steering system.

- (16) Install stinger (310DB), fairings (340AL and 340AR), pedestal cover, carpet, rudder shield assemblies, and seats. Refer to Chapter 6, Access/Inspection Plates - Description and Operation, Chapter 25, Front Seats and Rails - Maintenance Practices, and Chapter 25, Rear Seat - Maintenance Practices.

WARNING: Make sure that the rudder moves in the correct direction when you operate the rudder pedals.

- (17) Operate the rudder system to check for ease of movement, full travel, and correct operation.

Figure 201 : Sheet 1 : Rudder Control System Installation

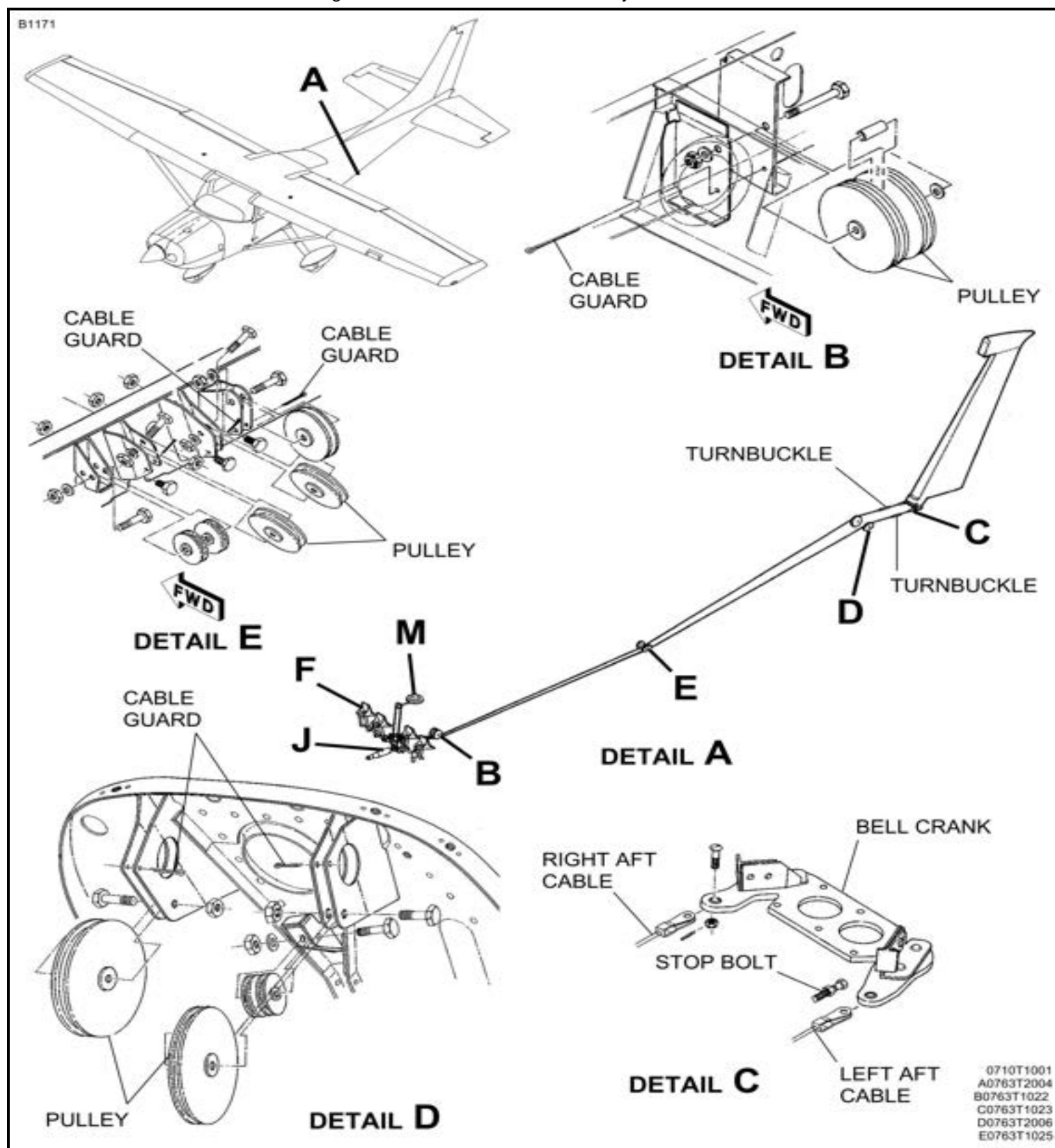


Figure 201 : Sheet 2 : Rudder Control System Installation

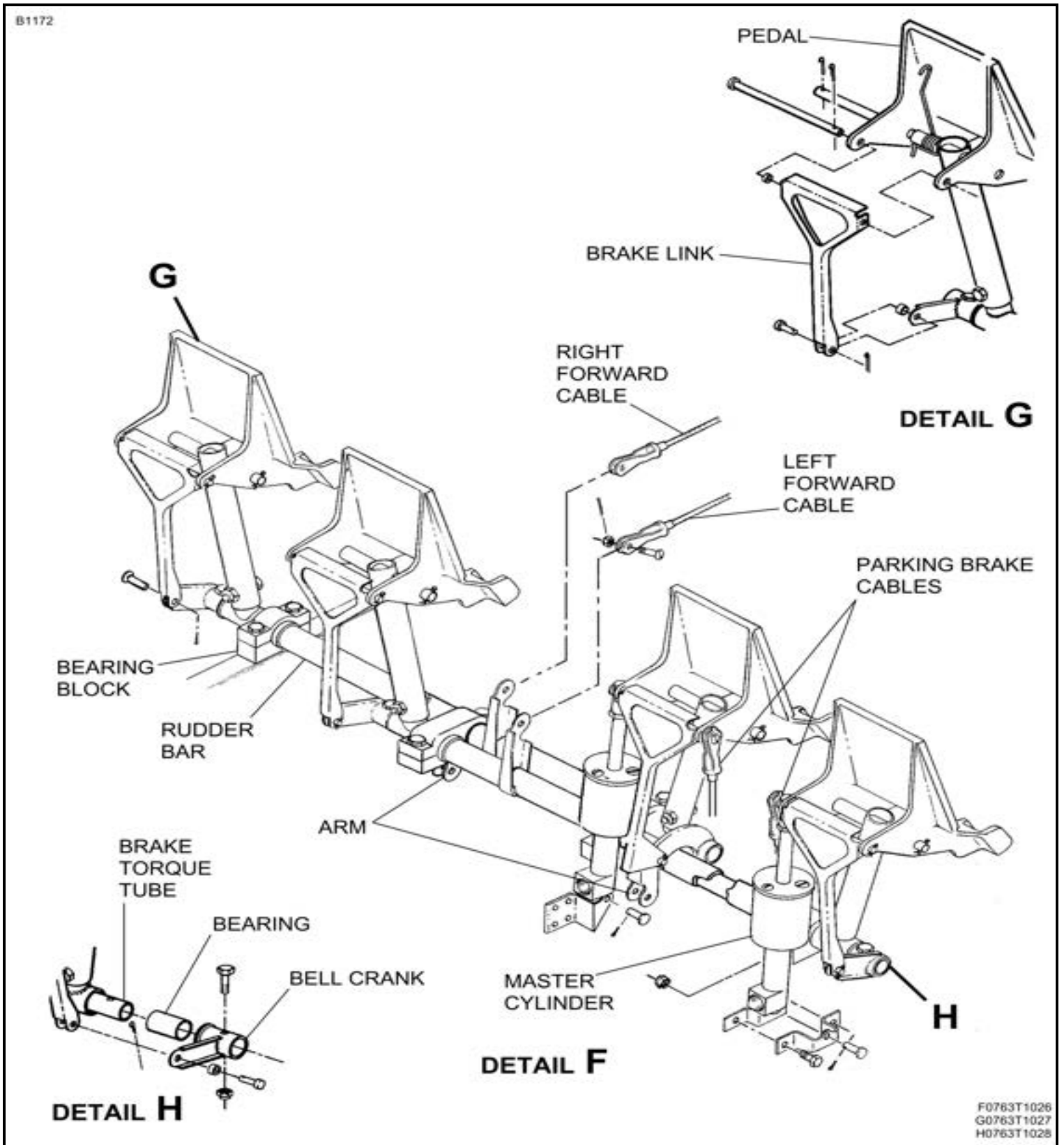


Figure 201 : Sheet 3 : Rudder Control System Installation

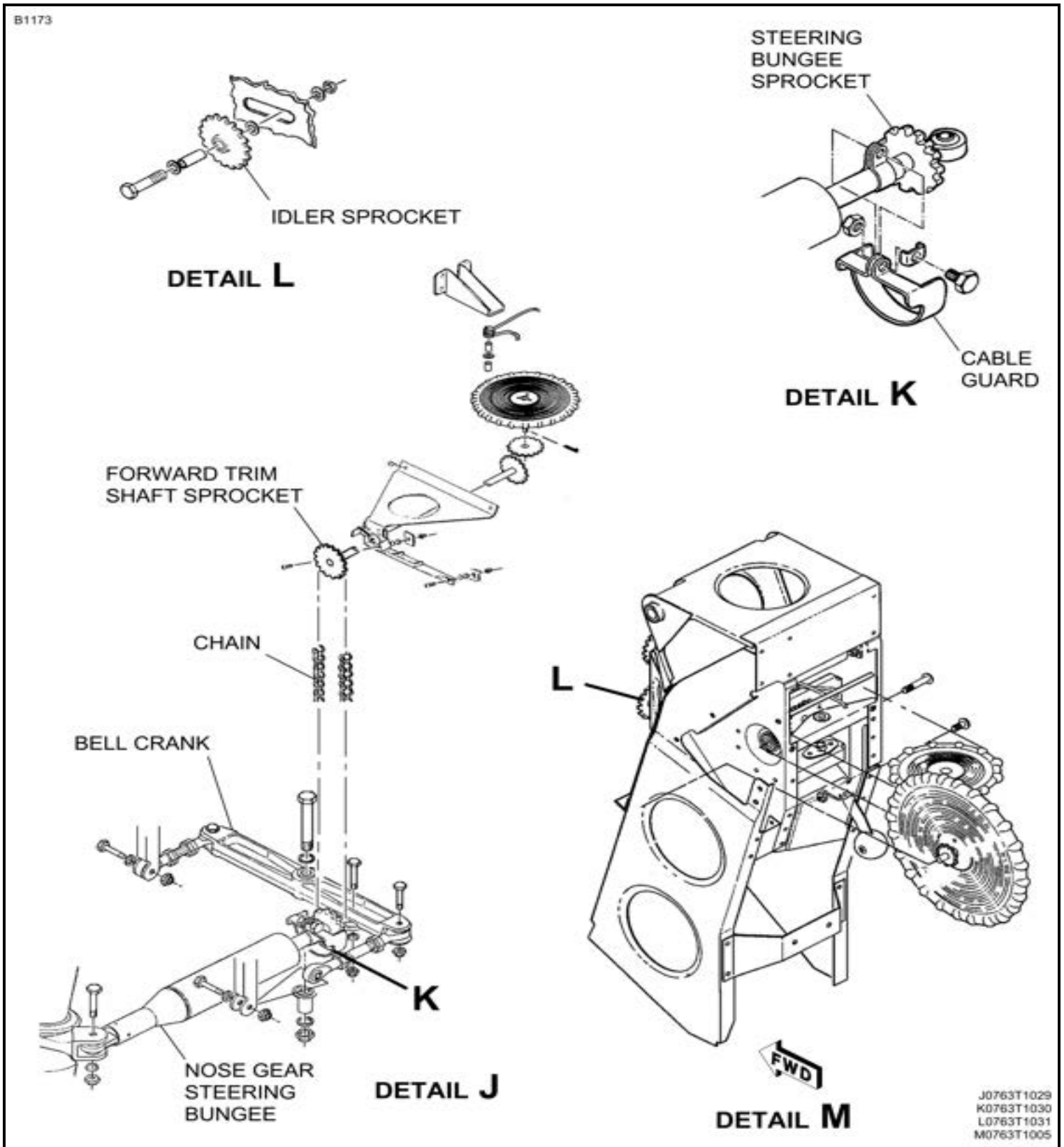
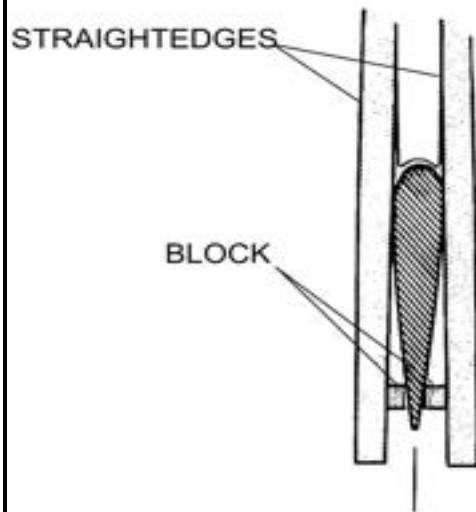


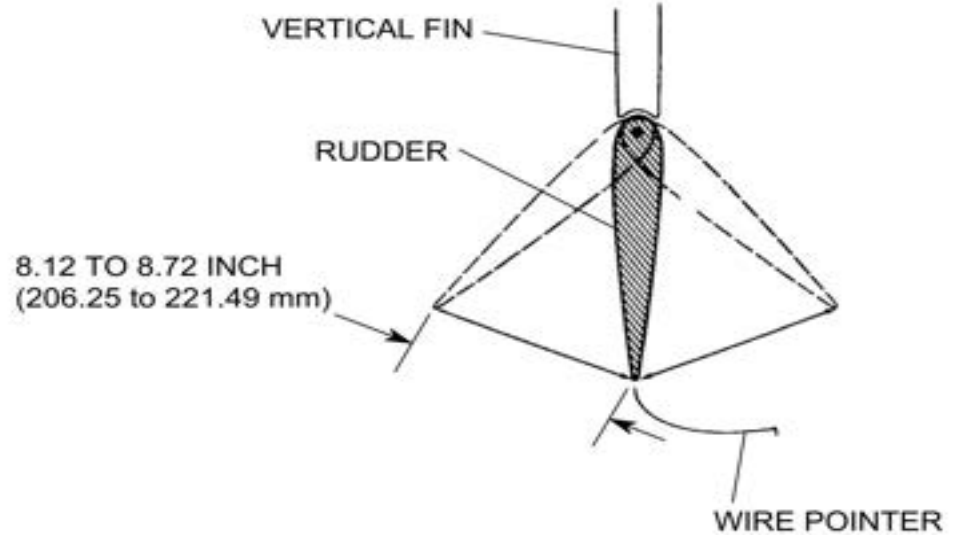
Figure 202 : Sheet 1 : Rudder Travel Adjustment

B1174

STEP 1: ESTABLISH NEUTRAL
POSITION OF RUDDER.



STEP 2: MEASURE
RUDDER TRAVEL.



0562T1009

Figure 203 : Sheet 1 : Rudder Cable Tension

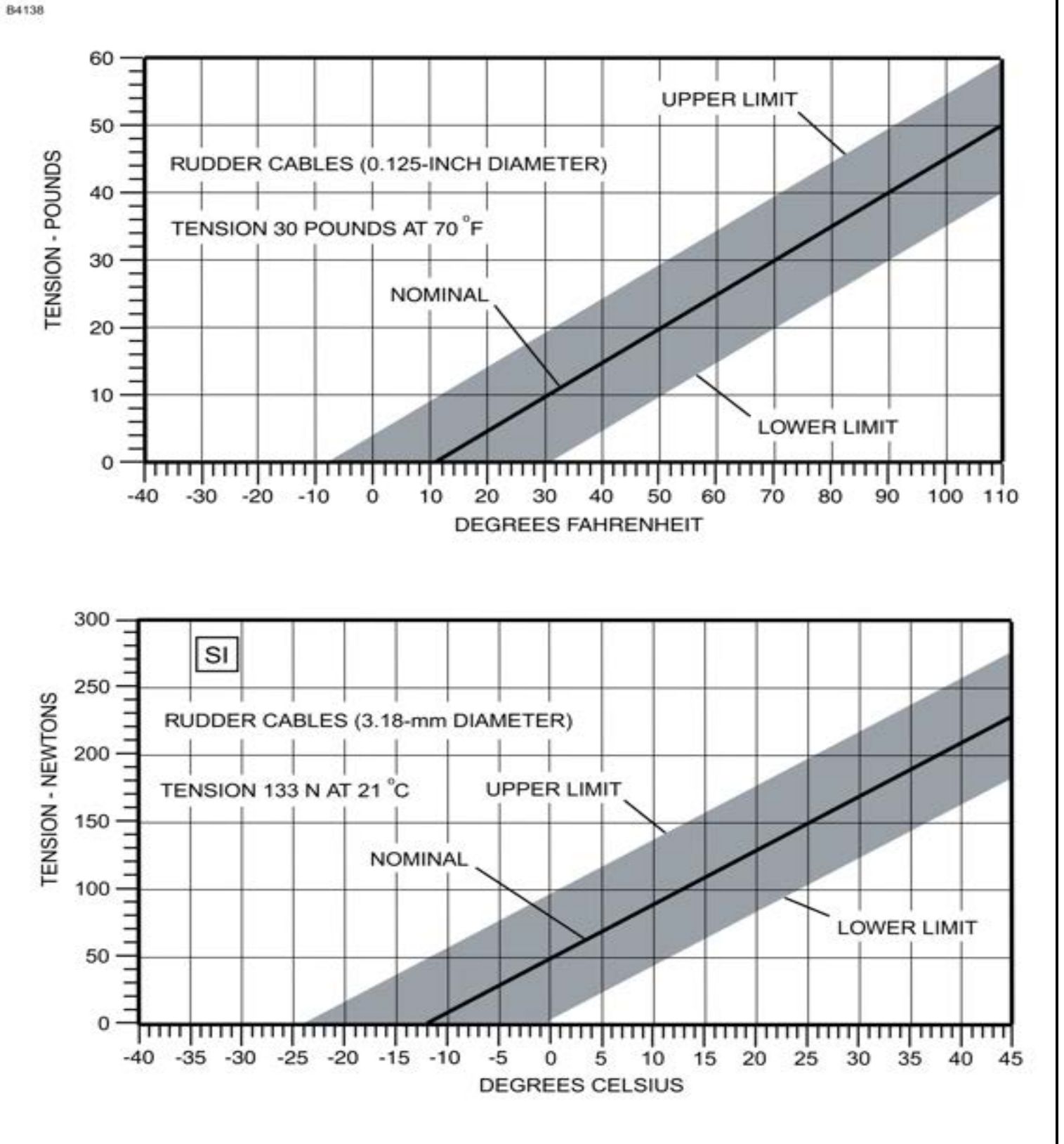
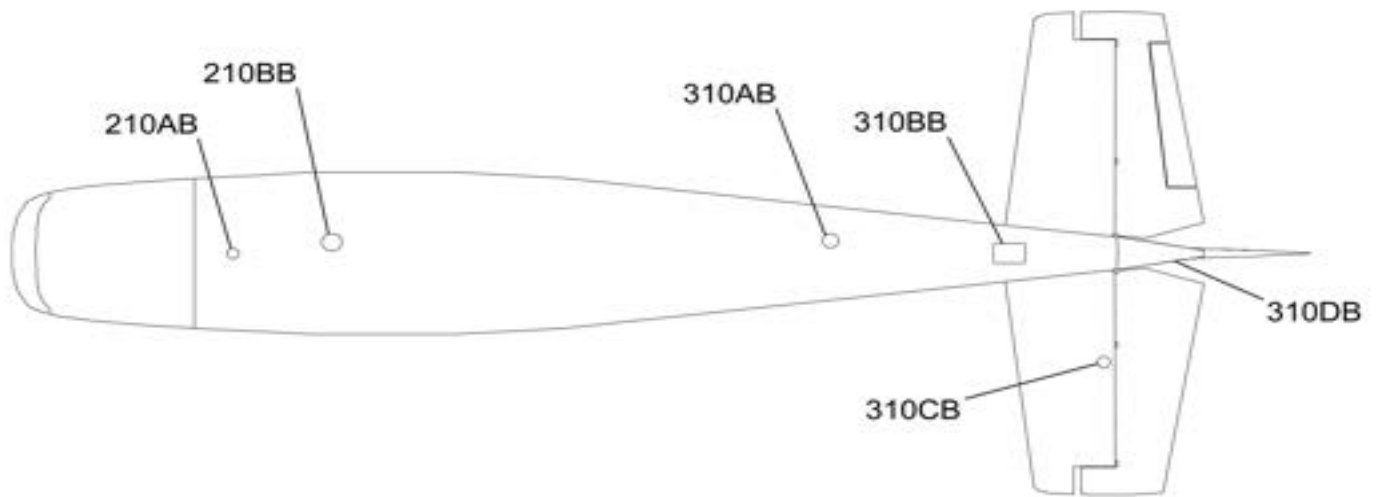
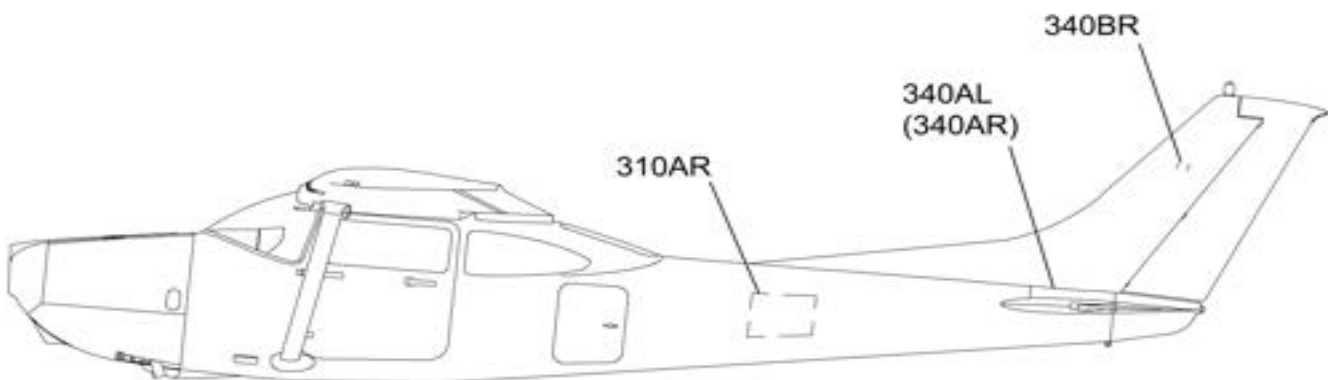


Figure 2 : Sheet 1 : Fuselage Panels

B1083



BOTTOM VIEW



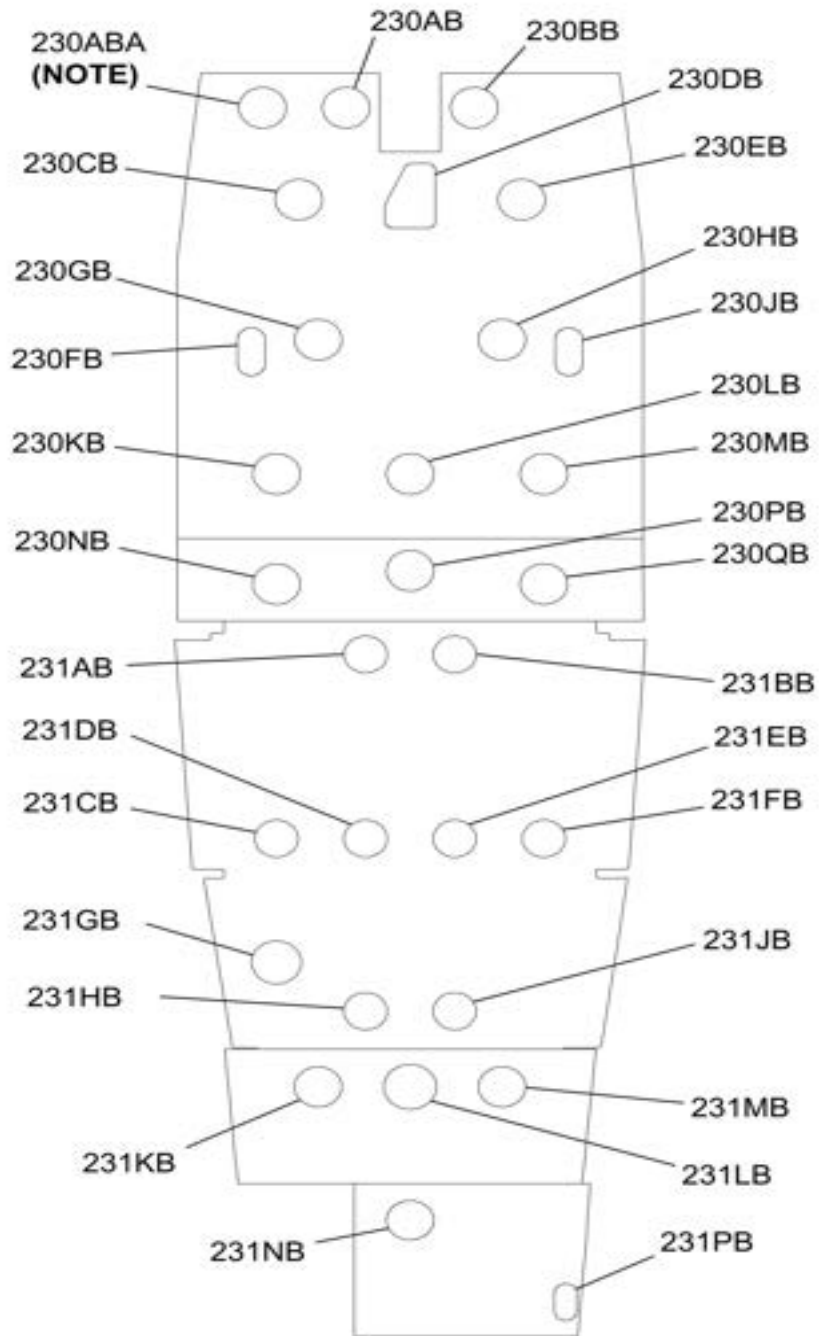
LEFT VIEW

FUSELAGE PANELS

0710T1010
0710T1010

Figure 1 : Sheet 1 : Cabin Floorboard Panels

B1084



CABIN FLOORBOARD PANELS

NOTE: THE ACCESS PANEL IS APPLICABLE
ON AIRPLANES 18281225 AND ON
AND AIRPLANES T18208203 AND ON.

0710T1009

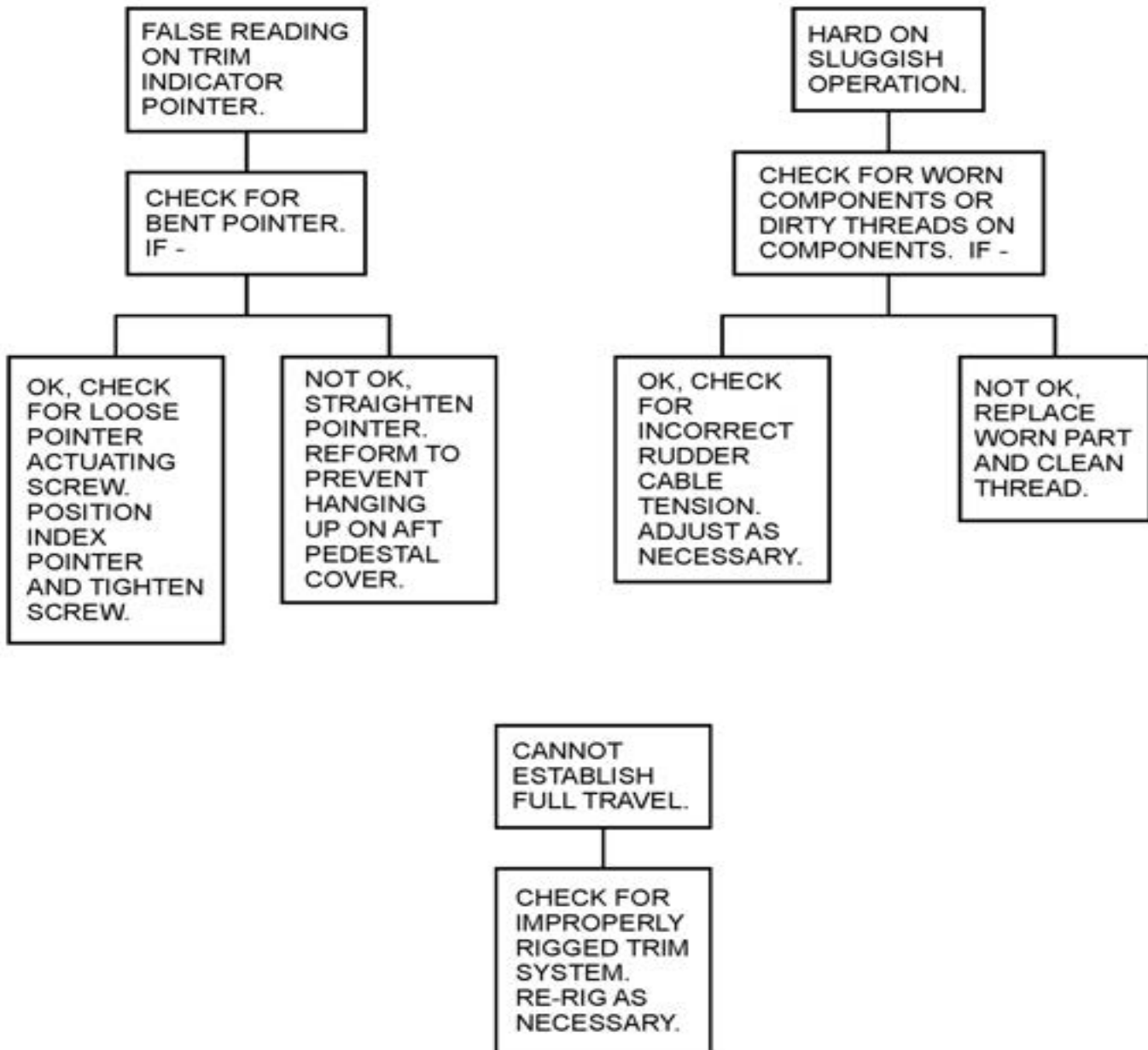
RUDDER TRIM CONTROL - TROUBLESHOOTING

1. General

- A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to [Figure 101](#).

Figure 101 : Sheet 1 : Rudder Trim System Troubleshooting Chart

B1175



RUDDER TRIM CONTROL - MAINTENANCE PRACTICES

1. General

- A. Rudder trim system maintenance practices consists of rudder trim system removal/installation and rudder trim system rigging.

2. Rudder Trim System Removal/Installation

- A. Remove Rudder Trim System (Refer to [Figure 201](#)).
- (1) Remove pilots and copilots seats, pedestal cover, carpet and shield assemblies, Refer to Chapter 25, [Front Seats - Maintenance Practices](#), and [Rear Seat - Maintenance Practices](#).
 - (2) Loosen bolt securing idler sprocket and relieve tension on chain.
 - (3) Remove chain guard from steering bungee sprocket.
 - (4) Disconnect steering bungee from bellcrank.
 - (5) Remove chain from steering bungee sprocket and forward trim shaft sprocket.
- B. Install Rudder Trim System (Refer to [Figure 201](#)).
- (1) Install chain on steering bungee sprocket and forward trim shaft sprocket.
 - (2) Connect steering bungee to bellcrank.
 - (3) Position chain on idler sprocket
 - (4) Rig trim system. Refer to [Rudder Trim Adjustment/Test](#).
 - (5) Install chain guard on steering bungee sprocket.
 - (6) Install pedestal cover, carpet and shield assemblies, pilots and copilots seats. Refer to Chapter 25, [Front Seats - Maintenance Practices](#), and [Rear Seat - Maintenance Practices](#).

3. Rudder Trim Adjustment/Test

NOTE: The rudder control system, rudder trim control system and nosewheel steering system are interconnected. Adjustments to any one of these systems will affect the others. The rudder control system must be correctly rigged prior to rigging the rudder trim and nosewheel steering system.

- A. Rig Rudder Trim System (Refer to [Figure 201](#)).

NOTE: Rudder control system must be rigged prior to rigging rudder trim system.

- (1) Ensure rudder control system is properly rigged.
- (2) Weight or tie down tail of airplane to raise nose wheel from floor.
- (3) Extend nose gear strut and ensure nose gear is centered against external centering stop.
- (4) Clamp rudder pedals in neutral position.
- (5) Adjust nose wheel steering bungee rod end to 0.81 inch +0.00 or -0.06 inches from sprocket to center of rod end bearing.
- (6) Rotate sprocket in or out as required to align rod end with attaching hole in bellcrank and install bolt, washer, and nut.
- (7) Rotate rudder trim wheel until indicator is centered in pedestal slot (neutral).
- (8) Without moving sprocket, engage chain on steering bungee sprocket, forward trim shaft sprocket and idler sprocket.
- (9) Adjust idler sprocket to allow approximately one-half inch deflection at chain midpoint and tighten sprocket.
- (10) Install cable guard over sprocket.
- (11) Lower nose wheel to ground and remove clamps from rudder pedals.

WARNING: Ensure rudder moves in the correct direction when operated by the rudder pedals and trim control wheel.

Figure 201 : Sheet 1 : Rudder Trim Control System Installation

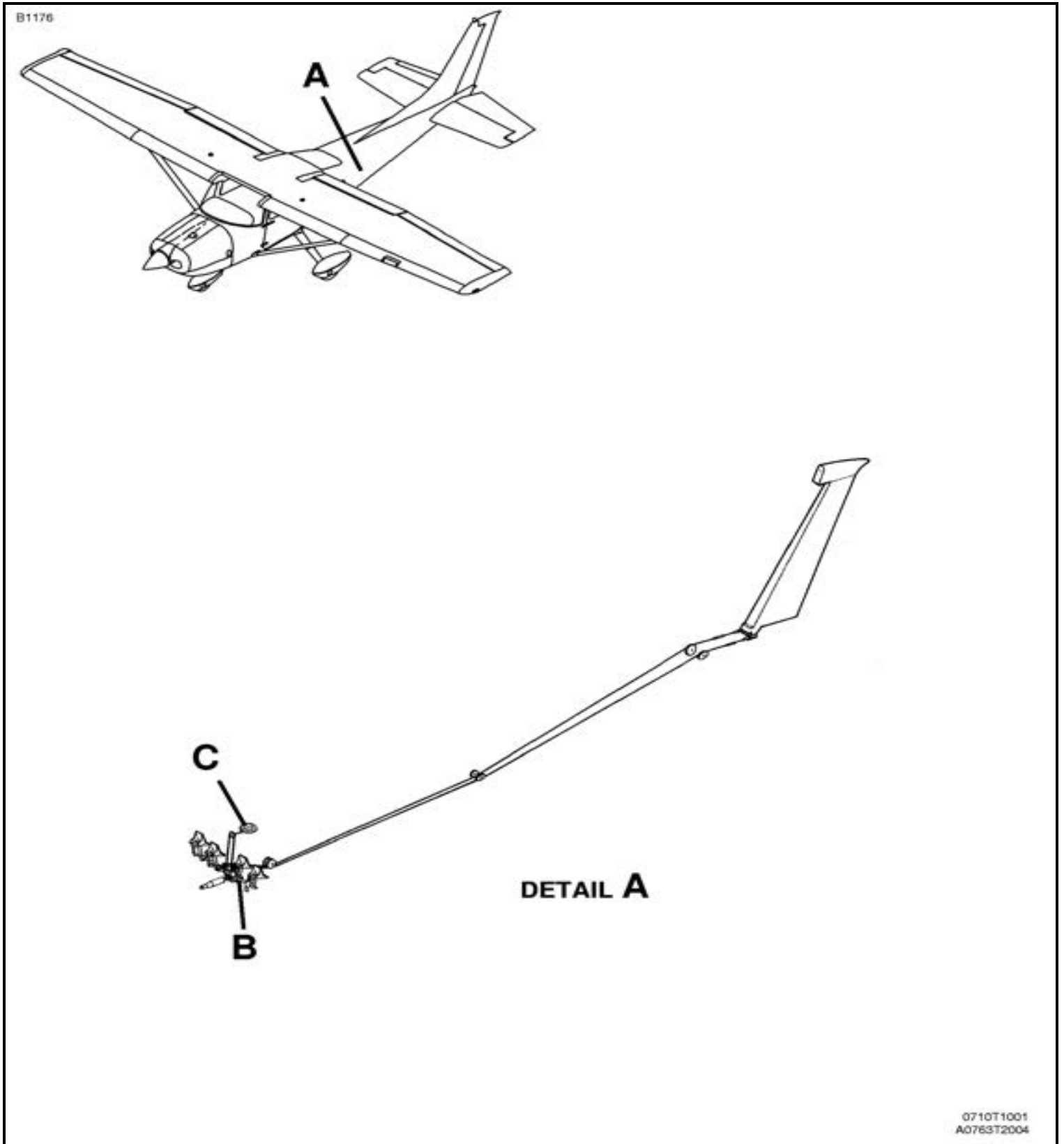
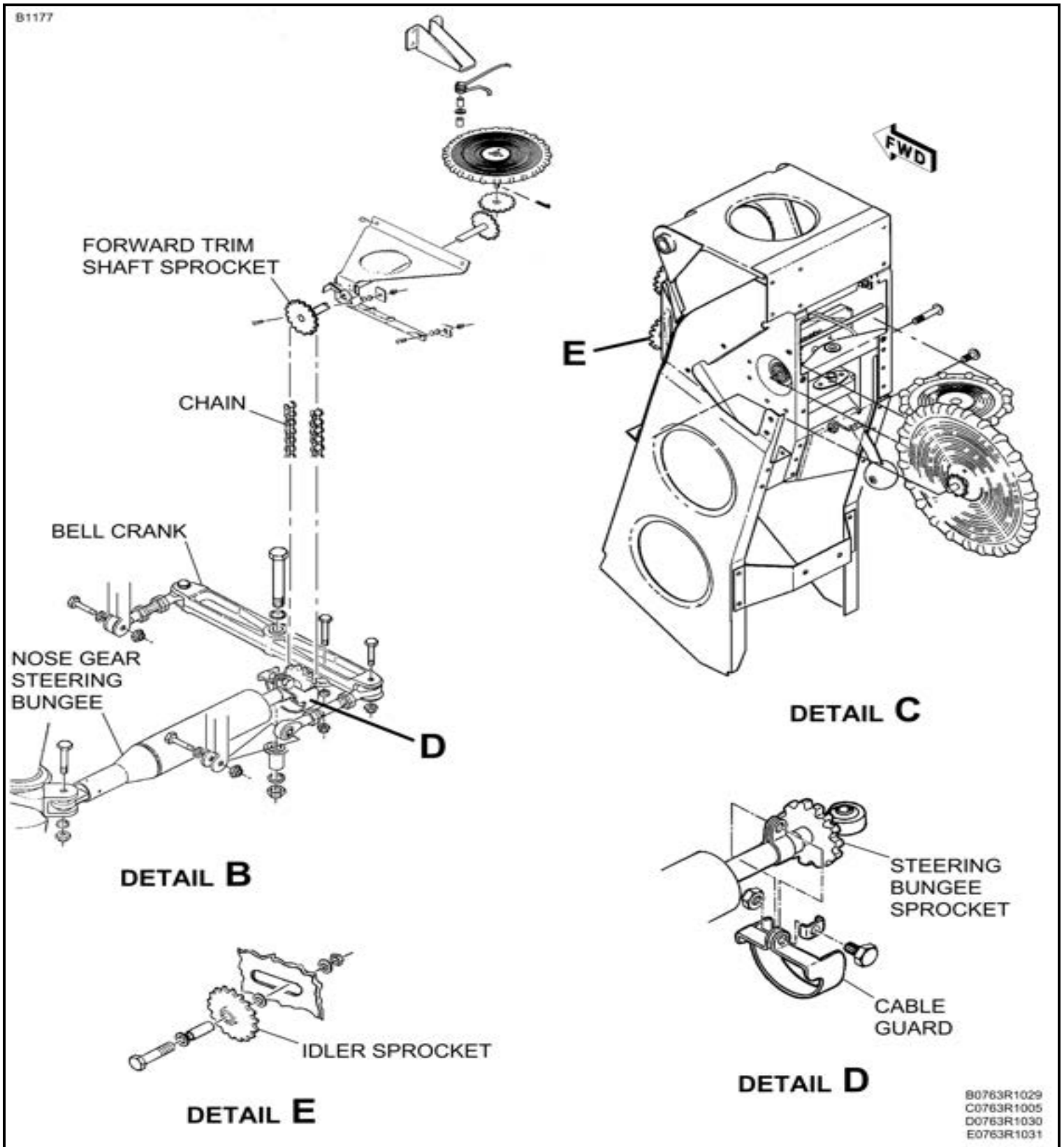


Figure 201 : Sheet 2 : Rudder Trim Control System Installation



ELEVATOR CONTROL SYSTEM - TROUBLESHOOTING

1. General

- A. A troubleshooting chart has been developed to aid maintenance technician in system understanding. Refer to [Figure 101](#).

Figure 101 : Sheet 1 : Elevator System Troubleshooting Chart

B1178

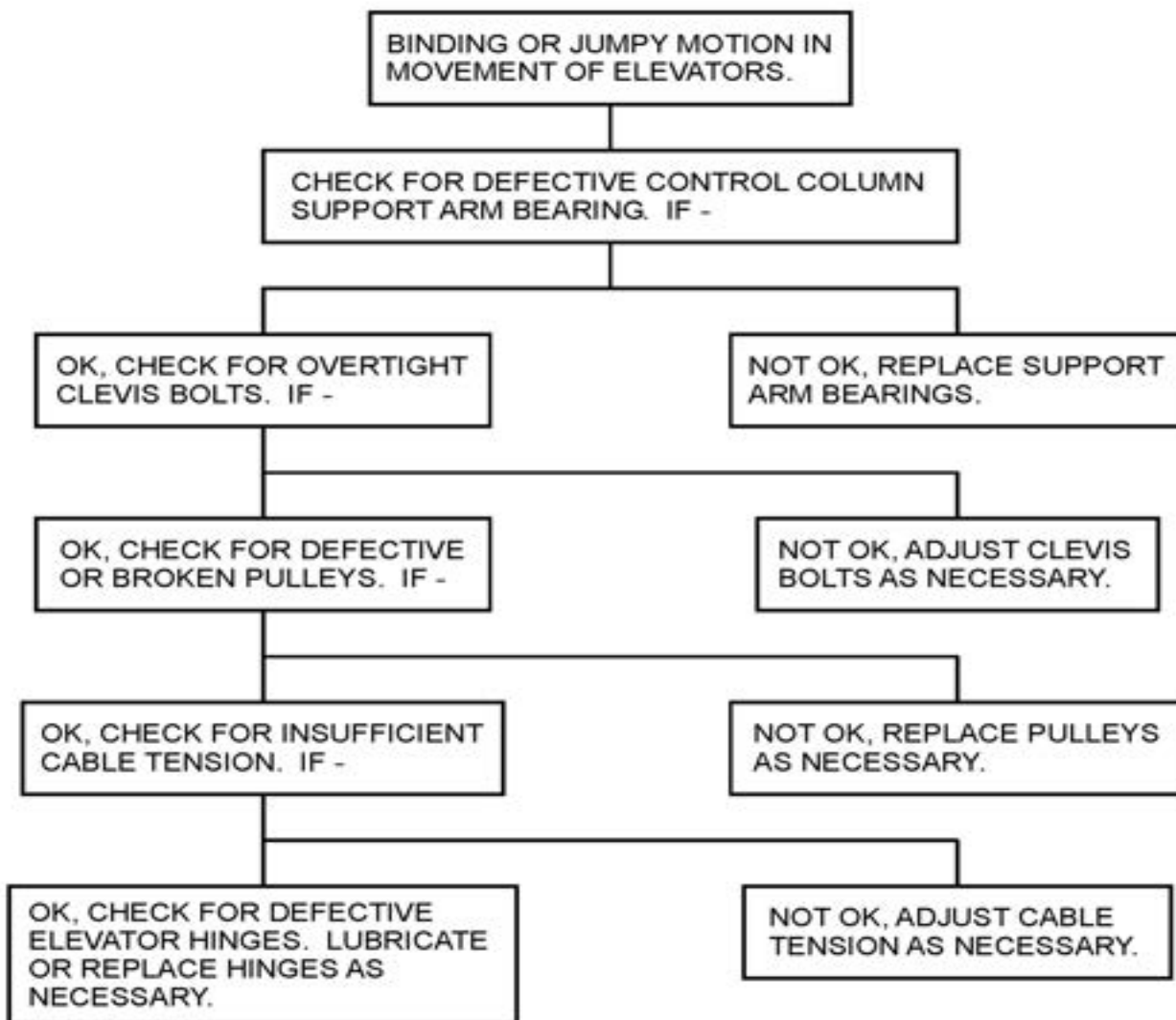
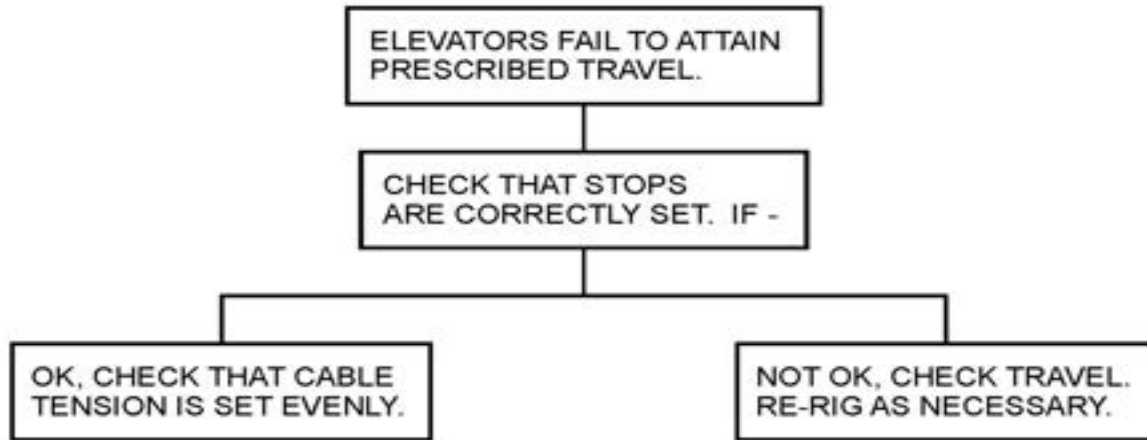


Figure 101 : Sheet 2 : Elevator System Troubleshooting Chart

B1179



ELEVATOR CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

- A. Elevators are operated by forward and aft movement of the control wheels. Movement of the control wheels goes to the elevators through the control yoke and a series of cables, bell cranks, and pushrods.

2. Forward Elevator Bell Crank Removal/Installation

- A. Forward Elevator Bell Crank Removal (Refer to [Figure 201](#)).
 - (1) Remove the seats and the carpet. Refer to Chapter 25, [Front Seats and Rails - Maintenance Practices](#) and [Rear Seat - Maintenance Practices](#).
 - (2) Remove the access plate ([310BB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (3) Relieve cable tension at the turnbuckles and disconnect the cables from the forward bell crank.
 - (4) Disconnect the push-pull tube from the forward bell crank.
 - (5) Remove the pivot bolt and remove the forward bell crank.
- B. Forward Elevator Bell Crank Installation (Refer to [Figure 201](#)).
 - (1) Place the forward bell crank in position and install the pivot bolt.
 - (2) Connect the push-pull tube to the forward bell crank.
 - (3) Install the cables.
 - (4) Adjust the cable tension and safety the turnbuckles. Refer to [Elevator Control Adjustment/Test](#).
 - (5) Install the access plate ([310BB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (6) Install the seats and the carpet. Refer to Chapter 25, [Front Seats and Rails - Maintenance Practices](#) and [Rear Seat - Maintenance Practices](#).

3. Aft Elevator Arm Assembly Removal/Installation

- A. Aft Elevator Arm Assembly Removal (Refer to [Figure 201](#)).
 - (1) Remove the stinger ([310DB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (2) Relieve cable tension at the turnbuckles and disconnect the cables from the arm assembly.
 - (3) Remove the bolt and the washer that attach the push-pull tube to the arm assembly.
 - (4) Remove the bolts that attach the elevators to the arm assembly.
 - (5) Remove the arm assembly pivot bolt and slide the arm assembly out between the tube assemblies.
NOTE: If necessary, you can remove one of the stabilizer attach bolts for clearance when you remove the bell crank pivot bolt.
- B. Aft Elevator Arm Assembly Installation (Refer to [Figure 201](#)).
 - (1) Place the bell crank in position and install the pivot bolt.
 - (2) If necessary, install the components that you removed for clearance when you removed the arm assembly.
 - (3) Install the bolts that attach the elevators to the arm assembly.
 - (4) Attach the push-pull tube to the arm assembly with the bolt and the washer.
 - (5) Install the cables.
 - (6) Adjust the cable tension and safety the turnbuckles. Refer to [Elevator Control Adjustment/Test](#).
 - (7) Install the stinger ([310DB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

4. Elevator Removal/Installation

- A. Elevator Removal (Refer to [Figure 205](#)).
NOTE: This procedure is written for the right elevator with the attached trim tab. The left elevator removal and installation is the same, but without the trim tab.
 - (1) Remove the stinger ([310DB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (2) Remove the cotter pin, nut, washers, bolt, and disconnect the push-pull tube from the elevator trim actuator.
 - (3) Remove the nut, washer, and bolt that attaches the torque tube to the arm assembly.
 - (4) Support the elevator, and remove the nut, washers, and bolts from the elevator hinge brackets.

- (5) Remove the elevator.

B. Elevator Installation (Refer to [Figure 205](#)).

- (1) Attach the elevator to the horizontal stabilizer at the hinge points and install bolts, washers and nut.
- (2) Attach the torque tube on the elevator to the arm assembly and install bolt, washer, and nut.
- (3) Install bolt, washers, nut, and cotter pin that connect the push-pull tube to the elevator trim actuator.
- (4) Do a check for the correct operation of the elevators. Refer to [Elevator Control Adjustment/Test](#).
- (5) Install the stinger ([310DB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

5. Elevator Control Adjustment/Test

A. Rig Elevator (Refer to [Figure 202](#), [Figure 203](#), and [Figure 204](#)).

- (1) Remove the stinger ([310DB](#)), fairings ([340AL and 340AR](#)), and access plate ([310BB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

CAUTION: Position a support stand under the tail tiedown to prevent the tailcone from falling while you work inside.

- (2) Lock the elevator control column in the neutral position with the neutral rigging tool (Refer to [Figure 202](#)).
- (3) Streamline the elevators to the neutral position with the horizontal stabilizer. Ignore counterweight areas of the elevators when you streamline the elevators.

NOTE: Neutral position for the elevators is when they are streamlined with the horizontal stabilizer.

NOTE: The counterweight areas have a contour of approximately 3 degrees DOWN at cruising speed.

- (4) While you hold the elevators in the neutral position, adjust the turnbuckles equally to cable tension at 70 °F (21 °C). Refer to [Figure 203](#) for the correct tensions at other temperatures.

- Without the GFC-700 Autopilot system, 30 pounds, +10 or -10 pounds (133.45 N, +44.48 or -44.48 N)
- With the GFC-700 Autopilot system, 35 pounds, +5 or -5 pounds (155.69 N, +22.24 or -22.24 N). Refer to [Figure 205](#).

- (5) Mount an inclinometer on one elevator.
- (6) While you keep the elevator streamlined with the horizontal stabilizer, set the inclinometer to 0 degrees. Ignore counterweight areas of the elevators when you streamline the elevators.

NOTE: Neutral position for the elevators is when they are streamlined with the horizontal stabilizer.

NOTE: The counterweight areas have a contour of approximately 3 degrees DOWN at cruising speed.

- (7) Remove the neutral rigging tool.
- (8) Adjust the bell crank up stop to get 28 degrees, +1 or -1 degree, up travel.
- (9) Adjust the bell crank down stop to get 21 degrees, +1 or -1 degree, down travel.

NOTE: The bell crank stop blocks (7) are four-sided bushings, drilled off center. They can be turned to four different positions for correct elevator travel. Each 90-degree turn of the stop changes the elevator travel approximately one degree.

- (10) Check the sponge at the control column in both up and down positions and, if necessary, adjust the turnbuckles until the control column cannot touch the instrument panel or the firewall.

- (11) Safety the turnbuckles.

- (a) Use the single-wrap preferred procedure with the 0.040 inch (1.0 mm) stainless steel or monel safety wire. Refer to Chapter 20, [Safetying - Maintenance Practices](#).

- (12) Install the stinger ([310DB](#)), fairings ([340AL and 340AR](#)), and access plate ([310BB](#)). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

- (13) Remove the support stand.

WARNING: Make sure that the elevators move in the correct direction when you move the control column.

- (14) Do a check for the correct operation of the elevators.

Figure 201 : Sheet 1 : Elevator Control System

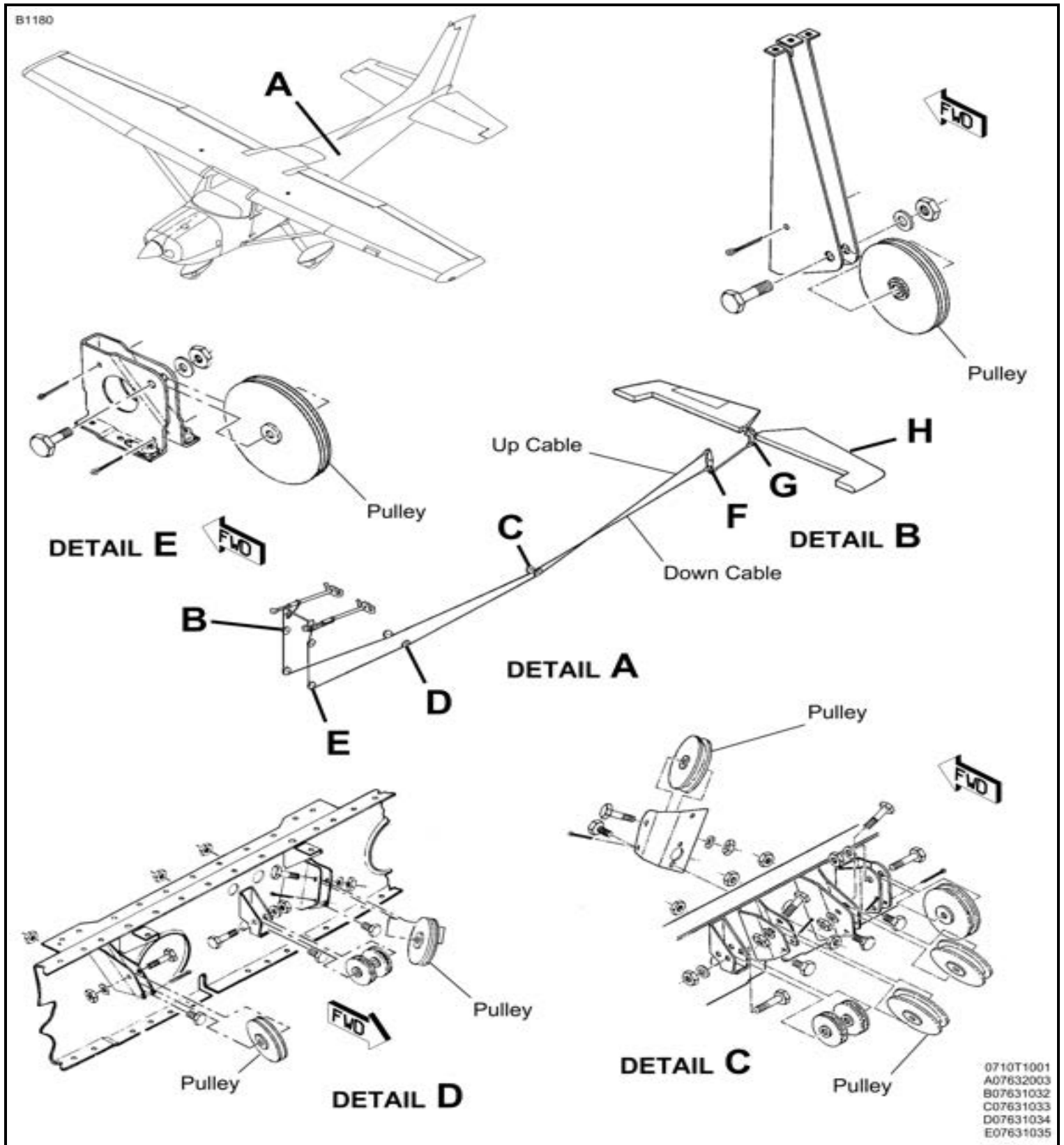
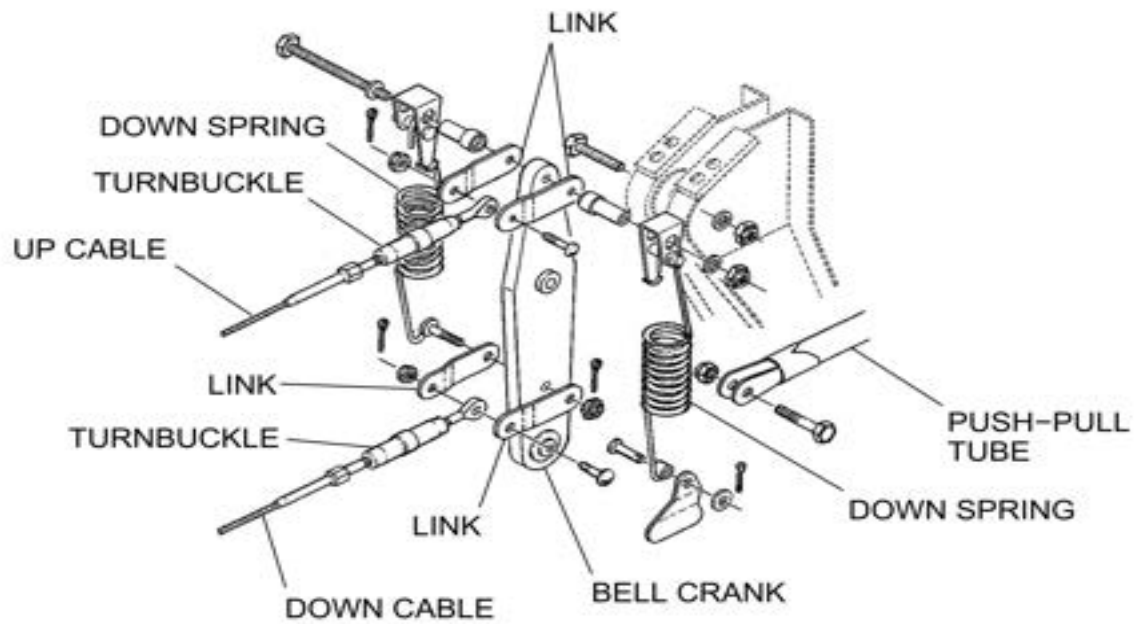
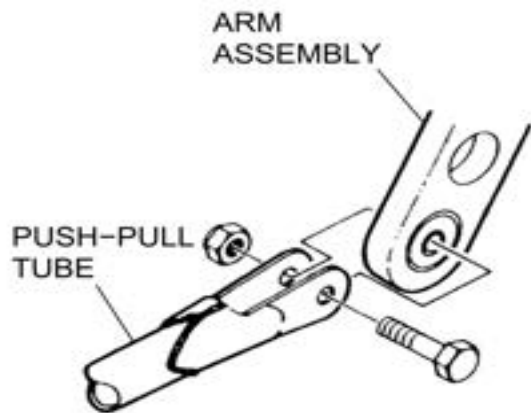


Figure 201 : Sheet 2 : Elevator Control System

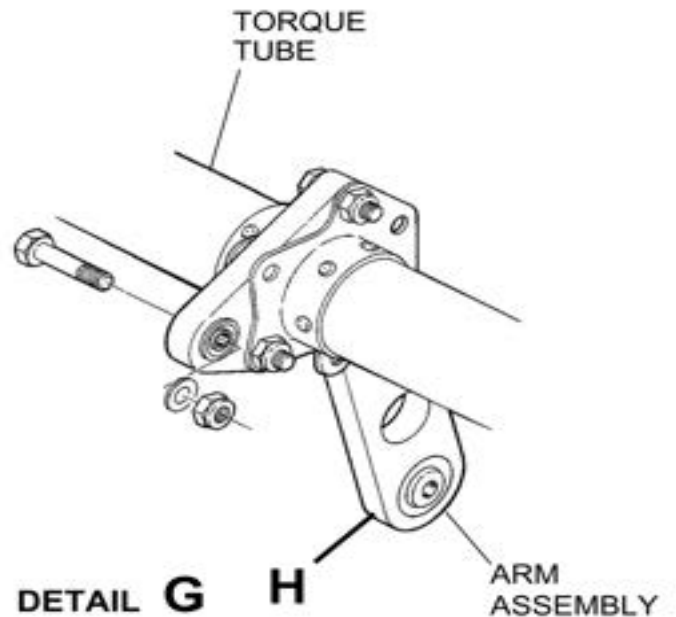
B1181



DETAIL F



DETAIL H



DETAIL G

H

F0763T2002
G0763T1036
H0763T1037

Figure 201 : Sheet 3 : Elevator Control System

B13298

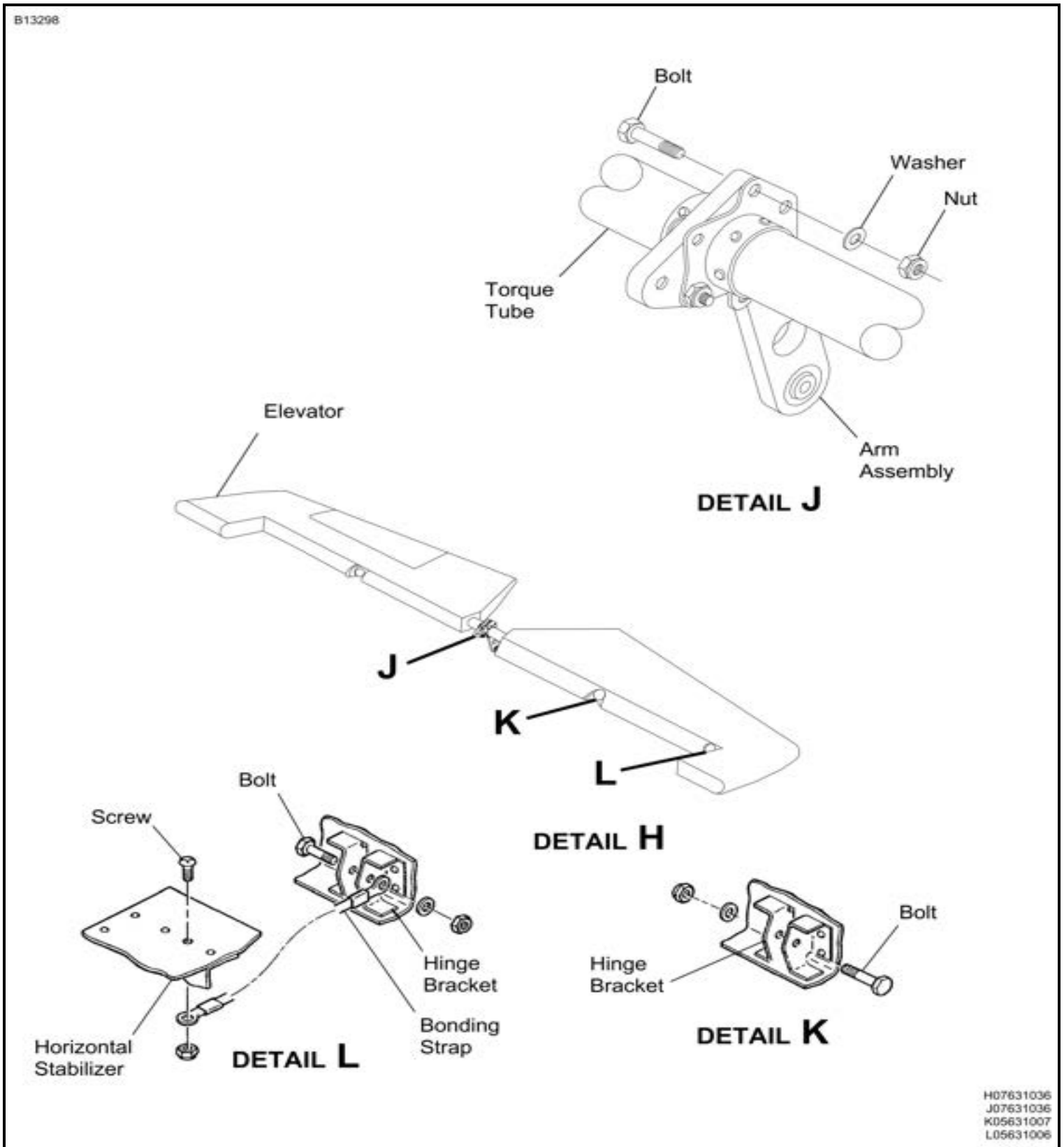


Figure 202 : Sheet 1 : Elevator Control System Rigging

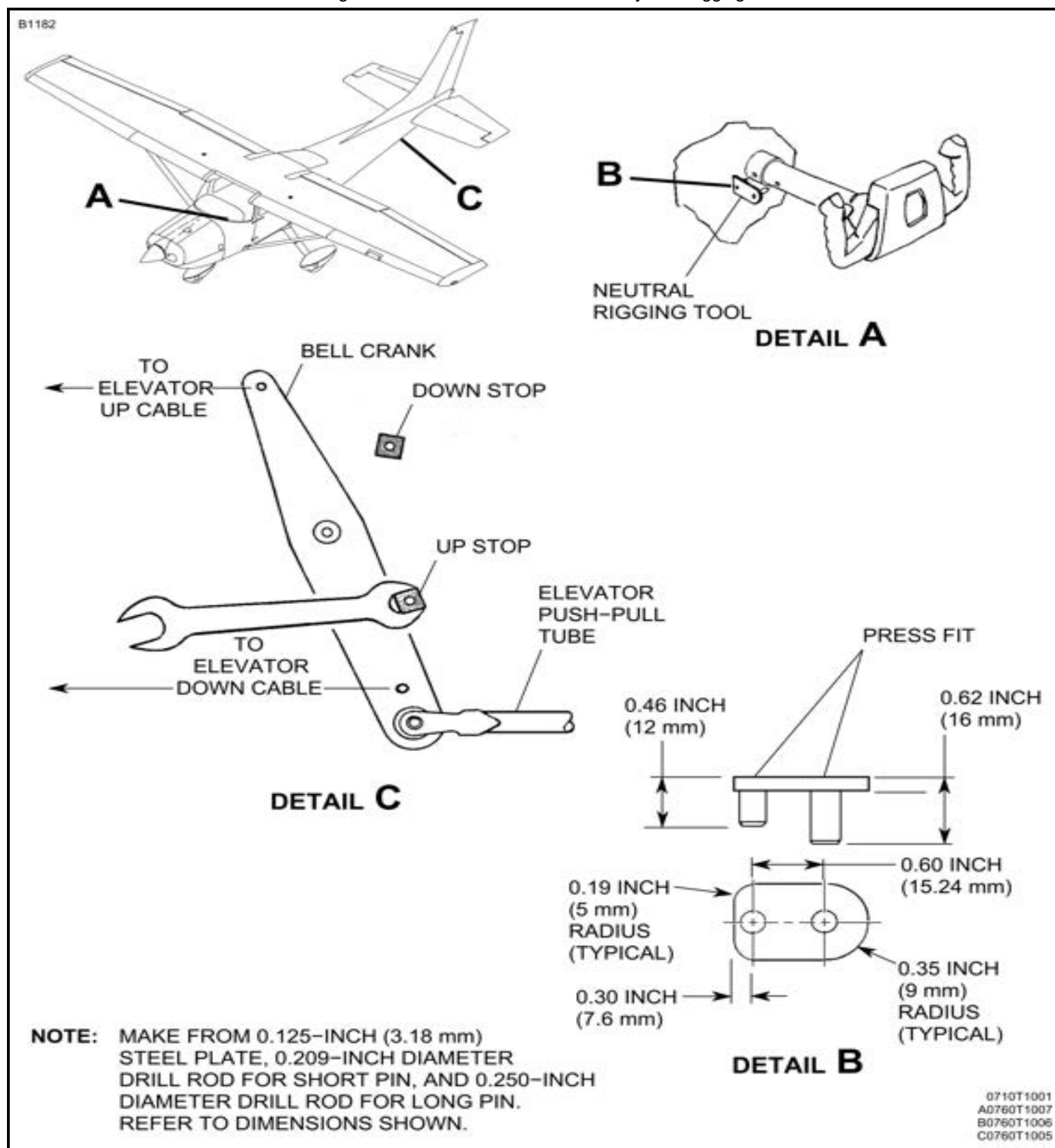


Figure 203 : Sheet 1 : Elevator Cable Tension (without the GFC-700 Autopilot)

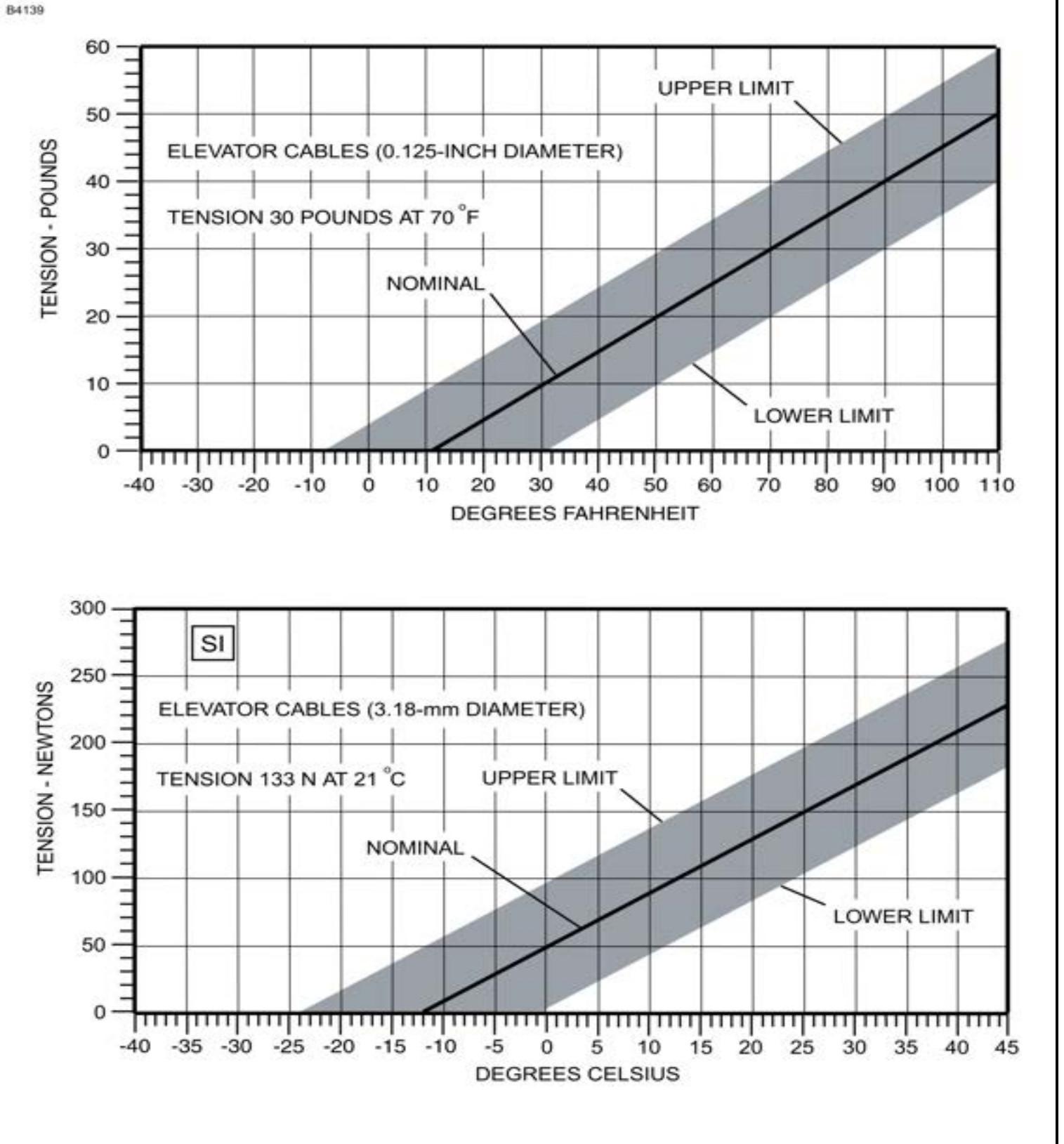


Figure 204 : Sheet 1 : Elevator Cable Tension (with the GFC-700 Autopilot)

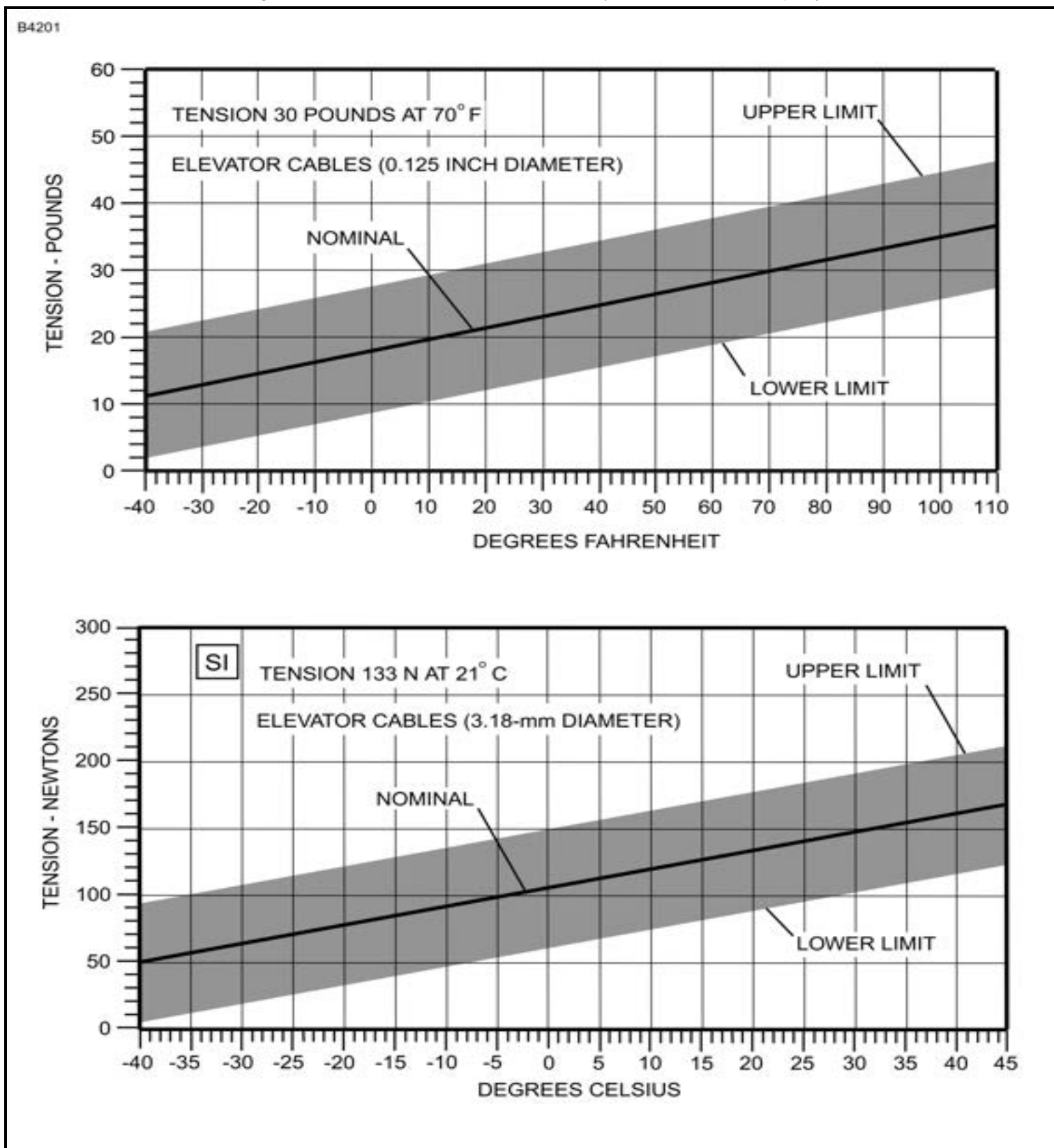


Figure 205 : Sheet 1 :

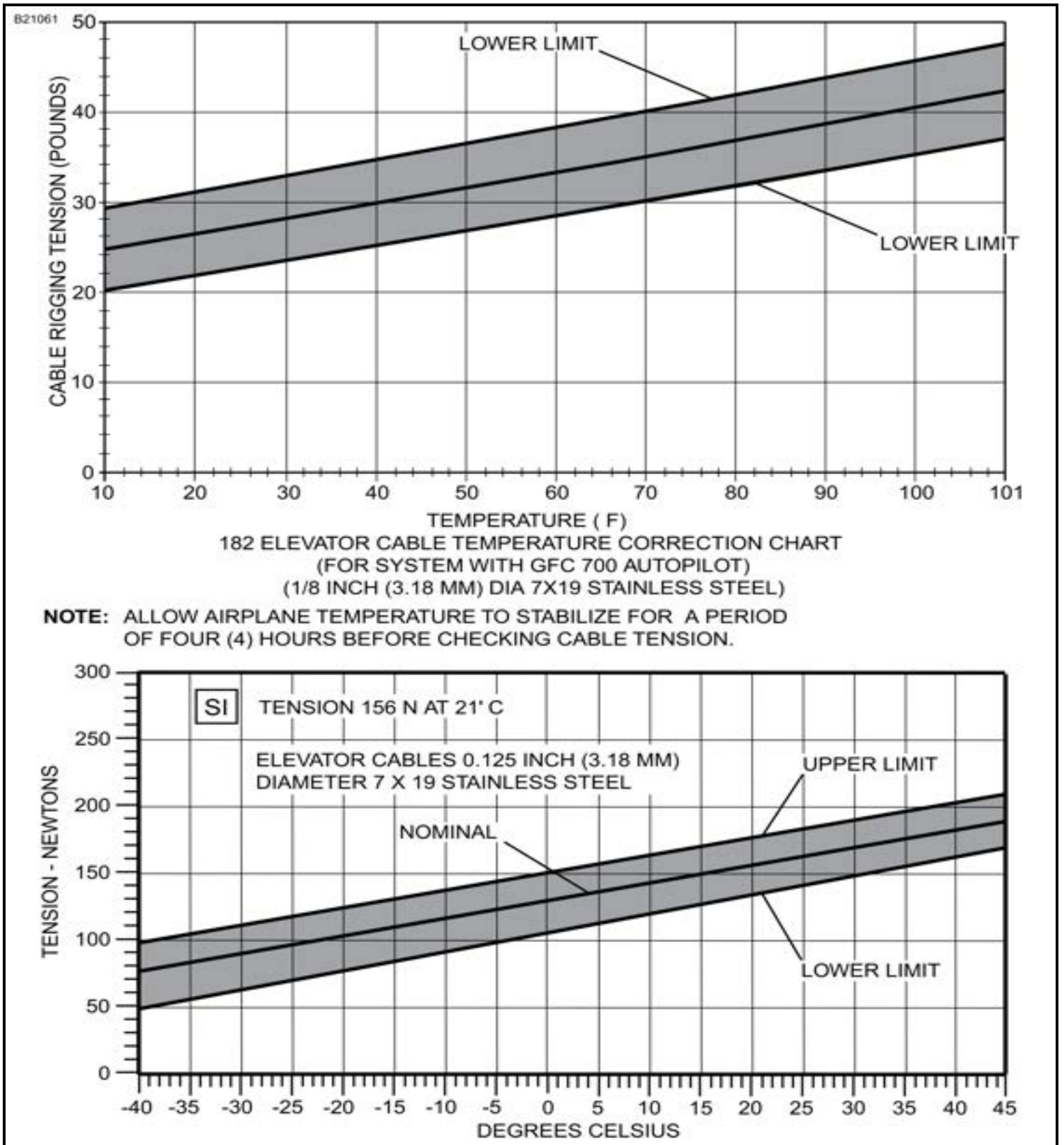
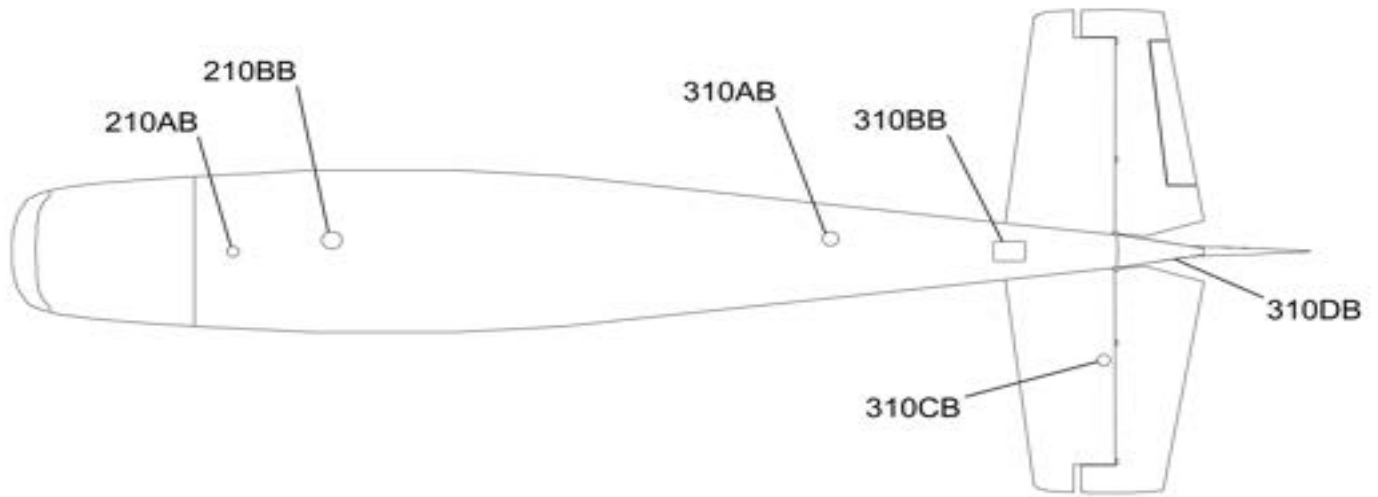
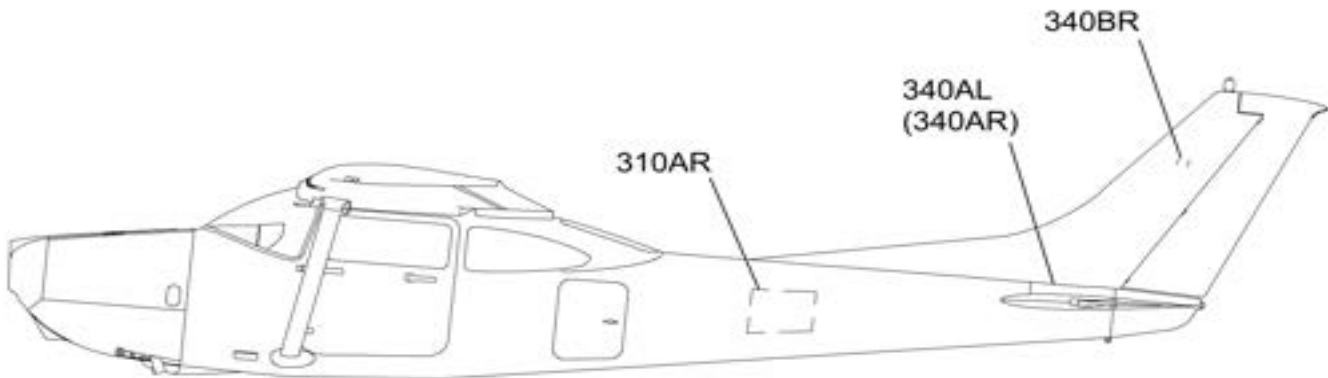


Figure 2 : Sheet 1 : Fuselage Panels

B1083



BOTTOM VIEW



LEFT VIEW

FUSELAGE PANELS

0710T1010
0710T1010

ELEVATOR TRIM CONTROL - TROUBLESHOOTING

1. General

- A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to [Figure 101](#).

Figure 101 : Sheet 1 : Elevator Trim System Troubleshooting Chart

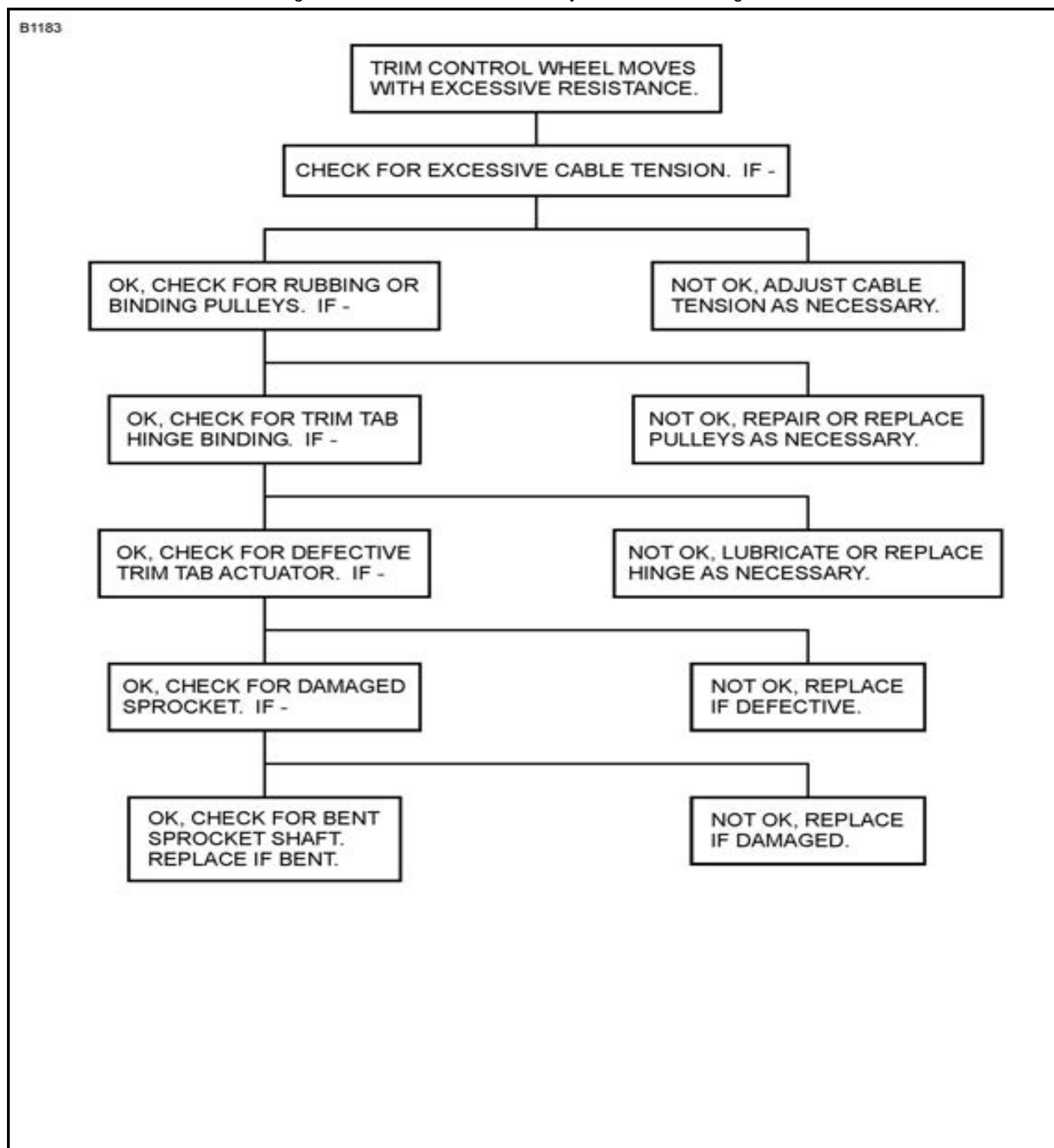


Figure 101 : Sheet 2 : Elevator Trim System Troubleshooting Chart

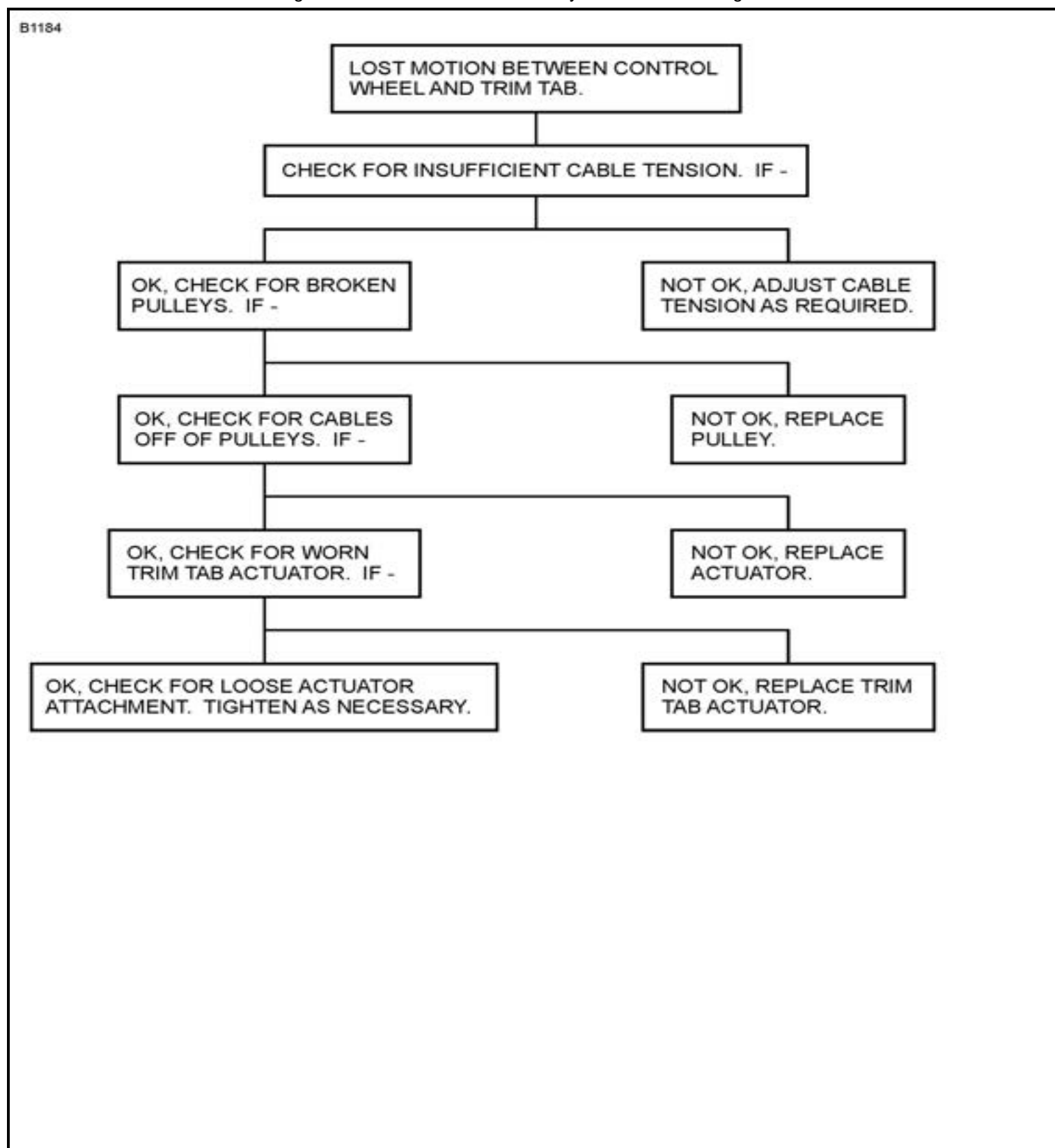
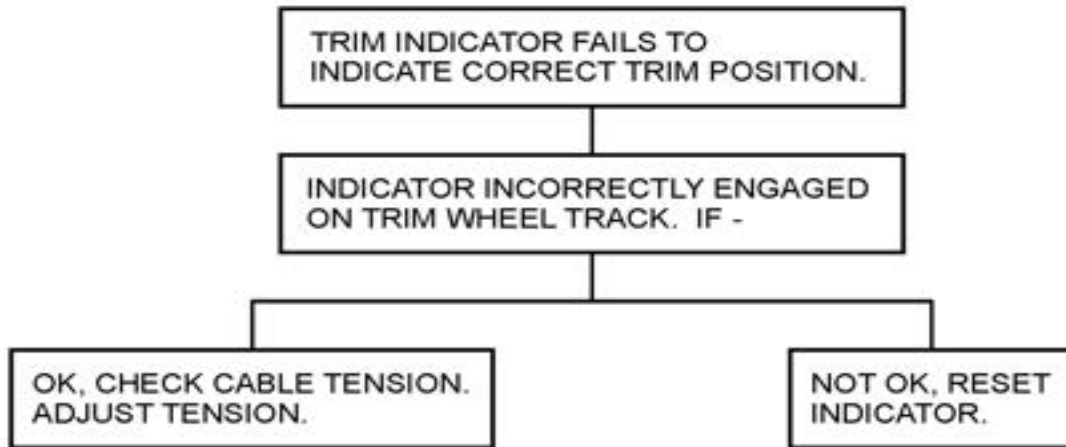


Figure 101 : Sheet 3 : Elevator Trim System Troubleshooting Chart

B1185



ELEVATOR TRIM CONTROL - MAINTENANCE PRACTICES

1. General

- A. The elevator trim tab is on the right elevator. It is controlled by a trim wheel installed in the pedestal. The power to operate the elevator trim tab comes from the trim control wheel through chains, cables, and an actuator. A mechanical pointer adjacent to the trim wheel shows elevator trim tab position. A nose up setting causes an elevator trim tab down position.

2. Trim Tab Actuator Removal/Installation

- A. Trim Tab Actuator Removal (Refer to [Figure 201](#)).

CAUTION: Put a support stand in position under the tail tiedown ring. The support stand will help to prevent the tailcone from falling while a person works inside.

- (1) Remove the panel [310AR](#) to get access to the stop blocks. Refer to Chapter 6, Access/Inspection Plates - Description and Operation (Refer to [Figure 201](#)).
- (2) Remove the safety clip and loosen the tension on the cable at the turnbuckle.
- (3) Remove the lock nut, bolt, and washers from the push-pull tube and disconnect it from the actuator.
- (4) Remove the access plate [310CB](#) to get access to the actuator. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (5) Remove the chain guard and the chain from the actuator sprocket.
- (6) Remove the screws that attach the actuator clamps to the bracket.
- (7) Carefully remove the actuator from the access opening.

- B. Trim Tab Actuator Installation (Refer to [Figure 201](#)).

- (1) Carefully install the actuator through the access opening.
- (2) Use the screws to attach the actuator clamps to the bracket.
- (3) Install the chain on the actuator sprocket.
- (4) Install the chain guard.
- (5) Install the access plate [310CB](#). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (6) Use the washers, bolt, and lock nut to connect the push-pull tube to the actuator.
- (7) Set the cable tension at the turnbuckle. Refer to the Trim Tab Control Adjustment/Test.
- (8) Install the safety clip. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (9) Install the panel [310AR](#). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (10) Remove the support stand.

CAUTION: Be sure trim tab moves in correct direction when the trim tab control wheel is moved toward the nose down position, the elevator trim tab moves up.

- (11) Perform a manual trim tab check. Make sure that when the trim tab control wheel moves to the nose down position, the elevator trim tab moves up.
- (12) Perform electric trim tab check. When engaging the electric trim, make sure the trim tab control wheel moves to the nose down position, the elevator tab moves up.
- (13) Perform electric trim override check, if applicable.

3. Trim Tab Actuator Disassembly/Assembly

- A. Trim Tab Actuator Disassembly (Refer to [Figure 202](#)).

- (1) Remove the trim tab actuator. Refer to Trim Tab Actuator Removal/Installation.
- (2) Turn the screw assembly to loosen and remove it from the actuator.

- B. Trim Tab Actuator Assembly (Refer to [Figure 202](#)).

- (1) If a new bearing is necessary, press it into the boss on the screw assembly. Make sure that the force pushes against the outer race of the bearing.
- (2) Install the screw assembly into the actuator as follows:
 - (a) Pack the internal housing with MIL-G-21164C grease.

NOTE: This supplies the lubrication for the screw assembly.

- (b) Install the screw assembly in the housing.
- (c) If necessary, clean the unwanted grease from the housing.
- (3) Hold the screw assembly and turn the sprocket by hand to do a test of the actuator assembly.

NOTE: The screw assembly must move smoothly in the actuator.

4. Trim Tab Actuator Cleaning and Inspection

- A. Complete a Trim Tab Actuator Cleaning and Inspection (Refer to [Figure 202](#)).
 - (1) Remove the screw assembly from the housing. Refer to Trim Tab Actuator Disassembly/Assembly.
 - (a) Do not remove the sealed bearing from the screw assembly unless the bearing replacement is necessary.
 - (2) Wash the screw assembly, except the sealed bearing, in Stoddard solvent or equivalent. Do not clean the sealed bearing.
 - (3) Do a check of the sealed bearing and screw assembly for wear and for parts that have scores. Refer to [Table 201](#) for dimensions.

Table 201. Wear Dimensions

COMPONENT	MAXIMUM DIMENSION	MINIMUM DIMENSION
Aft End Bearing Inside Diameter	0.249 Inch	0.248 Inch
Threaded Rod End Outside Diameter	0.246 Inch (Shank)	0.245 Inch (Shank)

- (4) Examine the screw assembly and the screw for threads that have damage or dirt particles that can cause the assembly to operate incorrectly.
- (5) Examine the screw assembly sealed bearing for smoothness of operation.
- (6) Examine the housing components for stripped threads, cracks, deep nicks, dents, and other signs of damage.
- (7) Examine the sprocket for broken, chipped, and/or worn teeth.
- (8) Examine the linear free play at the sprocket end of the housing.

NOTE: The linear free play at the sprocket end must not be more than 0.010 inch maximum.

- (a) If the free play is more than the permitted limits, replace the actuator.
- (9) Do not try to repair the actuator assembly parts that have damage or wear.
- (10) Install the screw assembly into the housing. Refer to Trim Tab Actuator Disassembly/Assembly.

5. Trim Tab Free Play Inspection

- A. Trim Tab Free Play Inspection ([Figure 203](#)).
 - (1) Put the elevator and the trim tab in the neutral position.
 - (2) With the elevator gust lock, make sure that the elevator cannot move.
 - (3) Find the maximum amount of permitted free play.
 - (a) Measure the chord length at the extreme inboard end of the trim tab.
 - (b) Multiply the chord length by 0.025 to get the maximum permitted free play.
 - (c) Measure the free play at the same point on the trim tab where the chord length was measured.
 - (d) The total free play must not be more than the maximum permitted free play.
 - (4) With moderate hand pressure (up and down), measure the free play at the trailing edge of the trim tab.
 - (5) If the trim tab free play is less than the maximum permitted free play, the system is in the approved limits.
 - (6) If the trim tab free play is more than the maximum permitted free play, check the items that follow for looseness while you move the trim tab up and down.
 - (a) The push-pull tube/trim tab horn assembly attachment.
 - (b) The push-pull tube/actuator assembly threaded rod-end attachment.
 - (c) The actuator assembly threaded rod end in the actuator assembly.
 - (7) If looseness is apparent while you check the push-pull tube/tab horn assembly, install new parts to repair.
 - (8) If looseness is apparent while you check the push-pull tube/actuator assembly threaded rod-end assembly, install new

parts to repair.

- (9) If looseness is apparent while you check the push-pull tube threaded rod end in the actuator assembly, the threaded rod end is out of tolerance and you must replace it.

6. Trim Tab Control Cables and Pulleys Removal/Installation

A. Cables and Pulleys Removal (Refer to [Figure 201](#)).

CAUTION: Position a support stand under the tail tiedown ring to prevent the tailcone from falling while a person works inside.

- (1) Remove the crew seats and the rear seat. Refer to Chapter 25, [Front Seats and Rails - Maintenance Practices](#) and [Rear Seat - Maintenance Practices](#).
- (2) Remove the pedestal cover.
- (3) Remove the access panel ([310AR](#)), access plates ([230DB](#), [230LB](#), [231LB](#), [310BB](#), and [310CB](#)), and fairings ([340AL](#) and [340AR](#)) for access. Refer to Chapter 6, [Access/Inspection Plates - Description and Operation](#).
- (4) Remove the stop blocks from the control cables.
- (5) Remove the cable guard from the actuator.
- (6) Remove the safety clip from the turnbuckle and disconnect the cable.
- (7) Disconnect the cables at the cable ends.

NOTE: To ease the routing of the cables, a length of wire can be attached to the end of the cable before you remove it from the airplane. You can leave the wire in place, routed through the structure. Then you can attach the new cable and pull it into position.

- (8) Remove the cable guards and the pulleys.
- (9) Disengage the chains from the sprockets and remove the cables from the airplane structure.

B. Cables and Pulleys Installation (Refer to [Figure 201](#)).

- (1) Attach the cables to the wires that are routed through the airplane structure and pull the cables into position.
- (2) Engage the chains on the sprockets and install the chain guard on the actuator.
- (3) Install the pulleys and the pulley guards.
- (4) Connect the cable ends and install the turnbuckle.
- (5) Rig the system. Refer to [Trim Tab Control Adjustment/Test](#).
- (6) Install the access panel ([310AR](#)), access plates ([230DB](#), [230LB](#), [231LB](#), [310BB](#), and [310CB](#)), and fairings ([340AL](#) and [340AR](#)) removed to get access. Refer to Chapter 6, [Access/Inspection Plates - Description and Operation](#).
- (7) Install the pedestal cover.
- (8) Install the crew seats and the rear seat. Refer to Chapter 25, [Front Seats - Maintenance Practices](#) and [Rear Seat - Maintenance Practices](#).
- (9) Remove the support stand.

7. Trim Tab Control Wheel Removal/Installation

A. Trim Tab Control Wheel Removal (Refer to [Figure 201](#)).

- (1) Relieve cable tension at the turnbuckle.
- (2) Remove the pedestal cover.
- (3) Remove the screws that attach the control wheel retainer.
- (4) Remove the retainer and the pointer. Do not drop the trim control wheel.

B. Trim Tab Control Wheel Installation (Refer to [Figure 201](#)).

- (1) Install the retainer and the pointer with the screws.
- (2) Install the pedestal cover.
- (3) Set the cable tension at the turnbuckle. Refer to [Trim Tab Control Adjustment/Test](#).

8. Trim Tab Control Adjustment/Test

A. Set Trim Tab Control Cable Tension (Refer to [Figure 204](#) and [Figure 205](#)).

CAUTION: Position a support stand under the tail tiedown ring to prevent the tailcone from falling while a person

works inside.

- (1) Remove the access panel (310AR) and the access plates as necessary. Refer to [Access/Inspection Plates - Description and Operation](#).
- (2) Loosen the travel stop blocks on the cables.
- (3) Disconnect the actuator from the trim tab push-pull tube.
- (4) Adjust the turnbuckle as necessary to get 10 to 15 pounds (44.48 to 66.72 N) of cable tension at 70 °F (21 °C). Refer to the Charts in Figure 205 for the correct tensions at other temperatures.
- (5) If this trim tab adjustment/test is done as part of a chain and/or cable installation, let the actuator screw turn freely, because the chains and the cables are connected.
- (6) Adjust the cable tension and safety the turnbuckle.
- (7) Turn the trim wheel full forward (nose down). Make sure that the pointer does not decrease the trim wheel movement. If necessary, move the pointer to a new position. To move the pointer to a new position, you can pry the trailing leg of the pointer out of the groove with a thin screwdriver if necessary.

NOTE: At the full forward (nose down) position of the trim wheel, more forward movement is prevented because the chain or the cable ends contact the sprockets or the pulleys.

- (8) With the elevator and the trim tab both in neutral (streamlined), mount an inclinometer on the tab and set it at 0 degrees. Ignore the counterweight areas of the elevators when you streamline. These areas are contoured so they will be approximately 3 degrees down at cruising speed.

NOTE: Neutral positions for the elevators are streamlined with the horizontal stabilizer. Ignore the counterweight areas of the elevators when you streamline. These areas are contoured so they will be approximately 3 degrees DOWN at cruising speed.

NOTE: An inclinometer for measuring control surface travel is available from the Cessna Parts Distribution.

- (9) Turn the trim tab actuator screw in or out as required to place the trim tab up with a maximum of 2 degrees overtravel, with the actuator screw connected to the push-pull tube.
- (10) Turn the trim wheel to position the trim tab up and down, and adjust the actuator screws as required to get correct travel in both directions.
- (11) Put the stop blocks in position. Refer to [Figure 204](#).
 - (a) With the elevators in neutral, set the trim tab to neutral.
 - (b) Position the stop block (2) approximately 0.25 inch (6.35 mm) forward of the turnbuckle.
 - (c) Position the stop block (3) approximately 0.25 inch (6.35 mm) aft of the turnbuckle.
 - (d) Attach the stop blocks (2) and (3) to cable A.
 - (e) Put the inclinometer on the trim tab and lower it to 15 degrees, +1 or -1 degree.
 - (f) Put the stop block (4) against the stop block (3) and attach it to cable B.
 - (g) Run the trim tab up to 24 degrees, +2 or -2 degrees.
 - (h) Place stop block (1) against stop block (2) and attach to cable B.
- (12) Make sure that the trim wheel pointer travels the same distance from the ends of the slot in the cover. Move the trailing leg of the pointer to a new position if necessary.

WARNING: Make sure that the elevators travel in the correct direction when you operate the control column.

- (13) Move the control column to make sure that the elevators travel in the correct direction.
- (14) Make sure that the trim tab moves in the correct direction when it is operated by the trim wheel.

NOTE: Nose down trim corresponds to the tab UP position.

- (15) Safety the turnbuckle (Refer to Chapter 20, [Safetying - Maintenance Practices](#)).
- (16) Install all of the items that you removed to get access to the components.
- (17) Remove the support stand.

Figure 201 : Sheet 1 : Elevator Trim Tab Control System

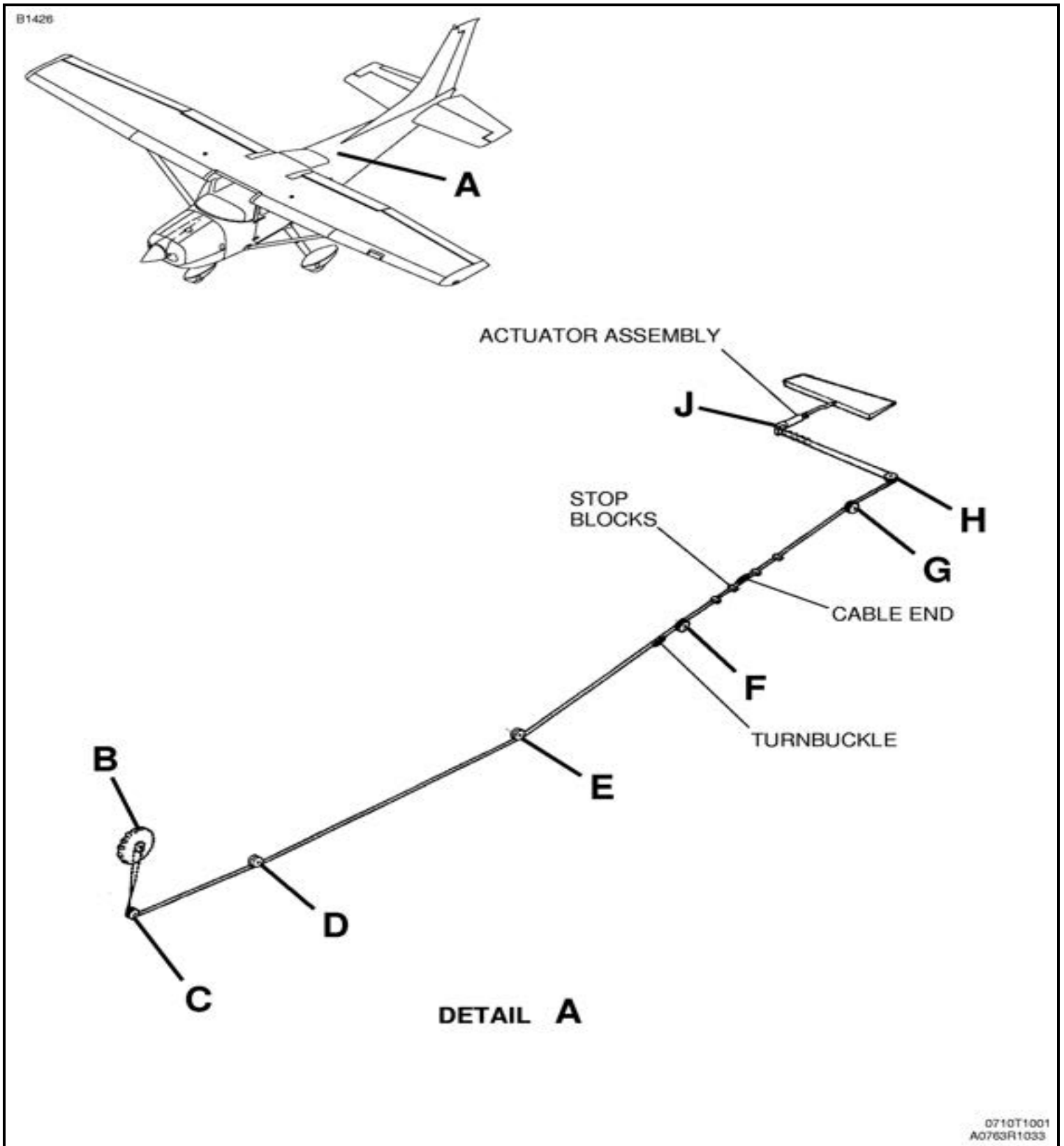


Figure 201 : Sheet 2 : Elevator Trim Tab Control System

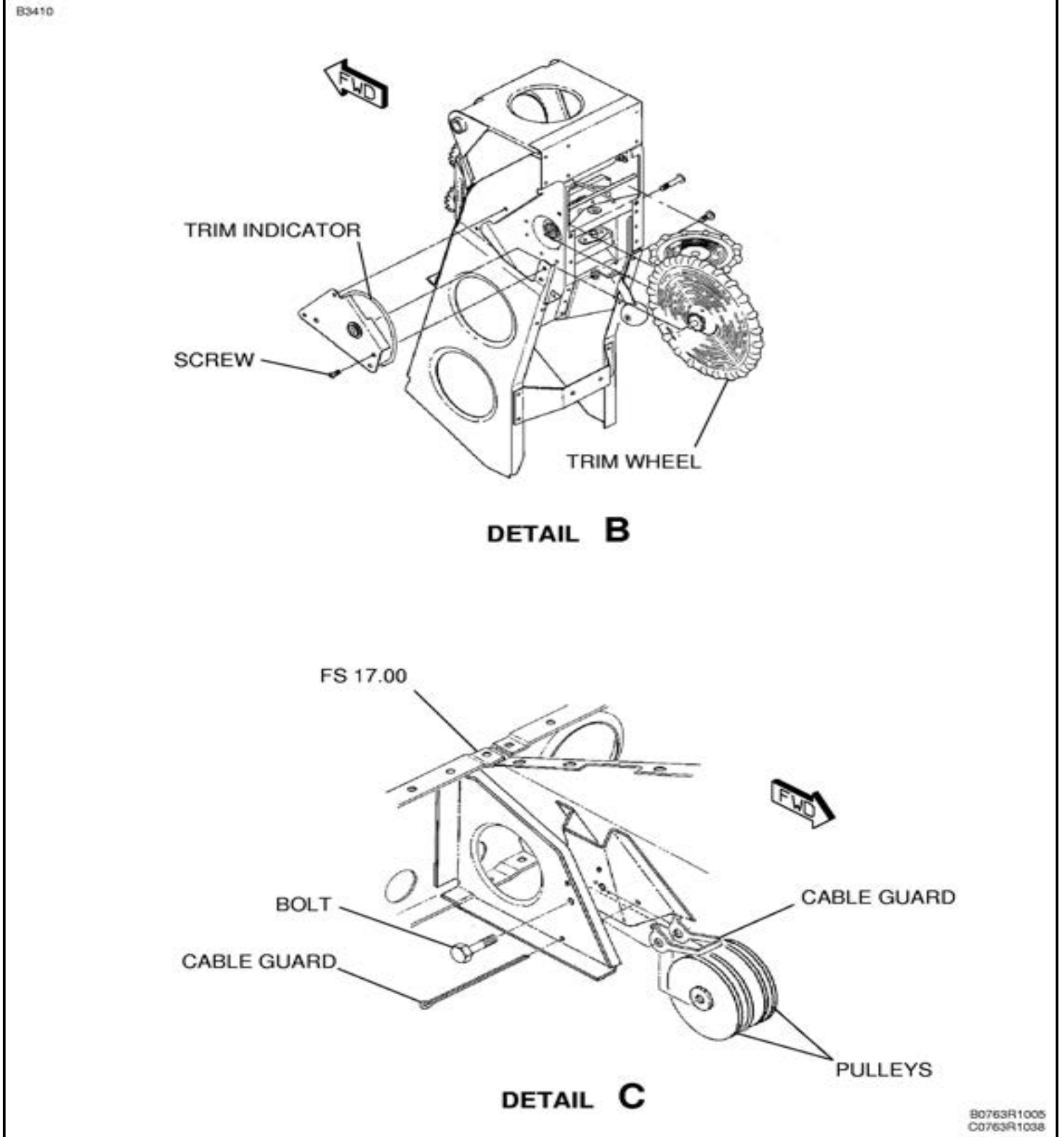


Figure 201 : Sheet 3 : Elevator Trim Tab Control System

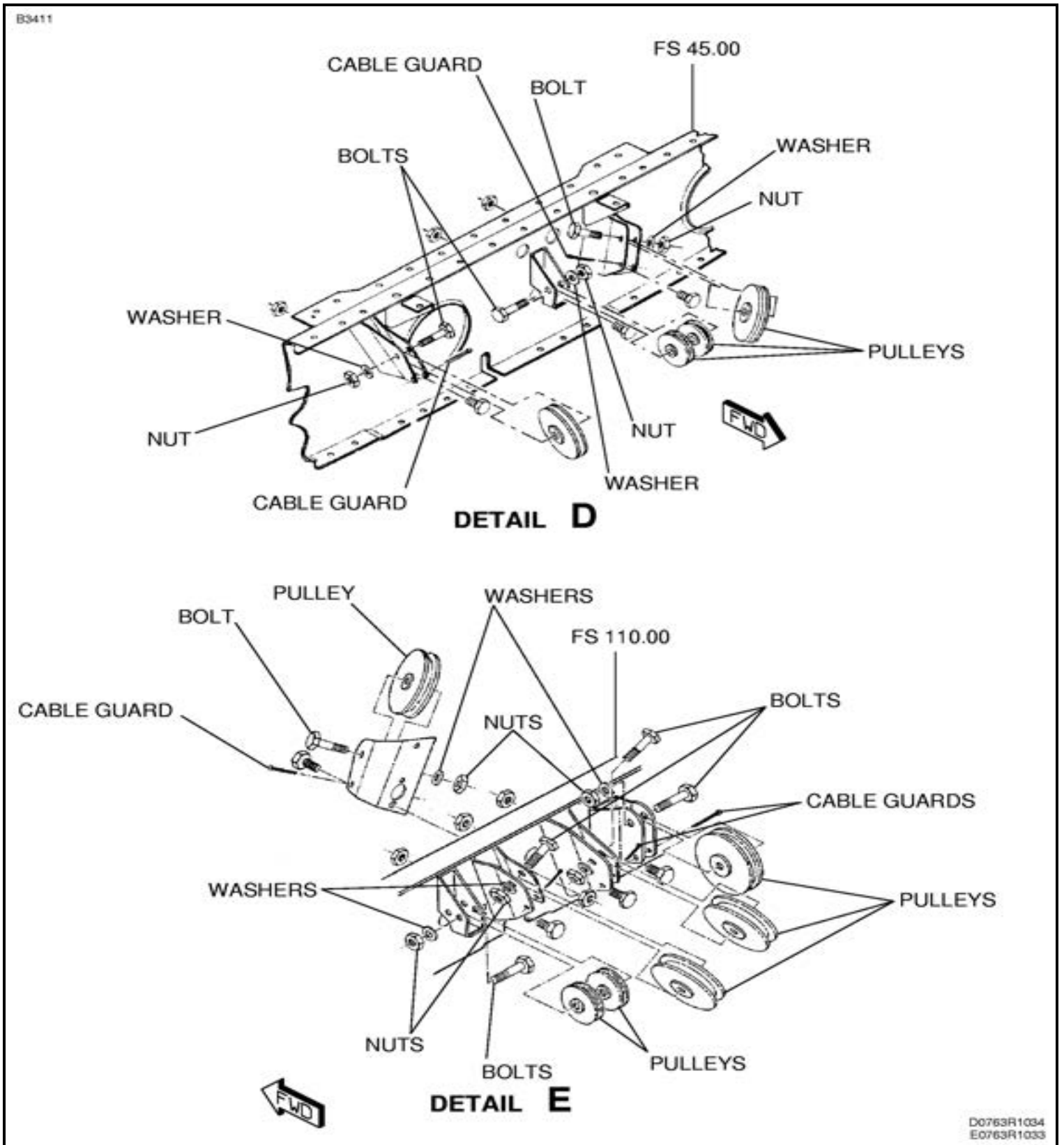


Figure 201 : Sheet 4 : Elevator Trim Tab Control System

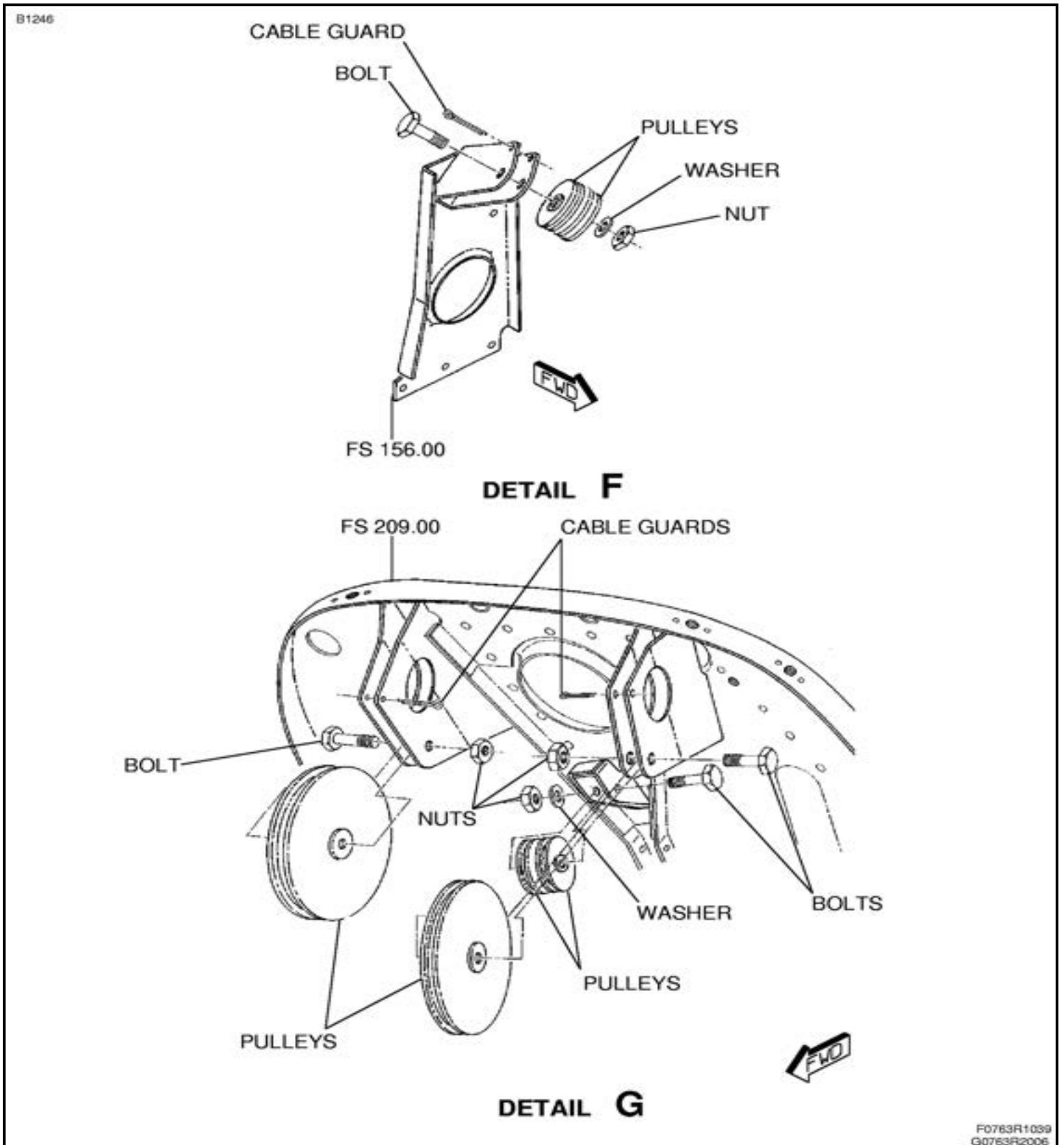


Figure 201 : Sheet 5 : Elevator Trim Tab Control System

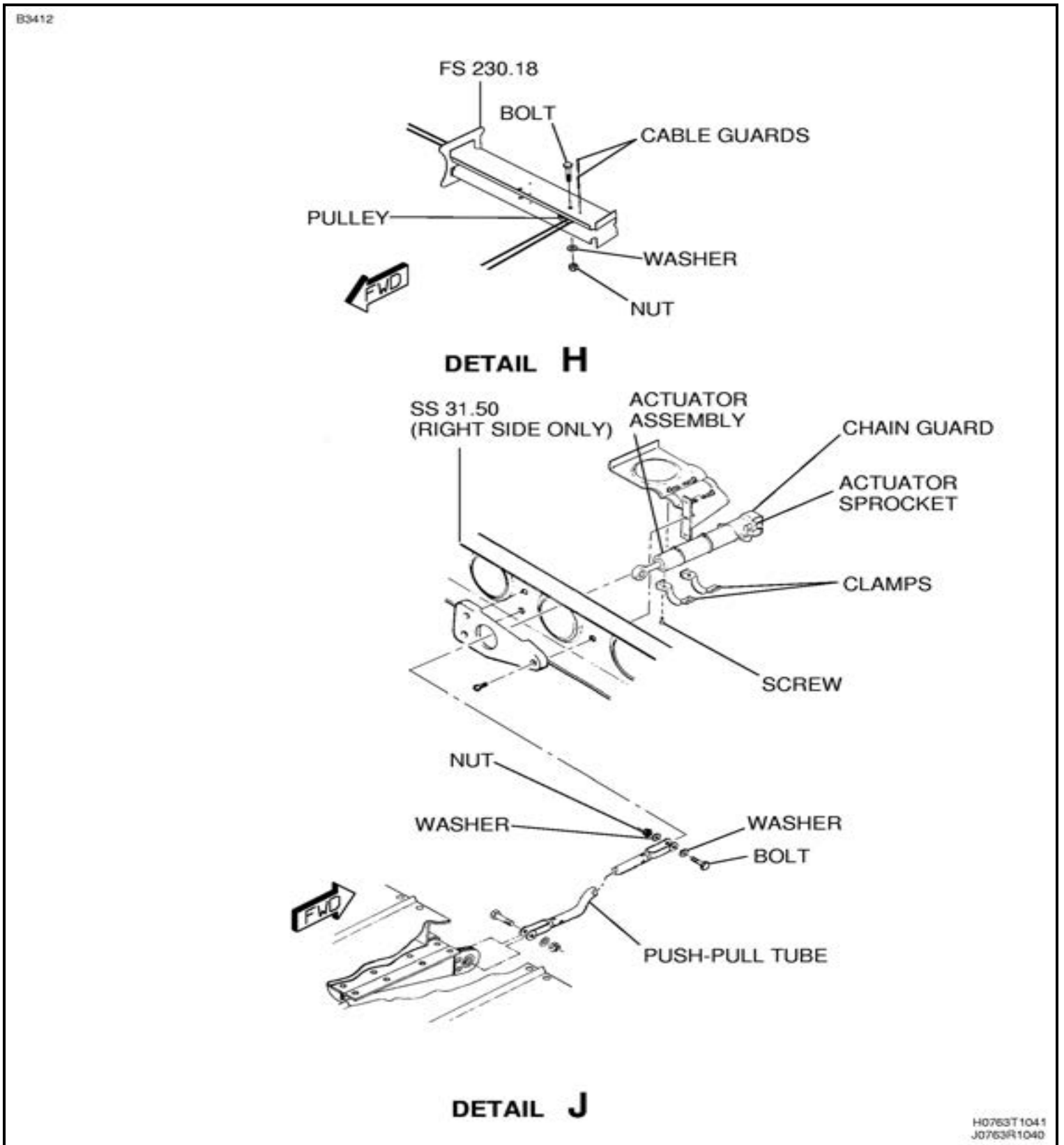


Figure 202 : Sheet 1 : Elevator Trim Tab Actuator Assembly

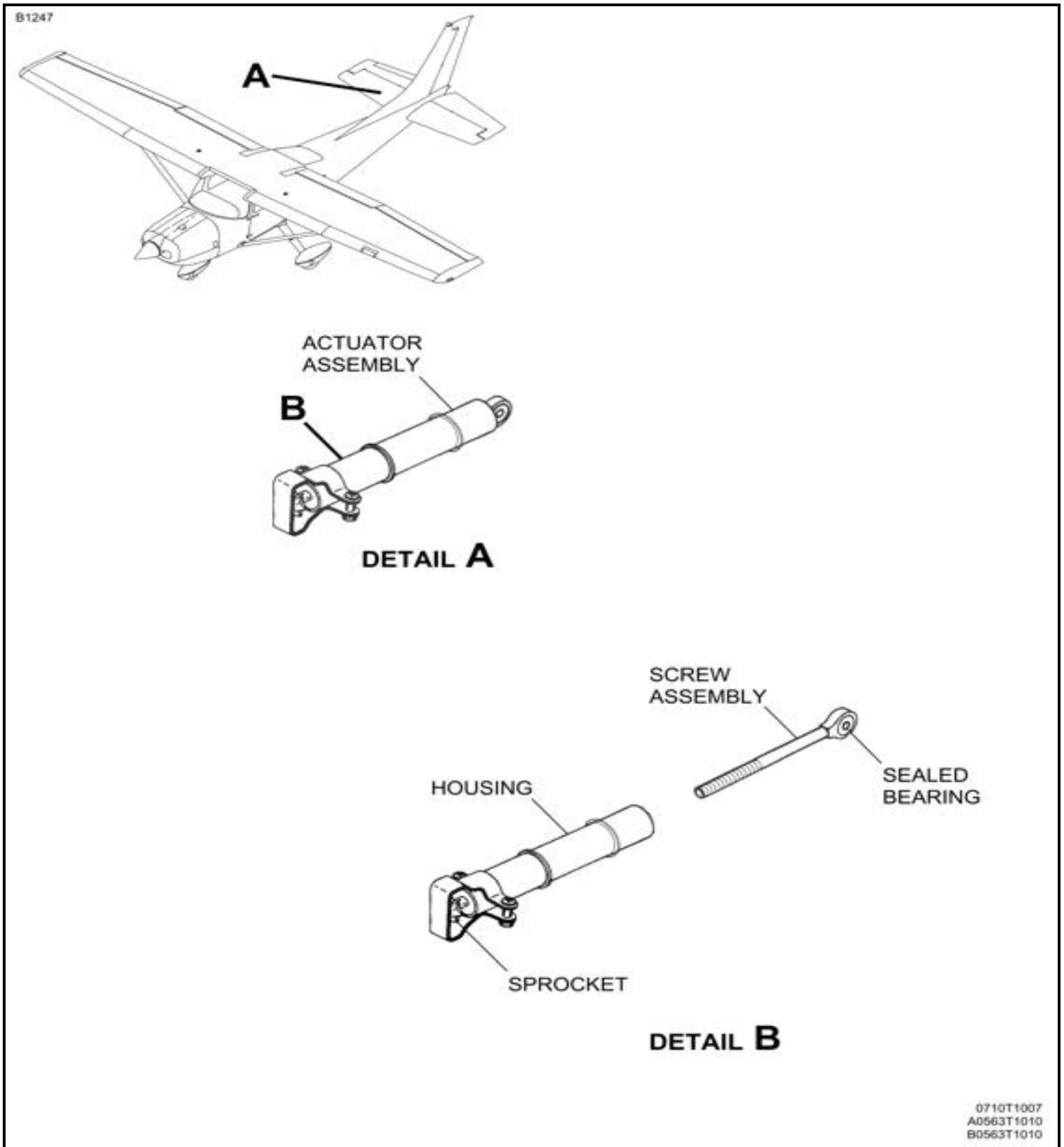


Figure 203 : Sheet 1 : Trim Tab Free Play Inspection

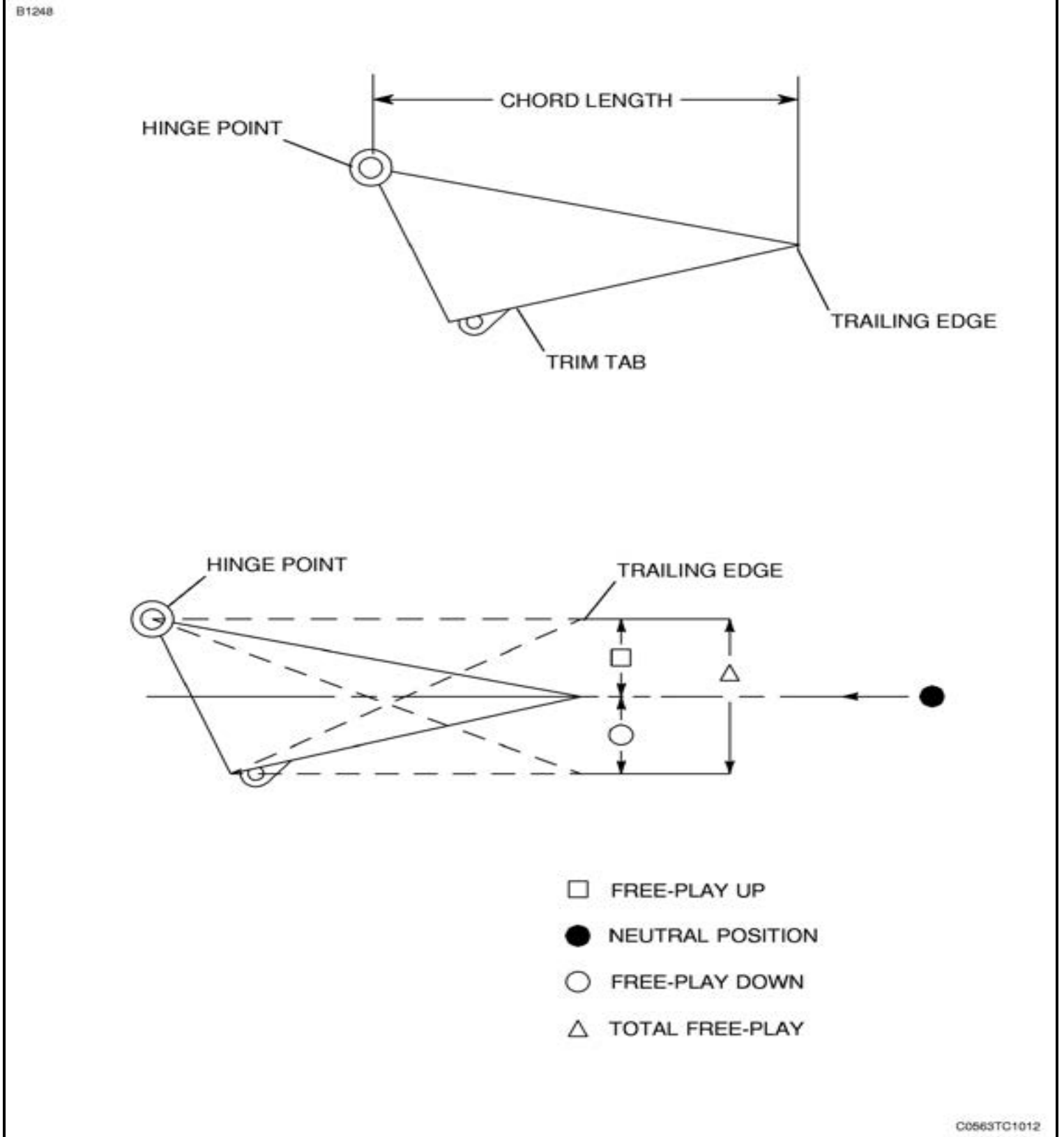


Figure 204 : Sheet 1 : Elevator Trim Tab Travel Stop Adjustment

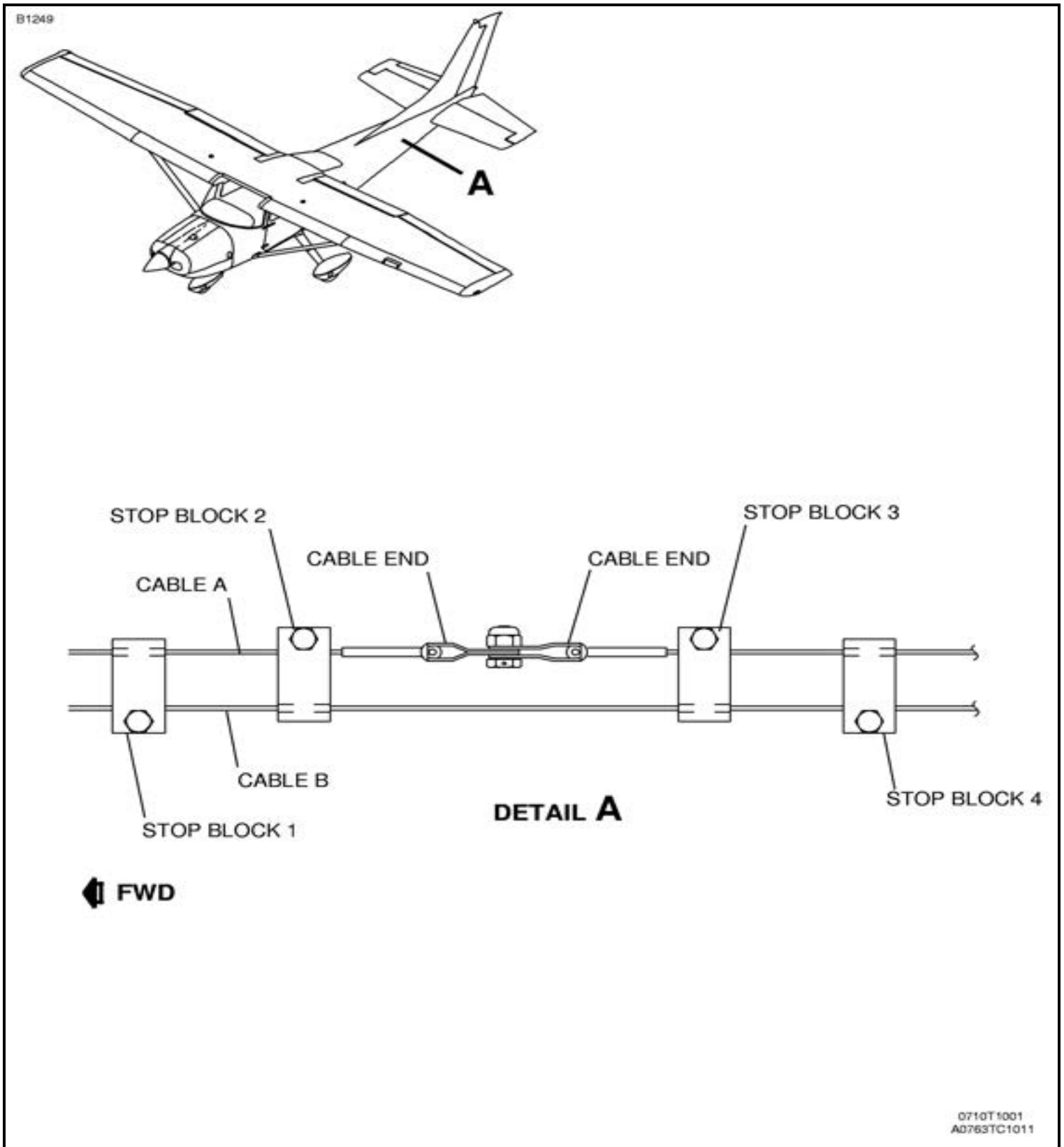


Figure 205 : Sheet 1 : Elevator Trim Cable Tension

B4206

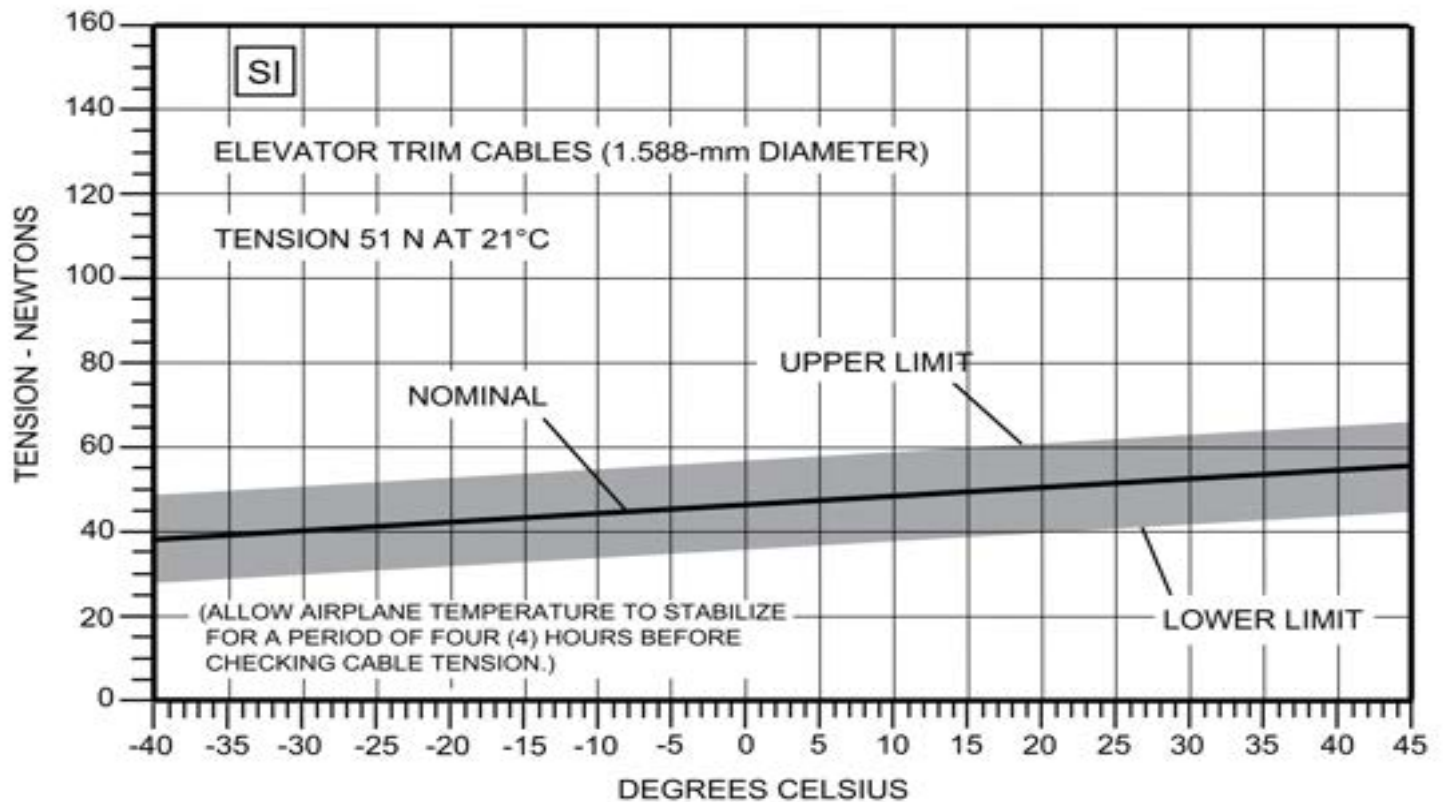
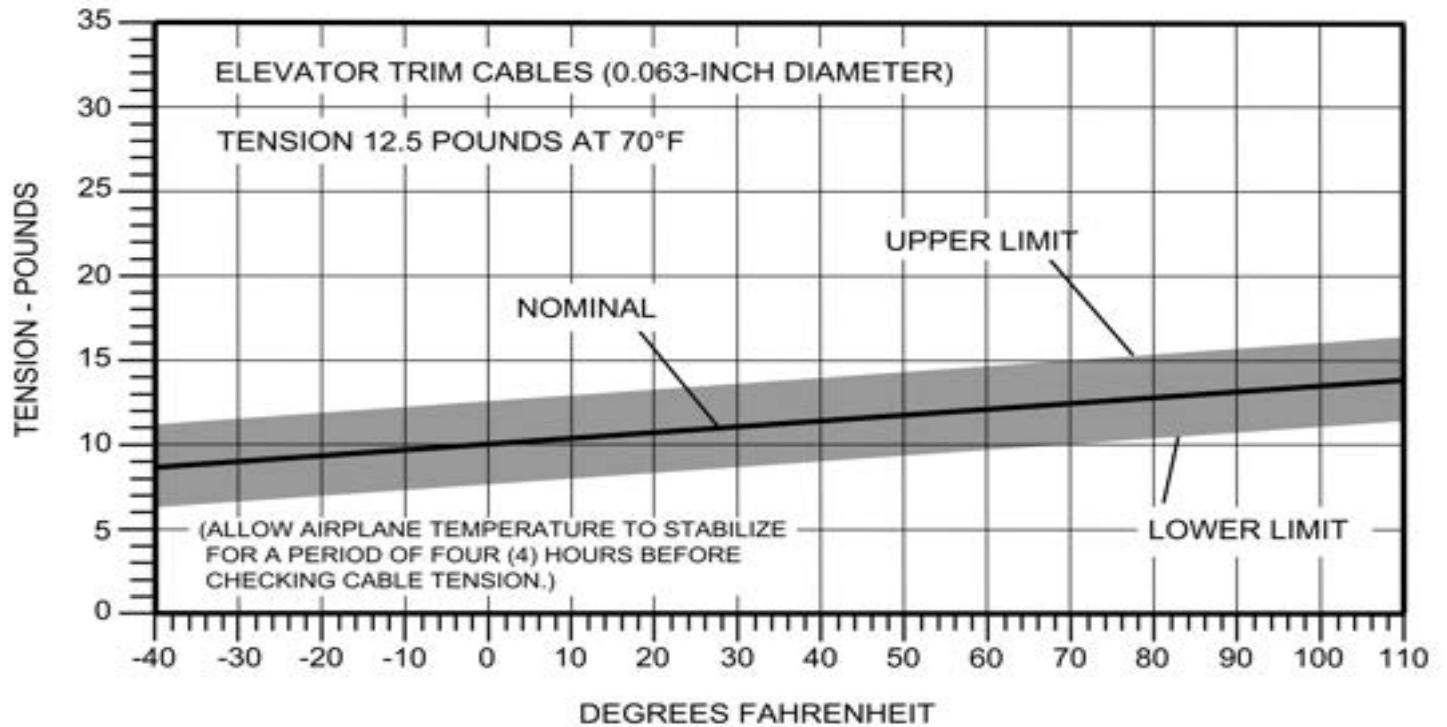
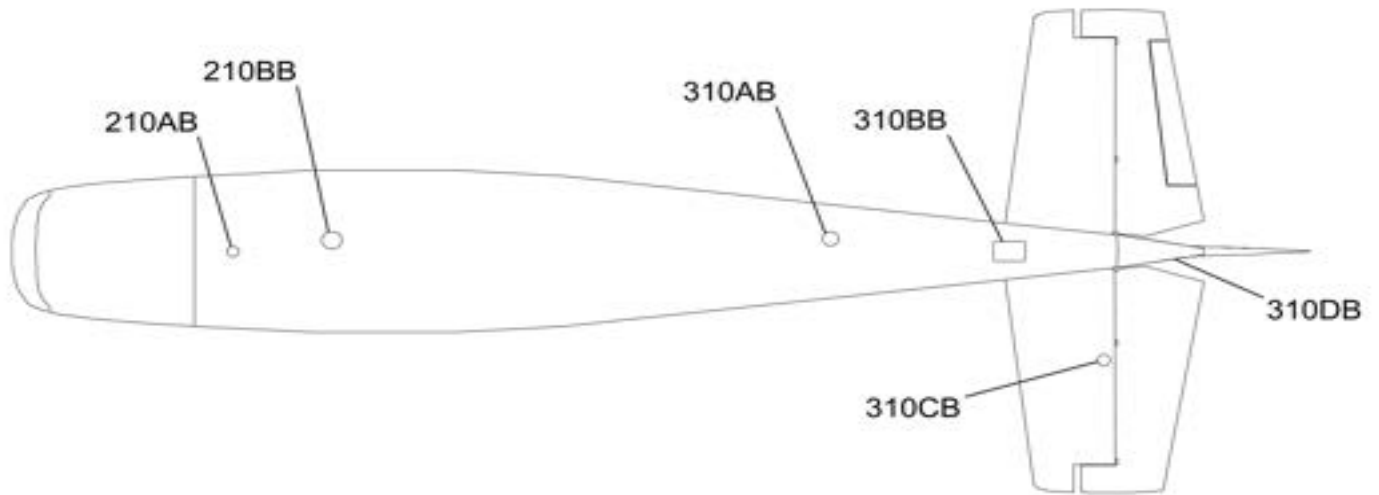
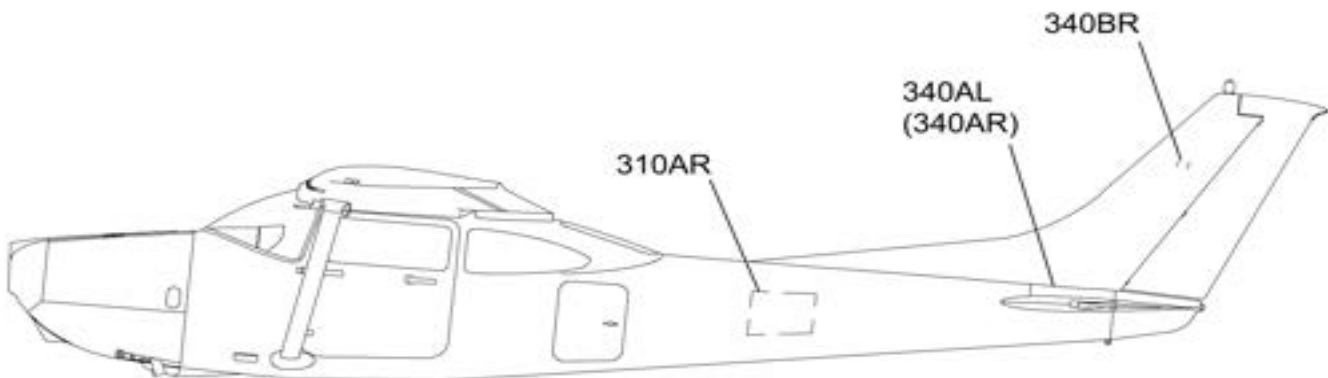


Figure 2 : Sheet 1 : Fuselage Panels

B1083



BOTTOM VIEW



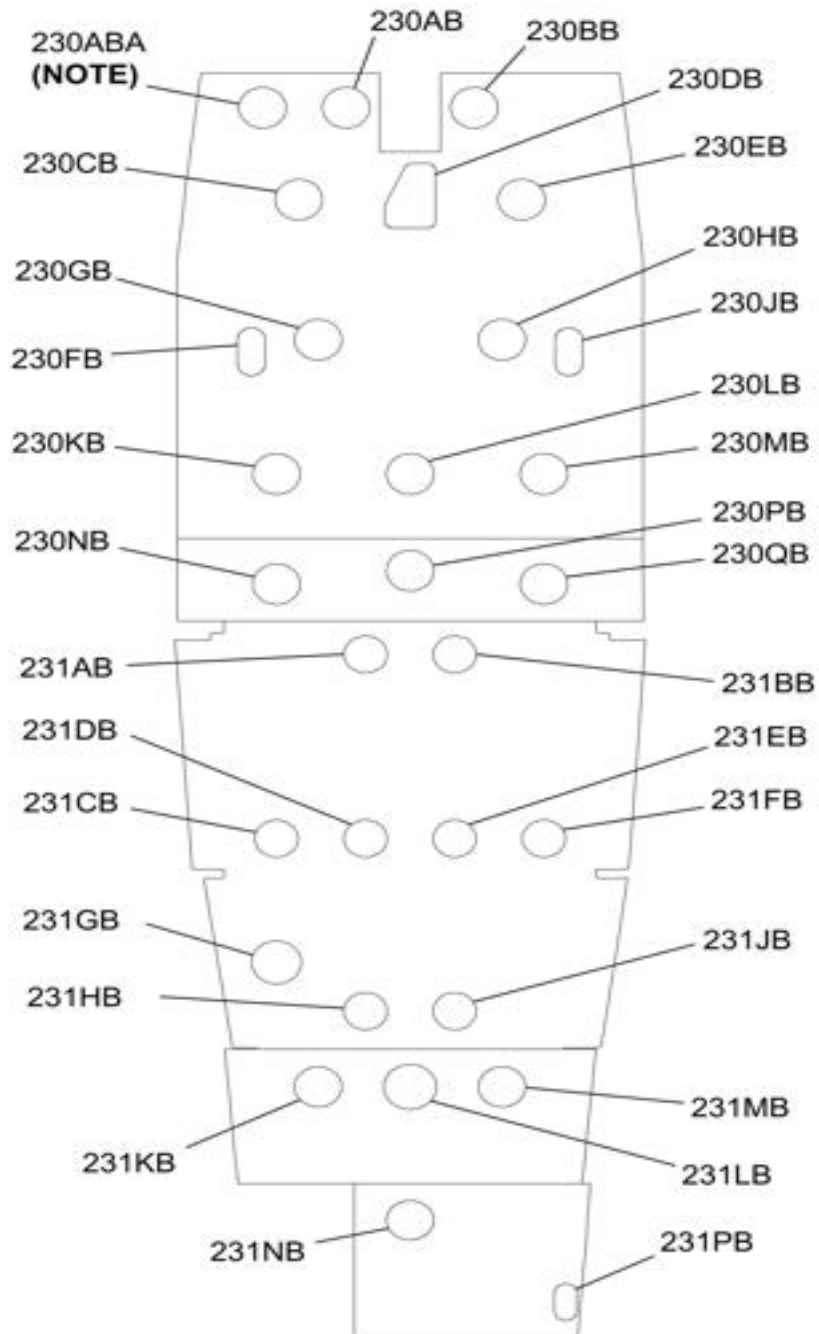
LEFT VIEW

FUSELAGE PANELS

0710T1010
0710T1010

Figure 1 : Sheet 1 : Cabin Floorboard Panels

B1084



CABIN FLOORBOARD PANELS

NOTE: THE ACCESS PANEL IS APPLICABLE
ON AIRPLANES 18281225 AND ON
AND AIRPLANES T18208203 AND ON.

0710T1009

FLAP CONTROL SYSTEM - TROUBLESHOOTING

1. General

- A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to [Figure 101](#).

Figure 101 : Sheet 1 : Flap System Troubleshooting Chart

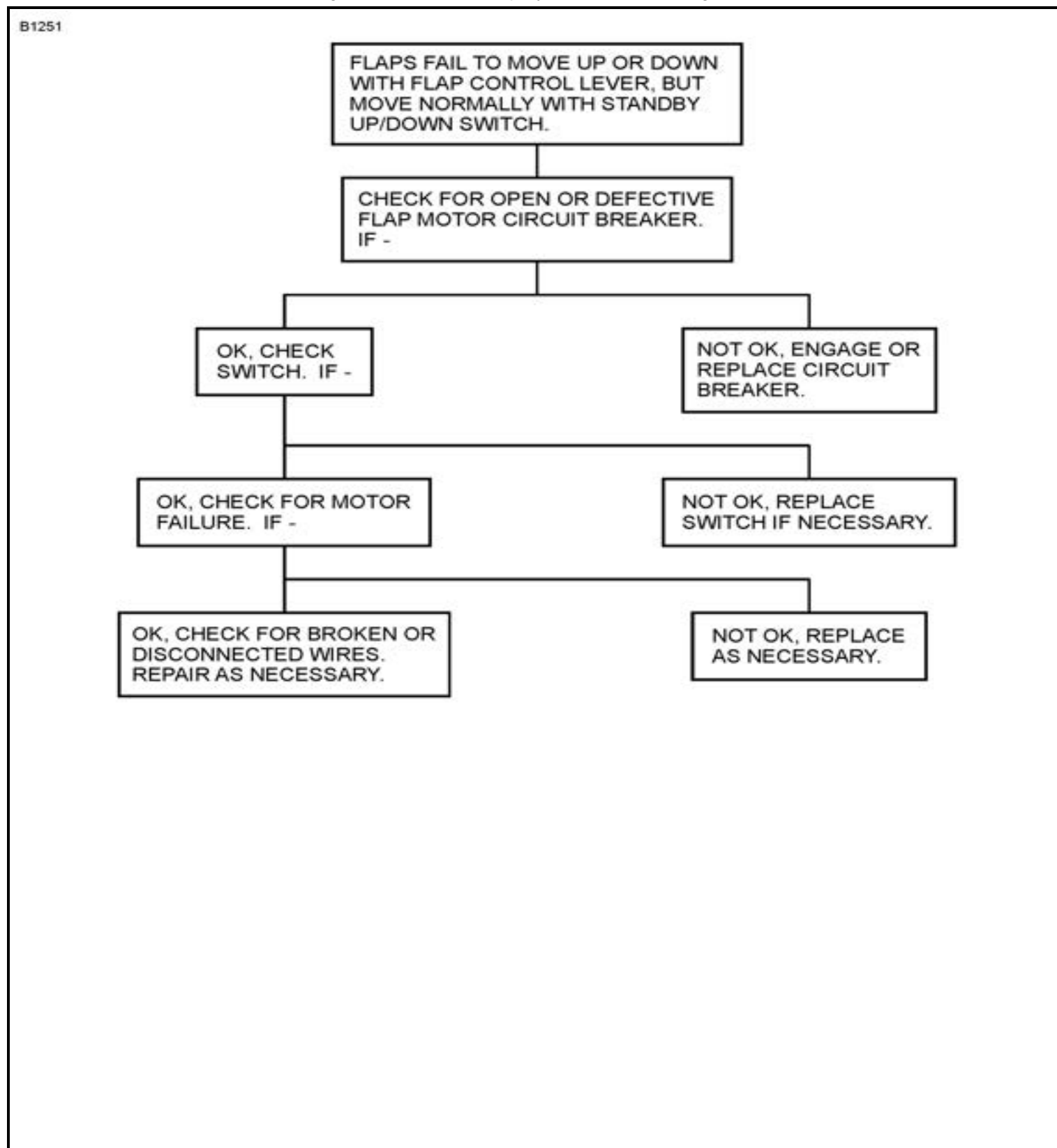


Figure 101 : Sheet 2 : Flap System Troubleshooting Chart

B1252

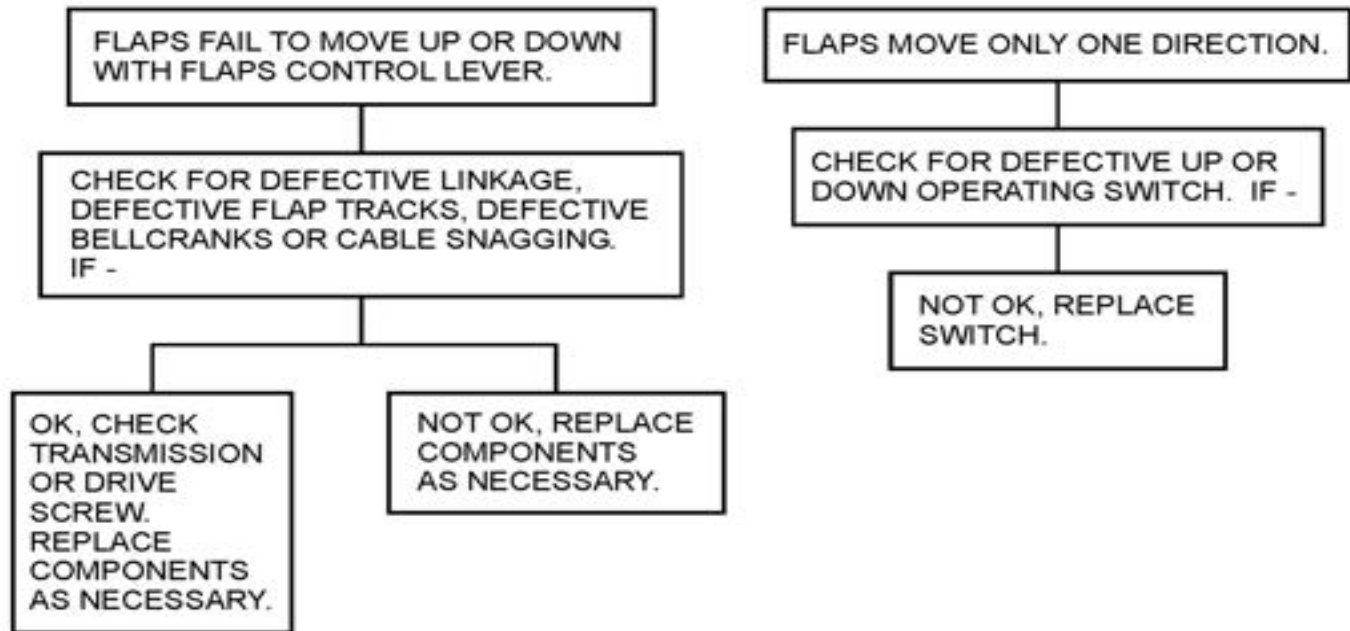
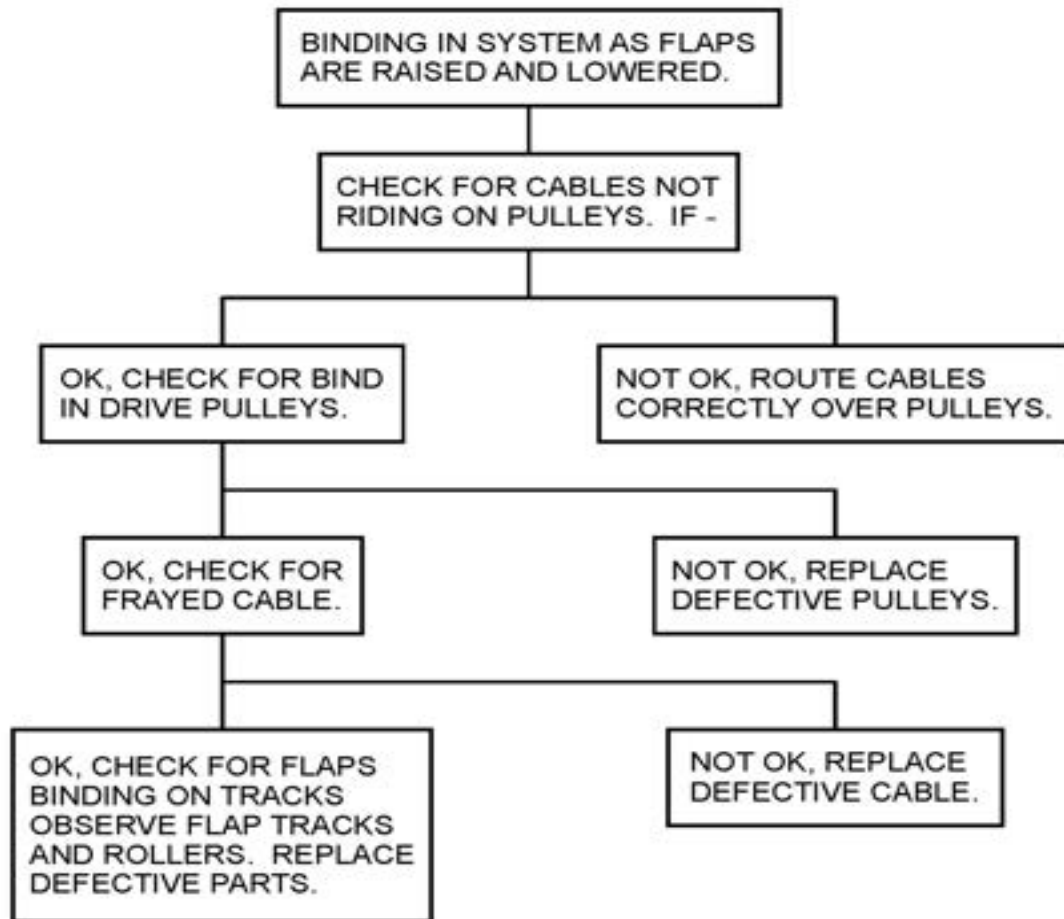


Figure 101 : Sheet 3 : Flap System Troubleshooting Chart

B1253



FLAP CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

- A. The wing flap control system contains an electric flap motor, transmission assembly, drive pulleys, push-pull rods, cables, and a follow-up control. Power from the motor and the transmission assembly is transmitted to the flaps by a system of drive pulleys, cables, and push-pull rods. Electric power to the motor is controlled by two microswitches mounted on a floating arm assembly, a cam lever, and a follow-up control. As the flap control lever is moved to the desired flap setting, the attached cam trips one of the microswitches, activating the flap motor. As the flaps move to the position selected, the floating arm is rotated by the follow-up control until the active microswitch clears the cam, breaking the circuit and stopping the motor. To reverse flap direction, the control lever is moved in the opposite direction, causing the cam to trip the second microswitch, which reverses the flap motor. The follow-up control moves the cam until it is clear of the second switch, shutting off the flap motor. Limit switches at the flap actuator assembly control flap travel as the flaps reach the full UP or DOWN positions.
- B. For a schematic of the flap system, refer to [Figure 201](#).

2. Flap Motor and Transmission Assembly Removal/Installation

- A. Flap Motor (MR001) and Transmission Assembly Removal (Refer to [Figure 202](#)).
 - (1) Lower the flaps fully.
 - (2) Set the ALT/BAT MASTER switch to the off position.
 - (3) Remove the access panels [610BB](#) and [610CB](#). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (4) Remove the bolt that attaches the actuating tube to the drive pulley.
 - (5) Turn the actuating tube in toward the transmission as far as possible by hand.
 - (6) Remove the bolt that attaches the flap motor hinge to the wing. Keep the brass washer between the hinge and the wing structure.
 - (7) Disconnect the electrical connectors from the flap motor (MR001).
 - (8) Disconnect the electrical connectors from the up limit switch (SR001) and the down limit switch (SR002).
 - (9) Carefully remove the flap motor and the transmission assembly from the wing through the access opening.
- B. Flap Motor and Transmission Assembly Installation (Refer to [Figure 202](#)).
 - (1) Carefully install the flap motor and the transmission assembly into the wing through the access opening. If the hinge assembly was removed from the transmission, make sure that the short end of the hinge is installed toward the top.
 - (2) Connect the electrical connectors to the flap motor (MR001).
 - (3) Connect the electrical connectors to the up limit switch (SR001) and the down limit switch (SR002).
 - (4) Attach the flap motor hinge to the wing with the bolt and the brass washer.
 - (5) Turn the actuating tube out toward the bell crank.
 - (6) Install the bolt that attaches the actuating tube to the drive pulley.
 - (7) Install the access panels [610BB](#) and [610CB](#). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (8) Set the ALT/BAT MASTER switch to the ON position.
 - (9) Make sure that the flaps operate correctly. Refer to [Flap System Adjustment/Test](#) for rigging instructions.

3. Flap Removal/Installation

- A. Flaps Removal (Refer to [Figure 202](#)).
 - (1) Lower the flaps fully with the flap selector switch.
 - (2) Set the ALT/BAT MASTER switch to the off position.
 - (3) Remove access panels [511AT \(611AT\)](#), [511BT \(611BT\)](#), [511CT \(611CT\)](#), and [511DT \(611DT\)](#) from the leading edge of the flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (4) Disconnect the push-pull rod at the flap bracket.
 - (5) Remove the bolts at each flap track.

NOTE: The washers, rollers, and bushings will fall as the flap is removed from the wing. Keep the hardware for installation.

- B. Flaps Installation (Refer to [Figure 202](#)).

CAUTION: Make sure that the width of the flap track slot is 0.5735 inch +0.03 or -0.03 inches (14.56 mm +0.76 or -0.76 mm). The flap track must be replaced if the width is not in the limits.

- (1) Install the flap to the flap tracks.

NOTE: It is permitted to apply 3M Y8671 (or equivalent) polyurethane tape on the upper flap skins as required to prevent chafing against the wing trailing edge.

- (2) Connect the push-pull rod to the flap bracket.

NOTE: Flap rigging may not be necessary if the push-pull rod adjustment was not disturbed.

- (3) Install access panels 511AT (611AT), 511BT (611BT), 511CT (611CT), and 511DT (611DT) to the leading edge of the flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (4) Set the inboard side of the MASTER switch to BAT.
- (5) Raise the flaps to the full position with the flap selector switch.
- (6) Set the BAT side of the MASTER switch to the off position.

4. Flap Drive Pulley Removal/Installation

- A. Flap Drive Pulley Removal (Refer to [Figure 202](#)).

- (1) Remove the overhead console. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
- (2) Remove the safety clips and loosen the flap adjustment at the turnbuckles.
- (3) Remove the access plates 510BB and 510CB. Refer to Chapter 6-20-02, Access/Inspection Plates - Description and Operation.
- (4) Remove the bolt that attaches the flap push-pull rod to the drive pulley.
- (5) Carefully lower the right flap.
- (6) Remove the bolt that attaches the actuating tube to the drive pulley.
- (7) Carefully lower the left flap.
- (8) Remove the cable locks that attach the control cables to the drive pulley. Tag the cables for identification.
- (9) Remove the bolt that attaches the drive pulley to the wing.
- (10) Carefully remove the drive pulley through the access opening without dropping the bushing.
- (11) Keep the brass washer from between the drive pulley and the wing structure for installation.

- B. Flap Drive Pulley Installation (Refer to [Figure 202](#)).

- (1) Install the drive pulley and the bushing through the access opening.
- (2) Install the brass washer and attach the drive pulley to the wing structure with the bolt.
- (3) Remove the identification tags and install the cable locks that attach the control cables to the drive pulley.
- (4) Raise the left flap fully and install the bolt that attaches the actuating tube to the drive pulley.
- (5) Raise the right flap fully and install the bolt that attaches the flap push-pull rod to the drive pulley.
- (6) Install the access plates 510BB and 510CB. Refer to Chapter 6-20-02, Access/Inspection Plates - Description and Operation.
- (7) Adjust the flap drive cables as necessary. Refer to [Flap Control Adjustment/Test](#).
- (8) Install the overhead console. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

5. Flap Control System Adjustment/Test

- A. Rig the Flap Control System (Refer to [Figure 202](#) and [Figure 203](#)).

- (1) Remove the overhead console. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
- (2) Remove the access plates 510BB, 510CB and 610BB. Refer to Chapter 6-20-02, Access/Inspection Plates - Description and Operation.
- (3) Remove the safety clips, loosen the cable tension, disconnect the turnbuckles, and carefully lower the left flap.
- (4) Disconnect the push-pull rods at the drive pulleys in both wings and carefully lower the right flap.
- (5) Disconnect the actuating tube from the drive pulley.
- (6) Adjust both push-pull rods to 8.83 inches +0.12 inch -0.12 inch (224.28 mm +3.04 mm or -3.04 mm) between the centers of the rod end bearings, and tighten the locknuts on both ends.

- (7) Attach the push-pull rods to the flaps and the drive pulleys.
 - (a) If the control cables are not connected to the left and the right drive pulleys, the actuating tube and the push-pull rods must be disconnected before you install the cables.
 - (b) If the drive pulleys are not installed, attach the control cables before you install the drive pulleys in the wings.
- (8) Turn the actuating tube in toward the transmission by hand 0.12 inch +0.05 or -0.05 inches (3.04 mm +1.27 or -1.27 mm) between the switch actuating collar and the transmission.
- (9) Temporarily connect the cables at the turnbuckles.
- (10) Test the flaps by hand to make sure that both flaps extend and retract together. If they do not, the cables are incorrectly attached to the drive pulleys. Make sure that the right drive pulley rotates clockwise when viewed from below as the flaps are extended.
- (11) Place identification tag on the cables, and disconnect the turnbuckles.
- (12) Loosen the setscrew that attaches the actuating tube to the switch actuating collar and hold the collar to maintain 0.12 inch +0.05 or -0.05 inches (3.04 mm +1.27 or -1.27 mm). Hold the right flap up, and adjust the actuating tube in or out as necessary to align with the attachment hole in the drive pulley.
- (13) Apply Loctite 242 or equivalent sealant to the threads of the setscrew and torque to 40 in-lbs (4.52 N-m).
- (14) Disconnect the push-pull rod at the drive pulley.
- (15) Manually hold the right flap in a full up position and readjust the push-pull rod to align with the attachment hole in the drive pulley.
- (16) Connect the push-pull rod and tighten the locknuts.
- (17) Set the flaps in the full up position.
- (18) Shut off the electrical power to the flap motor (MR001) by loosening the setscrew and the idle up limit switch adjustment block on the support to activate the switch.
- (19) Tighten the setscrew.
- (20) Manually hold the left flap full up and connect the control cables at the turnbuckles. Remove the identification tags that are installed on the control cables.
- (21) Adjust the retract cable first. With the flaps up, adjust the turnbuckles to 30 pounds, +10 or -10 pounds (133.45 N, +44.48 or -44.48 N) of tension on the cables at 70 °F (21 °C). Refer to the Charts in Figure 203 for the correct tensions at other temperatures.
- (22) Disconnect the push-pull rod at the left drive pulley.
- (23) Turn on the motor (MR001) to extend the flaps approximately 20 degrees.
- (24) Check the tension on each flap cable.
- (25) Adjust the turnbuckles as necessary to maintain 30 pounds, +10 or -10 pounds (133.45 N, +44.48 or -44.48 N) of tension on the cables at 70 °F (21 °C). Refer to the Charts in Figure 203 for the correct tensions at other temperatures.
- (26) Install safety clips on the turnbuckles. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (27) Fully retract the right flap.
- (28) Manually hold the left flap in the up position and adjust the push-pull rod to align with the attaching hole in the drive pulley.
- (29) Attach the push-pull rod and tighten the locknuts.
- (30) Set an inclinometer on the right flap and adjust to zero degrees.
- (31) Operate the flaps to the full down position. Repeat the check on the left flap.
- (32) Adjust the down limit switch (SR002) to stop the flap motor (MR001) and flap at the degree of travel.
- (33) Check the down limit switch (SR002) through some flap cycles.
- (34) Connect and rig the flap follow-up system. Refer to [Flap Follow-Up and Indicating System - Maintenance Practices](#).
- (35) Complete an operational check.
- (36) Check all items for correct safetying. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (37) Install the access plates [510BB](#), [510CB](#) and [610BB](#). Refer to Chapter 6-20-02, Access/Inspection Plates - Description and Operation.
- (38) Install the overhead console. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

Figure 201 : Sheet 1 : Flap System Schematic

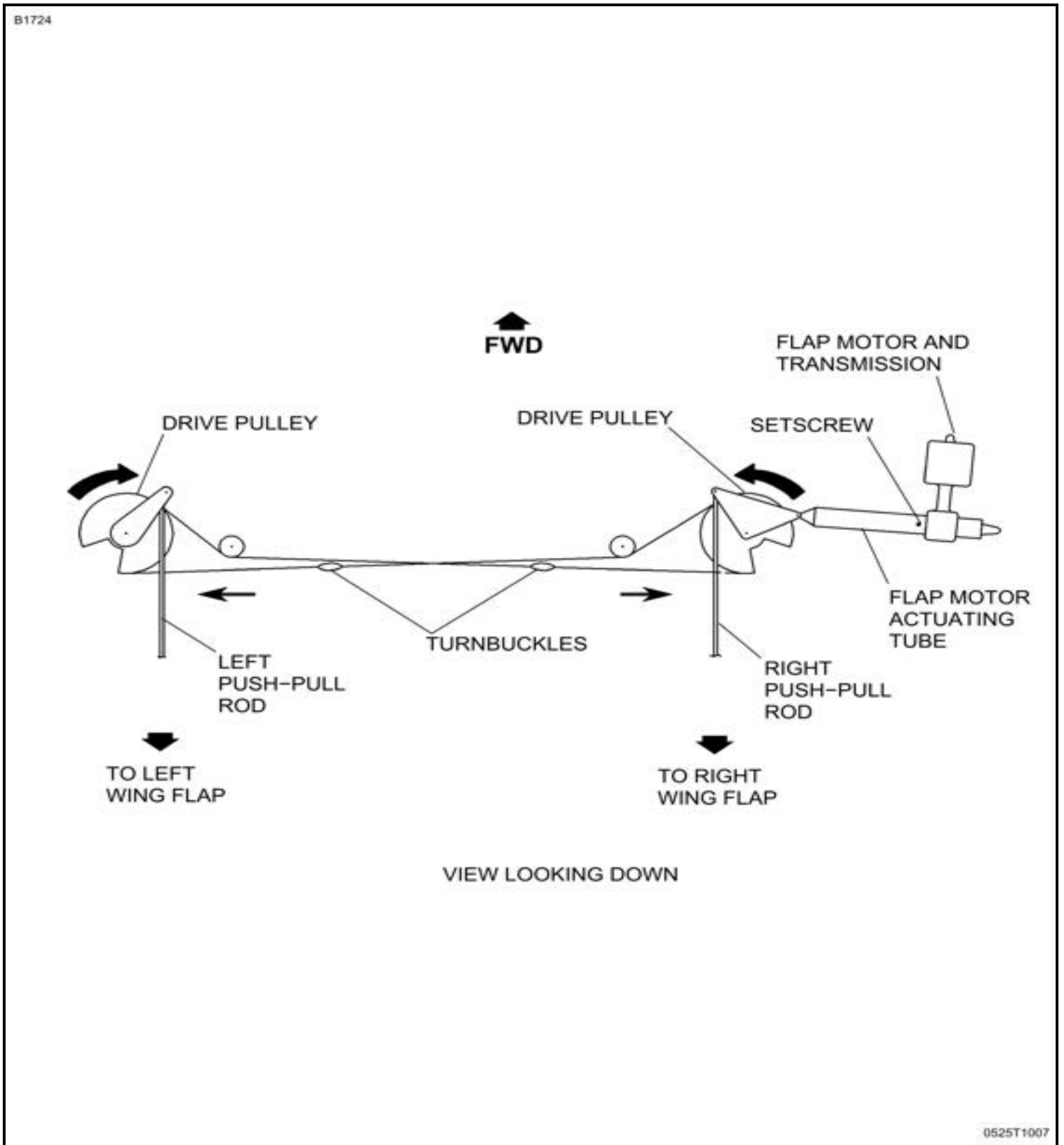


Figure 202 : Sheet 1 : Wing Flap Control System Installation

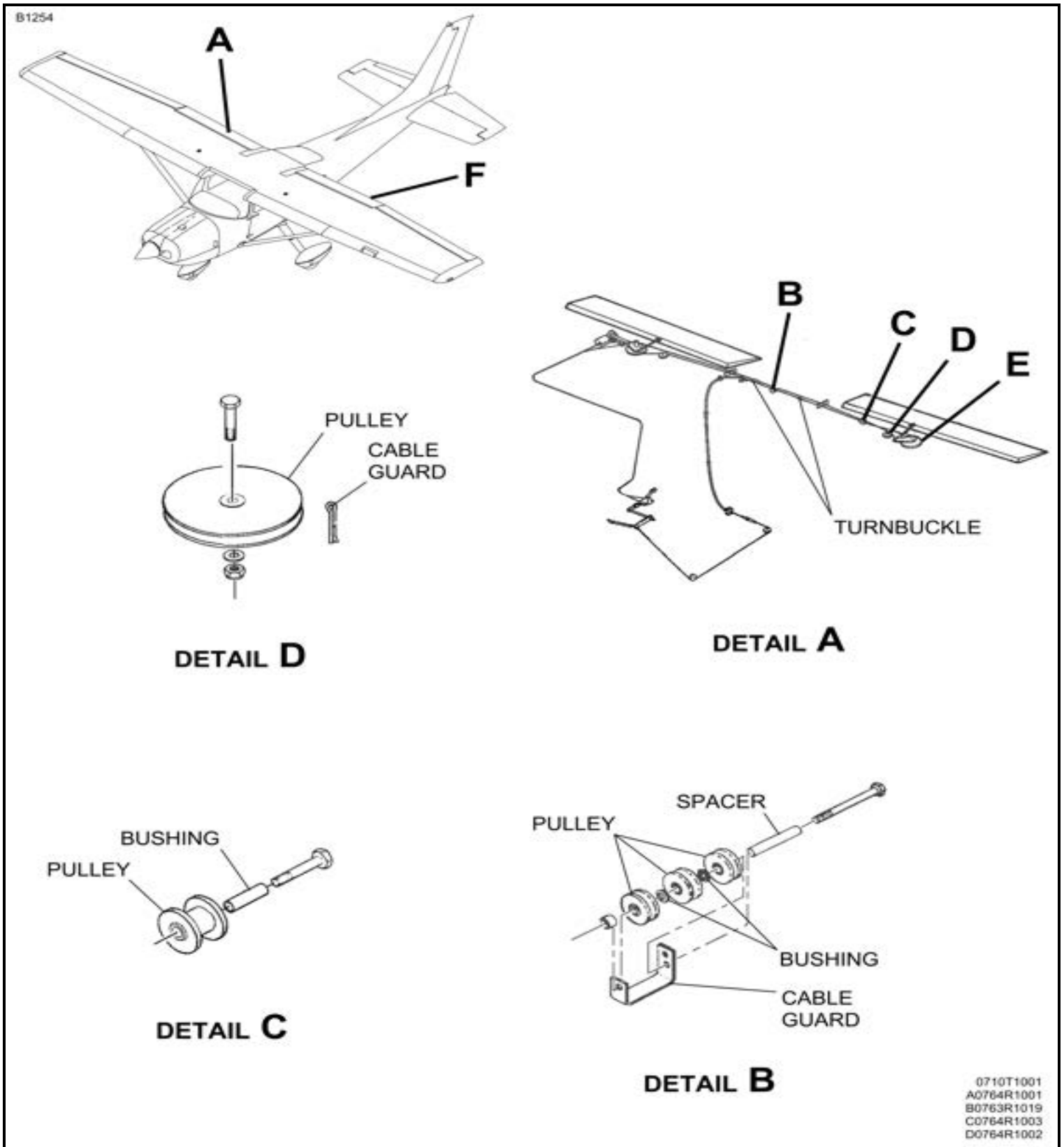


Figure 202 : Sheet 2 : Wing Flap Control System Installation

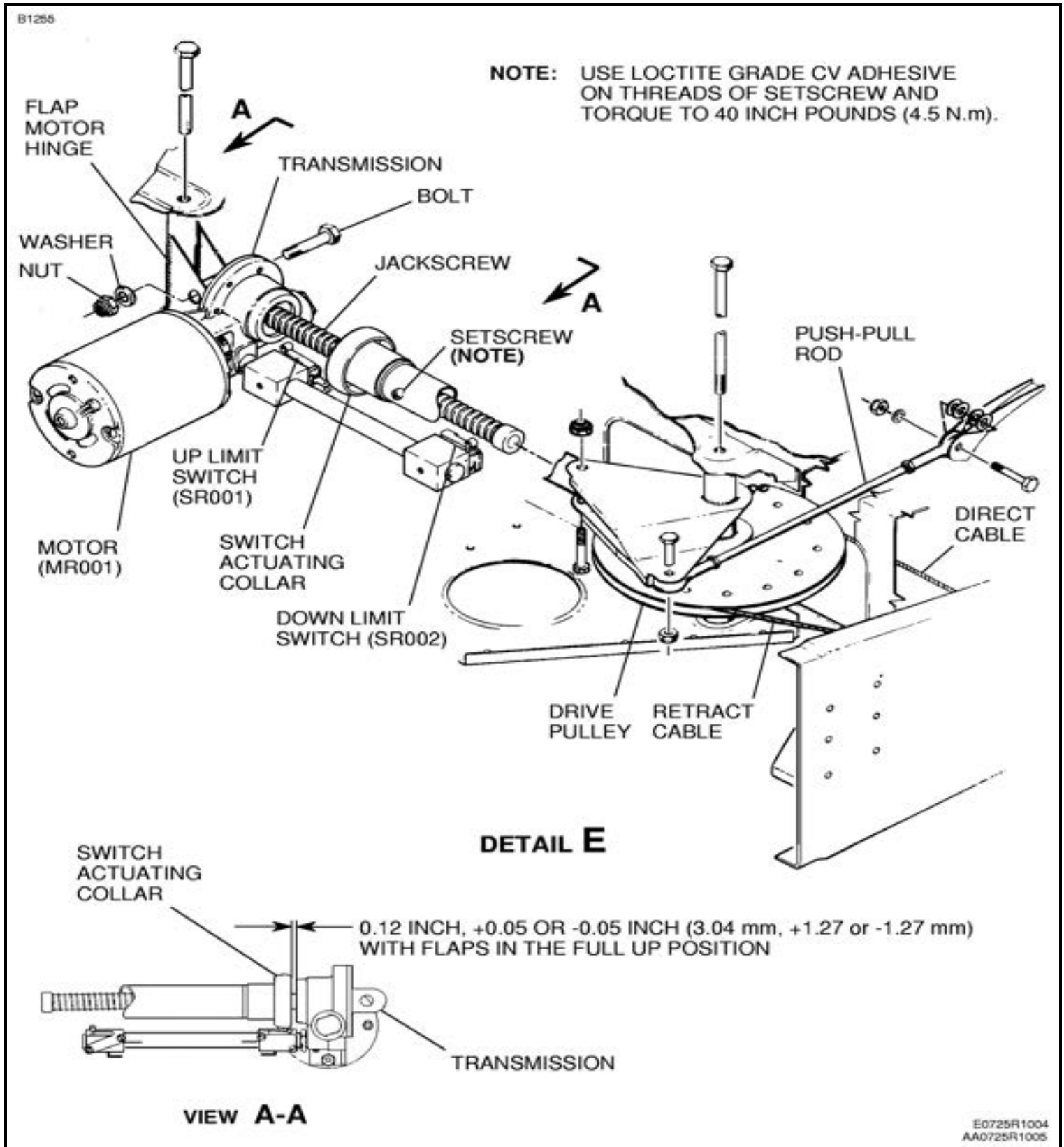


Figure 202 : Sheet 3 : Wing Flap Control System Installation

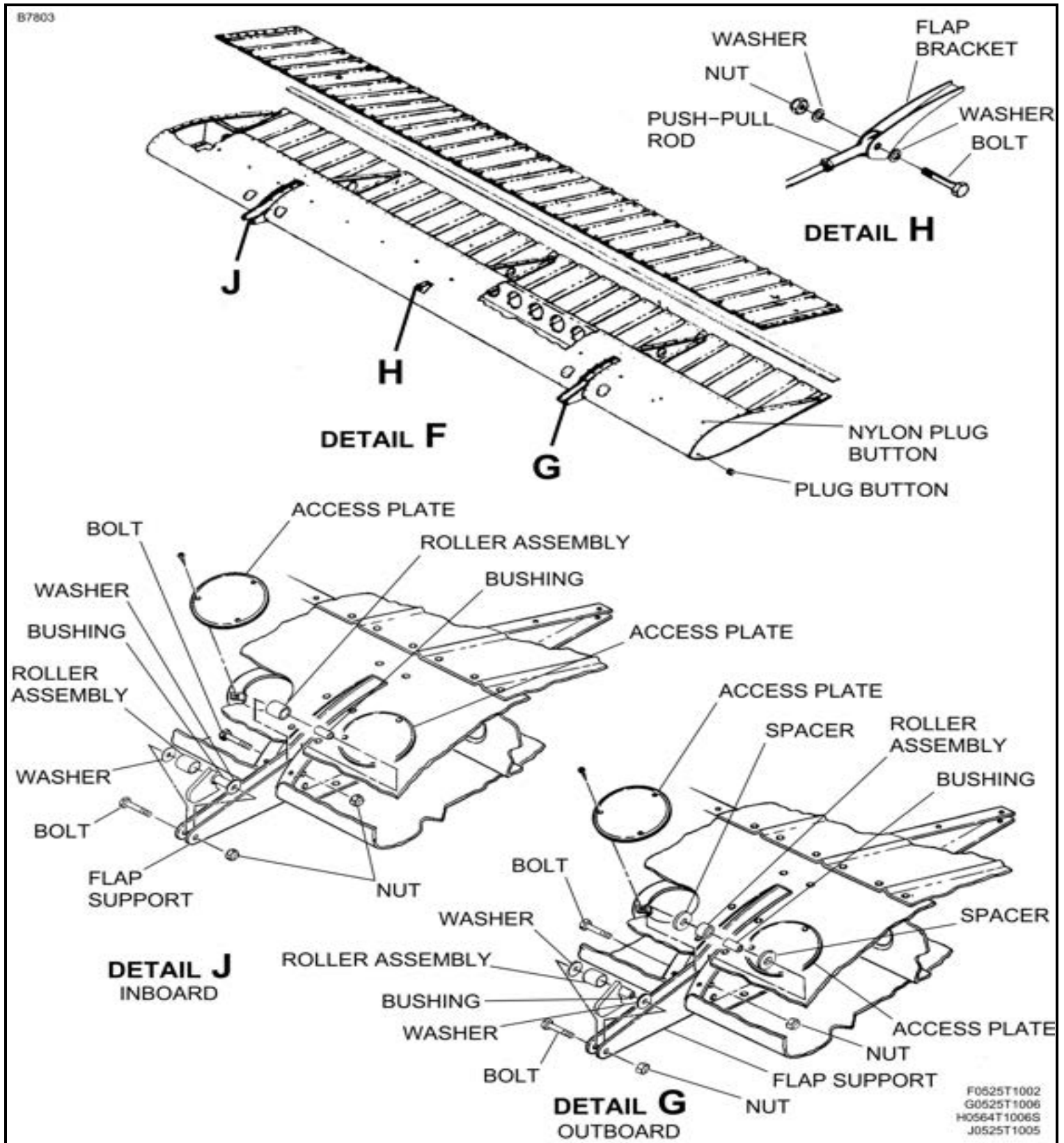
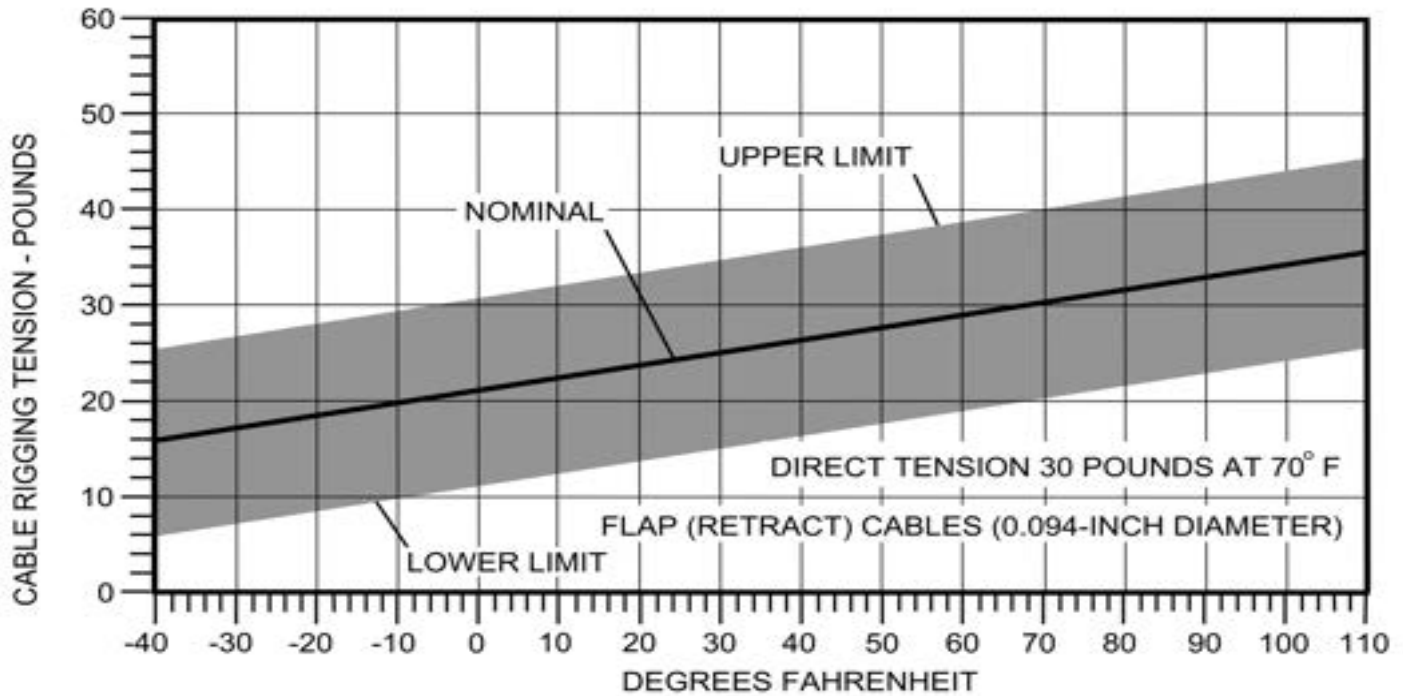


Figure 203 : Sheet 1 : Flap Cable Tensions

B22033



ALLOW AIRPLANE TEMPERATURE TO STABILIZE FOR A PERIOD OF FOUR (4) HOURS BEFORE CHECKING CABLE TENSION.

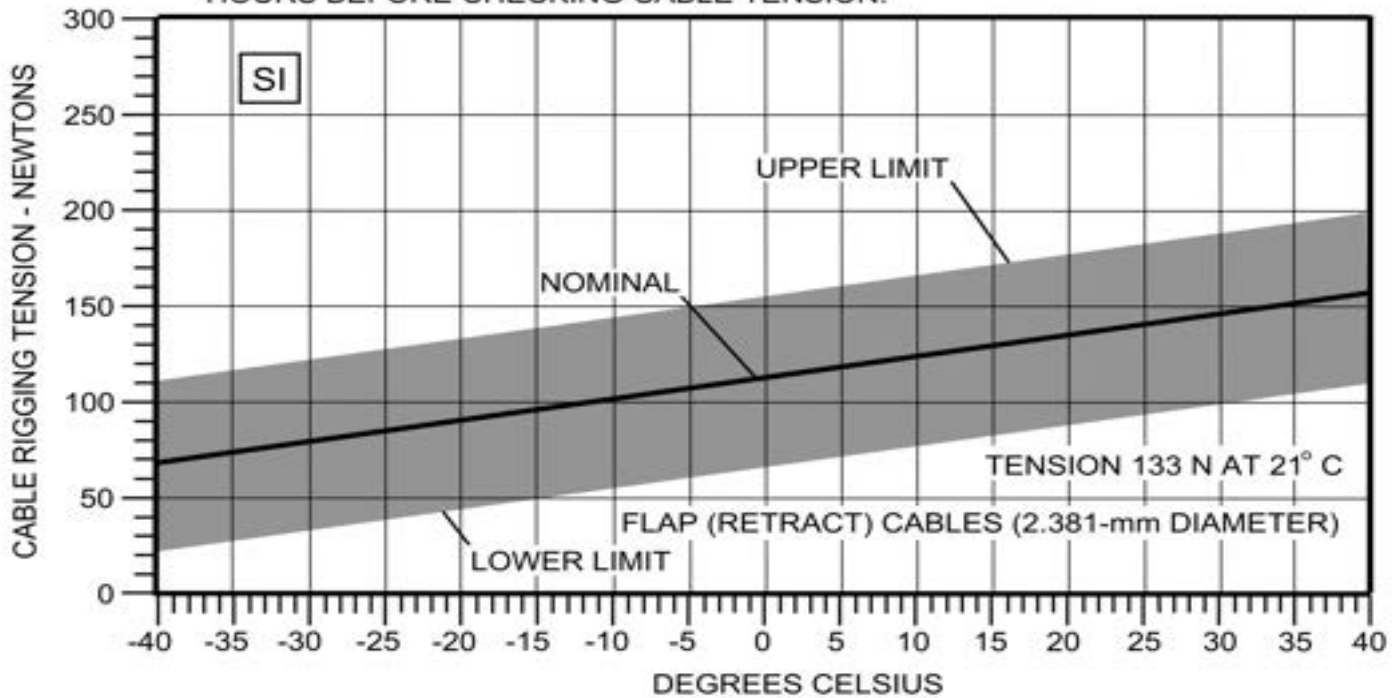


Figure 3 : Sheet 1 : Wing Access Panels

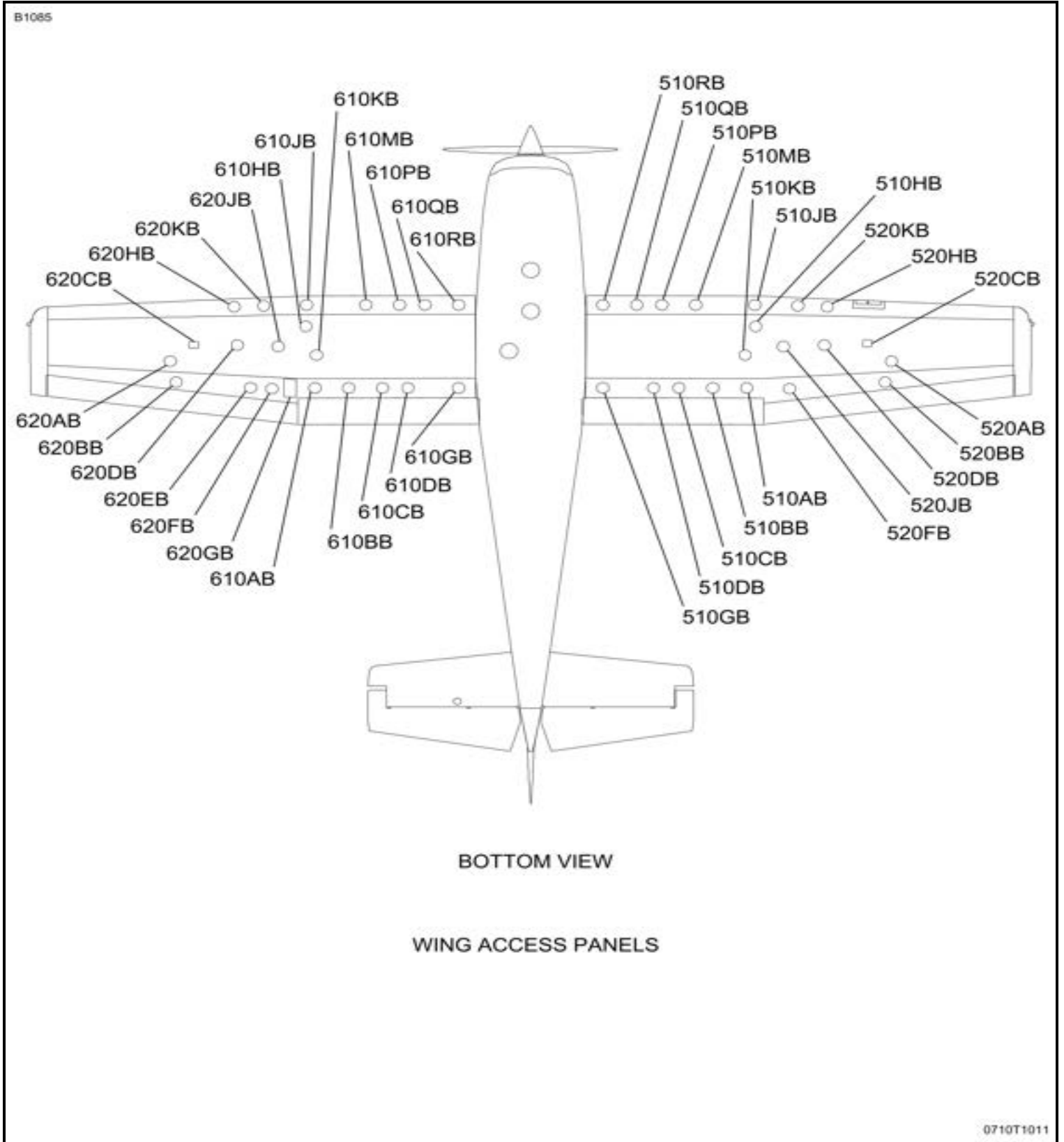


Figure 3 : Sheet 2 : Wing Access Panels

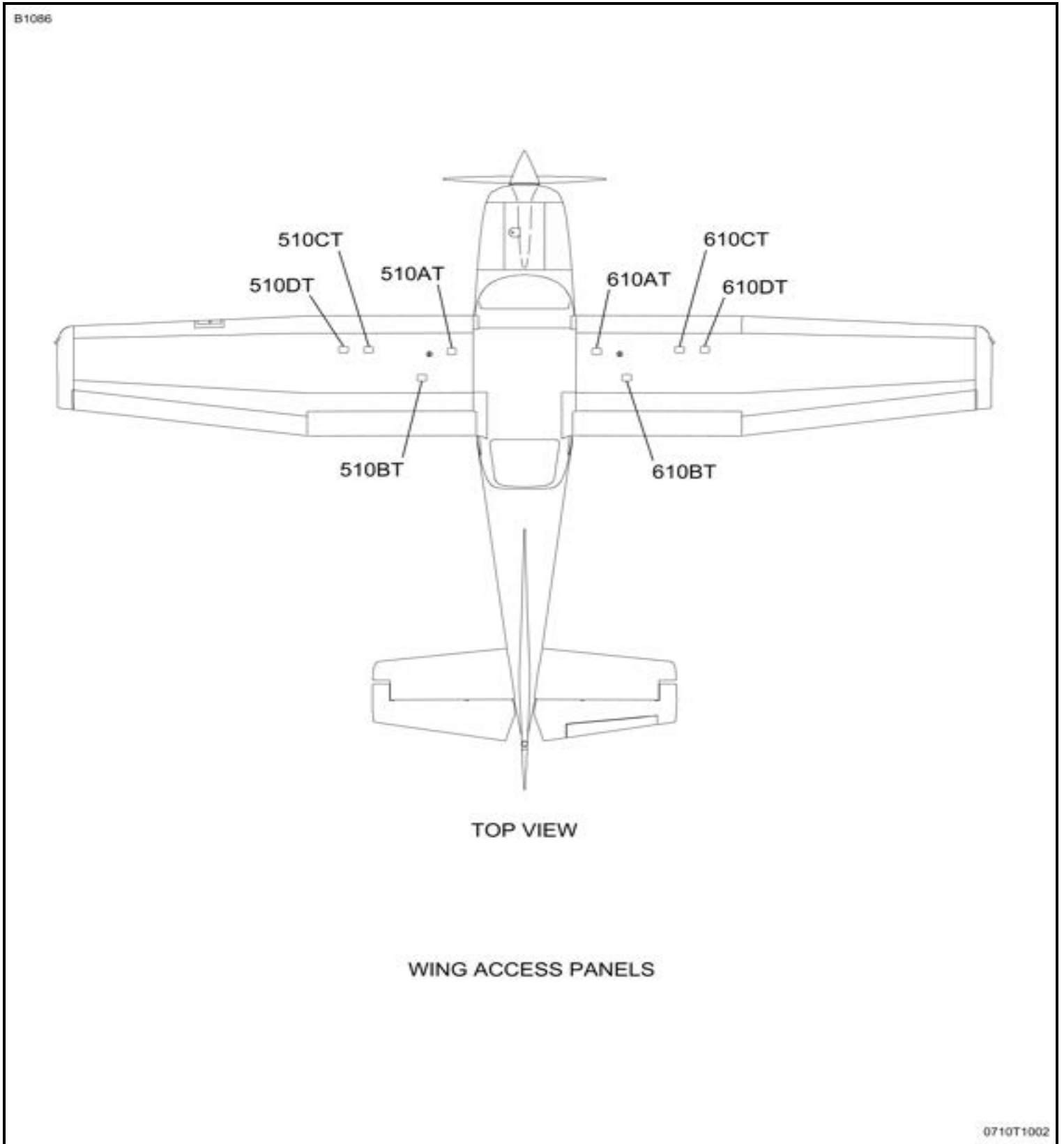
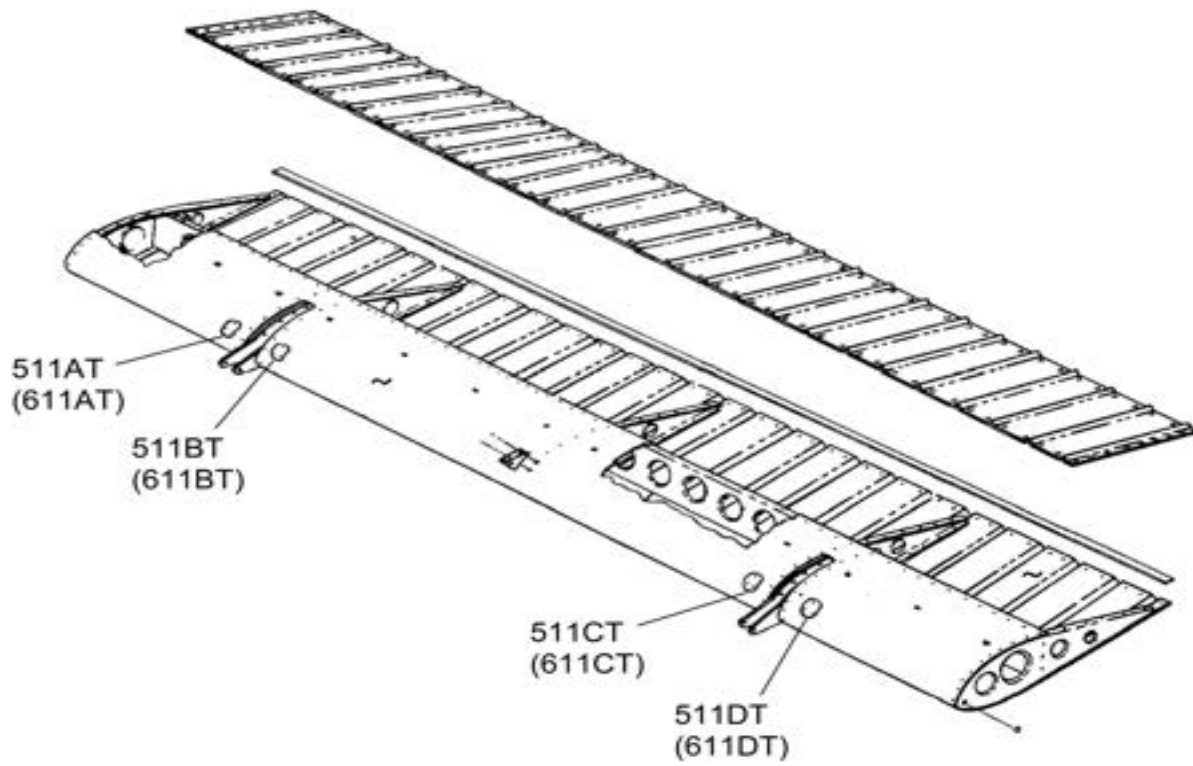


Figure 4 : Sheet 1 : Flap Panels



FLAP PANELS

0725T1001

FLAP FOLLOW-UP AND INDICATING SYSTEM - MAINTENANCE PRACTICES

1. General

- A. The flap follow-up and indicating system consists of a sheathed cable assembly, pointers and microswitches. One end of the cable is attached to the flap operating switch operating arm. The other end is clamped to the flap direct cable, above the headliner in the rear cabin area. Motion of the flap cable is transmitted through the follow-up control to the pointer, attached to the switch mounting arm. Pointer moves along a scale as the flaps are extended or retracted. When the motion of the switch mounting arm with the attached operating switches positions the "active" operating switch to clear the cam on flap lever, flap motor circuit is broken and flaps stop at selected position.

2. Flap Follow-Up and Indicating System Removal/Installation

- A. Remove Flap Control Lever. (Refer to [Figure 201](#)).

- (1) Remove follow-up control torque tube from switch mounting arm.
- (2) Remove flap UP SI007 and DOWN SI008 operating switches from switch mounting arm. Do not disconnect electrical wiring at switches.

NOTE: Insulators are installed between switches and switch mounting arm.

- (3) Remove knob from control lever.
- (4) Remove remaining washers, bushings, switch mounting arm, and control lever by removing mounting bolt. Use care not to drop parts into tunnel area.

- B. Install Flap Control Lever. (Refer to [Figure 201](#)).

- (1) Install mounting bolt, assembling washers, bushings, switch mounting arm, and control lever.

NOTE: Before installing knob on control lever, clean threads on control lever with methyl propyl ketone or equivalent. After threads have thoroughly dried, prime with grade T primer. Allow primer to flash off or dry for three to five minutes. Apply grade CU Loctite (MIL-S-22473), Loctite 271, STA-LOK Catalog No. 800, or equivalent to threads of control lever.

- (2) Install knob and allow Loctite to cure for five to twenty minutes before service.
- (3) Install flap UP SI007 and DOWN SI008 operating switches on switch mounting arm, making sure to install insulators.
- (4) Install follow-up control torque tube to switch mounting arm.
- (5) Rig system. Refer to [Flap Follow-Up and Indicating System Adjustment/Test](#).

3. Flap Follow-Up and Indicating System Adjustment/Test

- A. Rig Flap Follow-Up and Indicating System. Refer to [Figure 201](#).

- (1) Run flaps to full up position.
- (2) Remove overhead center console.
- (3) Secure follow-up cable to retract cable with clamp assembly.
- (4) Torque clamp nut to 40 inch-pounds to 50 inch-pounds (4.52 N.m to 5.65 N.m) and lock with a second nut.
- (5) Pull all slack from follow-up cable, and with position indicator in full UP position connect turnbuckle to follow-up cable.
- (6) Connect spring to arm assembly.
- (7) Make minor cable length adjustments using turnbuckle to position indicator at "0" degrees.
- (8) With control lever in the full UP position adjust Up SI007 operating and Down SI008 operating switch in slotted holes until cam is centered between switch rollers. Ensure control lever is in full UP position during this adjustment.
- (9) Mount inclinometer on trailing edge of one flap and set to "0" Degrees.
- (10) Turn master switch SI009 ON and move control lever to "10" degree position.
- (11) If flaps travel is more than 10 Degrees, +2 or -2 degrees, adjust flap DOWN operating switch away from cam and recycle flaps.
- (12) If flaps travel is less than 10 Degrees, +2 or -2 degrees, adjust flap DOWN operating switch closer to cam and recycle flaps.
- (13) Move control lever to "20" degree position.
- (14) If flaps travel is more than 20 Degrees, +2 or -2 degrees, adjust flap DOWN operating switch away from cam and recycle flaps.

- (15) If flaps travel is less than 20 Degrees, +2 or -2 degrees, adjust flap DOWN operating switch closer to cam and recycle flaps.
- (16) Adjust flaps UP SI007 operating switch in slotted holes for 0.062 inch (1.51 mm) clearance between switch roller and cam when the flaps DOWN SI008 operating switch has just opened in the "10" degree and "20" degree position.

NOTE: Flap travel on UP cycle may deviate a maximum of 4 degrees from indicated position.

- (17) Turn master switch SI009 ON and run flaps through several cycles, stopping at various mid-range settings and checking that cable tension is within limits. Retract cable tension may increase to 90 pounds (400 N) when flaps are fully retracted.
- (18) Check all rod ends and clevis ends for sufficient thread engagement, and all jamnuts are tight.
- (19) Install overhead center console.

Figure 201 : Sheet 1 : Flap Control Lever and Follow-up Installation

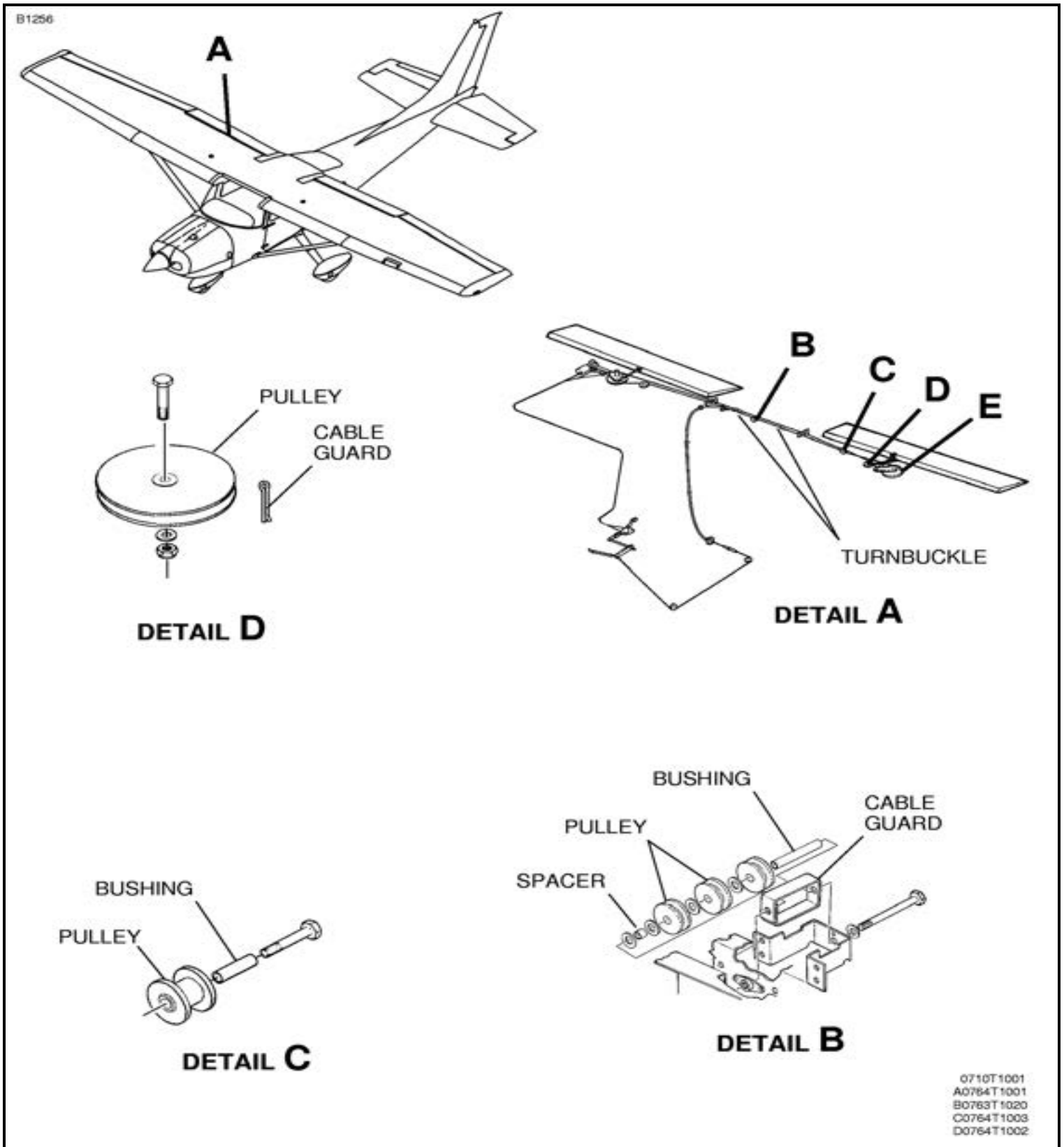
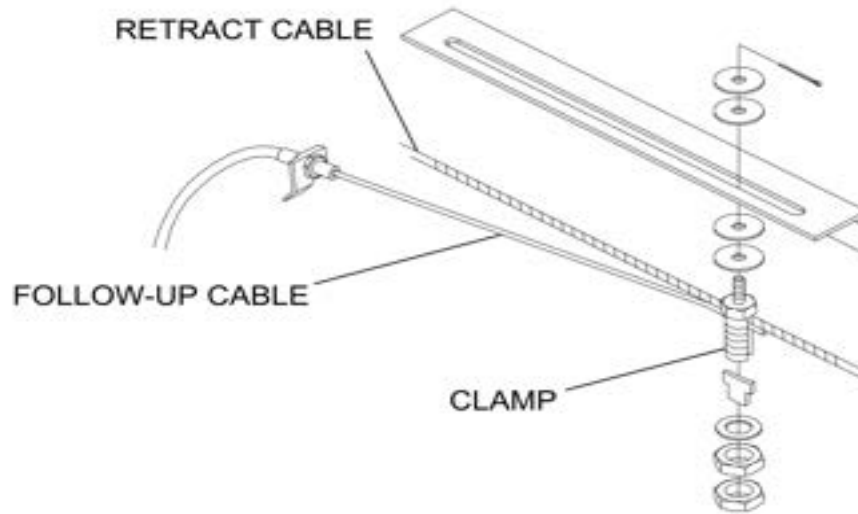


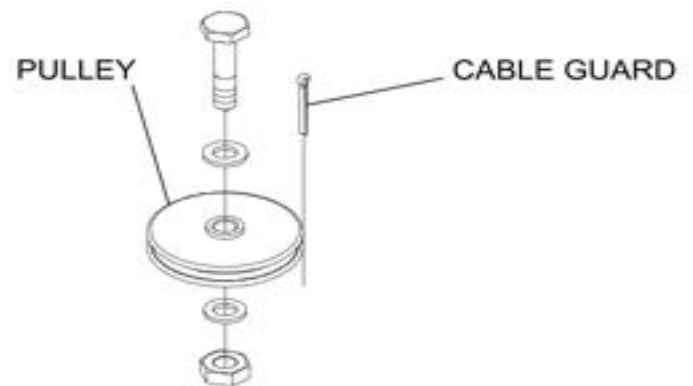
Figure 201 : Sheet 2 : Flap Control Lever and Follow-up Installation

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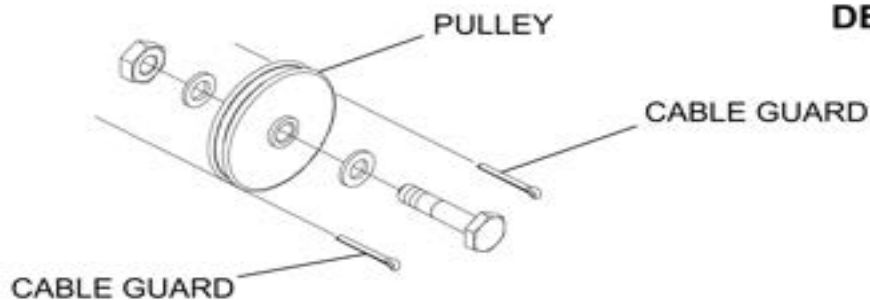


DETAIL D

NOTE: TORQUE CLAMP NUT TO 40 TO 50 INCH POUNDS (4.5 TO 5.6 N.m).



DETAIL E



DETAIL F

D0764T1006
E0764T1007
F0764T1007

LIGHTING - GENERAL

1. Scope

- A. This chapter describes those units and components which provide for external and internal illumination such as landing lights, taxi lights, position lights, dome lights, etc. This chapter does not include warning lights for individual systems or self-illuminating signs.
- B. It is intended to use the information in this chapter in conjunction with wiring diagrams to provide data required to maintain the lighting systems that illuminate the interior and exterior of the airplane. An understanding of the function of the components, electrical circuits, electrical wiring, and switches is necessary to perform effective troubleshooting beyond lamp replacement. See the Model 182 Wiring Diagram Manual for electrical diagrams of specific systems.
- C. This chapter is divided into sections to aid maintenance personnel to find information. The sections provide maintenance procedures for individual exterior and interior lighting systems of the airplane.
 - (1) Exterior lighting.
 - (a) Flashing beacon light assembly located on the vertical fin tip assembly.
 - (b) Tail navigation light.
 - (c) Underwing courtesy lights.
 - (d) Wing tip strobe lights.
 - (e) Landing and taxi lights located on the left wing.
 - (f) Left (red) and right (green) navigation lights.
 - (2) Interior lighting.
 - (a) Dome lights provide cabin flood lighting.
 - (b) Map light is located on the pilot control wheel.
 - (c) Pedestal (console) lighting is provided by an upper, and lower pedestal light.
 - (d) Instrument and a glareshield lights provide lighting for flight instruments. Control of light brightness is provided through dimming circuitry.
 - (e) A center light is included in the 182T and T182T models.

FLOOD LIGHTING - MAINTENANCE PRACTICES

1. General

- A. Cabin floodlights are mounted in the aft and the forward parts of the overhead console. Each floodlight has a switch. The forward and the aft lights are reading lights. On airplanes with Garmin G1000 that are equipped with oxygen, there is a light mounted on the oxygen panel. Dimming of the oxygen panel light is controlled by the STBY IND dimmer switch located on the switch panel on the pilot instrument panel.

WARNING: Obey all oxygen safety precautions on airplanes that have the oxygen panel installed in the overhead console. Refer to the oxygen maintenance practices for correct procedures to use when you must do maintenance on or near to the oxygen lines.

2. Floodlight Bulb Removal/Installation

CAUTION: Be careful when you remove and install the floodlight bulb. The floodlight bulb can break if too much pressure is applied when you remove and install it.

NOTE: Removal/Installation is typical for all floodlight bulbs.

- A. Floodlight Bulb Removal (Refer to [Figure 201](#)).
 - (1) Press the lens holder up and turn it counterclockwise.
 - (2) Remove the lens holder.
 - (3) Carefully push the bulb up and turn it counterclockwise.
 - (4) Remove the bulb.
- B. Floodlight Bulb Installation (Refer to [Figure 201](#)).
 - (1) Put the bulb in position.
 - (2) Carefully push the bulb up and turn it clockwise.
 - (3) Put the lens in position.
 - (4) Push the lens holder up and turn it clockwise.

3. Light Assembly Removal/Installation

NOTE: Removal/installation is typical for the overhead dome light assemblies.

- A. Light Assembly Removal (Refer to [Figure 201](#)).
 - (1) Put the ALT/BAT MASTER switch in the off position.

CAUTION: Support the overhead console when you remove the screws to prevent damage to the electrical wiring in the overhead console.

 - (2) Remove the screws that attach the overhead console to the attach brackets.
 - (3) Identify, tag, and disconnect the electrical wires from the light assembly.
 - (4) Remove the light assembly from the overhead console.
- B. Light Assembly Installation (Refer to [Figure 201](#)).
 - (1) Put the light assembly in position.
 - (2) Attach the light assembly to the overhead console.
 - (3) Connect the electrical wires to the light assembly.
 - (4) Attach the overhead console to the attach brackets with the screws.
 - (5) Put the ALT/BAT MASTER switch in the ON position.

4. Light Assembly Switch Removal/Installation

- A. Light Assembly Switch Removal (Refer to [Figure 201](#)).
 - (1) Put the ALT/BAT MASTER switch in the off position.

CAUTION: Support the overhead console when you remove the screws to prevent damage to the electrical wiring in the overhead console.

 - (2) Remove the overhead console from the attach brackets.
 - (3) Identify, tag, and disconnect the wires from the switch.
 - (4) Remove the switch from the overhead console.

- B. Light Assembly Switch Installation (Refer to [Figure 201](#)).
 - (1) Install the switch in the overhead console.
 - (2) Connect the electrical wires to the switch.
 - (3) Attach the overhead console to the attach brackets with the screws.
 - (4) Put the ALT/BAT MASTER switch in the ON position.

5. Potentiometer Removal/Installation

- A. Potentiometer Removal (Refer to [Figure 201](#)).
 - (1) Put the ALT/BAT MASTER switch in the off position.
CAUTION: Support the overhead console when you remove the screws to prevent damage to the electrical wiring in the overhead console.
 - (2) Remove the overhead console from the attach brackets.
 - (3) Identify, tag, and disconnect the wires from the switch.
 - (4) Remove the knob assembly and the jam nut from the potentiometer.
 - (5) Remove the potentiometer from the overhead console.
- B. Potentiometer Installation (Refer to [Figure 201](#)).
 - (1) Install the jam nut and the knob assembly.
 - (2) Connect the electrical wires to the potentiometer.
 - (3) Attach the overhead console to the attach brackets with the screws.
 - (4) Put the ALT/BAT MASTER switch in the ON position.

6. Oxygen Panel Light Bulb Removal/Installation (Airplanes with Garmin G1000)

CAUTION: Be careful when you remove and install the oxygen panel light bulb. The oxygen panel light bulb can break if too much pressure is applied when you remove and install it.

- A. Oxygen Panel Light Bulb Removal (Refer to [Figure 201](#)).
 - (1) Put the ALT/BAT MASTER switch in the off position.
 - (2) Remove the oxygen panel light assembly.
 - (3) Carefully turn the bulb counterclockwise.
 - (4) Remove the bulb from the light assembly.
- B. Oxygen Panel Light Bulb Installation (Refer to [Figure 201](#)).
 - (1) Put the bulb in position.
 - (2) Carefully turn the bulb clockwise.
 - (3) Install the oxygen panel light assembly.
 - (4) Put the ALT/BAT MASTER switch in the ON position.

7. Oxygen Panel Light Assembly Removal/Installation (Airplanes with Garmin G1000)

- A. Oxygen Panel Light Assembly Removal (Refer to [Figure 201](#)).
 - (1) Put the ALT/BAT MASTER switch in the off position.
 - (2) Turn the cap on the oxygen panel light assembly counterclockwise.
 - (3) Remove the cap, washer, and light assembly from the oxygen panel.
- B. Oxygen Panel Light Assembly Installation (Refer to [Figure 201](#)).
 - (1) Put the washer and light assembly in position on the oxygen panel.
 - (2) Put the cap in position on the light assembly.
 - (3) Turn the cap clockwise to tighten.
 - (4) Put the ALT/BAT MASTER switch in the ON position.

Figure 201 : Sheet 1 : Floodlight Installation

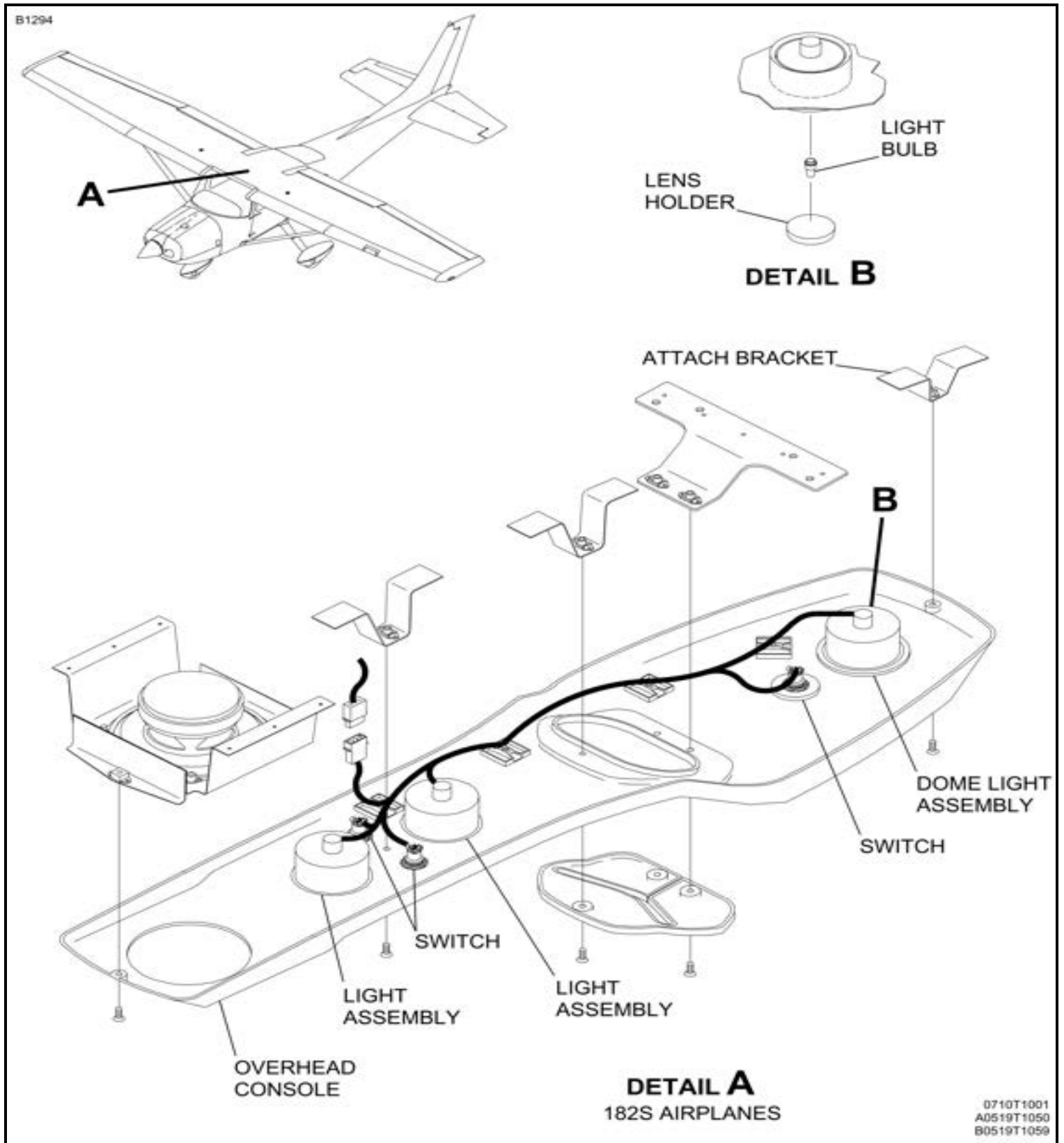


Figure 201 : Sheet 2 : Floodlight Installation

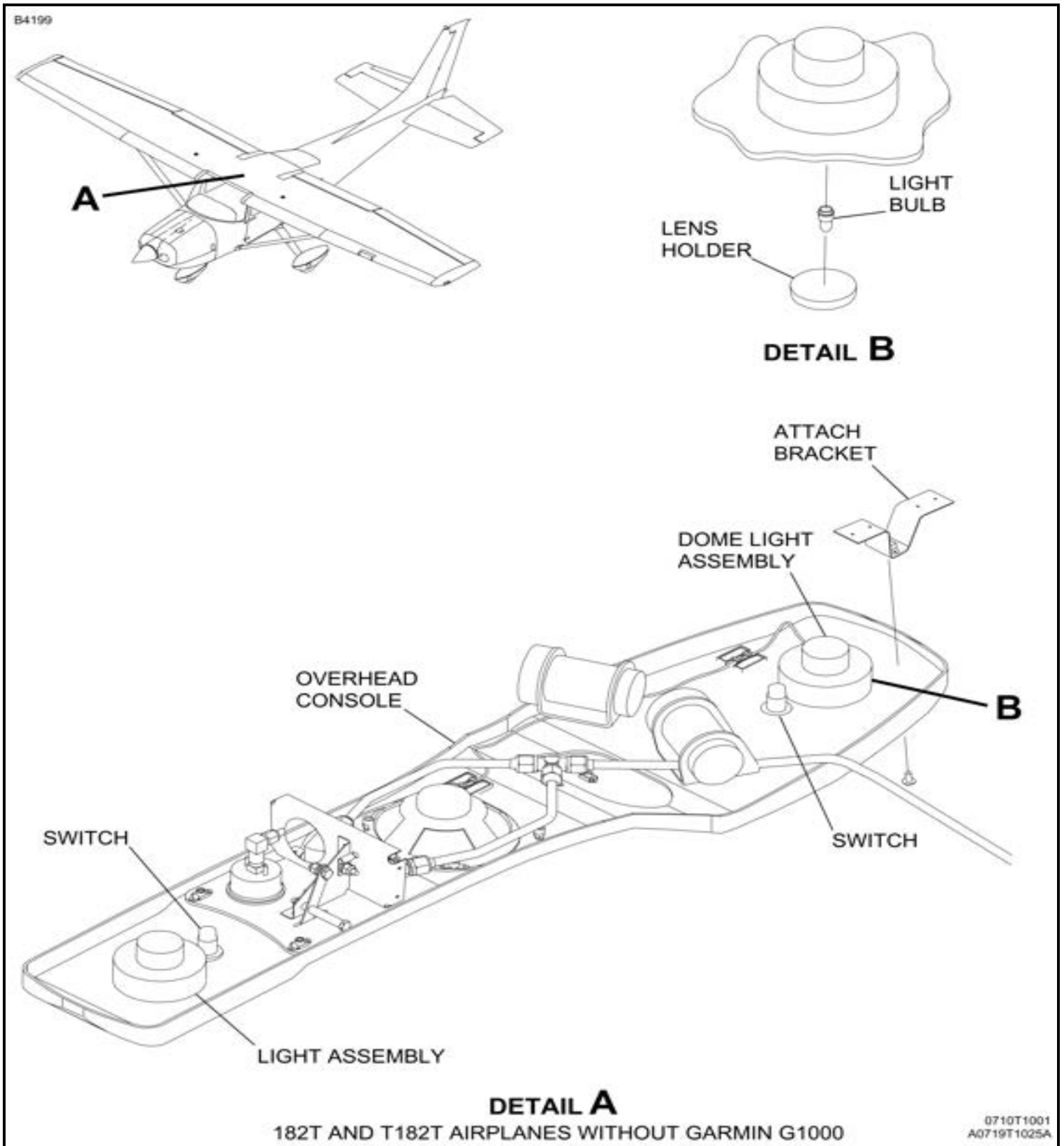
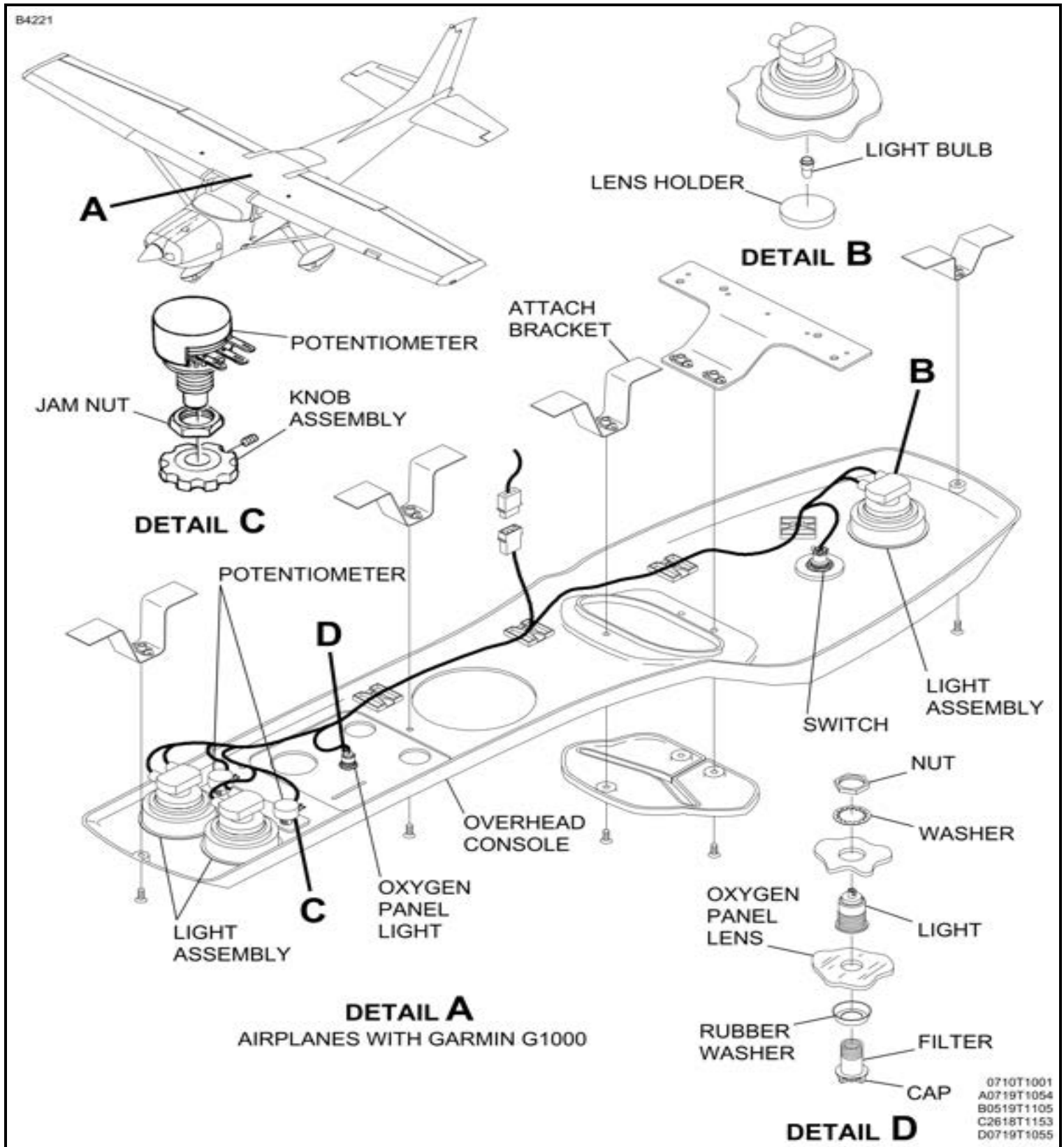


Figure 201 : Sheet 3 : Floodlight Installation



GLARESHIELD LIGHTING - MAINTENANCE PRACTICES

1. General

- A. The glareshield light provides overall lighting for the instrument panel and is located under the glareshield. Model 182S aircraft have a single neon tube light and is powered by a variable AC current lighting inverter. The inverter is located behind the copilot instrument panel assembly. Model 182T and T182T airplanes have a glareshield lighting dimming control mounted on the right side of the circuit panel assembly. Model 182T, T182T and J182T airplanes have a light strip with multiple Light Emitting Diodes (LED). The glareshield LED light is not controlled by a dimming circuit.

2. Glareshield Lamp Removal/Installation (182S)

- A. Remove Glareshield Lamp (Refer to [Figure 201](#)).
- (1) Remove electrical power from airplane and turn off the ALT/BAT Master Switch.
 - (2) Remove screws securing copilot instrument panel assembly to bulkhead to gain access to glareshield light connector. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
NOTE: Note location of two spacers installed between the panel and bulkhead for installation of copilot instrument panel assembly.
 - (3) Disconnect glareshield light connector.
 - (4) Remove screws securing lens to glareshield assembly.
NOTE: Velcro strips are located on the edge of the lens to prevent light leakage around lens.
 - (5) Remove lamp from light clips.
- B. Install Glareshield Lamp (Refer to [Figure 201](#)).
- (1) Position lamp at glareshield assembly with electrical wire and connector toward the right side of the airplane. Secure lamp in light clips.
 - (2) Secure glareshield light lens to glareshield assembly with screws.
NOTE: Apply Velcro strips to the edge of the lens as required to prevent light leakage around lens.
 - (3) Connect glareshield light connector.
 - (4) Secure copilot instrument panel assembly to bulkhead with screws. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
NOTE: Two spacers are installed between the panel and bulkhead using the two screws securing the right side of the panel.
 - (5) Restore electrical power to airplane as required and turn on the ALT/BAT Master Switch.

3. Glareshield LED Light Removal/Installation (T182, T182T and J182T)

- A. Remove the Glareshield LED Light Strip (Refer to [Figure 202](#)).
- (1) Remove electrical power from airplane and turn off the ALT/BAT Master Switch.
 - (2) Remove screws securing the left and right glareshield light enclosure plates and remove enclosure plate.
CAUTION: LED light strip is fragile when not supported in glareshield. Overbending of strip could cause failure of strip.
 - (3) Remove screws securing light strip and gently remove light strip.
 - (4) Disconnect glareshield light connector.
- B. Install the Glareshield LED Light Strip (Refer to [Figure 202](#)).
- (1) Connect glareshield light connector.
CAUTION: LED light strip is fragile when not supported in glareshield. Overbending of strip could cause failure of strip.
 - (2) Gently install light strip into glareshield.
 - (3) Secure light strip, then left and right enclosure plates with screws.
 - (4) Restore electrical power to airplane as required and turn on the ALT/BAT Master Switch.

4. Lighting Inverter Removal/Installation (182S)

- A. Remove Lighting Inverter (Refer to [Figure 201](#)).

- (1) Remove electrical power from airplane and turn off the ALT/BAT Master Switch.
- (2) Remove screws securing copilot instrument panel assembly to bulkhead to gain access to lighting inverter wiring connectors. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).

NOTE: Note location of two spacers installed between the panel and bulkhead for installation of copilot instrument panel assembly.

- (3) Disconnect glareshield light connector and glareshield power supply connector.
- (4) Remove screws securing lighting inverter to back of instrument panel assembly.
- (5) Remove lighting inverter from airplane.

B. Install Lighting Inverter (Refer to [Figure 201](#)).

- (1) Secure lighting inverter to back of instrument panel assembly with screws.
- (2) Connect glareshield light connector and glareshield power supply connector.
- (3) Secure copilot instrument panel assembly to bulkhead with screws. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).

NOTE: Two spacers are installed between the panel and bulkhead using the two screws securing the right side of the panel.

- (4) Restore electrical power to airplane as required and turn on the ALT/BAT Master Switch.

5. **Glareshield Lighting and Dimming Control Removal/Installation**

- A. For the Glareshield Lighting and Dimming Control Removal/Installation, refer to [Radio Lighting - Maintenance Practices](#).

Figure 201 : Sheet 1 : Glareshield Lighting Installation

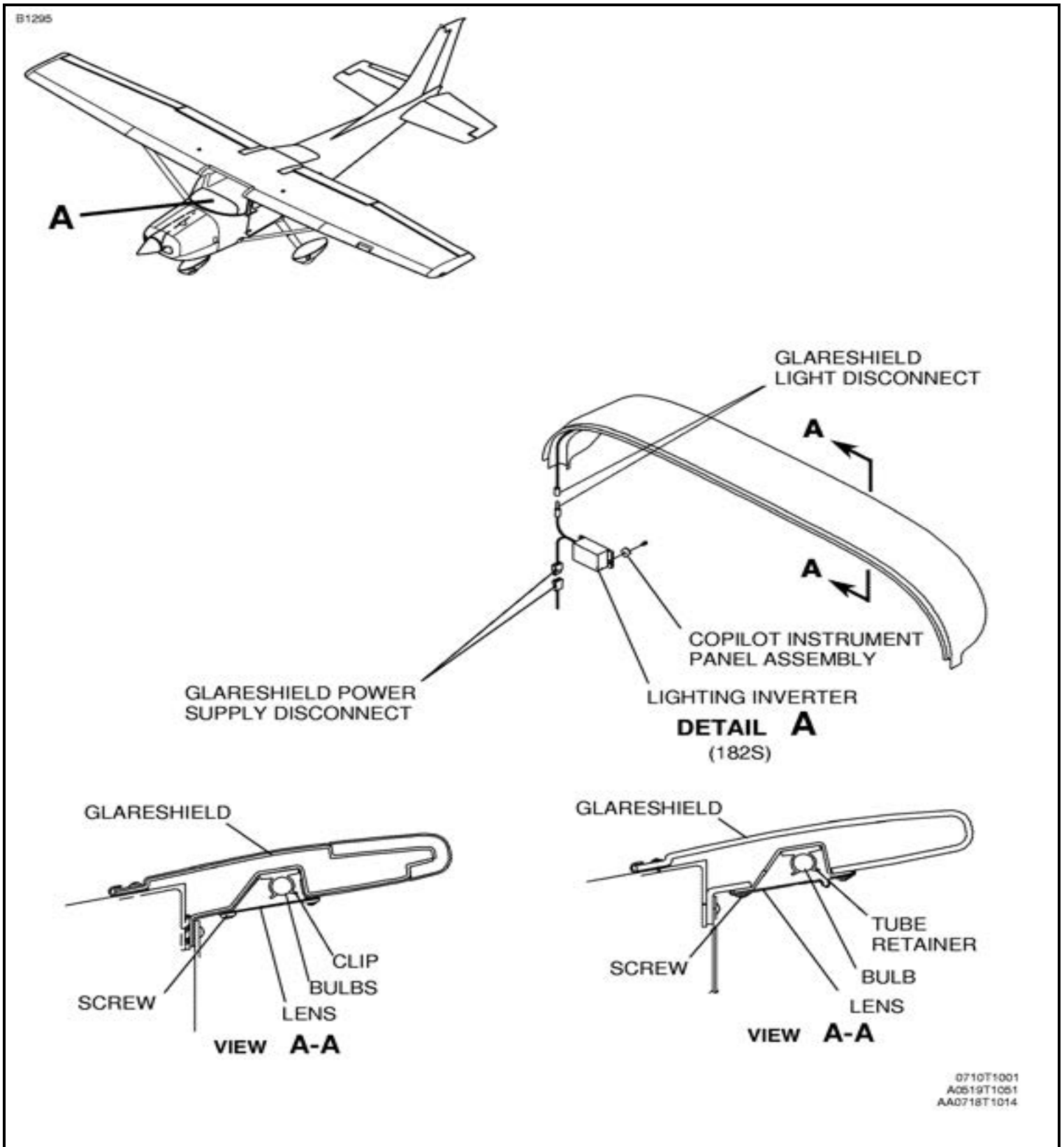
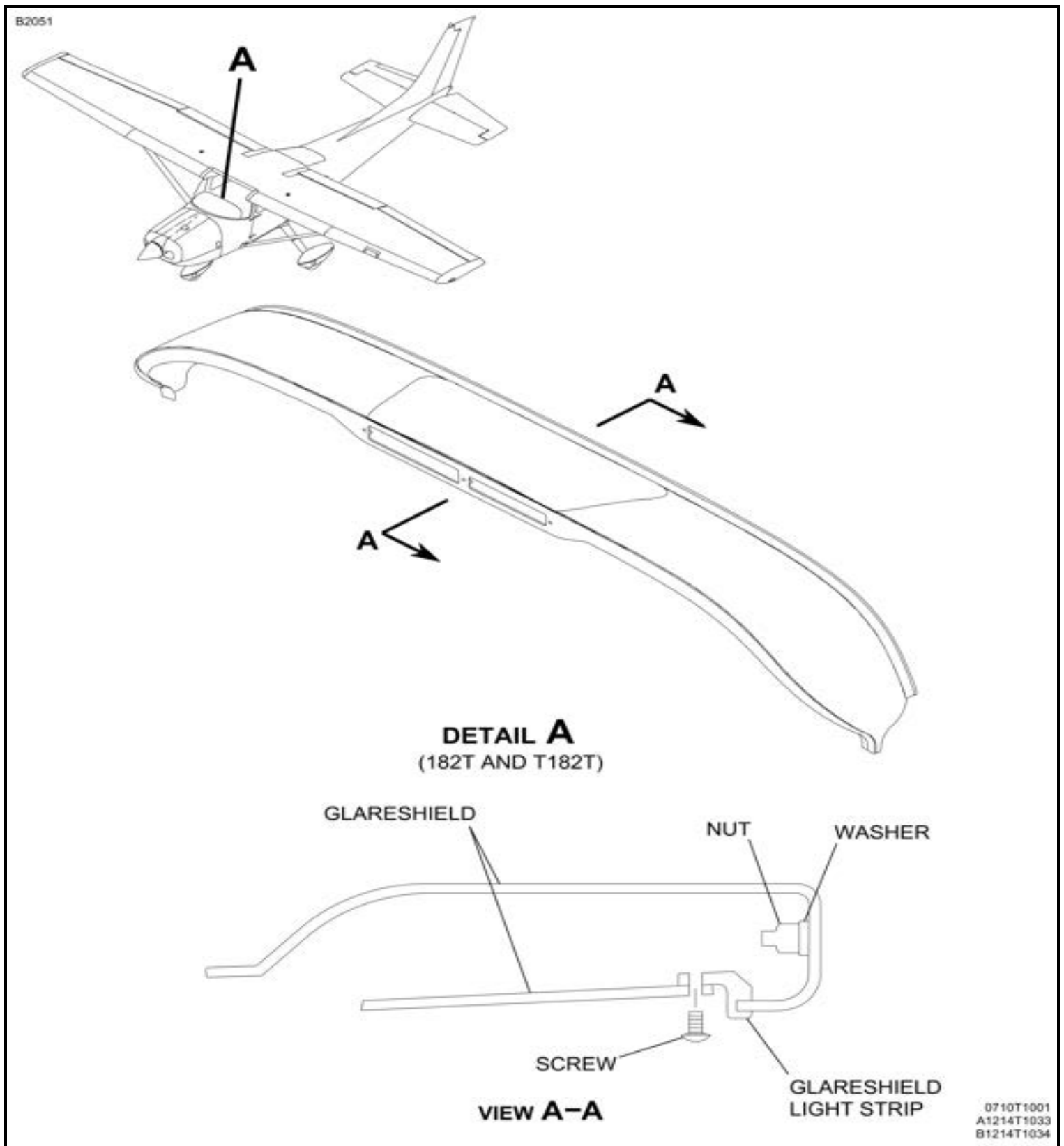


Figure 202 : Sheet 1 : Glareshield Lighting



PEDESTAL LIGHTING - MAINTENANCE PRACTICES

1. General

- A. Two single bulb-type lights are installed on the console cover assembly, one an upper pedestal light and the second a lower pedestal light. The upper pedestal light is located on the upper left corner of the console protected by a light cover. The lower pedestal light is centered in the recessed portion of the lower console cover assembly in front of the horizontal support. A pedestal lighting dimming control (PEDESTAL LT) is mounted on the right side of the circuit panel assembly.
- B. General maintenance is limited to lamp replacement. See Model 182 Wiring Diagram Manual for troubleshooting associated electrical wiring and lamp holders. The upper and lower pedestal light disconnects are located in the console assembly behind the console cover assembly.

2. Pedestal Light Lamp Replacement

- A. Replace Upper Pedestal Light Lamp (Refer to [Figure 201](#)).
 - (1) Remove electrical power from airplane. Disengage INST LTS circuit breaker on the circuit panel assembly.
 - (2) Remove screws securing light cover to console cover assembly.
 - (3) Rotate lamp to free lamp from lamp holder. Remove lamp from lamp holder.
 - (4) Install new lamp in lamp holder.

CAUTION: For proper heat dissipation, attaching tab of reflector must be sandwiched between console assembly and console cover assembly.

- (5) Ensure reflector is properly positioned and secure light cover to console cover assembly with screws.
 - (6) Restore electrical power to airplane. Engage INST LTS circuit breaker.

- B. Replace Lower Pedestal Light Lamp (Refer to [Figure 201](#)).
 - (1) Remove electrical power from airplane. Disengage INST LTS circuit breaker on the circuit panel assembly.
 - (2) Rotate lamp to free lamp from lamp holder. Remove lamp from lamp holder.

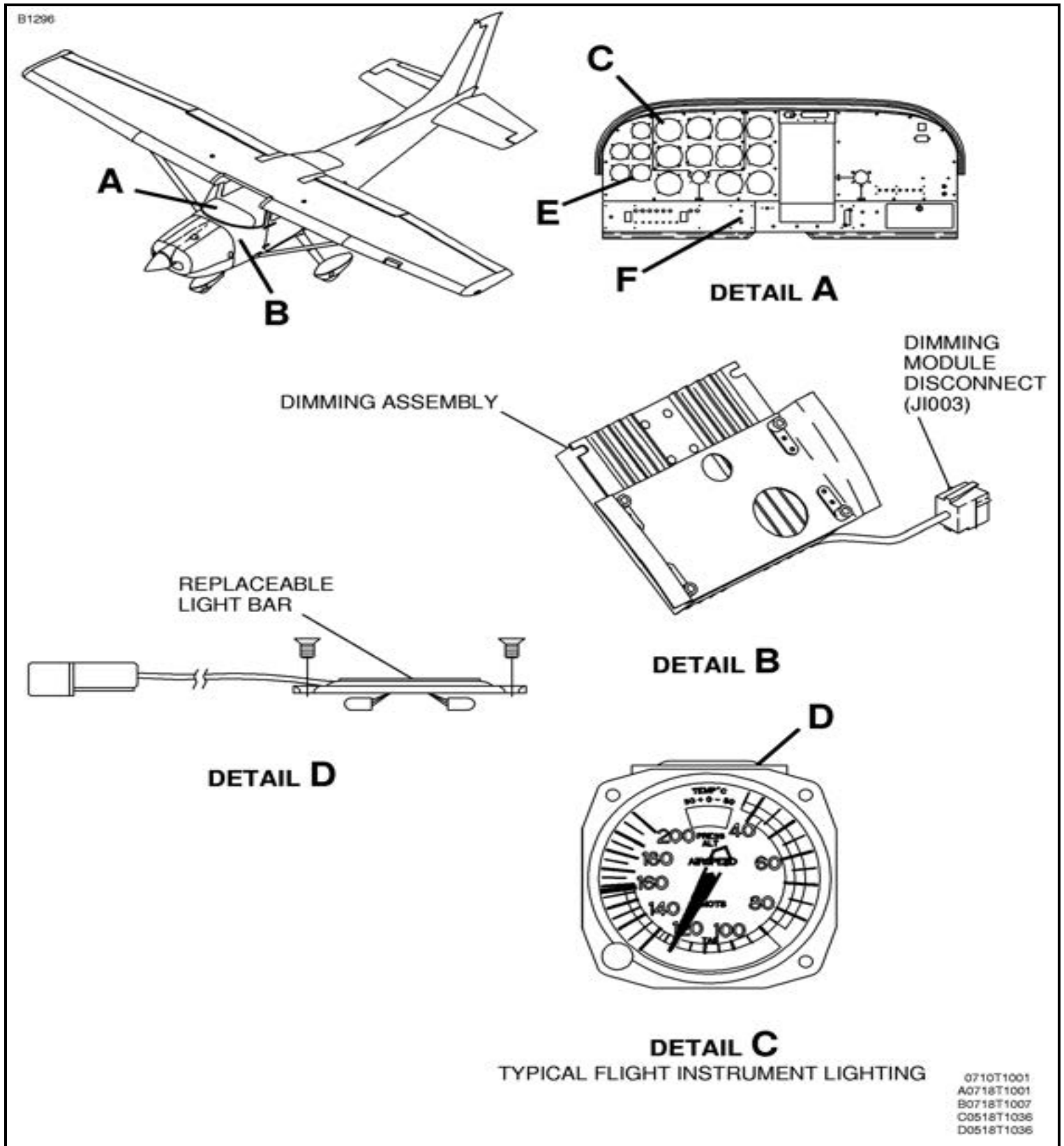
NOTE: Lamp is directly accessible from the lower front, recessed portion of the console cover assembly.

- (3) Install new lamp in lamp holder.
 - (4) Restore electrical power to airplane. Engage INST LTS circuit breaker.

3. Pedestal Lighting Dimming Control Removal and Installation

- A. For Pedestal Lighting Dimming Control Removal and Installation, refer to Radio Lighting - Maintenance Practices, [Radio Lighting Dimming Control Removal and Installation](#).

Figure 201 : Sheet 1 : Pedestal Lighting Installation



INSTRUMENT LIGHTING - MAINTENANCE PRACTICES

1. General

- A. Flight instruments are individually lighted by a replaceable light bar installed at the top of the instrument. Engine instruments are individually lighted by replaceable light bulbs. Both flight and engine instruments are connected to a dimming assembly and an instrument lighting dimming control. The dimming assembly is located behind (forward of) the copilot instrument panel assembly at RBL 18.00 and WL 15.00. The instrument lighting dimming control (PANEL LT) is mounted on the right side of the circuit panel assembly.

2. Description and Operation

- A. Panel illumination is operated with independent lights installed in each instrument and gage. The lights are wired parallel and are controlled by the PANEL LT dimmer, found below the navigation indicators. Instrument illumination for the RH navigation indicators in the pilot's instrument panel, is controlled by the TST (test) - BRT (bright) - DIM (night) switch. When the switch is in the BRT position, the instrument lights will be off regardless of the RADIO LT dimmer position.

3. Flight Instrument Light Bar Replacement

- A. Replace Flight Instrument Light Bar (Refer to [Figure 201](#)).
 - (1) Disconnect the electrical power from the airplane.
 - (2) Make sure the ALT/BAT MASTER switch is in the off position.
 - (3) Remove necessary instrument panel assemblies to gain access to flight instrument. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (4) Remove flight instrument.
 - (5) Remove screws securing light bar to flight instrument.
 - (6) Replace light bar and secure with screws.
 - (7) Install flight instrument.
 - (8) Install instrument panel assemblies previously removed. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (9) Connect the electrical power to the airplane.
 - (10) Press the ALT/BAT MASTER switch to ON to do a check of the light bar.

4. Engine Instrument Light Bulb Replacement

- A. Replace Engine Instrument Light Bulbs (Refer to [Figure 201](#)).
 - (1) Disconnect the electrical power from the airplane.
 - (2) Make sure the ALT/BAT MASTER switch is in the off position.
 - (3) Remove necessary instrument panel assemblies to gain access to engine instrument. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (4) Remove engine instrument.
 - (5) Remove screws securing light cover plate to bottom of instrument.
 - (6) Replace light bulbs.
 - (7) Secure light cover plate to bottom of instrument with screws.
 - (8) Install engine instrument.
 - (9) Install instrument panel assemblies previously removed. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (10) Connect the electrical power to the airplane.
 - (11) Press the ALT/BAT MASTER switch to ON to do a check of the instrument light bulb.

5. Dimming Assembly Removal and Installation

- A. Remove Dimming Assembly (Refer to [Figure 201](#)).
 - (1) Disconnect the electrical power from the airplane.
 - (2) Make sure the ALT/BAT MASTER switch is in the off position.
 - (3) Remove copilot instrument panel assembly to gain access to dimming assembly. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).

- (4) Disconnect dimming module connector (J1003/J1).
- (5) Remove screws securing dimming assembly to heat sink support assembly.
- (6) Remove dimming assembly from airplane.
- B. Install Dimming Assembly (Refer to [Figure 201](#)).
 - (1) Position dimming assembly and secure to heat sink support assembly with screws.
 - (2) Connect dimming module connector (J1003/J1).
 - (3) Install copilot instrument panel assembly. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
 - (4) Connect the electrical power to the airplane.
 - (5) Press the ALT/BAT MASTER switch to ON to do a check of the dimming assembly.

6. Instrument Lighting Dimming Control Removal and Installation

- A. For Instrument Lighting Dimming Control Removal and Installation, refer to Radio Lighting - Maintenance Practices, [Radio Lighting Dimming Control Removal and Installation](#).

Figure 201 : Sheet 1 : Instrument Lighting Installation

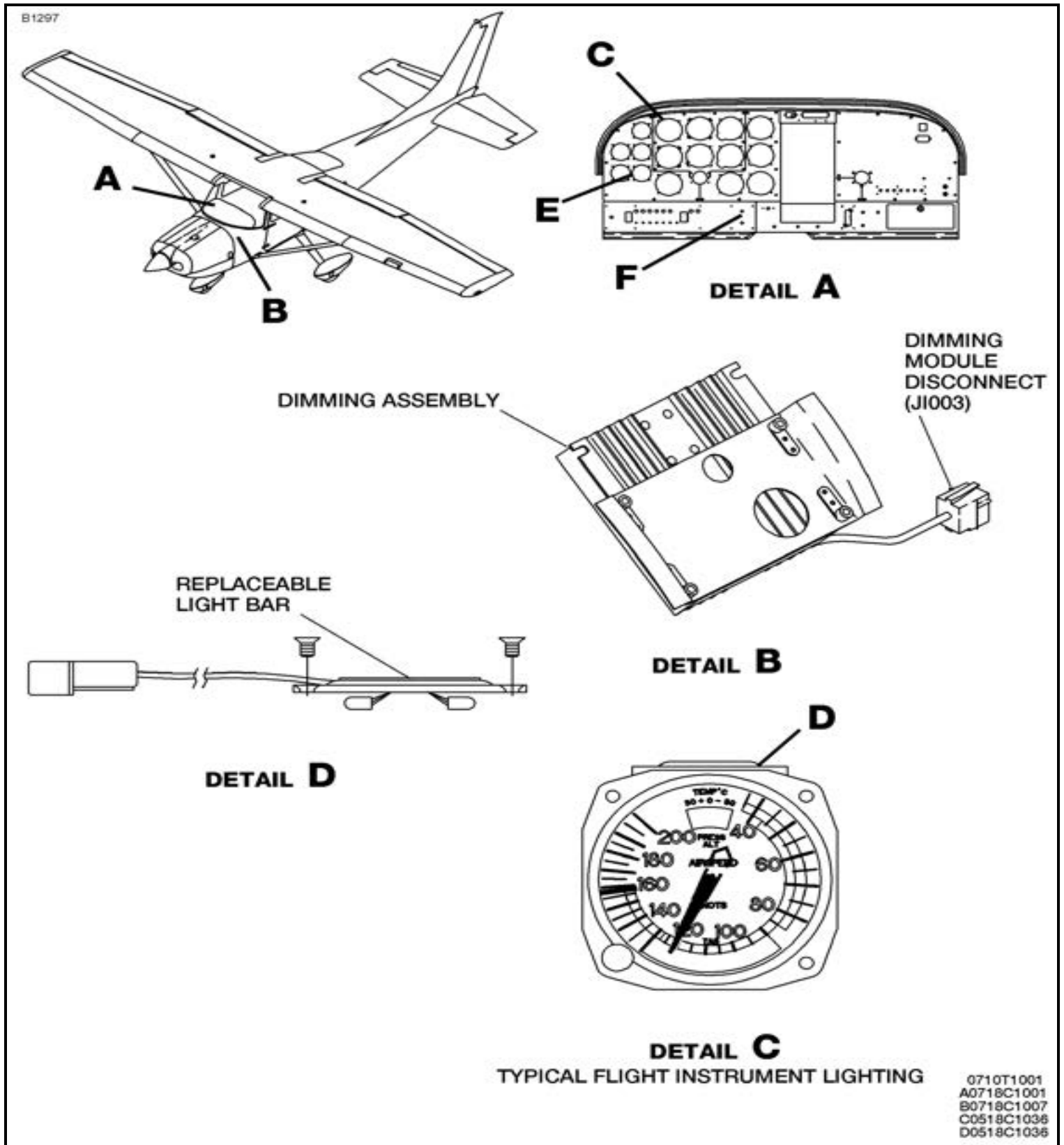
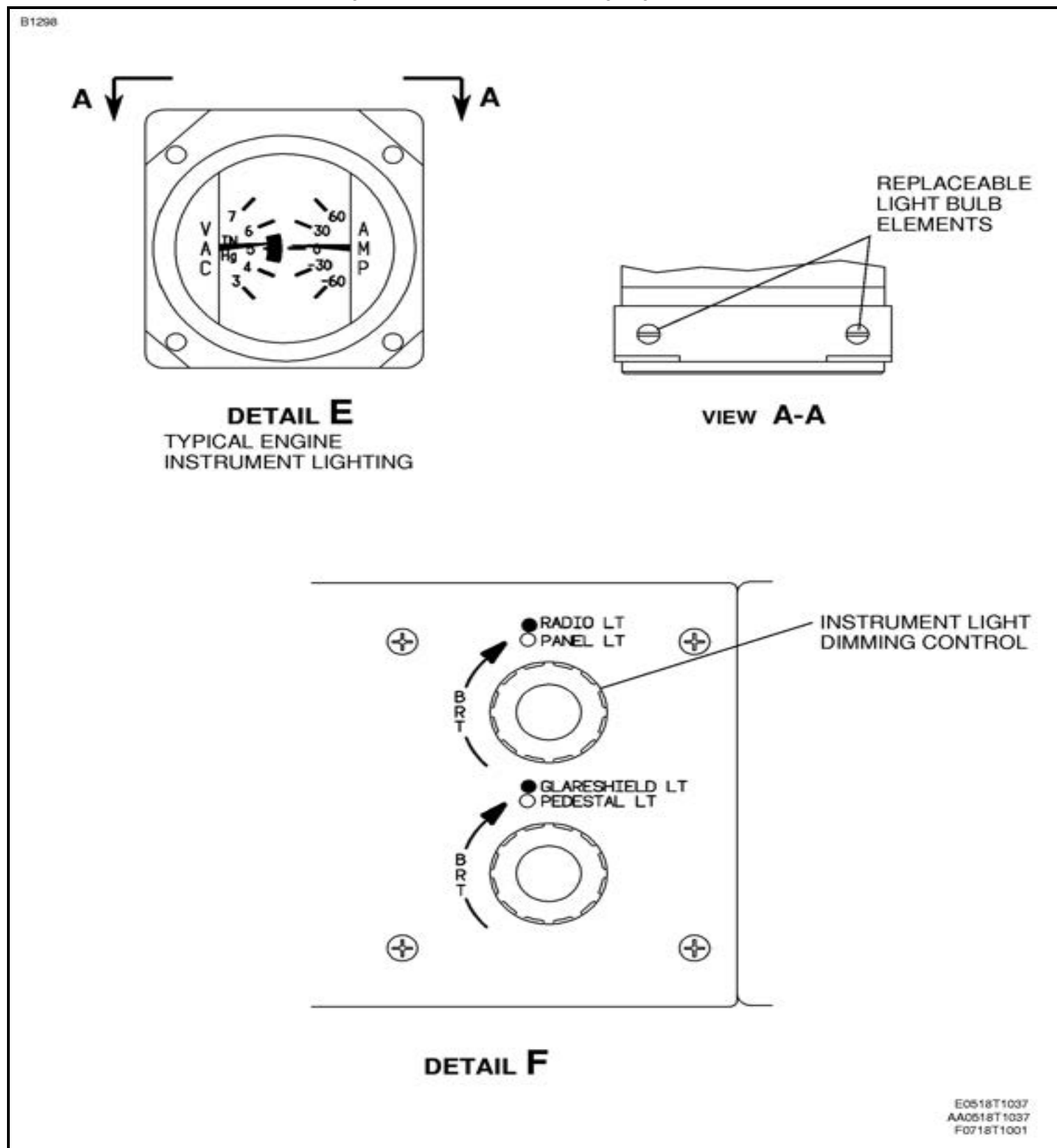


Figure 201 : Sheet 2 : Instrument Lighting Installation



RADIO LIGHTING - MAINTENANCE PRACTICES**1. General**

- A. Radio lighting consists of internally lighted radios, a dimming assembly, and a radio lighting (RADIO LT) dimming control. Maintenance practices consist of removal and installation for the dimming assembly and radio lighting dimming control.

2. Description and Operation

- A. Panel illumination is operated with independent lights installed in each instrument and gage. The lights are wired parallel and are controlled by the PANEL LT dimmer, found below the navigation indicators. Illumination intensity for the radios is controlled by the TST (test) - BRT (bright) - DIM (night) switch. When the switch is in the BRT position, the radio illumination will be off regardless of the RADIO LT dimmer position.

3. Dimming Assembly Removal and Installation

- A. For Dimming Assembly Removal and Installation, refer to Instrument Lighting - Maintenance Practices, [Dimming Assembly Removal and Installation](#).

4. Radio Lighting Dimming Control Removal and Installation

NOTE: Two dimming control potentiometers are located on the circuit panel assembly. One dimming control serves as the radio lighting (RADIO LT) and instrument lighting (PANEL LT) dimming control, the second dimming control serves as the glareshield lighting (GLARESHIELD LT) and pedestal lighting (PEDESTAL LT) dimming control. Removal and installation for both dimming controls are typical.

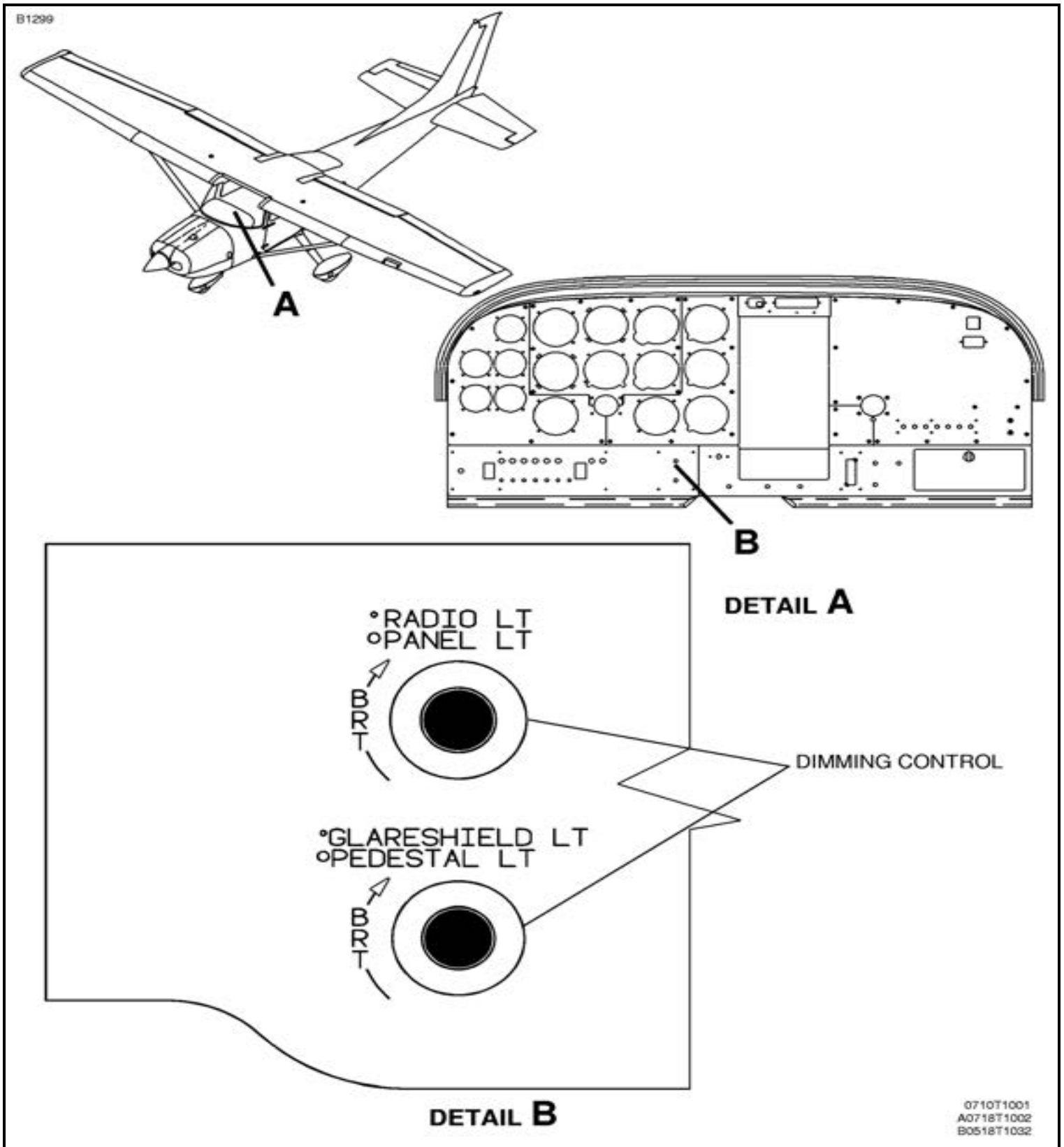
- A. Remove Dimming Control (Refer to [Figure 201](#)).

- (1) Disconnect the electrical power from the airplane.
- (2) Make sure the ALT/BAT MASTER switch in the off position.
- (3) Remove circuit panel assembly. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
- (4) Loosen setscrew on knob and remove knob to access nut securing dimming control to circuit panel assembly.
- (5) Remove nut securing dimmer control to circuit panel assembly.
- (6) Identify, tag and disconnect the wires from the dimming control.
- (7) Remove dimming control from airplane.

- B. Install Dimming Control (Refer to [Figure 201](#)).

- (1) Position dimming control and solder labeled wires to proper pins. See Model 182 Wiring Diagram Manual.
- (2) Place dimming control through circuit panel assembly and secure with nut.
- (3) Position knob on dimming control and set with setscrew.
- (4) Install circuit panel assembly. Refer to Chapter 31, [Instrument and Control Panels - Maintenance Practices](#).
- (5) Connect the electrical power to the airplane.
- (6) Press the ALT/BAT MASTER switch to ON to do a check of the dimming control.

Figure 201 : Sheet 1 : Dimming Control Installation



PILOT CONTROL WHEEL LIGHTING - MAINTENANCE PRACTICES

1. General

- A. A map light is installed in the bottom center surface of the pilot's control wheel. Light brilliance is controlled by a potentiometer located in the bottom right side of the pilot's control wheel. A knob is attached to the potentiometer and accessible on the bottom of the control wheel for map light adjustment.

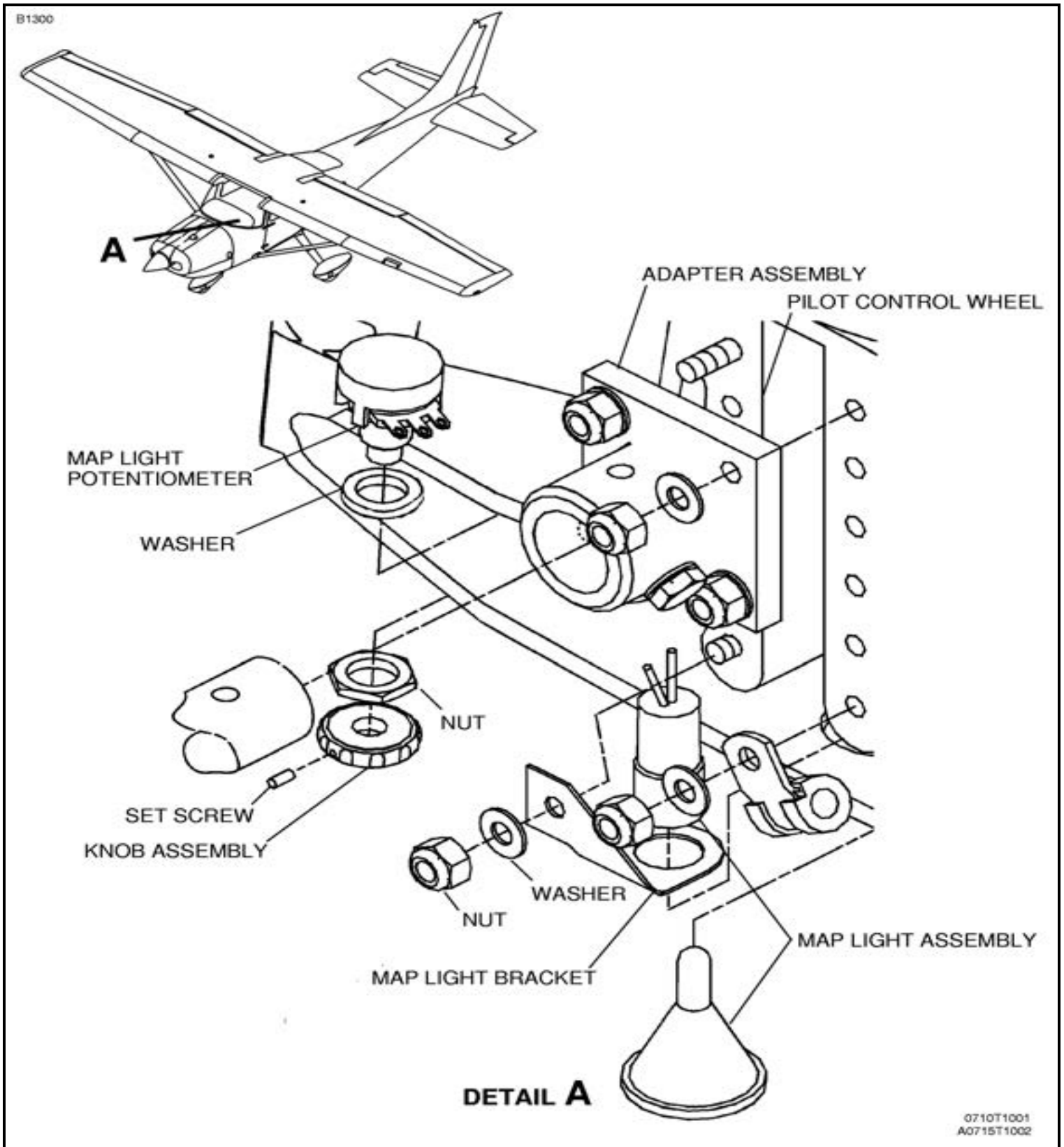
2. Map Light Assembly Removal and Installation

- A. Remove Map Light Assembly (Refer to [Figure 201](#)).
 - (1) Remove electrical power from airplane. Position the LIGHTS NAV switch to the OFF position.
 - (2) Remove nut, washer, and bolt securing map light bracket to control wheel.
 - (3) Remove map light assembly from control wheel.
 - (4) Identify, tag, and disconnect map light assembly wiring.
 - (5) Remove map light assembly from airplane.
- B. Install Map Light Assembly (Refer to [Figure 201](#)).
 - (1) Position map light assembly to pilot control wheel and connect map light assembly wiring.
 - (2) Place bracket and map light assembly in control wheel and secure with bolt, washer, and nut.
 - (3) Restore electrical power to airplane. Position LIGHTS NAV switch to desired position.

3. Map Light Potentiometer Removal and Installation

- A. Remove Map Light Potentiometer (Refer to [Figure 201](#)).
 - (1) Remove electrical power from airplane. Position the LIGHTS NAV switch to the OFF position.
 - (2) Loosen setscrew securing knob assembly to map light potentiometer. Remove knob assembly.
 - (3) Remove nut and washer securing map light potentiometer to control wheel.
 - (4) Pull map light potentiometer out of control wheel to access electrical wires.
 - (5) Identify, tag, and disconnect wires from map light potentiometer.
 - (6) Remove map light potentiometer from airplane.
- B. Install Map Light Potentiometer (Refer to [Figure 201](#)).
 - (1) Position map light potentiometer at pilot control wheel and connect electrical wires to map light potentiometer.
 - (2) Place map light potentiometer in control wheel and secure with washer and nut.
 - (3) Position knob assembly on map light potentiometer and secure with set screw.
 - (4) Restore electrical power to airplane. Position LIGHTS NAV switch to desired position.

Figure 201 : Sheet 1 : Map Light Assembly and Potentiometer Installation



NAVIGATION AND STROBE LIGHTS - TROUBLESHOOTING LED

1. General

- A. This section gives the troubleshooting procedures for the navigation and strobe light assemblies. For a general description of the navigation and strobe light assemblies, refer to [Navigation and Strobe Lights - Maintenance Practices](#) in this chapter.

2. Tools and Equipment

- A. For a list of tools and equipment, refer to [Lighting - General](#) in this chapter.

3. Troubleshooting

- A. It is necessary to understand the navigation and strobe light systems before you can troubleshoot the navigation and strobe light assemblies. Become familiar with system components, assemblies, and mechanical functions before you do any of the troubleshooting procedures.

NOTE: Once a discrepancy has been found and repaired, it is not necessary to do the remainder of the troubleshooting procedure.

B. LED Navigation Lights Fail to Operate

- (1) Make sure that the NAV LTS circuit breaker on the circuit breaker panel is engaged.
- (2) Make sure that the LIGHTS NAV/OFF switch is in the NAV position.
- (3) If the LED navigation light assembly fails to operate, do the following:
 - (a) If both the left and right LED navigation light assemblies fail to operate, check for a proper ground at the LIGHTS NAV/OFF switch. If found, repair the open ground as necessary and check the lights for correct operation.
 - 1 Check for the proper power (28VDC) to the LIGHTS NAV/OFF switch. If found, repair the open circuit as necessary and check the lights for correct operation.
 - (b) If both the left and right LED navigation light assemblies fail to operate, check the NAV LTS circuit breaker for correct operation. If found, repair or replace the bad circuit breaker as necessary and check the lights for correct operation.
 - (c) Check for a proper ground on the applicable electrical connector. If found, repair the open ground as necessary and check the LED navigation light assembly for correct operation.
 - (d) Check for the proper power (28VDC) to the applicable electrical connector. If found, repair the open circuit as necessary and check the LED navigation light assembly for correct operation.
 - (e) If the electrical connectors have proper ground and power, replace the LED navigation light assembly. Refer to Chapter 33, [Navigation and Strobe Lights - Maintenance Practices](#).

C. LED Strobe Lights Fail to Operate

- (1) Make sure that the STROBE LTS circuit breaker on the circuit breaker panel is engaged.
- (2) Make sure that the LIGHTS STROBE/OFF switch is in the STROBE position.
- (3) If the LED strobe light assembly fails to operate, do the following:
 - (a) If both the left and right LED strobe light assemblies fail to operate, check for a proper ground at the LIGHTS STROBE/OFF switch. If found, repair the open ground as necessary and check the strobe light assemblies for correct operation.
 - 1 Check for proper power (28VDC) on the LIGHTS STROBE/OFF switch. If found, repair the open circuit as necessary and check the lights for correct operation.
 - (b) If both the left and right LED strobe light assemblies fail to operate, check the STROBE LTS circuit breaker for correct operation. If found, repair or replace the bad circuit breaker as necessary and check the lights for correct operation.
 - (c) Check for a proper ground on the applicable electrical connector. If found, repair the open ground as necessary and check the LED strobe light assembly for correct operation.
 - (d) Check for the proper power (28VDC) on the applicable electrical connector. If found, repair the open circuit as necessary and check the LED strobe light assembly for correct operation.
 - (e) If the electrical connectors have proper ground and power, replace the LED strobe light assembly. Refer to Chapter 33, [Navigation and Strobe Lights - Maintenance Practices](#).

NAVIGATION AND STROBE LIGHTS - MAINTENANCE PRACTICES

1. General

- A. The airplane is equipped with both fixed intensity navigation lights and pulsing strobe lights.
- (1) Navigation lights are located on the left wing tip, right wing tip, and tailcone. The navigation lights in the wing tips are co-located with the strobe lights, and the navigation light in the tailcone is located in its own housing.
 - (a) Bulbs for all three navigation lights are clear. The lens assembly on the right wing tip is colored green, the lens assembly on the left wing tip is colored red, and the lens assembly on the tailcone is clear.
 - (b) The navigation lights are activated by placing the LIGHTS NAV/OFF switch on the circuit panel assembly to the NAV position. This position supplies power concurrently to all three lights.
 - (2) Strobe lights are co-located with navigation lights in the wing tip housing .For Model 182 airplanes equipped with LED strobe lights, the LED strobe light assembly is located aft of the navigation lights in the wing-tip housing.
 - (a) The strobe tube (light) and lens are both clear. The strobe lights are activated by placing the LIGHTS STROBE/OFF switch to the STROBE position. This position supplies power to the right and left strobe power supplies located in the wing tips, providing pulsed energy to the strobe tube assemblies.
 - (b) The LED strobe light assembly is a clear light with a built in power supply. The light is operated on the STROBE LTS circuit breaker and activated when you place the switch/circuit breaker in the STROBES position. This position supplies electrical power to the LED strobe light assembly, which fires the strobes.
 - (3) General maintenance is limited to lamp/tube replacement and removal and installation of the strobe light power supplies. See the Model 182 Wiring Diagram Manual for troubleshooting light assemblies and associated electrical wiring.

2. Navigation Light Lamp Removal and Installation

- A. Wing Tip Navigation Light Lamp Removal and Installation.

NOTE: Removal and installation is typical for the left and right wing tip navigation light lamps.

- (1) Remove Wing Tip Navigation Light Lamp (Refer to [Figure 201](#)).
 - (a) Remove electrical power from airplane. Position LIGHTS NAV/OFF switch on circuit panel assembly to OFF.
 - (b) Remove screws securing lens shield to wing tip.
 - (c) Remove lens from navigation light assembly.
 - (d) Grasp lamp, depress slightly and turn counterclockwise to release and remove lamp from bayonet mount.
- (2) Install Wing Tip Navigation Light Lamp (Refer to [Figure 201](#)).
 - (a) Place lamp in bayonet socket, depress, and gently turn clockwise until lamp seats in socket.
 - (b) Position lens and gasket in place.
 - (c) Secure lens by installing lens shield to wing tip with screws.
 - (d) Restore electrical power to airplane. Position LIGHTS NAV/OFF switch to NAV.

- B. Tail Navigation Light Lamp Removal and Installation.

- (1) Remove Tail Navigation Light Lamp (Refer to [Figure 201](#)).
 - (a) Remove electrical power from airplane. Position LIGHTS NAV/OFF switch on circuit panel assembly to OFF.
 - (b) Remove screws securing lens retainer to mount.
 - (c) Remove lens to gain access to lamp.
 - (d) Grasp lamp, depress slightly and turn counterclockwise to release and remove lamp from bayonet mount.
- (2) Install Tail Navigation Light Lamp (Refer to [Figure 201](#)).
 - (a) Place Lamp in bayonet socket, depress, and gently turn clockwise until lamp seats in socket.
 - (b) Position lens and gasket over lamp.
 - (c) Secure lens by installing lens retainer with screws.
 - (d) Restore electrical power to airplane. Position LIGHTS NAV/OFF switch to NAV.

3. LED Navigation Lights Removal/Installation

- A. Remove the LED Wing Tip Navigation Lights. (Refer to [Figure 202](#)).

- (1) Make sure the electrical power is off.

- (2) Remove the wing tip.
- (3) Disconnect the electrical connections for the navigation light and strobe light.
- (4) Remove the lens shield from the wing tip.
- (5) Remove the shroud from the light assembly.
- (6) Remove the light assembly.

B. Install the LED Wing Tip Navigation Lights. (Refer to [Figure 202](#)).

- (1) Install the light assembly.
- (2) Install the shroud on the light assembly.
- (3) Install the lens shield on the wing tip.
- (4) Connect the electrical connections for the navigation light and strobe light.
- (5) Install the wing tip.
- (6) Make sure the light operates correctly.
 - (a) Put the MASTER (BAT only) switch to the ON position.
 - (b) Put the LIGHTS NAV/OFF switch to NAV.
 - (c) Make sure the light comes on and is the correct color.
 - (d) If necessary, replace the light.

C. Remove Tailcone-Mounted Navigation Light (Refer to [Figure 202](#)).

- (1) Make sure the electrical power is off.
- (2) Remove the screws that attach the light assembly.
- (3) Pull the light out of the stinger.
- (4) Disconnect the electrical connector.

D. Install Tailcone-Mounted Navigation Light (Refer to [Figure 202](#)).

- (1) Connect the electrical connector.
- (2) Put the light into the stinger.
 - (a) Install the screws that attach the light assembly.
- (3) Make sure the light operates correctly.
 - (a) Put the MASTER (BAT only) switch to the ON position.
 - (b) Put the LIGHTS NAV/OFF switch to NAV.
 - (c) Make sure the light comes on.
 - (d) If necessary, replace the light.

4. Strobe Tube Assembly Removal and Installation

NOTE: Removal and installation is typical for both the right and left strobe tube assemblies.

A. Remove Strobe Tube Assembly (Refer to [Figure 201](#)).

- (1) Remove electrical power from airplane. Position LIGHTS STROBE/OFF switch on circuit panel assembly to OFF.
- (2) Remove screws securing lens shield to wing tip.

NOTE: Following removal of lens shield and prior to removing the strobe light lens, note the placement of the braided ground wire positioned on the inside of the lens between the lens and strobe tube assembly.

- (3) Remove lens from front of strobe tube assembly.

CAUTION: If strobe tube assembly is being removed to facilitate other maintenance and not being replaced with new strobe tube assembly, then use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

- (4) Carefully pull the strobe light assembly wiring to retrieve the strobe connector (J1/P1) from inside the wing tip. Disconnect strobe connector.

NOTE: If the strobe connector cannot be retrieved from inside of wing tip, it will be necessary to remove

wing tip to gain access to strobe connector.

- (5) Remove strobe tube assembly from base assembly and remove from wing tip.

B. Install Strobe Tube Assembly (Refer to [Figure 201](#)).

CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

- (1) Position strobe tube assembly and connect strobe connector.

- (a) If access to the strobe connector required removal of the wing tip, then perform the following:

CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

- 1 Position wing tip and strobe tube assembly at wing.
 - 2 Feed strobe connector (P1) and strobe light assembly wiring through wing tip and connect to strobe connector (J1).
 - 3 Install wing tip.

- (2) Feed strobe connector and access strobe light assembly wiring into wing tip.

NOTE: If wing tip was removed to access strobe connector, then strobe connector will already be positioned in the wing tip.

CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

- (3) Position spacer and install strobe tube assembly to base assembly.

- (4) Position lens at strobe tube assembly and place braided ground wire inside of lens.

CAUTION: Following placing lens onto strobe tube assembly, verify that braided ground wire is properly positioned inside of lens and between the lens and strobe tube assembly.

- (5) Place lens on strobe tube assembly.
- (6) Secure lens by installing lens shield with screws.
- (7) Restore electrical power to airplane. Position LIGHTS STROBE/OFF switch to STROBE position.

5. Strobe Power Supply Removal and Installation

NOTE: Removal and installation is typical for both the left and right strobe power supplies.

A. Remove Strobe Power Supply (Refer to [Figure 201](#)).

- (1) Remove electrical power from airplane. Position LIGHTS STROBE/OFF switch on circuit panel assembly to OFF.
- (2) Remove wing tip to access strobe power supply.
- (3) Disconnect the strobe connector (J1/P1) and strobe power supply connector (JL005/PL005 for left strobe power supply and JR004/PR004 for right strobe power supply).
- (4) Remove screws securing strobe power supply to wing tip rib assembly.

NOTE: Note the screw location used for installation of the strobe power supply ground wire and the braided ground wire from the lens for the strobe tube assembly.

- (5) Remove strobe power supply from airplane.

B. Install Strobe Power Supply (Refer to [Figure 201](#)).

- (1) Position strobe power supply to wing tip rib assembly.
 - (a) Secure by using all required screws, except for the screw used for the two ground wires.
 - (b) Position ground wire and braided ground wire and secure with remaining screw used to secure strobe power supply.
- (2) Connect strobe connector (J1/P1) and strobe power supply connector (JL005/PL005 for left strobe power supply and JR004/PR004 for right strobe power supply).
- (3) Install wing tip.
- (4) Restore electrical power to airplane. Position LIGHTS STROBE/OFF switch on circuit panel assembly to STROBE.
- (5) Check strobe for proper operation.

6. Strobe Light Assembly Removal and Installation

NOTE: Removal and installation is typical for both the right and left strobe light assemblies.

- A. Remove the Strobe Light Assembly (Refer to [Figure 201](#)).
 - (1) Remove the electrical power from airplane.
 - (a) Put the LIGHTS STROBE/OFF switch to the OFF position.
 - (2) Remove the wing tip.
 - (3) Remove the screws, nuts, and washers that attach the strobe light to wing tip.
 - (4) Remove the shield from airplane.
 - (5) Disconnect the electrical connector from the strobe light.
 - (6) Remove the strobe light from airplane.
- B. Install the Strobe Light Assembly (Refer to [Figure 201](#)).
 - (1) Install the strobe light on the airplane.
 - (2) Connect the electrical connector to the strobe light.
 - (3) Install the shield on the airplane.
 - (4) Install washers, nuts and screws to attach the strobe light onto the wing tip.
 - (5) Install the wing tip.
 - (6) Make sure the strobe light operates correctly.
 - (a) Put the MASTER (BAT only) switch to the ON position.
 - (b) Put the LIGHTS STROBE/OFF switch to the STROBE position
 - (c) Make sure the light comes on.
 - (d) If necessary, replace the strobe light.

7. LED Strobe Lights Removal/Installation

NOTE: Removal and installation is typical for both the right (FR008) and left (FL012) LED strobe light assemblies.

- A. Remove the LED strobe light assembly (Refer to [Figure 201](#)).
 - (1) Make sure the electrical power to the airplane is OFF.
 - (2) Remove the wing-tip. Refer to [Chapter 57, Wings and Wing Struts - Maintenance Practices](#), Wing-Tip Removal/Installation.
 - (3) Remove the screws that secure the shield and LED strobe light assembly to the airplane.
 - (4) Remove the shield from the airplane.
 - (5) Disconnect the electrical connector for the LED strobe light assembly.
 - (6) Remove the LED strobe light assembly from the wing-tip.
- B. Install the LED strobe light assembly.
 - (1) Put the LED strobe light assembly in its place in the wing-tip.
 - (2) Connect the electrical connector to the LED strobe light assembly.
 - (3) Put the shield in its place on the LED strobe light assembly.
 - (4) Install the screws that secure the shield and LED strobe light assembly to the aircraft.
 - (5) Install the wing-tip.
 - (6) Make sure the light operates properly.
 - (a) Put the MASTER (BAT only) switch to the ON position.
 - (b) Put the LIGHTS STROBE/OFF switch to STROBE.
 - (c) Make sure the light comes on and flashes.
 - (d) If necessary, replace the light.

Figure 201 : Sheet 1 : Navigation and Strobe Light Installation

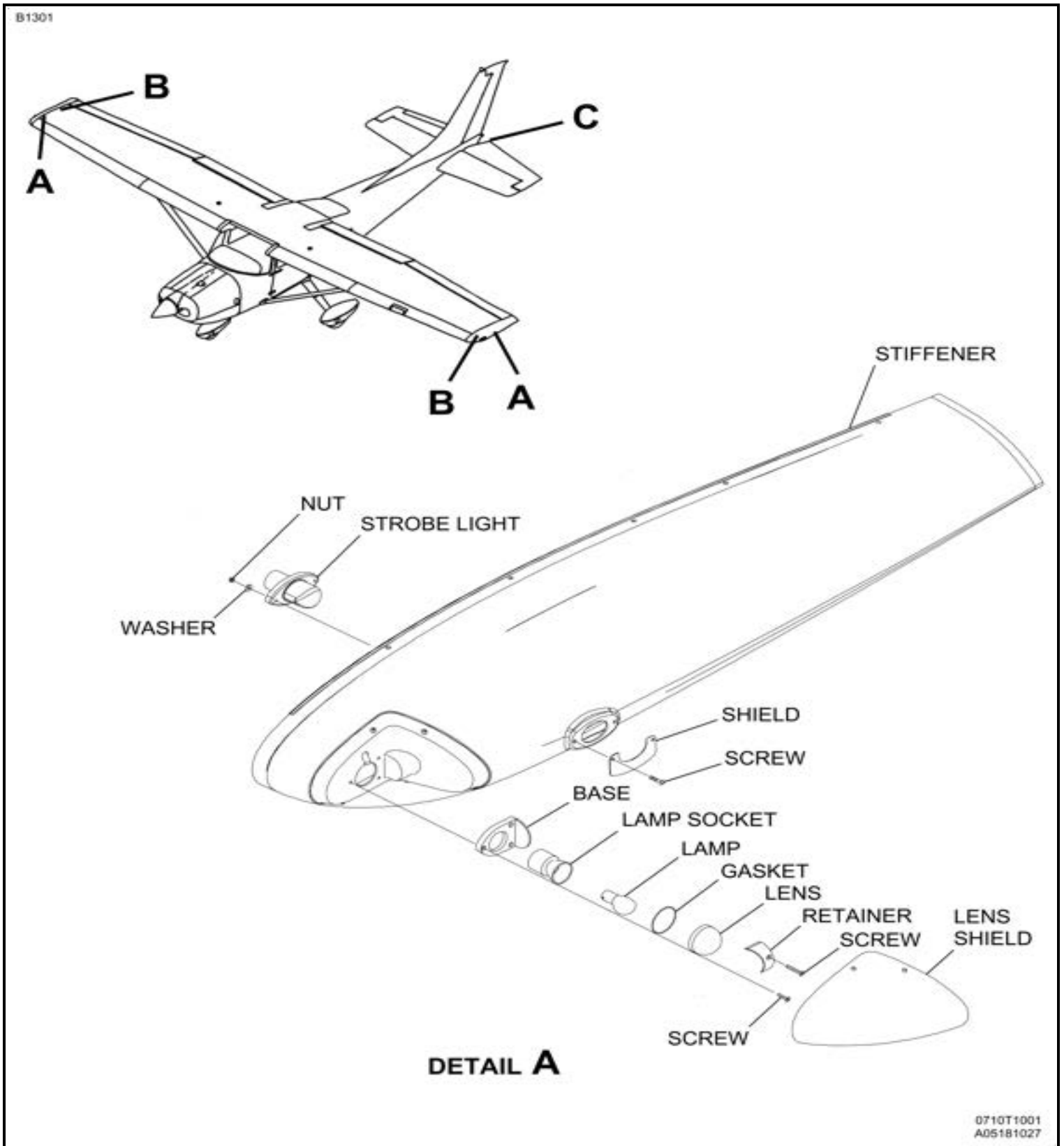


Figure 201 : Sheet 2 : Navigation and Strobe Light Installation

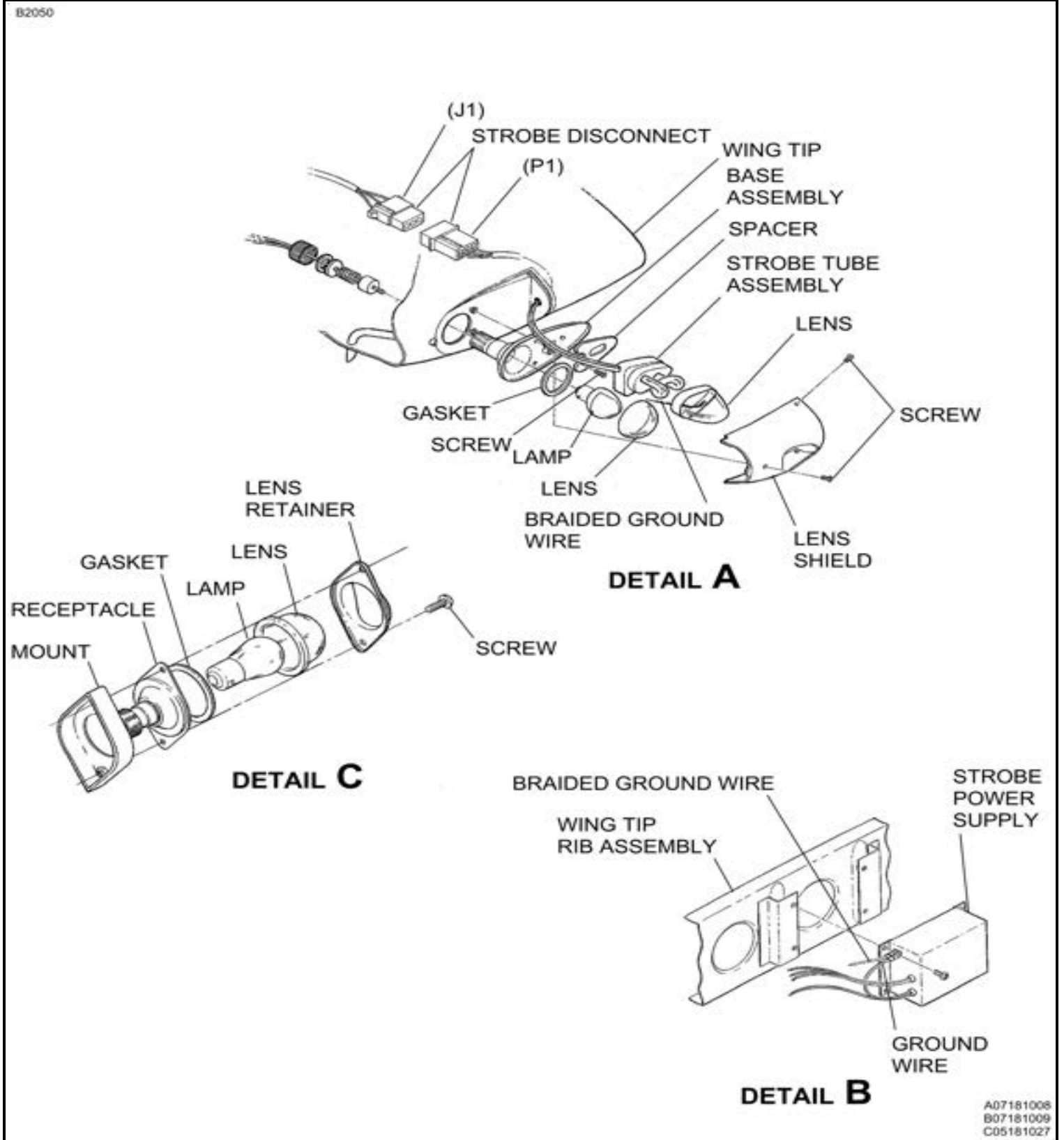


Figure 201 : Sheet 3 : Navigation and Strobe Light Installation

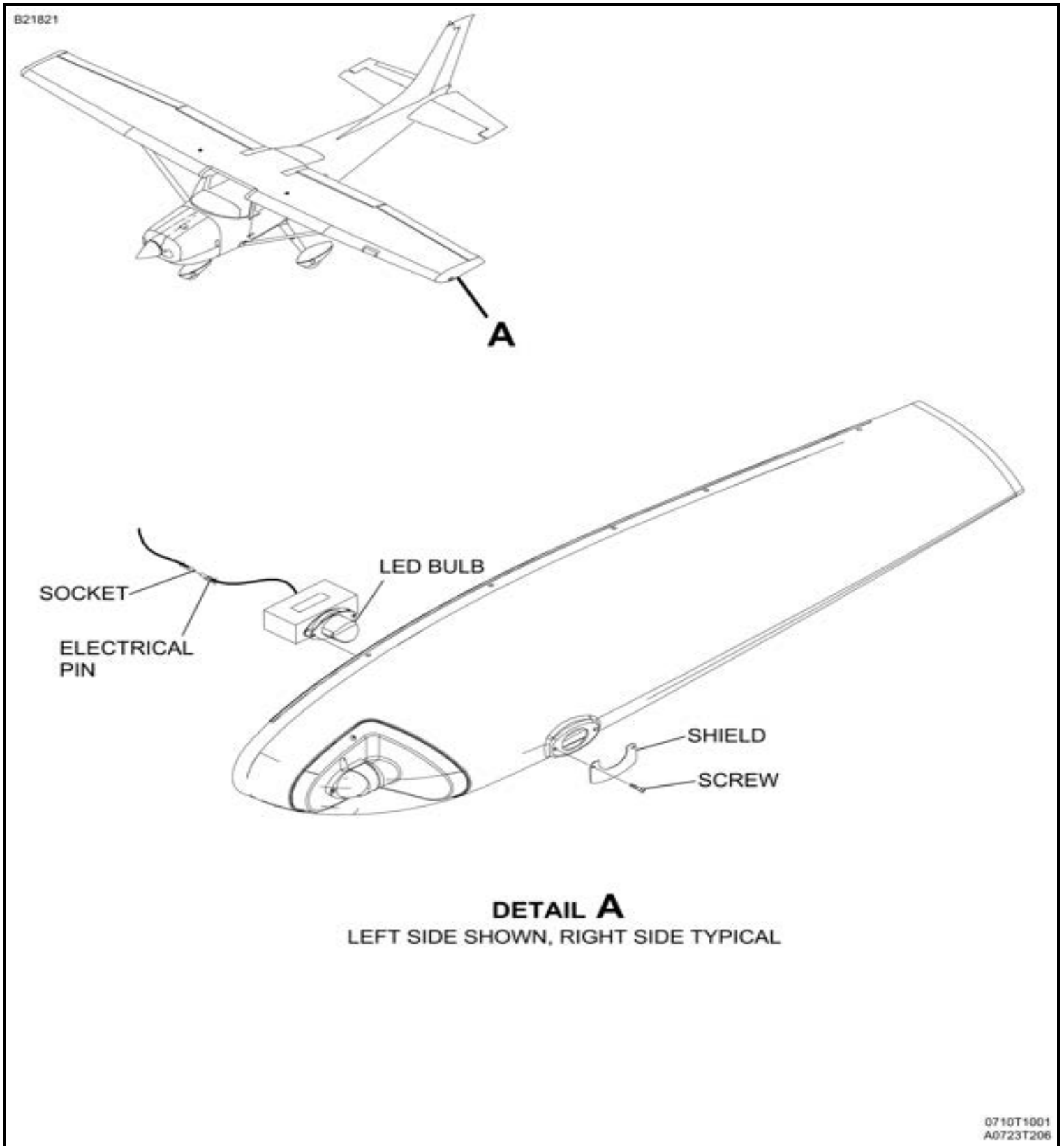
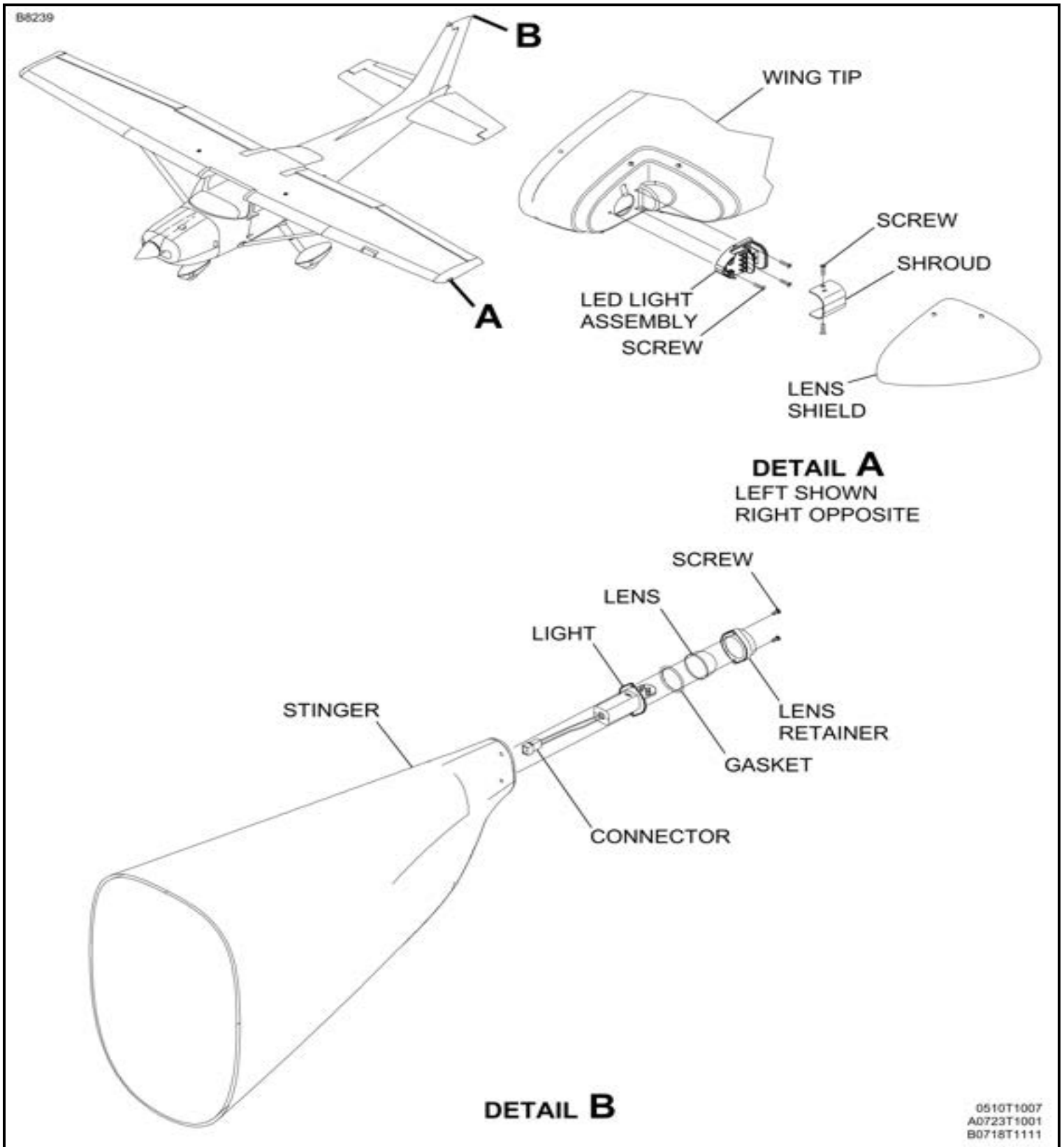


Figure 202 : Sheet 1 : LED Navigation Light Installation



VERTICAL FIN FLASHING BEACON - MAINTENANCE PRACTICES

1. General

- A. The vertical fin flashing beacon is on top of the vertical fin tip assembly. It is a recognition light that flashes red.
- B. Put the LIGHTS BCN/OFF switch to the BCN position to start the flashing beacon. This position supplies power to the light. Internal circuitry makes the light flash on and off at approximately 50 cycles per minute.

2. Flashing Beacon Lamp Removal/Installation

- A. Flashing Beacon Lamp Removal (Refer to [Figure 201](#)).

- (1) Remove electrical power from the airplane.
- (2) Put the LIGHTS BCN/OFF switch in the OFF position.
- (3) Loosen the screw on the clamp around the flashing beacon light assembly and remove the clamp.
- (4) Remove the lens from the flasher base assembly.

CAUTION: Use protective gloves or cotton wrap to make sure that fingertip oil does not come in contact with the lamp assembly.

- (5) Remove the lamp assembly from the flasher base assembly.

- B. Flashing Beacon Lamp Installation (Refer to [Figure 201](#)).

CAUTION: Use protective gloves or cotton wrap to make sure fingertip oil does not come in contact with the lamp assembly.

- (1) Align the lamp assembly with the flasher base assembly electrical pins and slide the lamp assembly into the flasher base assembly.
- (2) Make sure that the gasket is placed on the flasher base assembly and place the lens on the flasher base assembly.
- (3) Place the lens with the black masking forward on the inside of the lens.
- (4) Put the clamp around the lens and attach the lens with the screw that tightens the clamp.
- (5) Connect electrical power to the airplane.
- (6) Put the LIGHTS BCN/OFF switch in the BCN position.
- (7) Make sure that the flashing beacon operates correctly.

3. Flashing Beacon Light Assembly Removal/Installation

- A. Flashing Beacon Light Assembly Removal (Refer to [Figure 201](#)).

- (1) Remove the lens and the lamp assembly for access to the screws that attach the flasher base assembly to the plate assembly. Refer to Vertical Fin Flashing Beacon - Maintenance Practices, and [Flashing Beacon Lamp Removal/Installation](#).
- (2) Remove the screws that attach the flasher base assembly to the plate assembly.
- (3) Lift the flasher base assembly for access to the flashing beacon electrical wiring.
- (4) Carefully pull the electrical wiring until you get access to the beacon light connector (JV004/PV004).
- (5) With a tie strap or a string, safety the electrical wiring to make sure that the beacon light connector (PV004) does not fall into the fin tip assembly after you connect the beacon light connector.
- (6) Disconnect the beacon light connector (JV004/PV004).
- (7) Remove the flasher base assembly from the airplane.

- B. Flashing Beacon Light Assembly Installation (Refer to [Figure 201](#)).

- (1) Position the flasher base assembly at the fin tip assembly and connect the beacon light connector (JV004/PV004).
- (2) Remove the tie strap or the string that kept the beacon light connector (PV004) away from the fin tip assembly.
- (3) Attach the flasher base assembly to the plate assembly with the screws.
- (4) Install the lamp assembly and the lens. Refer to Vertical Fin Flashing Beacon - Maintenance Practices, [Flashing Beacon Lamp Removal and Installation](#).

4. LED Beacon Removal/Installation

- A. Remove the beacon (Refer to [Figure 202](#)).
- (1) Make sure the electrical power is off.

- (2) Remove the screws and washers that attach the lens retainer.
- (3) Remove the lens retainer, lens and lens gasket.
- (4) Remove the screws that attach the beacon.
- (5) Lift the beacon out of the cap assembly.
 - (a) Make sure the mounting gasket is removed.
- (6) Disconnect the electrical connector.

B. Install the beacon (Refer to [Figure 202](#)).

- (1) Connect the electrical connector.
- (2) Put the beacon in the top of the cap assembly.
 - (a) Make sure the mounting gasket is put between the beacon and cap assembly.
- (3) Install the screws that attach the beacon.
- (4) Install the lens gasket, lens, and lens retainer with screws and washers.
- (5) Make sure the beacon operates properly.
 - (a) Put the MASTER (BAT only) switch to the ON position.
 - (b) Put the BEACON switch to the ON position.
 - (c) Make sure the beacon flashes correctly.

NOTE: During correct operation the beacon will flash at a rate of 45 flashes per minute, +5 or -5 flashes per minute.

- (d) If necessary, replace the beacon.
- (6) Make sure electrical power is off.

Figure 201 : Sheet 1 : Flashing Beacon Light Installation

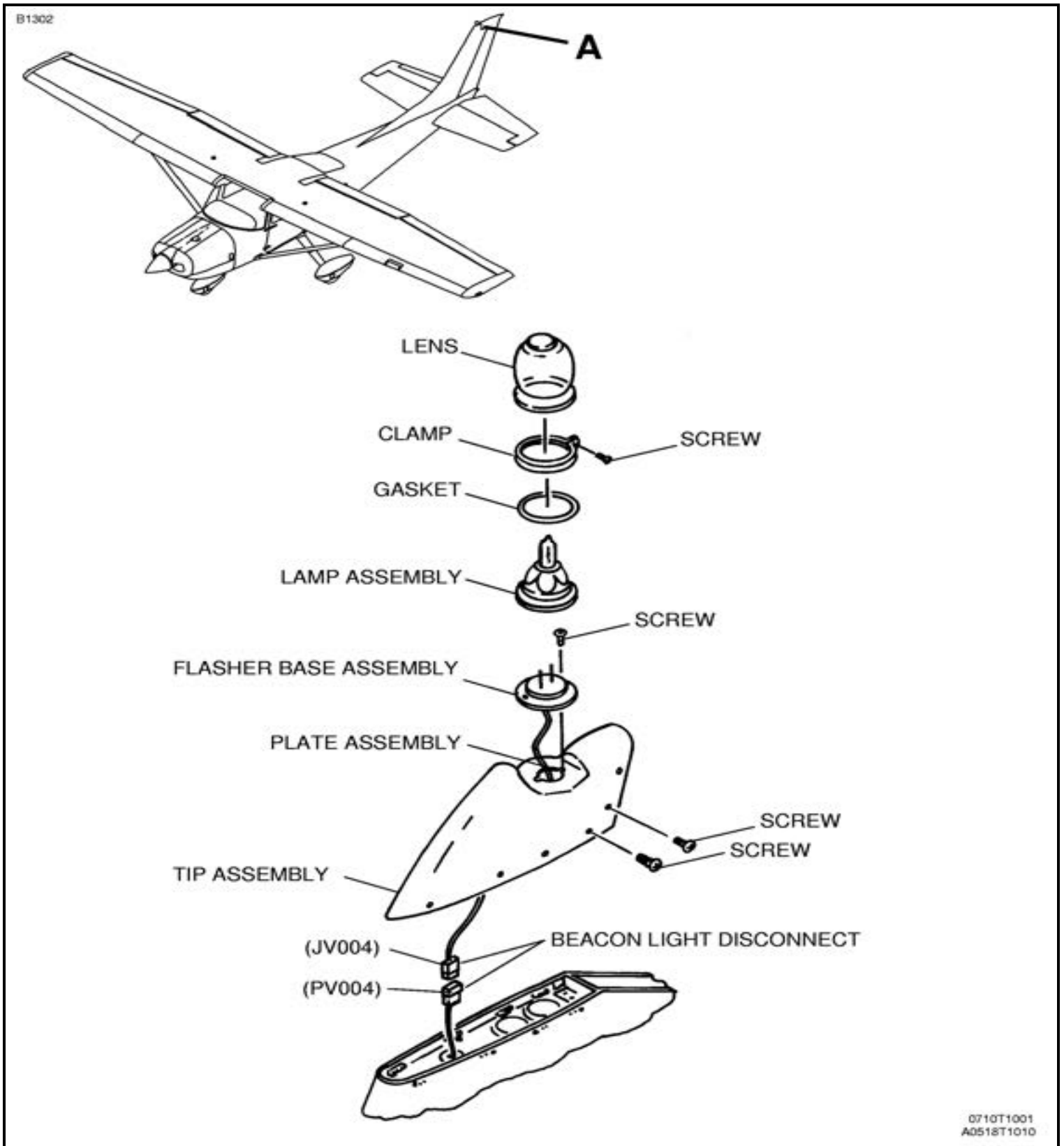
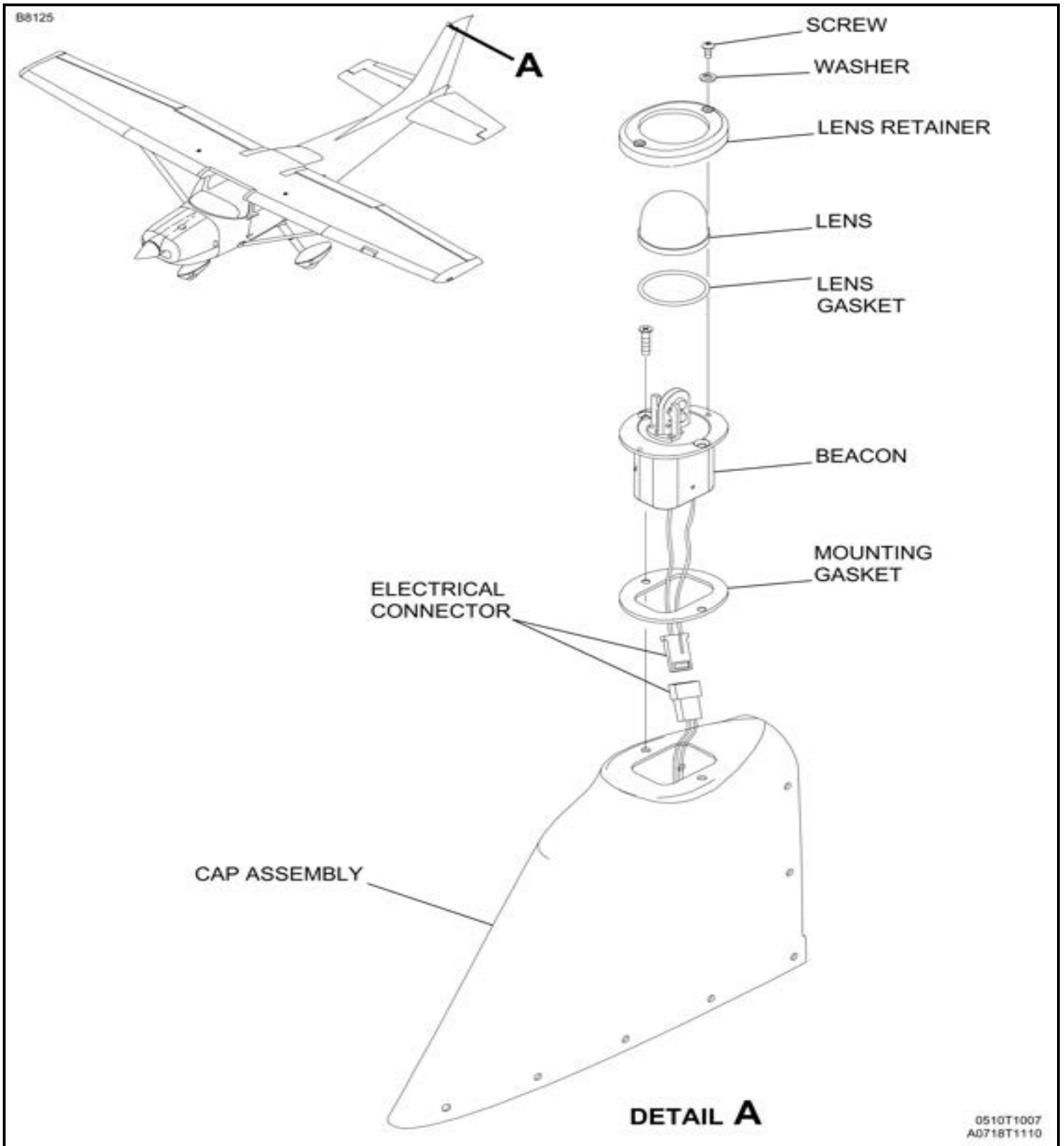


Figure 202 : Sheet 1 : LED Flashing Beacon Light Installation



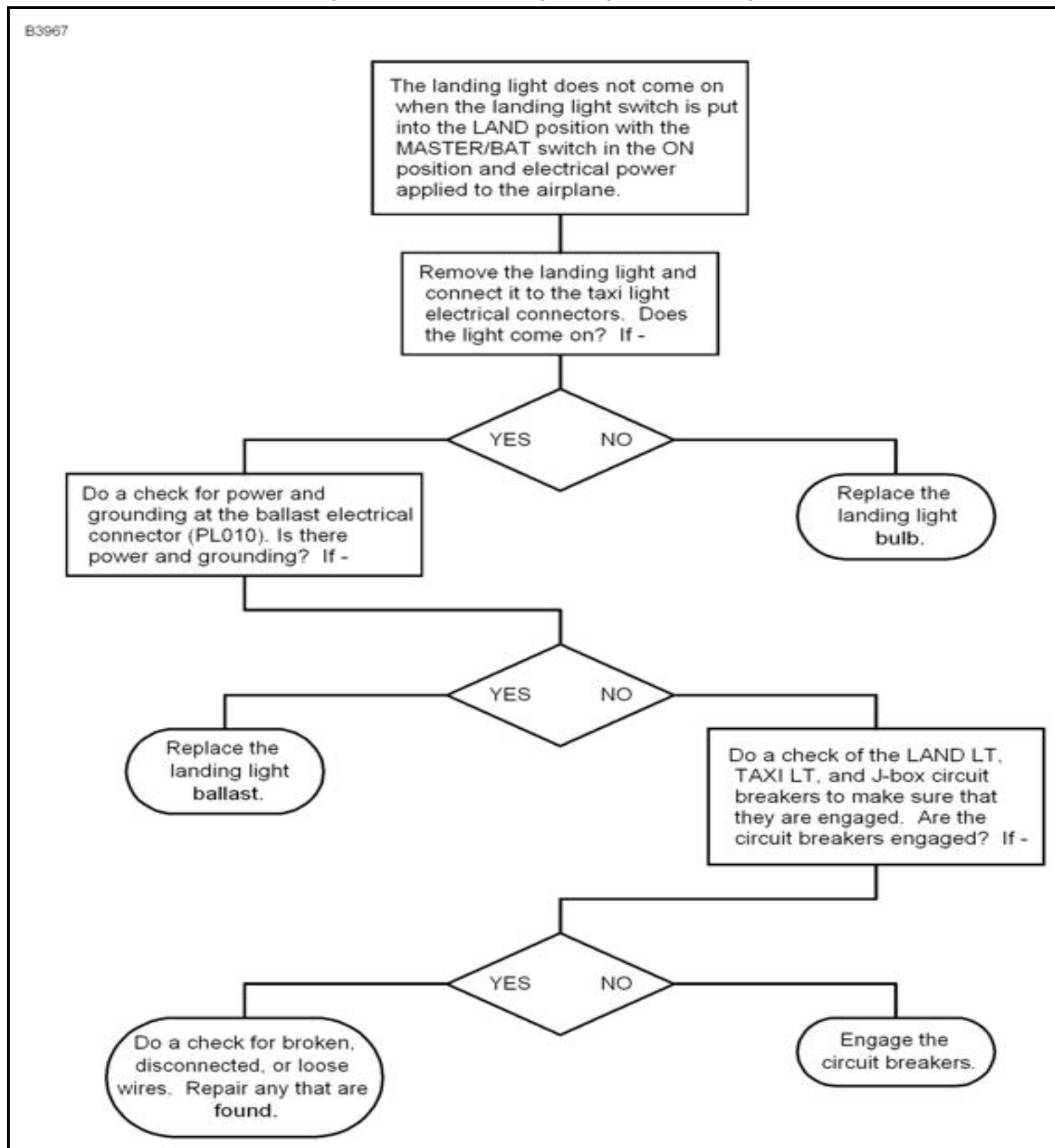
LANDING/TAXI LIGHTS - TROUBLESHOOTING

1. High-Intensity Discharge (HID) Landing and Taxi Lights Troubleshooting

- A. The troubleshooting [flow chart](#) that follows is for Airplanes 18281504 and On and T18208358 and On, and Airplanes 18280001 thru 18281503 and Airplanes T18208001 thru T18208357 incorporating MK206-33-01 that have high-intensity discharge (HID) lighting installed.

NOTE: The troubleshooting procedure is typical for the landing light and the taxi light.

Figure 101 : Sheet 1 : Landing/Taxi Light Troubleshooting



LANDING/TAXI LIGHTS - MAINTENANCE PRACTICES

HID and Incandescent

1. General

- A. Airplanes 18280001 thru 18281503 and Airplanes T18208001 thru T18208357 not incorporating MK206-33-01 have an incandescent landing and taxi light installed. The landing and taxi lights are installed on the left wing leading edge between WS 136.00 and WS 154.00. The landing and taxi lights are controlled by two switches on the circuit panel assembly. The landing light is operated by the landing light switch and the taxi light is operated by the taxi light switch.
- B. Airplanes 18281504 and On and Airplanes T18208358 and On, and Airplanes 18280001 thru 18281503 and Airplanes T18208001 thru T18208357 incorporating MK206-33-01 have high-intensity discharge (HID) landing and taxi lighting installed. The landing and taxi lights have an igniter installed on the back side of each light. A ballast is necessary for the operation of the HID bulbs. The ballast for the landing light HID bulb (inboard bulb) is installed on a bracket that is attached to a wing leading-edge rib inboard of the bulb. The ballast for the taxi light HID bulb (outboard bulb) is installed on a bracket that is attached to a wing leading-edge rib outboard of the bulb. The wiring is almost the same as the incandescent bulb installation, but there is one more cable necessary to connect the ballast to the HID bulbs. The landing and taxi light switches, and the landing and taxi light circuit breakers for the HID lighting system are the same as those for the incandescent lighting system.

2. Troubleshooting

- A. For troubleshooting of the HID landing and taxi light installation, refer to Chapter 33, [Landing/Taxi Lights - Troubleshooting](#).

3. Light Adjustment

- A. The landing and taxi lights are set to specified positions, but you can adjust them as necessary. The procedures that follow give information on the correct landing and taxi light adjustment procedure. The procedures that follow are typical for incandescent and HID lights.
 - (1) Park the airplane on a flat, level surface with the landing and taxi lights in front of a light-reflecting object. Make sure that the waterline of the airplane is level and that the wings are level. Refer to Chapter 8, [Leveling - Maintenance Practices](#).
 - (2) Park the airplane so that the distance from the light-reflecting object to the rivet line on the bottom of the front spar is approximately 3 feet.
 - (3) Set the landing light switch to the LAND position.
 - (4) Measure the distance from the floor to the center of the beam that shines on the light-reflecting object. The correct distance is 74.41 inches.
 - (5) Set the landing light switch to the OFF position.
 - (6) Set the taxi light switch to the TAXI position.
 - (7) Measure the distance from the floor to the center of the beam that shines on the light-reflecting object. The correct distance is 73.29 inches.
 - (8) Set the taxi light switch to the OFF position.
 - (9) To adjust the beam to the correct position, add or remove washers between the spacers and the plate.

4. Light Removal/Installation

NOTE: Removal/installation is typical for incandescent and HID landing and taxi lights.

- A. Light Removal (Refer to [Figure 201](#)).
 - (1) Disconnect the main battery from the airplane. Refer to Chapter 24, [Battery - Maintenance Practices](#).
 - (2) Set the landing light and the taxi light switches to OFF.
 - (3) Remove the screws that attach the lens assembly to the leading edge of the wing.
 - (4) Remove the screws, brackets, and nuts that hold the light in position against the plate.

NOTE: Some airplanes that have the HID landing and taxi lights have an aluminum ring installed between the HID landing and taxi lights and the bracket.
 - (5) Disconnect the electrical wires from the back side of the light and remove the light from the airplane.
- B. Light Installation (Refer to [Figure 201](#)).
 - (1) Put the light at the correct wing location (between WS 136.00 and WS 154.00) and connect the electrical wires to the light.
 - (2) With screws and nuts, attach the light to the bracket so the light is attached tightly against the plate.

NOTE: The tops of the nuts are not flush with the lip of the plate. The remaining parts of the nuts are

behind the plate at the screw opening.

NOTE: Some airplanes that have the HID landing and taxi lights will have an aluminum ring installed between the HID landing and taxi lights and the bracket.

- (3) Install the lens assembly to the leading edge of the wing.
- (4) Connect the main battery to the airplane. Refer to Chapter 24, [Battery - Maintenance Practices](#).
- (5) Set the landing light switch to LAND and the taxi light switch to TAXI.
- (6) Do a check of the operation of the landing and taxi lights.

5. High-Intensity Discharge (HID) Ballast Removal/Installation

NOTE: The procedures that follow are for airplanes that have the HID landing and taxi light installation.

A. HID Ballast Removal (Refer to [Figure 201](#)).

NOTE: Removal/installation procedures are typical for the HID landing and taxi lights.

- (1) Disconnect the main battery from the airplane. Refer to Chapter 24, [Battery - Maintenance Practices](#).
- (2) Put the landing and taxi light switches in the OFF position.
- (3) Remove the HID landing and taxi lights. Refer to [Light Removal and Installation](#).
- (4) Remove the screws and the nylon washers that attach the HID ballast to the support bracket on the wing leading-edge rib.
- (5) Disconnect the electrical connectors from the HID ballast.
 - (a) Landing light connectors: PL010 and UL005.
 - (b) Taxi light connectors: PL011 and UL006.
- (6) Remove the HID ballast from the airplane.

B. HID Ballast Installation (Refer to [Figure 201](#)).

- (1) Disconnect the main battery from the airplane. Refer to Chapter 24, [Battery - Maintenance Practices](#).
- (2) Put the landing and taxi light switches in the OFF position.
- (3) Put the ballast at the correct wing location.
 - (a) Landing light: outboard side of the wing rib found at WS 136.00.
 - (b) Taxi light: inboard side of the wing rib found at WS 154.00.
- (4) Connect the electrical connectors to the HID ballast.
 - (a) Landing light connectors: PL010 and UL005.
 - (b) Taxi light connectors: PL011 and UL006.

CAUTION: Do not install the HID ballast to the support bracket without the nylon shoulder washers between the HID ballast and the support bracket and the nylon washers between the HID ballast and the screw head. If the HID ballast is installed without the nylon washers, an electromagnetic field in the wing structure can cause incorrect operation of the magnetometer.

- (5) Install the screws and the nylon washers that attach the HID ballast to the support bracket on the wing leading-edge rib.
- (6) Install the HID landing and taxi lights. Refer to [Light Removal and Installation](#).
- (7) Connect the battery to the airplane. Refer to Chapter 24, [Battery - Maintenance Practices](#).
- (8) Set the landing light switch to LAND and the taxi light switch to TAXI.
- (9) Do a check of the operation of the landing and taxi lights.

Figure 201 : Sheet 1 : Landing and Taxi Light Installation

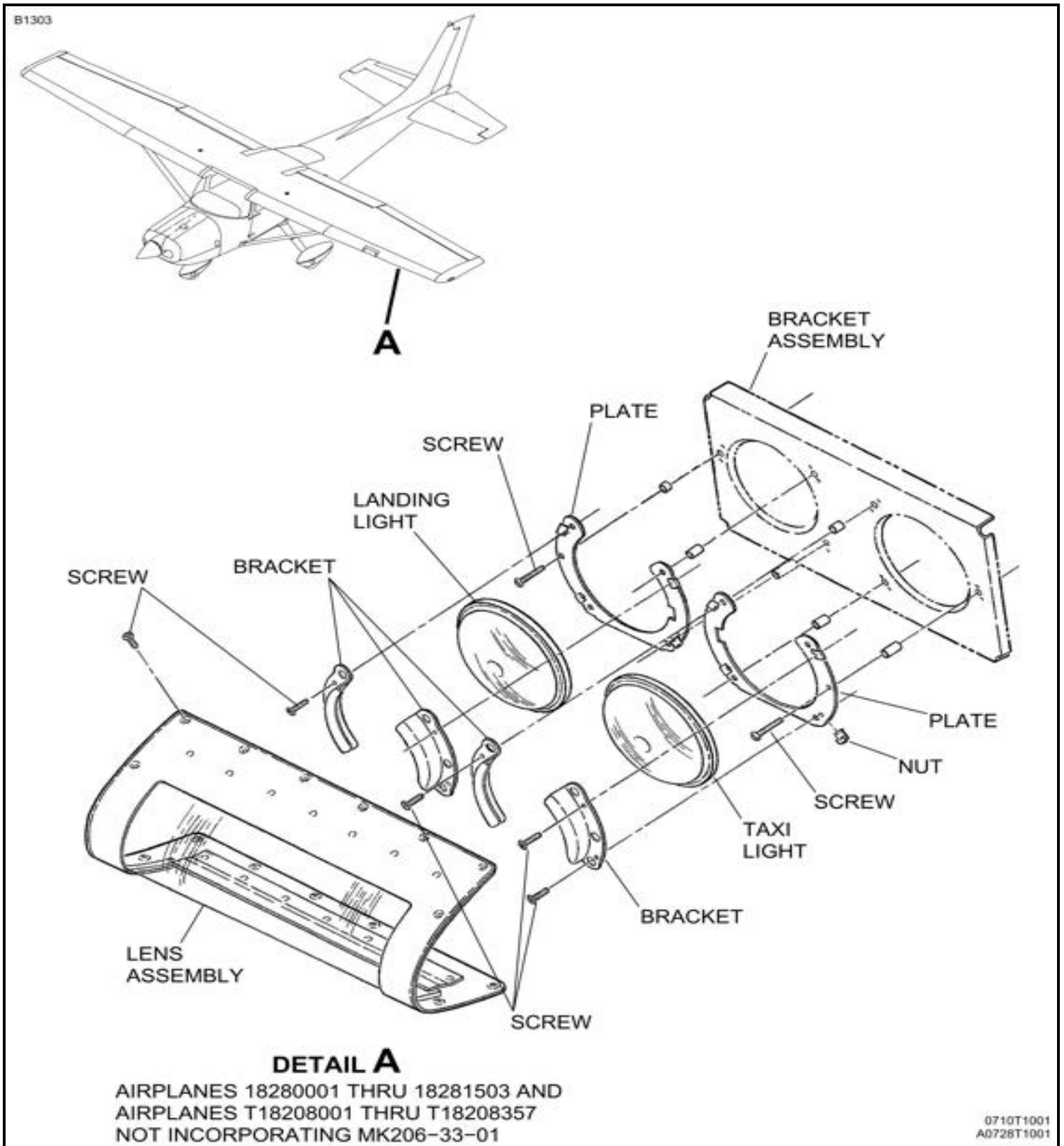
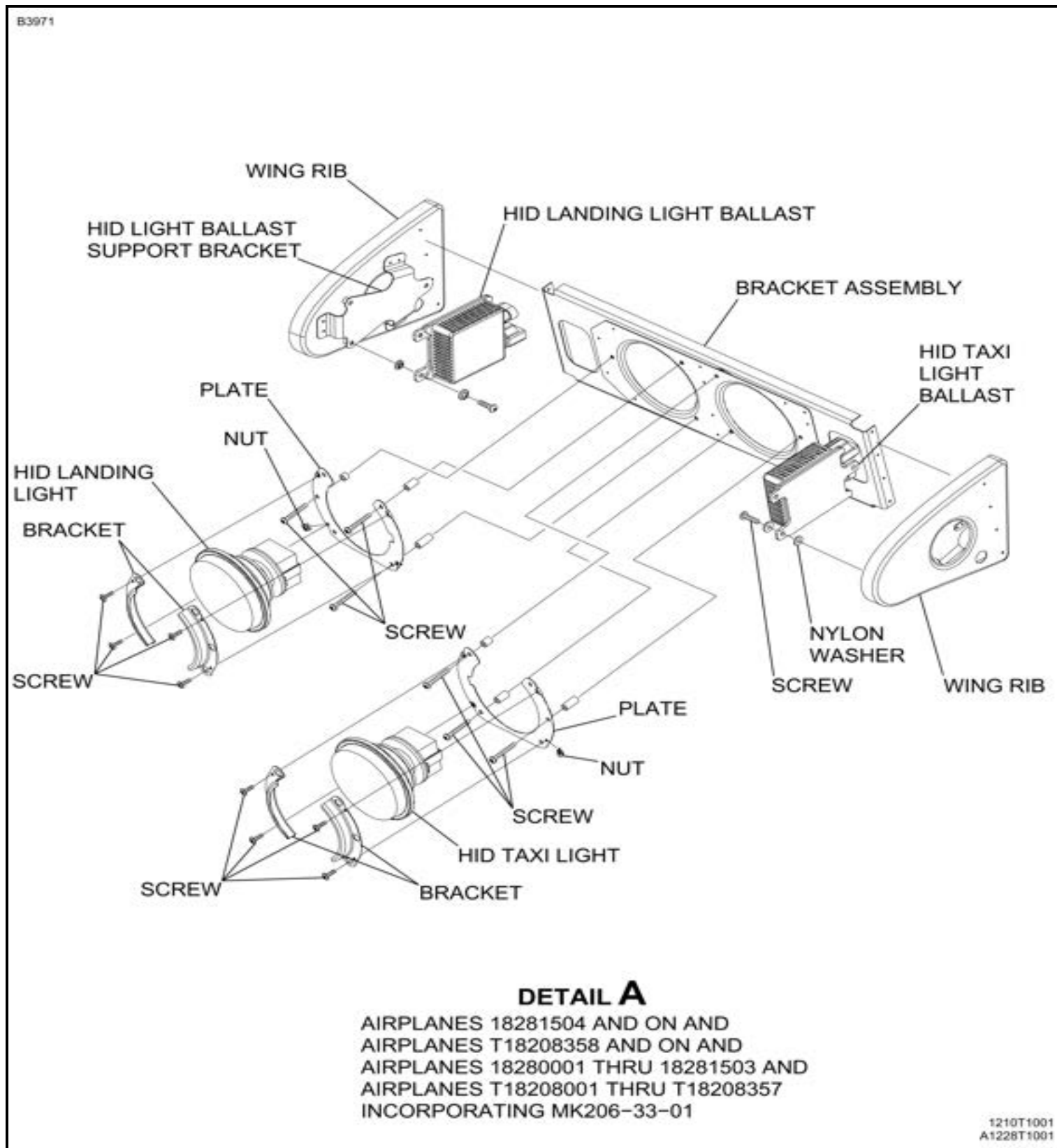


Figure 201 : Sheet 2 : Landing and Taxi Light Installation



LANDING/TAXI/RECOGNITION LIGHTS - TROUBLESHOOTING LED

1. High-Intensity Discharge (HID) Landing and Taxi Lights Troubleshooting

- A. The troubleshooting [tables](#) that follow are for airplanes that have the Light Emitting Diode (LED) Landing, Taxi and Recognition (LTR) light systems installed.

NOTE: The troubleshooting procedure is typical for the left and right LED LTR lights.

Table 101. Troubleshooting - Landing Light(s)

Aircraft Condition – Landing, Taxi and Recognition Light Switch in the LAND position.	
Failure Condition	Check or Action Items
Individual or a group of 6 LEDs are inoperative on a light assembly.	Replace the light assembly that has the inoperative LEDs.
One light assembly is inoperative (no LEDs are illuminated on one assembly).	1. Check for 28 VDC at the inoperative light assembly connector (JL012 or JR013) pins 1, 2 and 3. If not, make sure there is continuity between the light assembly connector and the switch panel disconnect (JC026 and JC037).
	2. Check for a ground at the inoperative light assembly connector (JL012 or JR013) pin 4. If not, make sure there is continuity between the light assembly connector pin 4 and the ground stud (GL010 or GR010).
	3. With an external 28 VDC power source, apply power to the suspect light assembly using connector pin 1 connected to +28 VDC and pin 4 connected to the power supply ground. Replace the light assembly if all the LEDs on the assembly are not illuminated.
Both light assemblies are Inoperative (no LEDs are illuminated).	1. Make sure that the LAND LTS and RECOG/TAXI LTS circuit breakers (HI065 and HI066) are engaged and the PFD Main Bus Voltage shows approximately 28 volts.
	2. Check for 28 VDC at the switch panel disconnect PC026 pins 4, 5 and PC037 pin 3. If not 28 VDC, make sure there is continuity between the switch and circuit breaker panel wire bundles.
	3. Check for 28 VDC at each light assembly connector (JL012 and JR013) pins 1, 2 and 3. If not 28 VDC, make sure there is continuity between the light assembly connector and the switch panel disconnect (JC026 and JC037).
One light assembly functions only as a Taxi light (on the ground) or Recognition light (in flight).	1. Check for 28 VDC at the inoperative light assembly connector (JL012 or JR013) pin 1. If not 28 VDC, make sure there is continuity between the light assembly connector and the switch panel disconnect (JC026) pin 4.
	2. With an external 28 VDC power source, apply power to the suspect light assembly using connector pin 1 connected to +28 VDC and pin 4 connected to the power supply ground. Replace the light assembly if all the LEDs on the assembly are not illuminated.
Both light assemblies function as a Taxi light (on the ground) or Recognition light (in flight).	1. Make sure that the LAND LTS circuit breaker (HI065) is engaged.
	2. Make sure that the Electrical Bus 1 circuit breaker (F2) in the power junction box is engaged.
	3. Check for 28 VDC at the switch panel disconnect PC026 pin 4. If not 28 VDC, make sure there is continuity between the PC026 pin 4 and the LAND LTS circuit breaker (HI065).
	4. Check for 28 VDC at each light assembly connector (JL012 and JR013) pin 1. If not 28 VDC, make sure there is continuity between the light assembly connector pin 1 and the switch panel disconnect (JC026) pin 4.

Table 102. Troubleshooting - Taxi Light(s)

Aircraft Condition – Landing, Taxi and Recognition Light Switch in the RECOG/TAXI position and the airplane on the ground	
Failure Condition	Check or Action Items

One light assembly is inoperative (no LEDs are illuminated on one assembly).	1. Check for 28 VDC at the inoperative light assembly connector (JL012 or JR013) pins 2 and 3. If not, make sure there is continuity between the light assembly connector and the switch panel disconnect (JC026 and JC037).
	2. Check for a ground at the inoperative light assembly connector (JL012 or JR013) pin 4. If not, make sure there is continuity between the light assembly connector pin 4 and the ground stud (GL010 or GR010).
	3. With an external 28 VDC power source, apply power to the suspect light assembly using connector pins 2 and 3 connected to +28 VDC and pin 4 connected to the power supply ground. Replace the light assembly if the six center LEDs on the assembly are not illuminated.
Both light assemblies are Inoperative (no LEDs are illuminated).	1. Make sure that the RECOG/TAXI LTS circuit breaker (HI066) is engaged.
	2. Make sure that the Electrical Bus 2 circuit breaker (F1) in the power junction box is engaged.
	3. Check for 28 VDC at the switch panel disconnect PC026 pin 5 and PC037 pin 3. If not, make sure there is continuity between the system wiring in the switch and the circuit breaker panel wire bundles.
	4. Check for 28 VDC at each light assembly connector (JL012 and JR013) pins 2 and 3. If not, make sure there is continuity between the light assembly connector and the switch panel disconnect (JC026 and JC037).
One or both light assemblies function as a Recognition light (pulsing) on the ground.	1. Check for an open circuit (not a ground) at the right light assembly connector (JR013) pin 6. If there is a ground, disconnect the GEA71 connector PI038 and check again for an open circuit at JR013 pin 6. If the ground remains, make sure there is continuity between JR013 pin 6 and GEA71 PI038 pin 2. If there is an open circuit, check the Garmin G1000 system in accordance with Step 4 below.
	2. Check that there is no wire in the left light assembly connector (JL012) pin 6.
	3. With an external 28 VDC power source, apply power to the suspect light assembly using connector pins 2 and 3 connected to +28 VDC and pin 4 connected to the power supply ground. Make sure pin 6 is not connected (open). Replace the light assembly if the six center LEDs on the assembly are not steadily illuminated and the outer 12 LEDs are not illuminated (steady or pulse).
	4. To make sure the Garmin G1000 System operates correctly, complete the following: - Make sure that the System Software is 0563.20 (or later). - Make sure that GEA71 PI038 pin 2 is open (not a ground). - Use the Pitot-Static Test Box and make sure of the status of pin 2 in the following conditions: Indicated TAS < 50 knots [GEA71 PI038 pin 2, Open], Indicated TAS > 50 knots [GEA71 PI038 pin 2, Ground]. Refer to the Operations section in Landing/Taxi/Recognition Lights - Maintenance Practices (LED). - If the Indicated Airspeed does not display on the PFD, inspect, repair and replace in accordance with the Garmin Line Maintenance Manual 190-00352-00 Rev P (or later) found in the List of Manufacturers Technical Publications. - If the pin logic does not follow as provided above inspect, repair and replace the GEA in accordance with the Garmin Line Maintenance Manual 190-00352-00 Rev P (or later) found in the List of Manufacturers Technical Publications.

Table 103. Troubleshooting - Recognition Light(s)

Aircraft Condition – Landing, Taxi and Recognition Light Switch in the RECOG/TAXI position and the airplane in flight (or simulated flight mode: pitot pressure set to indicate an airspeed of greater than 50 knots)	
Failure Condition	Check or Action Items

Left light assembly only does not pulse.	1. Disconnect the right and left light assembly connectors JR013 and JL012. Check for continuity between pin 8 on JR013 and pin 8 on JL012. Check for an open circuit (not a ground and not 28 VDC) on both pins. If there is no continuity and not an open circuit, do a visual inspection of the wiring between pin 8 on JR013 and pin 8 on JL012.
	2. Interchange the left and right light assemblies on the airplane and do the system test again.
Right light assembly only does not pulse.	With an external 28 VDC power source, apply power to the right light assembly using connector pins 2 and 3 connected to +28 VDC and pins 4 and 6 connected to the power supply ground. Replace the light assembly if all the LEDs on the assembly do not pulse.
Both light assemblies do not pulse.	1. Check for a ground at the right light assembly connector (JR013) pin 6. If there is no ground, disconnect the GEA71 connector PI038 and check for a ground at P702 pin 2 on the GEA71. If there is a ground on P702 pin 2, make sure there is continuity between JR013 pin 6 and GEA71 PI038 pin 2. If there is no ground, check the Garmin 1000 system in accordance with Step 3 below.
	2. With an external 28 VDC power source, apply power to the right light assembly using connector pins 2 and 3 connected to +28 VDC and pins 4 and 6 connected to the power supply ground. Replace the light assembly if all LEDs on the assembly do not pulse.
	3. To make sure the Garmin G1000 System operates correctly, complete the following: - Make sure that the System Software is 0563.20 (or later). - Make sure that the GEA71 PI038 pin 2 is grounded (not open). - Use the Pitot-Static Test Box and make sure of the status of pin 2 in the following conditions: Indicated TAS < 50 knots [GEA71 PI038 pin 2, Open], Indicated TAS > 50 knots [GEA71 PI038 pin 2, Ground]. Refer to the Operations section in Landing/Taxi/Recognition Lights - Maintenance Practices (LED). - If the Indicated Airspeed does not display on the PFD, inspect, repair and replace in accordance with the Garmin Line Maintenance Manual 190-00352-00 Rev P (or later) found in the List of Manufacturers Technical Publications. - If the pin logic does not follow as provided above inspect, repair and replace the GEA in accordance with the Garmin Line Maintenance Manual 190-00352-00 Rev P (or later) found in the List of Manufacturers Technical Publications.
Both light assemblies pulse simultaneously (not alternately).	1. Make sure that there is no wire in pin 7 on each light assembly connector (JL012 and JR013). Pin 7 must be an open circuit.
	2. With an external 28 VDC power source, apply power to the right light assembly using connector pins 2 and 3 connected to +28 VDC and pins 4 and 6 connected to the power supply ground. Make sure pin 7 is not connected (an open circuit). Replace the right light assembly if all LEDs on the assembly pulse at approximately 75 pulses per minute (the correct output should be approximately 37.5 pulses per minute). An alternative to the replacement of light assembly is to interchange the left and right light assemblies on the airplane and do the system test again.

LANDING/TAXI/RECOGNITION LIGHTS - MAINTENANCE PRACTICES

LED

1. General

- A. The multifunction Light Emitting Diode (LED) Landing, Taxi and Recognition (LTR) lights are installed on the left and right wing leading edges between WS 136.00 and WS 154.00. The LTR light consists of 18 high intensity LEDs whose light emitting angles are determined by three lenses. Each lens diffuses the light for a string of 6 LEDs. The two outboard lenses have a high intensity narrow beam spread while the center lens (known as the spreader lens) has a lower intensity but broader horizontal beam spread.
- B. In addition to the light assemblies found in the wings, the system includes a switch and two circuit breakers. The three position (LAND, RECOG/TAXI, OFF) toggle switch, is found on the pilot's switch panel. The circuit breakers (LAND LTS and RECOG/TAXI LTS) are found on the pilot's circuit breaker panel.

2. Operation

- A. The LED LTR light system supplies 3 functions for the pilot: landing light, taxi light and pulsing recognition light. The pilot can select all three functions with a single three position (LAND, RECOG/TAXI, OFF) toggle switch. Since two functions share the center position on the toggle switch, the selection of the Recognition or Taxi function will depend on a discrete electrical input from Garmin G1000 system. This Garmin input to the lights defines when the aircraft is in the Airborne Mode ("In-Air" pin grounded) or in the Ground Mode ("In-Air" pin open). With the toggle switch in RECOG/TAXI position, the Airborne Mode will activate the Recognition function and the Ground Mode will activate the Taxi function. Airborne and Ground Mode logic is as follows:
 - The airplane is in the Airborne Mode when a valid GPS groundspeed is greater than 30 knots or a valid True Airspeed is greater than 50 knots or both GPS and True Airspeed are invalid.
 - The airplane is in the Ground Mode when it is not in the Airborne Mode.
 - (1) The landing function is usually used during the Landing and Takeoff operations. With the switch in the LAND position, all 18 LEDs on each left and right light assembly are illuminated continuously. Power for all LEDs is supplied through the LAND LTS circuit breaker.
 - (2) The taxi function is usually used for taxiing or ground operations. With the switch in the RECOG/TAXI position and the airplane on the ground ("In-Air" pin open) the 6 center LEDs on each assembly are on steady. Power for these 12 LEDs is supplied through the RECOG/TAXI LTS circuit breaker.
 - (3) The recognition function is designed for use during flight operations (other than night landing or night takeoff) where there is a desire to increase the airplane visibility to other close proximity aircraft. With the switch in the center RECOG/TAXI position and the airplane in flight ("In-Air" pin grounded), all 18 LEDs on each light assembly pulse alternately between the left and right assemblies. A "Sync" function wire between each assembly controls the synchronization of the system pulsing. The right light assembly is the controlling "master" unit and the left light is the "slave". The total system pulse frequency is 75 pulses per minute with a 75 percent duty cycle. Power for all pulsing LEDs is supplied through the RECOG/TAXI LTS circuit breaker.
- B. The LTR system is designed so that even with a complete single system function failure, the Landing function can be used as a backup for Taxi or Recognition functions, and the Recognition and Taxi functions can be used as a backup for Landing function. For the Landing and Taxi functions, both the left and right LTR assemblies function independently. This means that the loss of function of one assembly does not result in the functional loss of the other.

3. Troubleshooting

- A. For troubleshooting of the LED landing and taxi light installation, refer to Chapter 33, [Landing/Taxi/Recognition Lights - Troubleshooting](#).

4. LED Landing, Taxi and Recognition Light Removal/Installation

NOTE: The removal and installation is typical for the left and right LED LTR lights.

- A. Remove the LED Landing, Taxi and Recognition (LTR) Light (Refer to [Figure 201](#)).
 - (1) Set the MASTER switches to the OFF position
 - (2) Set the Landing/Taxi/Recognition light switch to the OFF position.
 - (3) Disengage the LAND LTS and RECOG/TAXI LTS circuit breakers.
 - (4) Disconnect external power from the airplane.
 - (5) Disconnect the negative terminal from the battery. Refer to [Battery - Maintenance Practices](#).

- (6) Remove the screws that attach the lens assembly to the leading edge of the wing.
 - (a) Remove the lens assembly from the airplane.
- (7) Disconnect the electrical connector (JL012 left or JR013 right) from the light assembly.
- (8) Remove the nut and washers that attach the bracket to the spar.
 - (a) Remove the light and bracket from the airplane.
- (9) Remove the six screws and lock washers that attach the light to the bracket.
 - (a) Remove the light from the bracket.

B. Install the LED Landing, Taxi and Recognition (LTR) Light (Refer to [Figure 201](#)).

- (1) Put the light in position to the bracket.

NOTE: The light is symmetrical. There is not a defined top or bottom of the light.

 - (a) Install the screws and lock washers that attach the light to the bracket.
- (2) Put the light and bracket in position to the spar.
 - (a) Put the light wires and connector through the light bracket inboard lightening hole.
 - (b) Install the nut and washers that attach the bracket to the spar.
- (3) Connect the electrical connector (JL012 left or JR013 right) to the light assembly.
- (4) Put the lens assembly in position to the leading edge.
 - (a) Install the screws that attach the lens assembly to the leading edge.
- (5) Connect the negative terminal to the battery. Refer to [Battery - Maintenance Practices](#).
- (6) Do the LED Landing, Taxi and Recognition Light Test. Refer to [LED Landing, Taxi and Recognition Light System Test](#).

5. LED Landing, Taxi and Recognition Light System Test

- A. A controllable pitot pressure source is necessary for this Recognition Light function test to simulate the Garmin G1000 Airborne Mode. Refer to Chapter 34, [Pitot and Static Systems – Maintenance Practices](#), Pitot System Leak Test/Inspection for a method of pressurizing the pitot system.

- B. Do the LED Landing, Taxi and Recognition Light System Test.

CAUTION: LEDs are bright to the eye to look at. When you make sure that the LEDs are on, do not look directly into the light face. Look from at least a 45 degree angle.

- (1) Connect external power to the airplane.
- (2) Engage the LAND LTS and RECOG/TAXI LTS circuit breakers.
- (3) Set the MASTER switches to the on position
- (4) Make sure that landing lights operate correctly.
 - (a) Set the Landing, Taxi and Recognition light switch to the LAND position.
 - (b) Make sure that the landing lights stay on continuously.
- (5) Make sure that taxi lights operate correctly.
 - (a) Set the Landing, Taxi and Recognition light switch to the RECOG/TAXI position.
 - (b) Make sure that the taxi lights stay on continuously.
- (6) Make sure that recognition lights operate correctly.
 - (a) Set the Landing, Taxi and Recognition light switch to the OFF position.
 - (b) Apply pitot system pressure to simulate the airplane in the Airborne Mode.
 - 1 Put a piece of air tight tape over the small hole in the lower aft end of the pitot tube.
 - 2 Attach a controllable pressure source to the end of the pitot tube. Refer to Chapter 34, [Pitot and Static Systems – Maintenance Practices](#), Pitot System Leak Test/Inspection for a method of pressurizing the pitot system.

CAUTION: Do not apply a pitot pressure of more than 200 knots or less than 0 knots. This can cause damage to the Standby Airspeed indicator.
 - 3 Slowly increase the pitot pressure to a minimum of 60 knots as shown on the Garmin primary flight display airspeed indicator.

- a Make sure that the True Airspeed (TAS) is also more than 50 knots in the True Airspeed window.
- (c) Set the Landing, Taxi and Recognition light switch to the RECOG/TAXI position.
- (d) Make sure that the recognition lights, all 18 LEDs on each light assembly, pulse alternately between the left and right assemblies.
- (e) Set the Landing, Taxi and Recognition light switch to the OFF position.
- CAUTION: Do not apply a pitot pressure of less than 0 knots. This can cause damage to the Standby Airspeed indicator.**
- (f) Remove the pitot system pressure as follows:
 - 1 Slowly decrease the pitot pressure to 0 knots.
 - 2 Remove the pressure source from the end of the pitot tube.
 - 3 Remove the piece of tape from the small hole in the lower aft end of the pitot tube.
- (7) Set the MASTER switches to the OFF position
- (8) Disconnect external power from the airplane.

6. LED Landing, Taxi and Recognition Light Aiming Check and Adjustment

- A. The LED Landing, Taxi and Recognition (LTR) Lights are set to specified positions at the factory, but you can make minor adjustments as necessary. The procedures that follow give checks for the approved aiming of the LED lights.
NOTE: The procedures that follow are typical for the left and right LED LTR lights.
- B. Do the Vertical Aiming Check and Adjustment.
NOTE: A digital inclinometer that can measure to the nearest tenth of a degree is necessary for this procedure.
 - (1) Park the airplane on a flat, level surface.
 - (2) Connect external power to the airplane.
 - (3) Make sure that the LAND LTS and RECOG/TAXI LTS circuit breakers are engaged.
 - (4) Set the Landing, Taxi and Recognition light switch to the OFF position.
 - (5) Level the airplane to waterline 0 degrees, +0.1 or -0.1 degrees, and wings level 0 degrees, +2.0 or -2.0 degrees. Refer to Chapter 8, [Leveling - Maintenance Practice](#).
 - (6) Remove the screws that attach the lens assembly to the leading edge of the wing.
 - (a) Remove the lens assembly from the airplane.
 - (7) Use a digital inclinometer on the center of the light face to find the light vertical aiming angle.
NOTE: For this procedure, it is assumed that the light's center beam emits normal to the face of the light.
 - (a) Set the Landing, Taxi and Recognition light switch to the RECOG/TAXI position.
 - (b) Record the vertical aiming angle to the nearest tenth of a degree.
 - 1 Record if the angle is with the light pointed up or down from water line zero.
 - (c) Is the light aimed within the approved range? Refer to [Figure 202](#).
NOTE: The approved factory-set vertical aiming is with the light pointing down 3.0 degrees, +0.5 or -0.5 degrees, from the waterline zero.
 - (8) If necessary, adjust the light vertical aiming to the approved position.
 - (a) Set the Landing, Taxi and Recognition light switch to the OFF position.
 - (b) To adjust the light add 0.016 or 0.032 inch flat washers to the upper or lower screws that attach the light mounting bracket to the wing forward spar. Refer to [Figure 201](#).
 - (9) As necessary, do again the steps above to check and adjust the light vertical aiming angle.
 - (10) Disconnect external power from the airplane.
- C. Do the Horizontal Aiming Check and Adjustment.
NOTE: The horizontal aiming must be checked visually at night on a flat, level, and light colored surface.
 - (1) Park the airplane on a flat, level, and light colored surface.
 - (2) Connect external power to the airplane.

- (3) Make sure that the LAND LTS and RECOG/TAXI LTS circuit breakers are engaged.
- (4) Set the Landing, Taxi and Recognition light switch to the LAND position.
- (5) Do a check of the horizontal aiming.
 - (a) Make sure that the left and right Landing Light Main Beams converge equally in front of the center of the aircraft. Refer to [Figure 202](#).
- (6) If necessary, adjust the light horizontal aiming to the approved position.
 - (a) Set the Landing/Taxi/Recognition light switch to the OFF position.
 - (b) To adjust the light add a 0.032 inch flat washer to the applicable upper screw that attaches the light mounting bracket to the wing forward spar. Refer to [Figure 201](#).

NOTE: To keep the vertical aiming for this adjustment, you must add one washer of half the thickness (0.016 inch) on the center lower mounting screw.
 - (c) Add a 0.016 inch flat washer to the center lower screw that attaches the light mounting bracket to the wing forward spar.
- (7) As necessary, do again the steps above to check and adjust the light horizontal aiming angle.
- (8) Put the lens assembly in position to the airplane.
 - (a) Install the screws that attach the lens assembly to the leading edge of the wing.
- (9) Disconnect external power from the airplane.

Figure 201 : Sheet 1 : LED Landing, Taxi and Recognition Light Installation

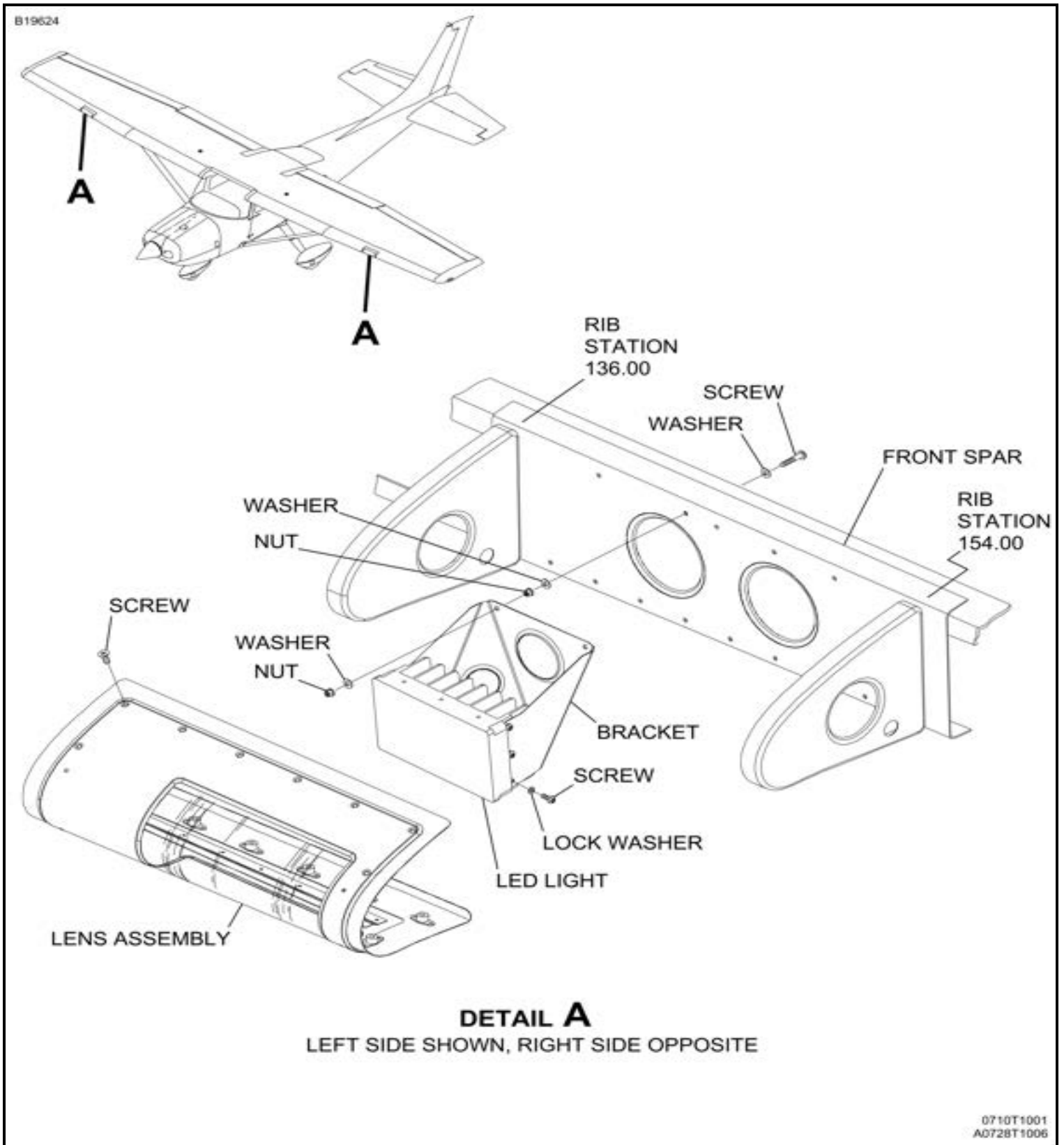
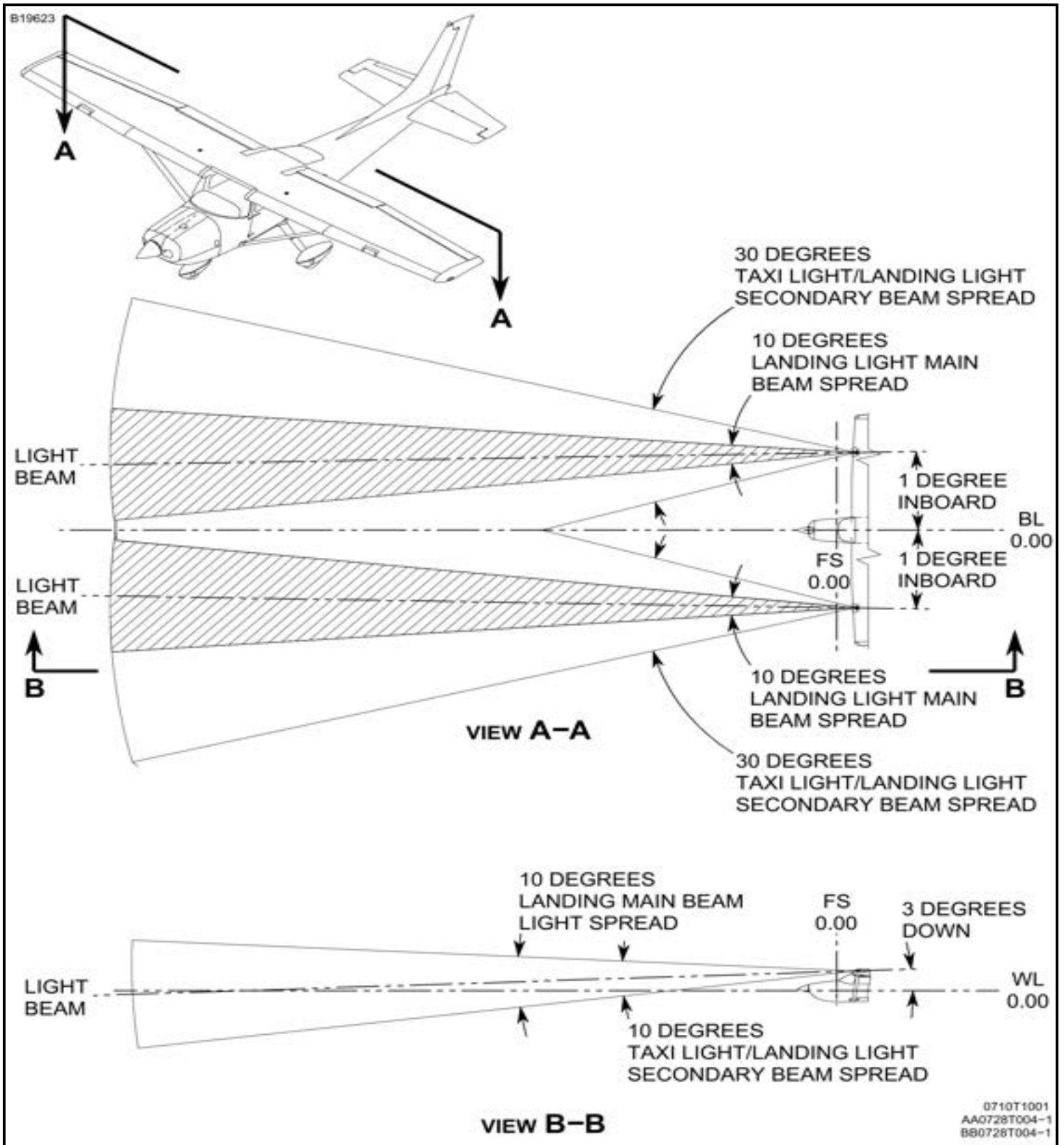


Figure 202 : Sheet 1 : LED Landing, Taxi and Recognition Light Aiming



COURTESY LIGHTS - MAINTENANCE PRACTICES

1. General

- A. Each wing is equipped with an under wing courtesy light located near the strut/wing intersection. The left wing courtesy light, the right wing courtesy light, and the rear dome light assembly are connected in parallel on a single circuit. Pressing the overhead light assembly switch supplies power to all three lights. Pressing the overhead light assembly switch again removes power from all three lights.
- B. See Model 182 Wiring Diagram Manual for diagrams for use in troubleshooting the courtesy light under the wing and necessary electrical wiring.

2. LED Courtesy Wing Light Assembly Removal/Installation

- A. Remove the LED Courtesy Wing Light Assembly (Refer to [Figure 201](#)).

NOTE: Removal and Installation is typical for the left and right wing courtesy light lamps.

- (1) Make sure the electrical power is off.
- (2) Remove the screws that attach the light assembly to the airplane.
- (3) Disconnect the electrical connector.
- (4) Remove the light from the airplane.

- B. Install the LED Courtesy Wing Light Assembly (Refer to [Figure 201](#)).

- (1) Connect the electrical connector.
- (2) Install the light assembly with the screws.
- (3) Make sure the light operates correctly.
 - (a) Put the MASTER (BAT only) switch to the ON position.
 - (b) Push the rear dome light switch.
 - (c) Make sure the light comes on.
 - (d) If necessary, replace the light assembly.
 - (e) Push the rear dome light switch.
 - (f) Put the MASTER (BAT only) switch to the OFF position.

3. Courtesy Light Lamp Removal and Installation

- A. Remove Courtesy Light Lamp (Refer to [Figure 201](#)).

NOTE: Removal and Installation is typical for the left and right wing courtesy light lamps.

- (1) Make sure the electrical power is off.
- (2) Remove the screws that attach the cover assembly to the airplane.
- (3) Remove the bulb.
 - (a) Push the bulb into the socket
 - (b) Turn the bulb counterclockwise.
 - (c) Remove the bulb from the airplane.

- B. Install the Courtesy Light Lamp (Refer to [Figure 201](#)).

- (1) Insert the bulb into the socket.
 - (a) Turn the bulb clockwise until the bulb is locked in the socket.
- (2) Install the cover assembly with the screws.
- (3) Make sure the light operates correctly.
 - (a) Put the MASTER (BAT only) switch to the ON position.
 - (b) Push the rear dome light switch.
 - (c) Make sure the light comes on.
 - (d) If necessary, replace the light.
 - (e) Push the rear dome switch.
 - (f) Put the MASTER (BAT only) switch to the OFF position.

Figure 201 : Sheet 1 : Courtesy Light Installation

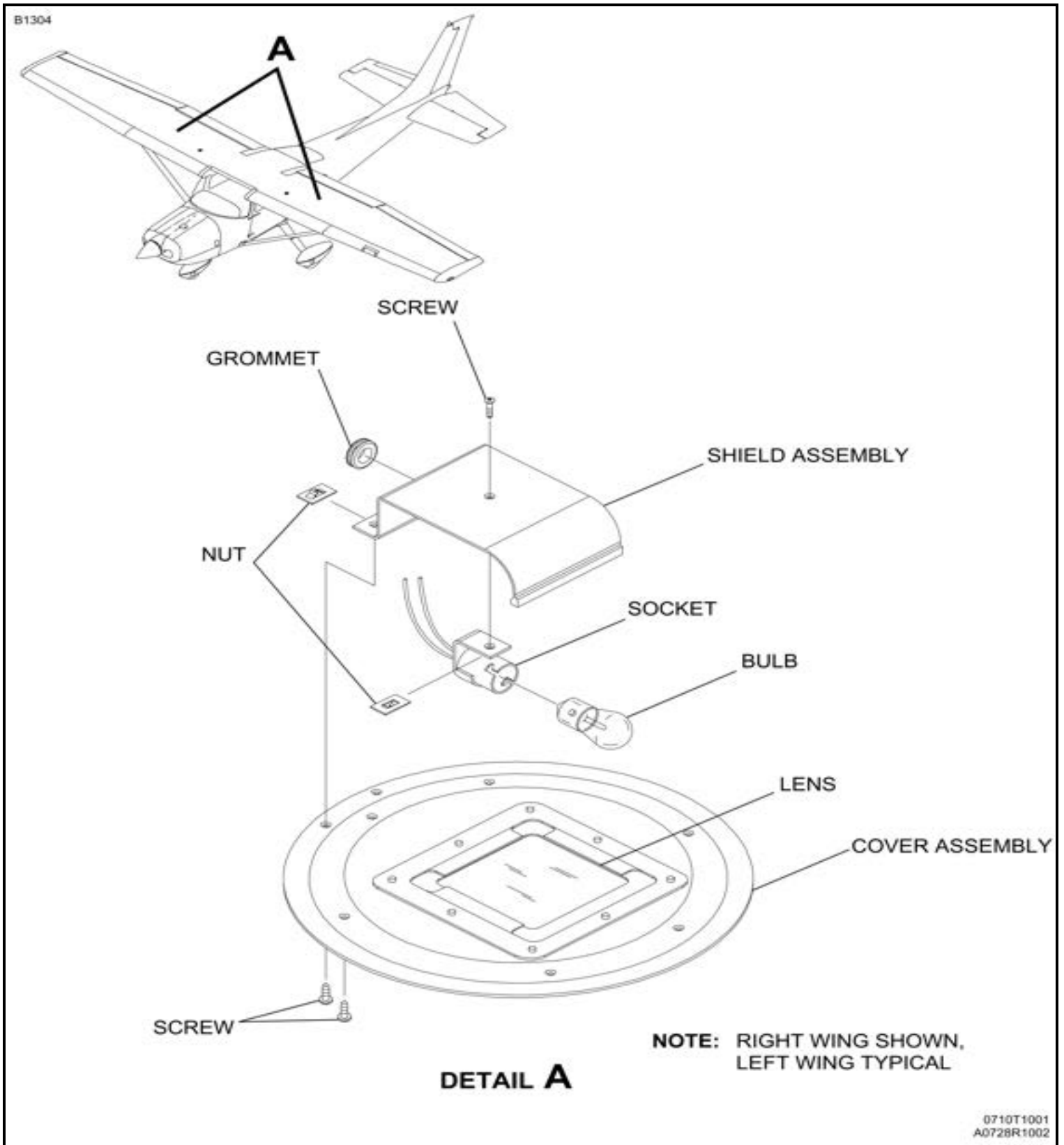
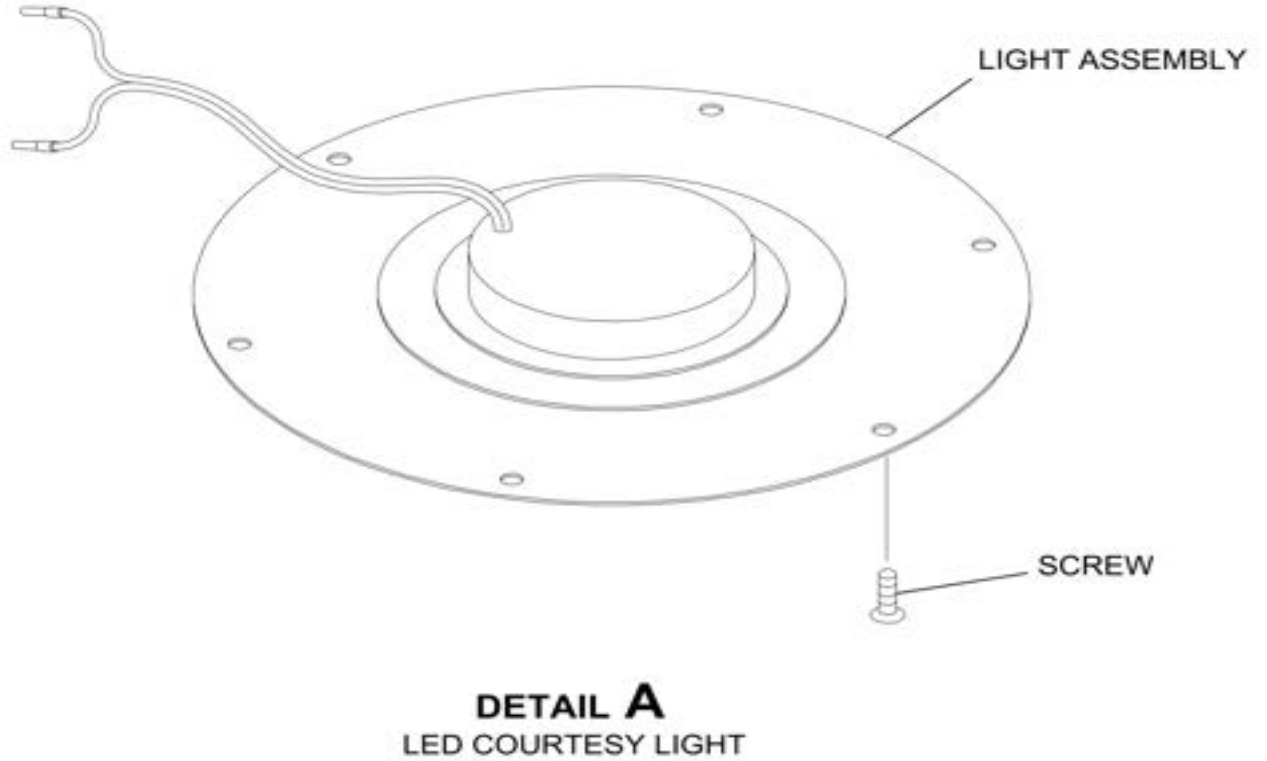


Figure 201 : Sheet 2 : Courtesy Light Installation

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STRUCTURES - GENERAL

1. Scope

- A. This chapter provides a description of general airplane structures and corrosion characteristics. For repair of structural members and repair techniques used throughout the airplane, refer to the Single Engine Models 172, 182, T182, 206, and T206 1996 and On Structural Repair Manual.

2. Definition

- A. This chapter is divided into two sections briefly described below.
 - (1) The section on structures provides an overall description of the airplane structure and methods of construction used on the airplane.
 - (2) The section on corrosion provides a general description of corrosion characteristics, types of corrosion and typical corrosion areas.

STRUCTURES - DESCRIPTION AND OPERATION

1. Description

- A. The fuselage is of semimonocoque construction and consists of three major sections: forward section, center section, and tailcone section. Construction consists of formed bulkheads, longitudinal stringers, reinforcing channels and skin. Frame members of the cabin section are constructed of formed bulkhead channels. Bulkheads are formed "U" channel sections. Principal material is 2024-0 clad aluminum alloy which, after forming, is heat treated to a 2024-T42 condition and painted with epoxy primer. All bulkheads in the fuselage are constructed of formed sheet metal or reinforced sheet metal.
- B. The wings are of all-metal, strut-braced, semi monocoque construction, utilizing two spars. Each wing consists of an outer wing panel with an integral fuel bay, an aileron and a flap. Flanged upper and lower edges of all ribs serve as cap-strips, in addition to providing rigidity to the rib. The skin, riveted directly to each rib flange, provides the cellular strength for each successive rib bay. The nose, center, and trailing edge rib segments are riveted together through the front and rear spars to form the basic airfoil sections. Alclad stringers stiffen the skin between ribs. Spars are comprised of machine milled, tapered extrusions riveted to sheet metal webs.
- C. The full cantilever, all-metal tail group consists of a vertical stabilizer and rudder, and a horizontal stabilizer and elevators. The horizontal stabilizer is of one-piece construction, consisting of spars, ribs and skins. Elevators are constructed of aluminum spars, ribs and skin panels. The skin panels are riveted to ribs and spars. A balance weight is located in the outboard end of each elevator, forward of the hinge line. An elevator trim tab, attached to the elevator, is constructed of a spar, ribs, and skin; all riveted together. The vertical stabilizer is constructed of a forward spar, an aft spar, ribs and skin. The rudder is constructed of spars, ribs and skin panels. The rudder trim tab is constructed of a spar, ribs, and skin; all riveted together.
- D. The main landing gear is constructed of 6150 alloy spring steel tubing with attaching parts of high strength 7075-T73 aluminum alloy forgings. Nose gear components are 4130, 6150 alloy steel and 7075-T73 aluminum alloy forgings.
- E. The engine mount is constructed of welded 4130 steel tubing.
- F. The engine cowling consists of upper and lower formed aluminum sections. The upper section includes an oil inspection/filler door, and the lower section includes an air induction scoop with an engine induction system air filter. Both sections are removable.

CORROSION - DESCRIPTION AND OPERATION

1. General

- A. This section describes corrosion to assist maintenance personnel in identification of various types of corrosion and application of preventative measures to minimize corrosion activity.
- B. Corrosion is the deterioration of a metal by reaction to its environment. Corrosion occurs because most metals have a tendency to return to their natural state.

2. Corrosion Characteristics

- A. Metals corrode by direct chemical or electrochemical (galvanic) reaction to their environment. The following describes electrochemical reaction:
 - (1) Electrochemical corrosion can best be compared to a battery cell. Three conditions must exist before electrochemical corrosion can occur:
 - (a) There must be a metal that corrodes and acts as the anode (+ positive).
 - (b) There must be a less corrodible metal that acts as the cathode (- negative).
 - (c) There must be a continuous liquid path between the two metals, which acts as the electrolyte. This liquid path may be condensation or, in some cases, only the humidity in the air.
 - (2) Elimination of any one of the three conditions will stop the corrosion reaction process.
 - (3) A simple method of minimizing corrosion is adding a layer of pure Aluminum to the surface. The pure Aluminum is less susceptible to corrosion and also has a very low electropotential voltage relative to the remainder of the alloyed sheet. This process is conducted at the fabricating mill and the product is called Alclad. Model 172 airplanes had sheet metal parts constructed of Alclad sheet.
 - (4) One of the best ways to eliminate one of the conditions is to apply an organic film (such as paint, grease or plastic) to the surface of the metal affected. This will prevent electrolyte from connecting the cathode to the anode so current cannot flow and therefore, prevent corrosive reaction and was not available for production Model 172 airplanes.
 - (5) Other means employed to prevent electrochemical corrosion include anodizing and electroplating. Anodizing and other passivating treatments produce a tightly adhering chemical film which is much less electrochemically reactive than the base metal. Because the electrolyte cannot reach the base metal, corrosion is prevented. Electroplating deposits a metal layer on the surface of the base material, which is either less electrochemically reactive (Example: chrome on steel) or is more compatible with the metal to which it is coupled (Example: cadmium plated steel fasteners used in aluminum).
 - (6) At normal atmospheric temperatures, metals do not corrode appreciably without moisture. However, the moisture in the air is usually enough to start corrosive action.
 - (7) 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 surfaces. This film tends to protect the metal underneath.
 - (8) When components and systems constructed of many different types of metals must perform under various climatic conditions, corrosion becomes a complex problem. The presence of salts on metal surfaces (sea or coastal operations) greatly increases the electrical conductivity of any moisture present and accelerates corrosion.
 - (9) Other environmental conditions that 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 are described in this section. In many instances more than one form of corrosion may exist at the same time. While this makes it difficult to determine the exact type of corrosion, it should still be possible to determine that a corrosive process is taking place. If it is impractical to replace an assembly or component, contact an authorized repair shop.
- B. Direct Chemical Attack.
 - (1) Direct chemical attack may take place when corrosive chemicals, such as battery electrolyte, caustic cleaning solutions or residual flux deposits are allowed to remain on the surface or become entrapped in cracks or joints. Welding or soldering flux residues are hygroscopic and will tend to cause severe pitting. Any potentially corrosive substance should be carefully and completely removed whenever such spillage occurs.
- C. Pitting Corrosion.

- (1) The most common effect of corrosion on polished aluminum 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) Intergranular corrosion (Refer to [Figure 1](#)) takes place because of the nature of the structure of metal alloys. As metals cool from the molten state, a granular structure is formed. The size and composition of the grains and the material in the grain boundaries depend on several factors including the type of alloy and rate of cooling from the molten state or cooling after heat-treating. The grains differ chemically and may differ electrochemically from the boundary material. If an electrolyte comes in contact with this type of structure, the grains and boundary material will act as anode and cathode and undergo galvanic corrosion. The corrosion proceeds rapidly along the grain boundaries and destroys the solidity of the metal.

- E. Exfoliation gives the appearance of sheets of very thin metal separated by corrosion products. It is a form of intergranular corrosion. Since the corroded products are thicker than the uncorroded aluminum, exfoliation shows itself by “lifting up” the surface grains of a metal by the force of expanding corrosion. This type of corrosion is most often seen on extruded sections, where the grain thicknesses are usually less than in rolled alloy form.

F. Dissimilar Metal Corrosion. (Refer to [Figure 1](#))

- (1) Dissimilar metal corrosion occurs when dissimilar metals are in contact in the presence of an electrolyte. A common example of dissimilar metal contact involves the attachment of aluminum parts by steel fasteners.

G. Concentration Cell Corrosion. (Refer to [Figure 1](#))

- (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, such as moist air, water and chemicals.
- (2) The general types of concentration cell corrosion are identified as metal ion cells and oxygen cells. 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 corrosion cell 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, damp and salty 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, damp environment).
- (b) Waxed with a good grade of water repellent wax to help keep water from accumulating in 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 filiform corrosion.

- (c) Keep the airplane hangared to protect it from the atmosphere.
- (d) Fly the airplane to promote aeration of enclosed parts.
- (e) Ensure all vent/drain holes are open to ventilate the interior of airplane.

- (3) To remove filiform corrosion once it has been discovered:

- (a) Remove paint from corroded area.
- (b) Remove corrosion by sanding area to metal surface, using either a ScotchBrite pad or 320 grit sandpaper (aluminum oxide or silicone carbide grit).
- (c) Clean and refinish surface.

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, press and shrink fitting general hardware and those induced when pieces, such as rivets and bolts, are formed. The amount of stress varies from point to point within the component. Stress corrosion is most likely to occur at points of highest stress, which are also subject to corrosion influence.

J. Fatigue Corrosion.

- (1) Fatigue corrosion is a special case of stress corrosion caused by the combined effects of cyclic stress and corrosion.

4. Typical Corrosion Areas

- A. Aluminum appears high in the 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) Battery electrolyte used in lead acid batteries is composed of 35% sulfuric acid and 65% water. When electrolyte is spilled, it should be cleaned up immediately. A weak boric acid solution may be applied to the spillage area followed by a thorough flushing with clean, cold running water. If boric acid is not available, flush the area with clean, cold water.
- (2) If corrosion appears, use an approved repair method to repair the structure.

C. Steel Control Cable.

- (1) Checking for corrosion on a control cable is normally accomplished during the preventative maintenance check. During preventative maintenance, broken wire and wear of the control cable are 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.

CAUTION: Do not use metallic wools or solvents to clean installed cables. Metallic wools will embed 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 exterior cable surfaces, if the cable appears dry, the lubrication originally supplied on the cable has probably oxidized and needs to be replaced with a light oil (5w motor oil, "3 in 1" oil, LPS-2, WD-40 or Diesel Fuel). Apply the oil with a cloth and then rub the cable with the cloth to coat the cable with a thin layer of oil. Excessive oil will collect dust and be as damaging to the cable as no lubrication.

D. Piano Type Hinges.

- (1) The construction of piano type hinges forms moisture traps as well as the dissimilar metal couple between the steel hinge pin and the aluminum hinge. Solid film lubricants are often applied to reduce corrosion problems.
- (2) Care and replacement of solid film lubricants require special techniques peculiar to the particular solid film being used. Good solid film lubricants are lubricants conforming to Specification MIL-PRF-81322.
 - (a) Solid film lubricants prevent galvanic coupling on close tolerance fittings and reduce fretting corrosion. Surface preparation is extremely important to the service or wear life of solid film lubricants.
 - (b) Solid film lubricants are usually applied over surfaces coated with other films, such as anodize and phosphate. They have been successfully applied over organic coatings such as epoxy primers.

CAUTION: Solid film lubricants containing graphite, either alone or in mixture with any other lubricants, should not be used since graphite is cathodic to most metals and will cause galvanic corrosion in the presence of electrolytes.

E. 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 should be protected. The following requirements are peculiar to faying surfaces on 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 must have the entire faying surface coated with sealant. Excess material squeezed out should be removed so that a fillet seal remains. Joint areas, which could hold water, should be filled or coated with sealant.
- (3) Attaching Parts.
 - (a) Attaching parts, such as nuts, bushings, spacers, washers, screws, self-tapping screws, self-locking nuts and clamps, do not need to be painted in detail except when dissimilar metals or wood contact are involved in the materials being

joined. Such parts should receive a wet or dry coat of primer.

NOTE: Corrosion inhibiting solid film lubricants, Specification MIL-PRF-46010 and/or 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 should be treated before installation of fasteners or bushings.
- (c) All rivets used to assemble dissimilar metals should be installed wet, with sealant, conforming to Specification MIL-PRF-81733 Corrosion inhibiting sealer (Type X).
- (4) Close tolerance bolts passing through dissimilar metals should be coated before installation, with a corrosion inhibiting solid film lubricant conforming to Specification MIL-PRF-46010 and/or MIL-L-46147.
- (5) Washers made of aluminum alloy of suitable design should be used under machine screws, countersunk fasteners, bolt heads and nuts.
- (6) Adjustable parts threads such as tie rod ends, turnbuckles, etc., should be protected with solid film lubrication conforming to Specification MIL-PRF-46010 and/or MIL-L-46147.
- (7) Slip fits should be assembled using wet primer conforming to Specification MIL-PRF-23377G or later, non-drying zinc chromate paste or solid film lubricant conforming to Specification MIL-PRF-46010 and/or MIL-L-46147.
- (8) Press fits should be accomplished with oil containing material conforming to Specification MIL-C-11796, Class 3 and/or MIL-C-16173, Class 1 or with other suitable material that will not induce corrosion.

F. Electrical.

- (1) Bonding and ground connections should be as described by the installation procedure.
- (2) Potting compounds are used to safeguard against moisture. Corrosion in electrical systems and resultant failure can often be attributed to moisture and climatic condition.
- (3) Corrosion of metal can be accelerated because of the moisture absorbed by fungi. Fungi can create serious problems since it can act as an electrolyte, destroying the resistance of electrical insulating surfaces. Specification ASTM D3955 or ASTM D295-58 outlines moisture and fungus resistant varnish to be used.

5. General Corrosion Repair

A. This section provides general guidance on the repair of corroded area. The procedure presented is:

- (1) Gain access to the entire corroded area.
- (2) Mechanically remove the corrosion products
- (3) Determine the extent of the corrosion damage
- (4) Repair or replace the damaged components
- (5) Finish the new or repaired parts.
- (6) Replace removed components

B. Gain access to the entire corroded area.

- (1) Corrosion products typically retain moisture. If those products are not removed, corrosion will continue. Corrosion can take place within layered construction or under (behind) equipment fastened in place.

C. Mechanically remove the corrosion.

- (1) Chemicals will not remove corrosion. The best chemicals can do is interrupt the corrosion cell by either displacing water or shielding corrosion products from oxygen. In either case, the effect is temporary and will need to be renewed.
- (2) Sand mild corrosion.
- (3) Use rotary files or sanding disks for heavier corrosion. Finish up with fine sand paper.

NOTE: Do not use metallic wool. Metal particles will be embedded in the surface, which will initiate additional corrosion.

D. Determine the extent of corrosion damage.

- (1) Direct measurement is simplest.
- (2) Indirect measurement may be necessary
 - (a) Eddy Current or ultrasound tools can be used for thickness measurement away from part edges.

E. Repair or replace corrosion damaged components

- (1) Replace damaged or corroded steel or aluminum fasteners.
- (2) If the material is sheet or plate, the thickness is allowed to be as little as 90% of the nominal thickness.
- (3) This general allowance is not allowed if:
 - (a) The area of the part contains fasteners.
 - (b) The reduced thickness compromises the fit or function of a part.

F. Finish the new or repaired parts

- (1) Apply Alodine or similar anticorrosion compounds to new or repaired parts or
- (2) Apply zinc chromate or
- (3) Apply epoxy fuel tank primer.
- (4) Paint the exterior or visible interior parts according to Section 19 of the applicable Model 172 Service Manual.

G. Replace Removed Components.

6. General

- A. This section contains maps which define the severity of potential corrosion on airplane structure.
- B. Corrosion severity zones are affected by atmospheric and other climatic factors. The maps provided in this section are for guidance when determining types and frequency of required inspections and other maintenance. Refer to [Figure 2](#), [Figure 3](#), [Figure 4](#), [Figure 5](#), [Figure 6](#) and [Figure 7](#).

Figure 1 : Sheet 1 : Corrosion

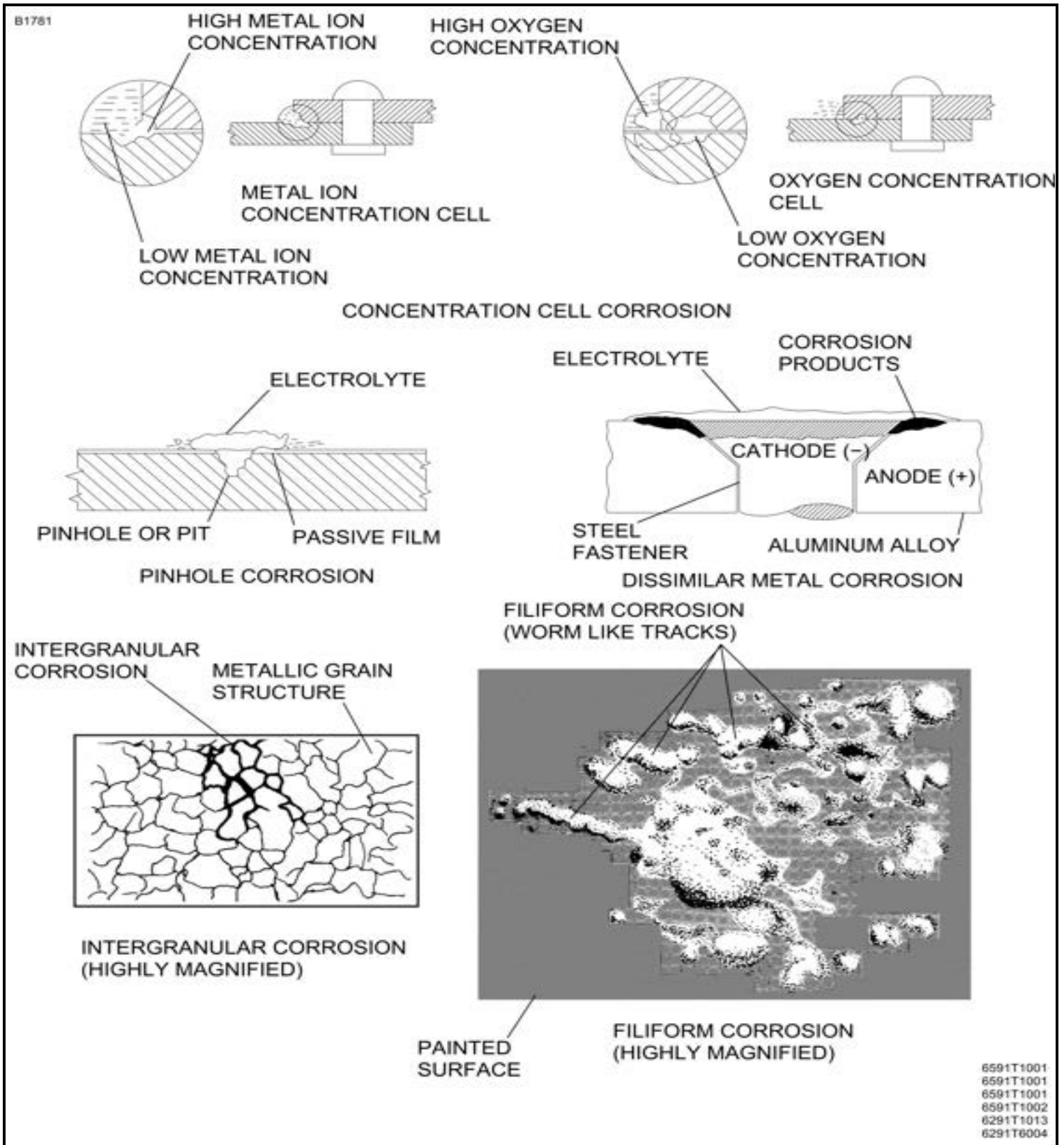


Figure 2 : Sheet 1 : North America Corrosion Severity Map



Figure 3 : Sheet 1 : South America Corrosion Severity Map



Figure 4 : Sheet 1 : Africa Corrosion Severity Map

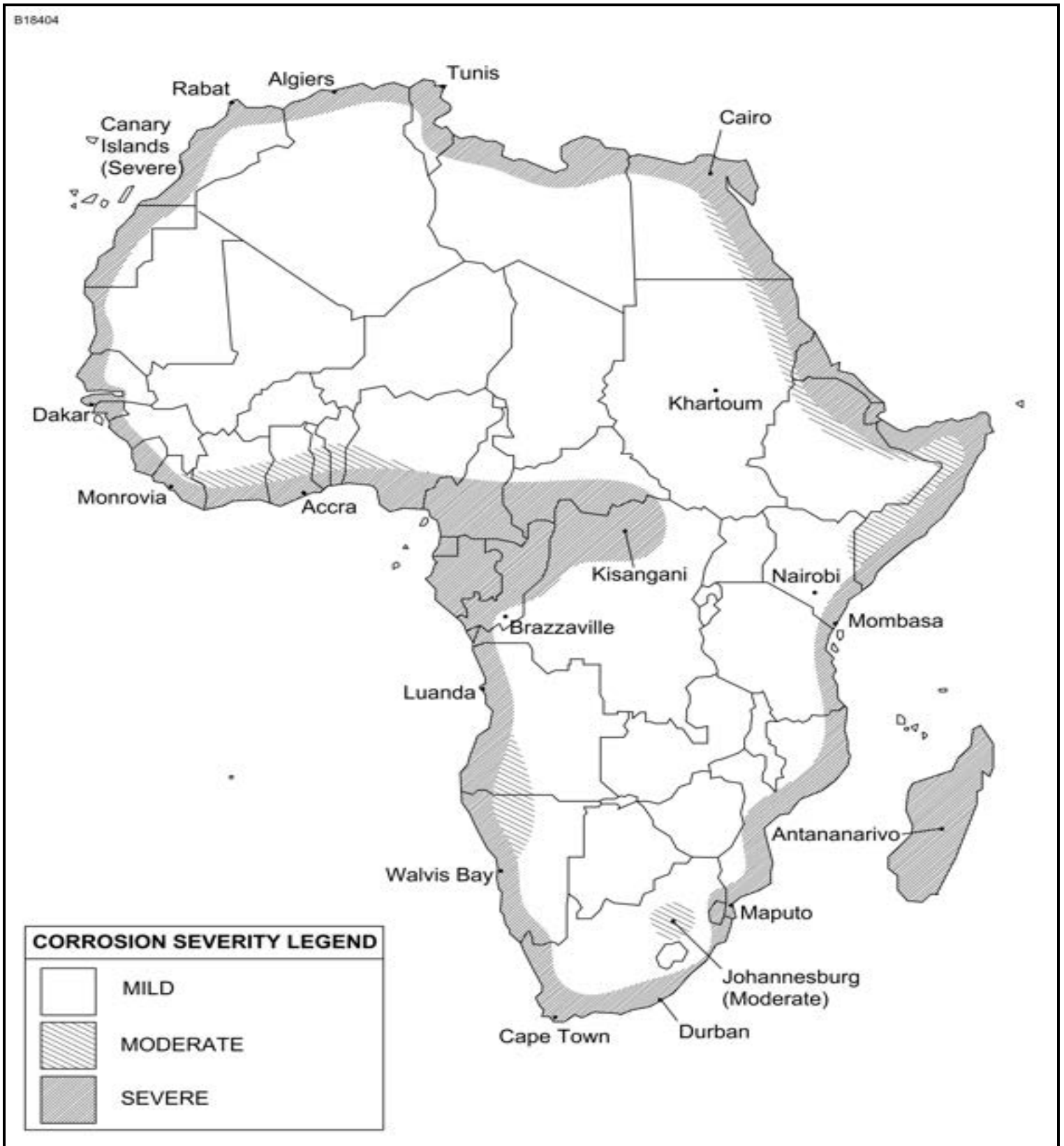


Figure 5 : Sheet 1 : Asia Corrosion Severity Map

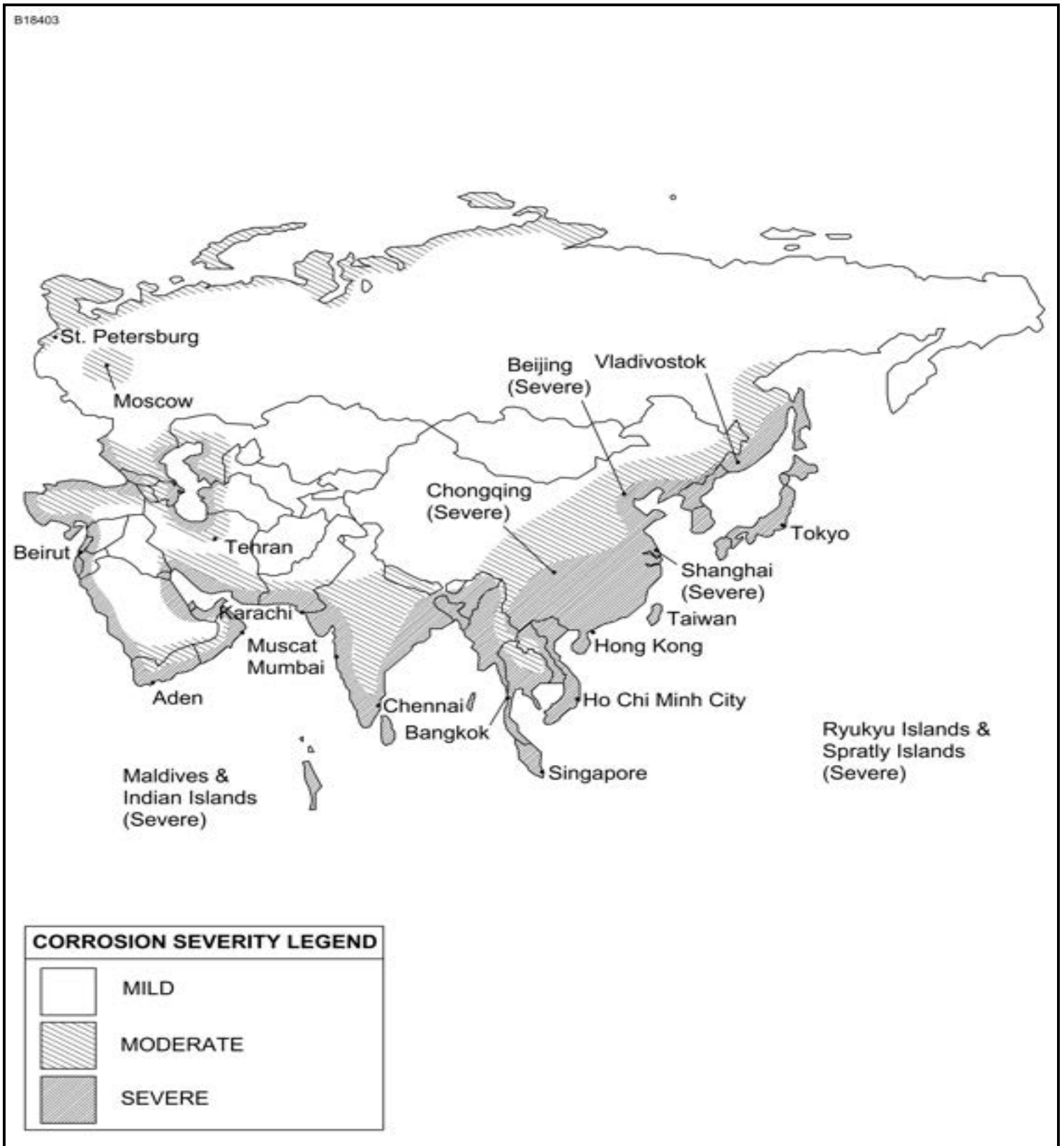


Figure 6 : Sheet 1 : Europe and Asia Minor Corrosion Severity Map

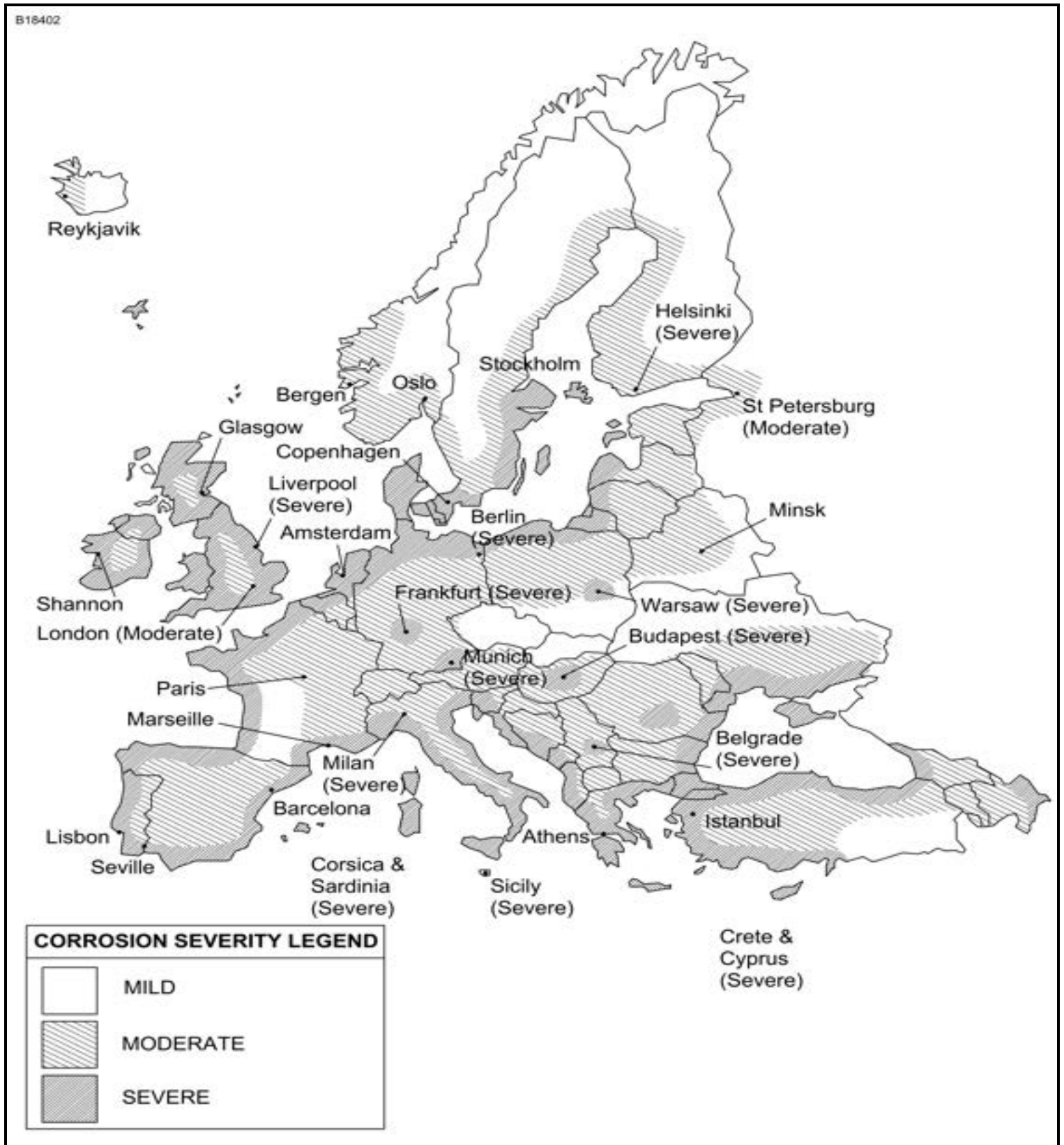
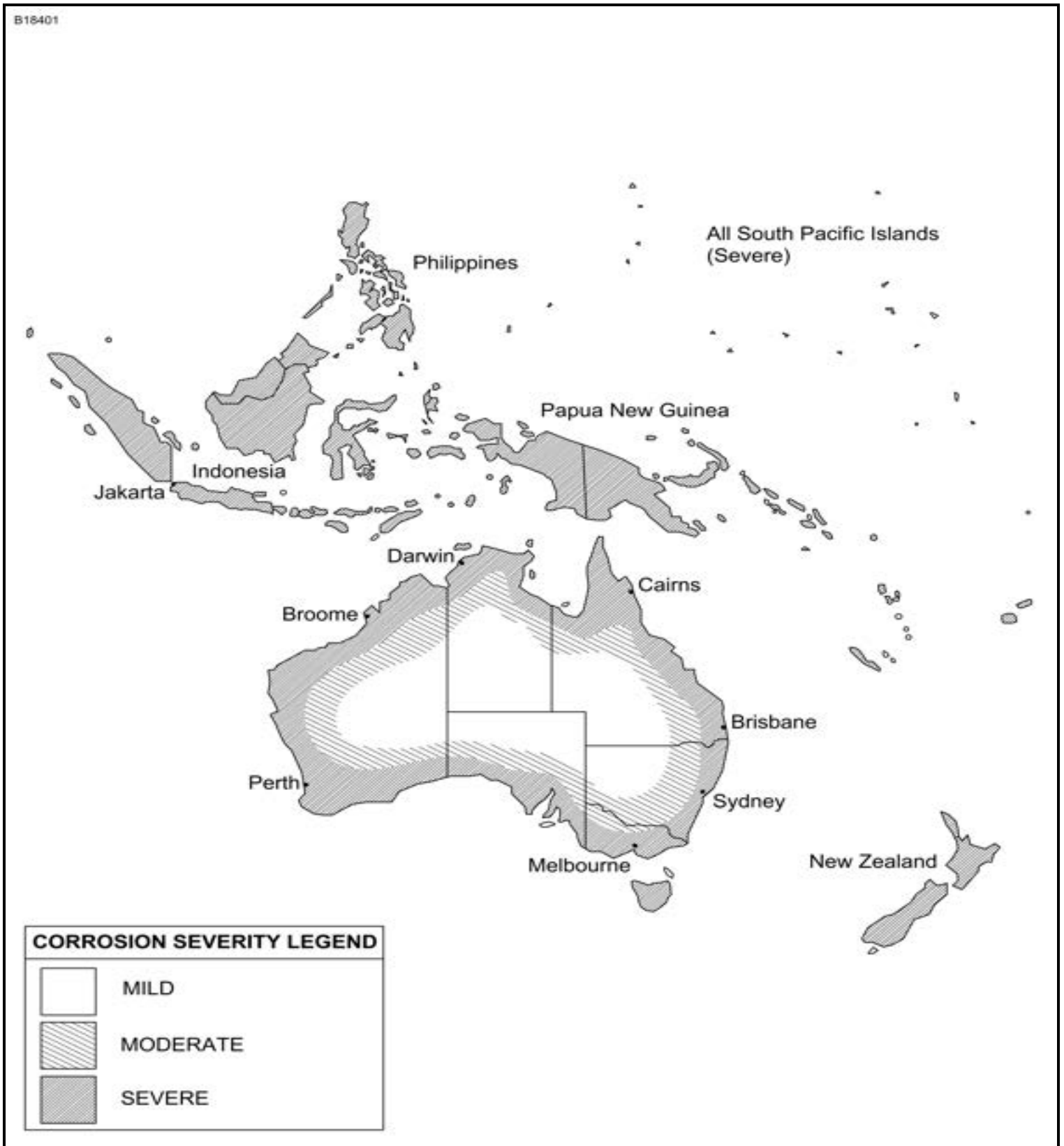


Figure 7 : Sheet 1 : South Pacific Corrosion Severity Map



CORROSION SEVERITY MAPS - DESCRIPTION AND OPERATION

1. General

- A. This section contains maps which define the severity of potential corrosion on airplane structure.
- B. The Corrosion Severity Zones identified in [Figure 1](#), [Figure 2](#), [Figure 3](#), [Figure 4](#), [Figure 5](#), and [Figure 6](#) are given for guidance to determine the types and frequency of required inspections and other maintenance.
- C. Corrosion severity zones are affected by atmospheric and other climatic factors. It is the responsibility of the owner and operator to determine the specific corrosion severity level with respect to the operating environment of the airplane based on geographic location and known environmental conditions. Corrosion Severity Zones are defined as follows:
 - (1) Mild Corrosion Severity Zone - Airplanes operated in arid, temperate or cold regions.
 - (2) Moderate Corrosion Severity Zone - Airplanes operated in tropical or subtropical high humidity regions.
 - (3) Severe Corrosion Severity Zone - Airplanes operated in the following conditions should follow the procedures for severe corrosion zones:
 - (a) Salt water or coastal regions
 - (b) Based in or near industrial or metropolitan areas with heavy atmospheric pollution
 - (c) From airports where the use of chemical de-icers is common
 - (d) Agricultural operations
 - (e) Airplanes with floats installed.

Figure 1 : Sheet 1 : North America Corrosion Severity Map



Figure 2 : Sheet 1 : South America Corrosion Severity Map



Figure 3 : Sheet 1 : Africa Corrosion Severity Map

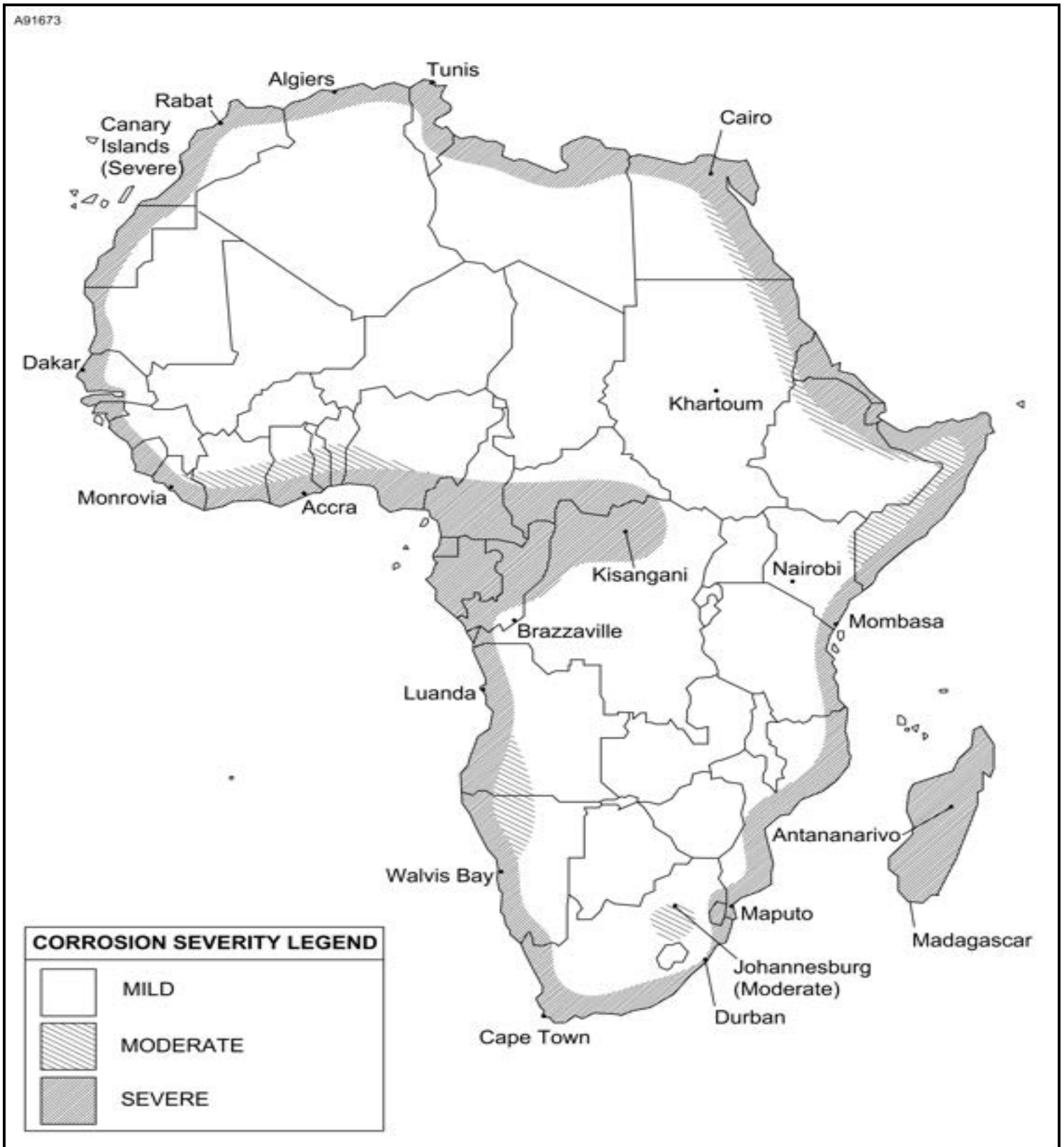


Figure 4 : Sheet 1 : Asia Corrosion Severity Map

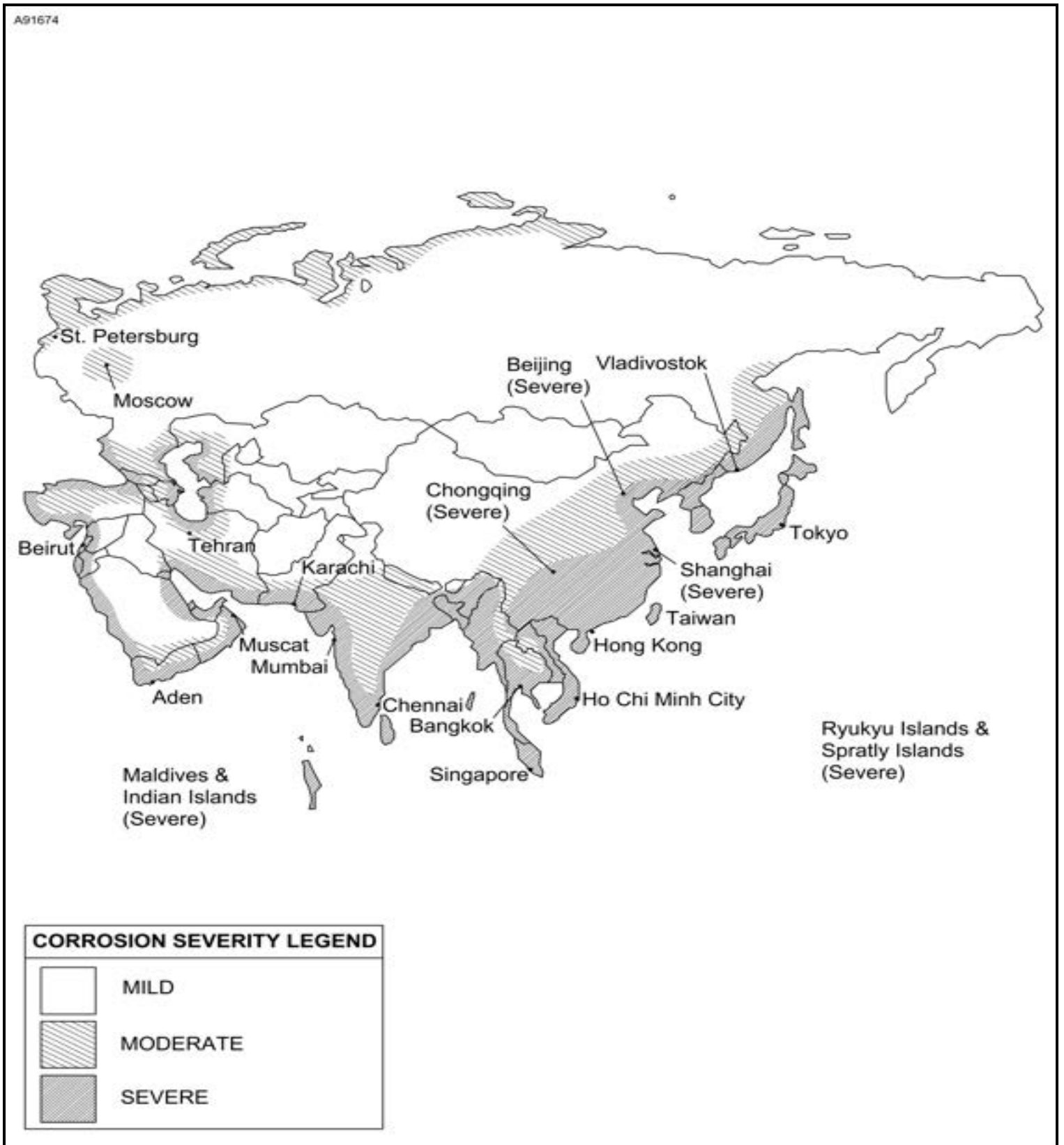


Figure 5 : Sheet 1 : Europe and Asia Minor Corrosion Severity Map

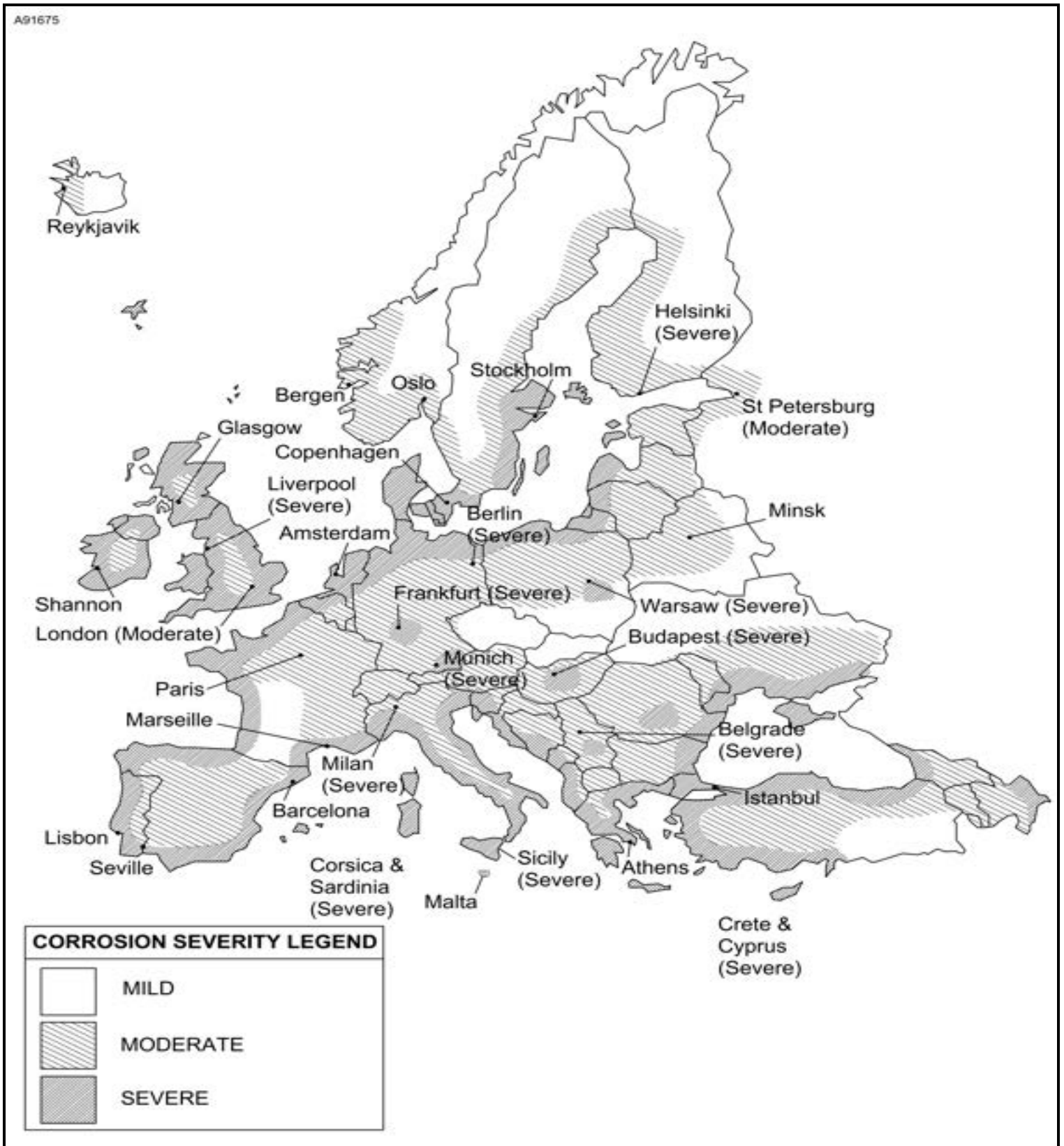
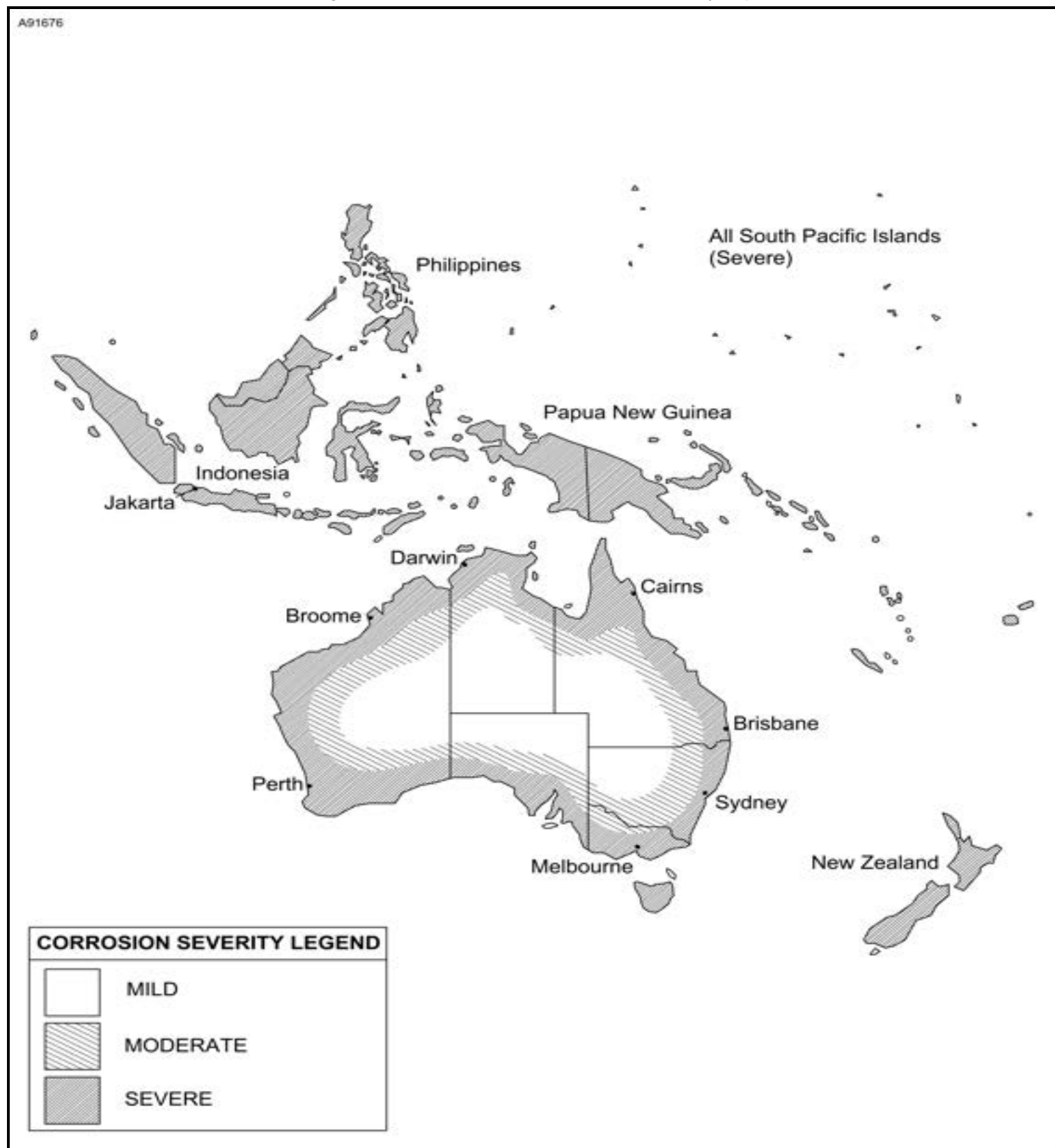


Figure 6 : Sheet 1 : South Pacific Corrosion Severity Map



PARKING, MOORING, STORAGE AND RETURN TO SERVICE - GENERAL

1. Scope

A. This chapter provides maintenance instructions for parking, mooring, storage and return to service.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Wheel Chocks		Available Commercially	To chock landing wheels.
Engine Air Inlet Cover		Cessna Aircraft Cessna Parts Distribution Department 701, CPD 25800 East Pawnee Road Wichita, KS 67218-5590	To prevent entry of moisture and/or foreign particles through cowling.
Pitot Tube Cover		Cessna Aircraft	To prevent entry of moisture and/or foreign particles in pitot tubes.
Static Ground Cable		Available Commercially	To static ground airplane.
Rope (0.375 inch diameter minimum) or equivalent		Available Commercially	To tie down wing and tail.
Dehydrator Plugs	MS27215-1 or -2	Available Commercially	To prevent moisture in cylinders during indefinite storage.
Corrosion Preventive Oil	One part MIL-L-6529, Type 1, with one part Royal "D"	Royal Lubricants Co. Inc. 72 Eagle Rock Ave. East Hanover, NJ 07936	Preserve engine during long term storage.
Preservative Oil	MIL-C-6529	Available Commercially	Preserve engine during long term storage.

3. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:

- (1) The section on parking describes methods, procedures and precautions used when parking the airplane.
- (2) The section on mooring describes procedures and equipment used to moor the airplane.
- (3) The section on storage provides information on recommended storage procedures. Recommendations vary with the length of time the airplane is to be stored.
- (4) The section on return to service describes procedures used when returning the airplane to service from flyable, temporary or indefinite storage.

PARKING - MAINTENANCE PRACTICES

1. General

- A. These maintenance practices cover procedures used to park the airplane.
- B. The airplane should be moored if high winds are anticipated or anytime the airplane remains outside for extended periods of time. Refer to [Mooring - Maintenance Practices](#) for mooring procedures. Refer to [Storage - Maintenance Practices](#) for detailed instructions regarding short term or long term storage.

2. Parking Instructions

- A. Hard Surface and Sod.
 - (1) Position airplane on level surface headed into wind.
 - (2) Set parking brake or chock main gear wheels.
CAUTION: Do not set parking brake during cold weather. Accumulated moisture may freeze brakes, or when brakes are overheated.
 - (3) Install control column lock.

STORAGE - MAINTENANCE PRACTICES

1. General

- A. This section provides maintenance instructions and inspection criteria for airplanes in flyable, temporary and indefinite storage. Refer to the Lycoming Service Letter L180B (or latest revision).
- (1) Flyable storage is defined as a maximum of 30 days of nonoperational status and/or the first 25 hours of intermittent engine operation.
 - (2) Temporary storage is defined as a maximum of 90 days of nonoperational status.
 - (3) Indefinite storage is defined as more than 90 days of nonoperational status.

2. Flyable Storage

- A. Flyable storage is a maximum of 30 days storage with no engine operation and/or the first 25 hours of intermittent engine operation.
- B. Engine temperature and length of operation time are very important in the control of corrosion. The desired flight time for air cooled engines is at least one continuous hour at oil temperatures of 165 degrees F (74 degrees C) to 200 degrees F (93 degrees C) at intervals not to exceed 30 days. The one hour does not include taxi, take-off, and landing time.
- C. The aircraft temperature gages must operate correctly.
- D. The cooling air baffles must be in good condition and fitted properly.
- E. The oil cooler system must be of the proper size for the engine and airframe. Oil coolers that are not the correct size can cause an engine to operate at too high or low a temperature. Low temperatures are as dangerous as high temperatures because of build-up of water and acids.
- F. Pulling the propeller through by hand is not recommended when the airplane has not operated for approximately a week . Pulling the propeller through by hand before you start the engine or to minimize corrosion can cause damage. When the propeller is pulled through by hand, the rings can remove oil from the cylinder walls. The cam load made by the valve train removes oil from the cam and followers. After two or three times of pulling the propeller through by hand without engine starts, the cylinders, cam, and followers are left without the correct quantity of oil film. Engine starts without the correct lubrication can cause the engine parts to score, which can cause damage to the engine.
- G. The pitot tube, static air vents, air vents, openings in the engine cowl, and other openings must have protective covers installed to prevent entry of foreign object debris.

3. Temporary Storage

NOTE: The airplane is constructed of corrosion resistant, epoxy primed aluminum, which will last indefinitely under normal conditions, if kept clean. The alloys are subject to oxidation. The first indication of corrosion on unpainted surfaces is in the form of white deposits or spots. Corrosion on painted surfaces shows up as the paint being discolored or blistered. Storage in a dry hangar is necessary for good preservation and must be procured if possible.

A. Temporary Storage of the Airplane

- (1) The tiedown rings must be used as electrical ground points for all ground wires during the refuel procedures.
- (2) Fill the fuel tanks with the correct grade of gasoline.

WARNING: During all fueling procedures, fire fighting equipment must be available. In case of an accidental disconnect of a ground wire. Two ground wires must be used from different points on the airplane which are attached to separate ground stakes . Make sure to ground the fuel nozzle the airplane.

- (3) Clean and wax the airplane thoroughly.
- (4) Clean all oil or grease from the tires.
- (5) Apply a tire preservative to the tires.
- (6) Cover the tires to protect against grease and oil.
- (7) Block up the fuselage to relieve the pressure on the tires or rotate the wheels every 30 days.

NOTE: This aids to change supporting points and prevent flat spotting on the tires.

- (8) Lubricate all airframe items and cover all openings which allow moisture and/or dust to enter.
- (9) Charge the avionics standby battery and the Garmin GI 275 Standby Battery (If Installed).

NOTE: For maximum battery life, the avionics standby battery and Garmin GI 275 Standby Battery (if

installed) must be kept partially charged with the aircraft main battery and external power.

- (a) Connect external power to the airplane.
 - (b) Put the MASTER switch in the ON position.
 - (c) Allow the avionics standby battery and the Garmin GI 275 Standby Battery (if installed) to charge for 1 hour.
 - (d) Put the MASTER switch in the OFF position.
 - (e) Disconnect external power from the airplane.
- (10) Remove battery and store in a cool, dry place. Service the battery periodically and charge as required.
- (11) Every 90 days, install a fully charged main aircraft battery and charge the avionics standby battery and the Garmin GI 275 Standby Battery (if installed). Use the battery charge procedure in this document.
- (12) Disconnect the spark plug leads.
- (13) Remove the upper and lower spark plugs from each cylinder.
- (14) Use a portable pressure sprayer to spray a preservative oil in the upper spark plug hole of each cylinder (the piston must be in a down position). Rotate the crankshaft as each pair of cylinders is sprayed.
- (15) Rotate the crankshaft so that no piston is at a top position.
- (16) If the airplane is to be stored outside, set the two bladed propeller in a horizontal position to provide maximum clearance for passing airplanes.
- (17) Spray each cylinder without moving the crankshaft to cover all interior surfaces of the cylinder above the piston.
- (18) Install the spark plugs and attach the spark plug leads.
- (19) Spray two ounces of the preservative oil into the engine interior through the oil filler tube.
- (20) Seal all engine openings exposed to the atmosphere using suitable plugs. Attach a red streamer at each point that a plug is installed.
- CAUTION: The pitot tube, static source vents, air vent openings in the engine cowlings and other similar openings must have protective covers installed to prevent entry of foreign material.**
- (21) If the airplane is to be stored outside, tie it down using the procedures outlined in Chapter 10, [Mooring - Maintenance Practices](#).
- (22) Attach a warning placard to the propeller to identify that the propeller must not be moved while the engine is in storage.

4. Indefinite Storage

- A. Put the airplane in indefinite storage.

NOTE: Periodic inspections must be performed to make sure of the integrity of preservation methods. Refer to Chapter 10, [Inspection During Indefinite Storage](#).

- (1) Operate the engine for the oil temperature to reach the normal operating temperature.
NOTE: Normal operating temperature is within the green arc of the oil temperature gage. The engine oil must be drained while the engine is still warm.
- (2) Shut off the engine and remove the lower cowling to drain the engine oil. Refer to Chapter 71, [Cowling - Maintenance Practices](#).
- (3) Lift the nose of the airplane slightly to aid in the removal of sludge in the engine oil sump.
WARNING: Avoid skin contact with engine oil. Any engine oil that inadvertently gets on the skin should be immediately removed.
- (4) Remove and discard the wire from the drain plug.
- (5) Remove the drain plug and let the oil drain into an applicable container.
- (6) Install plug in sump when all oil is drained.
CAUTION: The corrosion preventive mixture is harmful to paint and shall be wiped from painted surfaces immediately.
- (7) Fill oil sump to normal capacity with thoroughly mixed corrosion preventative oil. Refer to Chapter 10, [Parking, Mooring, Storage and Return to Service - General](#).
- (8) Remove the top spark plugs.
- (9) Slowly turn the propeller with the crankcase full of oil, through two revolutions.

- (10) Allow the engine to stand for ten minutes, then turn the propeller back and forth through 90 degrees for twelve cycles.
- (11) Drain the preservative oil.
- (12) Use MIL-C-6529 oil Type 1, to spray the exhaust port and valve of each cylinder. The piston must be approximately 1/4 turn before top center of the exhaust stroke.
- (13) Use an airless spray gun to spray two ounces of MIL-C-6529 oil, Type 1, into each cylinder through the spark plug hole.
- (14) For all spraying, the spray nozzle temperature must be maintained between 200°F (93.33°C) and 220°F (104.44°C).
- (15) Install dehydrator plugs in the upper spark plug holes. Make sure the dehydrator plugs are blue in color when installed.
- (16) Cover spark plug lead terminals with shipping plugs or other suitable covers.
- (17) Set the throttle in the full open position.
- (18) Place a bag of desiccant in the induction air intake and seal the opening with moisture resistant paper and tape.
- (19) Place a bag of desiccant in the exhaust tailpipe and seal openings with moisture resistant tape.
- (20) Seal the cold air inlet to the heater muff with moisture resistant tape.
- (21) Seal the engine breather tube by inserting a plug in the breather hose and clamping it in place.
- (22) Seal all other engine openings exposed to the atmosphere. Use applicable plugs or non-hydroscopic tape.
- (23) Attach a red streamer to each location where plugs or tapes are installed. Attach the red streamers outside the sealed area with tape or to the inside of the sealed area with safety wire to prevent wicking of moisture into the sealed area.

CAUTION: The corrosion preventive mixture is harmful to paint and must be wiped from painted surfaces immediately.

- (24) Drain corrosion preventative mixture from engine sump.
- (25) Install and safety the drain plug with wire. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
- (26) Install the lower cowling. Refer to Chapter 71, [Cowling - Maintenance Practices](#).
- (27) Attach a warning placard on the throttle control knob to identify that the engine contains no lubricating oil.
- (28) Placard the propeller to the effect that it must not be moved while the engine is in storage.

NOTE: As an alternate method of indefinite storage, the airplane may be serviced according to the temporary storage procedures. Run up at the maximum intervals of 90 days, and then service again according to the procedures in temporary storage.

5. Inspection During Flyable Storage

- A. There are no inspection requirements for airplanes in flyable storage.

6. Inspection During Temporary Storage

- A. Airplanes in temporary storage must use the following procedure to complete an inspection.
 - (1) Inspect the airframe for corrosion every 30 days.
 - (2) Remove the dust collections as frequently as possible.
 - (3) Clean and wax airplane as necessary.
 - (4) Every 30 days do a minimum of one cylinder inspection for interior corrosion.

NOTE: Do not move the crankshaft during an inspection of the interior of cylinder.

7. Inspection During Indefinite Storage

- A. Airplanes in indefinite storage must use the following procedure to complete an inspection.
 - (1) Inspect cylinder Protex plugs every seven days. Change Protex plugs if their color indicates an unsafe condition.
 - (2) If Protex plugs have changed color in one half of the cylinders, all desiccant material in the engine must be replaced with new material.
 - (3) Inspect the interior of one cylinder for corrosion through the spark plug hole and remove at least one rocker box cover and inspect the valve mechanism.

CAUTION: The corrosion preventive mixture is harmful to paint and shall be wiped from painted surfaces immediately.

- (4) Spray cylinder interiors with corrosion preventative mixture every six months and replace the desiccant and Protex plugs.

MOORING - MAINTENANCE PRACTICES

1. General

A. This section provides instructions for mooring the airplane.

2. Mooring Procedures

A. When mooring the airplane in the open, head into the wind if possible. Tie down the airplane as follows:

- (1) Tie ropes, cables, or chains to the wing tie-down fittings located at the upper end of each wing strut. Secure the opposite ends of ropes, cables, or chains to ground anchors.
- (2) Secure a tie-down rope (no chains or cables) to upper strut of the nose gear, and secure opposite end of rope to a ground anchor.
- (3) Secure the middle of a rope to the tail tie-down ring. Pull each end of rope away at a 45° angle and secure to ground anchors at each side of tail.
- (4) Secure control lock on pilot control column. If control lock is not available, tie pilot control wheel back with front seat belt.
- (5) These aircraft are equipped with a spring-loaded steering bungee which affords protection against normal wind gusts. However, if extremely high wind gusts are anticipated, additional external locks may be installed.

RETURN TO SERVICE - MAINTENANCE PRACTICES

1. General

- A. Airplanes which have been in storage must be returned to service prior to first flight. Procedures for returning an airplane to service depend on length of time the airplane was stored. Refer to the following procedures for return to service after flyable storage, temporary storage and indefinite storage.

2. Flyable Storage Return to Service

- A. Accomplish the following:
 - (1) Perform a thorough preflight inspection.
NOTE: At the end of the first 25 hours of engine operation, drain engine oil, change oil filter and service engine correct grade and quantity of engine oil.

3. Temporary Storage Return to Service

- A. Accomplish the following:
 - (1) Remove airplane from blocks and check tires for proper inflation. Check for proper nose gear strut inflation.
 - (2) Check battery and install.
 - (3) Ensure oil sump has proper grade and quantity of engine oil.
 - (4) Service induction air filter and remove warning placard from propeller.
 - (5) Remove materials used to cover openings.
 - (6) Remove, clean and gap spark plugs.
 - (7) While spark plugs are removed, rotate propeller several revolutions to clear excess rust preventative oil from cylinders.
 - (8) Install spark plugs. Torque plugs to 330 inch-pounds and connect spark plug leads.
 - (9) Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks and fuel lines for moisture and sediment. Drain enough fuel to eliminate any moisture and sediment.
 - (10) Perform a thorough preflight inspection, then start and warm up engine.

4. Indefinite Storage Return to Service

- A. Accomplish the following:
 - (1) Remove aircraft from blocks. Check tires for correct inflation.
 - (2) Check and install battery.
 - (3) Remove all materials used to seal and cover openings.
 - (4) Remove warning placards posted at throttle and propeller.
 - (5) Remove drain plug and allow preservative oil to drain from engine sump.
NOTE: Preservative oil which remains in sump will mix with engine oil. Flushing of the oil system is not required.
 - (6) Remove old oil filter. Install new oil filter.
 - (7) Reinstall drain plug and service engine with correct quantity and grade of engine oil.
 - (8) Service and install induction air filter.
 - (9) Remove dehydrator plugs and spark plugs/plugs installed in spark plug holes. Rotate propeller several revolutions by hand to clear corrosion preventative mixture from cylinders.
 - (10) Clean, gap and install spark plugs.
 - (11) Rotate propeller by hand through compression stroke of each cylinders to check for possible liquid lock. Torque plugs to 330 inch-pounds.
 - (12) Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks and fuel lines for moisture and sediment. Drain enough fuel to eliminate any moisture and sediment.
 - (13) Perform a thorough preflight inspection, then start and warm up engine.
 - (14) Thoroughly clean and test fly airplane.

COMMUNICATIONS - GENERAL

1. Scope

- A. This chapter describes and provides maintenance instructions for equipment which furnishes a means of communicating from one part of the airplane to another, and between the airplane and other airplanes or ground stations
- B. Additional information on communications equipment can be found in the Wiring Diagram Manual supplied with the airplane.
- C. Technical publications available from the manufacturer of the various components and systems which are not covered in this manual must be utilized as required for maintenance of those components and systems.

2. Definition

- A. Information contained in this chapter provides the basic procedures which can be accomplished at the flight line level; such as, removal and installation of components and system operation.
- B. This chapter is divided into sections to aid maintenance personnel in locating information. A brief description of each section is as follows:
 - (1) The speech communication section describes radio equipment used for reception and transmission of voice communication.
 - (2) The audio integrating system section describes that portion of the system which controls the output of the communications and navigation receivers into the pilot and passengers headphones and speakers, and the output of the pilot's microphone into the communications transmitters.
 - (3) The static discharging section describes the static discharge wicks used to dissipate static electricity.

COMMUNICATIONS - MAINTENANCE PRACTICES

1. General

- A. This section gives maintenance practices for the NAV/COM component removal and installation.
- B. The dual navigation/communications (NAV/COM/) radio is in the instrument panel.
- C. For airplanes with the Garmin G1000, the center of the Garmin G1000 is the GIA 63 Integrated Avionics Unit (IAU), which is in the tailcone. The GIA 63 operates as a primary communications center that connects all of the Line Replaceable Units (LRUs) with the Primary Function Display (PFD) and Multi-Function Display (MFD). The GIA 63 has the GPS receiver, VHF NAV/COM receivers, and system integration microprocessors. The GIA 63 has the Wide Area Augmentation System (WAAS) installed. The GIA 63 transmits directly to the PFD and MFD by a High-Speed Data Bus (HSDB) Ethernet connection. Software and configurations are sent from the displays through the GIA 63 to the LRU's in the system.

2. Troubleshooting

- A. For troubleshooting procedures of the GIA 63 Integrated Avionics Units in airplanes with Garmin G1000, refer to the Garmin G1000 Line Maintenance Manual.

3. NAV/COM Radio Removal/Installation

CAUTION: Do not interchange the KX-155A and the KX-165A NAV/COM radios. The wiring is not the same for the two different radios. If these radios are interchanged and used with the same wiring, damage can occur to the KX-155A and/or the KX-165A NAV/COM radios.

NOTE: The airplane has dual NAV/COM units installed. One NAV/COM unit contains the glideslope function. The removal and installation are typical.

- A. Remove the NAV/COM Unit (Refer to [Figure 201](#)).
 - (1) Put the MASTER switch in the OFF position.
 - (2) Put the NAV/COM switch in the OFF position.
 - (3) Disengage the NAV/COM 1 and/or NAV/COM 2 circuit breaker.
 - (4) Turn the recessed mounting screw on the face of the NAV/COM unit counterclockwise until the locking paw releases from the mounting tray.
 - (5) Move the NAV/COM unit aft out of the mounting tray to disconnect the electrical connectors (PI1004, PI1000, and PI1002).
 - (6) Remove the NAV/COM unit from the mounting tray.
- B. Install the NAV/COM Unit (Refer to [Figure 201](#)).
 - (1) Put the NAV/COM unit in the mounting tray and move the unit forward.
 - (2) Connect the electrical connectors (PI1004, PI1000, and PI1002).
 - (3) Turn the recessed mounting screw on the face of the NAV/COM unit clockwise until the NAV/COM unit is attached to the mounting tray.
 - (4) Engage the NAV/COM 1 and/or NAV/COM 2 circuit breaker.
 - (5) Put the MASTER switch in the ON position.
 - (6) Put the NAV/COM switch in the ON position and make sure that the electronic display comes on.
 - (7) Put the MASTER and NAV/COM switches in the OFF position.

4. GIA 63 Integrated Avionics Unit (Garmin G1000) Removal/Installation

NOTE: The airplane has dual integrated avionics units installed. The removal and installation are typical.

- A. Remove the Integrated Avionics Unit (Refer to [Figure 202](#)).
 - (1) Put the MASTER switch in the OFF position.
 - (2) Disengage the NAV/COM 1 and/or NAV/COM 2 circuit breaker.
 - (3) Remove the tailcone access/inspection plate ([310AR](#)) to get access to the integrated avionics units. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
 - (4) Push on the screw and turn it 90 degrees counterclockwise to release the lever.
 - (5) Move the lever up to disengage the locking stud with the dogleg slot in the mounting rack.
 - (6) Remove the unit from the mounting rack.
- B. Install the Integrated Avionics Unit (Refer to [Figure 202](#)).

CAUTION: Make sure that the unit goes into position without resistance. Damage to the connectors, unit, or mounting rack will occur if the unit is pushed into position with force.

NOTE: The unit must be in position in the mounting rack to let the locking stud engage the channel.

- (1) Carefully put the unit in position in the mounting rack.
- (2) Push the lever down toward the bottom of the unit to engage the locking stud with the dogleg slot in the mounting rack.
- (3) Push on the screw and turn it 90 degrees clockwise to attach the lever.
- (4) Install the tailcone access/inspection plate (310AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (5) Engage the NAV/COM 1 and/or NAV/COM 2 circuit breaker.
- (6) Put the MASTER switch in the ON position.
- (7) Do a check for correct operation. Refer to the Garmin G1000 Line Maintenance Manual.
- (8) Put the MASTER and NAV/COM switches in the OFF position.

5. VHF Antenna Removal/Installation

NOTE: The removal and installation procedures are typical for all VHF antennas.

NOTE: The left VHF antenna is also the GDL-69A antenna and a GPS antenna.

A. Remove the VHF Antenna (Refer to Figure 203).

- (1) Put the MASTER switch in the OFF position.
- (2) Remove the four screws that attach the VHF antenna to the upper surface of the fuselage.
- (3) Pull the antenna away from the fuselage to disconnect the coax connector from the antenna.

NOTE: Coax connector reference designators for airplanes without the Garmin G1000 are PC1001 for VHF1 and PC1002 for VHF2.

NOTE: Coax connector reference designators for airplanes with the Garmin G1000 are PF1002 for VHF1 and PC1007 for VHF2.

- (4) Attach the coax cable to the airplane structure so it will not fall into the headliner area.

B. Install the VHF Antenna (Refer to Figure 203).

- (1) Connect the coaxial connector to the antenna.

NOTE: Coax connector reference designators for airplanes without the Garmin G1000 are PC1001 for VHF1 and PC1002 for VHF2.

NOTE: Coax connector reference designators for airplanes with the Garmin G1000 are PF1002 for VHF1 and PC1007 for VHF2.

- (2) Attach the antenna to the upper surface of the fuselage with the four screws.

6. NAV Antenna Removal/Installation

A. Remove the NAV Antenna (Refer to Figure 204).

- (1) Put the MASTER switch in the OFF position.
- (2) Remove the screws that attach the NAV antenna to the tail.
- (3) Carefully remove the fillet seal from the junction of the NAV antenna and the skin of the airplane.
- (4) Pull the antenna away from the fuselage to disconnect the coax connector from the antenna.

B. Install the NAV Antenna (Refer to Figure 204).

- (1) Connect the coaxial connector to the antenna.
- (2) Attach the antenna to the tail with the screws.
- (3) Clean and fillet seal the interface area of the antenna base and fuselage with Type VI sealant. Refer to Chapter 20, Fuel, Weather and High Temperature Sealing for a list of Type VI sealants.

7. Microphone Switch Removal/Installation

A. Remove the Microphone Switch (Refer to Figure 205).

- (1) Remove the nut that attaches the microphone switch (S1) to the escutcheon.
- (2) Remove the screw that attaches the escutcheon to the control wheel.

- (3) Lift up the escutcheon to get access to the microphone switch and disconnect the microphone switch from the control wheel connection.

B. Install the Microphone Switch (Refer to [Figure 205](#)).

- (1) Connect the microphone switch (S1) to the connection in the control wheel.
- (2) Attach the microphone switch to the escutcheon with the nut.
- (3) Set the escutcheon in position and install the screw in the escutcheon.

8. Microphone Switch Button Cleaning

A. Clean the Switch Button (Refer to [Figure 205](#)).

CAUTION: Make sure that you clean the switch. Oil and dirt can collect on the internal electrical contacts of the switch and cause the button to operate incorrectly.

- (1) Apply a sufficient quantity of electrical contact cleaning spray around the full edge of the button so it will soak down into the switch.

NOTE: The electrical cleaner will help to remove oil and dirt from the internal electrical contacts of the switch. The recommended contact cleaner is Zip-Chem Aviation Products D-5026 NS Aerosol or equivalent.

- (2) Press the button many times to make sure the cleaner gets into the internal electrical contacts of the switch.
- (3) Complete an operational check of the switch.

NOTE: The transmit light on the com radio will come on when the power is turned on.

- (4) If the button does not operate after the first application of the electric cleaner, apply more cleaner.
- (5) If the button continues to operate incorrectly, replace the microphone switch. Refer to [Microphone Switch Removal/Installation](#).

Figure 201 : Sheet 1 : NAV/COM Installation

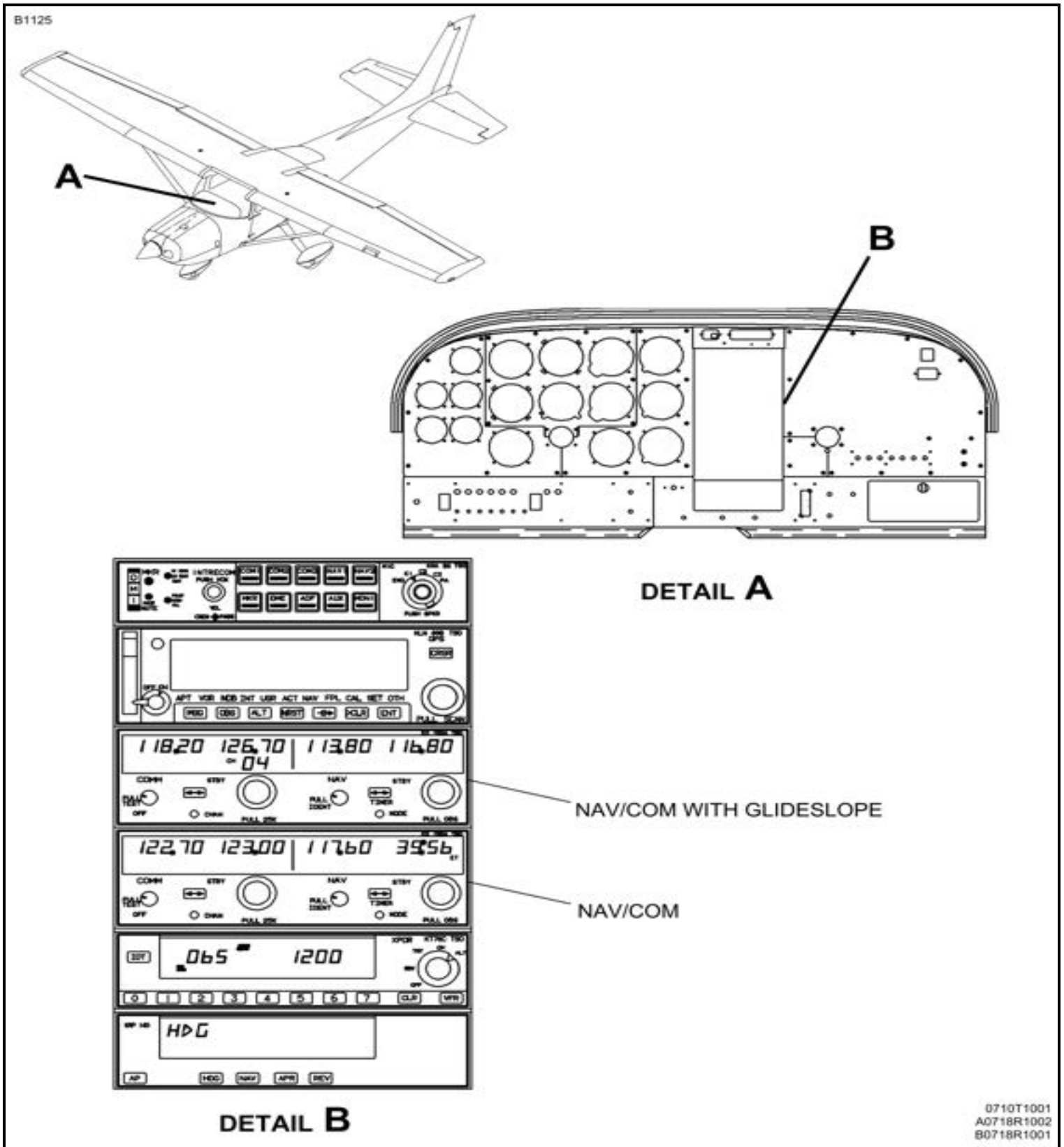


Figure 202 : Sheet 1 : Tailcone Avionics Installation

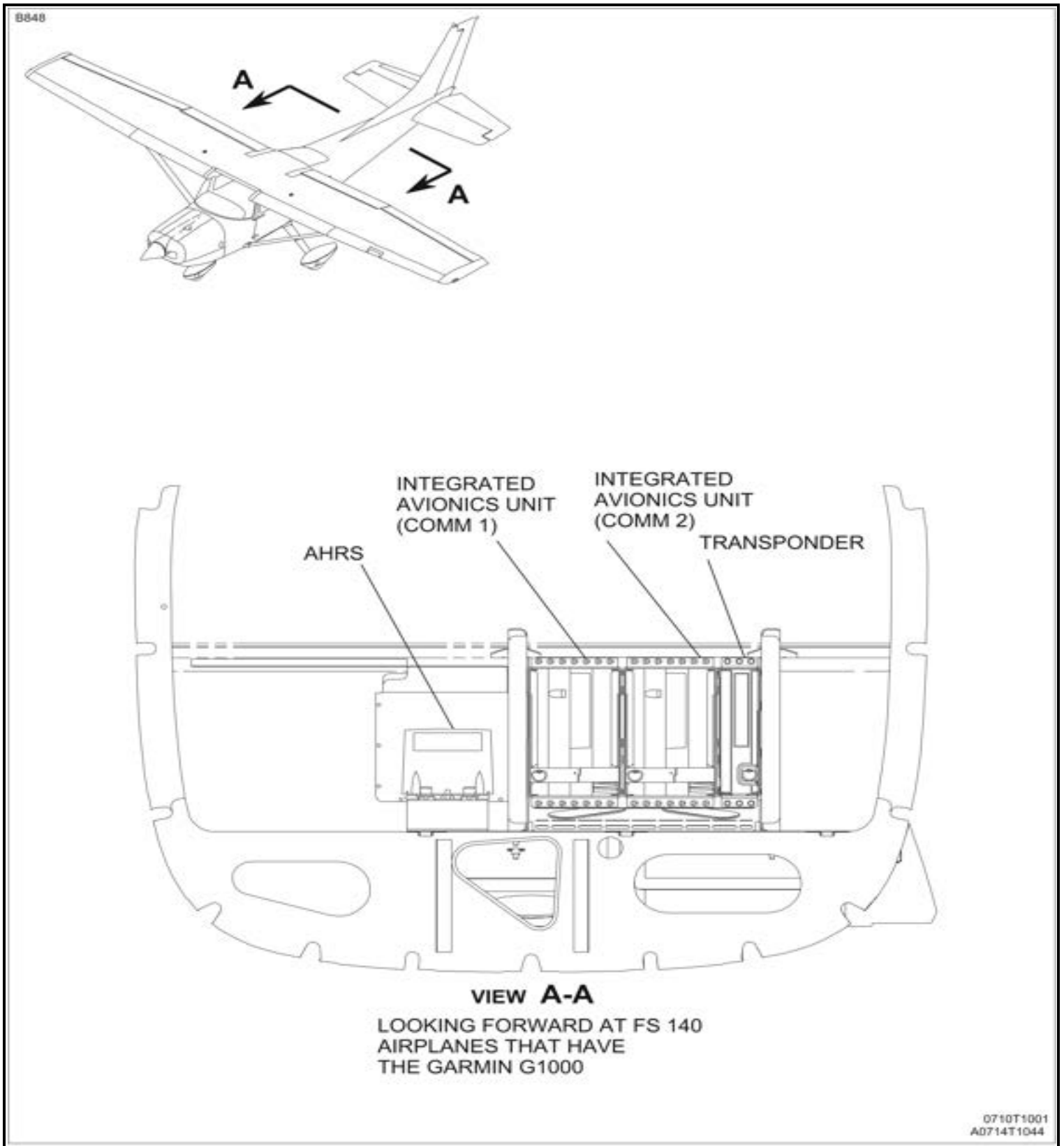


Figure 203 : Sheet 1 : VHF Communication Antenna Installation

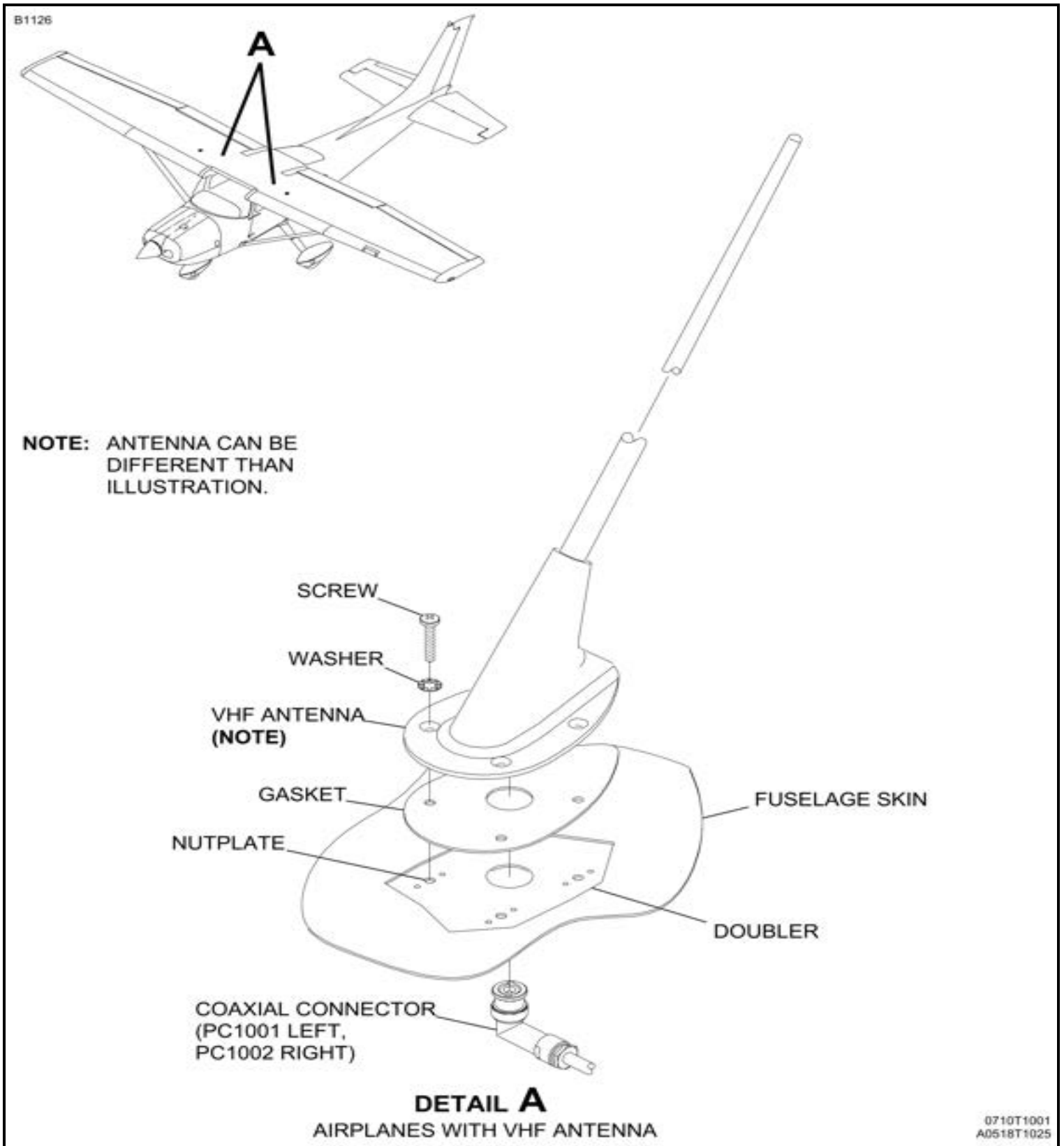


Figure 203 : Sheet 2 : VHF Communication Antenna Installation

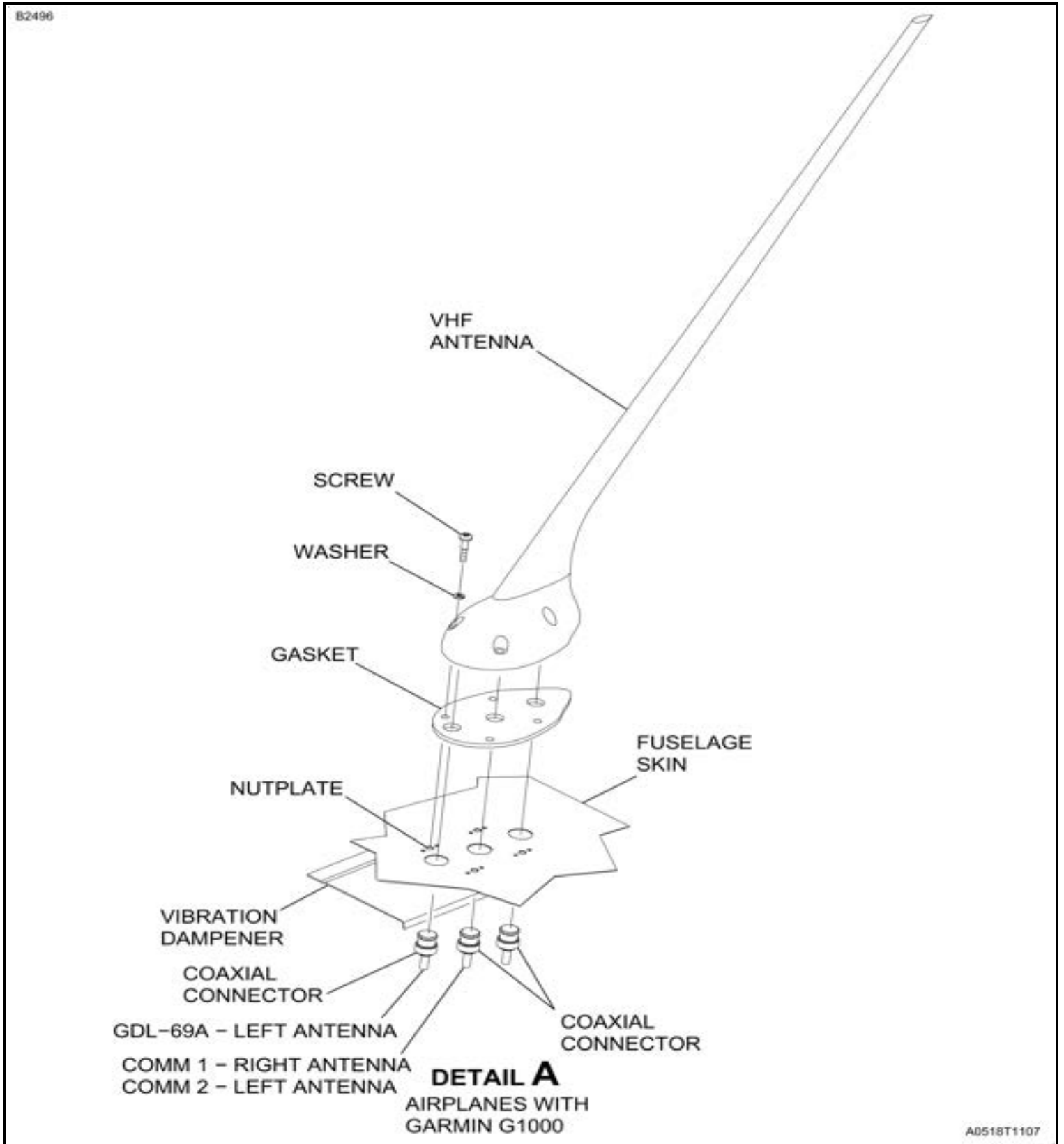


Figure 204 : Sheet 1 : NAV Antenna Installation

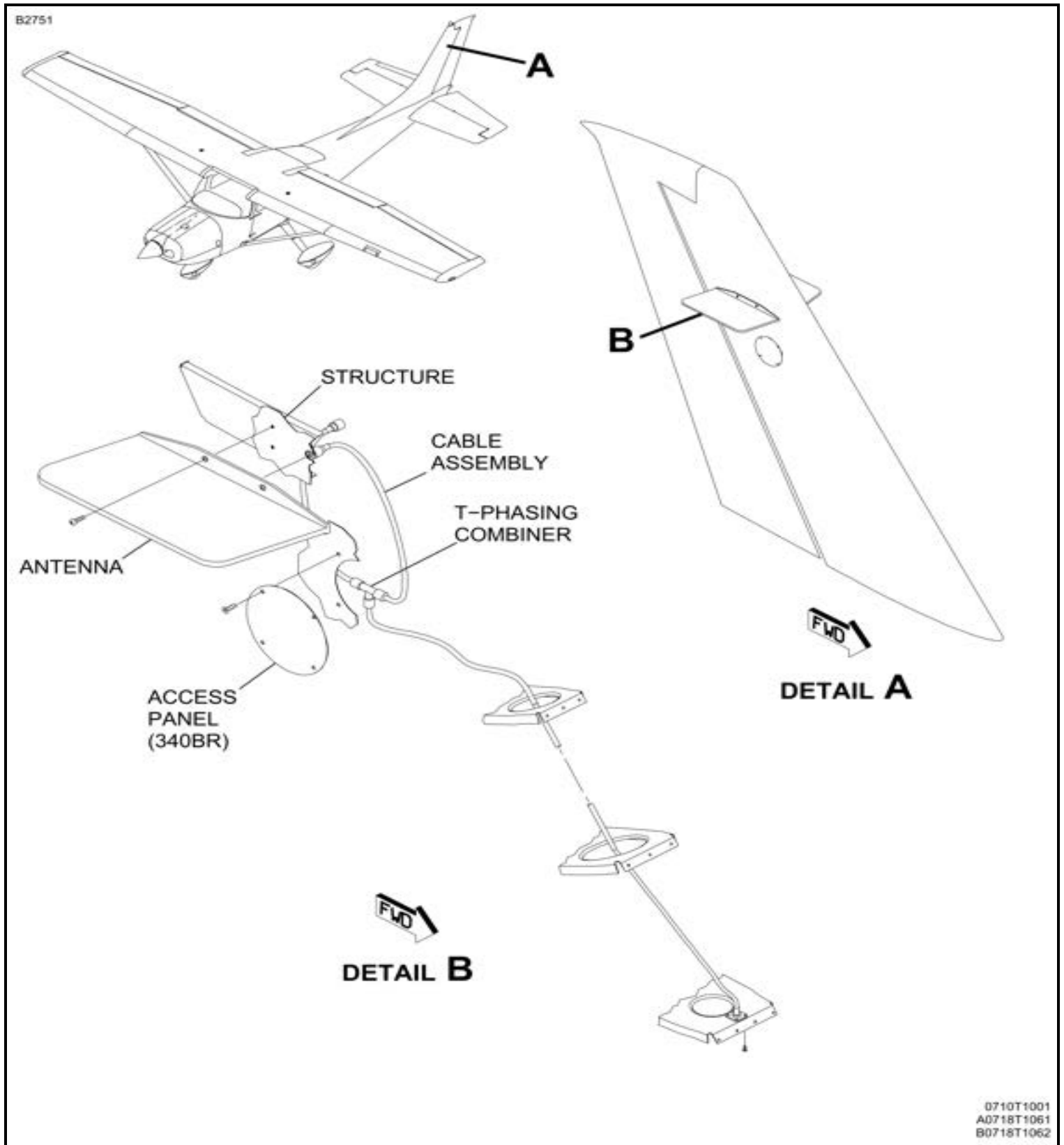


Figure 205 : Sheet 1 : Microphone Switch

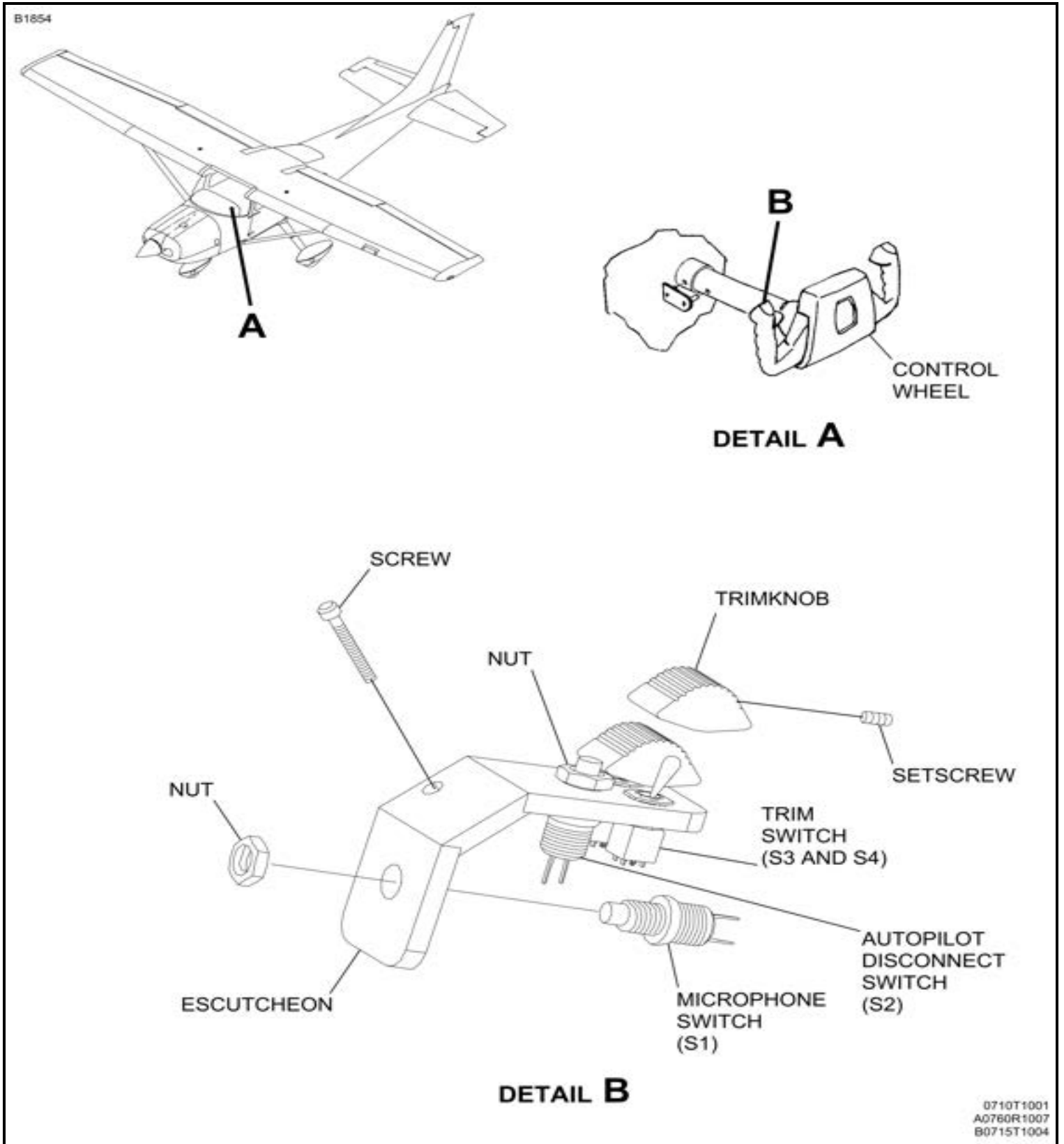
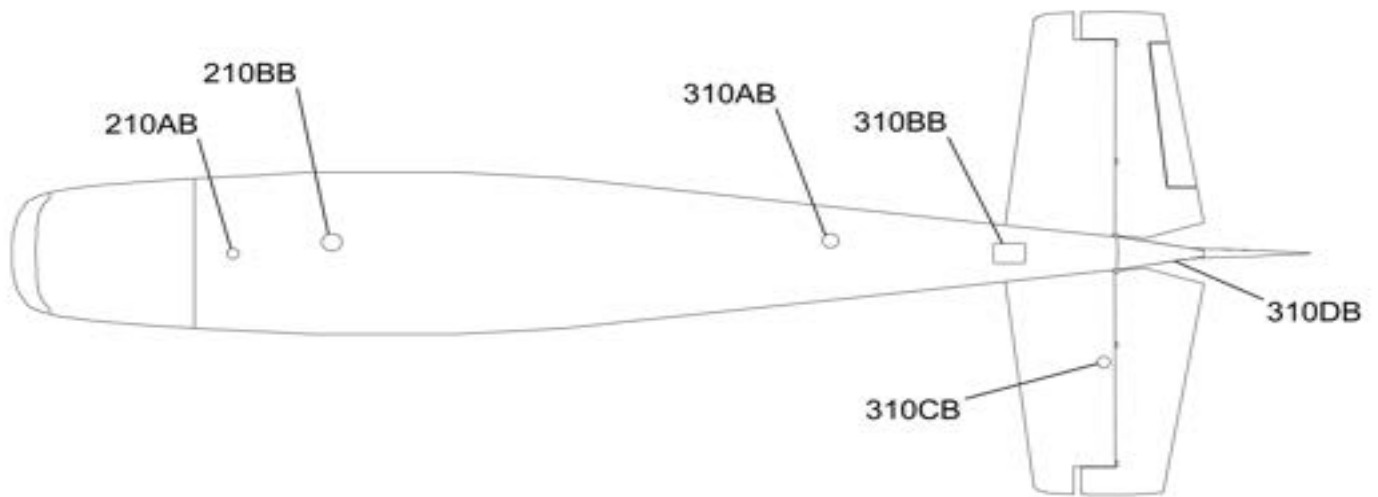
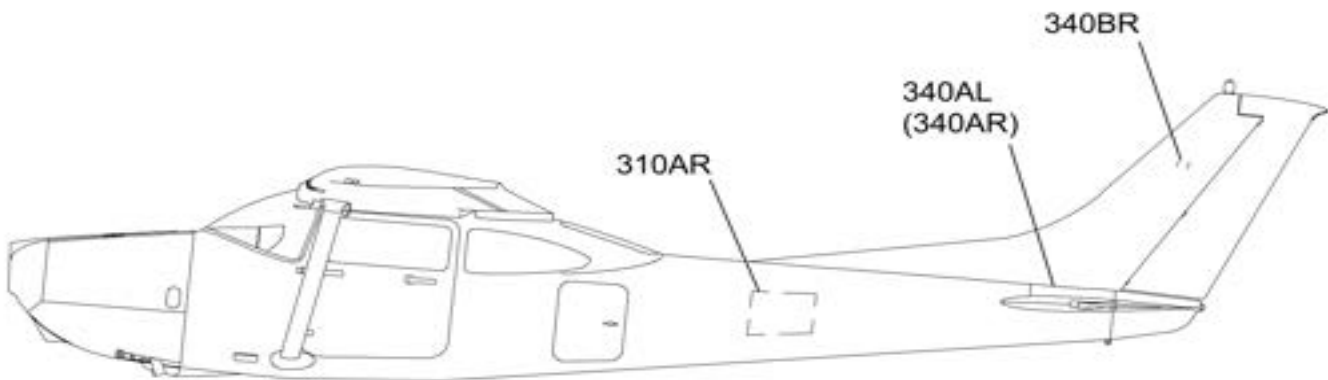


Figure 2 : Sheet 1 : Fuselage Panels

B1083



BOTTOM VIEW



LEFT VIEW

FUSELAGE PANELS

0710T1010
0710T1010

AUDIO PANEL - MAINTENANCE PRACTICES

1. General

- A. The audio panel is in the center of the instrument panel. It has audio function, intercom function, and marker beacon indicators in a single unit.
- B. Maintenance practices for the audio panel have procedures for the removal/installation of the audio panel and the intercom jacks.
- C. For removal/installation of the overhead speaker, refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
- D. For removal/installation of the marker beacon antenna, refer to Chapter 34, [Marker Beacon - Maintenance Practices](#).

2. Audio Panel Removal/Installation

NOTE: Audio panel removal and installation is typical for all avionics packages.

- A. Remove the Audio Panel (Refer to [Figure 201](#)).
 - (1) Make sure the AVIONICS and MASTER switches are in the off position.
 - (2) Turn the recessed screw on the face of the audio panel counterclockwise until the locking paw releases from the mounting tray.
 - (3) Carefully pull the audio panel out of the mounting tray.
- B. Install the Audio Panel (Refer to [Figure 201](#)).
 - (1) Put the audio panel in position and move it forward into the mounting tray.
 - (2) Turn the recessed screw on the face of the audio panel clockwise until the audio panel is attached to the mounting tray.

3. Pilot/Front Intercom Jacks Removal/Installation

- A. Remove the Pilot/Front Passenger Intercom Jacks (Refer to [Figure 201](#)).
 - (1) Make sure the AVIONICS and MASTER switches are in the off position.
 - (2) To get access to the jacks, remove the interior sidewall panel between the instrument panel and the forward doorpost. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
 - (3) Remove the jamnut that attaches the jack to the interior panel.
 - (4) Put a label on the applicable wires of the microphone jack (small plug) or the headphone jack (large plug).
 - (5) Cut the wires near the soldered joint of the applicable jack.
- B. Install the Pilot/Front Passenger Intercom Jacks (Refer to [Figure 201](#)).
 - (1) If applicable, remove unwanted solder from the jack.
 - (2) Solder the applicable wires to the jack. Refer to Model 182 Wiring Diagram Manual, Chapter 20, [Soldering - Maintenance Practices](#).
 - (3) Attach the jack to the sidewall panel with the jamnut.
 - (4) Install the sidewall panel. Refer to the Chapter 25, [Interior Upholstery - Maintenance Practices](#).

4. Rear Passenger Intercom Jacks Removal/Installation

- A. Remove the Rear Passenger Intercom Jacks (Refer to [Figure 201](#)).
 - (1) Make sure the AVIONICS and MASTER switches are in the off position.
 - (2) Remove the rear seat. Refer to Chapter 25, [Rear Seats - Maintenance Practices](#).
 - (3) Remove the rear sidewall panel. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
 - (4) Put a label on the applicable wires of the microphone jack (small plug) or the headphone jack (large plug).
 - (5) Cut the wires near the soldered joint of the applicable jack.
 - (6) Remove the jamnut that attaches the jack to the interior panel.
- B. Install the Rear Passenger Intercom Jacks (Refer to [Figure 201](#)).
 - (1) If applicable, remove unwanted solder from the jack.
 - (2) Solder the applicable wires to the jack. Refer to Model 182 Wiring Diagram Manual, Chapter 20, [Soldering - Maintenance Practices](#).
 - (3) Attach the jack to the sidewall panel with the jamnut.

- (4) Install the rear sidewall panel. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
- (5) Install the rear seat. Refer to Chapter 25, [Rear Seats - Maintenance Practices](#).

Figure 201 : Sheet 1 : Audio Panel Installation

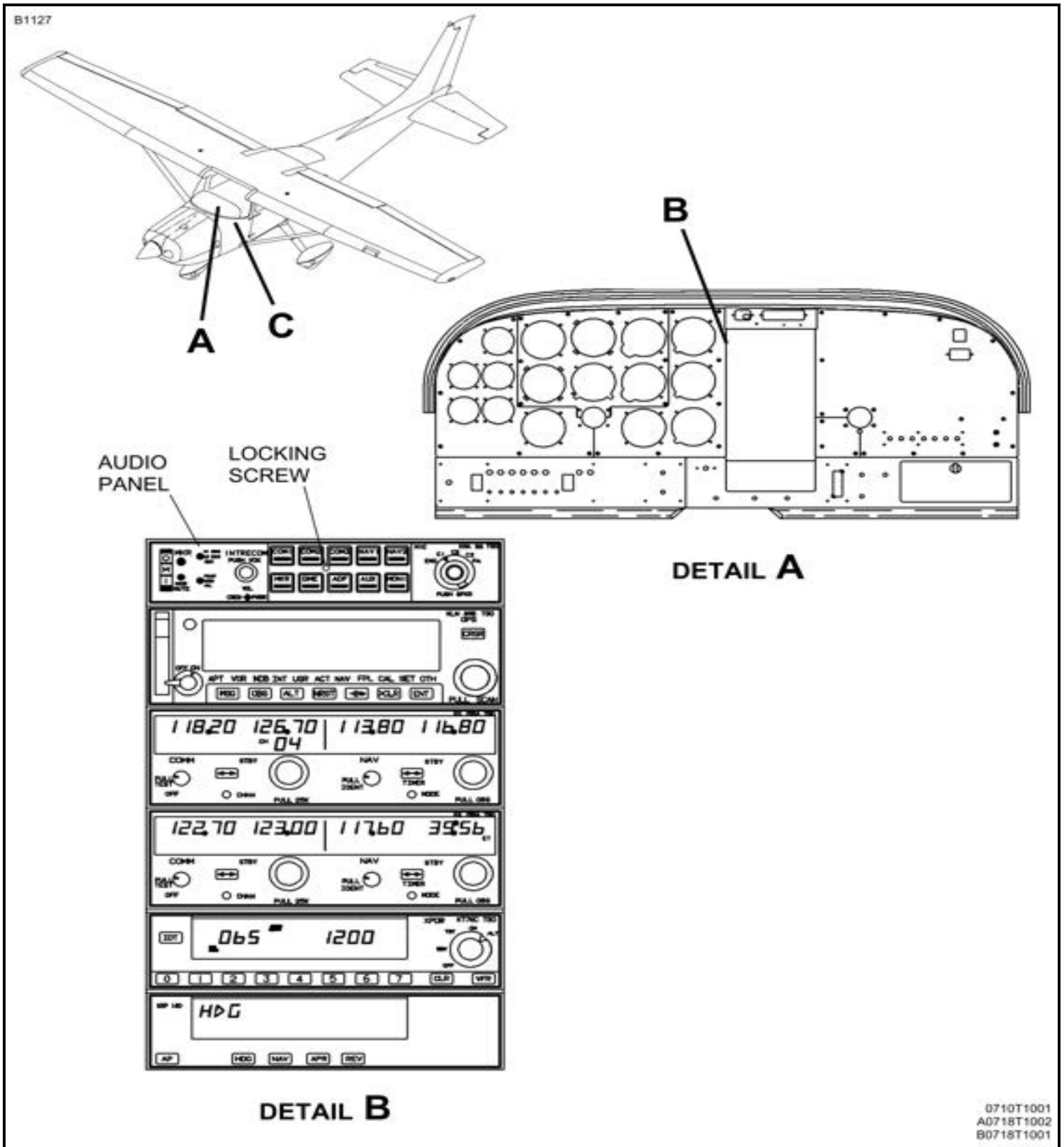
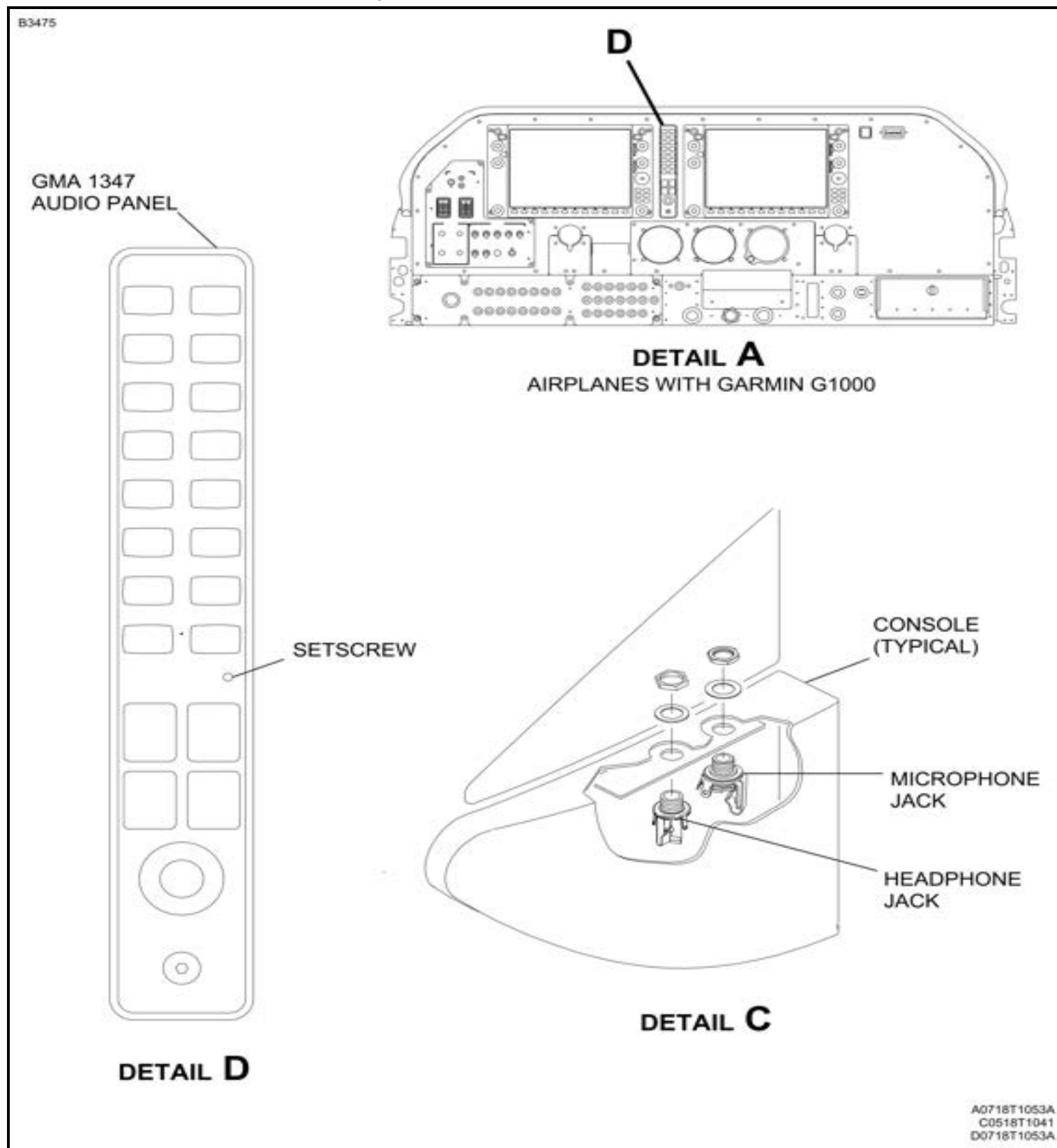


Figure 201 : Sheet 2 : Audio Panel Installation



STATIC DISCHARGING - MAINTENANCE PRACTICES

1. General

- A. Maintenance of the static (discharger) wicks consists of removal/replacement of the wick assembly and ensuring that bonding straps are properly connected between control surfaces and primary structure.
- B. Static wicks are mounted on the trailing edges of the ailerons, rudder and the elevators. Bonding straps are secured to flight control surfaces and electrically connect those surfaces to the primary structure.

2. Tools and Equipment

- A. For a list of applicable tools and equipment, refer to Chapter 23, [Communications - General](#).

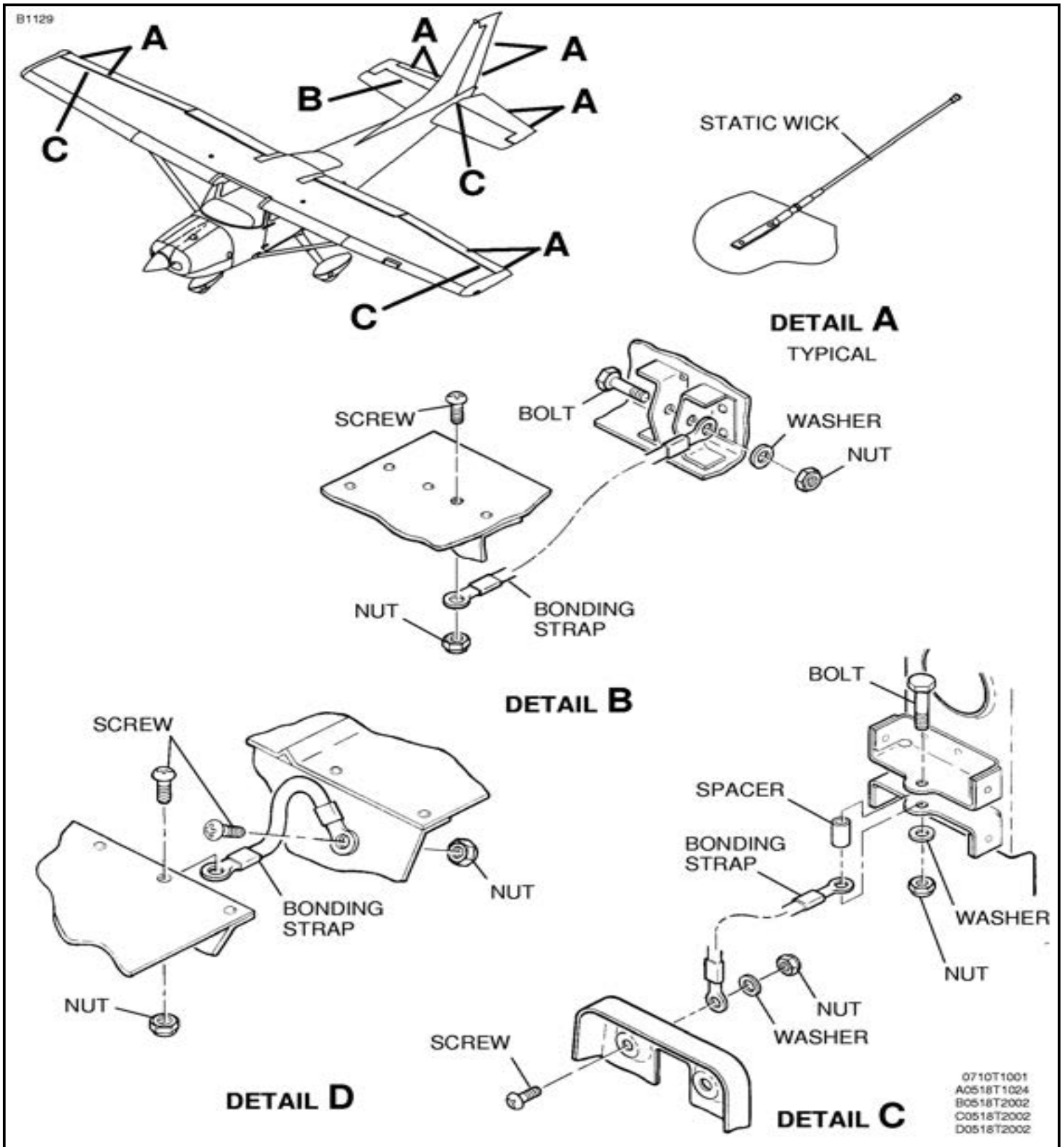
3. Static Wicks Removal/Installation

- A. Remove Static Wick (Refer to [Figure 201](#)).
 - (1) Carefully drill out mounting rivets which attach static wick to structure. Ensure holes are not drilled oversize.
 - (2) Remove static wick from the airplane skin.
- B. Install Static Wick (Refer to [Figure 201](#)).
 - (1) Clean surface of airplane skin where static wick will attach to skin. Remove all traces of contaminants (including paint/primer) using scotchbrite and P-D-680 solvent.
 - (2) Secure static wick to airplane skin using rivets.
 - (3) Repaint base of new wick (if required).
 - (4) Do a Static Discharge System Functional Check, refer to Chapter 23, [Static Discharging Inspection/Check](#).
 - (5) Rebalance control surfaces. Refer to 1996 and On Single Engine Structural Repair Manual [Flight Control Surface Balancing](#).

4. Bonding Straps Removal/Installation

- A. Bonding straps are provided to ensure that electrical potential between primary and secondary structure remains nearly equal. If bonding straps are removed, they should be reinstalled using hardware called out in the Model 182 Illustrated Parts Catalog.
- B. The maximum allowable resistance (in ohms) for bonding straps is 0.0025 ohms.
- C. Primary and secondary structure should be cleaned using scotchbrite pad and P-D- 680 solvent before installing bonding hardware. Aluminum surfaces should be chemically protected (alodine or equivalent) before attaching bonding hardware to surface.
- D. Do a Static Discharge System Functional Check, refer to Chapter 23, [Static Discharging Inspection/Check](#).

Figure 201 : Sheet 1 : Static Discharger Installation



STATIC DISCHARGING - INSPECTION/CHECK

1. General

- A. This section has the inspections and checks necessary to keep the static discharging system in a serviceable condition.

2. Static Discharge System Functional Check

A. General

- (1) This procedure gives the information needed to complete the bonding check for the static discharge system.

B. Special Tools

- (1) Digital Ohmmeter
(2) Megohmmeter

C. Do the Static Discharge System Checks.

- (1) Visually examine the static dischargers for lightning damage and erosion of the airplane skin at the attach points.
(a) If the static discharger shows signs of a lightning strike, replace the static discharger and examine the entire aircraft for lightning strike damage. Refer to Chapter 5, [Unscheduled Maintenance Checks](#).
(2) Visually examine between the tips of the static dischargers and the base assemblies for erosion.
(3) Visually examine the static dischargers for condition and security.
(4) Replace the damaged or the missing static dischargers.
(5) Make sure that all static dischargers are tight.

D. Do a Functional Check of the Static Discharge System.

- (1) Use an ohmmeter (bonding meter) to do a check of the resistance between the base assemblies and a good airplane ground.
(a) Make sure that the resistance between the base assembly and the metal surface is 0.0025 ohms or less.
(b) Make sure there is a good ground before you do the next step.

WARNING: Use precaution when you use a high voltage megohmmeter to prevent an electrical shock.

- (2) Use a megohmmeter set to 500 volts to do a check of the resistance between the base assemblies and the static dischargers.
(a) Make sure that the resistance between the base assembly and the static discharger is 1 to 100 megohms.
(b) If the resistance between the base assembly and the static discharger is not in tolerance, replace the static discharger.

FUEL - GENERAL

1. Scope

- A. This chapter provides information on systems and components associated with fuel storage, fuel distribution, refueling and fuel quantity indicating.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Fuel Quantity Test Box	0580001-1	Cessna Aircraft Company Cessna Parts Distribution Department 701, CPD 25800 East Pawnee Road Wichita, KS 67218-5590	To calibrate fuel quantity system.
Pressure Regulator		Commercially Available	To regulate input pressure.
Thermometer		Commercially Available	To monitor test area temperature.
Leak Detector	Eldorado LD-4	Eldorado Chemical Co. Inc. 14350 Lookout Road P. O. Drawer 34837 San Antonio, TX 78265-4837	To locate source of leak.
Methyl Propyl Ketone		Commercially Available	To clean surfaces prior to sealing.
ScotchBrite Pad	N/A	Commercially Available	To remove loose primer.

3. Definition

- A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.

FUEL CONTAMINATION - MAINTENANCE PRACTICES

1. General

- A. This section consists of information concerning fuel contamination. Included are definitions of various kinds of fuel contamination and the required actions when known fuel contamination exists.

2. Description

- A. Fuel is considered contaminated when it contains any foreign substances that are not provided under the fuel specification. These foreign substances normally consist of water, rust, sand, dust/dirt, microbial growth, unapproved additives and approved additives mixed at improper ratios to the fuel.
- B. All aviation fuels absorb moisture from the air and contain water in both suspended particle and liquid forms. Water contamination of the fuel is normally remedied by daily draining of water from the tanks utilizing the poppet drain valves.
- C. Particle contamination of fuels, consisting of sand, dirt and/or rust is usually caused by dirty refueling equipment, contaminated fuel storage equipment or damaged seals on fuel filler caps.
- D. All Model 182S, 182T and T182T airplanes, even those utilizing an anti-ice additive, in the fuel, require periodic inspections listed in this section. Refer to Chapter 12, [Fuel - Servicing](#), for the use of anti-ice, for controlling ice and microorganisms of bacteria and fungi.
- E. When unapproved additives are blended with the airplane fuel, it should be considered contamination. Also anti-icing additive blended with the fuel at the improper ratio renders the fuel contaminated, unless the ratio of anti-icing additive to fuel mixture by volume can be corrected by the addition of nonpreblended fuel or additional anti-ice additive.

3. Removing Fuel Contamination from Airplane Fuel Tanks

- A. The procedures which follow define various types of fuel contamination and the specific action required to remove the contamination.

CAUTION: Observe all applicable local and facility safety regulations when performing fuel system maintenance. Refer to [Fuel Storage and Distribution - Maintenance Practices](#).

(1) Water contamination.

- (a) There is no way to prevent accumulation of water formed through condensation in fuel tanks. The rate of accumulation due to condensation varies with temperature of the fuel, but samples of fuel should be taken daily at each poppet drain valve. Any water discovered by taking samples should be removed immediately.

NOTE: Water suspended in fuel appears in the form of droplets that reflect light. High concentration of water droplets will cause fuel to have a cloudy or hazy appearance.

- 1 Using an approved container positioned under poppet drain valve, open drain valve.
- 2 Allow fuel to drain until no more water is being expelled.
- 3 Close poppet drain valve.
- 4 Repeat procedure at remaining poppet drain valves until all have been serviced.

(2) Dirt, sand and rust particle contamination.

- (a) Dirt, sand or rust particle contamination is normally discovered when taking daily fuel samples from the poppet drain valves or evidenced by particles found in the fuel filters. If contamination is discovered, the contamination must be removed immediately as follows:

- 1 Completely defuel the airplane. Refer to Chapter 12, [Fuel - Servicing](#).

NOTE: Fuel with known dirt, sand or rust particle contamination must be discarded as waste fuel.

- 2 Remove all fuel tank access plates. Refer to Chapter 6, [Access Plates and Panels Identification - Description and Operation](#). Also refer to [Fuel Storage and Distribution - Maintenance Practices](#).
- 3 Using tack rags (commercially available from paint supply manufacturers), begin wiping interior areas of all fuel tanks. Tack rags should be changed frequently to prevent redepositing contamination back into the tanks. Continue wiping until no more contamination is present on tack rags.
- 4 Before reinstalling fuel tank access panels, inspect the interior of the tanks using a mirror and approved light to be sure all contamination has been removed.
- 5 Clean or replace fuel filters.
- 6 Reinstall access plates on wing fuel tanks.

7 Refuel airplane. Refer to Chapter 12, [Fuel - Servicing](#).

- (3) Unapproved fuels contamination.
 - (a) Any fuels introduced into the airplane fuel tanks that are not approved for usage should be considered contamination. Refer to FAA Approved Airplane Flight Manual for approved fuels.
 - (b) If unapproved fuels are added to the airplane fuel tanks, the airplane must be completely defueled. Refer to Chapter 12, [Fuel - Servicing](#). After draining all residual fuel from the poppet drain valves, after defueling, the airplane may be refueled with an approved aviation fuel.
- (4) Improperly mixed anti-ice additive contamination.
 - (a) When mixing anti-ice, it must be mixed at a ratio as specified for the additive being used. Any mixture of additive in the fuel above or below the specified ratio must be considered fuel contamination.
 - (b) Should an improper mixture ratio of anti-ice to the fuel by volume be discovered, the airplane should be completely defueled per Chapter 12, [Fuel - Servicing](#), and refueled with properly blended fuel.

NOTE: As an alternative, the improper mixture may be corrected by the addition of the proper amount of non-preblended fuel or the addition of anti-ice to bring the mixture ratio to within the specified concentration by volume. The reblended fuel/additive mixture must be retested to ensure the proper mixture has been obtained before returning the airplane to service.

- (5) Unapproved additives and foreign liquids contamination.
 - (a) Should it be discovered that any unapproved additives or foreign liquids have been inadvertently introduced into the airplane fuel tanks, the airplane must be immediately completely defueled. All residual contaminated fuel must be removed by opening all poppet drain valves. Refer to Chapter 12, [Fuel - Servicing](#).
 - (b) When all residual fuel has been drained, close all poppet drain valves and refuel the airplane with an approved aviation fuel. Refer to FAA Approved Airplane Flight Manual for approved fuels.

NOTE: All fuels contaminated with unapproved additives or foreign liquids must be discarded as waste fuel.

- (c) Before returning the airplane to service, the fuel filters must be cleaned or replaced.

FUEL STORAGE AND DISTRIBUTION - DESCRIPTION AND OPERATION

1. General

- A. The airplane is equipped with a wet wing fuel storage system. The system consists of two integral fuel tanks (one each wing), a four position selector valve, an electrically driven auxiliary fuel pump, fuel strainer, and a fuel quantity indicating system.
- B. Components beyond the fuel strainer include the engine driven fuel pump, the fuel/air control unit and the fuel distribution valve. These components are considered part of the power plant and are covered in [Chapter 73, Fuel Injection System - Description and Operation](#).
- C. A schematic of the entire fuel system is shown to aid in system understanding. Refer to [Figure 1](#).

Figure 1 : Sheet 1 : Fuel System Schematic

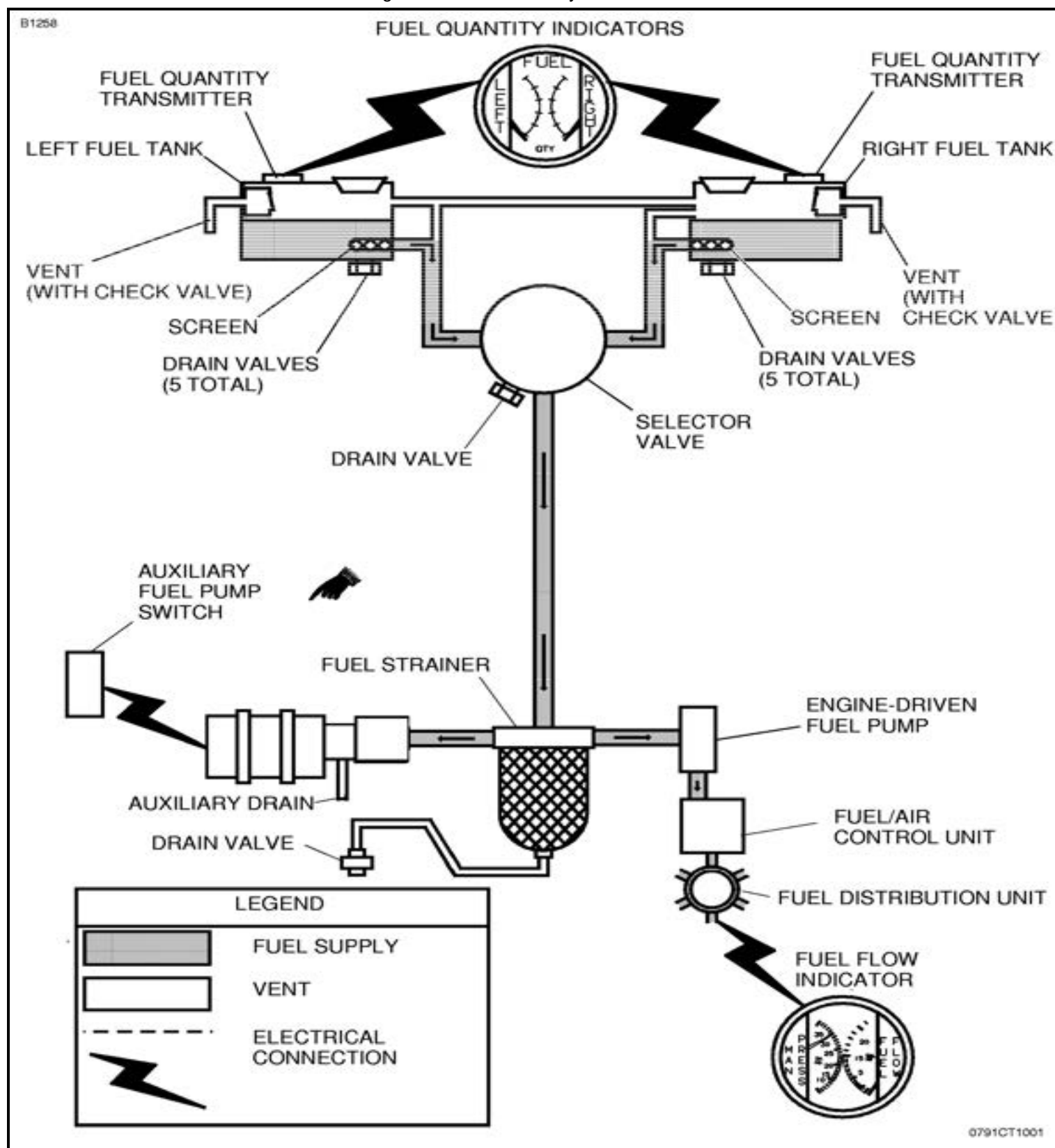
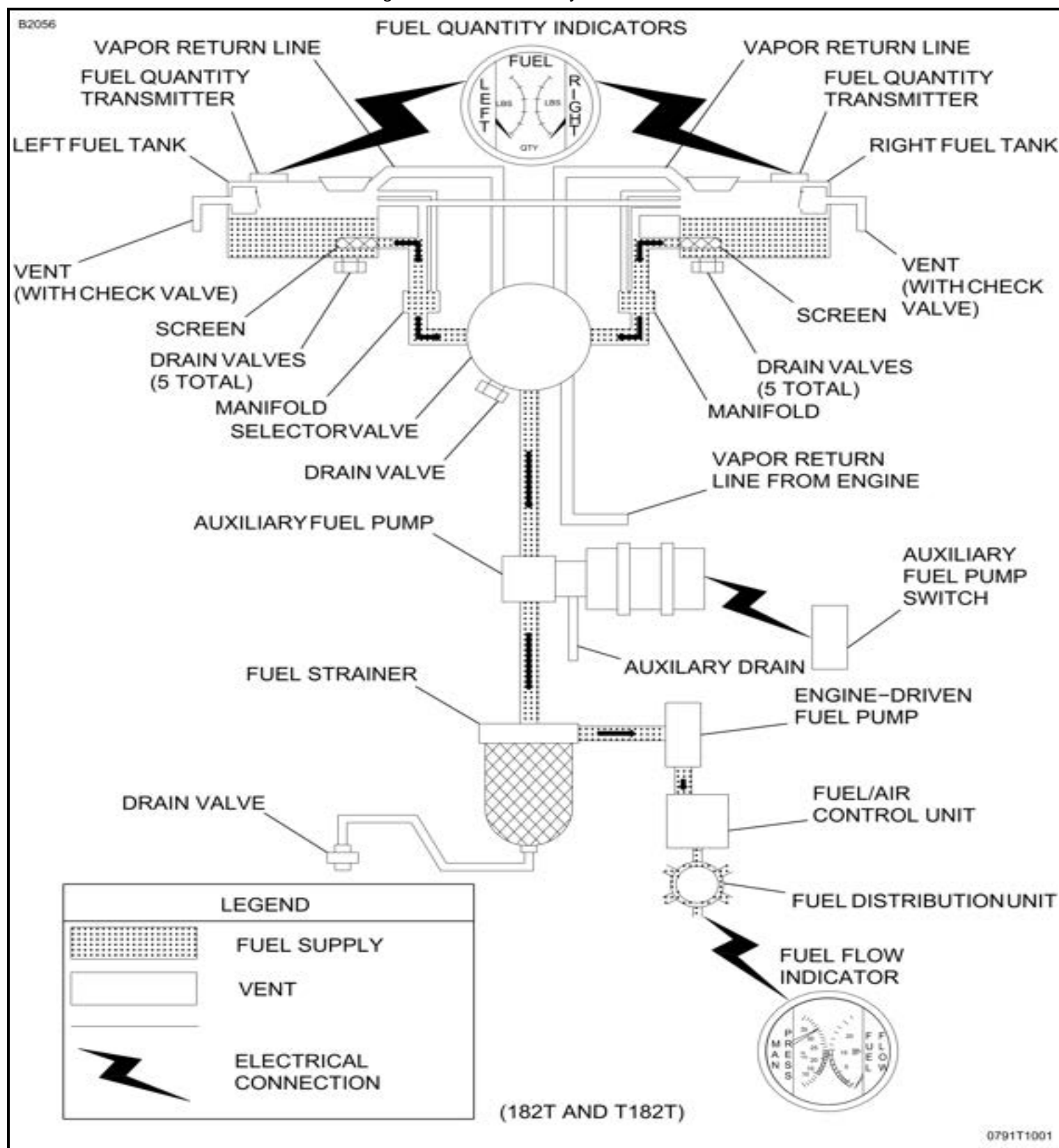


Figure 1 : Sheet 2 : Fuel System Schematic



FUEL STORAGE AND DISTRIBUTION - MAINTENANCE PRACTICES

1. General

- A. This section gives fuel storage and distribution maintenance practices for the fuel tank component removal and installation, and adjustment/test (Refer to [Figure 201](#) and [202](#)).

2. Precautions

- A. Obey these general precautions and rules when you refuel, defuel, clean the fuel tank, repair, assemble or disassemble system components, and do electrical system tests and repairs on the airplane fuel system.
- (1) Put covers or caps on all disconnected hoses, lines, and fittings to prevent residual fuel drainage, thread damage, or entry of dirt or unwanted material into the fuel system.
 - (2) When the fuel system is opened, use the fuel boost pump to flush the system with 1/2 gallon of fuel at the inlet of the servo and flow divider.
 - (3) When you work on the fuel injection system, keep all parts clean and free from contamination.

3. Fuel Drain Valve Removal/Installation

NOTE: The left and right fuel drain valve removal and installation are typical. Five fuel drains are installed in each wing.

- A. Remove the Fuel Drain Valve (Refer to [Figure 203](#)).
- (1) Defuel the airplane. Refer to Chapter 12, [Fuel - Servicing](#).
 - (2) With a fuel sampler cup, push each fuel drain valve up to make sure that the fuel tank is fully drained.
 - (3) Remove the safety wire and remove each fuel drain valve from the fuel tank. Chapter 20, [Safetying - Maintenance Practices](#).
- B. Install the Fuel Drain Valve (Refer to [Figure 203](#)).
- (1) Install a new O-ring on the fuel drain valve.
 - (2) Install the fuel drain valve in the fuel tank and safety the valve with wire to the clip. Refer to Chapter 20, [Safetying - Maintenance Practices](#).
 - (3) Add a small quantity of fuel to the fuel tank and examine the fuel drain valve for leaks.

4. Fuel Tank Vents Adjustment/Test

- A. DESCRIPTION - A vent line is installed in the outboard end of each fuel tank and extends overboard through the lower wing skin near the point where lift struts attach to the underside of the wings.
- B. TEST - Fuel vents may become clogged as shown by field experience, and can cause fuel starvation of the engine. If the bleed hole in the vent valve becomes clogged, over-pressurization can occur due to normal temperature variation. This would usually occur when the airplane engine is not operating. The procedure that follows must be used to make sure that the fuel vent and bleed system operate correctly.
- (1) Attach a rubber tube to the end of the vent line below the wing.

WARNING: Clogged vent lines and bleed holes can cause either fuel starvation or the pressurization of the fuel tanks by fuel expansion. You must clean any fuel vent found clogged or not operating correctly before the airplane is returned to service.

CAUTION: Do not use a mechanical means of pressurizing the fuel tank unless a water manometer capable of measuring 20 inches of water is used to monitor tank pressure and a well-regulated supply of air (0.5 psi maximum, or 13.8 inches of water) is used to pressurize the fuel tank.

- (2) As you do the test, put a cap on the vent in the opposite wing.
- (3) Physically blow air into the tube to pressurize the fuel tank. If air can enter the tank, the vent line is open.
 - (a) Alternate mechanical means of pressurizing the fuel tank:
 - 1 Attach a water manometer capable of measuring 20 inches of water in-line with the supply air at the wing vent.
 - 2 Connect a well-regulated supply of air (0.5 psi maximum, or 13.8 inches of water) to the same wing vent.

NOTE: Nitrogen may be used if desired.

- 3 Make sure the fuel filler caps are installed correctly.
- 4 Do not attempt to apply pressure to the fuel tank without using a regulator that has been tested to be accurate

5 Do not pressurize the fuel bay to more than 0.5 psi or damage to the airplane will occur.

- NOTE:** A serviceable wing fuel vent check valve will release positive pressure through the bypass port from the fuel tank. An unserviceable wing fuel vent check valve will not release positive pressure through the bypass port from the fuel tank.

- WARNING:** One of the fuel vent lines must stay set behind the lift strut with the dimensions given in Figure 205. This position will give protection against ice formation in at least one vent tube.

1 The distance from the strut to the end of the fuel vent line must be 1.12 inches, +0.03 or -0.03 inch.

- NOTE:** This procedure must be done during a sequence of routine flight operations. Special flights to measure and adjust the fuel tank feed rates are not recommended.

- (2) Park the airplane on level ground and set fuel selector switch in the BOTH position. Keep the airplane parked until the tank levels are equal, or until the two tanks are full.
- (3) After takeoff, with the fuel selector in the BOTH position, climb to an altitude where there is no turbulence.
- (4) Adjust the airplane for straight and level flight. Make sure that the airplane is free of yaw by adjusting the rudder to align the ball to the center of the turn coordinator. Fly at maximum cruise power for a minimum of one hour.
- (5) At the end of the hour, and while still in straight and level flight, record the fuel tank levels as shown on the fuel gage.
- (6) If the fuel tank levels are different by more than 5.0 gallons, do the applicable steps that follow after the airplane is on the ground.
 - (a) Find the fuel tank with the most remaining fuel. With your hand, move the fuel vent on the bottom of the wing outboard 0.25 inch.
 - (b) Find the fuel tank with the least remaining fuel. With your hand, move the fuel vent on the bottom of the wing inboard 0.25 inch.

NOTE: One of the vents must remain positioned behind the strut as illustrated in Figure 206 for icing protection.

- (c) Do steps 5.C.(1) thru 5.C.(6) again and make sure that the fuel flow rates for the tanks are equal, ± 5.0 gallons/hour.

5. Fuel Filler Cap Vent Cleaning/Seal Replacement

A. Examine, Clean, and Repair the Vented Fuel Filler Cap (Refer to Figure 206).

- (1) Remove the vented fuel filler cap from the adapter assembly, disconnect the safety chain (if installed), and put a cover or cap on the tank opening to keep unwanted material out.
- (2) Examine the condition of the gasket and frictionless washer, and replace if necessary.
- (3) Use cotton swabs and solvent to carefully lift the edges of the rubber umbrella inside the fuel cap and clean the inside of the umbrella to remove all contaminants. Use a second cotton swab to clean the umbrella, and remove all cotton fibers. Repeat these steps until the cotton swabs show no discoloration.
- (4) Replace the umbrella if the vent shows that there is a leak or shows deterioration.

NOTE: It can be faster to buy and replace the fuel filler cap assembly, which is an alternative to the removal of the umbrella.

CAUTION: Be careful when you remove the umbrella stem. If the umbrella stem breaks when you remove it, make sure you remove all the stem parts from the vent before you install the new umbrella. If the stem parts are left in the vent, the vent will not operate correctly.

- (a) To remove the umbrella, apply lubricant to the umbrella stem with MIL-PRF-5606 hydraulic fluid to prevent damage to the stem.
 - (b) When you install the new umbrella, apply lubricant to the stem with MIL-PRF-5606 hydraulic fluid. Use a small blunt tool to install the knob on the umbrella into the check valve body.
- (5) Connect the fuel cap to the safety chain (if installed) and install the cap in the adapter assembly.

6. Fuel Selector Valve Removal/Installation

A. Remove the Fuel Selector Valve (Refer to Figure 207 and Figure 208).

- (1) Drain all of the fuel from the wing fuel tanks. Refer to Chapter 12, Fuel - Servicing.
- (2) Drain all of the fuel from the fuel selector valve and the door post fuel lines by draining the fuel through the fuel selector valve drain.
- (3) Remove the carpet as necessary to get access to the access plate (230DB) and remove the access plate. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (4) Remove the cotter pin and pin from the fitting assembly and disconnect the fitting from the valve.
- (5) Disconnect the inlet and outlet fuel lines from the valve. Put a cover on the valve fittings and seal the lines.
- (6) Remove the safety wire and remove the screws and washers that attach the valve. Remove the valve.

B. Install the Fuel Selector Valve (Refer to Figure 207 and Figure 208).

- (1) Put the fuel selector valve on the bracket and install the washers and screws. Safety the screws with wire.
- (2) Remove the caps from the fuel selector valve fittings and remove the seals from the fuel lines. Connect the fuel lines to the fuel selector valve.

- (3) Put the fitting on the fuel selector valve and install the pin and cotter pin.
- (4) Refuel the airplane and examine the fuel lines for leaks. Refer to Chapter 12, [Fuel - Servicing](#).
- (5) Install the access plate (230DB). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
- (6) Install the carpet.

7. Fuel Strainer Disassembly/Cleaning/Assembly

A. Disassemble and Clean the Fuel Strainer (Refer to [Figure 209](#)).

- (1) Turn the fuel selector valve to the OFF position.
- (2) Disconnect the strainer drain tube, remove the safety wire, nut, and washer at the bottom of the filter bowl, and remove the bowl.
- (3) Carefully remove the standpipe.
- (4) Remove the filter screen and gasket.
- (5) Clean the filter screen and the bowl in solvent and dry with compressed air.

B. Assemble the Fuel Strainer (Refer to [Figure 209](#)).

- (1) Install the screen and standpipe with a new gasket between the filter screen and the top assembly. Tighten the standpipe with your fingers.
- (2) Install the bowl with all new O-rings. Torque the nut to between 25 and 30 inch-pounds.
- NOTE:** The step-washer at the bottom of the bowl is installed so that the step is against the O-ring.
- (3) Connect the strainer to the drain tube.
- (4) Turn the fuel selector valve to the ON position, close the strainer drain, and examine the system for leaks. Make sure that the system operates correctly.
- (5) Loosen the fuel supply hose at the fuel injection servo inlet.
- (6) Set the mixture control to the OFF position.
- (7) Set the throttle control to the IDLE STOP position.
- (8) Set the FUEL PUMP switch to the ON position.
- (9) Operate the electric auxiliary fuel pump until the air is removed from the fuel lines and the pump is full of fuel.
- (10) Set the FUEL PUMP switch to the OFF position.

- (11) Tighten the fuel supply hose at the fuel injection servo inlet. Refer to Chapter 20, [Torque Data - Maintenance Practices](#).
- (12) Install the safety wire from the bottom nut to the top of the assembly. Refer to Chapter 20, [Safetying - Maintenance Practices](#).

8. Electric Auxiliary Fuel Pump Removal/Installation (Airplanes 18280001 thru 18280944)

A. Remove the Electric Auxiliary Fuel Pump (Refer to [Figure 210](#)).

- (1) Set the MASTER ALT BAT switch to the OFF position.
- (2) Turn the fuel selector handle to the OFF position.
- (3) Disconnect the battery ground cable from the battery.
- (4) Disconnect the electrical connector (P1) from the electric auxiliary fuel pump (UF005).
- (5) Disconnect the fuel lines and drain the line from the electric auxiliary fuel pump.
- (6) Loosen the mounting clamps that attach the electric auxiliary fuel pump and remove the pump from the airplane.
- (7) Remove all the fuel fittings from the electric auxiliary fuel pump and discard the used O-rings from the inlet and outlet fuel fittings.

B. Install the Electric Auxiliary Fuel Pump (Refer to [Figure 210](#)).

- (1) Put the new O-rings on the inlet and outlet fuel fittings.
- (2) Install the inlet and outlet fuel fittings into the electric auxiliary fuel pump and tighten the fittings. Refer to Chapter 20, [Torque Data - Maintenance Practices](#).
- (3) Install the fuel drain fitting into the electric auxiliary fuel pump and tighten the fitting. Refer to Chapter 20, [Torque Data - Maintenance Practices](#).
- (4) Put the electric auxiliary fuel pump into mounting clamps.

- (5) Loosely install the mounting clamps.
- (6) Connect the fuel drain line to the fuel drain fitting.
- (7) Connect and tighten the fuel lines to the inlet and outlet fittings.
- (8) Tighten the mounting clamps. Refer to Chapter 20, [Torque Data - Maintenance Practices](#).
- (9) Tighten the fuel lines onto the fittings. Refer to Chapter 20, [Torque Data - Maintenance Practices](#).
- (10) Connect the electrical connectors to the electric auxiliary fuel pump.
- (11) Turn the fuel selector handle to the ON position.
- (12) Examine the electric auxiliary fuel pump and fuel fittings for fuel leaks.
- (13) Connect the battery ground cable to the battery.
- (14) Loosen the fuel supply hose at the fuel injection servo inlet.
- (15) Set the mixture control to the OFF position.
- (16) Set the throttle control to the IDLE STOP position.
- (17) Set the MASTER ALT BAT switch to the ON position.
- (18) Set the FUEL PUMP switch to the ON position.
- (19) Operate the electric auxiliary fuel pump until the air is removed from the fuel lines and the pump is full of fuel.
- (20) Set the FUEL PUMP switch to the OFF position.
- (21) Tighten the fuel supply hose at the fuel injection servo inlet. Refer to Chapter 20, [Torque Data - Maintenance Practices](#).
- (22) Set the FUEL PUMP switch to the ON position.
- (23) Operate the electric auxiliary fuel pump and examine all fuel fittings for leaks.
- (24) Set the FUEL PUMP switch to the OFF position.

9. Electric Auxiliary Fuel Pump Removal/Installation (Airplanes 18280945 and On and Airplanes T18208001 and On)

- A. Remove the Electric Auxiliary Fuel Pump (Refer to [Figure 211](#)).
 - (1) Make sure that the master switch is in the OFF position.
 - (2) Disconnect the battery ground cable.
 - (3) Set the fuel selector to the OFF position.
 - (4) Remove the copilot's seat and carpet. Refer to Chapter 25, [Front Seats and Rails - Maintenance Practices](#) and Chapter 25, [Interior Upholstery-Maintenance Practices](#).
 - (5) Remove the access plate (230AB) to get access to the pump. Refer to Chapter 6, Access/Inspection Plates-Description and Operation.
 - (6) Disconnect the fuel lines, drain line, and electrical connectors from the pump.
 - (7) Loosen the mounting clamps that attach the pump and remove the pump from the airplane.
- B. Install the Electric Auxiliary Fuel Pump (Refer to [Figure 211](#)).
 - (1) Put the pump in the mounting clamps and tighten the clamps. Refer to Chapter 20, [Torque Data - Maintenance Practices](#).
 - (2) Connect all the fuel lines, drain line, and electrical connectors to the pump.
 - (3) Set the master switch to the ON position and connect the battery ground cable.
 - (4) Turn fuel selector to the ON position.
 - (5) Operate the electric auxiliary fuel pump and examine all the fuel fittings for leaks.
 - (6) Install the access plate (230AB). Refer to Chapter 6, Access/Inspection Plates-Description and Operation.
 - (7) Install the carpet and copilot's seat. Refer to Chapter 25, [Front Seats and Rails - Maintenance Practices](#) and Chapter 25, [Interior Upholstery-Maintenance Practices](#).

10. Auxiliary Fuel Pump Serviceability Test (Airplanes 18280001 thru 18280944)

- A. Auxiliary Fuel Pump Test (Refer to [Table 201](#)).

WARNING: Obey all fuel system fire and safety procedures. Remove all flammable materials from the airplane and from all areas where the fumes are dangerous.

 - (1) Remove the fuel supply hose from the inlet fitting of the engine-driven fuel pump.

- (2) Install a tee fitting on the fuel supply hose.
- (3) Connect a calibrated fuel pressure test gage and locally-purchased fuel shutoff valve to the tee fitting.
- (4) Set the fuel shutoff valve so that the fuel drains into a container.
- (5) Use a controlled electric power source to supply the 24 VDC electric power to the airplane and a multimeter to measure the electric current.
 - (a) Operate the auxiliary fuel pump and adjust the fuel shutoff valve to get a pressure value as shown in Table 201. Make sure that the test is for the applicable part number.
 - (b) Monitor the current draw of the auxiliary fuel pump electric motor.
 - (c) Measure the fuel pump current draw and output. The output will be 1 gallon in 2.5 minutes.

NOTE: The Dukes Model 5100-00-1 auxiliary fuel pumps that are capable of giving a minimum flow rate of 23.5 GPH at 23 PSI and have a maximum current of 3.0 amps at 24 volts DC are considered serviceable. Dukes Models 5100-00-3 and 5100-00-4 auxiliary fuel pumps that are capable of giving a minimum flow rate of 23.5 GPH at 14 PSI and have a maximum current draw of 3.0 amps at 24 volts DC are considered serviceable.

- (6) If the fuel pump does not meet the requirements, replace it with a pump that does meet the requirements.
- (7) If the fuel pump meets the requirements, it must be considered serviceable.

Table 201. Dukes Model 5100 Serviceability Requirements

PUMP PART NUMBER	FUEL FLOW VOLUME (MINIMUM)	FUEL FLOW PRESSURE	SUPPLIED VOLTAGE	MAXIMUM FUEL PUMP CURRENT
5100-00-1 (or -1RX)	23.5 GPH	23 PSI	24 Volts DC	3.0 Amps
5100-00-3 (or -3RX)	23.5 GPH	14 PSI	24 Volts DC	3.0 Amps
5100-00-4 (or -4RX)	23.5 GPH	14 PSI	24 Volts DC	3.0 Amps

Figure 201 : Sheet 1 : Fuel System

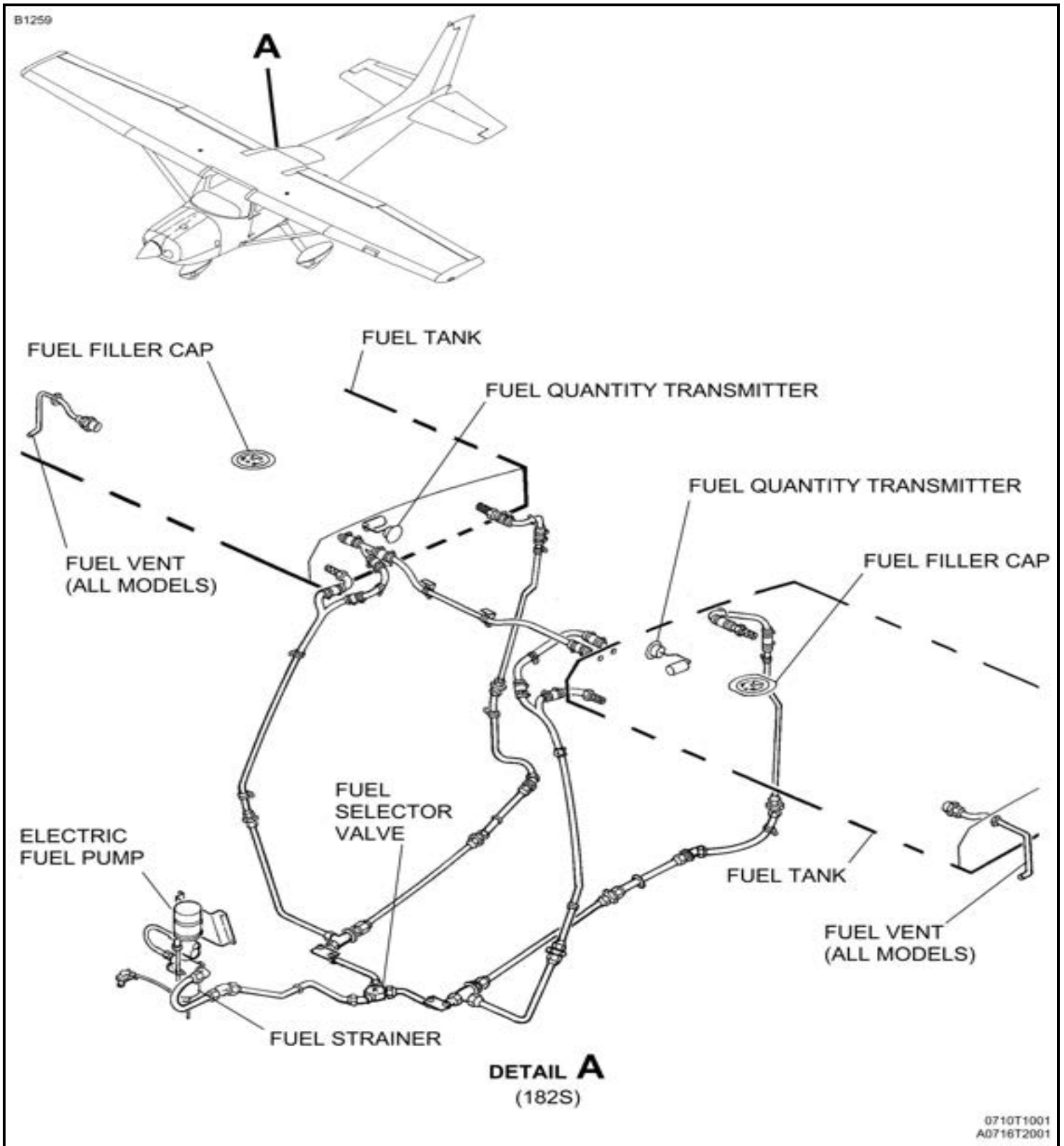


Figure 202 : Sheet 1 : Fuel System

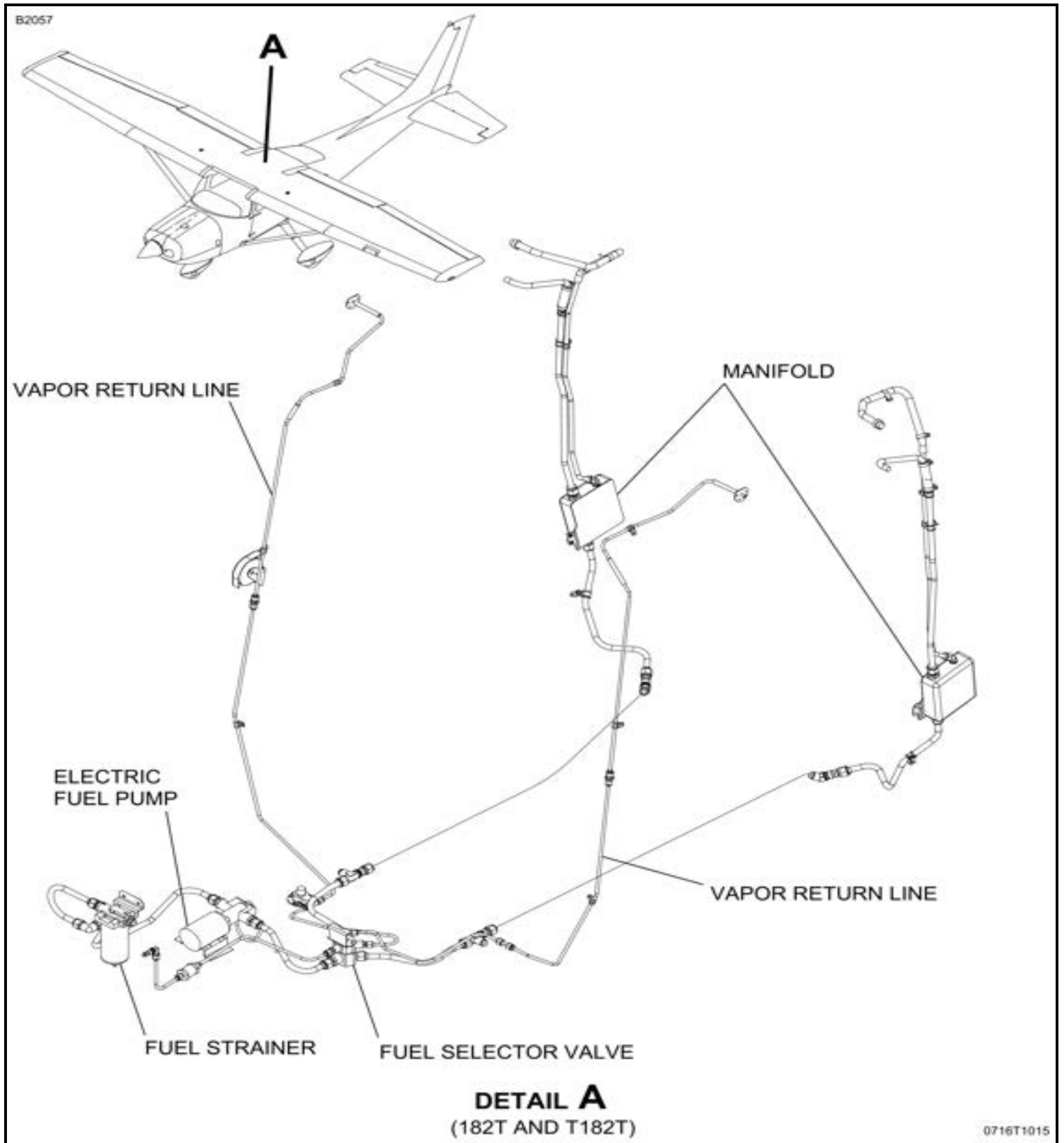


Figure 203 : Sheet 1 : Fuel Drain Valve

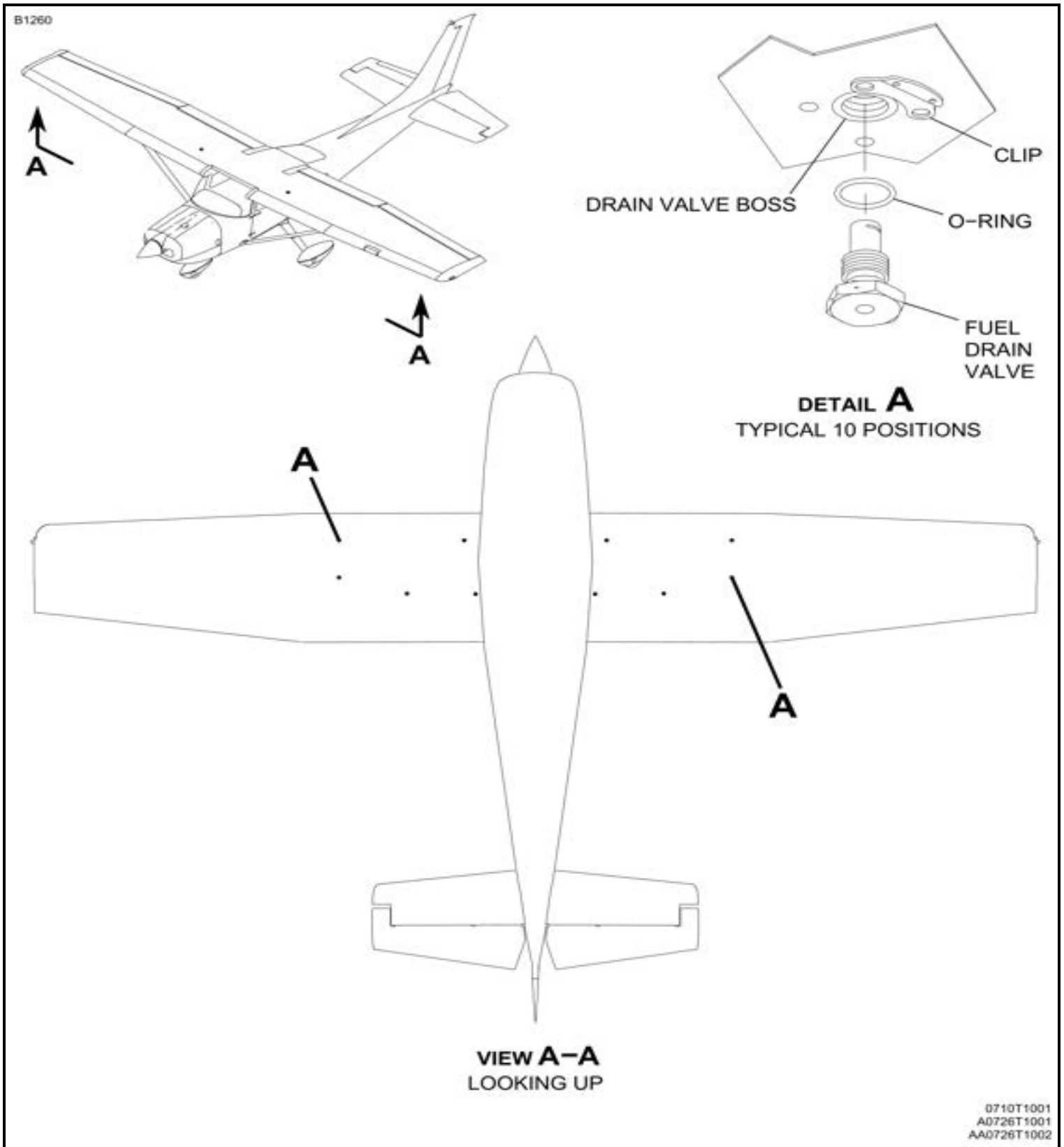


Figure 204 : Sheet 1 : Fuel Vent Location

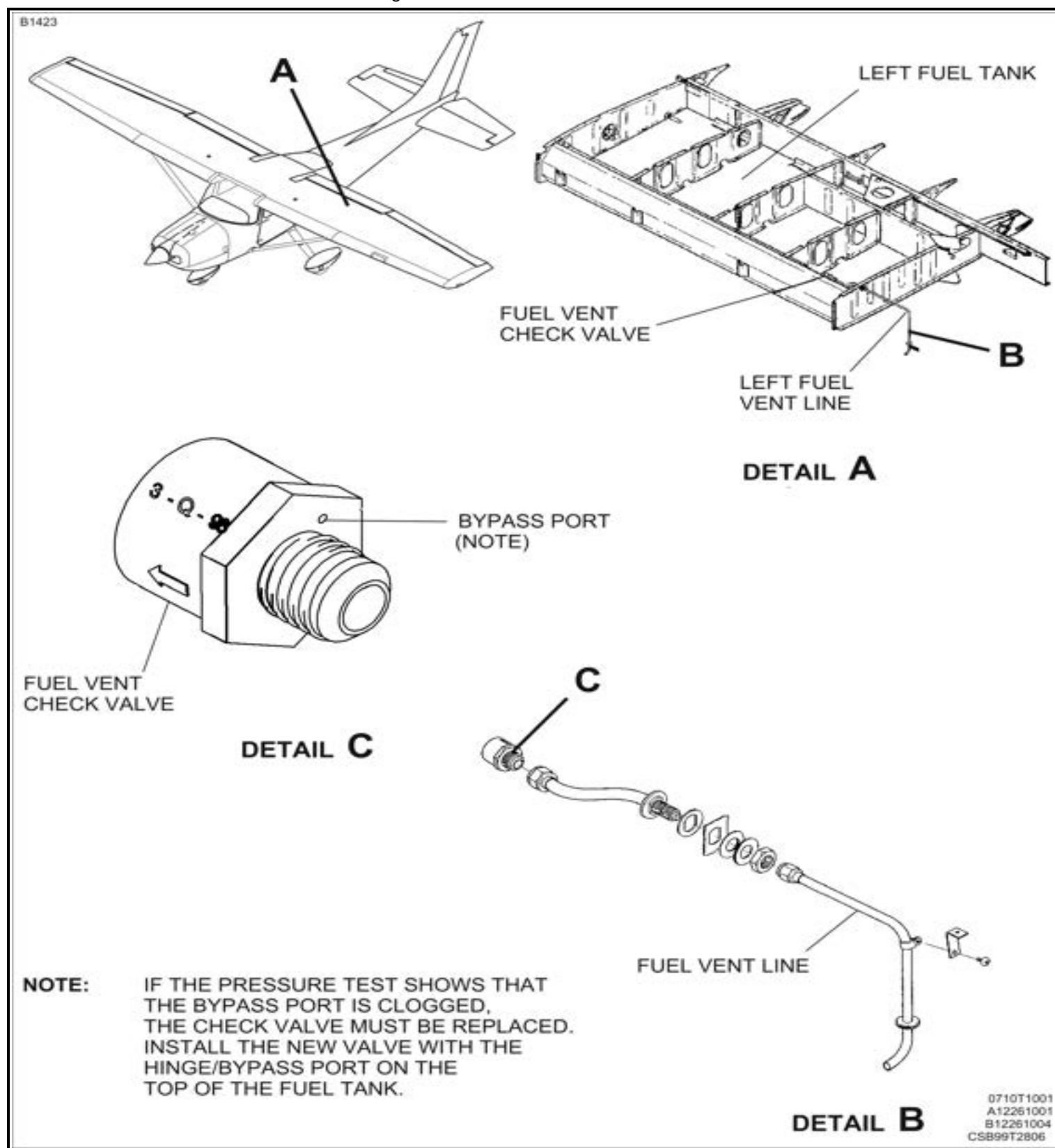


Figure 205 : Sheet 1 : Fuel Vent Location

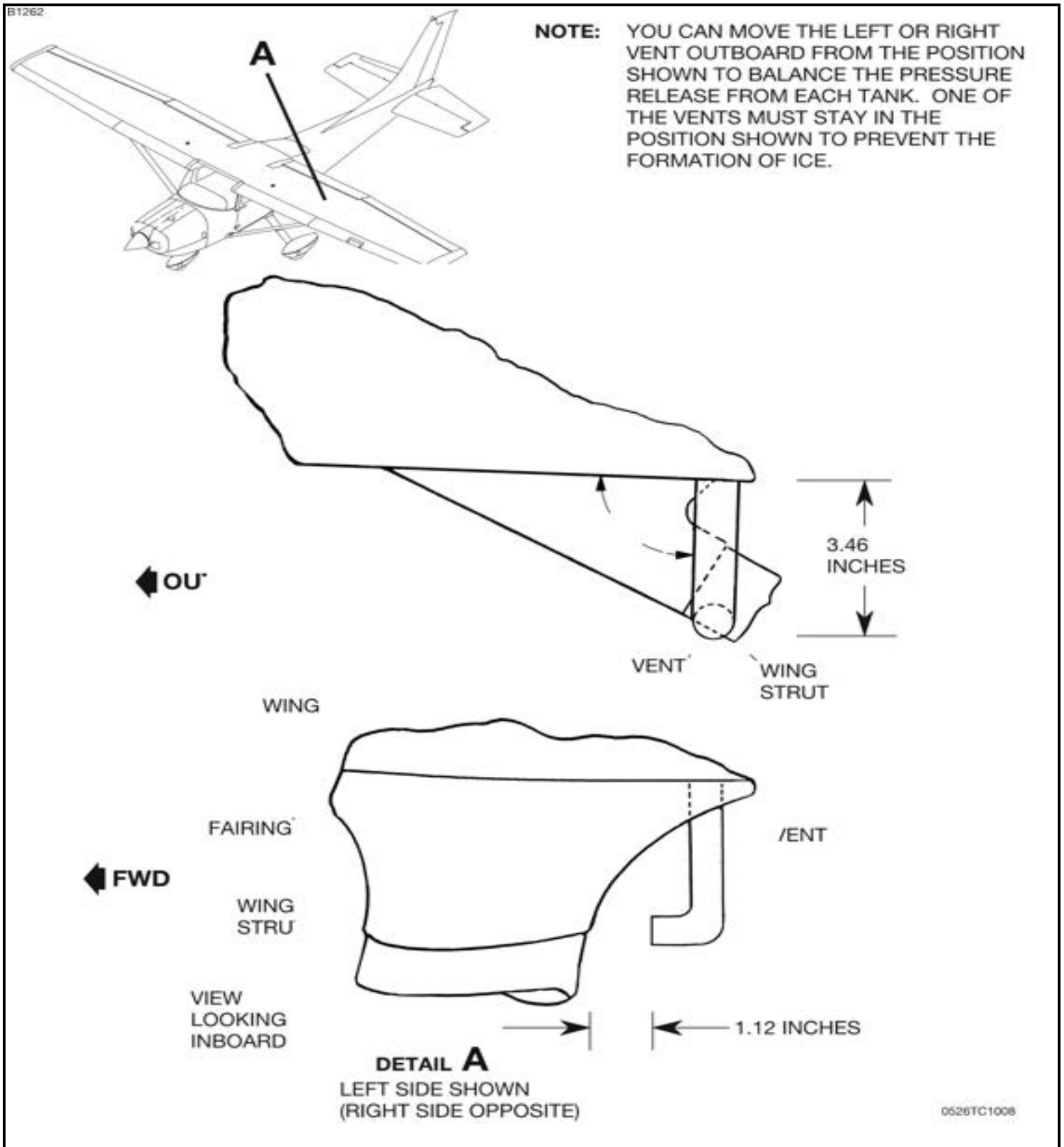


Figure 206 : Sheet 1 : Vented Fuel Filler Cap

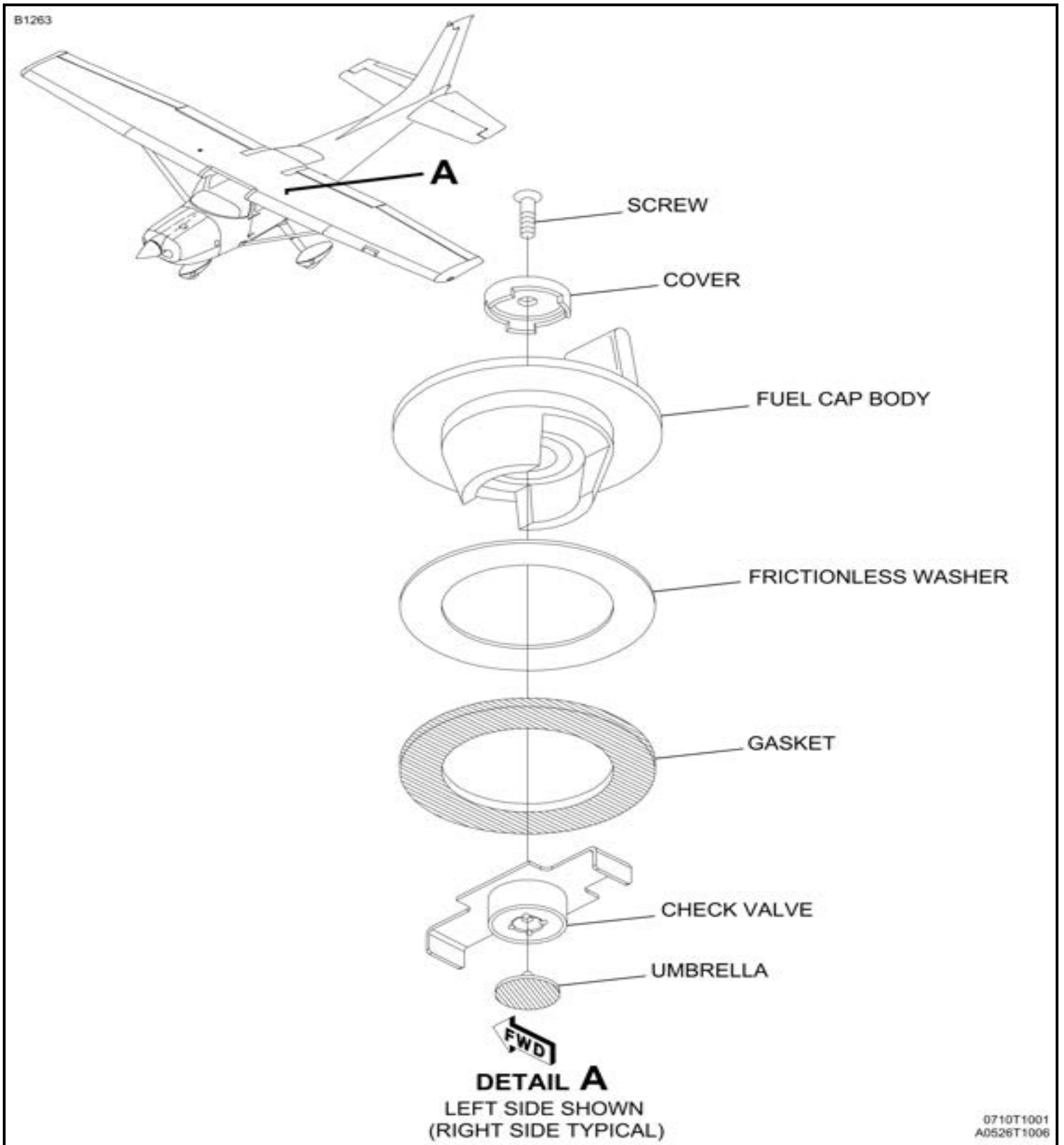


Figure 207 : Sheet 1 : Fuel Selector Valve

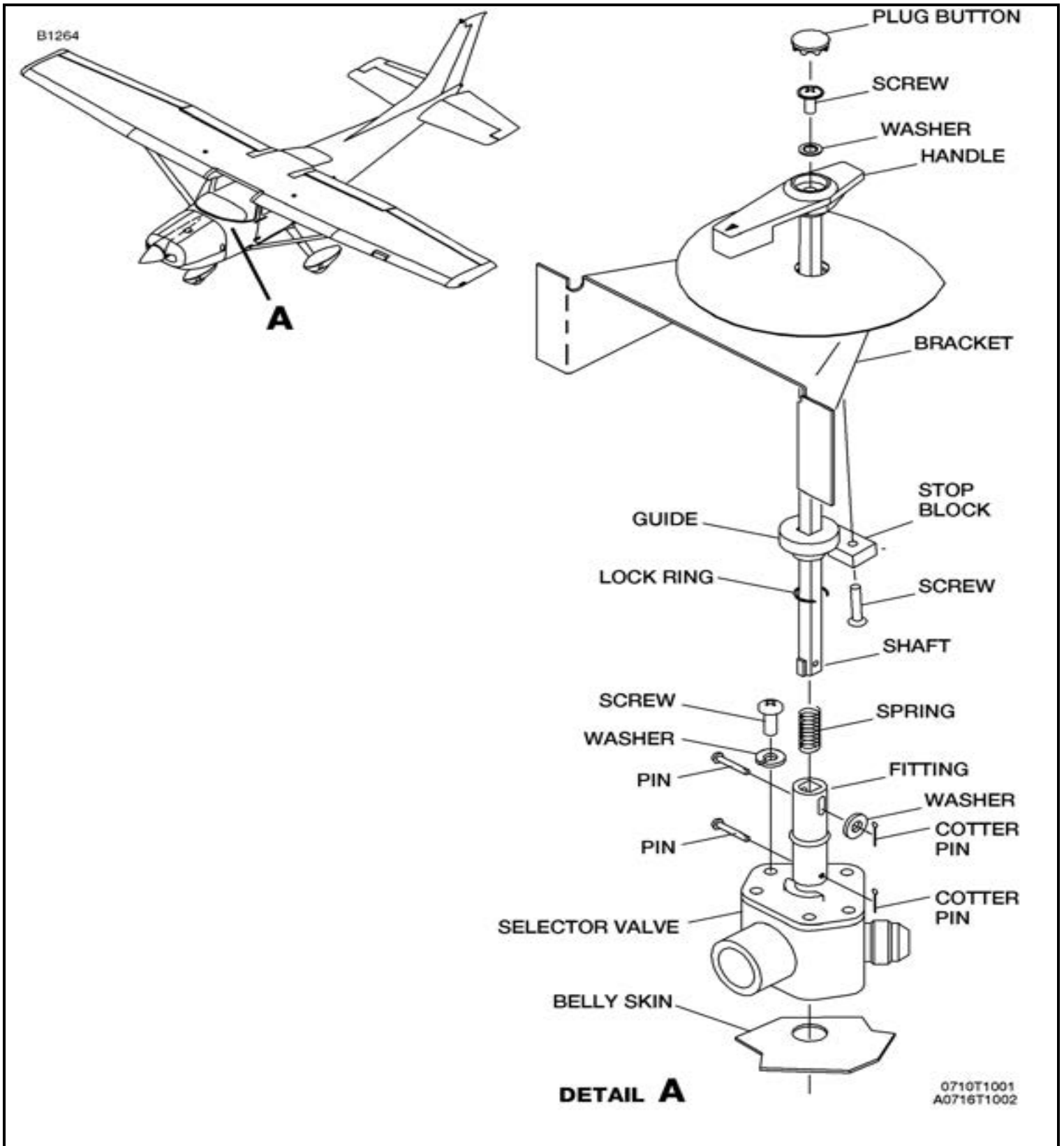


Figure 208 : Sheet 1 : Fuel Selector Valve

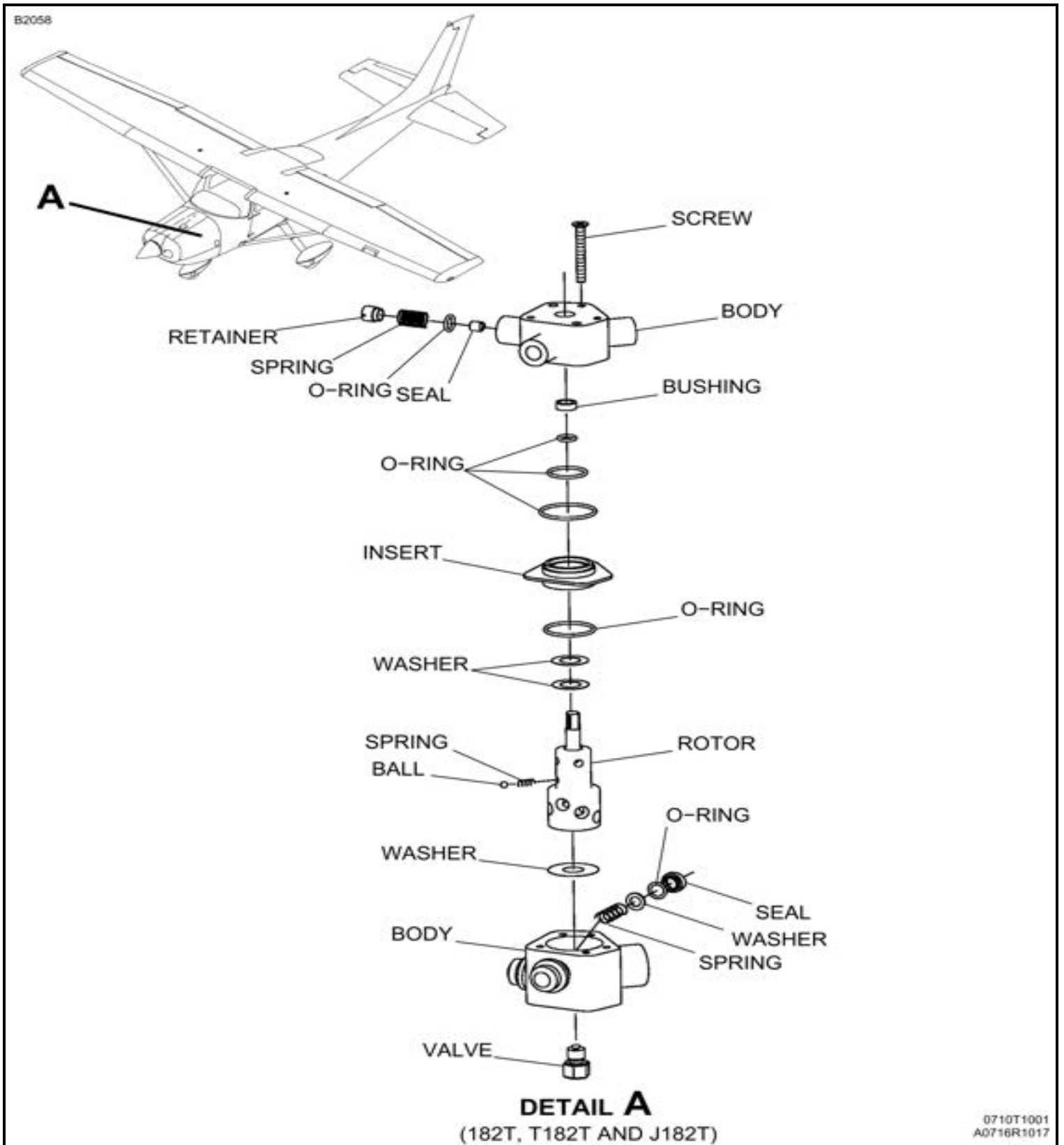


Figure 209 : Sheet 1 : Fuel Strainer Assembly

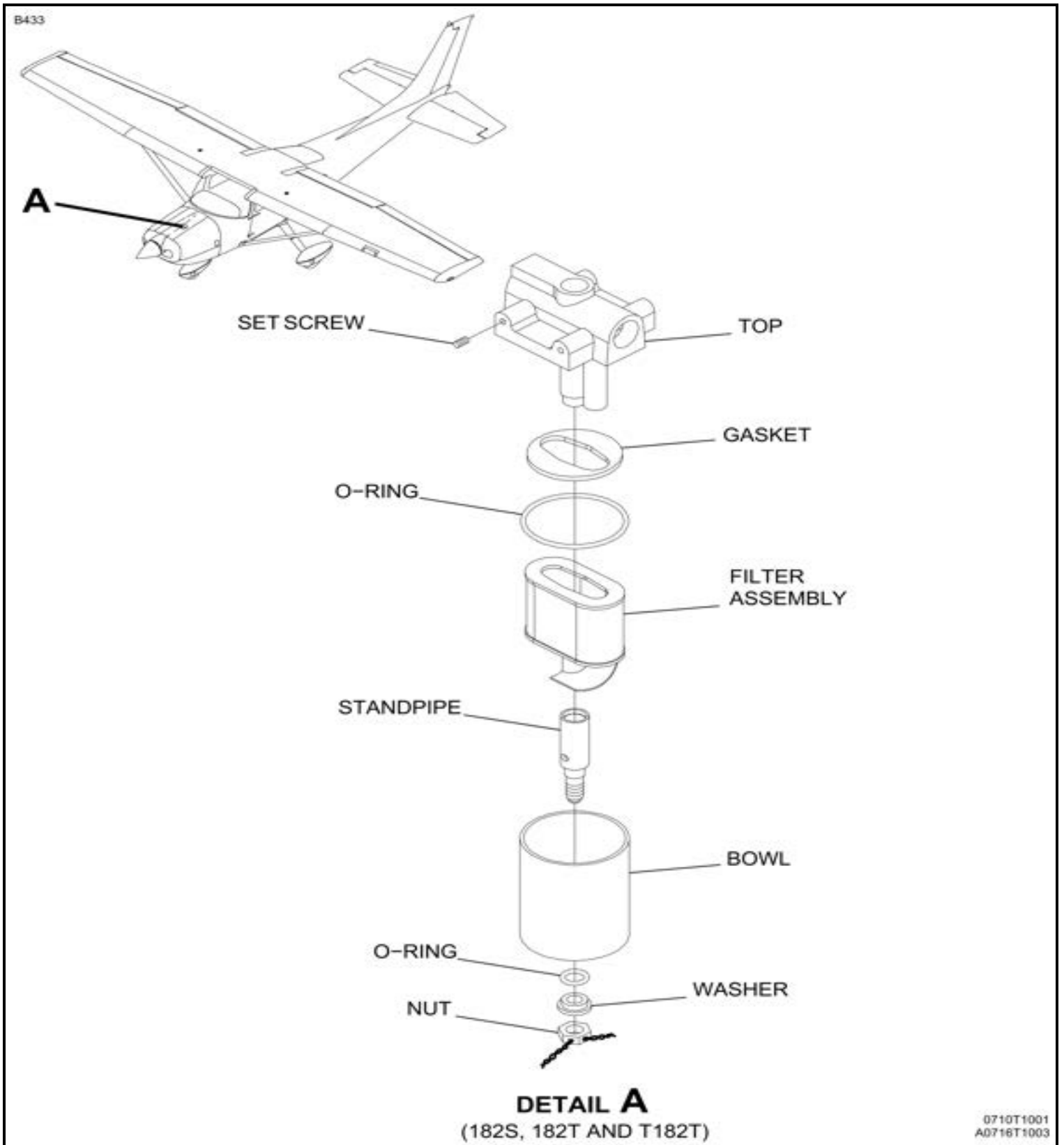


Figure 210 : Sheet 1 : Electric Auxiliary Fuel Pump

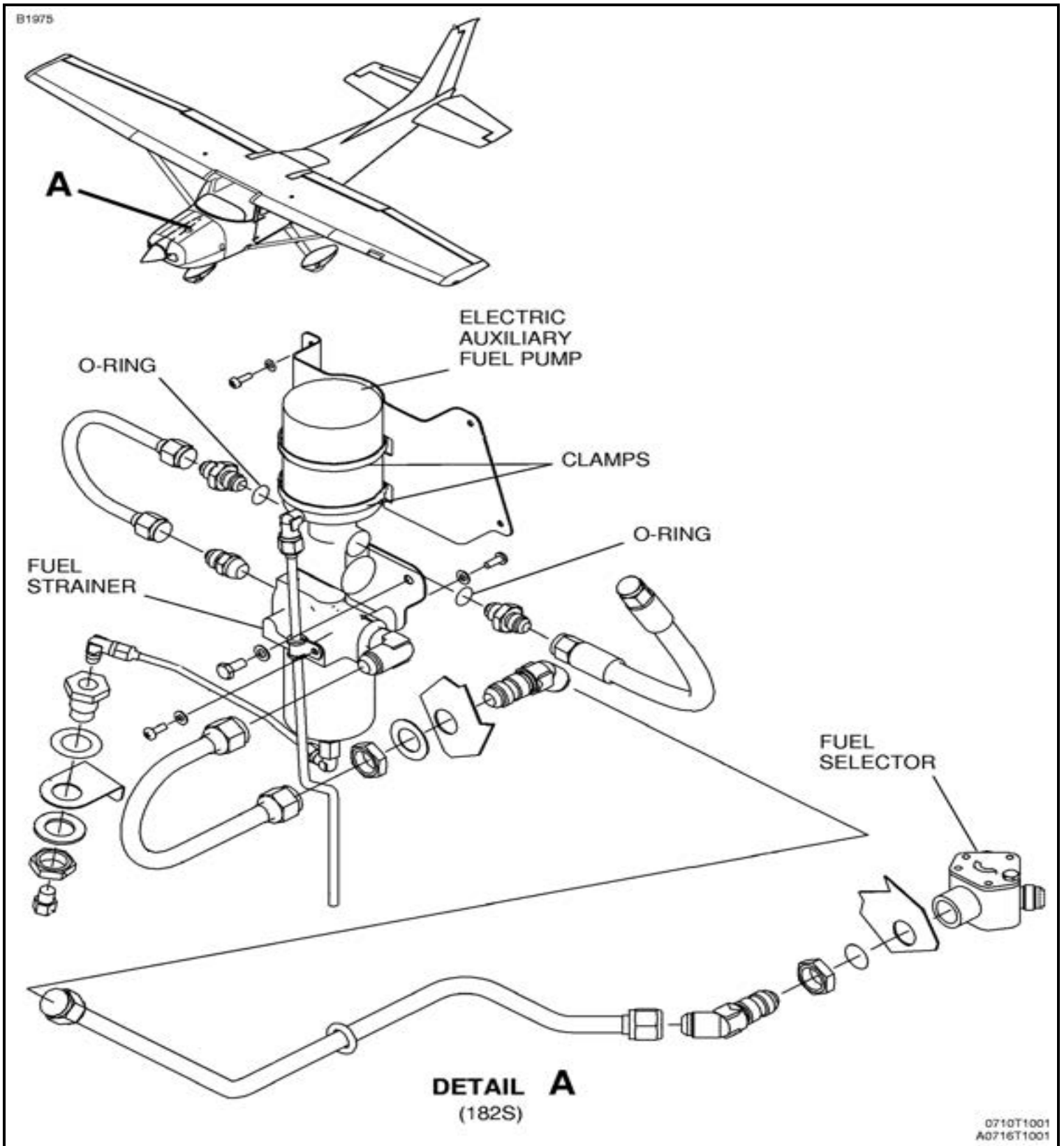


Figure 211 : Sheet 1 : Electric Auxiliary Fuel Pump

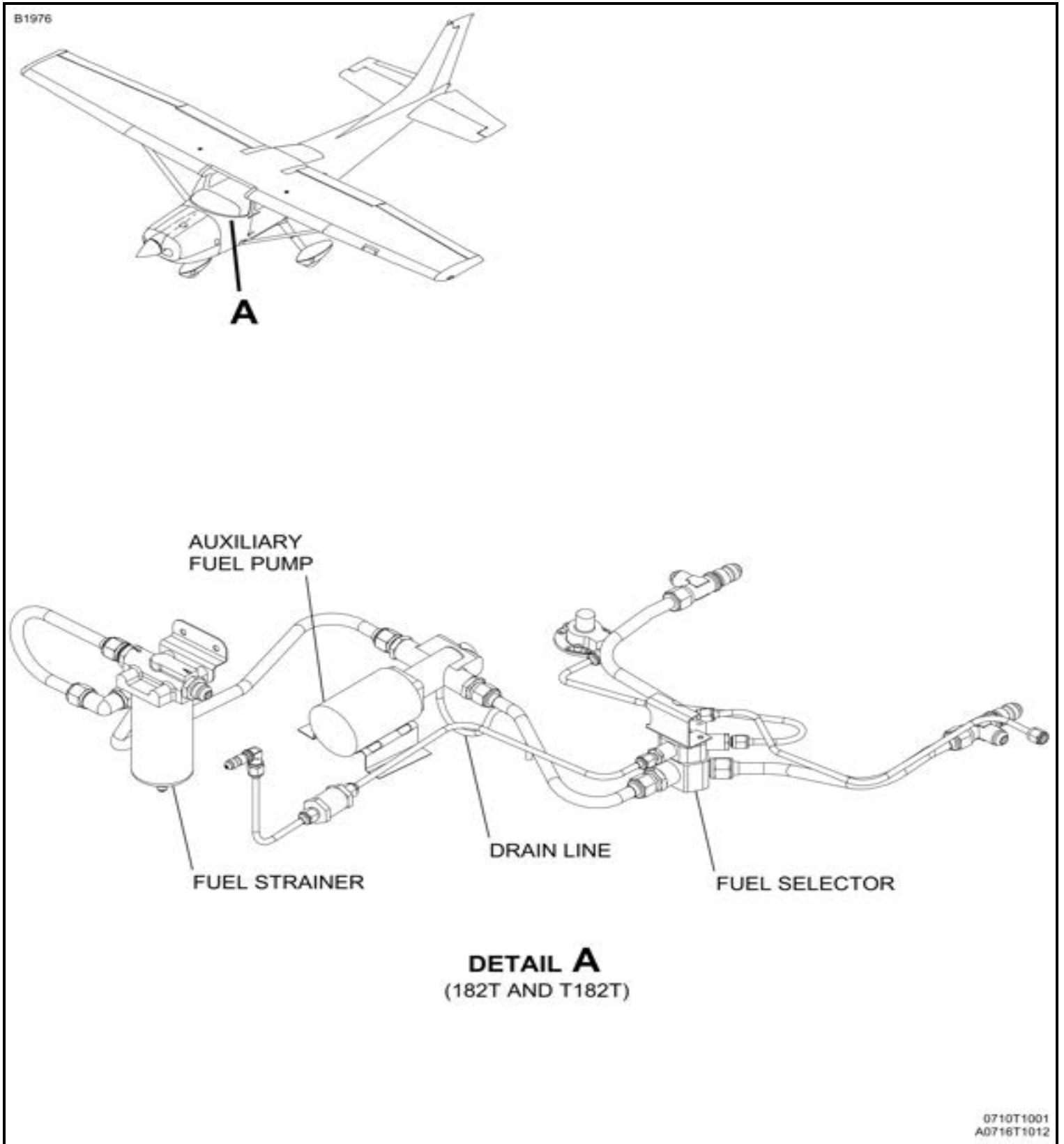


Figure 3 : Sheet 1 : Wing Access Panels

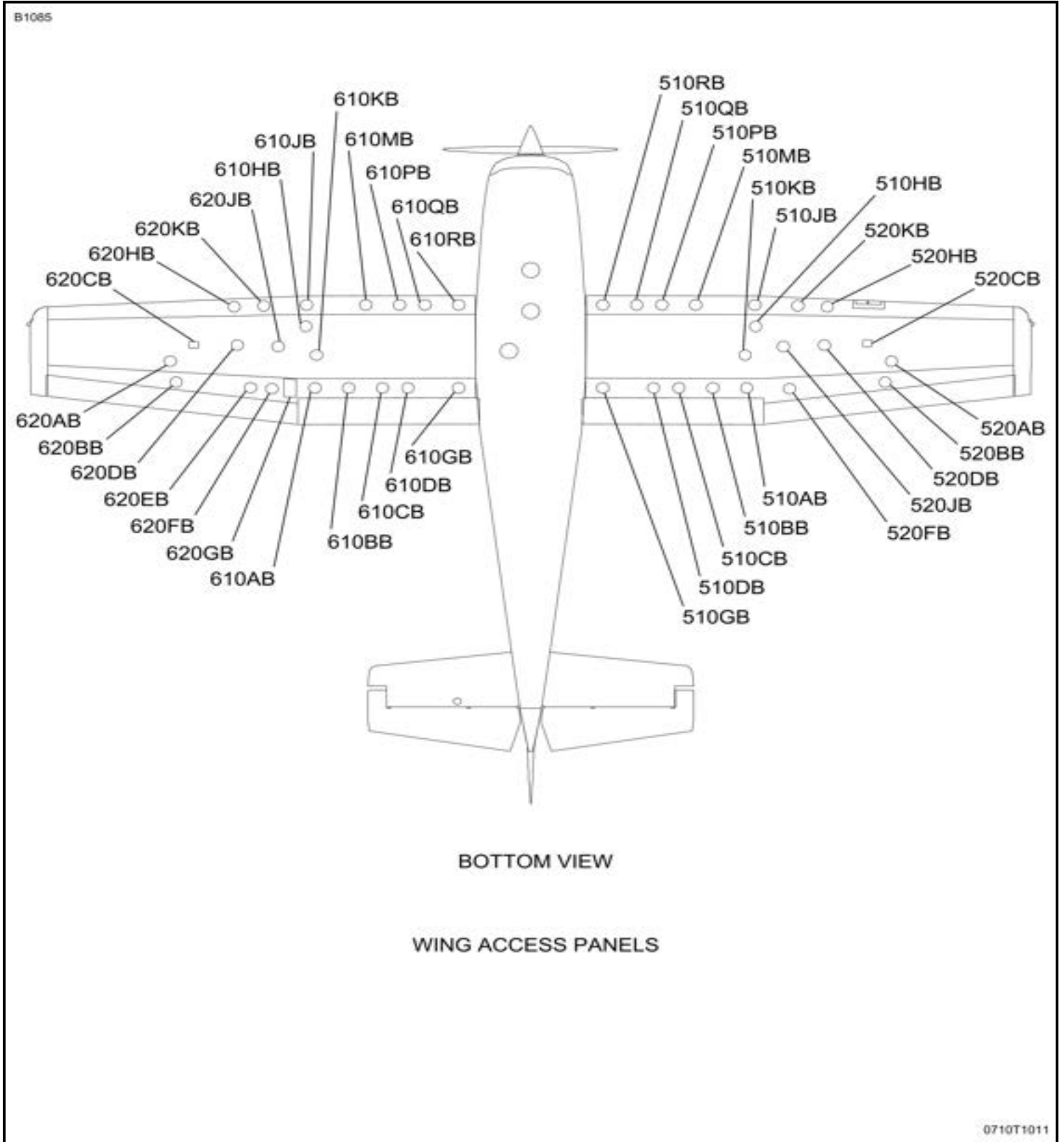


Figure 3 : Sheet 2 : Wing Access Panels

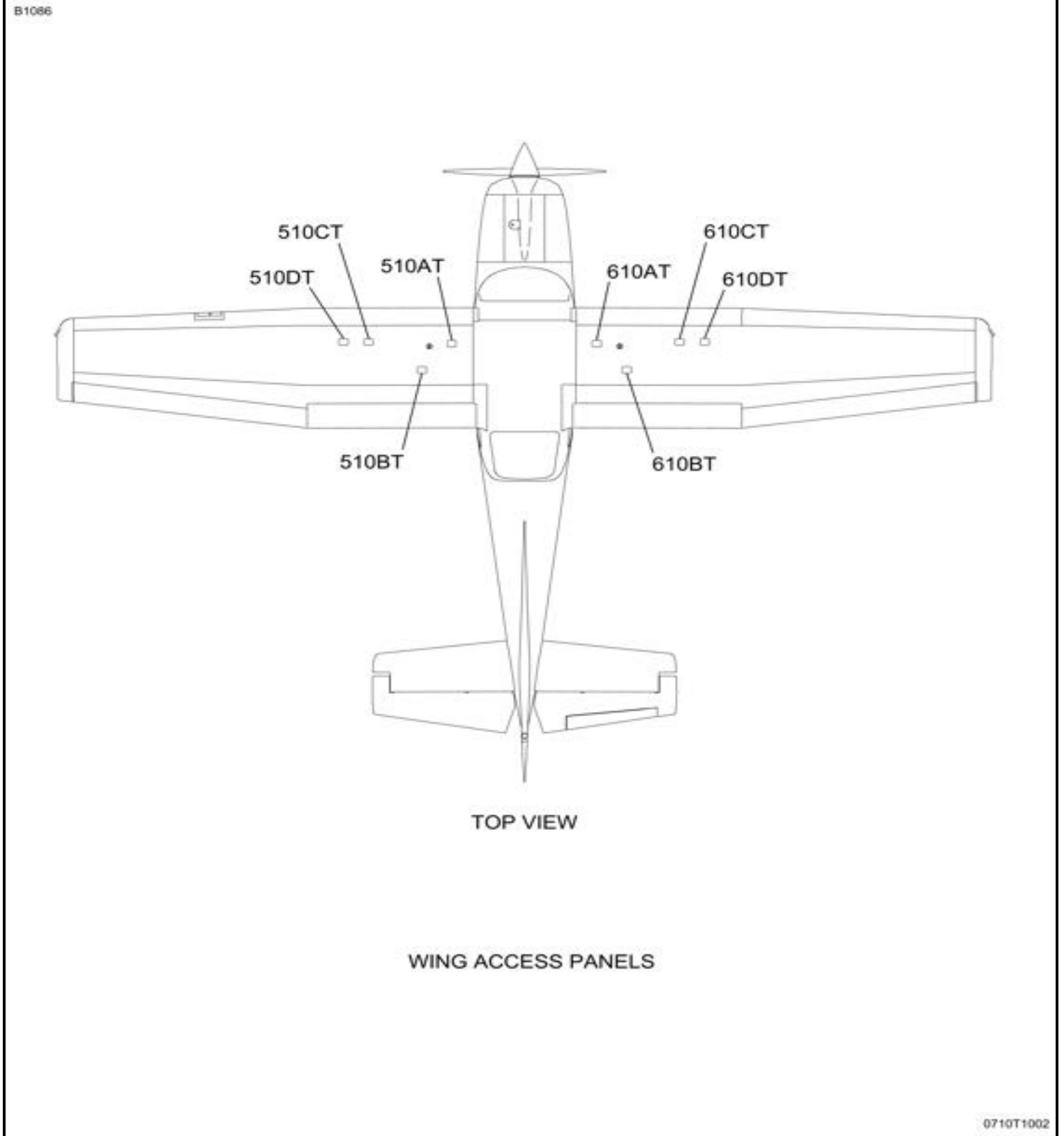
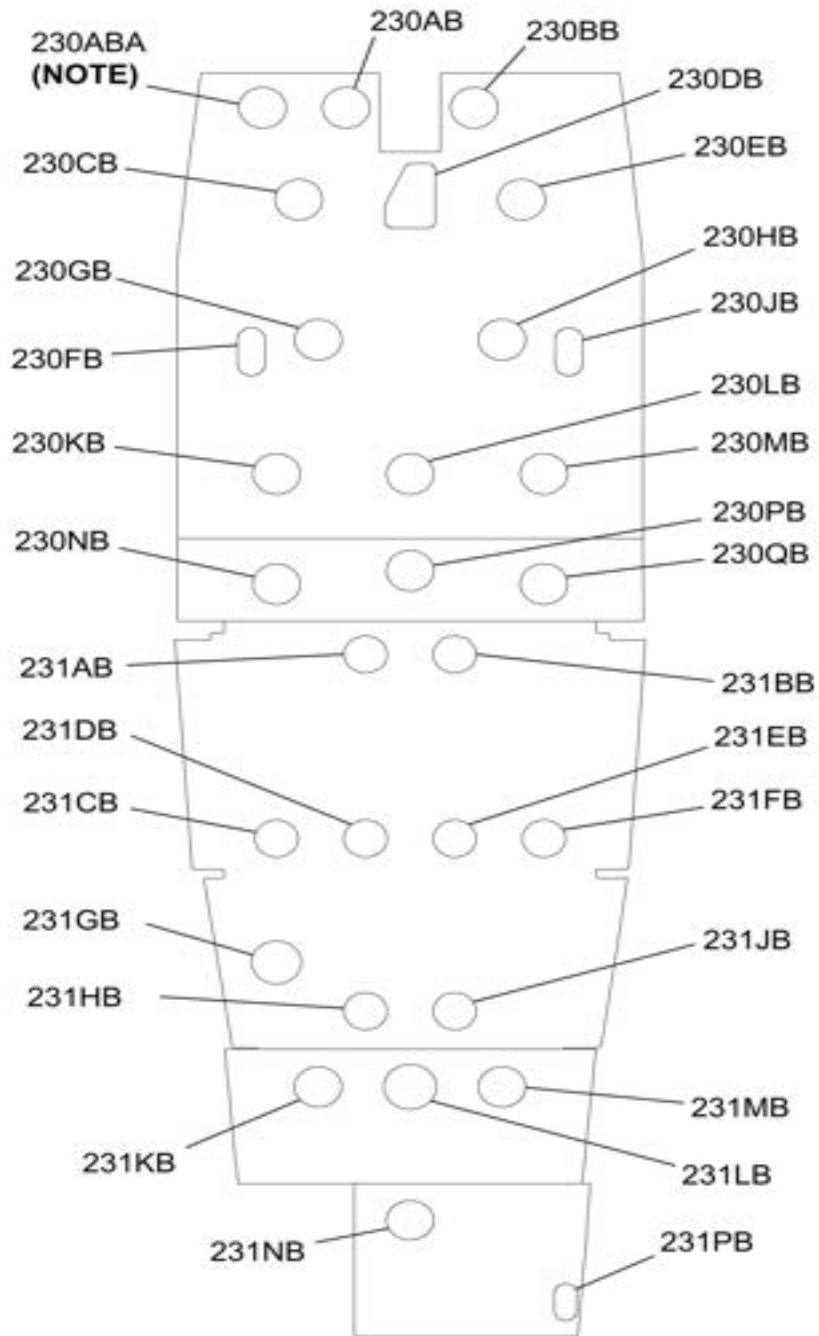


Figure 1 : Sheet 1 : Cabin Floorboard Panels

B1084



CABIN FLOORBOARD PANELS

NOTE: THE ACCESS PANEL IS APPLICABLE
ON AIRPLANES 18281225 AND ON
AND AIRPLANES T18208203 AND ON.

0710T1009

FUEL BAY SEALING - MAINTENANCE PRACTICES

1. General

- A. The fuel bays may need to be resealed if a leak has developed or if the wing has been repaired. This procedure provides instructions for sealing fuel bays, classifying fuel leaks and testing fuel bays after repair.

2. Tools and Equipment

- A. Refer to Fuel - General, for Tools and Equipment.

3. Classification of Fuel Leaks

- A. Fuel leaks are classified in to one of four categories based on the observed size of the leaks. Dependent on where the leak is located, immediate corrective action may be required prior to flight. Leaks may be classified as follows and are illustrated in [Figure 201](#):
 - (1) Stains - An area of 0.75 inch (19.05 mm) or less in diameter.
 - (2) Seep - An area from 0.75 inch to 1.50 inch (19.05 mm to 38.1 mm) in diameter.
 - (3) Heavy Seep - An area from 1.50 inch to 4.00 inch (38.1 mm to 101.6 mm) in diameter.
 - (4) Running Leak - Size varies with location and intensity of leak.
- B. The following leaks require corrective action before further flight:
 - (1) Running leaks in any area.
 - (2) Stains, seeps or heavy seeps in an enclosed area.
NOTE: An enclosed area is defined as the wing leading edge and the section of wing inboard or outboard of the fuel bays.
- C. The following leaks require correction when the airplane is grounded for other maintenance:
 - (1) Stains, seeps or heavy seeps not in an enclosed area.

4. Sealing Fuel Leaks

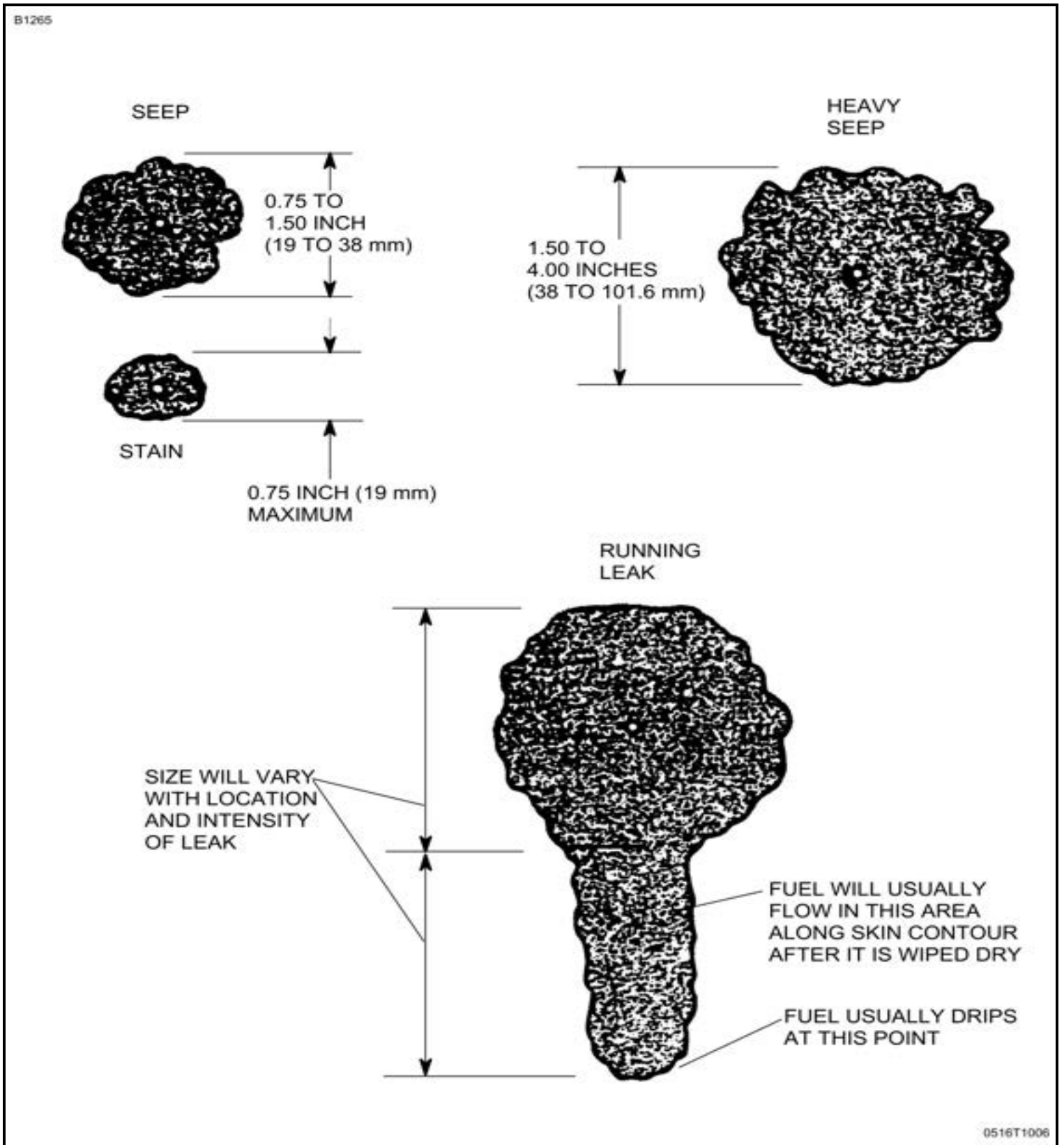
- A. Determine Source of Leak.
 - (1) Fuel can flow along a seam or structure of the wing for several inches, making the leak source difficult to find. A stained area is an indication of the leak source.
 - (2) Fuel leaks can be found by testing the complete bay as described in Testing Integral Fuel Bay.
 - (3) Another method of detecting the source of a fuel leak is to remove access doors and blow with an air nozzle from the inside of the bay in the area of the leak while soap bubble solution is applied to the outside wing skin.
- B. Repair Leak.
 - (1) Remove existing sealant in the area of the leak.
 - (2) Clean the area and apply a fillet seal. Press sealant into leaking area with a small paddle, working out all air bubbles.
 - (3) If leakage occurs around a rivet or bolt, replace the rivet or loosen bolt, retorque and reseal around nutplate.
 - (4) Apply Type VIII sealant to access doors, fuel quantity transmitter, etc., as required and reinstall to structure. Refer to [Chapter 20, Fuel, Weather and High-Temperature Sealing - Maintenance Practices](#).
 - (5) Allow sealant to cure completely.
 - (6) Test fuel bay for leakage. Refer to [Testing Integral Fuel Bay](#).

5. Testing Integral Fuel Bay

- A. The fuel system consists of two vented, integral fuel tanks (one in each wing). The following procedure should be used only after sealant has fully cured.
 - (1) Remove vent line from vent fitting and cap fitting.
 - (2) Disconnect fuel lines from bay.
 - (3) To one of the bay fittings, attach a water manometer capable of measuring 20 inches (0.508 m) of water.
 - (4) To the other bay fitting, connect a well regulated supply of air (0.5 PSI (3.45 kPa) maximum, or 13.8 (0.351 m) inches of water). Nitrogen may be used where the bay might be exposed to temperature changes while testing.
 - (5) Make sure filler cap is installed and sealed.
 - (6) Apply pressure slowly until 0.5 PSI (3.45 kPa) is obtained.

- (7) Apply a soap solution as required.
- (8) Allow 15 to 30 minutes for pressure to stabilize.
- (9) If bay holds for 15 minutes without pressure loss, seal is acceptable.
- (10) Reseal and retest if any leaks are found.

Figure 201 : Sheet 1 : Classification of Fuel Leaks



FUEL QUANTITY INDICATION SYSTEM - TROUBLESHOOTING

1. Troubleshooting

- A. This section provides troubleshooting information for the fuel quantity indication system on airplanes with the CAN bus fuel sensors.

TROUBLE	PROBABLE CAUSE	REMEDY
RED Xs OVER THE FUEL QUANTITY INDICATORS.	1. Proper software configuration not loaded.	Check the software configuration. Refer to Software Configuration Check .
	2. No information transmitted between the fuel quantity sensor and the Integrated Avionics Unit (GIA).	Check the system wiring. Refer to the System Wiring Resistance Check .
	3. No electrical power to the fuel quantity sensors.	Check for power to the sensor in question. Refer to System Power Check .
	4. Damaged fuel quantity sensor.	Remove the fuel quantity sensor in question and connect it to the connector on the opposite side. If the problem follows the sensor, replace it. Refer to Fuel Quantity Indication System-Removal/Installation . If the problem does not follow the sensor, contact Cessna Customer Services at 316-517-5800.
Questionable Fuel Quantity Indication Value	1. Proper software configuration not loaded.	Check the software configuration. Refer to Software Configuration Check .
	2. A Fuel Quantity Calibration is necessary.	Do a fuel quantity calibration. Refer to Fuel Quantity System Calibration (Airplanes with Garmin G1000 and CAN bus type fuel level sensors) .

2. Software Configuration Check

- A. Check the software configuration.
- Put the BAT MASTER switch and the AVIONICS MASTER switches to the ON position to start the G1000 system in normal mode.
 - Disengage the MFD and both PFD circuit breakers.
 - After 10 seconds, engage both PFD circuit breakers while the ENT button is pushed on the PFD.
 - Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
- NOTE:** The PFD is now in the configuration mode.
- Use the Flight Management System (FMS) outer knob to go to the GIA page group.
 - Use the FMS inner knob to go to the CAN CONFIGURATION page.
 - Push the inner FMS knob to start the cursor.
 - Use the outer FMS knob to move the cursor over CHNL 1.
 - Use the FMS inner knob to go to the CHNL 2.
 - Make sure that the values on the PFD match the values in Tables 101 and 102.
 - If the values on the PFD do not match the values in Tables 101 and 102, load the configuration data. Refer to [Fuel Quantity Indication System-Adjustment/Test](#).

Table 101. CAN I/O (Inputs/Outputs)

	SET	ACTIVE
INPUT DATA	VIBRO-METER FUEL PROBE	VIBRO-METER FUEL PROBE
OUTPUT DATA	OFF	OFF

SPEED	0000125000	0000125000

Table 102. FUEL PACKETS PRESENT

	SET	ACTIVE
FUEL QNTY L #1	ON	ON
FUEL QNTY L #2	OFF	OFF
FUEL QNTY L #3	OFF	OFF
FUEL QNTY L #4	OFF	OFF
FUEL QNTY L #5	OFF	OFF
FUEL QNTY C #1	OFF	OFF
FUEL QNTY C #2	OFF	OFF
FUEL QNTY R #1	ON	ON
FUEL QNTY R #2	OFF	OFF
FUEL QNTY R #3	OFF	OFF
FUEL QNTY R #4	OFF	OFF
FUEL QNTY R #5	OFF	OFF

3. System Wiring Resistance Check

A. Check the system wiring resistance. Refer to [Figure 101](#)

- (1) Remove electrical power from the plane.
- (2) Remove the headliner to get access to the wing root. Refer to Chapter 25, [Cabin Panels - Removal/Installation](#).
- (3) Test the system as described in Table 103, Continuity and Resistance Test
 - (a) If necessary, repair the damaged wiring.

Table 103. Continuity and Resistance Test

Airplane Configuration	Pins to measure		Acceptable Resistance (Ohms)
	Positive meter lead	Negative meter lead	
Left sensor (PL900) disconnected to take measurements on PL900. Right sensor connected. Airplane master switches OFF.	Pin 3 (CAN BUS HI)	Pin 4 (CAN BUS LO)	Approximately 120Ω
	Pin 3 (CAN BUS HI)	Airplane ground	Greater than 100kΩ
	Pin 4 (CAN BUS LO)	Airplane ground	Greater than 100kΩ
	Pin 3 (CAN BUS HI)	Pin 1 (28VDC)	Greater than 100kΩ
	Pin 4 (CAN BUS LO)	Pin 1 (28VDC)	Greater than 100kΩ
	Pin 6 (CONFIG 0)	Pin 11 (CONFIG RETURN)	Approximately 0Ω
	Pin 12 (CAN TERM RES START)	Pin 5 (CAN TERM RES END)	Approximately 0Ω
	Make sure pins 7, 8, 9, 10, and 13 have no connection.		
Right sensor (PR900) disconnected to take measurements on PR900. Left sensor connected. Airplane master switches OFF.	Pin 3 (CAN BUS HI)	Pin 4 (CAN BUS LO)	Approximately 120Ω
	Pin 3 (CAN BUS HI)	Airplane ground	Greater than 100kΩ
	Pin 4 (CAN BUS LO)	Airplane ground	Greater than 100kΩ
	Pin 3 (CAN BUS HI)	Pin 1 (28VDC)	Greater than 100kΩ
	Pin 4 (CAN BUS LO)	Pin 1 (28VDC)	Greater than 100kΩ
	Pin 9 (CONFIG 0)	Pin 11 (CONFIG RETURN)	Approximately 0Ω
	Pin 12 (CAN TERM RES START)	Pin 5 (CAN TERM RES END)	Approximately 0Ω

		Make sure pins 6, 7, 8, 10, and 13 have no connection.		
	Both sensors (PR900 and PL900) disconnected. Take measurements on PR900. Airplane master switches OFF.	Pin 3 (CAN BUS HI)	Pin 4 (CAN BUS LO)	Greater than 1kΩ

4. System Power Check

A. Check the System Power.

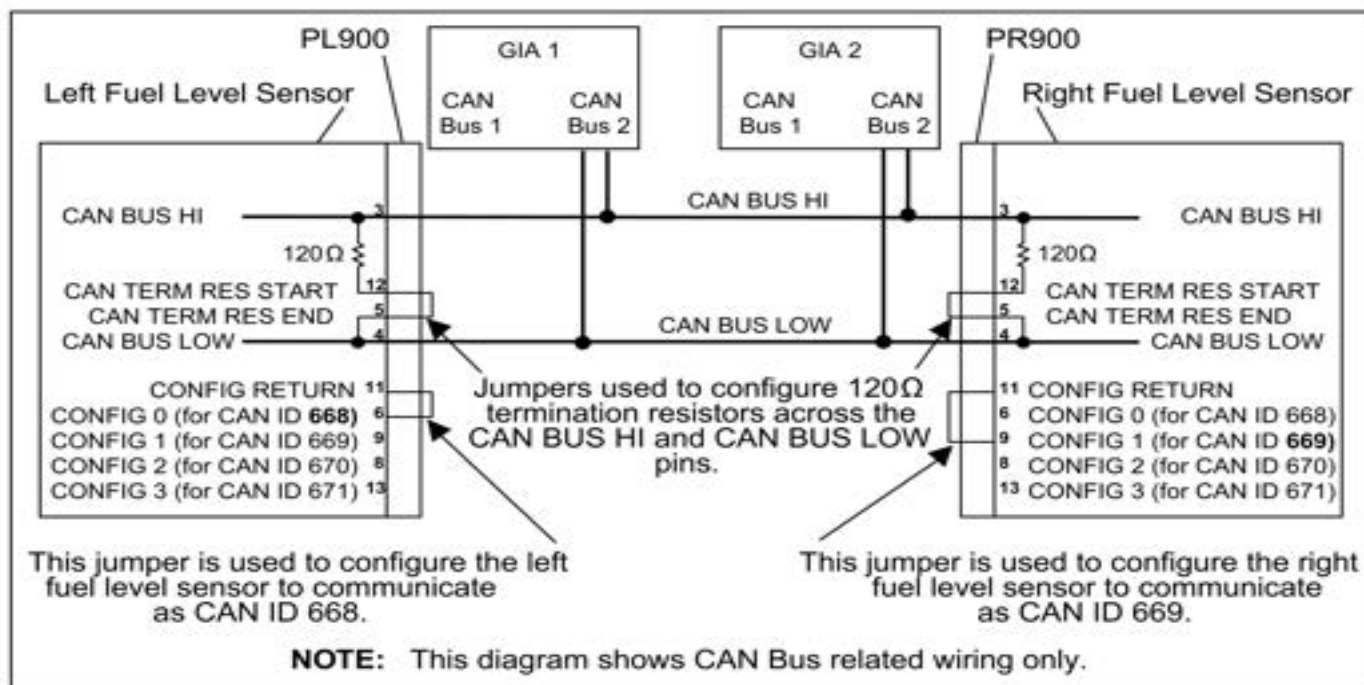
- (1) Disengage the NAV1 ENG circuit breaker on the ESS BUS.
- (2) Put a wires in Pin 1 (28VDC) and Pin 2 (GROUND) of the connector.
- (3) Put the voltmeter probes on the wire to the applicable pin.

CAUTION: Make sure the wires or probes do not touch when the NAV1 ENG circuit breaker is engaged. If the wires or probes touch, the inline system protection fuse will open.

- (4) Engage the NAV1 ENG circuit breaker.
- (5) Make the system reads 28 volts.
 - (a) If the system does not have power, troubleshoot the power distribution system including the inline system protection fuse.
- (6) Disengage the NAV1 ENG circuit breaker.
- (7) Remove the wires from the connector.

Figure 101 : Sheet 1 : CAN Bus Wiring Diagram

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FUEL QUANTITY INDICATION SYSTEM - REMOVAL/INSTALLATION

1. General

- A. This section gives the instructions for removal and installation of the components fuel quantity indication system.

2. Float-type Fuel Level Sender Removal/Installation

NOTE: The fuel quantity sender removal/installation is typical for left and right fuel tanks.

- A. Remove the Left and Right Fuel Quantity Senders (Refer to [Figure 401](#)).

- (1) Defuel the airplane. Refer to Chapter 12, [Fuel - Servicing](#).
- (2) Remove the headliner to get access to the wing root. Refer to Chapter 25, [Cabin Panels - Removal/Installation](#).
- (3) Disconnect the wire ring terminals from the fuel level sender.

CAUTION: Do not bend the float arm of the fuel level sender.

- (4) Remove and keep the screws that attach the fuel level sender to the nut ring. Carefully remove the fuel level sender and the gasket from the fuel tank. Keep the gasket for an inspection and for installation.

- B. Install the Left and Right Fuel Quantity Senders (Refer to [Figure 401](#)).

NOTE: Do the fuel quantity calibration only after installation of the fuel level sender.

- (1) Connect an ohmmeter between the ground terminal and center terminal to check the resistance of the fuel level sender as applicable:
 - (a) If tanks are empty, check resistance is 3 ohms, +2 or -2 ohms.
 - (b) If tanks are full, check resistance is 90 ohms, +5 or -5 ohms.
- (2) Examine the gaskets for cracks or other damage that can prevent the gasket from making a good seal. If the gaskets have damage, or if there are signs of fuel leaks, install new gaskets. Always install new gaskets when you install a new fuel level sender.

CAUTION: Do not bend the float arm of the fuel level sender.

- (3) Carefully install the fuel quantity sender into the fuel tank and attach the nut ring with screws.
- (4) Connect the wire ring terminals to the fuel level sender.
- (5) Install the headliner. Refer to Chapter 25, [Cabin Panels - Removal/Installation](#).

3. Fuel Quantity Indicator Removal/Installation

- A. Make sure the fuel level senders operates correctly before the fuel quantity indicator is replaced.

- (1) Connect an ohmmeter between the ground terminal and center terminal to check the resistance of the fuel level sender as applicable:
 - (a) If tanks are empty, check resistance is 3 ohms, +2 or -2 ohms.
 - (b) If tanks are full, check resistance is 90 ohms, +5 or -5 ohms.
- (2) Make sure the resistance is 3 ohms, +2 or -2 ohms when the tanks are empty.
- (3) Make sure the resistance is 90 ohms, +5 or -5 ohms when the tanks are full.

- B. Remove the Indicator (Refer to [Figure 401](#)).

- (1) Make sure the electrical power is OFF.
- (2) Get access to the forward of the fuel quantity indicator and disconnect the electrical connector.
- (3) Remove the screws that attach the indicator to the instrument panel and remove the indicator from the airplane.

- C. Install the Indicator (Refer to [Figure 401](#)).

NOTE: Fuel quantity calibration must be done after installing sender. Refer to [Fuel Quantity Calibration](#).

- (1) Connect the electrical connector to the indicator.
- (2) Put the indicator in position and attach to the instrument panel with screws.
- (3) Make sure the fuel quantity gauge operates correctly.

4. CAN Bus Fuel Level Sensor Removal/Installation

- A. Remove the Sensor (Refer to [Figure 402](#).)

- (1) Make sure the electrical power is OFF.

- (2) Defuel the airplane. Refer to Chapter 12, [Fuel Servicing](#).
- (3) Remove the headliner to get access to the wing root. Refer to Chapter 25, [Cabin Panels - Removal/Installation](#).
- (4) Disconnect the electrical connector from the fuel level sensor.
- (5) Disconnect the fuel level sensor ground braid.
- (6) Remove the screws that attach the fuel level sensor to the bracket.

CAUTION: Do not bend the fuel level sensor tube on the structure inside or outside the tank. A bent tube will give incorrect operation.

- (7) Carefully remove the fuel level sender from the fuel bay
 - (a) Carefully rotate the sensor tip forward of the mounting hole.
 - (b) Carefully pull the sensor out and forward of the mounting hole.

B. Install the Sensor (Refer to [Figure 402](#).)

NOTE: If the fuel level senders are replaced, the system must be calibrated. Refer to [Fuel Quantity Calibration](#).

- (1) Install the new gaskets on the fuel level sensor.

CAUTION: Do not bend the fuel level sensor tube on the structure inside or outside the tank. A bent tube will give incorrect operation.

- (2) Carefully install the fuel level sender in the fuel bay.
 - (a) Put the sensor in position so that the sensor tip is in the hole in the tank and the sensor housing is toward to the front of the airplane.
 - (b) Put the sensor tube into the tank.

NOTE: When the sensor tube is put into the tank correctly, the sensor tip should point forward.

- (c) Carefully turn the sensor tip down when all of the sensor tube is inside the tank.
- (3) Attach the fuel level sensor with screws.
- (4) Torque the screws to 20 inch-pounds by cross pattern sequence.
- (5) Connect the electrical connector to fuel level sensor.
- (6) Connect the fuel level sensor ground braid.
- (7) Install the headliner. Refer to Chapter 25, [Cabin Panels - Removal/Installation](#).
- (8) Do a check of the fuel quantity calibration. Refer to [Fuel Quantity System Calibration \(Airplanes with Garmin G1000 and CAN bus type fuel level sensors\)](#).

Figure 401 : Sheet 1 : Float-type Fuel Level

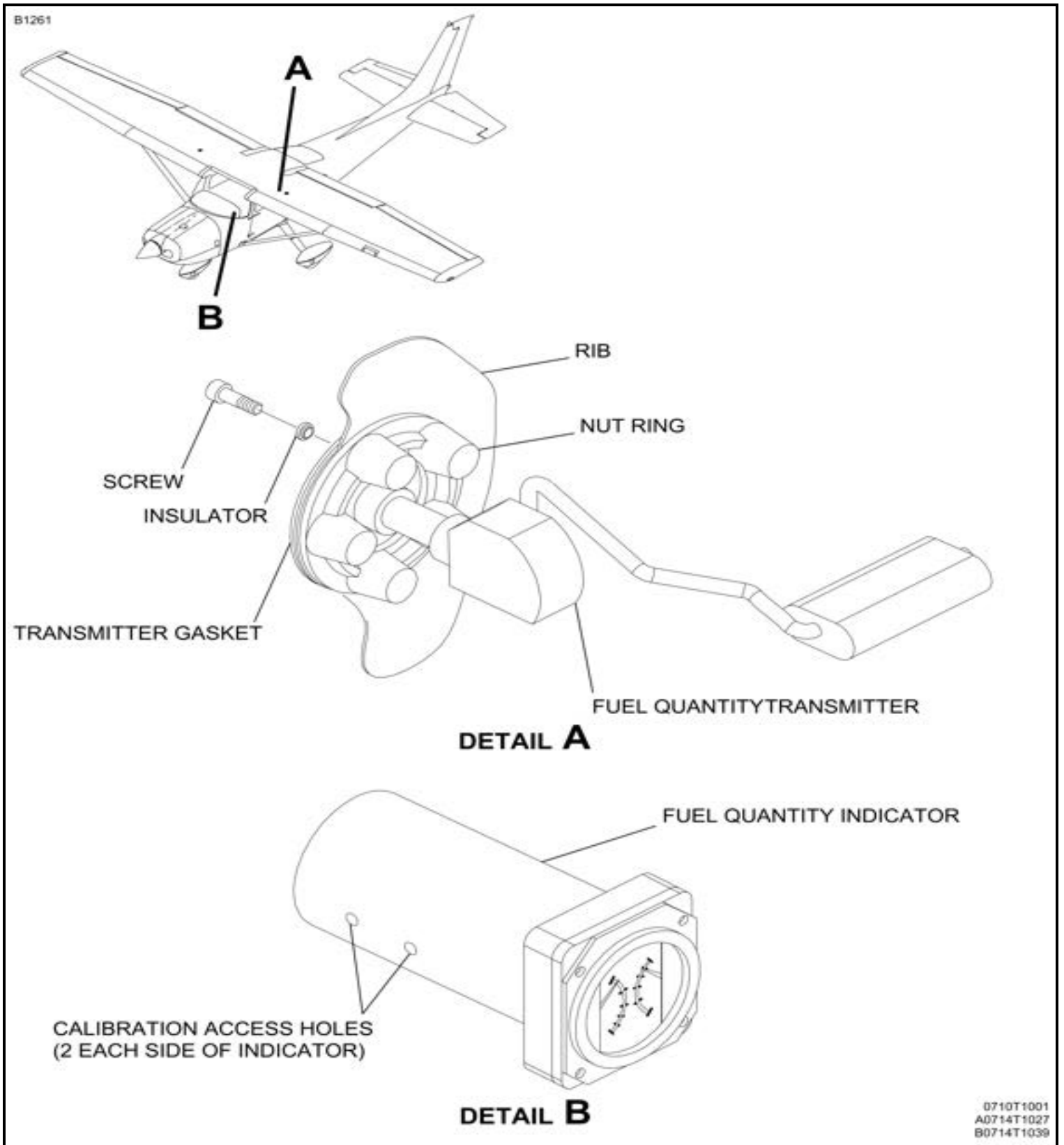
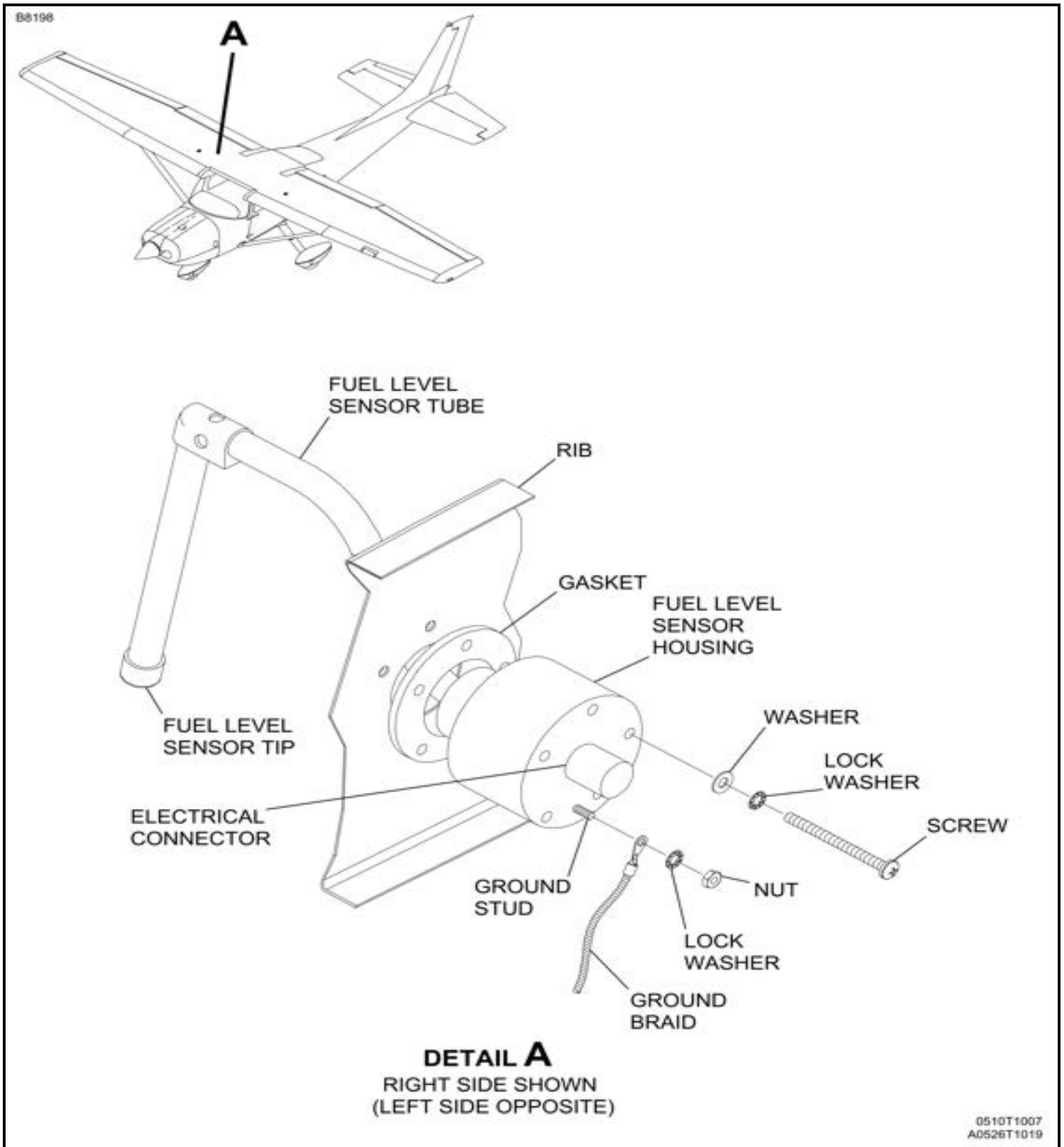


Figure 402 : Sheet 1 : Fuel Level Sensor



FUEL QUANTITY INDICATION SYSTEM - ADJUSTMENT/TEST

1. General

A. This section gives the adjustment/test procedures for the fuel storage and distribution system.

2. Fuel Quantity Calibration And Check (Airplanes without Garmin G1000)

A. Fuel Indicator Calibration

- (1) Put the fuel selector valve in the BOTH position.
- (2) Defuel the airplane. Refer to Chapter 12, [Fuel - Servicing](#).
 - (a) Open all the wing drain valves and drain the fuel bays until both are empty.
 - (b) Drain the fuel selector valve until empty.
- (3) Put the fuel selector valve in the OFF position.
- (4) Remove the fuel quantity indicator from the instrument panel.
- (5) Install a 0580001-1 test box between the wire harness connector and the fuel quantity indicator connector.
NOTE: The internal light for the fuel quantity indicator will not work when the test box is connected.
- (6) Make the airplane level.
 - (a) Make the wings level to 0.00 degree, +0.25 degree or -0.25 degree. Use blocks under the wheels or adjust the tire pressure to make the wings level. Refer to Chapter 8, [Leveling - Maintenance Practices](#).
 - (b) Make the airplane level to 2.00 degrees, +0.25 or -0.25 degrees nose up position. Refer to Chapter 8, [Leveling - Maintenance Practices](#).
- (7) Use an external power source to apply 28 VDC, +0.5 or -0.5 VDC, to the airplane, and put the master switch in the ON position. Put both switches on the test box to the NORM position.
- (8) Add unusable fuel to each fuel bay. Refer to Pilot's Operating Handbook for the amount of unusable fuel.
- (9) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
- (10) Let the airplane become stable for approximately 30 seconds.
- (11) Make sure that the airplane is still at 2 degrees nose up and the wings are still level.
- (12) Adjust the "EMPTY" potentiometer, on the fuel quantity indicator, for the left and right gages until the indicator pointer is in the middle of the red radial line.

NOTE: A nonmagnetic screwdriver must be used when you adjust the potentiometers on the fuel quantity indicator.

- (13) Make sure that the low-fuel warning-lamps come on.
- (14) Fill both fuel bays.
- (15) Adjust the "FULL" potentiometer for the left and right gages until the pointer is in the middle of the white radial line at the full indication.
- (16) Make sure the low-fuel warning-lamps go off.
- (17) Proceed to the Fuel Warning System Check.

B. Fuel Warning System Check.

- (1) Configure the airplane for the Fuel Warning System Check.
 - (a) Apply 28 VDC to the airplane.
 - (b) Set the master switch to ON.
 - (c) Move the test box switches to NORM.
 - (d) Make sure the fuel gages read FULL.
 - (e) Make sure the low-fuel annunciator is OFF.
- (2) Turn the NORM/OPEN switch on the text box to the OPEN position and start the timer.

NOTE: The airplane's digital clock can be used in the timer mode to measure the time of the annunciators. The interval for this test is from switch operation until the annunciator begins to flash. The annunciators will flash for approximately 10 seconds before they come continuously on without a flash.

- (3) Monitor the fuel quantity indicator.
 - (a) Make sure the pointer goes to the power off position below the first graduation.
 - (b) The annunciators must come on within 75 seconds.
- (4) Put the NORM/OPEN switch to the NORM position.
 - (a) The indicators must read full and the annunciators must go off.
 - (b) Set the timer again.
- (5) Turn the SHORT/NORM/100+ OHM switch to the 100+ OHM position. Start the timer.
- (6) Monitor the fuel quantity indicator.
 - (a) Make sure the pointer goes to the power off position below the first graduation.
 - (b) The annunciators must come on within 75 seconds.
- (7) Turn the SHORT/NORM/100+ OHM switch to the NORM position.
 - (a) The indicators must read full and the annunciators must go off.
 - (b) Set the timer again.
- (8) Turn the SHORT/NORM/100+ OHM switch to the SHORT position. Start the timer.
- (9) Monitor the fuel quantity indicator.
 - (a) Make sure the pointer goes to the power off position below the first graduation.
 - (b) The annunciators must come on within 75 seconds.
- (10) Turn the SHORT/NORM/100+ OHM switch to the NORM position.
 - (a) The indicators must read full and the annunciators must go off.
- (11) Set the airplane digital clock back to the clock mode.
- (12) Set the master switch to OFF.
- (13) Remove the test box.
- (14) Install the fuel quantity indicator in the instrument panel.
- (15) Set the master switch to ON.
- (16) Make sure the fuel quantity indicators show FULL and the annunciators are off.
- (17) Set the master switch to OFF.

3. Fuel Quantity Calibration and Check Setup (Airplanes with Garmin G1000 and float-type fuel level senders).

NOTE: All G1000 airplanes must have software version 563.03 or later. The software version is shown on the upper right corner of the MFD on the first page shown after the MFD is powered on in normal operation.

NOTE: If the fuel quantity indicator on the Garmin G1000 system has a red X on it during normal operation, examine the fuel quantity sender and wiring and refer to the Garmin G1000 Line Maintenance Manual for more Garmin system troubleshooting.

A. Do a Fuel Quantity Calibration and Check Setup.

- (1) Put the selector valve in the BOTH position.
- (2) Defuel the airplane. Refer to Chapter 12, [Fuel - Servicing](#).
 - (a) Drain the fuel tanks with all wing drain valves until the two tanks are empty.
 - (b) Drain the fuel-selector drain valve until it is empty.
- (3) Put the fuel selector valve in the OFF position.
- (4) Make the airplane level.
 - (a) Make the wings level to 0.0 degrees, +0.25 or -0.25 degree. Use blocks under the wheels or adjust tire pressure to make the wings level. Refer to Chapter 8, [Leveling - Maintenance Practices](#).
 - (b) Make the airplane level to 2.00 degrees, +0.25 or -0.25 degrees nose up position. Refer to Chapter 8, [Leveling - Maintenance Practices](#).
- (5) Add unusable fuel to each fuel tank. Refer to the Pilot's Operating Handbook for the unusable fuel quantity.
- (6) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.

- (7) Let the airplane become stable for approximately 30 seconds.
- (8) Put the BAT MASTER switch and the AVIONICS MASTER switches to the ON position to start the G1000 system in normal mode.
- (9) Make sure the fuel quantity indications do not show red Xs.
- (10) Disengage both NAV1 ENG circuit breakers and make sure that red Xs are shown for the fuel quantity.
- (11) Engage both NAV1 ENG circuit breakers and make sure no red Xs are shown for the fuel quantity.
- (12) After 60 seconds with no red Xs, make sure LOW FUEL L and LOW FUEL R annunciations are seen.
NOTE: The annunciations will be seen when the fuel quantity indicates less than 8 gallons for 60 seconds.
- (13) Disengage the MFD and both PFD circuit breakers.
- (14) After 10 seconds, engage both PFD circuit breakers while the ENT button is pushed on the PFD.
- (15) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
NOTE: The PFD is now in the configuration mode.
- (16) Use the Flight Management System (FMS) outer knob to go to the CAL page group.
- (17) Use the FMS inner knob to go to the FUEL TANK CALIBRATION page.
- (18) Engage the MFD circuit breaker while the ENT button is pushed on the MFD.
- (19) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.
CAUTION: Before you do the calibration procedure, you must turn on the G1000 system and let it become stable for a minimum of three minutes.
NOTE: The MFD is now in the configuration mode.
- (20) Use the FMS outer knob to go to the GRS page group on the MFD.
- (21) Use the FMS inner knob to go to the GRS/GMU CALIBRATION page on the MFD.
- (22) Do the steps that follow:
 - (a) If only a fuel quantity system check is needed, do a [Fuel Quantity System Check \(Airplanes with Garmin G1000 and float-type fuel level senders\)](#).
 - (b) If a fuel quantity system calibration is needed, do a [Fuel Quantity System Calibration \(Airplanes with Garmin G1000 and float-type fuel level senders\)](#).

4. Fuel Quantity System Calibration (Airplanes with Garmin G1000 and float-type fuel level senders).

A. Do the Fuel Quantity System Calibration.

- (1) If not completed before, do the [Fuel Quantity System Calibration and Check Setup \(Airplanes with Garmin G1000 and float-type fuel level senders\)](#).
- (2) Push the softkeys on the FUEL CALIBRATION page of the PFD, in the sequence that follows, to enter the password.
 - (a) Push Softkey 12 (far right softkey).
 - (b) Push Softkey 11.
 - (c) Push Softkey 10.
 - (d) Push Softkey 9.
- (3) Make sure that the FUEL FLOW ENG 1 SCALE value is 1.00000.
 - (a) If the FUEL FLOW ENG 1 SCALE value is not 1.00000, use the FMS knobs to make it 1.00000. Push in the inner FMS knob to activate the cursor. Use the outer FMS knob to select FUEL FLOW ENG 1 SCALE. Use the inner FMS knob to change the value.
- (4) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (5) Turn the inner FMS knob to select LEFT.
NOTE: After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.
- (6) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
- (7) Calibrate empty for the left fuel tank.
 - (a) Make sure that the CALIBRATED TOTAL value shown for the LEFT tank is stable.

- (b) Push the EMPTY softkey and push the enter (ENT) button to add or overwrite the 0.00 GL calibration point in the CALIBRATION TABLE.
 - (c) Make sure that the CALIBRATED TOTAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the LEFT tank.
 - (d) Make sure there is only one calibration point in the CALIBRATION TABLE. Under ACTUAL QUANTITY you must have "0.00 GL" and you must have one number under CALIBRATED VALUE. If you have more points in the CALIBRATION TABLE highlight them and use the DELETE softkey to delete them. Calibrate empty for the left fuel tank again if more than one calibration point was found.
- (8) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (9) Turn the inner FMS knob to select RIGHT.
- NOTE:** After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.
- (10) Calibrate empty for the right fuel tank.
- (a) Make sure that the CALIBRATED TOTAL value shown for the RIGHT tank is stable.
 - (b) Push the EMPTY softkey and push the ENT button to add or overwrite the 0.00 GL calibration point in the CALIBRATION TABLE.
 - (c) Make sure that the CALIBRATED TOTAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the RIGHT tank.
 - (d) Make sure there is only one calibration point in the CALIBRATION TABLE. Under ACTUAL QUANTITY you must have "0.00 GL" and you must have one number under CALIBRATED VALUE. If you have more points in the CALIBRATION TABLE highlight them and use the DELETE softkey to delete them. Calibrate empty for the right fuel tank again if more than one calibration point was found.
- (11) Do the [Fuel Quantity System Check \(Airplanes with Garmin G1000 and float-type fuel level senders\)](#).

5. Fuel Quantity System Check (Airplanes with Garmin G1000 and float-type fuel level senders).

A. Do the Fuel Quantity System Check.

- (1) If not completed before, do the [Fuel Quantity System Calibration and Check Setup \(Airplanes with Garmin G1000 and float-type fuel level senders\)](#).
- (2) Make sure that the left, L, and right, R, fuel quantity pointers are on the red line on the MFD on the GRS group GRS/GMU CALIBRATION page.
- (3) Add 8 gallons of fuel (low fuel level) to the left fuel tank. Refer to Chapter 12, [Fuel - Servicing](#).
- (4) Make sure fuel is sensed in the LEFT tank.
- (5) Add 8 gallons of fuel (low fuel level) to the right fuel tank. Refer to Chapter 12, [Fuel - Servicing](#).
- (6) Make sure fuel is sensed in the RIGHT tank.
- (7) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
- (8) Let the airplane become stable for approximately 30 seconds.
- (9) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
- (10) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (11) Turn the inner FMS knob to select LEFT.

NOTE: After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.

- (12) Make sure the CALIBRATED TOTAL value for the LEFT tank is stable and between 6.0 to 9.6 gallons.
- (13) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (14) Turn the inner FMS knob to select RIGHT.

NOTE: After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.

- (15) Make sure the CALIBRATED TOTAL value for the RIGHT tank is stable and between 6.0 to 9.6 gallons.
- (16) If the values are in tolerance, the procedure is complete.

- (17) If the CALIBRATED TOTAL values are not in the range:
 - (a) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
 - (b) Let the airplane become stable for approximately 30 seconds.
 - (c) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
 - (d) Make sure the CALIBRATED TOTAL value for the LEFT tank is stable and between 6.0 to 9.6 gallons.
 - 1 If the CALIBRATED TOTAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
 - (e) Make sure the CALIBRATED TOTAL value for the RIGHT tank is stable and between 6.0 to 9.6 gallons.
 - 1 If the CALIBRATED TOTAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
- (18) Make sure the tires are inflated to the correct pressure if necessary.
- (19) Remove blocks from under the gear if necessary.
- (20) Put the AVIONICS switch to the OFF position.
- (21) Put the BAT MASTER switch to the OFF position.

6. Fuel Quantity System Calibration and Check Setup (Airplanes with Garmin G1000 and CAN bus type fuel level sensors).

NOTE: All G1000 airplanes must have software version 563.03 or later. The software version is shown on the upper right corner of the MFD on the first page shown after the MFD is powered on in normal operation.

NOTE: If the fuel quantity indicator on the Garmin G1000 system has a red X on it during normal operation, examine the fuel quantity sensors and wiring and refer to the Garmin G1000 Line Maintenance Manual for more Garmin system troubleshooting. If the values given on the PFD are not the same as the values given in the calibration procedure, refer to [Fuel Quantity Indication System - Troubleshooting](#).

A. Do a Fuel Quantity Calibration and Check Setup.

- (1) Put the selector valve in the BOTH position.
- (2) Defuel the airplane. Refer to Chapter 12, [Fuel - Servicing](#).
 - (a) Drain the fuel tanks with all wing drain valves until the two tanks are empty.
 - (b) Drain the fuel-selector drain valve until it is empty.
- (3) Put the fuel selector valve in the OFF position.
- (4) Make the airplane level.
 - (a) Make the wings level to 0.0 degrees, +0.25 or -0.25 degree. Refer to Chapter 8, [Leveling - Maintenance Practices](#).
 - (b) Make the airplane level to 2.00 degrees, +0.25 or -0.25 degrees nose up position. Refer to Chapter 8, [Leveling - Maintenance Practices](#).
- (5) Add unusable fuel to each fuel tank. Refer to the Pilot's Operating Handbook for the unusable fuel quantity.
- (6) Put the BAT MASTER switch and the AVIONICS MASTER switches to the ON position to start the G1000 system in normal mode.
- (7) Make sure the fuel quantity indications do not show red Xs.
- (8) Disengage the NAV1 ENG circuit breaker on the ESS BUS and make sure that red Xs are shown for the fuel quantity.
- (9) Engage the NAV1 ENG circuit breaker on the ESS BUS and make sure no red Xs are shown for the fuel quantity.
- (10) After 60 seconds with no red Xs, make sure LOW FUEL L and LOW FUEL R annunciations are seen.

NOTE: The annunciations will be seen when the fuel quantity indicates less than 8 gallons for 60 seconds.
- (11) Disengage the MFD and both PFD circuit breakers.
- (12) After 10 seconds, engage the MFD circuit breaker while the ENT button is pushed on the MFD.
- (13) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.

CAUTION: Before you do the calibration procedure, you must turn on the G1000 system and let it become stable for a minimum of three minutes.

NOTE: The MFD is now in the configuration mode.
- (14) Use the FMS outer knob to go to the GRS page group on the MFD.

- (15) Use the FMS inner knob to go to the GRS/GMU CALIBRATION page on the MFD.
- (16) Engage both PFD circuit breakers while the ENT button is pushed on the PFD.
- (17) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
NOTE: The PFD is now in the configuration mode.
- (18) Use the Flight Management System (FMS) outer knob to go to the CAL page group.
- (19) Use the FMS inner knob to go to the FUEL TANK CALIBRATION page.
- (20) Do the steps that follow:
 - (a) If only a fuel quantity system check is needed, do a [Fuel Quantity System Check \(Airplanes with Garmin G1000 and CAN bus type fuel level sensors\)](#).
 - (b) If a fuel quantity system calibration is needed, do a [Fuel Quantity System Calibration \(Airplanes with Garmin G1000 and CAN bus type fuel level sensors\)](#).

7. Fuel Quantity System Calibration (Airplanes with Garmin G1000 and CAN bus type fuel level sensors).

A. Do the Fuel Quantity System Calibration.

- (1) If not completed before, do the [Fuel Quantity System Calibration and Check Setup \(Airplanes with Garmin G1000 and CAN bus type fuel level sensors\)](#).
- (2) Make sure the software configuration is correct. Refer to [Fuel Quantity Indication System- Troubleshooting](#).
 - (a) If the configuration is correct, continue the calibration procedure.
 - (b) If the configuration is not correct, do a [CAN Bus Fuel Level Sensor Configuration Load](#).
- (3) Push the softkeys on the FUEL CALIBRATION page of the PFD, in the sequence that follows, to enter the password.
 - (a) Push Softkey 12 (far right softkey).
 - (b) Push Softkey 11.
 - (c) Push Softkey 10.
 - (d) Push Softkey 9.
- (4) Make sure that the FUEL FLOW ENG 1 SCALE value is 1.00000.
 - (a) If the FUEL FLOW ENG 1 SCALE value is not 1.00000, use the FMS knobs to make it 1.00000. Push in the inner FMS knob to activate the cursor. Use the outer FMS knob to select FUEL FLOW ENG 1 SCALE. Use the inner FMS knob to change the value.
- (5) Push the SCALE softkey to select the scale function.
NOTE: The SCALE softkey will be gray with black letters when it is selected.
NOTE: The scale function needs to be selected when overwriting the 0.00 GL calibration points for both the left and right tank.
- (6) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (7) Turn the inner FMS knob to select LEFT.
NOTE: After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.
- (8) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
- (9) After 30 seconds, make sure that the CALIBRATED TOTAL value shown for the LEFT tank is stable.
- (10) Push the EMPTY softkey and push the enter (ENT) button to overwrite the 0.00 GL calibration point in the CALIBRATION TABLE.
NOTE: There should be several calibration points in the CALIBRATION TABLE.
- (11) Make sure that the CALIBRATED TOTAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the LEFT tank.
- (12) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (13) Turn the inner FMS knob to select RIGHT.
NOTE: After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.
- (14) After 30 seconds, make sure that the CALIBRATED TOTAL value shown for the RIGHT tank is stable.

- (15) Push the EMPTY softkey and push the ENT button to overwrite the 0.00 GL calibration point in the CALIBRATION TABLE.
- NOTE:** There should be several calibration points in the CALIBRATION TABLE.
- (16) Make sure that the CALIBRATED TOTAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the RIGHT tank.
- (17) Do the [Fuel Quantity System Check \(Airplanes with Garmin G1000 and CAN bus type fuel level sensors\)](#).

8. Fuel Quantity System Check (Airplanes with Garmin G1000 and CAN bus type fuel level sensors).

A. Do the Fuel Quantity System Check.

- (1) If not completed before, do the [Fuel Quantity System Calibration and Check Setup \(Airplanes with Garmin G1000 and CAN bus type fuel level sensors\)](#).
- (2) Make sure that the left, L, and right, R, fuel quantity pointers are on the red line on the MFD on the GRS group GRS/GMU CALIBRATION page.
- (3) Make sure the CALIBRATED VALUE on the CALIBRATION TABLE on the PFD agrees with the values in the Verification Table.
 - (a) On PFD on the FUEL TANK CALIBRATION page, find the CALIBRATED VALUE next to 0.00 GL. Find that number on the Verification Table in a "0.00 GL Calibrated Value" column.
 - (b) On the Verification Table, find the value in the 2.00 GL Calibrated Value (+0.3 or -0.3) column next to the chosen 0.00 GL Calibrated Value.
 - (c) Compare the 2.00 GL Calibrated Value on Verification Table to the 2.00 GL CALIBRATED VALUE on the PFD.

NOTE: For example, if the 0.00 GL CALIBRATED VALUE is 6.00000 then the 2.00 GL CALIBRATED VALUE should be 13.70000, +0.3 or -0.3.
 - (d) If the 2.00 GL CALIBRATED VALUE does not agree with the Verification Table, +0.3 or -0.3, do a [Fuel Calibration Initialization Data Load](#) and a [Fuel Quantity System Calibration \(Airplanes with Garmin G1000 and CAN bus type fuel level sensors\)](#).

0.00 GL Calibrated Value	2.00 GL Calibrated Value (+0.3 or -0.3)	0.00 GL Calibrated Value	2.00 GL Calibrated Value (+0.3 or -0.3)	0.00 GL Calibrated Value	2.00 GL Calibrated Value (+0.3 or -0.3)	0.00 GL Calibrated Value	2.00 GL Calibrated Value (+0.3 or -0.3)
0.00000	8.19149	0.10000	8.28330	0.20000	8.37511	0.30000	8.46691
0.40000	8.55872	0.50000	8.65053	0.60000	8.74234	0.70000	8.83415
0.80000	8.92596	0.90000	9.01777	1.00000	9.10957	1.10000	9.20138
1.20000	9.29319	1.30000	9.38500	1.40000	9.47681	1.50000	9.56862
1.60000	9.66043	1.70000	9.75223	1.80000	9.84404	1.90000	9.93585
2.00000	10.02766	2.10000	10.11947	2.20000	10.21128	2.30000	10.30309
2.40000	10.39489	2.50000	10.48670	2.60000	10.57851	2.70000	10.67032
2.80000	10.76213	2.90000	10.85394	3.00000	10.94574	3.10000	11.03755
3.20000	11.12936	3.30000	11.22117	3.40000	11.31298	3.50000	11.40479
3.60000	11.49660	3.70000	11.58840	3.80000	11.68021	3.90000	11.77202
4.00000	11.86383	4.10000	11.95564	4.20000	12.04745	4.30000	12.13926
4.40000	12.23106	4.50000	12.32287	4.60000	12.41468	4.70000	12.50649
4.80000	12.59830	4.90000	12.69011	5.00000	12.78191	5.10000	12.87372
5.20000	12.96553	5.30000	13.05734	5.40000	13.14915	5.50000	13.24096
5.60000	13.33277	5.70000	13.42457	5.80000	13.51638	5.90000	13.60819
6.00000	13.70000	6.10000	13.79181	6.20000	13.88362	6.30000	13.97543
6.40000	14.06723	6.50000	14.15904	6.60000	14.25085	6.70000	14.34266
6.80000	14.43447	6.90000	14.52628	7.00000	14.61809	7.10000	14.70989

7.20000	14.80170	7.30000	14.89351	7.40000	14.98532	7.50000	15.07713
7.60000	15.16894	7.70000	15.26074	7.80000	15.35255	7.90000	15.44436
8.00000	15.53617	8.10000	15.62798	8.20000	15.71979	8.30000	15.81160
8.40000	15.90340	8.50000	15.99521	8.60000	16.08702	8.70000	16.17883
8.80000	16.27064	8.90000	16.36245	9.00000	16.45426	9.10000	16.54606
9.20000	16.63787	9.30000	16.72968	9.40000	16.82149	9.50000	16.91330
9.60000	17.00511	9.70000	17.09691	9.80000	17.18872	9.90000	17.28053
10.00000	17.37234	10.10000	17.46415	10.20000	17.55596	10.30000	17.64777
10.40000	17.73957	10.50000	17.83138	10.60000	17.92319	10.70000	18.01500
10.80000	18.10681	10.90000	18.19862	11.00000	18.29043	11.10000	18.38223
11.20000	18.47404	11.30000	18.56585	11.40000	18.65766	11.50000	18.74947
11.60000	18.84128	11.70000	18.93309	11.80000	19.02489	11.90000	19.11670
12.00000	19.20851	12.10000	19.30032	12.20000	19.39213	12.30000	19.48394
12.40000	19.57574	12.50000	19.66755	12.60000	19.75936	12.70000	19.85117
12.80000	19.94298	12.90000	20.03479	13.00000	20.12660	13.10000	20.21840
13.20000	20.31021	13.30000	20.40202	13.40000	20.49383	13.50000	20.58564
13.60000	20.67745	13.70000	20.76926	13.80000	20.86106	13.90000	20.95287
14.00000	21.04468	14.10000	21.13649	14.20000	21.22830	14.30000	21.32011
14.40000	21.41191	14.50000	21.50372	14.60000	21.59553	14.70000	21.68734
14.80000	21.77915	14.90000	21.87096	15.00000	21.96277	15.10000	22.05457
15.20000	22.14638	15.30000	22.23819	15.40000	22.33000	15.50000	22.42181
15.60000	22.51362	15.70000	22.60543	15.80000	22.69723	15.90000	22.78904
16.00000	22.88085	16.10000	22.97266	16.20000	23.06447	16.30000	23.15628
16.40000	23.24809	16.50000	23.33989	16.60000	23.43170	16.70000	23.52351
16.80000	23.61532	16.90000	23.70713	17.00000	23.79894	17.10000	23.89074
17.20000	23.98255	17.30000	24.07436	17.40000	24.16617	17.50000	24.25798
17.60000	24.34979	17.70000	24.44160	17.80000	24.53340	17.90000	24.62521
18.00000	24.71702	18.10000	24.80883	18.20000	24.90064	18.30000	24.99245
18.40000	25.08426	18.50000	25.17606	18.60000	25.26787	18.70000	25.35968
18.80000	25.45149	18.90000	25.54330	19.00000	25.63511	19.10000	25.72691
19.20000	25.81872	19.30000	25.91053	19.40000	26.00234	19.50000	26.09415
19.60000	26.18596	19.70000	26.27777	19.80000	26.36957	19.90000	26.46138

- (4) Add 8 gallons of fuel (low fuel level) to the left fuel tank. Refer to Chapter 12, [Fuel - Servicing](#).
- (5) Make sure fuel is sensed in the LEFT tank.
- (6) Add 8 gallons of fuel (low fuel level) to the right fuel tank. Refer to Chapter 12, [Fuel - Servicing](#).
- (7) Make sure fuel is sensed in the RIGHT tank.
- (8) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
- (9) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (10) Turn the inner FMS knob to select LEFT.

NOTE: After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.

- (11) After 30 seconds, make sure the CALIBRATED TOTAL value for the LEFT tank is stable and between 6.2 to 9.8 gallons.

- (12) Push the TNK SEL softkey to highlight the CURRENT TANK field.
- (13) Turn the inner FMS knob to select RIGHT.
NOTE: After turning the inner FMS knob, some versions of software will make it necessary to push the ENT button to select the tank.
- (14) After 30 seconds, make sure the CALIBRATED TOTAL value for the RIGHT tank is stable and between 6.2 to 9.8 gallons.
- (15) If the values are in tolerance, the procedure is complete.
- (16) If the CALIBRATED TOTAL values are not in the range:
 - (a) Move the wing tips up and down for approximately 10 seconds.
 - (b) Let the airplane become stable for approximately 30 seconds.
 - (c) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
 - (d) After 30 seconds, make sure the CALIBRATED TOTAL value for the LEFT tank is stable and between 6.2 to 9.8 gallons.
 - 1 If the CALIBRATED TOTAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
 - (e) After 30 seconds, make sure the CALIBRATED TOTAL value for the RIGHT tank is stable and between 6.2 to 9.8 gallons.
 - 1 If the CALIBRATED TOTAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
- (17) Put the AVIONICS switch to the OFF position.
- (18) Put the BAT MASTER switch to the OFF position.

9. Fuel Calibration Initialization Data Load (Airplanes with Garmin G1000 and CAN bus type fuel level sensors)

- A. Load the Fuel Calibration Initialization Data.
 - (1) Disengage both PFD circuit breakers (ESS and AVN BUS 1) and the MFD circuit breaker on the avionics circuit breaker panel.
 - (2) Remove the database cards from the bottom SD card slots on the PFD and MFD.
 - (3) Install the SD loader card in the top SD card slot on the PFD.
 - (4) Start the system in configuration mode.
 - (a) Engage the MFD circuit breaker while the ENT button is pushed on the MFD.
 - (b) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.
NOTE: The MFD is now in the configuration mode.
 - (c) Engage the PFD circuit breakers while the ENT button is pushed on the PFD.
 - (d) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
NOTE: The PFD is now in the configuration mode.
 - (5) Push the NO softkey when asked "DO YOU WANT TO UPDATE THE SYSTEM FILES?".
 - (6) Use the FMS knobs to go to the SYSTEM group's SYSTEM UPLOAD page .
 - (7) Push the inner FMS knob to start the cursor.
 - (8) Use the cursor to highlight the applicable model for the AIRFRAME menu.
 - (9) Push the ENT button.
 - (10) Turn the inner FMS knob to expand the FILE menu.
 - (11) Highlight the file INITIALIZE FUEL CAL DATA.
 - (12) Push the ENT button.
 - (13) Push the LOAD softkey to start the software update.
NOTE: Every time after the "INITIALIZE FUEL CAL DATA" is loaded the Fuel Quantity System Calibration (Airplanes with Garmin G1000 and CAN bus type fuel level sensors) must be performed for each tank.
 - (14) Monitor the upload status.

- (a) If the upload fails, push the LOAD softkey again. If the upload fails five times, contact Cessna Customer Service for assistance; (316) 517-5800 or Fax (316) 942-9006.
- (b) If the upload is successful, push the ENT button to accept the end of the upload.
- (15) Push the "UPDT CFG" softkey.
- (16) Select "YES" when asked "Update Config Module?".
- (17) Push the ENT button.
- (18) When the update is complete, push the ENT button.
- (19) Disengage both PFD and MFD circuit breakers.
- (20) Install the database cards in the bottom SD card slots on the PFD and MFD.
- (21) Remove the SD loader card from the top SD card slot on the PFD.
- (22) Start the system in configuration mode.
 - (a) Engage the MFD circuit breaker while the ENT button is pushed on the MFD.
 - (b) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.
NOTE: The MFD is now in the configuration mode.
 - (c) Engage the PFD circuit breakers while the ENT button is pushed on the PFD.
 - (d) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
NOTE: The PFD is now in the configuration mode.

10. CAN Bus Fuel Level Sensor Configuration Load (Airplanes with Garmin G1000 and CAN bus type fuel level sensors)

A. Load the CAN Bus Fuel Level Sensor Configuration.

- (1) Disengage both PFD circuit breakers (ESS and AVN BUS 1) and the MFD circuit breaker on the avionics circuit breaker panel.
- (2) Remove the database cards from the bottom SD card slots on the PFD and MFD.
- (3) Install the SD loader card in the top SD card slot on the PFD.
- (4) Start the system in configuration mode.
 - (a) Engage the MFD circuit breaker while the ENT button is pushed on the MFD.
 - (b) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.
NOTE: The MFD is now in the configuration mode.
 - (c) Engage the PFD circuit breakers while the ENT button is pushed on the PFD.
 - (d) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
NOTE: The PFD is now in the configuration mode.
- (5) Push the NO softkey when asked "DO YOU WANT TO UPDATE THE SYSTEM FILES?".
- (6) Use the FMS knobs to go to the SYSTEM group's SYSTEM UPLOAD page .
- (7) Push the inner FMS knob to start the cursor.
- (8) Use the cursor to highlight the applicable model for the AIRFRAME menu.
- (9) Push the ENT button.
- (10) Turn the inner FMS knob to expand the FILE menu.
- (11) Highlight the file CESSNA NAV III CAN BUS FUEL LEVEL SENSORS.
- (12) Push the ENT button.
- (13) Push the LOAD softkey to start the software update.
- (14) Monitor the upload status.
 - (a) If the upload fails, push the LOAD softkey again. If the upload fails five times, contact Cessna Customer Service for assistance; (316) 517-5800 or Fax (316) 942-9006.
 - (b) If the upload is successful, push the ENT button to accept the end of the upload.
- (15) Push the "UPDT CFG" softkey.
- (16) Select "YES" when asked "Update Config Module?".

- (17) Push the ENT button.
- (18) When the update is complete, push the ENT button.
- (19) Disengage both PFD and MFD circuit breakers.
- (20) Install the database cards in the bottom SD card slots on the PFD and MFD.
- (21) Remove the SD loader card from the top SD card slot on the PFD.
- (22) Start the system in configuration mode.
 - (a) Engage the MFD circuit breaker while the ENT button is pushed on the MFD.
 - (b) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.
NOTE: The MFD is now in the configuration mode.
 - (c) Engage the PFD circuit breakers while the ENT button is pushed on the PFD.
 - (d) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
NOTE: The PFD is now in the configuration mode.

OXYGEN - GENERAL

1. Scope

A. This chapter provides information on components associated with storage and distribution of oxygen to crew and passengers.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Teflon Lubricating Tape	S1465	Commercially Available	To lubricate threads and fittings.
Trichloro-ethylene	ASTM D4080	Commercially Available	To clean oxygen lines.
Naphtha	TT-N-95	Commercially Available	Flush oxygen lines.
Anti-Icing Fluid	TT-I-735	Commercially Available	Flush oxygen lines.
Sherlock Leak Detector	Type CG (MIL-PRF-25567 Oxygen leak detector, Type 1)	Lub-O-Seal Co. Inc. 17519 Lewis Dr. Cypress, TX 77433	To do a leak test of the oxygen system.
Flow rater (0 to 10 Liters per Minute LPM)		Commercially Available	Check pressure flow to passenger mask.
Pressure Gage (0-100 PSIG)		Commercially Available	To check oxygen flow.
Oxygen Outlet Adapter		Commercially Available	Used with pressure gage.
Merthiolate		Commercially Available	To clean oxygen mask's and hose.
Snoop Liquid Leak Detector	MS-SNOOP-XXX	Commercially Available	To do a leak test of the oxygen system.

3. Definition

A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.

OXYGEN - DESCRIPTION AND OPERATION

1. Description and Operation

- A. The system has an oxygen cylinder and regulator assembly, filler valve, pressure gage, pressure lines, outlets, and mask assemblies. The oxygen cylinder is attached aft of the baggage compartment. The pilot's mask supply line gives a larger flow of oxygen than the passenger mask supply lines. The pilot's mask has a microphone, keyed by a switch button on the pilot's control wheel. The filler valve is found on the left side of the tailcone.

WARNING: Do not let oil, grease, or other lubricants near high-pressure oxygen because it can cause a fire. Do not smoke or have an open flame in or near the airplane while you work on the oxygen system.

- B. Oxygen flow to the outlet ports starts when the oxygen control valve knob, located in the overhead console, is put in the ON position and mask hoses are connected to the overhead oxygen ports. The oxygen outlet valves are located at FS 70.80 / BL 19.63 / WL 26.75.

NOTE: Each oxygen port has a spring-loaded valve which prevents the flow of oxygen until a mask hose is connected. Each mask hose has an oxygen flow indicator for visual proof of oxygen flow.

NOTE: Airplanes T18209114, T18209137 and On have moved the location of the oxygen outlet valves from FS 70.80 / BL 19.63 / WL 26.75 to FS 73.00 / BL 2.23 / WL 30.84.

- C. The oxygen system has an emergency release indicator with a green disc installed. The green disc will be pushed out if there is too much oxygen pressure in the system. When there is too much pressure in the oxygen system, a safety disc inside the oxygen regulator will release oxygen from the oxygen tank to the emergency release indicator. The oxygen pressure will then push out the green disc and release oxygen outside the airplane. The indicator disc will release oxygen at a pressure of 80 psi +30 or -30 psi (551 kPa +208 or -208 kPa).

- (1) The emergency release indicator is installed inside the tailcone on the left side. The green indicator disc can be seen when it is not removed, from the outside of the airplane on the left side of the tailcone.

- (2) A indicator disc that has been removed shows a possible problem. Refer to [Oxygen - Maintenance Practices](#).

NOTE: Airplanes T18208309 and on do not have an emergency release indicator disc installed. These airplanes have a vent found in the tailcone for emergency oxygen release.

- D. The information that follows is found on the shoulder, neck, or top head of the oxygen cylinder to help in correct identification.

- (1) Cylinder specification followed by service pressure. For example, ICC or DOT-E8162.
- (2) Cylinder serial number. This is found below or directly after the cylinder specification. The symbol of the purchaser, user, or maker, if registered with the Bureau of Explosives, can be found directly below the serial number. The cylinder serial number can possibly be found in an alternative location on the cylinder top head.
- (3) Inspector's official mark. This is found near the serial number.
- (4) Date of manufacture. This is the date of the first hydrostatic test. For example, 6-98 for June 1998. The dash between the month and the year figures can be replaced with the mark of the inspection agency or agency doing the test. For example, 6L98.
- (5) Hydrostatic test date. The dates of subsequent hydrostatic tests must be steel-stamped (month and year) directly below the original manufacturer date. The dash between the month and year figures can be replaced with the mark of the testing agency.
- (6) A Cessna identification placard. This is found near the center of the cylinder body.
- (7) Halogen test stamp (if applicable). The phrase "Halogen Tested," the date of the test (month, day, and year), and the inspector's mark is found below the Cessna identification placard.

OXYGEN - MAINTENANCE PRACTICES

1. General

- A. Before you do maintenance on the oxygen system, you must read and understand these maintenance practices.

2. Precautions

WARNING: Do not smoke or have an open flame near the airplane while you do maintenance on the oxygen system. Make sure all electrical power is disconnected and that the airplane is correctly grounded. Oils, grease, and solvents can burn or explode when near to oxygen under pressure.

- A. Make sure every port on the system is always fully clean and free of water, oil, grease, and solvent contamination.
B. Put a cap on all openings immediately after you remove a component. Do not use tape or caps which will cause moisture to collect.
C. Lines and fittings must be clean and dry. One of the methods that follow can be used to clean lines.

CAUTION: Most air compressors are lubricated with oil, and a minimum amount of oil can be carried by the airstream into the system. Use a water-lubricated compressor to blow tubing clean only when nitrogen or argon is not available. The air must be clean, dry, and filtered.

- (1) Wash with a vapor-degreasing solution of stabilized trichloroethylene that conforms to MIL-T-7003. Then blow tubing clean with a jet of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).
- (2) Flush with naphtha that conforms to Specification TT-N-95. Then blow clean and dry with clean, dry filtered air.
- (3) Flush with anti-icing fluid that conforms to MIL-F-5566 or anhydrous ethyl alcohol. Rinse thoroughly with fresh water and dry with a jet of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).
- (4) Flush with hot inhibited alkaline cleaner until free from oil and grease. Rinse with fresh water and dry with a jet of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455). Put a cap on all lines immediately after they are dry.
- (5) Do not fabricate pressure lines. Replace lines with factory parts, by part number.
- (6) Make sure that your hands are free of dirt and grease before you install the oxygen tubing or fittings.

WARNING: Do not use tools that can cause sparks.

CAUTION: With oxygen bottle charged, do not put the control in the ON position with outlet ports (low pressure) open to the atmosphere. Damage to the regulator metering poppet can occur.

CAUTION: When a component of the oxygen system has been removed, installed, replaced, or the system has been disassembled in any way, the oxygen system must be purged and a check for leaks must be done.

- D. Use only S1465 Teflon lubricating tape on threads of male fittings. Do not use lubricating tape on coupling sleeves or outside of flares. Use care to prevent contamination of Teflon tape with oil, grease, or other lubricants. The Teflon tape must be used in accordance with the instructions that follow.

- (1) Lay the tape on the threads close to the end of the fitting; Apply the tape clockwise on standard threads and counter-clockwise on the left-hand threads.
- (2) Apply enough tension while you wind to make the tape form into thread grooves.
- (3) After the installation of the tape is complete, keep tension on the tape and pull it apart in the direction it was applied. The necessary result is a ragged edge, which makes the tape stay in place. (If you shear or cut it, the tape can unwind.)
- (4) Press the tape well into the threads.
- (5) Make connections.

- E. Keep all of the tools used for the installation of the oxygen tubes or fittings free of dirt, grease, and oils.

NOTE: An accurate record of the number of recharges must be kept by the owner or his agent if the cylinder is recharged an average of once every other day or more.

3. Replacement of Components

- A. Use Figure 201 to help you as you remove and install components in the oxygen system.

NOTE: Oxygen cylinder and regulator assemblies cannot always be installed in the field exactly as illustrated in Figure 201, which shows factory installation.

CAUTION: The pressure regulator, pressure gage and line, and filler valve must be removed and replaced only by

personnel familiar with high-pressure fittings. Obey all maintenance precautions.

- B. Before you remove the cylinder, open the cabin outlets to release the low-pressure line. Disconnect the push-pull control cable, filler line, pressure gage line, and outlet line from the regulator.

WARNING: Cap all lines immediately.

- C. Filler Valve Removal (Refer to [Figure 201](#)).
- (1) Remove the line from the quick-disconnect valve at the regulator.
 - (2) Disconnect the chain, but do not remove the cap from the filler valve.
 - (3) Remove the screws that attach the valve and disconnect the pressure line.
 - (4) Cap and seat the pressure line.
 - (5) Remove the filler valve.

- D. Filler Valve Installation (Refer to [Figure 201](#)).
- (1) Install the filler valve.
 - (2) Uncap the pressure line and seat.
 - (3) Attach the valve with the screws and connect the pressure line.
 - (4) Connect the chain.
 - (5) Connect the line to the quick-disconnect valve at the regulator.

- E. To remove all of the oxygen system, lower the headliner and remove the soundproofing to get access to the lines. Refer to Chapter 25 [Equipment/Furnishings - Maintenance Practices](#).

- F. Oxygen Outlet Valve Removal (Refer to [Figure 201](#)).

NOTE: Airplanes T18209114, T18209137 and On have moved the location of the aft oxygen outlet ports from FS 70.80 / BL 19.63 / WL 26.75 to FS 73.00 / BL 2.23 / WL 30.84.

- (1) Disconnect the adapter from the tube assembly.
- (2) Remove the oxygen outlet valve from the bracket and the tube assembly.

- G. Oxygen Outlet Valve Installation (Refer to [Figure 201](#)).

NOTE: Airplanes T18209114, T18209137 and On have moved the location of the aft oxygen outlet ports from FS 70.80 / BL 19.63 / WL 26.75 to FS 73.00 / BL 2.23 / WL 30.84.

- (1) Put the oxygen outlet valve in its position at the bracket and the tube assembly.
- (2) Attach the oxygen outlet valve to the bracket.
- (3) Connect the adapter to the tube assembly.

4. Oxygen Release Indicator Disc

NOTE: Airplanes T18208309 and On do not have an emergency release indicator disc installed. These airplanes have a vent found in the tailcone for emergency oxygen release.

- A. A release of the indicator disc can be the result of a malfunction. Do the steps that follow to make sure the oxygen cylinder operates correctly before you install a new indicator disc. (Refer to [Figure 201](#)).
- (1) Look at the indication on the oxygen gage in the overhead console. If the indication on the gage shows the oxygen cylinder is less than full, then fill the cylinder. Refer to [Oxygen System Charging](#).
 - (a) Look at the oxygen gage to see if it fills with oxygen.
 - (b) If the cylinder will not fill with oxygen, then you must replace the oxygen cylinder or you must do an overhaul. Refer to [Replacement of Components](#).

NOTE: The oxygen cylinder and regulator are removed and installed together as one assembly.
 - (c) A Scott Aviation approved service center must do the overhaul. Contact Scott Aviation at (716) 686-1666 to find an approved service center.

NOTE: The phone number for Scott Aviation after close of business hours is (716) 683-5100.
 - (2) To install a new indicator disc, press the disc past the snap ring in the oxygen release indicator fitting found in the left side of the tailcone.
 - (3) Do a functional test of the oxygen system. Refer to [Oxygen Function Test](#).

5. Oxygen Cylinder Inspection Requirements

A. Oxygen Cylinder Inspection (Refer to [Figure 201](#)).

- (1) Do an inspection of the full external surface of the cylinder for an indication of damage.
 - (a) Make sure to carefully examine the neck of the cylinder for cracks, distortion, or damaged threads.
- (2) Complete an inspection of the cylinder to see if markings are clear.
- (3) Complete an inspection of the date of the last hydrostatic test. If the test date is expired, do not let the cylinder go back to service until the test has been done.
- (4) Complete an inspection of the cylinder mounting bracket, bracket hold-down bolts, and cylinder holding straps for cracks, deformation, a clean surface, and correct attachment.
- (5) Do a check for signs of interference, chafing, deformation, or deterioration in the area adjacent to where the cylinder is stored and attached.

6. Oxygen Mask and/or Cannula Inspection

A. Oxygen Mask and/or Cannula Inspection.

- (1) Examine the oxygen masks and/or cannula for cracks and rough face seals.
- (2) Flex the hose gently all over and check for signs of deterioration or dirt.
- (3) Examine the mask and/or cannula and hose storage for cleanliness and general condition.

7. Oxygen Mask and/or Cannula Maintenance

A. Oxygen Mask and/or Cannula Cleaning and Care.

- (1) Clean and disinfect the mask or cannula assemblies after use, as applicable.
 - (a) Be careful while you clean and disinfect the mask assemblies to avoid damage to the microphone assembly.
- (2) Wash the mask or cannula and the hose with a mild soap solution and rinse it with clean water.
- (3) To sterilize, rub the mask or cannula and hose with a gauze or sponge soaked in a water and merthiolate solution.
NOTE: This solution must contain 1/5 teaspoon of merthiolate per one quart of water.
- (4) Wipe the mask and hose with a clean cloth and air dry.
- (5) Make sure that each breathing tube end is free of nicks.
- (6) Make sure the breathing tube end will fit into the cabin oxygen receptacle easily and does not leak.
- (7) If a mask or cannula assembly has a leak, it cannot be breathed through, or has a damaged microphone, return the mask assembly to the manufacturer or a repair station.
- (8) Replace the hose if it shows signs of deterioration.

8. Precise Flight Oxygen Flow Meter Antistatic Treatment

NOTE: The Precise Flight Oxygen Flow Meter can become static charged because of friction. This charge does not let the ball move freely inside the flow meter. This treatment will remove the static charge.

A. Do the Antistatic Treatment.

- (1) Disconnect the mask or cannula from the hose.
- (2) Put some drops of a mixture of deionized water and breathing safe detergent or Snoop Liquid Leak Detector into the end of the hose.
- (3) Let the drops get to the flow meter.
- (4) Connect the flow meter inlet to a source of aviation oxygen.
- (5) Dry the flow meter with the oxygen.
- (6) Make sure the flow meter operates smoothly.

9. Oxygen System Functional Testing

A. After the regulator and the cylinder assembly have been replaced or overhauled, do the flow and internal leakage tests that follow to make sure that the system operates correctly.

- (1) Fully charge the oxygen system in accordance with the procedures outlined in this section.
- (2) Disconnect the line and the fitting assembly from the pilot's mask and the line assembly. Put the outlet end of the line and the fitting assembly into the cabin outlet and attach the opposite end of the line to a pressure gage (the gage must be

calibrated in one-pound increments from 0 to 100 PSI). Put the control lever in the ON position. The gage pressure should read 75 PSI, +10 or -10 PSI.

- (3) Put the mask and the line assemblies into all remaining cabin outlets. With oxygen flowing from all outlets, the test gage pressure must still be 75 PSI, +10 or -10 PSI.
- (4) Put the oxygen control lever in the OFF position and let the test gage pressure fall to 0 PSI. Remove all the adapter assemblies, but do not remove the one with the pressure gage. The pressure must not rise above 0 PSI after one minute. Remove the pressure gage and the adapter from the oxygen outlet.
- (5) If you do not get the specified pressure readings when you do this test, remove and replace the cylinder regulator assembly and do the test again.
- (6) Connect the mask and the line assemblies to each cabin outlet and do a check of each mask for correct operation.
- (7) Do a check of the pilot's mask microphone and control wheel switch for correct operation. After the check, return all of the masks to the mask case.
- (8) Recharge the oxygen system in accordance with these procedures.

10. System Leak Test

- A. When there are leaks in the system, you must find the opening. Frequently you can find leakage if you listen for the hissing of gas as it escapes. If you cannot hear the oxygen as it escapes, you must soap test all of the lines and connections with a Castile soap and water solution or specified leak-test material. Make the solution sufficiently thick to stay on the contours of the fittings. At the end of the leakage test, remove all of the leak detector or soap and water solution.

CAUTION: Do not try to tighten the connections while the system is charged.

11. Oxygen System Charging

- A. Charge Oxygen System (Refer to [Figure 201](#)).

WARNING: Be sure to ground the aircraft and the equipment used to service the system before you charge the oxygen system.

- (1) Use only aviator's breathing oxygen per MIL-0-27210 to charge the oxygen system.
- (2) Do not charge the oxygen cylinders if the equipment fittings used to service the system or the filler valve is corroded or contaminated. If necessary, clean with stabilized trichloroethylene and let air dry. Do not let the solvent enter the internal parts.
- (3) If the cylinder is empty, do not charge, as the cylinder must then be removed, inspected, and cleaned.

CAUTION: A cylinder which is empty can be contaminated. The regulator and cylinder assembly must then be disassembled, inspected, and cleaned by an FAA approved facility before filling. Contamination, as used here, means dirt, dust, or foreign material, or air in large quantities. If a gage line or filler line is disconnected and you put caps on all of the fittings immediately, no contamination of the cylinder will occur unless temperature variation has caused a suction in the cylinder. Air contains water vapor which can condense and freeze. Since there are very small orifices in the system, it is very important that this condition not occur.

- (4) Connect the charging cylinder line from the oxygen service cart to the filler valve.
- (5) Slowly open the valve on the oxygen service cart and charge the airplane oxygen bottle to correct the pressure. Refer to Table 1 for charging pressures at different temperatures.
- (6) Ambient temperature listed in the chart is the air temperature in the area where the system is to be charged. Filling pressure refers to the pressure to which aircraft cylinders must be filled. This table gives approximations only and assumes a rise in temperature of approximately 25° F, due to heat of compression. This table also assumes the aircraft cylinders will be filled as quickly as possible and that they will only be cooled by ambient air; no water bath, or other means of cooling can be used.

Table 201. Oxygen Cylinder Filling Pressures

Ambient Temp. (Degrees F)	Filling Pressure (psig)	Ambient Temp. (Degrees F)	Filling Pressure (psig)
0	1650	50	1875
10	1700	60	1925
20	1725	70	1975

30	1775	80	2000
40	1825	90	2050

NOTE 1:

Example: If ambient temperature is 70° F, fill the aircraft cylinders to approximately 1,975 psi or as close to this pressure as the gage can read. When they cool, cylinders must have approximately 1,850 psi pressure.

Figure 201 : Sheet 1 : Oxygen System

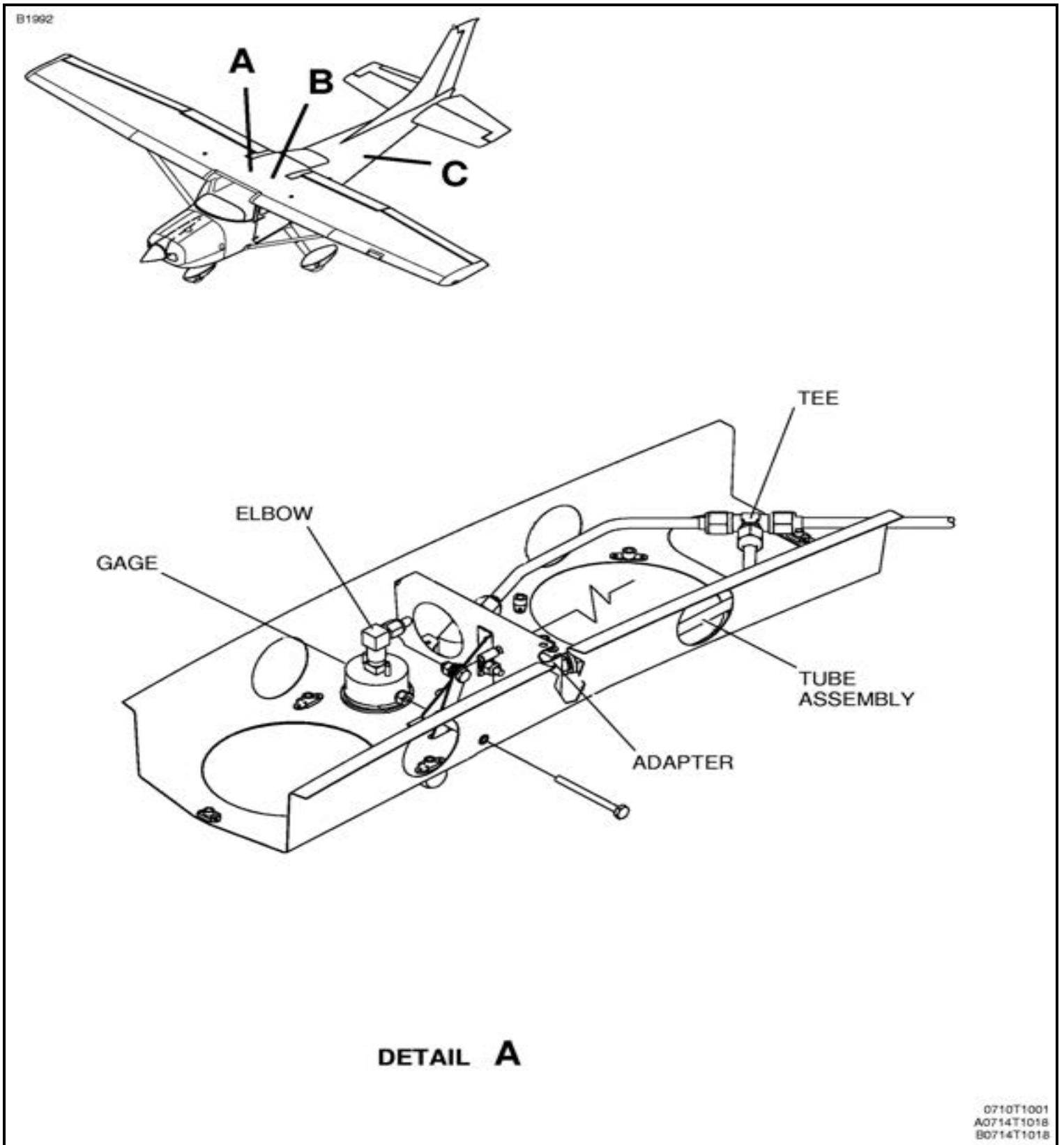


Figure 201 : Sheet 2 : Oxygen System

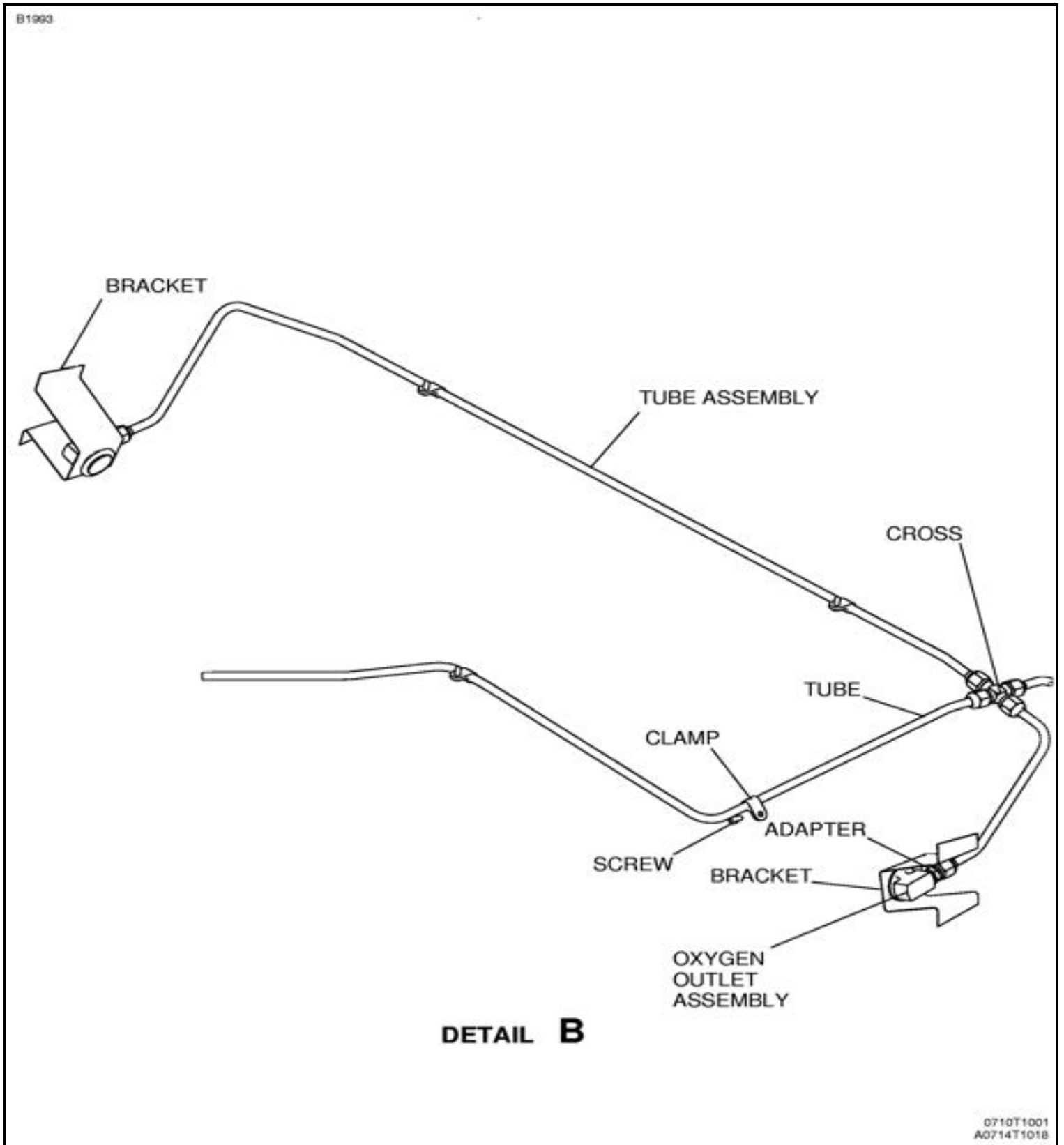
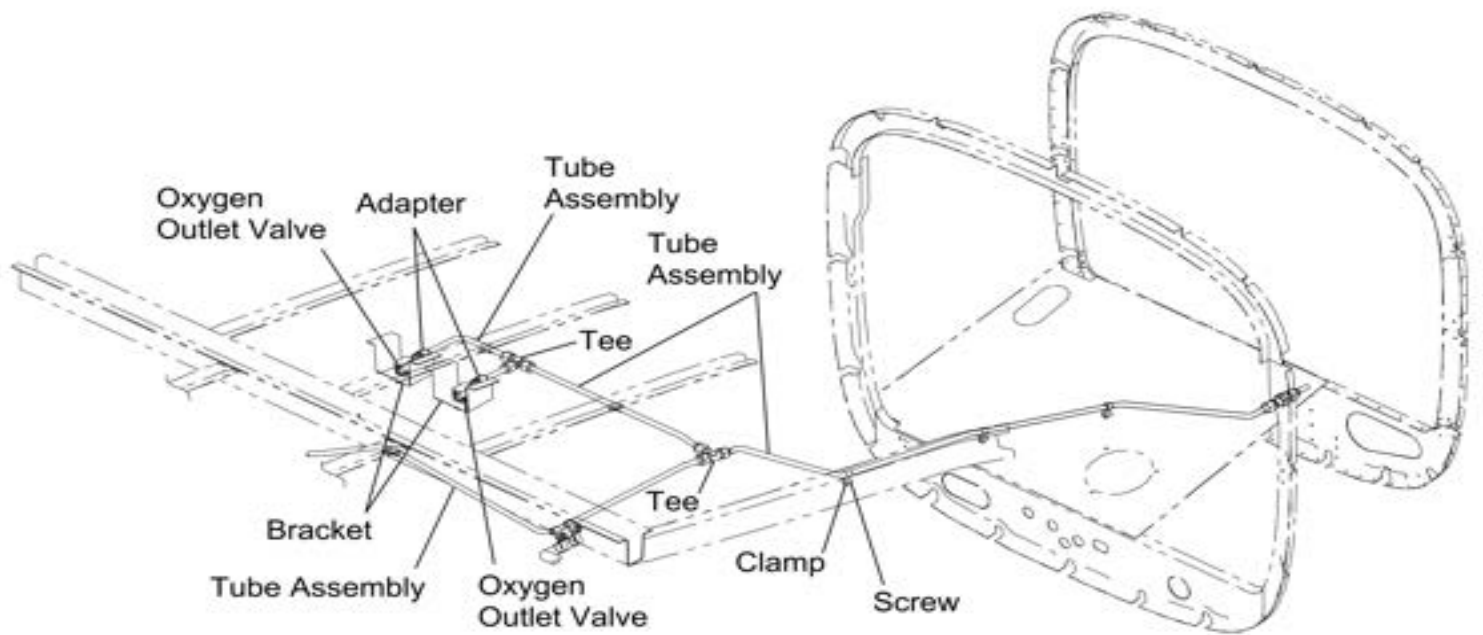


Figure 201 : Sheet 3 : Oxygen System

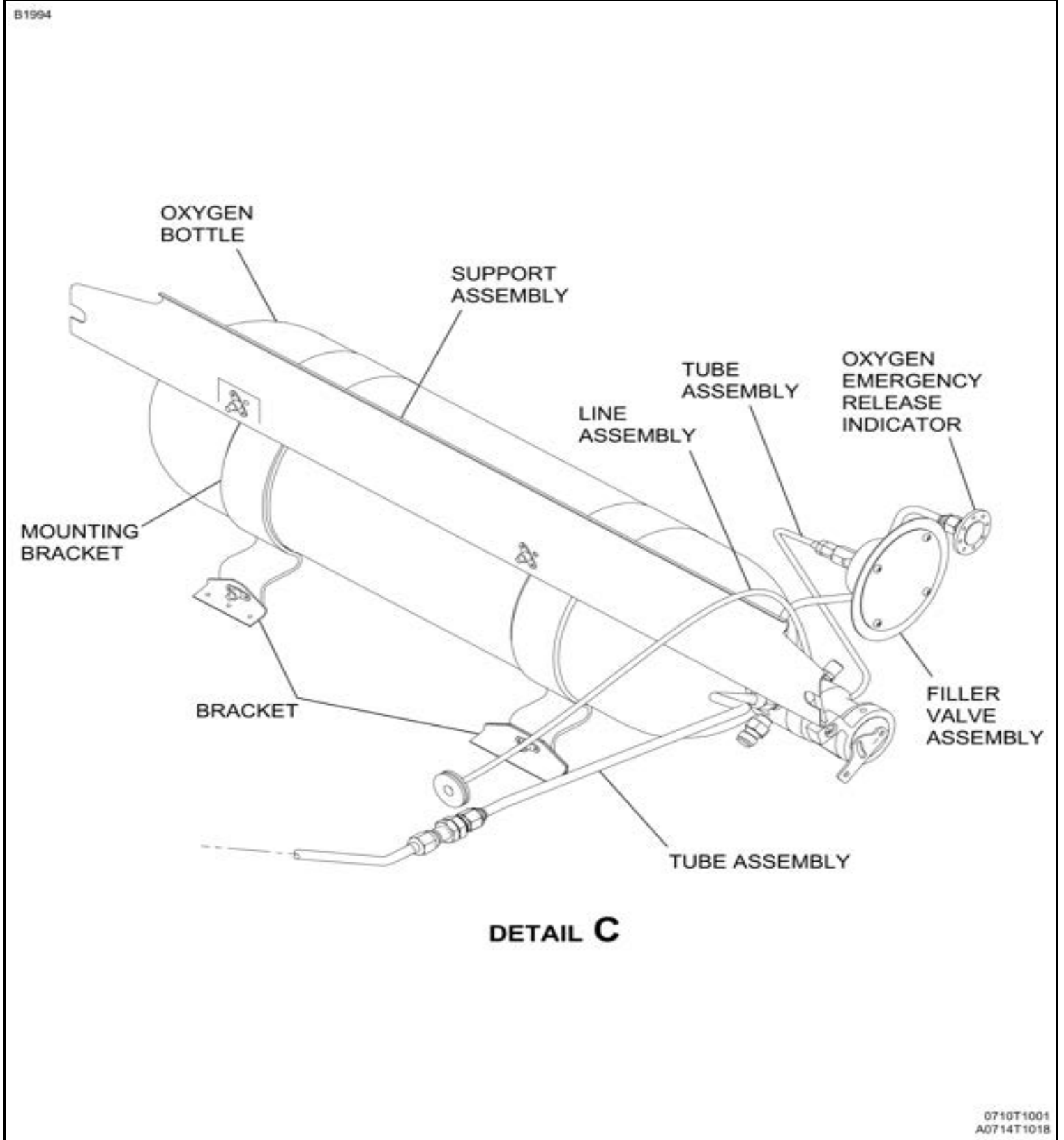
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DETAIL B

(Airplanes T18209114, T18209137 and On)

Figure 201 : Sheet 4 : Oxygen System



DOORS - GENERAL

1. Scope

- A. This chapter provides maintenance information on doors. Provided are removal/installation instructions and rigging procedures.

2. Definition

- A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.
 - (1) The cabin door section provides information on removal/installation and rigging of the doors.
 - (2) The baggage door section provides information on removal/installation.

CABIN DOORS - DESCRIPTION AND OPERATION

1. Description

- A. A cabin door is installed on each side of the airplane. Each door has an outer sheet skin that is chemically bonded to an inner pan assembly. Each door has a latch assembly, an inside handle, a pair of external hinges, and a doorstop assembly.

2. Operation

- A. The cabin doors open by the inside or outside handle, that is connected to internal components.
 - (1) The cabin door latch is a two-part assembly latch base, external handle, spring-loaded latch bolt and pull-bar assembly, and a spring-loaded catch pin assembly. The interior handle base plate assembly is directly connected to the cabin door latch by an adjustable push rod assembly. This push rod assembly has two clamps attached 180 degrees apart on the main rod. These clamps operate a cable assembly that moves a cable pin from the top aft end of the cabin door into the aft top door sill.
 - (2) The door latch exterior handle is extended when the cabin door is open. The handle is held in position by the spring-loaded latch catch engaged with the latch bolt through the hole in the bolt. The push rod assembly will move forward. The attached cable assembly will be retracted from the top door sill with the cable pin in a recess in the pin guide. The interior handle will move approximately 15 degrees aft of the vertical position.
- B. The cabin doors close and latch by the internal or external handle connected with internal components.
 - (1) The cabin door moves the catch pin over the actuator attached to the cover plate. The cover plate is on the rear door post. The catch pin disengages the latch catch from the latch bolt as the catch pin is moved forward. The latch handle extends and the pull-bar assembly compresses. The latch handle is pulled in and the latch bolt is moved on the latch striker. The latch striker is on the rear door post.
 - (2) The push rod assembly moves aft and moves the cable pin from the pin guide in the door into the top aft door sill receptacle when the exterior handle is pushed flush with the fuselage skin. The interior door handle has moved from approximately 15 degrees aft of the vertical position to approximately 45 degrees forward of the vertical position. The interior handle pushed to the horizontal position, flush with the armrest, will overcenter the door latch.
- C. The cabin doors have a key lock.
 - (1) The key lock turns and moves the pin into the exterior latch handle when the cabin door is closed and the exterior latch handle is flush.
 - NOTE:** It is possible to lock the cabin door when the exterior handle is used and the push rod assembly is not adjusted correctly. The rigging and adjustment procedures must be used to correctly adjust the push rod.
 - (2) An optional Medeco lock is installed on the cabin doors on some airplanes.

CABIN DOORS - MAINTENANCE PRACTICES

1. General

- A. The cabin door maintenance practices give procedures for the removal and installation of the cabin doors, weatherstrip, locks, latches, handles, and cable assemblies.
- B. The cabin door maintenance practices also give procedures for the adjustment and the test of the cabin door, latch cable, and inside handle.

2. Cabin Door Removal/Installation

NOTE: The removal and installation procedures given are for the pilot's door. The procedures for the copilot's door are typical.

- A. Cabin Door Removal (Refer to [Figure 201](#)).
 - (1) Open the cabin door.
 - (2) Remove the nut, screw, and spacers from the stop fitting.
 - (3) Remove the nuts and screws that attach the hinges to the fuselage structure.
 - (4) Remove the cabin door from the airplane.
- B. Cabin Door Installation (Refer to [Figure 201](#)).
 - (1) Put the cabin door in position and attach the door with the screws and nuts.
 - (2) Install the screw, spacers, and nut on the stop fitting.
 - (3) Close and latch the cabin door.
 - (4) Make sure the cabin door is correctly adjusted. Refer to [Cabin Door Adjustment/Test](#).

3. Cabin Door Weatherstrip Removal/Installation

- A. Cabin Door Weatherstrip Removal (Refer to [Figure 201](#)).
 - (1) Use a nonmetallic scraper to remove the weatherstrip and adhesive from the door assembly.
 - (2) Use solvent to remove all remaining adhesive from the door surface.
- B. Cabin Door Weatherstrip Installation (Refer to [Figure 201](#)).
 - (1) Cut the new weatherstrip to the correct length with the used weatherstrip as a template.
 - (2) Cut a small notch in the butt ends of the new weatherstrip to let water drain.
 - (3) Put the weatherstrip in position with the notches at the door low point.
 - (4) Apply a thin, smooth layer of EC-1300L, or equivalent adhesive to the two surfaces.
 - (5) Let the adhesive dry until it is tacky.
 - (6) Push the weatherstrip in position.
 - (7) Do not stretch the weatherstrip around the door corners.

4. Cabin Door Latch Lock Removal/Installation

- A. Cabin Door Latch Lock Removal (Refer to [Figure 201](#)).
 - (1) Remove the cam from the latching side of the locking arm.
 - (2) Remove the washers between the cam and the locking arm.
 - (3) Remove the locking arm pin from the locking arm and the catch base assembly.
- B. Cabin Door Latch Lock Installation (Refer to [Figure 201](#)).
 - (1) Assemble the locking arm with the locking arm pin.
 - (a) Put one washer on each side of the locking arm.
 - (b) Swage the locking arm pin so there is minimum movement between the parts.
 - (c) Cut the unwanted material from the pin.
 - (2) Put the locking arm pin into the 0.125 inch (3.2 mm) diameter hole at the catch base assembly.
 - (3) Align the hole in the locking arm with the hole in the latch base assembly and install the pin.
 - (4) Put three washers between the cam and the locking arm.
 - (5) Attach the cam to the latch side of the locking arm.

5. Cabin Door Latch Assembly Removal/Installation

A. Cabin Door Latch Assembly Removal (Refer to [Figure 201](#)).

- (1) Remove the cabin door lock assembly. Refer to [Cabin Door Lock Assembly Removal/Installation](#).
- (2) Remove the rivets that attach the latch base to the door skin.
- (3) Remove the screws that attach the latch to the door pan.
- (4) Remove the pushrod and bolt.
- (5) Pull the latch handle through the cutout in the door skin.
- (6) Remove the latch assembly from the airplane.

B. Cabin Door Latch Assembly Installation (Refer to [Figure 201](#)).

- (1) Put the latch assembly in the closed position between the door pan and the door skin.
- (2) Make sure the cable assembly is forward of the latch base attach plate, and inboard of latch base cup.
- (3) Extend the latch handle through the cutout in the door skin.
- (4) Push the latch assembly aft so the bolt and pushrod extend through their related holes.
- (5) Release the pushrod so the bolt is fully extended and the handle is flush.
- (6) Attach the latch to the door pan with the screws through the base assembly and through the aft flange of the door pan.
- (7) Make sure the door skin dimension around the latch assembly is correct.

CAUTION: Do not make the holes oversize in the latch base.

- (8) Drill eleven 0.128 inch (3.25 mm) diameter holes that align with the latch base.
- (9) Make sure the cabin door latch cable assembly rigging and the cabin door inside handle rigging is done before the latch base is attached to the skin. Refer to [Cabin Door Latch Cable Assembly Adjustment/Test](#) and [Cabin Door Inside Handle Rigging](#).
- (10) Attach the latch base to the door skin with rivets.
- (11) Install the cabin door lock assembly. Refer to [Cabin Door Lock Assembly Removal/Installation](#).

6. Cabin Door Latch Cable Assembly Installation

A. Cabin Door Latch Cable Assembly Removal (Refer to [Figure 201](#)).

- (1) Remove the screw and clamp that attach the cable assembly to the door.
- (2) Remove the plug button.
- (3) Remove the pin from the pin guide.
- (4) Pull the pin end of the cable from the top of the door.
- (5) Remove the nut and clamp from the opposite end of the cable casing.
- (6) Remove the cable assembly from the door.

B. Cabin Door Latch Cable Assembly Installation (Refer to [Figure 201](#)).

- (1) Attach the clamp and nut one inch (25 mm) from the end of the cable casing on the pin end of the cable assembly.
- (2) Put the pin end of the cable between the door pan and the door skin at the aft end of the door.
- (3) Push the pin end of the cable to the top of the door.
- (4) Remove the plug button and align the pin of the cable with the pin guide.
- (5) Put the pin through the pin guide.
- (6) Align the clamp on the cable casing through the hole that is below the 0.875 inch (22.22 mm) access hole.
- (7) Install the screw.
- (8) Make sure the cable operates freely.
 - (a) Add washers as necessary if the cable does not operate freely.
- (9) Do the cabin door latch cable assembly rigging. Refer to [Cabin Door Latch Cable Assembly Rigging](#).

7. Cabin Door Lock Assembly Removal/Installation (On airplanes with standard locks)

A. Cabin Door Lock Assembly Removal (Refer to [Figure 201](#)).

- (1) Remove the lower door accent panel and main door panel to get access to the cabin door lock assembly. Refer to Chapter

25, [Interior Upholstery - Maintenance Practices](#).

- (2) Remove the armrest door plugs, door panel insert at the armrest, armrest, door handle and cover plate from the door to get access to the cabin door lock assembly.
- (3) Remove the nut and washer.
- (4) Remove the cabin door lock assembly.

B. Cabin Door Lock Assembly Installation (Refer to [Figure 201](#)).

- (1) Put the cabin door lock assembly in position.
- (2) Install the washer and nut.
- (3) Install the armrest door plugs, door panel insert at the armrest, armrest, door handle and cover plate.
- (4) Install the lower door accent panel and main door panel. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

8. Cabin Door Lock Assembly Removal/Installation (On airplanes with Medeco locks)

A. Cabin Door Lock Assembly Removal (Refer to [Figure 201](#)).

- (1) Remove the lower door accent panel and main door panel to get access to the cabin door lock assembly. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
- (2) Remove the armrest door plugs, door panel insert, armrest, door handle, and cover plate from the door to get access to the cabin door lock assembly.
- (3) Remove the cotter pin, washer, locking arm, and spacer from the lock assembly.
- (4) Remove the hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly.
- (5) Remove the lock assembly from the door.

B. Cabin Door Lock Assembly Installation (Refer to [Figure 201](#)).

- (1) Put the cabin door lock assembly in position on the cabin door.
- (2) Install the hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly. Install the anti-rotational washer under the hex nut.
- (3) Torque the nut.
- (4) Bend the applicable tab on the anti-rotational washer against the flat part of the nut.
- (5) Install the spacer, locking arm, washer, and cotter pin that connect the lock assembly to the door handle.
- (6) Bend the applicable tabs on the cam-pin assembly to make sure that they do not touch the latch housing.
- (7) Install the armrest door plugs, door panel insert, armrest, door handle, and cover plate.
- (8) Install the lower door accent panel and main door panel. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

9. Cabin Door Lock Cam Assembly Removal/Installation (On airplanes with standard locks)

A. Cabin Door Lock Cam Assembly Removal (Refer to [Figure 201](#)).

- (1) Remove the lower door accent panel and main door panel to get access to the cabin door lock cam assembly. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
- (2) Remove the armrest door plugs, door panel insert at the armrest, armrest, door handle, and cover plate from the door to get access to the cabin door lock cam assembly.
- (3) Remove the cam stop screw from the cabin door lock cam assembly.
- (4) Remove the cam assembly.

B. Cabin Door Lock Cam Assembly Installation (Refer to [Figure 201](#)).

- (1) Put the cam assembly in position.
- (2) Install the cam stop screw with Loctite 242.
- (3) Install the armrest door plugs, door panel insert at the armrest, armrest, door handle, and cover plate.
- (4) Install the lower door accent panel and main door panel. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

10. Cabin Door Lock Cam Assembly Removal/Installation (On airplanes with Medeco locks)

A. Cabin Door Lock Cam Assembly Removal (Refer to [Figure 201](#)).

- (1) Remove the lower door accent panel and main door panel to get access to the cabin door lock cam assembly. Refer to

Chapter 25, [Interior Upholstery - Maintenance Practices](#).

- (2) Remove the armrest door plugs, door panel insert, armrest, door handle, and cover plate from the door to get access to the cabin door lock cam assembly.
- (3) Remove the machine screws, serrated washers, and retaining washer from the cabin door lock cam assembly.
- (4) Remove the cam assembly.

B. Cabin Door Lock Cam Assembly Installation (Refer to [Figure 201](#)).

- (1) Put the cam assembly in position.
- (2) Install the machine screws, serrated washers, and retaining washer that attach the cam assembly to the cabin door lock. Install the machine screws with Loctite 242.
- (3) Install the armrest door plugs, door panel insert, armrest, door handle, and cover plate.
- (4) Install the lower door accent panel and the main door panel. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

11. Cabin Door Adjustment/Test

A. Adjust the new cabin doors.

CAUTION: Do not adjust the bonded door flange or the airplane structure with force. The bonded areas and the structural components can be damaged.

- (1) Trim the door flange as necessary to get a gap between the door skin and fuselage skin of 0.09 inch (2.3 mm) or less.

B. Adjust the cabin doors.

NOTE: The cabin doors must be smooth with the fuselage skin.

- (1) Use the slots at the door latch plate to adjust the latch assembly and the bolt engagement with the rotary clutch on the door post.

12. Cabin Door Latch Cable Assembly Rigging

A. Do the Cabin Door Latch Cable Assembly Rigging (Refer to [Figure 201](#)).

- (1) Pull the cable tight.
- (2) Attach the clamp and the nut to the cable so it aligns with the 0.193 inch (4.9 mm) diameter hole in the door pan.
- (3) Make sure the door latch is open.
- (4) Cut the casing of the cable assembly approximately two inches (50 mm) from the clamp bolt on the push rod assembly.
- (5) Put the core of the cable through the clamp.
- (6) Pull the core of the cable through the clamp bolt so the pin extends approximately 0.125 inch (3.2 mm) from the door pan contour.
- (7) Cut the core of the cable approximately one inch (25 mm) forward of the push rod clamp.
- (8) Attach the two nuts to the push rod clamp bolt.
- (9) Make sure the latch operates freely.
 - (a) If the latch binds up and will not operate freely, remove the cable core from the clamp and operate the latch.
 - (b) Do a check of the cable for possible adjustments that will make the latch operate correctly.
- (10) Install the cover assembly.
- (11) Do another cable operational check.

13. Cabin Door Inside Handle Rigging

A. Do the Cabin Door Inside Handle Rigging (Refer to [Figure 201](#)).

- (1) Attach the pushrod assembly to the pull bar and attach it with the pin while the latch is attached to the door pan.
- (2) Do not install the cotter pin.
- (3) Make sure the latch is in the closed position.
- (4) Remove the pin that connects the push-pull rod to the latch base assembly.
- (5) Adjust the rod so a load of 6 to 12 pounds (2.7 to 5.4 kilograms) is necessary at the end of the inner handle to move it from the closed position to the over center position.

NOTE: The rod can be turned in or out 180 degree to make the applicable adjustments.

NOTE: The rod must be attached to the latch assembly before the cabin door inside handle rigging can be done.

14. Latch Assembly Adjustment/Test

A. Do the adjustment of the latch assembly. (Refer to [Figure 201](#)).

- (1) Make sure the cabin door is installed and fitted to the fuselage before the adjustment/test can be done.
- (2) Make sure the cabin door latch is in the OPEN position before the adjustment/test can be done.
- (3) Make sure the door latch operates smoothly and freely.
- (4) Make sure the bolt or pull bar are not filed, ground, or sanded in any way.

NOTE: A noise can be heard when the inside handle is pushed down. It is recommended that the outside door handle be flush with the door skin, although the noise is heard.

- (5) Install shims to adjust the striker plate forward to give a minimal clearance between the bolt and the striker plate.

NOTE: This adjustment will make sure that the pushrod will engage the latch catch. It will also make sure the exterior handle will stay open until the door is closed again when the door is opened from the outside.

- (6) Install shims as necessary below the actuator on the cover assembly.

NOTE: If the cabin door is too far forward, the door latch will not operate correctly because the latch assembly pushrod will not cause the bolt to move.

- (7) Close the cabin door from inside the airplane.

- (8) Make sure the exterior handle is flush with the door skin when you close the door.

(a) If the exterior handle is not flush with the door skin when the door is closed, adjust the push-pull rod out.

- 1 Remove the screws and the nuts that attach the base plate to the door.
- 2 Remove the smaller end of the push-pull rod and turn it 180 degrees.
- 3 Install the screws and nuts that attach the base plate.

- (9) Do a check for slippage between the cable casing and the clamps that attach the cable.
- (10) Install the cotter pin in the clevis pin.

Figure 201 : Sheet 1 : Cabin Door Installation

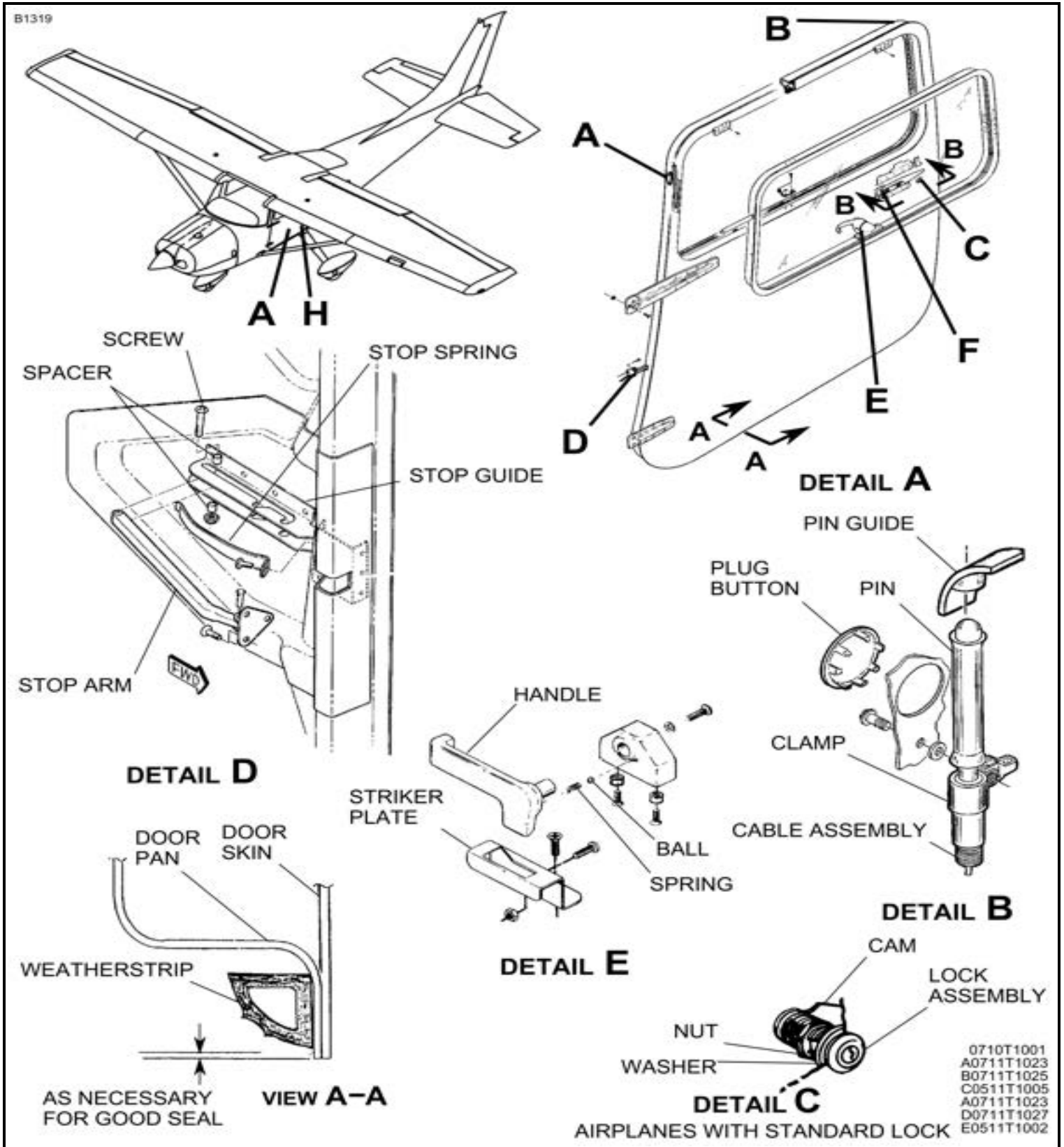


Figure 201 : Sheet 2 : Cabin Door Installation

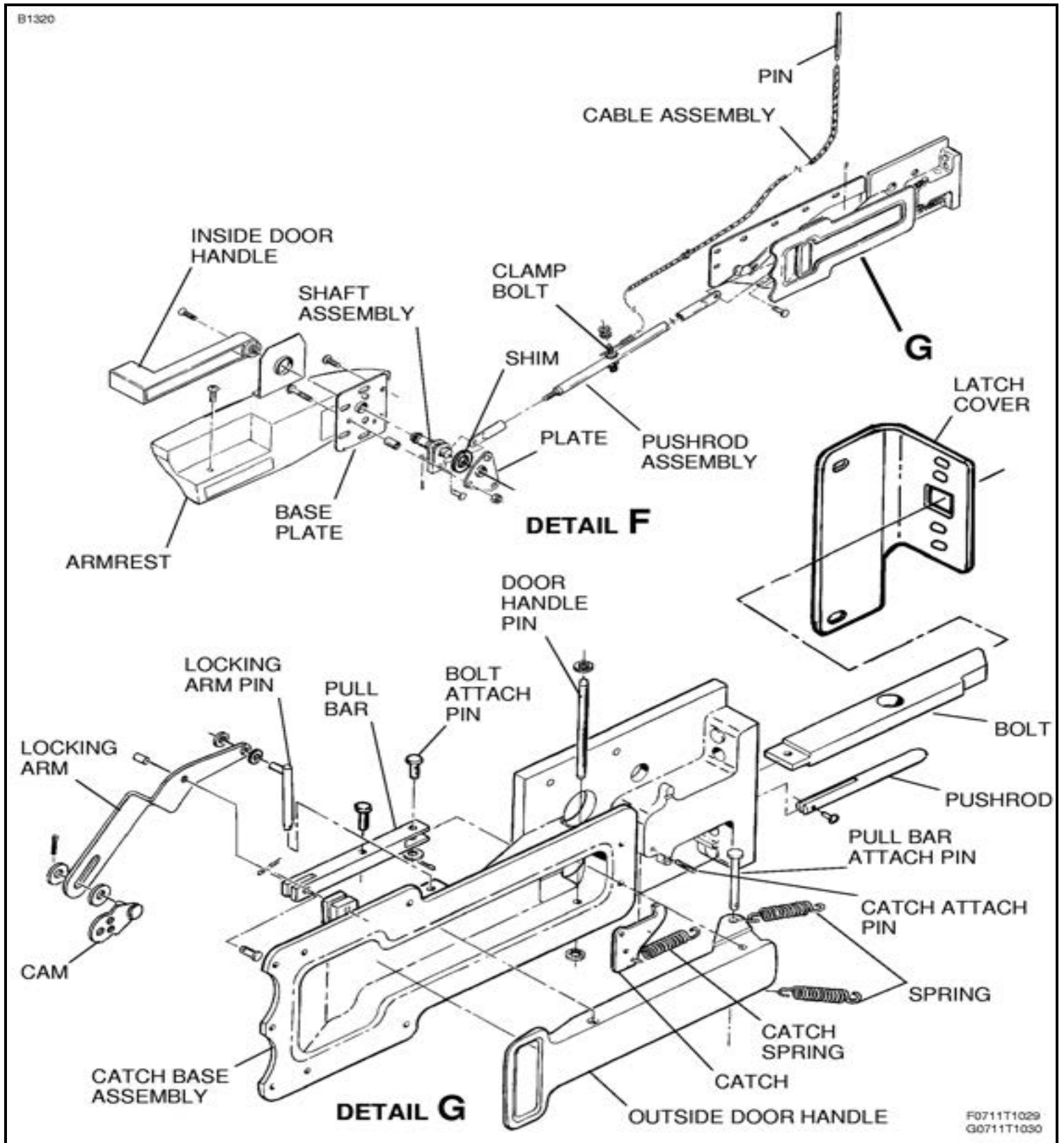


Figure 201 : Sheet 3 : Cabin Door Installation

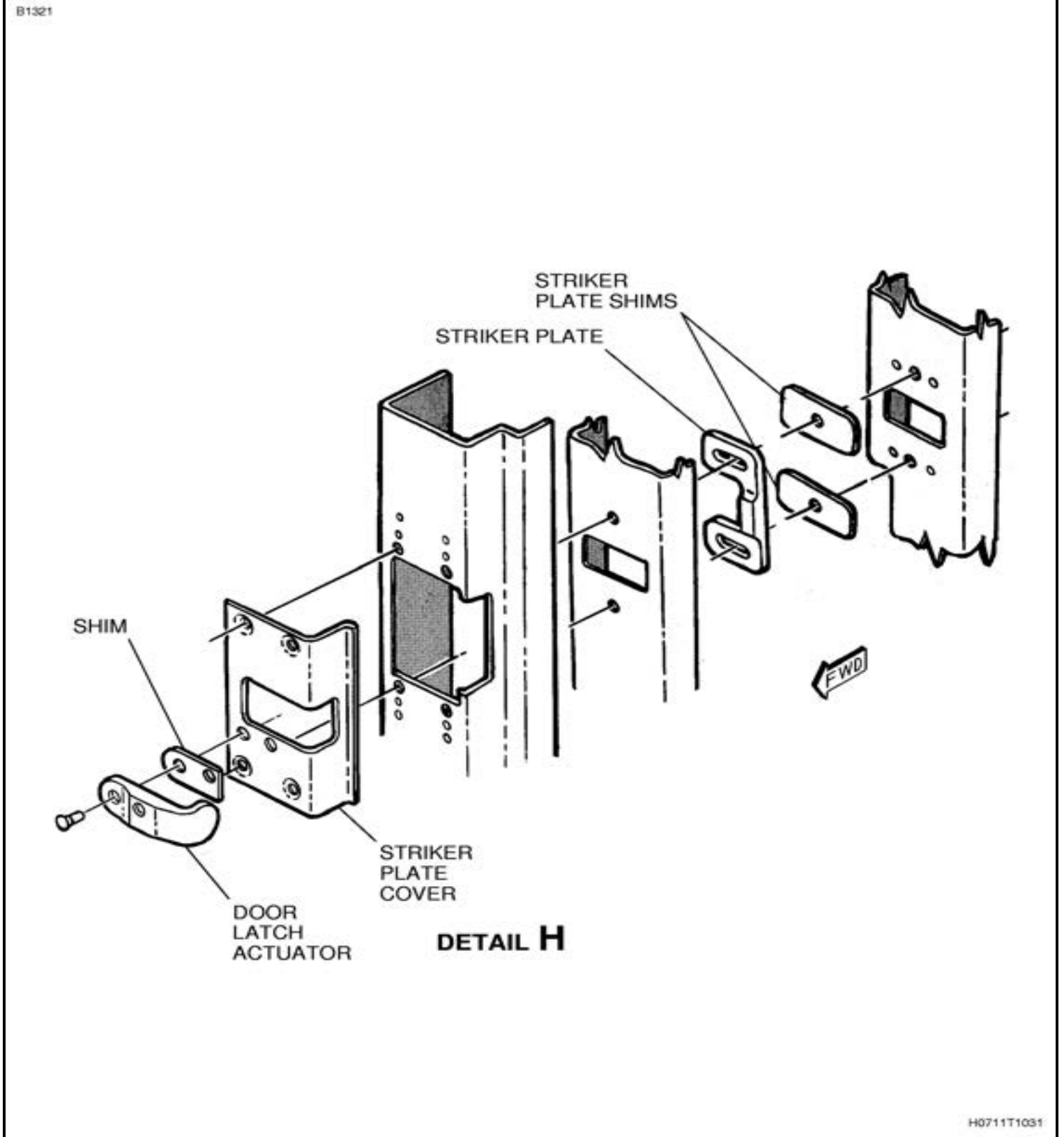
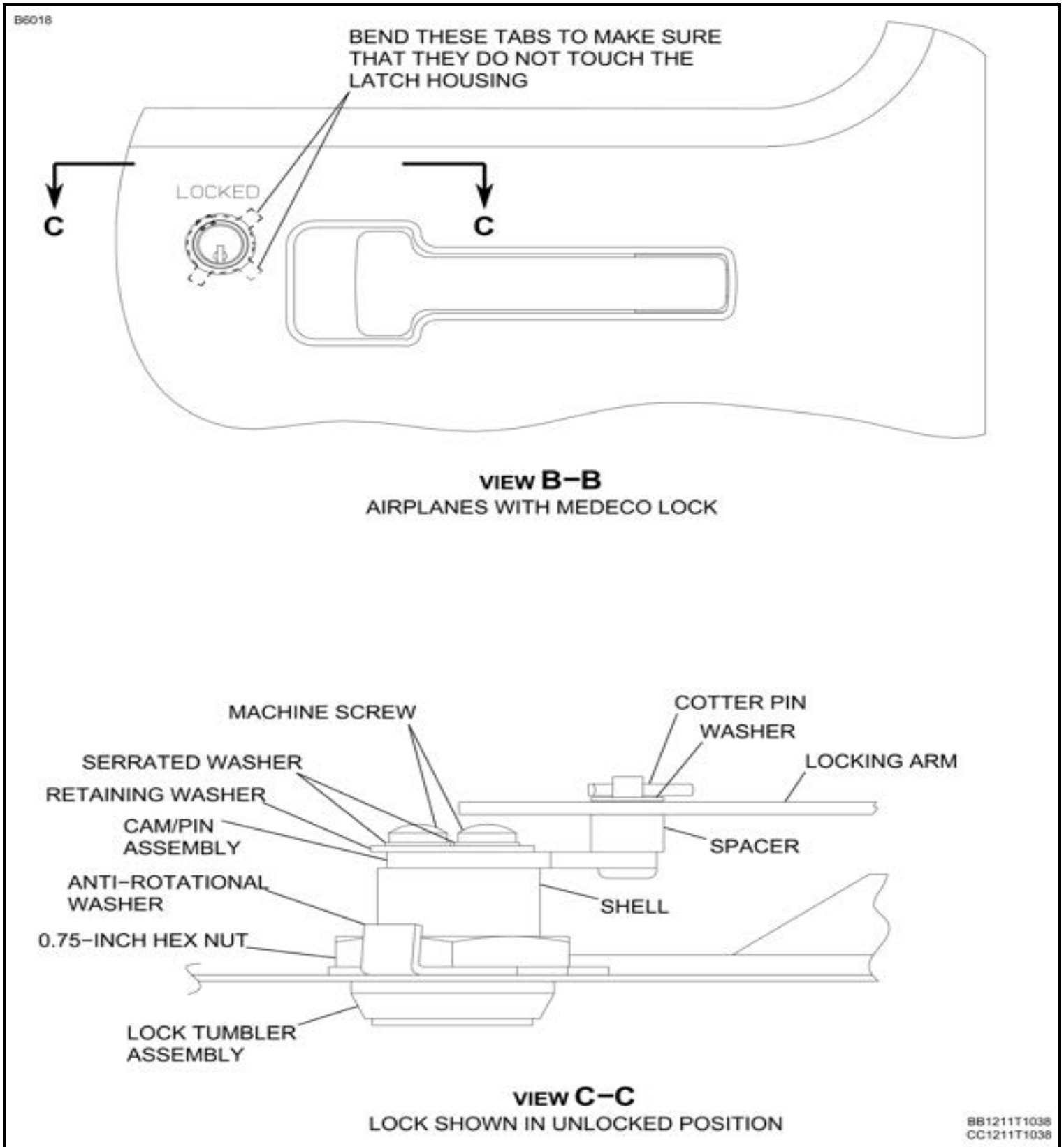


Figure 201 : Sheet 4 : Cabin Door Installation



BAGGAGE DOOR - MAINTENANCE PRACTICES

1. General

- A. A baggage door is installed on the left side of the airplane, aft of the cabin door. The baggage door allows access into the baggage area and into the tailcone.
- B. A rubber weatherstrip is cemented around the edge of the doorsill.
- C. An optional Medeco lock is installed on the baggage door on some airplanes.

2. Baggage Door Removal/Installation

- A. Baggage Door Removal (Refer to [Figure 201](#)).
 - (1) Open the baggage door.
 - (2) Disconnect the doorstop chain.
 - (3) Remove the upholstery panel from the door.
 - (4) Remove the bolts that attach the door to the hinges.
- B. Baggage Door Installation (Refer to [Figure 201](#)).
 - (1) Put the baggage door in position on the hinges and attach it with the bolts.
 - (2) Install the upholstery panel to the door.
 - (3) Connect the door stop chain.
 - (4) Close the baggage door and do a check for smooth operation.

3. Baggage Door Seal (Weatherstrip) Removal/Installation

- A. Baggage Door Seal (Weatherstrip) Removal (Refer to [Figure 201](#)).
 - (1) Remove the baggage door.
 - (2) With a nonmetallic scraper, remove the seal and its adhesive from the doorsill.
 - (3) Remove the adhesive residue and clean the doorsill area with DeSoclean 110 Solvent.
- B. Baggage Door Seal (Weatherstrip) Installation (Airplanes 18280001 thru 18282368 and T18208001 thru T18209100) (Refer to [Figure 201](#)).
 - (1) Use the old seal or the doorsill area as a guide to measure and cut the new seal to length.
 - (2) Apply a thin, even coat of EC1300L Adhesive around the circumference of the doorsill area.
 - (3) Make sure that you put the seam at the bottom center of the doorsill.
 - (4) Make sure that you do not stretch the seal around the corners of the doorsill.
 - (5) Press the new seal (P/N S1346-1) into the adhesive. Allow the adhesive to cure per the manufacturer's instructions, and make sure that the seal completely adheres to the doorsill with no gaps between the seal and the doorsill.
 - (6) Install the baggage door.
- C. Baggage Door Seal (Weatherstrip) Installation (Airplanes 18282369 and On and T18209101 and On) (Refer to [Figure 201](#)).
 - (1) Use the old seal or the doorsill area as a guide to measure and cut the new seal to length.
 - (2) Apply double-sided transfer tape (U065050) around the circumference of the doorsill area.
 - (3) Make sure that you put the seam at the bottom center of the doorsill.
 - (4) Make sure that you do not stretch the seal around the corners of the doorsill.
 - (5) Press the new seal (P/N 4383-1) into the transfer tape. Allow the transfer tape to cure per the manufacturer's instructions, and make sure that the seal completely adheres to the doorsill with no gaps between the seal and the doorsill.
 - (6) Install the baggage door.

4. Baggage Door Seal (Weatherstrip) Inspection

- A. Do an Inspection of the Baggage Door Seal (Weatherstrip).
 - (1) Put a 4-inch by 11-inch piece of paper between the baggage door frame and the baggage door. Close the baggage door. Slowly pull on the paper to make sure there is seal tension. Move the paper around the perimeter of the door to test the door seal tension.
 - (2) Remove the paper from the door frame. Make sure that the baggage door is closed. Pour a gallon of water over the door and tailcone door frame. After the water no longer drips, open the door and inspect for leaks.

- (3) If you find a leak, towel dry the upholstery with a clean, dry towel. Install the weatherstrip again as necessary to make sure that there are no leaks around the seal area of the baggage door.

5. Baggage Door Lock Assembly Removal/Installation (On airplanes with Medeco lock)

- A. Baggage Door Lock Assembly Removal (Refer to [Figure 201](#)).
 - (1) Remove the baggage door panel to get access to the lock assembly of the baggage door. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
 - (2) Remove the 0.75-inch hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly.
 - (3) Remove the lock assembly from the door.
- B. Baggage Door Lock Assembly Installation (Refer to [Figure 201](#)).
 - (1) Put the baggage door lock assembly in position on the baggage door.
 - (2) Install the 0.75-inch hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly. Make sure that the anti-rotational washer is installed under the 0.75-inch hex nut.
 - (3) Torque the nut.
 - (4) Bend the applicable tab on the anti-rotational washer against the flat part of the nut.
 - (5) Install the baggage door panel to the baggage door. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

6. Baggage Door Lock Cam Assembly Removal/Installation (On airplanes with Medeco lock)

- A. Baggage Door Lock Cam Assembly Removal (Refer to [Figure 201](#)).
 - (1) Remove the baggage door panel to get access to the baggage door lock assembly. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).
 - (2) Remove the hex nut and the serrated washer that attach the cam assembly to the baggage door lock.
 - (3) Remove the cam assembly.
- B. Baggage Door Lock Cam Assembly Installation (Refer to [Figure 201](#)).
 - (1) Put the cam assembly in position.
 - (2) Install the hex nut and the serrated washer that attach the cam assembly to the baggage door lock. Install the hex nut with Loctite 242.
 - (3) Install the baggage door panel to the baggage door. Refer to Chapter 25, [Interior Upholstery - Maintenance Practices](#).

Figure 201 : Sheet 1 : Baggage Door Installation

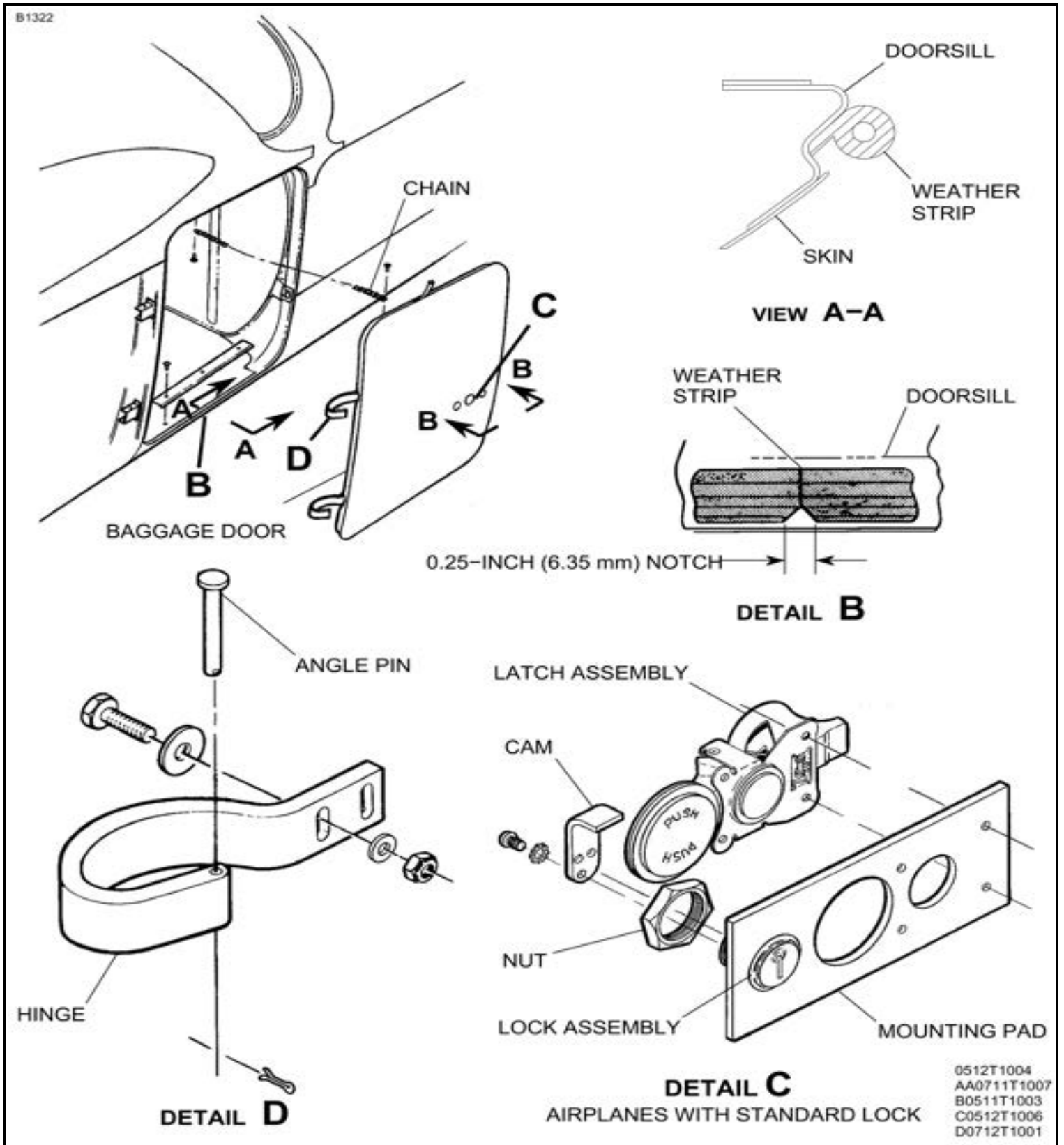


Figure 201 : Sheet 2 : Baggage Door Installation

