

CHAPTER 28**FUEL SYSTEM**

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CHAPTER 28

FUEL SYSTEM

28-00 Description

A single bladder-type crash-resistant fuel cell supplies fuel via gravity flow to the engine. The fuel cell incorporates vent fittings, a filler port, a fuel gage sender, a low-fuel sender, a sump drain, and a finger strainer at the fuel outlet.

The low-fuel sender is a float switch which activates the LOW FUEL annunciator, indicating approximately five gallons of usable fuel remaining. On later aircraft, a second float switch activates the < 12 GAL FUEL annunciator, indicating approximately 12 gallons of usable fuel remaining. At moderate to high power settings, the 12 gallon annunciator will illuminate approximately 15 to 20 minutes prior to the LOW FUEL annunciation.

NOTE

Due to fuel tank geometry, the level at which the < 12 GAL FUEL annunciator illuminates varies with helicopter pitch and roll attitude and is therefore affected by helicopter CG. 12 gallon annunciation is accurate in a level attitude but may be inaccurate by as much as four gallons if helicopter is loaded to CG limits. Aft, left loadings cause annunciation with less than 12 gallons remaining and forward, right loadings cause annunciation with more than 12 gallons remaining.

The fuel cell is secured inside an aluminum structure. The filler cap is located under a cowl door. The left and right vent fittings are interconnected and are vented through two risers within the mast fairing. The vent fittings each have a rollover valve to prevent fuel leakage in any attitude. A fuel valve is located on the forward side of the firewall and is controlled by a push-pull cable control at the base of the pilot's collective stick.

The engine incorporates a fuel pump assembly with an inlet filter. A differential pressure switch illuminates the FUEL FILTER annunciator if the filter becomes contaminated.

A single drain allows fuel sampling from the low point in the fuel cell. The drain tube is accessible via a left side cowl door. The drain is opened by extending the plastic tube clear of the aircraft and pushing up on the drain. On later helicopters, a glass tube stowed inside the upper left cowl door is provided which may be used to catch fuel samples.

Refer to § 28-50 for optional aux fuel tank installation system description.

Refer to § 28-60 for optional pressure fueling system installation system description.

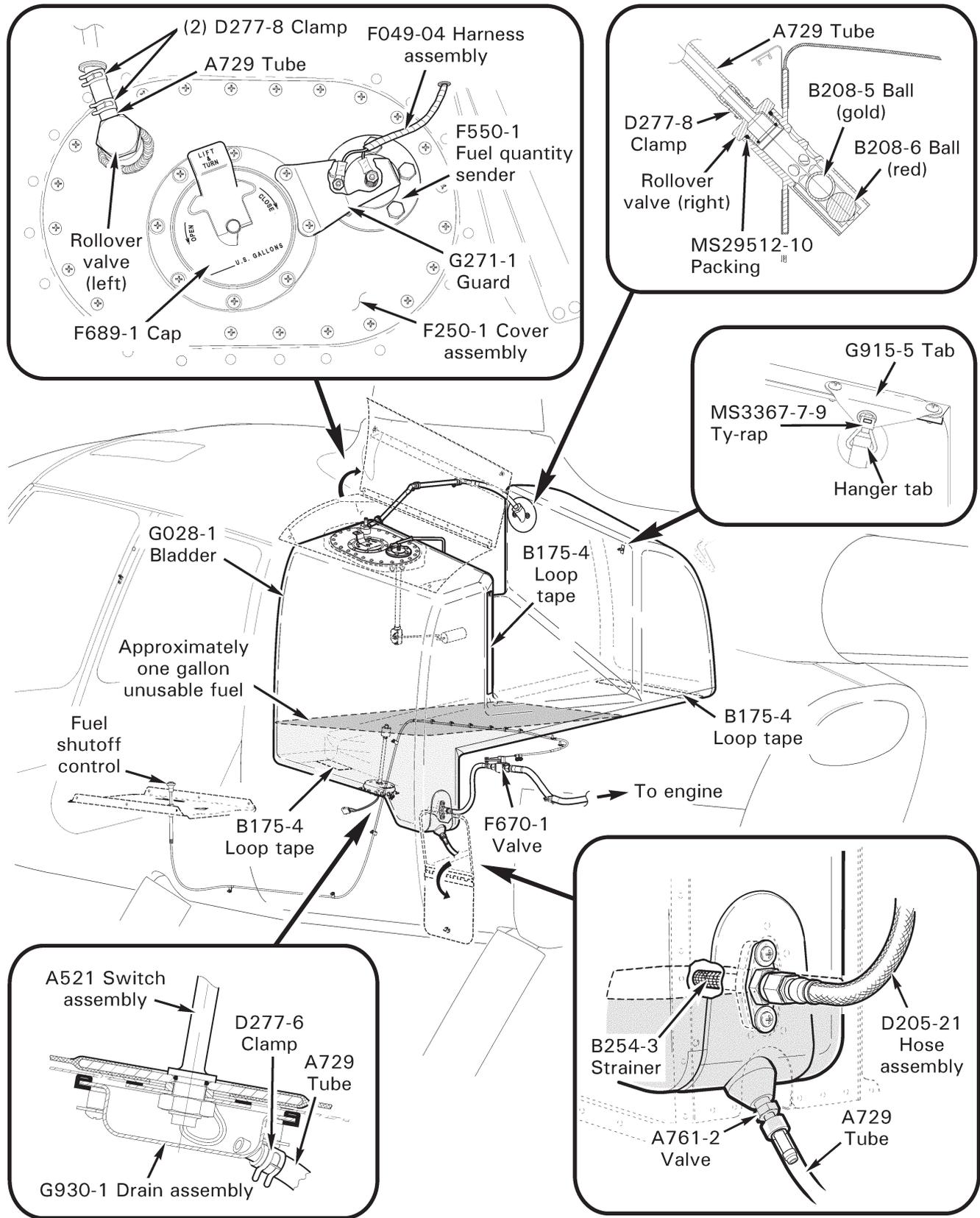


FIGURE 28-1 MAIN FUEL SYSTEM (STANDARD)

28-10 Bladder Assembly**CAUTION**

G028-1 bladder assembly temperature should be above 65°F before removing, installing, or flexing bladder.

A. Removal

1. Defuel helicopter per § 12-42.
2. Remove tailcone cowling assembly per § 53-23.
3. Remove fuel quantity sender per § 28-21.
4. Refer to Figure 28-1. Remove D277-8 clamps or cut and discard safety wire securing A729 tube to left rollover valve and pull tube off of valve. Remove screws securing F250-1 cover assembly to G028-1 bladder assembly and F028-1 support assembly and remove cover. Remove and discard o-ring.
5. Remove D277-8 clamp or cut and discard safety wire securing A729 tube to right rollover valve and pull tube off of valve. Remove screws and washers securing valve to bladder and support. Cut and discard ty-rap securing 35486 hanger tab to G915-5 tab.
6. Remove low-fuel switch assembly per § 28-22. Tape bladder openings.
7. Disconnect D205-21 (fuel outlet) hose assembly from B254-3 strainer and cap fittings. Remove screws and washers securing strainer to bladder and support. Remove strainer and tape bladder opening.
8. Remove sump valve per § 28-12.
9. Remove hardware securing G004-4 (right side, aft fuselage) skin to cabin and remove skin. Detach bladder hook tape from support loop tape, and remove bladder through right side opening.

28-10 Bladder Assembly (continued)**B. Installation**

1. Refer to Figure 28-1. Dust exterior of G028-1 bladder assembly and F028-1 support assembly floor with talcum powder to facilitate bladder slippage along metal surface. Do not allow powder to enter bladder.
2. Note locations of hook and loop tape on bladder lower surface and support floor. Orient bladder, fold into thirds, place in center of support, and unfold into position.
3. Apply light coat A257-9 anti-seize to screw threads and install screws and washers securing right rollover valve to bladder and support; verify security. Secure A729 tube to valve using D277-8 clamp; verify security.
4. Install (new) MS3367-7-9 ty-rap securing 35486 hanger tab to G915-5 tab. Cinch ty-rap until snug without over-tightening, and trim tip flush with head.

NOTE

Verify bladder is free of wrinkles across lower surface and properly located before attaching hook and loop tape. Bladder may be pressurized with air to 1 psi max to assist installation.

CAUTION

Avoid contaminating bladder assembly interior. Cover arms with sleeves and use lint-free gloves when working inside bladder.

5. Remove tape from bladder assembly openings. Insert a clean, smooth, blunt wooden dowel through bladder's fuel port opening and press on bladder lower surface to attach hook and loop tape. Verify security.
6. Install low-fuel switch assembly per § 28-22.
7. Apply light coat A257-9 anti-seize to screw threads and install screws and washers securing bladder outlet to support. Lubricate new MS29512-06 packing using A257-6 grease and install on B254-3 strainer. Install strainer in bladder and special torque strainer per § 20-33.
8. Remove caps and connect D205-21 hose assembly to strainer. Using backup wrench, special torque hose nut per § 20-33, and torque stripe per Figure 5-1.
9. Install sump valve per § 28-12.
10. Lubricate (new) MS29513-270 packing using A257-6 grease and install packing in recess at bladder's fuel port opening. Apply light coat A257-9 anti-seize to screw threads and install screws securing F250-1 cover assembly to bladder and support; verify security. Secure A729 tube to left rollover valve using D277-8 clamps; verify security.
11. Install fuel quantity sender per § 28-21.

28-10 Bladder Assembly (continued)**B. Installation (continued)**

12. Service helicopter with minimum two gallons fuel per § 12-41. Verify no leaks, especially at bladder outlets. Install G004-4 (right side, aft fuselage) skin and install hardware securing skin to cabin; verify security.
13. Perform fuel flow check per § 28-40.
14. Install tailcone cowling assembly per § 53-23.

28-11 Rollover Valves**WARNING**

Orientation of rollover valve balls is critical to valve operation. The gold ball on top (earlier ball on top was blue) floats and seals the vent in the event of inadvertent over-filling or in-flight sloshing. The red ball on bottom presses the top ball against the vent seat if the aircraft is inverted.

A. Packing Replacement and Valve Inspection

1. Remove tailcone cowling assembly per § 53-23, as required.
2. Refer to Figure 28-1. Remove D277-8 clamp(s) or cut and discard safety wire securing A729 tube to rollover valve and pull tube off of valve.
3. Remove G254-2 fitting or G254-6 retainer. Remove and discard MS29512-10 packing (G254-2 fitting only) and A215-015 o-ring.
4. Carefully remove B208-5 and B208-6 balls using a suction cup attached to a syringe. Inspect condition of balls, valve body, and fitting or retainer. Clean parts and verify no nicks, scratches, gouges, dents, cracks, or corrosion.
5. Carefully install B208-6 ball (red, solid) on bottom and B208-5 ball (gold or blue, hollow) on top in valve body using a suction cup attached to a syringe.
6. Install new A215-015 o-ring in groove inside fitting or retainer. Lubricate new MS29512-10 packing using A257-6 grease and install over G254-2 fitting threads.
7. Install fitting or retainer and special torque per § 20-33.
8. Secure A729 tube to valve using D277-8 clamp; verify security.
9. Install tailcone cowling assembly per § 53-23, as required.

28-12 Sump Valve**A. Removal**

1. Defuel helicopter per § 12-42.
2. Refer to Figure 28-1. Cut and discard safety wire (if installed) securing A729 tube to A761-2 or 1250H (sump) valve and remove tube.
3. Remove valve from G154-1 outlet assembly; tape bladder opening.
4. Actuate and lock valve to expose stem; remove and discard o-ring.

B. Installation

1. Actuate and lock A761-2 or 1250H (sump) valve to expose stem; install (new) o-ring in stem seat.
2. Refer to Figure 28-1. Lightly coat valve threads using B270-6 sealant. Remove tape and install valve in bladder outlet. Special torque A761-2 valve per § 20-33, or standard torque 1250H valve per § 20-32, and torque stripe per Figure 5-1.
3. Secure A729 to valve stem. Note: safety wire is not required.
4. Service helicopter with minimum two gallons fuel per § 12-41. Verify no leaks.

28-20 Fuel Quantity

28-21 Fuel Quantity Sender

CAUTION

Avoid contaminating bladder interior. Cover arms with sleeves and use lint-free gloves when working inside bladder.

A. Removal

1. Turn battery switch off and pull out (2 amp) GAGES circuit breaker at panel.
2. a. Main tank: Refer to Figure 28-1. Remove screws securing G271-1 guard to F250 cover assembly and remove guard.
b. Aux tank: Pull out (5 amp) AUX FUEL PUMP circuit breaker at panel. Remove screws securing G271-1 guard to G759 cover assembly and remove guard.

CAUTION

Rotation of fuel sender center stud or base nut is not permitted.

3. a. Main tank: Using a backup wrench, remove hardware securing F049-04 harness assembly to F550-1 fuel quantity sender.
b. Aux tank: Disconnect G768 harness assembly from airframe harness and G759 cover assembly at connectors.
4. Remove bolts securing fuel sender to cover assembly. Carefully pull fuel sender lever through opening. Tape bladder opening.

B. Installation

1. Perform fuel sender check per Part C.
2. Turn battery switch off and pull out (2 amp) GAGES circuit breaker at panel.
3. a. Main tank: Refer to Figure 28-1. Remove tape and carefully lower F550-1 fuel quantity sender lever through F250-1 cover assembly opening.
b. Aux tank: Pull out (5 amp) AUX FUEL PUMP circuit breaker at panel. Remove tape and carefully lower F550-2 (large tank) or F550-3 (small tank) fuel quantity sender lever through G759 cover assembly opening.
4. Install bolts securing fuel sender to cover assembly. Special torque bolts in criss-cross pattern per § 20-33 and torque stripe per Figure 5-1.

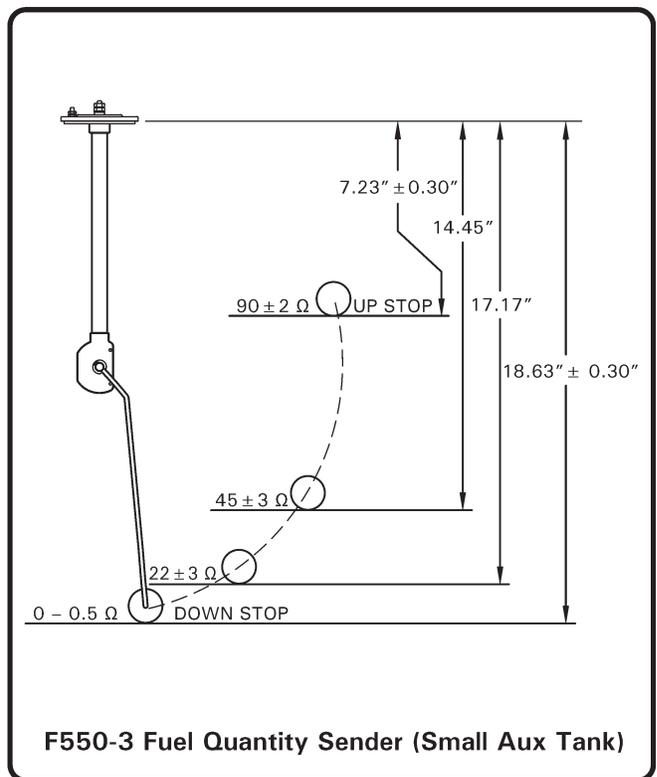
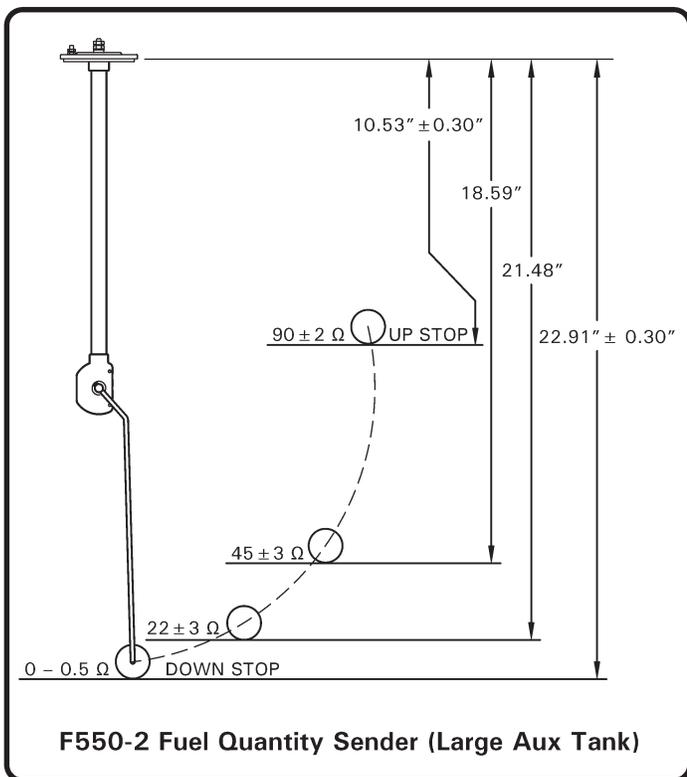
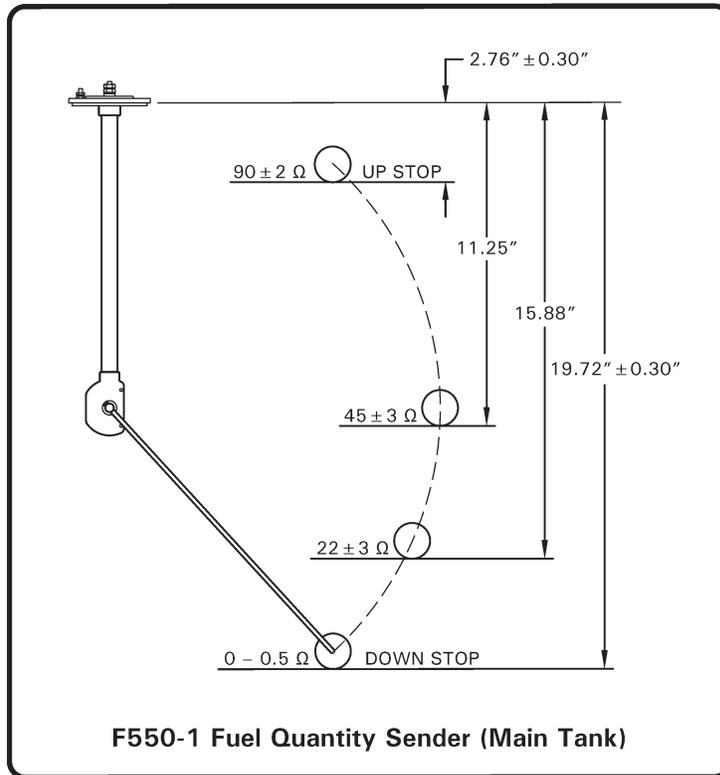


FIGURE 28-2 FUEL SENDER CHECK

28-21 Fuel Quantity Sender (continued)**B. Installation (continued)****CAUTION**

Rotation of fuel sender center stud or base nut is not permitted.

5. a. Main tank: Using a backup wrench, install hardware securing F049-04 harness assembly to fuel sender. Special torque nuts per § 20-33, standard torque palnuts per § 20-32, and torque stripe per Figure 5-1.
- b. Aux tank: Connect G768 harness assembly to G759 cover assembly and airframe harness at connectors. Verify security.
6. Apply light coat A257-9 anti-seize to threads and install screws securing G271-1 guard to cover assembly. Verify security.
7. Perform fuel indication check per Part D.

C. Fuel Sender Check

1. Remove fuel sender per Part A.
2. Simulate mounting position of appropriate F550 fuel quantity sender per Figure 28-2. Position float arm as shown and measure the resistance with a multimeter. Verify resistance is within tolerance at each noted height.
3. If resistance is out of tolerance at any height, bend float arm up for a fuel sender with excessive resistance, or bend float arm down for a fuel sender with too little resistance. Repeat steps until fuel sender resistance is within tolerance.
4. Install fuel sender per Part B.

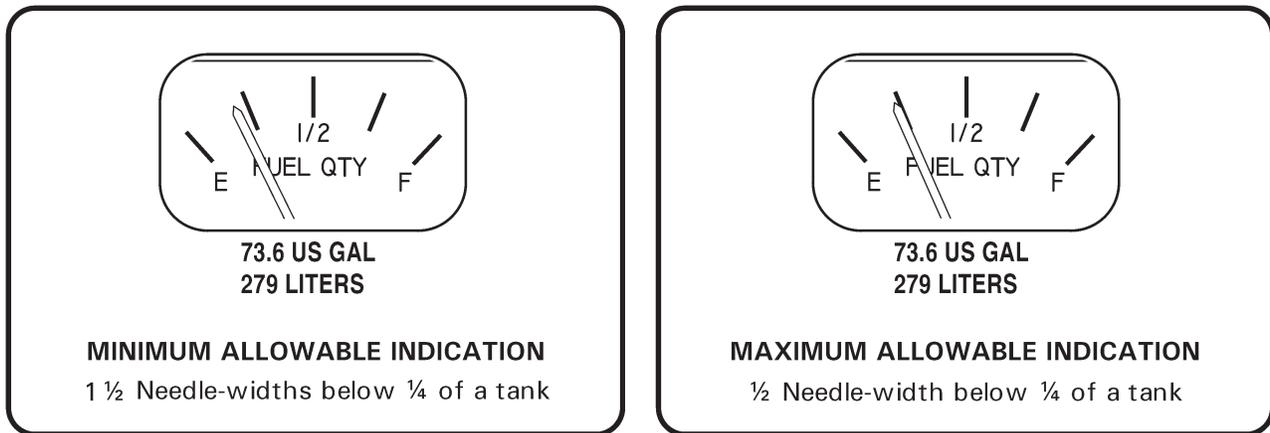


FIGURE 28-3 FUEL INDICATION CHECK

28-21 Fuel Quantity Sender (continued)

D. Fuel Indication Check

1. a. Main bladder fuel indication check: Defuel main bladder per § 12-42.
 - b. Aux tank fuel indication check: Verify main bladder has no more than 65 gallons fuel; defuel main bladder per § 12-42, as required.
2. Pull fuel valve into off position.
3. a. Main bladder fuel indication check: Fuel main bladder with 19.4 gallons ± 0.5 gallon per § 12-41.
 - b. Aux tank fuel indication check: Fuel aux tank with 10.1 gallons ± 0.5 gallon (large tank) or 5.9 gallons ± 0.5 gallon (small tank) per § 12-41.
4. Refer to Figure 28-3. Push in (2 amp) GAGES circuit breaker at panel and turn battery switch on. (Press QUANTITY button on aux fuel control panel for aux tank quantity, displayed on fuel quantity gage.) Verify gage reads one-half needle width to one & one-half needle widths below one-quarter mark. If fuel gage indication is correct, proceed to step 6.
5. If fuel gage indication is incorrect, remove fuel quantity sender per Part A. Slightly bend sender lever up for a gage that reads too high, or down for a gage that reads too low. Install fuel quantity sender per Part B.
6. Turn battery switch off and push fuel valve into on position.

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28-22 Low-Fuel Switch Assembly**CAUTION**

Avoid contaminating bladder interior. Cover arms with sleeves and use lint-free gloves when working inside bladder.

A. Schematic

Refer to Figure 98-1 or 98-2 for (single) low fuel warning installation wiring schematic.

Refer to Figure 98-33 for (dual) low fuel warning installation wiring schematic.

B. Removal

1. Defuel helicopter per § 12-42.
2. Open baggage compartment door. Remove G248 (battery compartment) cover.
3. Refer to Figure 28-1. Remove D277-6 clamp or cut and discard safety wire securing A729 tube to G930-1 drain assembly. Remove screws securing G930-4 retainer and drain assembly to G250-1 sump tray.
4. Remove fuel cap. Carefully capture A521-2 (single) or A521-4 (dual) switch assembly body with clean mechanical fingers (avoid capturing float).
5. Inside baggage compartment, remove nut, washer assembly, and spacer securing switch assembly to tray. Disconnect F049 harness assembly from switch assembly at connectors; extract switch assembly pins from housing.
6. Carefully pull switch assembly through (fuel cap) opening, avoiding fuel sender. Install fuel cap and tape bladder opening.

C. Installation

1. Lubricate (new) MS29512-05 packing with A257-6 grease and install packing over switch assembly threads.
2. Refer to Figure 28-1. Remove fuel cap. Tape A521-2 (single) or A521-4 (dual) switch assembly wiring to 4-ft length of lockwire; insert other end of wire through fuel cap opening and through switch assembly opening. Carefully grip switch assembly body with mechanical fingers and lower switch assembly to bottom of bladder. Inside baggage compartment, remove tape, guide wiring through opening, and install spacer, washer assembly, and nut securing switch assembly to G250-1 sump tray. Special torque nut per § 20-33 and torque stripe per Figure 5-1. Remove tape and lockwire. Release and remove mechanical fingers, and install fuel cap.
3. Assemble switch assembly pins in housing per Figure 98-1; connect F049 harness assembly to switch assembly at connectors. Fit wiring through gap in G930-1 drain assembly seal; install G930-4 retainer and screws securing retainer and drain assembly to tray. Verify security. Seal gap in drain assembly seal where wires pass thru using B270-5 sealant.

28-22 Low-Fuel Switch Assembly (continued)**C. Installation (continued)**

4. Secure A729 tube to drain assembly using D277-6 clamp; verify security.
5. Perform operation check per Part D.

D. Operation Check

1. Service helicopter with 7 gallons fuel per § 12-41.
2. If not previously accomplished, remove G248 (battery compartment) cover. Verify no leaks around switch assembly. Open sump drain access door and verify no leaks from (low-fuel switch) drain tube.
3. Turn battery switch on.
4. Remove fuel cap. Insert a clean, non-sparking rod through (fuel cap) opening and gently depress A521 switch assembly's float (lower float, if dual switch is installed); verify LOW FUEL annunciator segment illuminates.
5. Dual switch only: Remove rod. Service helicopter with additional 5 gallons fuel (12 gallons total) per § 12-41. Insert clean, non-sparking rod through opening and gently depress switch assembly's upper float; verify < 12 GAL FUEL light illuminates.
6. Remove rod and install fuel cap.
7. Turn battery switch off.
8. Secure access doors and install battery compartment cover; verify security.

E. Scheduled Maintenance

Every 12 Months: Perform operation check per Part D.

28-23 Fuel Flow Meter Installation

A. Description

The fuel flow meter installation consists of a fuel flow transducer installed in the engine fuel line, and a fuel flow signal adapter installed behind the left rear seatback on the cabin bulkhead. The output signal from the adapter provides fuel information including flow rate, calculated fuel remaining, and fuel range rings on either Garmin GTN-series or Avidyne IFD-series moving-map navigation displays.

The fuel flow meter transducer is installed between the engine fuel control unit (FCU) and an engine fuel check valve. A short, rigid fuel line is installed between the transducer and the FCU. A longer, rigid fuel line (delivered with the helicopter), may be installed to put the engine in its original configuration.

Fuel gages and low fuel warning light(s) are independent of the fuel flow meter installation and are the primary indicators of fuel quantity. Fuel flow meter data is for electronic display purposes only.

B. Schematic

Refer to Figure 98-33 for fuel flow meter installation electrical schematic.

C. Removal

Transducer

1. Remove engine cowling assembly per § 53-21.
2. Turn battery & avionics switches off and pull out GPS (5 amp) circuit breaker on panel. Pull fuel shut off valve off.
3. Disconnect airframe harness electrical connector from 660534HR-01 transducer assembly.
4. Refer to Rolls-Royce OMM Task 73-00-00-000-801 and observe precautions. Place a drip pan under the engine to catch fuel leakage.
5. Remove hardware securing G155-1 (aft) and G155-2 (forward) brackets to engine horizontal shield assembly. Remove hardware securing forward bracket to transducer and remove bracket.
6. Loosen nuts securing fuel tube and transducer sub-assembly to fuel control unit and check valve using back-up wrench. Remove transducer sub-assembly and engine nut, washers, and G155-1 aft bracket; discard AS4824N0 seals. Cap and plug all open fittings.
7. Further disassemble parts from transducer as required; discard AS4824N08 seals.
8. As required, install the fuel check valve per Rolls-Royce OMM Task 73-11-15-400-801. Install fuel control-to-check valve fuel tube per OMM Task 73-00-00-420-005; install new AS4824N04 seals.

28-23 Fuel Flow Meter Installation (continued)**C. Removal (continued)**Adapter

1. Remove aft left back rest assembly per § 25-22.
2. Turn battery & avionics switches off and pull out GPS (5 amp) circuit breaker on panel.
3. Disconnect airframe harness electrical connector from AIS-380 adapter.
4. Remove hardware securing adapter to cabin bulkhead and remove adapter.

D. InstallationTransducer

1. Configure AIS-380 adapter if a replacement adapter or 660534HR-01 transducer assembly was installed per Part E.
2. Turn battery & avionics switches off and pull out GPS (5 amp) circuit breaker on panel.
3. Refer to Rolls-Royce OMM Task 73-00-00-400-801 and observe precautions. Place a drip pan under the engine to catch fuel leakage.
4. As required, remove fuel control-to-check valve fuel tube per Rolls-Royce OMM Task 73-00-00-990-805; discard AS4824N04 seals. Refer to Rolls-Royce OMM Task 73-11-15-000-801; remove hardware securing fuel check valve to horizontal fireshield.
5. Remove caps and plugs from fittings. Assemble engine washers, G155-1 (aft) bracket, engine nut, new (2) AS4824N04 seals, SS6565-8-4 (reducer) fitting, new (2) AS4824N08 seals, 660534HR-01 transducer assembly, and 564601 tube assembly between fuel check valve and fuel control unit. Install hardware securing G155-2 (forward) bracket to transducer and tighten screws; install hardware securing G155 brackets to horizontal fireshield finger tight. Verify proper alignment with aft bracket; relocate engine-supplied washers as required.
6. Special torque engine-supplied nut to fuel check valve per § 20-33; special torque SS6565-8-4 fitting to fuel check valve per § 20-33; special torque SS6565-8-4 fitting to transducer per § 20-33; special torque 564601 tube assembly to transducer per § 20-33; special torque 564601 tube assembly to fuel control unit per § 20-33. Tighten hardware securing G155 brackets to horizontal fireshield. Verify security.
7. Connect airframe harness electrical connector to transducer assembly; verify security.
8. Push in GPS circuit breaker (5 amp) on panel. Turn battery & avionics switches on.

28-23 Fuel Flow Meter Installation (continued)

D. Installation (continued)

Transducer (continued)

9. Perform appropriate functional checks per Garmin GTN-series or Avidyne IFD-series moving-map navigation display Pilot’s Guide.
10. Install engine cowling assembly per § 53-21.

Adapter

1. Configure AIS-380 adapter if a replacement adapter or 660534HR-01 transducer assembly was installed per Part E.
2. Turn battery & avionics switches off and pull out GPS (5 amp) circuit breaker on panel.
3. Install hardware securing adapter to cabin bulkhead; verify security.
4. Connect airframe harness electrical connector to adapter; verify security.
5. Push in GPS circuit breaker (5 amp) on panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin GTN-series or Avidyne IFD-series moving-map navigation display Pilot’s Guide.
7. Install aft left back rest assembly per § 25-22.

E. Configuration

Configure AIS-380 fuel flow adapter per Shadin Avionics M833811-01 Installation Manual Section 5.

Make the following selections for R66 installation:

Field	Selection
Serial Port	Autopopulated (may change depending on connection point to PC)
ARINC	Leave at defaults
Fuel Flow Parameters	Enabled
Engine Type	Single Engine
Engine 1 K Factor	See transducer*
Engine 2 K Factor	See transducer*
Fuel Density (lbs/Gal)	6.71
Serial Output Format	SHADIN_Z

* The K Factor is 1000 times the number printed on the transducer. For example, a transducer with a K Factor of 9.63 is configured as 9630.

28-23 Fuel Flow Meter Installation (continued)**F. Scheduled Maintenance**

Every 12 Months:

Transducer

Visually inspect fuel control unit-to-transducer fuel tube connections, transducer, and reducer connections to transducer and check valve for evidence of leakage. Visually inspect components for any obvious damage; verify proper installation and security. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.

Adapter

Visually inspect adapter for any obvious damage; verify proper installation and security. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.

G. Special MaintenanceTransducer and Adapter

Refer to configuration procedure per Part E. Determine K-factor printed on the transducer; verify adapter is configured properly. Perform 100-Hour/Annual inspection per Part F.

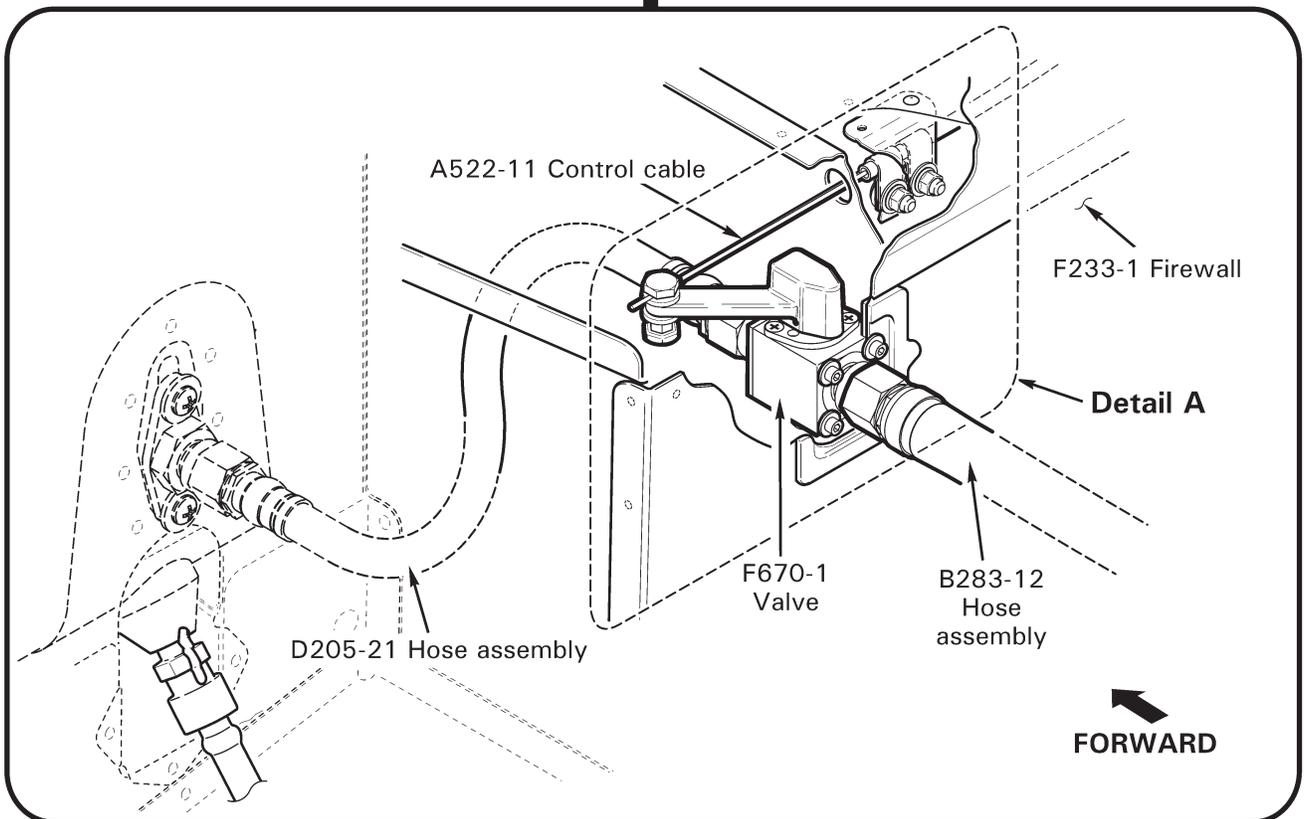
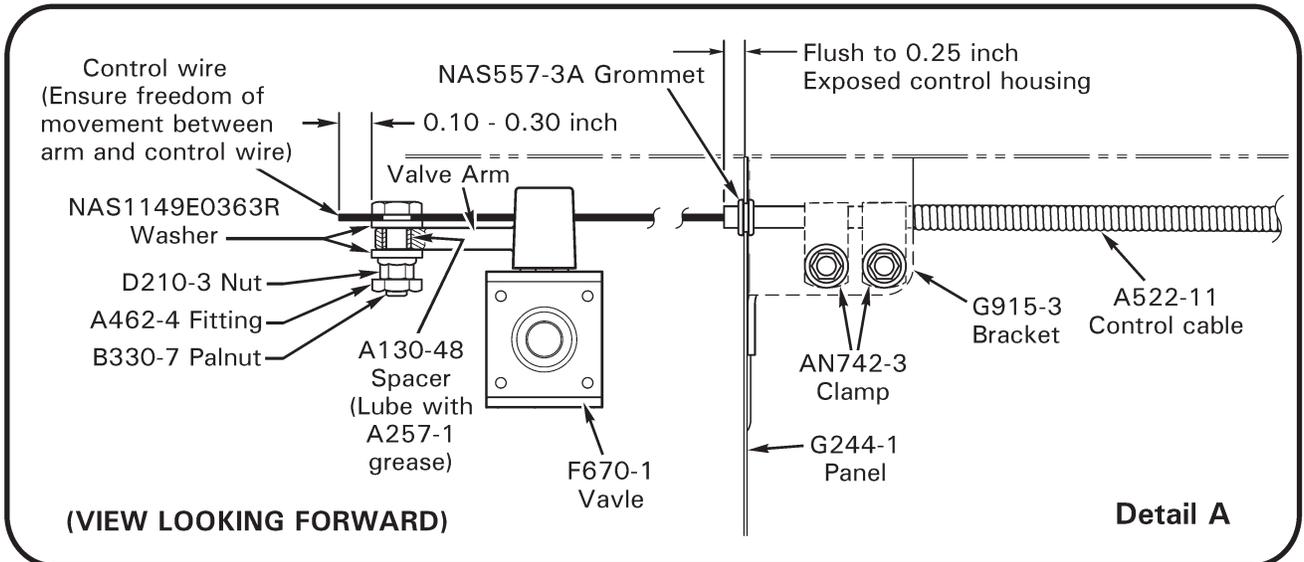


FIGURE 28-4 FUEL VALVE

28-30 Fuel Valve**A. Removal**

1. Defuel helicopter per § 12-42.
2. Refer to Figures 28-1 and 28-4. Open sump drain access door. Remove palnut and loosen nut securing A462-4 fitting and A522-11 (fuel valve) control inner wire to F670-1 fuel valve arm.
3. Disconnect D205-21 and B283-12 hose assemblies from fuel valve and cap fittings.
4. Remove screws and washers securing fuel valve to F233-1 firewall and remove fuel valve through sump drain access door.

B. Installation

1. Refer to Figures 28-1 and 28-4. Install screws and washers securing F670-1 fuel valve to F233-1 firewall. Verify security.
2. Remove caps and connect D205-21 and B283-12 hose assemblies to fuel valve. Special torque hose nuts per § 20-33 and torque stripe per Figure 5-1.
3. Perform fuel valve control rigging per § 28-31.
4. Perform fuel flow check per § 28-40.

28-31 Fuel Valve Control Rigging

1. Refer to Figures 28-1 and 28-4. Open sump drain access door. Remove palnut and loosen nut securing A462-4 fitting and A522-11 (fuel valve) control inner wire to F670-1 fuel valve arm.
2. Open baggage compartment door. As required, loosen hardware securing AN742-3 clamps and control housing to G915-3 bracket. Position end of control housing flush to 0.25 inch at or beyond edge of G244-1 panel and install fasteners. Verify security.
3. Refer to detail in Figure 76-3. Push fuel valve into on position then pull up slightly to create 0.03-0.10 clearance under control knob. Position fuel valve arm in full open detent. Verify sufficient inner wire beyond outboard edge of fitting and special torque fitting nut per § 20-33.
4. Pull fuel valve into off position and verify valve arm fully contacts OFF detent. Push fuel valve into on position and verify valve arm fully contacts ON detent, meeting clearance requirement. Reposition fitting per previous steps, as required.
5. Install fitting palnut, standard torque per § 20-32, and torque stripe per Figure 5-1. Trim control wire 0.10-0.30 inch beyond aft edge of fitting.
6. Close sump drain access door. Close and latch baggage compartment door.

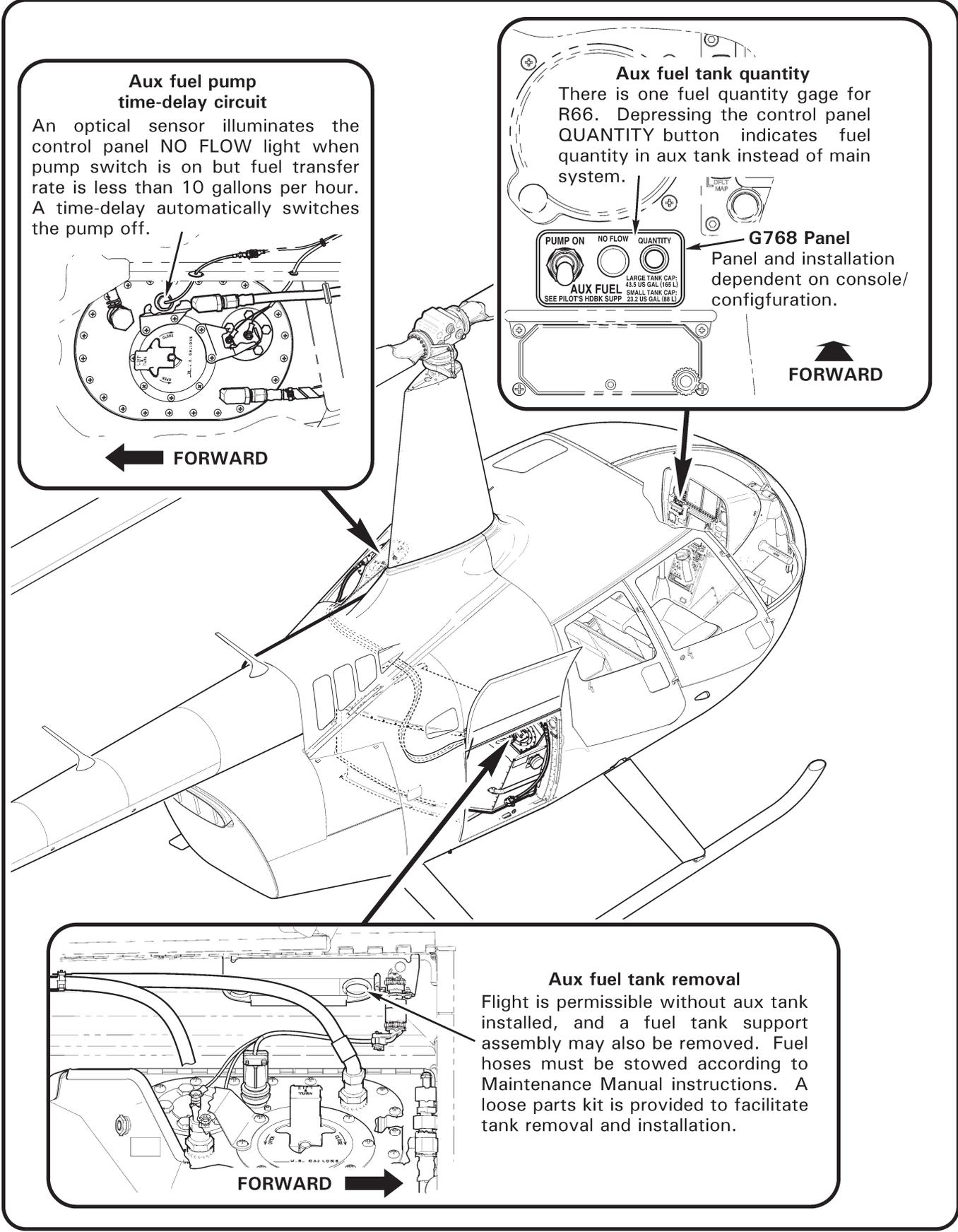
28-40 Fuel Flow Check

1. Open mast fairing per § 53-22. Remove engine cowling per § 53-21.
2. Refer to Figure 28-1. Attach a temporary hose to one of the vent weldment openings. With the fuel cap installed, blow into the hose (do not use compressed air) and verify air blows out the other vent opening. If air does not blow out the other vent, remove obstruction(s) in vent line(s) or in fuel bladder and repeat check.
3. Defuel helicopter per § 12-42, then service helicopter with 19.4 gallons of fuel per § 12-41.
4. Weigh a suitable, empty container having a volume of at least one gallon. Record weight of empty container in table below.
5. Pull fuel valve into off position and disconnect B283-12 hose assembly from the engine fuel inlet fitting.
6. Using a second, suitable container, push fuel valve into on position and drain fuel into second container for a few seconds to purge system of air. Then fill the weighed container for 60 seconds. Weigh and record weight of empty container & 60 seconds of fuel flow in table below.
7. Perform the following calculation:

Combined weight of empty container & 60 seconds fuel flow: _____ lb
Subtract Weight of empty container: - _____ lb
Equals Weight of 60 seconds fuel: = _____ lb

8. Minimum fuel flow (at 19.4 gallons of fuel) is 4.75 lb/min (60 seconds). If fuel flow is less than 4.75 lb/min, remove obstruction(s) in vent line(s), fuel bladder, fuel hoses, fuel valve, or fuel strainer (inside bladder at outlet), and repeat check until fuel flow is satisfactory.
9. Close mast fairing per § 53-22. Install engine cowling per § 53-21.

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Aux fuel pump time-delay circuit
 An optical sensor illuminates the control panel NO FLOW light when pump switch is on but fuel transfer rate is less than 10 gallons per hour. A time-delay automatically switches the pump off.

Aux fuel tank quantity
 There is one fuel quantity gage for R66. Depressing the control panel QUANTITY button indicates fuel quantity in aux tank instead of main system.

G768 Panel
 Panel and installation dependent on console/ configuration.

FORWARD

Aux fuel tank removal
 Flight is permissible without aux tank installed, and a fuel tank support assembly may also be removed. Fuel hoses must be stowed according to Maintenance Manual instructions. A loose parts kit is provided to facilitate tank removal and installation.

FORWARD

FIGURE 28-5 AUX FUEL SYSTEM (LARGE TANK SHOWN)

28-50 Aux Fuel System

A. Description

The auxiliary fuel system consists of a removable fuel tank located in the forward section of the baggage compartment, hoses connecting the auxiliary tank to the main fuel tank, and a small control panel on the instrument console.

The auxiliary fuel tank includes a crash-resistant bladder in an aluminum and fiberglass enclosure, an internal fuel transfer pump, a quantity sender, a filler port, and a sump drain. The filler port and sump drain are accessed by opening the baggage door. The tank mounts on a separate fiberglass tray which is also removable.

The pump transfers fuel to the main tank at approximately 40 gallons per hour (150 liters per hour). Venting is provided through a second hose connected to the main tank. If the main tank is full, any excess fuel transferred by the pump returns to the auxiliary tank through the vent hose.

A fuel flow sensor is located at the fitting where transferred auxiliary fuel enters the main tank (hose connection near the main tank filler port). The sensor illuminates the NO FLOW light on the control panel when the pump switch is on but the fuel transfer rate is less than ten gallons per hour.

The AUX FUEL control panel on the console includes a pump switch, a NO FLOW annunciator light, and a QUANTITY button. The pump switch engages the transfer pump. When the pump switch is on, the NO FLOW light indicates fuel is not transferring from auxiliary tank to the main tank, either because the auxiliary tank is empty or the pump has failed. It is normal for the light to illuminate for approximately five seconds when the pump is first switched on while the system is priming.

A time-delay circuit automatically switches the pump off if the NO FLOW light is illuminated for more than 15 seconds. The light will remain on even after the time delay has removed power from the pump. Turning the pump switch off will extinguish the light.

While the QUANTITY button is depressed, the fuel quantity gage indicates fuel quantity in the auxiliary tank instead of the main tank. The NO FLOW light also comes on while the QUANTITY button is depressed to provide a test of the circuit and to confirm that the auxiliary tank quantity is being displayed on the fuel gage.

The auxiliary fuel tank has two drains through the belly of the helicopter. Any fuel spilled at the filler port is collected by the surrounding scupper and drains through a hose into the outboard belly drain location. The tank support tray has a drain at the inboard drain location. Fuel leaking from the inboard drain indicates a possible leak in the fuel bladder.

A sump drain hose stowed vertically along the right side of the tank allows preflight fuel sampling from the low point of the tank. To sample fuel, extend hose away from the helicopter and push in on the valve. The valve may be locked open to allow draining of the tank.

28-50 Aux Fuel System (continued)

A. Description (continued)

Operationally, the fuel transfer pump may be switched on any time at the pilot’s discretion. If the main tank is full, any excess fuel transferred from the auxiliary tank will return through the vent/return hose. Note that fuel in the auxiliary tank is not considered usable for flight planning purposes because the fuel transfer system has no redundancy in case of pump failure.

The auxiliary fuel tank may be removed to provide additional baggage space. The separate support tray may also be removed. A small container which may be clipped to the outboard side of the tank is provided for stowing installation hardware.

28-51 Aux Fuel System – Tank Assembly

A. Removal

1. Defuel aux fuel tank per § 12-42.
2. Turn battery switch off and pull out (5 amp) AUX FUEL PUMP circuit breaker at panel. Open main baggage compartment door.
3. Disconnect G768-4 harness assembly from airframe harness at connectors.
4. Using a back-up wrench, disconnect D205-36 (vent/return) and D205-36 (pump) hose assemblies from aux tank fittings in G759-1 cover assembly. Install AN820-6 or AN929-6 caps (included in MT183-1 kit) on aux tank fittings. Install AN806-6D plugs (included in MT183-1 kit) on hose fittings, special torque plugs to 120 in.-lb, and stow hoses in G769-1 bracket assembly.
5. Remove B526-6 screws securing G010 aux tank assembly to G259-1 bulkhead and G251-1 panel. Remove tank assembly using straps.

NOTE

Flight is permissible without G010 aux tank assembly installed when (2) AN806-6D plugs installed on D205-36 hose assemblies and hoses are stowed in G769-1 bracket assembly (see above instructions).

6. As required, revise Weight and Balance Record in R66 Pilot’s Operating Handbook (POH) Section 6 to reflect aux tank assembly removal using the following data:

Subtract:

Item	Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
Large Aux Tank Assy	-30.0 lb	101.0 in.	-3030.0 in.-lb	1.5 in.	-45.0 in.-lb
Small Aux Tank Assy	-23.0 lb	96.8 in.	-2226.4 in.-lb	3.5 in.	-80.5 in.-lb

28-51 Aux Fuel System – Tank Assembly (continued)

B. Installation

1. Turn battery switch off and pull out (5 amp) AUX FUEL PUMP circuit breaker at panel. Open main baggage compartment door.
2. Position G010 aux tank assembly on G755 support assembly (tank pin will align with relief in support); route drain tube into floor weldment. Install B526-6 screws securing aux tank to G259-1 bulkhead and G251-1 panel. Verify security.
3. Remove AN820-6 or AN929-6 caps from aux tank fittings in G759-1 cover assembly, and AN806-6D plugs from D205-36 (vent/return) and D205-36 (pump) hose assemblies. Stow caps and plugs in MT183-1 kit’s jar assembly.
4. Connect hose assemblies to aux tank fittings. Using a back-up wrench on fittings, special torque hose nuts per § 20-33, & torque stripe per Figure 5-1. Verify security.
5. Connect G768-4 harness assembly to airframe harness at connectors. Verify security.
6. As required, revise Weight and Balance Record in R66 Pilot’s Operating Handbook (POH) Section 6 to reflect aux tank assembly installation using the following data:

Add:

Item	Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
Large Aux Tank Assy	30.0 lb	101.0 in.	3030.0 in.-lb	1.5 in.	45.0 in.-lb
Small Aux Tank Assy	23.0 lb	96.8 in.	2226.4 in.-lb	3.5 in.	80.5 in.-lb

7. Fuel as required per § 12-41.
8. Turn battery switch on and push in (5 amp) AUX FUEL PUMP circuit breaker at panel. Turn pump switch on and inspect vent/return, pump, and sump drain hose assemblies where they connect to tank. Verify no fuel leaks.
9. Turn pump and battery switches off. Close and secure main baggage compartment door.

28-52 Aux Fuel System – Support Assembly

A. Removal

1. Remove aux fuel tank per § 28-51.
2. Remove B526-6 screws securing G755 support assembly to bulkhead and remove B536-8 screws securing support assembly to floor. Carefully remove support.

NOTE

Flight is permissible without G010 aux tank assembly installed when (2) AN806-6D plugs installed on D205-36 hose assemblies and hoses are stowed in G769-1 bracket assembly (refer to § 28-51). G755 support assembly installation is optional when tank is removed.

3. As required, revise Weight and Balance Record in R66 Pilot’s Operating Handbook (POH) Section 6 to reflect support assembly removal using the following data:

Subtract:

Item	Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
Large Tank Support Assy	-3.0 lb	101.0 in.	-303.0 in.-lb	-1.2 in.	3.6 in.-lb
Small Tank Support Assy	-2.0 lb	96.8 in.	-193.6 in.-lb	-0.4 in.	0.8 in.-lb

B. Installation

1. Verify baggage compartment floor where G755 support assembly is to be installed is free of debris. Position support assembly on floor.
2. Install B526-6 screws securing support assembly to bulkhead and install B536-8 screws securing support assembly to floor. Verify security.
3. As required, revise Weight and Balance Record in R66 Pilot’s Operating Handbook (POH) Section 6 to reflect support assembly installation using the following data:

Add:

Item	Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
Large Tank Support Assy	3.0 lb	101.0 in.	303.0 in.-lb	-1.2 in.	-3.6 in.-lb
Small Tank Support Assy	2.0 lb	96.8 in.	193.6 in.-lb	-0.4 in.	-0.8 in.-lb

4. Install aux fuel tank per § 28-51 or refer to NOTE in Part A.

28-53 Aux Fuel System – Bladder**CAUTION**

Avoid contaminating bladder interior. Cover arms with sleeves and use lint-free gloves when working inside bladder.

A. Removal

1. Remove aux fuel tank per § 28-51.
2. Cut ty-rap securing D205 (drain) hose assembly to G762-11 scupper. Using a back-up wrench, disconnect hose from drain fitting, release hose at tab, and remove hose. Cap and plug fittings. Remove screws securing G756 bladder and scupper to G754 enclosure assembly.
3. Remove fuel quantity sender per § 28-21.
4. Remove screws securing G759-1 cover assembly and bladder to enclosure. Lift cover and inside bladder, release clamp securing drain tube to fitting. Inside bladder, remove screws securing G764-1 drain weldment and G765-1 pump assembly to bladder. Remove weldment, pump, and tubes with connected cover assembly.
5. Remove screws securing G758-1 cover to enclosure assembly. Remove G762-12 hinge. Guide cover clear of strap and remove cover.
6. Detach bladder hook tape from enclosure loop tape and remove bladder. Tape bladder openings.

B. Installation

1. Fold forward, aft, and left sides of G756 bladder inward; align bladder's G759-4 ring assembly with G754 enclosure assembly's servicing panel to clear strap, and press bottom of bladder to enclosure's tray. Unfold bladder, and align bladder and enclosure hook and loop tape.

CAUTION

Verify bladder is free of wrinkles across lower surface and properly located before attaching hook and loop tape. Bladder may be pressurized with air to 1 psi max to assist installation.

2. Remove tape protecting bladder openings. Insert a clean, smooth, blunt wooden dowel through bladder service opening and press on bladder lower surface to attach hook and loop tape. Verify security.
3. Guide G758-1 cover clear of strap and install screws securing cover to enclosure. Install G762-12 hinge. Verify security.

28-53 Aux Fuel System – Bladder (continued)**B. Installation (continued)**

4. Position G765-1 pump assembly, G764-1 drain weldment, and tubes (with connected G759-1 cover assembly) inside bladder and install screws. Verify security.
5. Inside bladder, install clamp securing drain tube to fitting. Verify security.
6. Install screws securing bladder and G762-11 scupper to enclosure at drain. Verify security.
7. Connect D205 (drain) hose assembly to drain fitting, aligning hose $8.5^{\circ} \pm 5.0^{\circ}$ from parallel with edge of enclosure's G757-1 tray. Using a back-up wrench, special torque hose nut per § 20-33, and torque stripe per Figure 5-1. Secure hose near drain valve at tab. Install MS336-7-9 ty-rap securing scupper to hose. Cinch ty-rap until snug without overtightening, and trim tip flush with head.
8. Apply light coat A257-9 anti-seize to screw threads and install screws securing G759-1 cover and bladder to enclosure. Verify security.
9. Install fuel quantity sender per § 28-21.
10. Install aux fuel tank per § 28-51.

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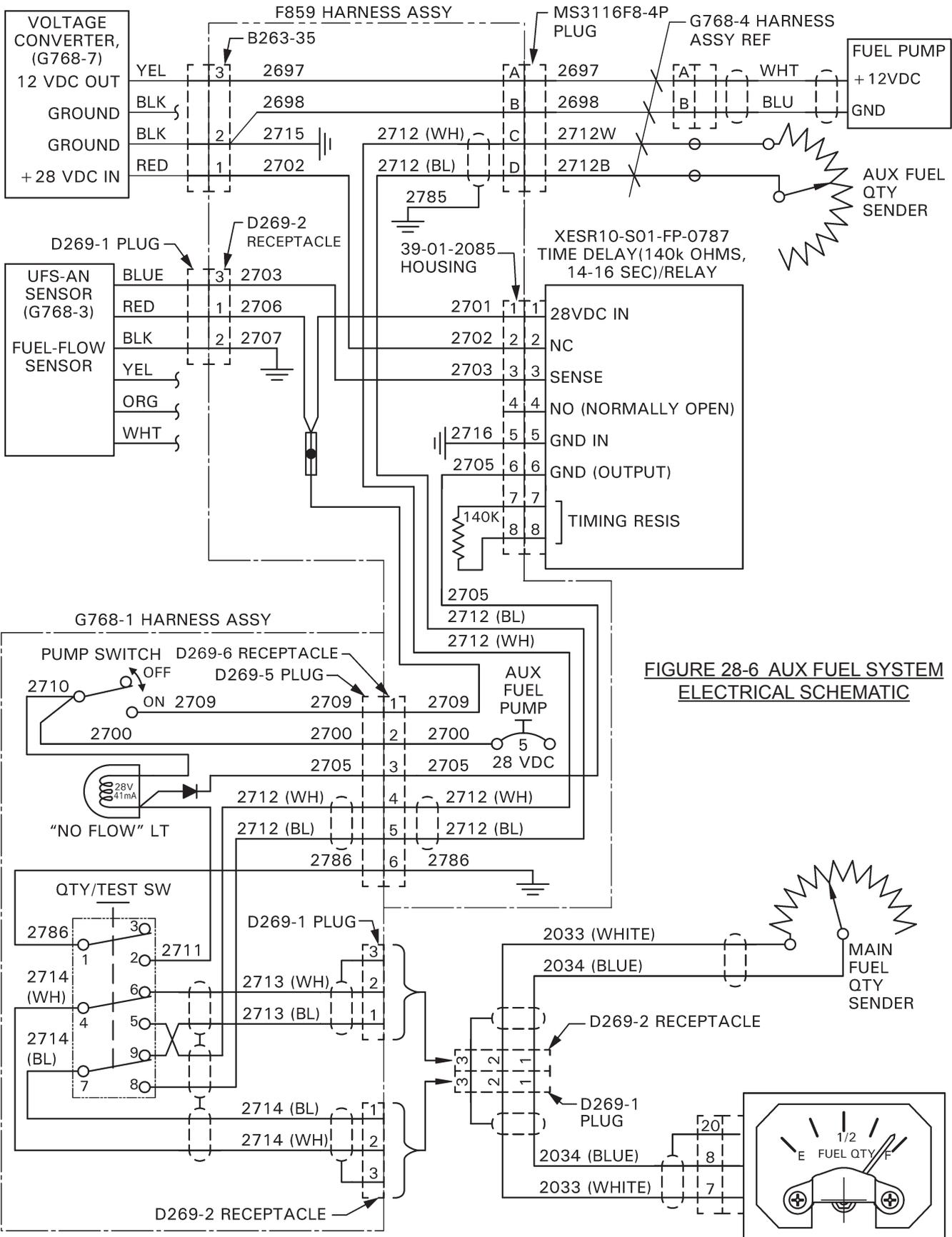


FIGURE 28-6 AUX FUEL SYSTEM ELECTRICAL SCHEMATIC

G010 REV I

28-54 Aux Fuel System – Fuel Quantity Sender

Refer to § 28-21 for fuel quantity sender maintenance instructions.

28-55 Aux Fuel System – Pump Assembly**CAUTION**

Avoid contaminating bladder interior. Cover arms with sleeves and use lint-free gloves when working inside bladder.

A. Removal

1. Defuel aux fuel tank per § 12-42.
2. Turn battery switch off and pull out (5 amp) AUX FUEL PUMP circuit breaker at panel. Open main baggage compartment door.
3. Disconnect G768-4 harness assembly from airframe harness at connectors.
4. Using a back-up wrench, disconnect D205-36 (vent/return) and D205-36 (pump) hose assemblies from aux tank fittings in G759-1 cover assembly. Temporarily cap and plug fittings (AN820-6 and AN929-6 caps, and AN806-6D plugs are included in MT183-1 kit).
5. Refer to Figure 28-7. Remove screws securing G759-1 cover assembly and G756 bladder to G754 enclosure assembly. Lift cover and inside bladder, release clamp securing A729-73 tube to drain fitting. Inside bladder, remove screws securing G764-1 drain weldment and G765-1 pump assembly to bladder. Remove weldment, pump, and tubes with connected cover assembly. Tape opening to prevent contamination of bladder interior.
6. Unwind B161-108 spirap from A729-24 tube and pump wiring. Remove D277-8 clamp and tube from pump. Remove hardware securing pump connector to cover.

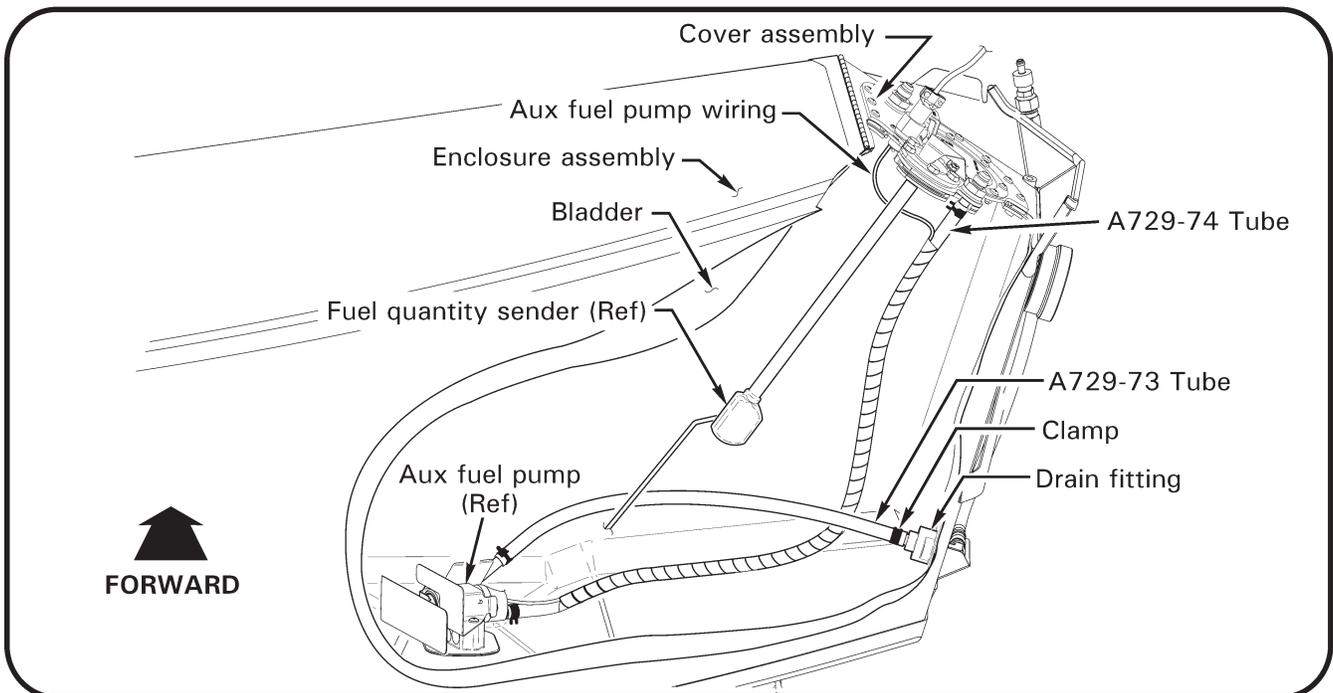
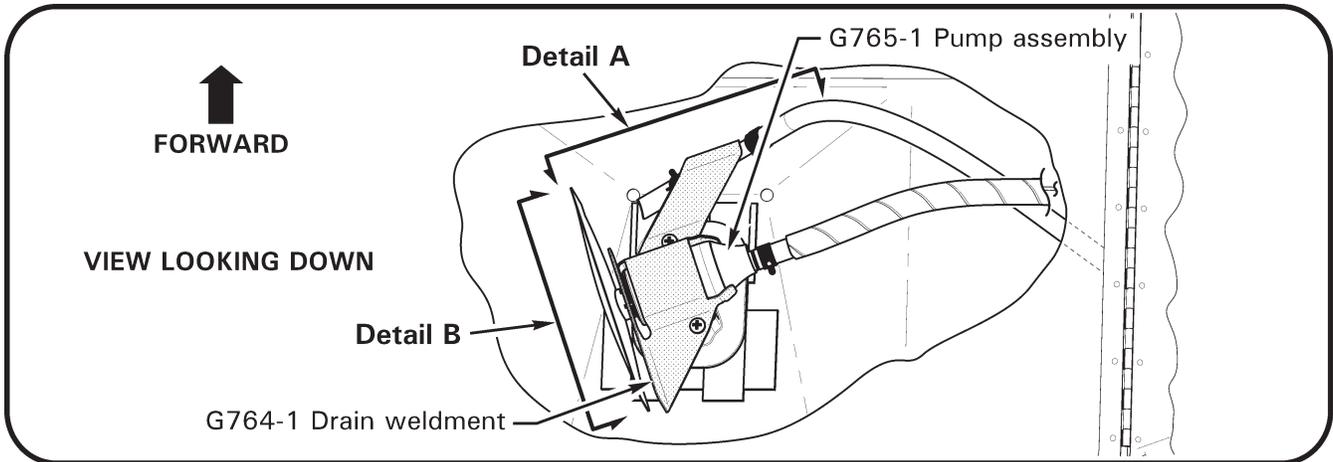
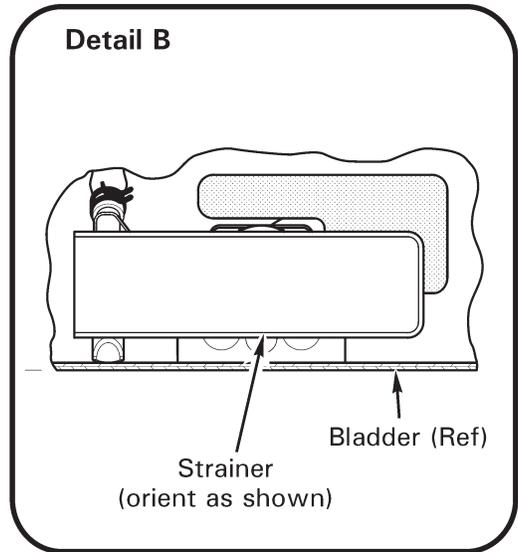
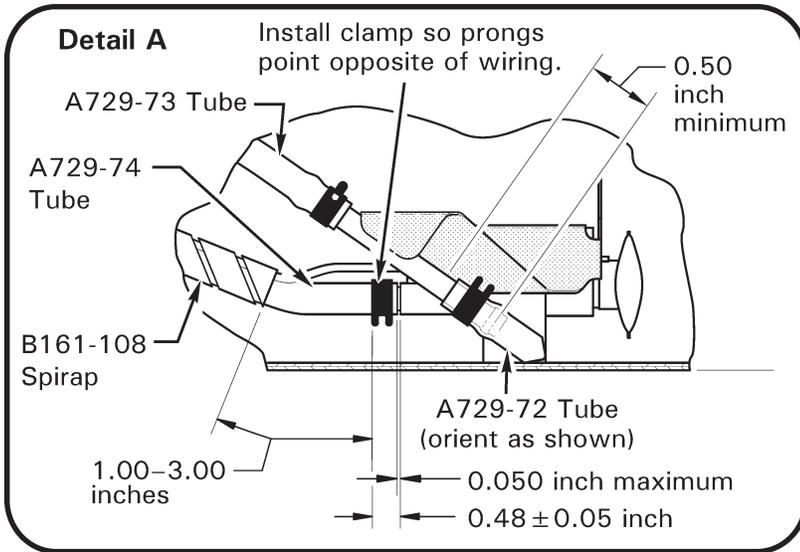


FIGURE 28-7 FUEL PUMP

28-55 Aux Fuel System – Pump Assembly (continued)**B. Installation**

1. Turn battery switch off and pull out (5 amp) AUX FUEL PUMP circuit breaker on circuit breaker panel. Open main baggage compartment door.
2. Remove tape from opening of G756 bladder. Verify bladder is free of wrinkles across lower surface of tank and is properly located.
3. Refer to Figure 28-7. Position G764-1 drain weldment with attached tubes (without pump) in bladder and temporarily secure with screws. Verify with flashlight and mirror bottom end of A729-72 tube contacts bladder as shown. Adjust tube and repeat step as required. Remove weldment with attached tubes.
4. Position A729-74 tube on G765-1 pump assembly as shown; install D277-8 clamp so prongs point opposite of wiring. Verify security. Run pump wiring along tube and secure with B161-108 spirap as shown; ensure there is 1.00–3.00 inches between spirap and clamp.
5. Place drain weldment with attached tubes on pump assembly and position weldment and pump inside bladder; verify strainer is positioned as shown and install mounting screws. Verify security.
6. Connect A729-73 tube to drain fitting and install D277-8 clamp; verify security. Connect A729-74 tube to G759-1 cover assembly, install D277-8 clamp, and ensure there is 1.00–3.00 inches between spirap and clamp; verify security. Install hardware securing pump connector to cover; verify security.
7. Install screws securing cover and bladder to G754 enclosure assembly; verify security.
8. Remove AN820-6 or AN929-6 caps from aux tank fittings in G759-1 cover assembly, and AN806-6D plugs from D205-36 (vent/return) and D205-36 (pump) hose assemblies. Stow caps and plugs in MT183-1 kit's jar assembly.
9. Connect hose assemblies to aux tank fittings. Using a back-up wrench on fittings, special torque hose nuts per § 20-33, and torque stripe per Figure 5-1. Verify security.
10. Connect G768-4 harness assembly to G768-1 harness assembly at connectors. Verify security.
11. Perform fuel quantity indication check per § 28-21.
12. Using ground power or during flight check, switch on aux pump and verify no flow light extinguishes in less than 15 seconds. Continue timing from when pump was switched on and verify light re-illuminates (aux fuel is transferred to main tank) in less than 16 minutes. Verify aux fuel quantity indication is empty after light re-illuminates.

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28-60 Pressure Fueling System

A. Description

The pressure fueling system consists of a fueling port on the right side of the fuselage, two shut-off valves in series just downstream of the port, a hose from the valves to an inlet at the top of the fuel tank, fuel tank level and pressure sensors, and a control panel on the instrument panel. The fueling port is compatible with an Emco Wheaton J71 dry-break coupler (recommended Emco Wheaton part no. J71C-AVN1-E004, which fits a fuel hose with a one inch male NPT threaded fitting).

Two shut-off valves are used to provide redundant protection against overfueling. Both valves must be open to allow fuel to flow. Each valve is connected to an independent float switch in the fuel tank to close the valve when the tank is full as well as an independent pressure switch to close the valve if fuel tank overpressure is detected. One of the valves is also connected to a second float switch to shut off at 25 gallons (95 liters).

The pressure fueling control panel includes a power switch, a quantity selector switch, a VALVE OPEN light, and a TANK PRESSURE warning light with two test buttons for testing the overpressure warning circuits. The power switch enables refueling by providing power to open the two shut-off valves. If the helicopter is running, the collective must be on the down stop for the valves to operate. The VALVE OPEN light illuminates when both shut-off valves are open, indicating the system is ready to accept fuel. The TANK PRESSURE light illuminates when excessive pressure is detected in the fuel tank. Excessive pressure will latch a shut-off valve closed until power to the system is cycled.

The pressure fueling system feeds fuel to the top of the main fuel tank. The system cannot be used for defueling and it will not add fuel to the optional auxiliary tank in the baggage compartment. Maximum allowable pressure for ground equipment connected to the fueling port is 50 psi (3.5 bar), which provides approximately 50 gallons per minute (190 liters per minute) fuel flow. Approximate flow rates at lower pressures are 30 gpm at 20 psi, 20 gpm at 10 psi, and 100 lpm at 1 bar.

The fueling port and recommended Emco Wheaton coupler are both dry-break fittings, allowing the external fueling equipment to be connected or disconnected without fuel spillage regardless of whether the shut-off valves are open or closed. A cap is provided which may be installed on the fueling port when the system is not in use.

An optical sensor near the fueling port will detect a fuel hose if the hose is connected to the port. If the collective is raised off the down stop while a hose is connected, a "fuel hose" audio alert will repeat in the headsets. The alert is muted 15 seconds after the collective is raised to prevent a distraction in case of a false alert.

CAUTION

The audio alert is only an aid. Do not rely on audio alert to verify hose is disconnected. Pilots must visually confirm fuel hose is disconnected and area is clear before takeoff.

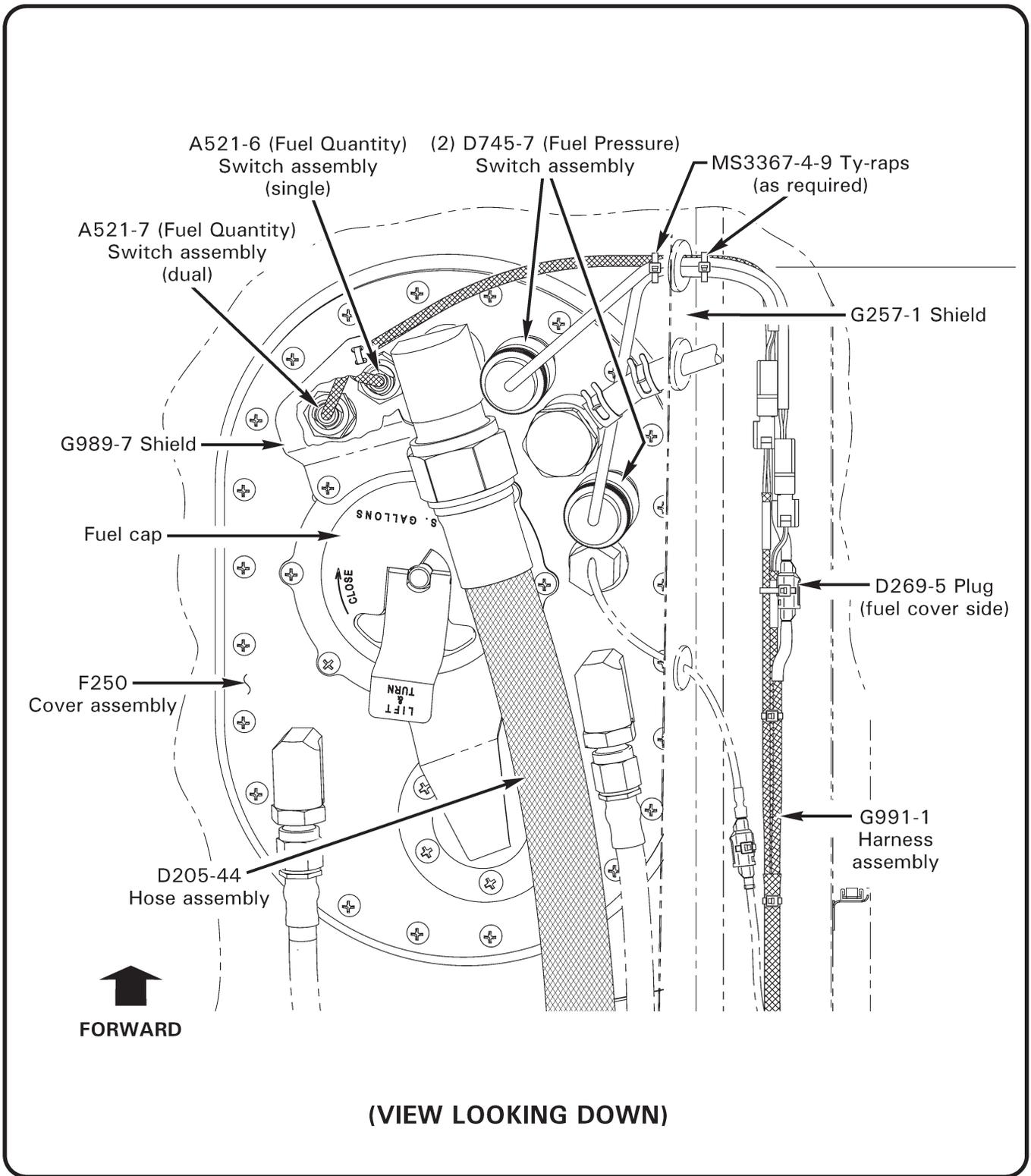


FIGURE 28-8 MAIN FUEL PORT (SHOWN WITH OPTIONAL AUX FUEL TANK)

28-61 A521 (Fuel Level) Switch Assemblies**CAUTION**

Avoid contaminating bladder interior. Cover arms with sleeves and use lint-free gloves when working inside bladder.

A. Schematic

Refer to Figure 98-34 for pressure fueling system installation schematic.

B. Removal

1. Defuel helicopter per § 12-42.
2. Turn battery & avionics switches off and pull PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel.
3. Remove tailcone cowling per § 53-23.
4. Refer to Figure 28-8. Open (main) fueling port door. Cut and discard ty-raps as required and disconnect A521 & D745-7 switch assembly wire harnesses from G991-1 harness assembly at connectors.
5. Using appropriate pin extractor, extract pins from switch assembly wire harness connectors; pull grommet and wires thru G257-1 shield.
6. Carefully pull A521 switch assembly wires through grommet, taking care not to damage other wire insulation or grommet.
7. Remove ty-rap as required, and remove screws securing G989-7 shield to F250 cover assembly. Remove shield.
8. Remove fuel cap. Carefully capture A521-6 (single) or A521-7 (dual) switch assembly body with gloved hand.
9. Remove nut securing switch assembly to F250 cover assembly; carefully route wires thru (switch) opening, inside bladder.
10. Carefully pull switch assembly through (fuel cap) opening, avoiding fuel sender. Install fuel cap and protect F250 cover assembly opening.

28-61 A521 (Fuel Level) Switch Assemblies (continued)**C. Installation**

1. Lubricate (new) MS29512-05 packing with A257-6 grease and install packing over A521-6 (single) or A521-7 (dual) switch assembly threads.
2. Refer to Figure 28-8. Open (main) fueling port door and remove fuel cap. With gloved hand, route switch assembly and wiring through (fuel cap) opening inside of bladder. Route wires thru switch assembly opening and install nut securing switch assembly to F250 cover assembly. Special torque nut per § 20-33 and torque stripe per Figure 5-1.
3. Install B266-8 sleeving over switch assembly wires, as required.
4. Carefully pull A521 switch assembly wires through grommet, taking care not to damage other wire insulation or grommet.
5. Pull A521 & D745-7 switch assembly wires and grommet thru G257-1 shield and install grommet.
6. As required, install pins on wires per the following: strip 0.18-inch insulation from wires. Crimp M39029/58-360 pin onto each wire. Using 10X magnification, inspect crimps per § 20-94. Verify no nicked or broken conductors (wire strands), and no insulation damage. As required, gently pry locking lance with fingernail so lance protrudes (lance will not lock in housing unless it protrudes).
7. Install wires in housings per schematic (see Part A). Connect switch assembly wire harnesses to airframe harness at connectors; verify security.
8. Secure switch assembly wiring to G989-7 shield using MS3367-4-0 ty-rap (locate head under shield); lock D269 plug and receptacle and secure to wiring using MS3367-4-9 ty-rap; install MS3397-4-X ty-raps as required to secure wiring. Cinch ty-raps until snug without overtightening and trim tips flush with heads.
9. Apply A257-9 anti-seize to screw threads and install screws securing G989-7 shield to F250 cover assembly.
10. Close (main) fueling port door. Install tailcone cowling per § 53-23.

D. Operation Check

1. Defuel helicopter per § 12-42, as required.
2. Push in PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel. Turn battery switch on.
3. Remove main tank fuel cap. Carefully capture A521-6 (single) or A521-7 (dual) switch assembly float with gloved hand. Have a second person turn on power and set quantity to 25 GAL at pressure fueling control panel; verify VALVE OPEN light is illuminated. Verify light extinguishes when actuating each float individually.
4. Turn off power at pressure fueling control panel. Turn battery switch off.

28-62 D745-7 (Pressure) Switch Assemblies**A. Schematic**

Refer to Figure 98-34 for pressure fueling system installation schematic.

B. Removal

1. Turn battery & avionics switches off and pull PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel.
2. Remove tailcone cowling per § 53-23.
3. Refer to Figure 28-8. Open (main) fueling port door. Cut and discard ty-raps as required and disconnect D745-7 & A521 switch assembly wire harnesses from airframe harness at connectors.
4. Using appropriate pin extractor, extract pins from D745-7 switch assembly wire harness connectors; pull grommet and wires thru G257-1 shield.
5. Carefully pull D745-7 switch assembly wires through grommet, taking care not to damage other wire insulation or grommet.
6. Remove switch assembly from F250 cover assembly. Protect F250 cover assembly opening.

C. Installation

1. Refer to Figure 28-8. Apply B270-6 sealant or A701-11 tape to D745-7 switch assembly threads and install switch in F250 cover assembly. Special torque switch per § 20-33 and torque stripe per Figure 5-1.
2. Carefully pull D745-7 switch assembly wires thru grommet, taking care not to damage other wire insulation or grommet.
3. Pull D745-7 & A521 switch assembly wires and grommet thru G257-1 shield and install grommet.
4. Install wires in housings per schematic (see Part A). Connect switch assembly wire harnesses to airframe harness at connectors; verify security.
5. Refer to figure and install MS3367-4-9 ty-raps as required to lock D269 plug and receptacle and to secure wiring. Cinch ty-raps until snug without overtightening and trim tips flush with heads.
6. Close (main) fueling port door. Install tailcone cowling per § 53-23.

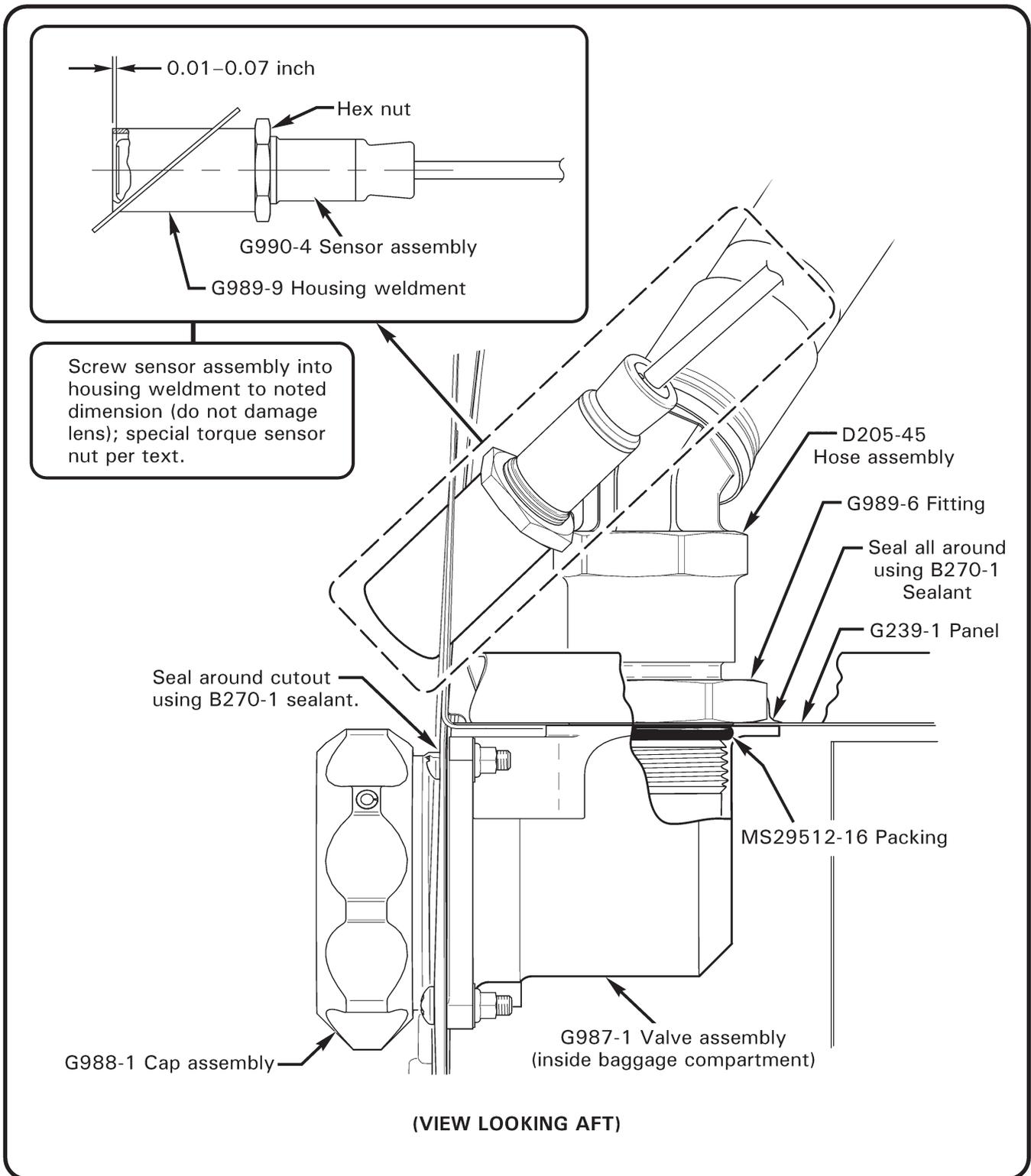


FIGURE 28-9 PRESSURE FUEL PORT

28-63 G987-1 (Fuel Port) Valve Assembly**A. Removal**

1. Remove residual fuel from system per § 28-66, as required.
2. Remove tailcone cowling per § 53-23.
3. Refer to Figure 28-10. Open right-side engine cowling door. Remove hardware securing G989-8 brackets to firewall. Cut and discard ty-raps as required.
4. Refer to Figure 28-9. Using backup wrench, disconnect D205-45 hose assembly from G989-6 fitting. Cap hose.
5. Remove G989-6 fitting from G987-1 valve assembly.
6. Remove G988-1 cap assembly. Open baggage compartment door. Remove hardware securing valve to aft cabin skin and firewall; remove valve. Install fuel cap and protect valve opening.
7. Remove residual B270-1 sealant from G239-1 panel and parts.

B. Installation

1. Refer to Figure 28-9. Open baggage compartment door and right-side engine cowling door. Remove G988-1 cap assembly and position G987-1 valve assembly between G239-1 panel and aft cabin skin. Install hardware securing valve to skin and firewall; verify security.
2. Lubricate new MS29512-16 packing with A257-6 grease and install on G989-6 fitting, as required, and install fitting thru panel in valve. Special torque fitting per § 20-33 but do not torque stripe.
3. Connect D205-45 hose assembly nut to fitting but do not tighten. Rotate assembled valves to minimize preload on G989-8 brackets and install hardware securing brackets to firewall. Verify security.
4. Using backup wrench, special torque hose nut per § 20-33 but do not torque stripe. Install ty-raps per Figure 28-10. Cinch ty-raps snug without over tightening and trim tips flush with heads
5. Seal all around cutout and fitting using B270-1 sealant; torque stripe fitting and hose nut per Figure 5-1.
6. Install tailcone cowling per § 53-23.

28-64 G990-4 (Proximity) Sensor Assembly**A. Schematic**

Refer to Figure 98-34 for pressure fueling system installation schematic.

B. Removal

1. Turn battery & avionics switches off and pull PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel.
2. Refer to Figure 28-9. Cut and discard ty-raps as required and disconnect G990-4 sensor assembly wire harness from airframe harness at connectors.
3. Loosen sensor assembly hex nut at G989-9 housing weldment and unscrew sensor from housing.

C. Installation

1. Turn battery & avionics switches off and pull PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel.
2. Refer to Figure 28-9. Screw G990-4 sensor assembly into G989-8 housing weldment to noted dimension (use care when measuring with calipers not to damage lens). Special torque sensor hex nut to 60 in.-lb.
3. Connect sensor assembly wire harness to airframe harness at connectors; verify security. Install MS3367-4-9 ty-rap to lock connector; install MS3367-5-9 ty-raps as required to secure wiring. Cinch ty-raps until snug without overtightening and trim tips flush with heads.

D. Operation Check

1. Connect external fueling equipment (dry-break coupler) to pressure fueling port. Push in PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel.
2. With appropriately rated person at controls, run-up helicopter to stabilized idle per R66 Pilot's Operating Handbook (POH) Section 4.
3. Turn on power at pressure fueling control panel. Lift collective stick slightly (valve open light will extinguish) and verify "fuel hose" audio alert sounds in headset for approximately 15 seconds and then ceases. Lower collective.
4. Turn off power at pressure fueling control panel. Shut down helicopter per R66 POH Section 4.
5. Disconnect external fueling equipment (dry-break coupler).

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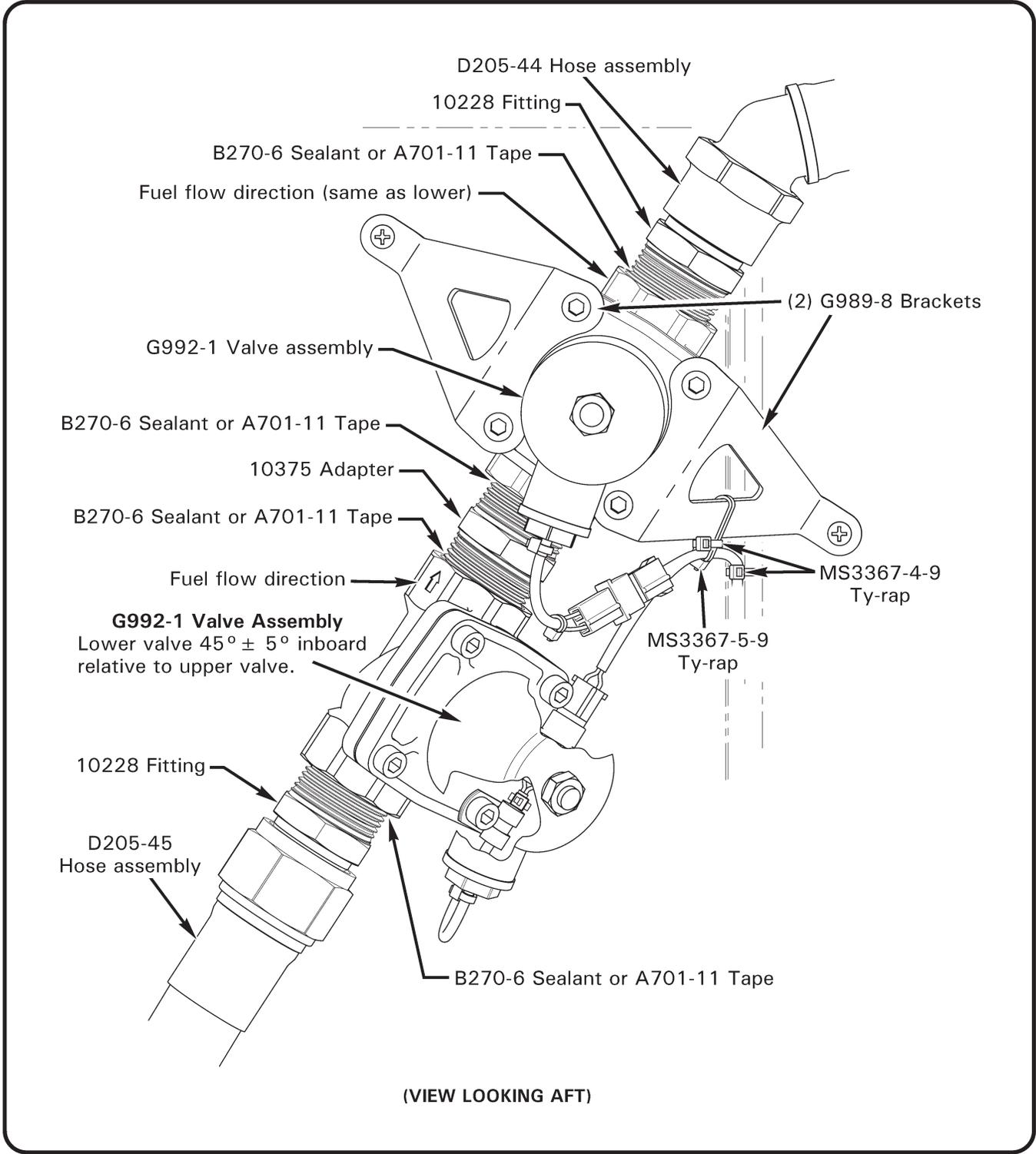


FIGURE 28-10 PRESSURE FUEL SYSTEM SHUT-OFF VALVE ASSEMBLIES

28-65 G992-1 Shut-off Valve Assemblies**A. Schematic**

Refer to Figure 98-34 for pressure fueling system installation schematic.

B. Removal

1. Remove residual fuel from system per § 28-66, as required.
2. Remove tailcone cowling per § 53-23.
3. Turn battery & avionics switches off and pull PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel.
4. Refer to Figure 28-10. Cut and discard ty-raps as required and disconnect G992-1 valve assembly wire harnesses from G991-1 harness assembly at connectors.
5. Using backup wrench, loosen D205-44 and D205-45 hose assembly nuts from 10228 fittings.
6. Remove hardware securing G989-8 brackets to firewall, and remove assembled G992-1 valve assemblies, brackets, fittings, and 10375 adapter. Cap or plug open fittings.
7. As required, remove brackets from upper valve assembly and reinstall screws in valve. As required, disassemble fittings and adapter from valve(s). Cap or plug open fittings.

28-65 G992-1 Shut-off Valve Assemblies (continued)**C. Installation**

1. Turn battery & avionics switches off and pull PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel.
2. Progressively remove caps and plugs; apply B270-6 sealant or A701-11 tape to 10375 adapter threads.
3. Refer to Figure 28-10. Assemble upper and lower G992-1 valve assemblies and 10375 adapter. Special torque valves and adapter to 500 in.-lb. Tighten valves to align lower valve to $45^\circ \pm 5^\circ$ inboard relative to upper valve and torque stripe per Figure 5-1.
4. Apply B270-6 sealant or A701-11 tape to 10228 fittings (valve side threads only).
5. Install 10228 fittings using backup wrench, special torque fittings per § 20-33 and torque stripe per Figure 5-1.
6. If removed, install screws securing G989-8 brackets to upper valve; special torque screws per § 20-33 and torque stripe per Figure 5-1.
7. Position assembled valves in helicopter and connect D205-44 & D205-45 hose assembly nuts to fittings; do not tighten nuts.
8. Rotate assembled valves to minimize preload on brackets and install hardware securing brackets to firewall. Verify security.
9. Using backup wrench, special torque hose nuts per § 20-33 and torque stripe per Figure 5-1.
10. Connect valve assemblies to G991-1 wire harness at connectors; verify security. Install MS3367-4-9 or MS3367-5-9 ty-raps per figure to secure wiring; cinch ty-raps until snug without overtightening and trim tips flush with heads.
11. Install tailcone cowling per § 53-23.

D. Operation Check

1. Push in PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel. Turn battery switch on. Turn on power at the pressure fueling panel; verify "VALVE OPEN" light is illuminated.
2. Via the right side access door, hold lower G992-1 valve assembly. Verify a valve actuates while a second person presses "PRESSURE CIRCUIT TEST" button 1; verify a valve actuates while a second person presses "PRESSURE CIRCUIT TEST" button 2.
3. Turn off power at pressure fueling control panel. Turn battery switch off.

28-66 Residual Fuel Removal**WARNING**

Review appropriate Safety Data Sheet (SDS) when working in proximity to hazardous materials. Specific recommendations for use of personal protective equipment are located in the SDS.

Remove residual fuel in pressure fueling system per the following:

1. Push in PRESS. FUELING circuit breaker (5 amp) at circuit breaker panel. Turn battery switch on.
2. Turn on power and set quantity to FULL at pressure fueling control panel. With collective stick lowered, verify VALVE OPEN light is illuminated.
3. Remove G988-1 cap assembly.
4. Using a suitable, grounded drain container and protective gloves, depress retainers at G987-1 fueling port valve assembly and drain fuel.
5. Release retainers and reinstall cap as required.

28-67 Maintenance**A. Scheduled Inspections**

Every 100-hour or annual inspection:

1. Visually inspect condition of associated equipment. Verify proper installation and security of equipment. Verify no fuel leaks.
2. Visually inspect wiring condition. Verify no loose, chafed, or broken wires or terminals. Verify neatness, proper routing and installation, and security.

B. Special InspectionsHard Landing:

1. Perform hard landing inspection per § 5-65, as required.
2. Perform scheduled inspections check per Part A.
3. Examine integrity of installed equipment's surrounding structures.
4. Refer to § 53-11 for cabin repairs.

Lightning strike:

1. Perform lightning strike inspection per § 5-72, as required.
2. Perform scheduled inspection checks per Part A.
3. Visually inspect wiring, connectors, and installed equipment for obvious damage such as electrical arcing or burns. If obvious damage is detected, additional components may require replacement. Contact RHC Technical Support with detailed documentation for further guidance prior to approving aircraft for return to service.