

## CHAPTER 28 — FUEL SYSTEM

### CONTENTS — MAINTENANCE PROCEDURES

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## FUEL SYSTEM

### 28-1. FUEL SYSTEM (Helicopter S/N 4 through 3566).

The fuel system (figure 28-1) incorporates a single bladder type fuel cell located below and aft of the passenger seat (figure 28-1). Installed within the fuel cell are two electrically operated boost pumps, lower and upper tank indicating unit and sump drain valve. Boost pumps are interconnected and supply fuel through a single hose assembly to the fuel shutoff valve and from the shutoff valve to the engine mounted fuel filter and pump. Boost pumps incorporate pressure switches in discharge ports and drain plugs in the pump drain port. The fuel cell is filled from the right side and has a capacity of 76 U.S. gallons (287.66 liters usable).

Access to boost pumps, lower tank unit and drain valve is from the bottom of fuselage and access to upper indicating unit is gained from a cover plate located on deck aft of passenger seatback. Access to fuel shutoff valve and vent line is in the fuel compartment located on the right side of access panel above filler cap. Provisions are also made in fuel compartment for combustion heater fuel, fuel pressure instrument line, and fuel pump purge line.

### 28-2. FUEL SYSTEM (Helicopters S/N 3567 and subsequent).

The fuel system (figure 28-2) incorporates a single crash resistant bladder type fuel cell located below and aft of the passenger seat. Installed within the fuel cell are two electrically operated boost pumps, lower and upper tank indicating unit and electrically operated sump drain valve. Boost pumps are interconnected and supply fuel through a single hose assembly to the fuel shutoff valve, and from shutoff valve to the airframe mounted fuel filter. Boost pumps incorporate pressure switches in discharge ports and drain plugs in pump drain ports. The fuel cell is filled from the right side and has a capacity of 91 U.S. gallons (344.44 liters usable).

Access to boost pumps, lower tank unit and solenoid drain valve is from the bottom of fuselage and access to upper indicating unit is gained from a coverplate located on deck aft of passenger seatback. Access to fuel shutoff valve and vent is in fuel compartment located on the right side above filler cap. Provisions are made in the fuel compartment for a fuel purging line to be installed at tank vent fitting for maintenance purposes.

### 28-3. SAFETY PRECAUTIONS.

1. All fueling and defueling operations should be performed in an area where fire hazards are reduced to a minimum.
2. Handle fuel cells with extreme care during removal and installation to prevent damage to cells. Do not attempt to remove or install a cold fuel cell.
3. Helicopter must be grounded prior to performing defueling operations.

### 28-4. TROUBLESHOOTING.

Refer to Chapter 96 for fuel quantity calibration, fuel filter and fuel pump electrical circuitry. Refer to figure 28-3 for fuel system schematics. Refer to table 28-1 for troubleshooting.

### 28-5. OPERATIONAL CHECK.

Refer to Chapter 96 for fuel filter, fuel flow switch, low fuel pump caution systems operational checks.

### 28-6. TESTING.

1. With throttle off and shutoff valve on, connect air source to vent line.



DO NOT APPLY MORE THAN RECOMMENDED PRESSURE AS DAMAGE TO FUEL SYSTEM AND STRUCTURE MAY RESULT. USE MILD SOAP SOLUTION TO LOCATE LEAKS.

#### NOTE

Use regulated low pressure from filtered, compressed air source with accurate pressure gage, and a shutoff valve.

2. Slowly apply pressure until gage indicates 0.75 to 1.00 psig (5.17 to 6.89 kPa). Shut off air source. The fuel system should hold this pressure for 15 minutes.
3. Alternate Method: Using a water manometer, test to a reading of 20.76 to 27.68 inches (527.30 to 703.07 mm) of water. The fuel system shall hold this reading for 15 minutes.
4. Locate and correct any leakage indicated. Repeat pressure test if leaks are found.
5. Remove test equipment from vent line.

Table 28-1. Troubleshooting Fuel System

INDICATION OF TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Engine fails to light off	Insufficient fuel in cell	Fill cell with correct fuel.
	Insufficient or no fuel pressure to engine pump	Turn on boost pumps and fuel shutoff valve.
	Boost pump inoperative	Check pump per <a href="#">Chapter 96</a> . Replace pump if required.
	Fuel contaminated	Refer to applicable Rolls-Royce Operation and Maintenance Manual.
Fuel quantity system not indicating or has incorrect reading	Defective shutoff valve, or valve fails to operate when selected	Replace valve. Refer to <a href="#">Chapter 96</a> .
	Defective boost pump, tank indicating units, or electrical malfunction	Refer to <a href="#">Chapter 96</a> .
	Fuel quantity/pressure circuit breaker	Check and replace breaker.
	Loose circuit connections	Tighten connections.
	Defective indicator	Replace indicator.
	Improper resistance setting on R5 or R6	Check resistance and calibrate system.
	Defective tank unit system	Replace tank unit and recalibrate system.
No pressure, fuel pressure gauge fluctuates or has erratic readings	Air trapped in fuel boost pump	Bleed boost pumps. Refer to <a href="#">paragraph 28-20, step 13</a> .
	Transducer failure	Replace transducer.
Fuel pump caution light on	Defective boost pump, cartridge, or fuel pressure switch. Defective boost pump check valves.	Replace pump, cartridge, or switch ( <a href="#">Chapter 96</a> ). Replace check valves.
Fuel filter caution light on	Clogged filter	See note <a href="#">1</a> .
Boost fuel pumps fail to operate when breaker is closed or circuit breaker trips	Electrical malfunction	Refer to <a href="#">Chapter 96</a> .

**NOTES** [1](#):

- Inspect fuel cell for contamination. Clean cell as required to remove all contaminants. Drain sump until all water is removed. Remove the line at the filter inlet and direct it into a bucket. Using the boost pumps, pump two gallons of fuel through the lines to purge out any additional water. Reconnect the line to the filter.
- Install a new airframe filter element.
- Refer to applicable Rolls-Royce Operation and Maintenance Manual for further action.

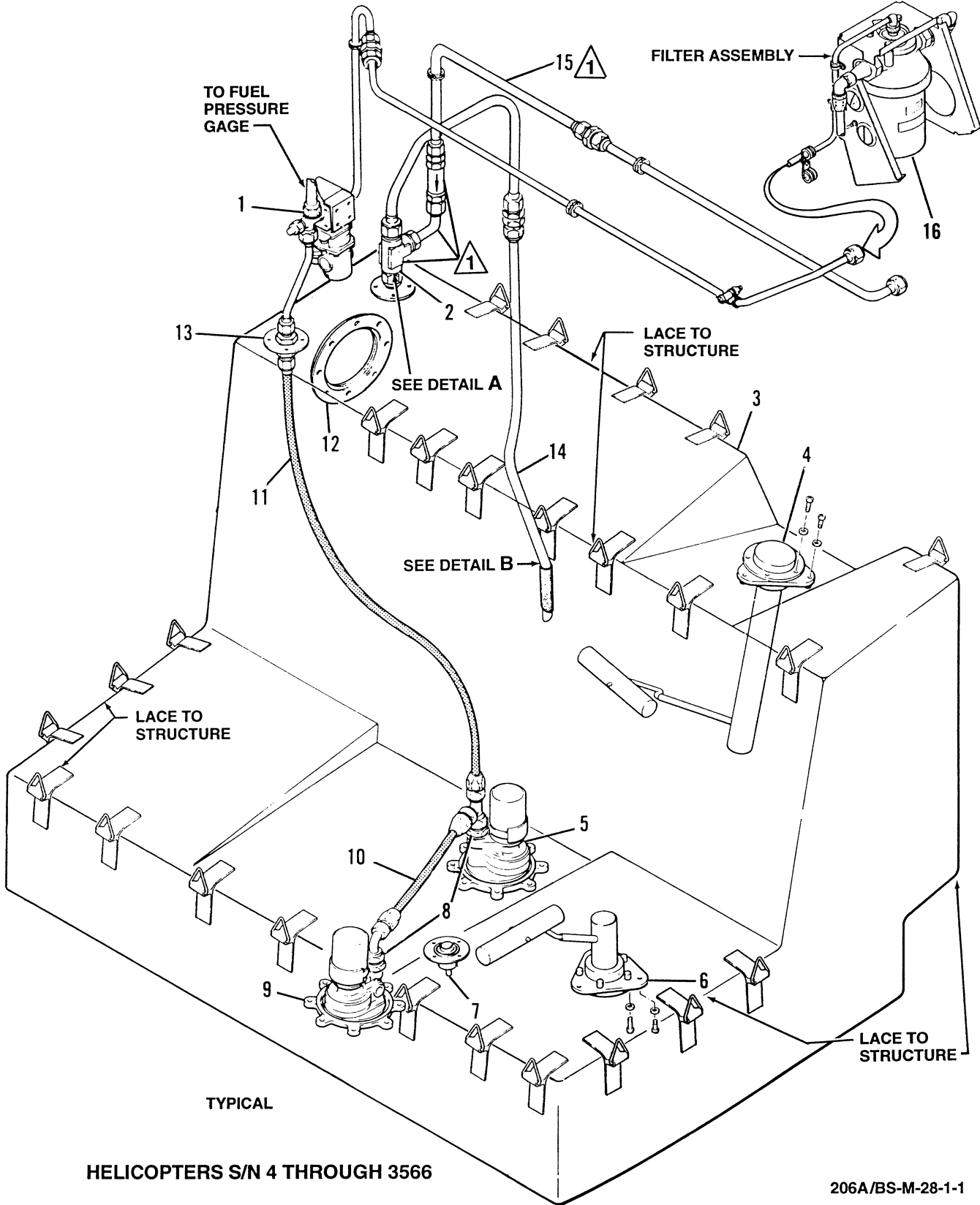
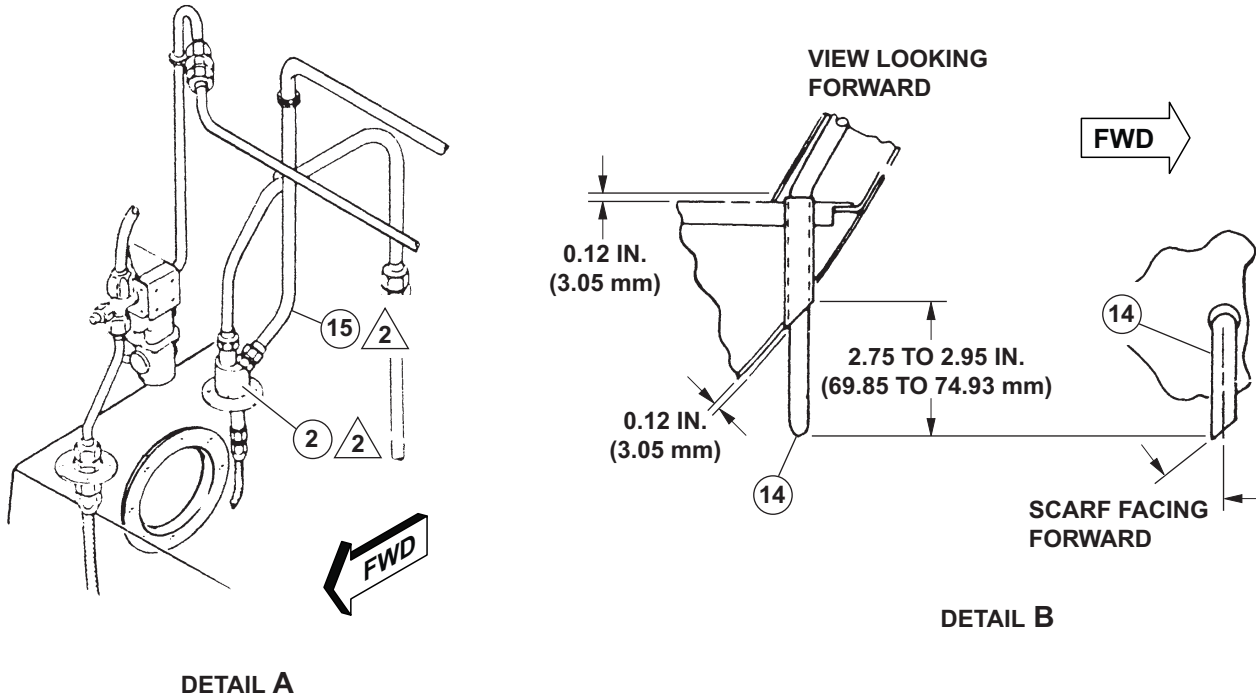


Figure 28-1. Fuel system (Sheet 1 of 2)



- |                        |                              |
|------------------------|------------------------------|
| 1. Fuel shutoff valve  | 9. Forward fuel boost pump   |
| 2. Tee                 | 10. Hose                     |
| 3. Fuel cell           | 11. Hose                     |
| 4. Upper tank unit     | 12. Cap and adapter assembly |
| 5. Aft fuel boost pump | 13. Fitting                  |
| 6. Lower tank unit     | 14. Tube                     |
| 7. Drain valve         | 15. Vent tube                |
| 8. Check valve         | 16. Filter                   |

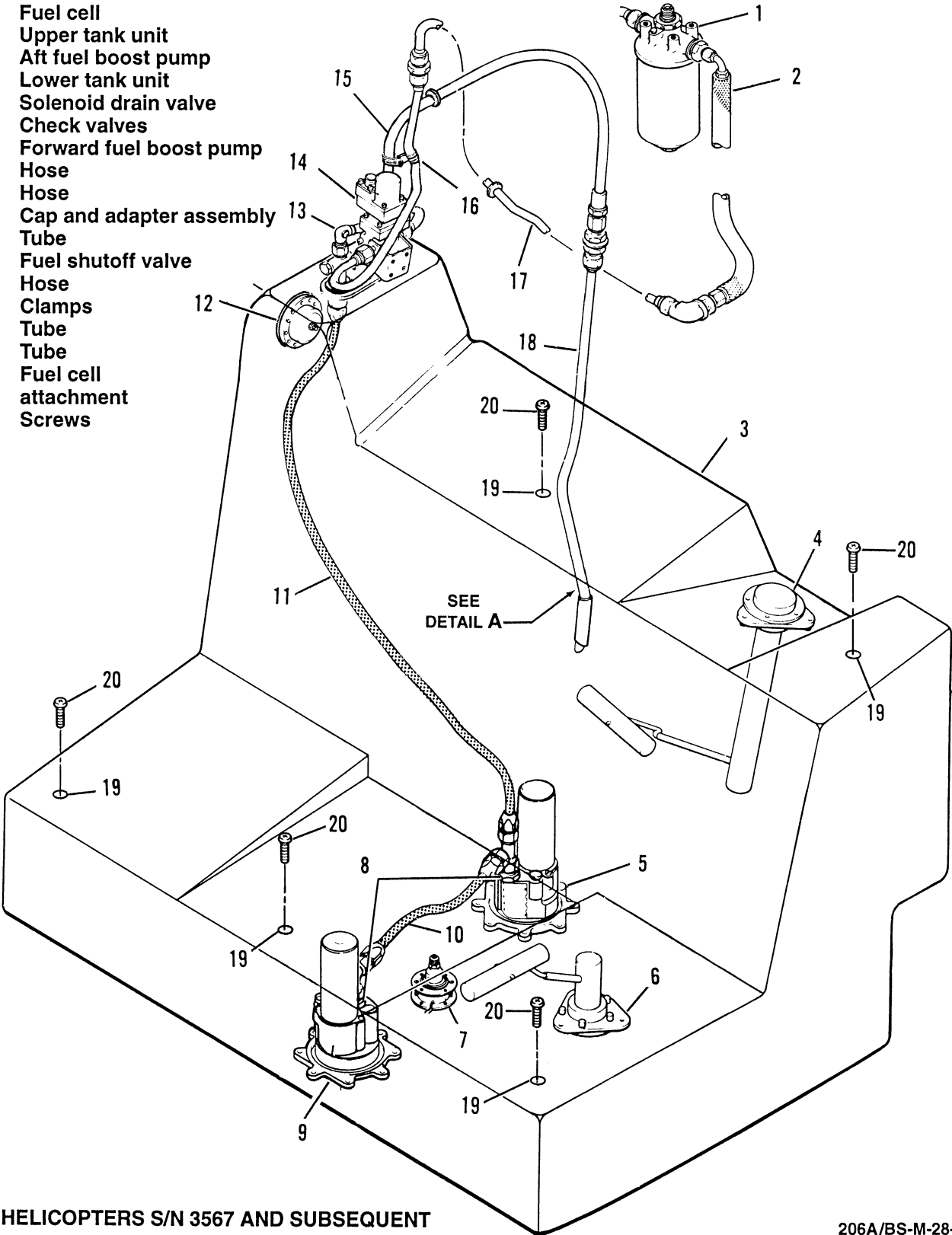
**NOTES**

- △ 1 Helicopters S/N 004 through 2123 must upgrade fuel purge system per SL206A-100, in accordance with [ASB 206-05-103](#).
- △ 2 Helicopters S/N 004 through 3566.

206AB\_MM\_28\_0001b

Figure 28-1. Fuel System (Sheet 2 of 2)

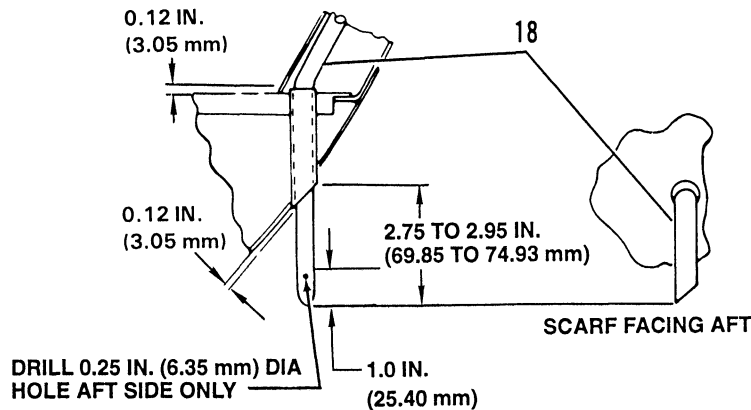
- 1. Airframe fuel filter
- 2. Hose
- 3. Fuel cell
- 4. Upper tank unit
- 5. Aft fuel boost pump
- 6. Lower tank unit
- 7. Solenoid drain valve
- 8. Check valves
- 9. Forward fuel boost pump
- 10. Hose
- 11. Hose
- 12. Cap and adapter assembly
- 13. Tube
- 14. Fuel shutoff valve
- 15. Hose
- 16. Clamps
- 17. Tube
- 18. Tube
- 19. Fuel cell attachment
- 20. Screws



HELICOPTERS S/N 3567 AND SUBSEQUENT

206A/BS-M-28-2-1

Figure 28-2. Fuel system (Sheet 1 of 2)



DETAIL A

HELICOPTERS S/N 3567 AND SUBSEQUENT

206A/BS-M-28-2-2

Figure 28-2. Fuel system (Sheet 2)

**28-7. FUEL CELL (Helicopters S/N 4 through 3566).**

Fuel cell is a bladder type unit installed in the fuselage cavity below and aft of passenger seat and laced to helicopter structure.

**28-8. FUEL CELL (Helicopters S/N 3567 and subsequent).**

Fuel cell is a crash resistant bladder type fuel cell located below and aft of passenger seat structure. The fuel cell is held to structure by screws.

**28-9. REMOVAL (Helicopters S/N 4 through 3566).**

**WARNING**

ALL DEFUELING OPERATIONS SHALL BE PERFORMED IN AN AREA WHERE

FIRE HAZARDS ARE REDUCED TO A MINIMUM.

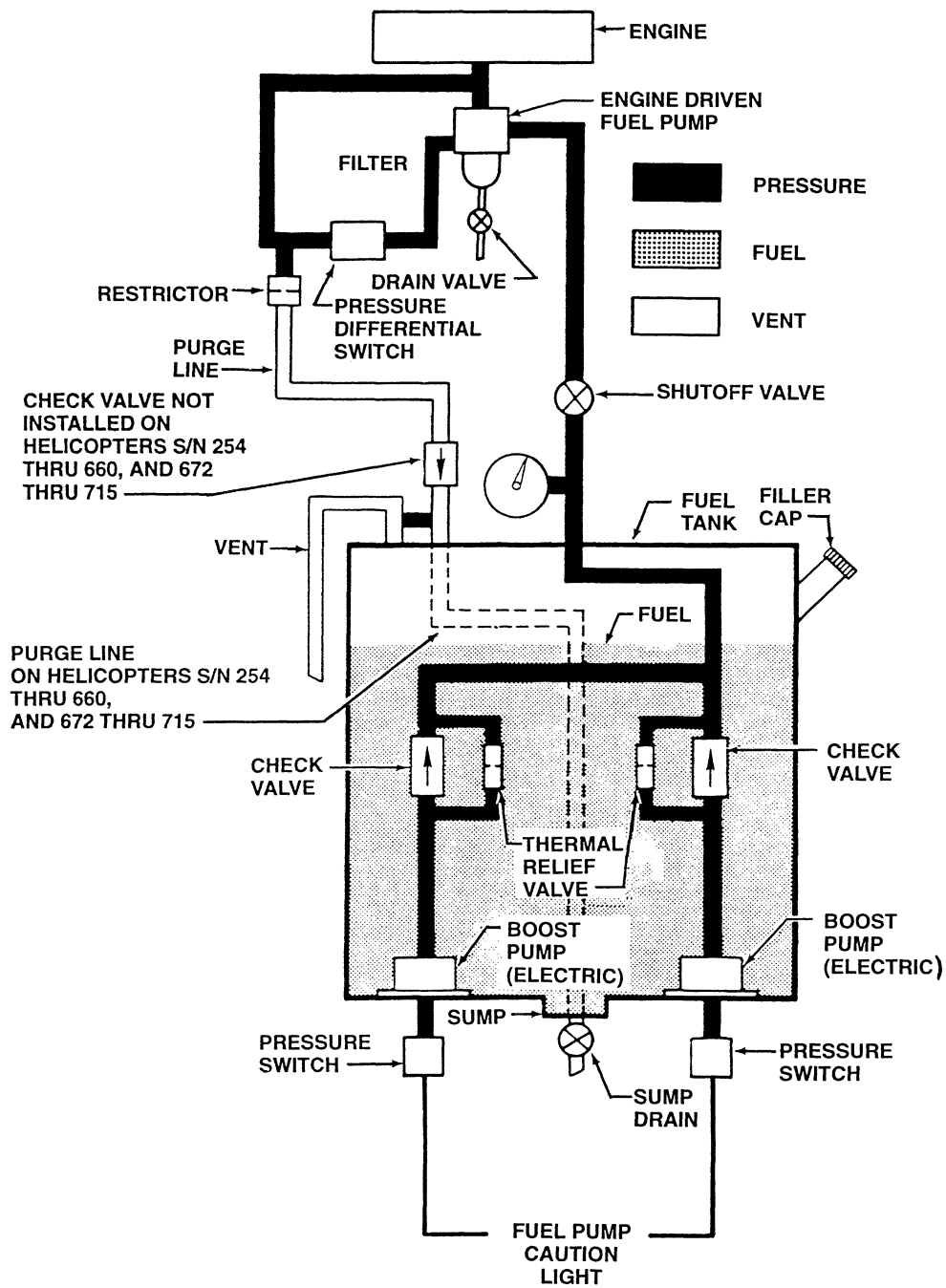
**CAUTION**

HANDLE FUEL CELL WITH EXTREME CARE DURING REMOVAL TO AVOID DAMAGE TO FUEL CELL. PROTECT ALL OPENINGS TO PREVENT FOREIGN MATERIAL FROM ENTERING. ENSURE FUEL CELL IS WARM ENOUGH TO BE FLEXIBLE.

IF FUEL CELL IS PURGED FOR ANY REASON, AVOID BUILD UP OF PRESSURE IN FUEL CELL. THERE SHALL BE NO MEASURABLE BUILDUP OF PRESSURE IN FUEL CELL DURING PURGING OPERATION.

1. Ground helicopter. Disconnect battery and external power supply.

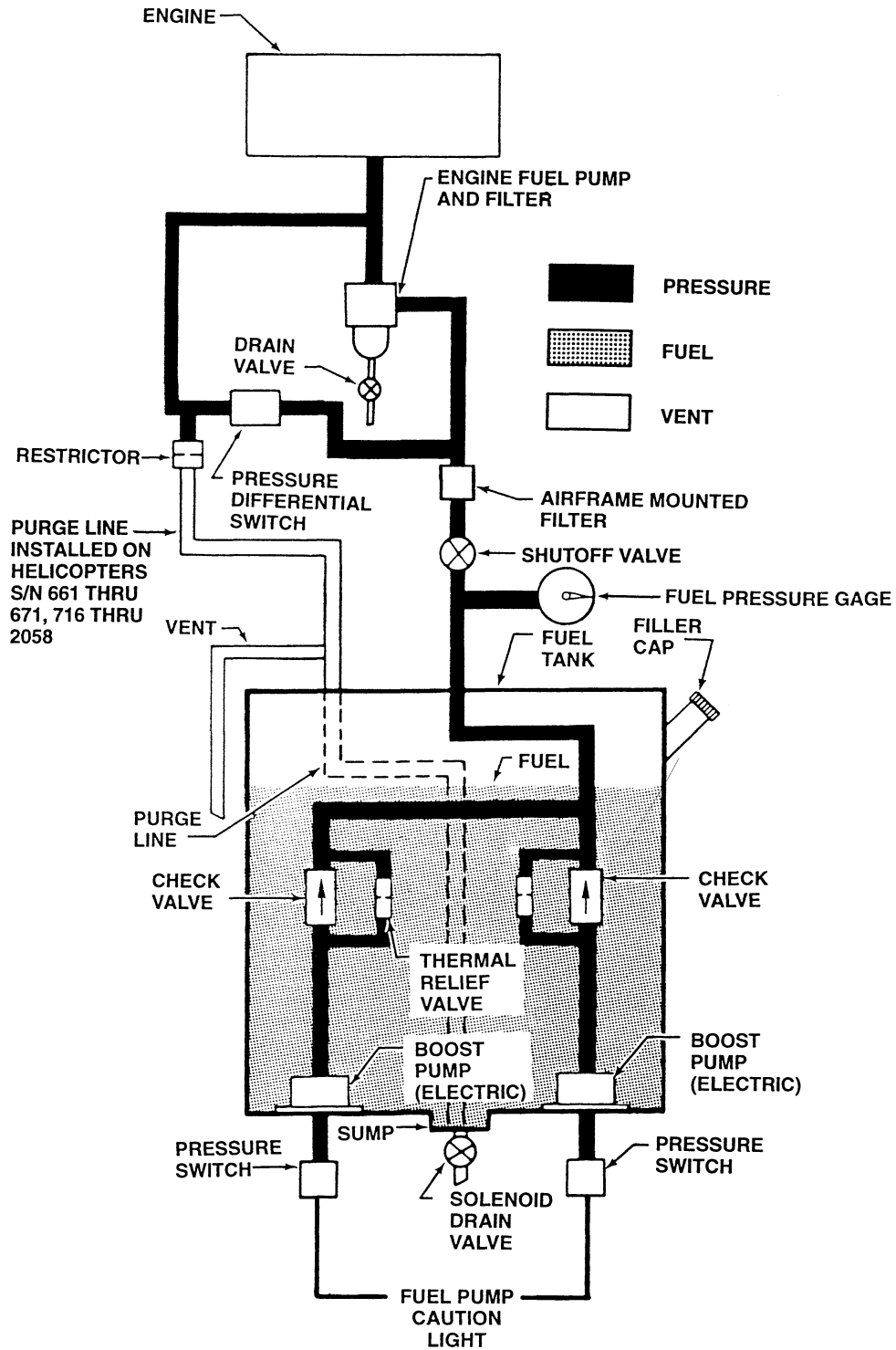




HELICOPTERS S/N 4 THROUGH 660, AND 672 THROUGH 715

206A/BS-M-28-3-1

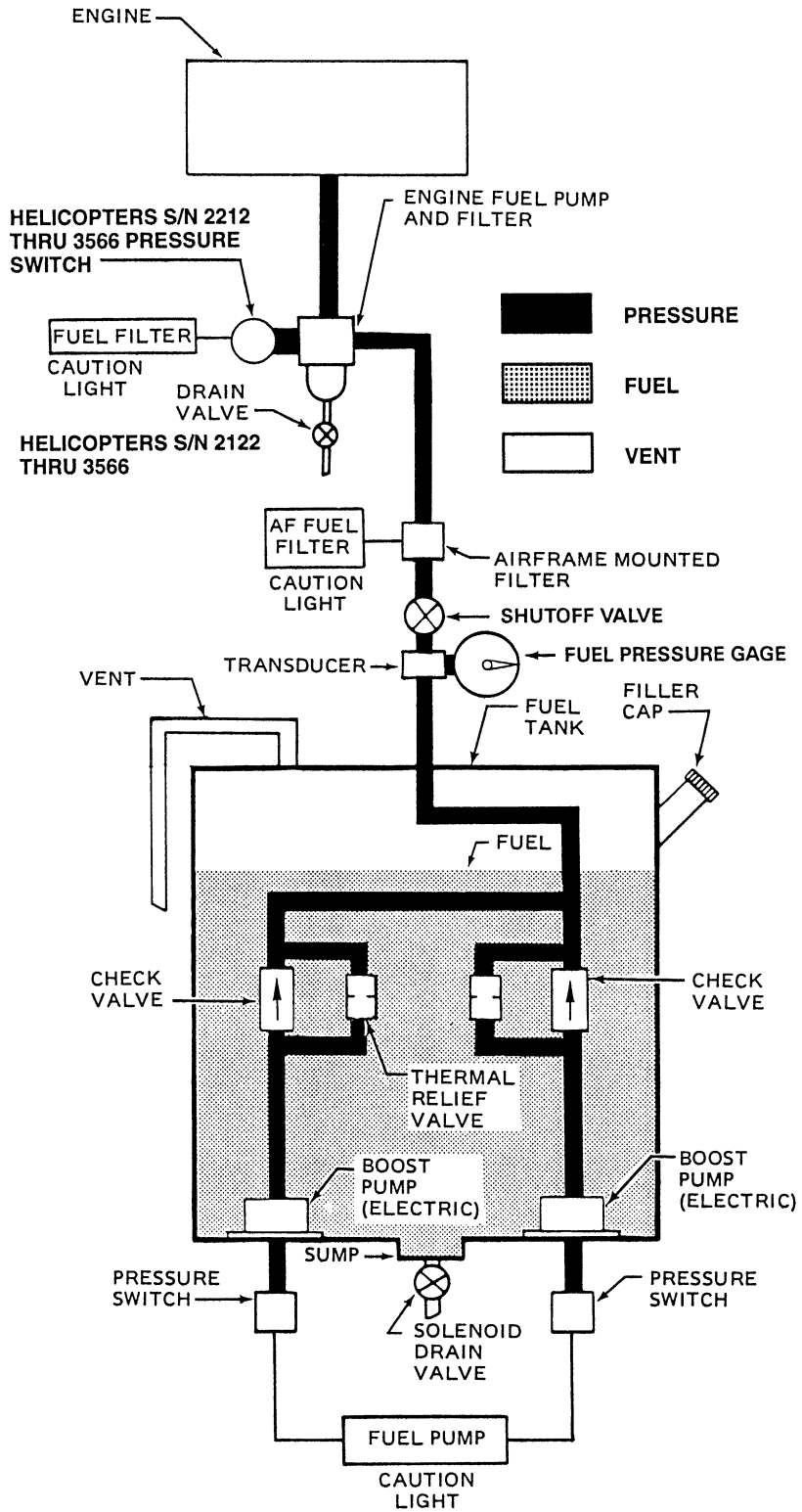
Figure 28-3. Fuel system schematic (Sheet 1 of 3)



HELICOPTERS S/N 661 THROUGH 671, AND 676 THROUGH 2211

206A/BS-M-28-3-2

Figure 28-3. Fuel system schematic (Sheet 2)



HELICOPTERS S/N 2212 AND SUBSEQUENT

206A/BS-M-28-3-3

Figure 28-3. Fuel system schematic (Sheet 3)

2. Defuel and purge fuel system (Chapter 12).
3. Remove seat cushions and seat backs (Chapter 25).
4. Remove panel from fuel compartment located on right side above cap and adapter assembly (12, figure 28-1).
5. Remove cap and adapter assembly (12) (paragraph 28-47).
6. Disconnect electrical connections from upper and lower tank units (4 and 6) and forward and aft fuel boost pumps (5 and 9).
7. Disconnect hose (10) from two check valves (8). Remove hose through pump mount opening.
8. Remove hose (11) from fitting (13). Remove hose from fuel cell (3).
9. Remove aft fuel boost pump (5) (paragraph 28-18).
10. Remove lower tank unit (6) (paragraph 28-38).
11. Remove forward fuel boost pump (9) (paragraph 28-18).
12. Remove drain valve (7) (paragraph 28-41).
13. Remove upper tank unit (4) (paragraph 28-38).
14. Remove fuel shutoff valve (1) (paragraph 28-26, 28-28, or 28-30 as applicable).
15. Remove tubes (14 and 15).
16. Remove tee (2).
17. Collapse fuel cell (3) and remove nylon cords attaching fuel cell to structure. Remove fuel cell through seat opening.

**28-10. REMOVAL (Helicopters S/N 3567 and subsequent).**

**WARNING**

ALL DEFUELING OPERATIONS SHALL BE PERFORMED IN AN AREA WHERE FIRE HAZARDS ARE REDUCED TO A MINIMUM.



HANDLE FUEL CELL WITH EXTREME CARE DURING REMOVAL TO AVOID DAMAGE TO FUEL CELL. PROTECT ALL OPENINGS TO PREVENT ENTRY OF FOREIGN MATERIAL. ENSURE FUEL CELL IS WARM ENOUGH TO BE FLEXIBLE.

IF FUEL CELL IS PURGED FOR ANY REASON, AVOID BUILDUP OF PRESSURE IN FUEL CELL. THERE SHALL BE NO MEASURABLE BUILD UP OF PRESSURE IN FUEL CELL DURING PURGING OPERATION.

1. Disconnect battery and external power supply. Ground helicopter.
2. Defuel and purge fuel system (Chapter 12).
3. Remove seat cushions and seat backs (Chapter 25).
4. Remove access panel from fuel compartment located on right side above cap and adapter assembly (12, figure 28-2).
5. Remove cap and adapter assembly (12) (paragraph 28-47).
6. Remove airframe fuel filter (1) (paragraph 28-54).
7. Remove hose (2).
8. Disconnect electrical connections from upper and lower tank units (4 and 6), aft and forward fuel boost pumps (5 and 9), and solenoid drain valve (7).
9. Remove upper tank unit (4) (paragraph 28-38).
10. Remove lower tank unit (6) (paragraph 28-38).
11. Remove solenoid valve (7) (paragraph 28-44).
12. Remove hose (11) from fuel shutoff valve (14) and check valve (8).
13. Remove clamps (16), hose (15) and tubes (17 and 18).
14. Remove fuel shutoff valve (14) (paragraph 28-26, 28-28, or 28-30 as applicable).
15. Remove hose (10) from two check valves (8).
16. Remove forward fuel boost pump (9) (paragraph 28-18).

**17.** Remove aft fuel boost pump (5) (paragraph 28-18).

**18.** Remove five fuel cell attachment screws (20) attaching fuel cell (3) to structure. Collapse fuel cell and remove through seat opening.

**28-11. INSPECTION AND REPAIR.**

**1.** Field repairs are permitted on fuel cell in all areas except any radius, any fitting area, or to any cut or tear longer than 1 inch (25.40 mm). Cells with damage beyond these limits should be returned to the fuel cell manufacturer for repair at one of the addresses listed in the following paragraphs.

**2.** Inspect fuel cell to determine manufacturer (marked on the fuel cell). Repair kits, complete with all materials and instructions for making field repairs, are available from the respective cell manufacturers.

**a.** Order RK-30S repair kit, from Uniroyal Inc., 312 N. Hill Street, Mishawaka, Indiana, 46544.

**b.** Order SK-2180-2, repair kit, from Firestone Coated Fabrics Co., Division of Firestone Tire and Rubber Company, 1200 Firestone Parkway, Akron, Ohio, 44317.

**c.** Order repair kit, number 2F1-3-42165, (Manual AP 30), from Engineered Fabrics Corporation, Rockmart, Georgia 30153.

**3.** Inspect fuel cell immediately prior to installation for damage which may have occurred during crating or removal from shipping container.

**4.** Inspect fuel cell for leaks after installation. Refer to paragraph 28-13, step 16.

**5.** Store fuel cells in original shipping containers at room temperature. Do not store fuel cells where they will be subjected to heat or extremes of humidity.

**6.** Handle fuel cells carefully to avoid damage. Observe the following precautions:

**a.** Leave fuel cells in original shipping containers until ready to install in helicopter.

**b.** Do not drag cells or pick up by fittings. Transport cells on carts. If a cell must be transported outside installation area, place it in original shipping containers.

**c.** Do not handle cell with sharp pointed tools.

**d.** Do not place cells on any surface with sharp projections which could damage cell.

**e.** Do not stack cells except in original shipping containers.

**f.** Do not handle cells when they are too cold to be flexible.

**g.** Do not allow cells to remain in strong light any longer than absolutely necessary. Do not allow light bulbs to contact cell. Fluorescent inspection lights are recommended for use in fuel cells.

**28-12. CLEANING.**

Bladder fuel cell may have accumulated heavy fungus growth due to contaminated fuel and may require the following recommended procedures.

**NOTE**

Bladder fuel cell construction used in the 206B helicopter has buna coated fabric inner plies. The buna rubber may be attacked to some degree by micro-organism action. Degree of attack is very minor.

**1.** Remove fuel cell. Refer to paragraphs 28-9 or 28-10.

**2.** Presence of fungus in fuel cell is usually caused by improper servicing and storage of jet fuels. To help alleviate problem of fungus in cells, suitable filters and water traps should be used in fuel storage tank complex and servicing equipment.

**NOTE**

A fuel additive meeting the requirement of specification MIL-I-27686 and approved by the FAA as PFA-55MB is recommended to be added routinely to the helicopter fuel cell while refueling. This is same as anti-icing additive recommended in applicable JetRanger Flight Manual. (Phillips product distributed as 'Prist' meets this requirement.) Usually one treatment of PFA-55MB is adequate to kill bacteria and inhibit regrowth in fuel cell for some time.

**3.** If evidence of fungus is present in fuel cell, contamination is usually present in fuel filter and the housing should be thoroughly cleaned, and the filter element replaced.

4. Remove all fungus growth from fuel cell by hand or with a soft scrub brush using warm or hot water.



IF HOT WATER IS USED TO CLEAN FUEL CELL, IT IS RECOMMENDED THAT TEMPERATURE OF HOT WATER BE LIMITED TO 160°F (71°C). HOTTER WATER CONSTITUTES A HAZARD TO PERSONNEL.

DO NOT USE SOAPS OR STRONG DETERGENTS WHEN CLEANING FUEL CELL. CERTAIN POWERFUL DETERGENTS ARE DETRIMENTAL TO THE BUNA TYPE RUBBER AND SOAPS CAN REACT WITH FUEL TO FORM A COMPOUND WHICH TENDS TO PLUG FUEL FILTERS.

5. When fungus is observed in fuel cell area, wipe the cell clean with cloths moistened with methyl alcohol (C-302). Burn wiping cloths after cleaning to destroy fungus.



UNDER NO CIRCUMSTANCES SHALL METHYL-ETHYL-KETONE (C-309) OR SIMILAR SOLVENTS BE USED FOR CLEANING FUEL CELL.

6. Turbine fuels (C-003) may be used to advantage for cleaning fuel cells. Turbine fuels are oily and assist in protecting cell inner liner against aging if cell remains out of service for several weeks without fuel.

**28-13. INSTALLATION (Helicopters S/N 4 through 3566.)**



INSPECT FUEL CELL CAVITY FOR FOREIGN OBJECTS BEFORE INSTALLATION OF FUEL CELL. EXERCISE EXTREME CAUTION TO PRECLUDE DROPPING OF TOOLS, HARDWARE, ETC. IN FUEL CELL CAVITY. ENSURE THAT ALL SHARP EDGES, CORNERS AND RIVET HEADS ARE PROTECTED WITH VINYL

TAPE (C-456). ENSURE THAT FUEL CELL IS WARM ENOUGH TO BE FLEXIBLE.



DO NOT FOLD A COLD FUEL CELL. FOLDING MAY CRACK OR DAMAGE A COLD FUEL CELL. HEAT LAMPS MAY BE USED TO WARM FUEL CELL PRIOR TO FOLDING. HEAT FOR APPROXIMATELY 2 HOURS, DO NOT EXCEED 125°F (52°C).

**NOTE**

Either 206-061-675-001 or 206-061-675-003 fuel cell may be used.

1. Warm fuel cell (3, figure 28-1) as required. Apply talcum powder to fuel cell cavities.
2. Insert collapsed fuel cell (3) through seatback opening and position forward section of fuel cell under seat.
3. Lace bottom aft side of fuel cell (3) to fuselage structure using nylon cord. Tie nylon cord to right aft lower structure fitting and lace through seven delta hangers and fittings. Secure end of nylon cord on left side.
4. Lace top aft side of fuel cell (3) to fuselage structure using nylon cord. Tie nylon cord to right top structure fitting and lace through seven delta hangers and fittings.
5. Lace top forward side of fuel cell (3) to fuselage structure using nylon cord. Tie nylon cord to right forward structure fitting and lace through eight delta hangers and fittings. Loosely tie off nylon cord at last structure fitting. Allow sufficient slack to provide hand room for installation of fittings on top of fuel cell.
6. Lace right and left forward sides of fuel cell (3) to fuselage structure using nylon cord. Tie nylon cord to fittings and lace through three delta hangers and fittings.
7. Lace bottom forward side of fuel cell (3) to fuselage structure using nylon cord. Tie nylon cord to structure fitting and lace through seven delta hangers and fittings.
8. Install fitting (2) with tubes (14 and 15).
9. Install fuel shutoff valve (1) (paragraph 28-27, 28-29, or 28-32) as applicable.
10. Install upper tank unit (4) (paragraph 28-39).

11. Install drain valve (7) (paragraph 28-42).
12. Install forward fuel boost pump (9) (paragraph 28-20).
13. Install lower tank unit (6) (paragraph 28-39).
14. Install aft fuel boost pump (5) (paragraph 28-20).
15. Install hose (10) to two check valves (8).
16. Connect electrical connections to forward and aft fuel boost pumps (9 and 5), and upper and lower tank units (4 and 6).
17. Inspect fuel cell (3) installation for security.
18. Perform leak test on fuel cell (3) as follows:
  - a. Disconnect fuel vent tubes (14 and 15) from tee (2). Connect air source to tee. On helicopter S/N 154 and subsequent disconnect line (15), install cap on tee (side port) and connect air source to top of tee.



DO NOT APPLY MORE THAN RECOMMENDED PRESSURE. DAMAGE TO FUEL CELL AND STRUCTURE MAY RESULT. USE A MILD SOAP SUDS SOLUTION TO LOCATE LEAKS.

#### NOTE

Use regulated low pressure, filtered, compressed air source, an accurate pressure gage, and a shutoff valve.

- b. Apply pressure until gage indicates 1.0 psi (6.895 kPa). Shut off air source. Fuel cell should hold this pressure for 15 minutes.
  - c. Alternate Method: Using a water manometer, test to a reading of 22.76 to 27.68 inches (527.30 to 703.07 mm) of water. The fuel system shall hold this reading for 15 minutes.
  - c. Locate and correct any leakage indicated. Repeat test if leaks are found.
  - d. Remove test equipment. On helicopters S/N 154 and subsequent, remove cap from tee (2) and connect tubes 14 and 15.
19. Install fuel cell (3) access panel on seat support.

20. Install coverplate on aft deck above passenger seatback.
21. Install seat cushions.
22. Connect battery.

#### 28-14. INSTALLATION (Helicopters S/N 3567 and subsequent).



INSPECT FUEL CELL CAVITY FOR FOREIGN OBJECTS BEFORE INSTALLATION. EXERCISE EXTREME CAUTION TO PRECLUDE DROPPING OF TOOLS, HARDWARE, OR OTHER FOREIGN MATERIAL INTO FUEL CELL CAVITY OR FUEL CELL.

DO NOT FOLD A COLD FUEL CELL. FOLDING MAY CRACK OR DAMAGE A COLD FUEL CELL. HEAT LAMPS MAY BE USED TO WARM FUEL CELL PRIOR TO FOLDING, HEAT FOR APPROXIMATELY 2 HOURS. DO NOT EXCEED 125°F (52°C).

1. Apply talcum powder into fuel cell (3, figure 28-1) cavities and insert collapsed fuel cell through seatback opening. Work fuel cell in place and install five fuel cell attachment screws (20, figure 28-2).
2. Install screws securing cap and adapter assembly (12) to fuel cell (3) (paragraph 28-48).
3. Install forward fuel boost pump (9) (paragraph 28-20).
4. Install aft fuel boost pump (5) (paragraph 28-20).
5. Install solenoid drain valve (7) (paragraph 28-45).
6. Install hose (10) to two check valves (8).
7. Install fuel shutoff valve (1) (paragraph 28-27, 28-29, or 28-32 as applicable).
8. Install tubes (17 and 18), hose (15), and clamps (16).
9. Install lower tank unit (6) (paragraph 28-39).
10. Install upper tank unit (4) (paragraph 28-39).
11. Connect electrical connections to solenoid drain valve (7), forward and aft fuel boost pumps (9 and 5), and upper and lower tank units (4 and 6).

**BHT-206A/B-SERIES-MM-4**

- 12.** Install airframe mounted fuel filter (1) with hose (2) (paragraph 28-6).
- 13.** Inspect fuel cell (3) installation for security.
- 14.** Perform leak test on fuel cell (3).
- 15.** Install fuel cell access panel on seat support.
- 16.** Install coverplate on aft deck above passenger seat back.
- 17.** Install seat cushions.
- 18.** Connect battery.



## FUEL DISTRIBUTION

### 28-15. FUEL DISTRIBUTION.

Fuel distribution consists of all fuel cell mounted components which transfer fuel, and monitor fuel quantity, fuel flow, or fuel pressure.

### 28-16. FUEL PUMP AND FILTER ASSEMBLY.

The engine fuel pump and filter assembly are integral units mounted on the aft end of engine. Fuel enters engine fuel system at inlet port of the pump and passes through filter before entering gear elements of pump. Filter draining is accomplished by a drain valve mounted on filter housing. Fuel filter is monitored by a pressure differential switch located on lower firewall and connected electrically to fuel filter caution light. Refer to Allison Engine Company Operation and Maintenance Manual (5W2 for C-18 engine or 10W2 for C-20 engine) for detailed maintenance instructions.

### 28-17. FUEL BOOST PUMP.

Two electrically operated fuel boost pumps are located in the bottom of fuel cell. Pumps are interconnected and furnish fuel through one supply line. Pumps are equipped with check and thermal relief valve, pump drain port, seal drain port, intake screen, and pump operating pressure switch located in discharge port of pump. Pumps are protected by circuit breakers located in overhead console.

Fuel pump motor/impeller cartridge can be removed without removing fuel boost pump assembly. Refer to paragraph 28-22 for replacement of motor/impeller cartridge.

### 28-18. REMOVAL.

#### **WARNING**

ALL DEFUELING OPERATIONS SHALL BE PERFORMED IN AN AREA WHERE FIRE HAZARDS ARE REDUCED TO A MINIMUM. REFER TO PARAGRAPH 28-3.

1. Disconnect battery and defuel helicopter (Chapter 12).
2. Disconnect electrical wiring to forward or aft pumps (6, figure 28-4).
3. Remove eight bolts (11) with seven washers (12) and ground lead from fuel pump.
4. Lower forward or aft pump (6) and disconnect attached fuel supply hose (2) or interconnect hose (1), as applicable and remove pump.
5. Cover fuel cell opening to prevent entrance of foreign material.
6. Remove check valve (4), plug (8), and pressure switch (9). Discard all packings (5, 7, and 10).

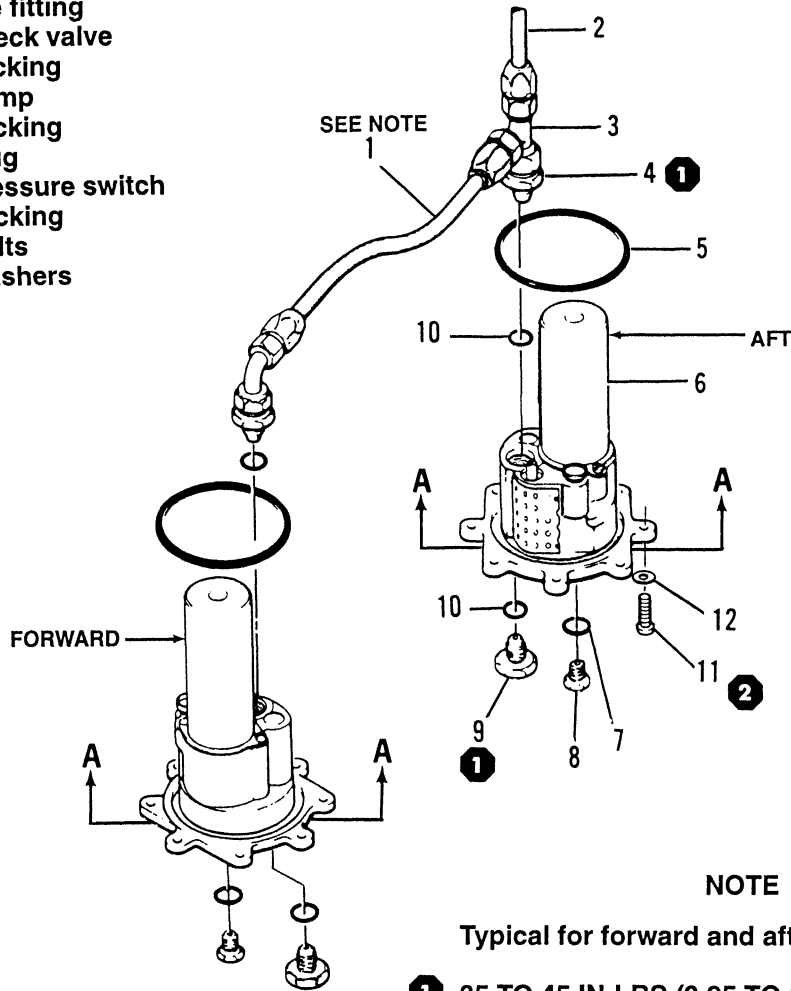
### 28-19. INSPECTION.

1. Inspect electrical connections for condition and security.
2. Inspect pump for cracks and corrosion. Inspect ports, packing groove and retaining ring groove for damage.
3. Inspect hoses, tee fitting and check valves for condition.

### 28-20. INSTALLATION.

1. Prior to installation of aft or forward pumps (6, figure 28-4) modify each pump not previously modified in accordance with figure 28-5, as applicable for pump part number. Modification of pumps will improve fuel pump performance and prevent ice clogging of fuel pump inlet screen(s) when fuel anti-icing additives are not used.
2. Lubricate new packing (10, 5, and 7, figure 28-4) with approved fuel.
3. Position packing (10) on check valve (4) and install. Tighten check valve **T**.
4. Remove protective covering from fuel cell openings.

- 1. Hose
- 2. Hose
- 3. Tee fitting
- 4. Check valve
- 5. Packing
- 6. Pump
- 7. Packing
- 8. Plug
- 9. Pressure switch
- 10. Packing
- 11. Bolts
- 12. Washers



**NOTE**

Typical for forward and aft fuel boost pump.

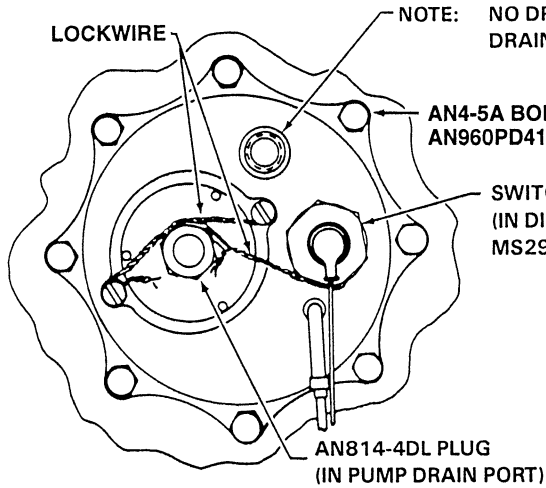
**1** 35 TO 45 IN-LBS (3.95 TO 5.08 Nm)

**2** 45 TO 55 IN-LBS (5.08 TO 6.21 Nm)

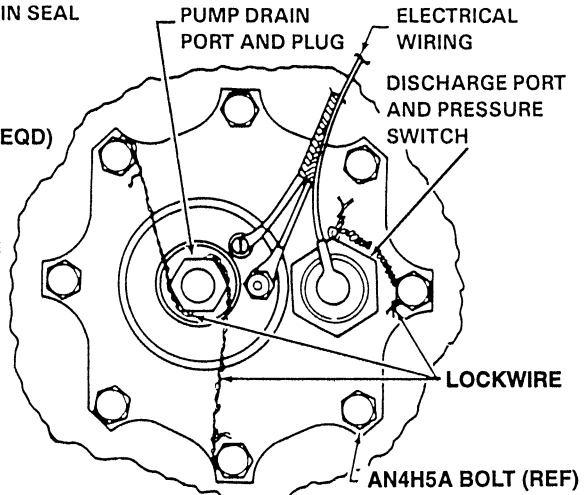
206-062-681-101  
**FUEL BOOST PUMP**

206A/BS-M-28-4-1

**Figure 28-4. Fuel boost pump (Sheet 1 of 5)**

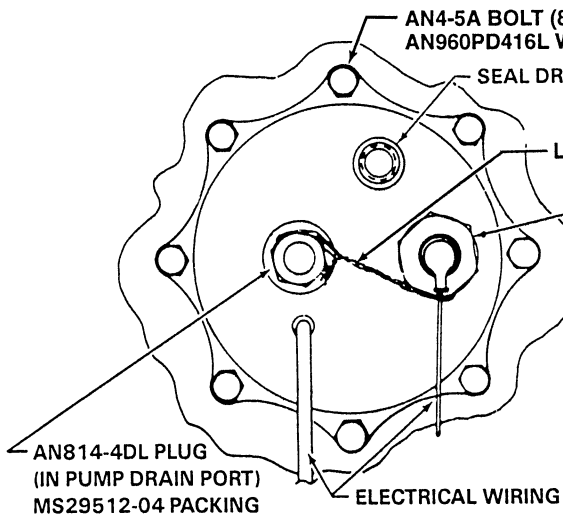


RG12650 FUEL PORT AND  
LOCKWIRE REQUIREMENTS (TYPICAL)

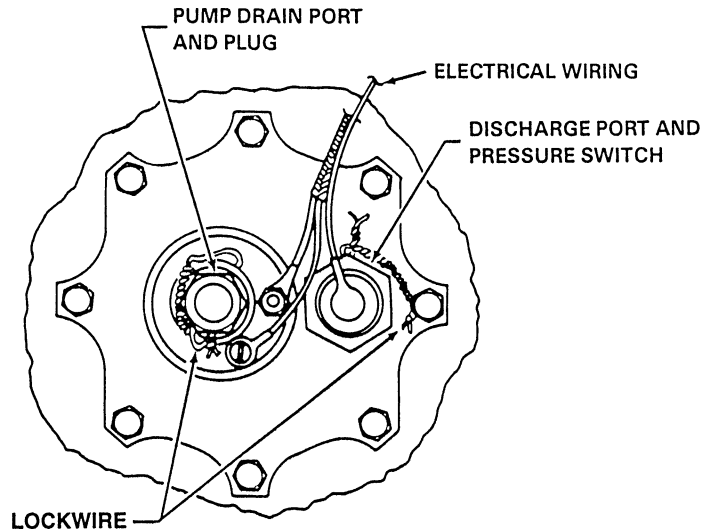


206-062-673-001 FUEL PUMP AND  
LOCKWIRE REQUIREMENTS (TYPICAL)

VIEW A-A



206-062-673-003 FUEL PUMP AND  
LOCKWIRE REQUIREMENTS



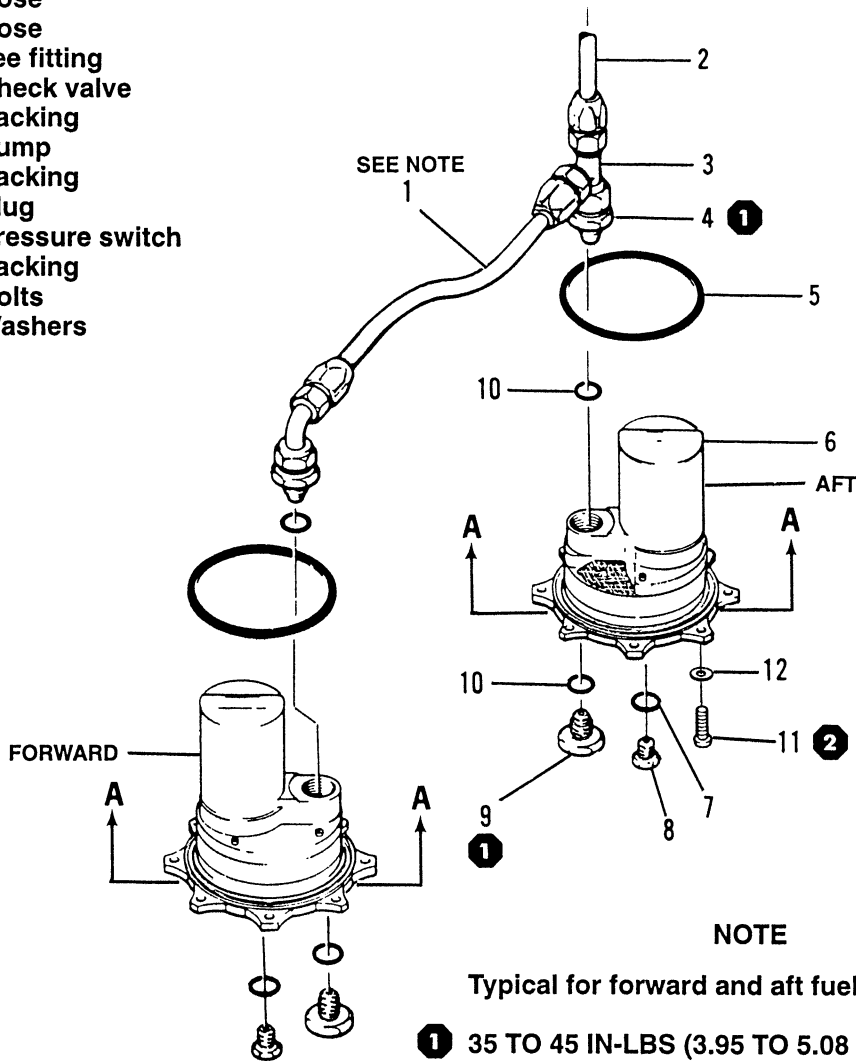
206-062-673-001 FUEL PUMP AND  
LOCKWIRE REQUIREMENTS (TYPICAL)

VIEW A-A

HELICOPTERS S/N 4 THROUGH 660, AND 672 THROUGH 715

Figure 28-4. Fuel boost pump (Sheet 2)

- 1. Hose
- 2. Hose
- 3. Tee fitting
- 4. Check valve
- 5. Packing
- 6. Pump
- 7. Packing
- 8. Plug
- 9. Pressure switch
- 10. Packing
- 11. Bolts
- 12. Washers



**NOTE**

Typical for forward and aft fuel boost pump.

1 35 TO 45 IN-LBS (3.95 TO 5.08 Nm)

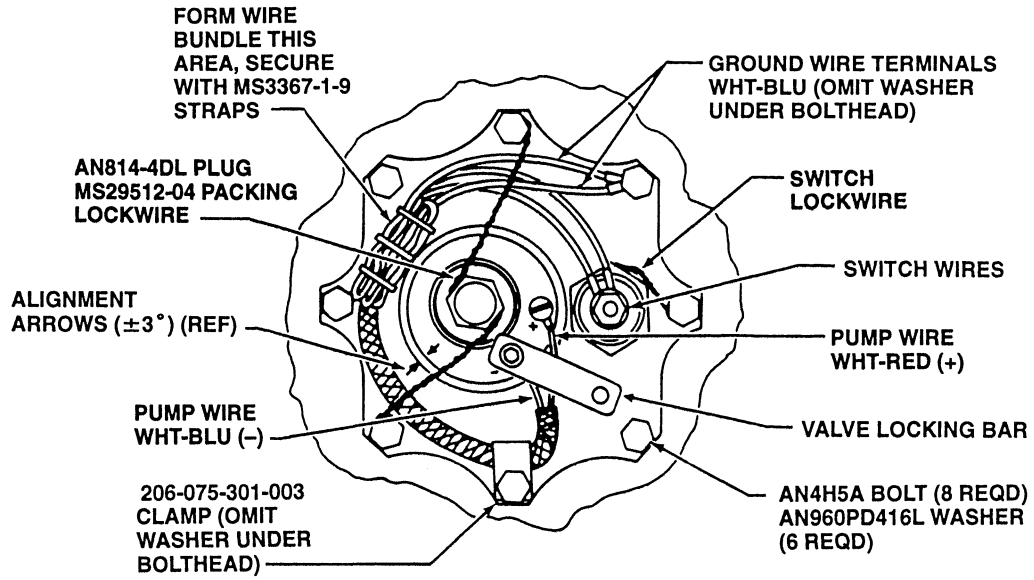
2 45 TO 55 IN-LBS (5.08 TO 6.21 Nm)

206-062-681-103  
**FUEL BOOST PUMP**

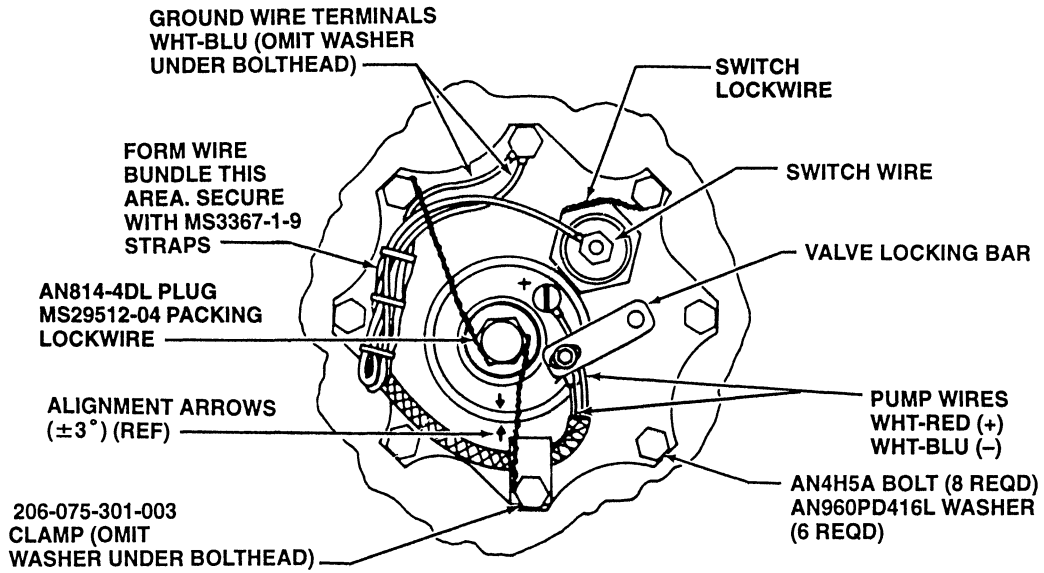
**HELICOPTERS S/N 2212 AND SUBSEQUENT**

206A/BS-M-28-4-3

**Figure 28-4. Fuel boost pump (Sheet 3)**



VIEW A-A  
VIEW LOOKING UP AT AFT PUMP



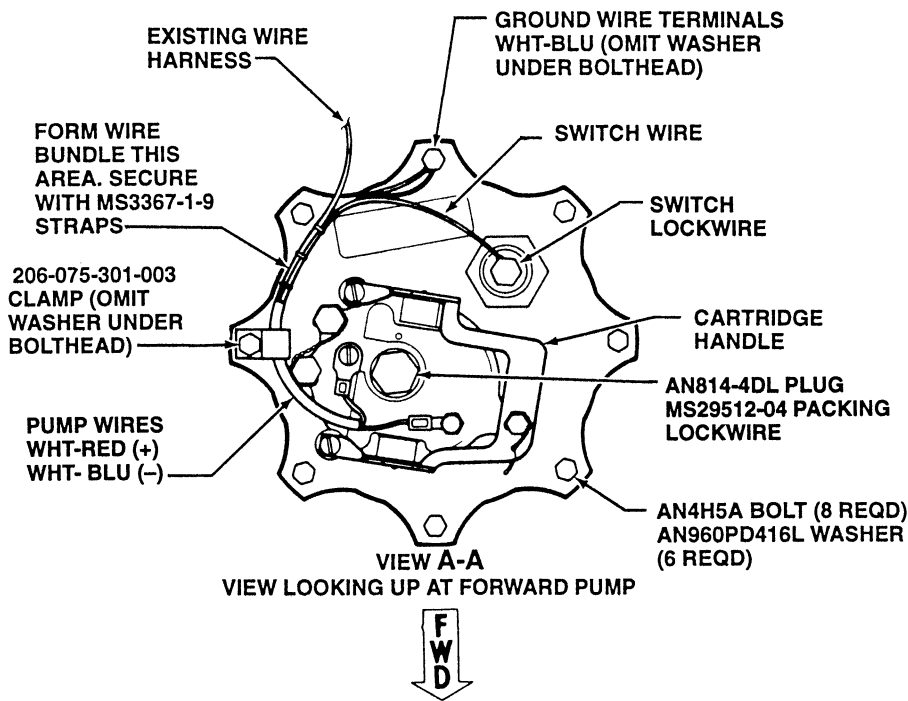
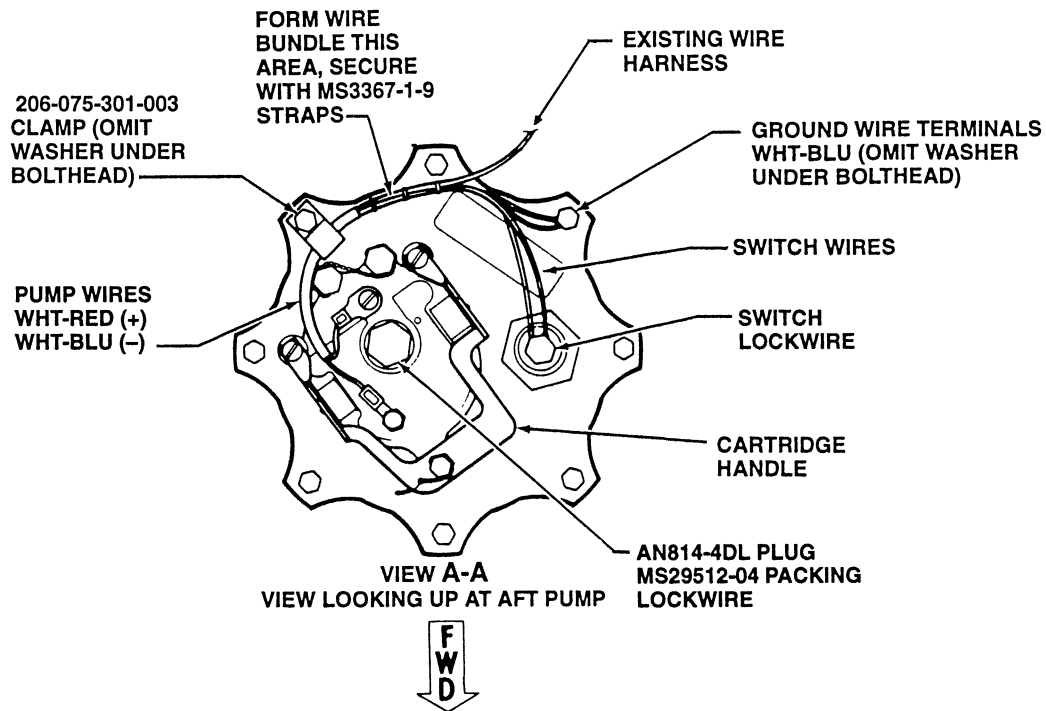
VIEW A-A  
VIEW LOOKING UP AT FORWARD PUMP



206-062-681-101

HELICOPTERS S/N 2212 AND SUBSEQUENT

Figure 28-4. Fuel boost pump (Sheet 4)

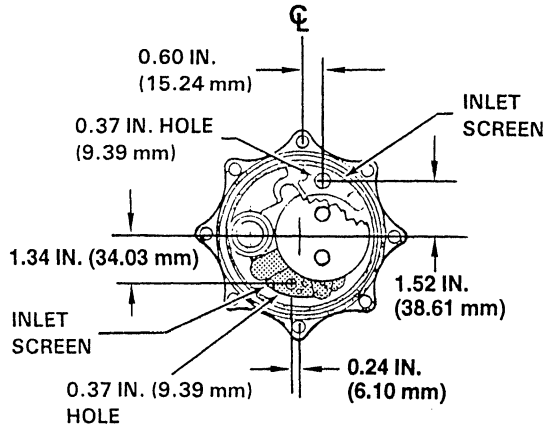


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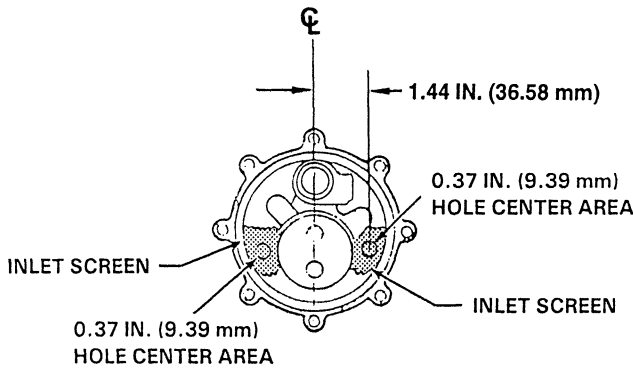
HELICOPTERS S/N 2212 AND SUBSEQUENT

206A/BS-M-28-4-5

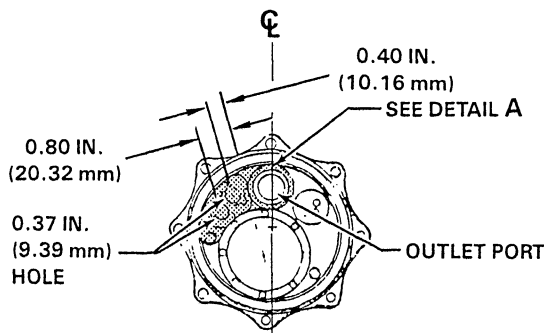
Figure 28-4. Fuel boost pump (Sheet 5)



LEAR SIEGLER INC.  
 MODIFICATION PART NO. RG12650D  
 PART NO. RG 12650



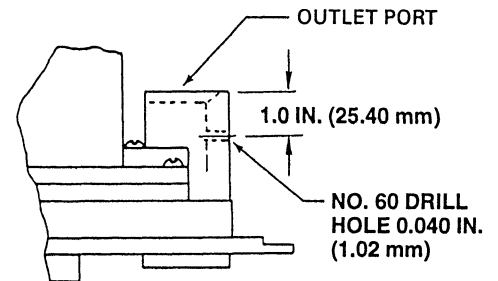
STELLAR HYDRAULICS CO.  
 PART NO. 2861



GLOBE INDUSTRIES DIV  
 PART NO. 164A136  
 MODIFICATION PART NO. 164A176  
 COMPLIANCE WITH DETAIL A  
 CHANGE TO PART NO. 164A204.

**MODIFICATION PROCEDURE**

1. Remove both front and rear fuel pumps, or prior to installation of a replacement fuel pump accomplish the following:
  - a. Inspect inlet screen(s) in each fuel pump for presence of two 0.37 inch (9.39 mm) holes. If holes are not present, invert pump so screen(s) are down and drill two 0.37 inch (9.39 mm) holes. Holes are to be located as illustrated according to part number of fuel pump. Ensure all drill filings are removed.
  - b. On Globe Industries 164A136 or 164A176 fuel pumps locate and drill (No. 60 drill) hole in the outlet port as illustrated in detail A. Invert pump for drilling operation and ensure all drill filings have been removed.
  - c. Identify fuel pumps as indicated.



DETAIL A

Figure 28-5. Modification of fuel boost pumps

5. Position new packing (5) on aft fuel pump (6) and install in fuel cell opening. Connect tee fitting (3), fuel supply hose (2), and interconnect hose (1) to pump. Secure pump with eight washers (12) and bolts (11) **T**.

**NOTE**

Boltheads and external flange of fuel pumps should be clean to provide a good electrical bond. Omit one washer and install pump ground wire.

6. Position new packing (10) on forward pump (6) and install in fuel cell opening. Connect interconnect hose (1) to check valve (4) on forward pump. Secure pump with eight washers (12) **T** and bolts (11). Observe preceding note.

7. Install plug (8) and pressure switch (9) in Globe and Lear Siegler fuel pumps as follows:

a. Globe boost pumps. Pumps contain one external fuel drain port in mounting flange. Plug external fuel drain port with a new packing (7) and plug (8).

**NOTE**

No plug is required in Lear Siegler fuel pumps at seal drain port.

b. Lear Siegler boost pump. Pumps contain two external ports in the mounting flange. Plug the fuel drain port with a new packing (7) and plug (8).

8. Install plug (8) and pressure switch (9) in pumps (6) as follows:

a. The pumps contain two external ports in the mounting flange. When installing pump, plug the fuel drain port with a new packing (7) and plug (8).

b. Install pressure switch (9) **T** with a new packing (10).

9. Connect electrical wiring to forward and aft pumps (6).

10. Inspect installation for security.

11. Connect battery and close fuel shutoff valve.

12. Perform leak test on fuel cell (paragraph 28-13, step 18).

13. Bleed trapped air from both pumps (6) after refueling by removing drain plug and draining a small amount of fuel from cell.

14. Secure plug (8) and pressure switch (9) using lockwire. Secure drilled head bolts (11) in pump mounting flange using lockwire. Refer to bottom view of applicable pump in figure 28-4.

15. Check pumps minimum pressure as follows:

a. Move helicopter to adequate tiedown facilities and secure for ground run.

b. Operate helicopter at flat pitch and 100 percent rotor speed with generator ON, refer to applicable JetRanger Flight Manual.

c. Check each individual pump with other inoperative. Pump pressure should be 4 psig (27.58 kPa) minimum and caution light segment should be illuminated for inoperative pump.

**NOTE**

Fuel pressure with both pumps in operation is not significant if each pump by itself meets requirements in step c. above.

d. Close both FUEL BOOST circuit breakers. Caution light segment should not be illuminated.

**28-21. FUEL PUMP CARTRIDGE.**

**SPECIAL TOOLS REQUIRED**

Number	Nomenclature
E2-10-1	Cartridge Removal

**28-22. REPLACEMENT — FUEL PUMP CARTRIDGE IN 206-062-673-001 PUMP.**

1. Disconnect battery and/or external power supply.
2. Drain fuel from cell (Chapter 12).
3. Disconnect electrical wiring at applicable fuel pump (6, figure 28-4).
4. Remove drain plug (8) and packing (7).
5. Remove retaining ring.
6. Install E2-10-1 special cartridge removal tool in pump drain boss and remove motor/impeller cartridge.
7. Clean cartridge hole and retaining ring.



8. Lubricate packings furnished on replacement motor/impeller cartridge and sides of the cartridge hole in mounting flange casting with approved fuel.



DO NOT FORCE ECCENTRIC CARTRIDGE. DESIGN REQUIRES ALIGNMENT ARROWS TO BE WITHIN 3 DEGREES TO BE PROPERLY INSTALLED.

**NOTE**

Align arrows on motor/impeller cartridge and on mounting flange.

9. Install motor/impeller cartridge in flange with arrows aligned and ensure it is properly seated and retaining ring groove is not obstructed.

10. Install retaining ring.

11. Install drain plug (8) with packing (7). Secure bolts (11) using lockwire as shown in view A-A for 206-062-673-001 fuel pump.



DO NOT OVERTIGHTEN POSITIVE (+) LEAD TERMINAL.

12. Connect electrical leads to the motor/impeller cartridge (Chapter 98).

13. Perform fuel boost pump operational check.

a. Ensure both boost pumps are covered with fuel. Refuel helicopter as required (Chapter 12).

b. Connect battery and/or external power supply.

c. Turn battery switch on and close fuel boost pump circuit breaker. Check fuel gage for adequate pressure from that pump with other pump inoperative (paragraph 28-20, step 15).

d. Turn battery switch off. Check exterior of boost pumps for evidence of leakage.

**28-23. REPLACEMENT — FUEL PUMP CARTRIDGE IN 206-062-681-101 CANISTER TYPE FUEL BOOST PUMP.**

1. Prepare helicopter by disconnecting battery and/or external power supply.

2. Remove socket head screw from valve locking bar (figure 28-4). Rotate bar clear of cartridge.

**NOTE**

Removal of socket head screw will disconnect electrical negative (–) lead and will allow valve locking bar to extend, closing off fuel supply to cartridge.

3. Disconnect positive (+) electrical lead from cartridge terminal and move wiring clear of cartridge area.

4. Remove drain plug, (8, figure 28-4), from cartridge center boss and allow trapped fuel to drain. Remove and discard packing.

5. Remove retaining ring securing cartridge in pump housing.

6. Install E2-10-1 special cartridge removal tool in pump drain plug boss and secure with check nut. Using weight, impact cartridge from pump housing. Remove tool from cartridge.

7. Clean all foreign matter from cartridge bore and retaining ring groove in pump housing and from retaining ring.

8. Lubricate V747-75-2-033 and V747-75-2-034 packings, (furnished with new cartridge) with approved fuel.

9. Using hand pressure, install cartridge in pump housing with arrows aligned on flanges (within  $\pm 3$  degrees). E2-10-1 special cartridge removal tool may be used as a work aid during installation. Do not impact cartridge as damage to parts may result.

10. Secure cartridge in pump housing with retaining ring.

11. Install drain plug (8) in cartridge boss with new packing (7). Double safety plug to adjacent mounting bolts with lockwire.

**NOTE**

Refer to Chapter 98 for wiring diagram.

12. Rotate valve locking bar over cartridge and in line with negative (–) terminal. Insert WHT-BLU negative (–) lead terminal under bar and secure both with screw.

13. Connect WHT-RED positive (+) lead terminal to positive (+) terminal on cartridge; do not overtighten.

14. Perform fuel boost pump operational check.

a. Ensure both boost pumps are covered with fuel. Refuel helicopter as required (Chapter 12).

b. Connect battery and/or external power supply.

c. Set battery switch to ON and close fuel boost pump circuit breaker. Check fuel gage for adequate pressure from each pump with other pump inoperative (paragraph 28-20, step 15).

d. Set battery switch to OFF. Check exterior of boost pumps for evidence of leakage.

**28-24. REPLACEMENT — FUEL PUMP CARTRIDGE IN 206-062-681-103 CANISTER TYPE FUEL BOOST PUMP.**

1. Prepare helicopter by disconnecting battery and/or external power supply.

2. Disconnect positive (+) and negative (–) leads from cartridge and move wiring clear of cartridge area (figure 28-4).

3. Remove lockwire, three bolts and washers (one at handle, two approximately 180 degrees opposite) securing cartridge in pump housing.

4. Pull cartridge handle and remove cartridge from pump housing. The handle contains a cam lever foot that provides a mechanical advantage to reduce friction force of packings when removing cartridge.

5. Remove drain plug (8) from cartridge center boss and discard packing. Install plug replacement cartridge with a new packing (7).

6. Clean all foreign matter from cartridge bore in pump housing.

7. Lubricate packings, MS29513-136 and MS29513-033 (furnished with new cartridge) with approved fuel.

8. Install cartridge in pump housing with the two bolt holes in cartridge flange and housing aligned. Fully seat cartridge in housing with handle closed. Secure cartridge in housing with three bolts and washers. Safety boltheads with lockwire (figure 28-4).

9. Secure drain plug to an adjacent bolthead with lockwire.

10. Connect positive (+) and negative (–) leads to terminals on cartridge. Do not overtighten.

11. Perform fuel boost pump operational check.

a. Ensure both boost pumps are covered with fuel. Refuel helicopter as required (Chapter 12).

b. Connect battery and/or external power supply.

c. Set battery switch on ON and close fuel boost pump circuit breaker. Check fuel gage for adequate pressure from each pump with other pump inoperative (paragraph 28-20, step 15).

d. Set battery switch to OFF. Check exterior of boost pumps for evidence of leakage.

**28-25. FUEL SHUTOFF VALVE.**

A motor operated shutoff valve incorporating a thermal relief feature is installed in main fuel supply line and is located in fuel compartment above fuel filler cap. Valve is electrically controlled by an ON-OFF switch located on instrument panel and protected by a circuit breaker located in overhead console panel. In event of electrical failure valve will remain in position selected before failure.

**28-26. REMOVAL (Helicopters S/N 4 through 153).**

1. Pull circuit breaker, remove coverplate above filler cap, and disconnect electrical connector on fuel shutoff valve.

2. Disconnect tube (9, figure 28-6).

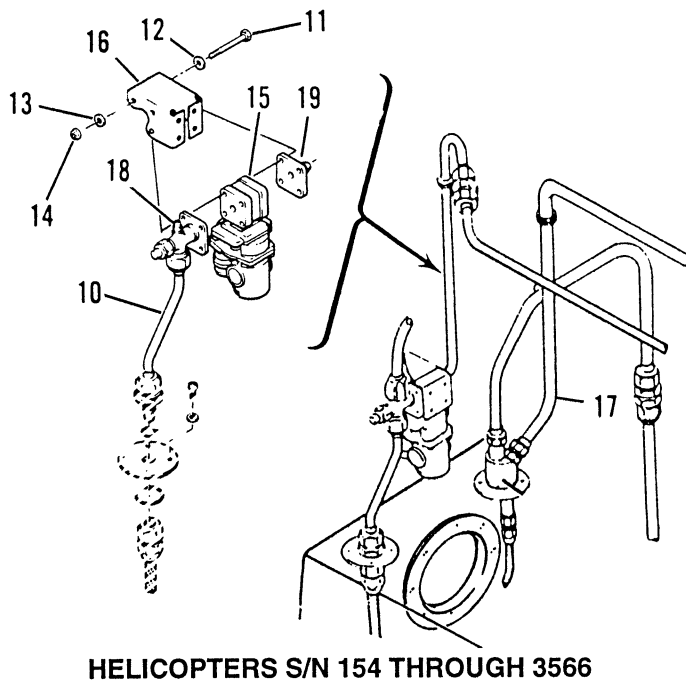
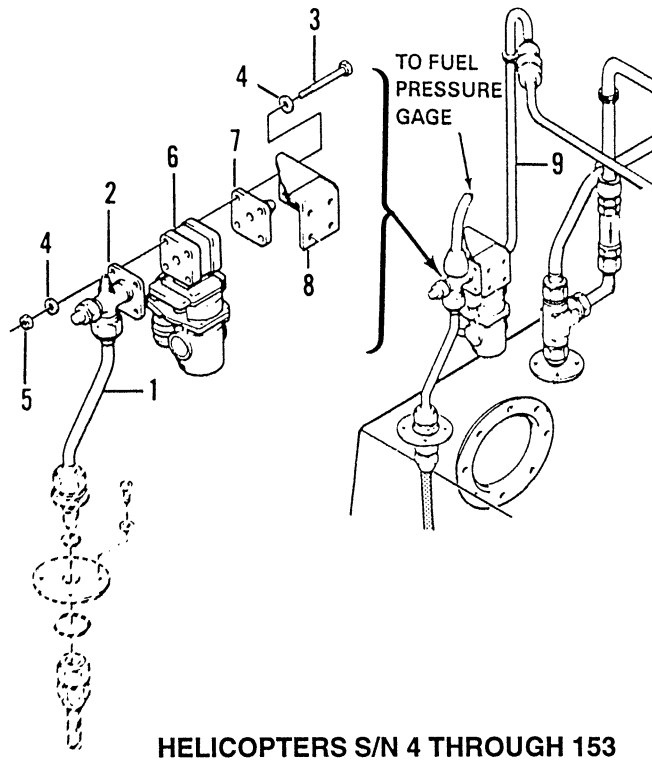
3. Disconnect pressure indicating tube (1) from cross (2) and remove bolts (3) washers (4) and nuts (5), securing fuel shutoff valve (6) to bracket (8).

**28-27. INSTALLATION (Helicopters S/N 4 through 153).**

1. Position cross (2), fuel shutoff valve (6), and connector (7) on bracket (8), and install bolts (3), washers (4), and nuts (5).

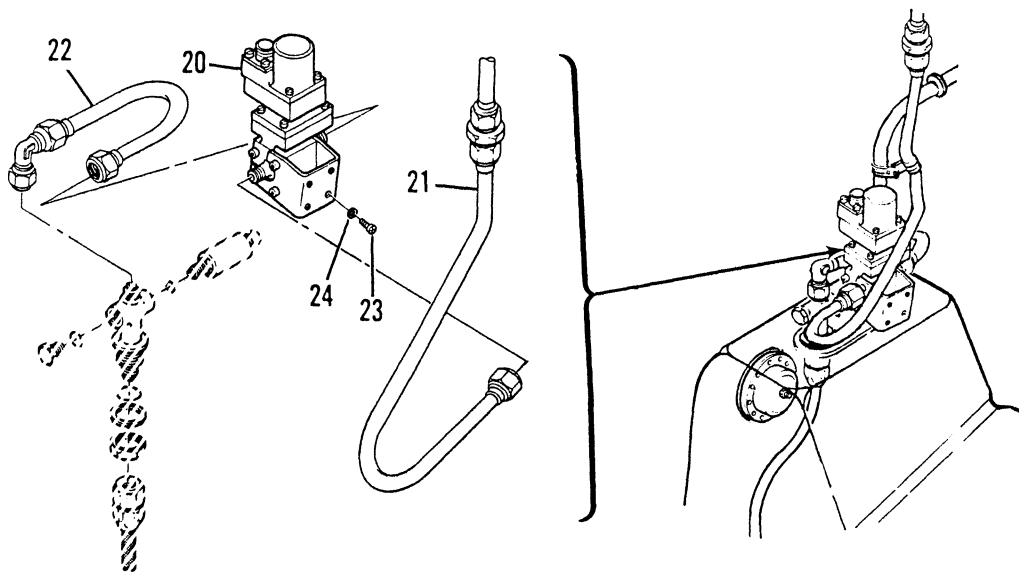
2. Connect tube assemblies (1 and 9) and electrical connector.

3. Install coverplate, and close circuit breaker.



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Figure 28-6. Fuel shutoff valve (Sheet 1 of 2)



HELICOPTERS S/N 3567 AND SUBSEQUENT

- |                       |                        |
|-----------------------|------------------------|
| 1. Tube               | 13. Washer             |
| 2. Cross              | 14. Nut                |
| 3. Bolt               | 15. Valve assembly     |
| 4. Washer             | 16. Bracket            |
| 5. Nut                | 17. Tube               |
| 6. Fuel shutoff valve | 18. Cross              |
| 7. Connector          | 19. Connector          |
| 8. Bracket            | 20. Fuel shutoff valve |
| 9. Tube               | 21. Tube               |
| 10. Tube              | 22. Tube               |
| 11. Bolt              | 23. Screw              |
| 12. Washer            | 24. Washer             |

206A/BS-M-28-6-2

Figure 28-6. Fuel shutoff valve (Sheet 2)

**28-28. REMOVAL (Helicopters S/N 154 through 3566).**

1. Pull circuit breaker, remove coverplate above the filler cap, and disconnect electrical connector on fuel shutoff valve (15).
2. Provide suitable container to catch fuel and disconnect tube (10, figure 28-6), and fuel supply tube (17).
3. Remove bolts (11) washers (12 and 13) and nuts (14), securing fuel shutoff valve assembly (15) to mount bracket (16).

**28-29. INSTALLATION (Helicopters S/N 154 through 3566).**

1. Position cross (18, figure 28-6) fuel shutoff valve assembly (15) and connector (19) on mount bracket (16), and install bolts (11), washers (12 and 13) and nuts (14).
2. Connect tube (10), fuel supply line (17), and electrical connector.
3. Install coverplate and close circuit breaker.

**28-30. REMOVAL (Helicopters S/N 3567 and subsequent).**

1. Remove right side fuel compartment access panel.
2. Disconnect electrical connector from fuel shutoff valve (20, figure 28-6).
3. Disconnect tubes (21 and 22) from fuel shutoff valve.
4. Remove screws (23) with washers (24). Remove fuel shutoff valve (20).

**28-31. INSPECTION.**

1. Inspect fuel shutoff valve for leaks.
2. Inspect fuel lines and electrical connectors for security.

**28-32. INSTALLATION (Helicopters S/N 3567 and subsequent).**

1. Position fuel shutoff valve (20, figure 28-6) in place and install washers (24) and screws (23).

2. Connect tubes (21 and 22) to fuel shutoff valve.
3. Connect electrical connector to fuel shutoff valve.
4. Install right side fuel compartment access door.

**28-33. FUEL PRESSURE TRANSDUCER.**

The fuel pressure transducer provides a means of monitoring fuel pressure. The transducer is located on a fitting on top of aft right side of fuel cell.

**28-34. REMOVAL.**

1. Remove fuselage access panel located above fuel filter.
2. Disconnect electrical connector (4, figure 28-7).
3. Unscrew fuel pressure transducer (3) from fitting (1). Remove and discard packing (2).

**28-35. INSPECTION.**

1. Inspect transducer for rust or corrosion.
2. Inspect for bent or broken pins.

**28-36. INSTALLATION.**

1. Install new packing (2, figure 28-7) on transducer and screw into fitting (1).
2. Connect electrical connector (4).
3. Pressurize fuel system and check for leaks (paragraph 28-6, and Chapter 5).
4. Install fuselage access panel.

**28-37. FUEL QUANTITY — INDICATING UNITS.**

Two float type fuel level transmitting units (tank units) are installed in fuel cell. The lower unit is mounted in the tank bottom and monitors fuel level up to horizontal surface of cell, under seat; upper unit monitors fuel level in upper section of fuel cell, behind seat, and is mounted to top of fuel cell. Both indicating units are connected to a common quantity indicator. Refer to Chapter 95 for calibration procedures and troubleshooting.

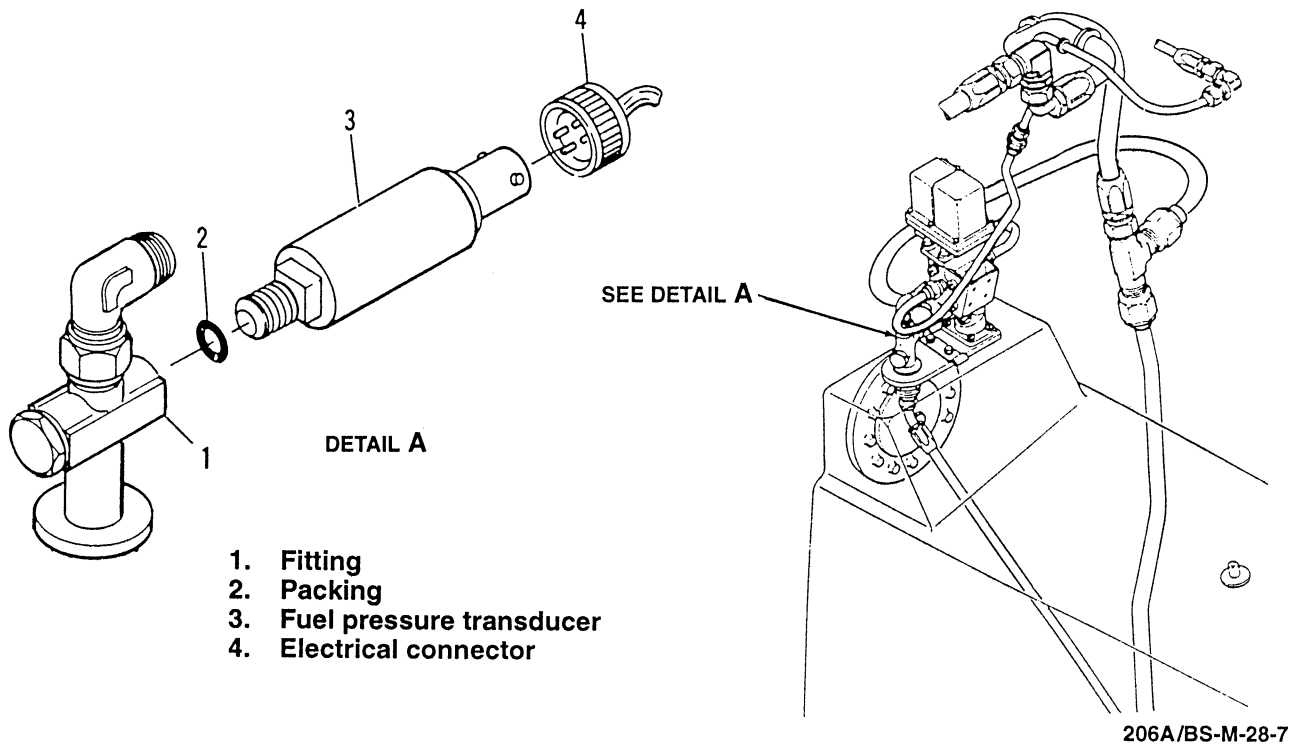


Figure 28-7. Fuel pressure transducer

**28-38. REMOVAL.**

1. Disconnect battery and defuel helicopter (Chapter 12).
2. Disconnect electrical wiring to upper or lower tank unit (1 or 2, figure 28-8).
3. Remove three screws (3 or 4) and washers (5 or 6) from upper and lower tank units (1 and 2) and remove from fuel cell. Discard gasket.
4. Cover fuel cell opening to prevent entrance of foreign material.
5. Remove five screws (7) and washers (8) from tank unit doubler (9 or 10) and separate doubler from tank unit.

**28-39. INSTALLATION.**

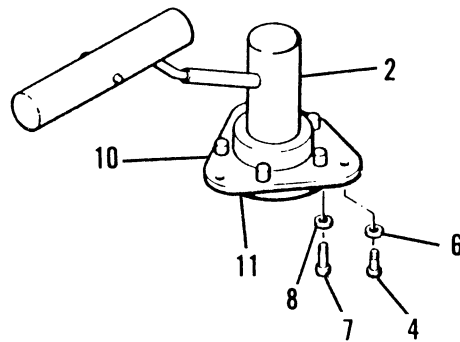
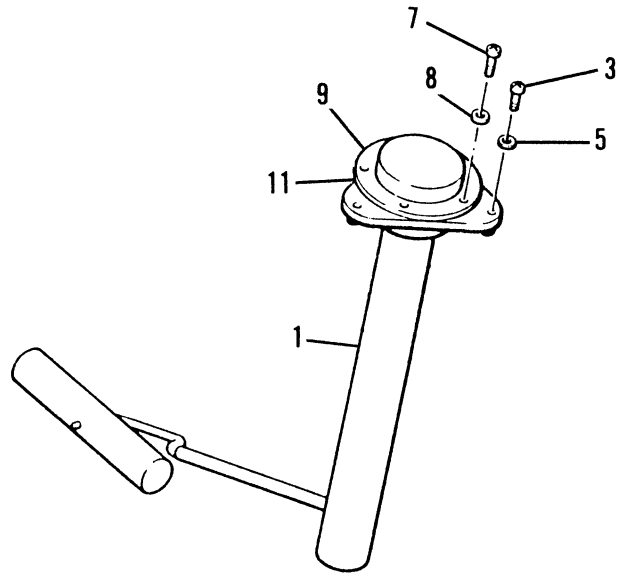
1. Position new gasket (11) on inside flange of upper or lower tank unit (1 or 2, figure 28-8). Install doubler (9 or 10) and secure with five screws (7) and washers (8).

2. Remove protective covers from fuel cell openings for upper and lower tank unit (1 and 2).
3. Insert upper or lower tank units (1 or 2) into fuel cell opening and secure with three screws (3 or 4) and washers (5 or 6).

**NOTE**

Position float arm of upper tank unit to the right side of helicopter and lower tank unit float arm forward.

4. Connect electrical wiring to upper and lower tank units (1 or 2).
5. Inspect fuel cell installation for security.
6. Connect battery and close fuel shutoff valve.
7. Perform leak test on fuel cell (paragraph 28-13, step 16).
8. Refer to Chapter 95 for fuel quantity calibration.



- |                    |             |
|--------------------|-------------|
| 1. Upper tank unit | 7. Screw    |
| 2. Lower tank unit | 8. Washer   |
| 3. Screw           | 9. Doubler  |
| 4. Screw           | 10. Doubler |
| 5. Washer          | 11. Gasket  |
| 6. Washer          |             |

206A/BS-M-28-8

Figure 28-8. Fuel quantity indicator units

**28-40. DRAIN VALVE.**

Drain valve is a manually operated valve located in bottom of fuel cell and is used to drain fuel.

**28-41. REMOVAL.**

1. Ground helicopter. Disconnect battery and external power source.
2. Defuel and purge fuel cell (Chapter 12).
3. Remove screws (1, figure 28-9), washers (2), and bolts (3).
4. Remove drain valve (7) with fitting (5) and packings (4 and 6); discard packings.

**28-42. INSTALLATION.**

1. Lubricate new packings (4 and 6, figure 28-9) with approved fuel before installation.
2. Place new packing (6) on drain valve (7).
3. Place new packing (4) on fitting (5).
4. Install drain valve (7) with fitting (5).
5. Secure drain valve (7) in closed position using lockwire.

**28-43. SOLENOID VALVE.**

The solenoid valve is an electrically and manually controlled drain valve used to drain fuel from fuel cell.

**28-44. REMOVAL.**

1. Ground helicopter. Disconnect battery and external power source.
2. Defuel and purge fuel cell (Chapter 12).
3. Remove screw (1, figure 28-10), and washer (2).
4. Remove solenoid valve (4) with packing (3).

**28-45. INSTALLATION.**

1. Lubricate new packing (3) with approved fuel before installation.

2. Place new packing (3, figure 28-10) on solenoid valve (3).
3. Install solenoid valve (4) with screw (1) and washers (2).
4. Tighten screws (1) **T**.
5. Secure solenoid valve (4) using lockwire.

**28-46. CAP.**

Cap and adapter assembly covers fuel access opening at top of fuel cell.

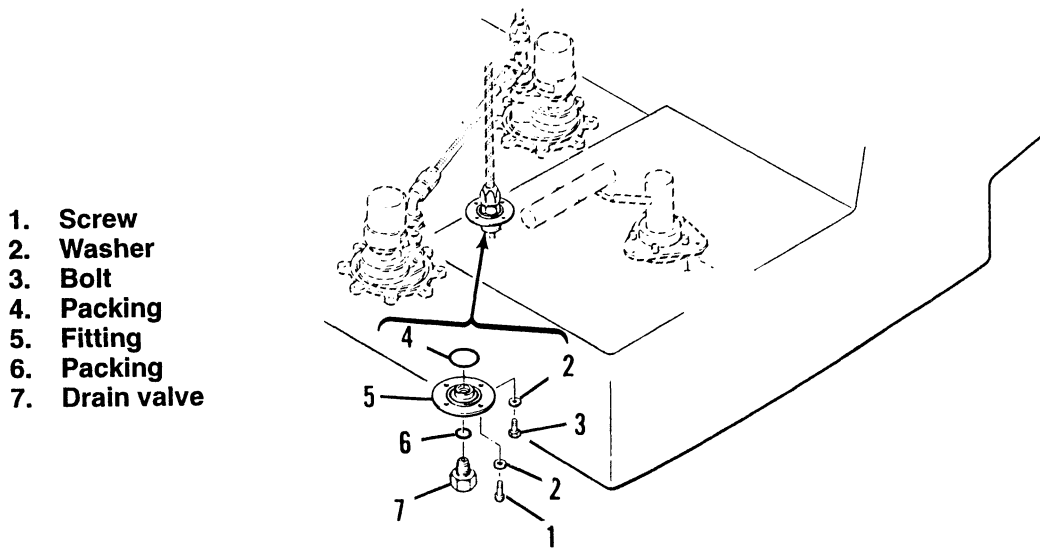
**28-47. REMOVAL.**

1. Ground helicopter and disconnect battery.
2. On helicopters S/N 4 through 3566, remove screws (1, figure 28-11), washers (2), retainer (3), cap and adapter (4), with packings (6, 7, and 8), and seal (5). Discard seal (5) and packings.
3. On helicopters S/N 3567 and subsequent, remove screws (1), washers (2) retainer (3), hinged cap and adapter (9), seal (5), and packing (6).

**28-48. INSTALLATION.**

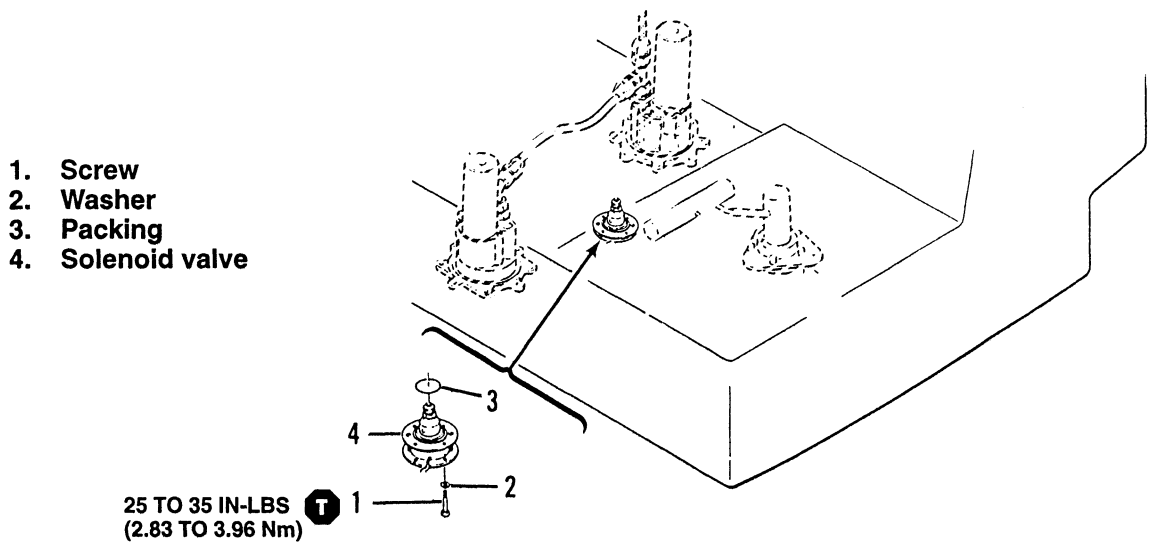
1. Lubricate new packings (6, 7, and 8, figure 28-11) with approved fuel before installation.
2. On helicopters S/N 4 through 3566 place new packing (6) in fuel cell port.
3. Install new packing (7 and 8) on cap and adapter (4).
4. Position seal (5), cap and adapter (4), and retainer (3) in place and secure with washers (2) and screws (1) **T**.
5. On helicopters S/N 3567 and subsequent, place new packing (6) in fuel cell port.
6. Prepare hinged cap and adapter assembly and retainer assembly for installation. Using Scotchbrite or 400 grit paper, remove alodine protective finish locally from inboard side of retainer to ensure good electrical bond.
7. Install seal (5), hinged cap and adapter (9), retainer (3), and secure with washers (2), and screws (1) **T**.
8. Connect battery and remove ground.





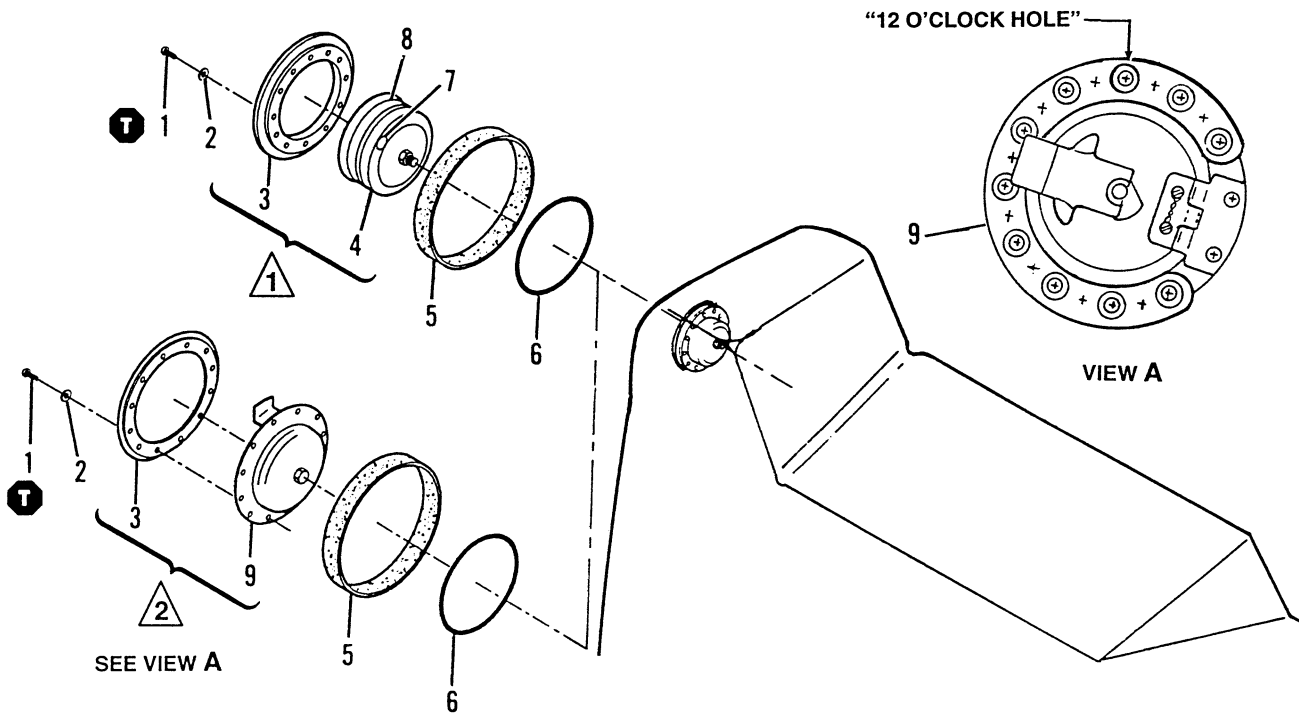
206A/BS-M-28-9

Figure 28-9. Drain valve



206A/BS-M-28-10

Figure 28-10. Solenoid valve



- 1. Screws
- 2. Washer
- 3. Retainer
- 4. Cap and adapter
- 5. Seal
- 6. Packing
- 7. Packing
- 8. Packing
- 9. Hinged cap and adapter

NOTES

- ① Helicopters S/N 4 through 3566.
- ② Helicopters S/N 3567 and subsequent.
- Ⓣ 50 TO 75 IN-LBS (5.65 TO 8.48 Nm).

206A/BS-M-28-11

Figure 28-11. Cap and adapter assembly

**28-49. FILTER ELEMENT CHANGE REQUIREMENT.**

Airframe mounted fuel filter element shall change at same hourly interval as engine fuel filter (located in fuel pump housing) and after any indication of clogging not due to removable ice particles.

**28-50. REMOVAL AND INSTALLATION — 206-706-603 FILTER ELEMENT.**

1. Remove lockwire securing filter bowl (4, figure 28-12) to filter valve (1).
2. Remove filter bowl (4) and filter element (3). Discard used filter element, and packing (2, 5, and 6).
3. Install new filter element (3), packings (2, 5, and 6) and filter bowl (4).
4. Install filter bowl (4) on filter body (7) and tighten until packing (5) contacts filter body. Mark a vertical line on filter bowl and body.
5. Tighten bowl 60 to 90 degrees past mark.

**NOTE**

Turning bowl 60 degrees past the reference mark will normally prevent any leakage. If leakage occurs at this point, continue tightening to a maximum of 90 degrees (90 degrees represents 150 inch-pounds (16.95 Nm)).

6. Install lockwire to secure filter bowl (4) to filter valve (1).
7. Bleed air from fuel system. Refer to Chapter 5 Special Inspections.

**28-51. REMOVAL AND INSTALLATION — 52-2889-016 OR 52-2889-016A FILTER ELEMENT.**

1. Remove lockwire securing filter bowl (4, figure 28-13) to filter valve (1).
2. Using a strap wrench, remove the filter bowl (4) and filter element (5). Discard used filter element, gaskets (6), and packing (7 and 3).
3. Install filter element (5), gaskets (6), and packing (7) in filter bowl (4).

4. Install bowl (4) on filter body (8) and tighten until packing (7) contacts filter body. Draw a vertical line on filter bowl and body.

5. Accomplish steps 5. through 7. of paragraphs 28-50.

**28-52. REMOVAL AND INSTALLATION — 222-366-621-101 FILTER ELEMENT.**

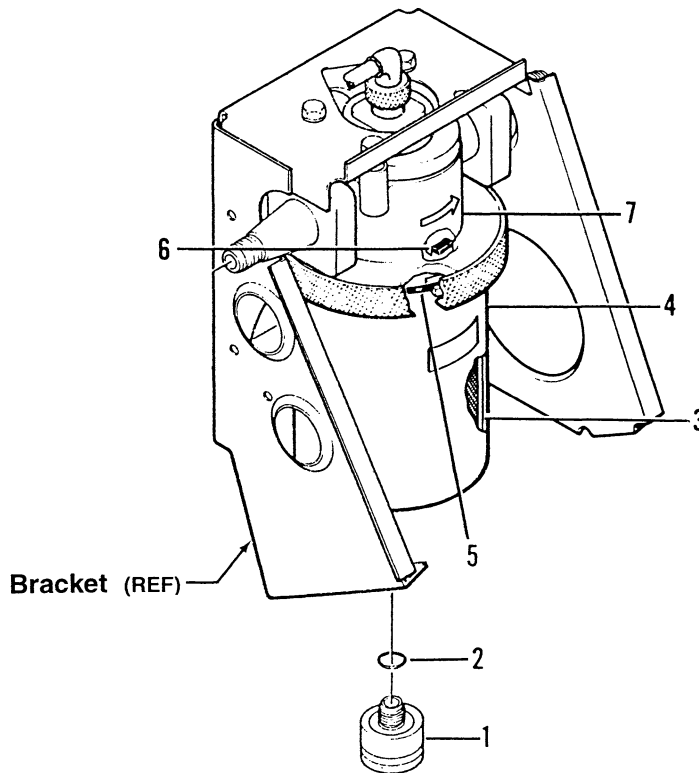
1. Remove lockwire securing bowl retainer (4, figure 28-14) and drain valve (1).
2. Drain fuel from filter bowl (5) and remove drain valve (1), retainer nut (2), and packing (3) from filter bowl.
3. Remove filter bowl (5), packing (8), filter element (7), and gaskets (6). Discard packings, filter element, and gaskets.
4. Install filter element (7), and gaskets (6) in filter bowl (5). Ensure that gaskets are installed with concave side facing the filter element.
5. Lubricate all packings with approved fuel, and install packing (8) in filter body (9).
6. Install filter bowl (5) with filter element (7) and gaskets (6) in filter body and tighten retainer bowl (4) **T**.
7. Install packing (3), retainer nut (2), and drain valve (1). Secure drain valve to retainer nut with lockwire.
8. Bleed air from fuel system. Refer to Chapter 5 Special Inspection.

**28-53. AIRFRAME MOUNTED FUEL FILTER.**

A fuel filter is mounted to structure on left side of engine compartment (right side of forward firewall on helicopters S/N 3387 and subsequent). Fuel filter (figure 28-15) consists of a replaceable filter element, drain valve, bypass valve, impending bypass switch, and manual test button. The airframe mounted fuel filter assembly eliminates requirement for adding anti-icing additive to fuel supply when temperatures are below 40°F (4°C). Indication of impending bypass lights the A/F FUEL FILTER segment on pilot caution panel.

**NOTE**

Filter element must be replaced when caution light comes on during engine operation. Replace filter element at same hourly interval as engine fuel filter maintenance is performed or 300 hours. (Refer to Allison 250-C20 Series Operation and Maintenance Manual, 10W2.)



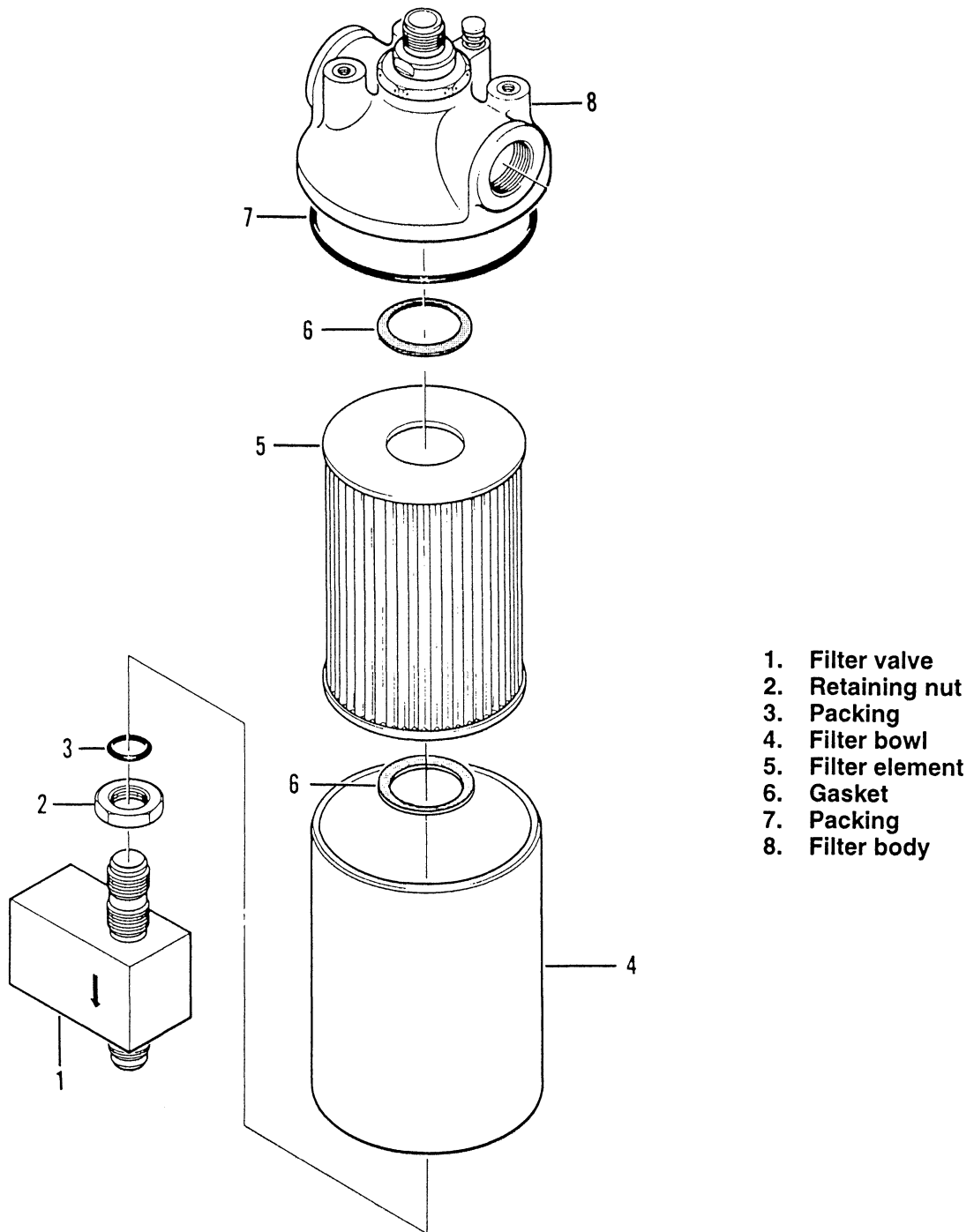
**NOTE**

On helicopters prior to T.B. 206-81-55 filter is located near engine pan of left side engine compartment. Post T.B. 206-81-55 filter is located on forward firewall.

- 1. Filter valve
- 2. Packing
- 3. Filter element
- 4. Filter bowl
- 5. Packing
- 6. Packing
- 7. Filter body

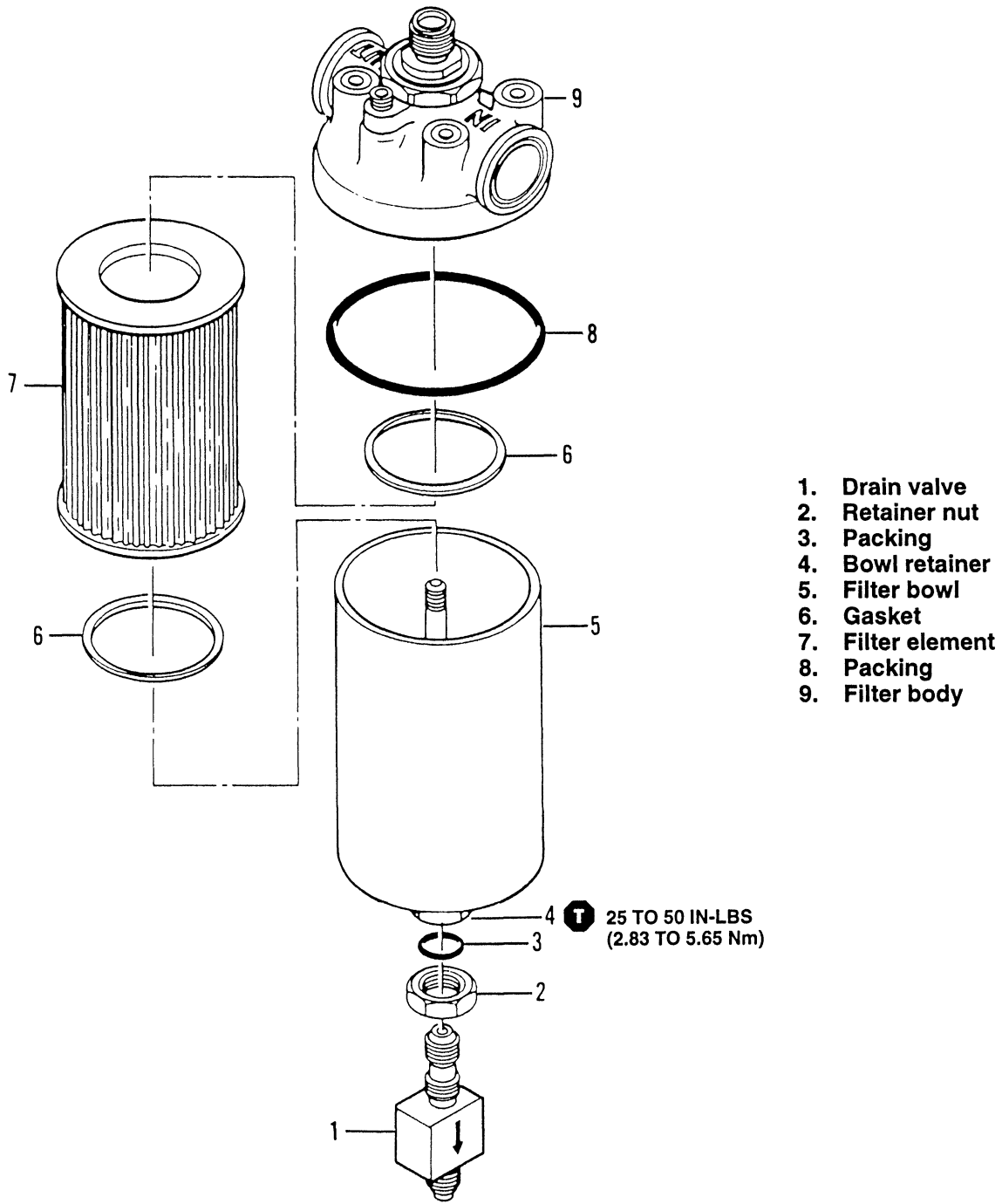
206A/BS-M-28-12

Figure 28-12. 206-706-603 Fuel filter assembly



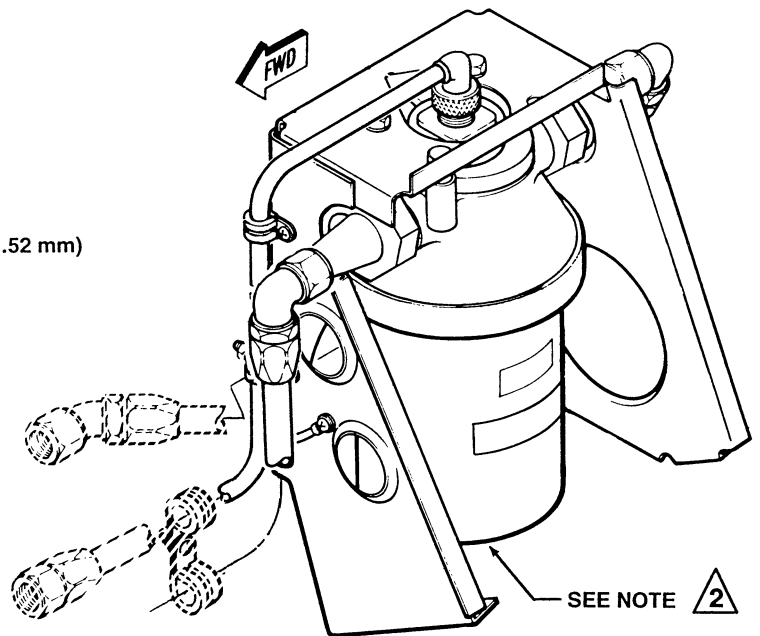
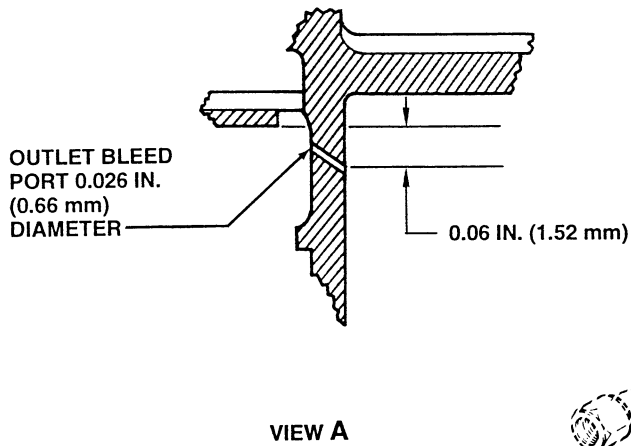
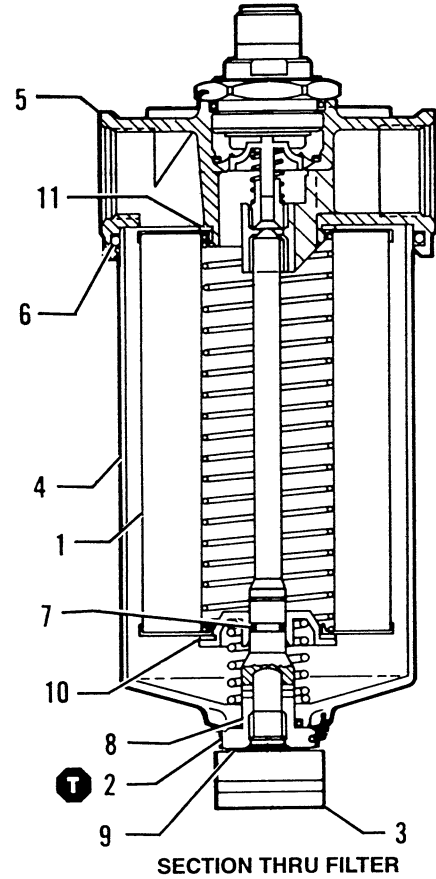
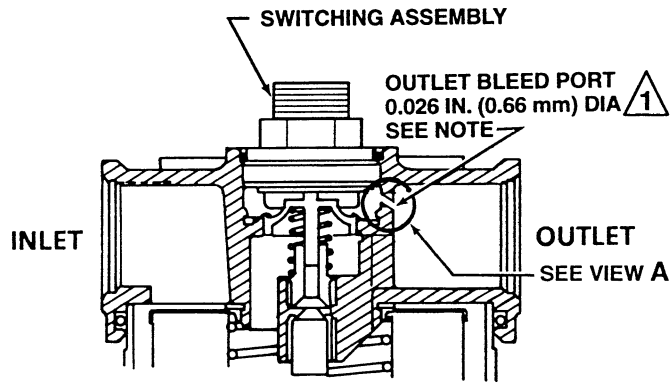
206A/BS-M-28-13

Figure 28-13. 52-2889-016 or 52-2889-016A Fuel filter assembly



206A/BS-M-28-14

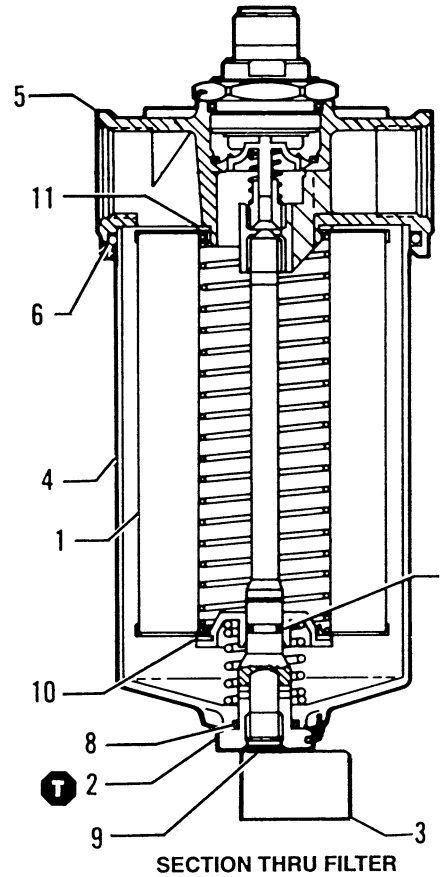
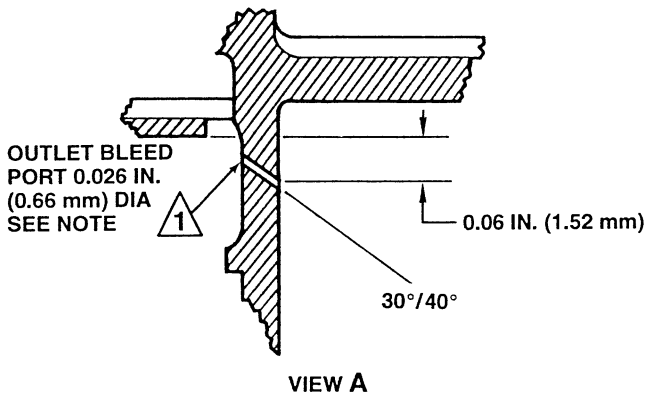
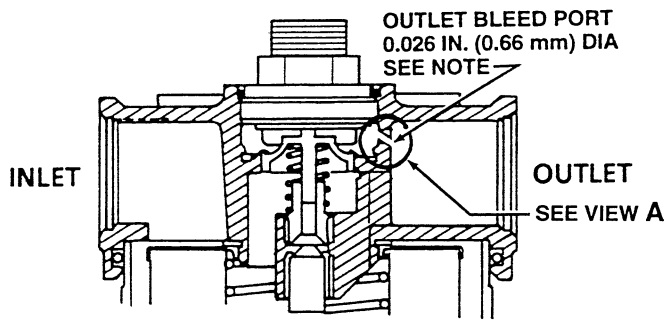
Figure 28-14. 222-366-621 Fuel filter assembly



Helicopters S/N 2212 through 3386

206A/BS-M-28-15-1

Figure 28-15. Airframe mounted fuel filter assembly (Sheet 1 of 2)

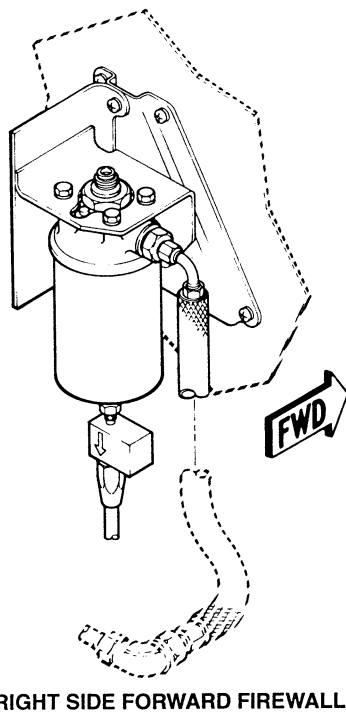


- |                         |            |
|-------------------------|------------|
| 1. Filter element       | 7. Packing |
| 2. Filter bowl retainer | 8. Packing |
| 3. Drain valve          | 9. Packing |
| 4. Filter bowl          | 10. Gasket |
| 5. Filter head          | 11. Gasket |
| 6. Packing              |            |

NOTES

- 1 To ensure self-bleeding of fuel filter, check outlet bleed port with 0.020 inch (0.51 mm) wire.
- 2 On helicopters prior to T.B. 206-81-55 filter is located near engine pan on left side engine compartment. Post T.B. 206-81-55 filter is located on forward firewall.

T 25 TO 50 IN-LBS (2.83 TO 5.65 Nm)



HELICOPTERS S/N 3387 AND SUBSEQUENT

206A/BS-M-28-15-2

Figure 28-15. Airframe mounted fuel filter assembly (Sheet 2)



**NOTE**

Refer to Service Instruction No. 206-65 for detailed installation instructions and wiring diagrams.

Purge fuel system after any filter maintenance (Chapter 12).

**28-54. REMOVAL.**

1. Remove filter element (1, figure 28-15) as follows:

a. Cut and remove lockwire securing filter bowl retainer (2) and drain valve (3).

b. Remove drain valve (3) and drain fuel from filter bowl (4).

c. Remove filter bowl retainer (2) and filter bowl (4) from filter head (5).

d. Remove filter element (1) from filter bowl retainer (2). Discard packings (6, 7, 8, and 9).

**28-55. INSPECTION.**

1. Remove contamination and residual water from filter bowl (4).

2. Examine filter element (1) for evidence of contamination. Ice crystals and water found present in the filter element may be removed. No other contaminant is removable.

3. At each fuel filter element (1) change interval, remove fitting from outlet port of filter head (5). Using a 0.020 inch (0.51 mm) wire, pass wire through outlet bleed port to ensure that bleed port is not clogged.

**NOTE**

Use new filter element replacement kit KD651511 (FMC 05160) if element is contaminated or due for time replacement.

4. Refer to applicable JetRanger Flight Manual for daily inspection requirement.

**28-56. INSTALLATION.**

1. Lubricate all packings with approved fuel.

2. Install new packings (7, 8, and 9).

3. Install new packing (6) in filter head (5).

4. Install filter bowl (4) with filter element (1), and gaskets (10 and 11) into filter head (5). Tighten filter bowl retainer (2) **T**.

5. Install drain valve (3) and secure with filter retainer bowl (2) to filter bowl (4) tab using lockwire.

6. Bleed air from fuel system.

**NOTE**

When purging airframe and engine fuel system of air, ensure both fuel boost pumps are on and motor engine for approximately 15 seconds or until no evidence of air is coming from the fuel supply hose. In addition, depress airframe fuel filter bypass indicator button during motoring operation to remove air more rapidly.

Refer to Allison 250-C20 Series Operation and Maintenance Manual, 10W2 for engine fuel system maintenance requirements.

7. Run engine and check for fuel leaks.

**28-57. ENGINE FUEL FILTER.**

Refer to Allison 250-C20 Series Operation and Maintenance Manual 10W2 for detailed maintenance instructions.

