LIST OF EFFECTIVE PAGES

CHAPTER SECTION	PAGE	DATE
LEP	1	Aug 27/2004
	2 blank	Aug 27/2004
Contents	1	Aug 27/2004
	2	Aug 27/2004
73-20-00	1	Feb 11/2000
Description and	2	Feb 11/2000
Operation	3	Feb 11/2000
	4	Feb 11/2000
	5	Feb 11/2000
	6	Feb 11/2000
	7	Feb 11/2000
	8	Feb 11/2000
73-20-00	201	Aug 27/2004
Maintenance	202	Aug 27/2004
Practices	203	Aug 27/2004
	204	Aug 27/2004
	205	Aug 27/2004
	206	Aug 27/2004
	207	Aug 27/2004
	208	Aug 27/2004
	209	Aug 27/2004
	210	Aug 27/2004
	211	Aug 27/2004
	212	Aug 27/2004
	213	Aug 27/2004
	214	Aug 27/2004
	215	Aug 27/2004
	216	Aug 27/2004
	217	Aug 27/2004
	218	Aug 27/2004
	219	Aug 27/2004
	220 blank	Aug 27/2004

TABLE OF CONTENTS

TABLE OF CONTENTS

FUEL CONTROL UNIT - DESCRIPTION AND OPERATION

1. Description

   A. General

      The fuel control unit (FCU) is mounted on the rear flange of the fuel pump. A splined coupling between the pump and the FCU transmits a speed signal, proportional to compressor turbine speed (Ng), to the governing section in the FCU. The FCU determines the fuel schedule for the engine to provide the power required as established by controlling the speed of the compressor. Engine power output is directly dependent upon Ng. Control of the Ng is done by regulating the amount of fuel to the combustion section of the engine.

2. Operation (Ref. Fig. 1)

   A. Metering Section

      The FCU is supplied with fuel at pump pressure (P1). Fuel flow is established by a metering valve and bypass valve system, with P1 fuel supplied to the metering valve input. The fuel pressure immediately after the metering valve is called metered fuel (P2), which flows to the starting control unit. The bypass valve maintains an essentially constant fuel pressure differential (P1 minus P2) across the metering valve. The orifice area of the metering valve is changed by valve movement to meet specific engine requirements, with fuel pump output (P1) in excess of requirements returned, via internal passages in the FCU and pump, to the pump inlet downstream of inlet screen. Bypassed fuel is referred to as Po fuel. The bypass valve consists of a sliding valve operating in a ported sleeve and is actuated via a diaphragm and spring. In operation, the spring force is balanced by the P1 minus P2 differential operating on the diaphragm. The valve is always in a position to maintain the P1 minus P2 difference, and to bypass Po fuel in excess of engine requirements.

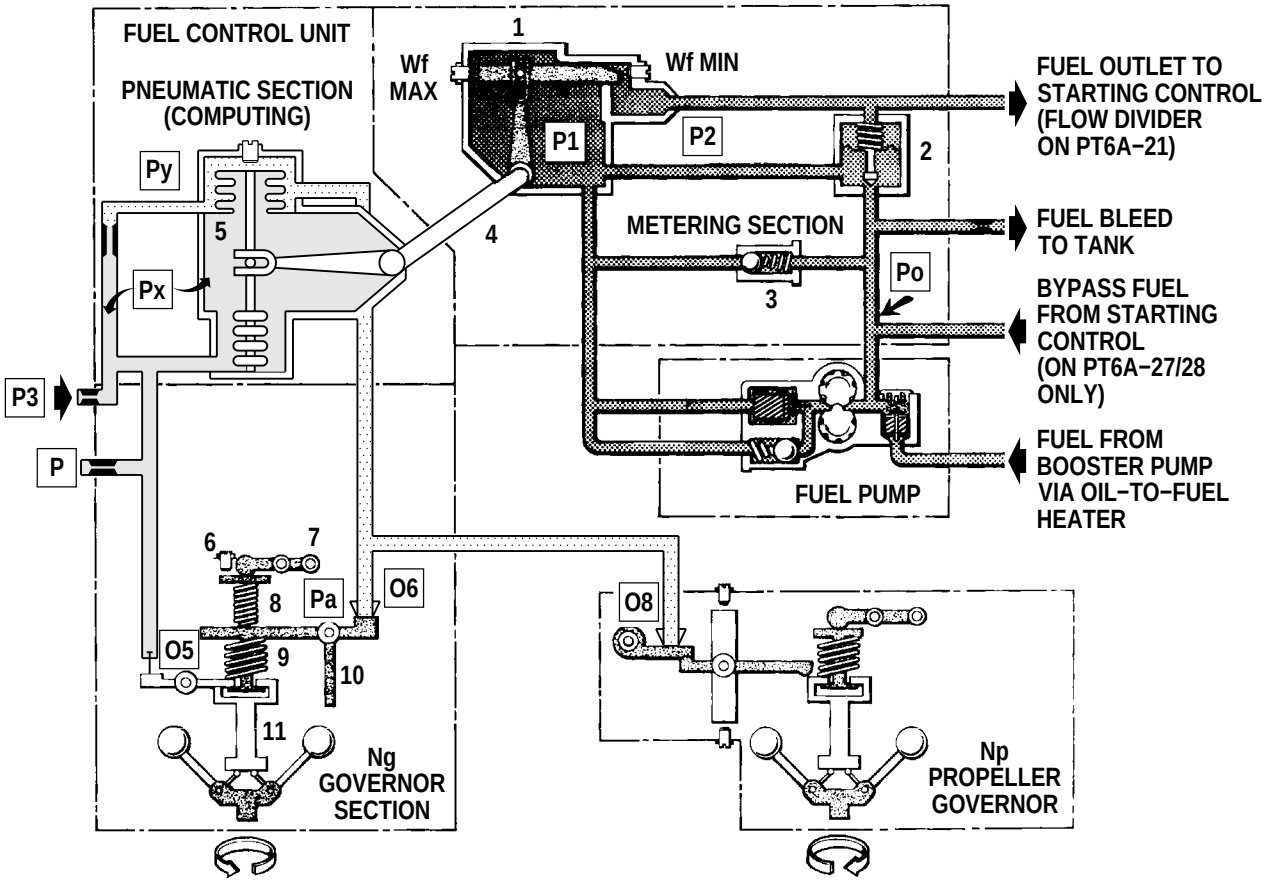
      A hign pressure relief valve is incorporated in parallet with the bypass valve to prevent excessive P1 pressure in the FCU. The valve is spring loaded closed and remains closed until the inlet pressure (P1) overcomes the spring force and opens the valve to Po. As soon as the pressure is reduced to an acceptable value, the valve closes.

      The metering valve consists of a contoured needle operating in a sleeve, and regulating the flow of fuel by varying the orifice area. Fuel flow after initial start is a function of metering valve position only because the bypass valve maintains an essentially constant differential pressure across the orifice regardless of fuel input or discharge pressure variations.

      An external adjustment is provided on the bypass valve spring cover to permit variation of acceleration rate, and acceleration matching, on multi-engined installations.

      Variations in specific gravity of the fuel resulting from changes in fuel temperature is compensated for with bimetallic disks installed under the bypass valve spring.

   B. Power Input and Speed Governing Section (Ref. Figs. 1 and 2)



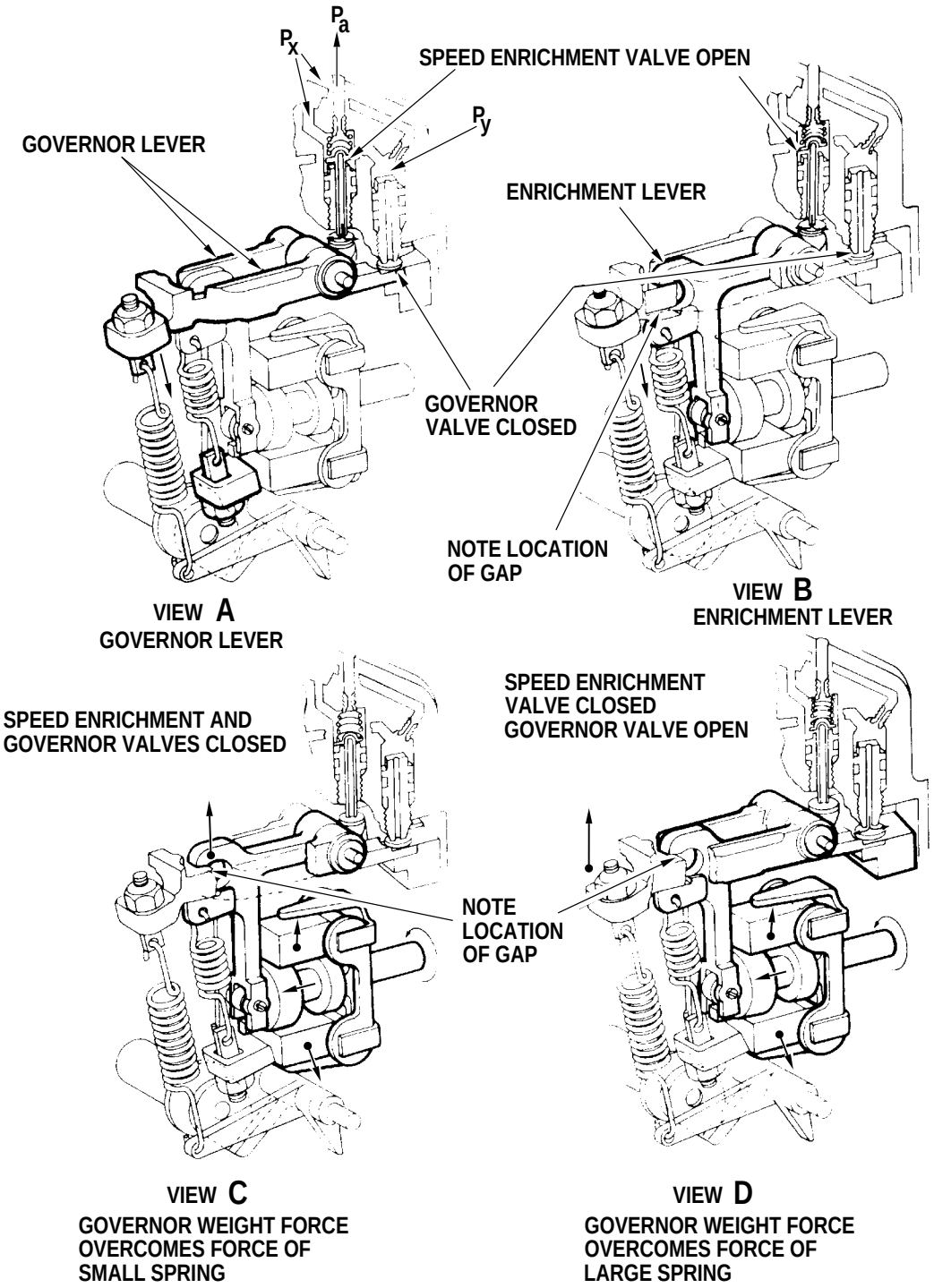
LEGEND

1. FUEL METERING VALVE
2. BYPASS VALVE
3. HIGH PRESSURE RELIEF VALVE
4. TORQUE TUBE ASSEMBLY
5. ROD
6. IDLE SPEED ADJUSTMENT
7. SPEED SET LEVER
8. GOVERNOR SPRING
9. ENRICHMENT SPRING
10. LINK
11. COMPRESSOR TURBINE GOVERNOR PLATFORM

Pa AMBIENT AIR
P1 UNMETERED PUMP DELIVERY FUEL
P2 METERED FUEL
P3 COMPRESSOR DISCHARGE AIR
Po BYPASS FUEL
Px ENRICHMENT PRESSURE
Py GOVERNING PRESSURE
O5 ENRICHMENT ORIFICE
O6 GOBERNING ORIFICE
O8 PROPELLER GOVERNOR
Nf SECTION ORIFICE

C7949B

Fuel Control Unit Schematic
Figure 1



C451

FCU/Governor Drive Body Assembly - Operation
Figure 2

The enrichment lever provides a mechanical link between the governor spool and governor lever. The power input shaft incorporates a speed scheduling cam which depresses a cam follower lever when power is increased. A spring connects the cam follower lever to the governor lever. The governor lever is pivoted and one end operates against an airflow restrictor to form the governor valve. The enrichment lever pivots at the same point as the governor lever and has two extensions which straddle a portion of the governor lever so that after a slight movement, a gap closes and both levers move together (Ref. Fig. 2, View A and View B). A smaller spring connects the enrichment lever to the governor lever. A roller on the arm of the enrichment lever contacts the end of the governor spool.

The speed scheduling cam applies tension to the governor spring through an intermediate lever/cam roller linkage which applies a force to close the governor valve.

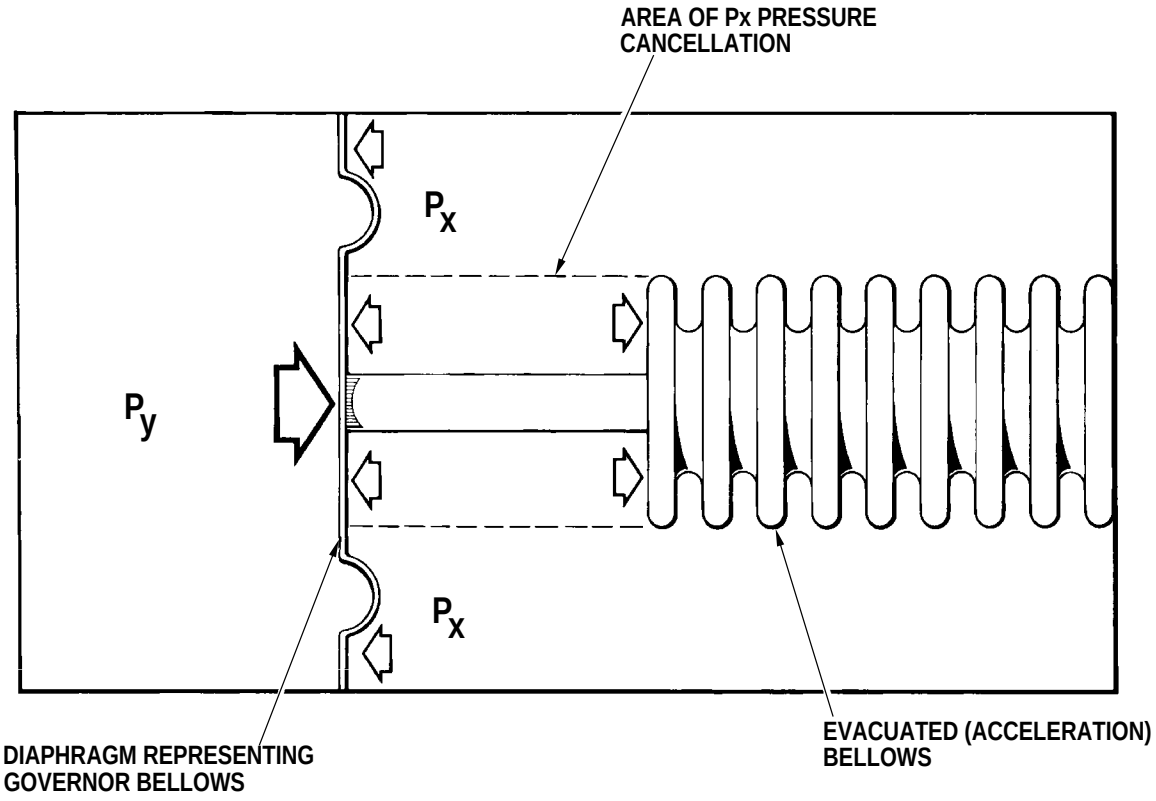
As the drive shaft revolves, it rotates a table to which the governor weights are attached. Small levers on the inner face of the weights contact the base of the governor spool. As the Ng increases, the drive shaft rotates faster; this causes the weights to pivot outward under centrifugal force, which in turn causes the small levers to exert an increasing force on the spool. This moves the spool outward on its shaft to bear against the enrichment lever roller. As governor weight force overcomes opposing spring force, the governor valve is opened. The enrichment lever will start to move whenever the Ng increases enough to cause the weight force to overcome the force of the smaller spring, until the lever contacts the governor lever (Ref. Fig. 2, View C). The governor valve will open if the Ng increases sufficiently to cause the weight force to overcome the force of the larger spring. At this point, the governor valve will be open (Ref. Fig. 2, View D).

A drain hole is incorporated to vent the inner cavity to ambient atmospheric pressure (Pa). Modified compressor discharge pressure (Px) is bled off to the atmosphere when the governor valve is open.

C. Computing Section (Ref. Figs. 1 and 3)

The computing section consists of an evacuated (acceleration) bellows and a governing bellows connected by a common rod. The end of the acceleration bellows, opposite the rod, is attached to the body casting. The acceleration bellows provides an absolute pressure reference. The governor bellows is secured in the body cavity and its function is similar to that of a diaphragm. Movement of the bellows is transmitted to the metering valve by the cross shaft and associated levers. The cross shaft moves within a torque tube assembly which is attached to the cross shaft near the bellows lever. The torque tube is secured in the body casting at the opposite end by an adjustment bushing. Therefore, any rotational movement of the cross shaft will result in an increase and decrease in the force of the torque tube. The torque tube forms the seal between the computing and metering sections of the FCU. The tube is positioned during assembly to provide a force in a direction tending to close the metering valve while the governor bellows act against this force to open the valve. Py pressure is applied to the outside of the governor bellows, while Px pressure is applied to the inside of the bellows and to the outside of the acceleration bellows.

For explanation purposes (Ref. Fig. 3), the governor bellows is shown as a diaphragm. Py pressure is applied to one side of the ‘‘diaphragm’’ and Px pressure is applied to the other side. Px pressure is also applied to the outside of the acceleration bellows which



C3029

FCU Computing Section Functional Diagram
Figure 3

is also attached to the diaphragm. The force of Px applied against the acceleration bellows is cancelled by application of the same pressure on an equal area of the diaphragm, as the forces act in opposite directions. All pressure forces applied to the computing section can be resolved into forces acting on the diaphragm only. The forces are:

(a) Py pressure acting on the entire surface on one side.

(b) Px pressure acting on the opposite surface partially cancelled by the effect of Px acting on the face of the evacuated bellows connected to the governor bellows.

Any change in Py will therefore have more effect on the diaphragm than an equal change in Px pressure, due to difference in effective area.

Px and Py vary with changing engine operating conditions as well as inlet air temperature. When both pressures increase simultaneously, as during acceleration, the bellows cause the metering valve to move in an opening direction. When Py decreases as the desired Ng is approached (for governing after acceleration), the bellows will travel to reduce the opening of the metering valve. When both pressures decrease simultaneously, the bellows will travel to reduce the metering valve opening because a change in Py is more effective than the same change in Px. This occurs during deceleration and moves the metering valve to its minimum flow stop.

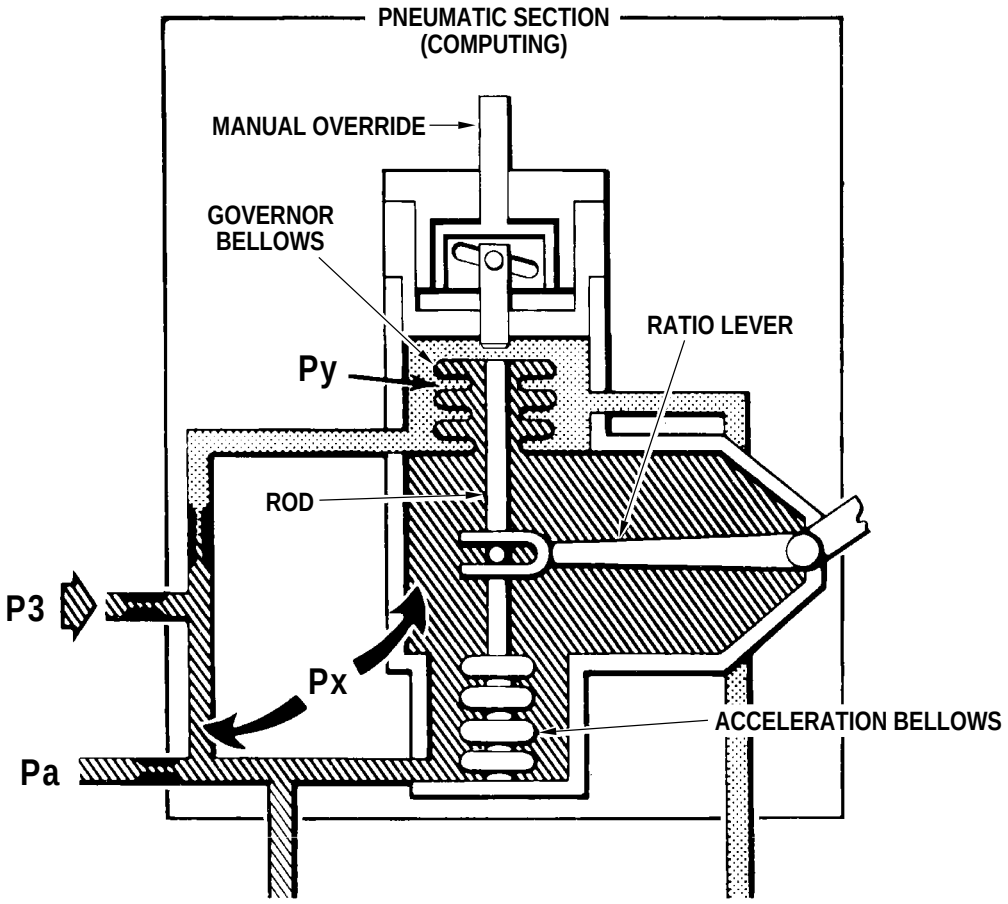
D. Manual Override System (Post-SB1469, PT6A-27 Engines) (Ref. Fig. 4)

On FCU's incorporating the manual override system, the retaining plate and cover containing the governor bellows stop are replaced by a shaft and stop assembly, which, if operated after a pneumatic failure, pushes against the end of the governor bellows to increase fuel flow.

The shaft and stop assembly consists of an actuating shaft incorporating spiral slots; a driving pin fits in the slots, passing through and activating an operating pin. When the actuating shaft is turned, the driving pin, which cannot rotate, moves in or out dependant on the slot position. Subsequent movement of the perating pin against the end of governor bellows opens the metering valve and increases fuel flow. In the OFF position, the operating pin acts as bellows travel stop.

E. Power Turbine (Nf) Governor (Ref. Fig. 1)

The power turbine Nf governor section of the propeller governor (Ref. 61-20-00) senses Py pressure through an external pneumatic line from the computing section of the FCU to the Nf governor. In the event of a power turbine overspeed condition, a governing orifice (08) in the Nf governing section is opened by flyweight action of the governor to bleed off Py pressure through the governor to atmosphere. When this occurs, Py pressure acting on the FCU governor bellows decreases and moves the metering valve in a closing direction, thus reducing fuel flow; this in turn decreases Ng speed and consequently Nf speed. The speed at which the Nf governing orifice (08) opens is dependent on the setting of the propeller governor speed set control and the setting of the Nf reset arm.



C11295A

Manual Override System
Figure 4

Normally, the Nf governing orifice (08) is opened at six percent above propeller governing speed setting with the Nf governor reset arm at maximum position and approximately four percent under propeller governor speed setting at minimum position. In reverse thrust, the propeller reversing interconnect linkage resets the Nf governor reset arm to a setting below the propeller governor speed set lever setting. Power turbine (Nf) speed, and hence propeller speed, is then limited by the Nf governor. Power from the gas generator is reduced to allow a propeller speed approximately four percent under the speed set by the propeller governor.

FUEL CONTROL UNIT - MAINTENANCE PRACTICES

1. General

   A. Maintenance personnel should make reference to the INTRODUCTION section and Chapter 70-00-00, STANDARD PRACTICES of this manual to familiarize themselves with general procedures.

   B. Install suitable protective caps/covers over all disconnected tubes/lines and component openings.

   C. Lockwire used shall comply with specification AMS 5687, heat and corrosion resistant steel wire MS9226-03 which is 0.025 inch diameter, and will not be called out in instructions.

2. Consumable Materials

   The consumable materials listed below are used in the following procedures.

Item No.	Name
PWC01-001	Fuel, Engine
PWC03-001	Oil, Engine
PWC03-002	Fluid, Calibrating
PWC05-061	Cloth, Abrasive Coated Crocus
PWC05-077	Oil, Preservative
PWC05-101	Cloth, Abrasive
PWC05-166	Solution, Chemical Treatment
PWC05-168	Compound, Polishing
PWC06-002	DELETED (Use PWC03-001)
PWC11-027	Solvent, Petroleum
PWC11-031	Cleaner, Engine
PWC11-038	Solvent, Cleaning

3. Special Tools

   Not Applicable

4. Fixtures, Equipment and Supplier Tools

   The fixtures, equipment and supplier tools listed below are used in the following procedures.

Name	Remarks
FCU Shipping Stand	P/N 2529654

5. Removal/Installation

A. Removal of Fuel Control Unit (PT6A-21 Engines) (Ref. Fig. 201)

NOTE: If the FCU is to stored off the engine, prepare the FCU for short or long term storage (Ref. Storage) after removal is complete.

(1) Disconnect fuel input hose from elbow fitting (18) on fuel control unit (1). Cap end fittings.

(2) Disconnect fuel delivery line from elbow fitting (22) on FCU. Cap end fittings.

(3) Disconnect coupling nuts of compressor delivery tube (P3) and propeller governor tube (Py) from respective elbow fittings (11 and 2) on FCU. Cap end fittings.

(4) Remove cotterpin, castellated nut, washer and bolt securing FCU reversing interconnect rod to fuel control unit arm (16).

(5) Remove four self-locking nuts (6) and washers (7) that secure fuel control unit (1) to fuel pump. Remove FCU from mounting studs.

(6) Remove fuel control-to-fuel pump coupling (12) and preformed packings (13).

(7) If fuel control unit is being replaced, remove fuel control arm extension (15), fuel control unit arm (16) and serrated spacer (14), and retain for installation on replacement unit. Install spacer (23), castellated nut (24) and retain with cotterpin (25) on removed unit.

NOTE: It is assumed shipping parts, items 23, 24 and 25 are available.

(8) Remove elbow fittings (2 and 11) and associated packings, retainers and jam nuts from respective ports on FCU, and retain for installation on replacement unit.

NOTE: Do not remove elbow fittings (18 and 22).

B. Installation of Fuel Control Unit (PT6A-21 Engines) (Ref. Fig. 201)

CAUTION: VARIOUS COMPONENTS ON THE FUEL CONTROL UNIT ARE LOCKWIRED AND SEALED. ENSURE ALL SUCH SEALS ARE INTACT PRIOR TO INSTALLATION AND ARE NOT TAMPERED WITH. UNITS WITH BROKEN SEALS MUST BE RETURNED TO OVERHAUL FOR RECALIBRATION.

NOTE: When a replacement FCU is being installed, check the length of storage and do reconditioning after storage (Ref. Storage).

(1) When a replacement fuel control unit (1) is being installed, depreserve, and assemble fittings (Ref. Para. A.) prior to installation:

NOTE: Depreservation is not required when original fuel control unit is being installed.

(a) Remove shipping caps from fuel inlet and outlet fittings. Ensure that air section of unit is sealed with shipping plugs and/or caps in Py and P3 ports.

(b) Drain as much residual preservation fluid as possible from fuel section of unit.

(c) Flush fuel section of unit with fuel (PWC01-001) that has been passed through a 10-micron (nominal) filter, until all preservation fluid has been removed. Ensure residual flushing fuel is drained from unit.

(d) Remove shipping plug from P3 port and assemble nut (10), back-up ring (9), and preformed packing (8), on elbow and metering plug (11). Install elbow in P3 inlet port of unit. (Ref. 70-00-00.) Cap elbow to prevent ingress of foreign material until unit is ready for installation.

NOTE: After installation of elbow and metering plug (11), do not final torque locknut (10). Final torquing will be done at a later stage of installation.

(e) Remove shipping plug from Py port and assemble nut (3), back-up ring (4), and preformed packing (5) on elbow (2). Install elbow in Py port of unit (Ref. 70-00-00.) Cap elbow to prevent ingress of foreign material until unit is ready for installation.

(2) Install fuel control-to-fuel pump coupling (12) on driveshaft of fuel control unit (1).

(3) Install preformed packing (13) in recess in mounting face to fuel pump; lubricate with engine oil (PWC03-001).

(4) Position fuel control unit (1) on studs of fuel pump, push in to engage splines of coupling (12) and pump driveshaft and, as mounting flanges meet, ensure preformed packing (13) is not displaced. Secure FCU to pump with four washers (7) and self-locking nuts (6). Tighten nuts and torque 75 to 85 lb.in.

(5) When a replacement fuel control unit is being installed, remove shipping components, item (23, 24 and 25) from FCU and retain. Install serrated spacer (14), together with FCU arm (16) on FCU and engage serrations with arm set at approximate position to that on original unit. Secure with FCU arm extension (15) and tighten fingertight.

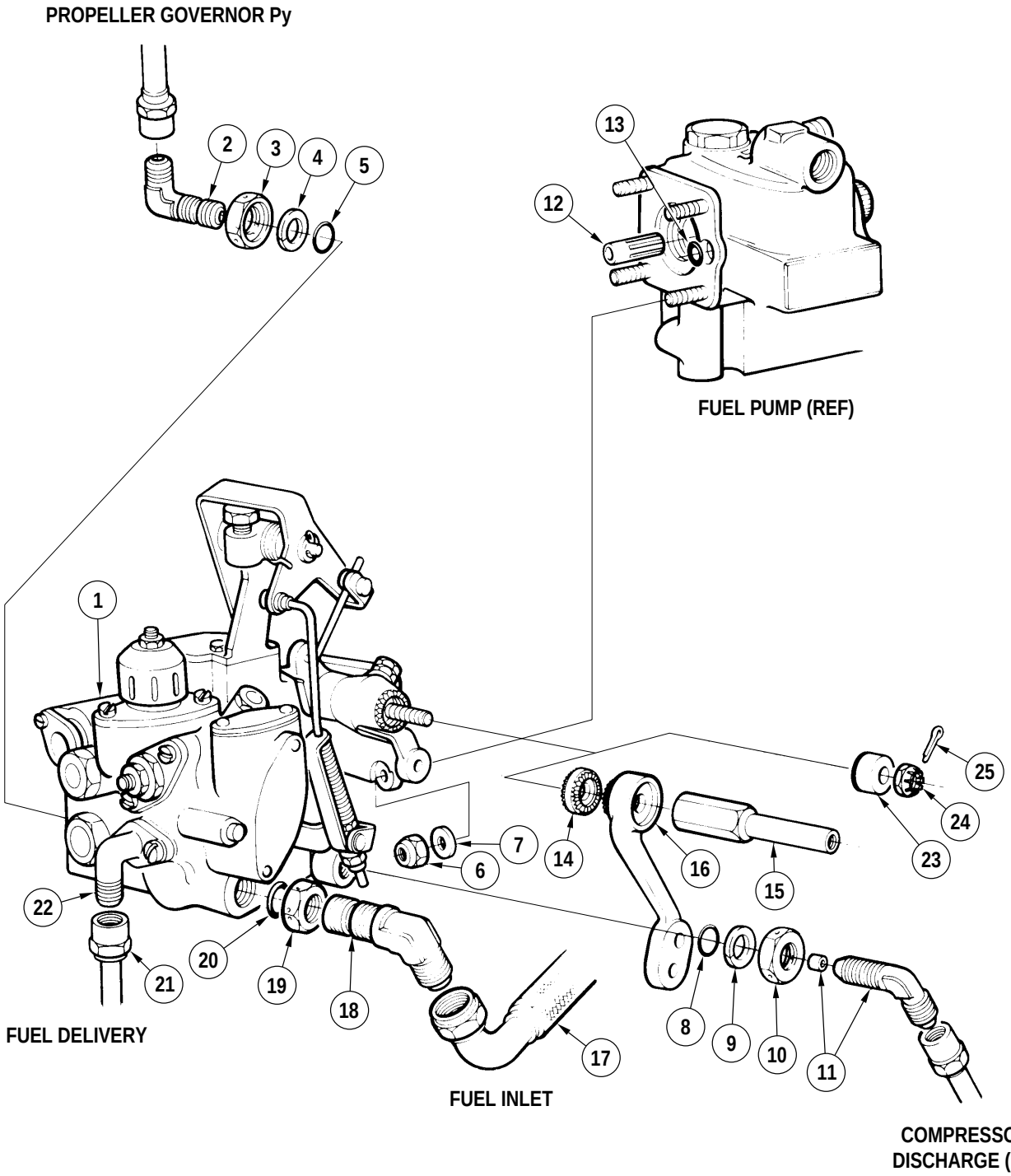
(6) Connect FCU reversing interconnect rod and adjust as required (Ref. 76-10-00) . Align inner hole in FCU arm (16) with hole in rod end connector of FCU reversing linkage by rotating arm (16) and serrated spacer (14) around on serrations. Alignment is achieved when a bolt can be inserted freely through holes in arm and rod end connector. Refer to Rigging Instructions in relevant airframe manual.

(7) After adjustment, tighten extension (15), torque 25 to 35 lb.in., and lockwire.

(8) Secure FCU reversing interconnect rod to inner hole in FCU arm (16) with bolt, washer and castellated nut. Tighten nut and torque 12 to 18 lb.in., ensuring slots in nut are aligned with hole in bolt within torque limit. Install and lock cotterpin.

NOTE: Do not lockwire connections of air pressure lines. Lockwiring must be done after pressure test (Ref. 73-10-07, Adjustment/Test.)

(9) Connect coupling nuts of compressor delivery (P3) and propeller governor (Py) tubes to elbow fittings (11 and 2) respectively. Final torque locknuts (10 and 3) respectively 38 to 42 lb.in. Tighten coupling nuts, torque 90 to 100 lb.in.



PT6A-21 C7915A

Removal/Installation of Fuel Control Unit
Figure 201

Key to Figure 201

1. Fuel Control Unit (FCU)
2. Elbow
3. Locknut
4. Back-up Ring
5. Preformed Packing
6. Self-locking Nut
7. Washer
8. Preformed Packing
9. Back-up Ring
10. Locknut
11. Elbow and Metering Plug
12. Coupling
13. Preformed Packing
14. Serrated Spacer
15. Arm Extension
16. Fuel Control Arm
17. Fuel Input Hose
18. Elbow
19. Locknut
20. Preformed Packing
21. Fuel Delivery Line
22. Fuel Delivery Elbow
23. Spacer
24. Castellated Nut
25. Cotterpin

(10) Connect coupling nut of fuel inlet hose (17) to elbow fitting (18) on FCU. Tighten nut, torque 270 to 300 lb.in., and lockwire.

CAUTION: IT MAY BE NECESSARY TO CHANGE THE ANGULAR POSITION OF FUEL CONTROL INLET ELBOW (18) TO ACHIEVE CORRECT ALIGNMENT OF HOSE (17), IN WHICH CASE INSTRUCTIONS IN STANDARD PRACTICES (REF. 70-00-00) MUST BE OBSERVED TO AVOID DAMAGE TO THE PREFORMED PACKING, WITH RESULTANT LEAKAGE.

(11) Connect coupling nut of fuel delivery tube (21) to elbow fitting (22) on FCU. Tighten nut, torque 90 to 100 lb.in., and lockwire.

(12) Do pressure leak test on FCU pneumatic system (Ref. 73-10-07).

(13) Check FCU operation and for leakage at next engine test (Ref. Adjustment/Test).

C. Removal of Fuel Control Unit (PT6A-27 and PT6A-28 Engines) (Ref. Fig. 202)

NOTE: If the FCU is to stored off the engine, prepare the FCU for short or long term storage (Ref. Storage) after removal is complete.

(1) Provide suitable drip pan for residual fuel spillage.

(2) Disconnect the following lines from fuel control unit (6):

(a) Fuel inlet line (16) from elbow (17).

(b) Fuel delivery line (18) from elbow (19).

(c) Fuel bypass line (20) from fluid connector (24).

(d) Air pressure line (14) from metered elbow (13).

(e) Air pressure line (1) from elbow (2).

(3) Disconnect reversing linkage control rods (9 and 15) (Ref. 76-10-00).

(4) Remove four self-locking nuts and washers securing fuel control unit (6) to studs on fuel pump. Carefully remove unit from pump.

(5) Remove coupling (7).

(6) Remove preformed packing (8) from bypass port in pump.

(7) Cap all lines and open ports.

(8) If fuel control unit is being replaced, remove fuel control arm extension (30), fuel control arm (29) and serrated spacer (28) and retain for installation on replacement unit. Install spacer (31), castellated nut (32) and retain with cotterpin (33) on removed unit.

(9) Remove line fittings (2, 13 and 24) and associated parts from respective parts on FCU, and retain for installation on replacement unit.

NOTE: Do not remove elbow fittings (17 and 19).

D. Installation of Fuel Control Unit (PT6A-27 and PT6A-28 Engines) (Ref. Fig. 202)

CAUTION: VARIOUS COMPONENTS ON THE FUEL CONTROL UNIT ARE LOCKWIRED AND SEALED. ENSURE ALL SUCH SEALS ARE INTACT PRIOR TO INSTALLATION AND ARE NOT TAMPERED WITH. UNITS WITH BROKEN SEALS MUST BE RETURNED TO OVERHAUL FOR RECALIBRATION.

NOTE: When a replacement FCU is being installed, check the length of storage and do reconditioning after storage (Ref. Storage).

(1) If fuel control unit to be installed is a replacement unit, depreserve and assemble fittings removed in Para. C.:

CAUTION: BEFORE FLUSHING, ENSURE AIR SECTION OF UNIT IS WELL SEALED TO PREVENT CONTAMINATION BY ENTRY OF FUEL.

(a) Remove shipping caps and covers from replacement unit.

(b) Flush fuel section of unit with fuel (PWC01-001), that has been passed through a 10-micron (nominal) filter, until all preservation fluid has been removed. Make sure residual flushing fuel is drained from unit.

NOTE: After installation of elbow (2) and metered elbow (13), do not final torque locknuts (3) and (12). Final torquing will be done at a later stage of installation.

(c) Install elbow (2) with locknut (3), back-up ring (4) and preformed packing (5) (Ref. 70-00-00). Cap elbow to prevent ingress of foreign material until unit is ready for installation.

(d) Install metered elbow (13) with locknut (12), back-up ring (11) and preformed packing (10) (Ref. 70-00-00). Cap elbow to prevent ingress of foreign material until unit is ready for installation.

NOTE: Elbow (13) is unmetered on Pre-SB1123 engines.

(e) Install fluid passage bolt (26) with preformed packing (27). Tighten bolt, torque to 90 to 100 lb.in., and lockwire.

(f) Install preformed packing (25) and fluid connector (24) on passage bolt (26). Secure with locknut (21), back-up ring (22) and preformed packing (23). Locknut to be fingertight.

(2) Install preformed packing (8) in bypass port in mounting face of pump; lubricate with engine oil (PWC03-001).

(3) Install coupling (7) in output drive of pump.

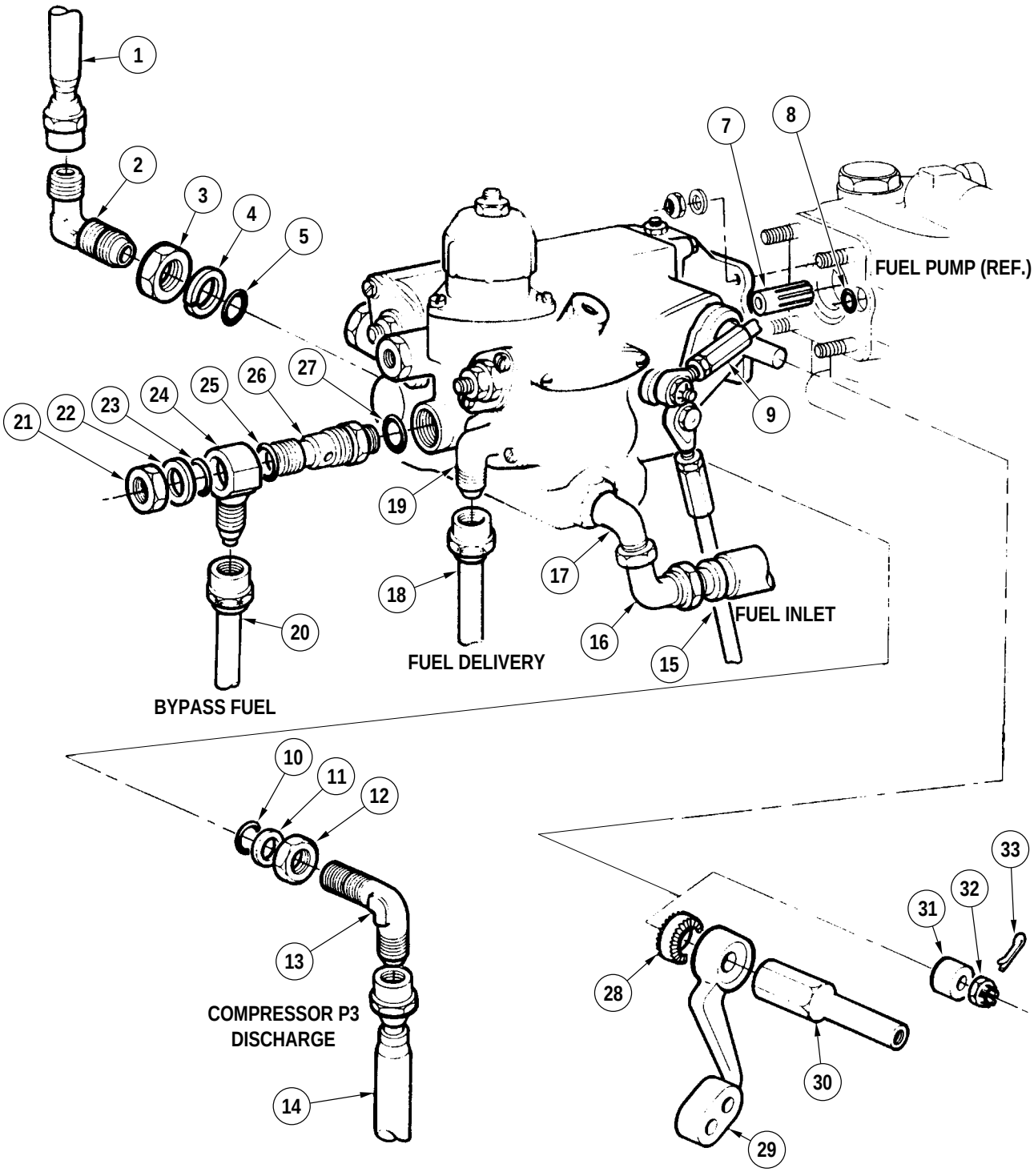
(4) Position fuel control unit (6) on studs of fuel pump, push in to engage splines of coupling (7) and pump driveshaft and, as mounting flanges meet, ensure preformed packing (8) is not displaced. Secure FCU to pump with four washers and self-locking nuts. Tighten nuts and torque to 75 to 85 lb.in.

(5) Reconnect fuel and air pressure lines:

(a) Connect fuel bypass line (20) to fluid connector (24); tighten locknut (21), torque to 38 to 42 lb.in., and lockwire. Tighten coupling nut of line, torque to 90 to 100 lb.in., and lockwire.

(b) Connect fuel delivery line (18) to elbow (19). Tighten coupling nut, torque to 90 to 100 lb.in., and lockwire.

NOTE: Do not lockwire connections of air pressure lines. Lockwiring must be done after pressure test (Ref. 73-10-07, Adjustment/Test)



PT6A-27 and PT6A-28 C7914

Removal/Installation of Fuel Control Unit
Figure 202

Key to Figure 202

1. Air Pressure Line (Py)
2. Elbow
3. Locknut
4. Back-up Ring
5. Preformed Packing
6. Fuel Control Unit
7. Coupling
8. Preformed Packing
9. Control Rod (to cambox)
10. Preformed Packing
11. Back-up Ring
12. Locknut
13. Elbow and Metering Plug (Unmettered on Pre-SB1123 engines)
14. Air Pressure Line (P3)
15. Control Rod (to start control unit)
16. Fuel Inlet Line
17. Elbow
18. Fuel Delivery Line
19. Fuel Delivery Elbow
20. Fuel Bypass Line
21. Locknut
22. Back-up Ring
23. Preformed Packing
24. Fluid Connector
25. Preformed Packing
26. Fluid Passage Bolt
27. Preformed Packing
28. Serrated Spacer
29. Fuel Control Arm
30. FCU Arm Extension
31. Spacer
32. Castellated Nut
33. Cotterpin

(c) Connect air pressure line (1) to elbow (2); final torque locknut (3) to 38 to 42 lb.in. Tighten coupling nut of line and torque to 90 to 100 lb.in.

(d) Connect air pressure line (14) to elbow and metering plug (13); final torque locknut (12) to 38 to 42 lb.in. Tighten coupling nut of line and torque to 90 to 100 lb.in.

(e) Connect fuel inlet line (16) to elbow (17). If a new unit is installed, torque locknut on elbow to 70 to 80 lb.in. Tighten coupling nut of line, torque to 270 to 300 lb.in., and lockwire.

(f) If new or replacement FCU is being installed, remove cotterpin (33), castellated nut (32) and spacer (31) from FCU and install serrated spacer (28), fuel control arm (29) and FCU arm extension on FCU. Tighten extension fingertight only.

(g) Reconnect FCU reversing interconnect rod (9) and starting control rod (15) to FCU and adjust as required (Ref. 76-10-00).

(h) Lockwire all connection locknuts.

6. Cleaning/Painting

A. General Cleaning

(1) Clean the exterior surfaces of the fuel control unit with solvent (PWC11-027) or (PWC11-031). To prevent the cleaning agent from entering the unit, do not remove the blanking caps and plugs.

(2) Wipe the surfaces dry with clean, lint-free cloths to remove all residual solvent and contamination.

B. Compressor Delivery Px Metering Plug (Ref. Figs. 201 and 202)

CAUTION: AVOID MIXING THE ELBOW (2) AND THE METERED ELBOW (11, Fig. 201; 13, Fig. 202) WITH SIMILAR PARTS AND MAKE SURE THAT THE ORIGINAL METERED ELBOW WITH THE METERING PLUG IS REINSTALLED. DO NOT REMOVE THE METERING PLUG FROM THE ELBOW FOR CLEANING.

(1) If the fittings were not removed from the fuel control unit (11 or 13 as applicable, note the angular position of the metered elbow (11, Fig. 201; 13, Fig. 202), loosen the locknut, and remove the elbow from the unit.

NOTE: Elbow (13) is unmettered on Pre-SB1123 engines.

(2) Flush the elbow and metering plug assembly in solvent (PWC11-027) or (PWC11-031) and make sure that all contamination is removed.

(3) Clean all foreign matter from the metering plug using an unpainted wooden dowel and flush with solvent (PWC11-027) or (PWC11-031).

(4) Dry the parts with clean, dry compressed air.

(5) Reinstall the elbows on the fuel control unit (1), positioning the elbows at the same angles noted during removal and tighten the locknuts. Torque the locknuts 38 to 42 lb.in., and secure the nut to the FCU with lockwire.

7. Inspection/Check

A. General

(1) Examine the mounting flange, housings and components of the lever mechanism for cracks and other surface defects. Cracks are not permissible; minor defects may be repaired.

(2) Examine the Po and drain ports for damage to the internal threads.

(3) Examine the elbow fittings for damage to threads.

(4) Check for signs of external leakage (Ref. Fig. 203):

(a) Leakage from the fuel pump/FCU seal drain port should not exceed 20 cc per hour maximum. No leakage is permitted from the fuel pump/FCU casting or interconnect line. Inspect the FCU driveshaft bearing for fuel and/or oil contamination. If leakage from the unit or line exceeds the limit or contamination is suspected or evident, ship the unit to an overhaul facility/repair or replace the line, as applicable.

(b) Check for evidence of blue dye or fuel leakage from the vent hole on the underside of the FCU; none is acceptable; if evident, ship the unit to an overhaul/repair facility.

(c) Coupling drive oil leakage from the fuel pump drain should not exceed 3 cc per hour; if the limit is exceeded, replace the plain seal on the accessory pad. Inspect FCU driveshaft bearing for fuel and/or oil contamination. If contamination is suspected or evident, ship unit to an overhaul/repair facility.

(d) Check for evidence of leakage at the bypass port preformed packing or fuel pump driveshaft seal. If leakage is evident at the bypass port, replace the preformed packing. If leakage is evident at the shaft seal, ship the unit to an overhaul/repair facility.

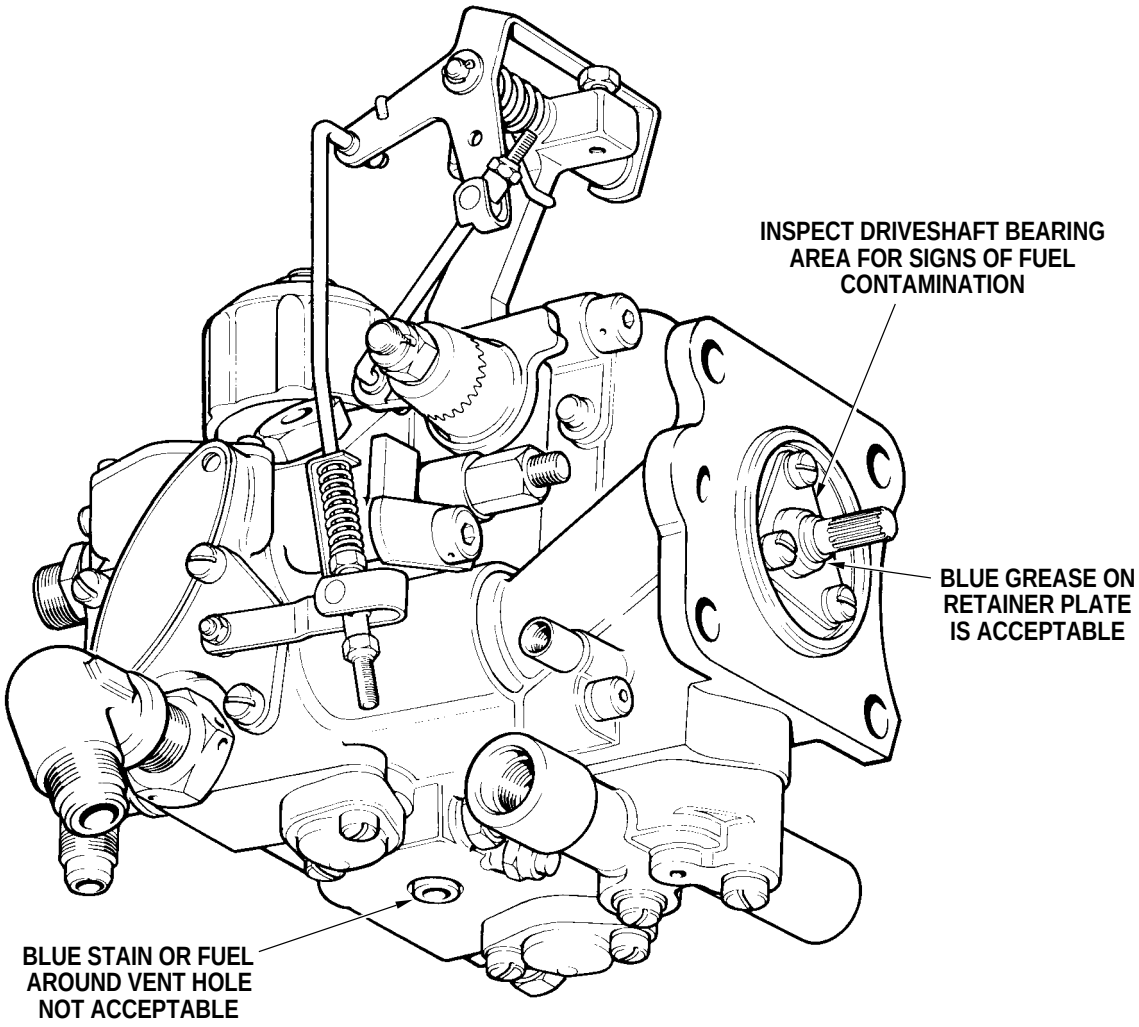
NOTE: The above limits are during engine operation.

(5) Examine external surfaces for corrosion and for general condition of the anodic treatment.

(6) Remove the FCU (Ref. Removal/Installation) and ship to an approved overhaul facility for a drivebody inspection driveshaft bearing replacement (Ref. Chapter 72-00-00, INSPECTION).

B. Lockwire and Seals

(1) Examine the lockwire and seals for security and damage. If any seal indicates tampering, or if the lockwire is broken, ship the unit to an overhaul facility for recalibration.



C41457A

Fuel Control Unit (FCU) (Typical) - Inspection/Check
Figure 203

CAUTION: TO MAKE SURE CALIBRATION AND OPERATION HAS NOT BEEN AFFECTED, DO NOT REPLACE A LOCKWIRED SEAL UNTIL THE UNIT HAS BEEN CHECKED.

(2) Examine the remainder of the lockwire and replace if damaged or broken.

8. Approved Repairs

A. General Repairs

NOTE: Clean all areas and apply corrosion preventive treatment to aluminum surfaces after carrying out minor repairs. Do not allow filings and dirt to enter the fuel control unit during the repair.

(1) Minor surface damage such as burrs, nicks, scores, scratches and similar defects may be cleaned up by local blending with a fine stone or crocus cloth (PWC05-061), making sure that all high spots and sharp edges are removed.

(2) Clean up minor thread damage in the drain and Po ports with a suitable swiss file, or chase threads 7/16-20 UNJF-3B.

(3) Clean up minor thread damage on the elbow fittings with a suitable swiss file, or chase with appropriately sized die. Replace the fittings if thread damage is severe.

B. Corrosion Removal

NOTE: Only light surface corrosion may be removed from the housing. Severe corrosion, indicated by surface etching and/or heavy pitting, is cause for rejection of the unit.

(1) Remove the corrosion using one of the following methods:

(a) Mask off the areas around the corrosion and vapor blast to remove the corrosion, using No. 1200 grit (PWC05-168) or finer.

(b) Carefully polish with No. 400 grit abrasive cloth (PWC05-101) followed by crocus cloth (PWC05-061) and blend into the surrounding area.

(2) Apply anti-corrosion treatment, in accordance with the procedure given in Subpara. C. following, to all repair areas.

C. Application of Anodize Surface Treatment

(1) The anodic anti-corrosion finish on the surfaces of the housings may be repaired by local application of a chemical treatment solution (PWC05-166). This treatment must be used on areas where minor repairs have been done by local blending and/or polishing. To apply the treatment, proceed as follows:

(a) Prepare the surface by swabbing with cleaning solution (PWC11-038). Keep the surface wetted with cleaning agent for one to five minutes.

(b) Rinse with clean water to remove all traces of the cleaning agent.

WARNING: ALODINE SOLUTION IS EXTREMELY DANGEROUS. IT CONTAINS AN OXIDIZING INGREDIENT WHICH CAN CAUSE AN EXPLOSION IF IT COMES IN CONTACT WITH COMBUSTIBLE MATERIALS SUCH AS PAINTS AND SOLVENTS.

WARNING: DURING THE USE OF ALODINE SOLUTION, AVOID BREATHING THE VAPORS; USE ONLY WITH ADEQUATE VENTILATION. WEAR CHEMICAL SAFETY GOGGLES AND RUBBER GLOVES WHEN HANDLING. IN CASE OF SKIN CONTACT, WASH WITH SOAP AND WATER; IF IRRITATION APPEARS AND PERSISTS, CONSULT A PHYSICIAN (MEDICAL DOCTOR). IN CASE OF EYE CONTACT, FLUSH EXTENSIVELY WITH FRESH WATER AND CONSULT A PHYSICIAN IMMEDIATELY.

(c) Apply the chemical treatment solution (PWC05-166) to the prepared surface by brush, swab, or spray method and allow three to five minutes setting time.

(d) Rinse with clean water to remove all excess chemical treatment solution and allow the surface to air dry.

(e) Examine the coating and make sure the repair area is completely covered. Reapply the treatment as necessary.

9. Adjustment/Test

Do a functional check of the fuel control unit during the next engine test run (Ref. 71-00-00).

10. Storage

A. Preservation of FCU

(1) Short term storage - 28 days or less:

CAUTION: DO NOT PERMIT FUEL OR OIL TO ENTER THE DRIVE BODY CAVITY OR ANY AIR PRESSURE PORTS.

(a) Fill the fuel section of the FCU with calibrating fluid (PWC03-002) filtered through a 10 micron filter.

(b) Install caps and plugs in all ports of the fuel section of the FCU.

(c) Check the security of all caps and plugs in all ports of the air section of the FCU to prevent the entrance of dirt or other contaminates.

(d) Put a tag on the unit indicating date of storage.

(e) Refer to Para. C., Packaging and Shipping, for protection from dirt and other contaminants.

(f) Every ten days, check the fluid level in the fuel section of the unit and refill as necessary.

(2) Long term storage - more than 28 days:

CAUTION: DO NOT PERMIT FUEL OR OIL TO ENTER THE DRIVE BODY CAVITY OR ANY AIR PRESSURE PORTS.

(a) Drain all remaining fluid from the FCU.

(b) Fill the fuel section of the FCU with preservative oil (PWC05-077) filtered through a 10 micron filter.

NOTE: Tip the FCU as necessary to make sure that a complete film of oil goes into all ports and passages of the fuel section of the unit.

(c) Drain the excess oil as required and install caps and plugs in all ports of the fuel section of the unit.

(d) Check the security of all caps and plugs in all openings of the air section of the FCU to prevent the entrance of dirt or other contaminates.

(e) Put a tag on the unit indicating date of storage.

(f) Refer to Para. C., Packaging and Shipping, for protection from dirt and other contaminants.

B. Depreservation of FCU - Reconditioning after Storage

CAUTION: DO NOT PERMIT FUEL OR OIL TO ENTER THE DRIVE BODY CAVITY OR ANY AIR PRESSURE PORTS.

CAUTION: DO NOT ATTEMPT TO REPLACE ANY LOCKWIRE SEAL UNTIL THE FCU HAS BEEN CHECKED TO BE CERTAIN THAT CALIBRATION OR OPERATION HAS NOT BEEN EFFECTED.

(1) Inspect all lockwire and lockwire seals. Replace broken lockwire after checking the torque value of nuts, plugs, caps or screws that were lockwired.

(2) Return the unit for recalibration if any lockwire seal indicates tampering or if the lockwire is broken.

(3) For units in storage three years or less, remove the plugs and drain preservation fluid prior to the return to service. No further action is required.

(4) Three year requirement:

(a) For units in storage three years or more but less than six years, ship the unit to an approved overhaul facility (Ref. Step (6)) for the following:

1 Replacement of the drive shaft bearings in accordance with the Honeywell Accessory Overhaul Manual (ATA No. 73-20-54).

2 Inspection of all remaining drive body assembly bearings.

3 A functional test of the FCU in accordance with the Honeywell Accessory Overhaul Manual (ATA No. 73-20-54).

(5) Six year requirement:

(a) For units in storage more than six years, ship the unit to an approved overhaul facility for reconditioning.

(b) For units on engines that are inactive for more than six months and that are not preserved, remove the FCU from the engine (Ref. Removal/Installation) and ship the unit to an approved overhaul facility for reconditioning.

(6) Fuel control units may be shipped to:

Pratt & Whitney Canada Corp.
Plant 12, Accessories Business
2525, Fernand-Lafontaine
Longueuil, PQ
Canada J4N 1N7

C. Packaging and Shipping of FCU (Ref. Fig. 204)

(1) When the FCU is to be shipped or stored, prepare the unit as follows:

(a) Make sure that all shipping plugs and caps are secure.

(b) Place the FCU (2) on the shipping base (5) and secure with bolts (4).

CAUTION: THE POWER LEVER MUST BE SECURED DURING STORAGE OR SHIPPING OR ELSE DAMAGE TO THE DRIVE SHAFT OR POWER LEVER CAN RESULT.

(c) Put the power lever (6) in position and secure with lockwire (3) as shown to prevent movement during storage or shipping.

(d) Put the FCU and stand into a moisture and vapor proof container or plastic bag and seal the opening. Attach a tag to the unit indicating the date of storage.

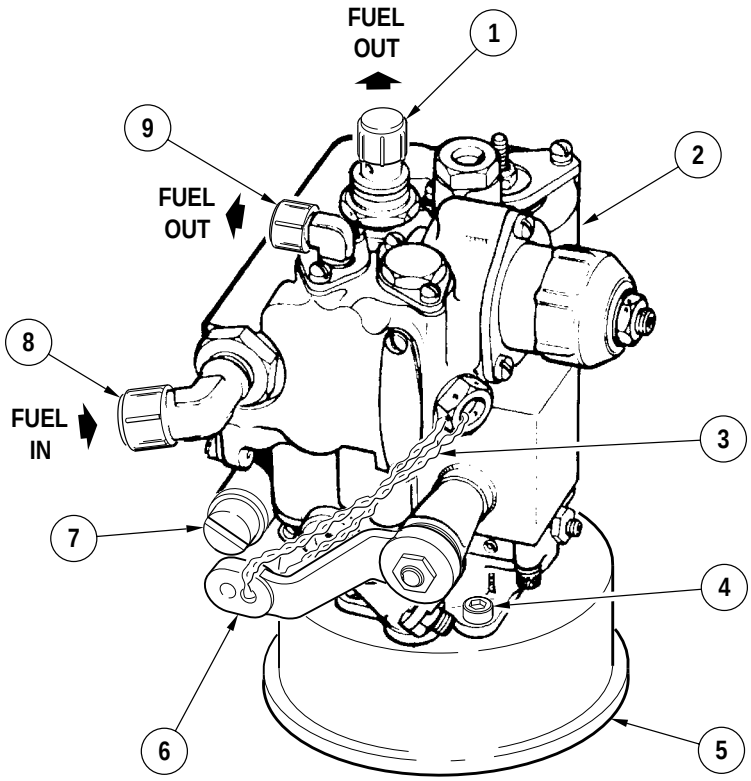
(e) Store the unit in an approved shipping carton or case.

(2) The shipping base P/N 2529654 can be purchased from:

Air Parts and Supply Company
12840 SW 84th. Avenue Rd.,
Miami, FL 33156
USA

TEL: (305) 235-5401
FAX: (305) 235-8185

THIS PAGE INTENTIONALLY LEFT BLANK



C88316

Fuel Control Unit (Typical) - Storage
Figure 204

Key to Figure 204

1. Fuel Bypass Connector and Shipping Cap/Plug
2. Fuel Control Unit
3. Lockwire
4. Bolt
5. Shipping Stand (P/N 2529654)
6. Power Lever
7. P3 Air Port and Shipping Cap/Plug
8. Fuel Inlet Connector and Shipping Cap/Plug
9. Fuel Pressure Connector and Shipping Cap/Plug