

M250-C20 SERIES OPERATION AND MAINTENANCE

Table 602 (cont) Scheduled Inspections				
Item	Inspection/Maintenance Action	REF PARA	✓	Initial
	300 Hour Inspection			
	In addition to the 100 hour and applicable 200 hour inspection items, do the following:			
	CAUTION: INSPECTION FREQUENCY MUST BE BASED ON THE NATURE OF THE EROSION AND/OR CORROSIVE ENVIRONMENT. THE OPERATING ENVIRONMENT CAN DICTATE A MORE FREQUENT INSPECTION INTERVAL. WHEN OPERATING IN A CORROSIVE AND/OR EROSION ENVIRONMENT FOR NON-COATED COMPRESSOR WHEELS, THE INSPECTION MUST NOT EXCEED 300 HOURS OR 6 MONTHS. FOR COATED COMPRESSOR WHEELS, INSPECTION MUST NOT EXCEED 300 HOURS OR 12 MONTHS. FOR COMPRESSOR BLISKS, INSPECTION MUST NOT EXCEED 300 HOURS OR 12 MONTHS. IF ANY WHEEL EXHIBITS CORROSION AND/OR EROSION, THE INSPECTION REQUIREMENT MUST REVERT BACK TO 300 HOURS OR 6 MONTHS.			
33	Inspect the compressor case, blades, and vanes when operating in an erosive and/or corrosive environment. 10X power magnification is recommended for corrosion pit inspection.	PARA 1.D.(9), this section and PARA 5.C, 72-30-00		
	CAUTION: AIRCRAFT INSTALLED-ENGINE FUEL-PUMP FILTER DIFFERENTIAL PRESSURE WARNING SYSTEMS AND/OR OPERATING EXPERIENCE CAN DICTATE REPLACEMENT AT A LESSER TIME INTERVAL. IN NO INSTANCE CAN THE 300 HR REPLACEMENT INTERVAL BE EXCEEDED.			
34	Replace the fuel filter element. This filter is a throw-away item. It is not cleanable. Before discarding filter, inspect for signs of contaminants. If any are found, inspect the entire fuel system and clean if necessary.	PARA 2.C., 73-10-01		
	CAUTION: WHEN THERE IS EVIDENCE THAT THE FUEL PUMP FILTER HAS BEEN BYPASSED, THE GAS PRODUCER FUEL CONTROL INLET FILTER, THE FUEL NOZZLE FILTER, THE GOVERNOR FILTER AND THE HIGH PRESSURE FUEL FILTER, IF APPLICABLE, MUST BE CLEANED. (REFER TO SPECIAL INSPECTIONS, 72-00-00, TABLE 604) IF ANY CONTAMINATION IS FOUND IN THE FUEL NOZZLE FILTER, THIS WILL REQUIRE THAT THE FUEL CONTROL BE SENT TO AN AUTHORIZED REPAIR FACILITY FOR INTERNAL CLEANING. REFERENCE MUST ALSO BE MADE TO THE AIRFRAME MAINTENANCE MANUAL FOR FUEL SYSTEM MAINTENANCE FOLLOWING FUEL CONTAMINATION.			
	CAUTION: PURGE AIR FROM THE FUEL SYSTEM.			
35	Do a fuel pump bypass valve operation check when a fuel filter is replaced. NOTE: Applicable to Sundstrand/Pesco and Eaton Argo-Tech/TRW manufactured pumps only.	PARA 3.A., 73-10-01		
36	Remove, clean and inspect engine P _c filter every 300 hours or earlier as engine performance dictates.	PARA 3., 73-20-06		
37	Inspect and clean the No. 1 bearing oil pressure reducer.	PARA 3., 72-30-00		

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Table 602 (cont)
Scheduled Inspections

Item	Inspection/Maintenance Action	REF PARA	✓	Initial
	<u>300 Hour Inspection (cont)</u>			
38	Visually inspect external sump. Clean internal carbonous deposits and build up from sump or replace if necessary.	PARA 7.F., 72-50-00		
39	Inspect scavenge oil strut in the power turbine support. Clean carbonous deposits from strut.	PARA 7.F., 72-50-00		
40	Inspect No. 6 and 7 bearing pressure oil nozzle. Clean internal carbonous deposits from nozzle.	PARA 7.H., 72-50-00		
41	Inspect the thermocouple assembly.	PARA 2.B., 77-20-01		
41A	Remove and disassemble fuel nozzle. Clean and inspect fuel nozzle filter assembly. Assemble and install fuel nozzle.	73-10-03		
	<u>500 Hour/1 Year Inspection</u>			
42	Inspect all uncoated and coated P/N 6846278 and 6871338 power turbine outer couplings nuts for corrosion.	M250-C20 CSL-1060		
	NOTE: Compliance with Rolls-Royce Commercial Engine Bulletin M250-C20 CEB-1120 and/or M250-C20 CEB-1158 removes this inspection requirement.			
	<u>600 Hour Inspection</u>			
43	Check the fuel pump driveshaft on the Sundstrand single-element pumps for spline wear.	Para 3.C., 73-10-01		
	NOTE: This inspection is not required for Eaton Argo-Tech (TRW) fuel pumps or Sundstrand fuel pumps P/N 23003114 and subsequent.			
44	Do the scavenge oil filter impending bypass functional test per Facet Service Bulletin No. 090589 (Ref. Rolls-Royce M250 CSL 1164) for aircraft equipped with this type of external scavenge filter system. Follow the Facet instructions and time intervals, or follow this recommended inspection interval each 600 hours.	N/A		
45	Replace the fuel control filter assembly. Bendix fuel controls P/N 2524552-4 or 2524552-6 (less-5) and prior unless M250-C20 CEB-1089 has been accomplished.	PARA 4.A., 73-20-02, 4.A., 73-20-03		
	<u>1000 Hour Inspection</u>			
46	Inspect Py port on Bendix power turbine governor per M250 CEB-A-1281. The governor must be removed from the engine to perform this inspection.	N/A		
	NOTE: If CEB-A-1289 or CEB 1330 have been accomplished, this inspection is not required.			

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D. Purging the Fuel System

WARNING: FAILURE TO PROPERLY INSTALL, ALIGN AND TIGHTEN FUEL, OIL, AND AIR FITTINGS AND TUBES COULD RESULT IN AN ENGINE FAILURE.

- (1) Maintenance of the fuel system can result in air entrapment in the fuel lines. To prevent subsequent false starts or flameouts, purge air from the fuel system whenever any of the following conditions are encountered:

WARNING: THE FUEL/AIR DISCHARGE DURING PURGING IS IRRITATING TO THE EYES AND HIGHLY FLAMMABLE. MECHANICS MUST TAKE SUITABLE MEASURES TO PROTECT THEIR EYES AND PREVENT FIRE.

WARNING: MAKE SURE THAT THE AIRCRAFT IS ADEQUATELY GROUNDED. (SEE AIRCRAFT MANUFACTURER'S INSTRUCTIONS FOR PROPER GROUNDING PROCEDURES.)

- (a) The fuel filter element or the fuel pump assembly has been replaced.
- (b) The fuel lines have been opened (anywhere between the fuel tank and the fuel nozzle).
- (c) The engine has flamed out because of fuel exhaustion.
- (d) The engine has been motored without fuel in the tank.
- (e) The fuel pump fuel filter bowl has been drained without start or boost pumps on.
- (f) The engine has been shut down using the emergency fuel shutoff valve.**
- (g) The fuel control is replaced on Bendix/Allied Signal/Honeywell systems.
- (h) The fuel control or power turbine governor is replaced on Chandler Evans systems.
- (i) Any symptom indicative of air being entrapped in the system is observed.

- (2) Purge the Bendix fuel system as follows:

- (a) Place a container under the aircraft to collect fuel drainage.
- (b) Disconnect the fuel supply hose from the fuel nozzle. Be prepared to catch fuel from the fuel hose.
- (c) Deactivate the ignition system.
- (d) Open the firewall fuel valve.
- (e) Turn on the boost pump(s)/start pump.
- (f) Position the throttle to the 30° (Ground Idle) position.
- (g) Motor the engine for approximately 15 sec or until there is no evidence of air coming from the fuel supply hose.

WARNING: FAILURE TO PROPERLY INSTALL, ALIGN AND TIGHTEN FUEL, OIL, AND AIR FITTINGS AND TUBES COULD RESULT IN AN ENGINE FAILURE.

- (h) Close the throttle and reconnect the fuel supply hose to the fuel nozzle. Tighten the coupling nut at the fuel nozzle to 80–120 lb in. (9.0–13.6 N·m).
- (i) Turn off the boost pump(s)/start pump(s) and reactivate the ignition system.

- (3) Purge the CECO fuel system as follows:

- (a) Place a container under the aircraft to collect fuel drainage.
- (b) Loosen the bypass tube at the governor bypass port (P_o). Cover the governor opening and the bypass tube open end with a rag to minimize fuel spray when the boost pumps(s) is started. (See Figure 205.)
- (c) Disconnect the fuel line from the fuel nozzle. Be prepared to catch fuel from the fuel line.

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- (d) Deactivate the ignition system.
- (e) Open the fire wall fuel valve.
- (f) Turn on the boost pump(s)/start pump.
- (g) Position the throttle at full open.
- (h) Allow fuel to flow from the governor port and the bypass line for 30 sec. If the fuel flow is without air (a solid stream), loosely install the bypass tube B-nut at the governor P_o port while the boost pump(s) remains in operation. If air is observed in the fuel flow, continue the bleed beyond the 30 sec until a solid stream of fuel is obtained.

NOTE: When loosely installing the bypass tube B-nut on the governor P_o port, contain the spray with a rag.

WARNING: FAILURE TO PROPERLY INSTALL, ALIGN, AND TIGHTEN FUEL, OIL, AND AIR FITTINGS AND TUBES COULD RESULT IN AN ENGINE FAILURE.

- (i) With the fuel nozzle line still disconnected and the boost pump(s) still operating, motor the engine with the starter to purge air from the nozzle line. Allow fuel to flow from the line for 30 seconds. If fuel still contains air (not a solid stream) repeat the motoring steps as permitted by starter limitations. If fuel flow is without air, close the throttle, attach the fuel line to the fuel nozzle, and tighten the B-nut at the governor P_o port. Tighten P_o tube B-nut to 150–200 lb in. (17–23 N·m). Tighten coupling nut at the fuel nozzle to 80–120 lb in. (9.0–13.6 N·m).
- (j) Turn off the boost pump(s) and reactivate the ignition system. Make a ground run as soon as possible.

NOTE: To prevent air in the fuel system, always start and operate the engine with the boost pump(s) operating.

Use the boost pump(s) to fill the system after component installation or after long idle periods.

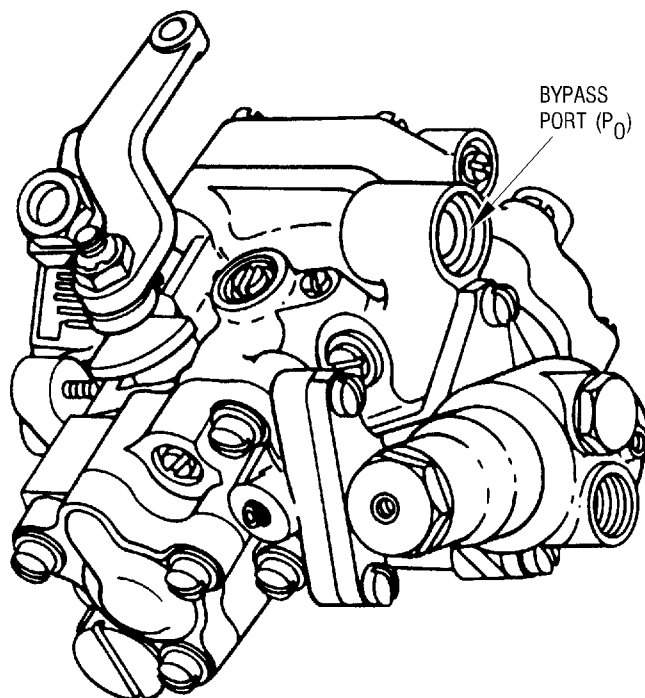
E. Purging Air From Single Element Pump Filter Bowl (Sundstrand (Pesco) and Eaton Argo-Tech (TRW) Pumps)

WARNING: THE FUEL/AIR DISCHARGE DURING PURGING IS IRRITATING TO THE EYES AND HIGHLY FLAMMABLE. MAKE SURE TO PROTECT EYES AND PREVENT FIRE.

WARNING: MAKE SURE THAT THE AIRCRAFT IS ADEQUATELY GROUNDED (SEE AIRCRAFT MANUFACTURER'S INSTRUCTIONS FOR PROPER GROUNDING PROCEDURES.)

- (1) Remove lockwire from the upper drain plug in the filter bowl cover.
- (2) Deactivate the ignition system and place the gas producer lever in FUEL OFF.
- (3) Turn on the aircraft boost pump.
- (4) Loosen the upper drain plug (approx 1/2 turn) until a solid stream of fuel is emitted. Use a shop towel to catch the spray. Retighten the plug to 40–65 lb in. (4.5–7.3 N·m).
- (5) Turn off the aircraft boost pump.
- (6) Remove any fuel that possibly spilled in the engine compartment.
- (7) Secure the drain plug with lockwire.
- (8) Purge the fuel system. (Refer to Purging the Bendix Fuel System, para 2.D.(2), this section or purging the CECO Fuel System, para 2.D.(3), this section.)

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CECO Power Turbine Governor P_o Port
Figure 205

F. Vacuum Check of Fuel System Lines and Components (Bendix fuel control system)

NOTE: The vacuum check is a troubleshooting procedure to detect engine or airframe fuel system leaks, and not a mandatory inspection unless otherwise specified by the airframe manufacturer.

The following vacuum check procedure is provided to check both the engine and airframe fuel system components to isolate the location of a possible leak in the fuel system. (Refer to the applicable airframe manual for additional information.)

NOTE: Figure 206 provides a flow diagram of the check procedure. Circled numbers on the flow diagram refer to procedural steps in this procedure.

- (1) Verify at the aircraft fuel tank that the fuel selector valve is in the closed position.

NOTE: During the vacuum check procedure, it will be necessary to disconnect various fuel tubes. Prior to disconnecting any fuel tube, verify that the coupling nuts and fittings were tightened to the proper torque. If insufficient torque was applied, note how far the coupling nut or fitting rotates to reach the proper torque. Inspect the connection areas for damage or indications of misalignment, over-tightening, cracks, bends, grooves and fretting wear.

- (2) Remove the upper drain plug from the rear of the engine fuel pump filter housing. Check the packing for damage. Connect a vacuum pump to the port. Ensure that the vacuum set-up includes a negative pressure gage (in. Hg) and a shutoff valve between the gage and pump. Apply 8 in. Hg vacuum and close the shutoff valve. Record gage reading after two minutes. If vacuum loss exceeds 1/2 in. Hg after the two minutes, proceed to the next step. If vacuum loss is 1/2 in. Hg or less, no further checks are required.

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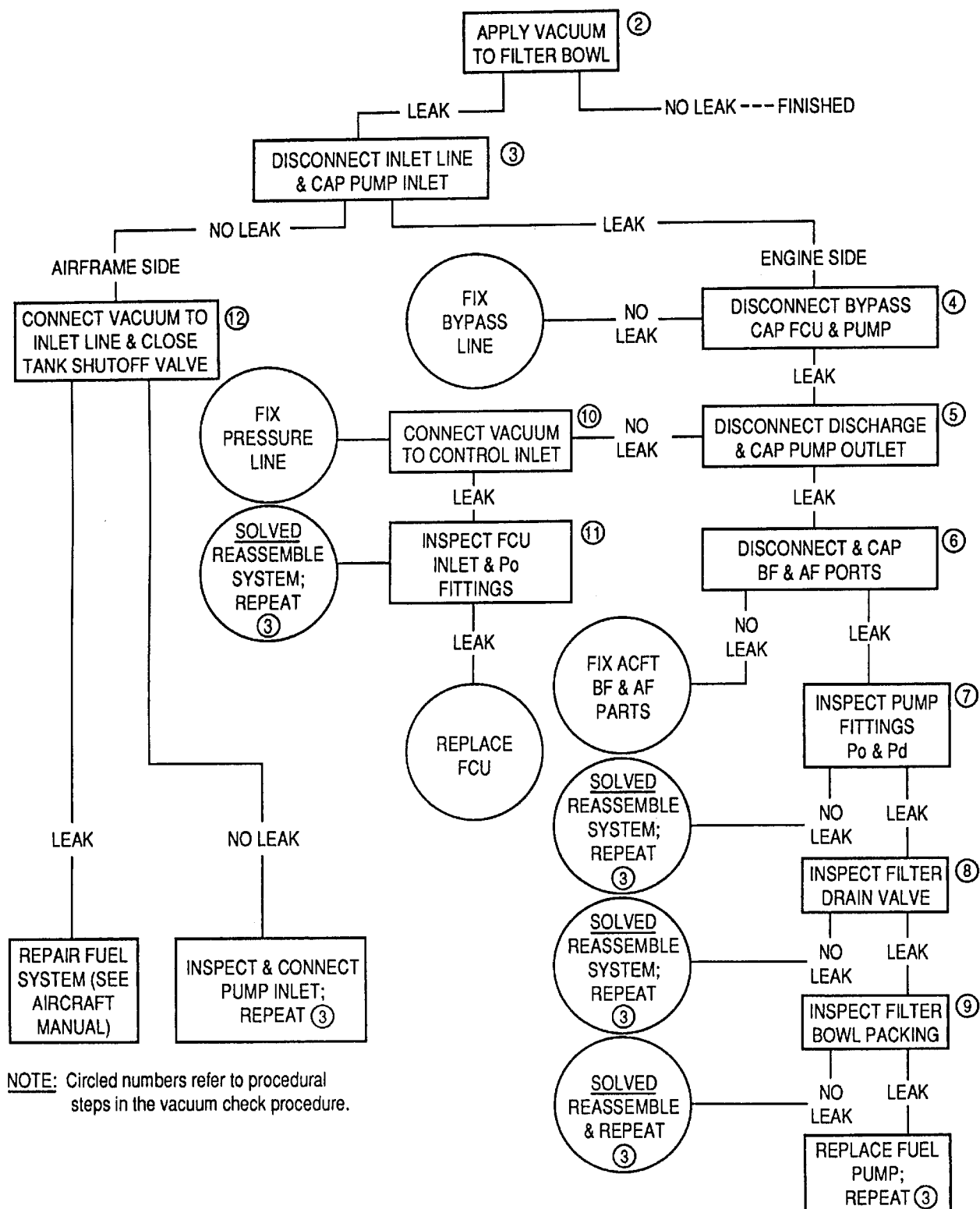
- (3) Disconnect the aircraft fuel line at the inlet to the engine fuel pump and cap the pump inlet port. Repeat the vacuum leakage check. If vacuum loss exceeds 1/2 in. Hg, the leakage is in the engine fuel system; proceed to next step. If vacuum loss is 1/2 in. Hg or less, the leakage is in the aircraft fuel supply system; proceed to step (12).
- (4) Disconnect the bypass fuel line between the engine fuel control and the fuel pump. Install B-nut type caps on both the control and pump fittings. Repeat the vacuum leakage check. If vacuum loss exceeds 1/2 in. Hg, proceed to next step. If vacuum loss is 1/2 in. Hg or less, the leakage is in the bypass fuel line. Repair or replace parts as required, reassemble the engine fuel system components and repeat step (3) to verify that the leak has been corrected.
- (5) Disconnect the pressure fuel line between the fuel pump and the fuel control. Install a B-nut type cap on the fuel pump fitting. Repeat the vacuum leakage check. If vacuum loss exceeds 1/2 in. Hg, proceed to the next step. If vacuum loss is 1/2 in. Hg or less, proceed to step (10).
- (6) Disconnect the impending filter bypass switch system at the AF and BF ports on the engine fuel pump. Cap or plug both ports. Repeat the vacuum leakage check. If vacuum loss exceeds 1/2 in. Hg, proceed to next step. If vacuum loss is 1/2 in. Hg or less, the leakage is in the filter bypass switch or its associated hoses. Refer to the applicable airframe manual and repair as required. Reassemble the engine fuel system components and repeat step (3) to verify that the leak has been corrected.
- (7) Inspect and check the two fuel bypass and pressure line fittings in the fuel pump and filter assembly as follows:
 - (a) Remove the two fittings from the engine fuel pump and filter assembly.
 - (b) Inspect the packings for damage or cuts.
 - (c) Inspect the packing sealing surfaces for damage and repair or replace parts as required.
 - (d) Reinstall the two capped fittings with new packings.
 - (e) Repeat the vacuum leakage check. If vacuum loss exceeds 1/2 in. Hg, proceed to next step. If vacuum leakage is less than 1/2 in. Hg, reassemble the engine fuel system components and repeat step (3) to verify that the leak has been corrected.
- (8) Remove the lower drain valve on the rear of the engine fuel pump fuel filter housing. Inspect the packing for damage. Also, inspect the valve stem packing for damage. Install a plug and packing in the drain valve port and repeat the vacuum leakage check. If vacuum loss exceeds 1/2 in. Hg, proceed to next step. If vacuum loss is 1/2 in. Hg or less, the leakage is in the drain valve and/or packings. Replace parts as required, reassemble the engine fuel system components and repeat step (3) to verify that the leak has been corrected.
- (9) Inspect and check the engine fuel pump and filter assembly as follows:
 - (a) Ensure that the filter housing was securely attached to the pump. Remove the housing and filter element. Inspect the large packing for damage or cuts. Inspect the packing sealing surfaces for damage and repair as required. Inspect inside the filter housing and pump housing for contamination and remove as required. Inspect the filter element (in the fuel-wetted state) for contamination and replace if required.
 - (b) Reassemble the filter element and housing on the pump using a new packing on the housing.
 - (c) Repeat the vacuum leakage check.
 - (d) If vacuum loss exceeds 1/2 in. Hg, replace the fuel pump and filter assembly, reassemble the engine fuel system components and repeat step (3) to verify that the leak has been corrected.
 - (e) If vacuum loss is 1/2 in. Hg or less, reassemble the fuel system components and repeat step (3) to verify that the leak has been corrected.
- (10) Connect the vacuum pump to the control inlet fuel fitting on the fuel control. Repeat the vacuum leakage check. If vacuum loss exceeds 1/2 in. Hg, proceed to the next step. If vacuum loss is 1/2 in. Hg or less, repair or replace the pressure fuel line, reassemble the engine fuel system components, and repeat step (3) to verify that the leak has been corrected.

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- (11) Inspect and check the two fuel bypass and pressure line fittings in the fuel control as follows:
- (a) Remove the two fittings from the engine fuel control.
 - (b) Inspect the packings for damage or cuts.
 - (c) Inspect the packing sealing surfaces for damage and repair or replace parts as required.
 - (d) Reinstall the two capped fittings with new packings. Be sure the bypass fitting is capped and the vacuum pump is reconnected to the pressure fitting.
 - (e) Repeat the vacuum leakage check.
 - (f) If vacuum loss exceeds 1/2 in. Hg, replace the fuel control, reassemble the engine fuel system components and repeat step (3) to verify that the leak has been corrected.
 - (g) If vacuum loss is 1/2 in. Hg or less, reassemble the engine fuel system components and repeat step (3) to verify that the leak has been corrected.
- (12) Connect the vacuum pump to the free end of the aircraft fuel line (the end that connects to the engine fuel pump). Apply 8 in. Hg vacuum and close the shutoff valve. Record gage reading after two minutes.
- (a) If vacuum decreases, a leak in the aircraft fuel supply system is indicated. Check and repair the leak in accordance with the applicable airframe manual.
 - (b) If no leakage is detected, check the aircraft fuel line and the engine fuel pump inlet fitting. Repair or replace parts as required. Reconnect the aircraft fuel line to the inlet port of the engine fuel pump and filter assembly. Repeat step (3) to verify that the leak has been corrected.

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Bendix Fuel System Vacuum Check Flow Diagram
Figure 206**73-00-00**

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**FUEL PUMP AND FILTER ASSEMBLY-MAINTENANCE PRACTICES
(SUNDSTRAND/PESCO AND EATON ARGO-TECH/TRW PUMPS)**1. General

Replace the complete pump assembly if it is found to be the cause of engine malfunction or for TBO expiration. (See Figure 201 or 202.)

NOTE: The unit exchange fuel pump package can be either a dual element set or a single element set. Since the plumbing for the two pumps differs, exchange the two pump-to-control tubes with the pump. Also, remove the two 1/2-20 unions and keep them for installation in the replacement pump.

2. Replacement

A. Removal

Remove the fuel pump and filter assembly from the engine as follows:

- (1) Remove the following from the pump:
 - (a) Fuel supply tube from the pump inlet.
 - (b) Fuel control-to-pump bypass (P_o) tube.
 - (c) Pump-to-fuel control inlet fuel (P_1) tube.
 - (d) Pump seal drain tube.
 - (e) Airframe furnished filter ΔP indicator equipment (if installed).
- (2) Remove the three self-locking nuts and washers which secure the fuel pump to the power and accessory gearbox housing. Remove pump from mounting studs.

NOTE: If the fuel pump drive shaft remains in the engine gearbox instead of the pump after the pump is removed, then return the pump and drive shaft to an approved repair facility.

- (3) Remove the mounting flange gasket. Discard packing.
- (4) Remove the two unions and bushing from the pump and keep them for installation in the replacement pump. Discard packings.

B. Installation

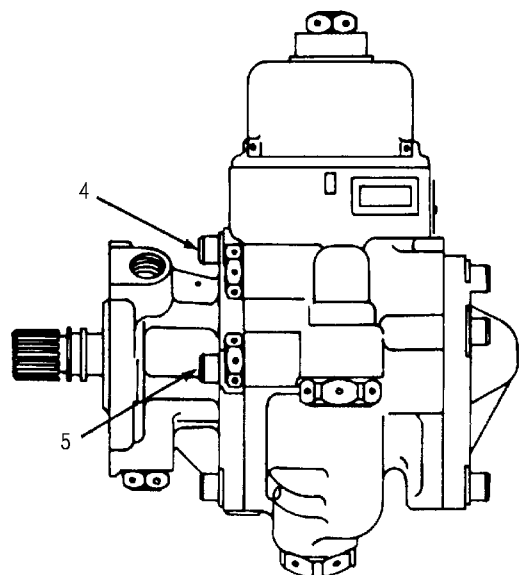
WARNING: FAILURE TO PROPERLY INSTALL, ALIGN AND TIGHTEN FUEL, OIL, AND AIR FITTINGS AND TUBES COULD RESULT IN AN ENGINE FAILURE.

Install the replacement fuel pump and filter assembly on the engine as follows:

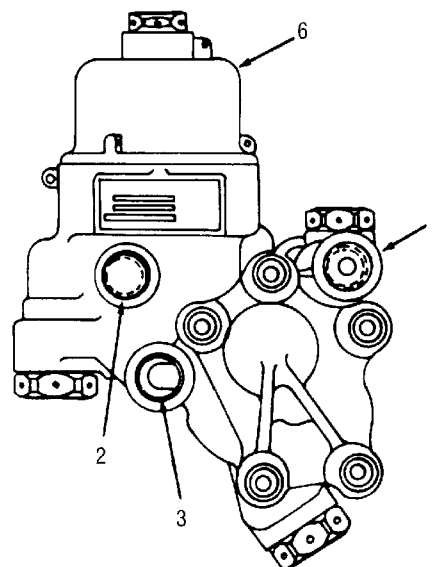
CAUTION: IF THE REPLACEMENT PUMP IS NOT THE SAME TYPE OF PUMP (SINGLE ELEMENT VS DUAL ELEMENT) AS THE PUMP BEING REPLACED, THE PORT LOCATIONS WILL BE DIFFERENT. CHECK THE APPROPRIATE ILLUSTRATION (FIGURE 201 OR 202) BEFORE INSTALLING THE BUSHING OR UNIONS. ALSO, THE TUBING CONFIGURATION DIFFERS FOR THE TWO PUMPS. DO NOT ATTEMPT TO REINSTALL THE EXISTING FUEL TUBES IF THE TYPE OF PUMP HAS CHANGED.

- (1) Lubricate three packings and install one each with the union in the control bypass return port and one with the union in the pump discharge return port. Tighten the union to 75-110 lb in. (8.5-12.4 N·m). Install the bushing into the fuel pump inlet port. Tighten the bushing to 150-200 lb in. (17-23 N·m).
- (2) Install a new fuel pump drive packing seal.

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LEFT SIDE VIEW



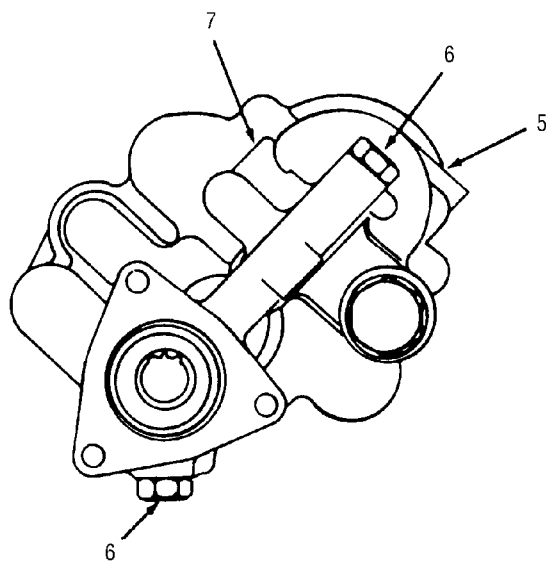
REAR VIEW

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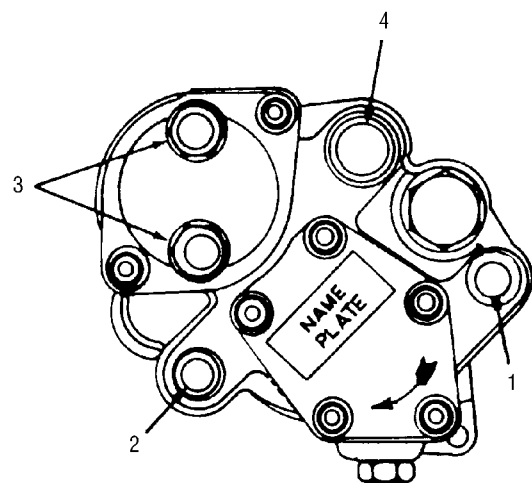
1. Pump Discharge Port
2. Fuel Inlet Supply Port
3. Control Bypass Return Port
4. Before Filter Pressure Drop Port
5. After Filter Pressure Drop Port
6. Filter Cover

Dual Element Fuel Pump and Filter Assembly
Figure 201

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FRONT VIEW



REAR VIEW

ADH065XD

1. Control Bypass Return Port
2. Pump Discharge Port
3. Filter Cover Drain Port (2)
4. Fuel Inlet Supply Port
5. Before Filter Pressure Drop Port
6. Seal Drain Port (2)
7. After Filter Pressure Drop Port

Single Element Fuel Pump and Filter Assembly
Figure 202

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PARA 2.B. (cont)

- (3) Install gasket on mounting pad.
- (4) Coat pump drive splines and packing with engine oil. Coat the fuel fitting with MIL-L-6081 oil (Atlantic Refining Co. 31100, or equivalent), and the studs with antiseize compound.
- (5) Install pump on mounting studs. Install three washers and self-locking nuts.
- (6) Tighten mount pad nuts to 70–85 lb in. (7.9–9.6 N·m). Tighten fuel line coupling nuts to 150–200 lb in. (17–23 N·m).

NOTE: Be sure the procedures and precautions of Rigid Tube Inspection and Installation, para 9., 72-00-00, Engine-Servicing, are observed when installing fuel system tubes.

- (7) Install the fuel control-to-pump bypass (P_o) fuel tube. Tighten coupling nuts to 150–200 lb in. (17–23 N·m).
- (8) Install the pump-to-fuel control inlet fuel (P_1) tube. Tighten coupling nuts to 150–200 lb in. (17–23 N·m). Clamp fuel control P_1 and P_o tubes together. Tighten clamp nut to 35–40 lb in. (3.9–4.5 N·m).
- (9) Purge air from the fuel system. (Refer to para 2.D., 73-00-00, for details.)

NOTE: After the fuel pump has been replaced, if a false start or a start that is not completed in a total time of one minute is encountered, return the gas producer lever to FUEL OFF and motor the engine without ignition for 10 seconds.

- (10) Check run the engine after fuel pump replacement. (Refer to Check Run, para 1., 72-00-00, Engine-Adjustment/Test.)
- (11) Make appropriate entry relative to pump replacement in the Engine Log.

C. Filter Element Replacement

- (1) Replacing the Filter in a Single Element Fuel Pump. (See Figure 203.)

CAUTION: THIS IS A THROW-AWAY FILTER ELEMENT AND IS NOT TO BE CLEANED AND REUSED.

- (a) Place a container under the pump assembly as some fuel spillage is likely. Remove the two screws and washers retaining the cover to the housing. Drain filter cover.
- (b) Remove the cover and the element. Discard two packings and the contaminated filter element. If the element is a tight fit, remove by pulling straight out. Twisting may cause the element end cap to tear off.
- (c) Clean the filter cap with a spray of mineral spirits or with a fuel-soaked cloth.
- (d) Be sure the new element packing is in place; then install the element in the housing. Install the cover with new packing. Tighten cover screws to 95–105 lb in. (10.7–11.8 N·m).
- (e) Purge air from the fuel system. (Refer to Purging the Fuel System, para 2.D., 73-00-00.)

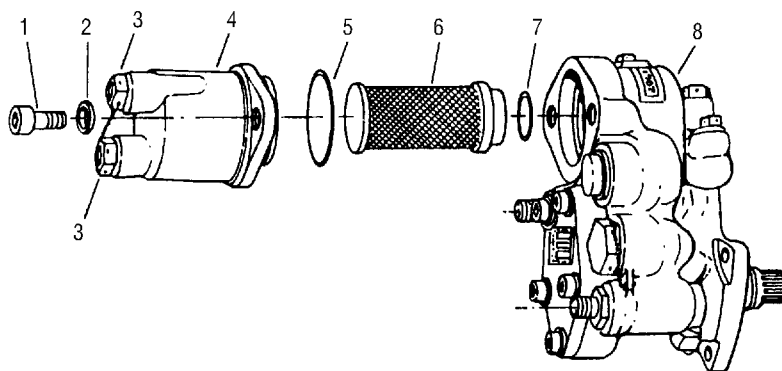
- (2) Replace the filter in a dual element fuel pump as follows: (See Figure 204.)

CAUTION: THIS IS A THROW-AWAY FILTER ELEMENT AND IS NOT TO BE CLEANED AND REUSED.

- (a) Cut the lockwire and loosen the cover by turning the one inch (25.4 mm) hex. Place a container under the pump assembly as some fuel spillage likely.
- (b) Remove the cover and the element. Discard two packings and the contaminated filter element. If the element is a tight fit, remove by pulling straight out. Twisting may cause the element end cap to tear off.
- (c) Clean the filter cap with a spray of mineral spirits or with a fuel-soaked cloth.

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1. Screw (2)
2. Washer (2)
3. Plugs (2)
4. Filter Cover

5. Packing
6. Filter Element
7. Packing
8. Fuel Pump

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Fuel Filter Replacement in the Single Element Pump
Figure 203

PARA 2.C. (cont)

- (d) Replace packing seal on filter element. Reinstall the filter in reverse of the order of removal. Replace the packing seal between the cover and housing. Tighten the cover to 180-220 lb in. (20-25 N·m) and secure with 0.032 in. (0.81 mm) lockwire.
- (e) Purge air from the fuel system. (Refer to PARA 2.D., 73-00-00.)

3. Inspection/Check

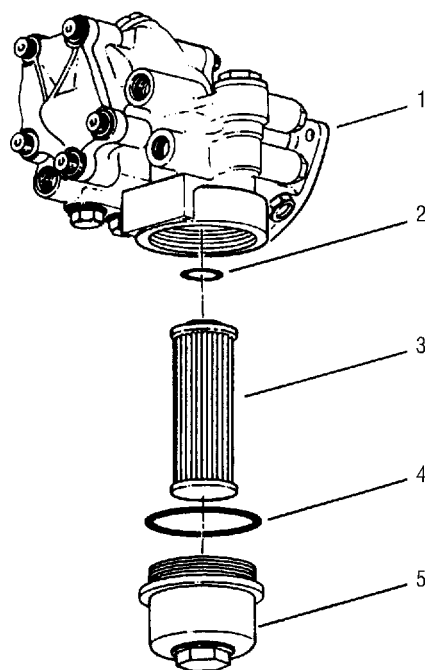
A. Fuel Pump Filter Bypass Valve Operational Check

The fuel pump incorporates a filter bypass valve which allows fuel to bypass the pump filter element if it becomes clogged. An open valve allows unfiltered fuel to be supplied to the fuel control (and governor on a CECO fuel system). Make the filter bypass valve operational check whenever any of the following conditions exist:

NOTE: If fuel system contamination is known or suspected, refer to Fuel Filter Bypassed in Table 604, Special Inspections, 72-00-00, Engine-Inspection/Check.

- (1) The impending filter bypass warning light comes on (this feature is not on all aircraft).
- (2) There is an indication the fuel pump filter bypass valve has been bypassing. Bypassing is evidenced by contamination in the fuel control or fuel control inlet filter and/or (CECO fuel system only) contamination of the high pressure filter.
- (3) When the fuel pump filter is replaced. Replacement of the element is required when the impending filter bypass warning system has been activated or during the scheduled 300-hour inspection. Under no circumstance should the element be cleaned and reused or remain in service beyond the 300-hour limit.

73-10-01



1. Fuel Pump
2. Packing
3. Filter Element

4. Packing
5. Cover

ADH067XD

Fuel Filter Replacement in the Dual Element Pump
Figure 204

PARA 3. (cont)

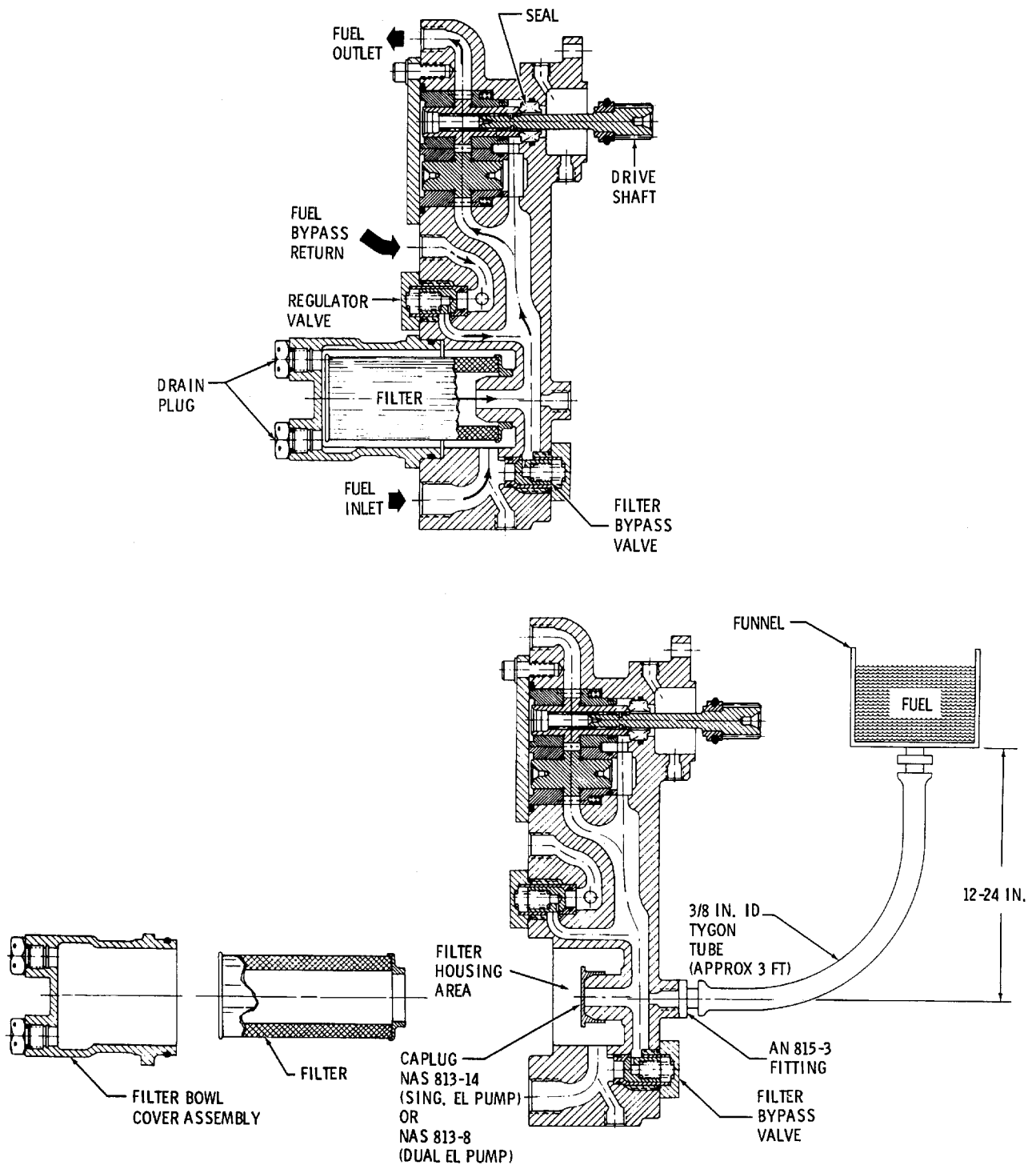
B. Operational Checks

Check the fuel pump bypass valve to ensure that the valve is not stuck in bypass; the valve will bypass if the filter becomes clogged and the valve will return from bypass to the closed position.

- (1) Determine that the bypass valve is not stuck in the open (bypass) position as follows:
 - (a) Remove lockwire and the filter cover. Separate the element from the pump. Discard two packings. (See Figure 203 or 204.)
 - (b) Install a capplug in the filter housing. Use NAS 813-14 capplug for single element pumps. (See Figure 205.)
 - (c) Remove the hose (or plug) from the after filter (AF) pressure drop port. (See Figure 201 or 202.)
 - (d) Install an AN 815-3 fitting in the AF port. Install a length of Tygon tube on the AN 815-3 fitting. (See Figure 205.)
 - (e) Using a funnel, fill the Tygon tube with fuel. Maintain the 12 to 24 in. (305-610 mm) fuel head shown in Figure 205. Observe the filter housing area for leakage.

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M250-C20 SERIES OPERATION AND MAINTENANCE



ADS036XA

Operational Check Schematic Diagram (Typical)
Figure 205

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M250-C20 SERIES OPERATION AND MAINTENANCE

PARA 3.B. (1) (cont)

1 Observed Fuel Leakage.

Leakage exceeding 10 drops per minute is excessive and indicates the valve is open (bypass position) and contaminated fuel has entered the fuel control system.

- a Remove the fuel pump and send it to an Authorized Rolls-Royce Maintenance Center for repair/replacement of the bypass valve.
- b On the fuel systems, comply with Table 602, 72-00-00, Engine-Inspection/Check.

2 No Observed Fuel Leakage.

No leakage is an indication that the bypass valve has satisfactorily closed (non-bypass position). Proceed with the check to ensure that the valve will open during clogged filter conditions.

(2) Determine that the bypass valve will open (bypass) if the filter becomes clogged as follows:

- (a) With the caplug still in place in the filter housing, reinstall the filter bowl cover assembly.

WARNING: AVOID FUEL ACCUMULATION IN THE ENGINE COMPARTMENT BY PROVIDING A SUITABLE CONTAINER TO COLLECT FUEL DISCHARGED FROM THE TYGON TUBE ATTACHED TO THE AF PRESSURE PORT.

- (b) Momentarily actuate the aircraft fuel boost (start) pump. If the aircraft is equipped with a differential pressure light, the light should come on, indicating bypass due to clogging.
- (c) Check the fuel flow from the AF pressure tap.

- 1 No fuel flow is an indication the bypass valve is stuck closed. Return pump to an overhaul facility for repair.
- 2 Fuel flow from the AF pressure tap indicates the bypass valve has satisfactorily opened. Proceed with the check to ensure that the valve will return to the closed (non-bypass) position.

(3) Determine that the bypass valve will return to the closed (non-bypass) position as follows:

- (a) Remove the filter bowl cover assembly. Leave the caplug in place.
- (b) Using a funnel, fill the Tygon tube with fuel. Maintain the 12-24 in. (305-610 mm) fuel head shown in Figure 205. Observe the filter housing area for fuel leaks.

1 Observed Fuel Leakage.

Leakage in excess of 10 drops per minute is excessive and indicates the bypass valve is open (bypass position). Return the fuel pump to an overhaul facility for repair of this condition.

2 No Observed Fuel Leakage.

No leakage is an indication that the bypass valve has satisfactorily closed (non-bypass position).

(4) After the operational checks have been completed, return acceptable fuel pumps to service.

- (a) Remove the caplug, the AN 815-3 fitting and the Tygon tube.
- (b) Reinstall the filter element and the filter bowl cover with new packings. Install the differential pressure sensing line or plug, as required.
- (c) Purge air from the filter bowl area of the single element pump. (Refer to Purging the Air from the Single Element Fuel Pump Filter Bowl, para 2.E., 73-00-00.)

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