

Product: TRACK-TYPE TRACTOR

Model: D5B TRACK-TYPE TRACTOR 5LD

Configuration: D5B TRACTOR / DIRECT DRIVE / 5LD00001-UP (MACHINE) POWERED BY 3306 ENGINE

Disassembly and Assembly SUPPLEMENT FOR 3306 ENGINE FUEL SYSTEM

Media Number -SEN3983-00

Publication Date -01/12/1988

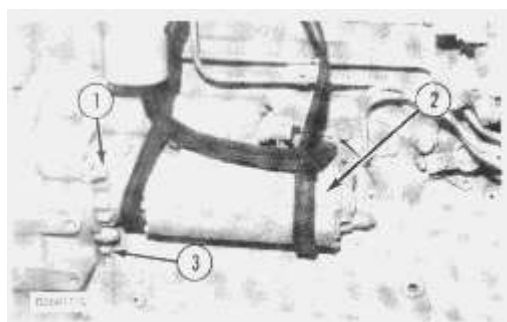
Date Updated -11/10/2001

Fuel Injection Pump And Governor

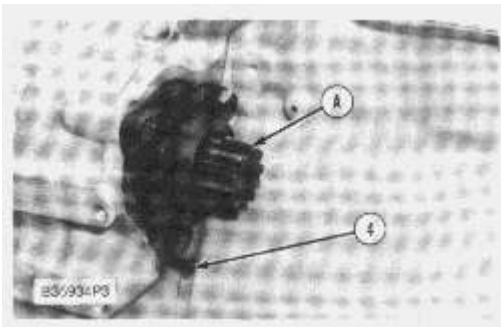
SMCS - 1288-010

Remove And Install Fuel Injection Pump And Governor

Tools Needed		A	B	C	D
5P7307	Engine Turning Tool	1			
8S2264	Puller Group		1		
8B7560	Step Plate		1		
6F7031	Bolt		2		
5M2894	Washer		2		
FT1635	Timing Pin			1	
FT1644	Adapter-Torque				1



1. Disconnect the wires (not shown) from the starter. Fasten a hoist to the starter. Remove three bolts (1) and remove starter (2). Remove the gasket. The weight of the starter is 29 kg (64 lb).
2. Remove plug (3) from the flywheel housing.



3. Install tooling (A) in the flywheel housing.

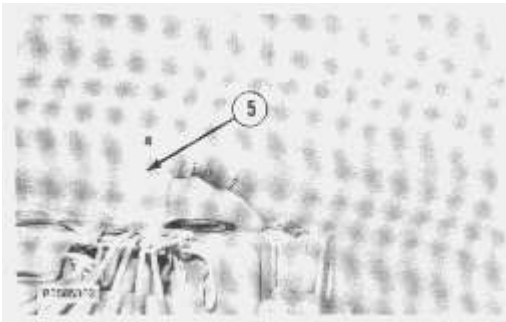
NOTE: No. 1 piston at top center (TC) on the compression stroke is the starting point for all timing procedures.

NOTE: The engine is seen from the flywheel end when direction of crankshaft rotation is given.

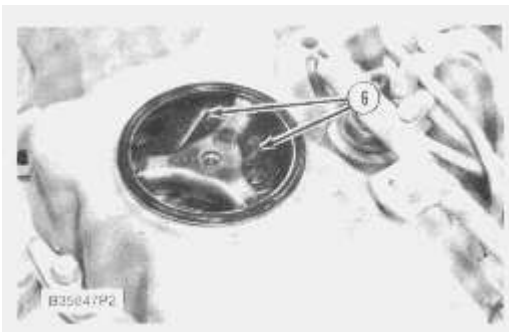
4. To find top center compression stroke for No. 1 piston, first turn the flywheel clockwise (opposite the direction of engine rotation) approximately 30 degrees. This procedure is to remove all play from the timing gears. Turn the flywheel counterclockwise until a 3/8"-16 NC bolt (4) can be installed in the flywheel through the hole in the flywheel housing. The No. 1 and No. 6 pistons are now at top center position.

NOTICE

If you go past the bolt hole you must start over with Step 2.

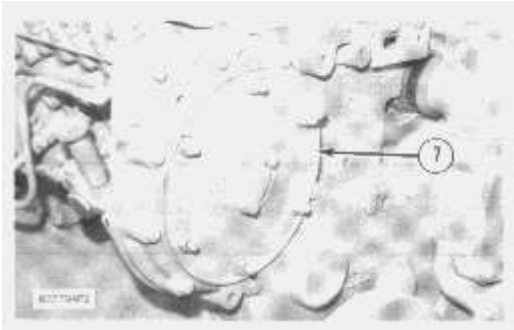


5. Remove breather (5) from the valve cover.

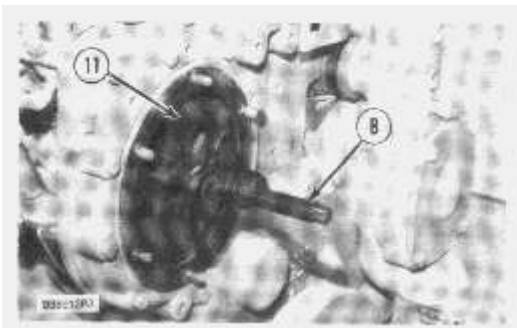
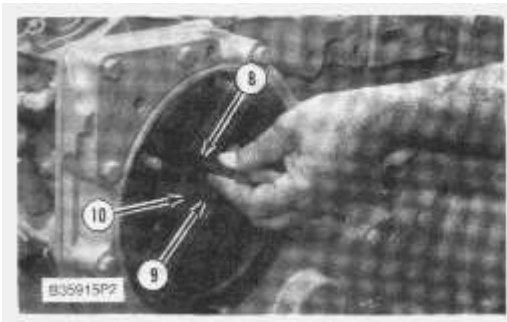


6. To see if the No. 1 piston is on the compression stroke, look at the valves of the No. 1 cylinder. The valves will be closed if No. 1 cylinder is on the compression stroke. You must be able to move both rocker arms (6) up and down with your hand.

7. If No. 1 piston is not on the compression stroke, remove the 3/8"-16 NC bolt (4) and turn the flywheel 360° counterclockwise. Install the 3/8" bolt as before. The No. 1 piston is now at top center (TC) on the compression stroke.



8. Remove cover (7) from the front of the timing gear cover.

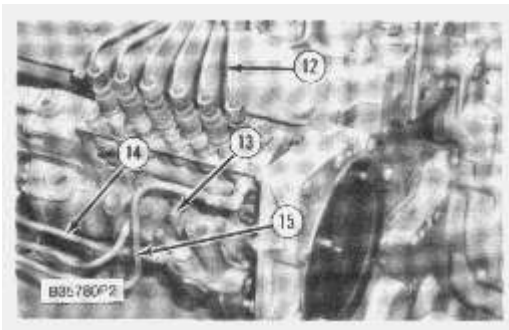


9. Install timing pin (8) [tool (C)] through the left top hole (as seen from the front of the engine) in the fuel injection pump gear and through the groove (slot) in the sleeve and into the hole in the adapter of the fuel injection pump. If the timing pin can not be installed at this time, install the timing pin after the fuel injection pump is removed.

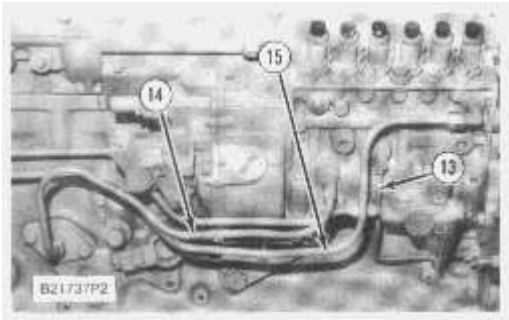
10. Loosen bolt (9) that holds the fuel injection pump gear to the sleeve approximately 3.2 mm (.125 in).

11. Install tooling (B) and loosen fuel injection pump gear (11) from the sleeve. Remove tooling (B). Remove bolt (9) and washer (10).

12. Disconnect the fuel return line from bypass valve.



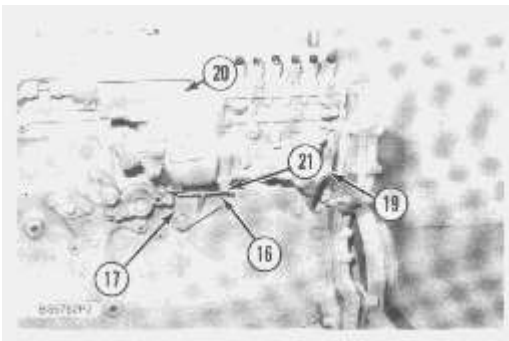
13. Remove fuel injection lines (12) from the engine. Put plugs or caps on all the openings.



14. Remove oil supply line (13).

15. Remove fuel supply lines (14) and (15).

16. Put plugs or caps in the openings.



17. Remove bolts (16) that hold the fuel injection pump spacer to bracket (17).

18. Remove three nuts (19) and remove fuel injection pump and governor (20). Remove the O-ring seal from the face of the fuel injection pump housing.

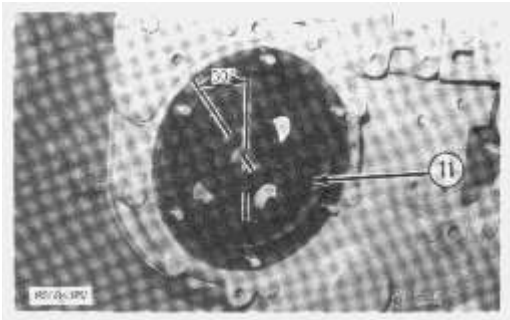
19. If the timing pin was not installed in Step 9, turn the pump as needed to make an alignment of the groove (slot) in the sleeve with the hole in the adapter and install the timing pin (8) [tool (C)].

20. Remove spacer (21).

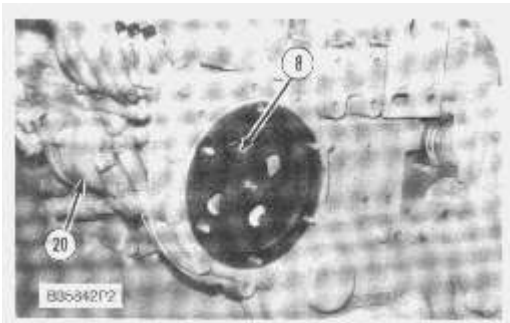
NOTE: The following steps are for the installation of the fuel injection pump and governor.

NOTICE

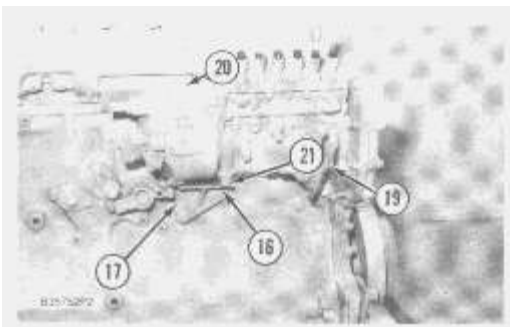
Make sure the timing pin [tool (C)] is installed through the groove (slot) in the sleeve and into the hole in the adapter so the fuel injection pump timing is correct.



21. Make sure that the centerline of one of the holes in fuel injection pump gear (11) is 30° to the left of the vertical centerline of the fuel injection pump gear. This will permit the timing pin [tool (C)] to go through the hole in the fuel injection pump gear when the fuel injection pump and governor is installed.

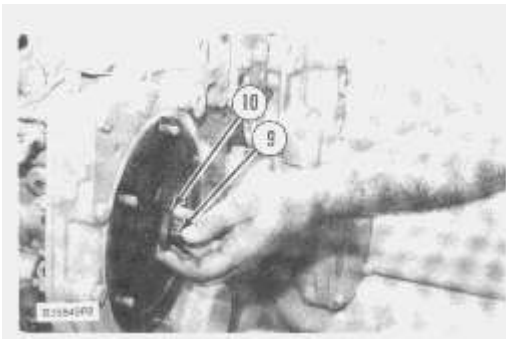


22. Install the O-ring seal on the face of the fuel injection pump housing. Put fuel injection pump housing and governor (20) in position on the engine and against the timing gear plate. Make sure timing pin (8) [tool (C)] goes through the hole in the fuel injection pump gear as shown.

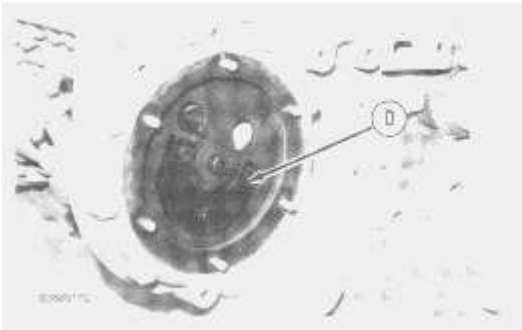


23. Install spacer (21) on the fuel injection pump housing (20).

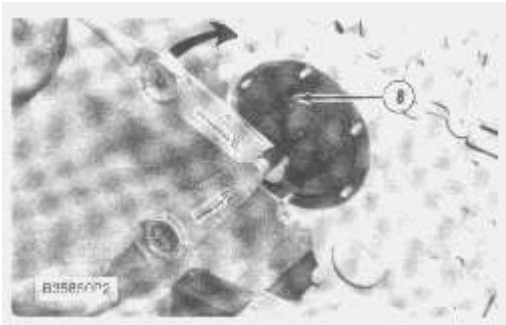
24. Install the three nuts (19) that hold the fuel injection pump housing and governor to the timing plate. Install bolts (16) that hold the fuel injection pump spacer (2) to bracket (17).



25. Install washer (10) and bolt (9) finger tight.



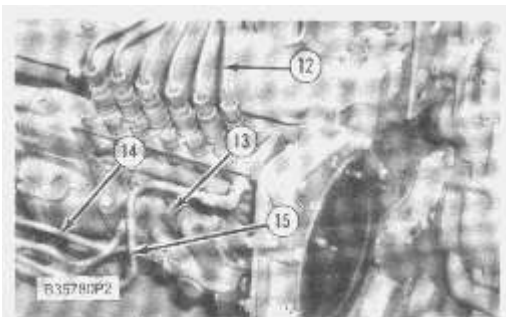
26. Install tooling (D) on the fuel injection pump gear as shown.



27. Put a torque wrench in tooling (D) with the wrench in line with the center of the fuel injection pump gear, and put a torque of 60 to 70 N·m (45 to 50 lb ft) on the fuel injection pump gear to remove the gear clearance (backlash). While this torque is held, tighten bolt (8) to a torque of 149 ± 7 N·m (110 ± 5 lb ft).

28. Remove timing pin (8) [tool (C)].

29. Put the gasket in place and install cover (7) on the front of the timing gear cover.



30. Install fuel supply lines (14) and (15).

31. Install oil supply line (13).

32. Install fuel injection lines (12) on the engine. Tighten the fuel line nuts to a torque of $40.7 \pm 6.8 \text{ N}\cdot\text{m}$ ($30 \pm 5 \text{ lb ft}$).

33. Connect fuel return line to bypass valve.

34. Install breather (5) on the valve cover.

35. Remove tooling (A) from the flywheel housing.

36. Remove bolt (4) from the flywheel.

37. Install plug (3) in the flywheel housing.

38. Fasten a hoist to the starter. Put the gasket in place and install starter (2) and bolts (1). Connect the wires (not shown) to the starter.

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Disassembly and Assembly SUPPLEMENT FOR 3306 ENGINE FUEL SYSTEM

Media Number -SEN3983-00

Publication Date -01/12/1988

Date Updated -11/10/2001

Fuel Transfer Pump

SMCS - 1256-010

Remove And Install Fuel Transfer Pump

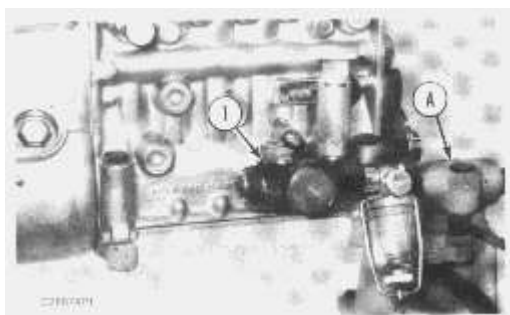
Tools Needed		A
2Y6847	Vise	1
2Y6848	Clamp	1

Start By:

- a. remove fuel injection pump and governor.

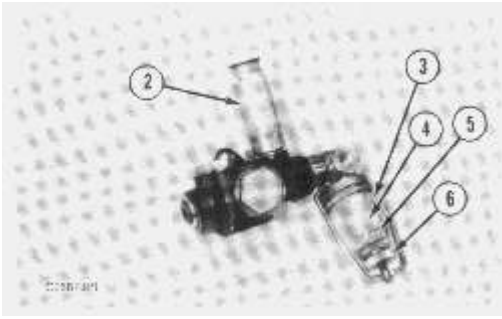
NOTICE

Thoroughly clean the outside of the fuel injection pump and governor. Make sure all parts are kept with their respective parts. Do not mix parts. Do not put parts in a metal tray. Highly machined and polished parts can be damaged.



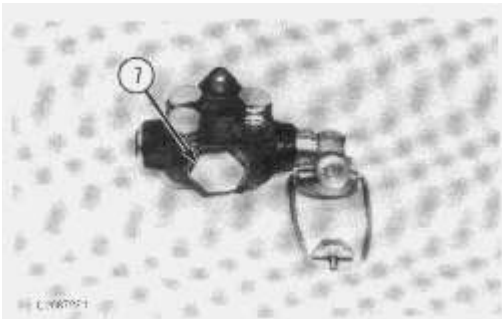
1. Install the fuel injection pump and governor on tooling (A) as shown.

2. Remove fuel transfer pump (1) from the fuel injection pump housing.



3. Remove hand priming pump (2). Remove the spring and valve from the housing.

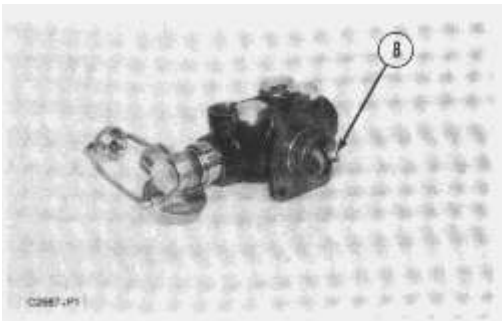
4. Loosen clamp nut (6) and remove bowl (3), element (4) and spring (5). Remove the bowl gasket from the housing.



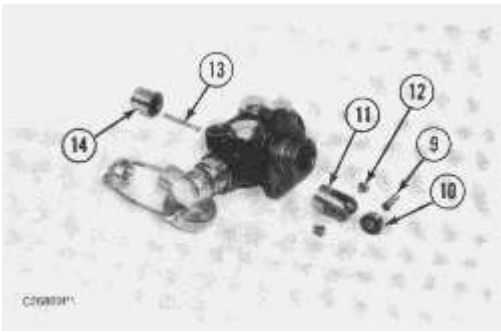
NOTICE

Plug (7) holds a spring under compression.

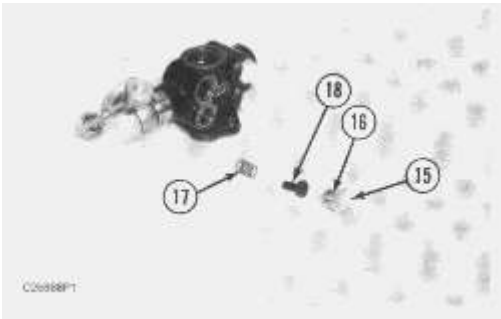
5. Remove plug (7), gasket and spring from the housing.



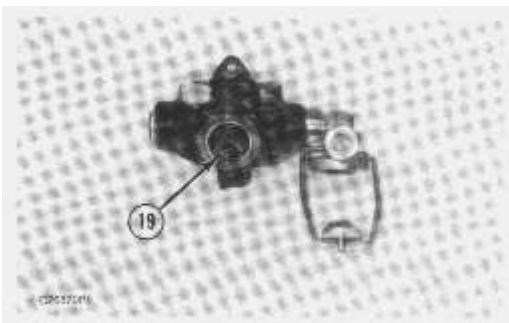
6. Remove lifter (8).



7. Remove two guide pins (12) from roller (10).
8. Remove pin (9) and roller (10) from lifter (11).
9. Push on rod (13) to remove rod (13) and the piston (14) from the opposite side.



10. Remove plug (15), O-ring seal (16), spring (17) and valve (18) from the housing.
- NOTE:** The following steps are for the installation of the fuel transfer pump.
11. Install spring (17), valve (18), O-ring (16) and plug (15) into the housing.
 12. Install rod (13) and piston (14) into the housing.
 13. Place roller (10) in position into the lifter (11) and install pin (9).
 14. Install two guide pins (12) in lifter (11) and install group into housing.



15. Install spring (19) into housing.
16. Install plug (7) and gasket into housing.
17. Install hand priming pump (2) with valve and spring into housing.

18. Place gasket into position and install element (4), spring (5) and bowl (3). Tighten clamp nut (6).

19. Plug the outlet fitting of the fuel transfer pump. Connect an air supply of 197 kPa (28.5 psi) to the inlet fitting of the fuel transfer pump. Put the fuel transfer pump in a container filled with clean diesel fuel. Move the lifter in and out by hand. There should be no air bubbles. If there are air bubbles, make a replacement to element (4) and inspect rod (13) for damage.

20. Install gasket and fuel transfer pump (1) on the fuel injection pump housing. Tighten the nuts that hold the fuel transfer pump in place to a torque of 4.9 to 6.9 N·m (3.6 to 5.1 lb ft).

21. Remove the fuel injection pump and governor from tooling (A).

22. For correct adjustment of the fuel injection pump and governor, see Use Of The Caterpillar Fuel Injection Test Bench To Test And Adjust The Fuel System Used On 3306 Engine With S/N 60Z, Form No. SEHS7968.

End By:

a. Install fuel injection pump and governor.

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Disassembly and Assembly SUPPLEMENT FOR 3306 ENGINE FUEL SYSTEM

Media Number -SEN3983-00

Publication Date -01/12/1988

Date Updated -11/10/2001

Governor

SMCS - 1286-017

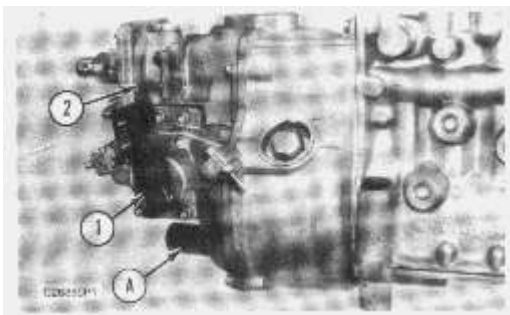
Disassemble And Assemble Governor

Tools Needed		A	B	C	D	E	F	G
2Y6847	Vise	1						
2Y6848	Clamp	1						
2Y6859	Pin Wrench		1					
2Y6865	Puller			1				
2Y6864	Pin Wrench				1			
2Y6935	Seal Protector					1		
8S2328	Dial Indicator Gp						1	
2Y6849	Shaft Turning Tool							1

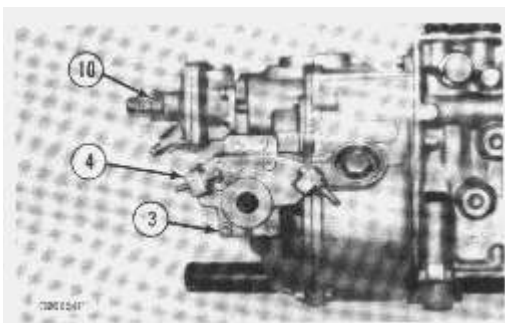
Tools Needed		H	J	K	L	M	N	P
5P4168	Plate	1						
1P2320	Puller	1						
2Y6858	Lifter Holder		6					
2Y6860	Wrench			2				
0L1732	Bolt				1			
1B4205	Nut				1			
4B4280	Washer				1			
2Y6863	Guide Bolt					1		
1P0510	Driver Group						1	
2Y6866	Plate Gauge							1

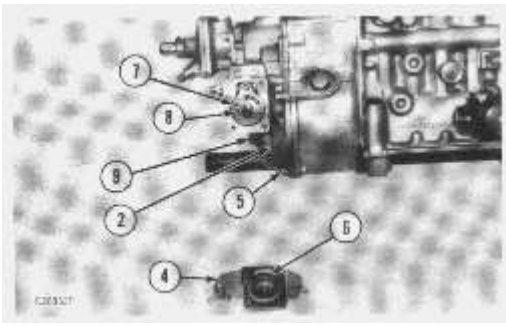
Start By:

- a. remove fuel injection pump and governor assembly
- b. remove fuel transfer pump

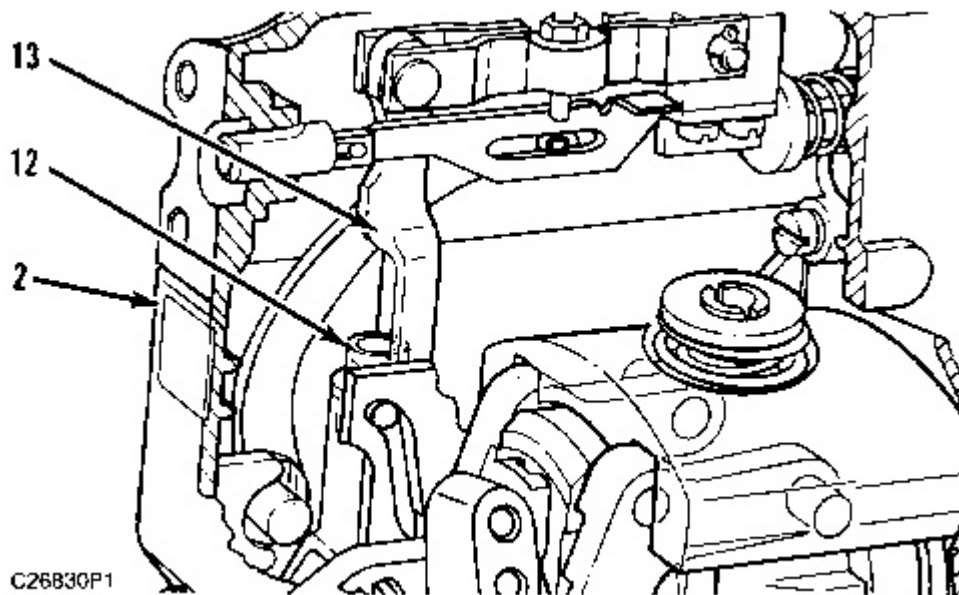
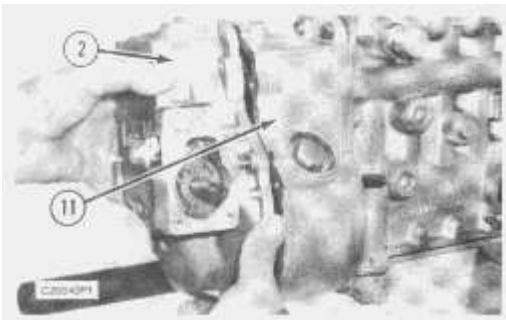


1. Place fuel injection pump and governor in tooling (A).
2. Remove lever (1) from governor cover (2).



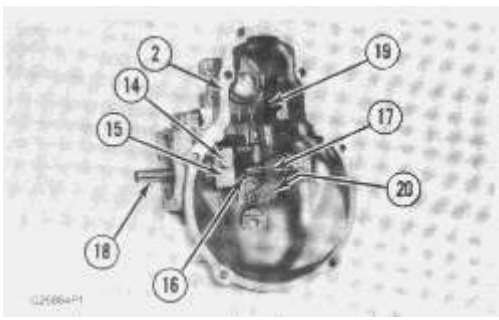


3. Remove four bolts (3), cover (4) and gasket. Remove spring (6) and the seal from cover (4). Remove two pins (7) from plate (8). Remove fuel air ratio control (10). See the topic, Remove And Install Fuel Air Ratio Control, in this manual. Remove guide screw (9) from the governor cover (2). Remove six screws (5) that hold the governor cover to the governor housing.



NOTE: Cover (2) must be lifted to disengage barrel (12) from fulcrum lever (13).

4. Remove cover (2) from housing (11).

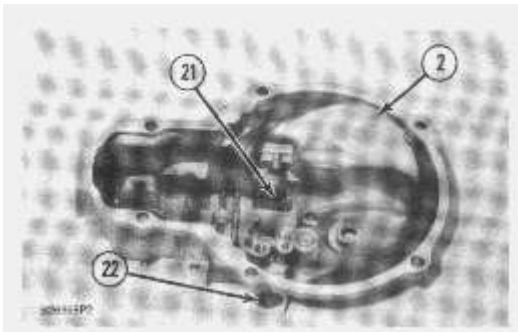


5. Remove bolt (14) that holds plate (15) to the governor cover.

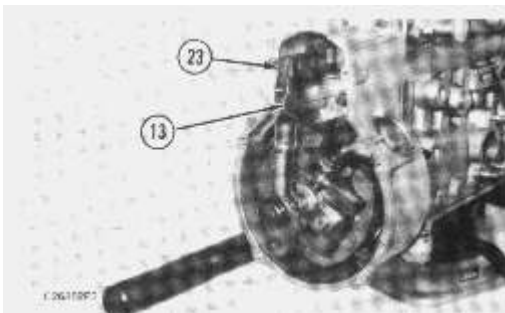
NOTICE

Take extra care not to damage the governor cover (2) when pins (16) are removed.

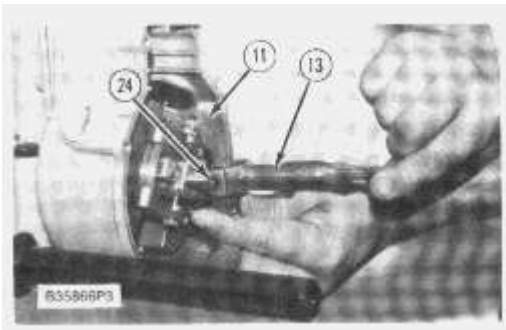
6. Use a punch and hammer and remove pins (16) from the lever and guide block (17).
7. Remove shaft (18).
8. Remove lever (19) and spring (20) from the governor cover (2).



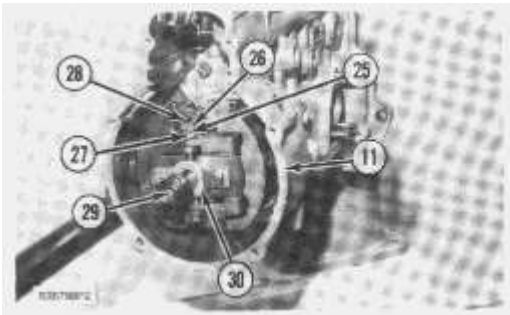
9. Remove bearing (21) and seal (22) from each side of the governor cover (2).



10. Disconnect fulcrum lever (13) from link (23). Use a rubber band to hold link (23) up.



11. Move fulcrum lever (13) 90° from the governor housing as shown and remove fulcrum lever (13) and fork (24) from the shaft.

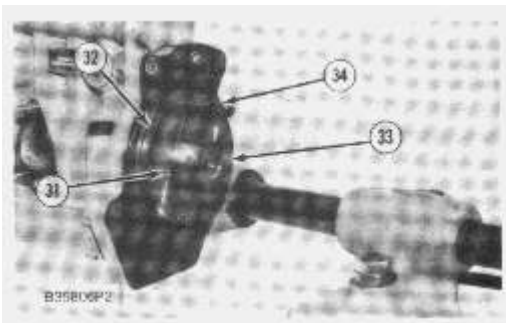


12. Bend lock (25) up. Remove nut (26), lock (25) and nut (27) from bolt (28).

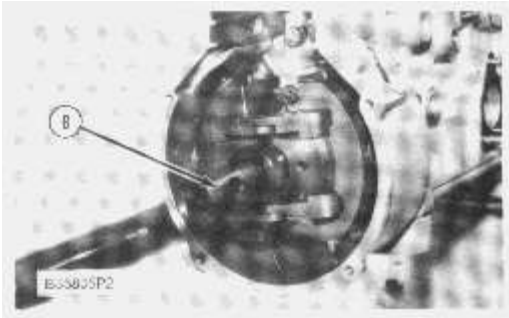
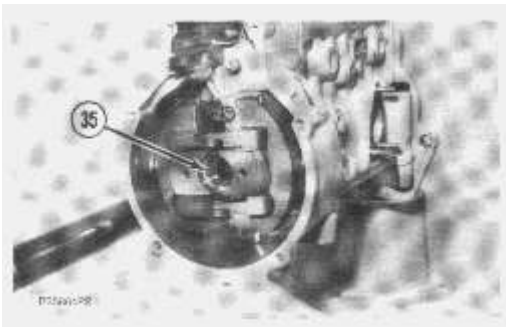
13. Turn the fuel injection pump camshaft as needed so the head of bolt (28) is toward the top of the governor housing. Remove bolt (28).

14. Remove shaft (29).

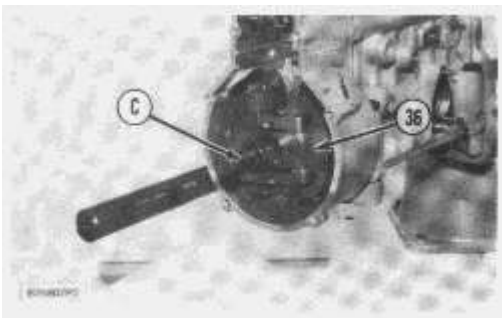
15. Bend the locks up and remove the bolts that hold bushing (30) to the flyweights. Remove bushing (30).



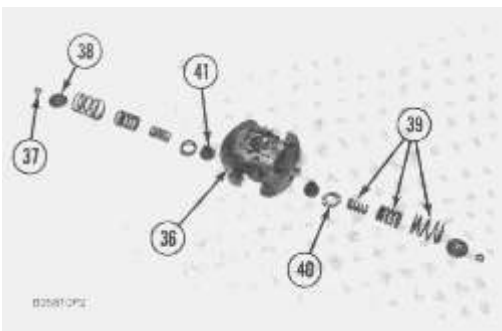
16. Turn the fuel injection pump camshaft (31) until the hole in the sleeve (32) is in alignment with the hole in the adapter (33). Install timing pin (34) so the fuel injection pump camshaft (31) will not turn.



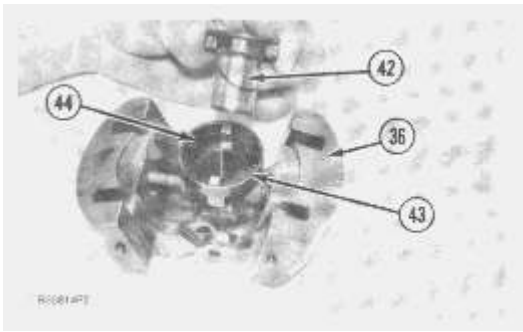
17. Use tooling (B) and remove nut (35) that holds the flyweights on the fuel injection pump camshaft. Remove the shim behind the nut.



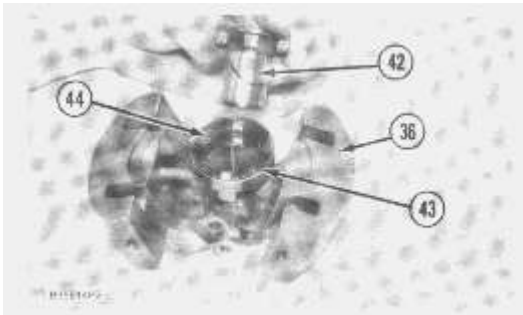
18. Use tooling (C) and remove flyweights (36) from the fuel injection pump camshaft.



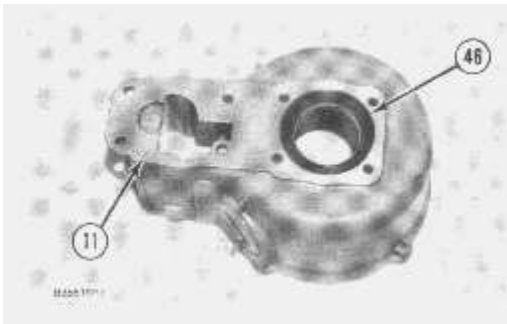
19. Use tool (D) and remove nut (37) from each side of the flyweight (36). Remove seat (38), spring (39), shims (40) and seat (41) from each side of flyweights (36).



20. Remove puller (42) from ring (43). Remove dampers (44) from ring (43). Remove ring (43) from the flyweight (36).

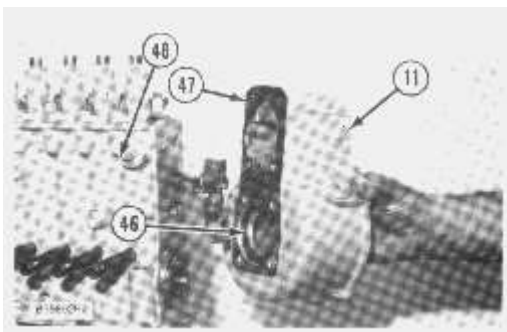


21. Remove eight bolts (45) that hold the governor housing to the fuel injection pump housing. Remove governor housing (11).

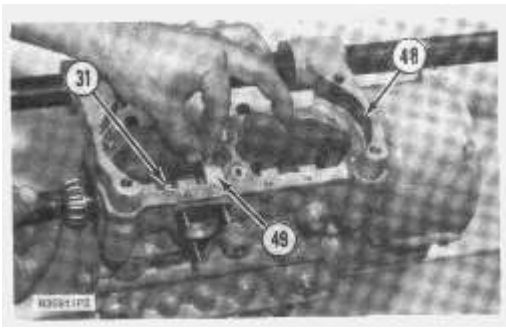


22. Remove shims (46) and gasket from governor housing (11).

NOTE: The following steps are to assemble the governor.

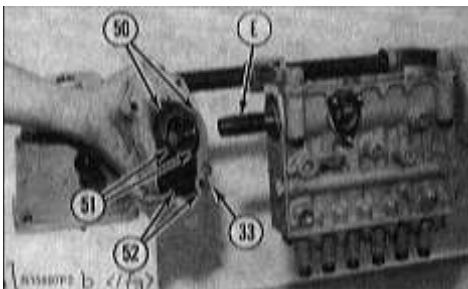


23. Put gasket (47) and shims (46) in position and install governor housing (11) on the fuel injection pump housing (48). Tighten the bolts that hold the governor housing in place to a torque of 8.8 to 10.8 N·m (6.5 to 8.0 lb ft).



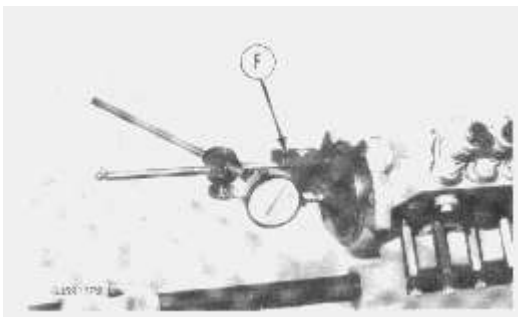
24. Slide fuel injection pump camshaft (31) into the fuel injection pump housing (48). Put center bearing (49) in position as the fuel injection pump camshaft is installed. Install the bolts that hold the center bearing in position. Tighten the bolts to a torque of 6.9 to 8.8 N·m (5.1 to 6.5 lb ft).

NOTE: The removal of center bearing item (49) is explained as item (11) in the Fuel Injection Pump Disassembly story.

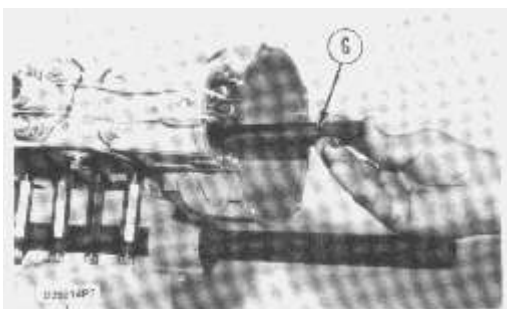


25. Put tool (E) in position on the end of the fuel injection pump camshaft.

26. Put adapter (33) in position against the fuel injection pump housing. Install the bolts in holes (50) and (51) first. Tighten the bolts in an "X" sequence to a torque of 6.9 to 8.8 N·m (5.1 to 6.5 lb ft). Install the bolts in holes (52) and tighten the bolts to a torque of 7 to 8 N·m (5 to 6 lb ft).



27. Install tooling (F) on the front of the fuel injection pump camshaft.



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