FUEL PUMP DISASSEMBLY

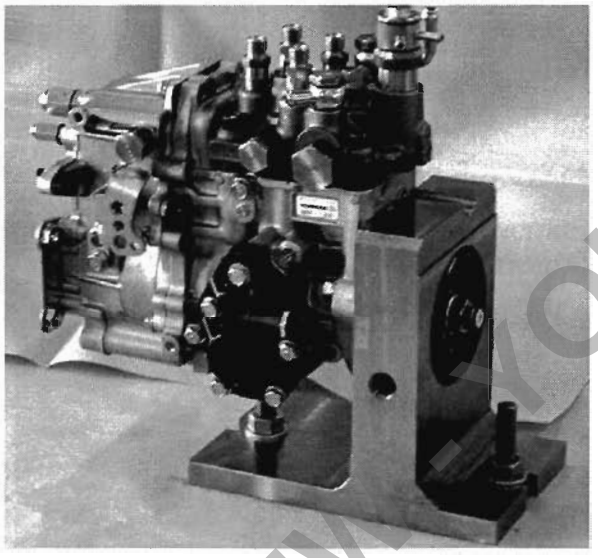
Note: Keep all parts clean and in order during disassembly and reinstall all fasteners and small parts to their mating part as components are removed. This will simplify in identification and assembly.

Inspect all parts for wear or damage, replace parts as necessary.

Drain the fuel pump of fuel oil and wash dirt and grease from the outside of the pump before disassembly.

Governor

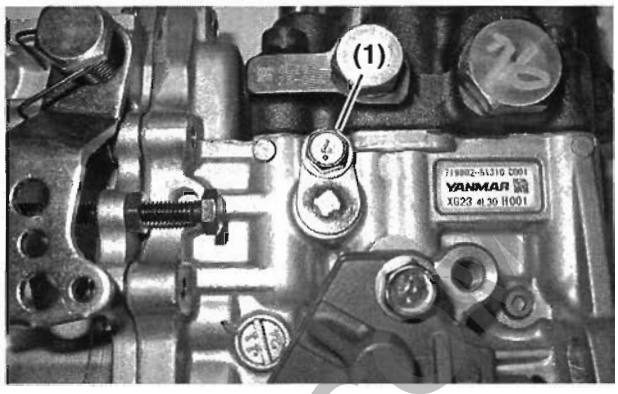
1. Mount the fuel pump and governor assembly to a repair stand **(Figure 5-11)**.



0001170

Figure 5-11

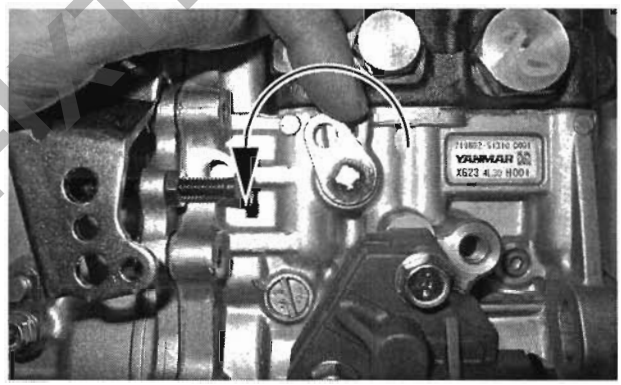
2. Remove the governor link retainer shaft bolt **(Figure 5-12, (1))**.



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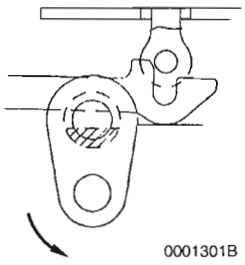
Figure 5-12

3. Turn the governor link retainer shaft **(Figure 5-13)** counterclockwise 180 degrees to the 6 o'clock position to disengage the governor link **(Figure 5-14)** from the control rack.



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Figure 5-13



0001301B

Figure 5-14

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PUMP TORQUE SPECIFICATIONS (MP2 / MP4 MODELS)

No.	Item	Tightening Torque MP2 / MP4	No.	Item	Tightening Torque MP2 / MP4
1	Fuel Inlet Fitting	18 - 21 ft-lb (25 - 29 N·m)	12	Control Rack Guide Retaining Screw	2 - 3 ft-lb (3 - 4 N·m)
		M12x1.25			M4x0.7 (hexagon socket head)
2	Fuel Return Fitting	18 - 21 ft-lb (25 - 29 N·m)	13	Distribution Shaft Retainer	6 - 7 ft-lb (8 - 10 N·m)

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4. Inspect the pump housing **(Figure 5-19, (1, 2))**. If the pump housing is worn, replace the complete pump assembly.

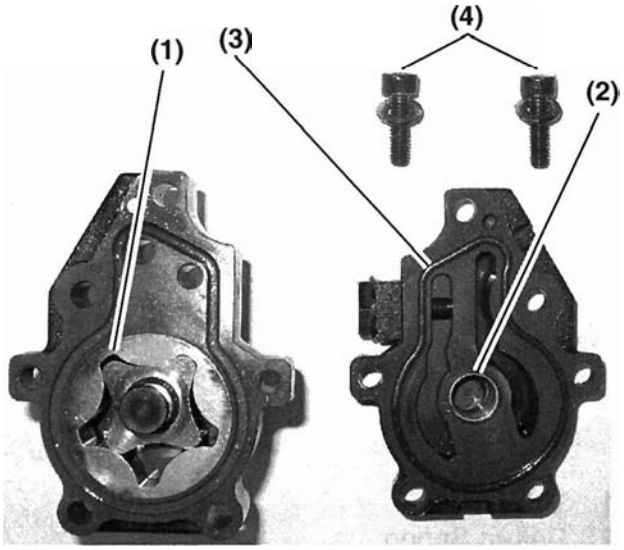


Figure 5-19

5. Inspect the drive gear **(Figure 5-20, (1))**, rotor assembly **(Figure 5-20, (2))**, drive pin **(Figure 5-20, (3))**, seal **(Figure 5-21, (2))** oil ports **(Figure 5-21, (3))** and O-ring seal areas **(Figure 5-21, (1))** for wear. If damaged or worn, replace the complete pump assembly.



Figure 5-20

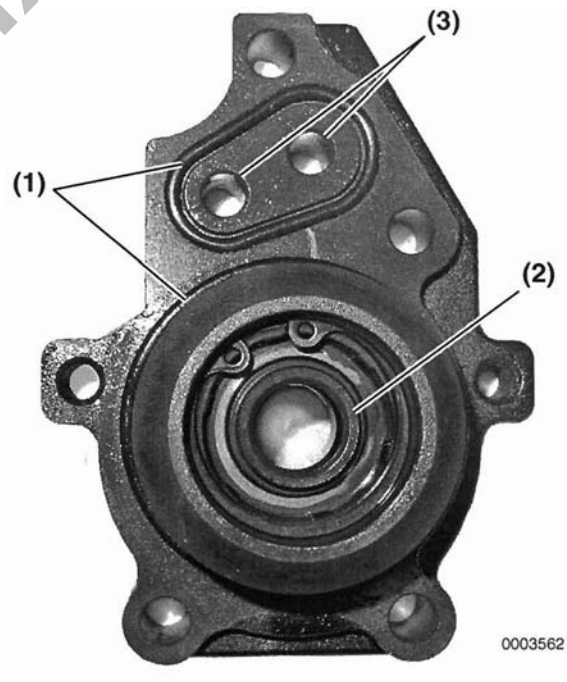


Figure 5-21

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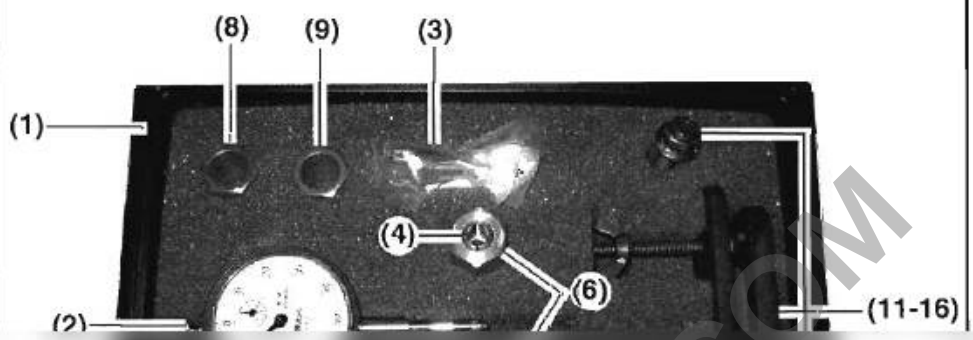
FUEL SYSTEM TROUBLESHOOTING CHART

Use this troubleshooting chart to assist in the diagnosis of the fuel system prior to removing the fuel injection pump.

Complaint		Cause	Correction
1. Engine won't start.	Fuel not delivered to injection pump.	(1) No fuel in the fuel tank.	Fill with fuel.
		(2) Fuel tank valve is closed.	Open.
		(3) Fuel line or valve is clogged.	Clean complete fuel system.
		(4) Fuel filter element is clogged.	Disassemble and clean, or replace element. Find and repair source of debris in fuel.
		(5) Air in fuel lines.	Locate air leak using clear fuel line and repair.
		(6) Fuel feed pump inoperable.	Replace.
		(7) Fuel has gelled.	Replace with a fuel for cold weather or use fuel heater.
	Fuel delivered to injection pump.	(1) Stop solenoid is Inoperative.	Determine cause and repair or replace solenoid.
		(2) Throttle control inoperative.	Repair or adjust.
		(3) Air in fuel lines.	Locate air leak using clear fuel line and repair.
		(4) Low cranking speed.	Check battery, starter motor or internal engine components for failure.
		(5) Internal failure of injection pump.	Remove pump and repair.
		(6) Governor is damaged.	Remove governor and repair or replace.
		(7) Injection pump coupling, gear or key is damaged.	Replace.
		(8) Lifter is seized.	Check lube oil supply and oil pump. Repair pump.
		(9) Cold start device is inoperative.	Repair device.
		(10) Transmission shaft is seized. Gear slip.	Repair pump.
	Nozzle inoperative.	(1) Compression leakage past injector.	Replace nozzle seat and tighten retainer to specifications.
		(2) Fuel leakage from nozzle.	Tighten case nut to specification.
		(3) One or more nozzles are sticking open or closed.	Determine cause of nozzle failure and repair.
	Injection timing is defective.	(1) Injection pump is installed incorrectly.	Reinstall pump and time engine.
		(2) Injection timing is excessively advanced or retarded due to failed key or coupler.	Replace key or coupler.
		(3) Internal failure of injection pump.	Remove pump and repair.

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Name of tool	Image
Fuel Injection Pump Special Tool Kit P/N 458091 Includes: Dial Indicator Set	

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INTRODUCTION

This section of the *Service Manual* describes the adjustment procedures necessary to setup and adjust the fuel injection pump and governor.

The fuel injection pump delivery must be calibrated, whenever the pump is disassembled.

A fuel pump test bench **(Figure 6-1)** is required to make the necessary adjustments.

3. Mount the fuel injection pump **(Figure 6-2)** on the pump tester platform.

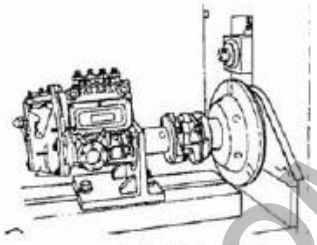


Figure 6-2

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SAFETY STATEMENTS

Yanmar considers safety of great importance and recommends that anyone that comes into close contact with its products, such as those that install, operate, maintain or service Yanmar products, exercise common sense and comply with the safety information in this manual and on the safety labels. Keep the labels from becoming dirty or torn and replace them if they are lost or damaged. Also, if you need to replace a part that has a label attached to it, make sure you order the new part and label at the same time.



This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

DANGER

Danger (the word "DANGER" is in white letters with a red rectangle behind it) - indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Danger is limited to the most extreme situations.

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WARNING

Warning (the word "WARNING" is in black letters with an orange rectangle behind it) – indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

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CAUTION

Caution (the word "CAUTION" is in black letters with a yellow rectangle behind it) – indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

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CAUTION

Caution without the safety alert symbol indicates a potentially hazardous situation that can cause damage to the machine, personal property and / or the environment or cause the machine to operate improperly.

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GOVERNOR COMPONENTS (MP2 / MP4 MODELS)

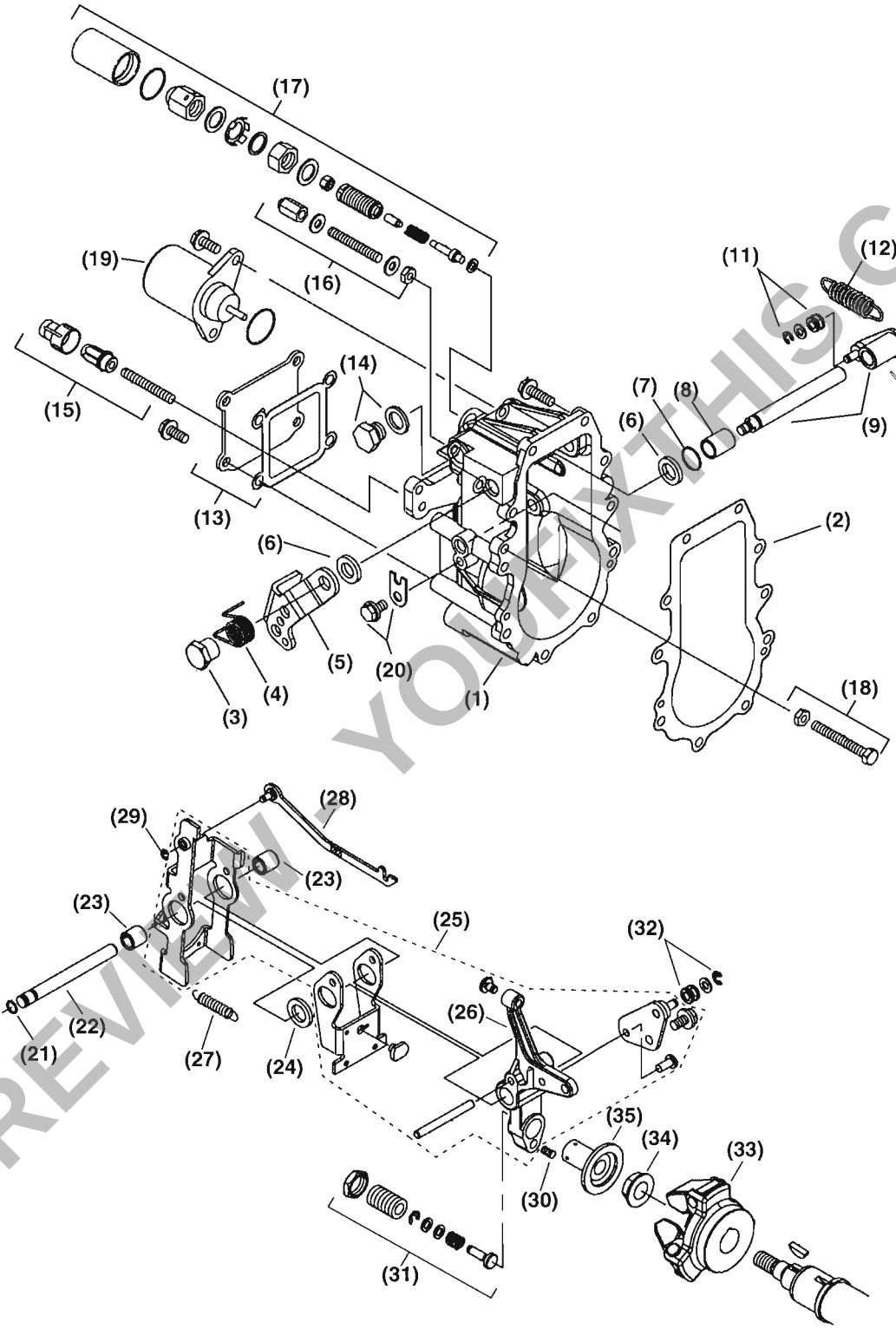
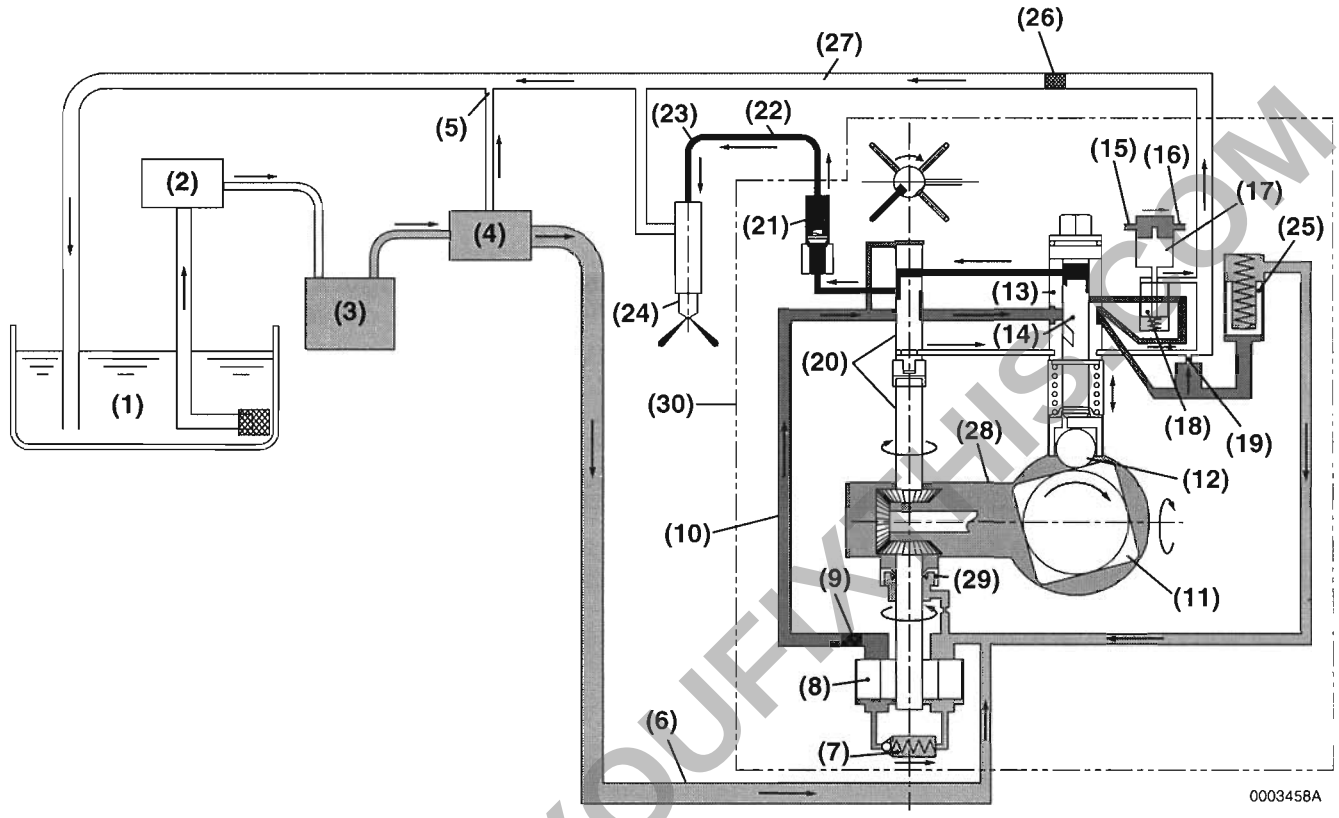


Figure 4-2

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Fuel Flow Diagram



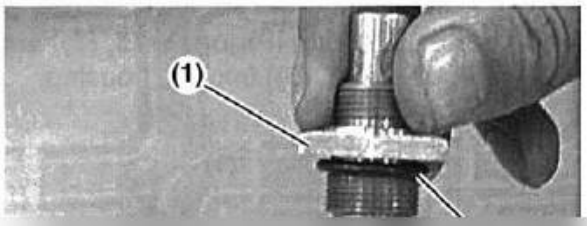
1. Fuel Tank
2. Water Separator
3. Electric Fuel Delivery Pump
4. Fuel Filter
5. Air Bleed Orifice
6. Low Pressure Fuel
7. Pressure Control Valve
8. Charge Pump
9. Charge Pump Outlet Fuel Strainer
10. Regulated Fuel Pressure
11. Camshaft Lobe
12. Roller Lifter
13. Barrel
14. Plunger
15. Engine Coolant IN
16. Engine Coolant OUT
17. Thermo-element
18. Timer Piston
19. Return Fuel Orifice
20. Distribution Shaft Assembly
21. Fuel Delivery Valve
22. High Pressure Fuel
23. High Pressure Fuel Injection Pipe
24. Fuel Injection Nozzle
25. Accumulator Assembly
26. Return Fuel Strainer
27. Return Fuel
28. Engine Oil
29. Oil Seal
30. Fuel Injection Pump Assembly

Figure 5-4

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12. Install a new O-ring **(Figure 5-76, (2))** on the thermo-element **(Figure 5-76, (1))** and tighten to 22 - 26 ft-lb. (30 - 35 N·m).
Do not over-torque.



Charge Pump

Note: If charge pump was disassembled for inspection, clean all parts thoroughly before reassembly. If any part is suspected of damage or failure, replace the complete pump assembly.

1. Install and align pump gears **(Figure 5-78, (1))** into pump housing.
2. Install the new pump housing O-ring **(Figure 5-78, (2))** into groove and assembly

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