

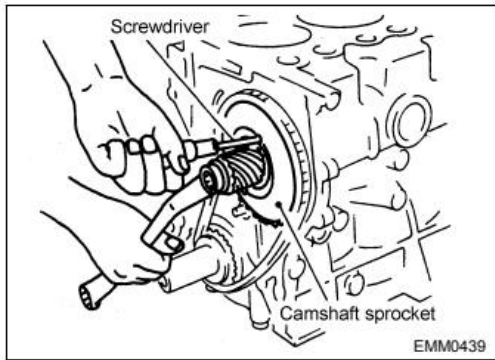


Service Manual

TB45 Gasoline Engine
111219-up

TIMING CHAIN

Removal (Cont'd)



12. Remove camshaft sprocket bolt.

- Insert a screwdriver wrapped in a shop cloth to the hole on camshaft sprocket, secure camshaft sprocket by attaching the tip of screwdriver to camshaft locating plate bolt, and then loosen the bolt.

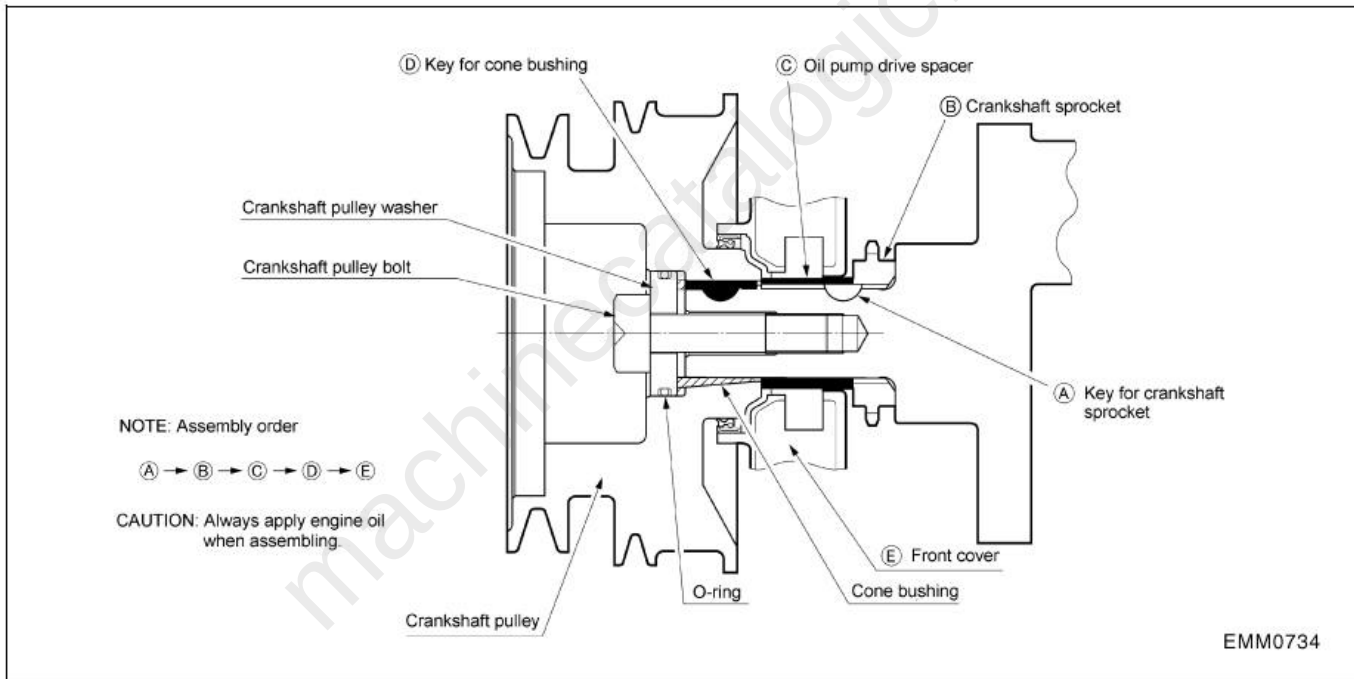
13. Remove chain tensioner and chain guide.

⚠ CAUTION:

Hold the sleeve with a finger to prevent it from popping out when removing.

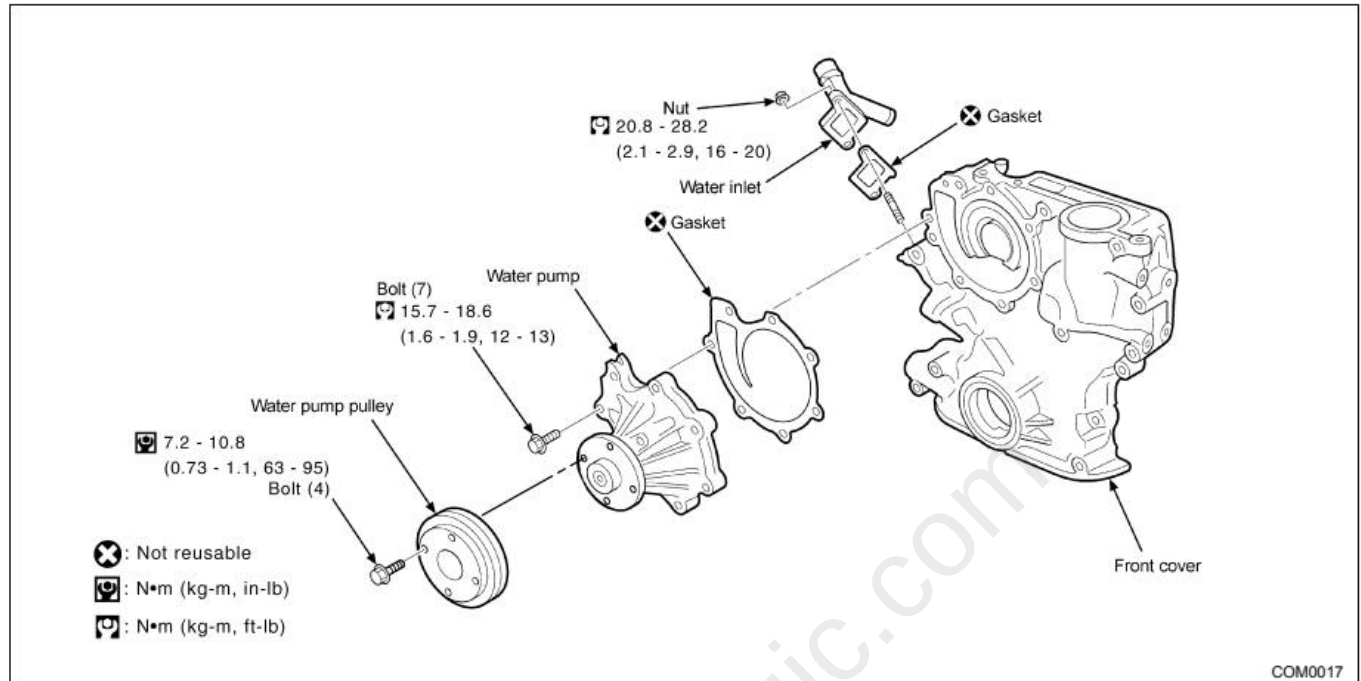
14. Remove distributor drive gear.

15. Remove camshaft sprocket and crankshaft sprocket together with timing chain.



WATER PUMP

Component Parts Location



Removal and Installation

PREPARATION

⚠ WARNING:

Do not drain coolant when engine is still hot. It may cause burns.

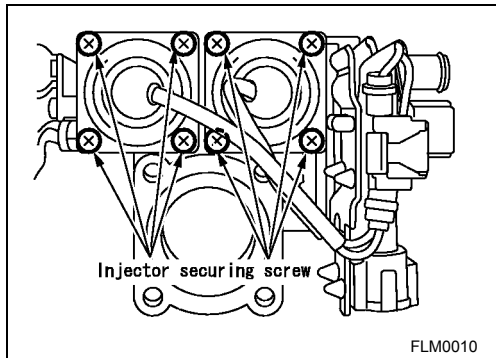
Engine drive belts

⚠ CAUTION:

Handle water pump vane so that it does not contact with other parts.

Inspection

- Check water pump body and vanes for severe corrosion and dirt.
- Make sure that water pump shaft turns smoothly without roughness.



Injector Holder (Cont'd)

LPG FUEL INJECTOR

Removal and installation

- Disassemble and assemble as shown in the figure.
- Install LPG fuel injector and check LPG leakage using soapy water after assembly.
- Insert straight and assemble O-ring and seal rubber on top after changing to new ones and applying engine oil to the circumference lightly.

⚠ CAUTION:

- O-ring may be damaged when tilting and inserting forcibly.
- Do not use silicon oil when inserting.
- Use correct injector specified for each engine type. (Check part number on fuel injector body label.)

Tightening torque of securing screw:

3.9 - 7.8 N·m (0.40 - 0.80 kg-m, 3 - 6 ft-lb)

Check and cleaning

- Perform continuity test of harness connector. If it is approximately 1Ω (at room temperature) with a tester, it is normal. If continuity should not exist, check for blown fuse.

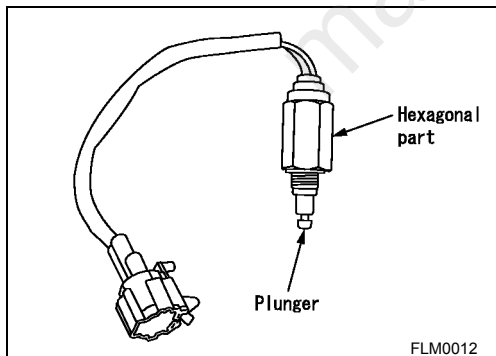
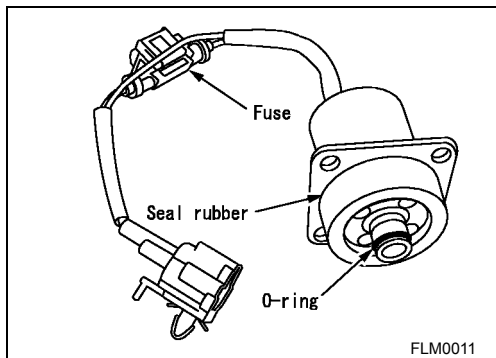
NOTE:

If fuse is blown, replace it with proper fuse (5A).

- Check signal wave of related harnesses. When a non-standard signal flows, a malfunction may occur again. Replace parts if the resistance is not normal.
- Clean injector. Clean injector from fuel inlet side with compressed air for approximately 5 minutes.

⚠ CAUTION:

Do not use cleaner such as carb cleaner because it negatively affects rubber parts of inside.



LPG ASSISTANCE INJECTOR

Removal and installation

- Rotate and remove hexagonal part of body using a spanner.

⚠ CAUTION:

When removing hexagonal part of body, inside spring, plunger, and washer are removed together. Do not drop and lose them.

- Install after assembling inner components in their original position. Replace aluminum washer with new ones.

Tightening torque:

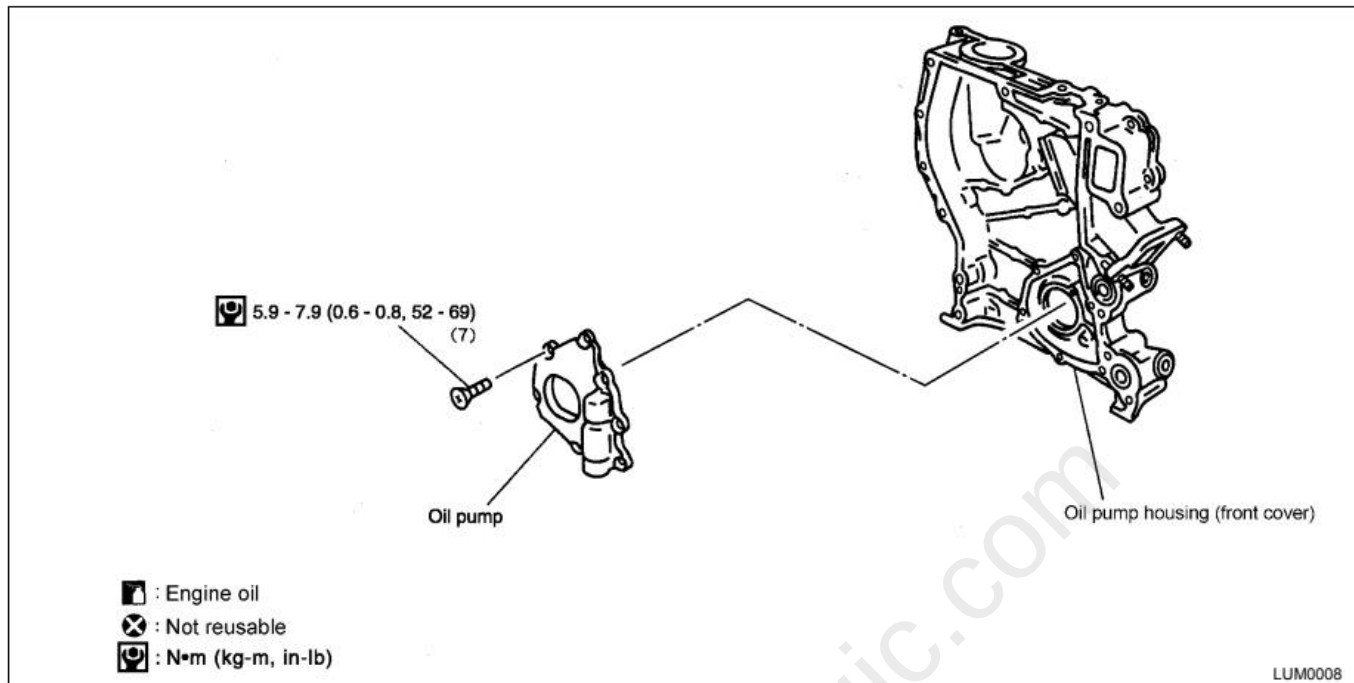
11.8 - 26.5 N·m (1.2 - 2.7 kg-m, 9 - 20 ft-lb)

Check and cleaning

If foreign materials such as tars are applied or collected on plunger or its inside, remove them with compressed air.

OIL PUMP

Component Parts Location



⚠ CAUTION:

Apply new engine oil to the parts marked in the figure prior to installation.

Disassembly and Assembly

PREPARATION

Front cover (Refer to "TIMING CHAIN" in EM section.)

NOTE:

Oil pump is integrated in front cover.

TROUBLE DIAGNOSIS

ECM Input/Output Signal Specifications (Cont'd)

Terminal	Signal name	Condition	Data (DC value)
118 121	Power supply for ECM	Ignition switch ON, engine running	Battery voltage
104	Throttle control motor relay	Ignition switch ON, engine running	Approx. 1V
3	Throttle control motor relay power supply	Always	Battery voltage
5	Throttle control motor (Open)	At idle after warming up	Approx. 0.1 to 0.15V
		At approx. 2000 rpm	
4	Throttle control motor (Close)	At idle after warming up	Approx. 2 - 2.5V
		At approx. 2000 rpm	
32	Fuel changing switch 2 (Gasoline)	Changing switch ON (At gasoline side)	Approx. 5V
		Changing switch ON (At LPG side or neutral)	Approx. 0V
49	Fuel changing switch power supply	Changing switch ON	Approx. 5V
		Changing switch OFF (At neutral)	Approx. 0V
70	Fuel changing switch 1 (LPG)	Changing switch ON (At LPG side)	Approx. 5V
		Changing switch OFF (At LPG side or neutral)	Approx. 0V
112	LPG interception valve relay	When ignition switch is ON (Approx. 1 second) and for approximately 10 seconds after ignition switch is OFF	Battery voltage
		Ignition switch OFF	Approx. 0V

Belt Tension Adjustment

ALTERNATOR BELT

- Loosen alternator bolt and adjusting bar bolt, and adjust them with alternator installing angle.
- Tighten adjusting bar bolt and alternator bolt.

Adjusting bar bolt:

 : 19 - 25 N•m (1.9 - 2.6 kg-m, 14 - 18 ft-lb)

Alternator bolts (2):

 : 14 - 20 N•m (1.4 - 2.0 kg-m, 10 - 15 ft-lb)

FAN BELT

- Loosen lock nut and two nuts for fan pulley, and adjust fan belt with adjust bolt.
- Tightening lock nut and nut for fan pulley.

Lock nut:

 : 9 - 13 N•m (0.9 - 1.3 kg-m, 7 - 10 ft-lb)

Nut for fan pulley:

 : 9 - 13 N•m (0.9 - 1.3 kg-m, 7 - 10 ft-lb)

Full Version Available

Caterpillar GP50NF Forklift LPG Service Manual (99739-31100)

Caterpillar GP50NF LPG forklift service manual, covers converter, regulator, mixer, tank and fuel lines. Instant PDF download.

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