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YANMAR LIMITED WARRANTY

What is Covered by this Warranty?

Yanmar warrants to the original retail purchaser that a new Yanmar TNM Series Industrial Engine will be free from defects in material and / or workmanship for the duration of the warranty period.

Note: Yanmar engines may be equipped with external components including, but not limited to: wiring harnesses, electrical devices, control panels, radiators, air filters, fuel filters, and / or exhaust systems that are supplied and / or installed by manufacturers other than Yanmar. For warranty information on such external components, please contact the machine or component manufacturer directly or see your authorized Yanmar dealer or distributor.

THIS WARRANTY IS PROVIDED IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. YANMAR SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, except where such disclaimer is prohibited by law. IF SUCH DISCLAIMER IS PROHIBITED BY LAW, THEN IMPLIED WARRANTIES SHALL BE LIMITED IN DURATION TO THE LIFE OF THE EXPRESSED WARRANTY.

How Long is the Warranty Period?

The Yanmar standard limited warranty period runs for a period of **twenty-four (24) months or two-thousand (2000) engine operation hours**, whichever occurs first. An extended limited warranty of thirty-six (36) months or three thousand (3000) engine operating hours, whichever occurs first, is provided for these specific parts only: the cylinder block, cylinder head, crankshaft forging, connecting rods, flywheel, flywheel housing, camshaft, timing gear, and gear case. The Warranty Period for both the standard limited warranty and the extended limited warranty (by duration or operation hours) begins on the date of delivery to the original retail purchaser and is valid only until the applicable warranted duration has passed or the operation hours are exceeded, whichever comes first.

What the Engine Owner Must Do:

If you believe your Yanmar engine has experienced a failure due to a defect in material and / or workmanship, you must contact an authorized Yanmar industrial engine dealer or distributor within thirty (30) days of discovering the failure. You must provide proof of ownership of the engine, proof of the date of the engine purchase and delivery, and documentation of the engine operation hours. Acceptable forms of proof of delivery date include, but are not limited to: the original warranty registration or sales receipts or other documents maintained in the ordinary course of business by Yanmar dealers and / or distributors, indicating the date of delivery of the Yanmar product to the original retail purchaser. This information is necessary to establish whether the Yanmar product is still within the warranty period. Thus, Yanmar strongly recommends you register your engine as soon as possible after purchase in order to facilitate any future warranty matters.

You are responsible for the transportation of the engine to and from the repair location as designated by Yanmar.

⚠ DANGER

CRUSH HAZARD!

- When you need to transport an engine for repair, have a helper assist you to attach it to a hoist and load it on a truck.
- NEVER stand under a hoisted engine. If the hoist mechanism fails, the engine will fall on you, causing death or serious injury.
- Failure to comply will result in death or serious injury.

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⚠ DANGER

EXPLOSION HAZARD!

- NEVER check the remaining battery charge by shorting out the terminals. This will result in a spark and may cause an explosion or fire. Use a hydrometer to check the remaining battery charge.
- If the electrolyte is frozen, slowly warm the battery before you recharge it.
- Failure to comply will result in death or serious injury.

0000007en

⚠ WARNING

SEVER HAZARD!

- Keep hands and other body parts away from moving / rotating parts such as the cooling fan, flywheel or PTO shaft.
- Wear tight-fitting clothing and keep your hair short or tie it back while the engine is running.
- Remove all jewelry before you operate or service the machine.
- NEVER start the engine in gear. Sudden movement of the engine and / or machine could cause death or serious personal injury.
- NEVER operate the engine without the guards in place.
- Before you start the engine make sure that all bystanders are clear of the area.
- Keep children and pets away while the engine is operating.
- Check before starting the engine that any tools or shop rags used during maintenance have been removed from the area.
- Failure to comply could result in death or serious injury.

0000002en

CAUTION

Do not turn the battery switch OFF while the engine is operating. Damage to the alternator will result.

0000038en

CAUTION

Do not operate the engine if the alternator is producing unusual sounds. Damage to the alternator will result.

0000039en

CAUTION

If the engine coolant pump must be replaced, replace the engine coolant pump as an assembly only. Do not attempt to repair the engine coolant pump or replace individual components.

0000041en

CAUTION

Use a new special O-ring between the engine coolant pump and the joint. Be sure to use the special O-ring for each engine model. Although the O-ring dimensions are the same as a commercially available O-ring, the material is different.

0000042en

CAUTION

Remove or install the high-pressure fuel injection lines as an assembly whenever possible. Disassembling the high-pressure fuel injection lines from the retainers or bending any of the fuel lines will make it difficult to reinstall the fuel lines.

0000047en

CAUTION

After marking the position of the pump drive gear, do not rotate the engine crankshaft. Rotating the crankshaft will cause the fuel injection pump to become misaligned.

0000048en

CAUTION

Do not use a high-pressure wash directly on the alternator. Water will damage the alternator and result in inadequate charging.

0000049en

CAUTION

Do not reverse the positive (+) and negative (-) ends of the battery cable. The alternator diode and stator coil will be damaged.

0000050en

CAUTION

When the battery indicator goes out, it should not come on again. The battery indicator only comes on during operation if the alternator fails. However, if an LED is used in the battery indicator, the LED will shine faintly during normal operation.

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CAUTION

Using a non-specified V-belt will cause inadequate charging and shorten the belt life. Use the specified belt.

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COMPONENT IDENTIFICATION

Figure 4-1 shows where major engine components are located.

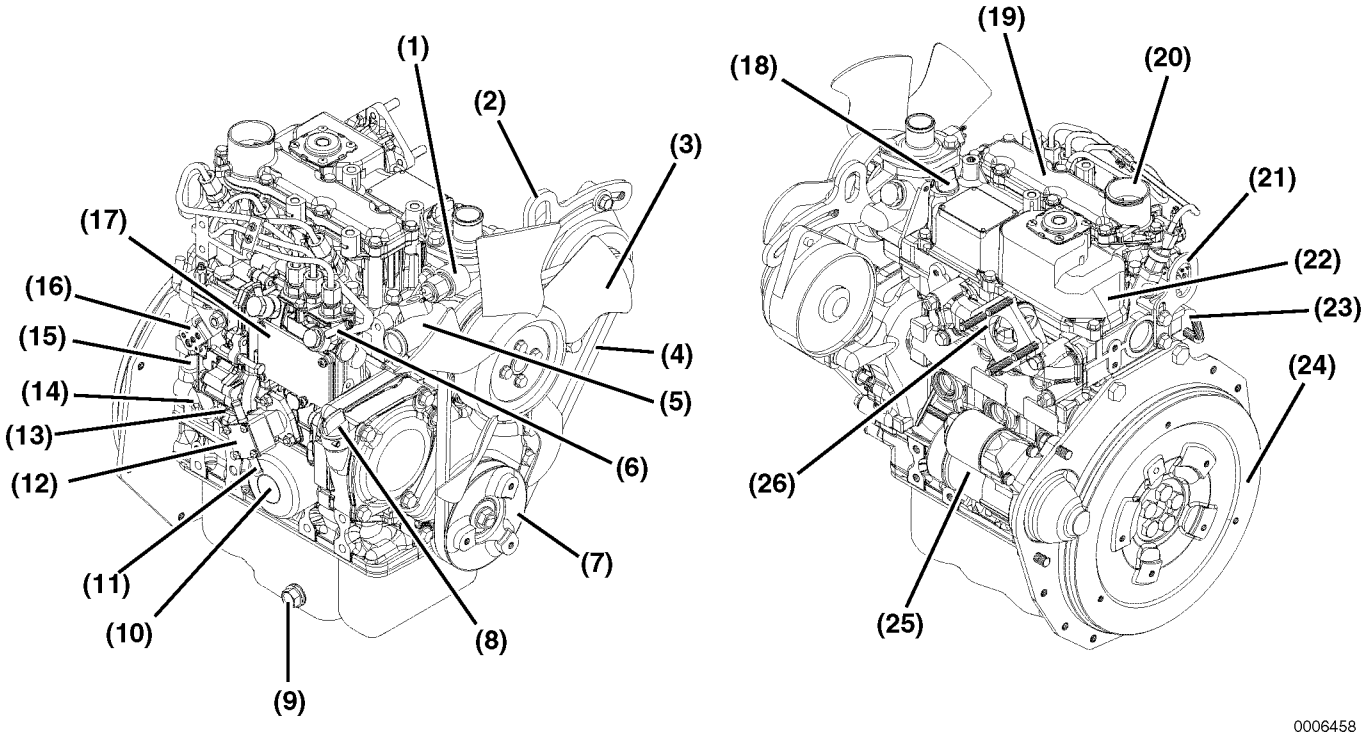

Figure 4-1

1 – Coolant Temperature Sensor
2 – Lifting Eye (engine cooling fan end)
3 – Engine Cooling Fan
4 – V-Belt
5 – Engine Coolant Pump
6 – Fuel Return to Fuel Tank
7 – Crankshaft V-Pulley
8 – Side Filler Port (engine oil)
9 – Drain Plug (engine oil)*
10 – Engine Oil Filter
11 – Fuel Inlet
12 – Mechanical Fuel Pump
13 – Fuel Priming Lever
14 – Oil Pressure Switch
15 – Dipstick (engine oil)
16 – Governor Lever
17 – Fuel Injection Pump
18 – Top Filler Port (engine oil)
19 – Intake Manifold
20 – Air Intake Port (from air cleaner)
21 – Lifting Eye (flywheel end)
22 – Rocker Arm Cover
23 – Stop Solenoid
24 – Flywheel
25 – Starter Motor
26 – Exhaust Manifold

* Engine oil drain plug location may vary based on oil pan options.

Note that a typical fuel tank is shown. The fuel tank on the equipment being serviced may be different.

1. Clean the area around the fuel cap **(Figure 4-3, (1))**.
2. Remove the fuel cap **(Figure 4-3, (1))** from the fuel tank **(Figure 4-3, (2))**.
3. Observe the fuel level sight gauge **(Figure 4-3, (3))** and stop fueling when gauge shows fuel tank is full. NEVER overfill the fuel tank.
4. Replace the fuel cap and hand-tighten. Over tightening the fuel cap will damage it.

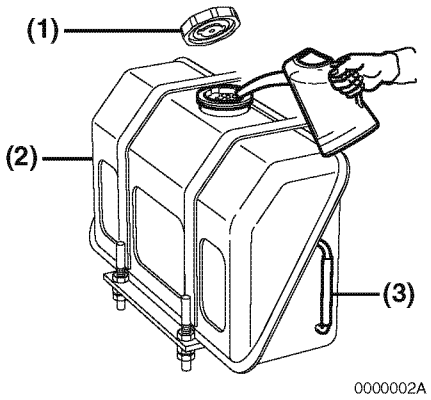

Figure 4-3

Priming the Fuel System

⚠ DANGER

FIRE AND EXPLOSION HAZARD!

- **Diesel fuel is flammable and explosive under certain conditions.**
- **If the unit has an electric fuel pump, when you prime the fuel system, turn the key switch to the ON position for 10 to 15 seconds to allow the electric fuel pump to prime the system.**
- **If the unit has a mechanical fuel pump, when you prime the fuel system, operate the fuel priming lever of the mechanical fuel pump several times until the fuel filter cup is filled with fuel.**
- **Failure to comply will result in death or serious injury.**

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The fuel system needs to be primed under certain conditions:

- Before starting the engine for the first time
- After running out of fuel and fuel has been added to the fuel tank
- After fuel system maintenance such as changing the fuel filter and draining the fuel filter / water separator, or replacing a fuel system component

To prime the fuel system if an electric fuel pump is installed:

1. Turn the key to the ON position for 10 to 15 seconds. This will allow the electric fuel pump to prime the fuel system.
2. NEVER use the starter motor to prime the fuel system. This may cause the starter motor to overheat and damage the coils, pinion and / or ring gear.

3TNM72 (EPA Tier 4)

Engine Model		3TNM72												
Version		CL		VM						CH		VH		
Type		Vertical In-line Diesel Engine												
Combustion System		Ball-Type Swirl Chamber												
Aspiration		Natural												
No. of Cylinders		3												
Bore × Stroke		2.83 x 2.91 in. (72 × 74 mm)												
Displacement		55.1 cu in. (0.904 L)												
Continuous Rated Output	rpm (min^{-1})	1500	1800						3000	3600				
	hp SAE	8.8	10.4						17.7	21.3				
	kW	6.6	7.8						13.2	15.9				
	PS	9.0	10.6						17.9	21.6				
Max. Rated Output (Net)	rpm (min^{-1})	1500	1800	2000	2200	2400	2600	2800	3000	3000	3600	3200	3400	3600
	hp SAE	9.7	11.5	12.7	14.2	15.6	16.8	18.2	19.7	19.4	23.4	20.9	22.1	23.6
	kW	7.3	8.6	9.5	10.6	11.7	12.6	13.6	14.7	14.5	17.5	15.6	16.5	17.6
	PS	9.9	11.7	12.9	14.4	15.9	17.1	18.5	20.0	19.7	23.8	21.2	22.4	23.9
High Idling	rpm (min^{-1}) ± 25	1600	1900	2185	2380	2595	2805	3020	3235	3175	3770	3415	3630	3840
Engine Weight (Dry) with Flywheel Housing*		242 lb (110 kg) SAE#5		205 lb (93 kg)						242 lb (110 kg) SAE#5		187 lb (85 kg)		
PTO Position		Flywheel End												
Direction of Rotation		Counterclockwise Viewed from Flywheel End												
Cooling System		Liquid-Cooled with Radiator												
Lubricating System		Forced Lubrication with Trochoid Pump												
Normal Oil Pressure at Rated Engine Speed		34.8 - 63.8 psi (0.240 -0.440 MPa, 2.4 - 4.4 kgf/cm^2)												
Normal Oil Pressure at Low Idle Speed		8.5 psi (0.06 MPa, 0.6 kgf/cm^2) or greater												
Starting System***		Electric Starting - Starter Motor: DC12V, 1.6 hp (1.2 kW)												
		Dynamo: DC12V, 20A												
		Recommended Battery Capacity: 12V, 36 Amp-Hour (5h rating)												
Dimensions (L × W × H)*		19.5 x 16.8 x 21.3 in. (497 × 427 × 542 mm)												
Engine Oil Pan Capacity		3.1 / 1.7 qt (2.9 / 1.6 L) (Dipstick Upper Limit / Lower Limit)								4.1 / 2.2 qt (3.9 / 2.1 L) (Dipstick Upper Limit / Lower Limit)		3.3 / 1.9 qt (3.1 / 1.8 L) (Dipstick Upper Limit / Lower Limit)		
Engine Coolant Capacity**		0.26 gal (1.0 L) Engine Only												
Standard Cooling Fan***		12.2 in. (310 mm) O.D., 5 Blade Pusher-Type												
Crank / Fan V-pulley Dia.***		3.9 / 3.5 in.(100 mm / 90 mm)												

* *Engine specifications without radiator*

** *Engine oil capacity for a "Deep Standard" oil pan. Refer to the Operation Manual provided by the driven machine manufacturer for the actual engine oil capacity of your machine.*

*** *May vary depending on application*

CAUTION

Observe the following environmental operating conditions to maintain engine performance and avoid premature engine wear:

- Avoid operating in extremely dusty conditions.
- Avoid operating in the presence of chemical gases or fumes.
- Avoid operating in a corrosive atmosphere such as salt water spray.
- NEVER install the engine in a floodplain unless proper precautions are taken to avoid being subject to a flood.
- NEVER expose the engine to the rain.

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CAUTION

Observe the following environmental operating conditions to maintain engine performance and avoid premature engine wear:

- The standard range of ambient temperatures for the normal operation of Yanmar engines is from +5°F (-15°C) to +113°F (+45°C).
- If the ambient temperature exceeds +113°F (+45°C) the engine may overheat and cause the engine oil to break down.
- If the ambient temperature is below +5°F (-15°C) the engine will be hard to start and the engine oil may not flow easily.
- Contact your authorized Yanmar industrial engine dealer or distributor if the engine will be operated outside of this standard temperature range.

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CAUTION

NEVER hold the key in the START position for longer than 15 seconds or the starter motor will overheat.

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CAUTION

For maximum engine life, Yanmar recommends that when shutting the engine down, you allow the engine to idle, without load, for five minutes. This will allow the engine components that operate at high temperatures, such as the turbocharger (if equipped) and exhaust system, to cool slightly before the engine itself is shut down.

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CAUTION

NEVER use an engine starting aid such as ether. Engine damage will result.

0000009en

CAUTION

Make sure the engine is installed on a level surface. If a continuously running engine is installed at an angle greater than (25°) in any direction or if an engine runs for short periods of time (less than three minutes) at an angle greater than (30°) in any direction, engine oil may enter the combustion chamber causing excessive engine speed and white exhaust smoke. This may cause serious engine damage.

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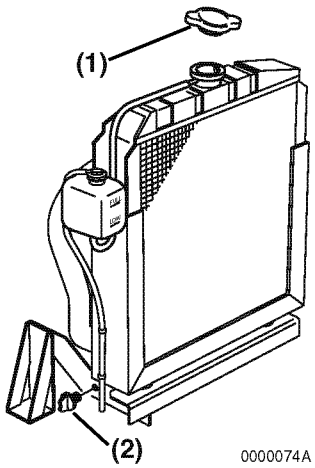


Figure 5-16

4. Drain the coolant from the engine block. Remove the coolant drain plug **(Figure 5-17, (1))** from the engine block.

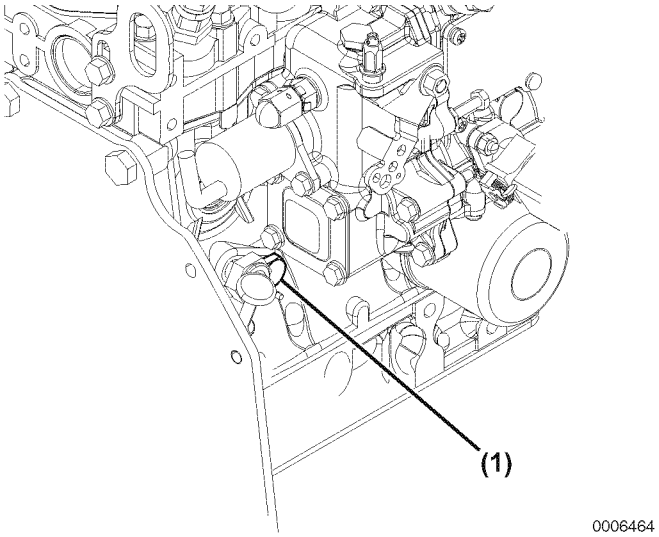


Figure 5-17

5. After draining the engine coolant, flush the radiator and engine block to remove any rust, scale and contaminants.
6. Reinstall and tighten the drain plug or close the drain cock at the radiator. Reinstall and tighten the engine block drain plug.
7. Fill radiator and engine with engine coolant. *See Filling Radiator with Engine Coolant on page 4-17.*

Adjust Intake / Exhaust Valve Clearance

Proper adjustment is necessary to maintain the correct timing for opening and closing the valves. Improper adjustment will cause the engine to run noisily, resulting in poor engine performance and engine damage. *See Measuring and Adjusting Valve Clearance on page 6-32.*

Rocker Arm and Shaft

Inspection Item	Standard		Limit		Reference Page
	3TNM68	3TNM72	3TNM68	3TNM72	
Arm Shaft Hole Diameter	0.3937 - 0.3945 in. (10.000 - 10.020 mm)	0.4724 - 0.4732 in. (12.000 - 12.020 mm)	0.3965 in. (10.07 mm)	0.4752 in. (12.07 mm)	*See Inspection of Rocker Arm Assembly on page 6-24*
Shaft Outside Diameter	0.3925 - 0.3933 in. (9.97 - 9.99 mm)	0.4711 - 0.4718 in. (11.966 - 11.984 mm)	0.3913 in. (9.94 mm)	0.4701 in. (11.94 mm)	
Oil Clearance	0.0004 - 0.0020 in. (0.010 - 0.050 mm)	0.0006 - 0.0021 in. (0.016 - 0.054 mm)	0.0051 in. (0.13 mm)	0.0051 in. (0.13 mm)	

CAMSHAFT AND TIMING GEAR TRAIN SPECIFICATIONS

Camshaft

Inspection Item			Standard		Limit		Reference Page
			3TNM68	3TNM72	3TNM68	3TNM72	
End Play			0.0020 - 0.0059 in. (0.05 - 0.15 mm)		0.0098 in. (0.25 mm)		*See Removal of Camshaft on page 6-39*
Bend			0 - 0.0008 in. (0 - 0.02 mm)		0.0020 in. (0.05 mm)		*See Inspection of Camshaft on page 6-49*
Cam Lobe Height			1.2100 - 1.2152 in. (30.735 - 30.865 mm)	1.3596 - 1.3648 in. (34.535 - 34.665 mm)	1.2287 in. (31.21 mm)	1.3499 in. (34.287 mm)	
Shaft Outside Diameter / Bearing Inside Diameter	Gear End	Inside Diameter	1.4173 - 1.4183 in. (36.000 - 36.025 mm)	1.5748 - 1.5758 in. (40.000 - 40.025 mm)	1.5807 in. (40.150 mm)	1.5787 in. (40.100 mm)	
		Camshaft Outside Diameter	1.4150 - 1.4157 in. (35.940 - 35.960 mm)	1.5724 - 1.5732 in. (39.940 - 39.960 mm)	1.4138 in. (35.911 mm)	1.5711 in. (39.906 mm)	
		Oil Clearance	0.0016 - 0.0033 in. (0.04 - 0.085 mm)		0.0061 in. (0.154 mm)		
	Interme-diate	Inside Diameter	1.4173 - 1.4183 in. (36.000 - 36.025 mm)	1.5748 - 1.5758 in. (40.000 - 40.025 mm)	1.4210 in. (36.093 mm)	1.5787 in. (40.100 mm)	
		Camshaft Outside Diameter	1.4138 - 1.4148 in. (35.910 - 35.935 mm)	1.5713 - 1.5722 in. (39.910 - 39.935 mm)	1.4126 in. (35.881mm)	1.5699 in. (39.875 mm)	
		Oil Clearance	0.0026 - 0.0045 in. (0.065 - 0.115 mm)		0.0089 in. (0.225 mm)		
	Flywheel End	Inside Diameter	1.4173 - 1.4183 in. (36.000 - 36.025 mm)	1.5748 - 1.5758 in. (40.000 - 40.025 mm)	1.4209 in. (36.092 mm)	1.5787 in. (40.100 mm)	
		Camshaft Outside Diameter	1.4150 - 1.4157 in. (35.940 - 35.960 mm)	1.5724 - 1.5732 in. (39.940 - 39.960 mm)	1.4138 in. (35.911 mm)	1.5711 in. (39.906 mm)	
		Oil Clearance	0.0016 - 0.0033 in. (0.040 - 0.085 mm)		0.0061 in. (0.154 mm)		

Disassembly of Rocker Arm Assembly

1. Remove the rocker arm shaft alignment set screw **(Figure 6-5, (6))** from support **(Figure 6-5, (5))**.

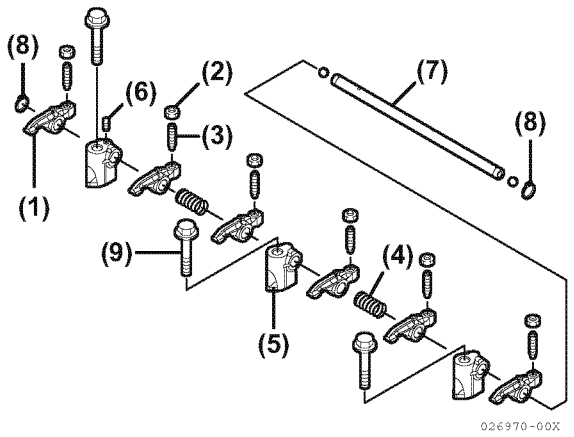


Figure 6-5

Note: On 3-cylinder models, the set screw is located in the center support. On 2-cylinder models, the set screw is located in the front (cooling fan) end support.

2. Remove two circlips **(Figure 6-5, (8))**.

Note: The rocker arm shaft fits tightly in the rocker arm supports. Clamp the support in a padded vise. Twist and pull out on the rocker arm shaft to remove. Reverse this process when installing the rocker arm shaft into the supports.

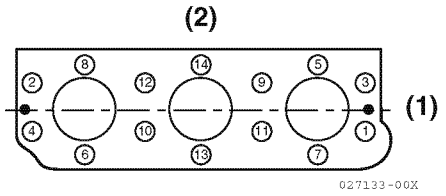
3. Slide the rocker arm shaft **(Figure 6-5, (7))** out of the rocker arm supports **(Figure 6-5, (5))**, springs **(Figure 6-5, (4))**, and rocker arms **(Figure 6-5, (1))**.

Note: Mark the rocker arms so they can be reinstalled with the original matching valve and pushrod.

4. Remove the valve adjusting screw **(Figure 6-5, (3))** and lock nut **(Figure 6-5, (2))** from the rocker arms. Mark parts so they can be reinstalled on the same rocker arm.

Removal of Cylinder Head

1. Loosen the cylinder head bolts following the sequence shown in **Figure 6-6**.



1 – Cooling Fan End
2 – Camshaft Side

Figure 6-6

2. Remove the cylinder head bolts **(Figure 6-7, (1))**.
3. Lift the cylinder head away from the cylinder block. Discard the cylinder head gasket **(Figure 6-7, (2))**. Position the cylinder head on the work bench to prevent damage to the combustion surface.

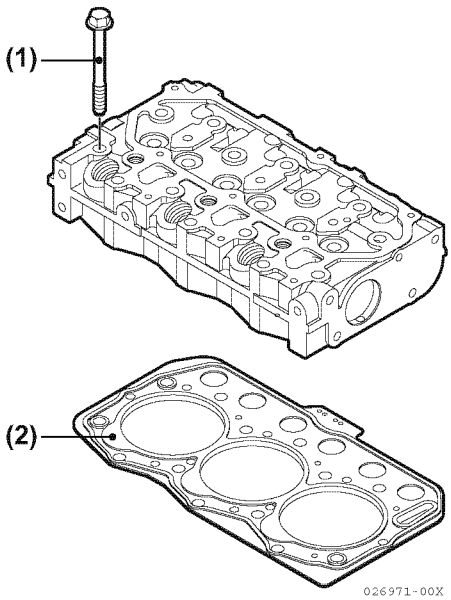


Figure 6-7

4. Do not remove the fuel injection pump drive gear unless absolutely necessary due to damage to the gear or pump. Do not loosen or remove the four bolts **(Figure 6-43, (3))** retaining pump drive gear to the hub. Only remove the nut **(Figure 6-43, (1))** and washer **(Figure 6-43, (2))**, leaving the hub attached to the gear. Remove the pump drive gear and hub as an assembly using a gear puller.

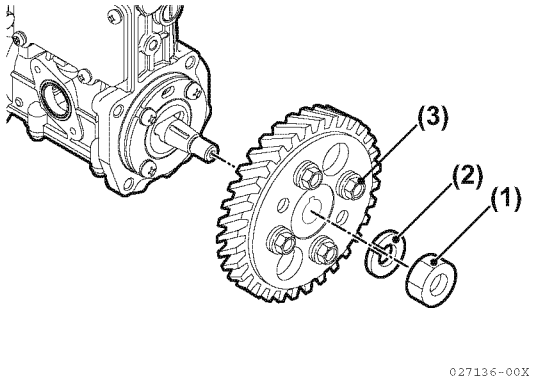


Figure 6-43

CAUTION

Do not loosen or remove the four bolts retaining the fuel injection pump drive gear to the fuel injection pump hub. Do not disassemble the fuel injection pump drive gear from the hub. Correct fuel injection timing will be very difficult or impossible to achieve.

0000031en

Removal of Oil Pan

1. Invert the engine (oil pan up) on the engine stand.
2. Remove the oil pan **(Figure 6-44, (4))**.
3. Remove the ladder frame **(Figure 6-44, (1))** if equipped.

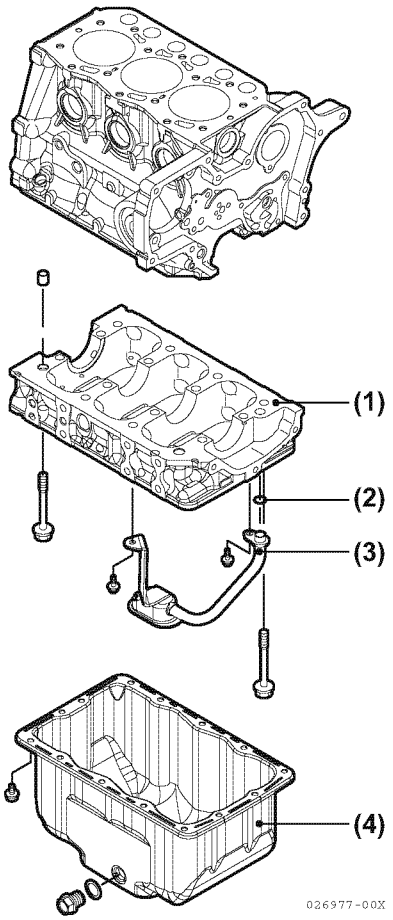


Figure 6-44

4. Remove the oil pickup tube **(Figure 6-44, (3))** and O-ring **(Figure 6-44, (2))**.

Note: Torx bolts are used for oil sump mounting bolts and rudder frame mounting bolts. Specialized tool (Torx bolt wrench) is required.
for Oil Sump Bolts : TORX E8
for Ladder frame : TORX E12

Reassembly of Pistons

1. Select the parts needed to assemble the piston and connecting rod for one cylinder.
2. If removed, install a new wrist pin bushing **(Figure 6-82, (7))** using a press and the appropriate service tool. Be sure to align the oil holes.

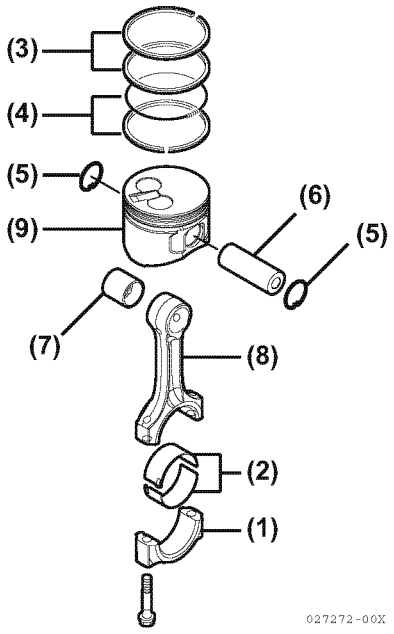


Figure 6-82

3. Reinstall one circlip **(Figure 6-82, (5))** into the piston. Ensure the circlip is securely seated in the groove.

IMPORTANT

*The piston and connecting rod must be assembled with the correct orientation. When correctly assembled, the piston identification mark **(Figure 6-83, (1))** stamped into the top of the piston will be on the opposite side of the connecting rod as the match marks **(Figure 6-83, (3))** stamped into the connecting rod and connecting rod cap. When reinstalled in the cylinder, the embossed mark **(Figure 6-83, (2))** cast into the beam of connecting rod will face the flywheel end of the engine.*

Note: The actual appearance of the match marks will vary but they will always be in the same locations.

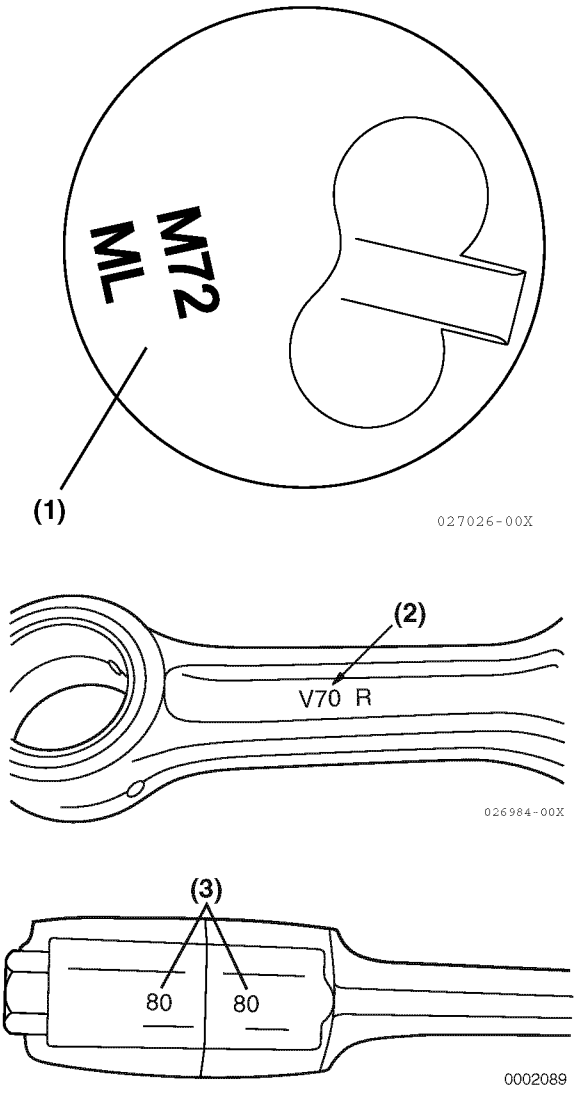


Figure 6-83

4. Place the connecting rod into the piston. The match marks **(Figure 6-84, (4))** on the connecting rod and cap must be on the opposite side as the piston identification mark **(Figure 6-84, (2))** on the top of the piston.

FUEL SYSTEM SPECIFICATIONS

Special Torque Chart

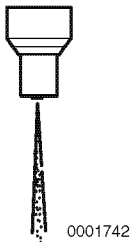
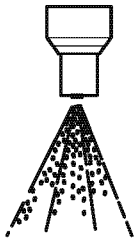
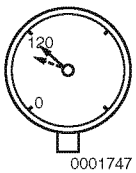
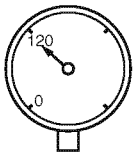
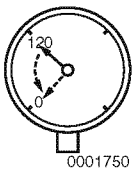
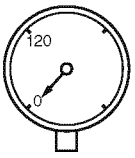
Component	Tightening Torque	Lubricating Oil Application (Thread Portion and Seat Surface)
Fuel Injector	36.1 - 39.1 ft·lb (49 - 53 N·m, 5.0 - 5.4 kgf·m)	Not Applied
Fuel Pump Drive Gear Nut	44 - 51 ft·lb (59 - 69 N·m; 6 - 7 kgf·m)	Not Applied
High -Pressure Fuel Injection Line Nuts	22 - 25 ft·lb (29 - 34 N·m; 3.0 - 3.5 kgf·m)	Not Applied
Fuel Return Line Nuts	18 - 24 ft·lb (24 - 33 N·m; 2.5 - 3.3 kgf·m)	Not Applied
Fuel Injection Pump Mounting Nuts	17 - 21 ft·lb (23 - 28 N·m; 2.3 - 2.9 kgf·m)	Not Applied
Fuel Injector Nozzle Case Nut	21.4 - 36.1 ft·lb (29 - 49 N·m; 3.0 - 5.0 kgf·m)	Not Applied

Test and Adjustment Specifications

Fuel Injector Pressure	Fuel Injection Timing
1784 - 1929 psi (12.3 - 13.3 MPa; 125 - 136 kgf/cm^2)	*See Checking and Adjusting Fuel Injection Timing on page 7-18*

Note: Fuel injector pressures given are for used parts. New injectors (5 hours operation or less) will read approximately 72.5 psi (0.5 MPa; 5 kgf/cm^2) higher.

Fuel Injector Test Results

	A	B	C	D	E
Injection Pattern	 0001742	 0001743	 0001744		
Pressure Gauge Reading	 0001747 Gauge needle fluctuates around the valve opening pressure.	 0001748 Gauge needle fluctuates around the valve opening pressure.	 0001749 Gauge needle stays at a position near the valve opening pressure.	 0001750 Although the gauge needle reaches the valve opening pressure, the pressure drop is large.	 0001751 Pressure does not increase even when the tester lever is operated.
Atomization Pattern	5°-10° cone and roughly uniform.	Atomization is excessively one-sided.	Although atomized (burner like shape), the needle does not pulsate.	Bar shape with excessive after drops.	Drops.
Possible Cause	(Normal, injector is good)	Normally caused by carbon contamination of the nozzle tip. Sometimes caused by flaws in or damage to the needle tip.	Caused by excessive carbon contamination of the nozzle tip. Sometimes caused by internal contamination.	Damage to the seat. Contamination of seat by fine foreign particles. Excessively worn seat.	Sticking of needle. Excessively damaged or worn seat. Contamination of seat by foreign matter. Damaged or broken internal parts or nozzle case nut.

Note: If the fuel injector fails any tests, it should be serviced or replaced as necessary. If the pressure is outside specified limits, adjust the pressure. *See Adjusting Fuel Injector Pressure on page 7-26.*