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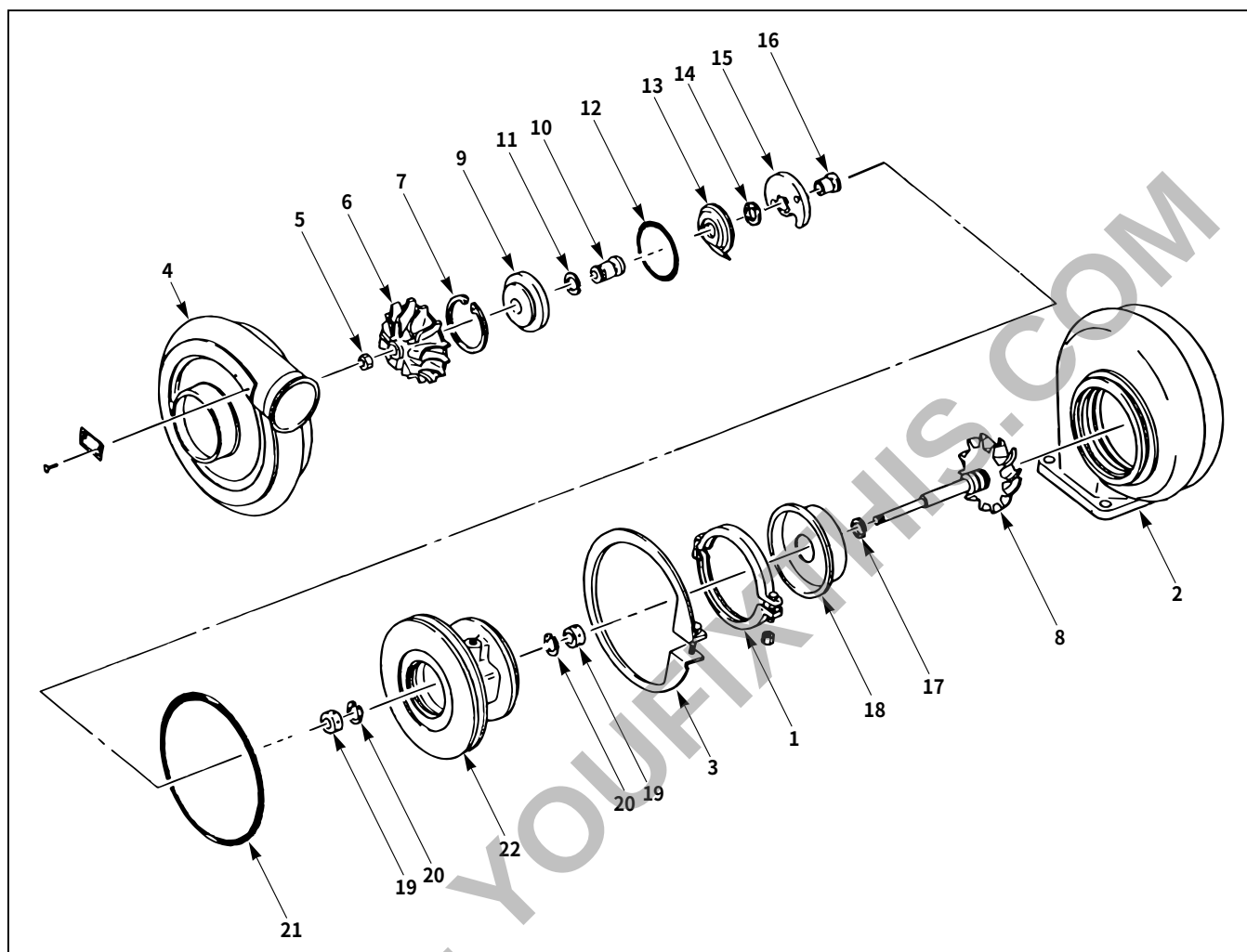
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Note:

Before using this manual to perform maintenance and repairs, be sure to read the section "General Servicing Precautions" included in Chapter 1 (General Information).



DISASSEMBLY



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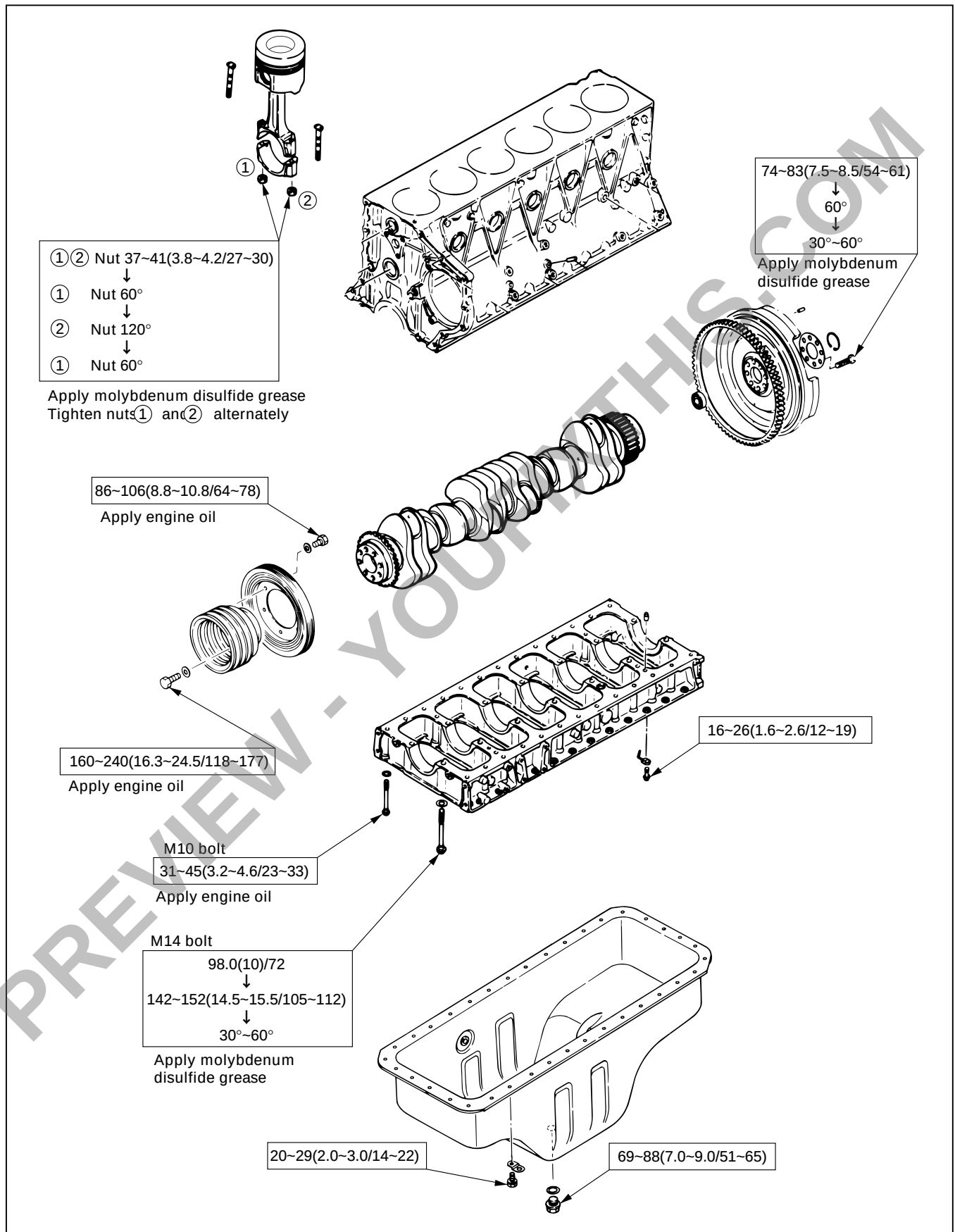
Legend

- | | |
|---------------------------|-------------------------|
| (1) Coupling ASM | (12) Gasket |
| (2) Turbine housing | (13) Oil deflector |
| (3) Snap ring | (14) Thrust ring |
| (4) Compressor cover | (15) Thrust bearing |
| (5) Nut | (16) Thrust ring |
| (6) Compressor wheel | (17) Piston ring |
| (7) Snap ring | (18) Turbine back plate |
| (8) Shaft & turbine wheel | (19) Bearings |
| (9) Insert | (20) Snap ring |
| (10) Thrust sleeve | (21) Gasket |
| (11) Piston ring | (22) Bearing housing |



Lower crankcase, connecting rod bearing caps, crank damper pulley, flywheel, oil pan

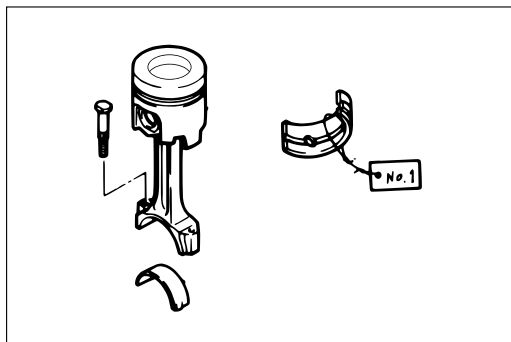
N·m (kgf·m/lb·ft)



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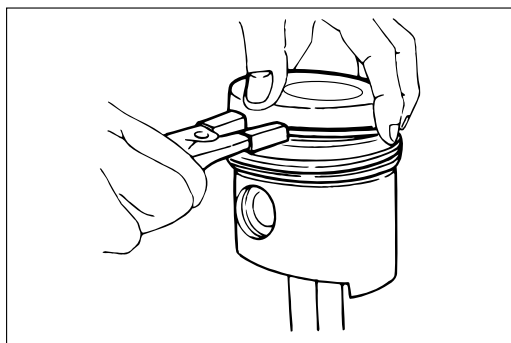
IMPORTANT OPERATIONS



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1. Connecting rod bearing

If the connecting rod bearings are to be reused, mark each one with the cylinder number so that they are reinstalled in the same position.



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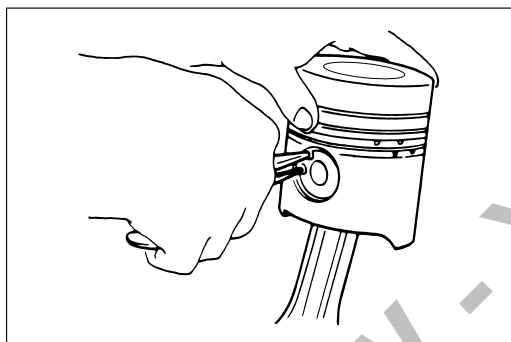


2. Piston ring

- (1) Fix the connecting rod in a vice.
Take care not to damage the connecting rod.
- (2) Use a piston pin replacer to remove the piston rings.

Piston ring replacer: 1-85221-029-0

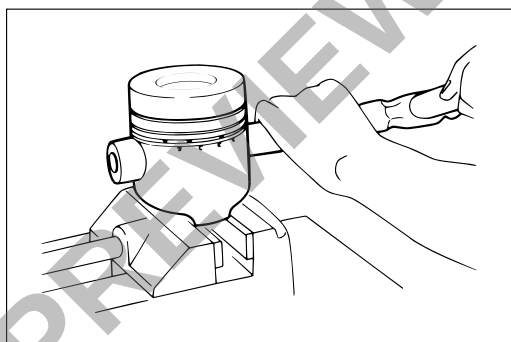
Do not use other tools to remove the rings, since they may stretch the rings, resulting in reduced ring tension.



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3. Snap ring

Use a pair of snap ring pliers to remove the piston pin snap ring.



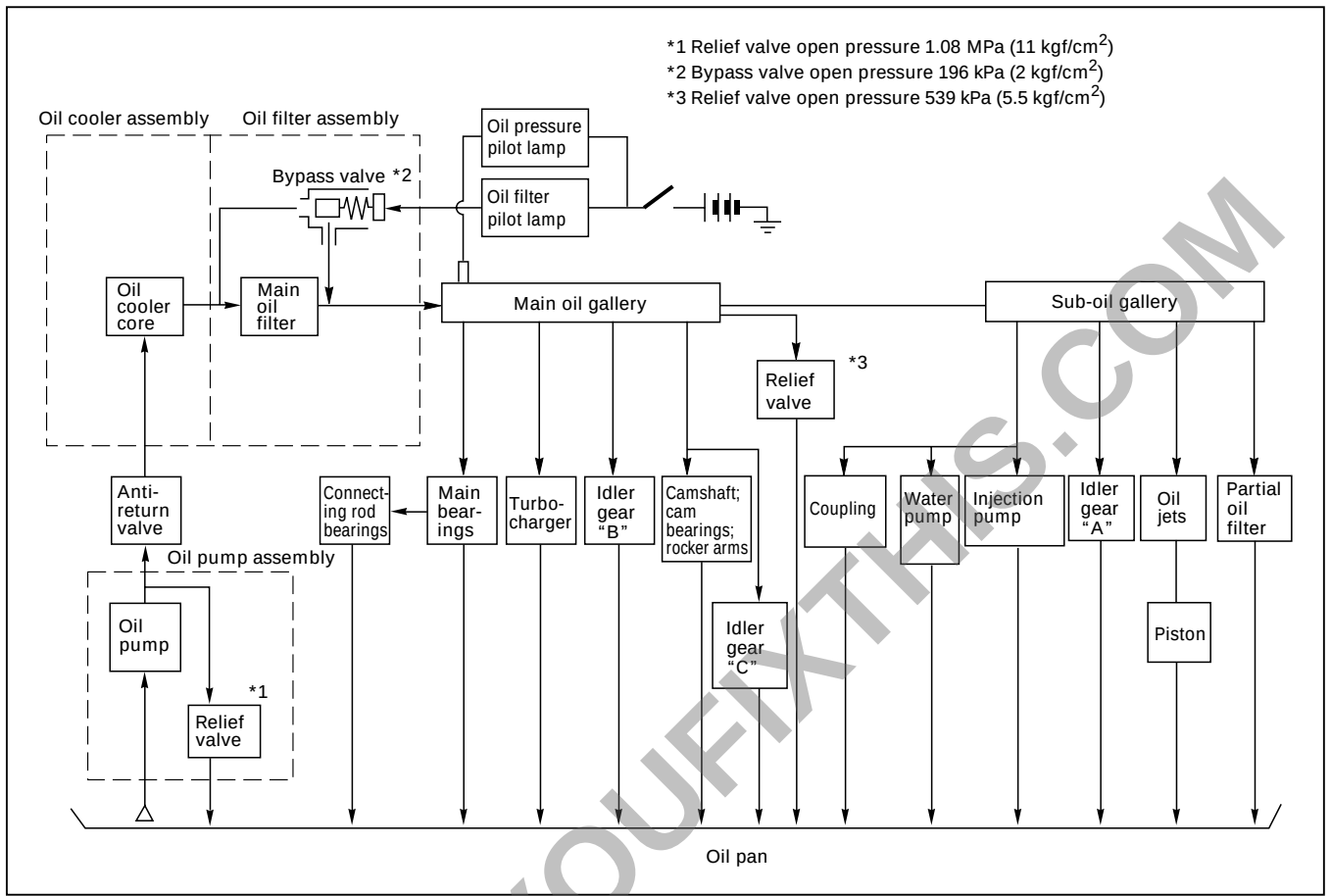
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4. Piston pin

Remove the piston pin by lightly tapping with a hammer and a brass bar.

If the piston pins are to be reused, label each one with the cylinder number, and be sure to replace in the same location.

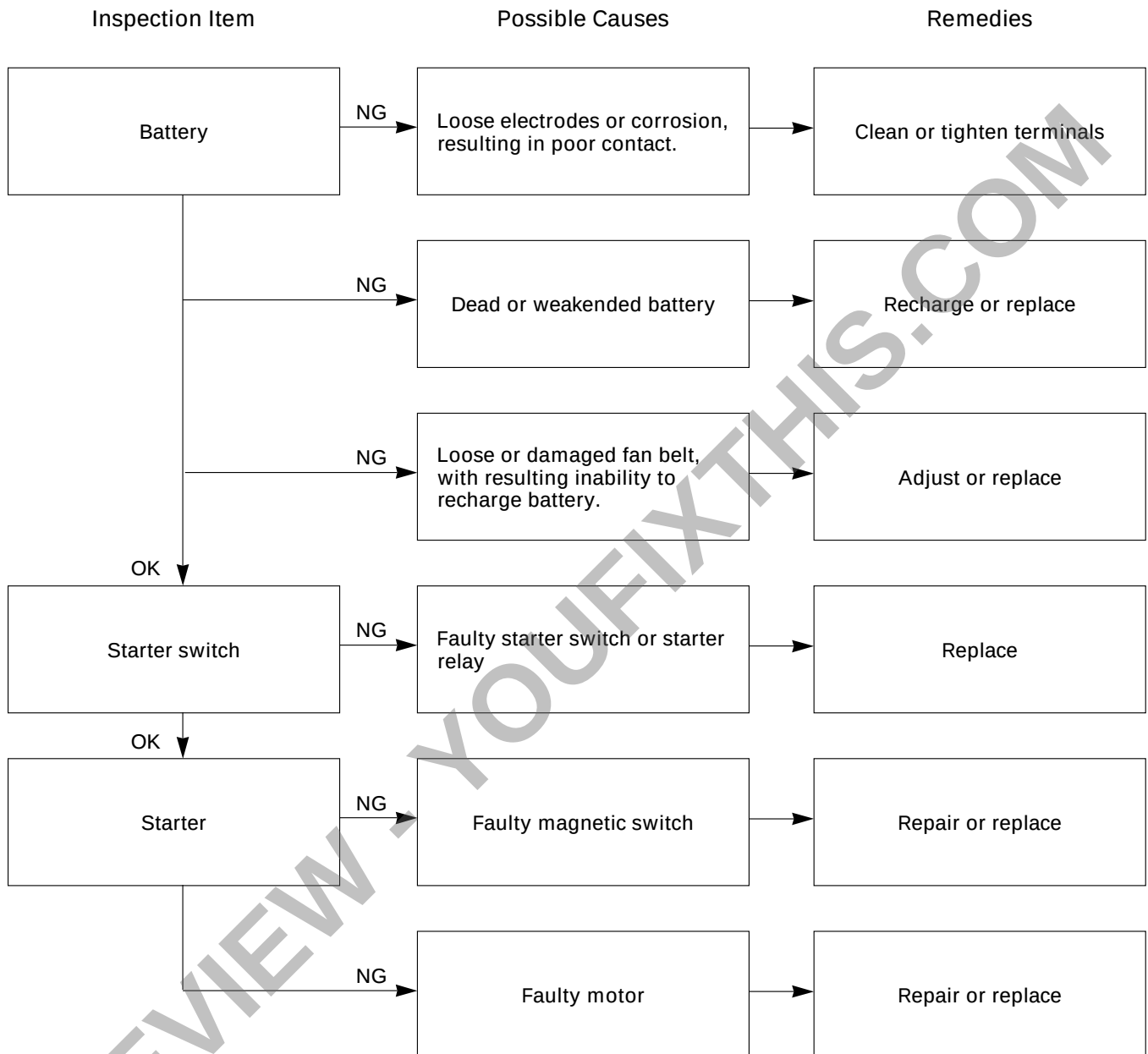
INTRODUCTION



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STARTING DIFFICULTIES

1. Starter doesn't turn



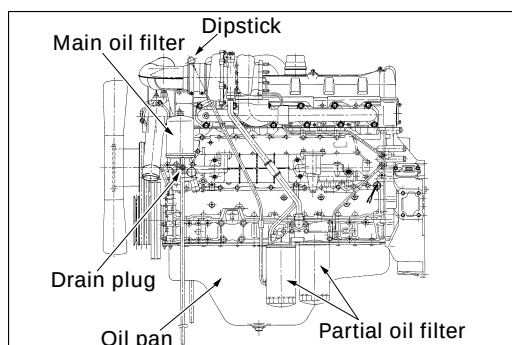
MAIN DATA AND SPECIFICATIONS

Engine Model		AA-6SD1T	
Item			
Engine type		4-cycle, water-cooled vertical in-line overhead camshaft	
Combustion chamber type		Direct injection	
Cylinder liner type		Dry type	
Number of cylinders; bore x stroke	mm	6 – 120 x 145	
Total exhaust displacement	L (cid)	9.839 (601)	
Compression ratio		16.8 : 1	
Dimensions (L x W x H)	mm	*	1379 x 859 x 1158
Weight	kg	*	693
Ignition sequence		1-5-3-6-2-4	
Fuel used		Diesel (2-D)	
Fuel-injection pump type		In-line Bosch	
Governor		Variable speed, mechanical, RSV type or electrically controlled type (Red IV)	
Injection nozzle type		Multi-hole type	
Injection starting pressure	MPa (kg/cm ² /psi)	*	17.7 – 22.1 (180 – 225/2570 – 3200)
Fuel injection timing (BTDC)		*	7°
Compression pressure (warm engine, 200 rpm)	MPa (kg/cm ² /psi)		2.84 (29/412)
Inlet valve	Open (BTDC)		15°
	Close (ATDC)		39°
Exhaust valve	Open (BTDC)		40°
	Close (ATDC)		14°
Valve clearance (cold engine)	Inlet valve mm		0.4
	Exhaust valve		0.4
Lubricating system		Forced circulation type	
Engine oil capacity; Oil pan	L (qts)	*	Max 30 (31.7), Min 25 (26.4)
Total system capacity	L (qts)	*	Max 35 (37), Min 30 (31.7)
Lubricating engine oil		API service type CD, or Isuzu Besco S-3	
Oil cooler		Water-cooled, internally mounted	
Cooling method		Forced circulation, pressurized water-cooled type	
Cooling system volume	L (qts)		About 19 (20) (engine only)
Cooling fan		*	Dia. 850 mm, 6-blade, sucker type
Alternator	V-A	*	24 – 50
Starter	V-kW	*	24 – 5.5

Specifications marked with an asterisk (*) will vary according to engine application.

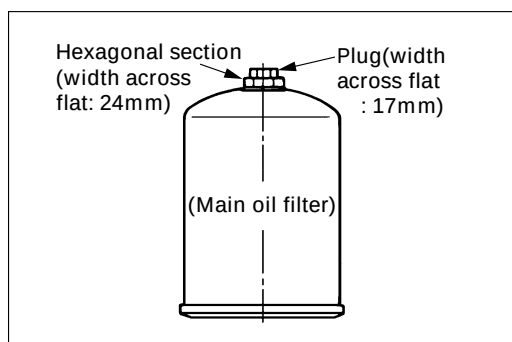
LUBRICATING SYSTEM

REPLACEMENT OF MAIN OIL FILTER ELEMENT (CARTRIDGE TYPE)



Removal

1. Remove the drain plug and drain the oil from the filter. Place a receptacle beneath the drain port to contain the drained oil. Removing the plug at the top of the main filter will facilitate draining the oil.

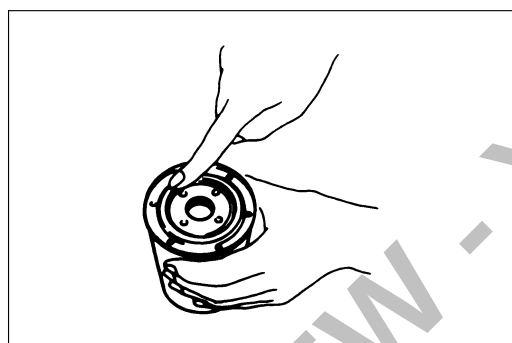


2. After draining the oil, replace the filter's drain plug.

Drain plug tightening torque N·m (kgf·m/lb·ft)

First	Second	Third
22 ~ 31 (2.2 ~ 3.2/16 ~ 23)	Loosen	13 ~ 23 (1.3 ~ 2.3/9 ~ 17)

3. Place a wrench on the cartridge's second hex lug and rotate counter-clockwise to remove the cartridge. Discard the removed cartridge.

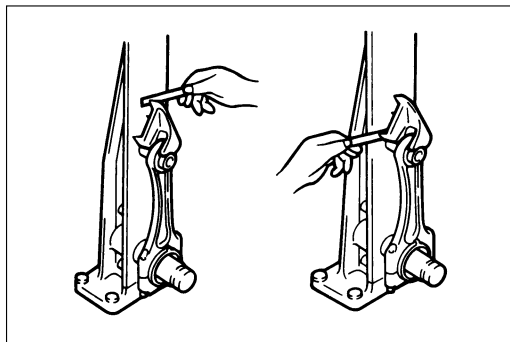


Installation

1. Clean the cartridge mounting surface on the engine.
2. Lightly apply a film of clean engine oil to the gasket on the new cartridge.
3. Screw the cartridge in lightly until the gasket surface contacts the mounting surface on the engine.
4. Using a filter wrench, tighten the filter by turning one revolution more.
5. After replenishing engine oil to the designated capacity, start the engine and check for leaks around the filter.
6. Stop the engine, wait for 10 — 20 minutes, then recheck the engine oil level and replenish if necessary.



CONNECTING RODS

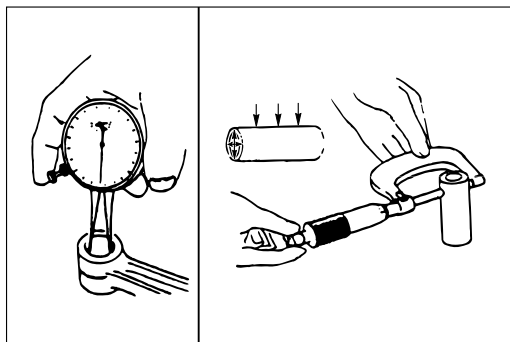
**Connecting rod twist and parallelism**

Use a connecting rod aligner to measure the connecting rod's twist distortion and parallelism between the rod's large and small ends.

If the measured value exceeds the limit, replace the connecting rod.

Connecting rod parallelism (per 100 mm length) mm (in)

	Standard	Limit
Twist, parallelism	0.03 (0.0012) or less	0.10 (0.0039)



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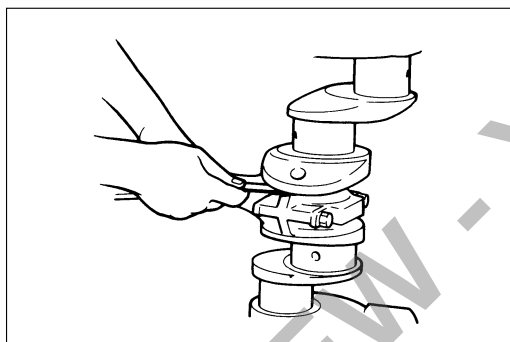
**Connecting rod small end bushing clearance**

Use an inside dial gauge and micrometer to measure the inside diameter of the connecting rod's small hole bushing and the outside diameter of the piston pin.

If the measured clearance exceeds the limit value, the piston pin, or the connecting rod's small hole bushing must be replaced.

Connecting rod small end bushing clearance mm (in)

Standard	Limit
0.012 ~ 0.027 (0.00047 ~ 0.0011)	0.10 (0.0039)

**Connecting rod side face clearance**

1. Install the connecting rod to the crankpin.
2. Use a feeler gauge to measure the clearance between the side face of the connecting rod's big end and the side face of the crankpin's arm.
If the measured value exceeds the limit, the connecting rod must be replaced.

Connecting rod large end side face clearance mm (in)

Standard	Limit
0.17 ~ 0.28 (0.0067 ~ 0.0110)	0.35 (0.014)

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Oil cooler	124

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