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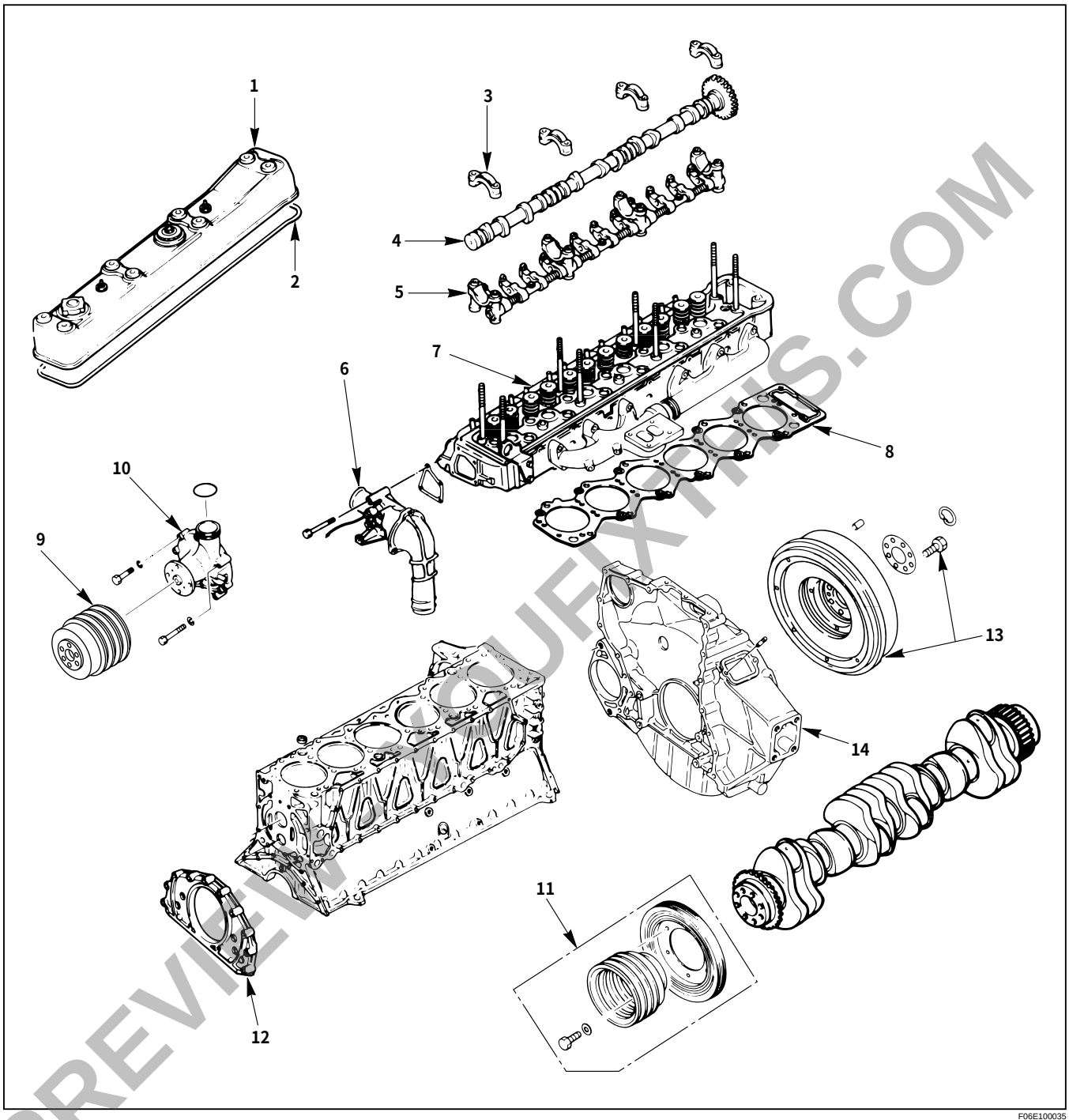
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Note:
Before using this manual to perform maintenance and repairs, be sure to read the section "General Servicing Precautions" included in Chapter 1 (General Information).

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DISASSEMBLY 2



Disassembly sequence

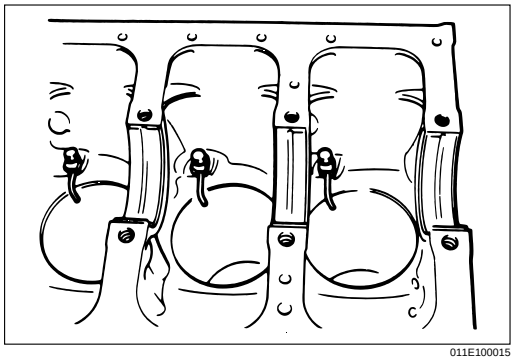
1. Cylinder head cover
2. Head cover gasket
3. Camshaft upper bracket
▲4. Camshaft
▲5. Rocker arm shaft assembly
6. Thermostat housing (with thermostat unit)
▲7. Cylinder head
8. Cylinder head gasket
9. Water pump pulley
10. Water pump
▲11. Crankshaft pulley (with damper)
12. Front cover
▲13. Flywheel
14. Flywheel housing

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IMPORTANT OPERATIONS

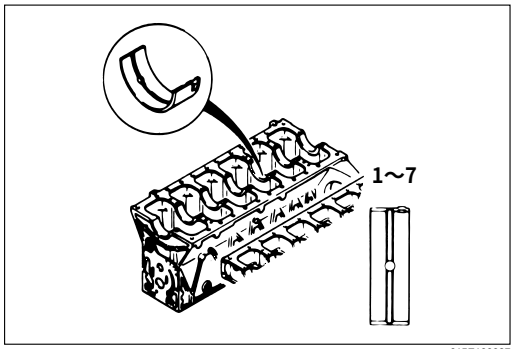
Note:
Before assembling, use compressed air to thoroughly blow out the inside of the cylinder block, particular the oil ports and water jacket.


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2. Oil jet
Tighten the oil jets with the designated torque.

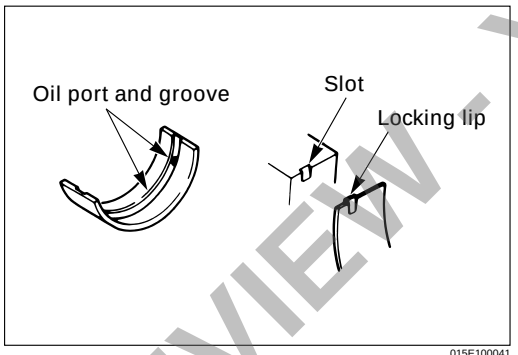
Note:
When installing the jets, take care not to damage the nozzles, or to deform the nozzle angle by impact.

Oil jet tightening torque	N·m (kgf·m/lb·ft)
16 ~ 25 (1.6 ~ 2.6 / 12 ~ 19)	



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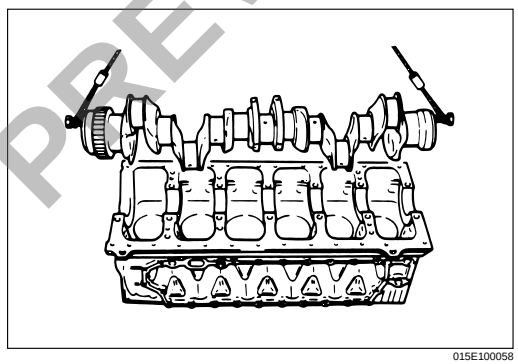
3. Crankshaft upper bearing
Thoroughly clean the upper bearing.
When reusing bearings which were previously removed, be sure to reinstall them in the same positions from which they were removed, in accordance with the tags affixed at the time of removal.



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Be sure the bearing's locking lip fits securely in the slot machined in the bearing mount.

Note:
The upper bearings can be discriminated from lower bearings since the upper bearings have oil ports and a groove along their entire surface. In contrast, the lower bearings have no oil port and only a partial groove. Be sure to install the bearings in their correct locations.


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4. Crankshaft
Before installing the crankshaft, apply a liberal coat of clean engine oil to the journals and the inner surface of the bearings.

Note:
Do not apply engine oil to the rear surface of the bearings, or to the bearing mounts in the cylinder block.

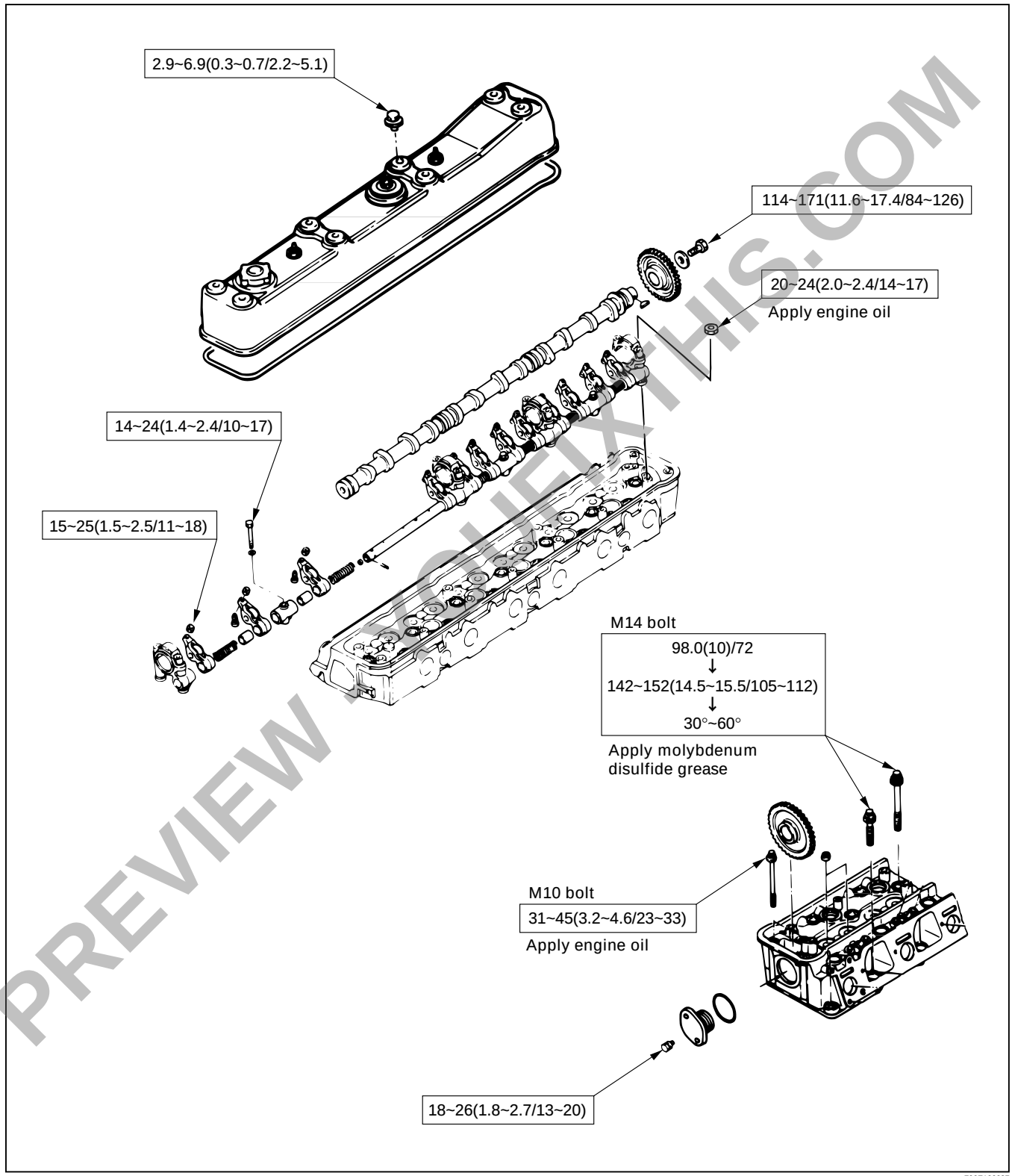
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TIGHTENING TORQUES FOR MAIN PARTS

Cylinder head cover, cylinder head, camshaft bracket, rocker arm shaft bracket

N·m (kgf·m/lb·ft)



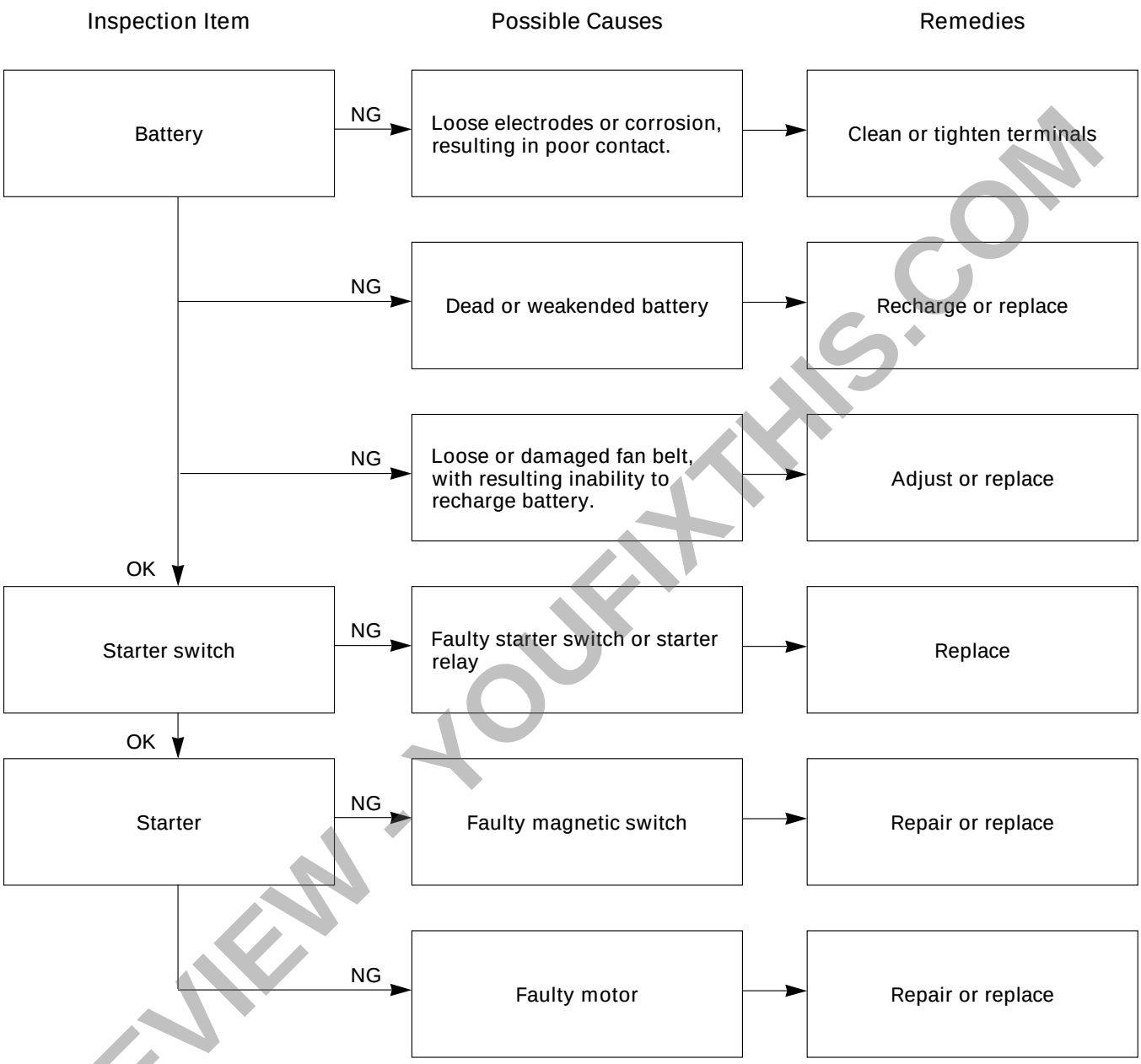
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STARTING DIFFICULTIES

1. Starter doesn't turn



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MAIN DATA AND SPECIFICATIONS

Item \ Engine Model				AA-6SD1T
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

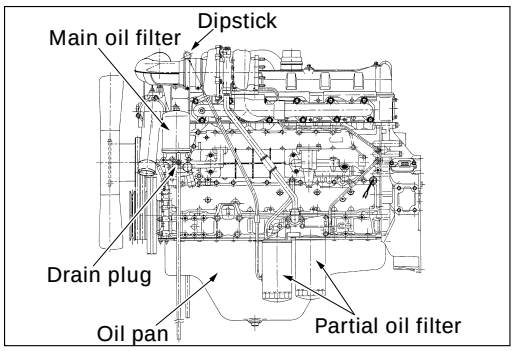
Specifications marked with an asterisk (*) will vary according to engine application.

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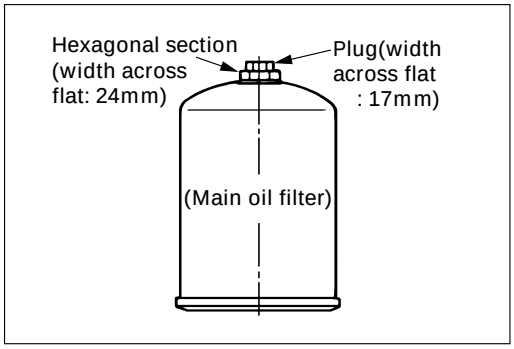
LUBRICATING SYSTEM

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.

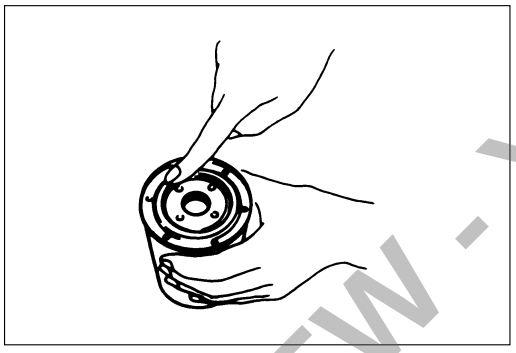


2. After draining the oil, replace the filter's drain plug.

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.



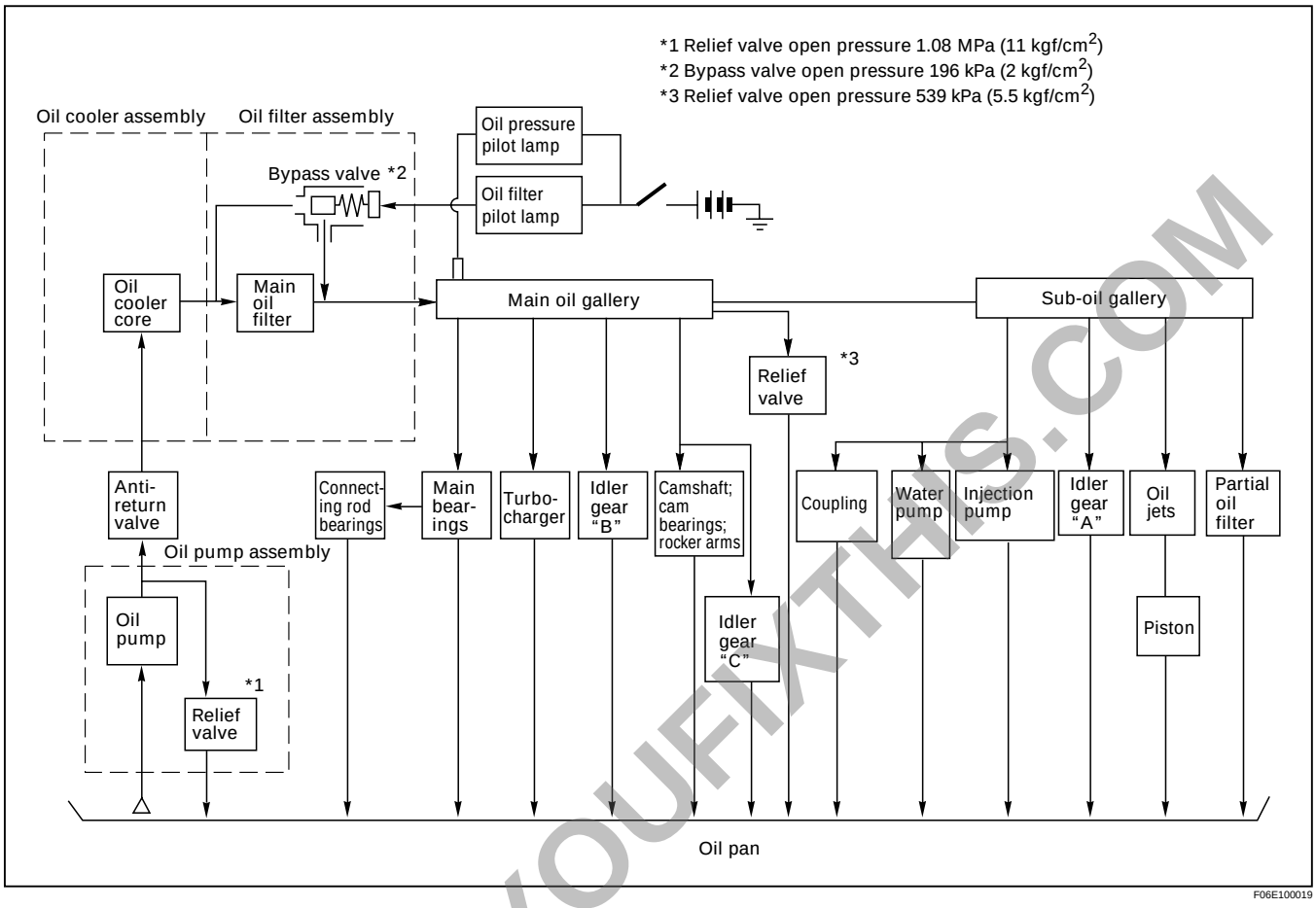
Installation

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.

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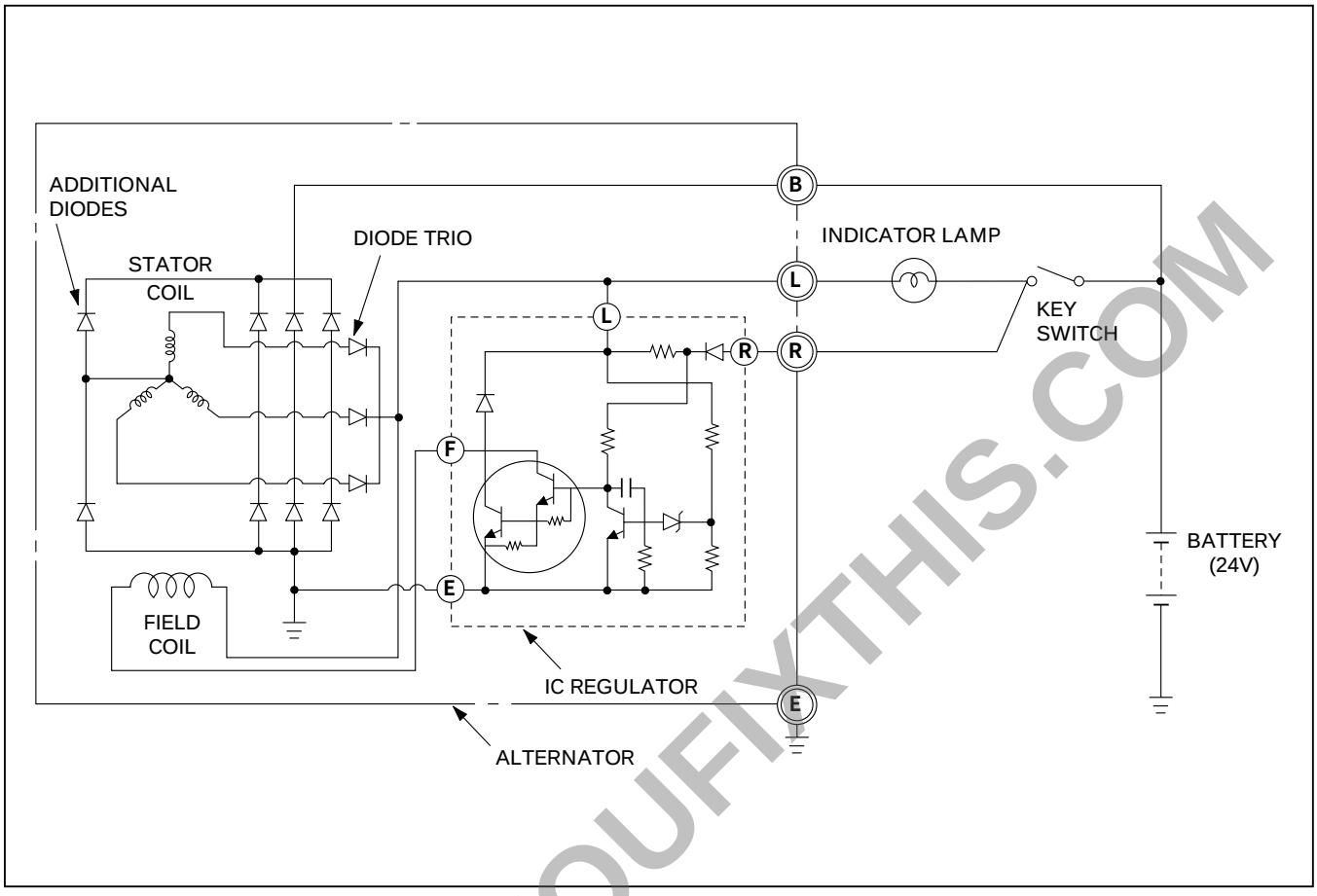
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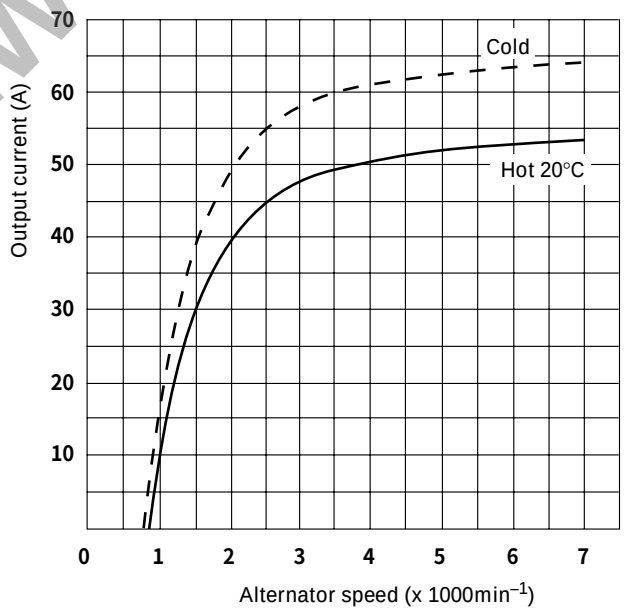
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CHARGING CIRCUIT



ALTERNATOR OUTPUT PERFORMANCE

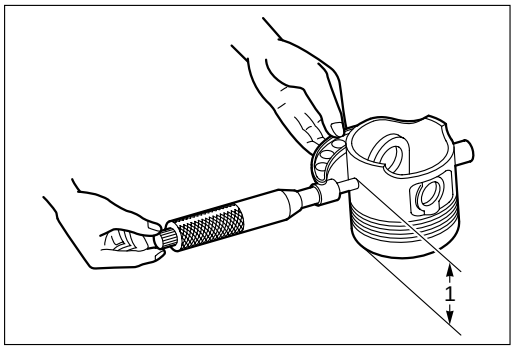


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PISTON



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Piston outside diameter measurement

Measure the piston O.D., and select from either grade AX or CX so that the standard clearance is obtained between liner and piston.

Measurement point ① .....98 mm (3.86 in.) from piston face

Clearance between cylinder liner and piston mm (in)

0.131 ~ 0.175 (0.0052 ~ 0.0069)

Cylinder liner bore and piston O.D. for service parts

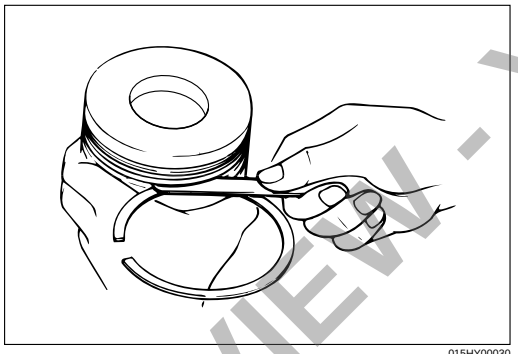
mm (in)

Grade	Cylinder liner bore	Piston O.D.
AX	120.000 ~ 120.020 (4.7244 ~ 4.7252)	119.849 ~ 119.864 (4.7185 ~ 4.7191)
CX	120.021 ~ 120.040 (4.7252 ~ 4.7260)	119.865 ~ 119.890 (4.7191 ~ 4.17201)

Note:

The clearance between liner and piston is correct at time of manufacture, but when a liner is removed from the cylinder block and later reinstalled, the amount of clearance may be reduced.

As a result, it is always necessary to measure the clearance again after any reinstallation of a removed liner.


015HY00030

Clearance between piston rings and piston ring grooves

Use a feeler gauge to measure the clearance between the piston ring and the piston ring groove at several points around the piston.

If the clearance between the piston ring and the ring groove exceeds the limit, the piston ring must be replaced.

Clearance between piston ring and piston ring groove

mm (in)

	Standard	Limit
No. 1 compression ring	0.105 ~ 0.140 (0.0041 ~ 0.0055)	0.20 (0.0079)
No. 2 compression ring	0.105 ~ 0.140 (0.0041 ~ 0.0055)	0.20 (0.0079)
No. 3 compression ring	0.085 ~ 0.120 (0.0033 ~ 0.0047)	0.20 (0.0079)
Oil ring	0.020 ~ 0.060 (0.0008 ~ 0.0024)	0.15 (0.0059)

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CHAPTER 1

GENERAL INFORMATION

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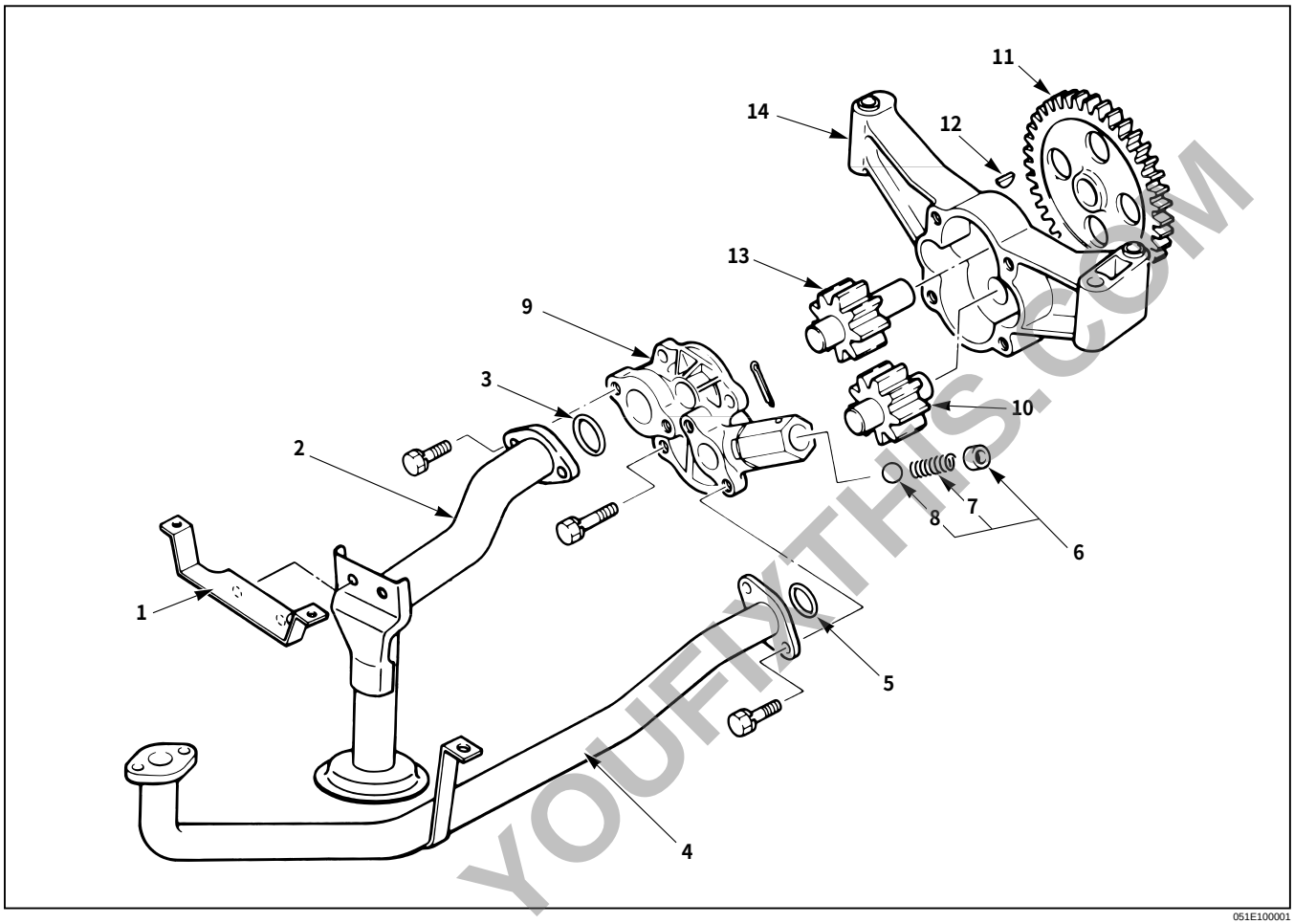
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OIL PUMP

DISASSEMBLY



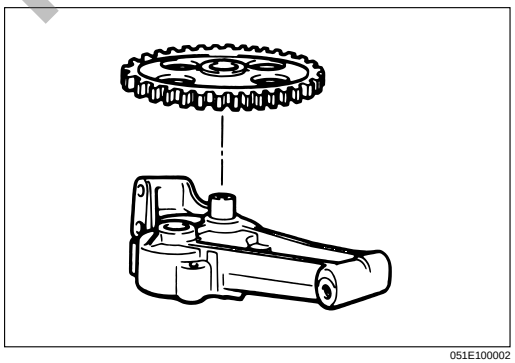
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Disassembly sequence

1. Oil strainer stay
2. Oil strainer
3. Gasket
4. Oil pump
5. Gasket
6. Spring seat
7. Spring
8. Oil relief valve
9. Oil pump body cover
10. Driven gear
▲11. Drive gear
12. Key
13. Drive gear shaft
14. Oil pump body

IMPORTANT OPERATIONS

11. Drive gear
Use a gear puller to remove the drive gear.



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