

ENGINE LUBRICATION & COOLING SYSTEMS

SECTION LC

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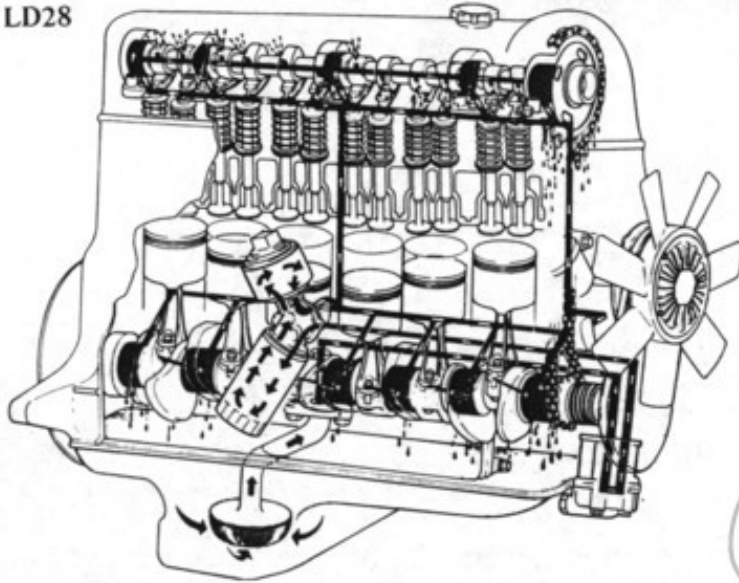
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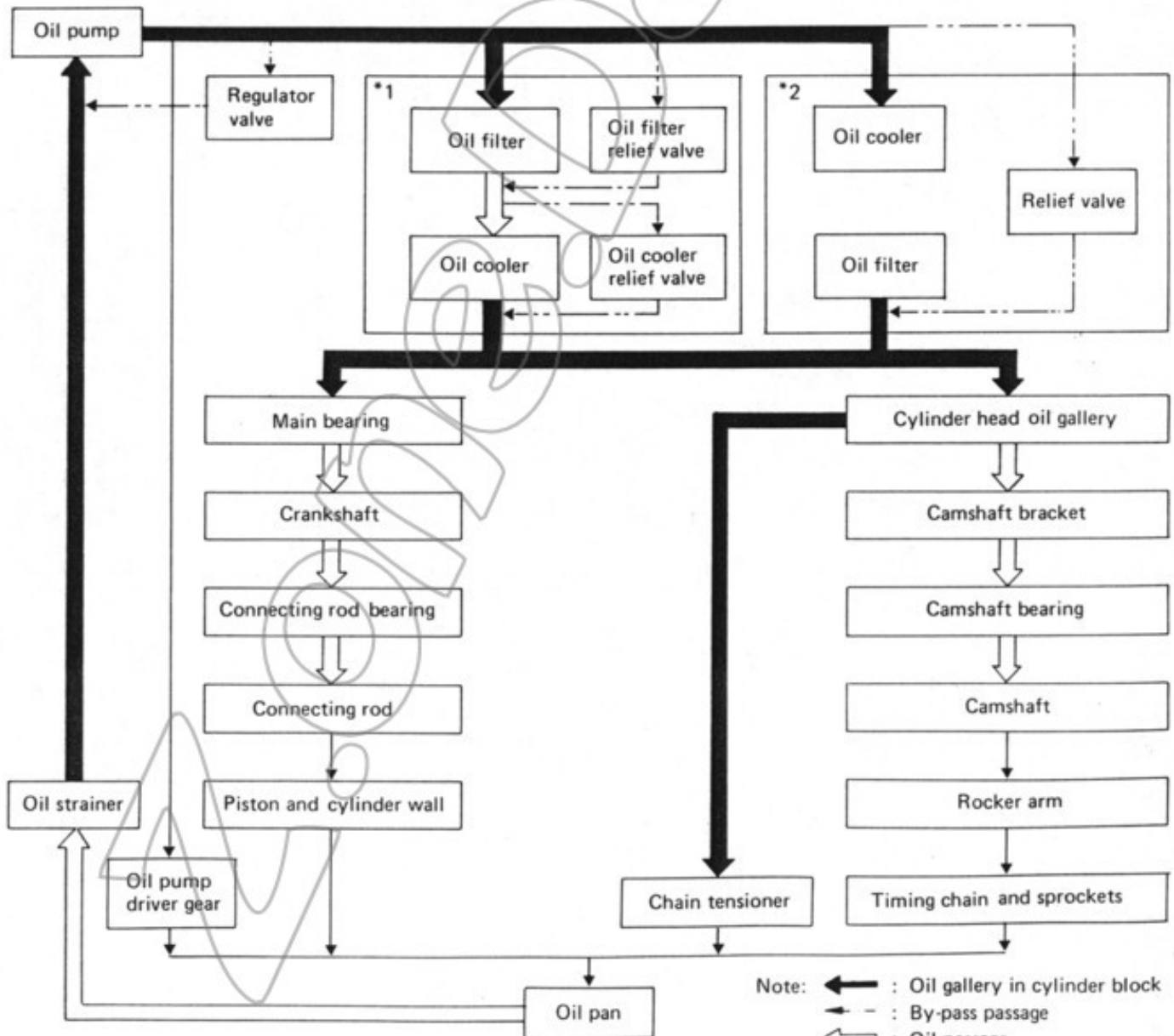
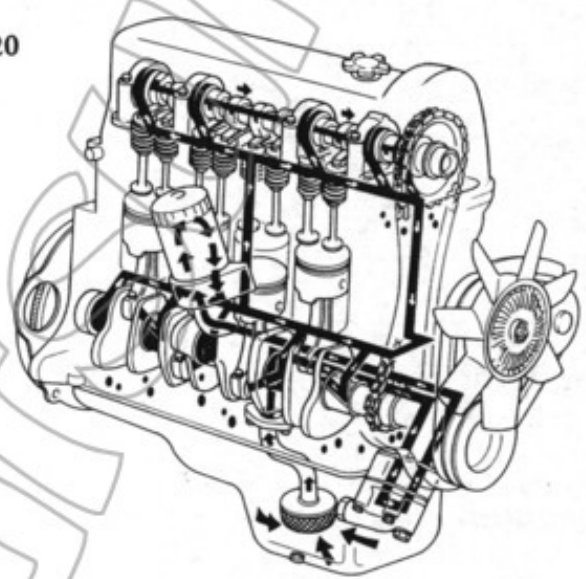
ENGINE LUBRICATION SYSTEM

LUBRICATION CIRCUIT

LD28

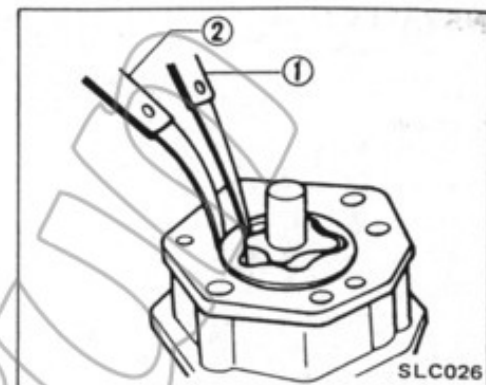
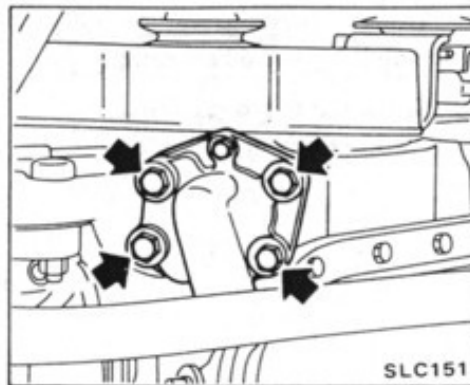
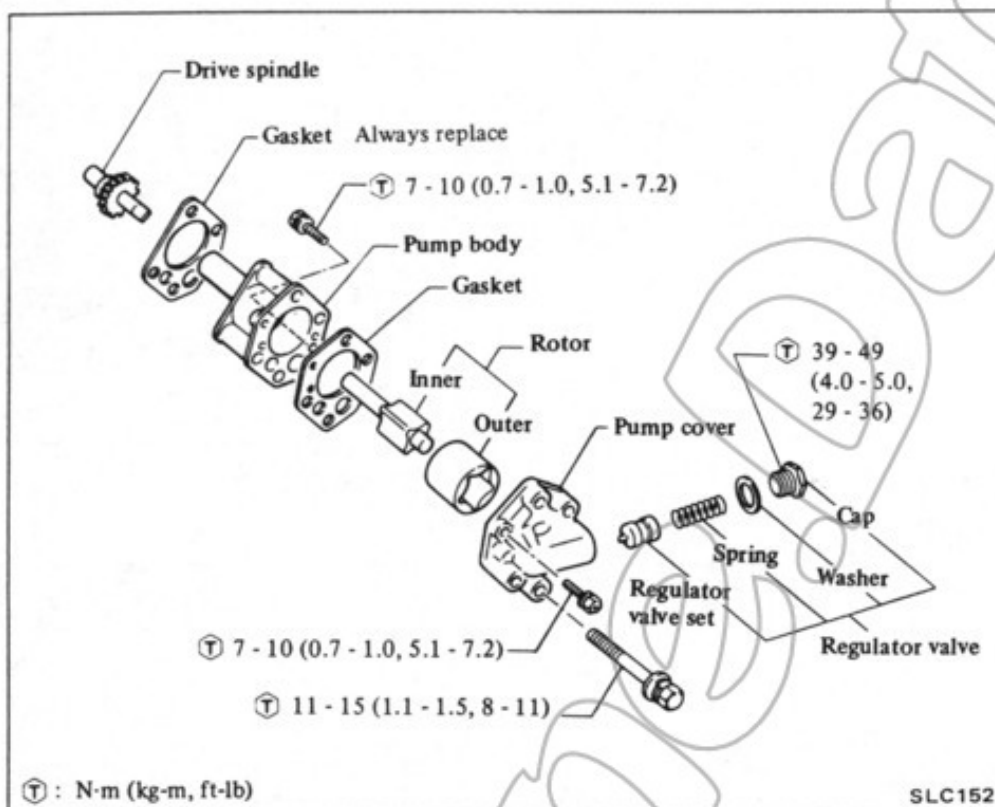


LD20

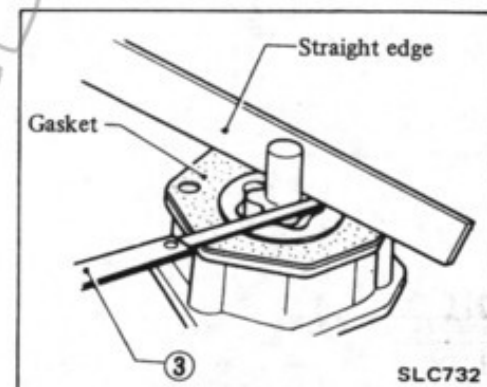


OIL PUMP**REMOVAL**

1. Remove engine undercover.
2. Remove oil pump and drive spindle as an assembly.

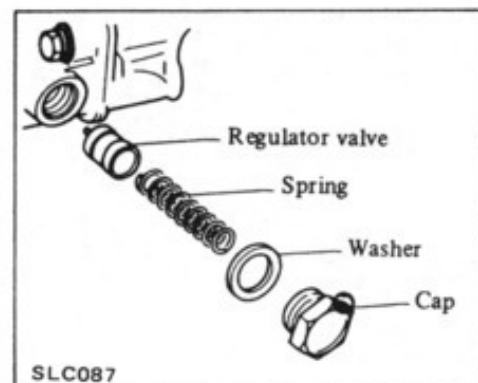
**DISASSEMBLY AND ASSEMBLY**

Outer and inner rotor side clearance (with gasket) ③:
0.04 - 0.08 mm
(0.0016 - 0.0031 in)

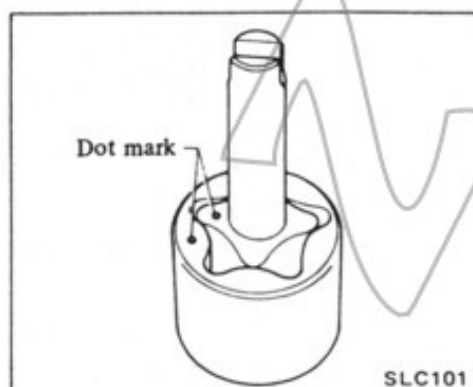


2. Check oil pressure regulator valve sliding surface and valve spring.

If damaged, replace valve set or pump assembly.



The dot on outer and inner rotor should face toward oil pump body.

**INSPECTION**

1. Using a feeler gauge, check the following clearance.

If it exceeds limit, replace rotor set or entire oil pump assembly.

Rotor tip clearance ①:

Less than 0.12 mm (0.0047 in)

Outer rotor to body clearance ②:

0.15 - 0.21 mm

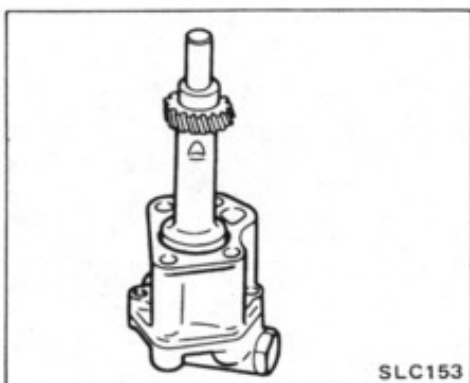
(0.0059 - 0.0083 in)

INSTALLATION

1. Install pump cover with gasket.

Ⓙ : Cover bolt
7 - 10 N·m
(0.7 - 1.0 kg-m,
5.1 - 7.2 ft-lb)

2. Fill pump housing with engine oil,
then install drive spindle.



3. Using a new gasket, install oil
pump and drive spindle assembly.

Ⓣ : Oil pump to front cover
11 - 15 N·m
(1.1 - 1.5 kg-m,
8 - 11 ft-lb)

4. Refill engine with oil.

After installing, run engine for a
few minutes, and check for leaks.

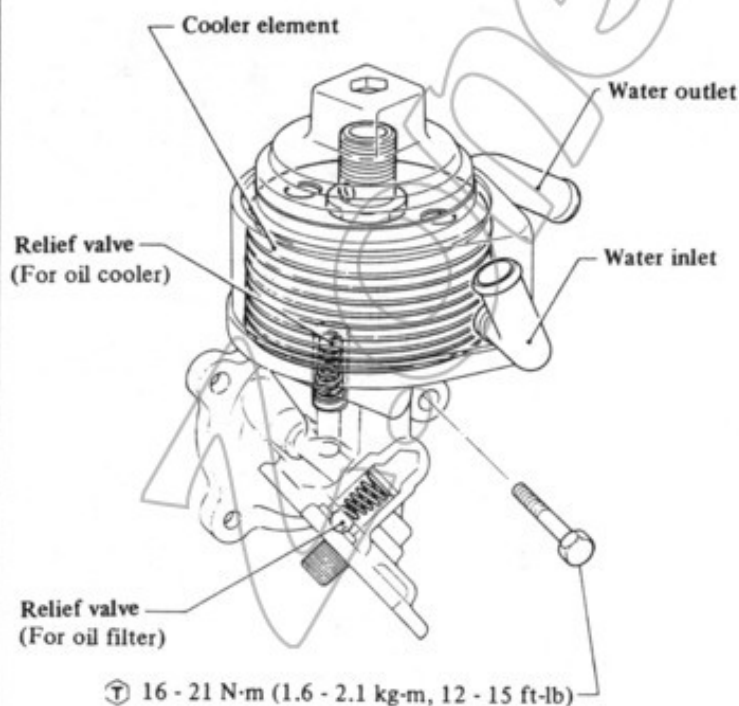
Approximate oil refill capacity

Unit: liter (Imp qt)

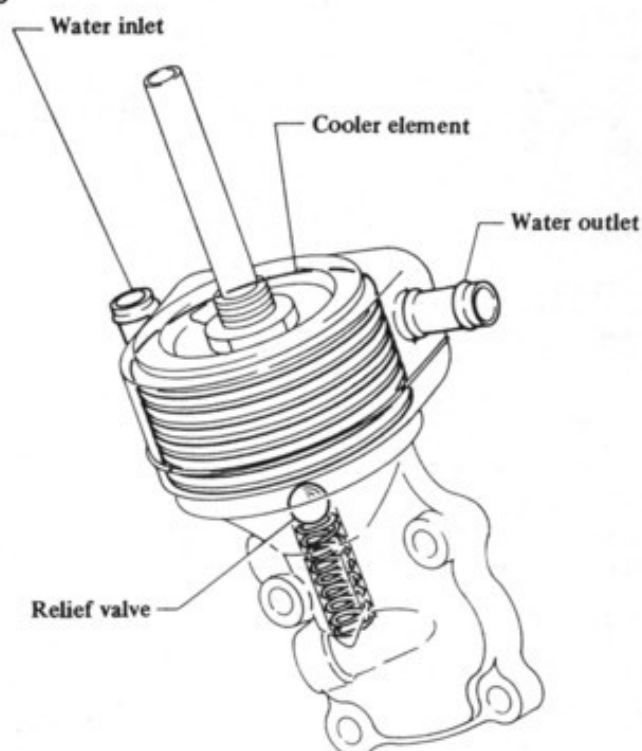
		Without oil filter change	With oil filter change
LD20	910	3.8 (3-3/8)	4.5 (4)
	C120	3.6 (3-1/8)	4.3 (3-3/4)
LD28	430	4.3 (3-3/4)	5.0 (4-3/8)
	C31	4.3 (3-3/4)	5.0 (4-3/8)

OIL COOLER

LD28



LD20

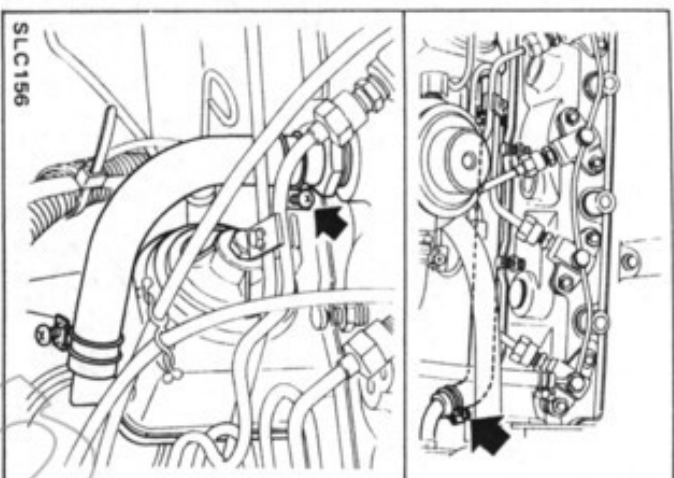


SLC237

REMOVAL

1. Remove radiator drain plug and radiator cap, and drain coolant.
2. Remove coolant hoses.

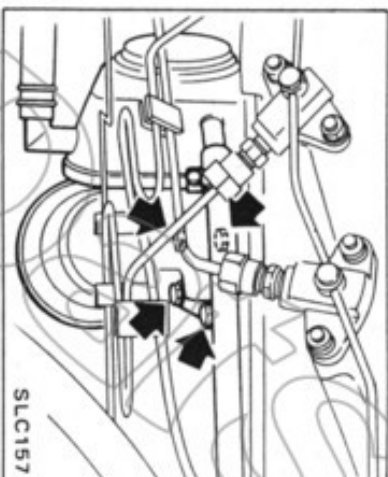
LD28



3.

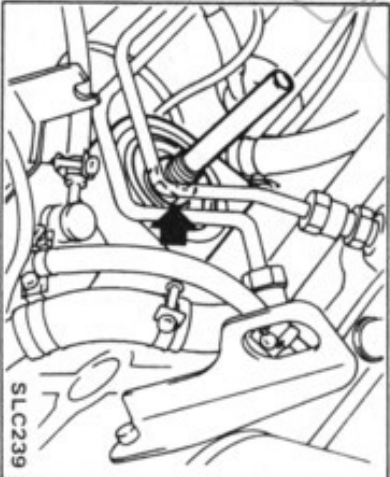
LD28

- Remove oil cooler assembly with oil filter and hoses.

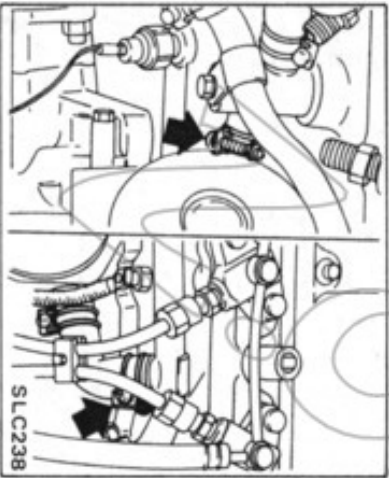


LD20

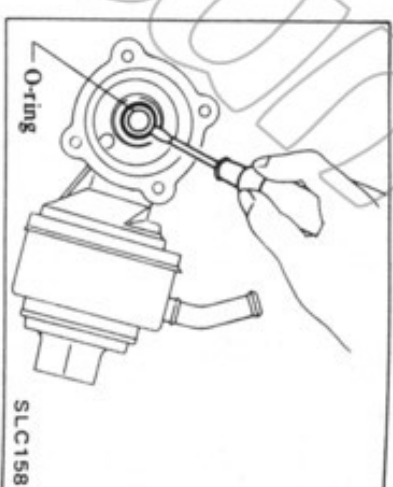
- Remove oil filter and nut, then take out oil cooler.



LD20



4. Remove O-ring from bracket (LD28).



INSTALLATION

Install oil cooler in the reverse order of removal.

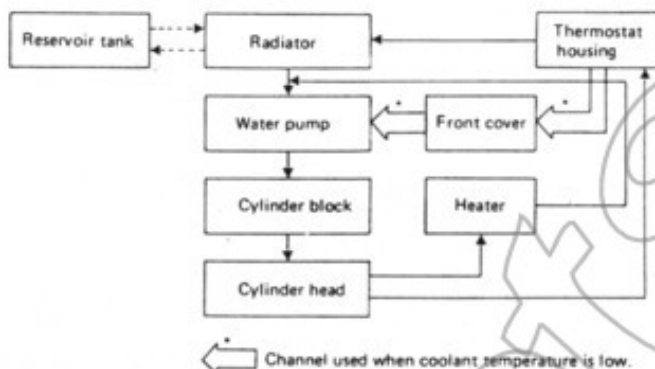
Always use new gasket.

- ⌚ : Oil cooler fixing bolt
16 - 21 N·m
(1.6 - 2.1 kg-m,
12 - 15 ft-lb)

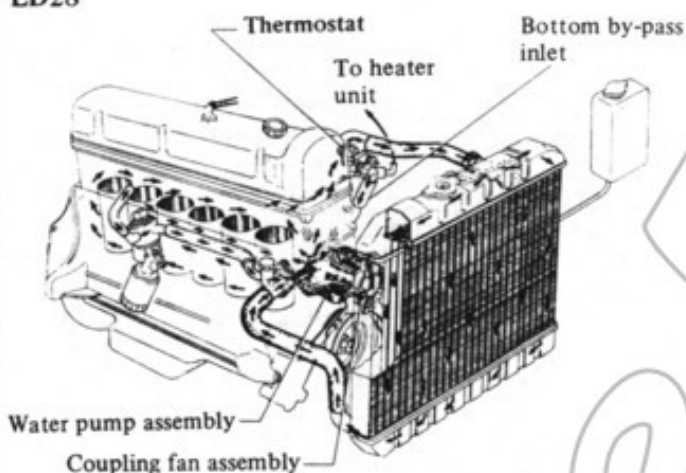
After installing, run engine for a few minutes, and check for leaks.

ENGINE COOLING SYSTEM

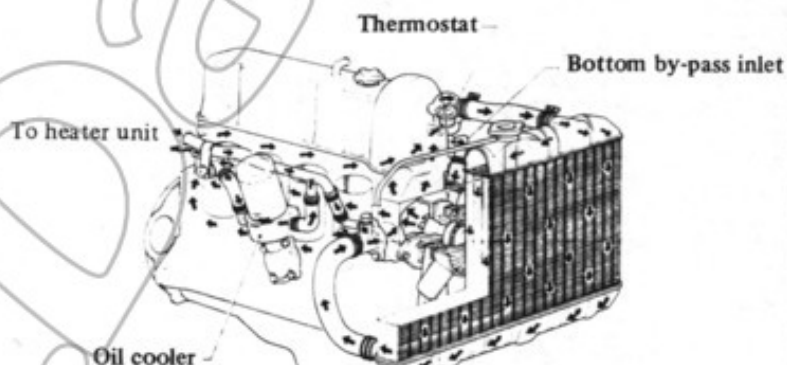
COOLING CIRCUIT



LD28



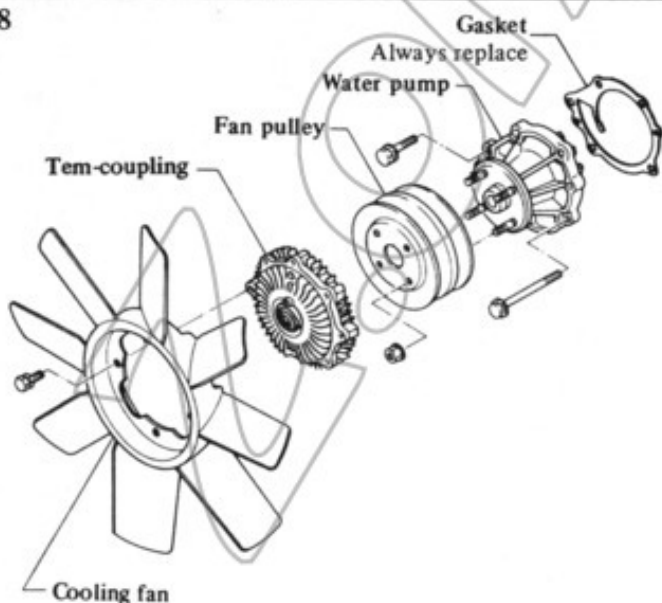
LD20



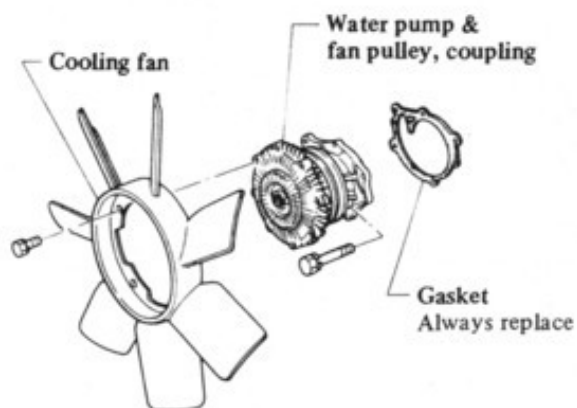
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WATER PUMP

LD28



LD20



SLC241

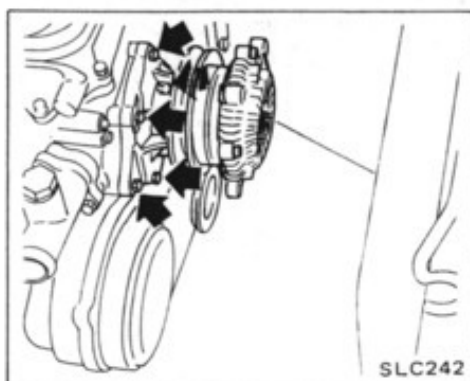
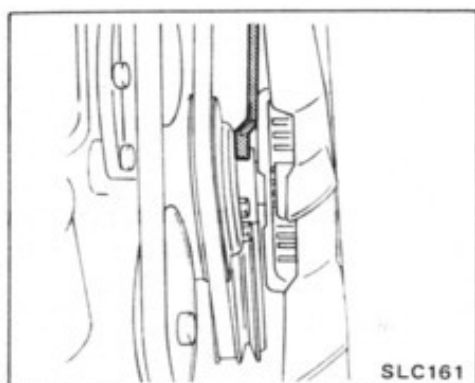
REMOVAL

1. Open radiator drain cock and radiator cap, and drain coolant.

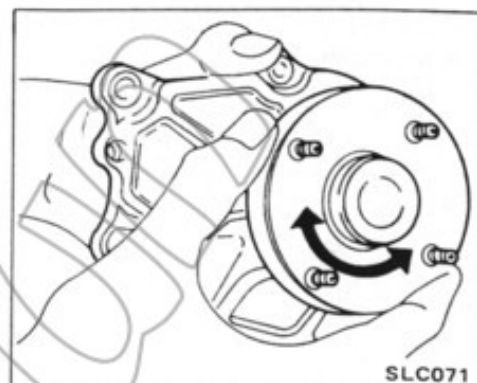
WARNING:

To avoid the danger of being scalded, never attempt to drain the coolant when the engine is hot.

2. Remove radiator shroud.
3. Loosen fan pulley nuts (LD28).



LD28

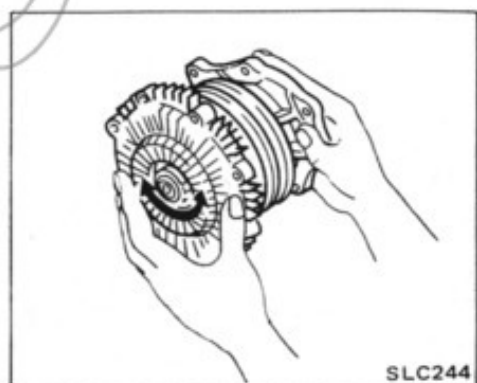


INSPECTION

The water pump and fan coupling cannot be disassembled and should be replaced as a unit.

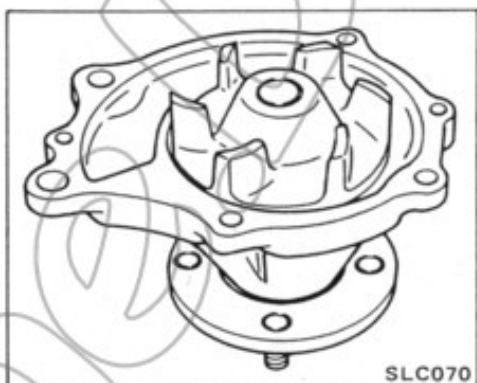
1. Inspect water pump body and vane for rust or corrosion.

LD20



4. Loosen fan belt.
- (1) Loosen alternator securing bolts.
 - (2) Move the alternator toward the engine.
5. Remove fan pulley with fan coupling and fan (LD28).
 6. Remove fan (LD20).
 - 7.
- Remove water pump with gasket (LD28).

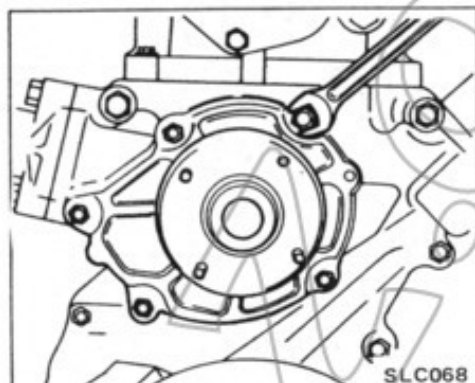
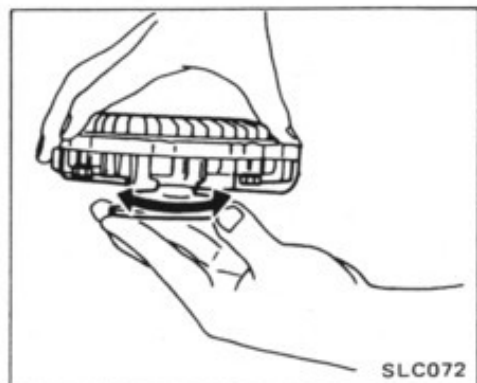
LD28



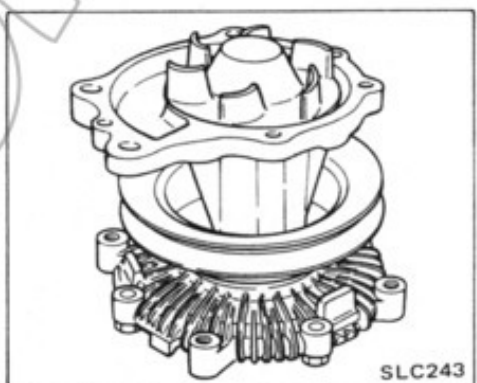
3. Inspect fan coupling.

Check the coupling for oil leakage or bent bimetal.

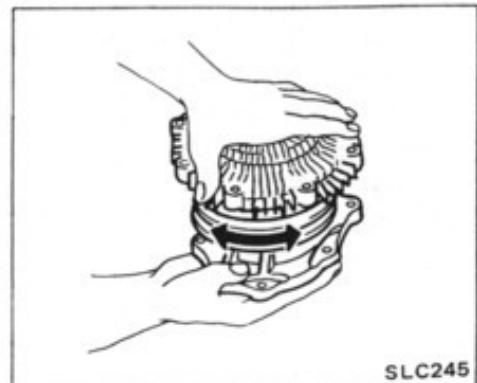
LD28



LD20



LD20




- Remove water pump with fan pulley, fan coupling and gasket (LD20).

2. Inspect water pump bearing.
- Check for excessive end play or rough operation.

TIGHTENING TORQUE

Unit	N·m	kg·m	ft·lb
M6	4 - 10	0.4 - 1.0	2.9 - 7.2
Water pump bolt M8	10 - 16	1.0 - 1.6	7 - 12
Water pump pulley stud	6 - 10	0.6 - 1.0	4.3 - 7.2
Thermostat housing	10 - 16	1.0 - 1.6	7 - 12
Water outlet bolt	12 - 20	1.2 - 2.0	9 - 14

SPECIAL SERVICE TOOL

Tool number	Tool name
ST19320000	Oil filter wrench
 <p>SLC036</p>	