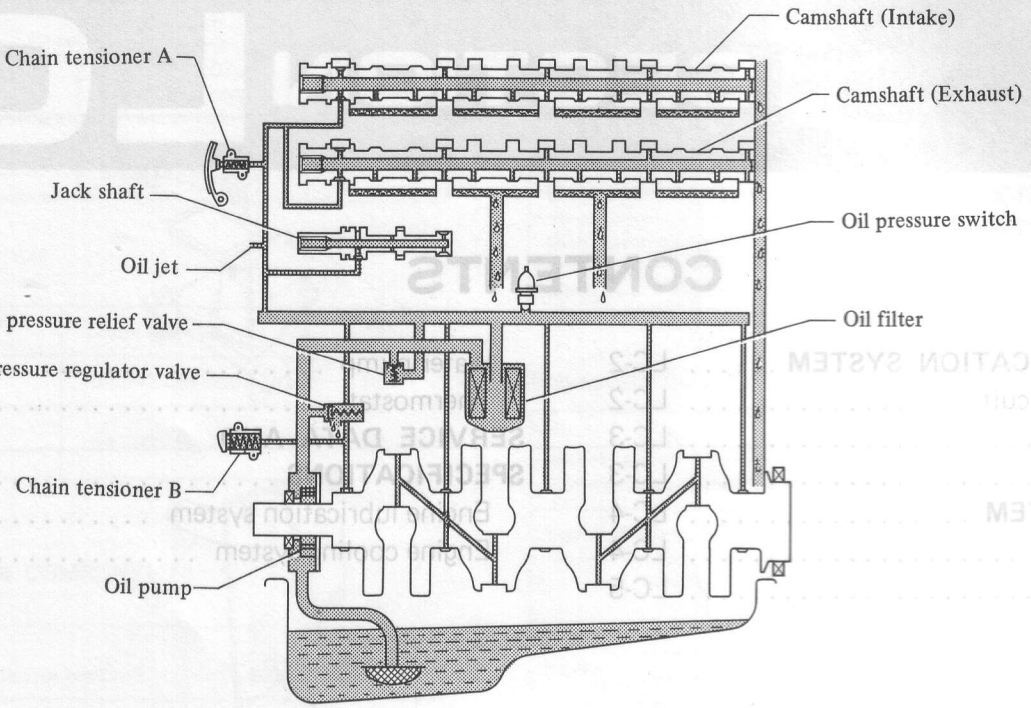
ENGINE LUBRICATION & COOLING SYSTEMS

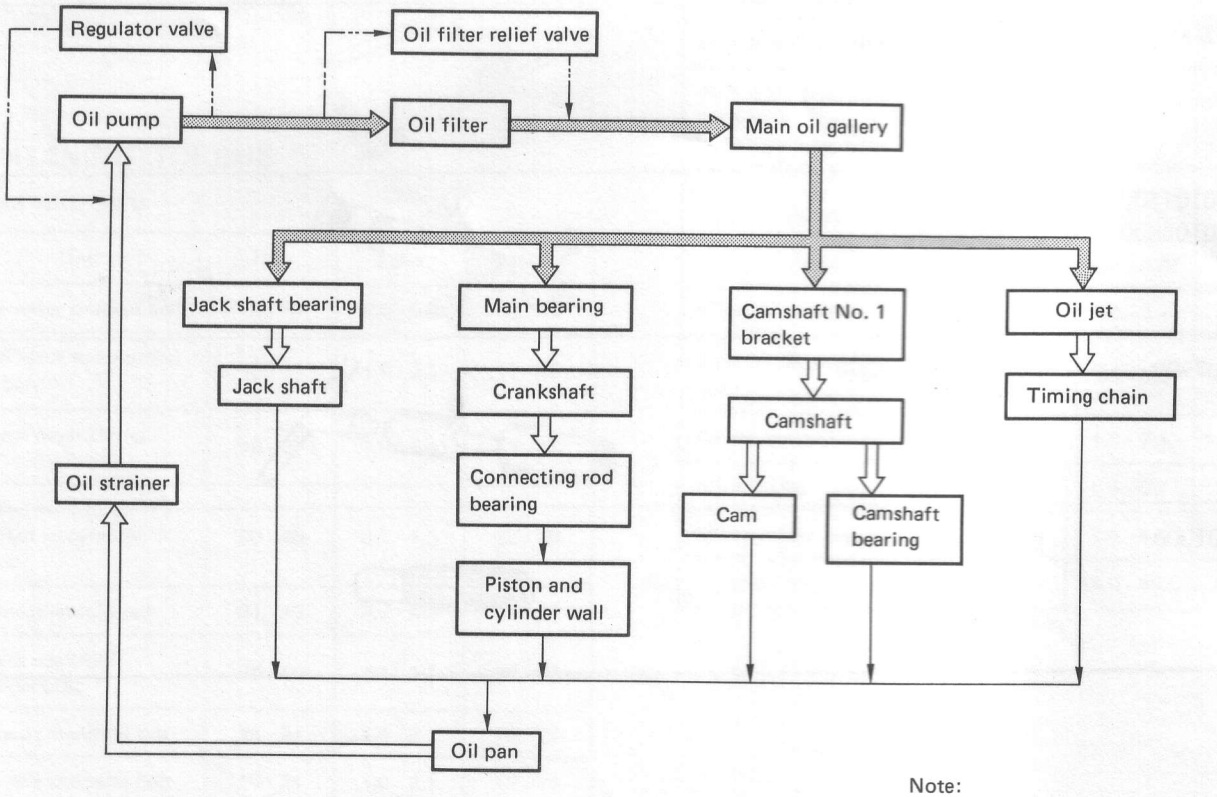
SECTION LC

CONTENTS

ENGINE LUBRICATION SYSTEM

LUBRICATION CIRCUIT





Note:
- : Oil passage
- : Oil gallery in cylinder block
- : By-pass passage

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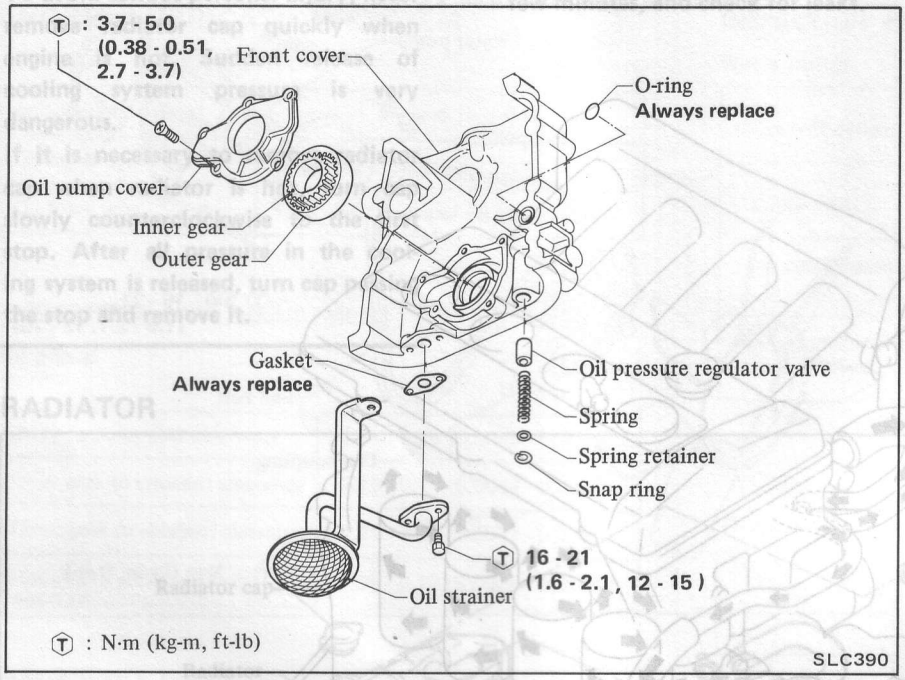
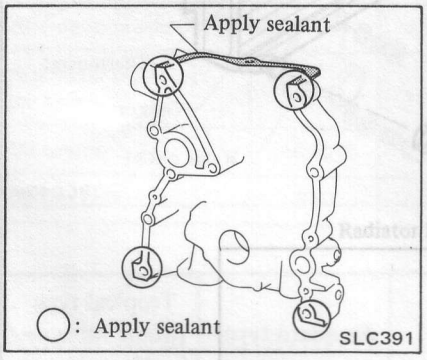
OIL PUMP

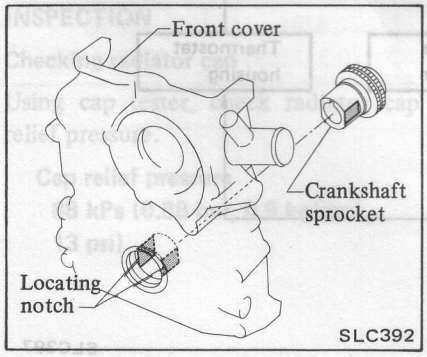
DISASSEMBLY AND ASSEMBLY



a. **Before removing front cover remove oil pan and oil strainer.**
b. **Do not damage cylinder head gasket.**
c. **Always use new gaskets, snap ring, O-ring and oil seal.**
d. **When installing front cover, apply sealant.**



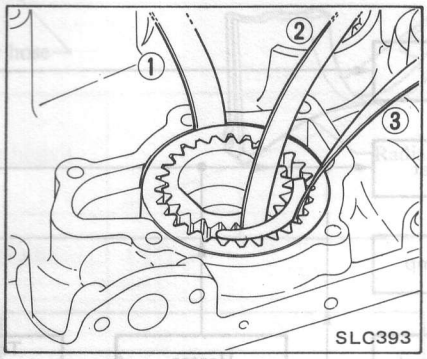
e. **Before installing front cover, align locating notches.**



INSPECTION

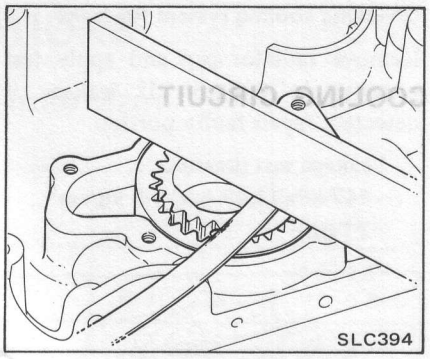
1. Measure clearance.

Body to outer gear clearance ①:
0.11 - 0.20 mm
(0.0043 - 0.0079 in)
Inner gear to crescent clearance ②:
0.12 - 0.23 mm
(0.0047 - 0.0091 in)
Outer gear to crescent clearance ③:
0.21 - 0.32 mm
(0.0083 - 0.0126 in)



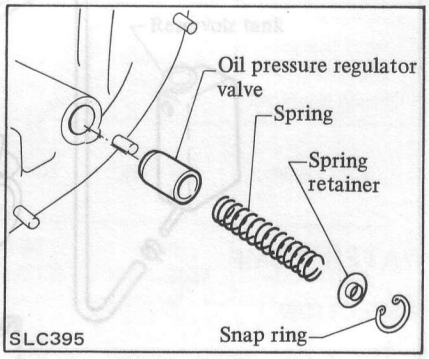
2. Measure oil pump gear end play.

Housing to gear clearance:
0.06 - 0.12 mm
(0.0024 - 0.0047 in)



OIL PRESSURE REGULATOR VALVE

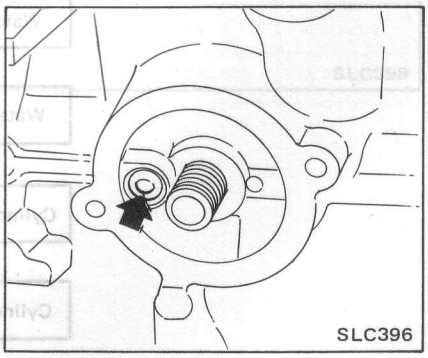
Check valve sliding surface and valve spring. Replace entire valve assembly if necessary.



OIL FILTER

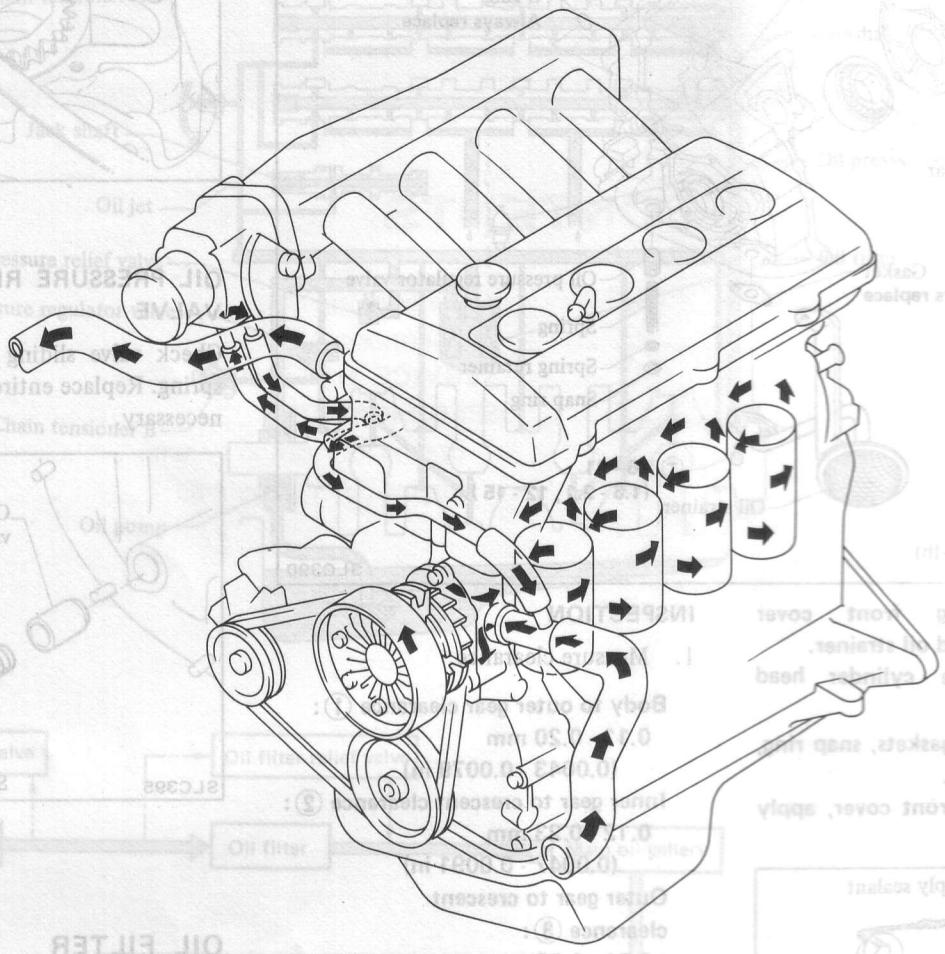
OIL PRESSURE RELIEF VALVE

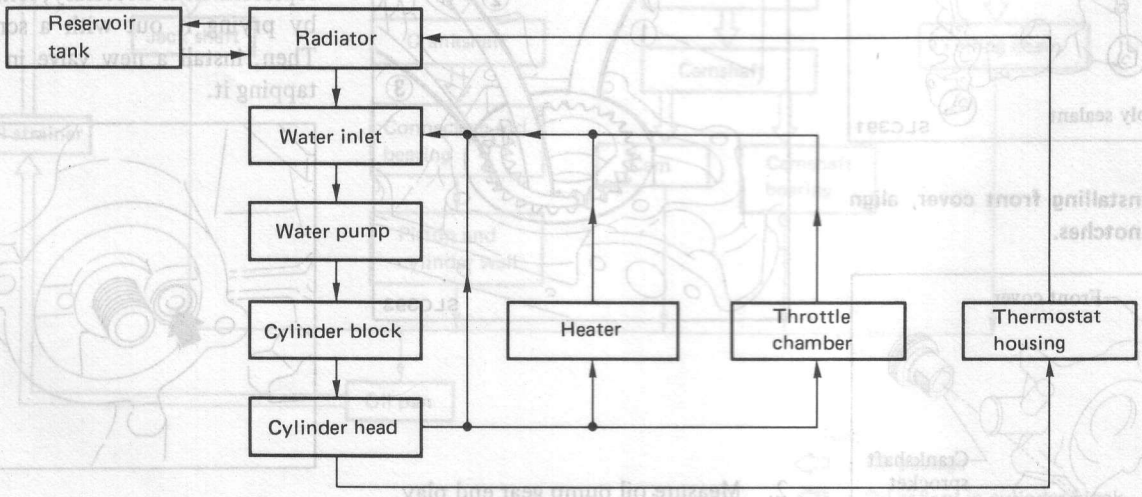
Check for a cracked or broken valve. If replacement is necessary, remove valve by prying it out with a screwdriver. Then, install a new valve in place by tapping it.



COOLING SYSTEM

COOLING CIRCUIT





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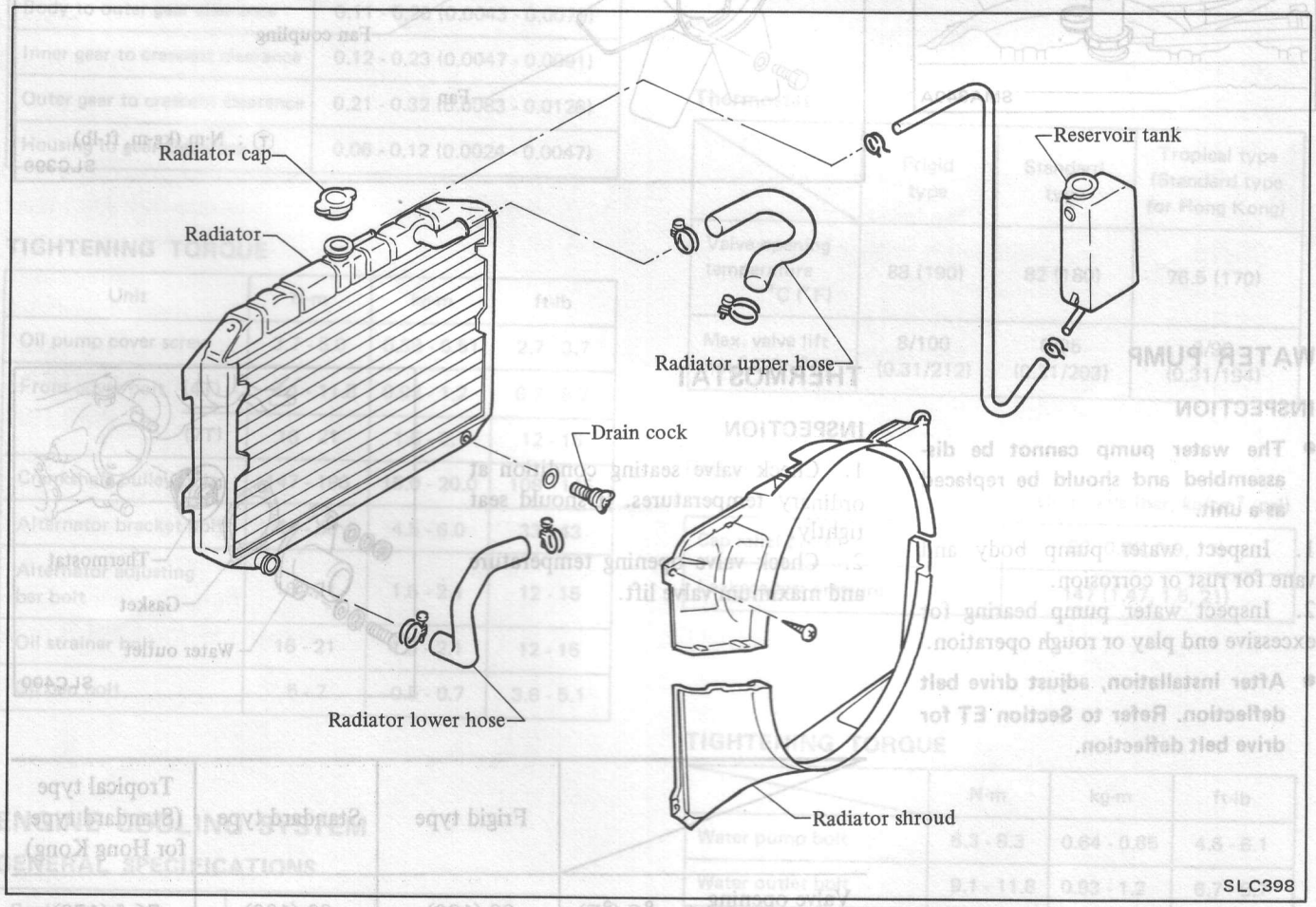
WARNING:
To avoid serious personal injury, never remove radiator cap quickly when engine is hot. Sudden release of cooling system pressure is very dangerous.
If it is necessary to remove radiator cap when radiator is hot, turn cap slowly counterclockwise to the first stop. After all pressure in the cooling system is released, turn cap passing the stop and remove it.

- **Always use new gaskets.**
- **After installation, run engine for a few minutes, and check for leaks.**

RADIATOR

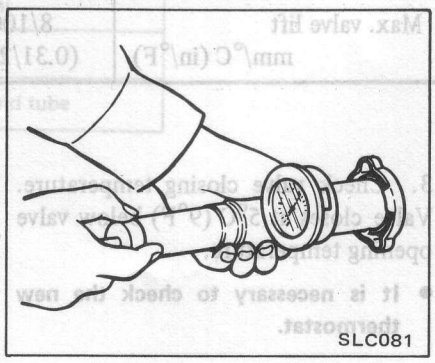


INSPECTION

Checking radiator cap

Using cap tester, check radiator cap relief pressure.

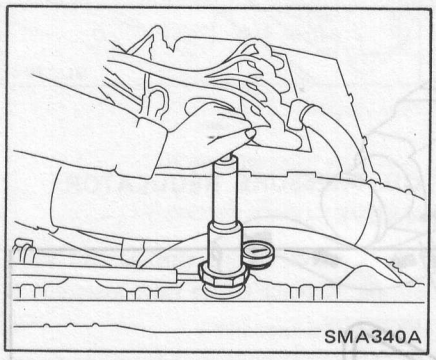
Cap relief pressure
88 kPa (0.88 bar, 0.9 kg/cm^2, 13 psi)

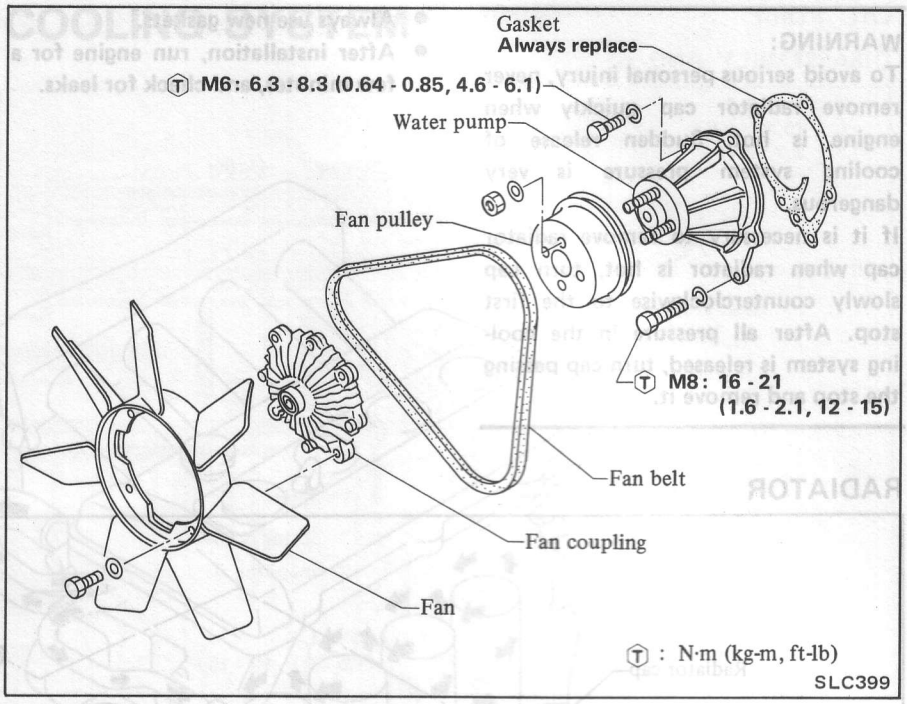


Checking cooling system for leaks

Remove radiator cap and apply test pressure to radiator. If leakage is detected, repair faulty portion.

Leakage test pressure
147 kPa (1.47 bar, 1.5 kg/cm², 21 psi)





WATER PUMP

INSPECTION

- **The water pump cannot be disassembled and should be replaced as a unit.**

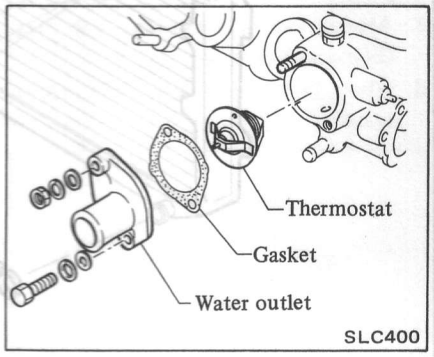
1. Inspect water pump body and vane for rust or corrosion.
2. Inspect water pump bearing for excessive end play or rough operation.

- **After installation, adjust drive belt deflection. Refer to Section ET for drive belt deflection.**

THERMOSTAT

INSPECTION

1. Check valve seating condition at ordinary temperatures. It should seat tightly.
2. Check valve opening temperature and maximum valve lift.



	Frigid type	Standard type	Tropical type (Standard type for Hong Kong)
Valve opening temperature °C (°F)	88 (190)	82 (180)	76.5 (170)
Max. valve lift mm/°C (in/°F)	8/100 (0.31/212)	8/95 (0.31/203)	8/90 (0.31/194)

3. Check valve closing temperature. Valve closes at 5°C (9°F) below valve opening temperature.

- **It is necessary to check the new thermostat.**

SERVICE DATA AND SPECIFICATIONS

ENGINE LUBRICATION SYSTEM

GENERAL SPECIFICATIONS

Lubrication method	Pressed feed flow
Oil pump type	Inner gear type
Oil filter type	Full flow and cartridge type

INSPECTION AND ADJUSTMENT

Oil pump

Unit: mm (in)

Body to outer gear clearance	0.11 - 0.20 (0.0043 - 0.0079)
Inner gear to crescent clearance	0.12 - 0.23 (0.0047 - 0.0091)
Outer gear to crescent clearance	0.21 - 0.32 (0.0083 - 0.0126)
Housing to gear clearance	0.06 - 0.12 (0.0024 - 0.0047)

TIGHTENING TORQUE

Unit	N·m	kg-m	ft-lb
Oil pump cover screw	3.7 - 5.0	0.38 - 0.51	2.7 - 3.7
Front cover bolt (4T)	9.1 - 11.8	0.93 - 1.2	6.7 - 8.7
(7T)	16 - 21	1.6 - 2.1	12 - 15
Crankshaft pulley bolt	147 - 196	15.0 - 20.0	108 - 145
Alternator bracket bolt	44 - 59	4.5 - 6.0	33 - 43
Alternator adjusting bar bolt	16 - 21	1.6 - 2.1	12 - 15
Oil strainer bolt	16 - 21	1.6 - 2.1	12 - 15
Oil pan bolt	5 - 7	0.5 - 0.7	3.6 - 5.1

ENGINE COOLING SYSTEM

GENERAL SPECIFICATIONS

Cooling method	Water cooling, forced circulation
Water pump type	Centrifugal
Thermostat type	Wax-pellet
Radiator type	Corrugated fin and tube

INSPECTION AND ADJUSTMENT

Water pump

Drive belt deflection	Adjust deflection of used belt	Set deflection of new belt
Cooling fan mm (in)	8 - 10 (0.31 - 0.39)	5.5 - 7.5 (0.217 - 0.295)
Air conditioner compressor mm (in)	7 - 10.5 (0.28 - 0.413)	7 - 8 (0.28 - 0.31)
Applied pushing force N (kg, lb)	98 (10, 22)	

Thermostat

	Frigid type	Standard type	Tropical type (Standard type for Hong Kong)
Valve opening temperature °C (°F)	88 (190)	82 (180)	76.5 (170)
Max. valve lift mm/°C (in/°F)	8/100 (0.31/212)	8/95 (0.31/203)	8/90 (0.31/194)

Radiator

Unit: kPa (bar, kg/cm², psi)

Cap relief pressure	88 (0.88, 0.9, 13)
Leakage test pressure	147 (1.47, 1.5, 21)

TIGHTENING TORQUE

	N·m	kg-m	ft-lb
Water pump bolt	6.3 - 8.3	0.64 - 0.85	4.6 - 6.1
Water outlet bolt	9.1 - 11.8	0.93 - 1.2	6.7 - 8.7