SERVICE MANUAL

MODEL
L20A, L24 SERIES
ENGINE

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION CO

COOLING SYSTEM

CO

COOLING SYSTEM ..... CO- 1

COOLING SYSTEM

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DESCRIPTION

The cooling system is a closed pressure type with high cooling capability. Cooling water flowing through resistance-free water passages in the cylinder head and block is maintained at adequate temperature range at all times by means of an ample capacity water pump, a corrugated fin type radiator with high cooling efficiency and a pellet type thermostat.

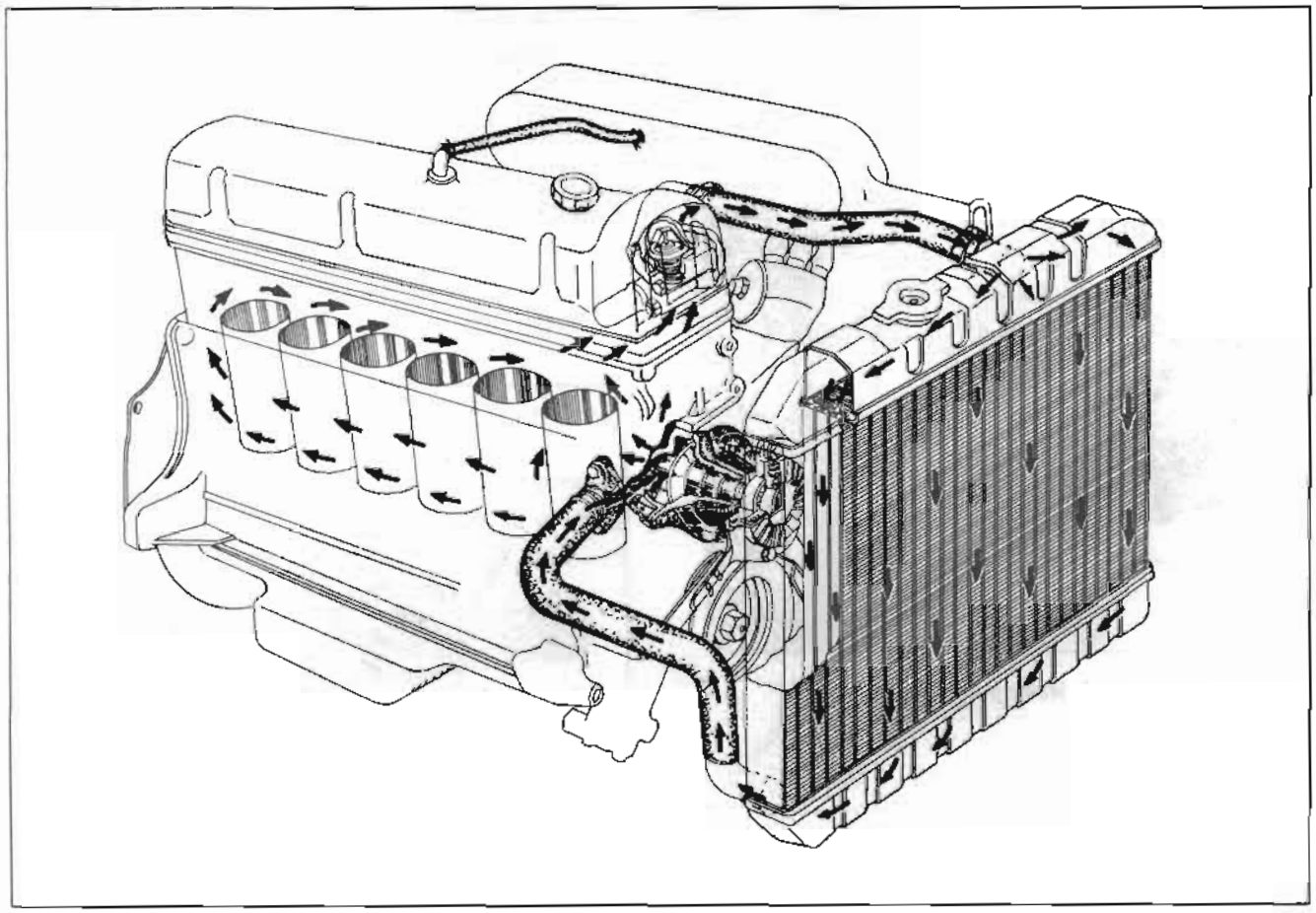


Fig. CO-1 Cooling system

WATER PUMP

The water pump is a centrifugal type water pump with an aluminum diecast pump body. The volute chamber is built in the front cover assembly and a high pressure sealing mechanism is adopted to prevent the water leakage and noise thoroughly.

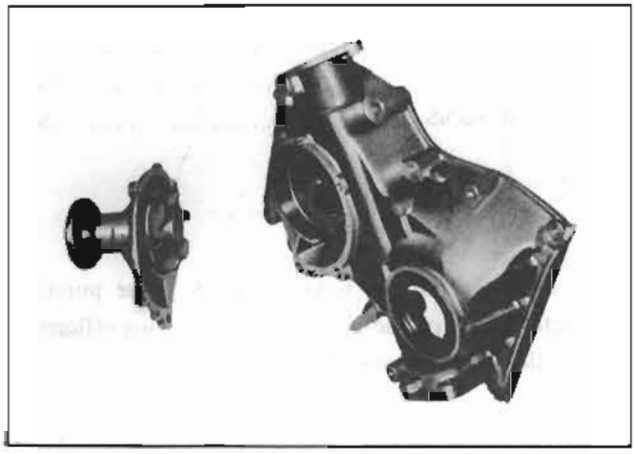


Fig. CO-2 Water pump and front cover

Removal

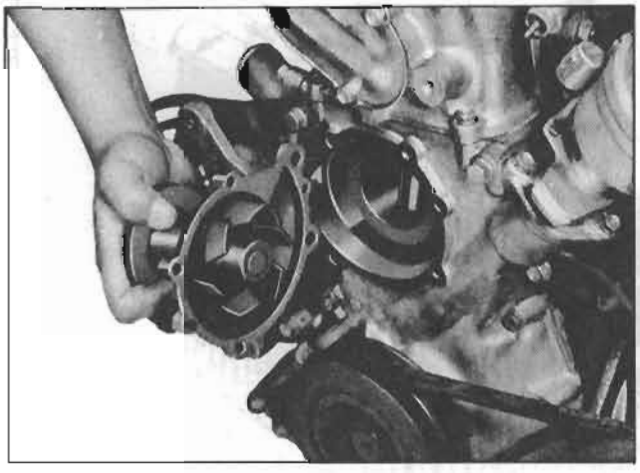


Fig. CO-3 Water pump removal

1. Drain cooling water completely.
2. Take the fan belt off the pulley.
3. Remove fan and pulley.
4. Remove the water pump.

Disassembly

Recommended the water pump be not disassembled by reason of an aluminum make.

Inspction

Pump body

- o Replace, if vanes are rusted or corroded considerably.
- o Replace, if it grows up excessive bearing noise or squeak with the engine running.

Note: To prevent squeak, use Nissan CSP (Cooling System Protector).
Prior to installing the pump, clean it with Nissan CSC (Cooling System Cleaner).

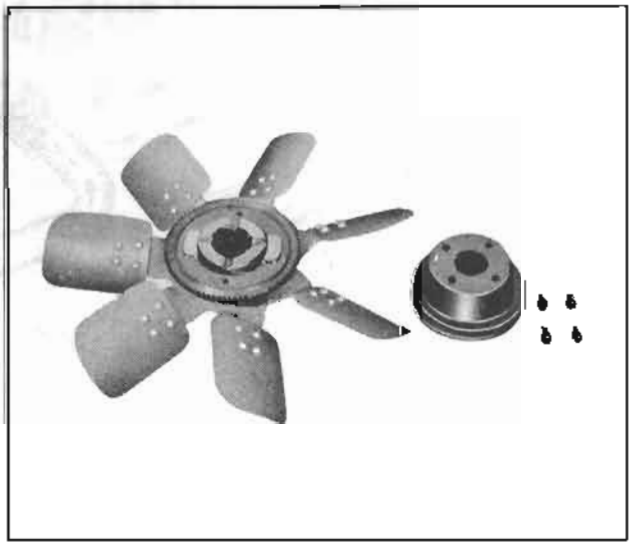
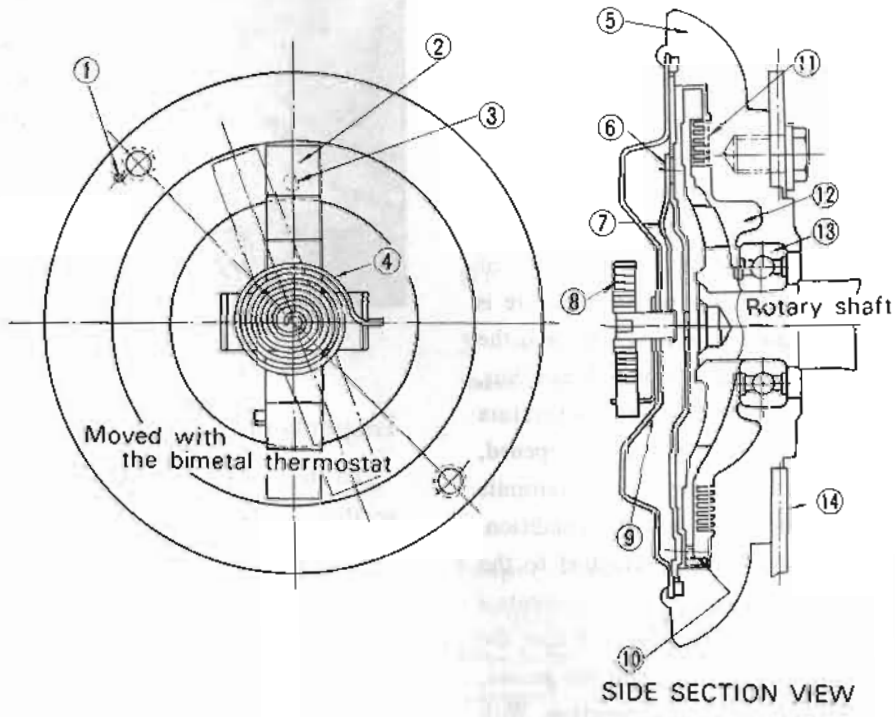


Fig. CO-4 Fan and coupling

FAN

The conventional silicon coupling fan has been far improved, and the new fan is equipped with Tempatrol coupling. (except HA30 series)



1	Oil drain pump unit	6	Oil inlet	10	Oil drain pump unit
2	Slide valve	7	Slide valve	11	Coupling part (labyrinth)
3	Oil inlet	8	Bimetal thermostat	12	Driving chamber
4	Bimetal thermostat	9	Reserve chamber for "OFF"	13	Bearing
5	Driven part		condition	14	Cooling fan

Fig. CO-5 Cross-sectional view of Tempatrol coupling

Tempatrol is a fan coupling which uses a temperature control system on the conventionally used fluid coupling (silicon oil is used).

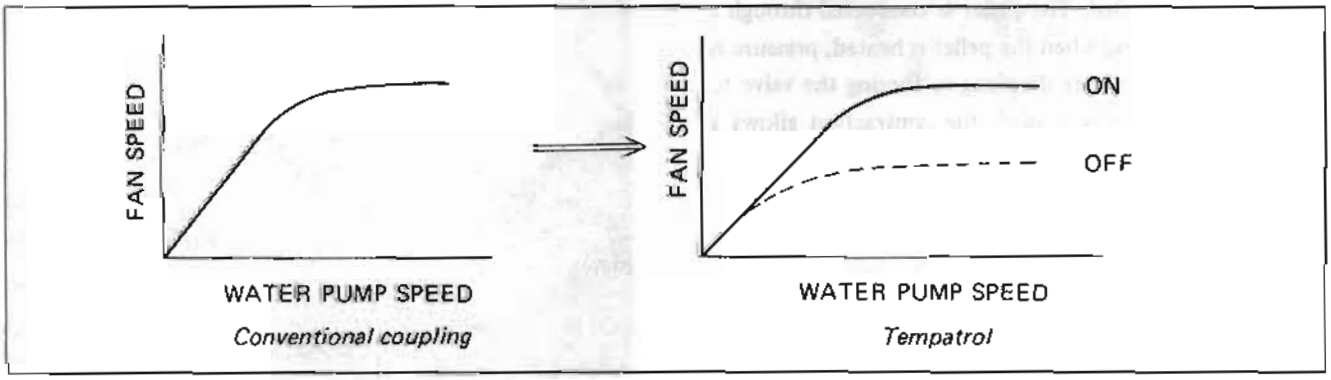


Fig. CO-6 Operating principle

The conventional coupling slips the fan at a high speed always under a constant ratio regardless of the engine cooling requirement.

Under the Tempatrol coupling, however, the slipping ratio is changed appropriately in response to the cooling requirement.

"ON" denotes that the cooling is required, and the fan operates upto approximately 2,500 rpm. When high cooling is not required (during cold season, engine warm up, etc.), however, the operation is placed under "OFF" condition, and the fan slips at approximately 1,600 rpm.

The coiled bimetal thermostat installed on the front center portion of the Tempatrol detects temperature of air passing through the radiator (The air temperature is directly relative to the engine water temperature.), the inside slide valve is opened or closed as required, and thus, the ON-OFF control is performed. When temperature rises, the bimetal is expanded, and the valve is opened, silicon oil is forwarded to the groove that transmits torque, and the system is placed under "ON" condition. When the valve closes, silicon oil is not supplied to the groove, oil in the groove is accumulated on the Tempatrol periphery due to the centrifugal force, and led into the reserve chamber. Now, oil is eliminated from the groove, and the system is placed under "OFF" condition. With the new system described above, when fan cooling is not required, the output loss is minimized, and noise can be far reduced.

THERMOSTAT

A pellet type thermostat is used in the water out-let passage to control the flow of coolant, providing fast engine warm-up and regulating coolant temperature. A wax pellet in the thermostat expands when heated and contracts when cooled. The pellet is connected through a piston to a valve and when the pellet is heated, pressure is exerted against a rubber diaphragm, forcing the valve to open. As the pellet is cooled, the contraction allows a spring to close the valve.

Removal

1. Drain cooling water.
2. Disconnect the radiator hose.
3. Remove the water out-let elbow, and take out the thermostat.

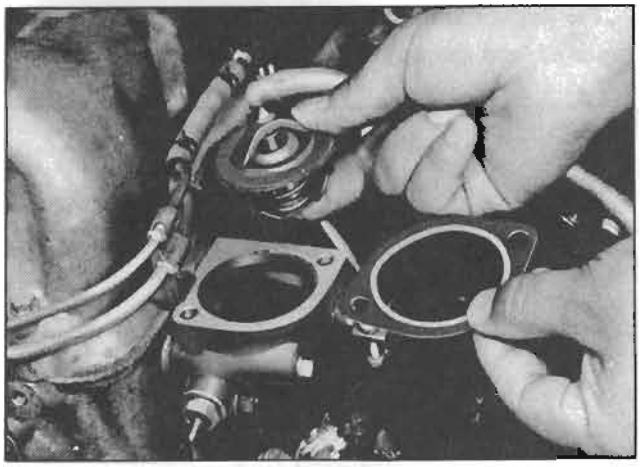


Fig. CO-7 Thermostat removal

Inspection

To test the thermostat for proper operating temperature, submerge the unit under water. Heat the water and observe the temperature.

1. Measure the temperature when the thermostat valve just starts rising.
2. Measure the maximum lift of the thermostat valve.

Valve open temperature:

82°C ±1.5°C (179.6°F ±2.7°F)

Maximum valve lift:

above 8 mm at 95°C (0.315 in at 203°F)

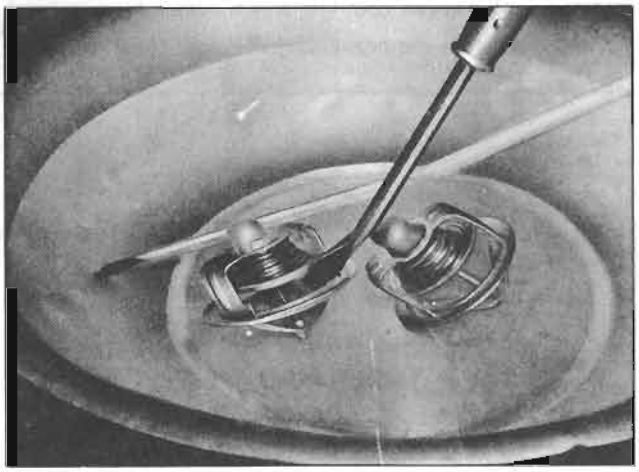


Fig. CO-8 Thermostat inspection

Installation

1. When installing, apply adhesive to both sides of the packing for prevention of water leakage.

2. Reinstall the thermostat in reverse sequence of removal.

RADIATOR

The radiator is of a down flow type.

The system is placed under a pressure, and the relief valve, built in the radiator filler cap, controls the pressure at approximately 0.9 kg/cm² (12.8 lb/sq in).

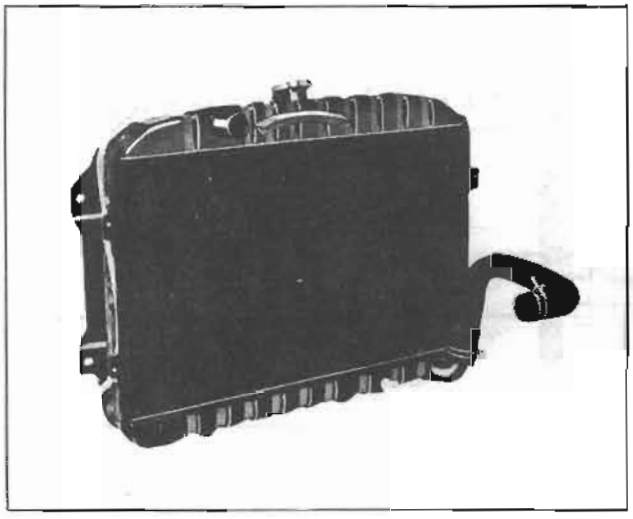


Fig. CO-9 Radiator

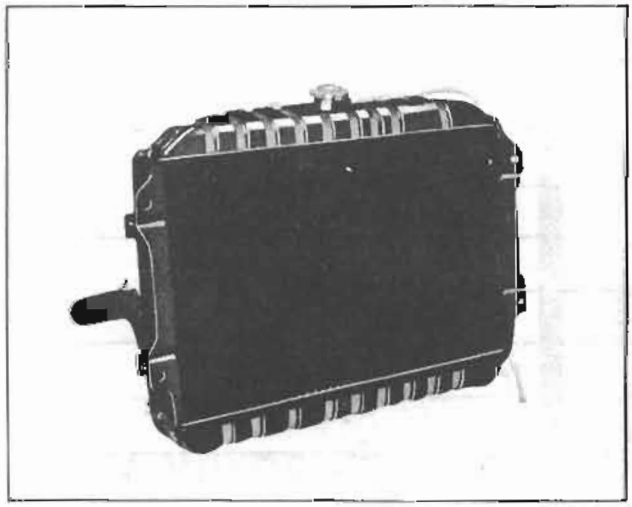


Fig. CO-10 Radiator

For the models with torque converter, the oil cooler is combined with the radiator to cool the torque converter oil.

Removal

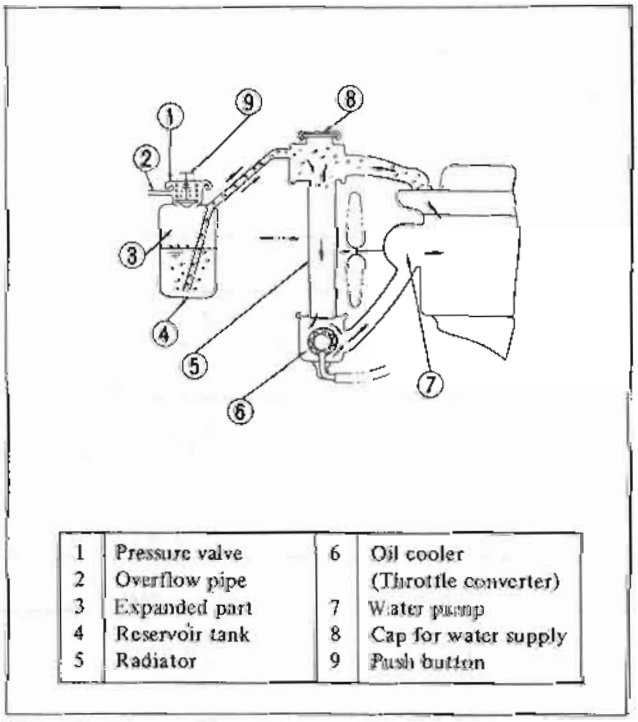
1. Drain cooling water.

2. Disconnect radiator upper hose and lower the hose and the hose to the reservoir tank.
(The reservoir tank is used 130, HA30 series only.)

3. Remove four installation bolts and detach the radiator assembly.

Inspection

Check for water leakage and cracks using a cap tester. If such defects are detected, repair or replace the radiator assembly.



1	Pressure valve	6	Oil cooler (Throttle converter)
2	Overflow pipe	7	Water pump
3	Expanded part	8	Cap for water supply
4	Reservoir tank	9	Push button
5	Radiator		

Fig. CO-11

SPECIFICATIONS

Model	130	HA30	S30
Engine	L20A, L24	L20A	L24
Dimensions of radiator core (Height x Width x Thickness)	395 x 558 x 38 mm (15.6 x 22.0 x 1.5 in)	350 x 600 x 32 mm (13.8 x 23.6 x 1.3 in)	350 x 600 x 38 mm (13.8 x 23.6 x 1.5 in)
Type	Corrugated fin type	←	←
Radiator fin pitch	2.3 mm (0.09 in)	2.5 mm (0.10 in)	2.5 mm (0.10 in)
Radiator capacity	more than 630 Kcal/h°C	more than 600 Kcal/h°C	more than 595 Kcal/h°C
Cap working pressure	0.9 kg/cm² (13 lb/sq in)	←	←
Testing pressure	1.6 kg/cm²(23 lb/sq in)	←	←
Water capacity	9.5 ℓ (2.5 US gal)	10.5 ℓ (2.8 US gal)	8.0 ℓ (2.1 US gal)

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT