

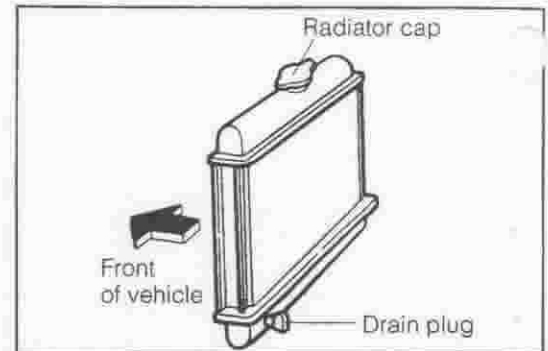


COOLING SYSTEM

CO

1. DRAIN ENGINE COOLANT**M101 & M201 Series**

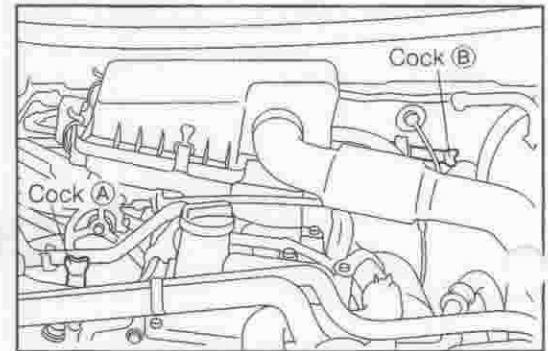
- (1) Remove the radiator cap.
- (2) Drain the coolant by loosening the radiator drain plug.



YCO00006-00003

J102 Series

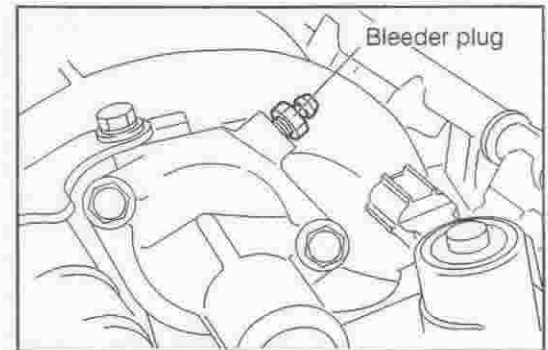
- (1) Remove the radiator cap.
- (2) Loosen and remove the cocks (white) of the air bleeding valves (A) and (B).
- (3) Drain the coolant by loosening the radiator drain plug.



YCO00007-00004

S221 Series

- (1) Remove the radiator cap.
- (2) Drain the coolant by loosening the radiator drain plug.
- (3) Loosen the bleeder plug located at the top of the engine water outlet housing.



YCO00008-00005

2. FILL ENGINE COOLANT**M101 & M201 Series**

- (1) Tighten the drain plug of the radiator. Fill the radiator with water.

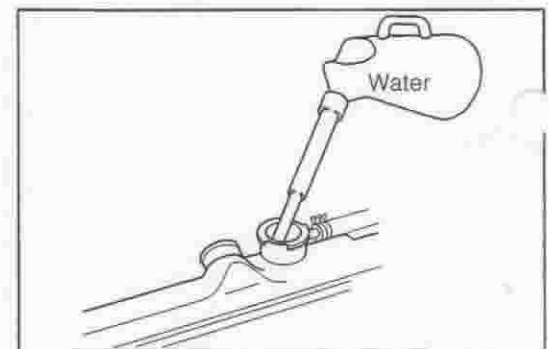
CAUTION:

- As regards water to be used as cooling water, use soft water which does not contain salts of minerals, calcium, magnesium, and so forth.

NOTE:

- The operations described in steps (1) through (5) are to completely expel any deteriorated coolant remaining in the cooling system.

- (2) Tighten the radiator cap.
- (3) Start the engine, and keep warming up the engine and then stop the engine and allow it to cool down.
- (4) Drain the water. (Refer to page CO-3.)
- (5) Repeat the steps (1) through (4) two to three times.



YCO00009-00006

YCO00010-00000

- (6) Tighten the drain plug of the radiator. Fill the radiator with coolant in accordance with the instructions of the manufacturer of the antifreeze solution.

CAUTION:

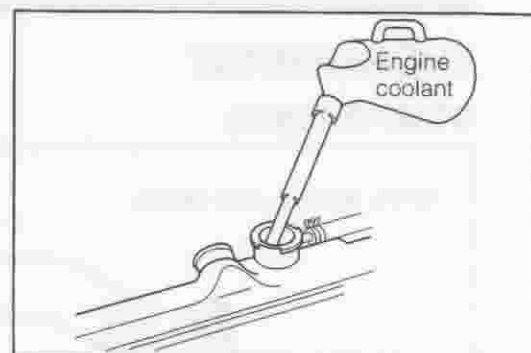
- Use a reliable brand of ethylene-glycol base antifreeze solution.

Coolant Capacity: 3.8 ℓ (W/heater, W/O reserve tank)

Reserve Tank Capacity:

Full: 0.45 ℓ

Low: 0.25 ℓ



YCC00011-00007

- (7) Tighten the radiator cap. Also add the coolant to the reserve tank.
- (8) Warm up the engine until the cooling fan operates twice, and then stop the engine.
- (9) After the engine has cooled down, fill the radiator with coolant and add the coolant up to the full level of the reserve tank.

YCC00012-00000

J102 Series

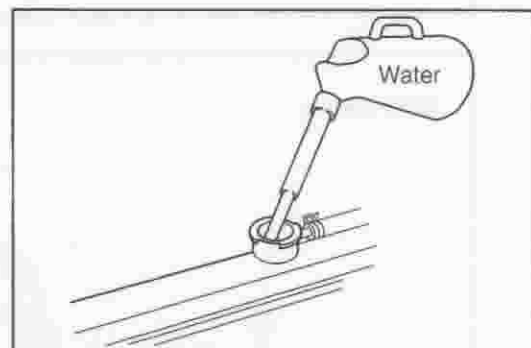
- (1) Tighten the drain plug of the radiator. Fill the radiator with water.

CAUTION:

- As regards water to be used as cooling water, use soft water which does not contain salts of minerals, calcium, magnesium, and so forth.

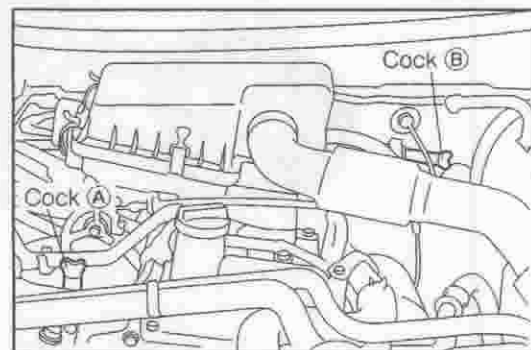
NOTE:

- The operations described in steps (1) through (7) are to completely expel any deteriorated coolant remaining in the cooling system.



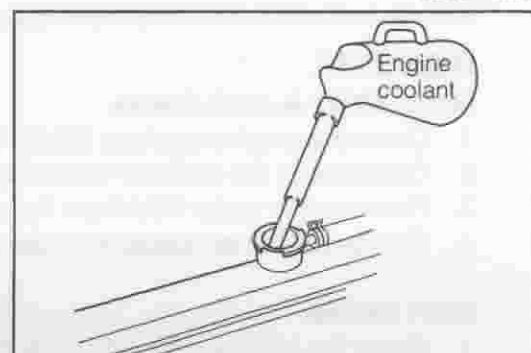
YCC00013-00008

- (2) Tighten the cock (A) when the water starts to overflow from the air bleeding valve (A).
- (3) Tighten the cock (B) when the water starts to overflow from the air bleeding valve (B).
- (4) Tighten the radiator cap when the water starts to overflow from the radiator.



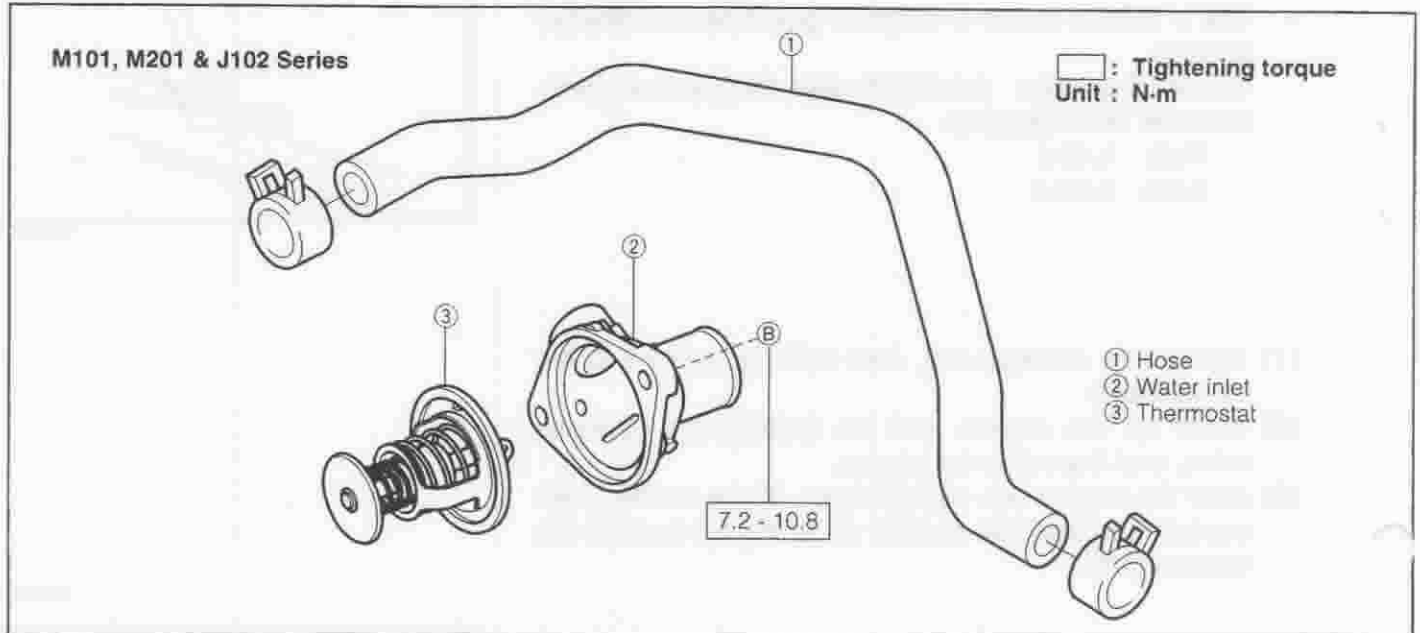
YCC00014-00009

- (5) Start the engine, and keep warming up the engine and then stop the engine and allow it to cool down.
- (6) Drain the water. (Refer to page CO-3.)
- (7) Repeat the steps (1) through (6) two to three times.

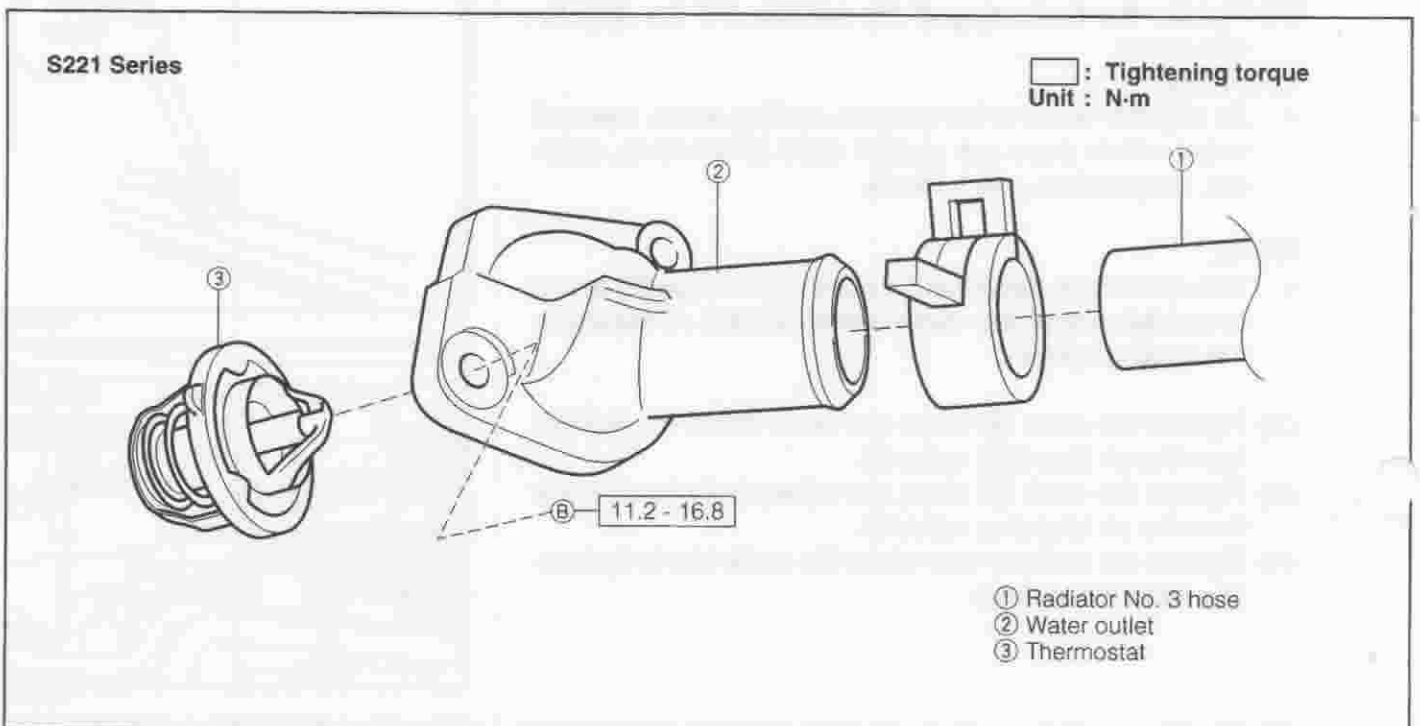


YCC00056-00048

THERMOSTAT COMPONENTS



YCO00032-00024



YCO00000-00025

REMOVAL

M101, M201 & J102 Series

1. Drain the engine coolant. (Refer to CO-3.)
2. Disconnect the radiator thermo control switch connector. (Only for EU spec.)
3. Remove the water inlet from the cylinder head.
4. Remove the thermostat from the cylinder head.

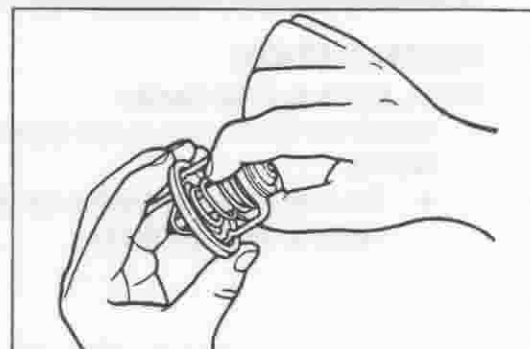
S221 Series

1. Drain the engine coolant (Refer to CO-3.)
2. Remove the water outlet from the cylinder head.
3. Remove the thermostat from the cylinder head.

YCO00033-00000

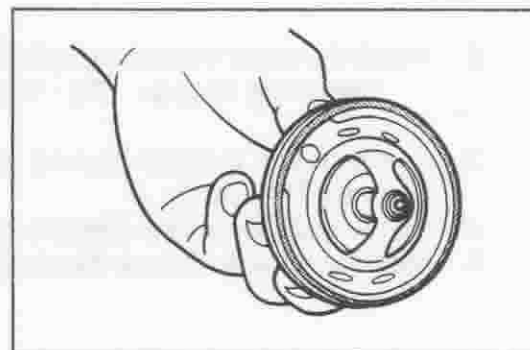
INSPECTION

1. Ensure that the thermostat valve is closed at room temperature of 20°C and the spring has no play.
Replace the thermostat if the valve is open or the spring has a play.



YCO00034-00026

2. Check the rubber grommet of the thermostat for damage or crack.
Replace the thermostat if the rubber grommet exhibits damage or crack.



YCO00035-00027

3. Check of thermostat valve opening temperature
 - (1) Immerse the thermostat in water, as indicated in the right figure. Heat the water gradually. Ensure that the temperature at which the valve begins to open conforms to the specified value.

Specified Valve Opening Temperature:

M101, M201 & J102 Series: $80 \pm 2^\circ\text{C}$

S221 Series: $88 \pm 1.5^\circ\text{C}$

If the temperature fails to conform to the specification, replace the thermostat with a new one.

- (2) M101, M201 & J102 Series

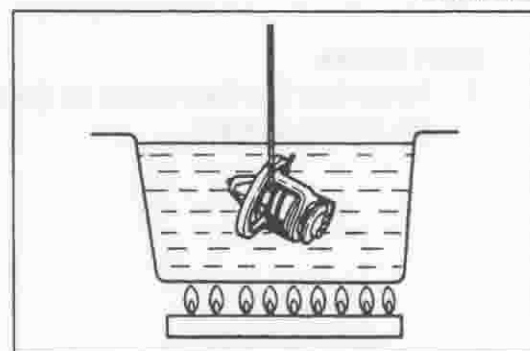
Under the condition described in the step (1), heat the water to 93°C. At this time, ensure that the valve lift is the specified value or more.

Specified Value: More than 8.5 mm

S221 Series

Under the condition described in the step (1), heat the water to 100°C. At this time, ensure that the valve lift is the specified value or more.

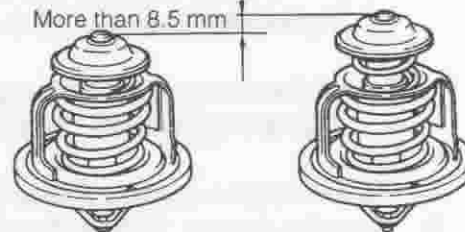
Specified Value: More than 8.0 mm



YCO00036-00028

M101, M201 & J102 Series

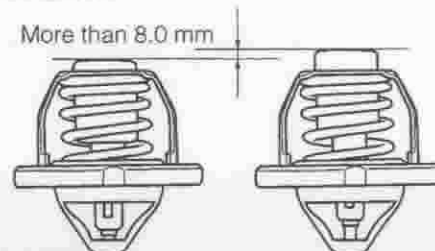
More than 8.5 mm



YCO00037-00029

S221 Series

More than 8.0 mm



YCO00000-00030

CAUTION:

- Be very careful not to get scalded, for the heated thermostat will be very hot.

CO-10-1

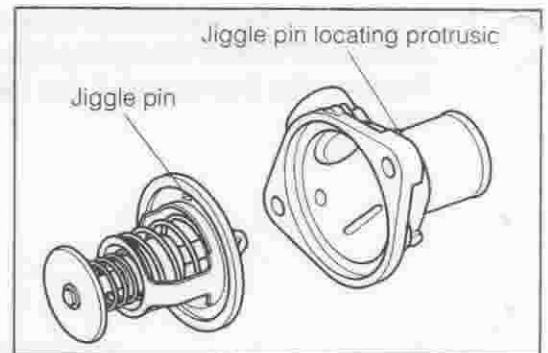
INSTALLATION

M101, M201 & J102 Series

1. Install the thermostat to the water inlet.

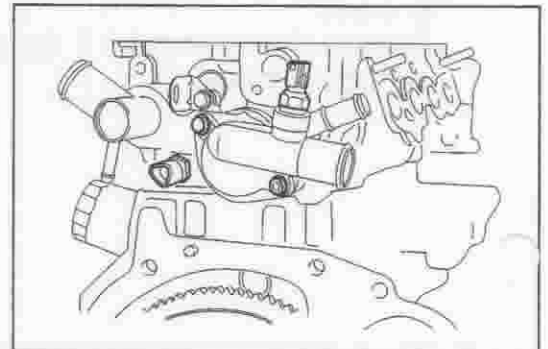
NOTE:

- Be sure to assemble the thermostat at the position indicated in the right figure.



YCO00076-00054

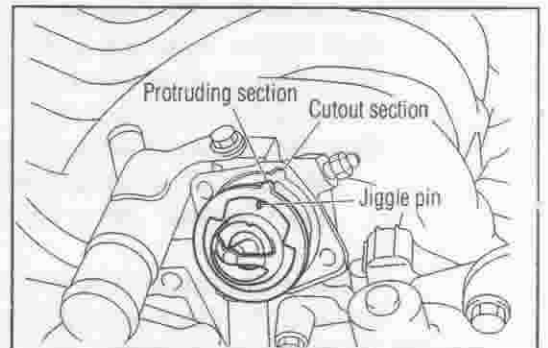
2. Install the water inlet to the cylinder head.
Tightening Torque: 7.2 - 10.8 N·m
3. Connect the radiator thermo control switch connector.
(Only for EU spec.)
4. Fill the engine coolant. (Refer to page CO-3.)
5. Start the engine. Ensure that no water leakage is present.



YCO00077-00055

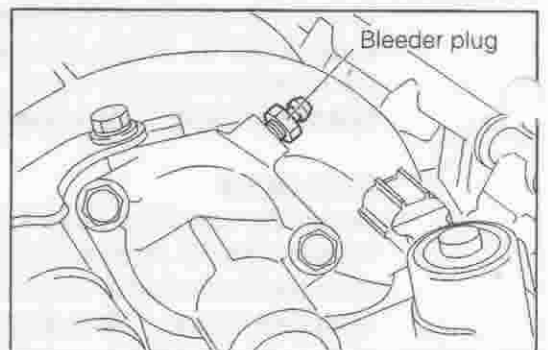
S221 Series

1. Assemble the thermostat to the water outlet with its jiggle pin facing upward.



YCO00040-00032

2. Install the water outlet to the water outlet housing.
Tightening Torque: 11.2 - 16.8 N·m
3. Install the water outlet housing to the cylinder head.
Tightening Torque: 16.0 - 24.0 N·m
4. Fill the engine coolant. (Refer to page CO-5.)
5. Start the engine. Ensure that no water leakage is present.

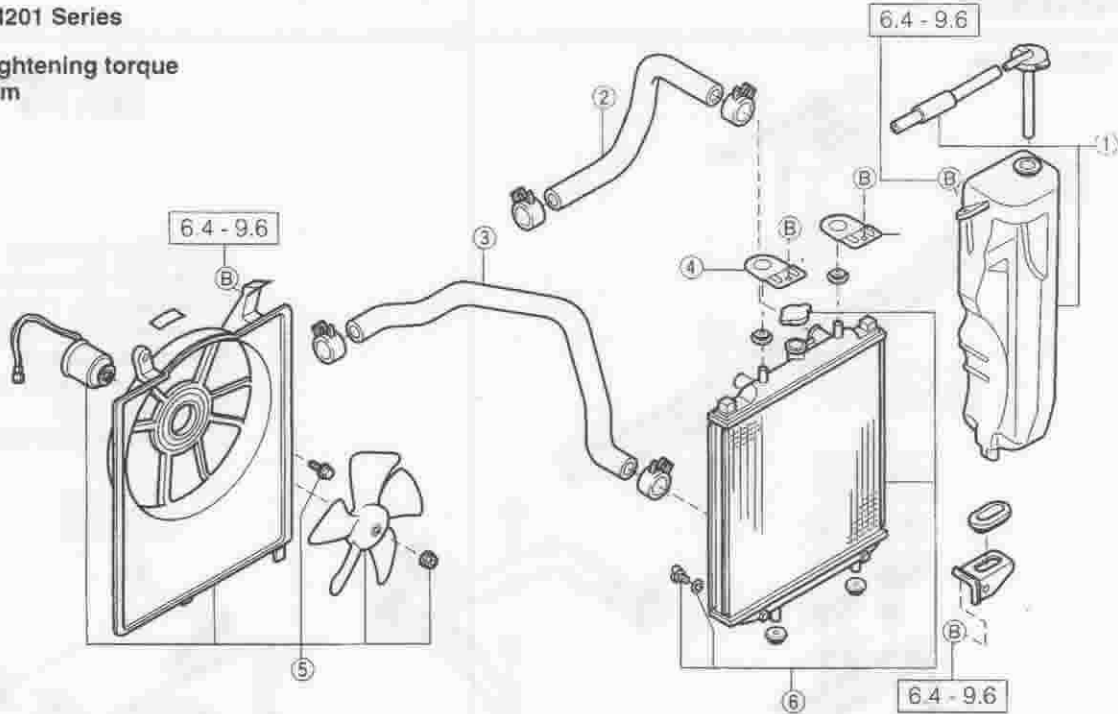


YCO00042-00034

RADIATOR COMPONENTS

M101 & M201 Series

□ : Tightening torque
Unit : N·m

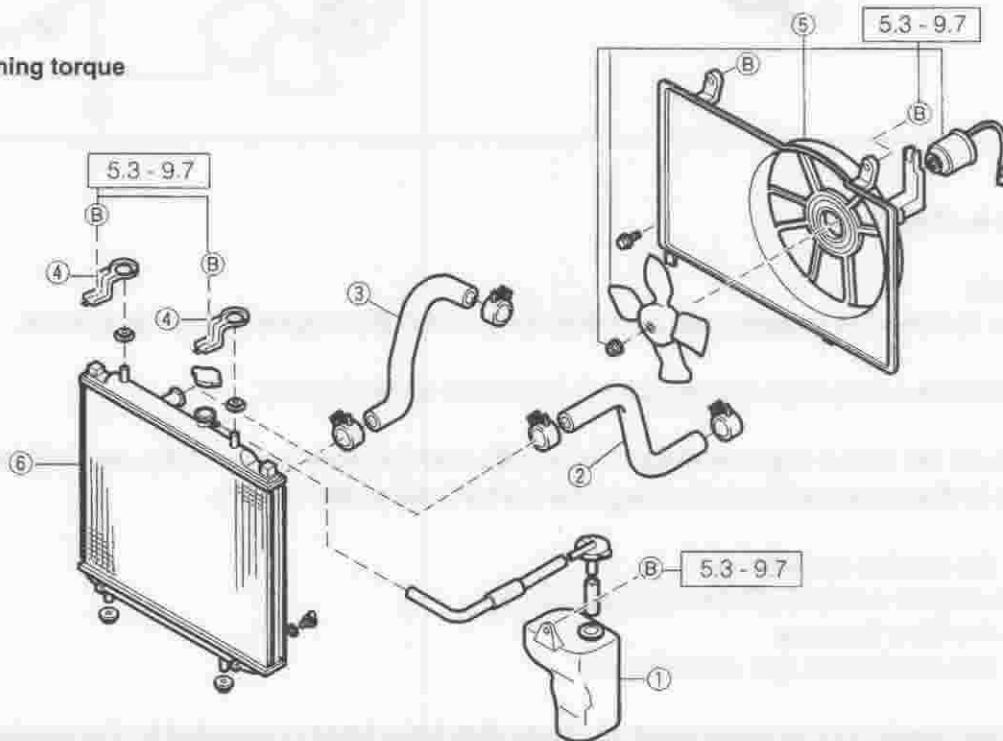


- ① Radiator reserve tank
- ② Radiator inlet hose
- ③ Radiator outlet hose
- ④ Radiator bracket
- ⑤ Fan motor assy
- ⑥ Radiator assy

YCD00043-00035

J102 Series

□ : Tightening torque
Unit : N·m

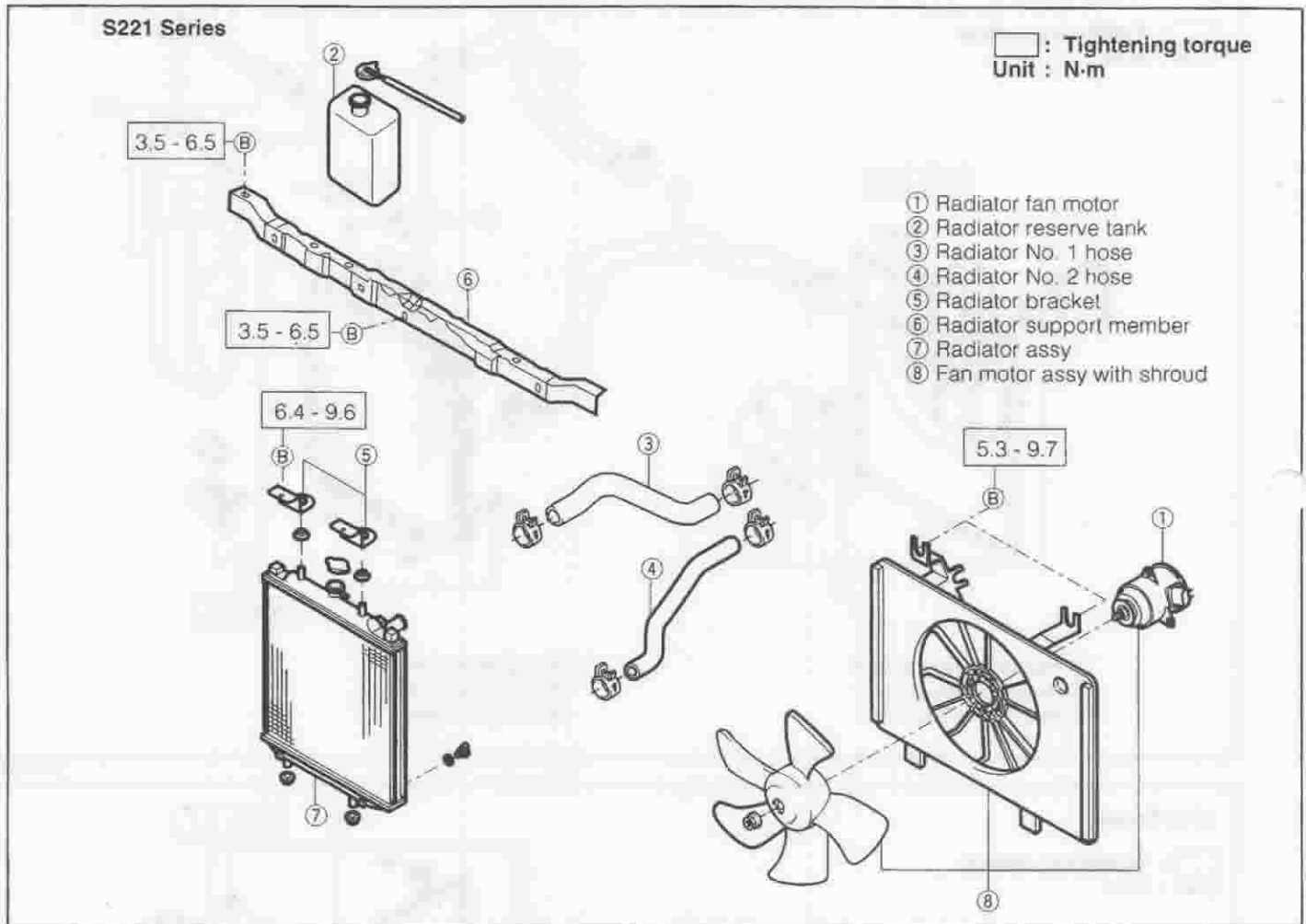


- ① Radiator reserve tank
- ② Radiator inlet hose
- ③ Radiator outlet hose
- ④ Radiator bracket
- ⑤ Fan motor assy
- ⑥ Radiator assy

YCD00000-00056

CO-11-1

RADIATOR COMPONENTS



YCC00046-00036

REMOVAL

M101, M201 & J102 Series

WARNING:

- Never remove the radiator cap and drain plug when the engine coolant is still hot.

1. Disconnect the cable from the negative (-) terminal of the battery.

NOTE:

- It should be noted that the diagnosis results and memory in the radio, etc. will be erased when the cable is disconnected from the negative (-) terminal of the battery.

2. Remove the engine undercover.
3. Drain the engine coolant. (Refer to page CO-3.)
4. Remove the front bumper.
5. Remove the condenser. (air conditioner.)

NOTE:

- Be very careful not to disconnect the pipes that have been connected to the condenser.

6. On automatic transmission vehicles, disconnect the oil cooler hose.
7. Disconnect the radiator inlet hose and radiator outlet hose at the radiator side.
8. Remove the radiator bracket and coupler of the fan motor.
9. Remove the fan motor assembly and radiator assembly as a set.

S221 Series

WARNING:

- Never remove the radiator cap and drain plug when the engine coolant is still hot.

1. Disconnect the cable from the negative (-) terminal of the battery.

NOTE:

- It should be noted that the memories of diagnosis results, radio, etc. will be erased at same time when the cable is disconnected from the negative (-) terminal of the battery.

2. Drain the coolant.
3. Remove the front grille and front bumper.
4. Remove the hood lock.
5. Disconnect the oil cooler hose. (A/T)
6. Disconnect the radiator hoses No. 1 and No. 2.
7. Remove the radiator bracket.
8. Remove the radiator support upper member.
9. Remove the radiator assembly.
10. Remove the fan motor assembly with shroud.

NOTE:

- When the radiator assembly is removed, be sure to lift the radiator assembly while pulling the condenser (for air conditioner) toward your side.
- Do not disconnect the pipes of the condenser (for air conditioner).

YCO00047-00000

INSTALLATION

M101, M201 & J102 Series

1. Install the fan motor assembly and radiator assembly as a set.
2. Install the radiator bracket.
3. Install the coupler of the fan motor.
4. Connect the radiator inlet hose and radiator outlet hose to the radiator.
5. On automatic transmission vehicles, connect the automatic transmission oil cooler hose to the radiator. (Refer to the A/T section.)
6. Install the condenser. (air conditioner.)
7. Fill engine coolant. (Refer to page CO-3.)
8. Install the front bumper.
9. Install the engine undercover.
10. Connect the cable to the negative (-) terminal of the battery.
11. Check the radiator for leakage.

YCO00049-00000

SPECIFICATIONS

Coolant capacity (ℓ) (w/heater, W/O reserve tank)	M/T	M101, M201	3.80
		J102	5.80
		S221	6.50
	A/T	M101, M201	3.80
		J102	5.72
		S221	6.70
Reserve tank capacity (ℓ)	FULL	M101, M201	0.45
		J102	0.95
		S221	0.70
	LOW	M101, M201	0.25
		J102	0.18
		S221	0.20
Thermostat	Valve opening temperature	M101, M201, J102	80.0 ± 2.0°C
		S221	88.0 ± 1.5°C
	Valve lift	M101, M201, J102	8.5 mm or more at 93°C
		S221	8.0 mm or more at 100°C
Radiator cap	Relief valve opening pressure	108 ± 15 kPa (1.1 ± 0.15 kg/cm ²)	

YC000064-00000

TIGHTENING TORQUE

Components		N-m	kgf-m	Remarks
Water pump × Cylinder block		7.2 - 10.8	0.72 - 1.08	
Water pump × Water pump pulley		8.1 - 15.0	0.81 - 1.50	
Water inlet × Cylinder head		7.2 - 10.8	0.72 - 1.08	M101, M201, J102
Water inlet pipe × Cylinder block		6.3 - 11.7	0.63 - 1.17	S221 only
Water outlet housing × Water outlet		11.2 - 16.8	1.12 - 1.68	S221 only
Fan motor × Fan shroud	80 W	1.8 - 3.3	0.18 - 0.33	
	120 W	2.7 - 5.0	0.27 - 0.50	
Fan motor × Fan		4.9 - 7.4	0.49 - 0.74	
Fan shroud × Radiator		6.4 - 9.6	0.64 - 0.96	M101, M201
Fan shroud × Radiator		5.3 - 9.7	0.53 - 0.97	S221, J102
Coolant reserve tank × Fan shroud		6.4 - 9.6	0.64 - 0.96	
Radiator bracket × Support upper member		6.4 - 9.6	0.64 - 0.96	S221 only

YC000065-00000