

SECTION

CO

ENGINE COOLING SYSTEM

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# PRECAUTIONS

## PRECAUTIONS

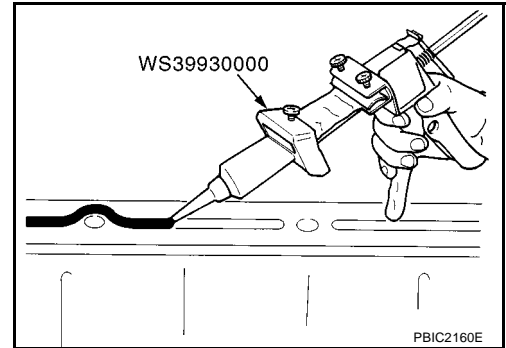
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### Precautions For Liquid Gasket

EBS01E6J

#### LIQUID GASKET APPLICATION PROCEDURE

1. Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface.
  - Remove liquid gasket completely from the liquid gasket application surface, mounting bolts, and bolt holes.
2. Wipe the liquid gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
3. Attach liquid gasket tube to the tube presser [SST].  
**Use Genuine Liquid Gasket or equivalent.**
  - Within five minutes of liquid gasket application, install the mating component.
  - If liquid gasket protrudes, wipe it off immediately.
  - Do not retighten mounting bolts or nuts after the installation.
  - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



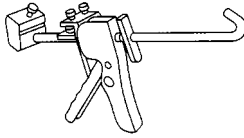
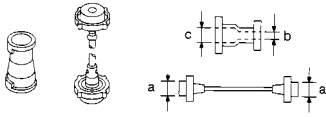
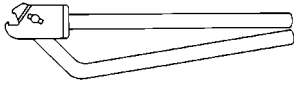
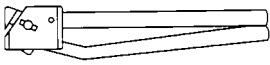
# PREPARATION

## PREPARATION

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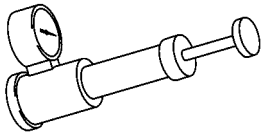
### Special Service Tools

EBS01E6K

Tool number Tool name	Description	
WS39930000 Tube presser	Pressing the tube of liquid gasket	CO
 S-NT052		C
EG17650301 Radiator cap tester adapter	Adapting radiator cap tester to radiator cap and radiator filler neck <b>a: 28 (1.10) dia.</b> <b>b: 31.4 (1.236) dia.</b> <b>c: 41.3 (1.626) dia.</b> Unit: mm (in)	E
 S-NT564		F
KV99103510 Radiator plate pliers A	Installing radiator upper and lower tanks	G
 S-NT224		H
KV99103520 Radiator plate pliers B	Removing radiator upper and lower tanks	I
 S-NT225		J
		K

### Commercial Service Tools

EBS01E6L

Tool name	Description	
Radiator cap tester	Checking radiator and reservoir tank cap	L
 PBIC1982E		M

# OVERHEATING CAUSE ANALYSIS

## OVERHEATING CAUSE ANALYSIS

PFP:00012

### Troubleshooting Chart

EBS01E6M

	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	—	
		Damaged fins	Dust contamination or paper clogging	
			Physical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Cooling fan does not operate	Refer to <a href="#">EC-132, "DTC P0217 ENGINE OVER TEMPERATURE"</a>	—
		High resistance to fan rotation	Fan assembly	
		Damaged fan blades		
	Damaged radiator shroud	—	—	—
	Improper engine coolant mixture ratio	—	—	—
	Poor engine coolant quality	—	Engine coolant density	—
	Insufficient engine coolant	Engine coolant leaks	Cooling hose	Loose clamp
				Cracked hose
			Water pump	Poor sealing
			Radiator cap	Loose
				Poor sealing
			Radiator	O-ring for damage, deterioration or improper fitting
Cracked radiator tank				
Cracked radiator core				
Reservoir tank		Cracked reservoir tank		
Overflowing reservoir tank		Exhaust gas leaks into cooling system	Cylinder head deterioration	
	Cylinder head gasket deterioration			

OVERHEATING CAUSE ANALYSIS

	Symptom		Check items	
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load
				Driving in low gear for extended time
				Driving at extremely high speed
			Powertrain system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing	
	Blocked or restricted air flow	Blocked bumper	—	—
		Blocked radiator grille	Installed car brassiere	
			Mud contamination or paper clogging	
		Blocked radiator	—	
		Blocked condenser	Blocked air flow	
		Installed large fog lamp		

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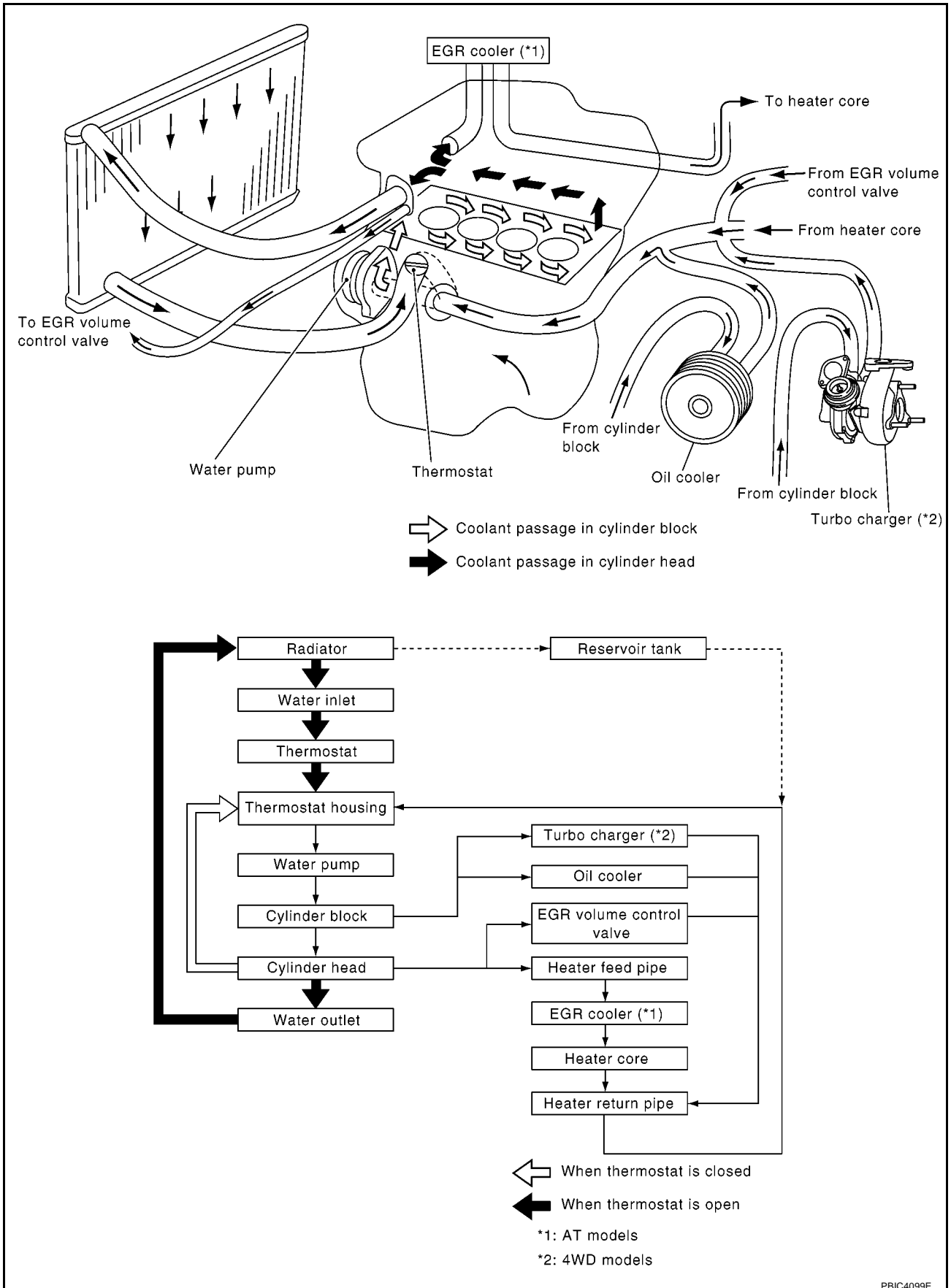
# COOLING SYSTEM

## COOLING SYSTEM

PFP:21020

### Cooling Circuit

EBS01E6N



PBIC4099E

# ENGINE COOLANT

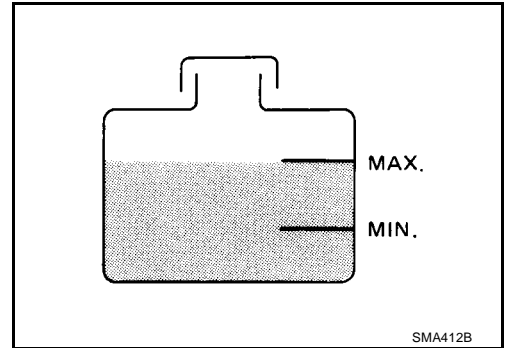
## ENGINE COOLANT

PFP:KQ100

### Inspection LEVEL CHECK

EBS01E6P

- Check if the reservoir tank engine coolant level within MIN to MAX when engine is cool.
- Adjust engine coolant level as necessary.



### CHECKING RADIATOR SYSTEM FOR LEAKS

- To check for leaks of cooling system, apply pressure to the reservoir tank (1) with the radiator cap tester (commercial service tool) (A) and the radiator cap tester adapter (B) [SST: EG17650301].

Testing pressure:

157 kPa (1.57 bar, 1.6 kg/cm<sup>2</sup> , 23 psi)

#### **WARNING:**

Do not remove reservoir tank cap and/or radiator cap when engine is hot. Serious burns could occur from high pressure engine coolant escaping from reservoir tank and/or radiator.

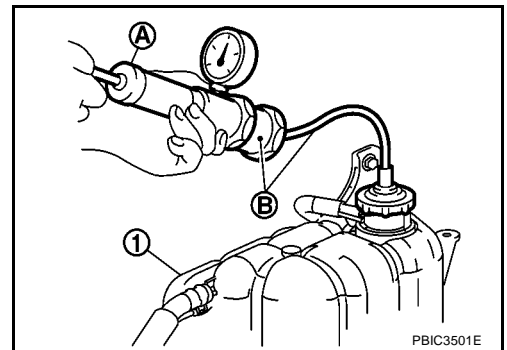
#### **CAUTION:**

Higher test pressure than specified may cause cooling system damage.

#### **NOTE:**

In a case that engine coolant decreases, replenish radiator and reservoir tank with engine coolant.

- If anything is found, repair or replace damaged parts.



### Changing Engine Coolant

EBS01E6Q

#### **WARNING:**

- To avoid being scalded, do not change engine coolant when engine is hot.
- Wrap a thick cloth around cap and carefully remove cap. First, turn cap a quarter of a turn to release built-up pressure. Then turn cap all the way.
- Be careful not to allow engine coolant to contact drive belts.

# ENGINE COOLANT

## DRAINING ENGINE COOLANT

1. Open radiator drain plug (1) at the bottom of radiator, and remove radiator cap.

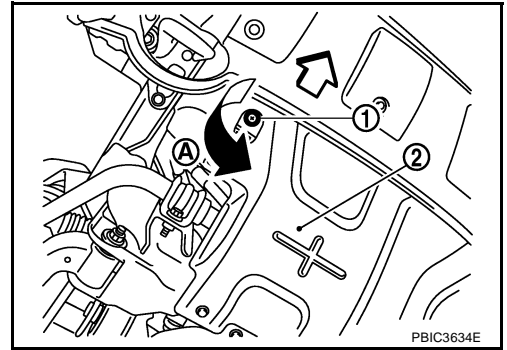
2 : Engine under cover (front)

A : Loosen.

⇨: Vehicle front

### CAUTION:

Be careful not to allow engine coolant to contact drive belts.



When draining all engine coolant in the system, also perform the following steps.

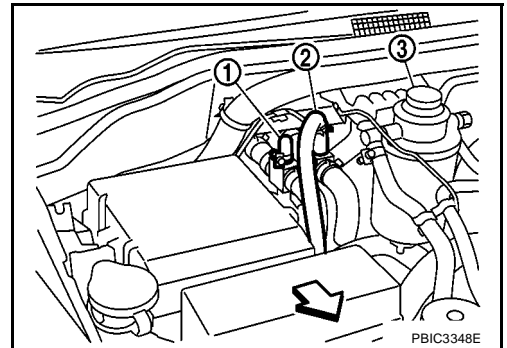
2. Remove air relief plug (1) on heater feed tube.

#### ● LHD models

2 : Water hose (from reservoir tank)

3 : Fuel filter

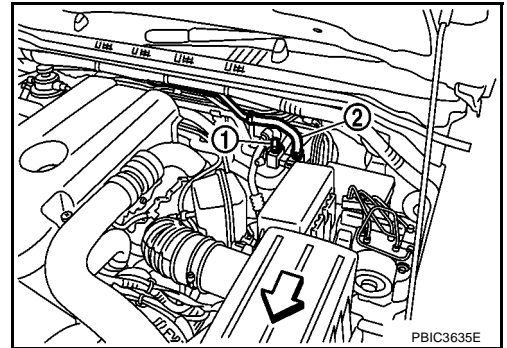
⇨: Vehicle front



#### ● RHD models

2 : Water hose (from reservoir tank)

⇨: Vehicle front



3. Open cylinder block drain plug. Refer to [EM-110, "CYLINDER BLOCK"](#).
4. Remove reservoir tank, drain engine coolant, then clean reservoir tank.
5. Check drained engine coolant for contaminants such as rust, corrosion or discoloration. If contaminated, flush engine cooling system. Refer to [CO-9, "FLUSHING COOLING SYSTEM"](#).

## REFILLING ENGINE COOLANT

1. Install reservoir tank, and radiator drain plug.

### CAUTION:

Be sure to clean radiator drain plug and install with new O-ring.

Radiator drain plug:

: 1.2 N·m (0.12 kg-m, 11 in-lb)

- If water drain plugs on cylinder block are removed, close and tighten them. Refer to [EM-110, "CYLINDER BLOCK"](#).
2. Make sure that each hose clamp has been firmly tightened.



# ENGINE COOLANT

3. Fill radiator and reservoir tank to the specified level.

- Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (1-3/4 Imp qt) a minute to allow air in system to escape.
- Use Genuine Nissan Anti-freeze Coolant (L250) or equivalent in its quality. Refer to [MA-14, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).

Engine coolant capacity  
(with reservoir tank at "MAX" level)

LHD models

: Approx. 9.9 ℓ (8-3/4 Imp qt)

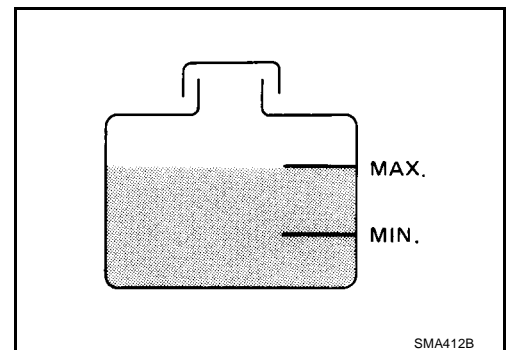
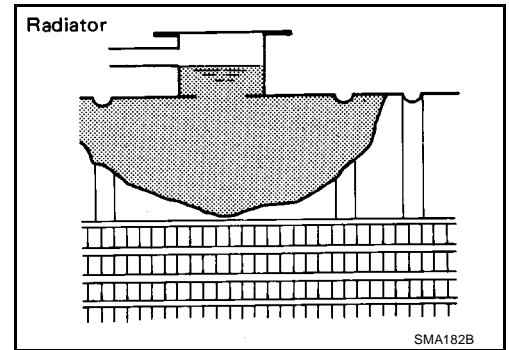
RHD models

: Approx. 10.2 ℓ (9 Imp qt)

Reservoir tank capacity (at "MAX" level)

: 0.8 ℓ (3/4 Imp qt)

- When engine coolant overflows air relief hole, install air relief plug.



4. Warm up engine to normal operating temperature without radiator cap and reservoir tank cap installed.

- If engine coolant overflows radiator filler hole and reservoir tank filler hole, install radiator cap and reservoir tank cap.

5. Run engine at 3,000 rpm for 10 seconds and return to idle speed with radiator cap installed.

- Repeat two or three times.

## CAUTION:

Watch engine coolant temperature gauge so as not to overheat the engine.

6. Stop engine and cool down to less than approximately 50°C (122°F).

- Cool down using a fan to reduce the time.
- If necessary, refill radiator up to filler neck with engine coolant.

7. Refill reservoir tank to MAX level line with engine coolant.

8. Repeat steps 3 through 6 two or more times with radiator cap installed until engine coolant level no longer drops.

9. Check cooling system for leaks with engine running.

10. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between COOL and WARM.

- Sound may be noticeable at heater unit.

11. Repeat step 10 three times.

12. If sound is heard, bleed air from cooling system by repeating steps 3 through 6 until engine coolant level no longer drops.

## FLUSHING COOLING SYSTEM

1. Fill radiator with water until water spills from the air relief hole, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap and reservoir tank cap.

2. Run engine and warm it up to normal operating temperature.

3. Rev engine two or three times under no-load.

4. Stop engine and wait until it cools down.

5. Drain water from the system. Refer to [CO-8, "DRAINING ENGINE COOLANT"](#).

## ENGINE COOLANT

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6. Repeat steps 1 through 5 until clear water begins to drain from radiator.

# RADIATOR

## RADIATOR

PFP:21400

## Components

EBS01F6F

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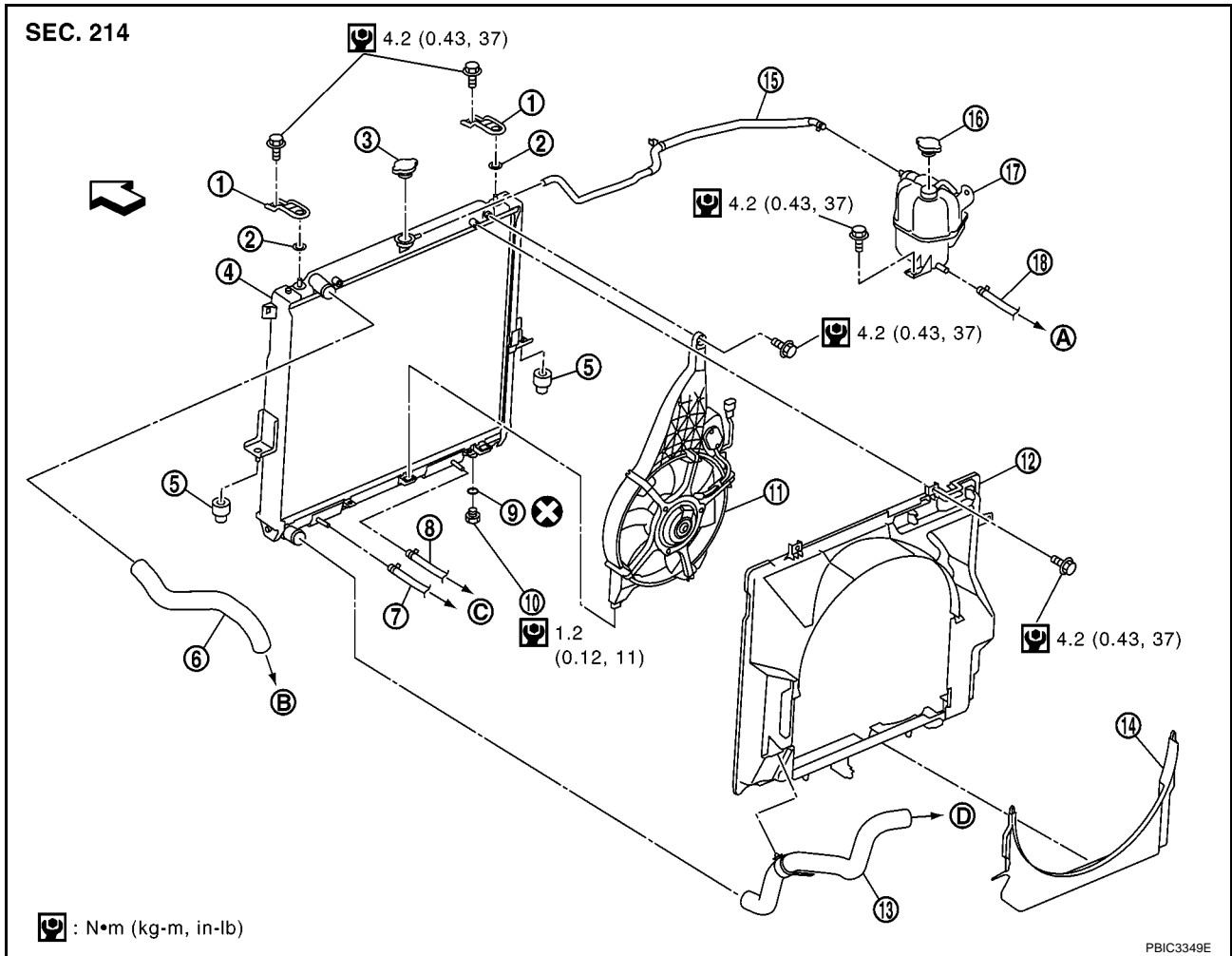
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- |                              |  |                             |
|------------------------------|--|-----------------------------|
| 1. Radiator mounting bracket | 2. Mounting rubber (upper)                 | 3. Radiator cap             |
| 4. Radiator                  | 5. Mounting rubber (lower)                 | 6. Radiator hose (upper)    |
| 7. A/T fluid cooler hose     | 8. A/T fluid cooler hose                   | 9. O-ring                   |
| 10. Drain plug               | 11. Cooling fan assembly (models with A/C) | 12. Radiator shroud (upper) |
| 13. Radiator hose (lower)    | 14. Radiator shroud (lower)                | 15. Reservoir tank hose     |
| 16. Reservoir tank cap       | 17. Reservoir tank                         | 18. Water hose              |
| A. To heater return tube     | B. To water outlet                         | C. To A/T fluid cooler tube |
| D. To water inlet            | ↶ Vehicle front                            |                             |

- Refer to [GI-10, "Components"](#) for symbol marks except in the above.

## Removal and Installation

EBS01E6R

### WARNING:

Do not remove radiator cap and/or reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator and/or reservoir tank.

### REMOVAL

- Drain engine coolant from radiator. Refer to [CO-8, "DRAINING ENGINE COOLANT"](#).

### CAUTION:

- Perform this step when engine is cold.
  - Do not spill engine coolant on drive belts.
- Remove battery. Refer to [SC-5, "BATTERY"](#).

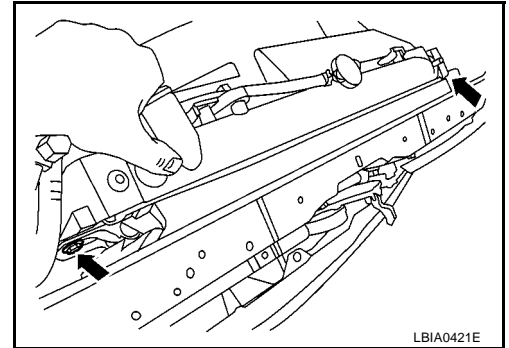
# RADIATOR

3. Remove engine cover. Refer to [EM-20, "INTAKE MANIFOLD"](#) .
4. Remove air inlet hoses between engine to charge air cooler. Refer to [EM-18, "CHARGE AIR COOLER"](#) .
5. Disconnect radiator hose (upper and lower) and reservoir tank hose.

**CAUTION:**

**Be careful not to allow engine coolant to contact drive belts.**

6. Remove reservoir tank.
7. Remove cooling fans (crankshaft driven type and motor driven type) and radiator shrouds (upper and lower). Refer to [CO-19, "COOLING FAN"](#) .
8. Disconnect A/T fluid cooler hoses. (A/T models)
  - Install blind plug to avoid leakage of A/T fluid.
9. Remove radiator mounting brackets.
10. Remove the two A/C condenser bolts. (models with A/C)



11. Remove radiator.  
**Remove radiator as follows (models with A/C):**

**CAUTION:**

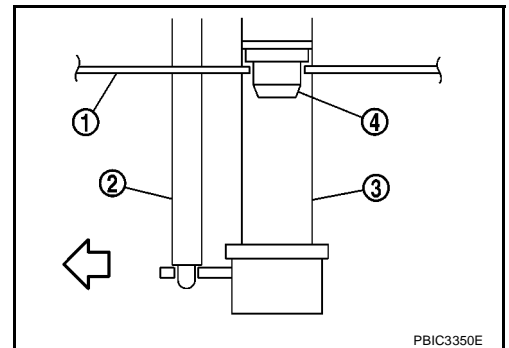
**Do not damage or scratch A/C condenser and radiator core when removing.**

- a. With lifting and pulling radiator (3) in a rear direction, remove radiator lower mount (4) from radiator core support (1).

↖: Vehicle front

**CAUTION:**

**Because A/C condenser (2) is onto the front-lower portion of radiator (3), moving to rear direction should be at minimum.**

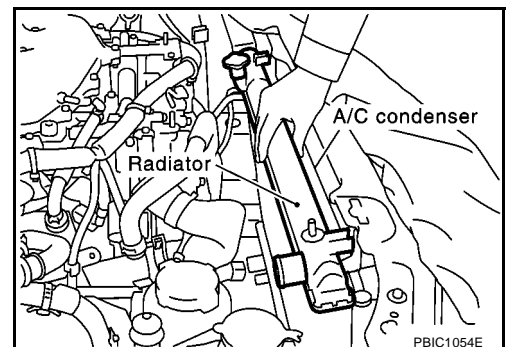


- b. Lift A/C condenser up and remove radiator.

**CAUTION:**

**Lifting A/C condenser should be minimum to prevent a load to A/C piping.**

- c. After removing radiator, temporarily secure it with rope or similar means to prevent a load to A/C piping.

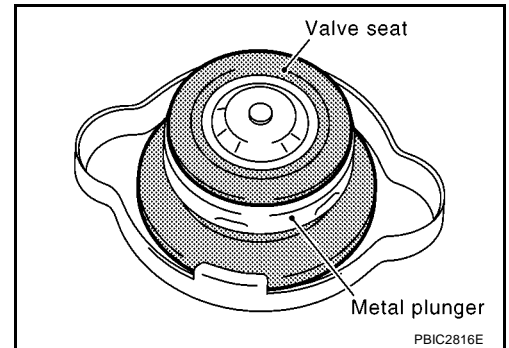


# RADIATOR

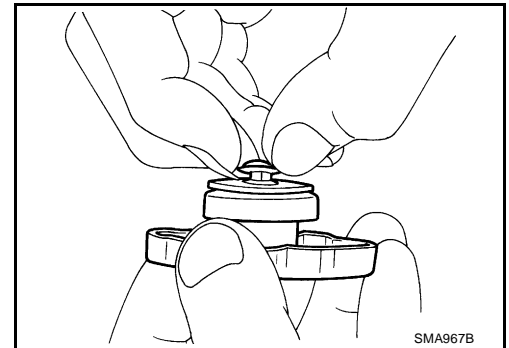
## INSPECTION AFTER REMOVAL

### Checking Reservoir Tank Cap

- Inspect valve seat of reservoir tank cap.
  - Check if valve seat is swollen to the extent that the edge of the plunger cannot be seen when watching it vertically from the top.
  - Check if valve seat has no soil and damage.



- Pull negative-pressure valve to open it, and make sure that it is completely closed when released.
  - Make sure that there is no dirt or damage on the valve seat of radiator cap negative-pressure valve.
  - Make sure that there are no unusualness in the opening and closing conditions of negative-pressure valve.

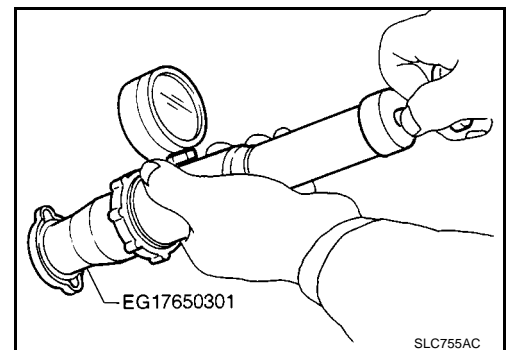


- Check reservoir tank cap relief pressure.

**Standard : 98.2 - 117.8 kPa (0.98 - 1.18 bar, 1.0 - 1.2 kg/cm<sup>2</sup> , 14 - 17 psi)**

**Limit : 59 kPa (0.59 bar, 0.6 kg/cm<sup>2</sup> , 9 psi)**

- When connecting reservoir tank cap to the radiator cap tester adapter [SST] and the radiator cap tester (Commercial service tool), apply engine coolant to the cap seal surface.



- Replace reservoir tank cap if there is an unusualness in negative pressure valve, or if the relief pressure falls below the limit.

### CAUTION:

**When installing a radiator cap and reservoir tank cap, thoroughly wipe out the radiator and reservoir tank filler neck to remove any waxy residue or foreign material.**

### Checking Radiator

Check radiator for mud or clogging. If necessary, clean radiator as follows.

- Be careful not to bend or damage the radiator fins.
  - When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape the harness and connectors to prevent water from entering.
1. Apply water by hose to the back side of the radiator core vertically downwards.
  2. Apply water again to all radiator core surface once per minute.
  3. Stop washing if any stains no longer flow out from the radiator.
  4. Blow air into the back side of radiator core vertically downwards.
    - Use compressed air lower than 490 kPa (4.9 bar, 5 kg/cm<sup>2</sup> , 71 psi) and keep distance more than 30 cm (11.8 in).
  5. Blow air again into all the radiator core surface once per minute until no water sprays out.

# RADIATOR

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## INSTALLATION

Installation is the reverse order of removal.

## INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using the radiator cap tester adapter [SST: EG17650301] and the radiator cap tester (commercial service tool). Refer to [CO-7, "CHECKING RADIATOR SYSTEM FOR LEAKS"](#).
- Start and warm up engine. Visually check if there is no leaks of engine coolant.

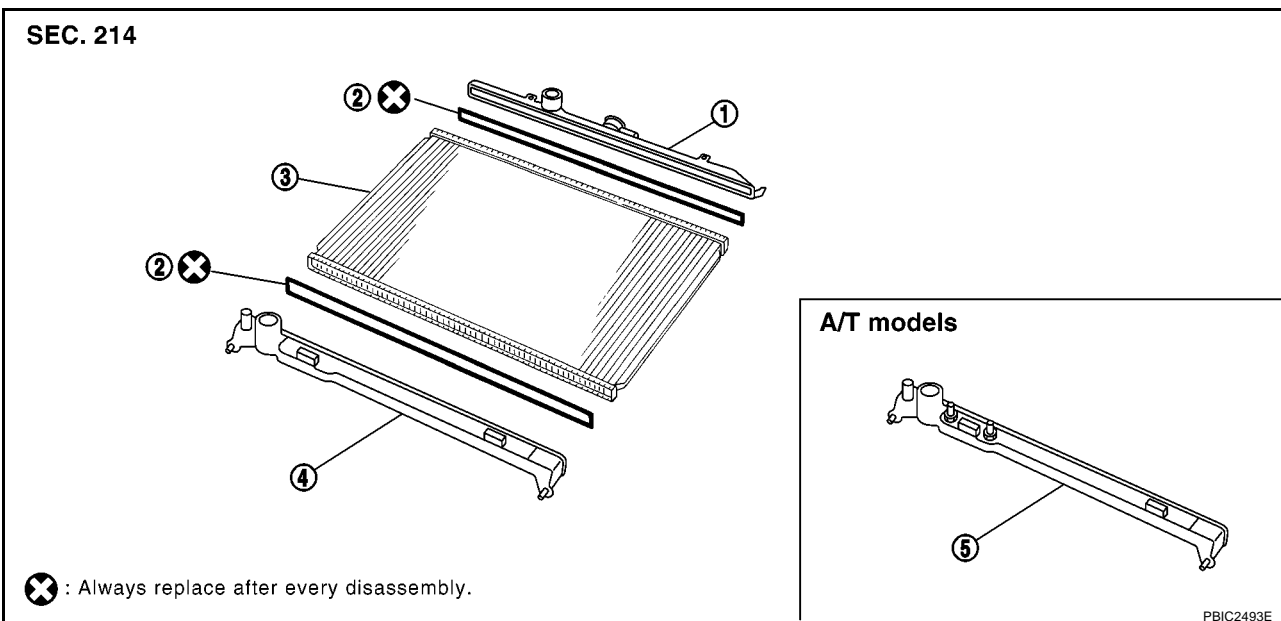
# RADIATOR (ALUMINUM TYPE)

## RADIATOR (ALUMINUM TYPE)

PFP:21460

### Components

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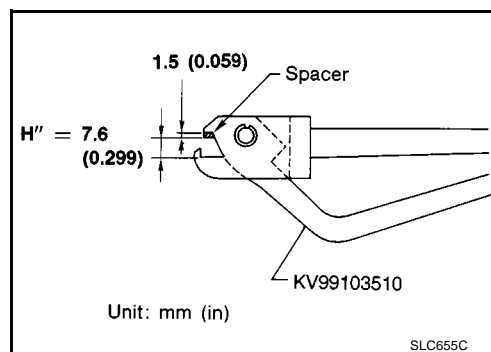


- |               |                                       |         |
|---------------|---------------------------------------|---------|
| 1. Upper tank | 2. Sealing rubber                     | 3. Core |
| 4. Lower tank | 5. Lower tank (with A/T fluid cooler) |         |

### Disassembly and Assembly PREPARATION

EBS01E6V

1. Attach the spacer to the tip of the radiator plate pliers A [SST].  
Spacer specification: 18 mm (0.71 in) wide x 8.5 mm (0.335 in) long x 1.5 mm (0.059 in) thick.
2. Make sure that when radiator plate pliers A [SST] are closed dimension H'' is approx. 7.6 mm (0.299 in).
3. Adjust dimension H'' with the spacer, if necessary.



### DISASSEMBLY

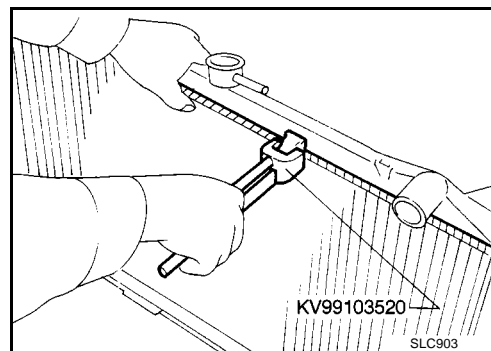
1. Remove upper and lower tanks with radiator plate pliers B [SST].

#### CAUTION:

Do not disassemble lower tank and A/T fluid cooler. (A/T models)

#### NOTE:

Regard lower tank and A/T fluid cooler as an assembly.

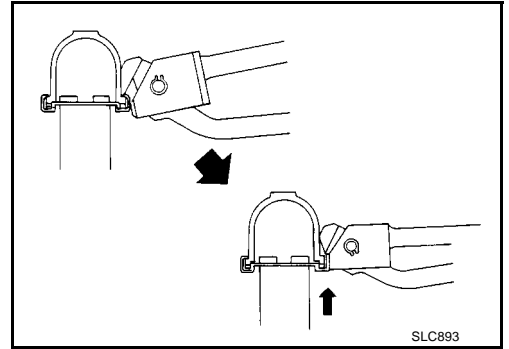


## RADIATOR (ALUMINUM TYPE)

- Grip the crimped edge and bend it upwards so that radiator plate pliers B slips off.

**CAUTION:**

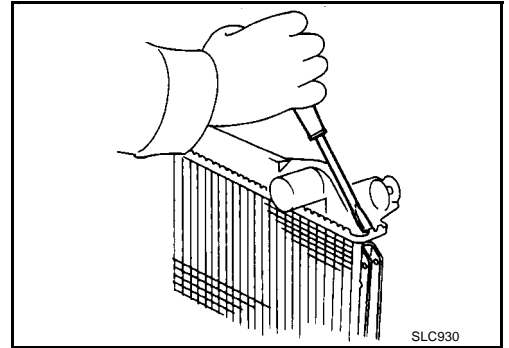
**Do not bend excessively.**



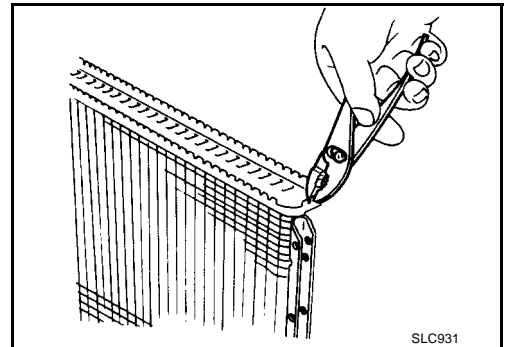
- In areas where radiator plate pliers B cannot be used, use a screwdriver to bend the edge up.

**CAUTION:**

**Be careful not to damage tank.**

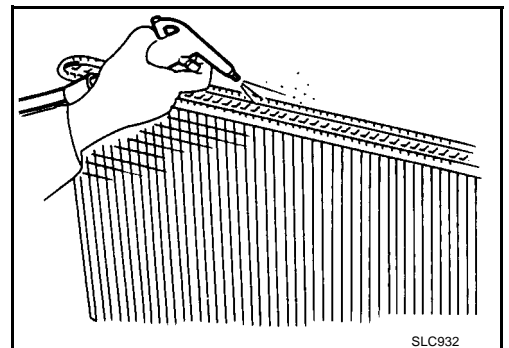


2. Remove sealing rubber.
3. Make sure the edge stands straight up.



### ASSEMBLY

1. Clean contact portion of tank.



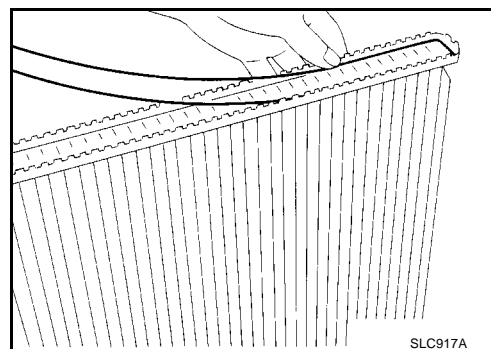


## RADIATOR (ALUMINUM TYPE)

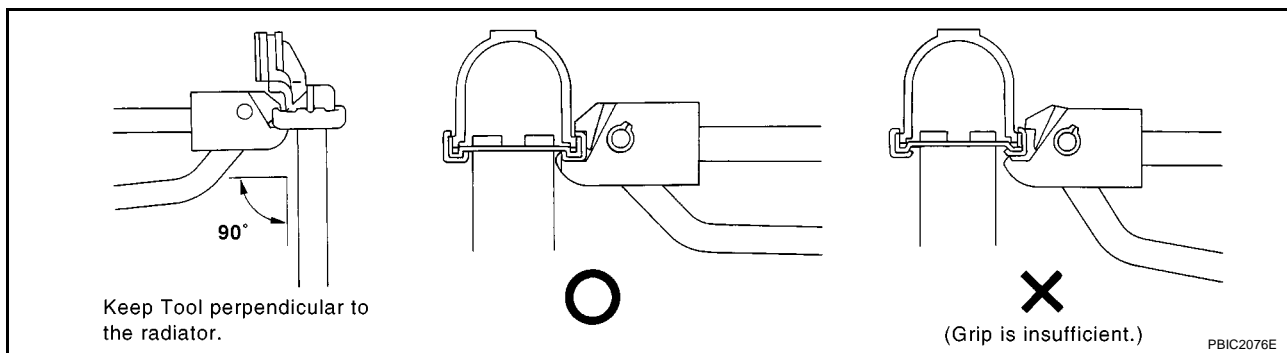
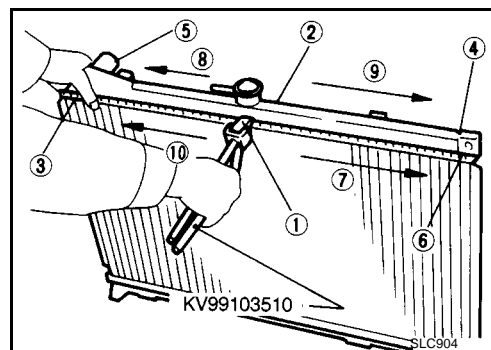
2. Install sealing rubber while pushing it with fingers.

**CAUTION:**

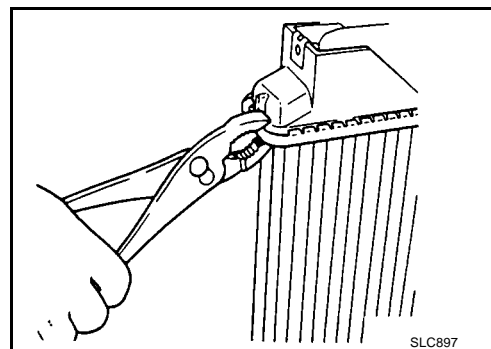
Be careful not to twist sealing rubber.



3. Caulk tank in numerical order as shown in the figure with radiator plate pliers A [SST].

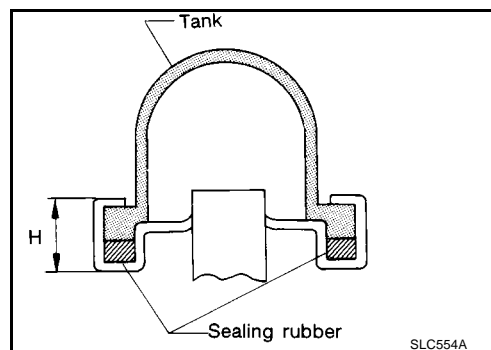


- Use pliers in the locations where radiator plate pliers A cannot be used.



4. Make sure that the rim is completely crimped down.

Standard height "H": 8.0 - 8.4 mm (0.315 - 0.331 in)



## RADIATOR (ALUMINUM TYPE)

5. Make sure that there is no leakage.  
Refer to **CO-18. "INSPECTION"**.

### INSPECTION

1. Apply pressure with the radiator cap tester adapter [SST] and the radiator cap tester (commercial service tool).

**Testing pressure**

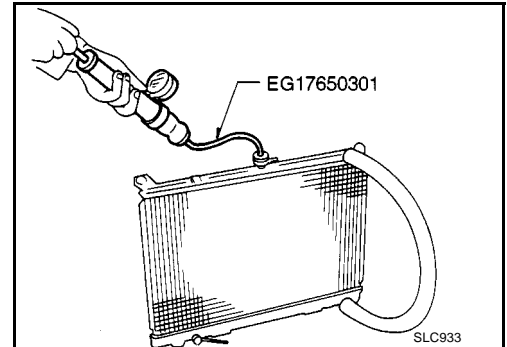
**: 157 kPa (1.57 bar, 1.6 kg/cm<sup>2</sup> , 23 psi)**

**WARNING:**

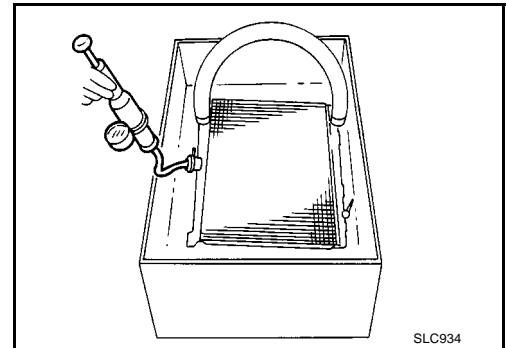
To prevent the risk of hose coming undone while under pressure, securely fasten it down with hose clamp.

**CAUTION:**

Attach hose to A/T fluid cooler to seal its inlet and outlet. (A/T models)



2. Check for leakage by soaking radiator in water container with the testing pressure applied.



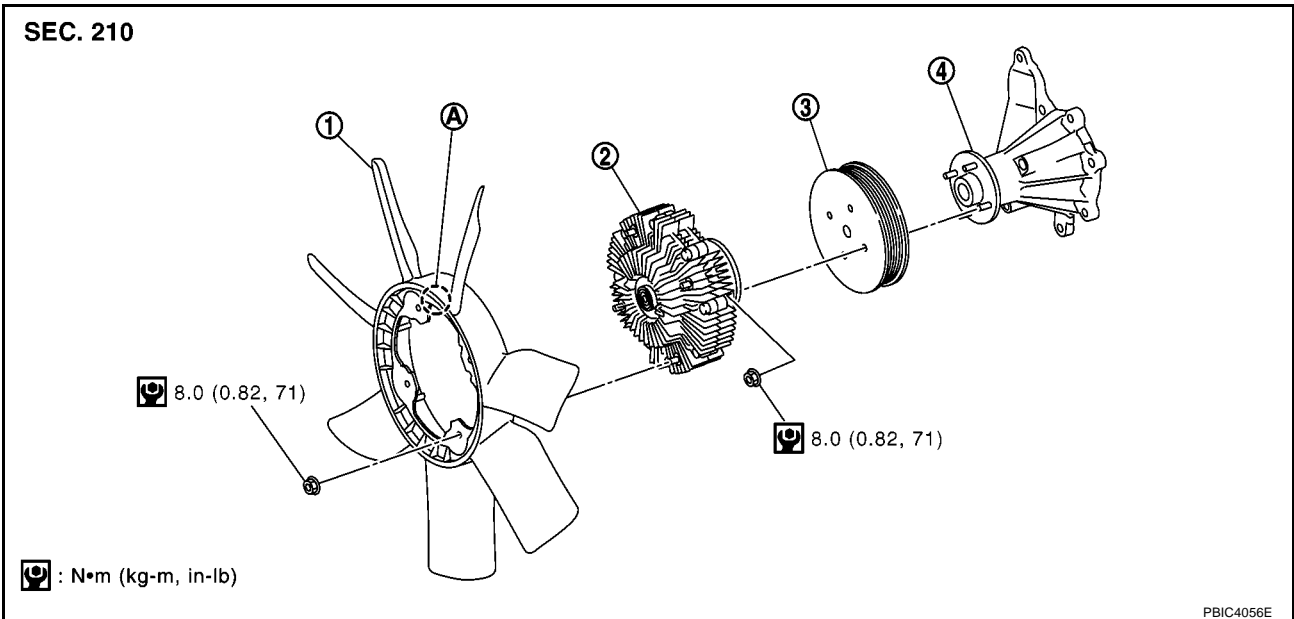
# COOLING FAN

## COOLING FAN

PFP:21140

### Components (Crankshaft Driven Type)

EBS01F6G



1. Cooling fan
2. Fan coupling
3. Water pump pulley
4. Water pump
- A. Front mark "AISIN"

## Removal and Installation

EBS01E7G

### REMOVAL

1. Remove engine cover. Refer to [EM-20, "INTAKE MANIFOLD"](#).
2. Remove drive belts. Refer to [EM-12, "DRIVE BELTS"](#).
3. Loosen and remove radiator shroud (upper) mounting bolts. Refer to [CO-11, "RADIATOR"](#).
4. Move radiator shroud (upper) toward engine, and remove cooling fan (crankshaft driven type).

#### CAUTION:

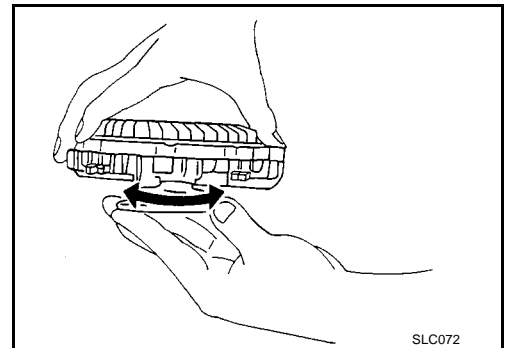
Be careful not to damage or scratch on radiator core.

5. Remove fan coupling and water pump pulley.

### INSPECTION AFTER REMOVAL

#### Fan Coupling

Check fan coupling for rough operation, wobbling, oil leakage or bent bimetal.



### INSTALLATION

Installation is the reverse order of removal.

- Install cooling fan with its front mark "AISIN" facing front of engine.

## Removal and Installation (Motor Driven Type) (Models with A/C)

EBS01E6U

### REMOVAL

1. Remove engine cover. Refer to [EM-20, "INTAKE MANIFOLD"](#).

## COOLING FAN

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2. Disconnect harness connector from fan motor, and move it to aside.
3. Loosen and remove radiator shroud (upper) mounting bolts. Refer to [CO-11, "RADIATOR"](#) .
4. Move radiator shroud (upper) toward engine, and remove cooling fan (motor driven type). Refer to [CO-11, "RADIATOR"](#) .

**CAUTION:**

**Be careful not to damage or scratch on radiator core.**

### INSTALLATION

Installation is the reverse order of removal.

- Cooling fan (motor driven type) is controlled by ECM. For details, refer to [EC-132, "DTC P0217 ENGINE OVER TEMPERATURE"](#) .

## WATER PUMP

PFP:21020

### Components

EBS01F6K

A

CO

C

D

E

F

G

H

I

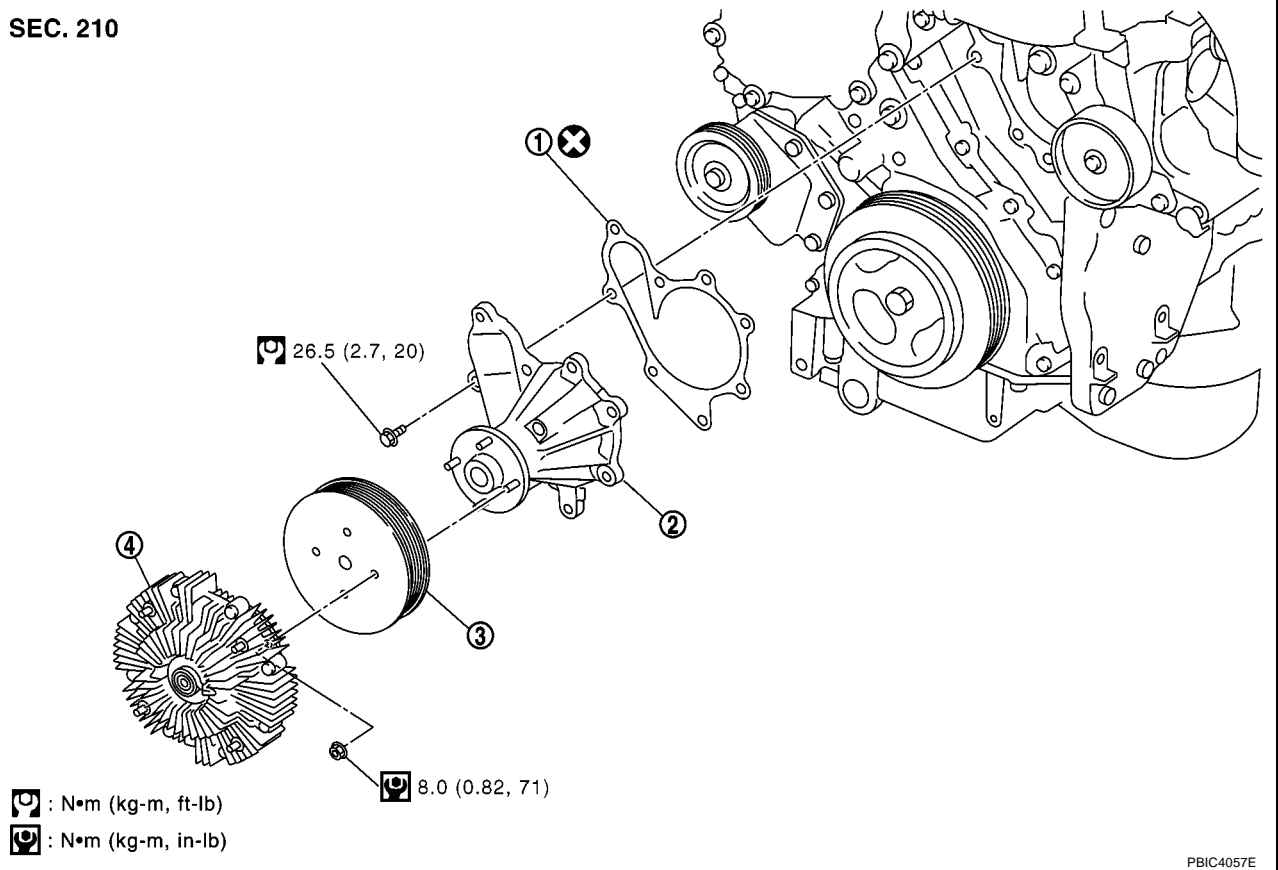
J

K

L

M

SEC. 210



PBIC4057E

1. Gasket
2. Water pump
3. Water pump pulley
4. Fan coupling

- Refer to [GI-10, "Components"](#) for symbol marks in the figure.

### Removal and Installation

EBS01E6W

#### WARNING:

Do not remove radiator cap and/or reservoir tank cap when the engine is hot. Serious burns could occur from high pressure engine coolant escaping from the radiator and/or the reservoir tank.

#### CAUTION:

- When removing water pump assembly, be careful not to get engine coolant on drive belts.
- Water pump cannot be disassembled and should be replaced as a unit.
- After installing water pump, connect hose and clamp securely, then check for leaks using radiator cap tester (commercial service tool) and radiator cap tester adapter [SST: EG17650301].

#### REMOVAL

1. Remove front engine undercover. Refer to [EI-15, "FRONT BUMPER"](#).
2. Drain engine coolant. Refer to [CO-8, "DRAINING ENGINE COOLANT"](#).

#### CAUTION:

- Perform this step when engine is cold.
- Do not spill engine coolant on drive belts.

3. Remove engine cover. Refer to [EM-20, "INTAKE MANIFOLD"](#).
4. Remove drive belts. Refer to [EM-12, "DRIVE BELTS"](#).
5. Remove water pump pulley. Refer to [CO-19, "Removal and Installation"](#).
  - Loosen the pulley bolts after fixing the pulley using a screwdriver etc.
6. Remove water pump.

# WATER PUMP

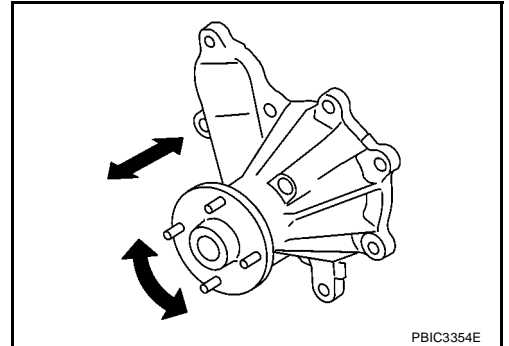
- Engine coolant will leak from cylinder block, so have a receptacle ready below.

## **CAUTION:**

- Handle the water pump vane so that it does not contact any other parts.
- Water pump cannot be disassembled and should be replaced as a unit.

## **INSPECTION AFTER REMOVAL**

- Visually check if there is no significant dirt or rusting on the water pump body and vane.
- Make sure that there is no looseness in the vane shaft, and that it turns smoothly when rotated by hand.
- If there are any unusualness, replace water pump assembly as necessary.



## **INSTALLATION**

- Install in the reverse order of removal.
- Install cooling fan (crankshaft driven type) with the front mark "AISIN" facing the front of engine. Refer to [CO-19, "Removal and Installation"](#).

## **INSPECTION AFTER INSTALLATION**

- Check for leaks of engine coolant using the radiator cap tester adapter [SST: EG17650301] and the radiator cap tester (commercial service tool). Refer to [CO-7, "CHECKING RADIATOR SYSTEM FOR LEAKS"](#).
- Start and warm up engine. Visually check if there is no leaks of engine coolant.

# THERMOSTAT AND WATER PIPING

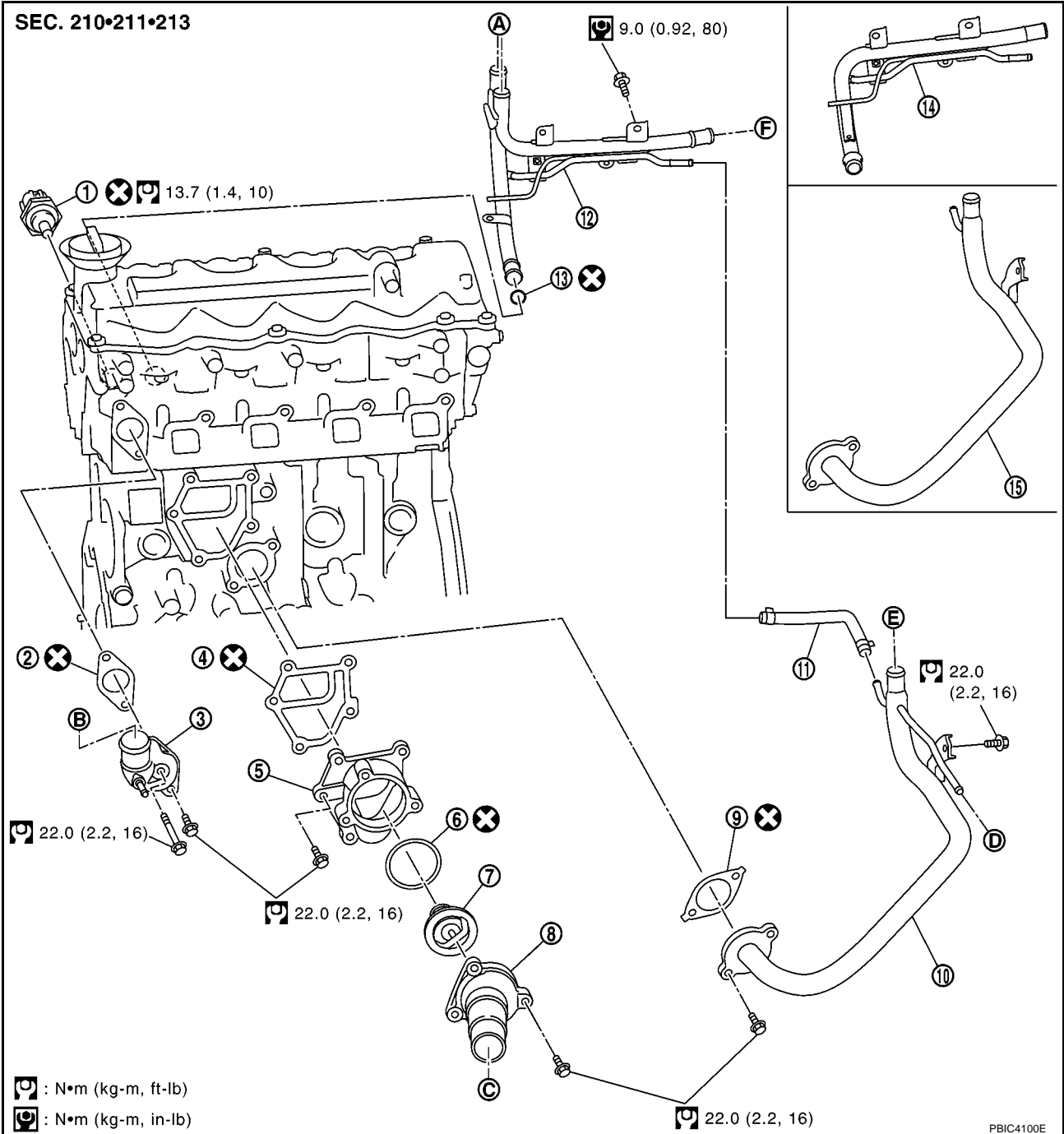
## THERMOSTAT AND WATER PIPING

PFP:21200

### Components

EBS01F6L

A  
CO  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



- Refer to [GI-10, "Components"](#) for symbol marks in the figure.

# THERMOSTAT AND WATER PIPING

EBS01E6X

## Removal and Installation

### WARNING:

Do not remove radiator cap and/or reservoir tank cap when engine is hot. Serious burns could occur from high pressure engine coolant escaping from radiator and/or reservoir tank.

### REMOVAL

1. Remove front engine undercover and middle engine undercover. Refer to [EI-15, "FRONT BUMPER"](#) .
2. Drain engine coolant from radiator drain plug at the bottom of radiator, and from water drain plug at the side of cylinder block. Refer to [CO-7, "Changing Engine Coolant"](#) and [EM-110, "CYLINDER BLOCK"](#) .

### CAUTION:

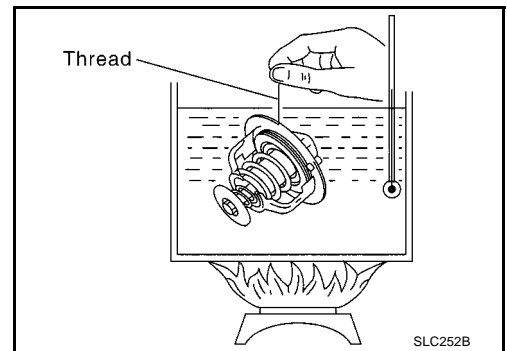
Perform this step when engine is cold.

3. Remove engine cover. Refer to [EM-20, "INTAKE MANIFOLD"](#) .
4. Disconnect radiator hoses (upper and lower) from engine side. Refer to [CO-11, "RADIATOR"](#) .
5. Remove air inlet pipe and air duct between air cleaner case and turbocharger. Refer to [EM-15, "AIR CLEANER AND AIR DUCT"](#) and [EM-28, "TURBO CHARGER"](#) .
6. Remove water outlet, water inlet and thermostat.
7. Remove thermostat housing.
8. Disconnect heater return hose and water hoses at heater return pipe side, and remove heater return pipe.
9. Remove oil level gauge guide mounting bolt, vacuum hoses (to turbocharger boost control solenoid valve) and spill hose. Refer to [EM-36, "OIL PAN AND OIL STRAINER"](#) , [EM-20, "INTAKE MANIFOLD"](#) and [EM-44, "INJECTION TUBE AND FUEL INJECTOR"](#) .
10. Disconnect water hoses (to EGR cooler) (A/T models), vacuum hoses and heater feed hose at heater feed pipe side, and remove heater feed pipe. Refer to [EM-20, "INTAKE MANIFOLD"](#) .

## INSPECTION AFTER REMOVAL

### Thermostat

- Place a string so that it is caught in the valves of the thermostat. Immerse fully in a container filled with water. Heat while stirring.
- The valve opening temperature is the temperature at which the valve opens and falls from the thread.
- Continue heating. Check the full-open lift amount.
- After checking the full-open lift amount, lower the water temperature and check the valve closing temperature.



### Standard values

Item	Thermostat
Valve opening temperature	80.5 - 83.5°C (177 - 182° F)
Full-open lift amount	More than 9 mm/ 95°C (0.35 in/ 203 °F)
Valve closing temperature	More than 77°C (171°F)

- If out of the standard, replace thermostat.

## INSTALLATION

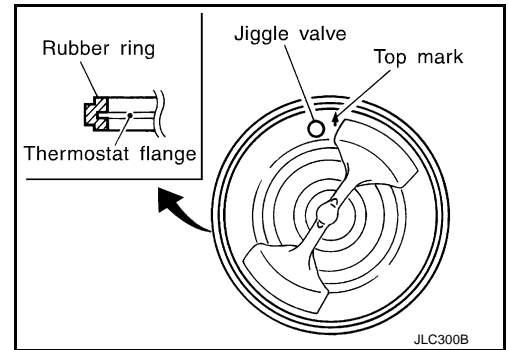
Note the following, and install in the reverse order of removal.

- Securely insert each hose, and install clamp at a position where it does not interfere with the pipe bulge.
- When inserting heater feed pipe end into cylinder head, apply a neutral detergent to O-ring. Then insert it immediately.



## THERMOSTAT AND WATER PIPING

- Install the thermostat with the whole circumference of each flange part fit securely inside the rubber ring.
- Install the thermostat with the jiggle valve facing upwards.



### INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant using the radiator cap tester adapter [SST: EG17650301] and the radiator cap tester (commercial service tool). Refer to [CO-7, "CHECKING RADIATOR SYSTEM FOR LEAKS"](#).
- Start and warm up engine. Visually check if there is no leaks of engine coolant.

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

#### Standard and Limit ENGINE COOLANT CAPACITY

EBS01E6Y

Unit: ℓ (Imp qt)

Engine coolant capacity (With reservoir tank at "MAX" level)	LHD models	Approx. 9.9 (8-3/4)
	RHD models	Approx. 10.2 (9)
Reservoir tank (at "MAX" level)		0.8 (3/4)

#### THERMOSTAT

Valve opening temperature	80.5 - 83.5°C (177 - 182°F)
Full open lift amount	More than 9 mm/ 95°C (0.35 in/203°F)
Valve closing temperature	More than 77°C (171°F)

#### RESERVOIR TANK

Unit: kPa (bar, kg/cm<sup>2</sup>, psi)

Cap relief pressure	Standard	98.2 - 117.8 (0.98 - 1.18, 1.0 - 1.2, 14 - 17)
	Limit	59 (0.59, 0.6, 9)
Leakage test pressure		157 (1.57, 1.6, 23)