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SECTION CO

ENGINE COOLING SYSTEM

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RADIATOR		

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000009269196

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

PREPARATION

< PREPARATION >

[HR16DE]

PREPARATION

PREPARATION

Special Service Tool

INFOID:000000009269197

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The actual shapes of Kent-Moore tools may from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV991J0070 (J-45695) Coolant refill tool	Refilling engine cooling system
EG17650301 (J-33984-A) Radiator cap tester adapter	Adapting radiator cap tester to radiator cap and radiator filler neck a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)
— (J-23688) Engine coolant refractometer	Checking concentration of ethylene glycol in engine coolant

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Commercial Service Tool

INFOID:000000009269198

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Tool name	Description
Power tool	Loosening nuts, screws and bolts
Radiator cap tester	Checking radiator and radiator cap

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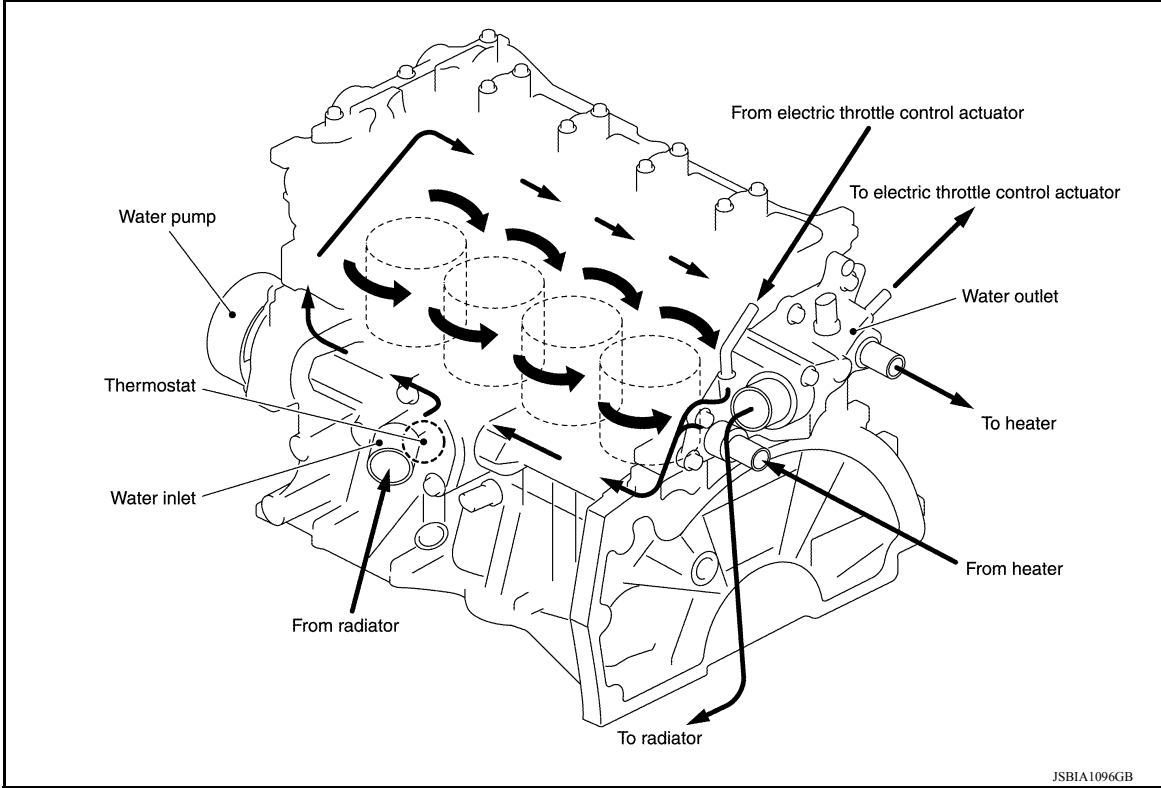
SYSTEM DESCRIPTION

DESCRIPTION

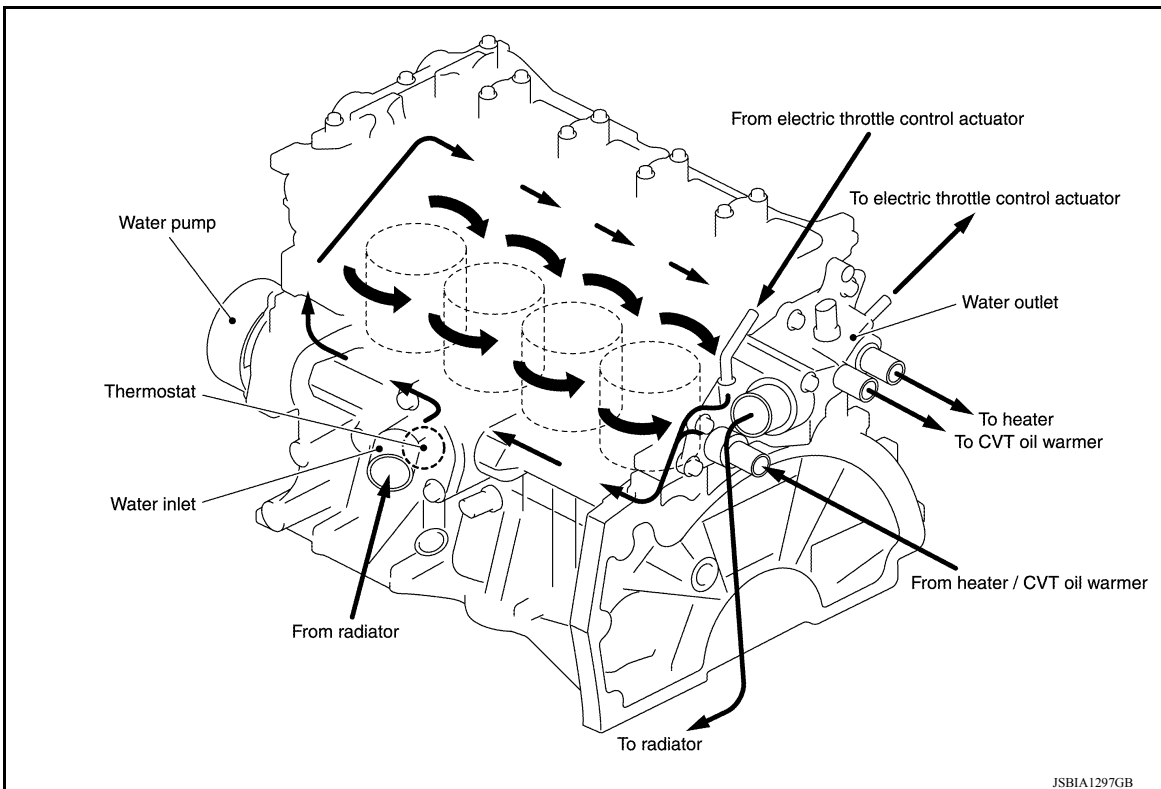
Engine Cooling System

INFOID:000000009269199

M/T models



CVT and A/T models



DESCRIPTION

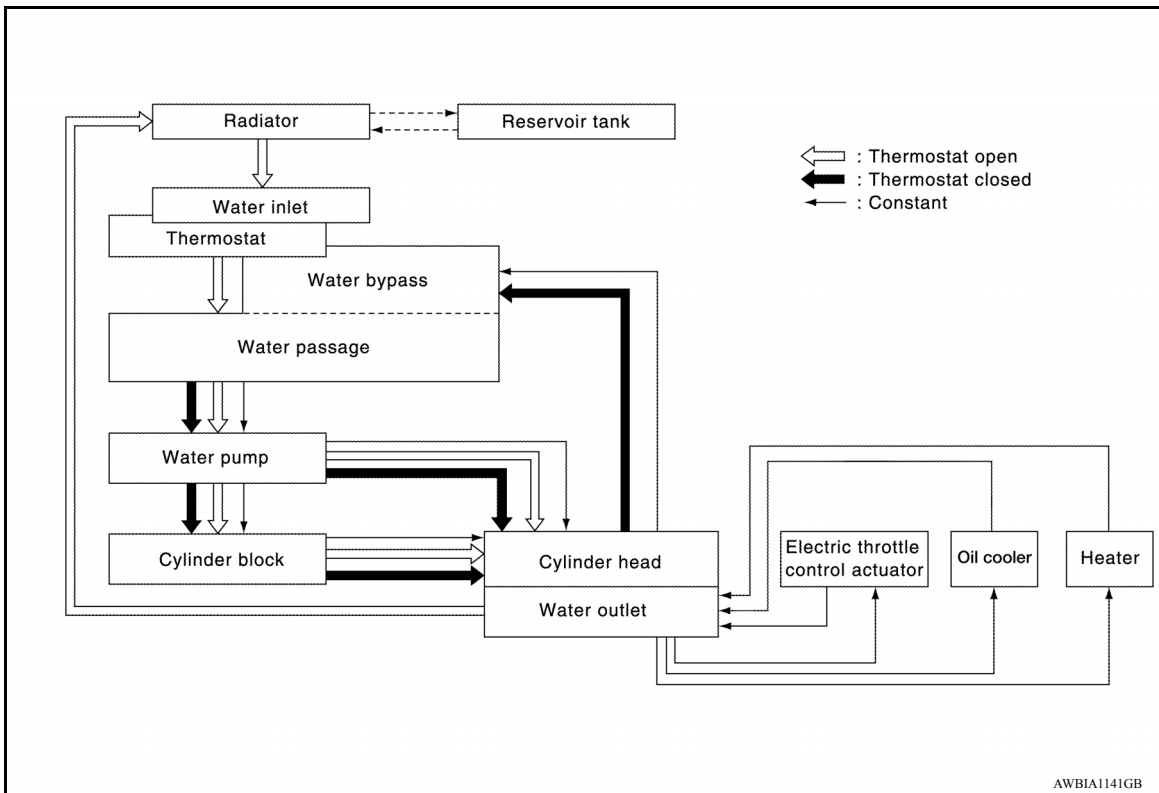
< SYSTEM DESCRIPTION >

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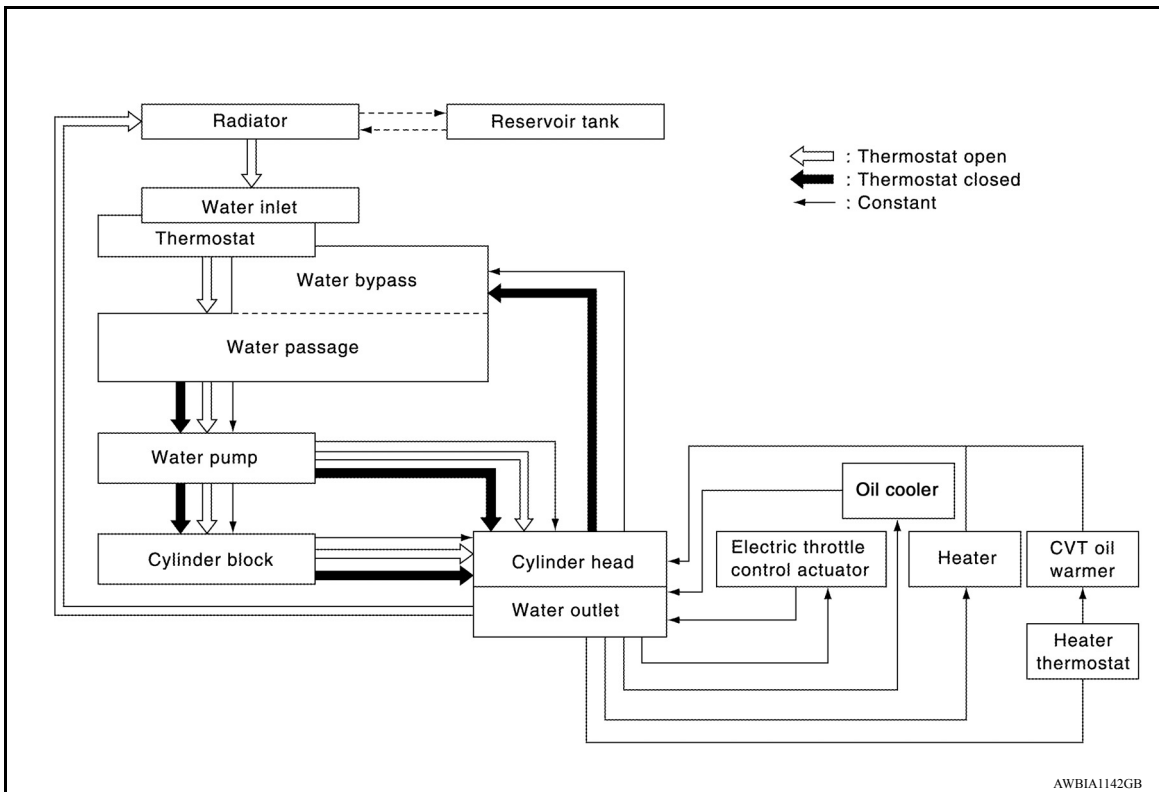
Engine Cooling System Schematic

INFOID:00000009269200

M/T models



CVT and A/T models



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OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[HR16DE]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000009269201

		Symptom	Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	Thermostat	
		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	Fan assembly	—
		High resistance to fan rotation		
		Damaged fan blades		
	Damaged radiator shroud	—	Radiator shroud	—
	Improper engine coolant mixture ratio	—	Engine coolant viscosity	—
	Poor engine coolant quality	—	Periodic maintenance	—
	Insufficient engine coolant	Engine coolant leakage	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 leaking into cooling system	Cylinder head deterioration		
		Cylinder head gasket deterioration		

OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[HR16DE]

	Symptom		Check items		
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load	A
				Driving in low gear for extended time	CO
				Driving at extremely high speed	
				Power train system malfunction	C
				Installed improper size wheels and tires	D
				Dragging brakes	
			Improper ignition timing	E	
	Blocked or restricted air flow		Blocked bumper	Installed front bumper fascia cover	
			Blocked radiator grille	Mud contamination or paper clogging	F
			Blocked radiator	Blocked air flow	
		Blocked condenser			
		Installed large fog lamp	G		

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PERIODIC MAINTENANCE

ENGINE COOLANT

Inspection

INFOID:000000009269202

CHECKING COOLING SYSTEM HOSES

Check hoses for the following:

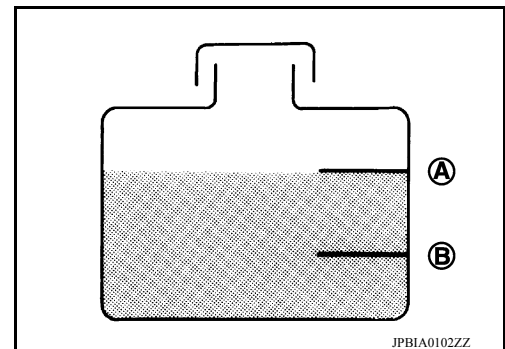
- Improper attachment
- Leaks
- Cracks
- Damage
- Loose connections
- Chafing
- Deterioration

CHECKING RESERVOIR LEVEL

- Check that the reservoir tank engine coolant level is within the MAX (A) to MIN (B) range when the engine is cool.
- Adjust the engine coolant level if necessary.

CAUTION:

Refill the engine cooling system with the specified coolant or equivalent. Refer to [MA-12, "Fluids and Lubricants"](#).



CHECKING COOLING SYSTEM FOR LEAKS

To check for leaks, apply pressure to the cooling system using suitable tool (A) and Tool (B).

Tool number (B) : EG17650301 (J-33984-A)

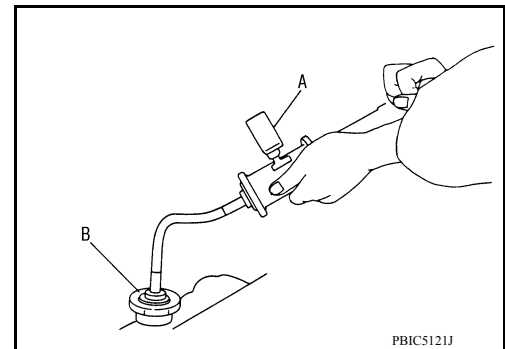
Testing pressure : Refer to [CO-12, "RADIATOR : Inspection"](#).

WARNING:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure coolant escaping from the radiator.

CAUTION:

Higher test pressure than specified may cause radiator damage.



Draining Engine Coolant

INFOID:000000009269203

WARNING:

- Do not remove radiator cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator.
- Wrap a thick cloth around the radiator cap. Slowly turn it a quarter of a turn to release built-up pressure. Then turn it all the way.

1. Remove engine under cover. Refer to [EXT-15, "Exploded View"](#).

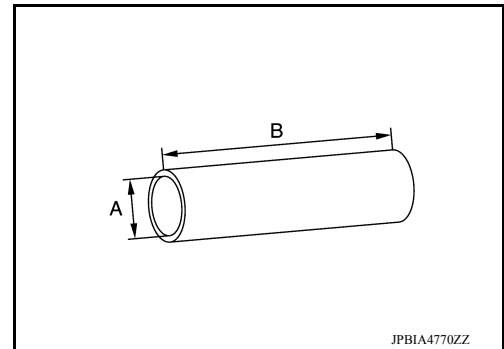
ENGINE COOLANT

[HR16DE]

< PERIODIC MAINTENANCE >

2. Connect a drain hose to the radiator drain plug.
 - Use a suitable hose with the dimensions as shown.

Diameter (A) : 0.8 mm (0.31 in)
Length (B) : 300 mm (11.81 in)

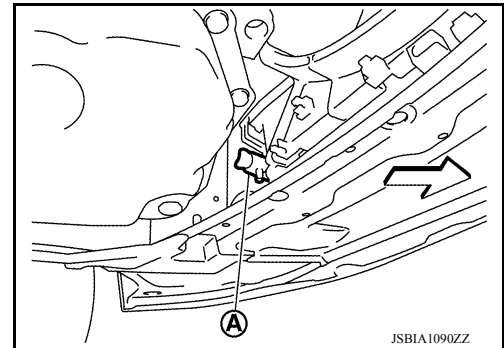


3. Open radiator drain plug (A) at the bottom of radiator, and then remove radiator cap.

↶ : Front

CAUTION:

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



4. It is necessary to drain the cylinder block when draining all of engine coolant in the system. To drain the cylinder block, open the water drain plugs on cylinder block. Refer to [EM-94, "Exploded View"](#).
5. Remove reservoir tank if necessary, and drain engine coolant and clean reservoir tank before installing. Refer to [CO-14, "Exploded View"](#).
6. Check drained engine coolant for contaminants such as rust, corrosion or discoloration. If contaminated, flush the engine cooling system. Refer to [CO-11, "Flushing Cooling System"](#).

Refilling Engine Coolant

INFOID:000000009269204

1. Install the radiator drain plug. Install the reservoir tank and cylinder block drain plug, if removed.

CAUTION:

- Be sure to clean drain plug and install with a new O-ring.
- Apply sealant to the threads of the cylinder block drain plug. Use Genuine High Performance Thread Sealant or equivalent. Refer to [GI-21, "Recommended Chemical Products and Sealants"](#).

Radiator drain plug : Refer to [CO-14, "Exploded View"](#).

Cylinder block drain plug : Refer to [EM-94, "Exploded View"](#).

2. Set the vehicle heater controls to the full HOT and heater ON position. Turn the vehicle ignition ON with the engine OFF as necessary to activate the heater mode.

ENGINE COOLANT

[HR16DE]

< PERIODIC MAINTENANCE >

3. Install the Tool by installing the radiator cap adapter onto the radiator neck opening. Then attach the gauge body assembly with the refill tube and the venturi assembly to the radiator cap adapter.

Tool number : KV991J0070 (J-45695)

4. Insert the refill hose into the coolant mixture container that is placed at floor level. Make sure the ball valve is in the closed position.

CAUTION:

Do not use any cooling system additives such as radiator sealer. Additives may clog the cooling system and cause damage to the engine, transmission and/or cooling system.

NOTE:

Use recommended coolant or equivalent. Refer to [MA-12. "Fluids and Lubricants"](#).

Engine coolant capacity (with reservoir tank) : Refer to [CO-26. "Standard and Limit"](#).

5. Install an air hose to the venturi assembly. The air pressure must be within specification.

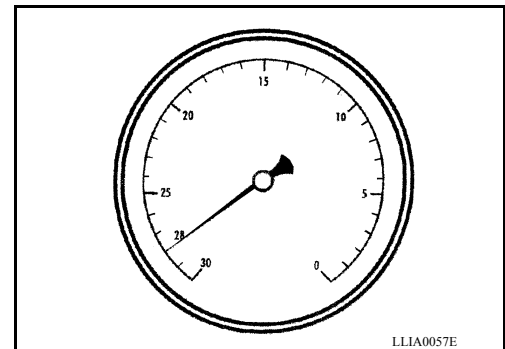
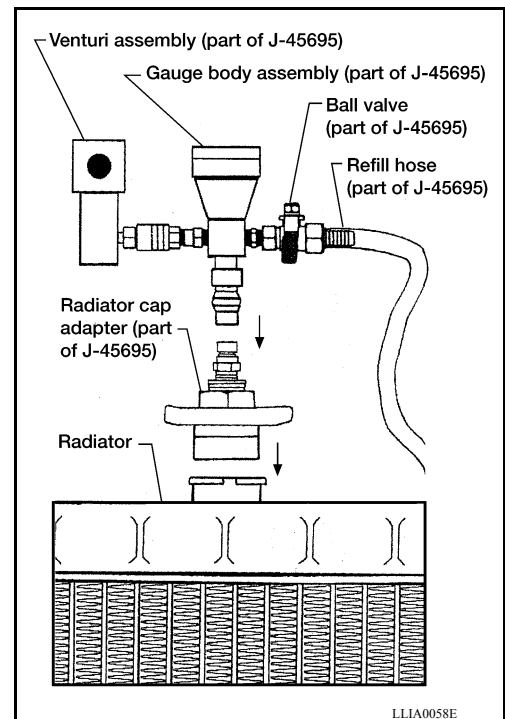
Compressed air supply pressure : 549 - 824 kPa (5.6 - 8.4 kg/cm², 80 - 119 psi)

CAUTION:

The compressed air supply must be equipped with an air dryer.

6. The vacuum gauge will begin to rise and there will be an audible hissing noise. During this process open the ball valve on the refill hose slightly. Coolant will be visible rising in the refill hose. Once the refill hose is full of coolant, close the ball valve. This will purge any air trapped in the refill hose.
7. Continue to draw the vacuum until the gauge reaches 28 inches of vacuum. The gauge may not reach 28 inches in high altitude locations; use the vacuum specifications based on the altitude above sea level.

Altitude above sea level	Vacuum gauge reading
0 - 100 m (328 ft)	: 28 inches of vacuum
300 m (984 ft)	: 27 inches of vacuum
500 m (1,641 ft)	: 26 inches of vacuum
1,000 m (3,281 ft)	: 24 - 25 inches of vacuum



8. When the vacuum gauge has reached the specified amount, disconnect the air hose and wait 20 seconds to see if the system loses any vacuum. If the vacuum level drops, perform any necessary repairs to the system and repeat steps 6 - 8 to bring the vacuum to the specified amount. Recheck for any leaks.
9. Place the coolant container (with the refill hose inserted) at the same level as the top of the radiator. Then open the ball valve on the refill hose so the coolant will be drawn up to fill the cooling system. The cooling system is full when the vacuum gauge reads zero.

CAUTION:

Do not allow the coolant container to get too low when filling, to avoid air from being drawn into the cooling system.

10. Remove the Tool from the radiator neck opening.
11. Fill the cooling system reservoir tank to the specified level and install the radiator cap. Run the engine to warm up the cooling system and top up the system as necessary.
12. Install engine under cover. Refer to [EXT-15. "Exploded View"](#).

ENGINE COOLANT

< PERIODIC MAINTENANCE >

[HR16DE]

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Flushing Cooling System

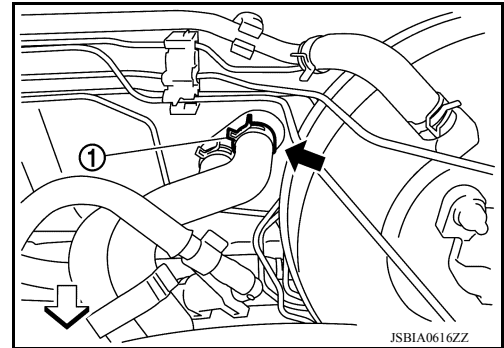
1. Install radiator drain plug and reservoir tank, if removed.

Radiator drain plug : Refer to [CO-14, "Exploded View"](#).

CAUTION:

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

2. If water drain plugs on cylinder block were removed, close and tighten them. Refer to [EM-94, "Exploded View"](#).
3. Remove air duct from between air cleaner case and electric throttle control actuator. Refer to [EM-25, "Removal and Installation"](#).
4. Disconnect heater hose (1) at location (←) as shown.
 - ←: Front
 - Position heater hose as high as possible.



5. Fill radiator until engine coolant flows out of the disconnected heater hose and then reconnect the heater hose.
6. Finish filling the engine and reservoir tank with water and reinstall the radiator cap.
7. Install air duct in between air cleaner case and electric throttle control actuator. Refer to [EM-25, "Removal and Installation"](#).
8. Run the engine and warm it up to normal operating temperature.
9. Rev the engine two or three times under no-load.
10. Stop the engine and wait until it cools down.
11. Drain water from the system. Refer to [CO-8, "Draining Engine Coolant"](#).
12. Repeat steps 1 through 11 until clear water begins to drain from radiator.

RADIATOR RADIATOR CAP

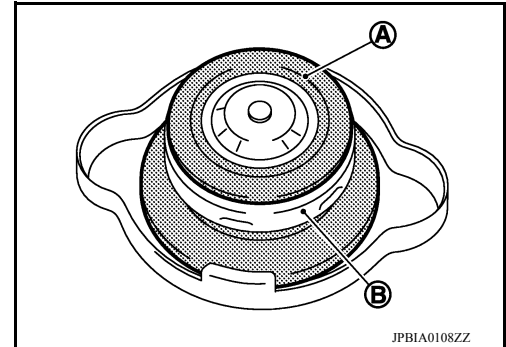
RADIATOR CAP : Inspection

INFOID:000000009269206

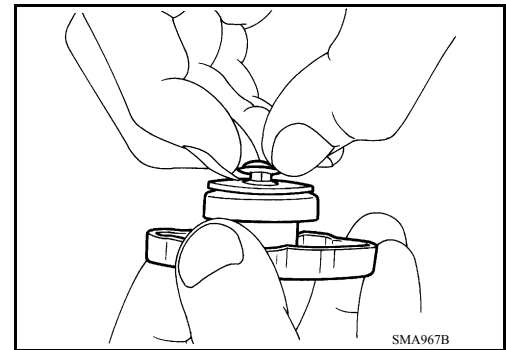
- Check valve seat (A) of radiator cap.

(B) : Metal plunger

- Replace the cap if the metal plunger cannot be seen around the edge of the black rubber gasket.
- Replace the cap if deposits of waxy residue or other foreign material are on the black rubber gasket or the metal retainer.



- Pull negative-pressure valve to open it, and check that it closes completely when released.
- Check that there is no dirt or damage on the valve seat of radiator cap negative-pressure valve.
- Make sure that the valve operates properly while opening and closing.

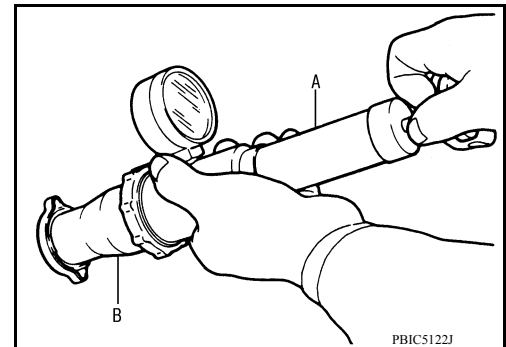


- Check radiator cap relief pressure using a suitable tool (A) and Tool (B).

Standard and Limit : Refer to [CO-26, "Standard and Limit"](#).

Tool number (B) : EG17650301 (J-33984-A)

- When connecting the radiator cap to the Tool (B), apply water or coolant to the cap seal surface.
- Replace radiator cap if there is an abnormality in the negative-pressure valve, or if the radiator cap does not perform within specifications.



CAUTION:

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

RADIATOR

RADIATOR : Inspection

INFOID:000000009269207

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

CAUTION:

- Be careful not to bend or damage radiator fins.
- When the radiator is cleaned on-vehicle, remove the surrounding parts in order to access the radiator core.
- Then tape the harness and harness connectors to prevent water from entering.

1. Spray water to the back side of the radiator core using a side-to-side motion from the top down.
2. Stop spraying when debris no longer flows from radiator core.
3. Blow air into the back side of radiator core using a side-to-side motion from the top down.

RADIATOR

< PERIODIC MAINTENANCE >

[HR16DE]

- Use compressed air lower than 490 kPa (5 kg/cm², 71 psi) and keep distance more than 30 cm (11.81 in).
- 4. Continue to blow air until no water sprays out.
- 5. Check for coolant leaks. Repair as necessary.

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RADIATOR

< REMOVAL AND INSTALLATION >

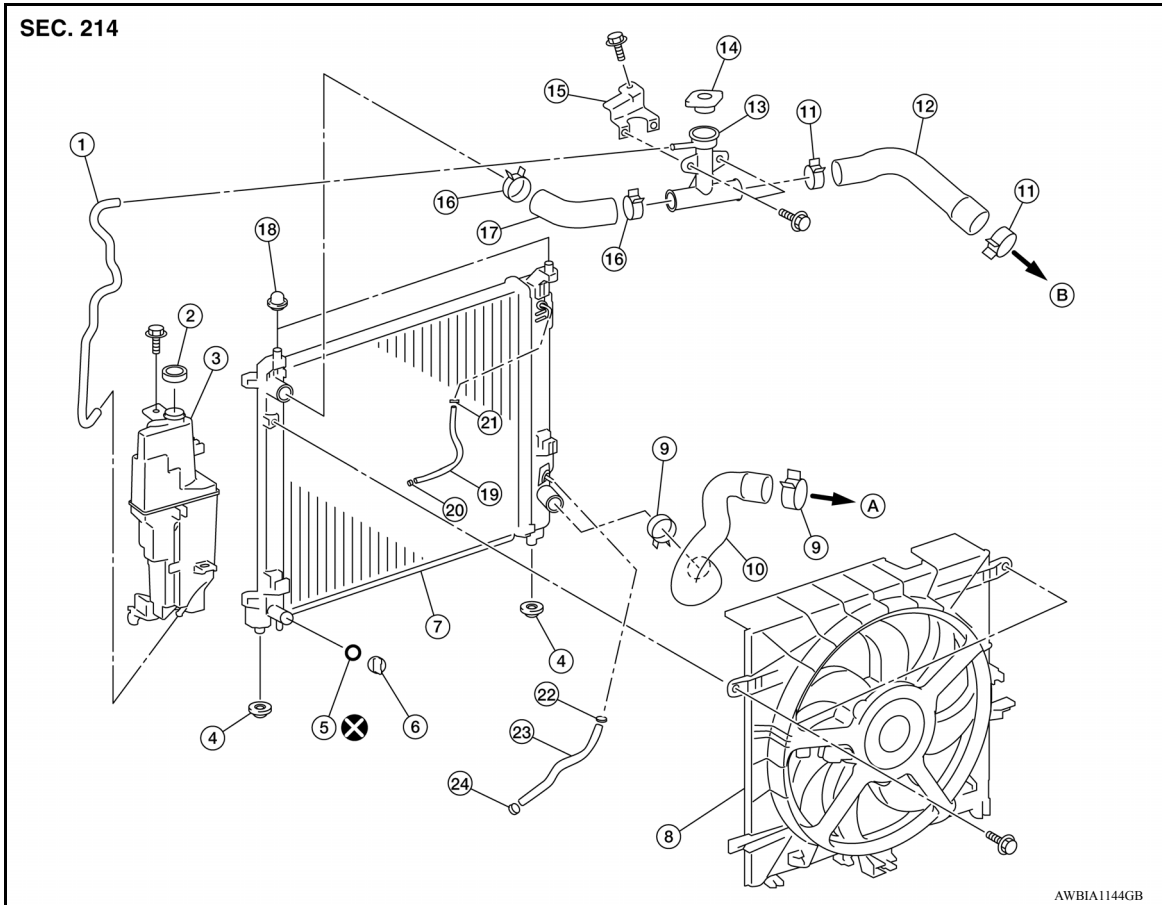
[HR16DE]

REMOVAL AND INSTALLATION

RADIATOR

Exploded View

INFOID:000000009269208



- | | | |
|--|--|---|
| 1. Reservoir tank hose | 2. Reservoir tank cap | 3. Reservoir tank |
| 4. Mounting rubber (lower) | 5. O-ring | 6. Drain plug |
| 7. Radiator | 8. Cooling fan assembly | 9. Clamp |
| 10. Radiator hose (lower) | 11. Clamp | 12. Radiator hose to water outlet (upper) |
| 13. Radiator cap adapter | 14. Radiator cap | 15. Radiator cap adapter bracket |
| 16. Clamp | 17. Radiator hose (upper) to radiator | 18. Mounting rubber (upper) |
| 19. CVT cooler hose/ A/T fluid cooler hose | 20. Clamp | 21. Clamp |
| 22. Clamp | 23. CVT cooler hose/ A/T fluid cooler hose | 24. Clamp |
| A. To water inlet | B. To water outlet | |

Removal and Installation

INFOID:000000009269209

REMOVAL

WARNING:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the radiator cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Drain engine coolant. Refer to [CO-8, "Draining Engine Coolant"](#).

RADIATOR

< REMOVAL AND INSTALLATION >

[HR16DE]

CAUTION:

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

- Remove air duct (inlet). Refer to [EM-25. "Removal and Installation"](#).
- Disconnect battery negative terminal. Refer to [PG-63. "Removal and Installation"](#).
- Loosen the following from the radiator core support (upper):
 - Air bag harness
 - Hood lock cable
 - Radiator cap adapter
 - Horn harness
- Remove radiator hose (lower).
- Remove radiator hose (upper) from water outlet.
- Disconnect harness connector from fan motor, and move harness aside.
- Disconnect reservoir tank hose, and remove reservoir tank.
- Remove radiator core support (upper).
- Remove radiator hose (upper) from radiator.
- Remove cooling fan assembly. Refer to [CO-17. "Removal and Installation"](#).

CAUTION:

Be careful not to damage or scratch the radiator.

- Disconnect CVT cooler lines or A/T fluid cooler hose (if equipped).
- Remove the radiator from bottom of the vehicle.

CAUTION:

When removing, do not damage or scratch radiator core or A/C condenser.

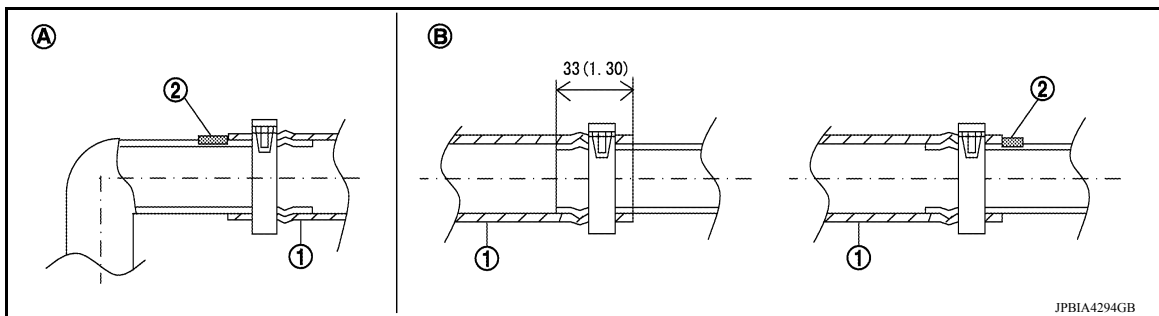
INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not reuse O-ring.

- Insert the radiator hose (1) all the way to the stopper (2) or by 33 mm (1.30 in) (hose without a stopper) as shown.



- | | | | |
|----|---------------|----|-------------|
| 1. | Radiator hose | 2. | Stopper |
| A. | Radiator side | B. | Engine side |

- The correct orientation of the hose clamps are as shown.

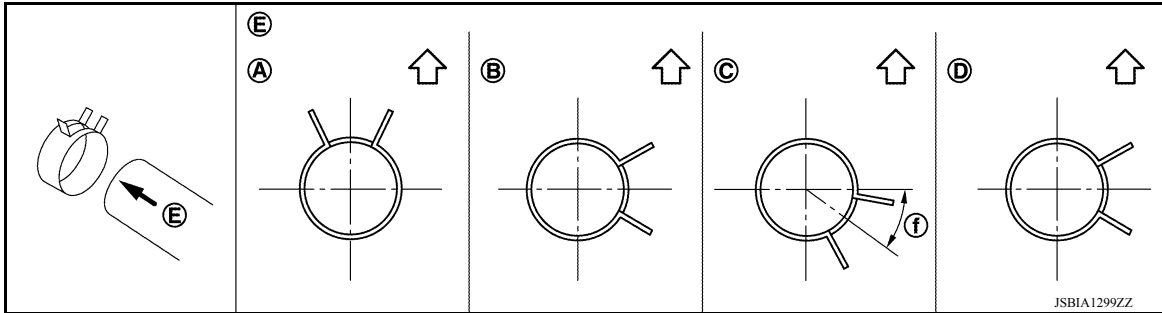
Radiator hose	Hose end	Paint mark	Position of hose clamp*
Radiator hose (upper)	Radiator side	Upper	A
	Engine side	Upper	B
Radiator hose (lower)	Radiator side	Lower	C
	Engine side	Upper	D

*: Refer to the illustrations for the specific position for each hose clamp tab.

RADIATOR

< REMOVAL AND INSTALLATION >

[HR16DE]



A. View A

B. View B

C. View C

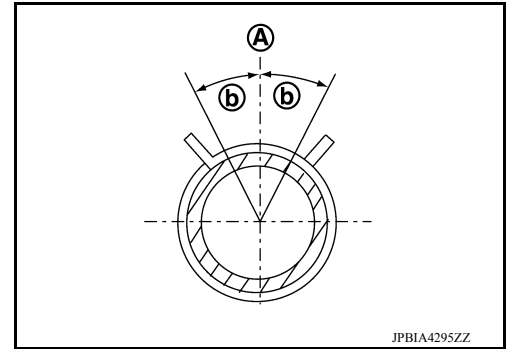
D. View D

E. View E

f. 45°

↖ : Vehicle upper

- The angle (b) created by the hose clamp pawl and the specified line (A) must be within $\pm 30^\circ$ as shown.

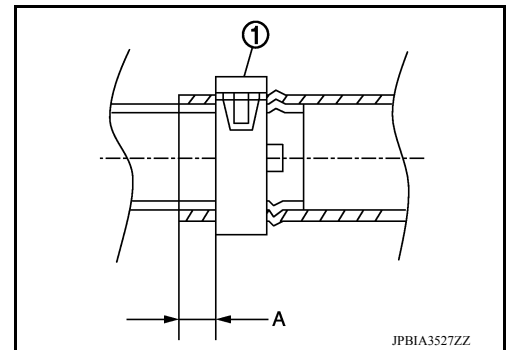


- To install hose clamps (1), check that the dimension (A) from the end of the hose clamp on the radiator hose to the hose clamp is within the reference value.

Dimension (A) : 3 – 7 mm (0.12 – 0.28 in)

CAUTION:

- When installing do not damage or scratch radiator core or A/C condenser.
- Replace water hose clamp if it is removed.
- Use only Genuine NISSAN bolts for the cooling fan assembly and strictly follow the tightening torque. Over tightening may damage the radiator.



INSPECTION AFTER INSTALLATION

- Check for engine coolant leaks. Refer to [CO-8. "Inspection"](#).
- Start and warm up the engine. Visually inspect for coolant leaks. Repair as necessary.

COOLING FAN

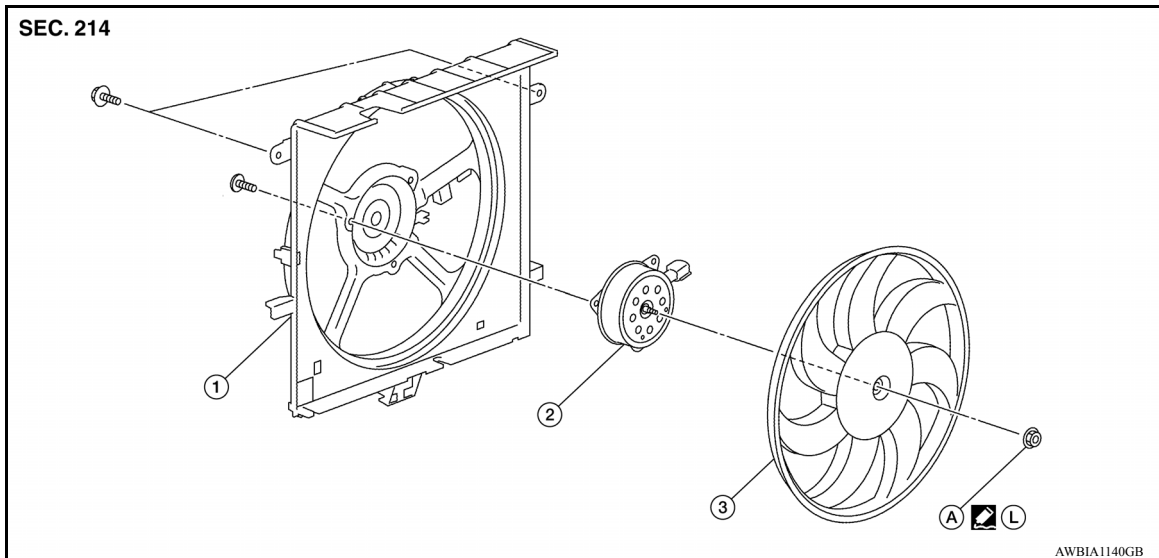
< REMOVAL AND INSTALLATION >

[HR16DE]

COOLING FAN

Exploded View

INFOID:00000009269210



- | | | | | | |
|----|-----------------|----|--|----|-------------|
| 1. | Fan shroud | 2. | Fan motor | 3. | Cooling fan |
| A. | Cooling fan nut | L. | Genuine NISSAN high strength locking sealant | | |

Removal and Installation

INFOID:00000009269211

REMOVAL

WARNING:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the radiator cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

- Partially drain engine coolant from radiator. Refer to [CO-8, "Draining Engine Coolant"](#).

CAUTION:

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

- Remove air duct (inlet). Refer to [EM-25, "Removal and Installation"](#).
- Disconnect battery negative terminal. Refer to [PG-63, "Removal and Installation"](#).
- Loosen the following from the radiator core support (upper):
 - Air bag harness
 - Hood lock cable
 - Radiator cap adapter
 - Horn harness
- Remove radiator hose (upper) from water outlet.
- Disconnect harness connector from fan motor, and move harness aside.
- Disconnect reservoir tank hose, and remove reservoir tank.
- Remove radiator core support (upper).
- Remove radiator hose (upper) from radiator.
- Remove cooling fan assembly. Refer to [CO-17, "Removal and Installation"](#).

CAUTION:

COOLING FAN

< REMOVAL AND INSTALLATION >

[HR16DE]

Be careful not to damage or scratch the radiator.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Only use Genuine NISSAN parts for the fan shroud bolt.

NOTE:

Cooling fan is controlled by ECM. For details, refer to [EC-50. "Diagnosis Description"](#).

Disassembly and Assembly

INFOID:000000009269212

DISASSEMBLY

1. Remove cooling fan nut, and then remove the cooling fan.
2. Remove fan motor.

INSPECTION AFTER DISASSEMBLY

Cooling fan and shroud

Inspect cooling fan and shroud for nicks, cracks, breaks and warping. Replace if necessary.

ASSEMBLY

Assembly is in the reverse order of disassembly.

CAUTION:

Apply Genuine NISSAN high strength thread locking sealant on fan motor shaft.

WATER PUMP

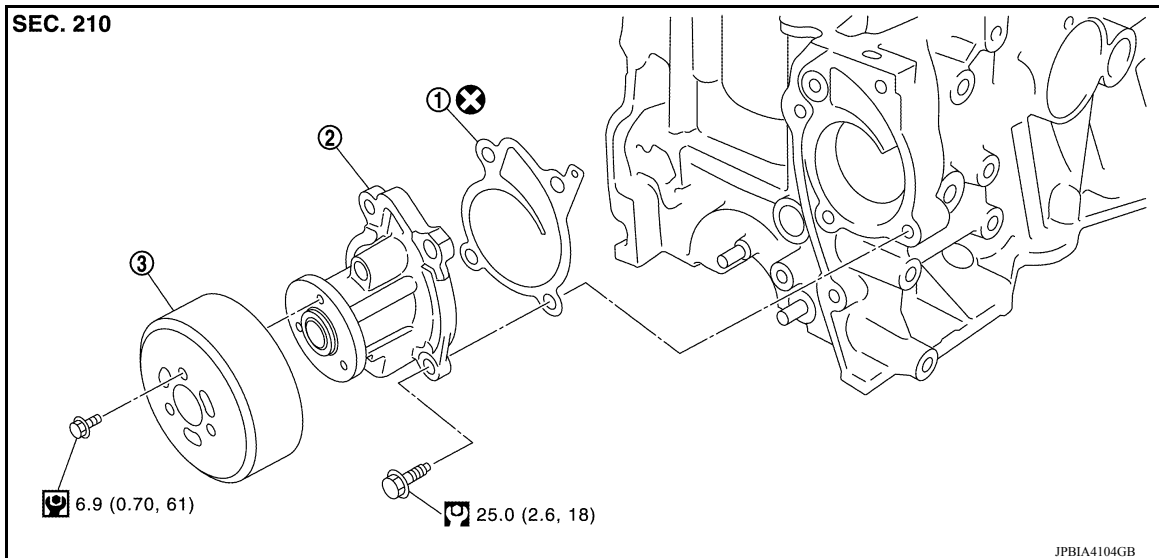
< REMOVAL AND INSTALLATION >

[HR16DE]

WATER PUMP

Exploded View

INFOID:000000009269213



1. Gasket

2. Water pump

3. Water pump pulley

Removal and Installation

INFOID:000000009269214

REMOVAL

CAUTION:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the radiator cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

1. Drain engine coolant from radiator. Refer to [CO-8, "Draining Engine Coolant"](#).

CAUTION:

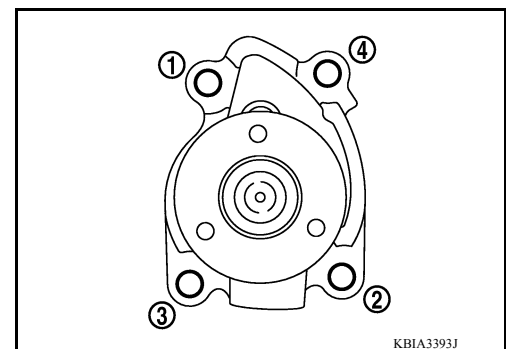
- Perform this step when the engine is cold.
- Do not spill engine coolant on drive belt.

2. Remove front wheel and tire (RH). Refer to [WT-39, "Adjustment"](#).
3. Remove front fender protector (RH). Refer to [EXT-26, "Removal and Installation"](#).
4. Loosen water pump pulley bolts before loosening belt tension of drive belt.
5. Remove drive belt. Refer to [EM-16, "Removal and Installation"](#).
6. Remove water pump pulley.
7. Remove water pump.

- Loosen water pump bolts in reverse order as shown.
- Engine coolant will leak from cylinder block, so have a receptacle ready below.

CAUTION:

- Do not allow water pump vane to contact any other parts.
- Water pump cannot be disassembled and must be replaced as an assembly.



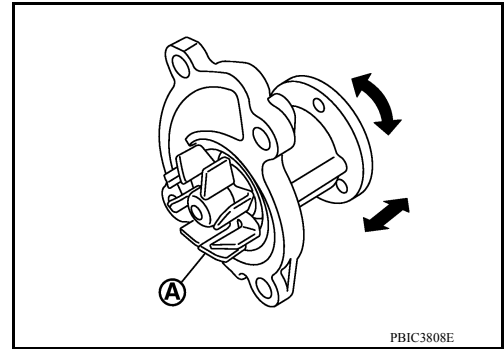
INSPECTION AFTER REMOVAL

WATER PUMP

[HR16DE]

< REMOVAL AND INSTALLATION >

- Visually check for significant dirt or rust on the water pump body and vane (A) and replace as necessary.
- Check that the vane shaft turns smoothly by hand and is not excessively loose.
- Replace the water pump assembly if the water pump does not perform properly.



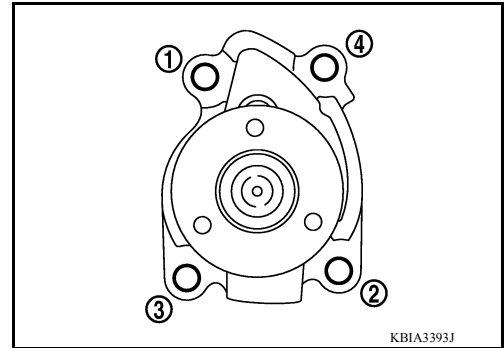
INSTALLATION

Installation is in the reverse order of removal.

- Tighten water pump bolts in order as shown.

CAUTION:

- **Do not allow the water pump vane to contact any other parts.**
- **Water pump cannot be disassembled and must be replaced as an assembly.**
- **Do not reuse gasket.**
- **Sealing surface must be clean and free of dents or flaws.**



INSPECTION AFTER INSTALLATION

- Before starting engine, check oil/fluid levels, including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to [MA-12. "Fluids and Lubricants"](#).
- Use procedure below to check for fuel leakage.
- Turn ignition switch ON (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

NOTE:

If hydraulic pressure inside timing chain tensioner drops after removal and installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.

- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gas, or any oils/fluids, including engine oil and engine coolant.
- Bleed air from passages in lines and hoses, such as in cooling system.
- After cooling down engine, again check oil/fluid levels, including engine oil and engine coolant. Refill to specified level, if necessary.
- Summary of the inspection items:

Item		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leakage	Level
Engine oil		Level	Leakage	Level
Transmission/ transaxle fluid	A/T and CVT Models	Leakage	Level/Leakage	Leakage
	M/T Models	Level/Leakage	Leakage	Level/Leakage
Other oils and fluids*		Level	Leakage	Level
Fuel		Leakage	Leakage	Leakage
Exhaust gas		—	Leakage	—

*Power steering fluid, brake fluid, etc.

THERMOSTAT

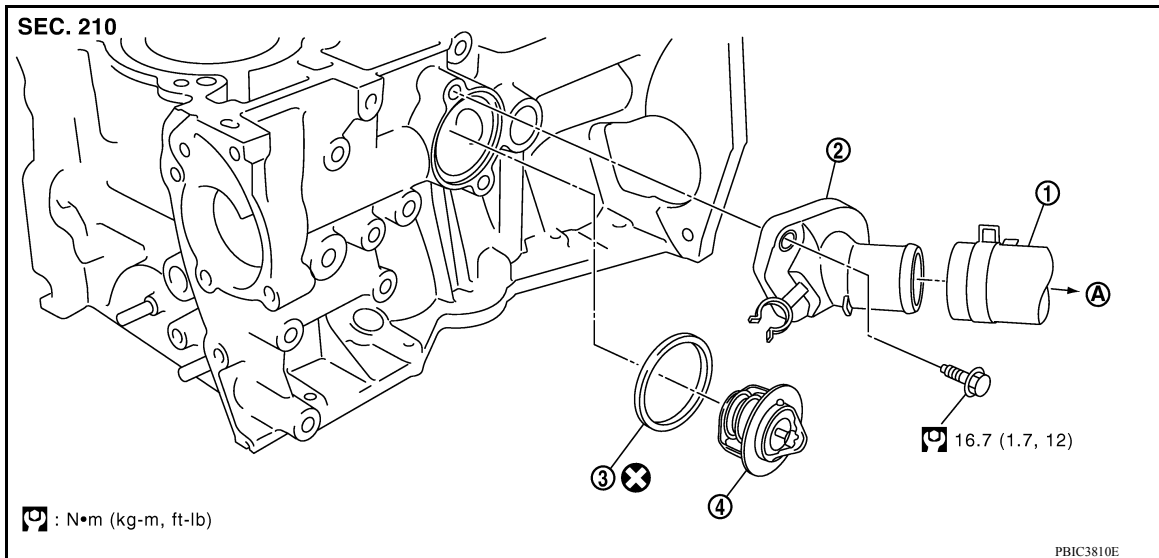
< REMOVAL AND INSTALLATION >

[HR16DE]

THERMOSTAT

Exploded View

INFOID:00000009269215



- | | | |
|--------------------------|----------------|----------------|
| 1. Radiator hose (lower) | 2. Water inlet | 3. Rubber ring |
| 4. Thermostat | A. To radiator | |

Removal and Installation

INFOID:00000009269216

WARNING:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the radiator cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

REMOVAL

1. 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 belt.
2. Remove air duct. Refer to [EM-25, "Removal and Installation"](#).
3. Remove oil level gauge and guide. Refer to [EM-47, "Exploded View"](#).
4. Disconnect radiator hose (lower) from water inlet. Refer to [CO-14, "Exploded View"](#).
5. Remove water inlet, thermostat, and rubber ring.

NOTE:

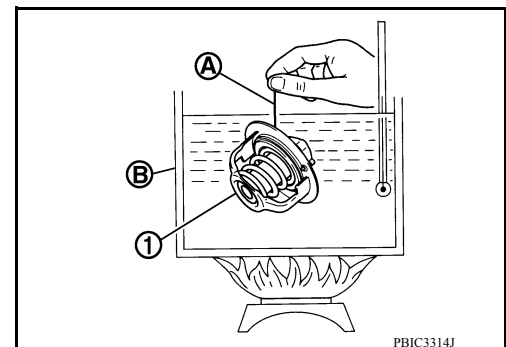
Engine coolant will leak from cylinder block, so have a receptacle ready below.

INSPECTION AFTER REMOVAL

Thermostat

- Place a thread (A) so that it is caught in the valves of thermostat (1). Immerse fully in a container (B) 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 valve lift amount.
- After checking the maximum valve lift amount, lower the water temperature and check the valve closing temperature.

Standard: Refer to [CO-26, "Standard and Limit"](#).



THERMOSTAT

[HR16DE]

< REMOVAL AND INSTALLATION >

- If out of the standard specification range, replace the thermostat.

INSTALLATION

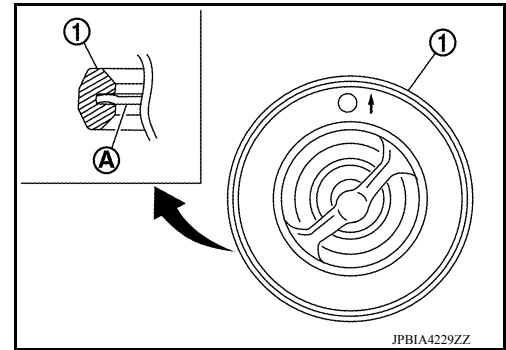
Installation is in the reverse order of removal.

Thermostat

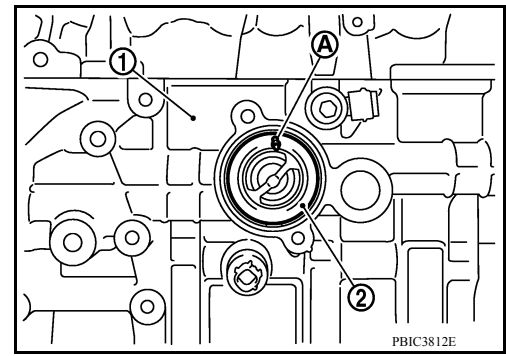
- Install thermostat making sure rubber ring (1) groove fits securely to thermostat flange (A).

CAUTION:

Do not reuse rubber ring.

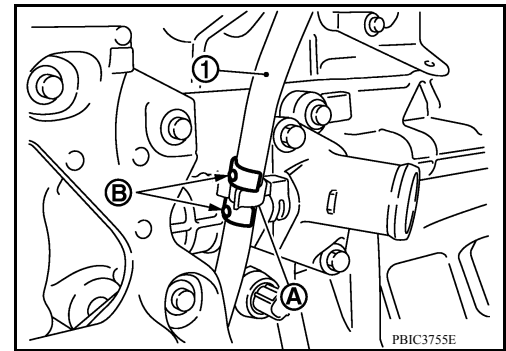


- Install thermostat (2) into the cylinder block (1) with jiggle valve (A) facing upward.



Water Inlet

After installation, attach the water inlet clip (A) on the oil level gauge guide (1) positioned at location (B) as shown.



INSPECTION AFTER INSTALLATION

- Before starting engine, check oil/fluid levels, including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to [MA-12. "Fluids and Lubricants"](#).
- Use procedure below to check for fuel leakage.
- Turn ignition switch ON (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

NOTE:

If hydraulic pressure inside timing chain tensioner drops after removal and installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.

- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gas, or any oils/fluids, including engine oil and engine coolant.
- Bleed air from passages in lines and hoses, such as in cooling system.
- After cooling down engine, again check oil/fluid level, including engine oil and engine coolant. Refill to specified level, if necessary.
- Summary of the inspection items:

THERMOSTAT

< REMOVAL AND INSTALLATION >

[HR16DE]

Item	Before starting engine	Engine running	After engine stopped	
Engine coolant	Level	Leakage	Level	A
Engine oil	Level	Leakage	Level	
Transmission/ transaxle fluid	A/T and CVT Models	Leakage	Level/Leakage	CO
	M/T Models	Level/Leakage	Leakage	
Other oils and fluids*	Level	Leakage	Level	C
Fuel	Leakage	Leakage	Leakage	
Exhaust gas	—	Leakage	—	D

*Power steering fluid, brake fluid, etc.

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WATER OUTLET

< REMOVAL AND INSTALLATION >

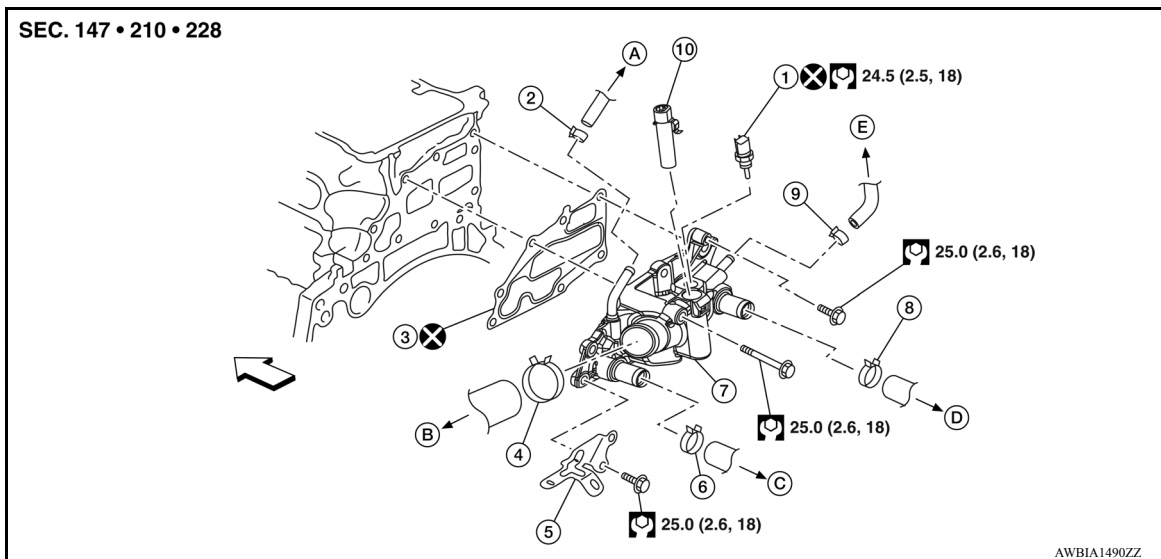
[HR16DE]

WATER OUTLET

Exploded View

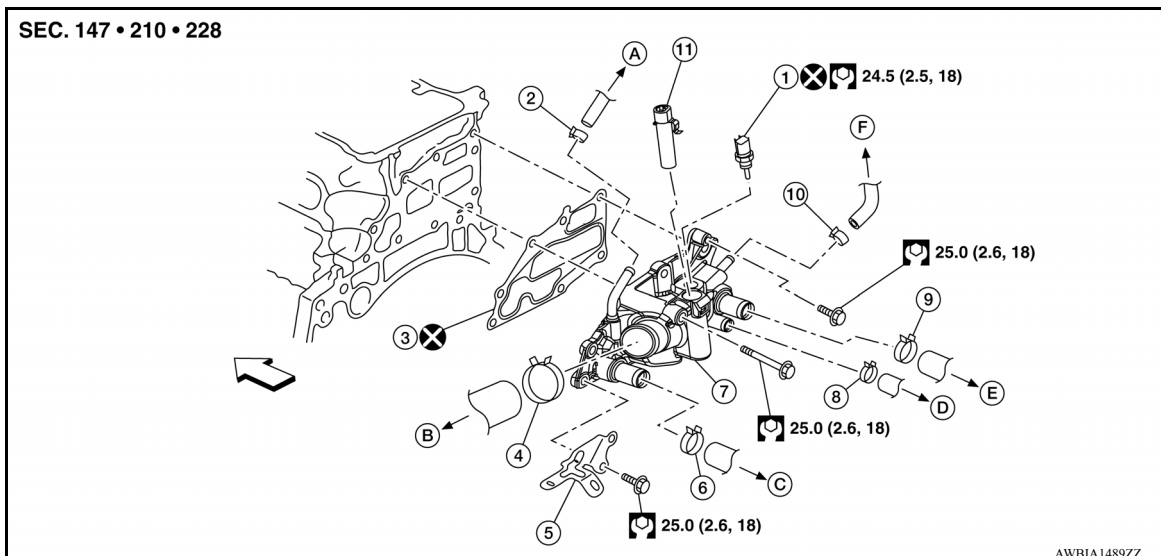
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M/T models



- | | | |
|--------------------------------------|--|--|
| 1. Engine coolant temperature sensor | 2. Clamp | 3. Gasket |
| 4. Clamp | 5. Bracket | 6. Clamp |
| 7. Water outlet | 8. Clamp | 9. Clamp |
| 10. Cylinder block heater (Canada) | A. From electric throttle control actuator | B. To radiator |
| C. From heater core | D. To heater core | E. To electric throttle control actuator |
- ← Front

CVT and A/T models



- | | | |
|--------------------------------------|--|--|
| 1. Engine coolant temperature sensor | 2. Clamp | 3. Gasket |
| 4. Clamp | 5. Bracket | 6. Clamp |
| 7. Water outlet | 8. Clamp | 9. Clamp |
| 10. Clamp | 11. Cylinder block heater (Canada) | A. From electric throttle control actuator |
| B. To radiator | C. To heater core / CVT oil warmer | D. To CVT oil warmer |
| E. To heater core | F. To electric throttle control actuator | ← Front |

WATER OUTLET

< REMOVAL AND INSTALLATION >

[HR16DE]

Removal and Installation

INFOID:00000009269218

WARNING:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the radiator cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. 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 belt.
2. Remove air ducts and air cleaner assembly. Refer to [EM-25, "Removal and Installation"](#).
 3. Remove battery wedge bracket. Refer to [PG-63, "Removal and Installation"](#).
 4. Disconnect radiator hose (upper). Refer to [CO-14, "Exploded View"](#).
 5. Disconnect harness connector from engine coolant temperature sensor.
 6. Disconnect harness connector from cylinder block heater (Canada only).
 7. Disconnect water hoses and heater hoses from water outlet.
 8. Remove water outlet.
 9. Remove engine coolant temperature sensor from water outlet, if necessary.
 10. Remove cylinder block heater from water outlet, if necessary (Canada only).

INSTALLATION

Installation is in the reverse order of removal.

INSPECTION AFTER INSTALLATION

- Before starting engine, check oil/fluid levels, including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to [MA-12, "Fluids and Lubricants"](#).
- Use procedure below to check for fuel leakage.
- Turn ignition switch ON (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

NOTE:

- If hydraulic pressure inside timing chain tensioner drops after removal and installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gas, or any oils/fluids, including engine oil and engine coolant.
 - Bleed air from passages in lines and hoses, such as in cooling system.
 - After cooling down engine, again check oil/fluid levels, including engine oil and engine coolant. Refill to specified level, if necessary.
 - Summary of the inspection items:

Item		Before starting engine	Engine running	After engine stopped
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Engine oil		Level	Leakage	Level
Transmission/ transaxle fluid	A/T and CVT Models	Leakage	Level/Leakage	Leakage
	M/T Models	Level/Leakage	Leakage	Level/Leakage
Other oils and fluids*		Level	Leakage	Level
Fuel		Leakage	Leakage	Leakage
Exhaust gas		—	Leakage	—

*Power steering fluid, brake fluid, etc.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[HR16DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Standard and Limit

INFOID:000000009269219

Engine coolant capacity (approximate)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at "MAX" level)*	CVT and A/T models	7.2 (7 5/8, 6 3/8)
	M/T models	6.3 (6 5/8, 5 1/2)
Reservoir tank engine coolant capacity (At "MAX" level)		0.7 (3/4, 5/8)

*: Includes reservoir amount.

Radiator

Unit: kPa (kg/cm², psi)

Cap relief pressure	Standard	88 (0.90, 12.8)
Radiator leak test pressure		156 (1.59, 22.6)

Thermostat

Standard

Valve opening temperature	80.5 - 83.5°C (177 - 182°F)
Maximum valve lift	8.0 mm/95°C (0.315 in/203°F)
Valve closing temperature	77°C (171°F)