SECTION CO
ENGINE COOLING SYSTEM

CONTENTS

MRA8DE

PRECAUTION

PRECAUTIONS

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

INFOID:0000000010304917

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. 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 three minutes before performing any service.**

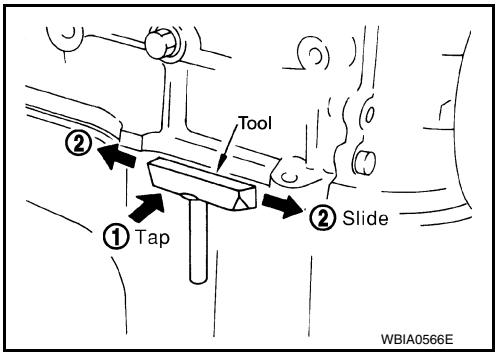
Precaution for Liquid Gasket

INFOID:0000000010304924

REMOVAL OF LIQUID GASKET

- After removing the bolts and nuts, separate the mating surface and remove the old liquid gasket using Tool.

Tool number : KV10111100 (J-37228)



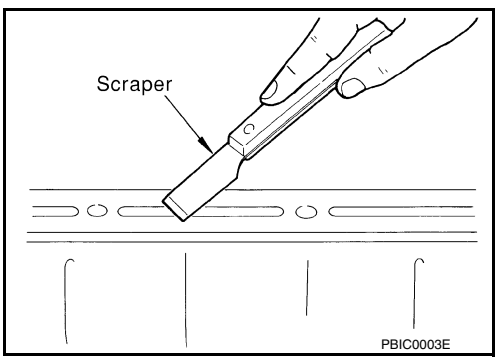
CAUTION:

Do not damage the mating surfaces.

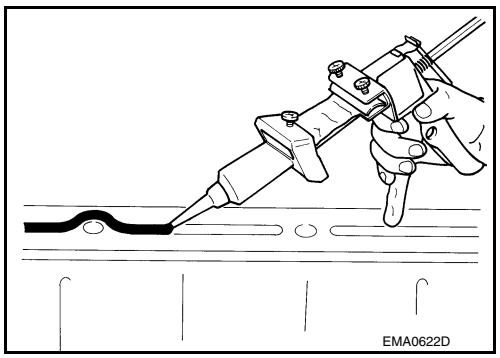
- Tap the seal cutter to insert it (1).
- In areas where the Tool is difficult to use, lightly tap to slide it (2).

LIQUID GASKET APPLICATION PROCEDURE

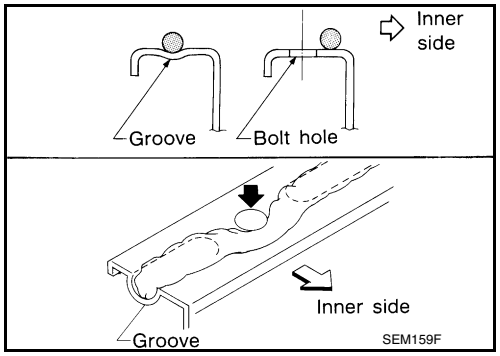
1. Remove the old liquid gasket adhering to the gasket application surface and the mating surface using suitable tool.
   - Remove the liquid gasket completely from the groove of the liquid gasket application surface, bolts, and bolt holes.
2. Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign material.



3. Attach the liquid gasket tube to the suitable tool.
Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-21, "Recommended Chemical Products and Sealants".
4. Apply the liquid gasket without breaks to the specified location with the specified dimensions.



- If there is a groove for the liquid gasket application, apply the liquid gasket to the groove.
- Normally apply the liquid gasket on the inside edge of the bolt holes. Also apply to the outside edge of the bolt holes when specified in the procedure.
- Within five minutes of liquid gasket application, install the mating component.
- If the liquid gasket protrudes, wipe it off immediately.
- Do not retighten after the installation.
- Wait 30 minutes or more after installation before refilling the engine with oil or coolant.



CAUTION:
If there are more specific instructions in the procedures contained in this manual concerning liquid gasket application, observe them.

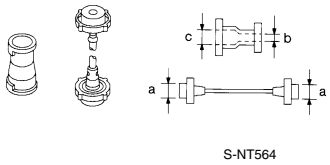
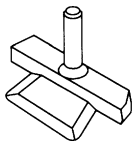
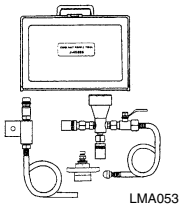
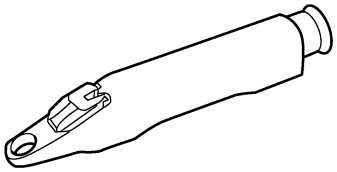
PREPARATION

PREPARATION

Special Service Tool

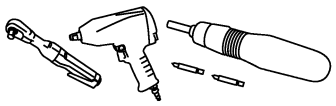
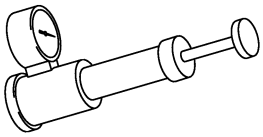
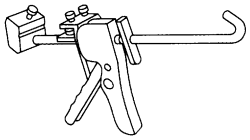
INFOID:0000000009757158

The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name	Description
EG17650301 (J-33984-A) Radiator cap tester adapter  S-NT564	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)
KV10111100 (J-37228) Seal cutter  NT046	Removing chain tensioner cover and water pump cover
KV991J0070 (J-45695) Engine coolant Refill Tool  LMA053	Refilling engine cooling system
— (J-23688) Engine coolant refractometer  WBIA0539E	Checking concentration of ethylene glycol in engine coolant

Commercial Service Tool

INFOID:0000000009757159

Tool name	Description
Power tool  PIIB1407E	Loosening nuts, screws and bolts
Radiator cap tester  PBIC1982E	Testing radiator cap
Tube presser  S-NT052	Pressing the tube of liquid gasket

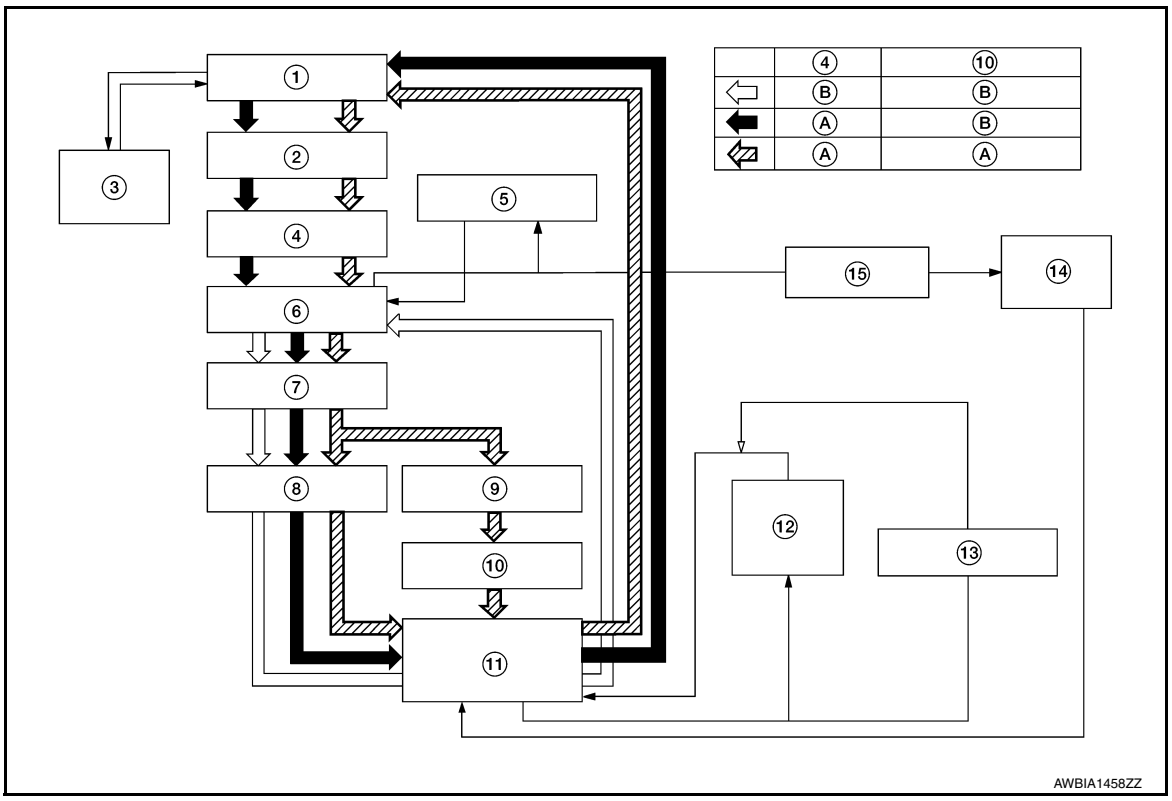
SYSTEM DESCRIPTION

DESCRIPTION

Engine Cooling System Schematic

INFOID:0000000009757160

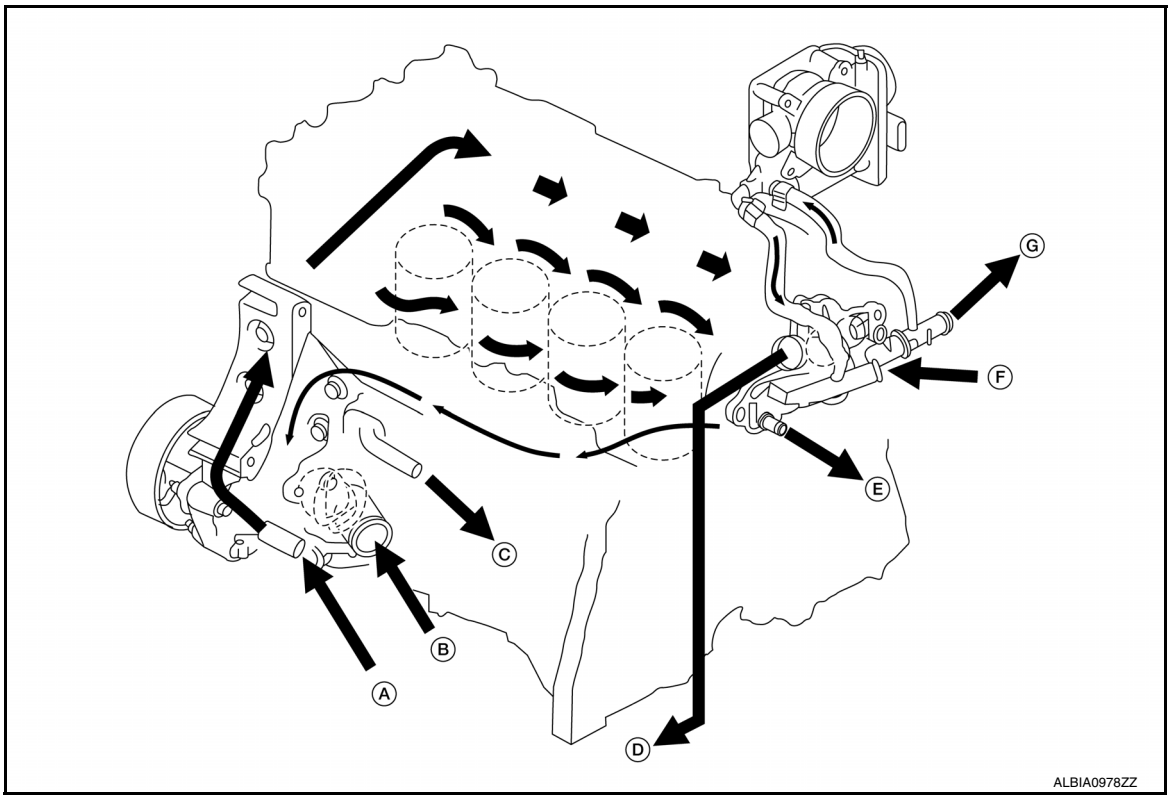
CVT MODELS



1. Radiator
2. Water inlet
3. Reservoir tank
4. Thermostat
5. Engine oil cooler
6. Thermostat housing
7. Water pump
8. Cylinder head
9. Cylinder block
10. Water control valve
11. Water outlet
12. Heater
13. Electric throttle control actuator
14. CVT oil warmer
15. Heater thermostat

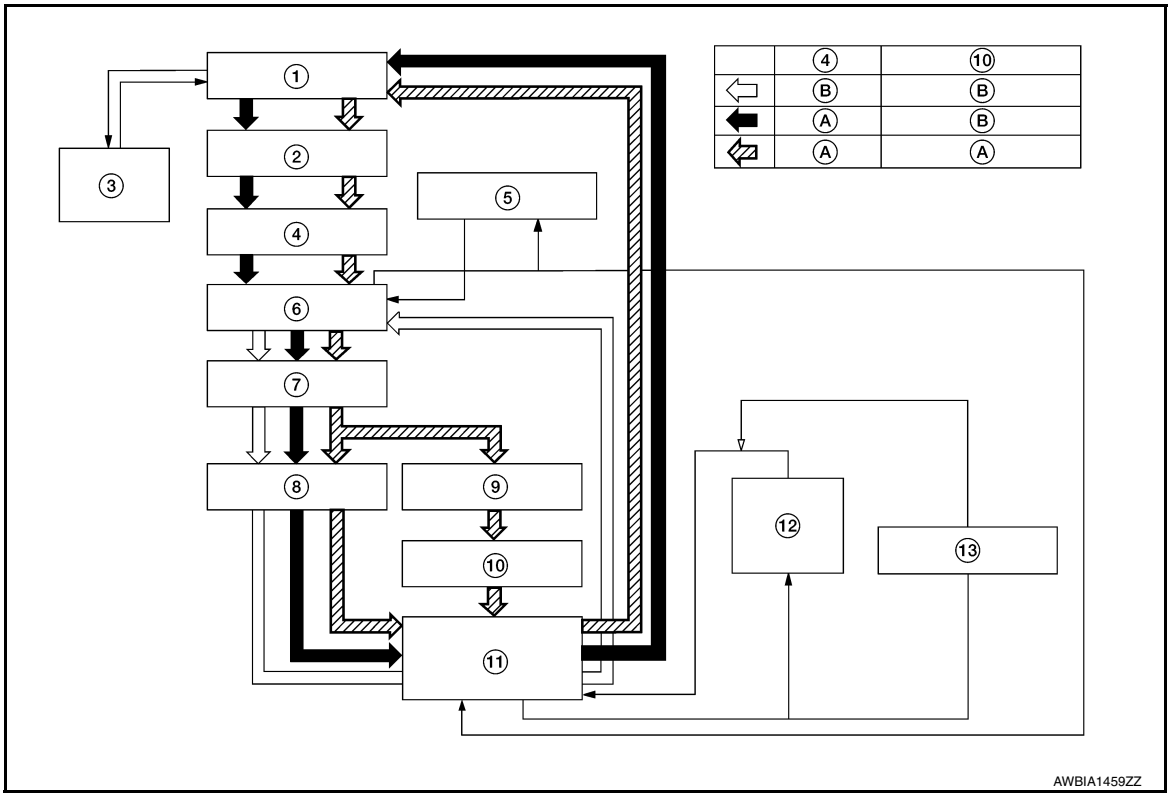
A. Open
B. Closed

CVT MODELS



A. From heater thermostat
B. From radiator
C. To engine oil cooler
D. To filler neck
E. To CVT oil warmer
F. From heater core
G. To heater core

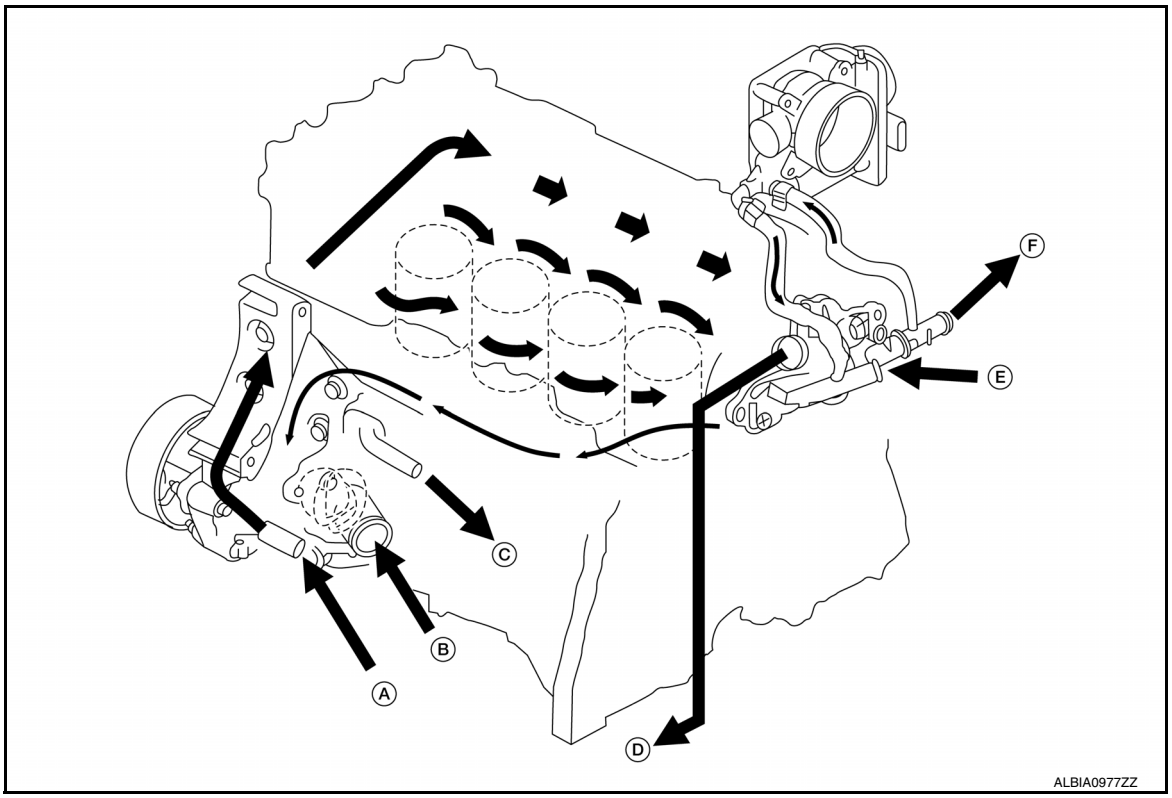
M/T MODELS



1. Radiator
2. Water inlet
3. Reservoir tank
4. Thermostat
5. Engine oil cooler
6. Thermostat housing

7. Water pump
8. Cylinder head
9. Cylinder block
10. Water control valve
11. Water outlet
12. Heater
13. Electric throttle control actuator
A. Open
B. Closed

M/T MODELS



A. From heater thermostat
B. From radiator
C. To engine oil cooler
D. To filler neck
E. From heater core
F. To heater core

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:0000000009757161

	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	Engine coolant circulation	
		Damaged fins	Dust contamination or rock clogging	
			Mechanical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Cooling fan does not operate	Fan shroud and motor 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 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

	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 radiator grille	Installed car brassiere	—
		Blocked bumper	Mud contamination or paper clogging	
		Blocked radiator		
		Blocked condenser		
		Installed large fog lamp		

PERIODIC MAINTENANCE

ENGINE COOLANT

System Inspection

INFOID:0000000009757162

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 cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing down and turning it all the way.**

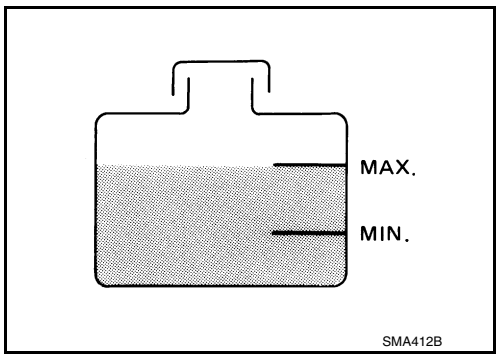
CHECKING COOLING SYSTEM HOSES

Check hoses for the following:

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

CHECKING RESERVOIR LEVEL

- Check if the reservoir tank engine coolant level is within MIN to MAX when the engine is cool.
- Adjust engine coolant level if it is too much or too little.

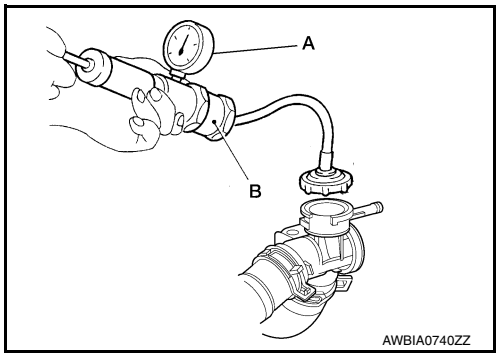


CHECKING COOLING SYSTEM FOR LEAKS

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

Tool number : EG17650301 (J-33984-A)

Testing pressure : Refer to CO-28, "Radiator".



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.

CAUTION:

Higher pressure than specified may cause radiator damage.

CHECKING RADIATOR CAP

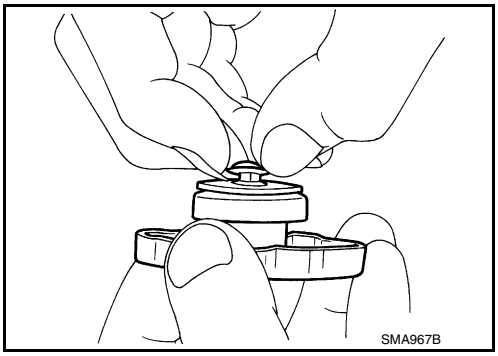
1. Inspect the radiator cap.
   - Replace the cap if the metal plunger cannot be seen around the edge of the black rubber gasket.
   - Replace the cap if deposits of waxy residue or other foreign material are on the black rubber gasket or the metal retainer.

   NOTE:

   Thoroughly wipe out the radiator filler neck to remove any waxy residue or foreign material.

2. Pull the 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 the radiator cap negative-pressure valve.
   - Check that there are no abnormalities in the opening and closing conditions of the negative-pressure valve.

   Negative pressure: Refer to CO-28, "Radiator".

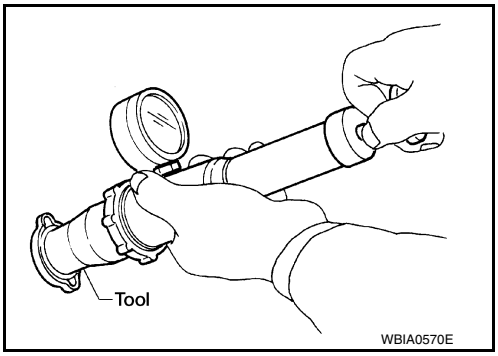


3. Check radiator cap relief pressure using suitable tool and Tool.

   Tool number : EG17650301 (J-33984-A)

   Positive pressure (relief): Refer to CO-28, "Radiator".

   - When connecting the radiator cap to the tester, apply water or engine coolant to the cap seal surface.
   - Replace the radiator cap if there is an abnormality in the negative-pressure valve, or if the open-valve pressure is outside of the standard values.



CHECKING RADIATOR

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

CAUTION:
- **Be careful not to bend or damage the radiator fins.**
- **When radiator is cleaned on-vehicle, remove surrounding parts in order to access the radiator core. 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.
   - Use compressed air lower than 490 kPa (5 kg/cm^2, 71 psi) and keep distance more than 30 cm (11.8 in).
4. Continue to blow air until no water sprays out.
5. Check for engine coolant leaks. Repair as necessary.

Changing Engine Coolant

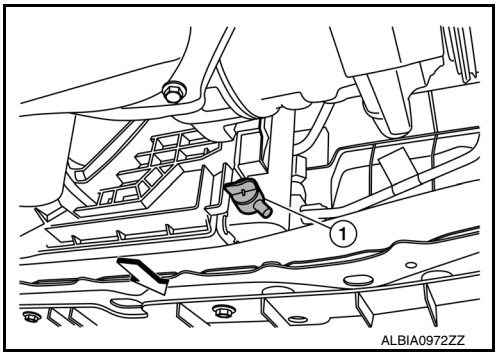
INFOID:0000000009757163

WARNING:
- **To avoid being scalded, do not change the engine coolant when the engine is hot.**
- **Wrap a thick cloth around cap and carefully remove the cap. First, turn the cap a quarter of a turn to release built-up pressure. Then push down and turn the cap all the way to remove.**

DRAINING ENGINE COOLANT

1. Remove the engine under cover. Refer to EXT-16, "Exploded View".
2. Open the radiator drain plug (1) at the bottom of the radiator and remove the radiator filler cap. This is the only step required when partially draining the cooling system (radiator only).

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



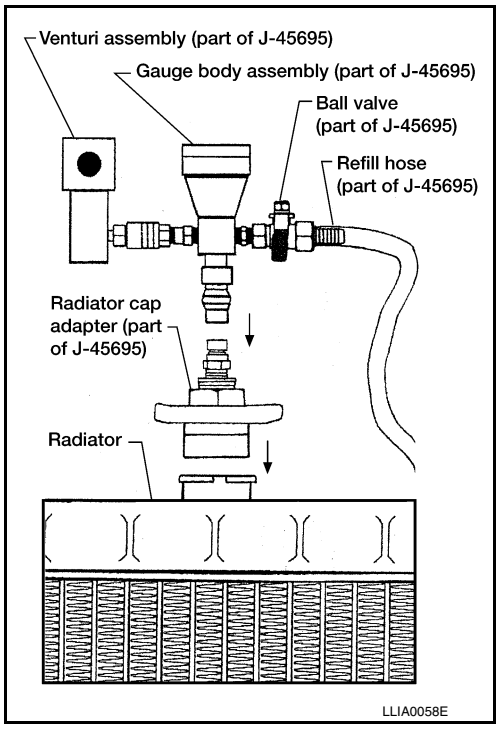
3. Follow this step for heater core removal/replacement only. Disconnect the upper heater hose at the engine side and apply moderate air pressure [103.46 kPa (1.055 kg/cm^2, 15 psi) maximum air pressure] into the hose for 30 seconds to blow the excess engine coolant out of the heater core.
4. When draining all of the engine coolant in the system, remove the reservoir tank and drain the engine coolant, then clean the reservoir tank before installation.
   CAUTION:
   - **Do not allow the engine coolant to contact the drive belt.**
   - **Perform this step when engine is cold.**
5. When draining all of the engine coolant in the system for engine removal or repair, remove the engine coolant drain plugs on the cylinder block.
6. Check the drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If the engine coolant is contaminated, flush the engine cooling system.

REFILLING ENGINE COOLANT

1. Install the radiator drain plug. Install the reservoir tank and cylinder block drain plug, if removed for a total system drain or for engine removal or repair.
   - **The radiator must be completely empty of engine coolant and water.**
   - **Apply sealant to the threads of the cylinder block drain plug. Use Genuine High Performance Thread Sealant or equivalent. Refer to MA-11, "Fluids and Lubricants".**

   Radiator drain plug : Refer to CO-15, "Exploded View".
2. If disconnected, reattach the upper radiator hose at the engine side.
3. 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.
4. 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)



5. Insert the refill hose into the engine coolant mixture container that is placed at floor level. Make sure the ball valve is in the closed position.
   - **Use recommended engine coolant or equivalent. Refer to** MA-11, "Fluids and Lubricants".

   Engine coolant capacity (with reservoir tank) : Refer to CO-28, "Periodical Maintenance Specification".

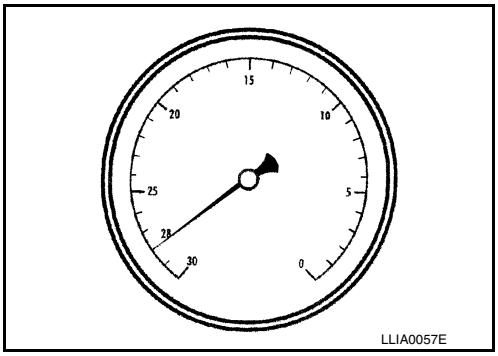
   CAUTION:
   Do not use any cooling system additives such as radiator sealer. Additives may clog the cooling system and cause damage to the engine, transmission and/or cooling system.
6. Install an air hose to the venturi assembly, the air pressure must be within specification.

   Compressed air supply pressure : 549 - 824 kPa (5.6 - 8.4 kg/cm^2, 80 - 119 psi)

   CAUTION:
   The compressed air supply must be equipped with an air dryer.
7. 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. Engine coolant will be visible rising in the refill hose. Once the refill hose is full of engine coolant, close the ball valve. This will purge any air trapped in the refill hose.

8. 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



9. 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.
10. Place the engine 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 engine 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 engine coolant container to get too low when filling, to avoid air from being drawn into the cooling system.
11. Remove the Tool from the radiator neck opening.
12. 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.
13. Install the engine under cover. Refer to EXT-16, "Exploded View".

FLUSHING COOLING SYSTEM

1. Fill the radiator from the filler neck above the radiator upper hose and reservoir tank with clean water and reinstall the radiator filler cap.
2. Run the engine until it reaches normal operating temperature.
3. Rev the engine two or three times under no-load.
4. Stop the engine and wait until it cools down.
5. Drain the water from the system. Refer to CO-12, "Changing Engine Coolant".
6. Repeat steps 1 through 5 until clear water begins to drain from the radiator.

REMOVAL AND INSTALLATION

RADIATOR

Exploded View

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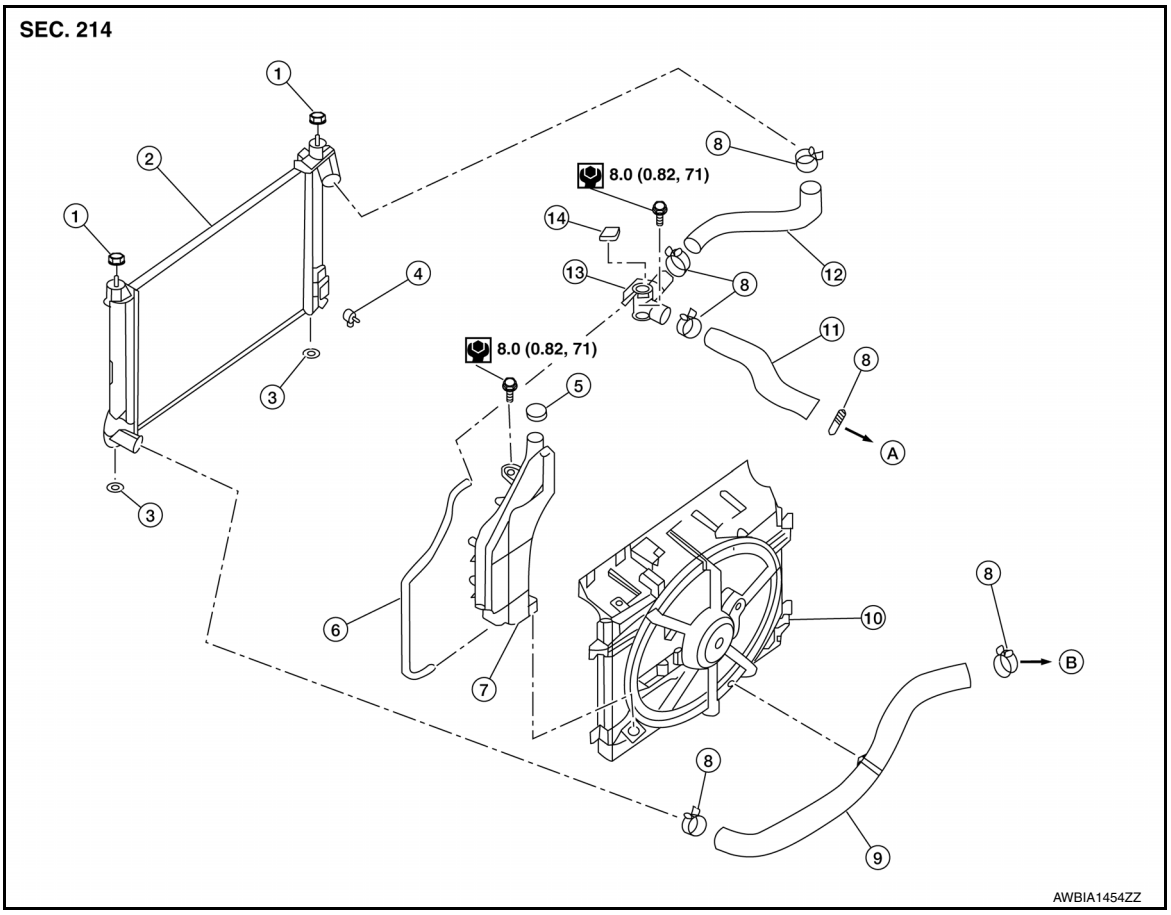


1.	Mounting rubber (upper)	2.	Radiator	3.	Mounting rubber (lower)
4.	Radiator drain plug	5.	Reservoir tank cap	6.	Reservoir tank hose
7.	Reservoir tank	8.	Clamp	9.	Radiator hose (lower)
10.	Fan shroud and motor assembly	11.	Radiator hose (upper)	12.	Filler neck hose
13.	Filler neck	14.	Radiator filler cap	A.	To water outlet
B.	To water inlet				

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 cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and turning it all the way.

NOTE:

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

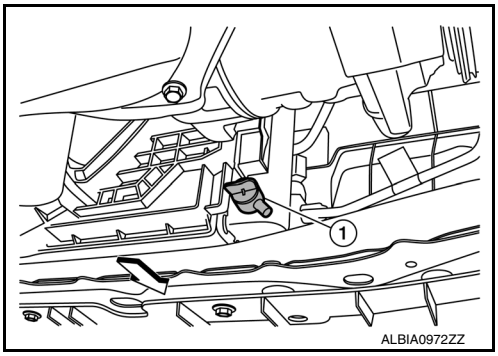
Removal and Installation

INFOID:0000000009757165

REMOVAL

1. Disconnect the negative battery terminal. Refer to PG-52, "Removal and Installation".
2. Remove fan shroud and motor assembly. Refer to CO-17, "Removal and Installation".

3. Remove radiator cap, open radiator drain plug and drain engine coolant from radiator. Refer to CO-12, "Changing Engine Coolant".
   CAUTION:
   - **Perform this step when the engine is cold.**
   - **Do not spill engine coolant on the drive belt.**



4. Remove radiator hose (lower). Refer to CO-15, "Exploded View".
5. Remove condenser bolts from radiator.
6. Remove the radiator from the vehicle.
   CAUTION:
   Be careful not to damage radiator core and condenser assembly core.

INSTALLATION

Installation is in the reverse order of removal.

- After installation, refill engine coolant and check for leaks. Refer to CO-12, "Changing Engine Coolant" and CO-11, "System Inspection".

NOTE:
When installing radiator core support (upper), check that both upper and lower mounts of radiator and air conditioner condenser are inserted in the mounting holes of radiator core support (upper, lower).

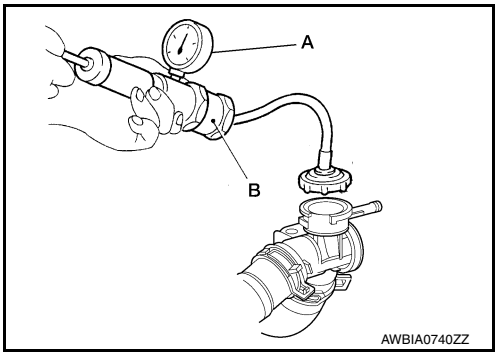
CAUTION:
Do not spill engine coolant in engine compartment. Use a shop cloth to absorb engine coolant.

Inspection

INFOID:0000000009757166

INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using Tool (B) and suitable tool (A). Refer to CO-11, "System Inspection".



Tool number : EG17650301 (J-33984-A)

Testing pressure : Refer to CO-28, "Radiator".

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.

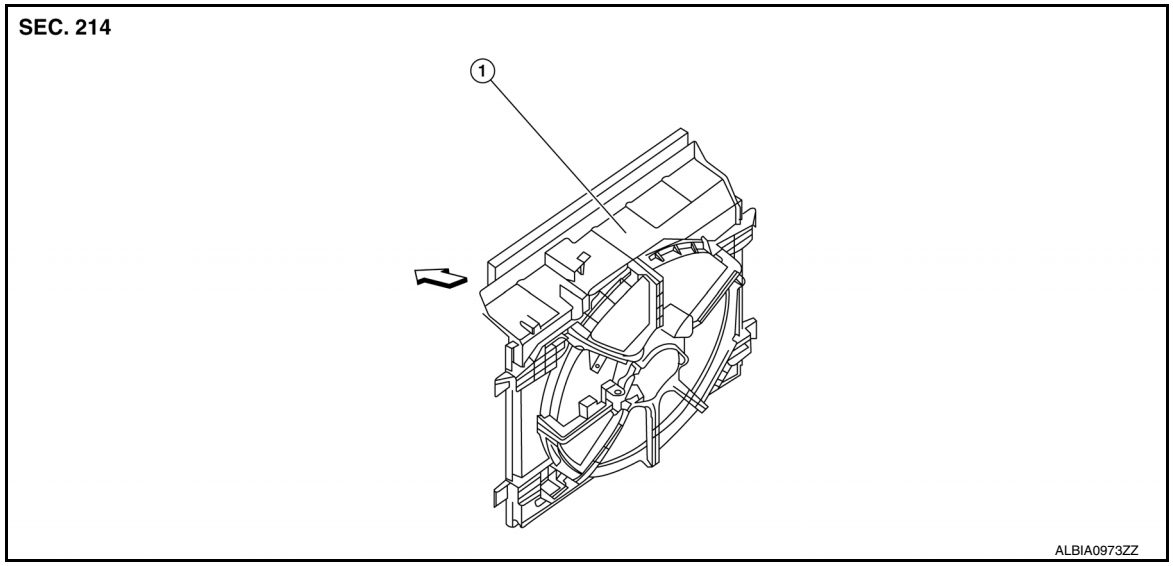
CAUTION:
Higher pressure than specified may cause radiator damage.

- Start and warm up the engine. Visually check that there are no engine coolant or CVT fluid leaks.

COOLING FAN

Component

INFOID:0000000009757167



1. Fan shroud and motor assembly ⇦ Front

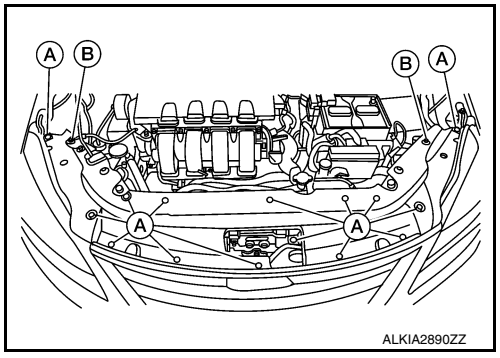
WARNING:
Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and turning it all the way.
NOTE:
- When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.
- Replace the fan shroud and motor assembly as a unit. Do not replace cooling fan motor or cooling fan blade separately.

Removal and Installation

INFOID:0000000009757168

REMOVAL

1. Remove engine under cover. Refer to EXT-16, "Exploded View".
2. Partially drain engine coolant from the radiator. Refer to CO-12, "Changing Engine Coolant".
   CAUTION:
   - **Perform this step when the engine is cold.**
   - **Do not spill engine coolant on the drive belt.**
3. Remove the radiator core support upper cover clips (A) and screws (B), and remove.



4. Remove the hood lock assembly from radiator core support (upper). Refer to DLK-154, "HOOD LOCK CONTROL : Removal and Installation".

5. Remove the radiator core support (upper) bolts, then remove the radiator core support (upper). Refer to CO-15, "Exploded View".
6. Disconnect filler neck hose from radiator and radiator hose (upper) from water inlet.
7. Remove filler neck screws from fan shroud and motor assembly, then remove filler neck with attached hoses.
8. Remove reservoir tank and reservoir tank hose.
9. Disconnect fan shroud and motor assembly harness connector.
10. Remove fan shroud and motor assembly.

INSTALLATION

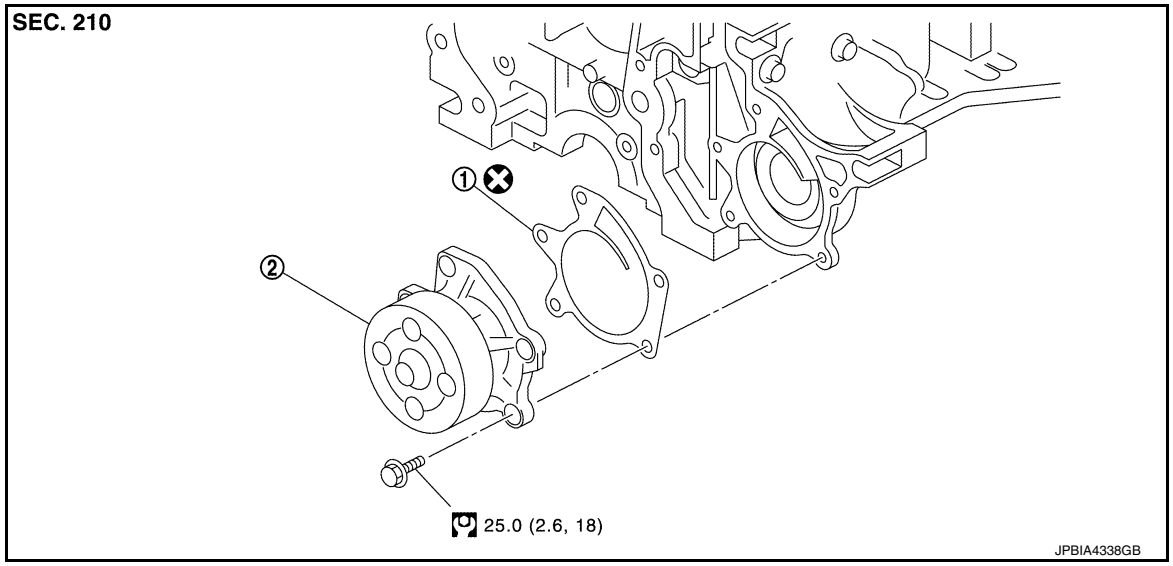
Installation is in the reverse order of removal.

- After installation refill engine coolant and check for leaks. Refer to CO-12, "Changing Engine Coolant" and CO-11, "System Inspection".
  CAUTION:
  Do not spill engine coolant in engine compartment. Use a shop cloth to absorb engine coolant.
- Fan shroud and motor assembly is controlled by ECM. Refer to EC-63, "On Board Diagnosis Function".

WATER PUMP

Exploded View

INFOID:0000000009757169



1. Gasket
2. Water pump

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 cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and turning it all the way.

CAUTION:
- **When removing water pump assembly, be careful not to get engine coolant on drive belt.**
- **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.**

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

Removal and Installation

INFOID:0000000009757170

REMOVAL

1. Disconnect the negative battery terminal. Refer to PG-52, "Removal and Installation".
2. Remove fan shroud and motor assembly. Refer to CO-17, "Removal and Installation".
   CAUTION:
   - **Perform this step when the engine is cold.**
   - **Do not spill engine coolant on the drive belt.**
3. Partially remove front fender protector (RH). Refer to EXT-27, "FENDER PROTECTOR : Exploded View".
4. Remove drive belt. Refer to EM-15, "Removal and Installation".
5. Remove generator. Refer to CHG-29, "Removal and Installation".
6. Remove water pump bolts, then remove water pump and gasket.
   - Engine coolant will leak from cylinder block, so have a receptacle ready below.

   CAUTION:
   - **Handle water pump vane so that it does not contact any other parts.**
   - **Water pump cannot be disassembled and should be replaced as an assembly.**

INSTALLATION

Installation is in the reverse order of removal.

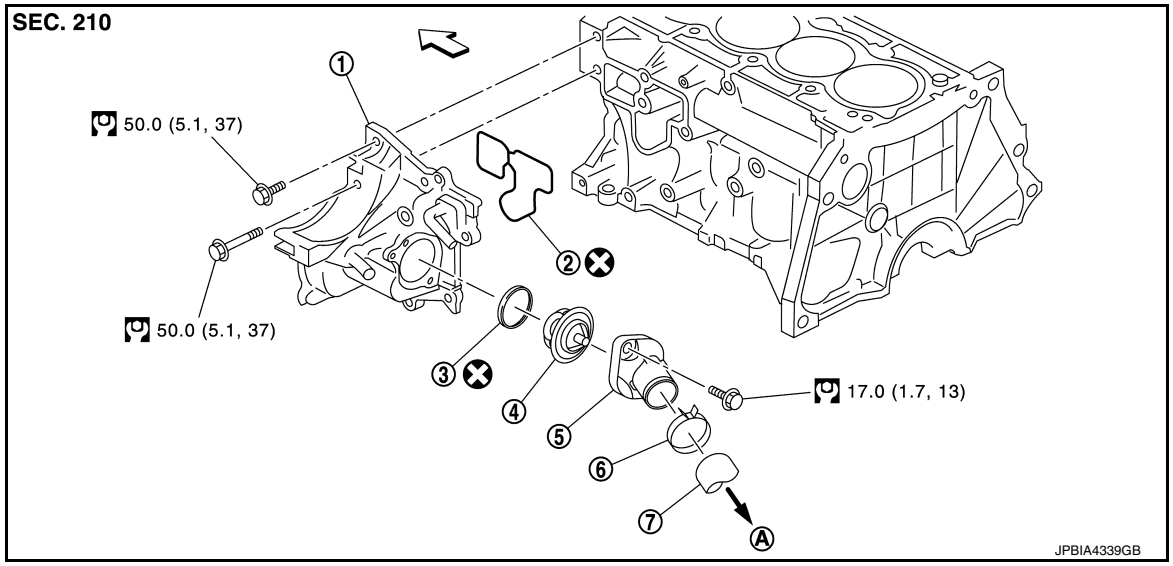
CAUTION:

Do not reuse gasket.

THERMOSTAT AND THERMOSTAT HOUSING

Exploded View

INFOID:0000000009757171



1.	Thermostat housing	2.	Gasket	3.	Rubber ring
4.	Thermostat	5.	Water inlet	6.	Clamp
7.	Radiator hose (upper)	A.	To radiator	⇦	Front

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 cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and 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 and Installation of Thermostat

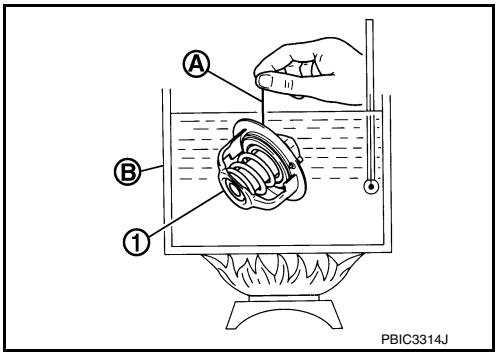
INFOID:0000000009757172

REMOVAL

1. Remove engine under cover. Refer to EXT-16, "Exploded View".
2. Drain engine coolant from radiator. Refer to CO-12, "Changing Engine Coolant".
   CAUTION:
   - **Perform this step when the engine is cold.**
   - **Do not spill engine coolant on the drive belt.**
3. Disconnect radiator hose (lower) from water inlet side. Refer to CO-15, "Exploded View".
4. Remove water inlet bolts, then remove water inlet and thermostat.

INSPECTION AFTER REMOVAL

- Place a thread (A) so that it is caught in the valves of the 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 the thermostat falls from the thread.
- Continue heating. Check the full-open lift amount.
  NOTE:
  The full-open lift amount standard temperature for the thermostat is the reference value.
- After checking the full-open lift amount, lower the water temperature and check the valve closing temperature.



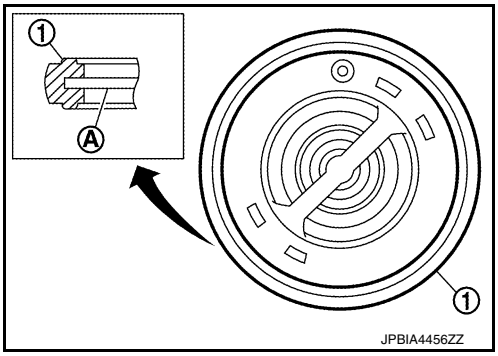
Thermostat	Standard Values
Valve opening temperature	Refer to CO-28, "Thermostat"
Full-open lift amount	Refer to CO-28, "Thermostat"
Valve closing temperature	Refer to CO-28, "Thermostat"

- If valve setting at measured values are out of standard range, replace thermostat.

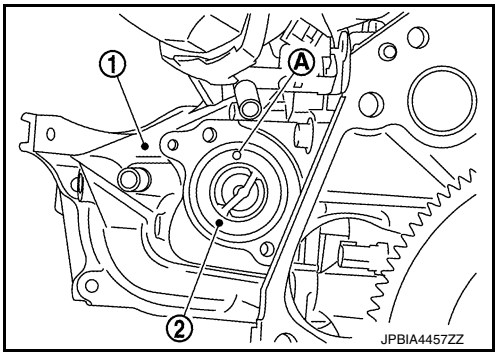
INSTALLATION

Installation is in the reverse order of removal.

- Install the thermostat with the whole circumference of the flange (A) fitting securely inside the rubber ring (1).
  CAUTION:
  Do not reuse rubber ring.



- Install the thermostat (2) into the thermostat housing (1) with the jiggle valve (A) facing upwards. The position deviation may be within the range of ±10°.
- After installation, refill engine coolant and check for leaks. Refer to CO-12, "Changing Engine Coolant" and CO-11, "System Inspection".



Removal and Installation of Thermostat Housing

INFOID:0000000009757173

REMOVAL

1. Remove the generator. Refer to CHG-29, "Removal and Installation".
2. Partially remove the fender protector (LH). Refer to EXT-28, "FENDER PROTECTOR : Removal and Installation - Front Fender Protector".
3. Remove the thermostat housing bolts, then remove the thermostat housing.
4. Remove thermostat if necessary. Refer to CO-21, "Removal and Installation of Thermostat".
5. Remove water pump if necessary. Refer to CO-19, "Removal and Installation".

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Do not reuse gasket**

- **Do not spill engine coolant on the drive belt.**

Inspection

INFOID:0000000009757174

INSPECTION AFTER INSTALLATION

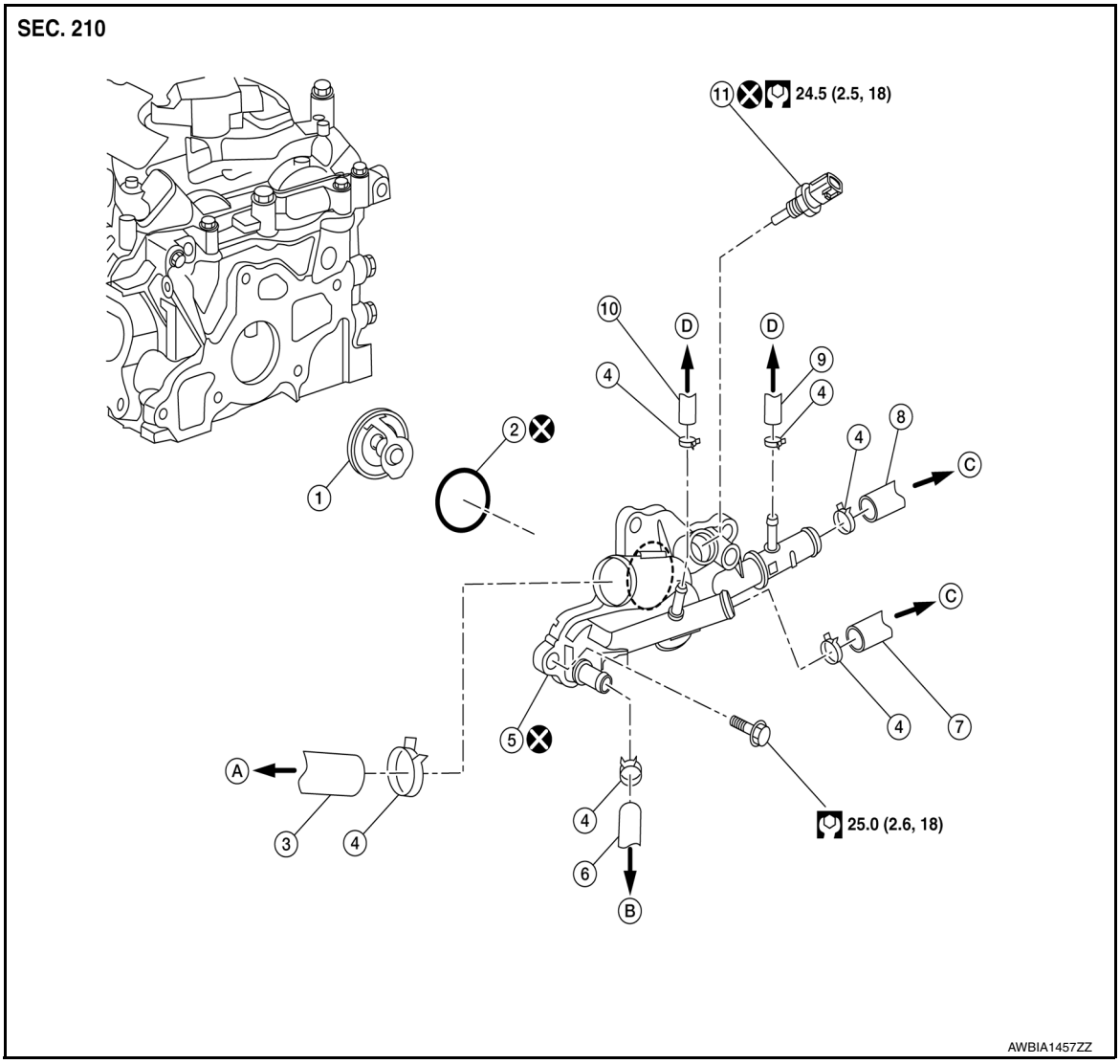
After installation, refill engine coolant and check for leaks. Refer to CO-11, "System Inspection" and CO-12, "Changing Engine Coolant".

WATER OUTLET

Exploded View

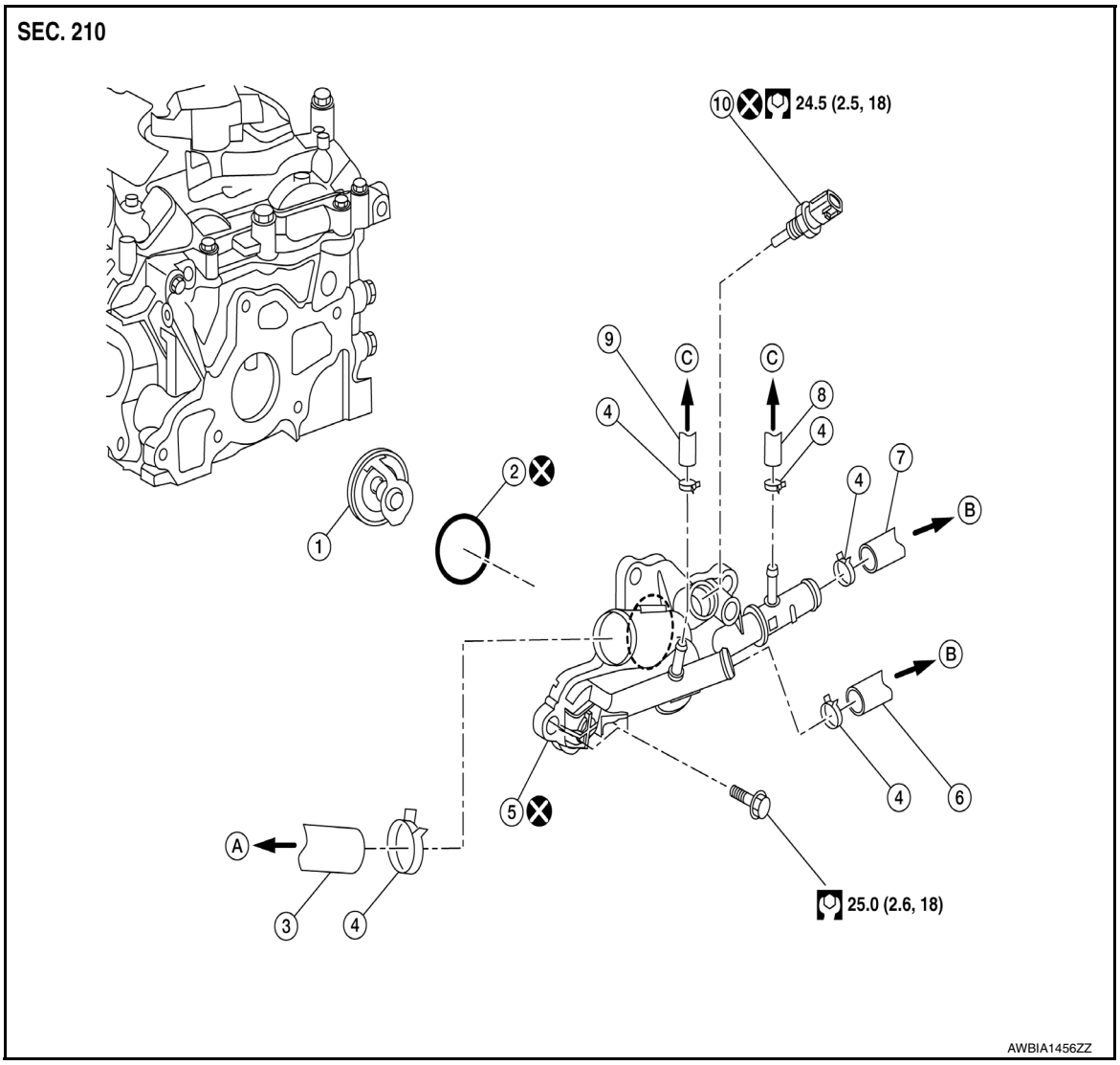
INFOID:0000000009757175

CVT MODELS



1.	Water control valve	2.	Rubber ring	3.	Radiator hose (upper)
4.	Clamp	5.	Water outlet	6.	CVT oil warmer hose (outlet)
7.	Heater hose (inlet)	8.	Heater hose (outlet)	9.	Electric throttle control actuator hose (outlet)
10.	Electric throttle control actuator hose (inlet)	11.	Engine coolant temperature sensor	A.	To filler neck
B.	To CVT oil warmer	C.	To heater core	D.	To electric throttle control actuator

M/T MODELS



1.	Water control valve	2.	Rubber ring	3.	Radiator hose (upper)
4.	Clamp	5.	Water outlet	6.	Heater hose (inlet)
7.	Heater hose (outlet)	8.	Electric throttle control actuator hose (outlet)	9.	Electric throttle control actuator hose (inlet)
10.	Engine coolant temperature sensor	A.	To filler neck	B.	To heater core
C.	To electric throttle control actuator				

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 cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and 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 and Installation

INFOID:0000000009757176

REMOVAL

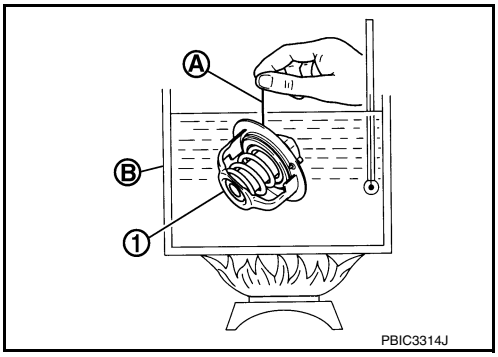
1. Remove the battery. Refer to PG-50, "Removal and Installation (Battery)".
2. Drain engine coolant from radiator. Refer to CO-12, "Changing Engine Coolant".
   CAUTION:

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

3. Remove engine under cover. Refer to EM-24, "Exploded View".
4. Remove air cleaner and air duct. EM-25, "Removal and Installation".
5. Disconnect engine coolant temperature sensor.
6. Remove radiator hose (upper), water hoses and heater hoses from water outlet.
7. Remove water outlet bolts and remove water outlet and rubber ring with water control valve.
8. Remove engine coolant temperature sensor from water outlet, if necessary.

INSPECTION AFTER REMOVAL

- Place a thread (A) so that it is caught in the valves of the water control valve (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 the water control valve falls from the thread.
- Continue heating. Check the full-open lift amount.
  NOTE:
  The full-open lift amount standard temperature for the water control valve is the reference value.
- After checking the full-open lift amount, lower the water temperature and check the valve closing temperature.



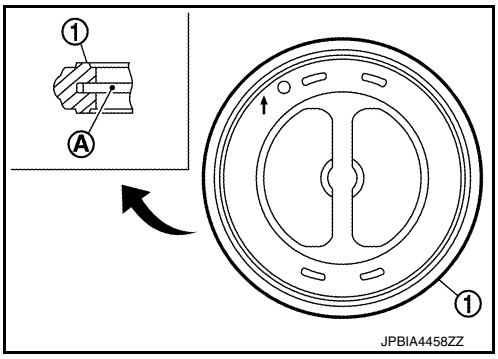
water control valve	Standard Values
Valve opening temperature	Refer to CO-28, "Thermostat"
Full-open lift amount	Refer to CO-28, "Thermostat"
Valve closing temperature	Refer to CO-28, "Thermostat"

- If valve setting at measured values are out of standard range, replace water control valve.

INSTALLATION

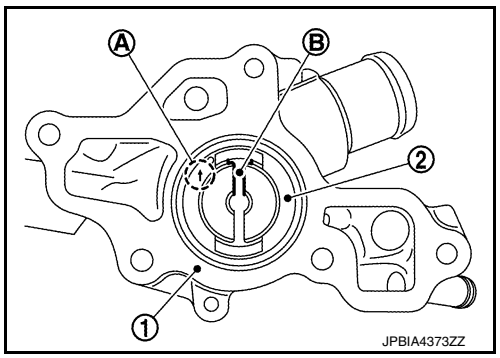
Installation is in the reverse order of removal.
Install the engine coolant temperature sensor if removed.
Use Genuine RTV Silicone Sealant or equivalent. Refer to MA-11, "Fluids and Lubricants".
CAUTION:

- **Do not reuse rubber-ring.**
- **Do not reuse water outlet.**
- **If removed, do not reuse engine coolant temperature sensor.**
- Install water control valve with the rubber ring (1) groove fit onto water control valve flange (A).



- Install water control valve (2) with the arrow (A) facing up, and the frame center part (B) facing engine.

(1) : Water outlet



CAUTION:
Do not spill engine coolant in engine compartment. Use a shop cloth to absorb engine coolant.

INSPECTION AFTER INSTALLATION

After installation, refill engine coolant and check for leaks. Refer to CO-11, "System Inspection" and CO-12, "Changing Engine Coolant".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:0000000009757177

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at “MAX” level)	CVT models	6.6 (7, 5-7/8)
	M/T models	
Reservoir tank engine coolant capacity (At “MAX” level)		0.6 (5/8, 1/2)

Radiator

INFOID:0000000009757178

Unit: kPa (kg/cm^2, psi)

Cap relief pressure	Standard	88 ± 9.8 (0.90 ± 0.10, 12.8 ± 1.42)
	LImit	59 (0.6, 9)
Leakage testing pressure		156 (1.6, 23)

Thermostat

INFOID:0000000009757179

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)

Water Control Valve

INFOID:0000000009757180

Standard

Valve opening temperature	93.5 - 96.5°C (200 - 206°F)
Maximum valve lift	8.0 mm/108°C (0.315 in/226°F)
Valve closing temperature	90°C (194°F)