

CO

SECTION

ENGINE COOLING SYSTEM

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PRECAUTION

PRECAUTIONS

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

INFOID:000000006921783

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.

Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000006393585

NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)

PRECAUTIONS

< PRECAUTION >

[QR25DE]

6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Liquid Gasket

INFOID:000000006393586

REMOVAL OF LIQUID GASKET SEALING

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

Tool number : KV10111100 (J-37228)

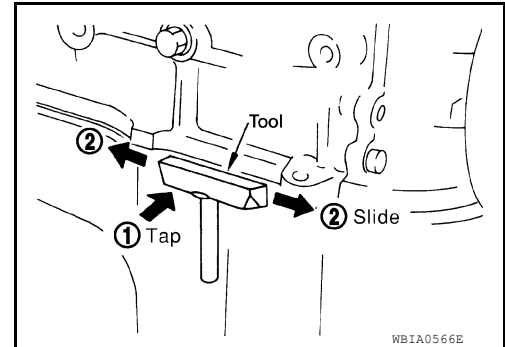
CAUTION:

Be careful not to damage the mating surfaces.

- Tap (1) Tool to insert it, and then slide it (2) by tapping on the side as shown.
- In areas where Tool is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

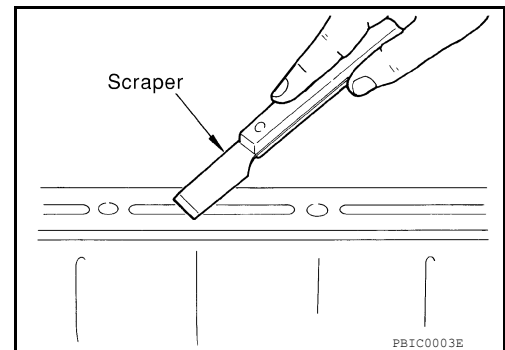
CAUTION:

If for some unavoidable reason suitable tool such as screw-driver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

- Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface, Using scraper.
 - Remove liquid gasket completely from the groove of the liquid gasket application surface, bolts, and bolt holes.
- Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign materials.

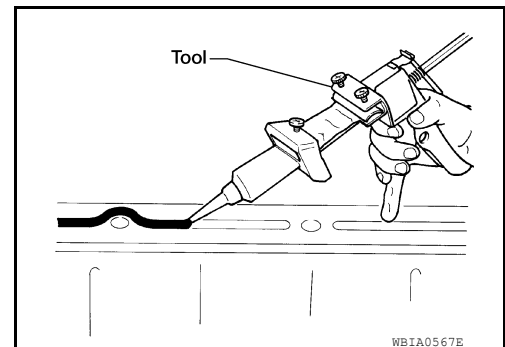


- Attach liquid gasket tube to Tool.

Tool number : WS39930000 (—)

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-15, "Recommended Chemical Products and Sealants".

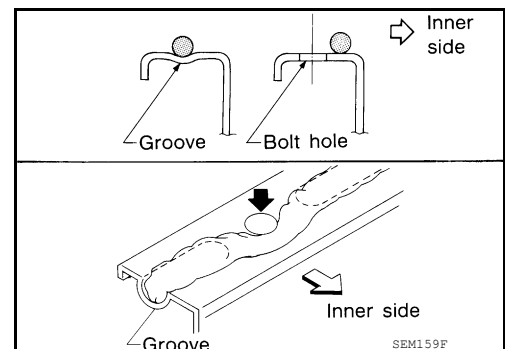
- Apply liquid gasket without breaks to the specified location with the specified dimensions.



- If there is a groove for the liquid gasket application, apply liquid gasket to the groove.
- As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
- Within five minutes of liquid gasket application, install the mating component.
- If liquid gasket protrudes, wipe it off immediately.
- Do not retighten nuts or bolts after the installation.
- After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.

CAUTION:

Carefully follow all of the warnings, cautions, notes, and procedures contained in this manual.



PREPARATION

< PREPARATION >

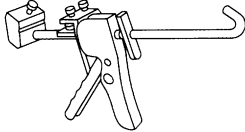
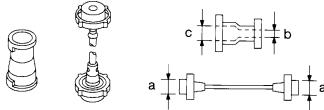
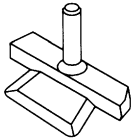
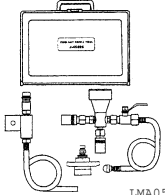
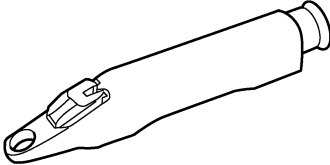
[QR25DE]

PREPARATION

Special Service Tool

INFOID:000000006393587

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

Tool number (Kent-Moore No.) Tool name	Description
WS39930000 (—) Tube presser	Pressing the tube of liquid gasket
 S-NT052	
EG17650301 (J-33984-A) Radiator cap tester adapter	Adapting radiator cap tester to radiator filler neck: a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)
 S-NT564	
KV10111100 (J-37228) Seal cutter	Removing chain tensioner cover and water pump cover
 NT046	
KV991J0070 (J-45695) Coolant Refill Tool	Refilling engine cooling system
 LMA053	
— (J-23688) Engine coolant refractometer	Checking concentration of ethylene glycol in engine coolant
 WBIA0539E	


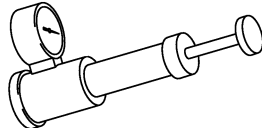
Commercial Service Tool

INFOID:000000006393588

PREPARATION

< PREPARATION >

[QR25DE]

Tool name	Description
Power tool  PIIB1407E	Loosening nuts, screws and bolts
Radiator cap tester  PBIC1982E	Testing radiator cap

COOLING SYSTEM

< SYSTEM DESCRIPTION >

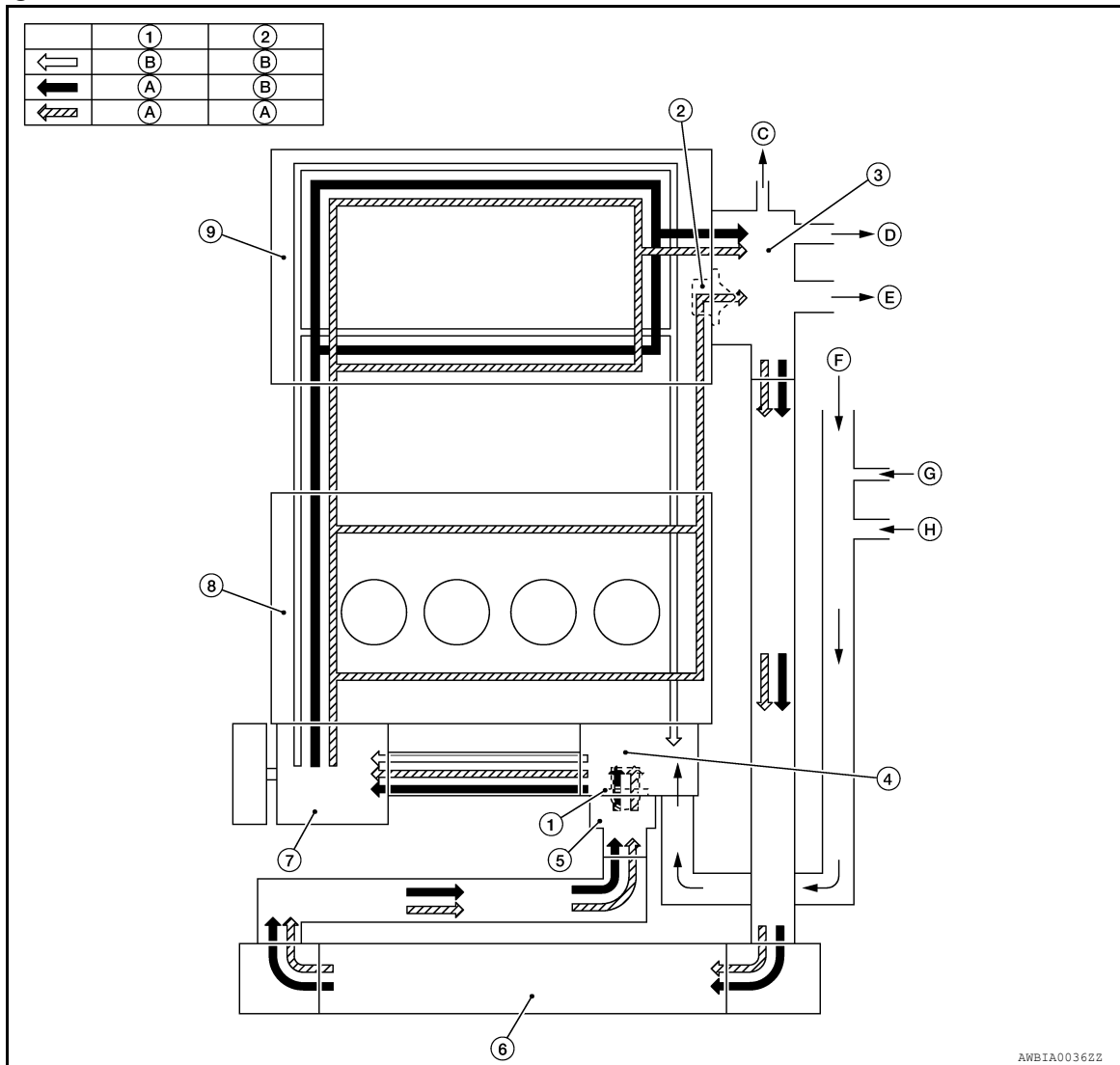
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SYSTEM DESCRIPTION

COOLING SYSTEM

Cooling Circuit

INFOID:000000006393589



- | | | |
|--|------------------------|---|
| 1. Thermostat | 2. Water control valve | 3. Water control valve housing (Water outlet) |
| 4. Cylinder block (Thermostat housing) | 5. Water inlet | 6. Radiator |
| 7. Water pump | 8. Cylinder block | 9. Cylinder head |
| A. Open | B. Closed | C. To electric throttle control |
| D. To oil cooler | E. To heater | F. From heater |
| G. From electric throttle control | H. From oil cooler | |

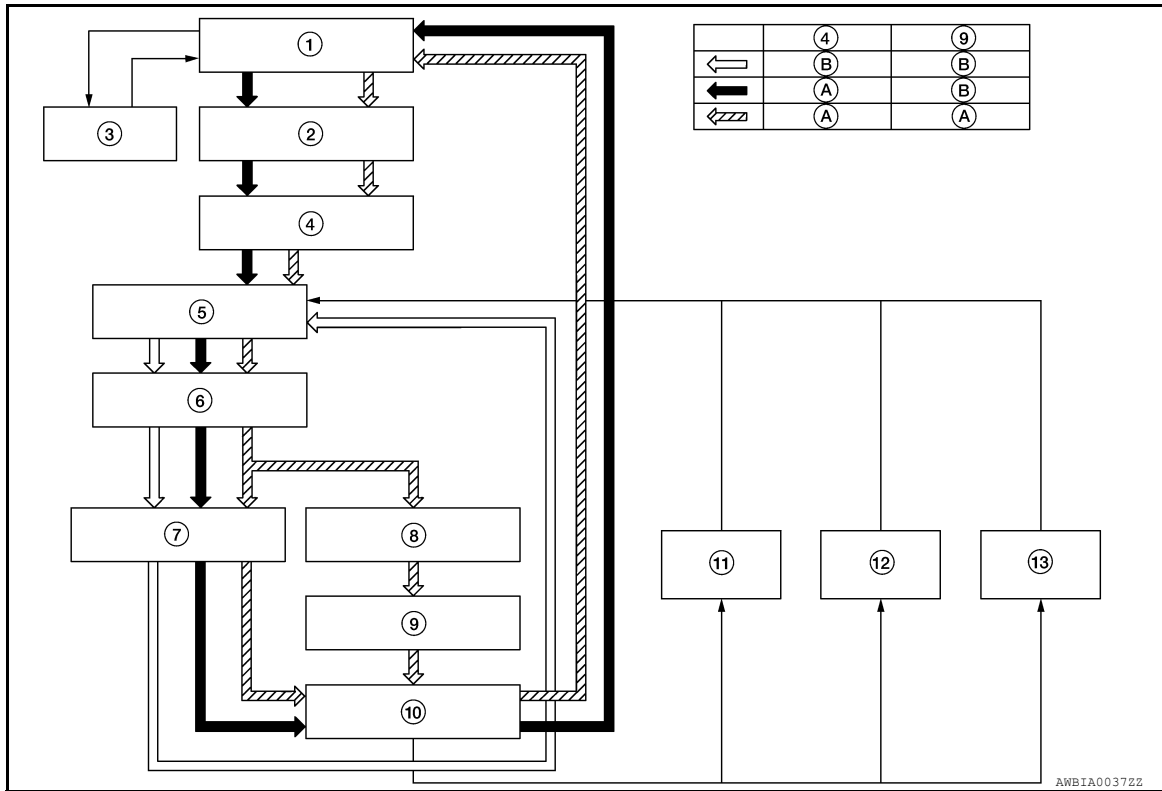
COOLING SYSTEM

< SYSTEM DESCRIPTION >

[QR25DE]

Schematic

INFOID:000000006393590



- | | | |
|---------------------------------|-----------------------|------------------------|
| 1. Radiator | 2. Water inlet | 3. Reservoir tank |
| 4. Thermostat | 5. Thermostat housing | 6. Water pump |
| 7. Cylinder head | 8. Cylinder block | 9. Water control valve |
| 10. Water control valve housing | 11. Heater | 12. Oil cooler |
| 13. Electric throttle control | A. Open | B. Closed |

OVERHEATING CAUSE ANALYSIS

< SYSTEM DESCRIPTION >

[QR25DE]

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000006393591

		Symptom	Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	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	Engine cooling fans	—
		High resistance to fan rotation		
		Damaged fan blades		
	Damaged radiator shroud	—	Radiator shroud	—
	Improper coolant mixture ratio	—	Coolant viscosity	—
	Poor coolant quality	—	Periodic maintenance	—
	Insufficient coolant	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

< SYSTEM DESCRIPTION >

[QR25DE]

	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:000000006393592

WARNING:

- Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure fluid 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.

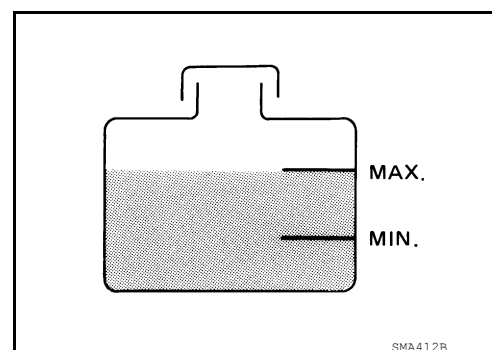
CHECKING COOLING SYSTEM HOSES

Check hoses for the following:

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

CHECKING RESERVOIR LEVEL

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



CHECKING COOLING SYSTEM FOR LEAKS

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

Tool number : EG17650301 (J-33984-A)

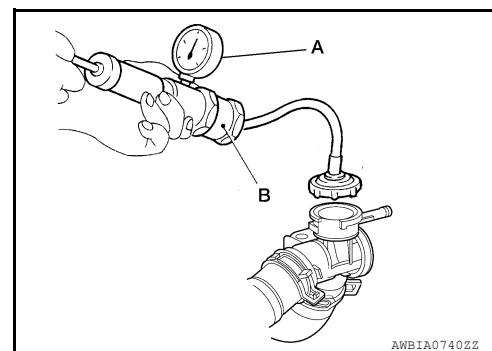
Testing pressure : 157 kPa (1.57 bar, 1.6 kg/cm², 23 psi)

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure 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:

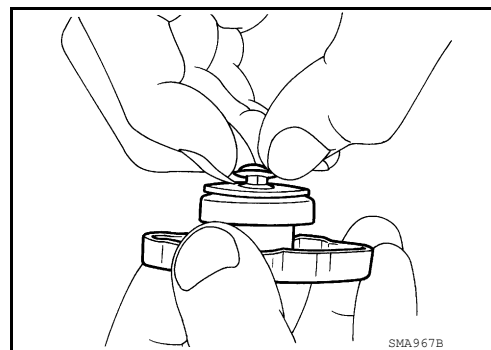
Thoroughly wipe out the radiator filler neck to remove any waxy residue or foreign material.

ENGINE COOLANT

< PERIODIC MAINTENANCE >

[QR25DE]

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.

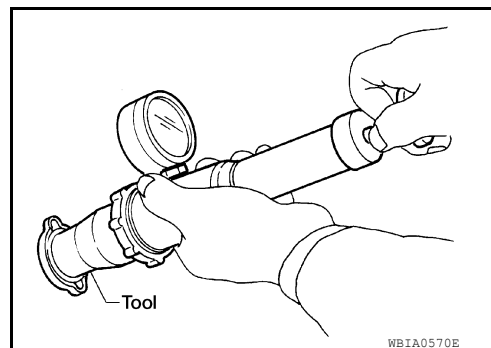


3. Check radiator cap relief pressure using suitable tool and Tool.

Tool number : EG17650301 (J-33984-A)

Standard : Refer to [CO-25, "Radiator"](#).

- When connecting the radiator cap to the tester, apply water or 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 electrical 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 (4.90 bar, 5 kg/cm², 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 coolant leaks. Repair as necessary.

Changing Engine Coolant

INFOID:000000006393593

WARNING:

- **To avoid being scalded, never change the 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, "Removal and Installation - Coupe"](#) (Coupe models) or [EXT-40, "Removal and Installation"](#) (Sedan models).
2. Open the radiator drain plug 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:

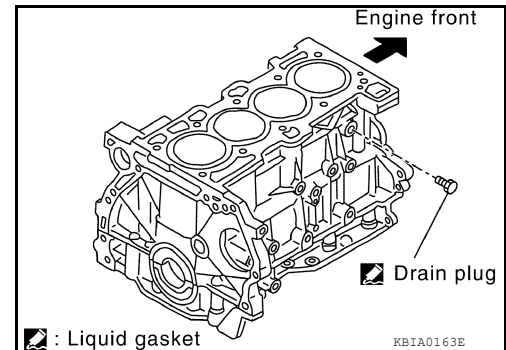
- **Do not to allow the coolant to contact the drive belts**
 - **Perform this step when engine is cold.**
3. Follow this step for heater core removal/replacement only. Disconnect the upper heater hose at the engine side and apply moderate air pressure [103.46 kPa (1.0346 bar, 15 psi, 1.055 kg/cm²) maximum air pressure] into the hose for 30 seconds to blow the excess coolant out of the heater core.

ENGINE COOLANT

< PERIODIC MAINTENANCE >

[QR25DE]

- When draining all of the coolant in the system, remove the reservoir tank and drain the coolant, then clean the reservoir tank before installation.
CAUTION:
 - Do not allow the coolant to contact the drive belts
 - Perform this step when engine is cold.
- When draining all of the coolant in the system for engine removal or repair, open the drain plug on the cylinder block.



- Check the drained coolant for contaminants such as rust, corrosion or discoloration. If the coolant is contaminated, flush the engine cooling system.

REFILLING ENGINE COOLANT

- 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 coolant and water.
 - Apply sealant to the threads of the cylinder block drain plugs. Use Genuine High Performance Thread Sealant or equivalent. Refer to [GI-15, "Recommended Chemical Products and Sealants"](#).

Radiator drain plug : Refer to [CO-15, "Removal and Installation"](#)

Cylinder block drain plug : 9.8 N·m (1.0 kg-m, 87 in-lb)

- If disconnected, reattach the upper radiator hose at the engine side.
- 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.
- 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)

- 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.
 - Use recommended engine coolant. Refer to [MA-12, "SAE Viscosity Number"](#).

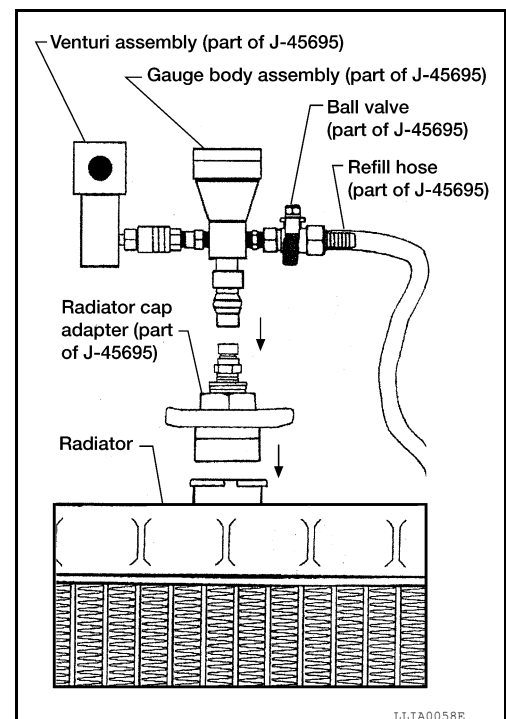
Engine coolant capacity (with reservoir tank) : Refer to [MA-12, "Fluids and Lubricants"](#).

- Install an air hose to the venturi assembly, the air pressure must be within specification.

Compressed air supply pressure : 549 - 824 kPa (5.49 - 8.24 bar, 5.6 - 8.4 kg/cm², 80 - 119 psi)

CAUTION:

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



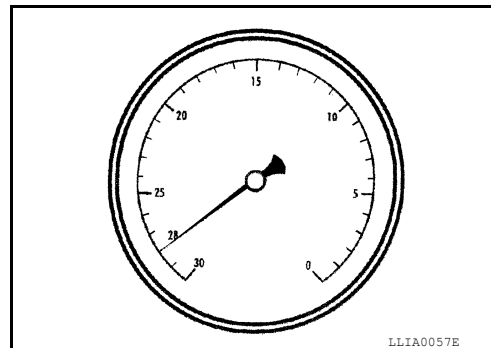
ENGINE COOLANT

[QR25DE]

< PERIODIC MAINTENANCE >

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. 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.
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 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.

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 undercover. Refer to [EXT-16, "Removal and Installation - Coupe"](#) (Coupe models) or [EXT-40, "Removal and Installation"](#) (Sedan models).

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.

RADIATOR

< REMOVAL AND INSTALLATION >

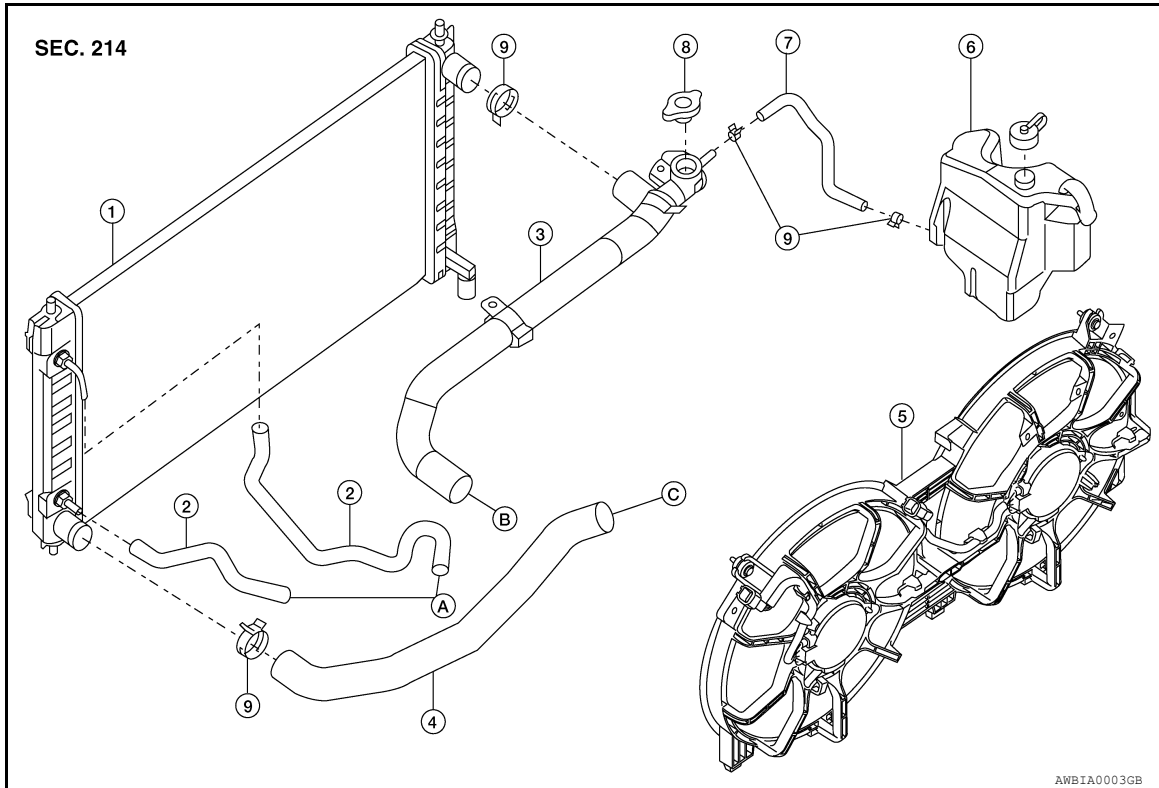
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REMOVAL AND INSTALLATION

RADIATOR

Exploded View

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- | | | |
|--------------------------|--------------------------------------|--------------------------|
| 1. Radiator | 2. CVT oil cooler hose (if equipped) | 3. Radiator hose (upper) |
| 4. Radiator hose (lower) | 5. Cooling fan | 6. Reservoir tank |
| 7. Reservoir hose | 8. Radiator filler cap | 9. Clamps |
| A. To CVT (if equipped) | B. To water outlet | C. To water inlet |

Removal and Installation

INFOID:000000006393595

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter turn to allow built-up pressure to escape. Carefully remove the 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 from the radiator. Refer to [CO-12, "Changing Engine Coolant"](#).
2. Remove front bumper fascia (Coupe only). Refer to [EXT-16, "Removal and Installation - Coupe"](#).
3. Remove engine under cover. Refer to [EXT-40, "Removal and Installation"](#) (Sedan) or [EXT-16, "Removal and Installation - Coupe"](#) (Coupe)
4. Remove front air duct. Refer to [EM-25, "Removal and Installation"](#).
5. Remove battery tray (CVT Models). Refer to [PG-69, "Removal and Installation \(Battery Tray\)"](#) (Coupe models) or [PG-141, "Removal and Installation \(Battery Tray\)"](#) (Sedan models).
6. Remove A/C condenser. Refer to [HA-38, "Removal and Installation for Condenser"](#).
7. Disconnect reservoir hose from radiator hose (upper) connector.

RADIATOR

[QR25DE]

< REMOVAL AND INSTALLATION >

8. Disconnect radiator hose (upper) and (lower).
9. Disconnect the CVT oil cooler hoses, if equipped. Plug the hoses to prevent CVT oil loss.
10. Remove radiator.

CAUTION:

- Do not damage or scratch the radiator core when removing.

INSPECTION AFTER REMOVAL

Radiator

1. 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 electrical connectors to prevent water from entering.
- a. Apply water by hose to the back side of the radiator core, point the hose vertically downward.
- b. Apply water again to all radiator core surfaces once per minute.
- c. Stop washing when no more dirt flows off the radiator.
- d. Blow air into the back side of radiator core, point the air hose vertically downward.
 - Use compressed air lower than 490 kPa (4.90 bar, 5 kg/cm², 71 psi) and keep distance more than 30 cm (11.8 in).
- e. Blow air again into all the radiator core surfaces once per minute until no water sprays out.
2. Inspect radiator for leaks as follows:
 - a. Apply pressure using Tool.

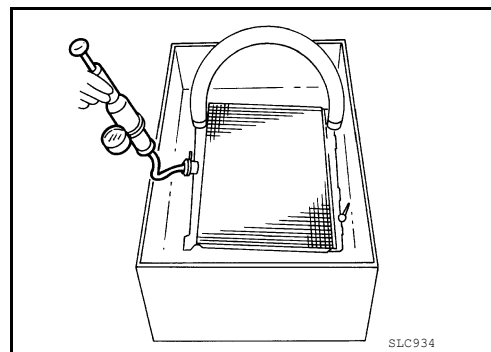
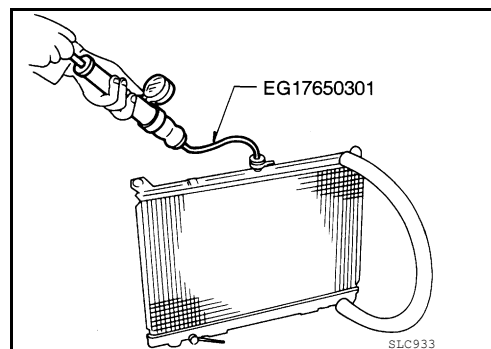
Tool number : EG17650301 (J-33984-A)

Specified pressure value : 157 kPa (1.57 bar, 1.6 kg/cm², 23 psi)

WARNING:

- To prevent the risk of the hose coming undone while under pressure, securely fasten it down with a hose clamp.
- Attach a hose to the oil cooler as well (CVT model only).

- b. Check for leakage.



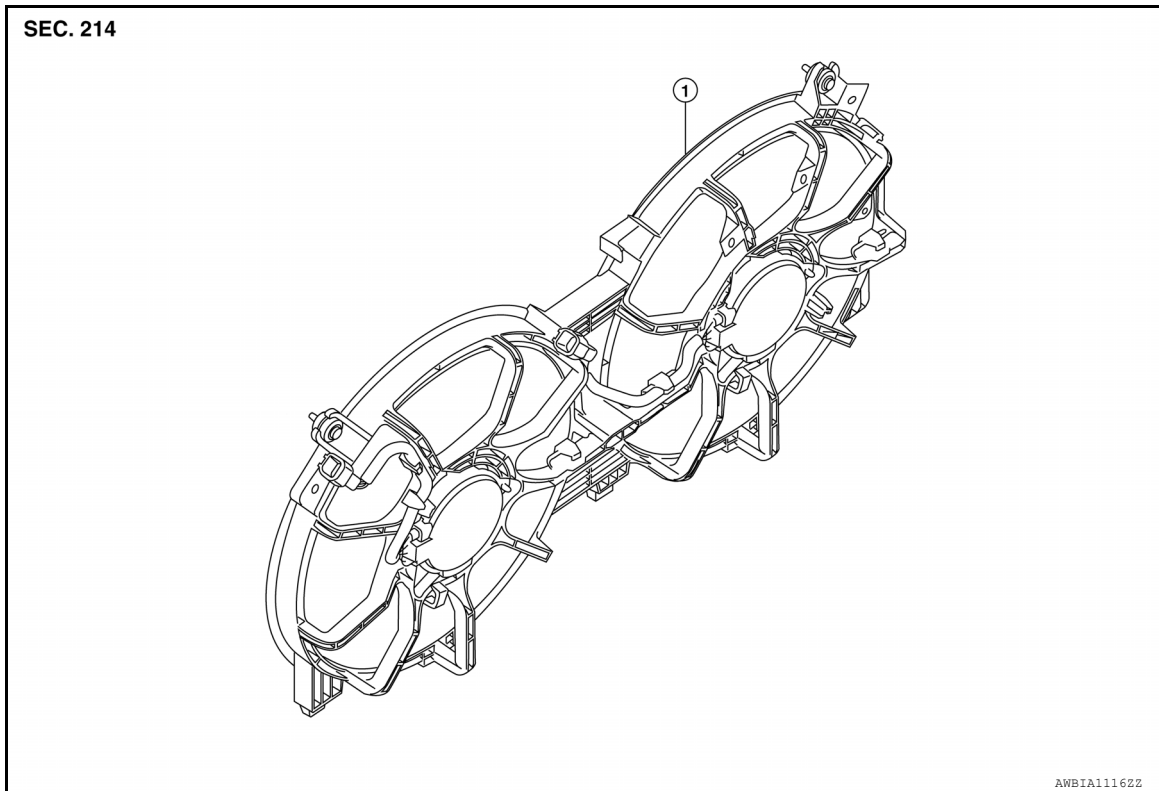
INSTALLATION

Installation is in the reverse order of removal.

COOLING FAN

Exploded View

INFOID:000000006393596



1. Fan shroud and motor assembly

Removal and Installation

INFOID:000000006393597

WARNING:

Never 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 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. Partially drain engine coolant from the radiator. Refer to [CO-12, "Changing Engine Coolant"](#).

CAUTION:

Perform when engine is cold.

2. Remove front air duct. Refer to [EM-25, "Removal and Installation"](#).
3. Disconnect radiator hose (upper).
4. Disconnect fan motor connectors.
5. Remove radiator cooling fan 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 coolant in engine compartment. Use a shop cloth to absorb coolant.

- Cooling fan is controlled by ECM. For details, refer to [EC-169, "Diagnosis Procedure"](#).

WATER PUMP

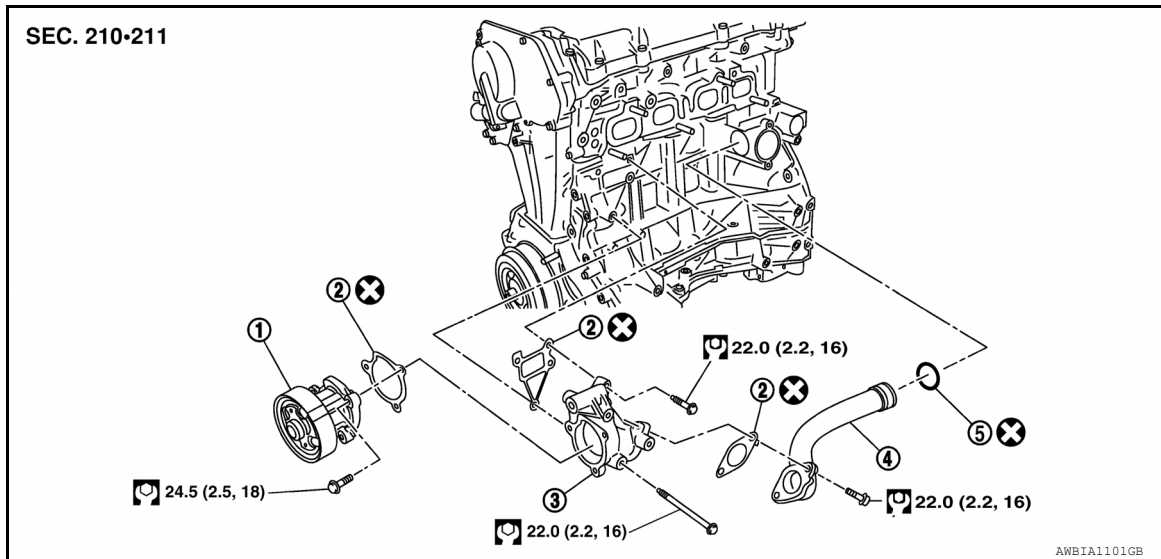
< REMOVAL AND INSTALLATION >

[QR25DE]

WATER PUMP

Exploded View

INFOID:000000006393598



- | | | |
|---------------|------------|-----------------------|
| 1. Water pump | 2. Gaskets | 3. Water pump housing |
| 4. Water pipe | 5. O-ring | |

Removal and Installation

INFOID:000000006393599

WARNING:

Never 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 turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

CAUTION:

- When removing water pump assembly, be careful not to get coolant on drive belt.
- Water pump cannot be disassembled and should be replaced as a unit.
- After installing water pump, connect hoses and clamps securely, then check for leaks using radiator cap tester.

REMOVAL

1. Drain engine coolant from the radiator. Refer to [CO-12, "Changing Engine Coolant"](#).
2. Remove front air duct. Refer to [EM-25, "Removal and Installation"](#).
3. Remove RH wheel and tire assembly. Refer to [WT-65, "Adjustment"](#).
4. Remove generator and generator bracket. Refer to [CHG-27, "Removal and Installation"](#).
5. Remove the water pump and water pump gasket.

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 an assembly.

NOTE:

If it is necessary to remove the water pipe, the exhaust manifold and three way catalyst assembly must be removed. Refer to [EM-30, "Removal and Installation"](#).

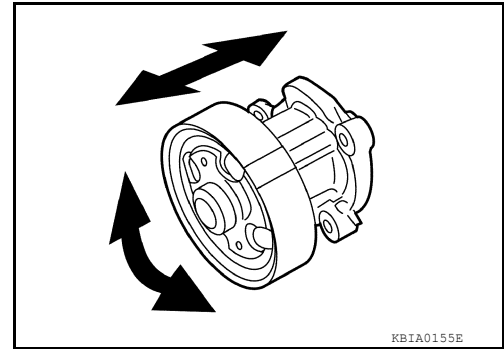
INSPECTION AFTER REMOVAL

WATER PUMP

[QR25DE]

< REMOVAL AND INSTALLATION >

- Visually check that there is no significant dirt or rusting on the water pump body and vane.
- Check that there is no looseness in the vane shaft, and that it turns smoothly when rotated by hand.
- If the water pump does not perform properly, replace the water pump assembly.



INSTALLATION

Installation is in the reverse order of removal.

- When inserting water pipe end to cylinder block, apply a mild soap to O-ring. Then insert it immediately.

CAUTION:

Do not reuse O-ring.

INSPECTION AFTER INSTALLATION

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

THERMOSTAT AND THERMOSTAT HOUSING

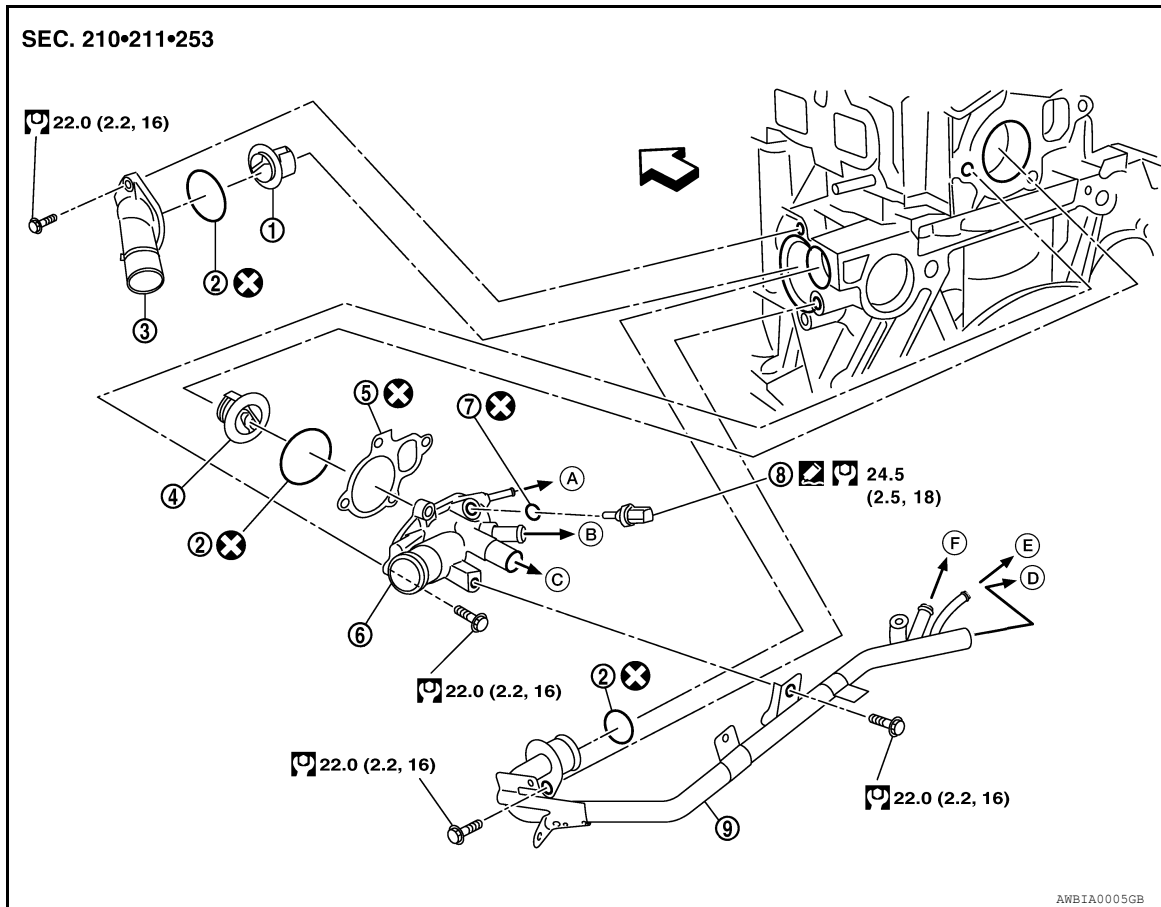
< REMOVAL AND INSTALLATION >

[QR25DE]

THERMOSTAT AND THERMOSTAT HOUSING

Exploded View

INFOID:000000006393600



- | | | |
|---------------------------------|--------------------------------------|--------------------------|
| 1. Thermostat | 2. O-ring | 3. Engine coolant inlet |
| 4. Water control valve | 5. Gasket | 6. Engine coolant outlet |
| 7. Copper washer | 8. Engine coolant temperature sensor | 9. Heater pipe |
| A. To electric throttle control | B. To oil cooler | C. To heater |
| D. To heater | E. To electric throttle control | F. To oil cooler |
| ⇐ Engine front | | |

Removal and Installation

INFOID:000000006393601

WARNING:

Never 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 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

CAUTION:

Perform when the engine is cold.

1. Drain engine coolant from the radiator. Refer to [CO-12, "Changing Engine Coolant"](#).
2. Remove the front air duct. Refer to [EM-25, "Removal and Installation"](#).
3. Remove engine under cover. Refer to [EXT-16, "Removal and Installation - Coupe"](#) (Coupe models) or [EXT-40, "Removal and Installation"](#) (Sedan models).

THERMOSTAT AND THERMOSTAT HOUSING

[QR25DE]

< REMOVAL AND INSTALLATION >

4. Remove radiator hose (lower) from the engine coolant inlet side.
5. Remove engine coolant inlet, thermostat and O-ring.

CAUTION:

Discard O-ring, do not reuse.

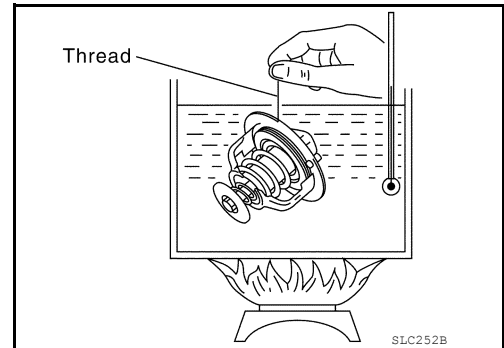
INSPECTION AFTER REMOVAL

- Place a thread 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 the 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-25, "Thermostat"
Full-open lift amount	Refer to CO-25, "Thermostat"
Valve closing temperature	Refer to CO-25, "Thermostat"

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

INSTALLATION

Installation is in the reverse order of removal.

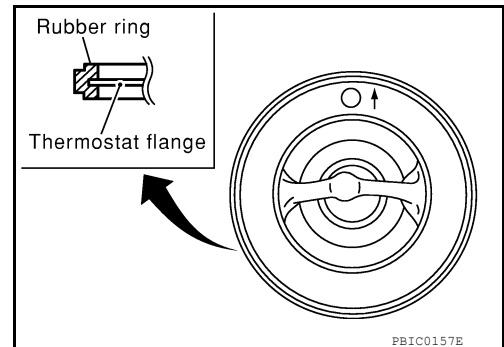
CAUTION:

Discard O-ring, do not reuse.

- Install the engine coolant temperature sensor.

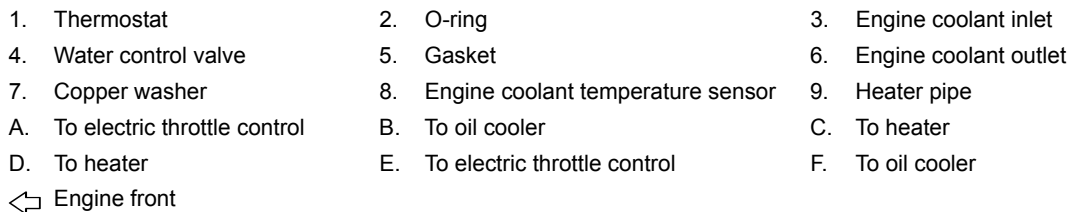
Use Genuine RTV Silicone Sealant or equivalent. Refer to [GI-15, "Recommended Chemical Products and Sealants"](#).

- Install the thermostat with the whole circumference of the flange part fitting securely inside the rubber ring.
- Install the thermostat with the jiggle valve facing upwards. The position deviation may be within the range of $\pm 10^\circ$.
- If necessary, to install the heater pipe, first apply a mild detergent to the new O-ring and then quickly insert the heater pipe into the housing.



[QR25DE]

INFOID:0000000006393602



INFOID:0000000006393603

2011 Altima GCC

WATER CONTROL VALVE

[QR25DE]

< REMOVAL AND INSTALLATION >

4. Remove the radiator hose (upper), heater pipe, electric throttle control actuator inlet hose, and heater hose.
5. Remove the engine coolant outlet and gasket.
6. Remove the water control valve, engine coolant outlet and O-ring.

CAUTION:

Discard O-ring, do not reuse.

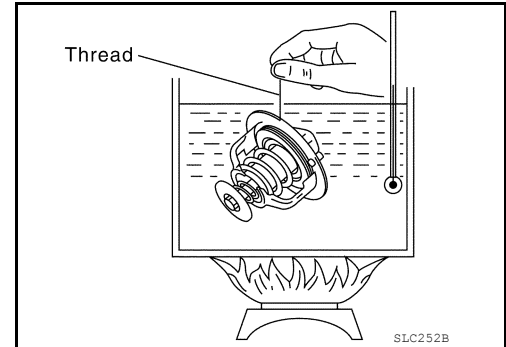
INSPECTION AFTER REMOVAL

- Place a thread so that it is caught in the valve of the water control valve. Immerse fully in a container filled with water. Heat while stirring.
- The valve opening temperature is the temperature at which the valve opens and the 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.



Standard values

Water Control Valve	Standard Value
Valve opening temperature	Refer to CO-25, "Water Control Valve"
Full-open lift amount	Refer to CO-25, "Water Control Valve"
Valve closing temperature	Refer to CO-25, "Water Control Valve"

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

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Discard O-ring, do not reuse.

- Install the engine coolant temperature sensor.
Use Genuine RTV Silicone Sealant or equivalent. Refer to [GI-15, "Recommended Chemical Products and Sealants"](#).
- Install the water control valve with the whole circumference of the flange part fitting securely inside the rubber ring.
- Install the water control valve with the up-mark facing up and the frame center part facing upwards. The position deviation may be within the range of $\pm 10^\circ$.
- Install the heater pipe, first apply a mild detergent to the new O-ring and quickly insert the heater pipe into the housing.

COOLING FAN

< UNIT DISASSEMBLY AND ASSEMBLY >

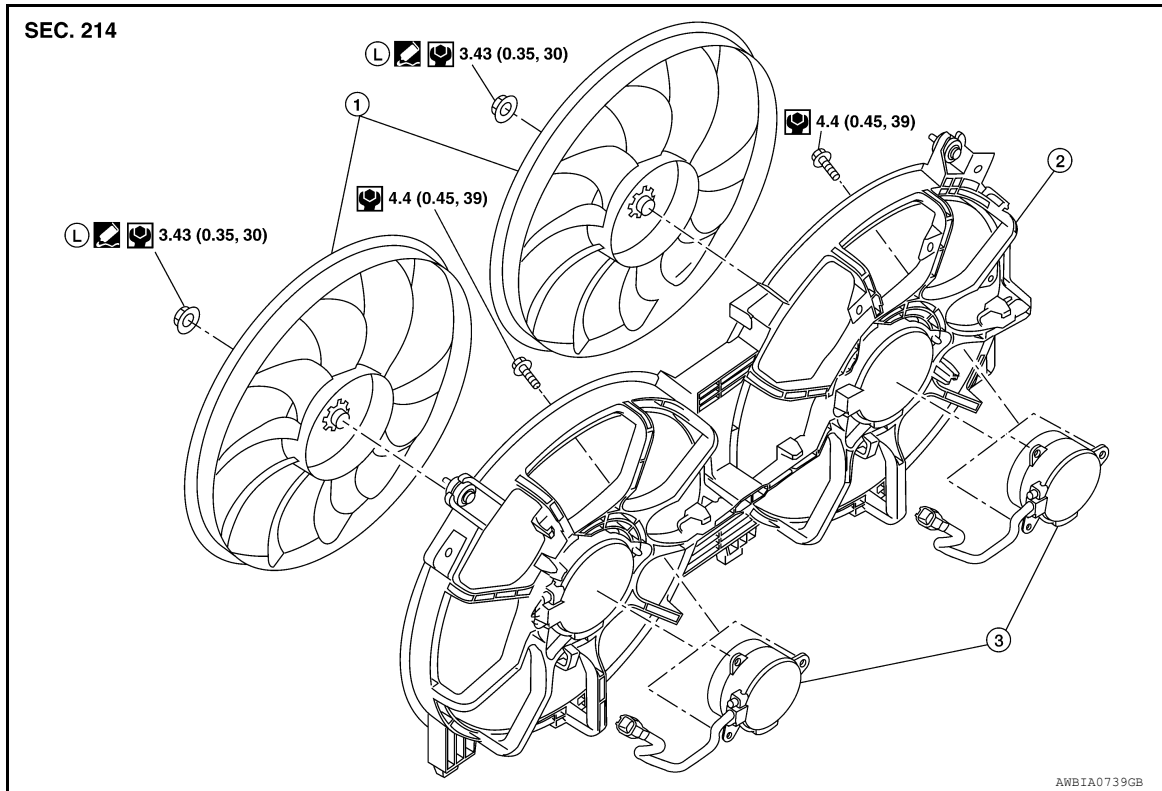
[QR25DE]

UNIT DISASSEMBLY AND ASSEMBLY

COOLING FAN

Disassembly and Assembly of Cooling Fan

INFOID:000000008655905



DISASSEMBLY

1. Remove fan blade nut.
2. Remove fan blade from fan motor.
3. Remove fan motor bolts and remove fan motor from fan shroud.

ASSEMBLY

Assembly is in the reverse order of disassembly.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[QR25DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Capacity

INFOID:0000000006393604

ℓ (US qt, Imp qt)

Coolant capacity (With reservoir tank at MAX level)	7.7 (8-1/8, 6-3/4)
---	--------------------

Thermostat

INFOID:0000000006393605

Valve opening temperature	80.5 - 83.5°C (177 - 182°F)
Full-open lift amount	More than 8 mm / 95°C (0.315 in / 203°F)
Valve closing temperature	77°C (171°F) or higher

Water Control Valve

INFOID:0000000006393606

Valve opening temperature	93.5 - 96.5°C (200 - 206°F)
Full-open lift amount	More than 8 mm / 108°C (0.315 in / 226°F)
Valve closing temperature	90°C (194°F) or higher

Radiator

INFOID:0000000006393607

Unit: kPa (bar, kg / cm², psi)

Cap relief pressure	Standard	127 ± 9.8 (1.27 ± 0.098, 1.30 ± 0.100, 18.4 ± 1.42)
Leakage test pressure		157 (1.57, 1.6, 23)

PRECAUTION

PRECAUTIONS

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

INFOID:000000006921806

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.

Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000006393609

NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)

PRECAUTIONS

< PRECAUTION >

[VQ35DE]

6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Liquid Gasket

INFOID:000000006393610

REMOVAL OF LIQUID GASKET SEALING

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

Tool number : KV10111100 (J-37228)

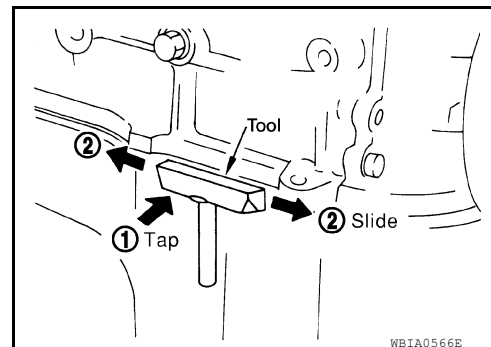
CAUTION:

Be careful not to damage the mating surfaces.

- Tap (1) Tool to insert it, and then slide it (2) by tapping on the side as shown.
- In areas where Tool is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

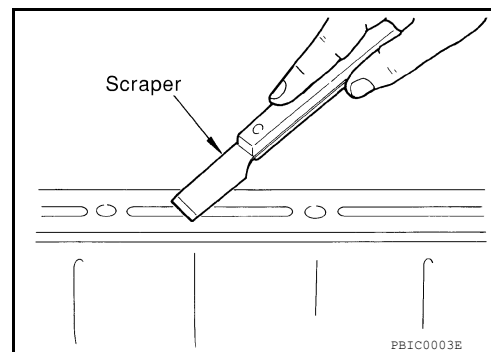
CAUTION:

If for some unavoidable reason suitable tool such as screw-driver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

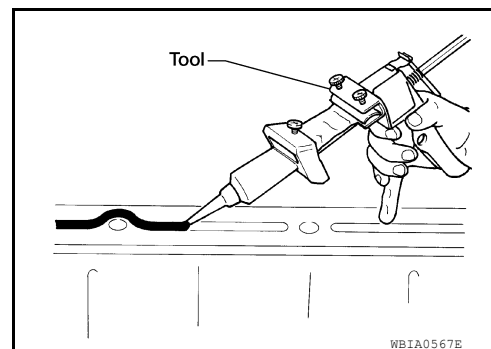
- Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface, Using scraper.
 - Remove liquid gasket completely from the groove of the liquid gasket application surface, bolts, and bolt holes.
- Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign materials.



- Attach liquid gasket tube to Tool.

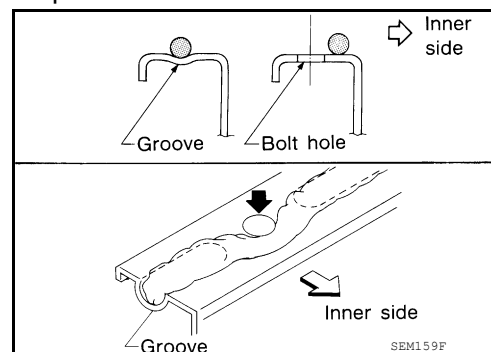
Tool number : WS39930000 (—)

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-15, "Recommended Chemical Products and Sealants".



- Apply liquid gasket without breaks to the specified location with the specified dimensions.

- If there is a groove for the liquid gasket application, apply liquid gasket to the groove.
- As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
- Within five minutes of liquid gasket application, install the mating component.
- If liquid gasket protrudes, wipe it off immediately.
- Do not retighten nuts or bolts after the installation.
- After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



CAUTION:

Carefully follow all of the warnings, cautions, notes, and procedures contained in this manual.

PREPARATION

< PREPARATION >

[VQ35DE]

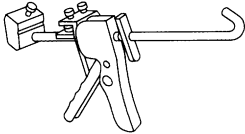
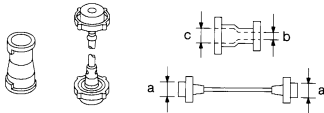
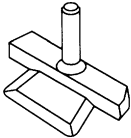
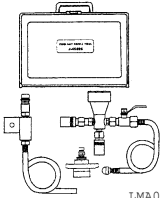
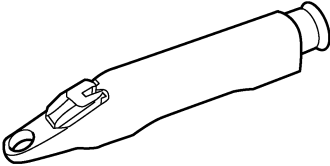
PREPARATION

PREPARATION

Special Service Tool

INFOID:000000006393611

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

Tool number (Kent-Moore No.) Tool name	Description
WS39930000 (—) Tube pressure	Pressing the tube of liquid gasket  S-NT052
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)  S-NT564
KV10111100 (J-37228) Seal cutter	Removing chain tensioner cover and water pump cover  NT046
KV991J0070 (J-45695) Coolant Refill Tool	Refilling engine cooling system  LMA053
— (J-23688) Engine coolant refractometer	Checking concentration of ethylene glycol in engine coolant  WBIA0539E


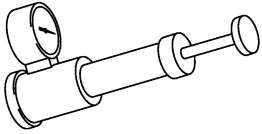
Commercial Service Tool

INFOID:000000006393612

PREPARATION

< PREPARATION >

[VQ35DE]

Tool name	Description
Power tool  PIIB1407E	Loosening nuts, screws and bolts
Radiator cap tester  PBIC1982E	Testing radiator cap

A

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P

COOLING SYSTEM

< SYSTEM DESCRIPTION >

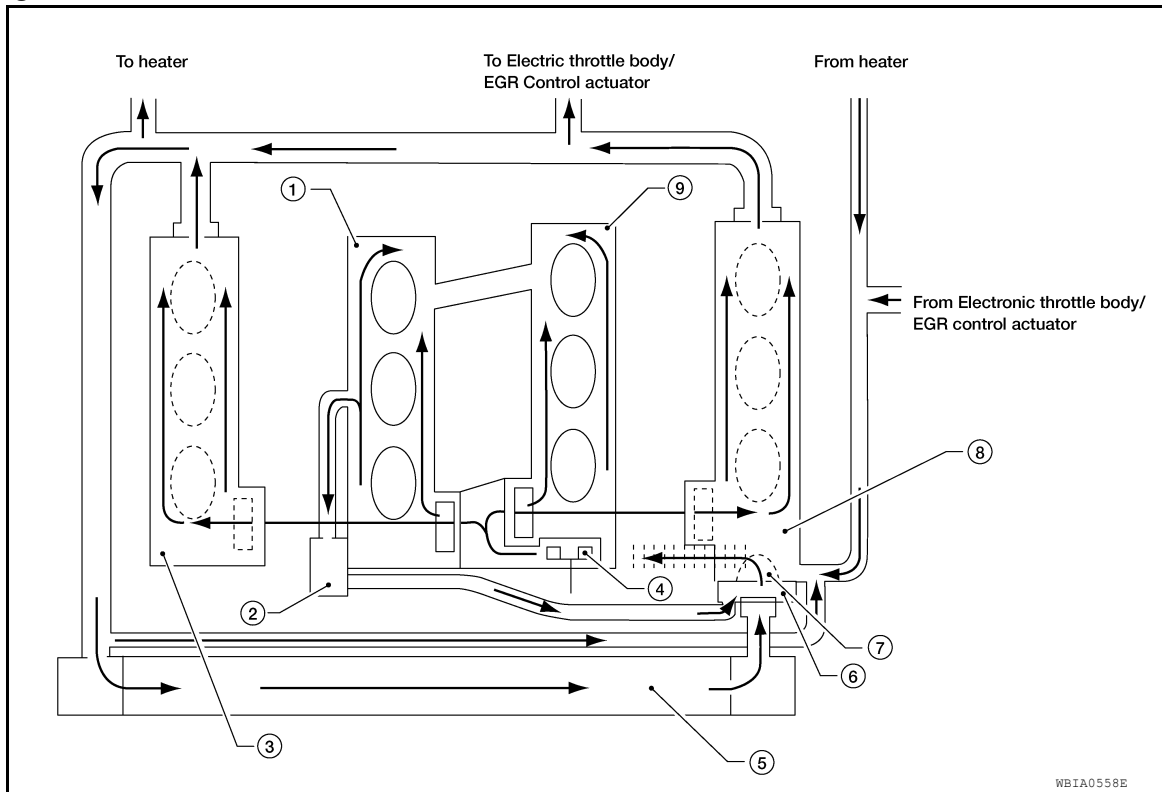
[VQ35DE]

SYSTEM DESCRIPTION

COOLING SYSTEM

Cooling Circuit

INFOID:000000006393613



- | | | |
|------------------------|-----------------------|------------------------|
| 1. Cylinder block (RH) | 2. Oil cooler | 3. Cylinder head (RH) |
| 4. Water pump | 5. Radiator | 6. Water inlet |
| 7. Thermostat | 8. Cylinder head (LH) | 9. Cylinder block (LH) |

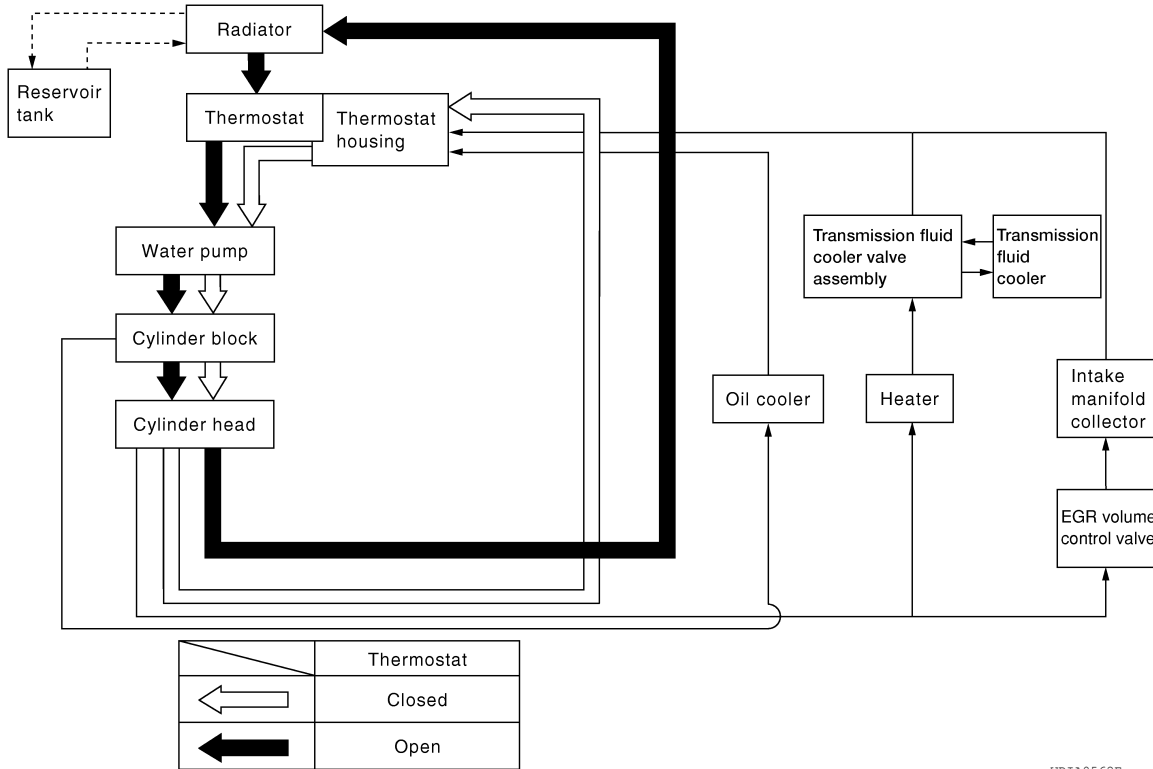
COOLING SYSTEM

< SYSTEM DESCRIPTION >

[VQ35DE]

Schematic

INFOID:000000006393614



WBIA0562E

OVERHEATING CAUSE ANALYSIS

< SYSTEM DESCRIPTION >

[VQ35DE]

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000006393615

		Symptom	Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	Coolant circulation	
		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 coolant mixture ratio	—	Coolant viscosity	—
	Poor coolant quality	—		—
	Insufficient coolant	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

< SYSTEM DESCRIPTION >

[VQ35DE]

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

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PERIODIC MAINTENANCE

ENGINE COOLANT

System Inspection

INFOID:000000006393616

WARNING:

- Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure 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.

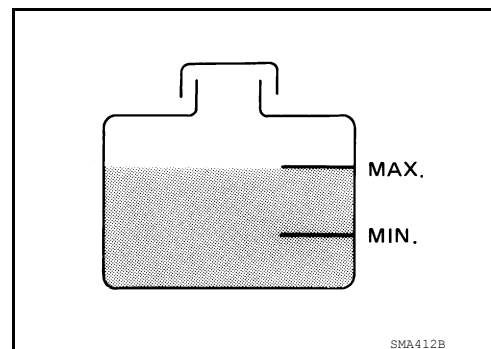
CHECKING COOLING SYSTEM HOSES

Check hoses for the following:

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

CHECKING RESERVOIR LEVEL

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

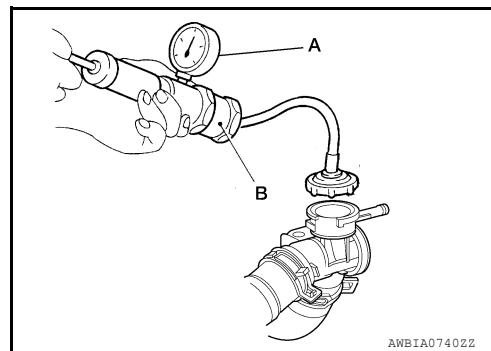


CHECKING COOLING SYSTEM FOR LEAKS

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 : 157 kPa (1.57 bar, 1.6 kg/cm², 23 psi)


WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure 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:

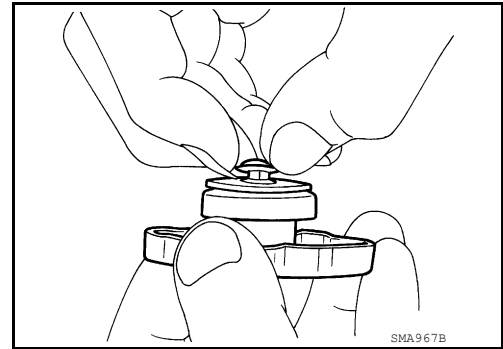
Thoroughly wipe out the radiator filler neck to remove any waxy residue or foreign material.

ENGINE COOLANT

< PERIODIC MAINTENANCE >

[VQ35DE]

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.

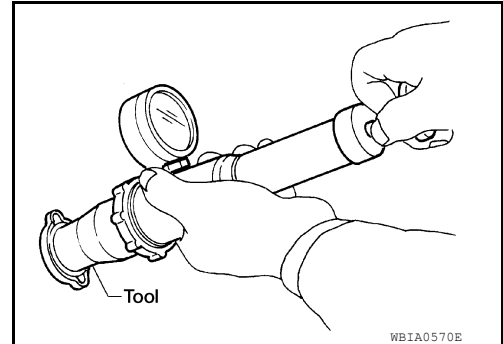


3. Check radiator cap relief pressure using suitable tool and Tool.

Tool number : EG17650301 (J-33984-A)

Standard : Refer to [CO-52. "Radiator"](#).

- When connecting the radiator cap to the tester, apply water or 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 sludge 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 electrical 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 (4.90 bar, 5 kg/cm², 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 coolant leaks. Repair as necessary.

Changing Engine Coolant

INFOID:000000006393617

WARNING:

- **To avoid being scalded, never change the 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. "Removal and Installation - Coupe"](#) (Coupe models) or [EXT-40. "Removal and Installation"](#) (Sedan models).
2. Open the radiator drain plug 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 allow the coolant to contact the drive belts.**
 - **Perform this step when 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 of 103.46 kPa (1.0346 bar, 1.055 kg-cm², 15 psi) maximum for 30 seconds into the hose to blow out excess coolant from the heater core.
 4. When draining all of the coolant in the system, remove the reservoir tank and drain the coolant, then clean the reservoir tank before installation.

CAUTION:

- Do not allow the coolant to contact the drive belts.
- Perform this step when engine is cold.

- When performing a complete cooling system drain (to remove the engine or for engine repair), remove the cylinder block front drain plug and the cylinder block RH drain plug.
- Check the drained coolant for contaminants such as rust, corrosion or discoloration.
 - If the coolant is contaminated, flush the engine cooling system.

REFILLING ENGINE COOLANT

- Install the radiator drain plug. If the cooling system was drained completely, install the reservoir tank and the cylinder block drain plugs.
 - The radiator must be completely empty of coolant and water.
 - Apply sealant to the threads of the cylinder block drain plugs. Use Genuine High Performance Thread Sealant or equivalent. Refer to [GI-15, "Recommended Chemical Products and Sealants"](#).

Radiator drain plug : Refer to [CO-38, "Removal and Installation"](#)

Cylinder block front drain plug : 9.8 N·m (1.0 kg-m, 87 in-lb)

Cylinder block RH drain plug : 19.6 N·m (2.0 kg-m, 14 ft-lb)

- If disconnected, reattach the upper radiator hose at the engine side.
- 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.
- 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)

- 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.
 - Use recommended engine coolant. Refer to [MA-12, "SAE Viscosity Number"](#).

Engine coolant capacity (with reservoir tank) : Refer to [MA-12, "Fluids and Lubricants"](#).

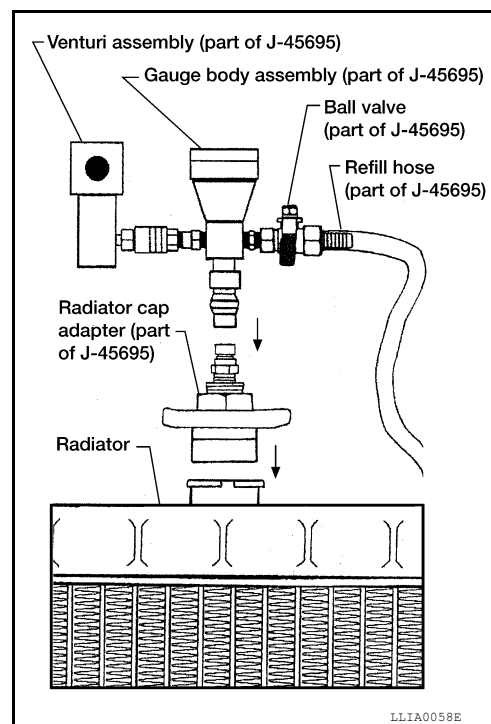
- Install an air hose to the venturi assembly, the air pressure must be within specification.

Compressed air supply pressure : 549 - 824 kPa (5.49 - 8.24 bar, 5.6 - 8.4 kg/cm², 80 - 119 psi)

CAUTION:

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

- 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.



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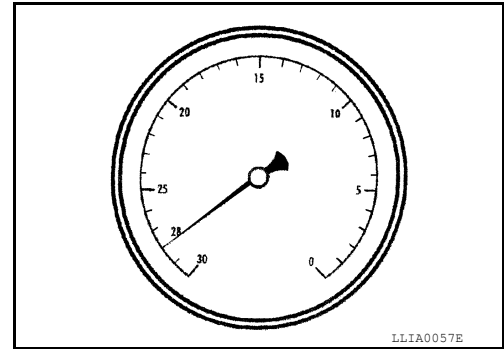
ENGINE COOLANT

< PERIODIC MAINTENANCE >

[VQ35DE]

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 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.

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 undercover. Refer to [EXT-16, "Removal and Installation - Coupe"](#) (Coupe models) or [EXT-40, "Removal and Installation"](#) (Sedan models).

FLUSHING COOLING SYSTEM

1. Fill the radiator from the filler neck above the radiator upper hose and reservoir tank with clean water and reinstall 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-35, "Changing Engine Coolant"](#).
6. Repeat steps 1 through 5 until clear water begins to drain from the radiator.

RADIATOR

< REMOVAL AND INSTALLATION >

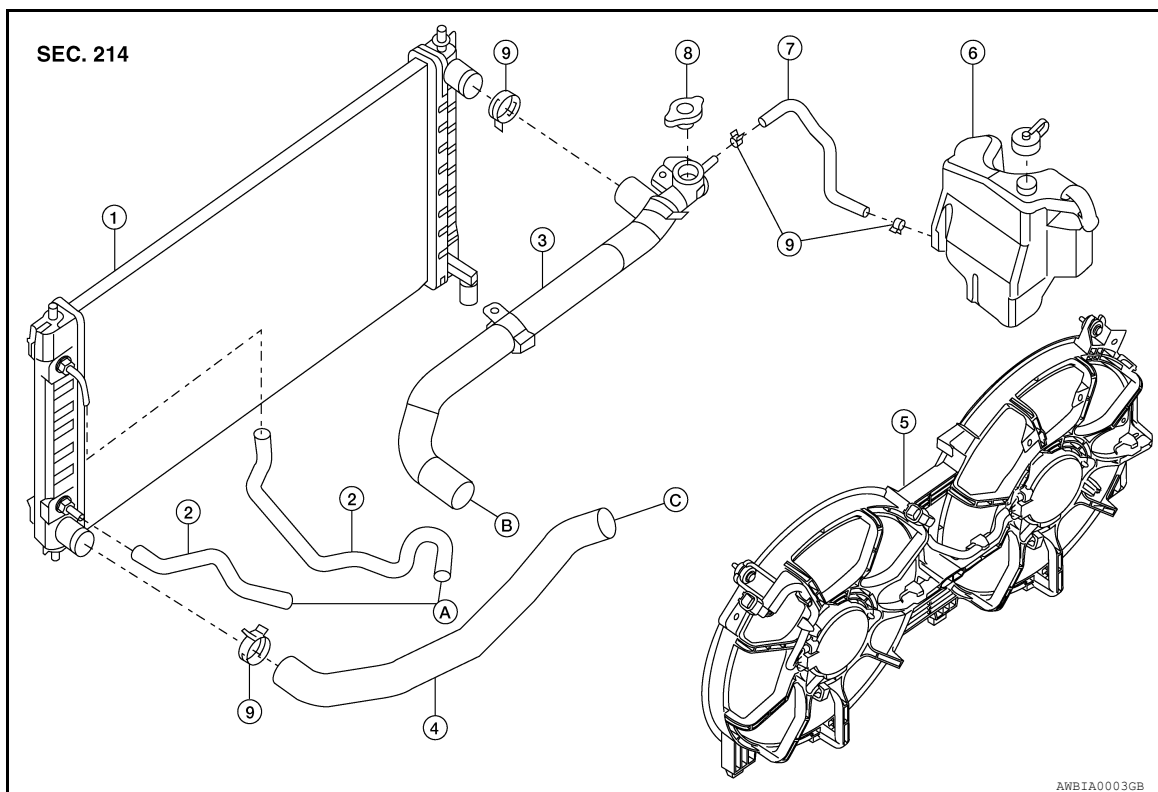
[VQ35DE]

REMOVAL AND INSTALLATION

RADIATOR

Exploded View

INFOID:000000006393618



- | | | |
|--------------------------|--------------------------------------|--------------------------|
| 1. Radiator | 2. CVT oil cooler hose (if equipped) | 3. Radiator hose (upper) |
| 4. Radiator hose (lower) | 5. Cooling fan | 6. Reservoir tank |
| 7. Reservoir hose | 8. Radiator filler cap | 9. Clamps |
| A. To CVT | B. To water outlet | C. To water inlet |

Removal and Installation

INFOID:000000006393619

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter turn to allow built-up pressure to escape. Carefully remove the 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 from the radiator. Refer to [CO-12, "Changing Engine Coolant"](#).
2. Remove front bumper fascia. Refer to [EXT-40, "Removal and Installation"](#) (Coupe models) or [EXT-40, "Removal and Installation"](#) (Sedan models).
3. Remove RH and LH fender protector side covers. Refer to [EXT-22, "Removal and Installation"](#) (Coupe models) or [EXT-46, "Removal and Installation"](#) (Sedan models).
4. Remove battery tray. Refer to [PG-69, "Removal and Installation \(Battery Tray\)"](#) (Coupe models) or [PG-141, "Removal and Installation \(Battery Tray\)"](#) (Sedan models).
5. Remove air cleaner assembly. Refer to [EM-131, "Removal and Installation"](#).
6. Remove front air duct. Refer to [EM-131, "Removal and Installation"](#).

RADIATOR

[VQ35DE]

< REMOVAL AND INSTALLATION >

7. Remove A/C condenser. Refer to [HA-38. "Removal and Installation for Condenser"](#).
8. Disconnect reservoir hose from radiator hose (upper) connector.
9. Disconnect radiator hoses (upper) and (lower).
10. Disconnect the CVT oil cooler hoses. Plug the hoses to prevent CVT oil loss.
11. Remove radiator.

CAUTION:

- Do not damage or scratch the radiator core when removing.

INSTALLATION

Installation is in the reverse order of removal.

- After installation refill engine coolant and check for leaks. Refer to [CO-35. "Changing Engine Coolant"](#) and [CO-34. "System Inspection"](#).

CAUTION:

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

INSPECTION

- Check that the reservoir tank cap is tightened.
- Check for leakage of engine coolant using Tool and suitable tool. Refer to [CO-34. "System Inspection"](#).

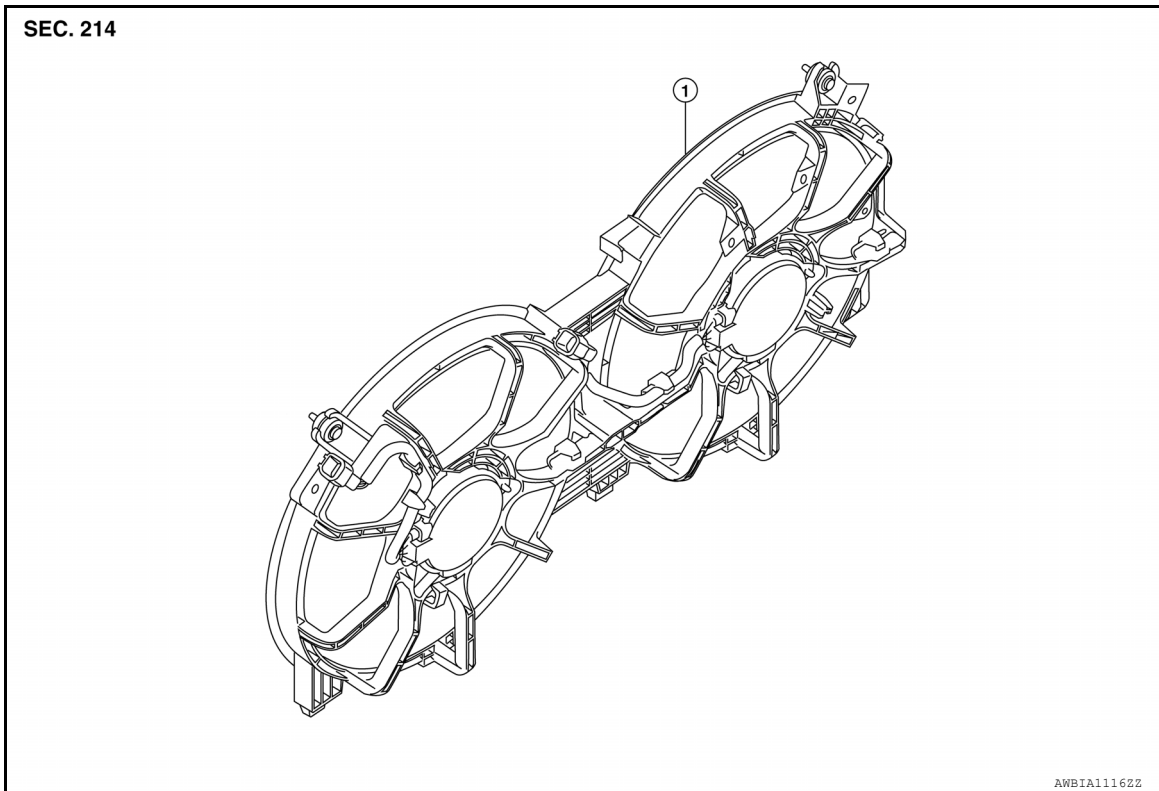
Tool number : EG17650301 (J-33984-A)

- Start and warm up the engine. Visually check that there is no leakage of engine coolant and CVT fluid.

COOLING FAN

Exploded View

INFOID:000000006393620



1. Fan shroud and motor assembly

Removal and Installation

INFOID:000000006393621

WARNING:

Never 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 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. Partially drain engine coolant from the radiator. Refer to [CO-35, "Changing Engine Coolant"](#).
CAUTION:
Perform when engine is cold.
2. Remove air cleaner assembly. Refer to [EM-131, "Removal and Installation"](#).
3. Remove battery tray. Refer to [PG-69, "Removal and Installation \(Battery Tray\)"](#) (Coupe models) or [PG-141, "Removal and Installation \(Battery Tray\)"](#) (Sedan models).
4. Disconnect radiator hose (upper).
5. Disconnect fan motor connectors.
6. Remove radiator cooling fan assembly.

INSTALLATION

Installation is in the reverse order of removal.

- After installation refill engine coolant and check for leaks. Refer to [CO-35, "Changing Engine Coolant"](#) and [CO-34, "System Inspection"](#).

CAUTION:

COOLING FAN

< REMOVAL AND INSTALLATION >

[VQ35DE]

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

- Cooling fans are controlled by ECM. For details, refer to [EC-529, "Diagnosis Procedure"](#).

A

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WATER PUMP

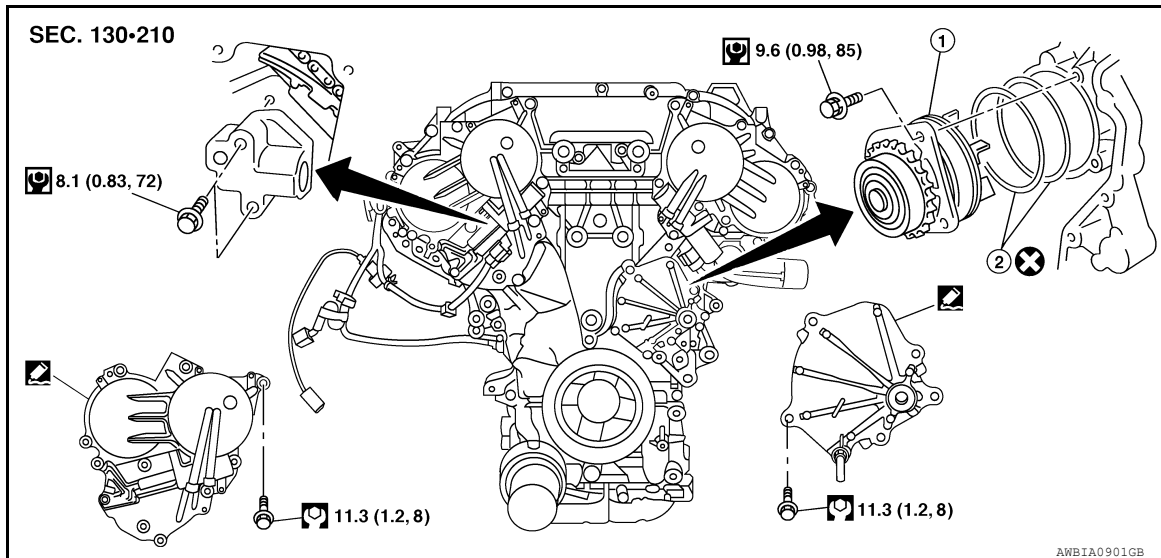
< REMOVAL AND INSTALLATION >

[VQ35DE]

WATER PUMP

Exploded View

INFOID:000000006393622



1. Water pump

2. O-rings

Removal and Installation

INFOID:000000006393623

WARNING:

Never 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 turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

CAUTION:

- When removing water pump assembly, be careful not to get coolant on drive belt.
- Water pump cannot be disassembled and should be replaced as a unit.
- After installing water pump, connect hoses and clamps 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

1. Drain engine coolant from the radiator. Refer to [CO-35, "Changing Engine Coolant"](#).

CAUTION:

Perform when the engine is cold.

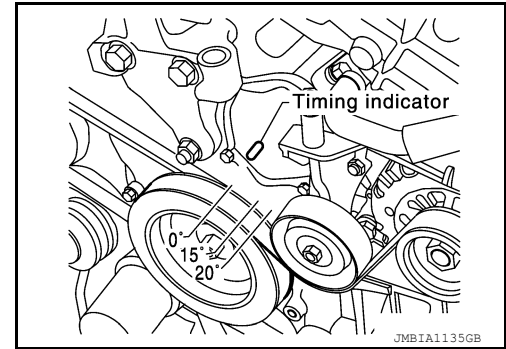
2. Remove coolant reservoir hose.
3. Remove coolant reservoir tank.
4. Remove RH wheel and tire. Refer to [WT-65, "Adjustment"](#).
5. Remove the fender protector side cover (RH). Refer to [EXT-22, "Removal and Installation"](#) (Coupe models) or [EXT-46, "Removal and Installation"](#) (Sedan models).

WATER PUMP

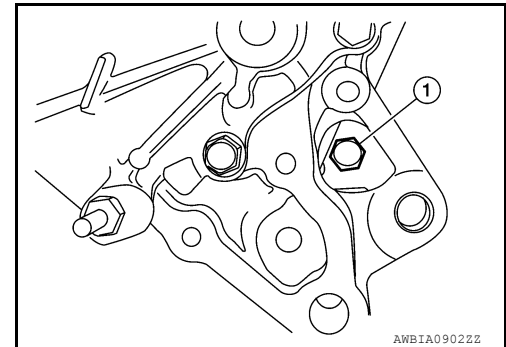
< REMOVAL AND INSTALLATION >

[VQ35DE]

6. Set No. 1 cylinder at TDC on its compression stroke.
 - Align pointer with TDC mark on crankshaft pulley.



7. Remove the idler pulley and the A/C idler pulley. Refer to [EM-123. "Removal and Installation of Drive Belt Auto-tensioner"](#).
8. Remove water drain plug (front) (1) on water pump side of cylinder block to drain engine coolant from engine.



9. Support engine and remove the front engine insulator and bracket. Refer to [EM-203. "Removal and Installation"](#).
10. Disconnect RH IVT control valve connector and remove RH IVT control valve cover.
11. Remove water pump cover.

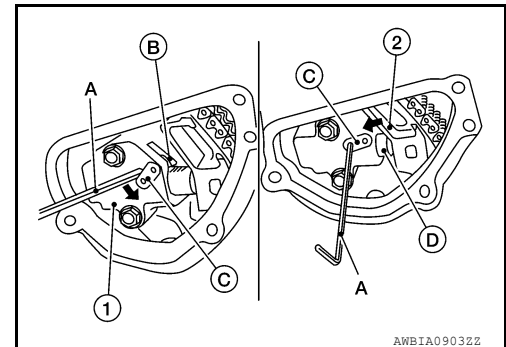
12. Remove the timing chain tensioner assembly as follows:

- a. Pull the lever (C) down to release the plunger stopper tab (B).
- b. Insert the stopper pin (A) into the tensioner body hole to hold the lever (C) and keep the plunger stopper tab (B) released.

NOTE:

An allen wrench [1.2 mm (0.047 in)] is used for a stopper pin (A) as an example.

- c. Compress the plunger (D) into the tensioner body (1) by pressing the slack guide (2).
- d. Keep the slack guide (2) pressed and lock the plunger (D) in by pushing the stopper pin (A) through the lever (C) and into the chain tensioner body hole.

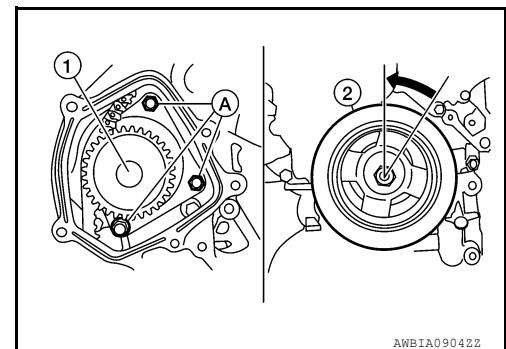


- e. Remove timing chain tensioner bolts and then remove the timing chain tensioner.

CAUTION:

Be careful not to drop timing chain tensioner bolts inside timing chain case.

13. Remove the three water pump bolts (A). Make a gap between water pump sprocket (1) and timing chain, by carefully turning crankshaft pulley (2) counterclockwise until timing chain loosens on water pump sprocket (1).



WATER PUMP

[VQ35DE]

< REMOVAL AND INSTALLATION >

14. Screw M8 bolts [pitch: 1.25 mm (0.49 in) length: approx. 50 mm (1.97 in)] into water pumps upper and lower bolt holes until they reach the timing chain case. Remove water pump.

CAUTION:

- Place a suitable shop cloth below the water pump housing to prevent any engine coolant from dripping into the timing chain case.
- Pull water pump straight out while preventing vane from contacting socket in installation area.
- Remove water pump without causing sprocket to contact timing chain.

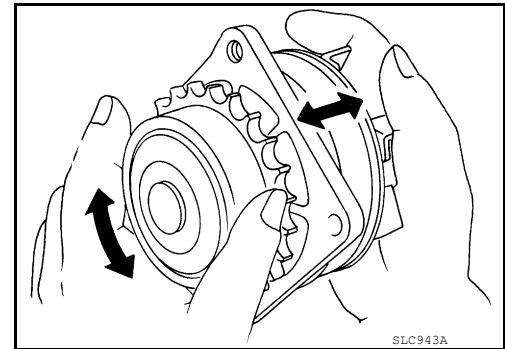
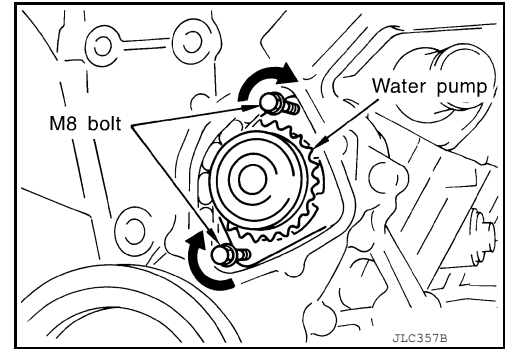
15. Remove M8 bolts and O-rings from water pump.

CAUTION:

Discard O-ring, do not reuse.

INSPECTION AFTER REMOVAL

- Visually check that there is no significant dirt or rusting on the water pump body and vane.
- Check that there is no looseness in the vane shaft, and that it turns smoothly when rotated by hand.
- If the water pump does not perform properly, replace the water pump assembly.



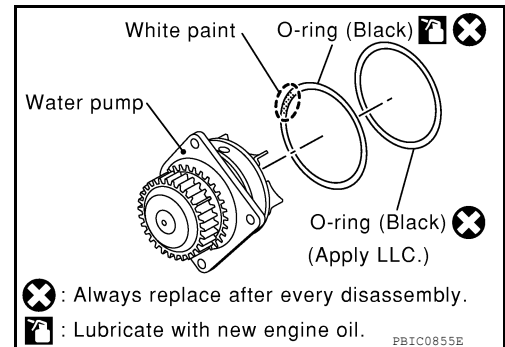
INSTALLATION

1. Install new O-rings to water pump.

CAUTION:

Discard O-ring, do not reuse.

2. Apply engine oil and coolant to the O-rings as shown.
- Locate the O-ring with white paint mark to engine front side.

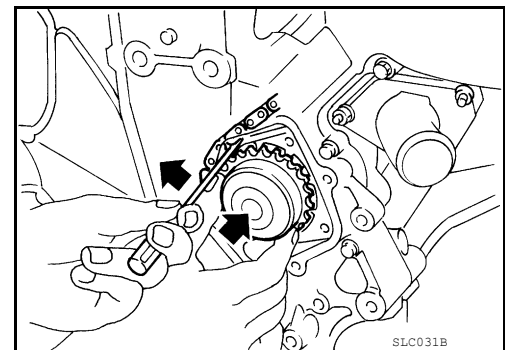


3. Hold timing chain to the side (←) and install the water pump (←).

CAUTION:

Do not allow cylinder block to interfere with the O-rings when installing the water pump.

- Check that timing chain and water pump sprocket are engaged.
- Tighten water pump bolts alternately and evenly.



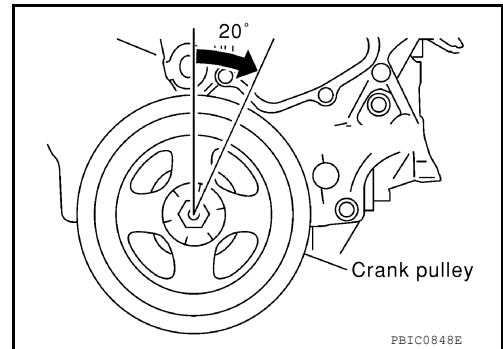
4. Remove dust and foreign material completely from installation area of timing chain tensioner and rear timing chain case.

WATER PUMP

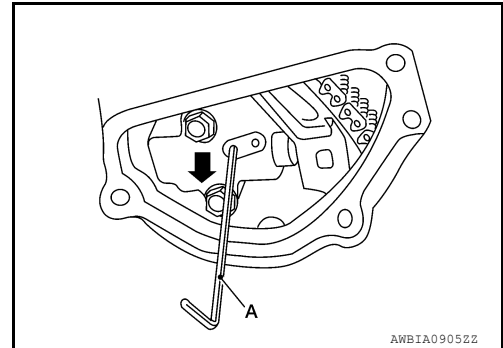
< REMOVAL AND INSTALLATION >

[VQ35DE]

5. Turn the crankshaft pulley approximately 20° clockwise so that the timing chain on the timing chain tensioner side is loose.

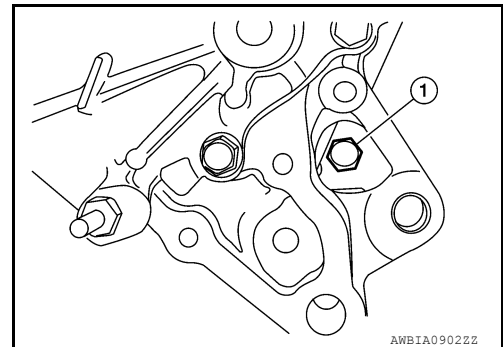


6. Apply engine oil to the oil feed hole and timing chain tensioner and install the timing chain tensioner.
7. Remove the stopper pin (A).



8. Install IVT control valve cover and water pump cover.
- a. Before installing, remove all traces of liquid gasket from mating surface of water pump cover and IVT control valve cover using a scraper. Also remove traces of liquid gasket from the mating surface of the front cover.
- b. Apply a continuous bead of liquid gasket to mating surface of IVT control valve cover and water pump cover. **Use Genuine RTV Silicone Sealant or equivalent. Refer to [GI-15, "Recommended Chemical Products and Sealants"](#).**
9. Install water drain plug (front) (1) on water pump side of cylinder block.
- Apply liquid gasket to the threads of water drain plug (front). **Use Genuine RTV Silicone Sealant or equivalent. Refer to [GI-15, "Recommended Chemical Products and Sealants"](#).**

Water drain plug (front) : 9.8 N·m (1.0 kg-m, 87 in-lb)



10. Installation of remaining components is in the reverse order of removal.

CAUTION:

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

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.

WATER PUMP

< REMOVAL AND INSTALLATION >

[VQ35DE]

- 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 AND THERMOSTAT HOUSING

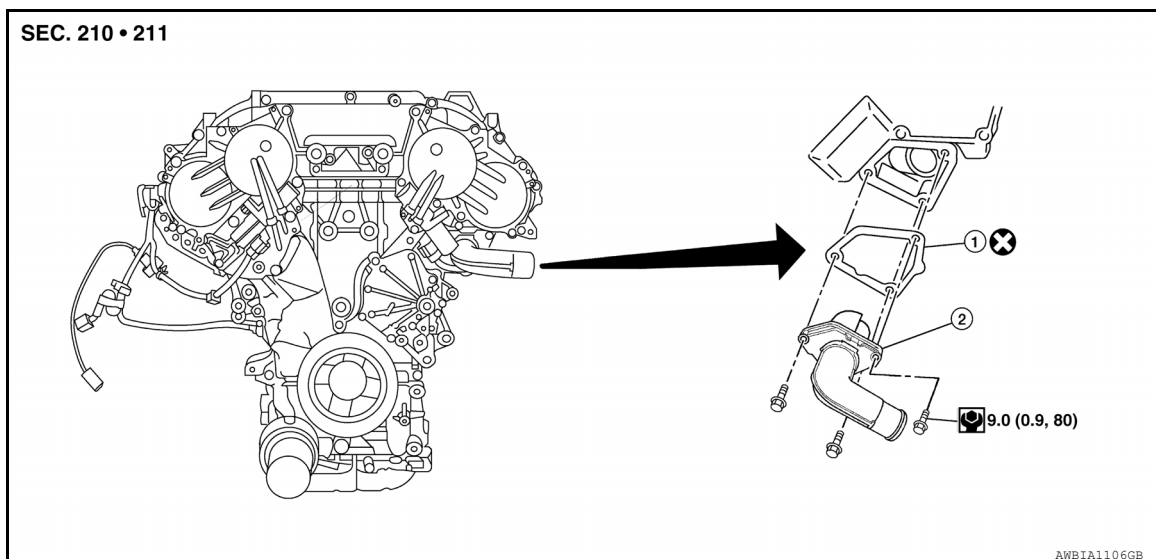
< REMOVAL AND INSTALLATION >

[VQ35DE]

THERMOSTAT AND THERMOSTAT HOUSING

Exploded View

INFOID:000000006393624



Removal and Installation

INFOID:000000006393625

WARNING:

Never 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 turn it a quarter of a turn to release built-up pressure. Carefully remove radiator cap by turning it all the way.

NOTE:

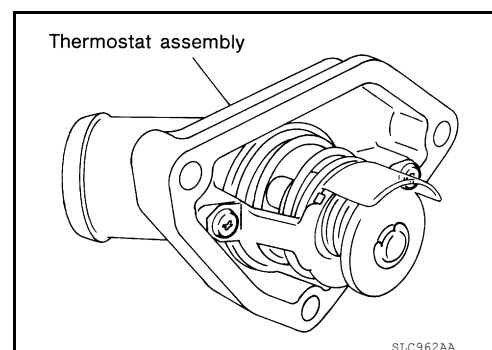
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

CAUTION:

Perform when engine is cool.

1. Drain engine coolant from the radiator. Refer to [CO-35, "Changing Engine Coolant"](#).
2. Remove coolant reservoir hose.
3. Remove coolant reservoir tank. Refer to [CO-38, "Exploded View"](#).
4. Disconnect IVT control valve connector.
5. Disconnect radiator hose (lower).
6. Remove engine coolant inlet, thermostat assembly and gasket.
 - Do not disassemble engine coolant inlet and thermostat. Replace them as a unit, if necessary.



INSPECTION AFTER REMOVAL

THERMOSTAT AND THERMOSTAT HOUSING

[VQ35DE]

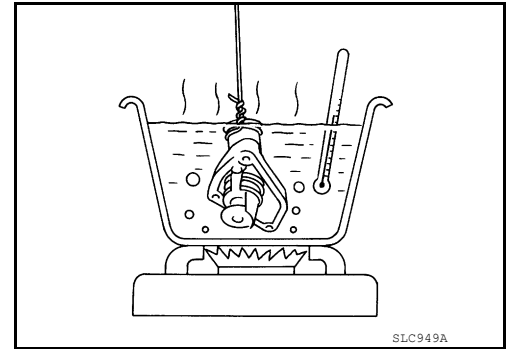
< REMOVAL AND INSTALLATION >

- Place a thread 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 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-52, "Thermostat"
Full-open lift amount	Refer to CO-52, "Thermostat"
Valve closing temperature	Refer to CO-52, "Thermostat"

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

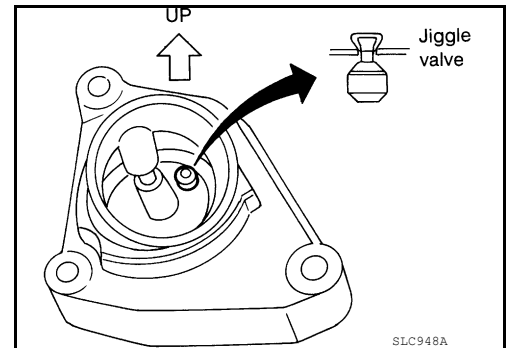
INSTALLATION

Installation is in the reverse order of removal.

- Install thermostat with jiggle valve facing upward.
- After installation refill engine coolant and check for leaks. Refer to [CO-35, "Changing Engine Coolant"](#) and [CO-34, "System Inspection"](#).

CAUTION:

Do not spill coolant over engine compartment. Use a shop cloth to absorb coolant.



WATER OUTLET AND WATER PIPING

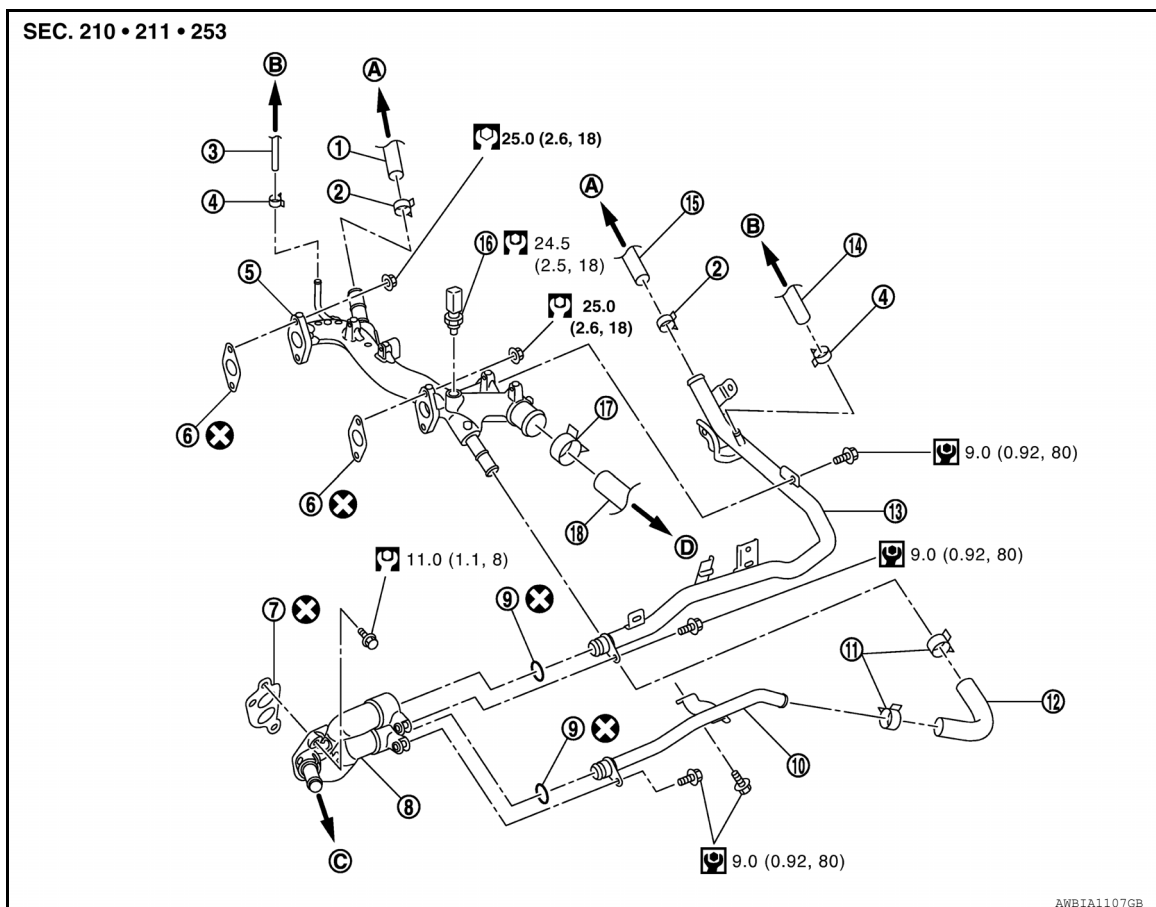
< REMOVAL AND INSTALLATION >

[VQ35DE]

WATER OUTLET AND WATER PIPING

Exploded View

INFOID:000000006393626



- | | | |
|---------------------------------------|--|---------------------------|
| 1. Heater hose | 2. Clamp | 3. Water hose |
| 4. Clamp | 5. Water outlet | 6. Gasket |
| 7. Gasket | 8. Water connector | 9. O-ring |
| 10. Water bypass pipe | 11. Clamp | 12. Water hose |
| 13. Heater pipe | 14. Water hose | 15. Heater hose |
| 16. Engine coolant temperature sensor | 17. Clamp | 18. Radiator hose (upper) |
| A. To heater core | B. To electric throttle control actuator | C. To oil cooler |
| D. To radiator | | |

Removal and Installation

INFOID:000000006393627

WARNING:

Never 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 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

CAUTION:

Perform when the engine is cold.

- Partially drain engine coolant from radiator. Refer to [CO-35. "Changing Engine Coolant"](#).
- Remove engine room cover.

WATER OUTLET AND WATER PIPING

[VQ35DE]

< REMOVAL AND INSTALLATION >

3. Remove air duct and air cleaner case assembly. Refer to [EM-131, "Removal and Installation"](#).
4. Disconnect hoses from electric throttle control actuator.
5. Remove radiator hose (upper) and heater hoses.
6. Remove connector(s) from heater pipe.
7. Disconnect engine coolant temperature sensor electrical connector on water outlet.
8. Remove water outlet, heater pipe, water connector, and water bypass pipe nuts and bolts.

INSTALLATION

Installation is in the reverse order of removal.

- Securely insert each hose, and install a clamp at a position where it does not interfere with the pipe bulge.
- When inserting heater pipe and water bypass pipe into water connector, apply mild soap to new O-rings.

CAUTION:

Do not reuse O-rings.

- After installation refill engine coolant and check for leaks. Refer to [CO-35, "Changing Engine Coolant"](#) and [CO-34, "System Inspection"](#).

CAUTION:

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

COOLING FAN

< UNIT DISASSEMBLY AND ASSEMBLY >

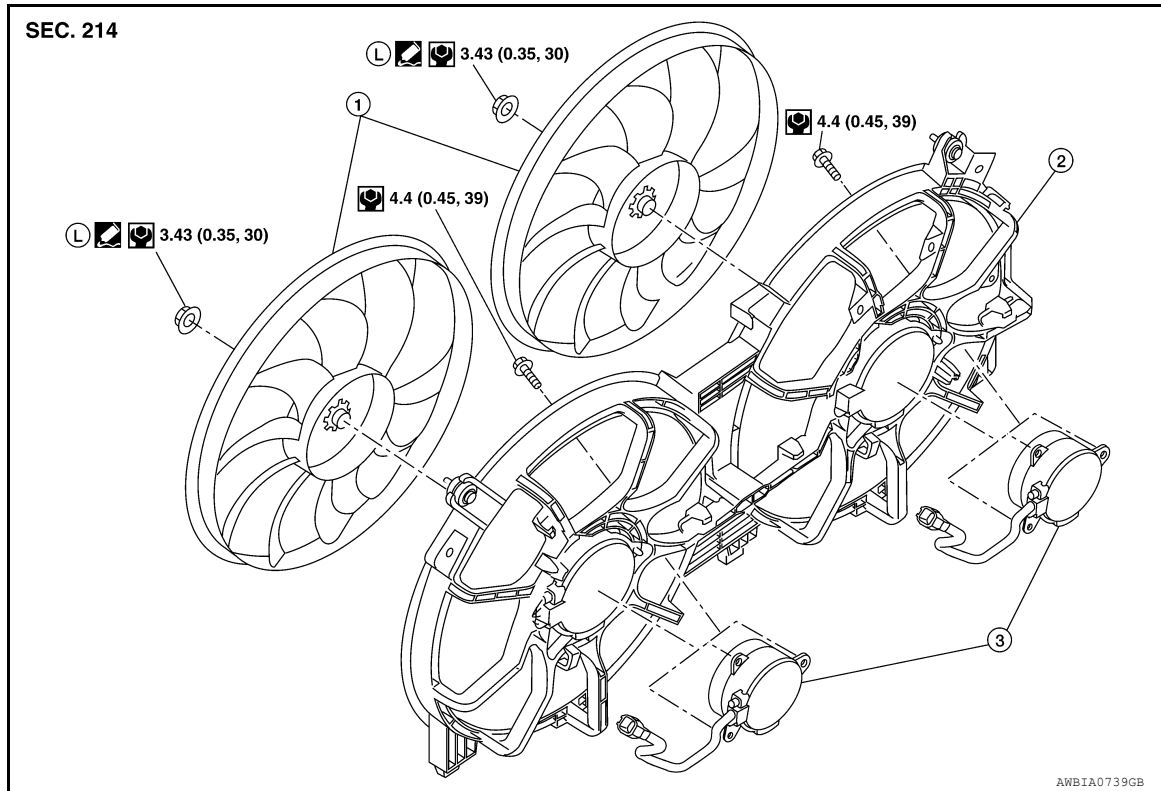
[VQ35DE]

UNIT DISASSEMBLY AND ASSEMBLY

COOLING FAN

Disassembly and Assembly of Cooling Fan

INFOID:000000008655912



DISASSEMBLY

1. Remove fan blade nut.
2. Remove fan blade from fan motor.
3. Remove fan motor bolts and remove fan motor from fan shroud.

ASSEMBLY

Assembly is in the reverse order of disassembly.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[VQ35DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Capacity

INFOID:0000000006393628

ℓ (US qt, Imp qt)

Coolant capacity (With reservoir tank at MAX level)	9.0 (9-1/2, 7-7/8)
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Thermostat

INFOID:0000000006393629

Valve opening temperature	82°C (180°F)
Full-open lift amount	8.6 mm / 95°C (0.339 in / 203°F)
Valve closing temperature	77°C (171°F)

Radiator

INFOID:0000000006393630

Unit: kPa (bar, kg/cm², psi)

Cap relief pressure	Standard	127 ± 9.8 (1.27 ± 0.098, 1.30 ± 0.100, 18.4 ± 1.42)
Leakage test pressure		157 (1.57, 1.6, 23)