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SECTION CO

ENGINE COOLING SYSTEM

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PRECAUTION

PRECAUTIONS

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

INFOID:000000012248759

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:000000012250307

REMOVAL OF LIQUID GASKET

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

Tool Number: KV10111100 (J-37228)

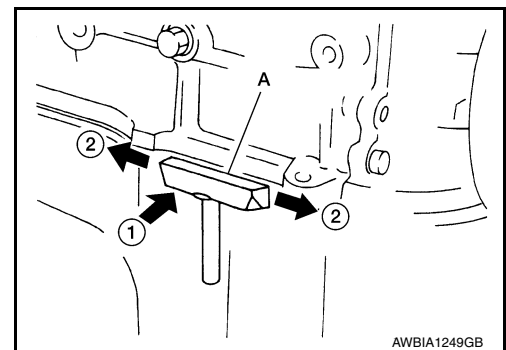
CAUTION:

Be careful not to damage the mating surfaces.

- In areas where the cutter is difficult to use, use a plastic hammer to lightly tap (1) the cutter where the liquid gasket is applied. Use a plastic hammer to slide (2) the cutter by tapping on the side.

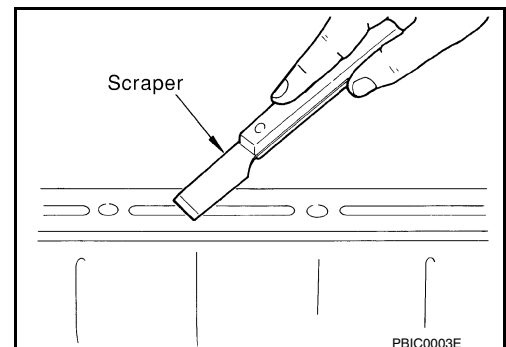
CAUTION:

Do not damage the mating surfaces.



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.

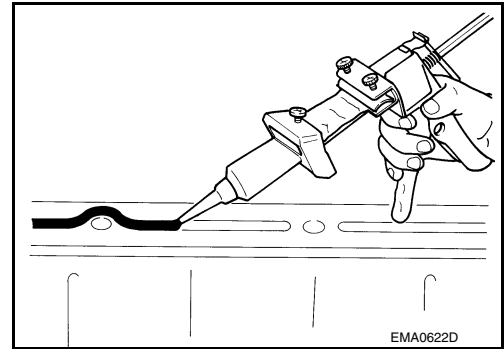


PRECAUTIONS

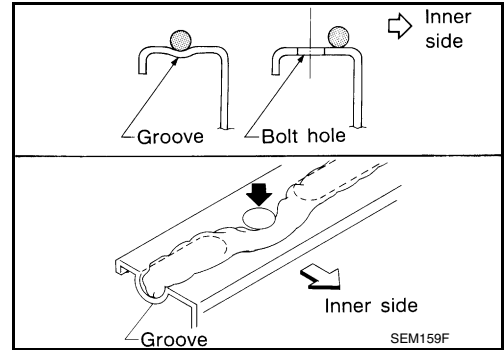
[VQ35DE]

< PRECAUTION >

3. Attach the liquid gasket tube to the suitable tool.
Use Genuine RTV Silicone Sealant or equivalent. Refer to MA-17, "FOR USA AND CANADA : Engine Oil Recommendation".



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 >

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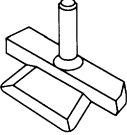
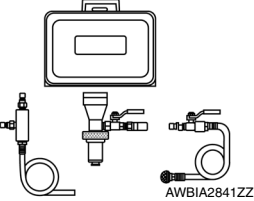
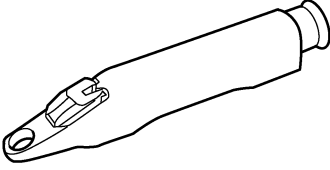
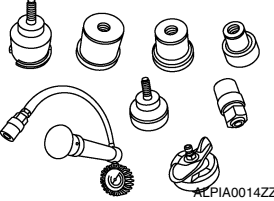
PREPARATION

PREPARATION

Special Service Tool

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

Tool number (TechMate No.) Tool name	Description
KV10111100 (J-37228) Seal cutter  <p style="text-align: center;">NT046</p>	Removing chain tensioner cover and water pump cover
KV991J0070 (J-45695-A) Coolant refill tool  <p style="text-align: center;">AWBIA2841ZZ</p>	Refilling engine cooling system
— (J-23688) Engine coolant refractometer  <p style="text-align: center;">WBIA0539E</p>	Checking concentration of ethylene glycol in engine coolant
— (J-51771) Cooling system pressure test kit  <p style="text-align: center;">AEPIA0014ZZ</p>	Checking cooling system and radiator cap


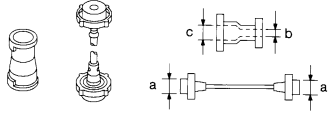
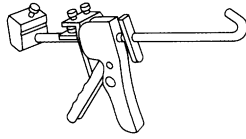
Commercial Service Tool

INFOID:000000011934747

PREPARATION

< PREPARATION >

[VQ35DE]

Tool name	Description
<p>Power tool</p>  <p>PIIB1407E</p>	<p>Loosening nuts, screws and bolts</p>
<p>— (J-33984-A) Radiator pressure adapter</p>  <p>S-NT564</p>	<p>Adapting cooling system pressure tester to radiator cap and reservoir tank cap</p> <p>a: 28 (1.10) diameter b: 31.4 (1.236) diameter c: 41.3 (1.626) diameter</p> <p>Unit: mm (in)</p>
<p>Tube presser</p>  <p>S-NT052</p>	<p>Pressing the tube of liquid gasket</p>

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OVERHEATING CAUSE ANALYSIS

< SYSTEM DESCRIPTION >

[VQ35DE]

SYSTEM DESCRIPTION

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000011934748

		Symptom	Check items		
Cooling system part malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—	
		Thermostat stuck closed	—		
		Damaged fins	Dust contamination or paper clogging		
			Physical damage		
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)		
	Reduced air flow	Cooling fan does not operate.	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 radiator cap	
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 part malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load	A		
				Driving in low gear for extended time	CO		
				Driving at an extremely high speed	C		
					Powertrain system malfunction		D
					Improper size of installed-wheels and tires	—	E
					Dragging brakes		F
			Improper ignition timing		G		
	Blocked or restricted air flow	Blocked bumper	Blocked air flow		H		
		Blocked radiator grille	Installed car brassiere		I		
			Mud contamination or paper clogging	—	J		
		Blocked radiator	Blocked air flow		K		
		Blocked condenser			L		
	Installed large fog lamp			M			

COOLING SYSTEM

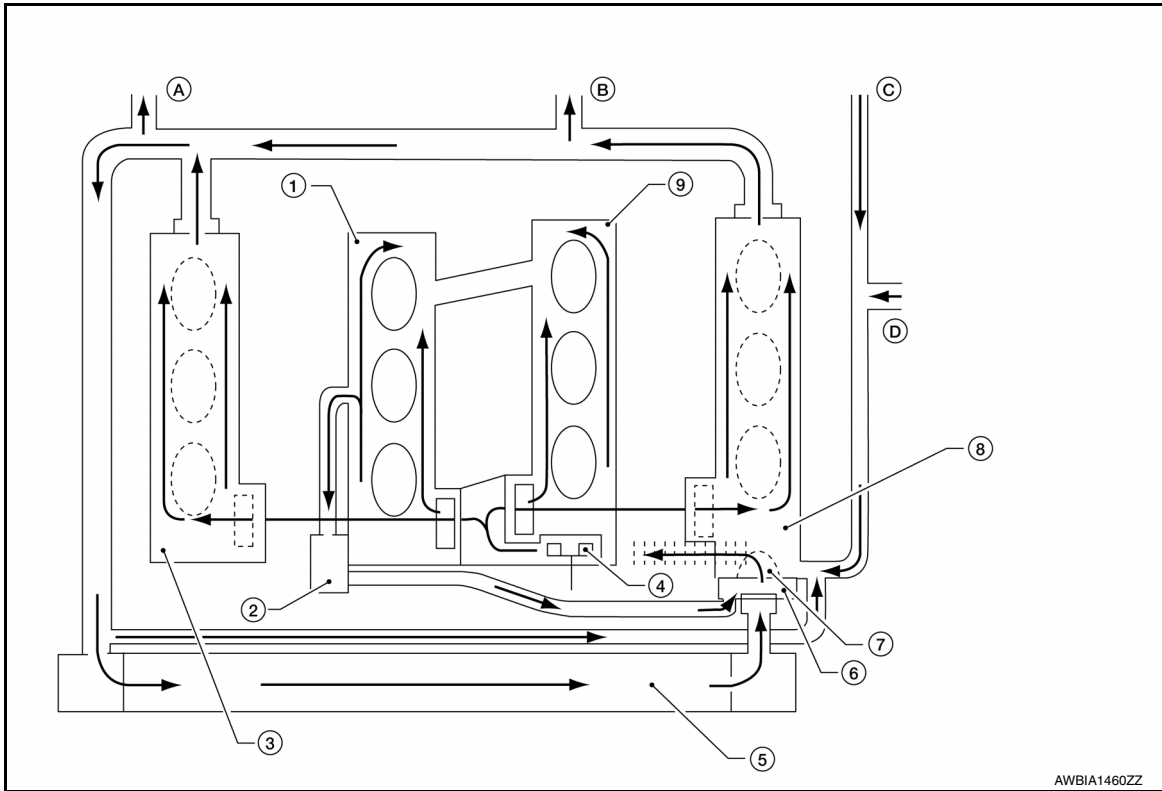
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< SYSTEM DESCRIPTION >

COOLING SYSTEM

Cooling Circuit

INFOID:000000011934749



AWBIA1460ZZ

- | | | |
|--|--|------------------------|
| 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) |
| A. To heater | B. To electric throttle control actuator | C. From heater |
| D. From electric throttle control actuator | | |

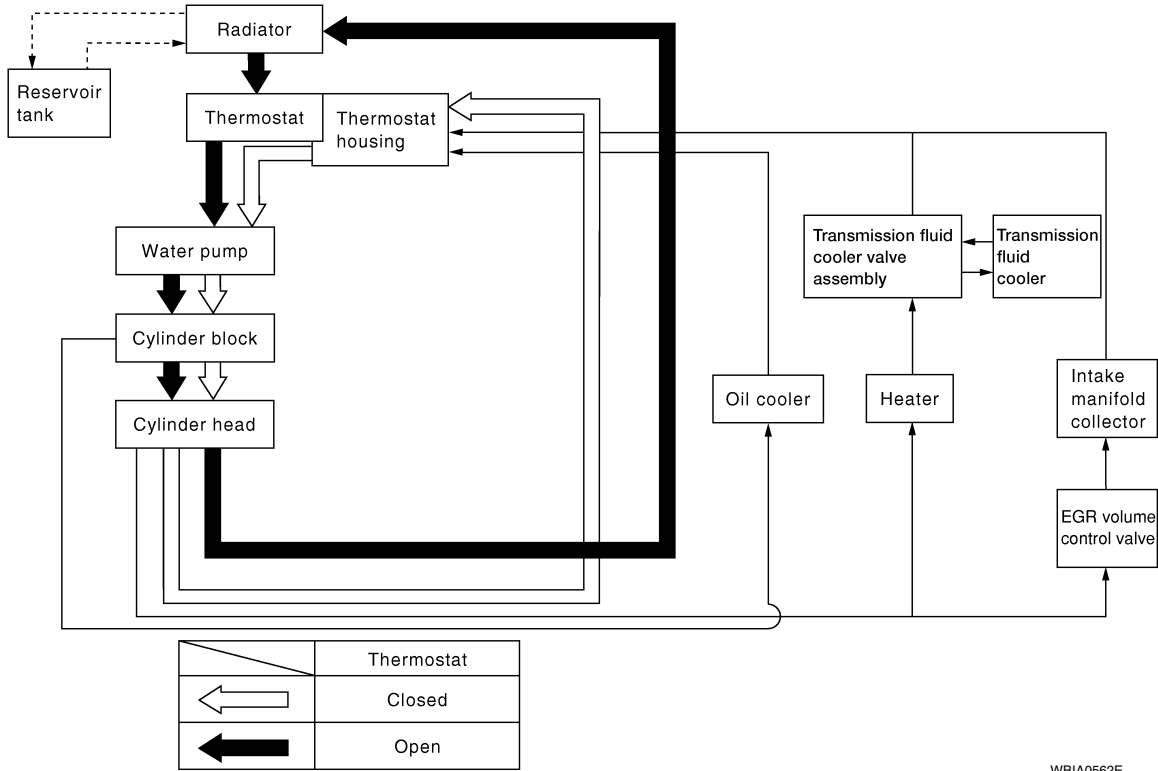
COOLING SYSTEM

< SYSTEM DESCRIPTION >

[VQ35DE]

Schematic

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PERIODIC MAINTENANCE

ENGINE COOLANT

System Inspection

INFOID:000000011934751

WARNING:

- Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.
- When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.

CHECKING COOLING SYSTEM HOSES

Check hoses for the following:

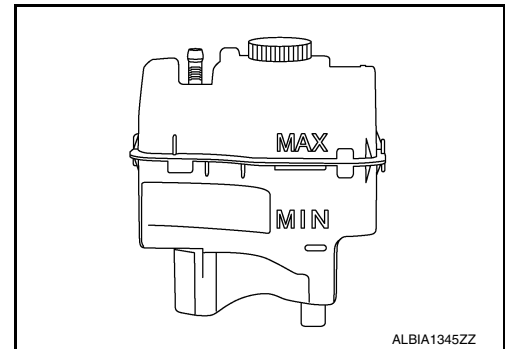
- Improper attachment
- Leaks
- Cracks
- Dents
- Bulges
- Internal obstruction
- Damage
- Loose connections
- Chafing
- Deterioration

CHECKING RESERVOIR LEVEL

- Check the coolant reservoir tank level when the engine is cool.
- Adjust engine coolant level, if necessary, to ensure that the engine coolant level is within the MIN to MAX range.

CAUTION:

Refill Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent in its quality mixed with water (distilled or demineralized). Refer to [MA-16, "FOR USA AND CANADA : Fluids and Lubricants"](#) (United States and Canada) or [MA-17, "FOR MEXICO : Fluids and Lubricants"](#) (Mexico).



CHECKING COOLING SYSTEM FOR LEAKS

WARNING:

- Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.
- When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.

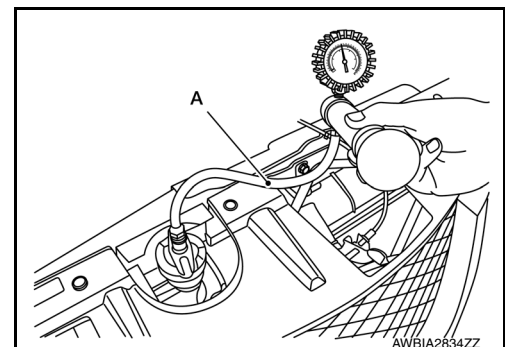
To check the cooling system for leaks, apply pressure to the cooling system using Tool (A).

Tool number (A) : — (J-51771)

Leakage test pressure : Refer to [CO-28, "Radiator"](#).

CAUTION:

Higher pressure testing than specified may cause radiator damage.



CHECKING RADIATOR CAP

WARNING:

ENGINE COOLANT

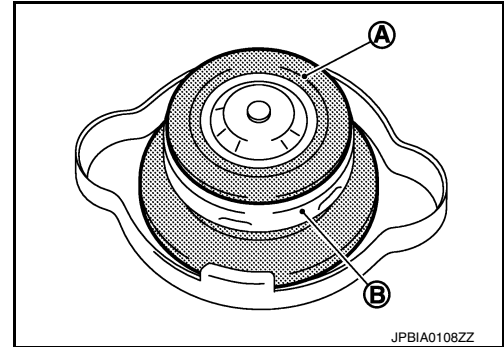
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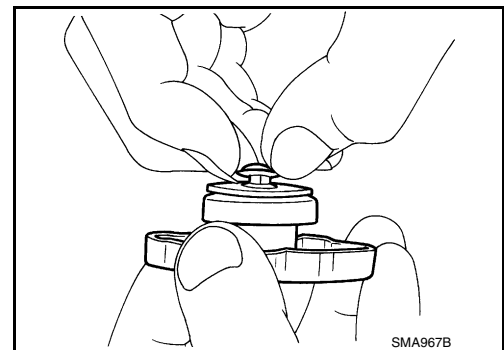
- Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.
- When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.
- Check the pressure valve of the radiator cap.
- Replace the radiator cap if the metal plunger (B) on the pressure valve cannot be seen around the edge of the rubber gasket (A).
- Replace the radiator cap if there is damage or deposits of foreign material on the rubber gasket or pressure valve.

CAUTION:

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



- Check the negative-pressure valve of the radiator cap.
- Replace the radiator cap if the negative-pressure valve does not close completely when pulled open and released.
- Replace the radiator cap if there is damage or deposits of foreign material on the valve seat of the negative-pressure valve.
- Replace the radiator cap if there is an abnormality in the operation of the negative-pressure valve.

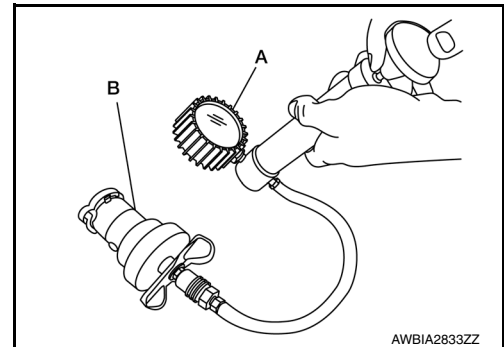


- Check radiator cap relief pressure.
- Check the radiator cap relief pressure using Tool (A) and tool (B).

Tool number (A) : — (J-51771)

Tool number (B) : — (J-33984-A or equivalent) (commercially available)

Radiator cap relief pressure : Refer to [CO-28, "Radiator"](#).



- When connecting the radiator cap to tool (B), apply water or coolant to the radiator cap seal surface.
- Replace the radiator cap if the radiator cap relief pressure is outside of specification.

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 (5 kg/cm², 71 psi) and keep a distance of 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

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.

DRAINING ENGINE COOLANT

1. Remove the front under cover. Refer to [EXT-26, "Removal and Installation"](#).
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:

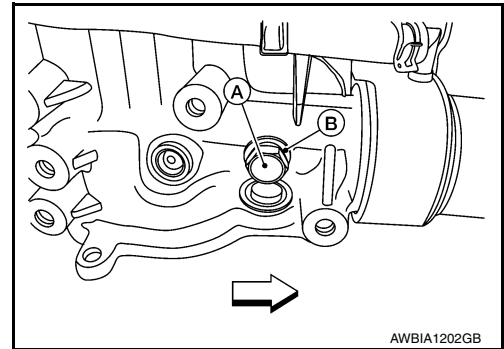
- Do not allow the coolant to contact the drive belts.
- Perform this step when engine is cold.

3. Remove water drain plug (A) and copper sealing washer (B).

CAUTION:

Do not reuse copper sealing washers.

⇐ : Engine front



4. 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/cm², 15 psi) maximum air pressure] into the hose for 30 seconds to blow the excess coolant out of the heater core.

5. 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.

6. When performing a complete cooling system drain, remove the water drain plug (A), connector bolt (D), water drain plug (C) and water drain plug O-ring (B) on the cylinder block.

CAUTION:

Do not reuse water drain plug O-ring (B).

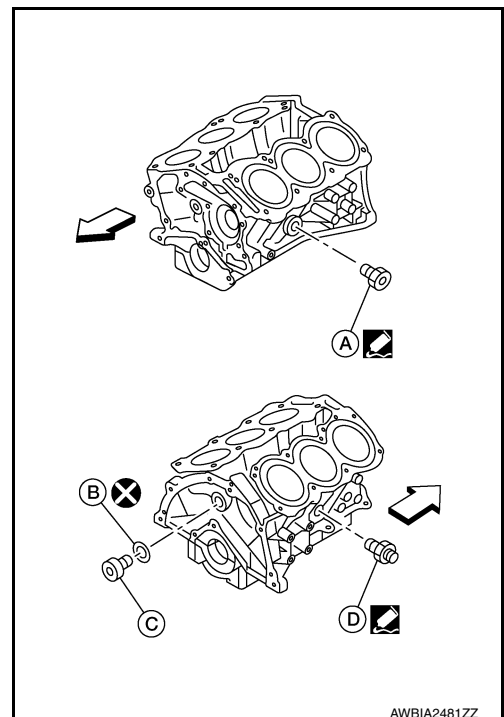
NOTE:

For Canada, connector bolt (D) is a block heater, not a water drain plug.

7. Check the drained coolant for contaminants, such as rust, corrosion or discoloration.

If the coolant is contaminated, flush the engine cooling system.

⇐ : Engine front



ENGINE COOLANT

[VQ35DE]

< PERIODIC MAINTENANCE >

REFILLING ENGINE COOLANT

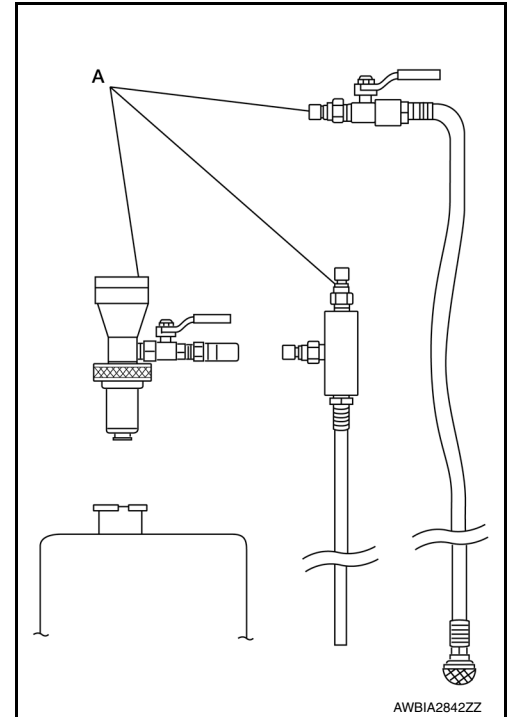
1. Install the following, if removed:
 - Cylinder block drain plugs, refer to [EM-115, "Exploded View"](#).
 - Reservoir tank, refer to [CO-14, "Exploded View"](#).
 - Cooling system hoses, refer to [CO-14, "Exploded View"](#)
 - Radiator drain plug, refer to [CO-14, "Exploded View"](#).
2. Set the vehicle heater controls to the full HOT and heater ON positions. Turn the vehicle ignition ON with the engine OFF as necessary to activate the heater mode.
3. Fill the cooling system with engine coolant using Tool (A), following the manufacturer's instructions included with the tool.

Tool number (A) : KV991J0070 (J-45695-A)

Engine Coolant : Refer to [MA-16, "FOR USA AND CANADA : Fluids and Lubricants"](#) (FOR USA AND CANADA) or [MA-17, "FOR MEXICO : Fluids and Lubricants"](#) (FOR MEXICO).

CAUTION:

- Use recommended coolant or equivalent.
 - Do not use any cooling system additives such as radiator sealer. Additives may clog the cooling system and cause damage to the engine, transmission or cooling system.
 - The compressed air supply must be equipped with an air dryer.
4. Remove the Tool (A) and top off the cooling system with engine coolant as necessary.



5. Install the radiator cap and reservoir tank cap.
6. Run the engine until it reaches normal operating temperature.
CAUTION:
Do not allow the engine to exceed normal operating temperature or engine damage may occur.
7. Stop the engine and allow it to cool.
8. Check the engine coolant level and adjust if necessary.

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-12, "Changing Engine Coolant"](#).
6. Repeat steps 1-5 until clear water begins to drain from the radiator.

RADIATOR

< REMOVAL AND INSTALLATION >

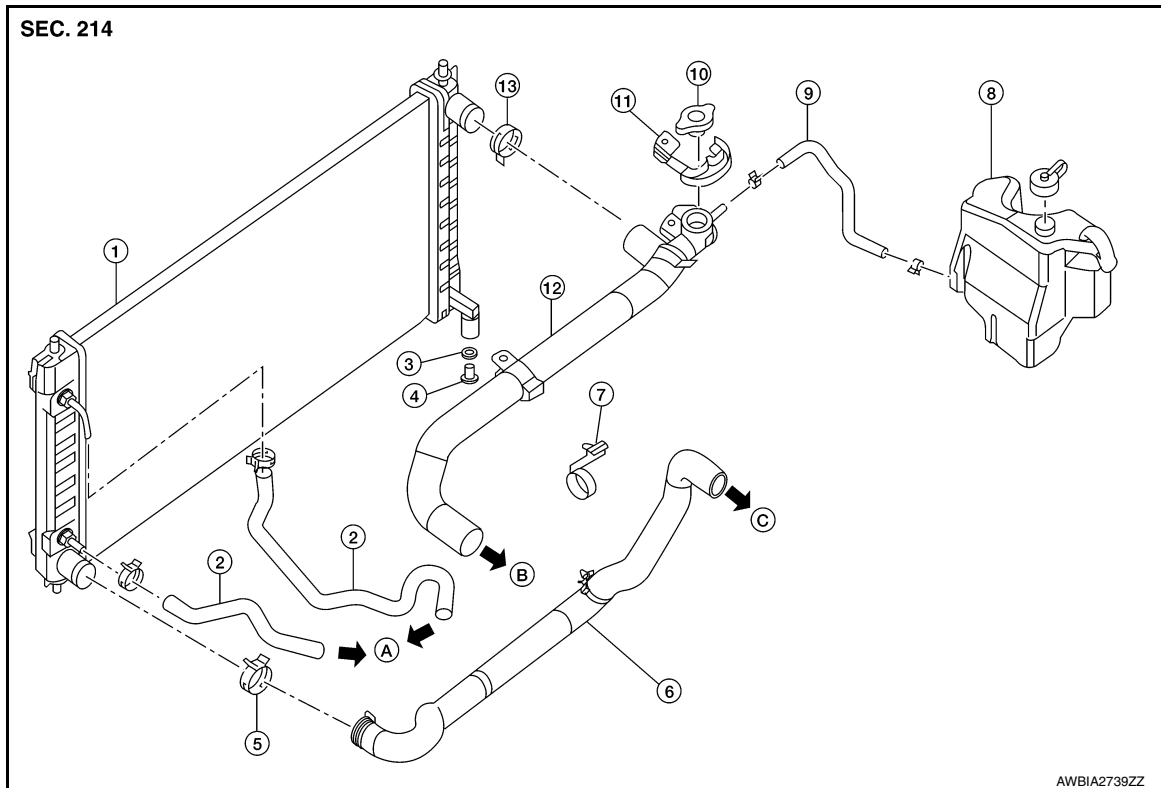
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REMOVAL AND INSTALLATION

RADIATOR

Exploded View

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- | | | |
|-----------------------------------|--------------------------------|---------------------------|
| 1. Radiator | 2. CVT oil cooler hose | 3. O-ring |
| 4. Radiator drain plug | 5. Radiator hose (lower) clamp | 6. Radiator hose (lower) |
| 7. Reservoir hose (lower) bracket | 8. Reservoir tank | 9. Reservoir hose |
| 10. Radiator cap | 11. Radiator cap adapter | 12. Radiator hose (upper) |
| 13. Radiator hose (upper) clamp | A. To CVT | B. To water outlet |
| C. To water inlet | | |

Removal and Installation

INFOID:000000012248917

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 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.
- The radiator hose clamps on the radiator hose (upper) and on the radiator hose (lower) are not serviced separately. Radiator hose clamps are part of the radiator hose assembly and serviced as one unit with the radiator hose.

REMOVAL

1. Remove radiator cap 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 coolant on the drive belt.

RADIATOR

[VQ35DE]

< REMOVAL AND INSTALLATION >

2. Remove fender protector side covers (LH/RH). Refer to [EXT-28, "Removal and Installation"](#).

3. Disconnect radiator hose (upper) and radiator hose (lower) from the radiator.

CAUTION:

Do not allow the coolant to contact the drive belt.

NOTE:

The radiator hose clamps on the radiator hose (upper) and on the radiator hose (lower) are not serviced separately. Radiator hose clamps are part of the radiator hose assembly and serviced as one unit with the radiator hose.

4. Disconnect the CVT oil cooler hoses.

5. Disconnect coolant reservoir hose from the radiator.

6. Remove front air duct. Refer to [EM-26, "Removal and Installation"](#).

7. Remove the front bumper fascia. Refer to [EXT-17, "Removal and Installation"](#).

8. Remove A/C condenser. Refer to [HA-41, "CONDENSER : Removal and Installation"](#).

CAUTION:

Be careful not to damage condenser core.

9. Remove the radiator mounts (upper).

10. 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 coolant and check for leaks. Refer to [CO-12, "Changing Engine Coolant"](#) and [CO-10, "System Inspection"](#).

CAUTION:

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

Inspection

INFOID:000000012248918

INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for engine coolant leaks. Refer to [CO-10, "System Inspection"](#).
- Start and warm up the engine. Visually check that there is no leakage of engine coolant and CVT fluid.

COOLING FAN

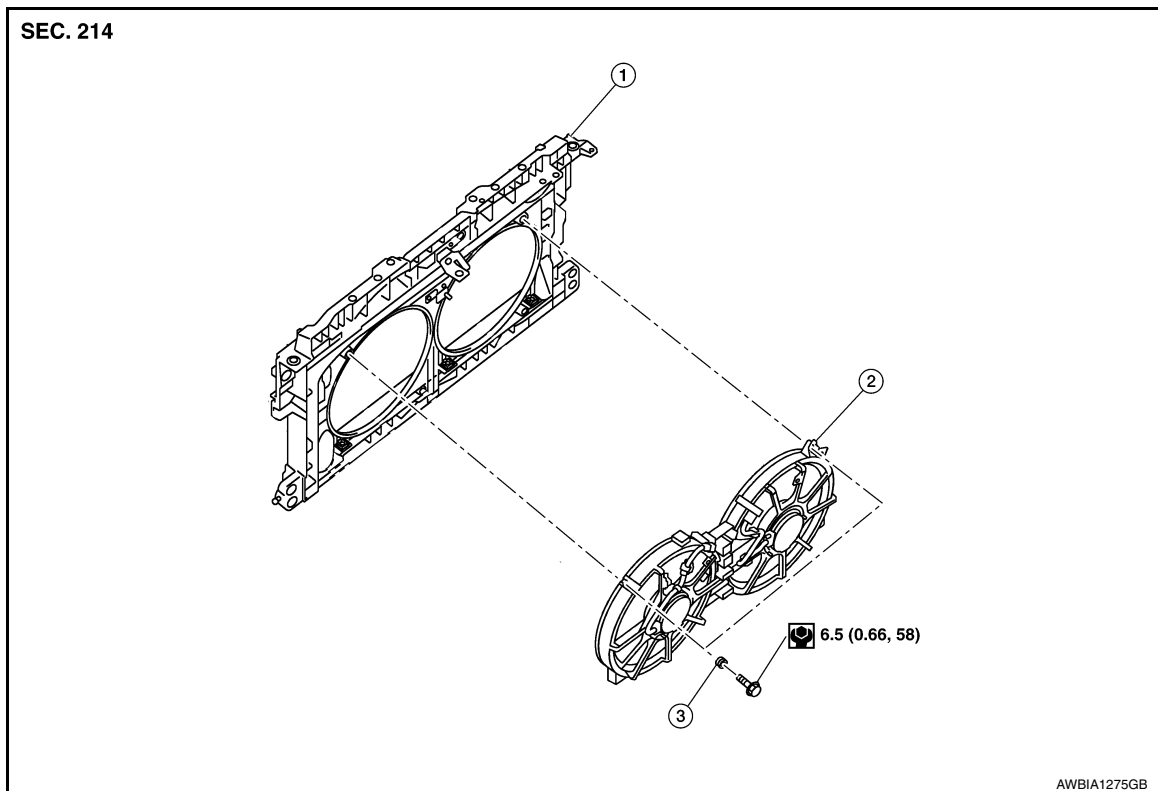
< REMOVAL AND INSTALLATION >

[VQ35DE]

COOLING FAN

Exploded View

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1. Radiator core support 2. Fan shroud and motor assembly 3. Grommet

Removal and Installation

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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

1. Partially drain engine coolant from the radiator. Refer to [CO-12, "Changing Engine Coolant"](#).

CAUTION:

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

2. Remove engine room cover. Refer to [EM-25, "Removal and Installation"](#).
3. Remove air cleaner and air duct assembly. Refer to [EM-26, "Removal and Installation"](#).
4. Remove battery tray and battery tray bracket. Refer to [PG-101, "Removal and Installation \(Battery\)"](#).
5. Disconnect radiator hose (upper) from radiator.
6. Disconnect the harness connectors from the fan motor.
7. Remove fan shroud and motor assembly.

INSTALLATION

Installation is in the reverse order of removal.

COOLING FAN

< REMOVAL AND INSTALLATION >

[VQ35DE]

- After installation, refill engine coolant and check for leaks. Refer to [CO-12, "Changing Engine Coolant"](#) and [CO-10, "System Inspection"](#).
- **CAUTION:**
Do not spill coolant in engine compartment. Use a shop cloth to absorb coolant.
- Cooling fans are controlled by ECM. Refer to [EC-541, "Diagnosis Procedure"](#).

A

CO

C

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P

WATER PUMP

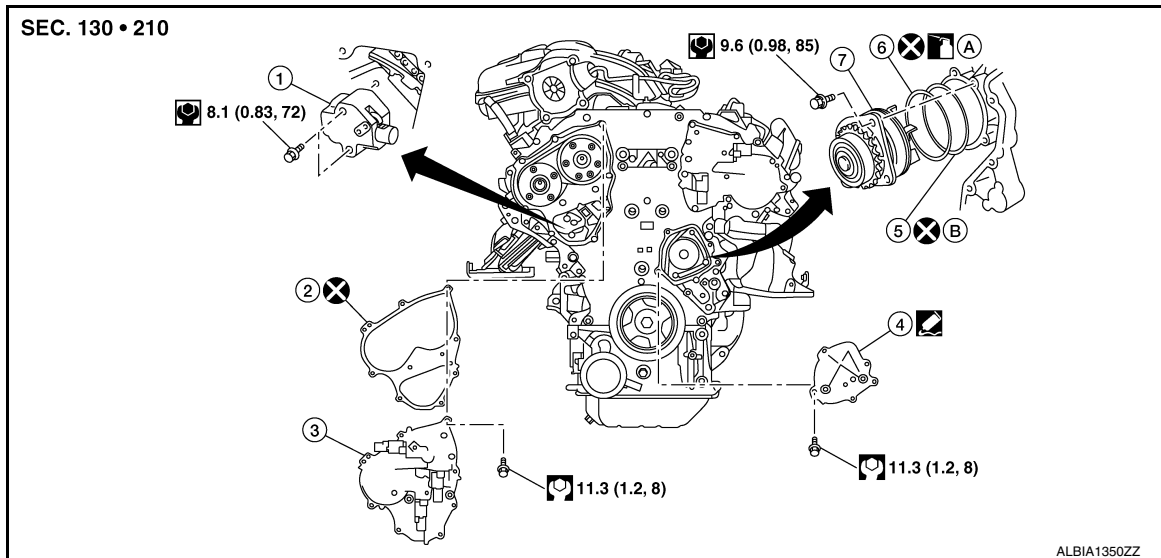
< REMOVAL AND INSTALLATION >

[VQ35DE]

WATER PUMP

Exploded View

INFOID:000000012248921



- | | | |
|-------------------------------------|---|--|
| 1. Timing chain tensioner (primary) | 2. Valve timing control cover gasket (bank 1) | 3. Valve timing control cover (bank 1) |
| 4. Water pump cover | 5. O-ring | 6. O-ring (Identify with white mark) |
| 7. Water pump | A. Apply engine oil | B. Apply engine coolant. |

Removal and Installation

INFOID:000000012248922

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 coolant on drive belt.
- Water pump cannot be disassembled and must be replaced as a unit.
- After installing the water pump, connect hose and clamp securely, then check for leaks. Repair as necessary.

NOTE:

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

REMOVAL

1. Disconnect the negative battery terminal. Refer to [PG-101, "Removal and Installation \(Battery\)"](#).
2. Remove front air duct. Refer to [EM-26, "Removal and Installation"](#).
3. Remove cowl top extension. Refer to [EXT-25, "Removal and Installation"](#).
4. Remove front undercover. Refer to [EXT-26, "Removal and Installation"](#).
5. Drain coolant from the radiator. Refer to [CO-12, "Changing Engine Coolant"](#).

CAUTION:

Perform when the engine is cold.

6. Disconnect coolant reservoir hose and remove coolant reservoir tank. Refer to [CO-14, "Exploded View"](#).
7. Drain the power steering fluid reservoir. Refer to [ST-29, "Draining and Refilling"](#).
8. Remove the power steering oil pump. Refer to [ST-43, "Removal and Installation"](#).

WATER PUMP

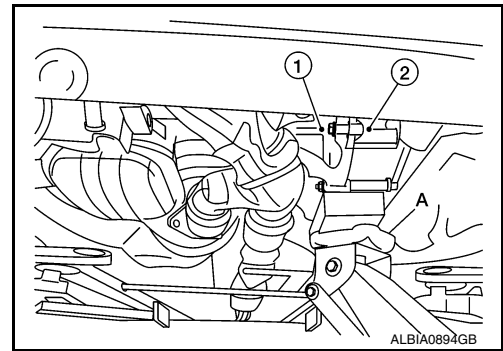
[VQ35DE]

< REMOVAL AND INSTALLATION >

9. Support the engine (1) and transaxle (2) using suitable jack (A).

CAUTION:

- Position a suitable jack under the engine and transaxle assembly as shown.
- Do not damage the front exhaust tube or transaxle oil pan with the jack.

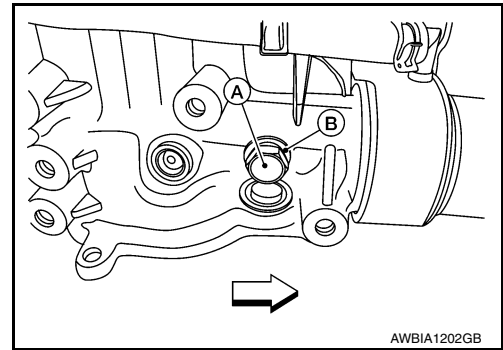


10. Remove The RH engine insulator and bracket. Refer to [EM-103. "ENGINE MOUNT \(REAR\) : Removal and Installation"](#).
11. Remove the drive belt auto-tensioner assembly. Refer to [EM-18. "Removal and Installation of Drive Belt Auto-tensioner"](#).
12. Set No. 1 cylinder at TDC on its compression stroke.
 - Align pointer with TDC mark on crankshaft pulley.
13. Remove water drain plug (A) and copper sealing washer (B) to drain coolant from engine.

CAUTION:

Do not reuse copper sealing washers.

← : Front



14. Disconnect valve timing control harness connectors and remove valve timing control cover (bank 1). Refer to [EM-55. "Valve Timing Control Cover \(bank 1\)"](#).

15. Remove water pump cover. Refer to [EM-58. "Exploded View"](#).

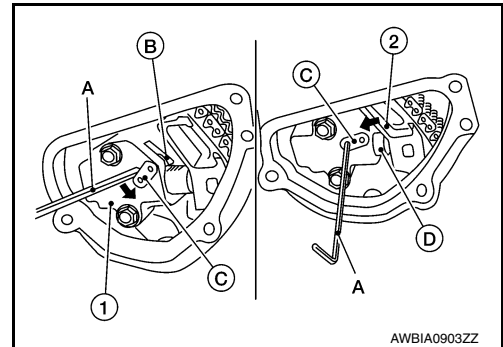
16. Remove the timing chain tensioner (primary) as follows:

- 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.

WATER PUMP

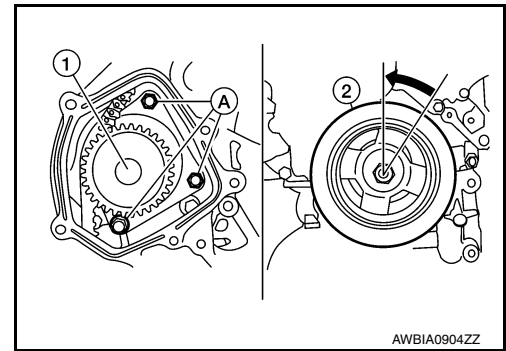
[VQ35DE]

< REMOVAL AND INSTALLATION >

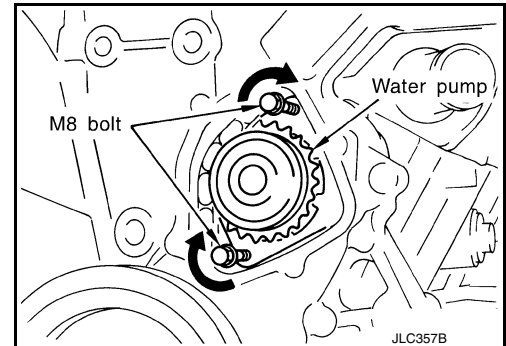
17. Remove the three water pump bolts (A). Make a gap between water pump sprocket (1) and timing chain by carefully turning crankshaft pulley (2) counterclockwise until timing chain loosens on water pump sprocket (1).

CAUTION:

Be careful not to drop water pump bolts inside the timing chain case.



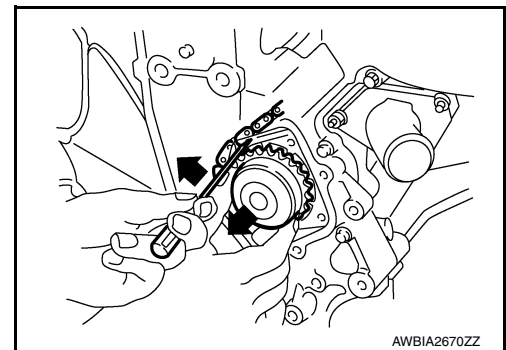
18. Screw M8 bolts [pitch: 1.25 mm (0.49 in) length: approx. 50 mm (1.97in)] into water pumps upper and lower bolt holes until they reach the timing chain case.



19. Hold the timing chain to the side using a suitable tool and alternately tighten the M8 bolts for a half turn until the water pump can be removed.

CAUTION:

- Place a suitable shop cloth below the water pump housing to prevent any engine coolant from dripping into the timing chain case.
- Remove water pump without causing sprocket to contact timing chain. It may be necessary to adjust the timing chain until it loosens enough to remove the water pump.
- Pull water pump straight out while preventing vane from contacting the engine block and timing chain case.



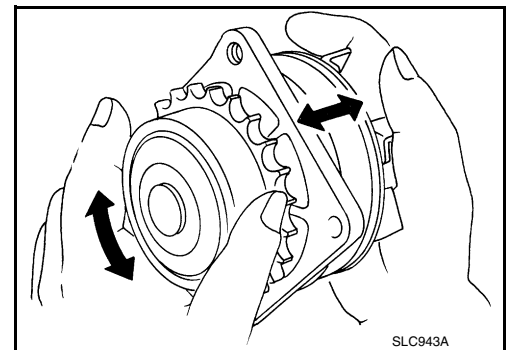
20. Remove M8 bolts and O-rings from water pump.

CAUTION:

Do not reuse O-rings.

INSPECTION AFTER REMOVAL

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



INSTALLATION

WATER PUMP

< REMOVAL AND INSTALLATION >

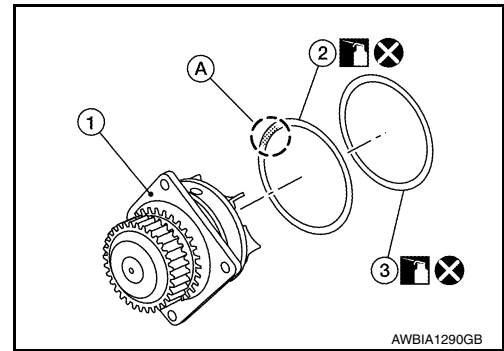
[VQ35DE]

1. Install new O-rings to water pump (1).

CAUTION:

Do not reuse O-rings.

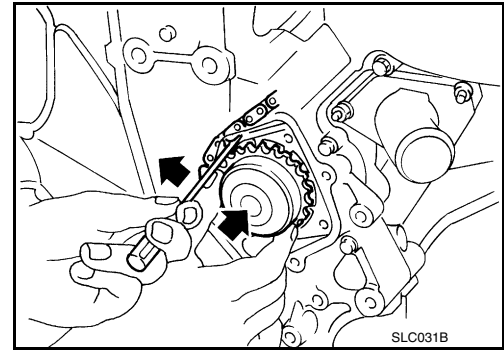
- a. Apply engine oil to the O-rings (2,3) as shown.
- b. Locate the O-ring (2) with white paint mark (A) to engine front side.



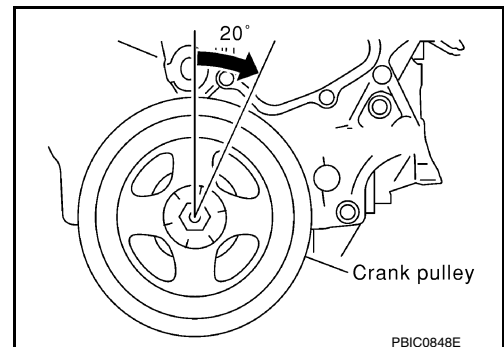
2. Hold timing chain to the side (←) and install the water pump (←).

CAUTION:

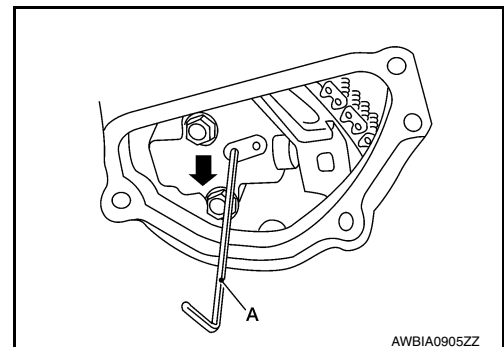
- Install water pump without causing sprocket to contact timing chain. It may be necessary to adjust the timing chain until it loosens enough to install the water pump.
- Install water pump straight in while preventing vane from contacting the engine block and timing chain case.
- Be careful not to damage 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 to specification.



3. Remove dust and foreign material completely from installation area of timing chain tensioner and rear timing chain case.
4. Turn the crankshaft pulley approximately 20° clockwise so that the timing chain on the timing chain tensioner side is loose.



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



7. Install valve timing control cover (bank 1) and water pump cover.
 - a. Before installing, remove all traces of liquid gasket from mating surface of water pump cover and IVT cover using a scraper. Also remove traces of liquid gasket from the mating surface of the front cover.

WATER PUMP

[VQ35DE]

< REMOVAL AND INSTALLATION >

- b. Using Genuine RTV Silicone Sealant or equivalent, apply a continuous bead of liquid gasket to mating surface of IVT cover and water pump cover. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

CAUTION:

- Installation should be done within 5 minutes after applying liquid gasket.
- Do not fill the engine with oil for at least 30 minutes after the components are installed to allow the sealant to cure.

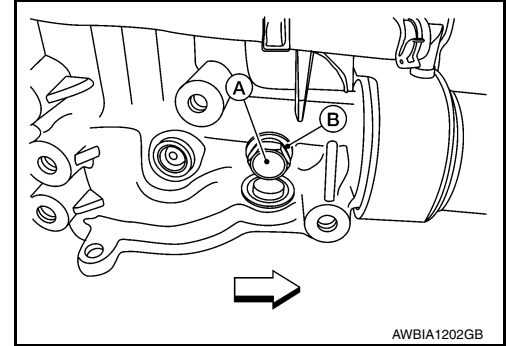
8. Install water drain plug (A) and copper sealing washer (B).

CAUTION:

Do not reuse copper sealing washers.

⇐ : Front

Water drain plug (A) : Refer to [CO-12, "Changing Engine Coolant"](#).



9. Installation of remaining components is in the reverse order of removal.
- After installation, refill coolant and check for leaks. Refer to [CO-12, "Changing Engine Coolant"](#) and [CO-10, "System Inspection"](#).

CAUTION:

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

- After starting engine, let idle for three minutes, then rev engine up to 3,000 rpm no-load to purge air from the high-pressure chamber of the chain tensioner. The engine may produce a rattling noise. This indicates that air still remains in the chamber and is not a matter of concern.

INSPECTION AFTER INSTALLATION

- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If the levels are less than required quantity, fill to the specified level. Refer to [MA-16, "FOR USA AND CANADA : Fluids and Lubricants"](#) (For USA and Canada) or [MA-17, "FOR MEXICO : Fluids and Lubricants"](#) (For Mexico).
- Use procedure below to check for fuel leakage.
- Turn ignition switch ON (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

NOTE:

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

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

Item		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leakage	Level
Engine oil		Level	Leakage	Level
Transmission/ transaxle fluid	CVT models	Leakage	Level/Leakage	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

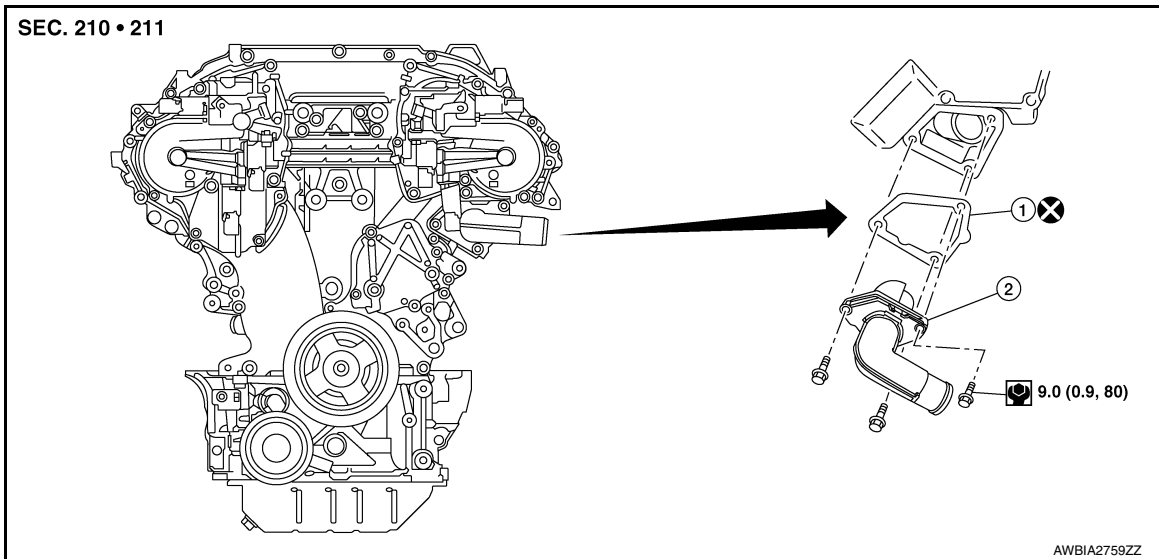
< REMOVAL AND INSTALLATION >

[VQ35DE]

THERMOSTAT AND THERMOSTAT HOUSING

Exploded View

INFOID:000000012248923



1. Gasket
2. Thermostat assembly

Removal and Installation

INFOID:000000012248924

REMOVAL

WARNING:

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

1. Drain engine coolant from the radiator. Refer to [CO-12. "Changing Engine Coolant"](#).

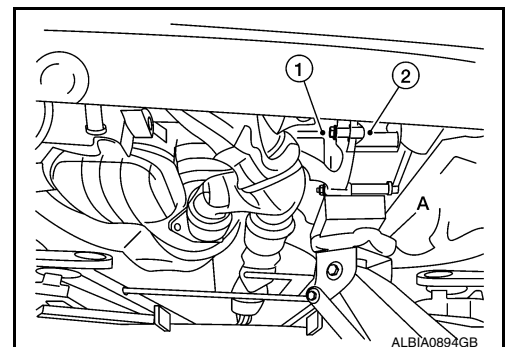
CAUTION:

Perform when engine is cool.

2. Remove cowl top extension. Refer to [EXT-25. "Removal and Installation"](#).
3. Remove front air duct. Refer to [EM-26. "Removal and Installation"](#).
4. Remove coolant reservoir hose.
5. Remove coolant reservoir tank. Refer to [CO-14. "Exploded View"](#).
6. Drain the power steering fluid reservoir. Refer to [ST-29. "Draining and Refilling"](#).
7. Remove the power steering oil pump. Refer to [ST-43. "Removal and Installation"](#).
8. Support the engine (1) and transaxle (2) using suitable jack (A).

CAUTION:

- Position a suitable jack under the engine and transaxle assembly as shown.
- Do not damage the front exhaust tube or transaxle oil pan with the jack.

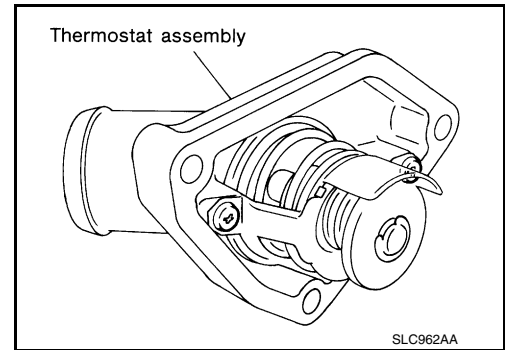


THERMOSTAT AND THERMOSTAT HOUSING

[VQ35DE]

< REMOVAL AND INSTALLATION >

9. Remove The RH engine insulator and bracket. Refer to [EM-103. "ENGINE MOUNT \(REAR\) : Removal and Installation"](#).
10. Disconnect radiator hose (lower).
11. Remove engine coolant inlet thermostat assembly and gasket.
 - **Do not disassemble engine coolant inlet and thermostat. Replace them as a unit if necessary.**
 - **Do not reuse gasket.**

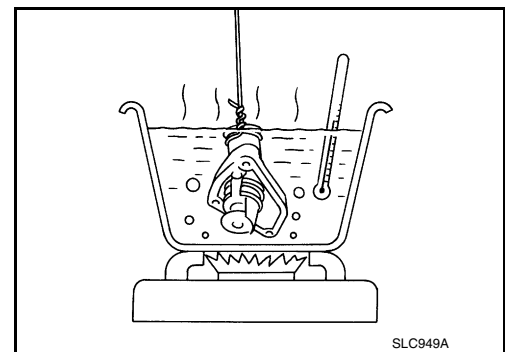


INSPECTION AFTER REMOVAL

- 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 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 is out of standard range, replace thermostat.

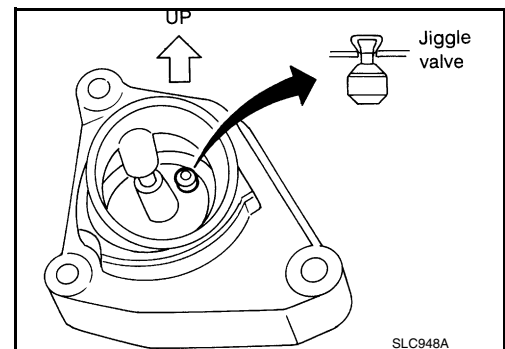
INSTALLATION

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-12. "Changing Engine Coolant"](#) and [CO-10. "System Inspection"](#).

CAUTION:

- **Do not spill coolant in engine compartment. Use a shop cloth to absorb coolant.**
- **Do not reuse gasket.**



WATER OUTLET AND WATER PIPING

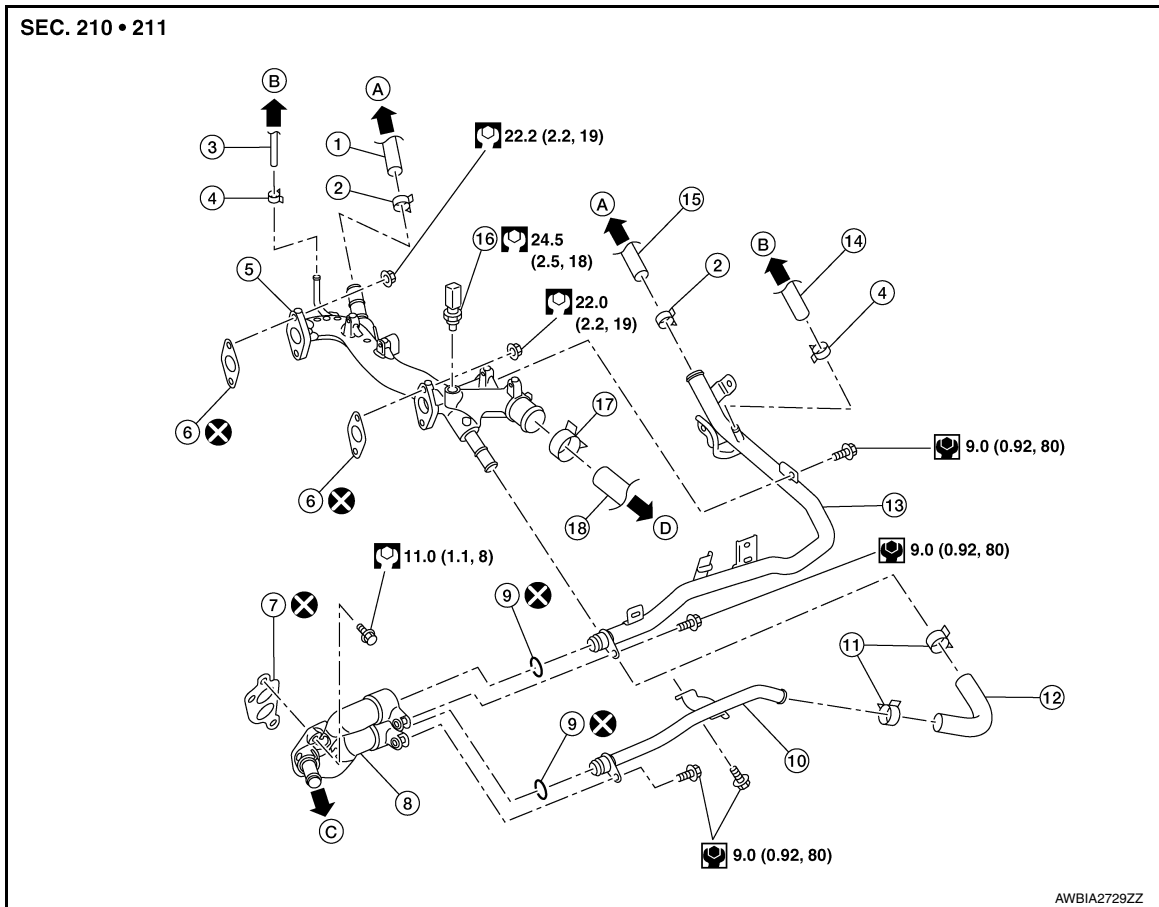
< REMOVAL AND INSTALLATION >

[VQ35DE]

WATER OUTLET AND WATER PIPING

Exploded View

INFOID:000000012482757



- | | | |
|---------------------------------------|--|---------------------------|
| 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:000000011934759

WARNING:

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

NOTE:

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

REMOVAL

CAUTION:

Perform when the engine is cold.

1. Remove the engine room cover. Refer to [EM-25. "Removal and Installation"](#).
2. Partially drain coolant from radiator. Refer to [CO-12. "Changing Engine Coolant"](#).

WATER OUTLET AND WATER PIPING

[VQ35DE]

< REMOVAL AND INSTALLATION >

3. Remove front air duct. Refer to [EM-26, "Removal and Installation"](#).
4. Remove the air duct and air cleaner assembly. Refer to [EM-26, "Removal and Installation"](#).
5. Remove the front fender protector side cover (RH/LH). Refer to [EXT-28, "Removal and Installation"](#).
6. Disconnect the hoses from the electric throttle control actuator.
7. Disconnect coolant hoses.
8. Remove upper radiator hose and heater hoses.
9. Remove connector(s) from heater pipe.
10. Disconnect the harness connector from engine coolant temperature sensor.
11. Remove water outlet, heater pipe, water connector, and water bypass pipe nuts and bolts.
12. Remove the engine coolant temperature sensor if necessary.

INSTALLATION

1. 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.
CAUTION:
Do not reuse gasket.
 - When inserting heater pipe and water bypass pipe into water connector, apply neutral detergent to new O-rings.
CAUTION:
Do not reuse O-rings.
 - After installation, refill engine coolant and check for leaks. Refer to [CO-10, "System Inspection"](#).

COOLING FAN

< UNIT DISASSEMBLY AND ASSEMBLY >

[VQ35DE]

UNIT DISASSEMBLY AND ASSEMBLY

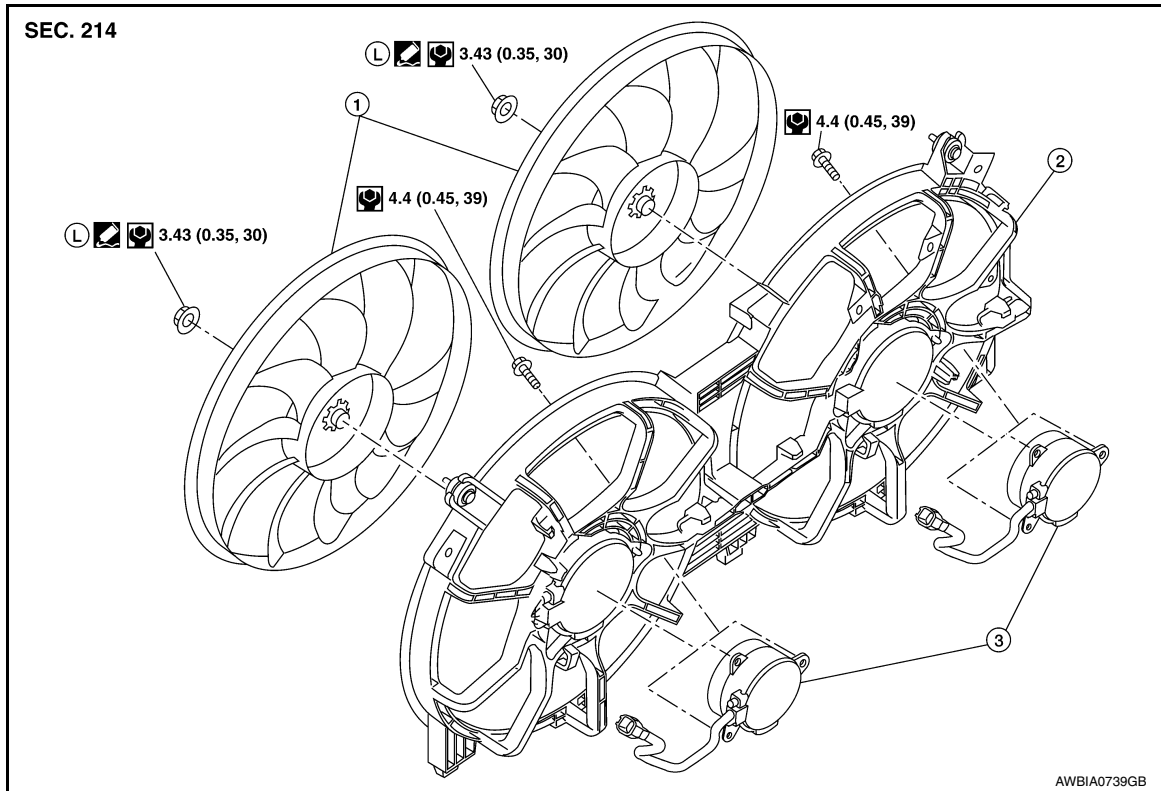
COOLING FAN

Disassembly and Assembly of Cooling Fan

INFOID:000000011934760

A

CO



1. Fan blade

2. Fan shroud

3. Fan motor

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.

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[VQ35DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Capacity

INFOID:0000000011934761

ℓ (US qt, Imp qt)

Coolant capacity (with reservoir tank at MAX level)	9.2 (9-3/4, 8-1/8)
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Thermostat

INFOID:0000000011934762

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:0000000011934763

Unit: kPa (kg/cm², psi)

Radiator cap relief pressure	Standard	122.3 – 151.7 (1.3 – 1.5, 17.7 – 22)
Leakage test pressure		156 (1.6, 23)