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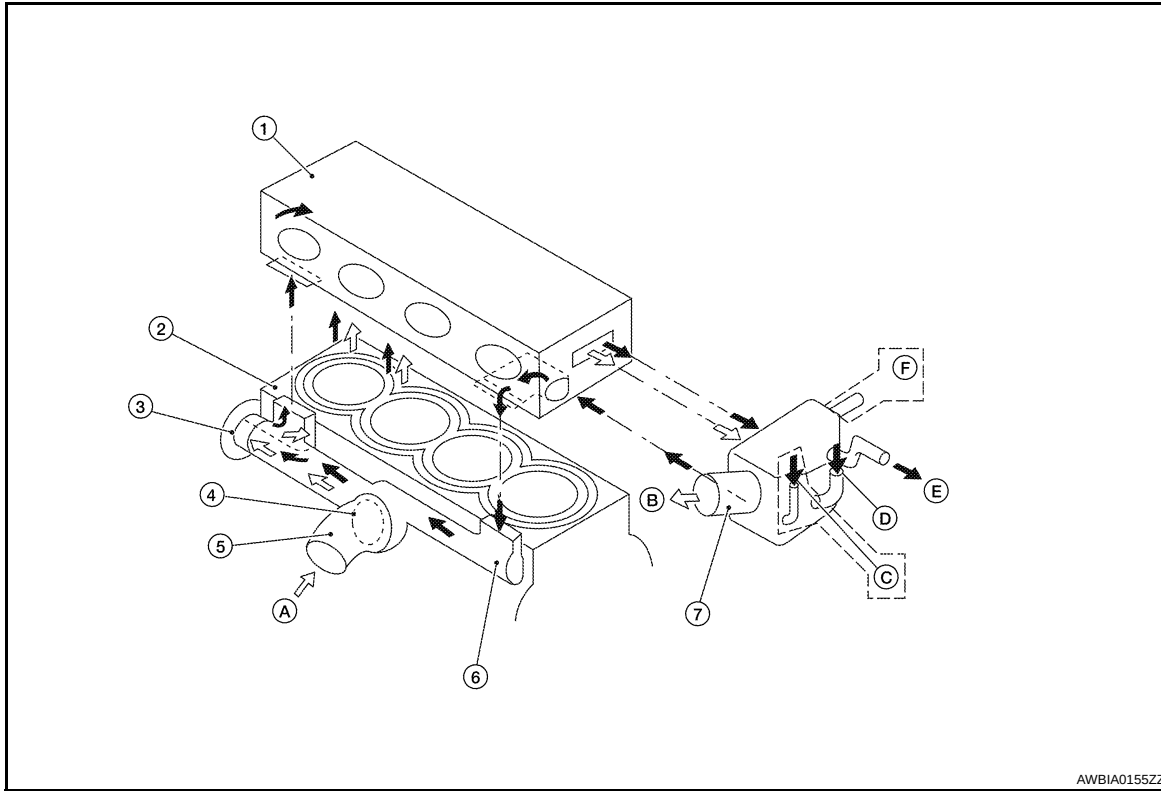
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FUNCTION DIAGNOSIS

DESCRIPTION

Engine Cooling System

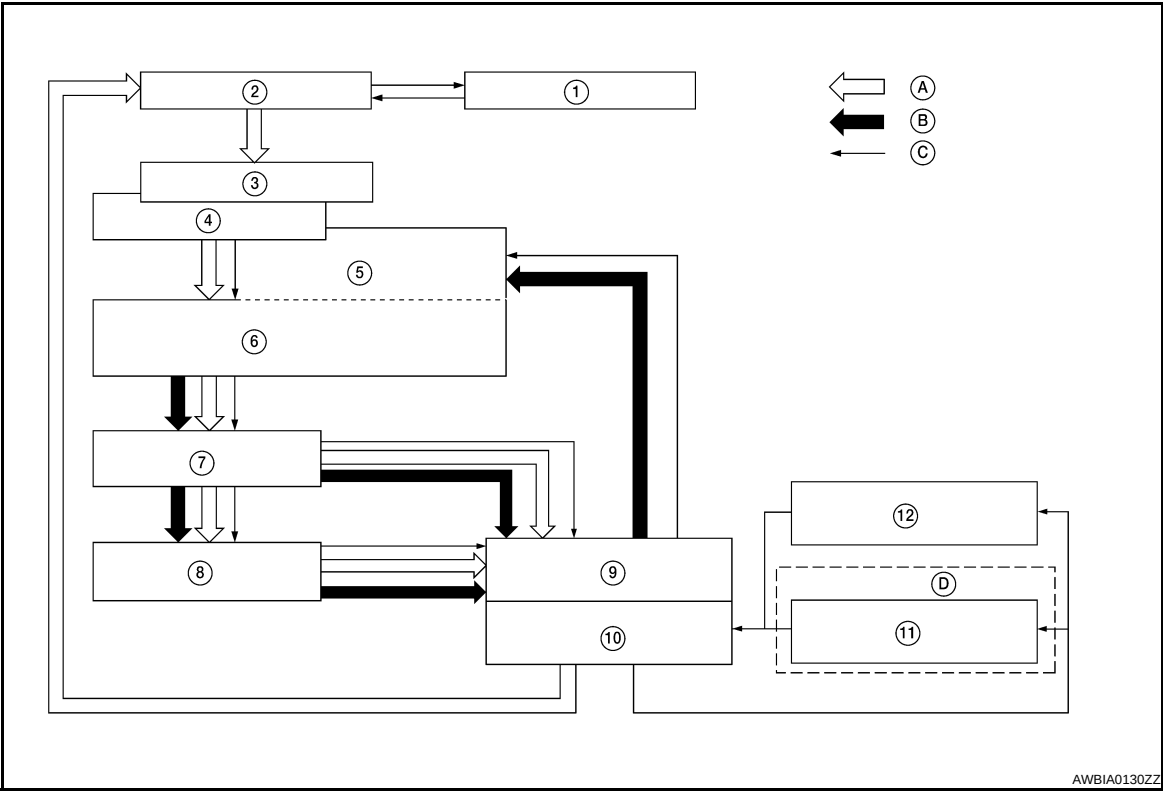
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- | | | |
|---|-------------------|-----------------|
| 1. Cylinder head | 2. Cylinder block | 3. Water pump |
| 4. Thermostat | 5. Water inlet | 6. Water bypass |
| 7. Water outlet | A. From radiator | B. To radiator |
| C. From electronic throttle control actuator (Northern European models) | D. From heater | E. To heater |
| F. To electronic throttle control actuator (Northern European models) | | |

Engine Cooling System Schematic

INFOID:000000001381551



- | | | |
|-----------------------------|--|------------------|
| 1. Reservoir tank | 2. Radiator | 3. Water inlet |
| 4. Thermostat | 5. Water bypass | 6. Water jacket |
| 7. Water pump | 8. Cylinder block | 9. Cylinder head |
| 10. Water outlet | 11. Electronic throttle control actuator | 12. Heater |
| A. Thermostat open | B. Thermostat closed | C. Constant |
| D. Northern European models | | |

OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[HR16DE]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000001381552

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

OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[HR16DE]

	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
			Power train system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing	
	Blocked or restricted air flow	Blocked bumper	—	—
		Blocked radiator grille	Installed car brassiere	
			Mud contamination or paper clogging	
		Blocked radiator	—	
		Blocked condenser	Blocked air flow	
	Installed large fog lamp			

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PRECAUTION

PRECAUTIONS

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

INFOID:000000001534589

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.

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000001534590

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-II to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-II.

Precaution for Liquid Gasket

INFOID:000000001534591

REMOVAL OF LIQUID GASKET SEALING

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

PRECAUTIONS

< PRECAUTION >

[HR16DE]

Tool number : KV10111100 (J-37228)

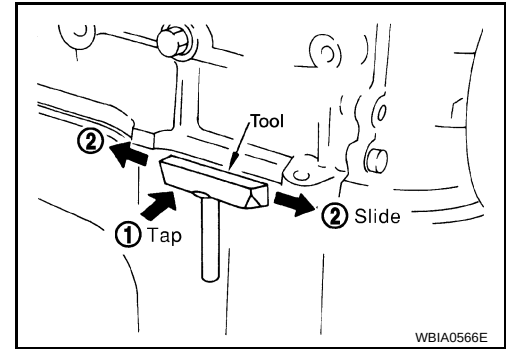
CAUTION:

Be careful not to damage the mating surfaces.

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

CAUTION:

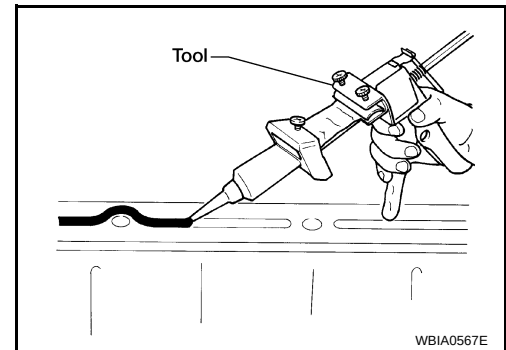
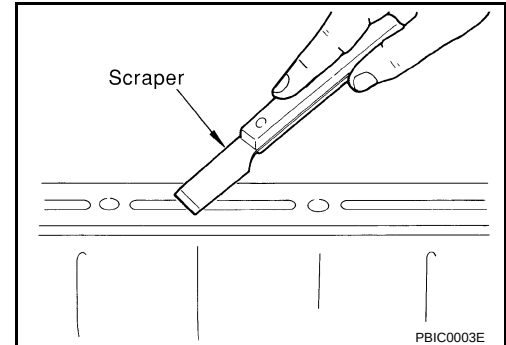
If for some unavoidable reason suitable tool such as screw-driver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

1. 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.
2. Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign materials.
3. Attach liquid gasket tube to Tool.

Tool number : WS39930000 (—)

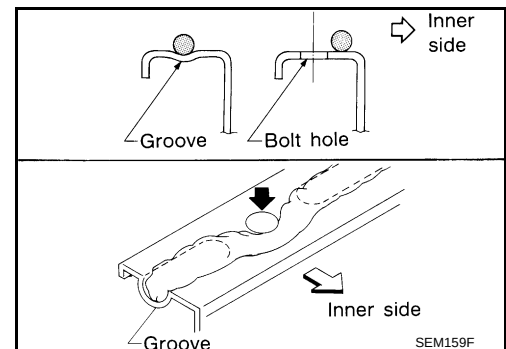


Use Genuine RTV Silicone Sealant or equivalent. Refer to [GI-27, "Recommended Chemical Products and Sealants"](#).

4. 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:

If there are specific instructions in this manual, observe them.



PREPARATION

< PREPARATION >

[HR16DE]

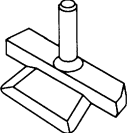
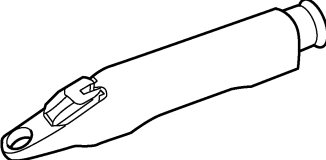
PREPARATION

PREPARATION

Special Service Tool

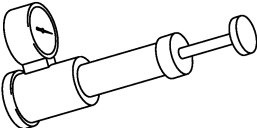
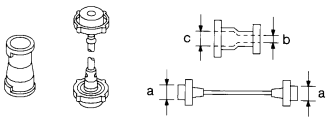
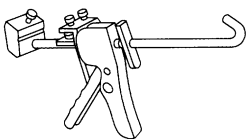
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The actual shapes of Kent-Moore tools may from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV10111100 (J-37228) Seal cutter	Removing chain tensioner cover and water pump cover
 NT046	
— (J-23688) Engine coolant refractometer	Checking concentration of ethylene glycol in engine coolant
 WBIA0539E	

Commercial Service Tool

INFOID:000000001534596

NISSAN tool number Tool name	Description
Radiator cap tester	Checking radiator and radiator cap
 PBIC1982E	
(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	
WS39930000 Tube pressure	Pressing the tube of liquid gasket
 S-NT052	

ON-VEHICLE MAINTENANCE

ENGINE COOLANT

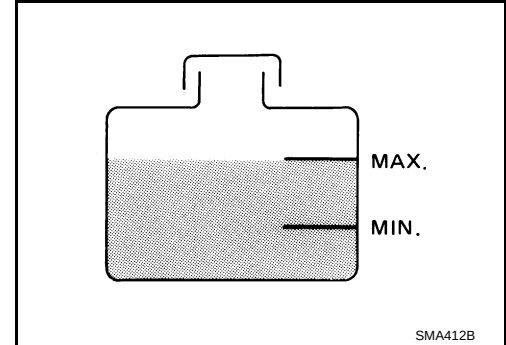
Inspection

INFOID:000000001534600

CO

LEVEL CHECK

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



CHECKING COOLING SYSTEM FOR LEAKS

To check for leaks, apply pressure to the cooling system using suitable tool.

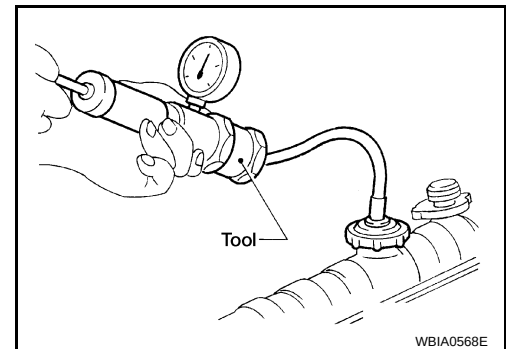
Testing pressure : 157 kPa (1.6 kg/cm², 23 psi)

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.



Changing Engine Coolant

INFOID:000000001534601

WARNING:

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

DRAINING ENGINE COOLANT

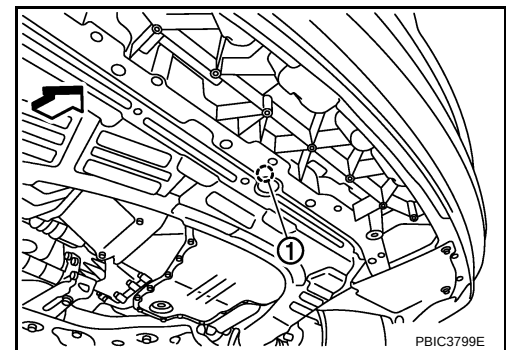
1. Open radiator drain plug (1) at the bottom of radiator, and then remove radiator cap.

- ⇐ Front

When drain all of engine coolant in the system, open water drain plug on cylinder block. Refer to [EM-100, "Exploded View"](#).

CAUTION:

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



2. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing.
3. Check drained engine coolant for contaminants such as rust, corrosion or discoloration. If contaminated, flush the engine cooling system. Refer to [CO-11, "Changing Engine Coolant"](#).

REFILLING ENGINE COOLANT

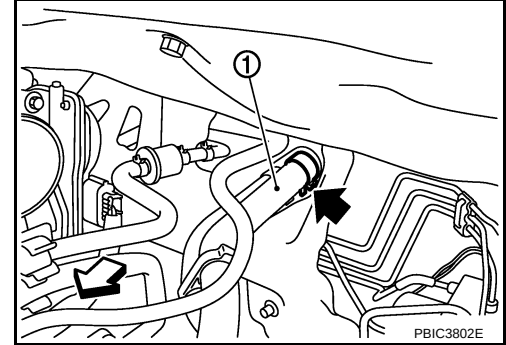
1. Install reservoir tank if removed.

ENGINE COOLANT

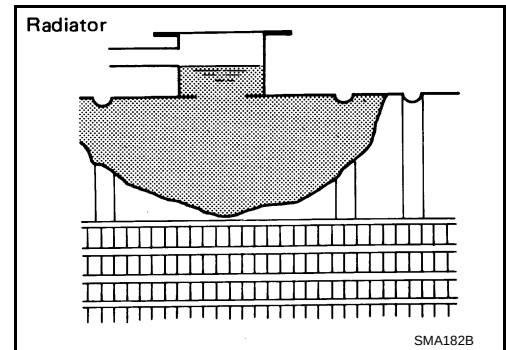
< ON-VEHICLE MAINTENANCE >

[HR16DE]

2. Install radiator drain plug.
 - If water drain plug on cylinder block is removed, close and tighten it. Refer to [EM-100, "Exploded View"](#).
- CAUTION:**
Be sure to clean radiator drain plug and install with new O-ring. Refer to [CO-16, "Component"](#).
3. Make sure that each hose clamp has been firmly tightened.
4. Remove air duct assembly. Refer to [EM-27, "Exploded View"](#).
5. Disconnect heater hose (1) at position (↔) as shown.
 - ↔ Front
 - Reposition heater hose as high as possible.



6. Fill radiator and reservoir tank to specified level.
 - Pour engine coolant through engine coolant filler neck slowly of less than 2ℓ (2 1/8 US qt, 1-3/4 Imp qt) a minute to allow air in system to escape.
 - Use NISSAN Genuine Engine Coolant or equivalent mixed with water (distilled or demineralized). Fill cooling system to specification. Refer to [MA-19, "Fluids and Lubricants"](#).
 - When engine coolant overflows disconnected heater hose, connect heater hose, and continue filling the engine coolant, if heater hose is disconnected.
7. Install radiator cap.
8. Install air duct assembly. Refer to [EM-27, "Exploded View"](#).
9. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
 - Make sure thermostat opening condition by touching radiator hose (lower) to see a flow of warm water.
- CAUTION:**
Watch water temperature gauge so as not to overheat the engine.
10. Stop engine and cool down to less than approximately 50°C (122°F).
 - Cool down using fan to reduce the time.
 - If necessary, refill radiator up to filler neck with engine coolant.
11. Refill reservoir tank to "MAX" level line with engine coolant.
12. Repeat steps 6 through 11 two or more times with radiator cap installed until engine coolant level no longer drops.
13. Check cooling system for leaks with engine running.
14. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between "COOL" and "WARM".
 - Sound may be noticeable at heater unit.
15. Repeat step 14 three times.
16. If sound is heard, bleed air from cooling system by repeating steps 6 through 11 until engine coolant level no longer drops.



FLUSHING COOLING SYSTEM

1. Install reservoir tank if removed.
2. Install radiator drain plug.
 - If water drain plug on cylinder block is removed, close and tighten it. Refer to [EM-100, "Exploded View"](#).
- CAUTION:**
Be sure to clean radiator drain plug and install with new O-ring. Refer to [CO-16, "Component"](#).

ENGINE COOLANT

[HR16DE]

< ON-VEHICLE MAINTENANCE >

3. Fill radiator and reservoir tank with water and reinstall radiator cap.
4. Run engine and warm it up to normal operating temperature.
5. Rev engine two or three times under no-load.
6. Stop engine and wait until it cools down.
7. Drain water from the cooling system. Refer to [CO-11, "Changing Engine Coolant"](#).
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.

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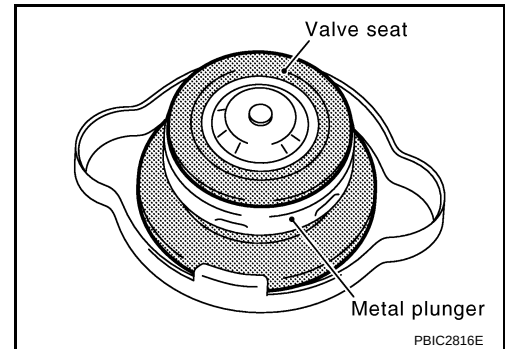
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RADIATOR

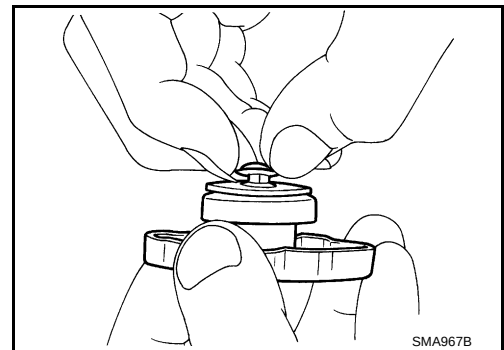
Checking Radiator Cap

INFOID:000000001534602

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



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

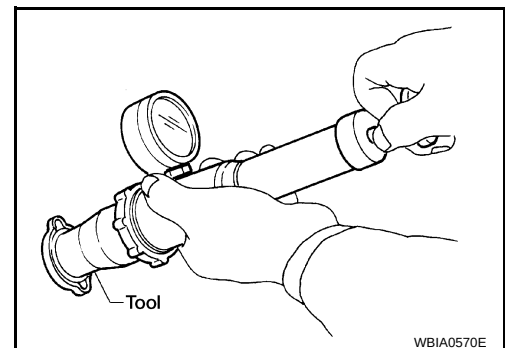


- Check radiator cap relief pressure using suitable tool.

Standard: 78 – 98 kPa (0.78 - 0.98 bar, 0.8 – 1.0 kg/cm², 11 – 14 psi)

Limit: 59 kPa (0.59 bar, 0.6 kg/cm², 9 psi)

- 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.



- Replace radiator cap if there it does not comply to specifications to the above three checks.

CAUTION:

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

Checking Radiator

INFOID:000000001534603

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

- Be careful not to bend or damage radiator fins.
 - When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape harness and connectors to prevent water from entering.
1. Apply water by hose to the back side of the radiator core vertically downward.
 2. Apply water again to all radiator core surface once per minute.
 3. Stop washing if any stains no longer flow out from radiator.
 4. Blow air into the back side of radiator core vertically downward.
 - Use compressed air lower than 490 kPa (4.9 bar, 5 kg/cm², 71 psi) and keep distance more than 30 cm (11.8 in).

RADIATOR

< ON-VEHICLE MAINTENANCE >

[HR16DE]

5. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

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RADIATOR

< ON-VEHICLE REPAIR >

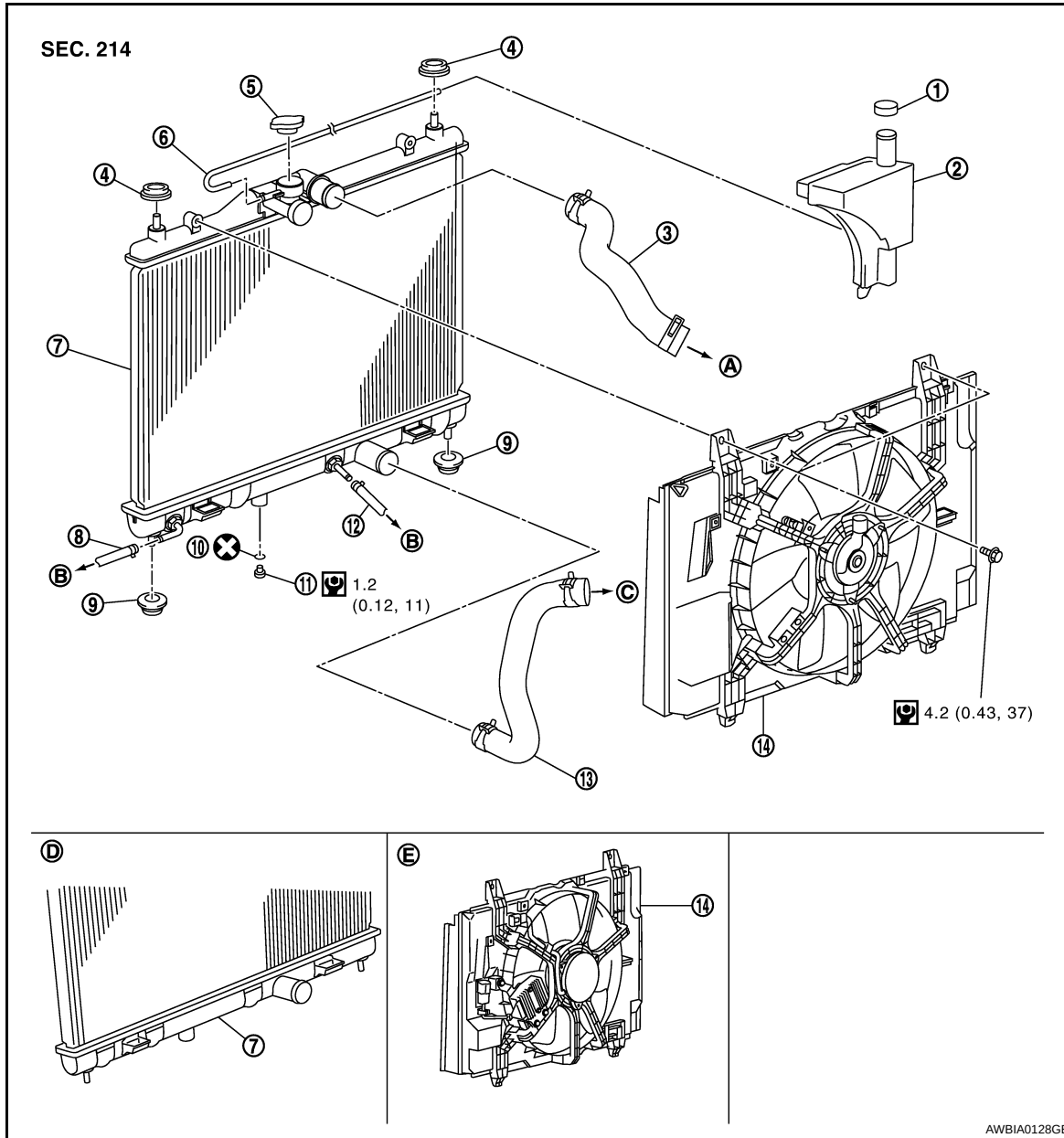
[HR16DE]

ON-VEHICLE REPAIR

RADIATOR

Component

INFOID:000000001534605



Removal and Installation

INFOID:000000001534606

WARNING:

RADIATOR

< ON-VEHICLE REPAIR >

[HR16DE]

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

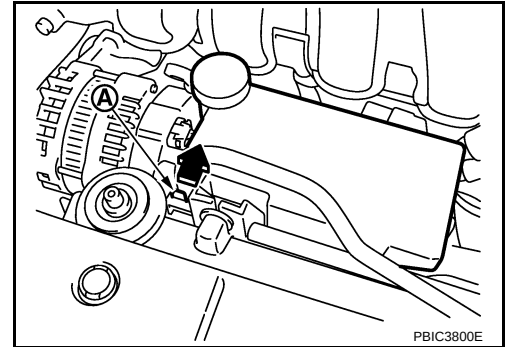
REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-11, "Changing Engine Coolant"](#).

CAUTION:

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

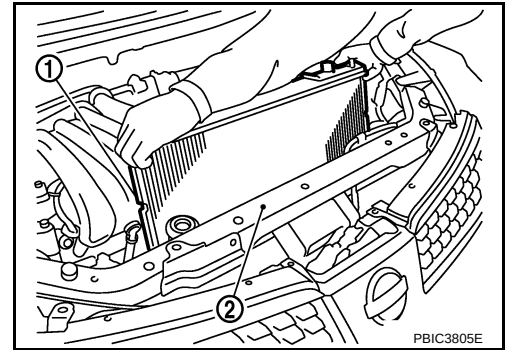
2. Remove air duct (inlet). Refer to [EM-27, "Exploded View"](#).
3. Remove reservoir tank as follows:
 - a. Disconnect reservoir tank hose.
 - b. Release the tab (A) in the direction shown by the arrow (←).
 - c. Lift up while removing the reservoir tank hose, and remove it.



4. Disconnect harness connector from fan motor, and move harness aside.
5. Disconnect A/T fluid cooler hoses if equipped.
 - Install plug to avoid leakage of A/T fluid if equipped.
6. Remove radiator hoses (upper and lower).
7. Remove radiator core support cover.
8. Remove radiator core support (upper) bolts, bolts of stationary part on the radiator core support side and clip. Lift radiator assembly (1) from radiator (upper) mount part of radiator core support (upper) (2).
9. Move radiator assembly (1) to the rearward direction of vehicle, and then lift it upward to remove.

CAUTION:

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



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

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

INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant.
- Start and warm up engine. Visually check if there is no leaks of engine coolant and A/T fluid if equipped.

COOLING FAN

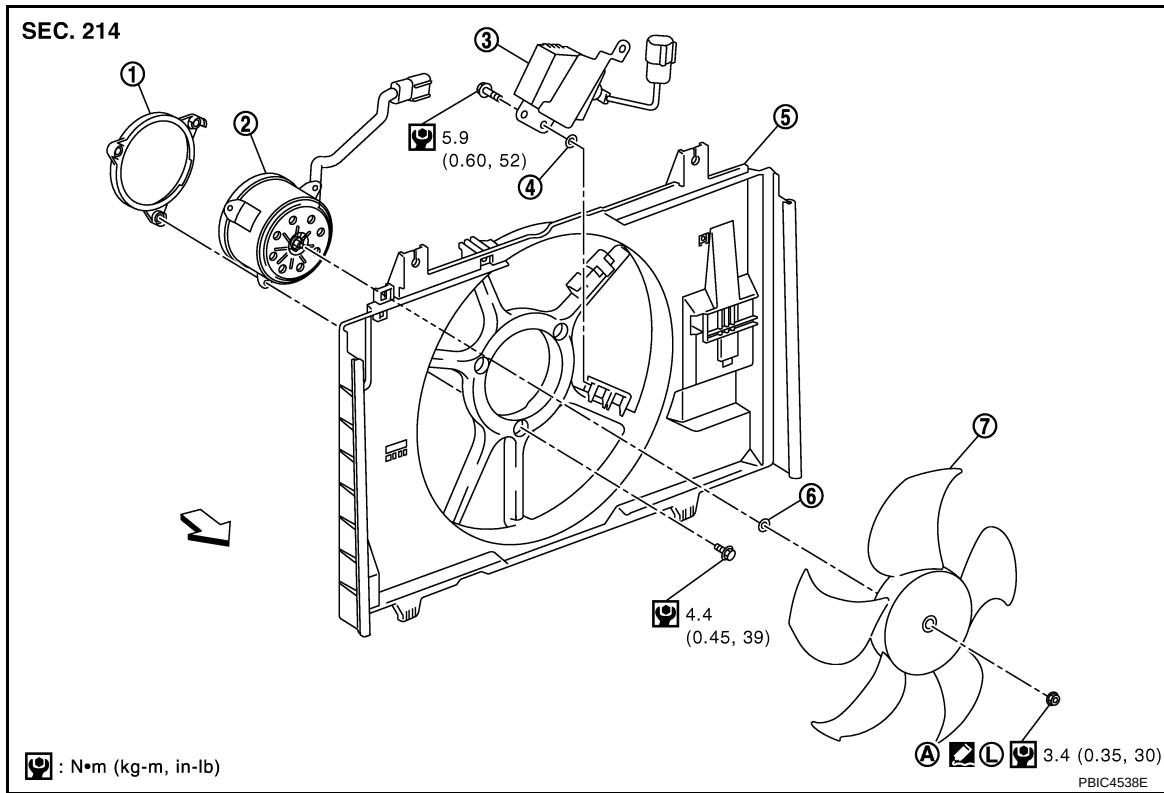
< ON-VEHICLE REPAIR >

[HR16DE]

COOLING FAN

Component (Models with A/C)

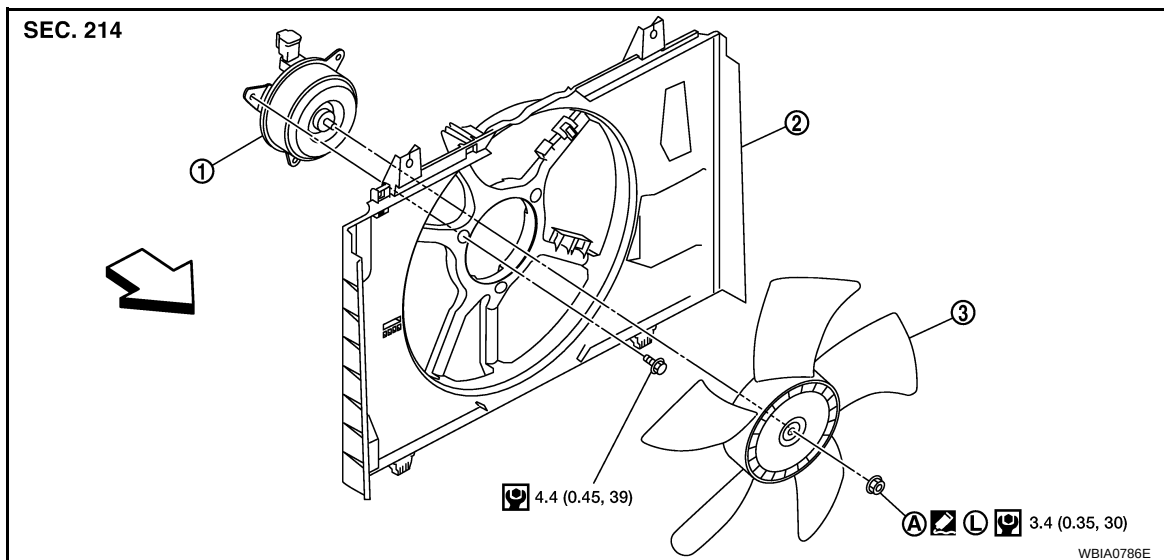
INFOID:000000001534607



- | | | |
|--------------------|-----------------------------|-------------------------------|
| 1. Fan motor cover | 2. Fan motor | 3. Cooling fan control module |
| 4. Washer | 5. Fan shroud | 6. Washer |
| 7. Cooling fan | A. Apply on fan motor shaft | ← Front |

Component (Models without A/C)

INFOID:000000001534608



- | | | |
|-----------------------------|---------------|----------------|
| 1. Fan motor | 2. Fan shroud | 3. Cooling fan |
| A. Apply on fan motor shaft | ← Front | |

Removal and Installation

INFOID:000000001534609

A

REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-11, "Changing Engine Coolant"](#).

CAUTION:

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

2. Remove air duct (inlet). Refer to [EM-27, "Exploded View"](#).
3. Remove reservoir tank.
4. Disconnect radiator hose (upper) at radiator side. Refer to [CO-16, "Component"](#).
5. Disconnect harness connectors from fan motor, and move harness to aside.
6. Remove cooling fan assembly.

CAUTION:

Be careful not to damage or scratch the radiator core.

INSTALLATION

Installation is the reverse order of removal.

- Cooling fans are controlled by ECM. For details, refer to [CO-4, "Engine Cooling System"](#).

CAUTION:

Be careful not to damage or scratch the radiator core.

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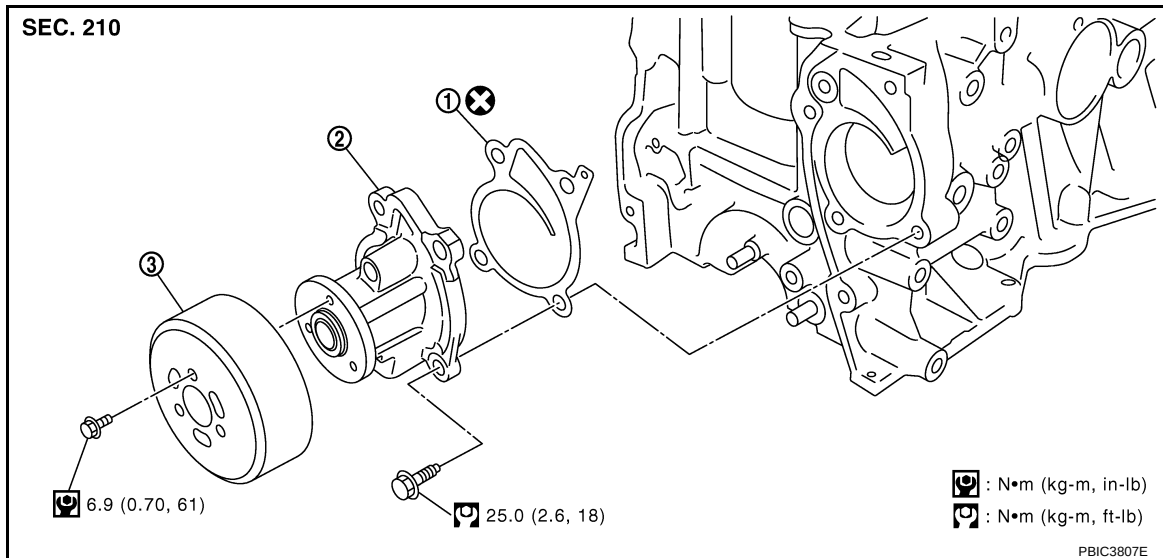
O

P

WATER PUMP

Exploded View

INFOID:000000001381568



1. Gasket

2. Water pump

3. Water pump pulley

Removal and Installation

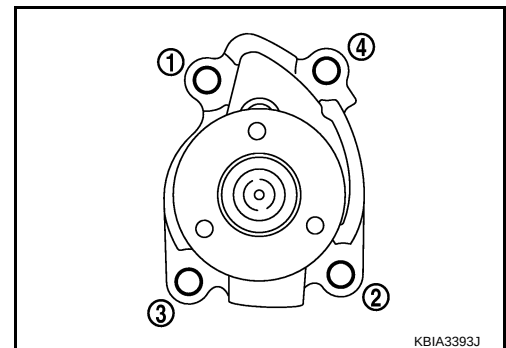
INFOID:000000001381569

REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-11, "Changing Engine Coolant"](#).
CAUTION:
 - Perform this step when the engine is cold.
 - Never spill engine coolant on drive belts.
2. Steer front wheel to the right.
3. Remove front fender protector (RH). Refer to [EXT-22, "Removal and Installation"](#).
4. Loosen mounting bolts of water pump pulley before loosening belt tension of drive belt.
5. Remove drive belt. Refer to [EM-16, "Removal and Installation"](#).
6. Remove water pump pulley.
7. Remove water pump.
 - Loosen mounting bolts in reverse order as shown.
 - Engine coolant will leak from cylinder block, so have a receptacle ready below.

CAUTION:

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



INSTALLATION

Installation is in the reverse order of removal.

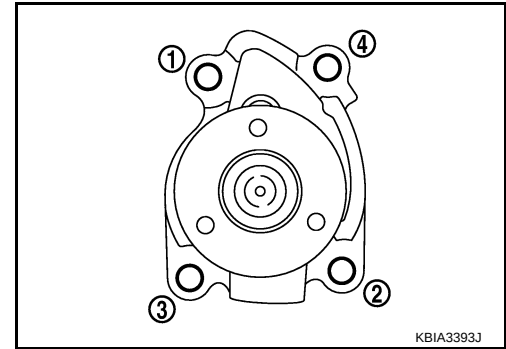
Water pump.

WATER PUMP

< ON-VEHICLE REPAIR >

[HR16DE]

- Tighten bolts in numerical order as shown.

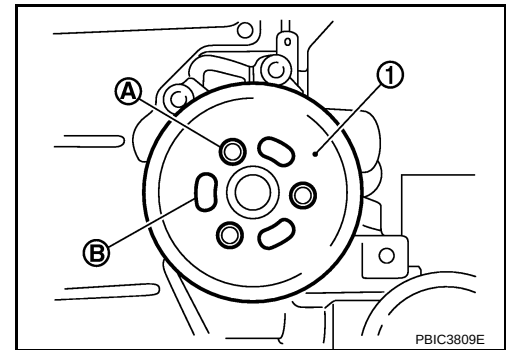


Water pump pulley.

CAUTION:

Never install mounting bolts (A) to oblong holes (B).

- Water pump pulley (1)

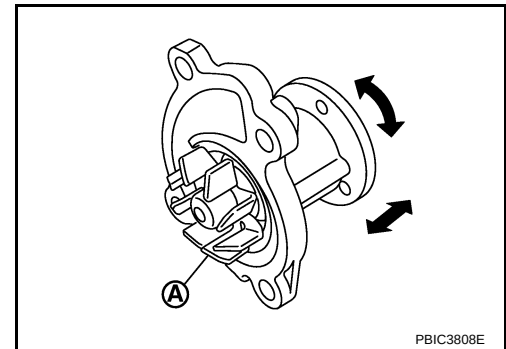


INFOID:000000001381570

Inspection

INSPECTION AFTER REMOVAL

- Visually check if there is no significant dirt or rusting on water pump body and vane (A).
- Make sure that there is no looseness in vane shaft, and that it turns smoothly when rotated by hand.
- Replace water pump, if necessary.



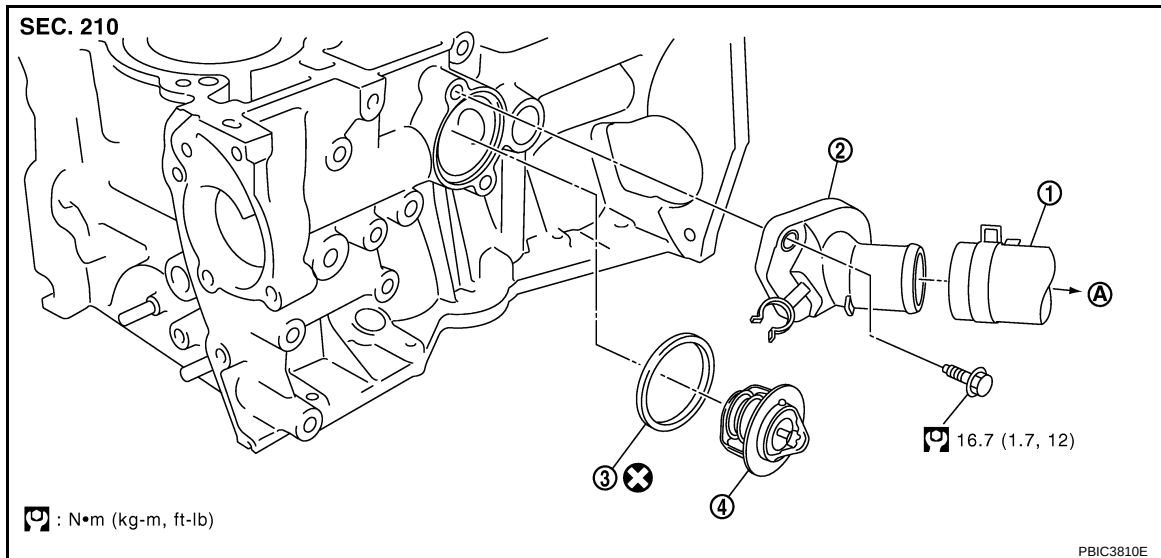
INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using suitable tools. Refer to [CO-11. "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

THERMOSTAT

Exploded View

INFOID:000000001381571



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

Removal and Installation

INFOID:000000001381572

REMOVAL

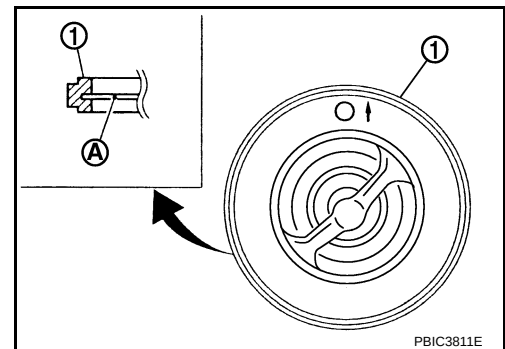
1. Drain engine coolant from radiator. Refer to [CO-11, "Changing Engine Coolant"](#).
CAUTION:
 - Perform this step when engine is cold.
 - Never spill engine coolant on drive belt.
2. Add paint mark, then disconnect radiator hose (lower) from water inlet. Refer to [CO-16, "Component"](#).
3. Remove water inlet and thermostat.
 - Engine coolant will leak from cylinder block, so have a receptacle ready below.

INSTALLATION

Installation is in the reverse order of removal.

Thermostat

- Install thermostat with making rubber ring (1) groove fit to thermostat flange (A) with the whole circumference.

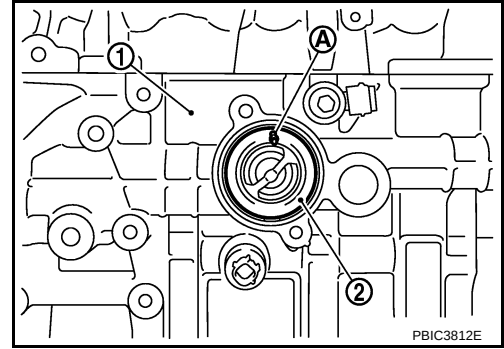


THERMOSTAT

< ON-VEHICLE REPAIR >

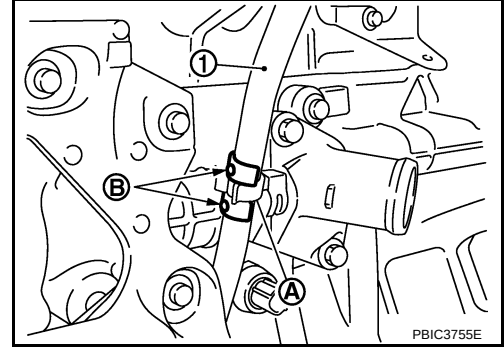
[HR16DE]

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



Water Inlet.

After installation, fix water inlet clip (A) on the oil level gauge guide (1) positioned (b) as shown.



Inspection

INFOID:000000001381573

INSPECTION AFTER REMOVAL

WARNING:

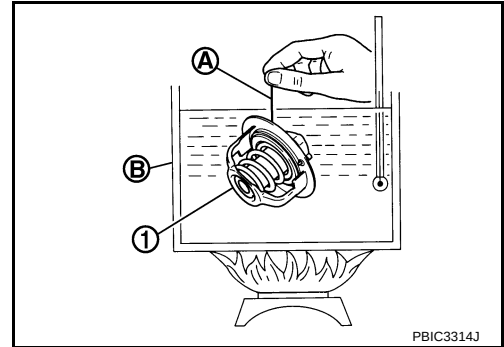
Use a protector to prevent a burn during the work.

Thermostat

- Place a thread (A) so that it is caught in the valves of thermostat (1). Immerse fully in a container (B) filled with water. Heat while stirring.
- The valve opening temperature is the temperature at which the valve opens and falls from the thread.
- Continue heating. Check the full open valve lift amount.
- After checking the maximum valve lift amount, lower the water temperature and check the valve closing temperature.

Standard : Refer to [CO-27, "Thermostat"](#).

- If out of the standard, replace thermostat.



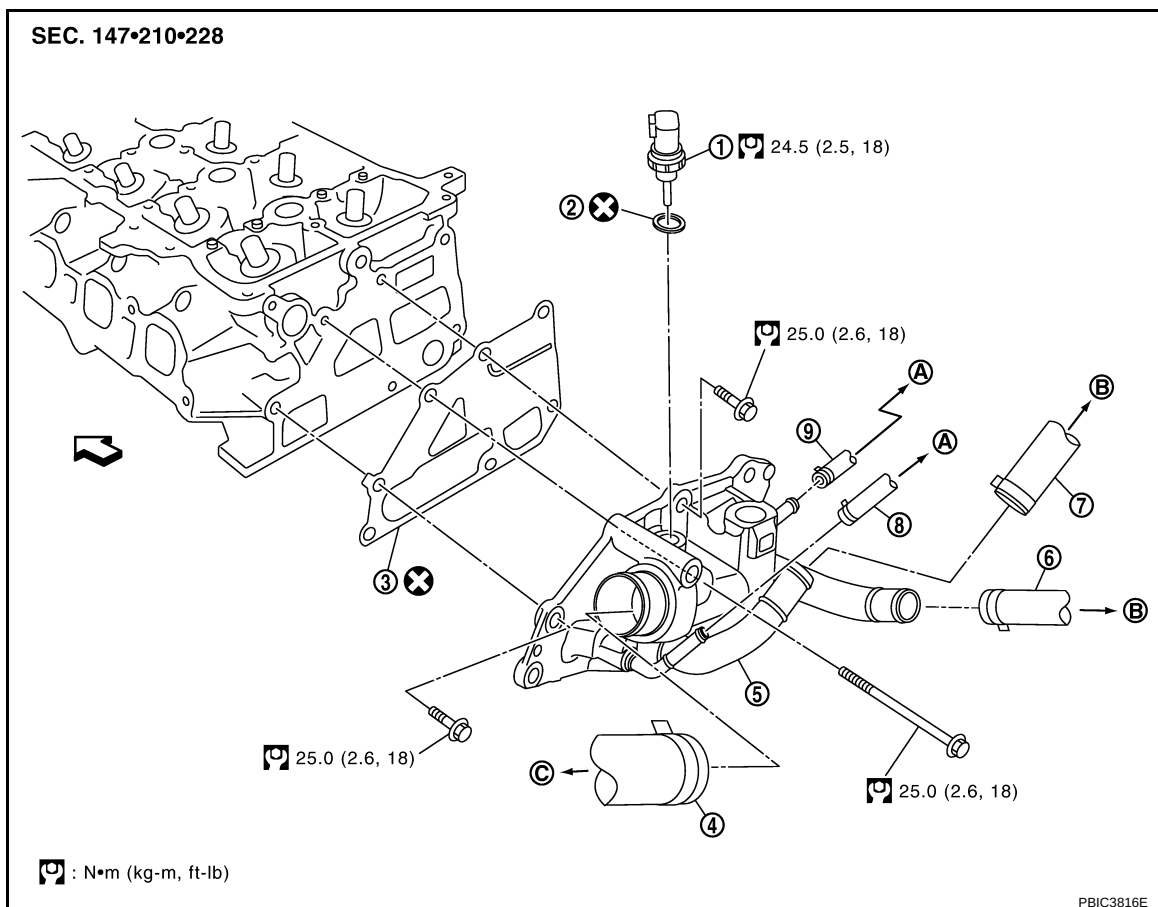
INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using suitable tools. Refer to [CO-11, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

WATER OUTLET

Exploded View

INFOID:000000001381574



- | | | |
|--|--|--|
| 1. Engine coolant temperature sensor | 2. Washer | 3. Gasket |
| 4. Radiator hose (upper) | 5. Water outlet | 6. Heater hose |
| 7. Heater hose | 8. Water hose (Northern Europe models) | 9. Water hose (Northern Europe models) |
| A. To electronic throttle control actuator | B. To heater core | C. To radiator |

↩ : Engine front

Removal and Installation

INFOID:000000001381575

REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-11, "Changing Engine Coolant"](#).
CAUTION:
• Perform this step when engine is cold.
• Never spill engine coolant on drive belt.
2. Disconnect radiator hose (upper). Refer to [CO-16, "Component"](#).
3. Disconnect harness connector from engine coolant temperature sensor.
4. Remove electronic throttle control actuator water hoses (Northern Europe models).
5. Remove heater hoses.
6. Remove water outlet.
7. Remove engine coolant temperature sensor from water outlet, if necessary.

INSTALLATION

Installation is the reverse order of removal.

Inspection

INFOID:000000001381576

INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using suitable tool. Refer to [CO-11, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

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DISASSEMBLY AND ASSEMBLY

COOLING FAN

DISASSEMBLY AND ASSEMBLY

INFOID:000000001534610

Disassembly

1. Remove cooling fan from fan motor.
2. Remove fan motor from fan shroud.

Inspection After Disassembly

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

Assembly

Assembly is the reverse order of disassembly.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[HR16DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:0000000001381577

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (Imp qt)

Engine coolant capacity [With reservoir tank ("MAX" level)]	6.3 (5-3/8)
---	-------------

Radiator

INFOID:0000000001381578

RESERVOIR TANK CAP

Unit: kPa (bar, kg/cm², psi)

Cap relief pressure	Standard	140 (1.4, 1.43, 20.3)
	Limit	150 (1.5, 1.53, 21.75)

RADIATOR

Unit: kPa (bar, kg/cm², psi)

Leakage testing pressure	150 (1.5, 1.53, 21.75)
--------------------------	------------------------

Thermostat

INFOID:0000000001381579

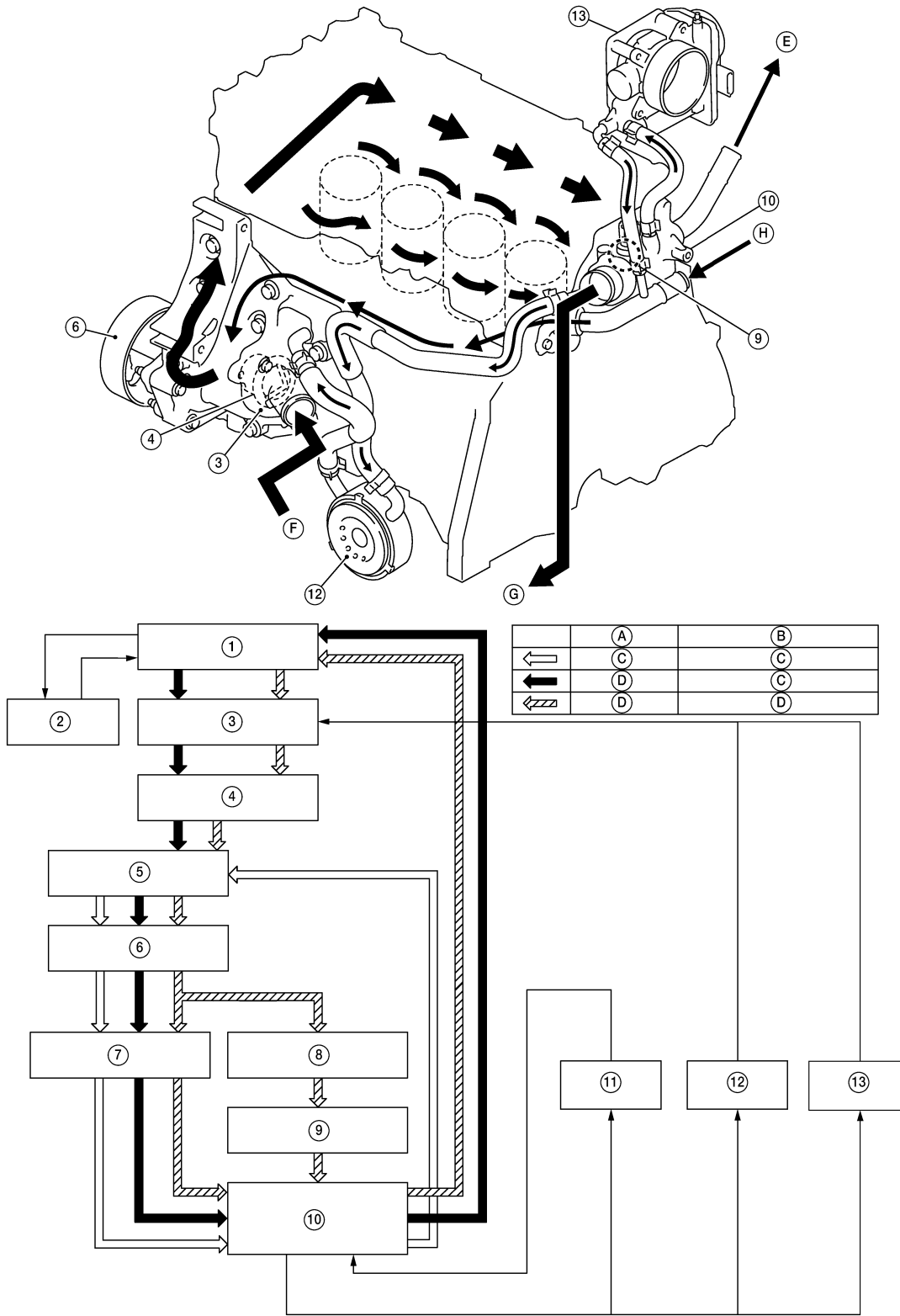
Thermostat	Standard
Valve opening temperature	80.5 - 83.5°C (177 - 182°F)
Maximum valve lift	8.0 mm/95°C (0.315 in/203°F)
Valve closing temperature	77°C (171°F)

FUNCTION DIAGNOSIS

COOLING SYSTEM

Cooling Circuit

INFOID:000000001337837



AWBIA0132ZZ

- | | | |
|------------------|-----------------------|------------------------|
| 1. Radiator | 2. Reservoir tank | 3. Water inlet |
| 4. Thermostat | 5. Thermostat housing | 6. Water pump |
| 7. Cylinder head | 8. Cylinder block | 9. Water control valve |

COOLING SYSTEM

< FUNCTION DIAGNOSIS >

[MR18DE]

- | | | |
|--|------------------------|------------------|
| 10. Water outlet | 11. Heater | 12. Oil cooler |
| 13. Electronic throttle control actuator | | |
| A. Thermostat | B. Water control valve | C. Closed |
| D. Open | E. To heater | F. From radiator |
| G. To radiator | H. From heater | |

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OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[MR18DE]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000001337836

Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt
		Thermostat stuck closed	Thermostat
		Damaged fins	Dust contamination or paper clogging
			Physical damage
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)
	Reduced air flow	Cooling fan does not operate	Fan assembly
		High resistance to fan rotation	
		Damaged fan blades	
	Damaged radiator shroud	—	—
	Improper engine coolant mixture ratio	—	—
	Poor engine coolant quality	—	—
	Insufficient engine coolant	Engine coolant leaks	Cooling hose
			Loose clamp
			Cracked hose
		Water pump	Poor sealing
			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

< SYMPTOM DIAGNOSIS >

[MR18DE]

	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
			Power train system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing	
	Blocked or restricted air flow	Blocked bumper	— Installed front bumper fascia cover	—
		Blocked radiator grille		
		Mud contamination or paper clogging		
		Blocked radiator	— Blocked air flow	
		Blocked condenser		
		Installed large fog lamp		

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PRECAUTION

PRECAUTIONS

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

INFOID:000000001516585

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.

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000001337832

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-II to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-II.

Precaution for Liquid Gasket

INFOID:000000001337833

REMOVAL OF LIQUID GASKET SEALING

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

PRECAUTIONS

< PRECAUTION >

[MR18DE]

Tool number : KV10111100 (J-37228)

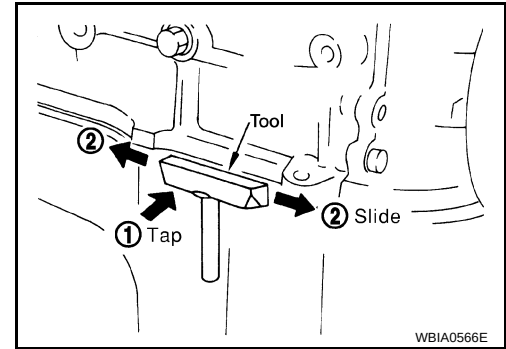
CAUTION:

Be careful not to damage the mating surfaces.

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

CAUTION:

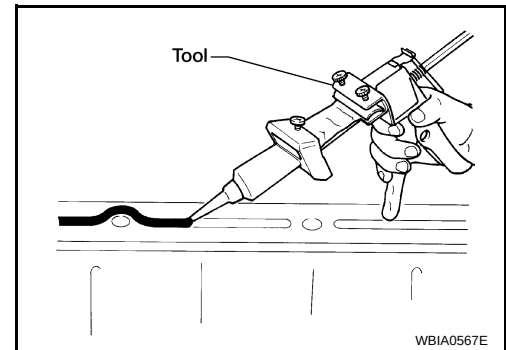
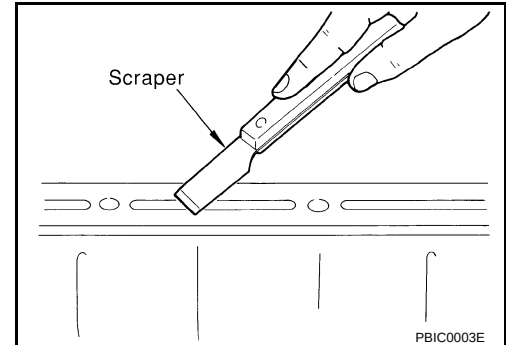
If for some unavoidable reason suitable tool such as screw-driver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

1. 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.
2. Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign materials.
3. Attach liquid gasket tube to Tool.

Tool number : WS39930000 (—)

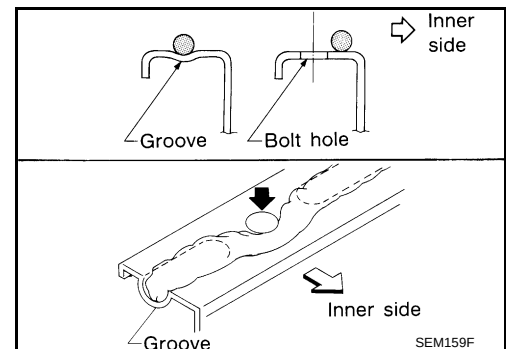


Use Genuine RTV Silicone Sealant or equivalent. Refer to [GI-27, "Recommended Chemical Products and Sealants"](#).

4. 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:

If there are specific instructions in this manual, observe them.



PREPARATION

< PREPARATION >

[MR18DE]

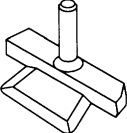
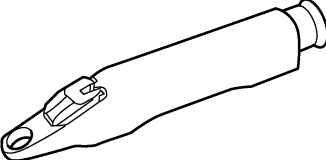
PREPARATION

PREPARATION

Special Service Tool

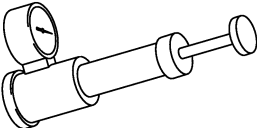
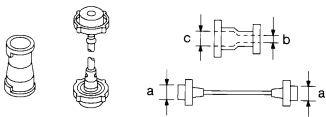
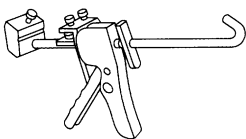
INFOID:000000001337834

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

Tool number (Kent-Moore No.) Tool name	Description
KV10111100 (J-37228) Seal cutter	Removing chain tensioner cover and water pump cover
 NT046	
— (J-23688) Engine coolant refractometer	Checking concentration of ethylene glycol in engine coolant
 WBIA0539E	

Commercial Service Tool

INFOID:000000001337835

NISSAN tool number Tool name	Description
Radiator cap tester	Checking radiator and radiator cap
 PBIC1982E	
(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	
WS39930000 Tube pressure	Pressing the tube of liquid gasket
 S-NT052	

ON-VEHICLE MAINTENANCE

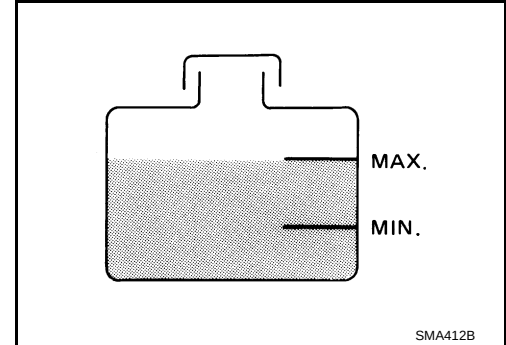
ENGINE COOLANT

Inspection

INFOID:000000001337838

LEVEL CHECK

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



CHECKING COOLING SYSTEM FOR LEAKS

To check for leaks, apply pressure to the cooling system using suitable tool.

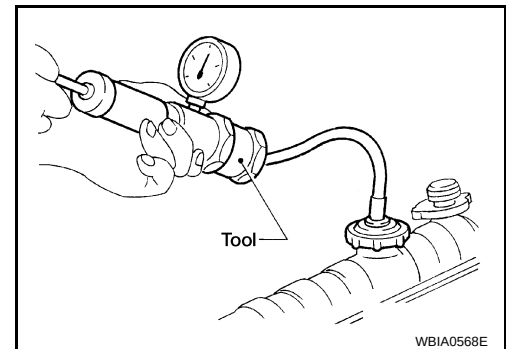
Testing pressure : 157 kPa (1.6 kg/cm², 23 psi)

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.



Changing Engine Coolant

INFOID:000000001337839

WARNING:

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

DRAINING ENGINE COOLANT

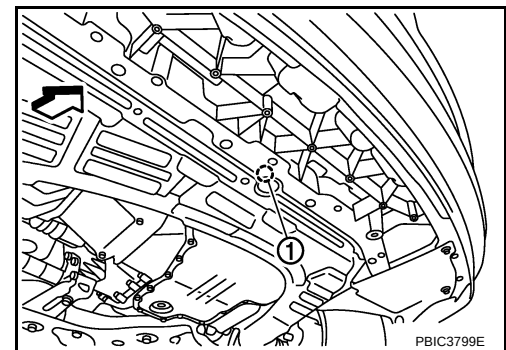
1. Open radiator drain plug (1) at the bottom of radiator, and then remove radiator cap.

- ⇐ Front

When drain all of engine coolant in the system, open water drain plug on cylinder block. Refer to [EM-211, "Component"](#).

CAUTION:

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



2. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing. Refer to [CO-35, "Changing Engine Coolant"](#).
3. Check drained engine coolant for contaminants such as rust, corrosion or discoloration. If contaminated, flush the engine cooling system. Refer to [CO-35, "Changing Engine Coolant"](#).

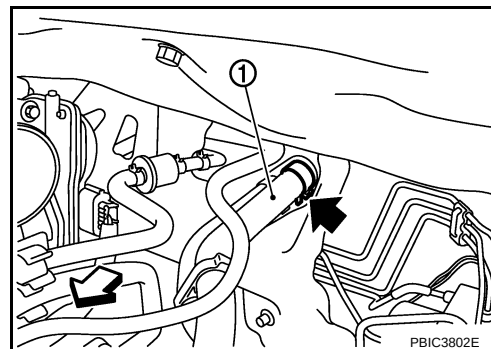
REFILLING ENGINE COOLANT

ENGINE COOLANT

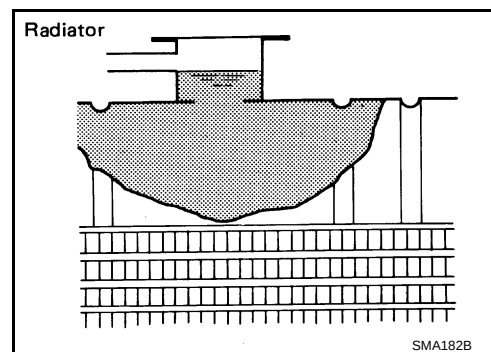
[MR18DE]

< ON-VEHICLE MAINTENANCE >

1. Install reservoir tank if removed.
 2. Install radiator drain plug.
 - If water drain plug on cylinder block is removed, install and tighten it. Refer to [EM-211, "Component"](#).
- CAUTION:**
Be sure to clean radiator drain plug and install with new O-ring. Refer to [CO-40, "Component"](#).
3. Make sure that each hose clamp has been firmly tightened.
 4. Remove air duct assembly. Refer to [EM-154, "Component"](#).
 5. Disconnect heater hose (1) at position (↔) as shown.
 - ↔ Front
 - Reposition heater hose as high as possible.



6. Fill radiator and reservoir tank to specified level.
 - Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2 1/8 US qt, 1-3/4 Imp qt) a minute to allow air in system to escape.
 - Use NISSAN Genuine Engine Coolant or equivalent mixed with water (distilled or demineralized). Fill cooling system to specification. Refer to [MA-19, "Fluids and Lubricants"](#).
 - When engine coolant overflows disconnected heater hose, connect heater hose, and continue filling the engine coolant, if heater hose is disconnected.
 7. Install radiator cap.
 8. Install air duct assembly. Refer to [EM-154, "Component"](#).
 9. Warm up until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
 - Make sure thermostat opening condition by touching radiator hose (lower) to see a flow of warm water.
- CAUTION:**
Watch water temperature gauge so as not to overheat the engine.
10. Stop engine and cool down to less than approximately 50°C (122°F).
 - Cool down using fan to reduce the time.
 - If necessary, refill radiator up to filler neck with engine coolant.
 11. Refill reservoir tank to "MAX" level line with engine coolant.
 12. Repeat steps 6 through 11 two or more times with radiator cap installed until engine coolant level no longer drops.
 13. Check cooling system for leaks with engine running.
 14. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature controller set at several position between "COOL" and "WARM".
 - Sound may be noticeable at heater unit.
 15. Repeat step 14 three times.
 16. If sound is heard, bleed air from cooling system by repeating steps 6 through 11 until engine coolant level no longer drops.



FLUSHING COOLING SYSTEM

1. Install reservoir tank if removed.
2. Install radiator drain plug.
 - If water drain plug on cylinder block is removed, close and tighten it. Refer to [EM-211, "Component"](#).

ENGINE COOLANT

< ON-VEHICLE MAINTENANCE >

[MR18DE]

CAUTION:

Be sure to clean radiator drain plug and install with new O-ring. Refer to [CO-40, "Component"](#).

3. Fill radiator and reservoir tank with water and reinstall radiator cap.
4. Run engine and warm it up to normal operating temperature.
5. Rev engine two or three times under no-load.
6. Stop engine and wait until it cools down.
7. Drain water from the cooling system. Refer to [CO-35, "Changing Engine Coolant"](#).
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.

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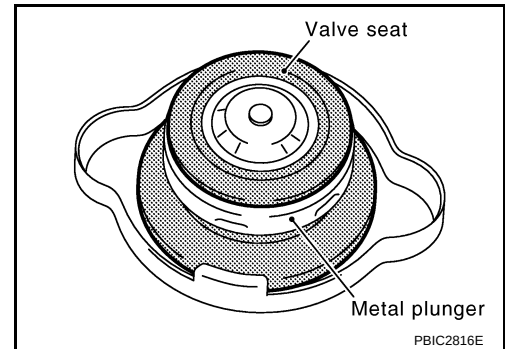
P

RADIATOR

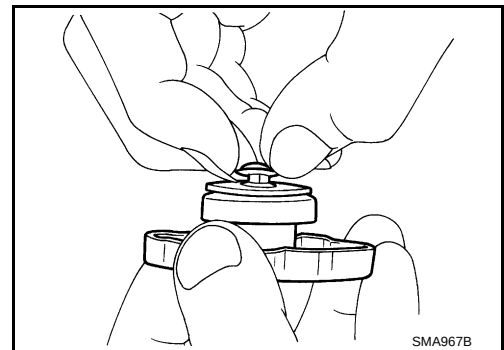
Checking Radiator Cap

INFOID:000000001337842

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



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

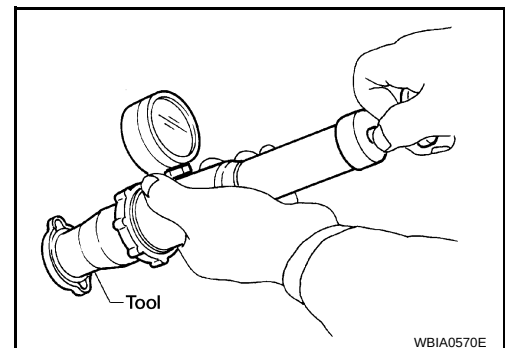


- Check radiator cap relief pressure using suitable tool.

Standard: 78 – 98 kPa (0.78 - 0.98 bar, 0.8 – 1.0 kg/cm², 11 – 14 psi)

Limit: 59 kPa (0.59 bar, 0.6 kg/cm², 9 psi)

- 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.



- Replace radiator cap if there it does not comply to specifications to the above three checks.

CAUTION:

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

Checking Radiator

INFOID:000000001337843

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

- Be careful not to bend or damage radiator fins.
 - When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape harness and connectors to prevent water from entering.
1. Apply water by hose to the back side of the radiator core vertically downward.
 2. Apply water again to all radiator core surface once per minute.
 3. Stop washing if any stains no longer flow out from radiator.
 4. Blow air into the back side of radiator core vertically downward.
 - Use compressed air lower than 490 kPa (4.9 bar, 5 kg/cm², 71 psi) and keep distance more than 30 cm (11.8 in).

5. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

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RADIATOR

< ON-VEHICLE REPAIR >

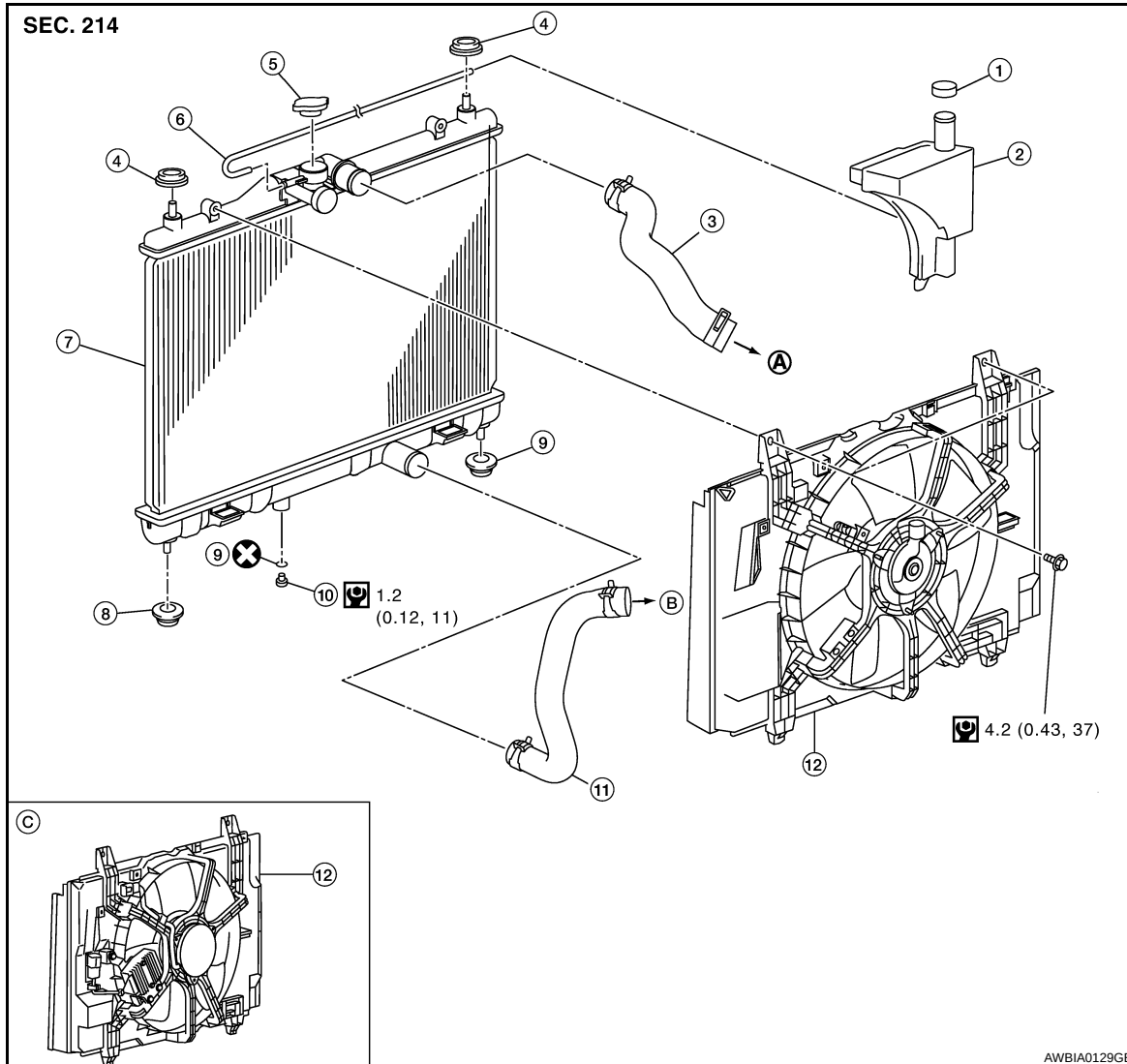
[MR18DE]

ON-VEHICLE REPAIR

RADIATOR

Component

INFOID:000000001337840



Removal and Installation

INFOID:000000001337841

WARNING:

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

REMOVAL

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

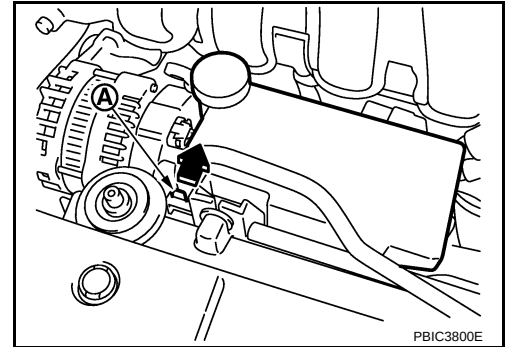
CAUTION:

RADIATOR

< ON-VEHICLE REPAIR >

[MR18DE]

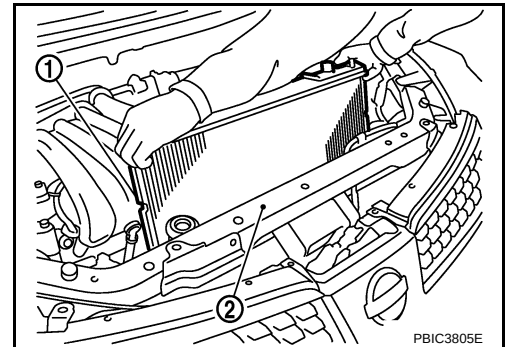
- Perform this step when engine is cold.
 - Do not spill engine coolant on drive belt.
2. Remove air duct (inlet). Refer to [EM-154, "Component"](#).
 3. Remove reservoir tank as follows:
 - a. Disconnect reservoir tank hose.
 - b. Release the tab (A) in the direction shown by the arrow (←).
 - c. Lift up while removing the reservoir tank hose, and remove it.



4. Disconnect harness connector from fan motors, and move harness to aside.
5. Remove radiator hoses (upper and lower).
6. Remove radiator core support cover.
7. Remove radiator core support (upper) bolts, bolts of stationary part on the radiator core support side and clip. Lift radiator assembly (1) from radiator (upper) mount part of radiator core support (upper) (2).
8. Move radiator assembly (1) to the rearward direction of vehicle, and then lift it upward to remove.

CAUTION:

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



INSTALLATION

Installation is the reverse order of removal.

CAUTION:

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

INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant. Refer to [CO-35, "Inspection"](#).
- Start and warm up engine. Visually check if there is no leaks of engine coolant.

COOLING FAN

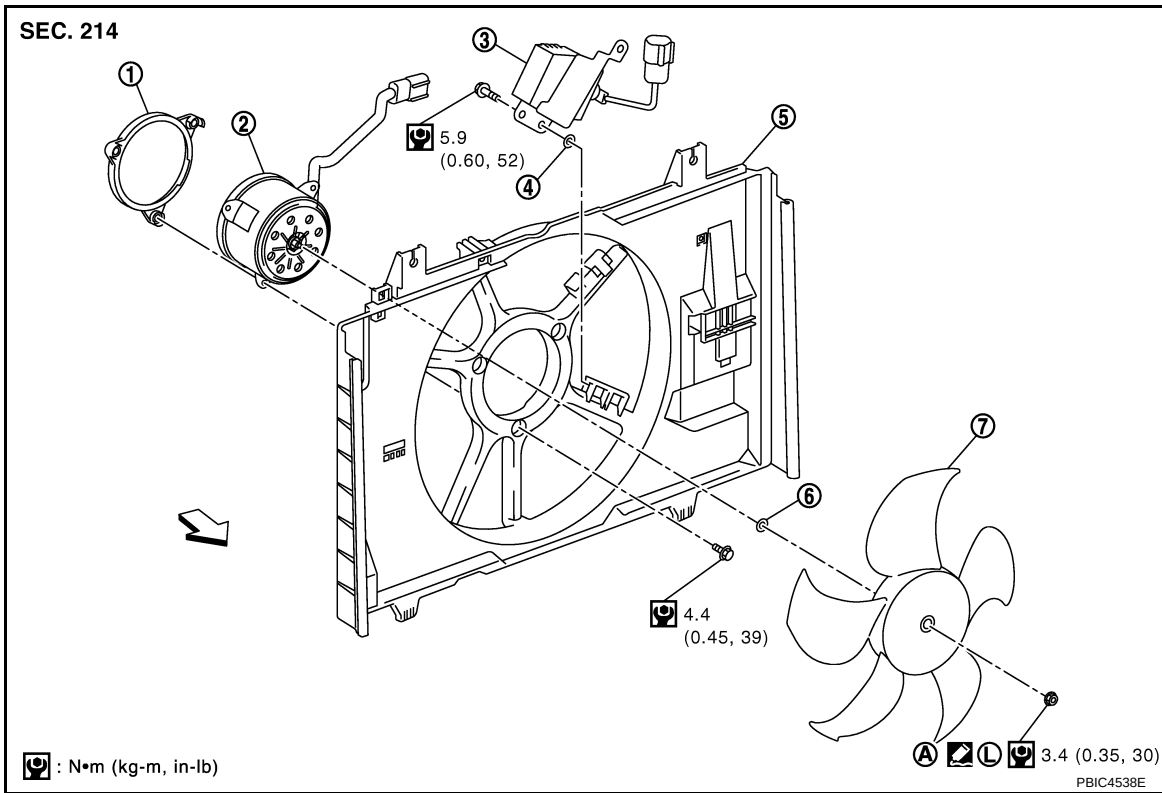
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[MR18DE]

COOLING FAN

Component (Models with A/C)

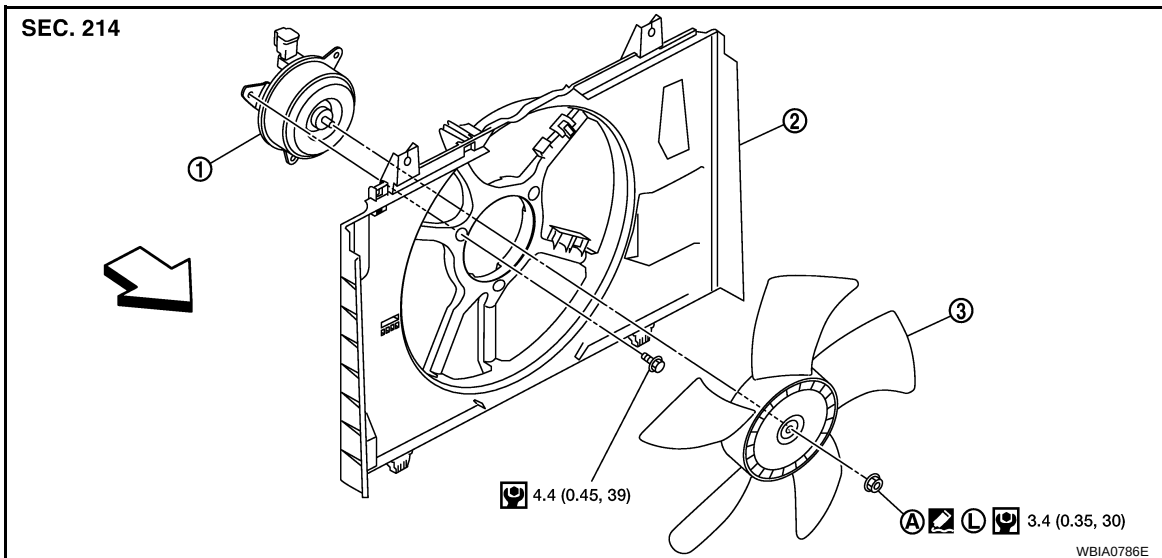
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- | | | |
|--------------------|-----------------------------|-------------------------------|
| 1. Fan motor cover | 2. Fan motor | 3. Cooling fan control module |
| 4. Washer | 5. Fan shroud | 6. Washer |
| 7. Cooling fan | A. Apply on fan motor shaft | ← Front |

Component (Models without A/C)

INFOID:000000001337845



- | | | |
|-----------------------------|---------------|----------------|
| 1. Fan motor | 2. Fan shroud | 3. Cooling fan |
| A. Apply on fan motor shaft | ← Front | |

Removal and Installation

REMOVAL

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

CAUTION:

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

2. Remove air duct (inlet). Refer to [EM-154, "Component"](#).
3. Remove reservoir tank.
4. Disconnect radiator hose (upper) at radiator side. Refer to [CO-40, "Component"](#).
5. Disconnect harness connectors from fan motor, and move harness to aside.
6. Remove cooling fan assembly.

CAUTION:

Be careful not to damage or scratch the radiator core.

INSTALLATION

Installation is the reverse order of removal.

- Cooling fans are controlled by ECM. For details, refer to [CO-28, "Cooling Circuit"](#).

CAUTION:

Be careful not to damage or scratch the radiator core.

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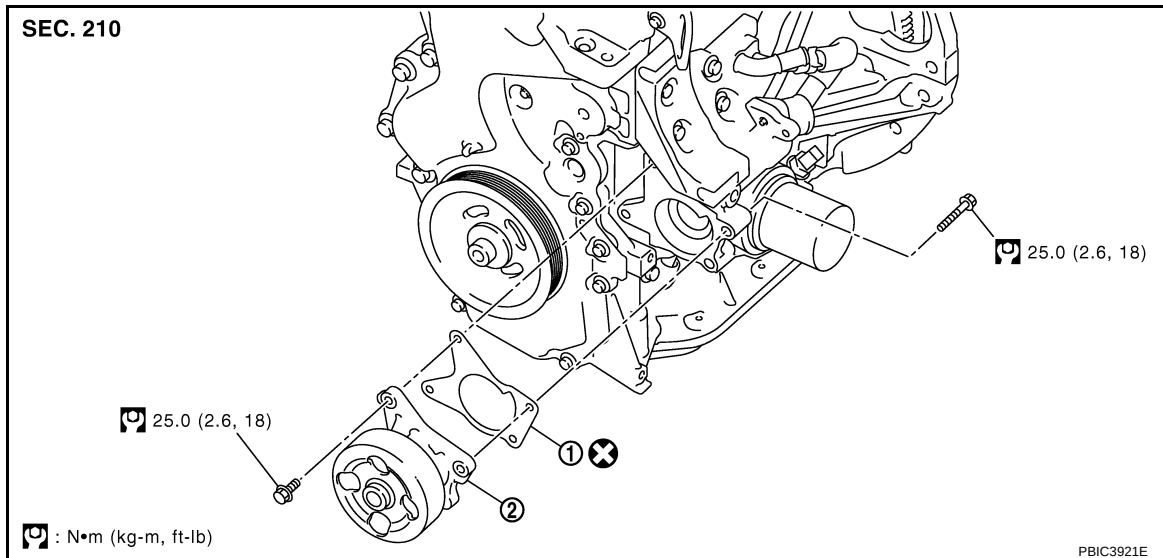
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P

WATER PUMP

Component

INFOID:000000001337848



1. Gasket
2. Water pump

Removal and Installation

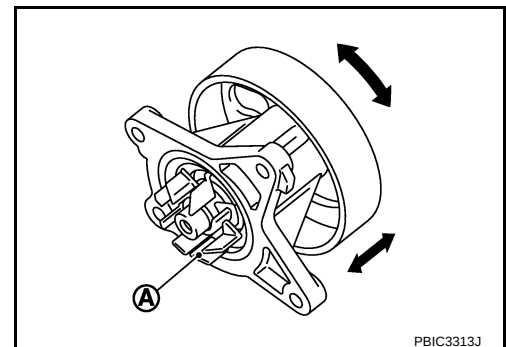
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REMOVAL

1. Drain engine coolant. Refer to [CO-35. "Changing Engine Coolant"](#).
CAUTION:
Perform this step when the engine is cold.
2. Remove drive belt auto-tensioner. Refer to [EM-153. "Removal and Installation of Drive Belt Auto Tensioner"](#).
3. Remove water pump.
CAUTION:
 - Handle water pump vane so that it does not contact any other parts.
 - Water pump cannot be disassembled and should be replaced as a unit.

INSPECTION AFTER REMOVAL

- Visually check that there is no significant dirt or rusting on water pump body and vane (A).
- Make sure that there is no looseness in vane shaft, and that it turns smoothly when rotated by hand.
- Replace water pump, if necessary.



INSTALLATION

Installation is in the reverse order of removal.

INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant. Refer to [CO-35. "Inspection"](#).
- Start and warm up the engine. Visually check if there is no leaks of engine coolant.

THERMOSTAT

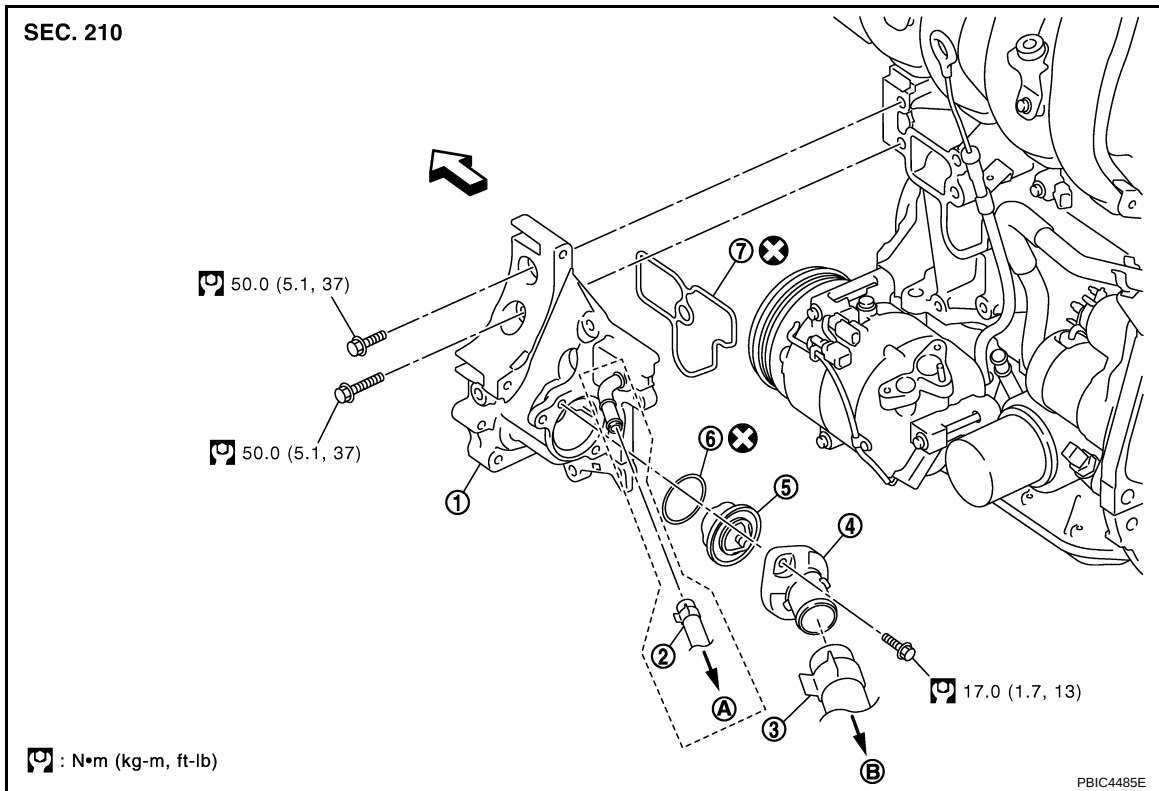
< ON-VEHICLE REPAIR >

[MR18DE]

THERMOSTAT

Component

INFOID:000000001337850



- | | | |
|-----------------------|------------------|--------------------------|
| 1. Thermostat housing | 2. Water hose | 3. Radiator hose (lower) |
| 4. Water inlet | 5. Thermostat | 6. Rubber ring |
| 7. Gasket | A. To oil cooler | B. To radiator |
- ↶ Engine front

Removal and Installation

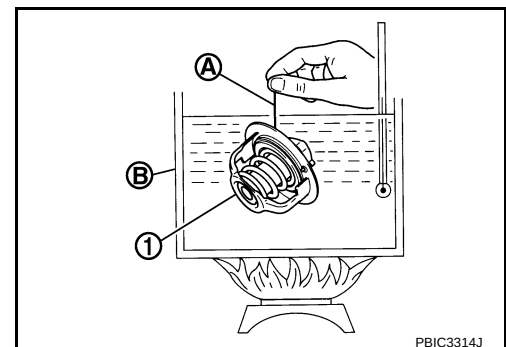
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REMOVAL

1. Drain engine coolant. Refer to [CO-35. "Changing Engine Coolant"](#).
2. Remove water inlet.
3. Remove thermostat.
4. Remove water pump. Refer to [CO-44. "Removal and Installation"](#).
5. Remove thermostat housing.

INSPECTION AFTER REMOVAL

- Place a thread (A) so that it is caught in the valves of thermostat (1). Immerse fully in a container (B) filled with water. Heat while stirring.
- The valve opening temperature is the temperature at which the valve opens and falls from the thread.
- Continue heating. Check the full open valve lift amount.
- After checking the maximum valve lift amount, lower the water temperature and check the valve closing temperature.



THERMOSTAT

< ON-VEHICLE REPAIR >

[MR18DE]

Items	Thermostat
Valve opening temperature	80.5 - 83.5°C (177 - 182°F)
Maximum valve lift	8 mm/ 95°C (0.315 in/ 203°F)
Valve closing temperature	77°C (171°F)

- If out of the specification, replace thermostat.

INSTALLATION

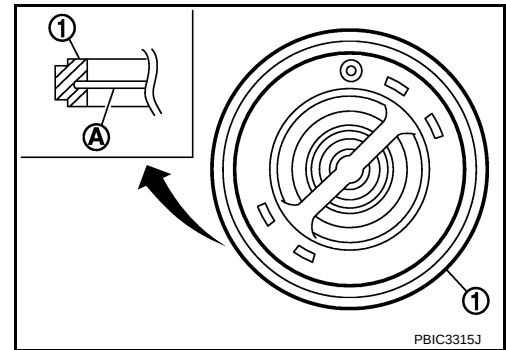
Installation is in the reverse order of removal.

Thermostat

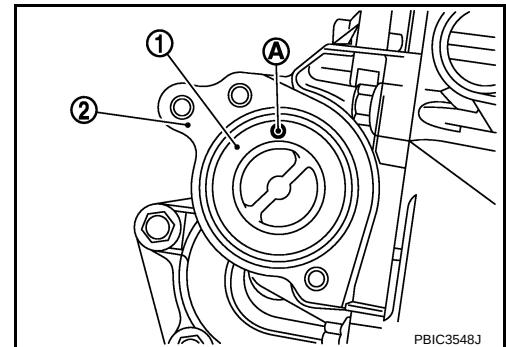
CAUTION:

Replace the rubber ring with a new one.

- Install thermostat while making rubber ring (1) groove fit to thermostat flange (A) around the whole circumference.



- Install thermostat (1) into the thermostat housing (2) with jiggle valve (A) facing upwards.



Thermostat Housing

CAUTION:

Replace the rubber ring with a new one.

- Securely insert the rubber ring into the mating groove of thermostat housing and install it.
- Install the thermostat housing to the cylinder block without displacing the gasket from the gasket position.

INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant. Refer to [CO-35. "Inspection"](#).
- Start and warm up the engine. Visually check for engine coolant leaks.

WATER OUTLET AND WATER CONTROL VALVE

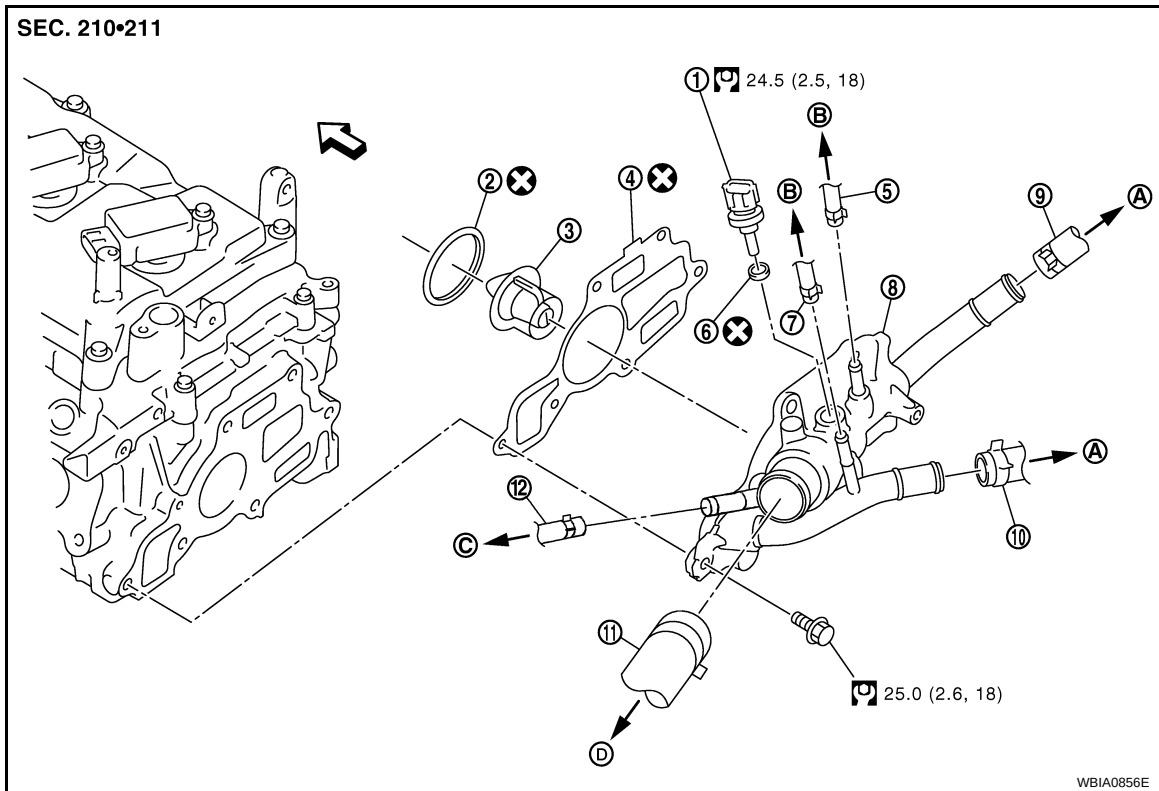
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[MR18DE]

WATER OUTLET AND WATER CONTROL VALVE

Component

INFOID:000000001337852



- | | | |
|--------------------------------------|--|------------------------|
| 1. Engine coolant temperature sensor | 2. Rubber ring | 3. Water control valve |
| 4. Gasket | 5. Water hose | 6. Gasket |
| 7. Water hose | 8. Water outlet | 9. Heater hose |
| 10. Heater hose | 11. Radiator hose (upper) | 12. Water hose |
| A. To heater | B. To electronic throttle control actuator | C. To oil cooler |
| D. To radiator | | |
- ⇐ Front

Removal and Installation

INFOID:000000001337853

REMOVAL

1. Drain engine coolant. Refer to [CO-35, "Changing Engine Coolant"](#).
CAUTION:
Perform this step when the engine is cold.
2. Remove air duct. Refer to [EM-154, "Component"](#).
3. Remove radiator hose (upper). Refer to [CO-40, "Component"](#).
4. Remove heater hoses and water hoses.
5. Remove water outlet.
6. Remove water control valve.
7. Remove engine coolant temperature sensor, if necessary.
CAUTION:
 - Handle carefully to avoid any shock to engine coolant temperature sensor.
 - Replace the gasket with a new one.

INSPECTION AFTER REMOVAL

WATER OUTLET AND WATER CONTROL VALVE

[MR18DE]

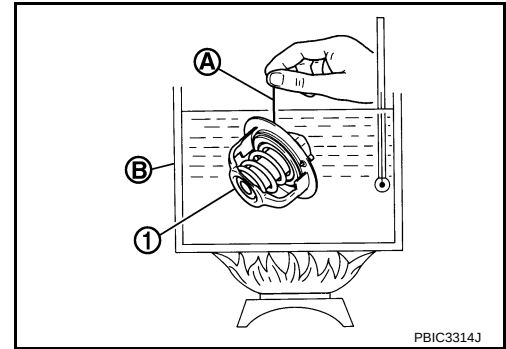
< ON-VEHICLE REPAIR >

- Place a thread (A) so that it is caught in the valves of water control valve (1). Immerse fully in a container (B) filled with water. Heat while stirring.
- The valve opening temperature is the temperature at which the valve opens and falls from the thread.
- Continue heating. Check the full open valve lift amount.

NOTE:

The maximum valve lift amount standard temperature for water control valve is the reference value.

- After checking the maximum valve lift amount, lower the water temperature and check the valve closing temperature.



Valve opening temperature	93.5 - 96.5°C (200 - 206°F)
Maximum valve lift	8 mm/ 108°C (0.315 in/ 226°F)
Valve closing temperature	90°C (194°F)

- If out of the specification, replace water control valve.

INSTALLATION

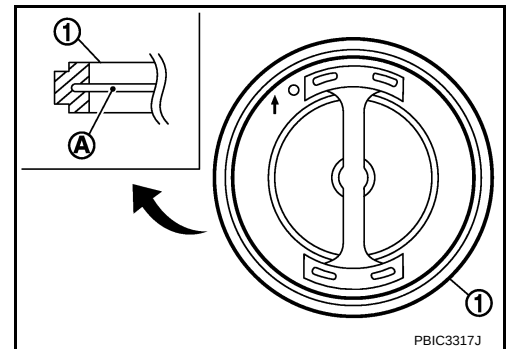
Installation is in the reverse order of removal.

Water Control Valve

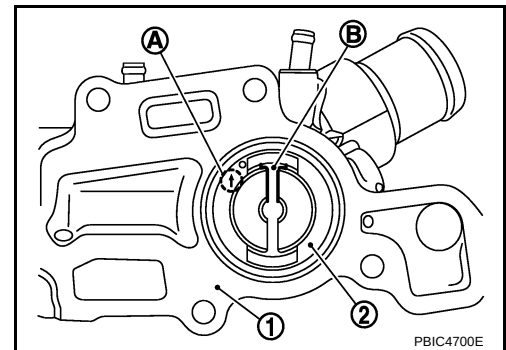
CAUTION:

Replace the rubber ring with a new one.

- Install water control valve while making rubber ring (1) groove fit to water control valve flange (A) around the whole circumference.



- While the mark (A) points to up, install water control valve (2) with frame center (B) facing straight upward into water outlet (1).



Water Outlet

Install the water control valve to the cylinder head without displacing the valve from the valve position.

Water Hoses

WATER OUTLET AND WATER CONTROL VALVE

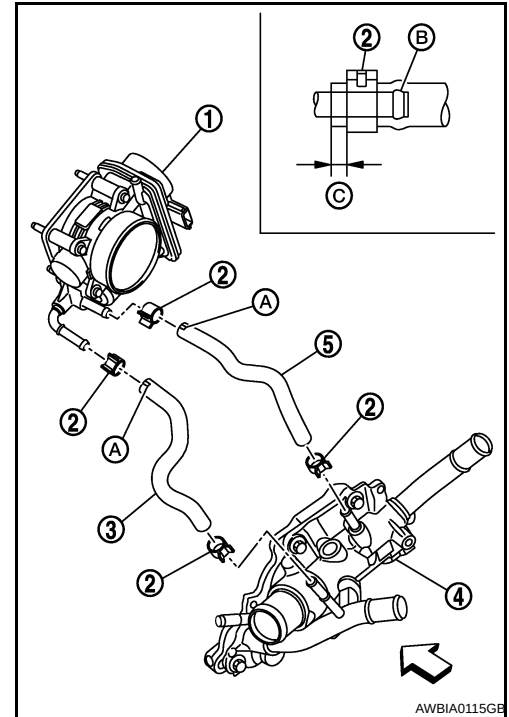
< ON-VEHICLE REPAIR >

[MR18DE]

Install water hoses (3),(5) as shown.

- Electric throttle control actuator (1)
- Clamp (2)
- Water outlet (4)
- Paint mark (A)
- Clamp shall not interfere with the bulged area (B)

C : 3 - 7 mm (0.12 - 0.29 in)



INSPECTION AFTER INSTALLATION

- Check for leaks of engine coolant. Refer to [CO-35, "Inspection"](#).
- Start and warm up the engine. Visually check if there is no leaks of engine coolant.

DISASSEMBLY AND ASSEMBLY

COOLING FAN

DISASSEMBLY AND ASSEMBLY

INFOID:000000001337847

Disassembly

1. Remove cooling fan from fan motor.
2. Remove fan motor from fan shroud.

Inspection After Disassembly

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

Assembly

Assembly is the reverse order of disassembly.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[MR18DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Standard and Limit

INFOID:0000000001337854

CAPACITY

Unit: ℓ (Imp qt)

Engine coolant capacity (with reservoir tank at "MAX" level)	Approx. 6.8 (6.0)
--	-------------------

THERMOSTAT

Valve opening temperature	80.5 - 83.5°C (177 - 182°F)
Maximum valve lift	8 mm/ 95°C (0.315 in/ 203°F)
Valve closing temperature	77°C (171°F)

WATER CONTROL VALVE

Valve opening temperature	93.5 - 96.5°C (200 - 206°F)
Maximum valve lift	8 mm/ 108°C (0.315 in/ 226°F)
Valve closing temperature	90°C (194°F)

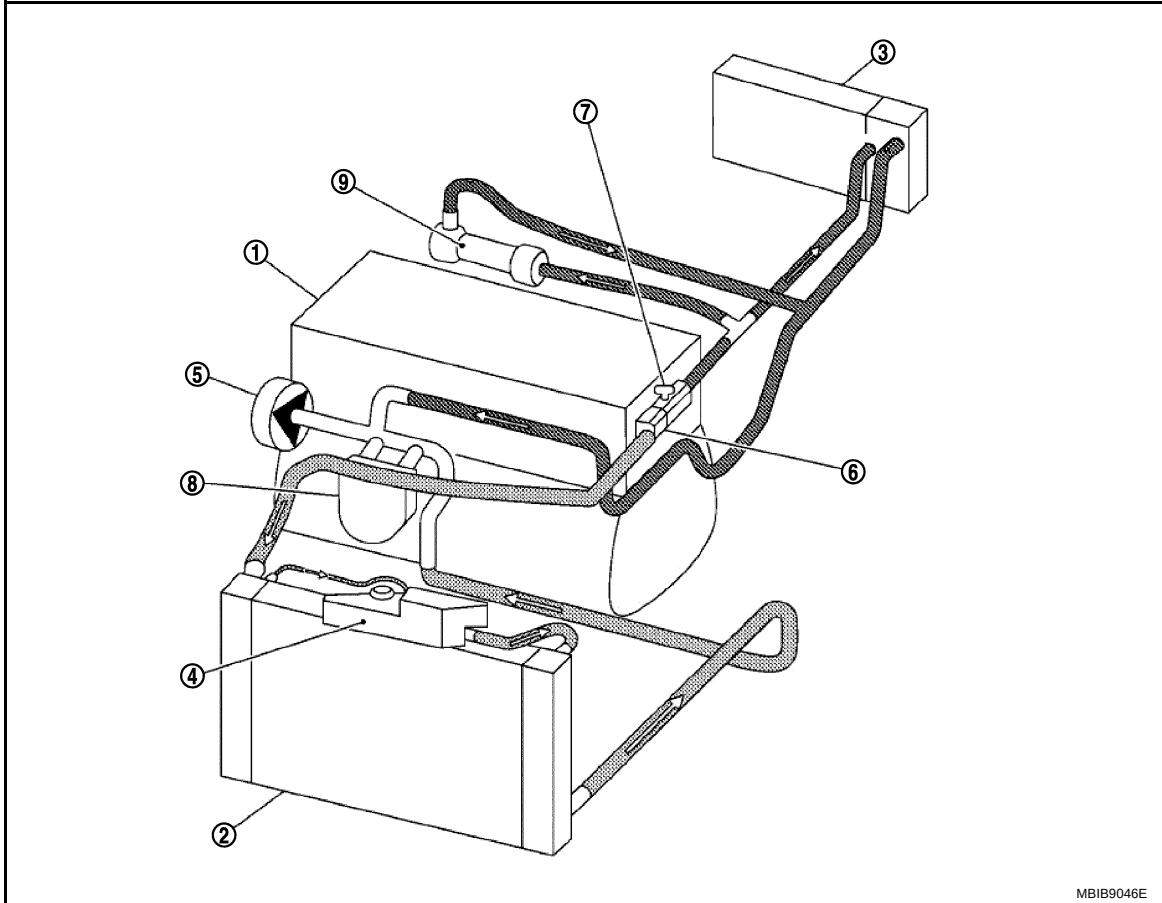
RADIATOR

Unit: kPa (bar, kg/cm², psi)

Cap relief pressure	Standard	78 - 98 (0.78 - 0.98, 0.8 - 1.0, 11- 14)
	Limit	59 (0.59, 0.6, 9)
Leakage test pressure		157 (1.57, 1.6, 23)

FUNCTION DIAGNOSIS**DESCRIPTION****Engine Cooling System**

INFOID:000000001381580



- | | | |
|--------------------|---------------|----------------|
| 1. Engine | 2. Radiator | 3. Heater core |
| 4. Reservoir tank | 5. Water pump | 6. Thermostat |
| 7. Air relief plug | 8. Oil cooler | 9. EGR cooler |

OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[K9K]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000001381581

Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn timing belt
		Thermostat stuck closed	—
		Damaged fins	Dust contamination or paper clogging
			Mechanical 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	—	—
	Improper coolant mixture ratio	—	—
	Poor coolant quality	—	—
	Insufficient coolant	Coolant leaks	Cooling hose
			Loose clamp
			Cracked hose
		Water pump	Poor sealing
			—
		Reservoir tank cap	Loose
			Poor sealing
		Radiator	O-ring for damage, deterioration or improper fitting
			Cracked radiator tank
			Cracked radiator core
		Reservoir tank	Cracked reservoir tank
	Overflowing reservoir tank	Exhaust gas leaks into cooling system	Cylinder head deterioration
			Cylinder head gasket deterioration

OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[K9K]

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

PRECAUTION

PRECAUTIONS

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

INFOID:000000001534592

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.

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000001534593

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-II to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-II.

Precaution for Liquid Gasket

INFOID:000000001534594

REMOVAL OF LIQUID GASKET SEALING

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

PRECAUTIONS

< PRECAUTION >

[K9K]

Tool number : KV10111100 (J-37228)

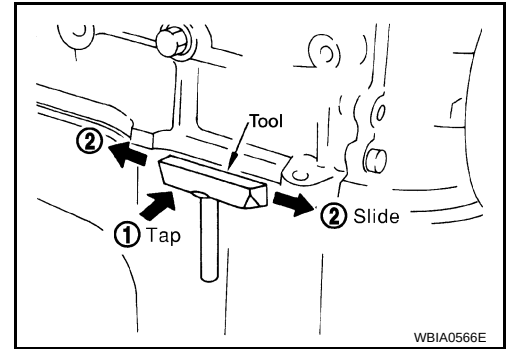
CAUTION:

Be careful not to damage the mating surfaces.

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

CAUTION:

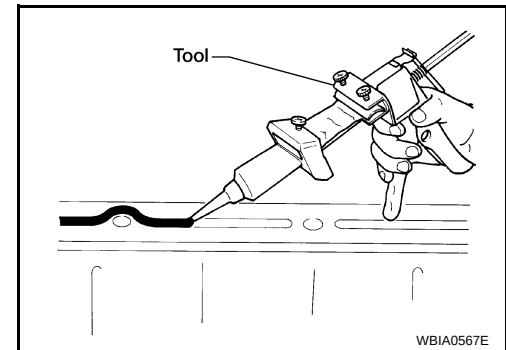
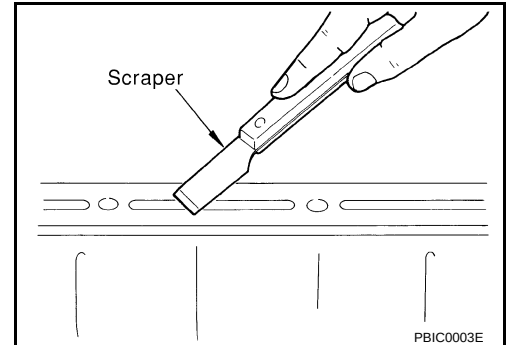
If for some unavoidable reason suitable tool such as screw-driver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

1. 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.
2. Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign materials.
3. Attach liquid gasket tube to Tool.

Tool number : WS39930000 (—)



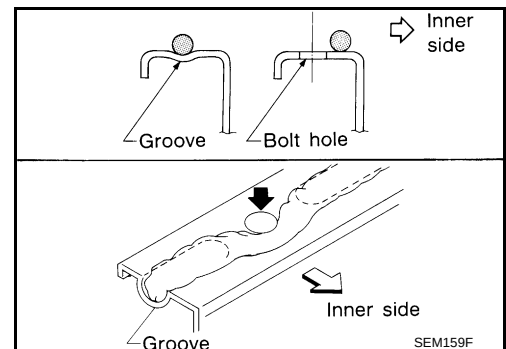
Use Genuine RTV Silicone Sealant or equivalent. Refer to [GI-27, "Recommended Chemical Products and Sealants"](#).

4. 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:

If there are specific instructions in this manual, observe them.



PREPARATION

< PREPARATION >

[K9K]

PREPARATION

PREPARATION

Special Service Tools

INFOID:000000001381583

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CO

NISSAN tool number (RENAULT tool number) Tool name	Description
— (M.S. 554-07) Reservoir tank cap tester 1. Adapter A — (M.S. 554-01) 2. Adapter B — (M.S. 554-06)	Leak checking Checking reservoir tank cap
KV10111100 (J-37228) Seal cutter	Removing chain tensioner cover and water pump cover
— (J-23688) Engine coolant refractometer	Checking concentration of ethylene glycol in engine coolant

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Commercial Service Tools

INFOID:000000001381584

K

NISSAN tool number Tool name	Description
Radiator cap tester	Checking radiator and radiator cap
WS39930000 Tube pressure	Pressing the tube of liquid gasket

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ON-VEHICLE MAINTENANCE

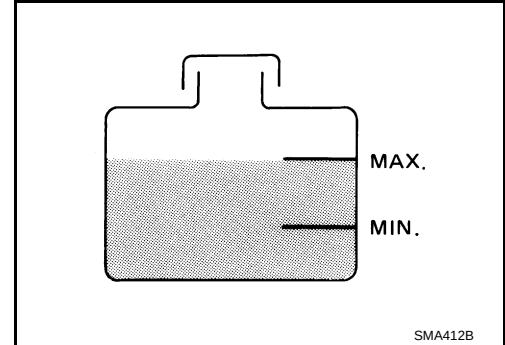
ENGINE COOLANT

Inspection

INFOID:000000001381585

LEVEL CHECK

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



CHECKING COOLING SYSTEM FOR LEAKS

To check for leaks, apply pressure to the cooling system using suitable tool.

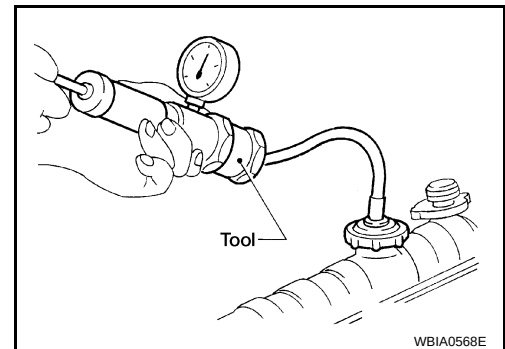
Testing pressure : 157 kPa (1.6 kg/cm², 23 psi)

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.



Draining

INFOID:000000001381586

WARNING:

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

1. Remove engine undercover using power tool.
2. Disconnect radiator hose (lower) from radiator and remove reservoir tank cap.
When draining all of engine coolant in the system, open water drain plug on cylinder block. Refer to [EM-314, "Exploded View"](#).
- CAUTION:**
 - Perform this step when engine is cold.
 - Do not spill engine coolant on drive belt.
3. Remove air relief plug from water outlet. Refer to [EM-302, "Exploded View"](#).
4. Remove reservoir tank as necessary, and drain engine coolant and clean reservoir tank before installing.
5. Check drained coolant for contaminants such as rust, corrosion or discoloration.
If contaminated, flush engine cooling system. Refer to [CO-59, "Flushing"](#).

Refilling

INFOID:000000001381587

- Before starting work, turn off the automatic air conditioner and the blower motor.
1. Install reservoir tank if removed, lower radiator hose and air relief plug.
 - If water drain plug on cylinder block is removed, install and tighten it. Refer to [EM-314, "Exploded View"](#).
 2. Fill reservoir tank slowly with coolant until coolant spills from the air relief hole.

ENGINE COOLANT

< ON-VEHICLE MAINTENANCE >

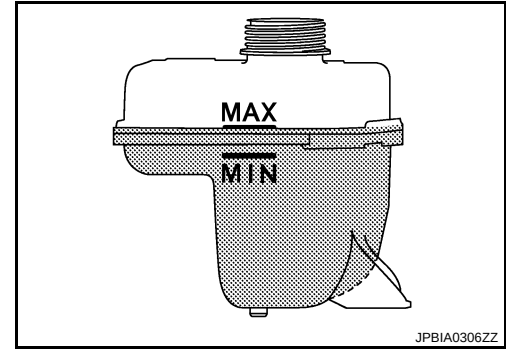
[K9K]

- Put a cloth under the air relief plug to prevent engine coolant from dampening the crankshaft position sensor.
 - Pour coolant to the MAX level line of the reservoir tank at a rate of 2 liter (1-3/4 lamp qt.)/min. or lower.
3. Close the air relief plug.

CAUTION:

If the filling rate is too fast, this could lead to air being mixed in the coolant. Be sure to fill the coolant slowly according to the rate indicated above.

Use Insane Genuine Engine Coolant or equivalent mixed with water (distilled or demineralized). Refer to [MA-21, "Engine Coolant Mixture Ratio"](#).



Engine coolant capacity : Refer to [MA-19, "Fluids and Lubricants"](#).
(With reservoir tank at MAX)

Reservoir tank capacity : Refer to [MA-19, "Fluids and Lubricants"](#).

4. Start engine without closing reservoir tank cap and keep engine racing at 1,500 rpm for about 2-3 minutes. If necessary, pour engine coolant up to MAX level.
 - If coolant overflows reservoir tank hole, install filler cap.
 - Watch engine coolant temperature gauge so as not overheat the engine.
- WARNING:**
 - Be careful not to be scalded with hot engine coolant or vacuum pump when operating.
 - Radiator fan blade can start at any time and cause personal injuries.
5. Turn off the engine and loosen air relief plug until coolant spills from air relief hole.
6. Close the air relief plug and run the engine at 2,000 rpm until the upper hose becomes hot and radiator fan operates. Leave the engine running approximately 5 minutes at idle speed and check for sound of coolant flow while running engine from idle up to 3,000 rpm.
 - Sound may be noticeable at heater water cock.
7. If sound is heard, bleed air from cooling system by repeating steps 4 to 6 until coolant level no longer drops.
 - Check the radiator lower hose for any signs of leakage.
8. Turn off the engine and let it cool down.
 - Cool down using a fan to reduce the time.
9. After cooling period, loosen the air relief plug and check if coolant spills from the air relief hole. if not, remove the air relief plug until the coolant spills, and then close the relief air plug. Bleed air from cooling system by repeating steps 6 to 10 until the coolant spills immediately.
10. Check the engine coolant level when engine is cool and refill to MAX level line if the level is lower.
 - Clean excess coolant from engine.
11. Check that the reservoir tank cap is tightened.

Flushing

INFOID:0000000001381588

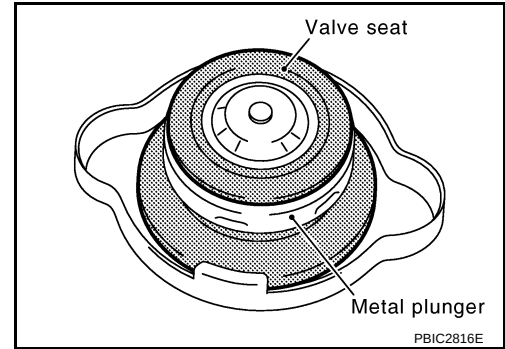
1. Install reservoir tank if removed.
 - If water drain plug on cylinder block is removed, close and tighten it. Refer to [EM-314, "Exploded View"](#).
2. Fill reservoir tank with water until water spills from the air relief hole, then close air relief plug. Reinstall reservoir tank cap.
3. Run engine and warm it up to normal operating temperature.
4. Rev engine two or three times under no-load.
5. Stop engine and wait until it cools down.
6. Drain water.
7. Repeat steps 1 through 6 until clear water begins to drain from radiator.
8. Blow compressed air into cooling circuit through the reservoir tank valve hole to drain all the water.

RADIATOR

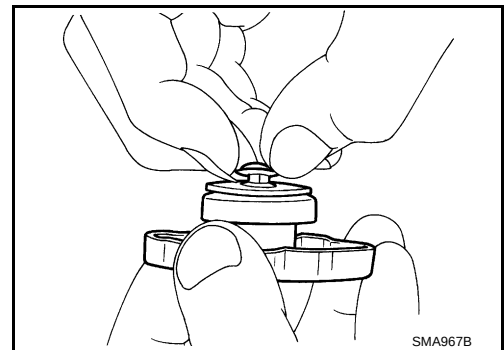
Checking Radiator Cap

INFOID:000000001538671

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



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

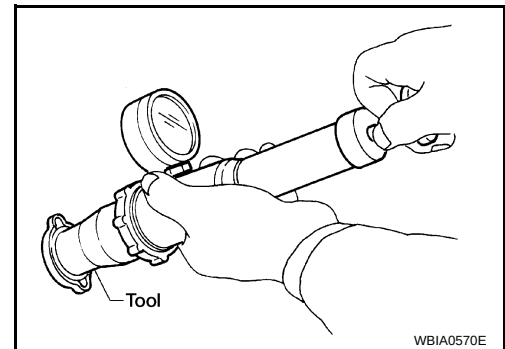


- Check radiator cap relief pressure using suitable tool.

Standard: 78 – 98 kPa (0.78 - 0.98 bar, 0.8 – 1.0 kg/cm², 11 – 14 psi)

Limit: 59 kPa (0.59 bar, 0.6 kg/cm², 9 psi)

- 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.



- Replace radiator cap if there it does not comply to specifications to the above three checks.

CAUTION:

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

Checking Radiator

INFOID:000000001538672

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

- Be careful not to bend or damage radiator fins.
 - When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape harness and connectors to prevent water from entering.
1. Apply water by hose to the back side of the radiator core vertically downward.
 2. Apply water again to all radiator core surface once per minute.
 3. Stop washing if any stains no longer flow out from radiator.
 4. Blow air into the back side of radiator core vertically downward.
 - Use compressed air lower than 490 kPa (4.9 bar, 5 kg/cm², 71 psi) and keep distance more than 30 cm (11.8 in).

RADIATOR

< ON-VEHICLE MAINTENANCE >

[K9K]

5. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

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RADIATOR

< ON-VEHICLE REPAIR >

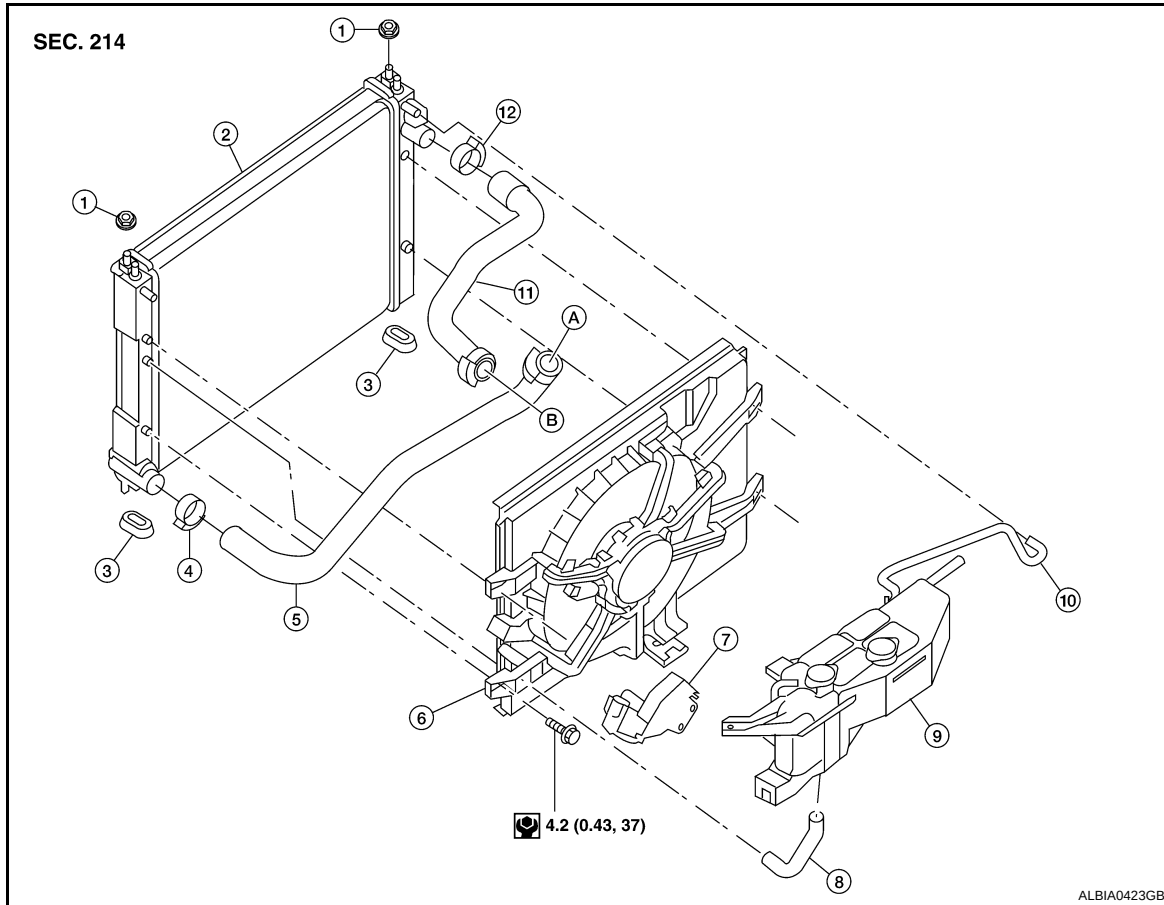
[K9K]

ON-VEHICLE REPAIR

RADIATOR

Exploded View

INFOID:000000001381591



- | | | |
|---------------------------------|--------------------------------|----------------------------|
| 1. Mounting rubber (upper) | 2. Radiator | 3. Mounting rubber (lower) |
| 4. Clamp | 5. Radiator hose (lower) | 6. Cooling fan assembly |
| 7. Cooling fan control module | 8. Reservoir tank hose (lower) | 9. Reservoir tank |
| 10. Reservoir tank hose (upper) | 11. Radiator hose (upper) | 12. Clamp |
| A. To water inlet | B. To water outlet | |

Removal and Installation

INFOID:000000001381592

WARNING:

Never remove the reservoir tank 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.

REMOVAL

1. Remove engine undercover using power tool.
2. Drain engine coolant. Refer to [CO-58, "Draining"](#).
CAUTION:
Perform when engine is cold.
3. Remove engine cover.
4. Remove air duct (inlet). Refer to [EM-269, "Exploded View"](#).
5. Remove reservoir tank hoses and reservoir tank.

RADIATOR

6. Disconnect radiator upper hose, reservoir tank hose and mounting bracket.
7. Disconnect radiator fan motor harness connectors.
8. Remove radiator core support cover.
9. Remove hood latch.
10. Disconnect horn and ambient temperature sensor harness connectors.
11. Remove radiator core support (upper).
12. Remove cooling fan and shroud assembly.
13. Release charge air cooler from the radiator. Refer to [EM-270, "Exploded View"](#).
14. Remove A/C condenser to radiator bolts.
15. Remove radiator.

CAUTION:
• Do not damage or scratch radiator core when removing.

INSTALLATION

- Installation is in the reverse order of removal.
- Check for engine coolant leaks. Refer to [CO-58, "Inspection"](#).

Inspection

INSPECTION AFTER INSTALLATION

- Check for engine coolant leaks using rsuitable tools. Refer to [CO-58, "Inspection"](#).

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COOLING FAN

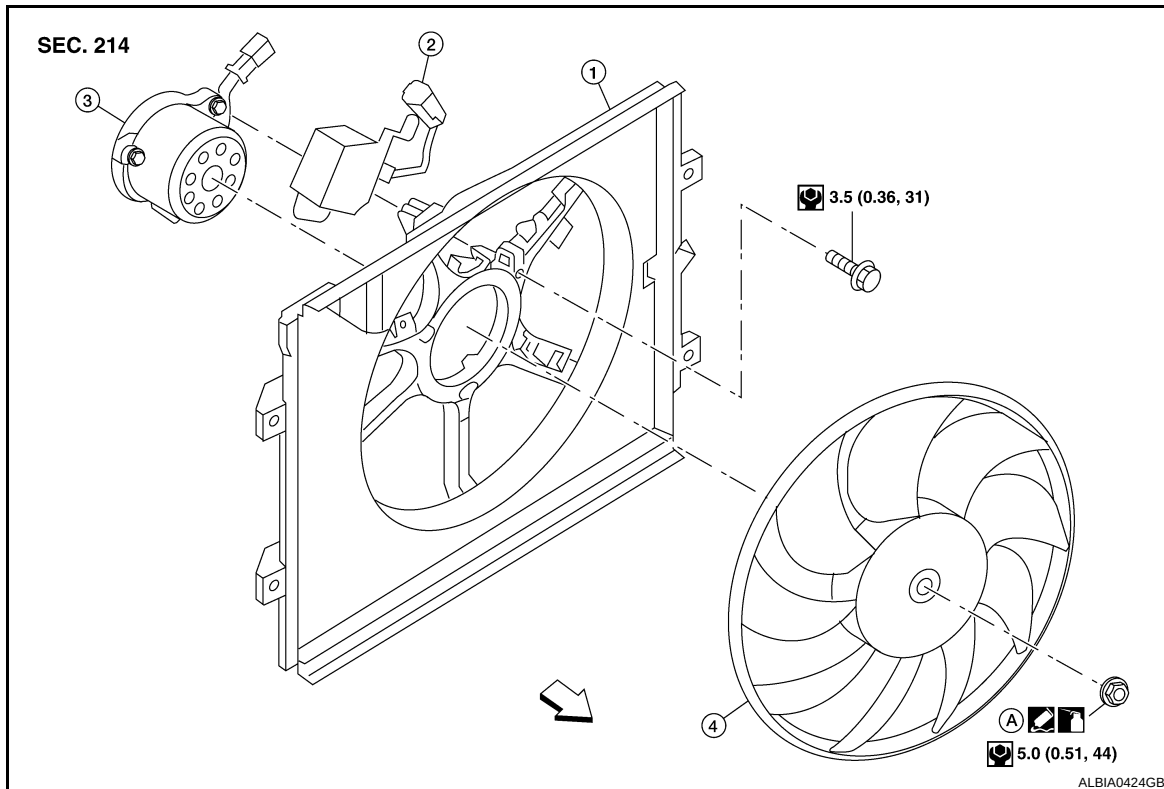
< ON-VEHICLE REPAIR >

[K9K]

COOLING FAN

Exploded View

INFOID:000000001381594



- 1. Fan shroud
- 2. Cooling fan control module
- 3. Fan motor
- 4. Cooling fan
- A. Reverse screw
- ⇐ : Vehicle front

Removal and Installation

INFOID:000000001381595

REMOVAL

1. Remove engine undercover using power tool.
2. Drain engine coolant. Refer to [CO-58, "Draining"](#).
3. Remove air duct (inlet). Refer to [EM-269, "Exploded View"](#).
4. Disconnect reservoir tank hoses and remove reservoir tank.
5. Remove radiator hose (upper). Refer to [CO-62, "Exploded View"](#).
6. Disconnect harness connector for cooling fan control module and fan motor, and move harness aside.
7. Remove cooling fan assembly.

CAUTION:

Be careful not to damage or scratch on radiator core.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Only use genuine parts for fan shroud bolt and observe the specified torque (to prevent radiator from being damaged).

NOTE:

Cooling fan is controlled by ECM. For details, refer to [CO-52, "Engine Cooling System"](#).

COOLING FAN

< ON-VEHICLE REPAIR >

[K9K]

Disassembly and Assembly

INFOID:000000001381596

DISASSEMBLY

1. Remove cooling fan control module from fan shroud.

CAUTION:

Handle carefully to avoid dropping and shocks.

2. Remove cooling fan mounting nut, and then remove the cooling fan.

CAUTION:

Reverse nut is used for the fan attachment. When removing or attaching, turn the nut the opposite direction from a normal nut.

3. Remove fan motor.

ASSEMBLY

Assembly is in the reverse order of disassembly.

- Apply thread locking sealant on fan motor shaft.

Inspection

INFOID:000000001381597

INSPECTION AFTER DISASSEMBLY

Cooling Fan

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

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WATER PUMP

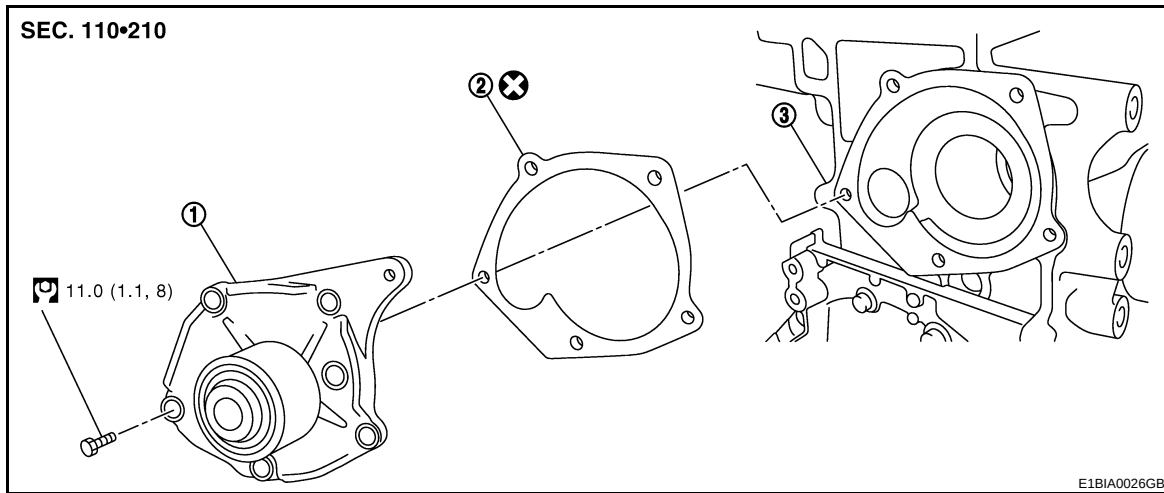
< ON-VEHICLE REPAIR >

[K9K]

WATER PUMP

Exploded View

INFOID:000000001381598



1. Water pump

2. Gasket

3. Cylinder block

Removal and Installation

INFOID:000000001381599

WARNING:

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

REMOVAL

1. Remove the following parts.
 - Battery ground cable
 - Engine undercover
 - RH front wheel
2. Remove fender protector RH. Refer to [EXT-22, "Removal and Installation"](#).
3. Drain engine coolant. Refer to [CO-58, "Draining"](#).

CAUTION:

Perform when engine is cold.

4. Remove drive belt. Refer to [EM-263, "Removal and Installation"](#).
5. Remove timing belt and inner cover. Refer to [EM-291, "Removal and Installation"](#).
6. Remove the water pump.
 - Coolant will leak from the cylinder block, so have a receptacle ready below.

CAUTION:

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

INSTALLATION

Installation is in the reverse order of removal.

Inspection

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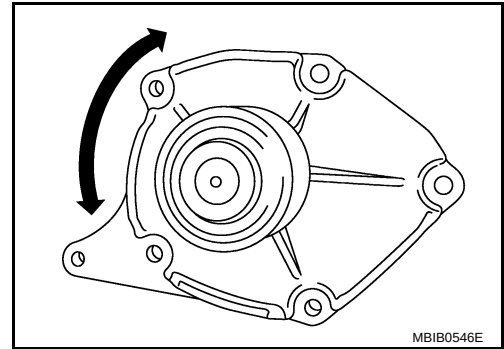
INSPECTION AFTER REMOVAL

WATER PUMP

[K9K]

< ON-VEHICLE REPAIR >

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



INSPECTION AFTER INSTALLATION

- Check for engine coolant leaks using suitable tools. Refer to [CO-58, "Inspection"](#).

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WATER OUTLET AND THERMOSTAT ASSEMBLY

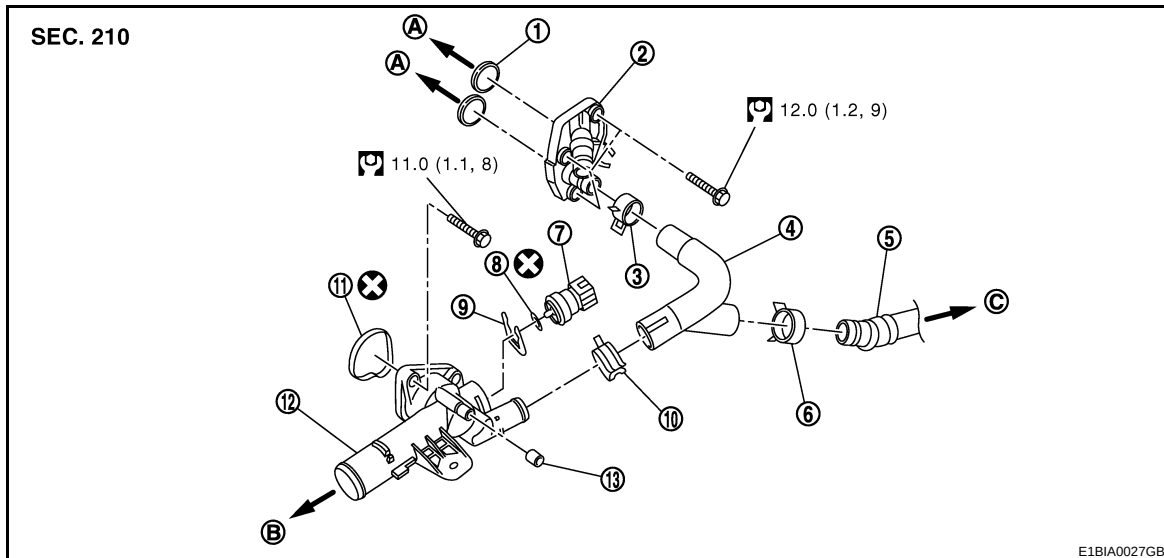
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[K9K]

WATER OUTLET AND THERMOSTAT ASSEMBLY

Exploded View

INFOID:000000001381601



- | | | |
|--|-----------------------------|--|
| 1. O-ring | 2. EGR cooler cover | 3. Clamp |
| 4. Water pipe | 5. Heater hose | 6. Clamp |
| 7. Engine coolant temperature sensor | 8. O-ring | 9. Lock plate |
| 10. Clamp | 11. Gasket | 12. Water outlet and thermostat assembly |
| 13. Air relief plug | | |
| A. To EGR volume control valve housing | B. To radiator hose (upper) | C. To heater core |

Removal and Installation

INFOID:000000001381602

REMOVAL

1. Remove battery.
2. Remove engine undercover using power tool.
3. Drain engine coolant. Refer to [CO-58, "Draining"](#).
CAUTION:
Perform when engine is cold.
4. Remove engine cover.
5. Remove air cleaner and air duct assembly. Refer to [EM-269, "Removal and Installation"](#).
6. Remove rear engine slinger. Refer to [EM-314, "Exploded View"](#).
7. Remove vacuum hose.
8. Remove vacuum pump. Refer to [EM-280, "Removal and Installation"](#).
9. Remove radiator upper hose. Refer to [CO-62, "Exploded View"](#).
10. Remove heater hose.
11. Disconnect reservoir tank hose.
12. Remove water outlet.

INSTALLATION

Installation is in the reverse order of removal.

Inspection

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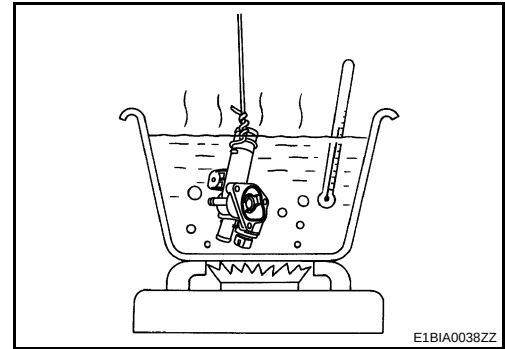
INSPECTION AFTER REMOVAL

WATER OUTLET AND THERMOSTAT ASSEMBLY

< ON-VEHICLE REPAIR >

[K9K]

- 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 example shows the thermostat.)
- The valve opening temperature is the temperature at which the valve opens and falls from the thread.
- Continue heating. Check the full-open lift amount.
- After checking the full-open lift amount, lower the water temperature and check the valve closing temperature.
- If the measured value is out of the standard value or unusual valve seating condition is found, replace water inlet and thermostat assembly.



	Temperature °C (°F)
Start of opening	89 (192)
End of opening	97 - 101 (207 - 214)

INSPECTION AFTER INSTALLATION

- Check for engine coolant leaks using suitable tools. Refer to [CO-58, "Inspection"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:0000000001381604

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (Imp qt)

Engine coolant capacity [With reservoir tank ("MAX" level)]	7.0 (6-1/8)
Reservoir tank engine coolant capacity (At "MAX" level)	0.8 (3/4)

Radiator

INFOID:0000000001381605

Unit: kPa (kg/cm², psi, bar)

Reservoir tank cap relief pressure	130 - 150 (1.33 - 1.53, 18.9 - 21.8, 1.3 - 1.5)
Leakage testing pressure	10 (0.10, 1.5, 0.1)

Thermostat

INFOID:0000000001381606

Unit: °C (°F)

Temperature of start opening	89 (192)
Temperature of end opening	97 - 101 (207 - 214)