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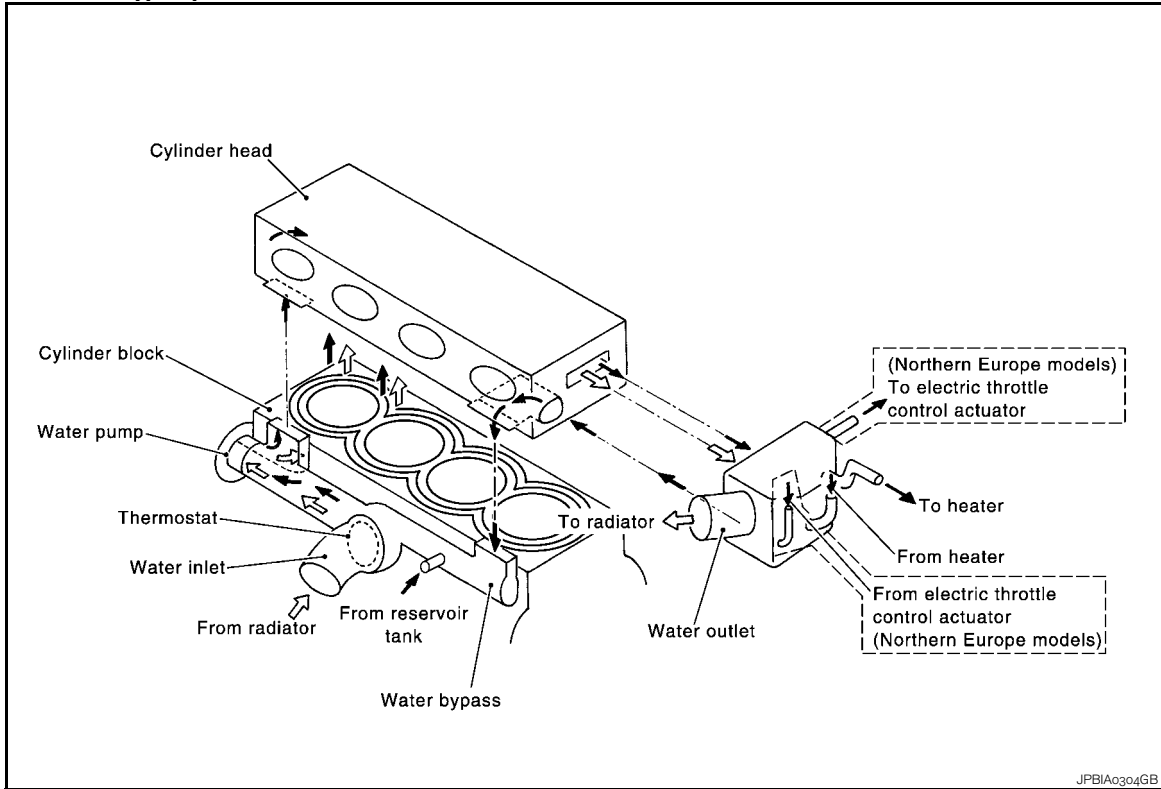
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FUNCTION DIAGNOSIS

DESCRIPTION

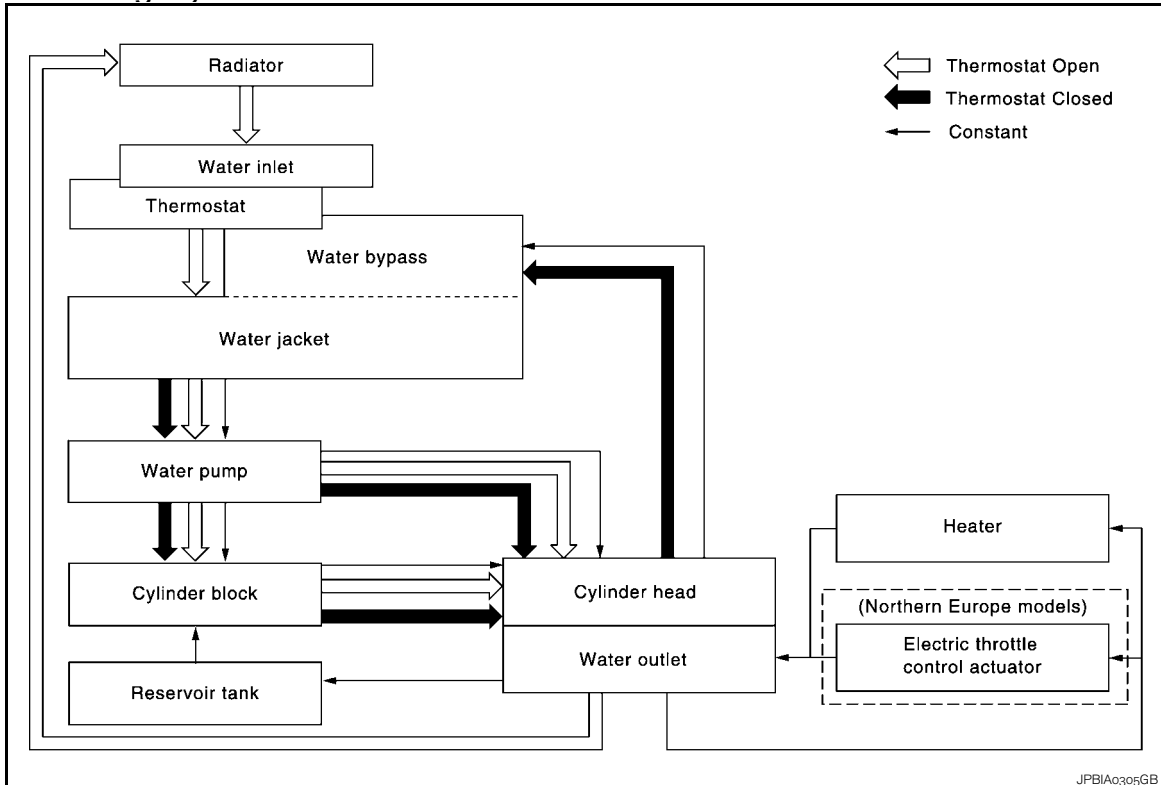
Engine Cooling System

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Engine Cooling System Schematic

INFOID:000000000903732



OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[HR16DE]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000000903733

	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				

PRECAUTION

PRECAUTIONS

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

INFOID:000000001094853

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

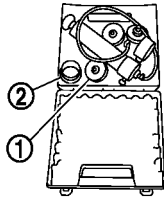
PREPARATION

PREPARATION

Special Service Tools

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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)	Checking radiator and reservoir tank cap



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ON-VEHICLE MAINTENANCE

ENGINE COOLANT

Inspection

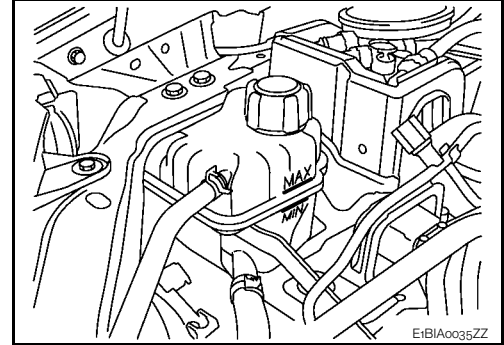
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LEVEL

- Check if the reservoir tank engine coolant level is within the “MIN” to “MAX” when the engine is cool.
- Adjust the engine coolant level as necessary.
- Check that the reservoir tank cap is tightened.

WARNING:

Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.



LEAKAGE

- To check for leakage, fit the adapter to the reservoir tank, and then connect it to the reservoir tank cap tester [SST: — (M.S.554-07)] (A) as shown.

Testing pressure: Refer to [CO-23, "Radiator"](#).

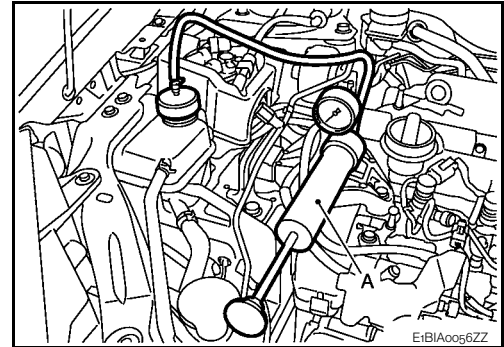
WARNING:

Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.

CAUTION:

Higher test pressure than specified may cause radiator damage.

- If anything is found, repair or replace damaged parts.



Draining

INFOID:000000000903735

WARNING:

- Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.
- Wrap a thick cloth around the reservoir tank cap. Slowly turn it a quarter of a turn to release built-up pressure. Then turn it all the way.

1. Disconnect radiator hose (lower) and reservoir tank cap.
When draining all of engine coolant in the system, open water drain plugs on cylinder block. Refer to [EM-93, "Exploded View"](#).

CAUTION:

- Perform this step when engine is cold.
- Never spill engine coolant on drive belt.

2. Remove reservoir tank if necessary, and drain engine coolant and clean reservoir tank before installing. Refer to [CO-13, "Exploded View"](#).
3. Check drained engine coolant for contaminants such as rust, corrosion or discoloration. If contaminated, flush the engine cooling system. Refer to [CO-12, "RADIATOR : Inspection"](#).

Refilling

INFOID:000000000903736

1. Install reservoir tank if removed.
2. Connect radiator hose (lower).
 - If water drain plugs on cylinder block are removed, close and tighten them. Refer to [EM-74, "Exploded View"](#).
3. Make sure that each hose clamp has been firmly tightened.

ENGINE COOLANT

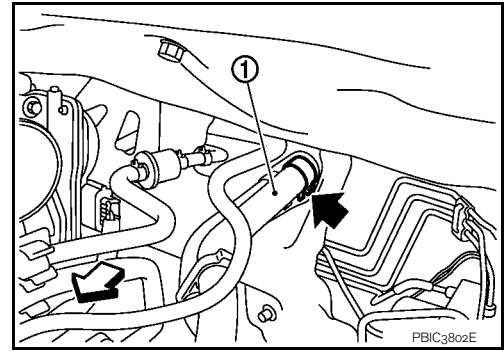
< ON-VEHICLE MAINTENANCE >

[HR16DE]

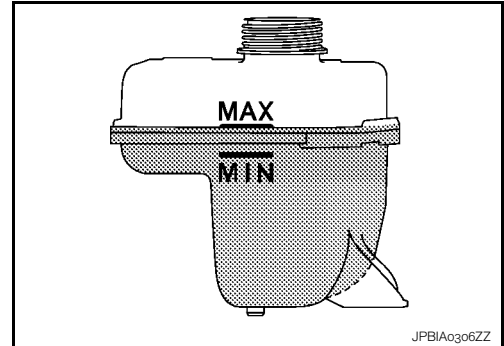
4. Disconnect heater hose (1) at position (←) in the figure.

← : Vehicle front

- Enhance heater hose as high as possible, keeping heater hose end above reservoir tank MAX level.



5. Fill reservoir tank to specified level.
- Pour coolant slowly of less than 2 (1-3/4 Imp qt) a minute to allow air in system to escape.
 - When coolant from heater unit starts to drain, connect heater hose and continue to fill up to reservoir tank MAX level.
 - Start engine without closing reservoir tank cap.
 - Keep engine racing at 1,500 rpm for about 2-3 minutes, filling reservoir tank up to MAX. Level, if necessary.
 - Use Genuine Nissan Engine Coolant or equivalent mixed with water (distilled or demineralized). Refer to [MA-21, "Fluids and Lubricants"](#).



Engine coolant capacity
(With reservoir tank at "MAX" level)

Refer to [CO-23, "Periodical Maintenance Specification"](#).

Reservoir tank engine coolant capacity
(At "MAX" level)

Refer to: [CO-23, "Periodical Maintenance Specification"](#).

6. Install reservoir tank cap.
7. Warm up engine until opening thermostat. Standard for warming-up time is approximately 10 minutes at 2,000 - 2,500 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 engine.
8. Stop the engine and cool down to less than approximately 50°C (122°F).
- Cool down using fan to reduce the time.
9. Refill reservoir tank to "MAX" level line with engine coolant, if necessary.
10. Repeat steps 6 through 9 two or more times with reservoir tank cap installed until reservoir tank level no longer drops.
11. Check cooling system for leaks with engine running.
12. Warm up the 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.
13. Repeat step 12 three times.
14. If sound is heard, bleed air from cooling system by repeating step 6 through 9 until reservoir tank level no longer drops.
15. Check that the reservoir tank cap is tightened.

Flushing

1. Install reservoir tank if removed.
2. Disconnect radiator hose (lower) and reservoir tank cap.

ENGINE COOLANT

< ON-VEHICLE MAINTENANCE >

[HR16DE]

If water drain plugs on cylinder block are removed, close and tighten them. Refer to [EM-83, "Exploded View"](#).

3. Fill reservoir tank with water and reinstall reservoir tank cap.
4. Run the engine and warm it up to normal operating temperature.
5. Rev the engine two or three times under no-load.
6. Stop the engine and wait until it cools down.
7. Drain water from the system. Refer to [CO-9, "Draining"](#).
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.
9. Check that the reservoir tank cap is tightened.

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RADIATOR

RESERVOIR TANK CAP

RESERVOIR TANK CAP : Inspection

INFOID:000000000903738

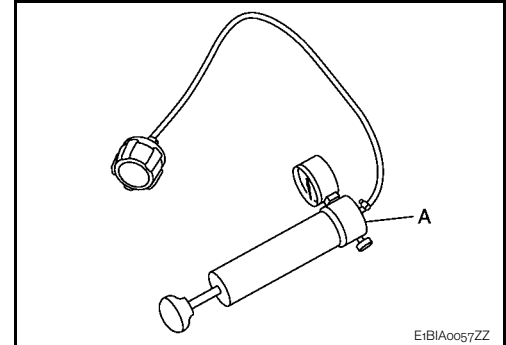
- Fit the adapter to the reservoir tank cap tester [SST: — (M.S. 554-07)] (A) as shown.
- When connecting the reservoir tank cap to the reservoir tank cap tester, apply water or LLC to the reservoir tank cap seal part.
- Check reservoir tank cap relief pressure.

Standard and limit : Refer to [CO-23, "Radiator"](#).

- Replace the reservoir tank cap if the engine coolant passes through it, or if any fur signs is detected.

CAUTION:

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



RADIATOR

RADIATOR : Inspection

INFOID:000000000903739

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

CAUTION:

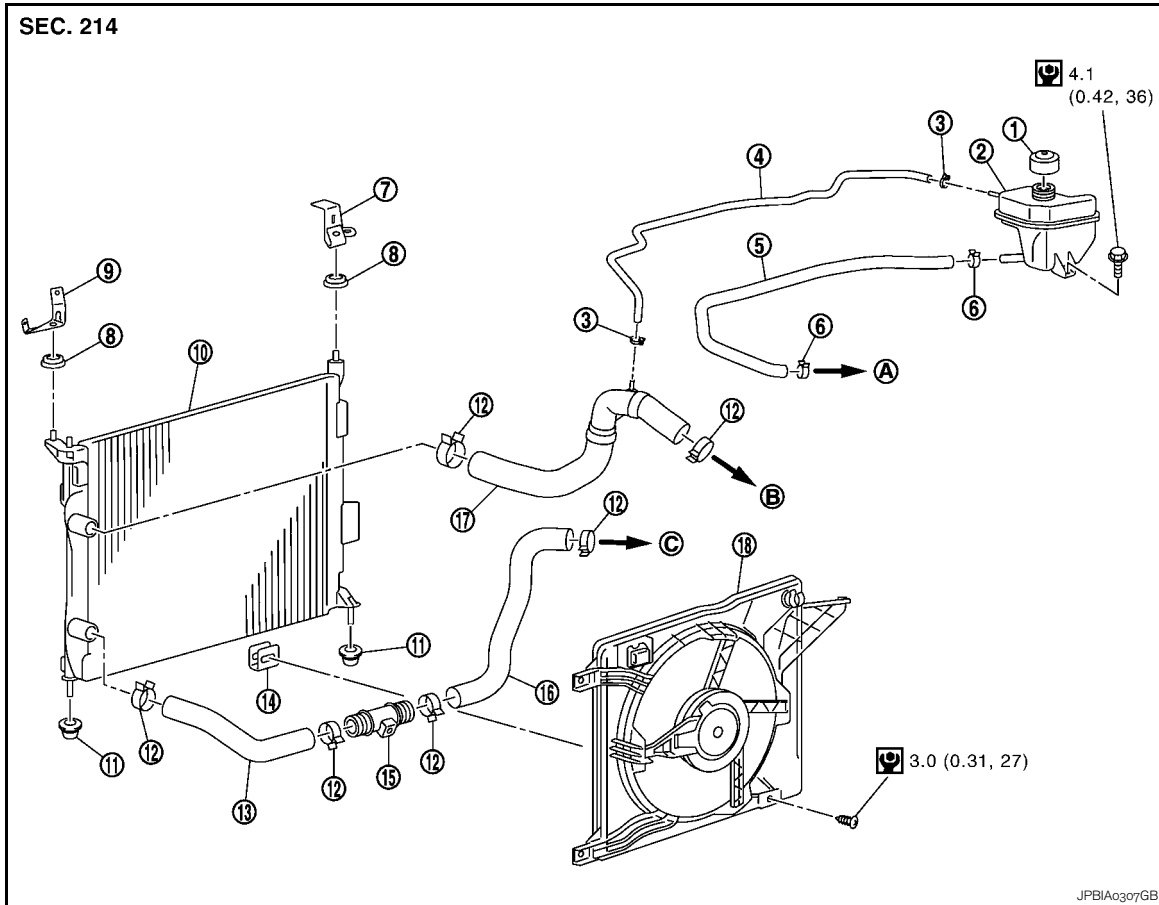
- **Be careful not to bend or damage radiator fins.**
 - **When radiator is cleaned without removal, remove all surrounding parts such as radiator cooling fan assembly and horns. Then tape harness and connectors to prevent water from entering.**
1. Apply water by hose to the back side of the radiator core vertically downward.
 2. Apply water again to all radiator core surfaces 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 (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.

ON-VEHICLE REPAIR

RADIATOR

Exploded View

INFOID:0000000000903740



- | | | |
|---------------------------|-----------------------------|--------------------------|
| 1. Reservoir tank cap | 2. Reservoir tank | 3. Clamp |
| 4. Reservoir tank hose | 5. Reservoir tank hose | 6. Clamp |
| 7. Bracket | 8. Mounting rubber (upper) | 9. Bracket |
| 10. Radiator | 11. Mounting rubber (lower) | 12. Clamp |
| 13. Radiator hose (lower) | 14. Clip | 15. Radiator hose pipe |
| 16. Radiator hose (lower) | 17. Radiator hose (upper) | 18. Cooling fan assembly |
| A. To cylinder block | B. To water outlet | C. To water inlet |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:0000000000903741

REMOVAL

WARNING:

- Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.
- Wrap a thick cloth around reservoir tank cap. Slowly turn it a quarter of a turn to release built-up pressure. Then turn it all the way.

1. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#).

CAUTION:

- Perform this step when the engine is cold.
- Never spill engine coolant on drive belts.

RADIATOR

[HR16DE]

< ON-VEHICLE REPAIR >

2. Remove air duct (inlet). Refer to [EM-27, "Exploded View"](#).
 3. Remove reservoir tank hose at radiator hose (upper) side.
 4. Disconnect connector from resistor and fan motor, and move harness to aside.
 5. Remove cooling fan assembly. Refer to [CO-15, "Exploded View"](#).
- CAUTION:**
Be careful not to damage radiator core.
6. Remove radiator hose (upper and lower).
 7. Remove liquid tank bracket mounting bolts. Refer to [HA-36, "Exploded View"](#).
 8. Remove mounting bracket (upper).
 9. Lift up the A/C condenser to disengage the radiator, and then remove the radiator.

CAUTION:
Be careful not to damage or scratch radiator and A/C condenser core.

INSTALLATION

Installation is the reverse order of removal.

Inspection

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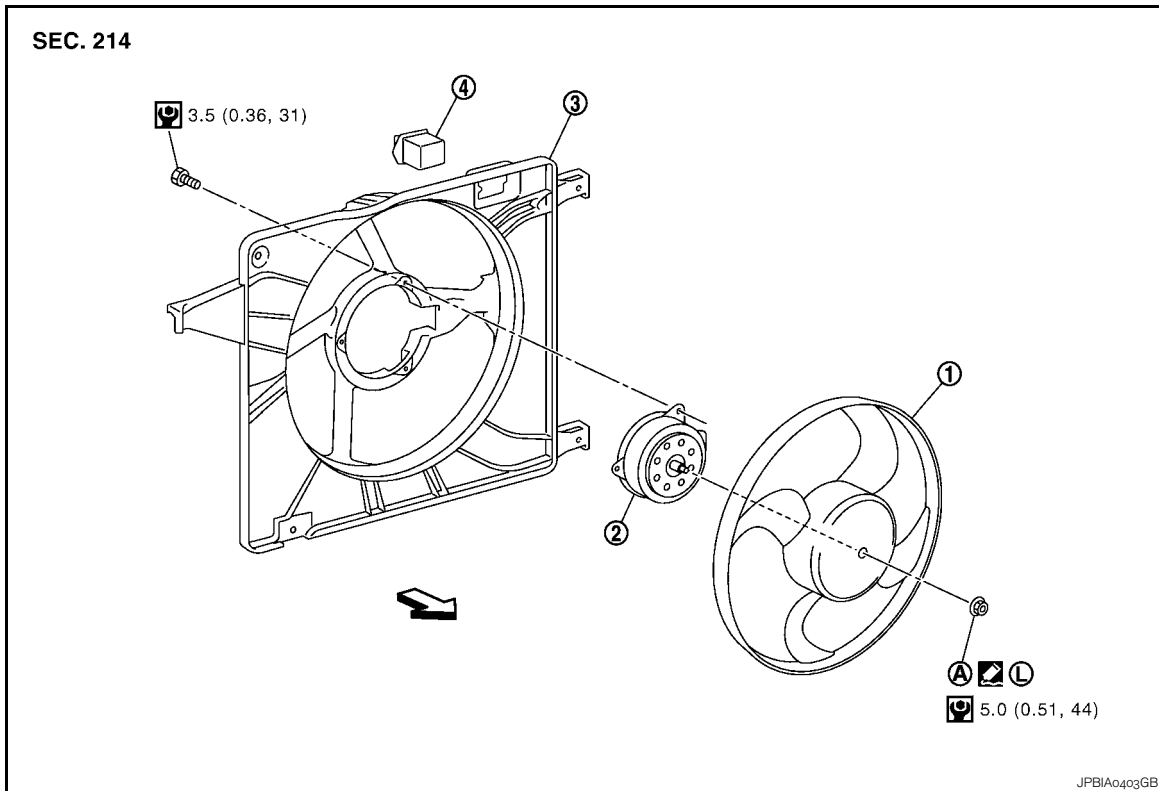
INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-9, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

COOLING FAN

Exploded View

INFOID:000000000903743



- | | | | | | |
|----|---------------|----|-----------|----|------------|
| 1. | Cooling fan | 2. | Fan motor | 3. | Fan shroud |
| 4. | Resistor | | | | |
| A. | Reverse screw | | | | |

: Apply thread locking sealant.

: Vehicle front

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000000903744

REMOVAL

1. Remove air duct (inlet). Refer to [EM-27, "Exploded View"](#).
2. Disconnect harness connector from resistor and fan motor, and move harness to aside.
3. Remove cooling fan assembly.

CAUTION:

Be careful not to damage or scratch on radiator core.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

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

NOTE:

Cooling fan is controlled by ECM. For details, refer to [EC-299, "Description"](#).

Disassembly and Assembly

INFOID:000000000905131

DISASSEMBLY

COOLING FAN

< ON-VEHICLE REPAIR >

[HR16DE]

1. Remove resistor from fan shroud.

CAUTION:

Handle carefully to avoid dropping and shocks.

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

CAUTION:

Reverse screw is used for the fan attachment nut. When removing or attaching, turn the screw the opposite way as for a normal screw.

3. Remove fan motor.

ASSEMBLY

Assembly is the reverse order of disassembly.

- Apply thread locking sealant on fan motor shaft.

Inspection

INFOID:0000000001008369

INSPECTION AFTER DISASSEMBLY

Cooling Fan

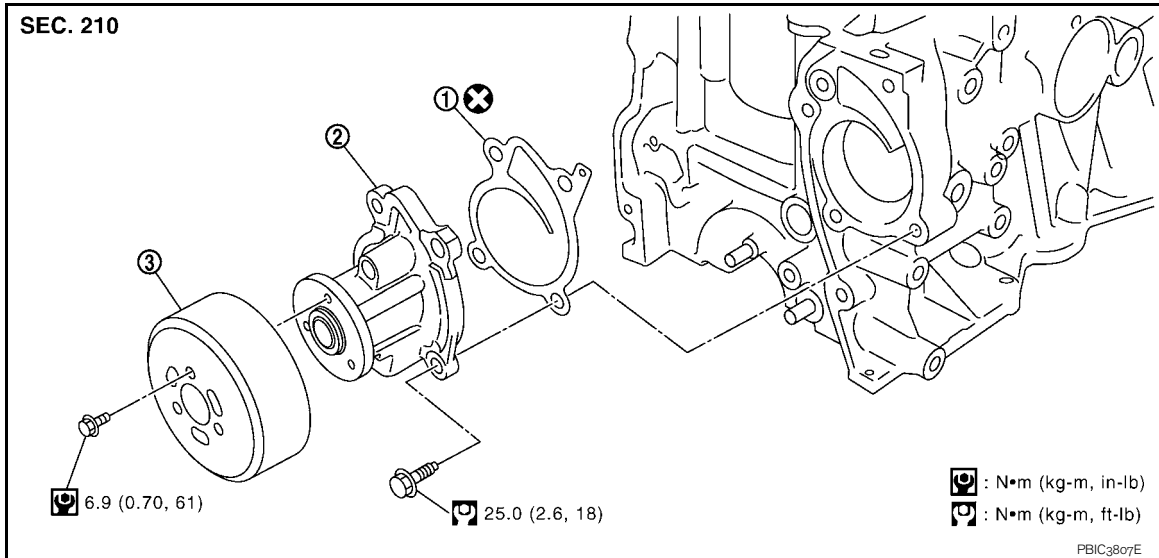
Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

WATER PUMP

Exploded View

INFOID:000000000903746



1. Gasket
2. Water pump
3. Water pump pulley

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

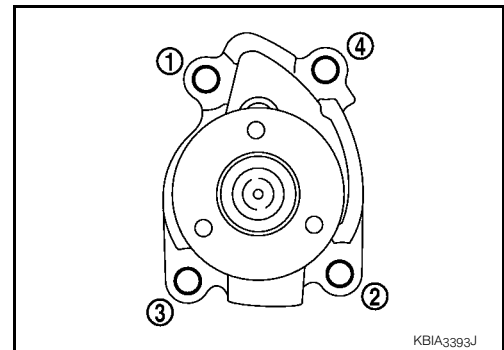
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REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#).
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 fender protector.
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 in the figure.
 - 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 disassemble and should replaced as a unit.



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INSTALLATION

Note the following, and install in the reverse order of removal.

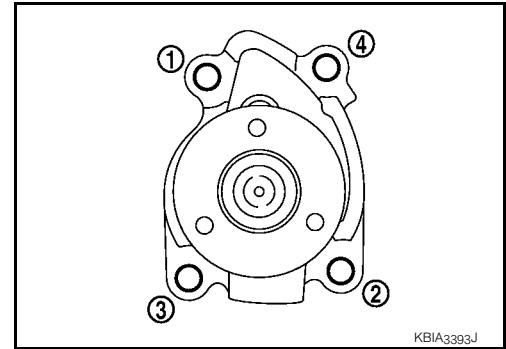
Water pump

WATER PUMP

< ON-VEHICLE REPAIR >

[HR16DE]

- Tighten mounting bolts in numerical order as shown in the figure.

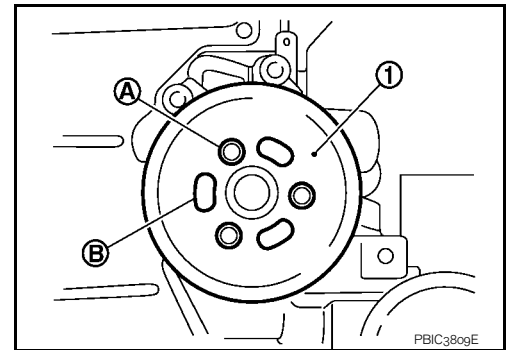


Water pump pulley

CAUTION:

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

1 : Water pump pulley

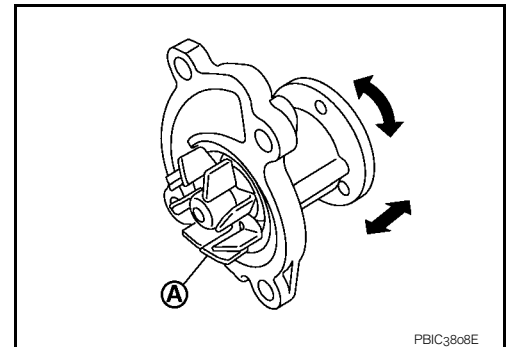


Inspection

INFOID:000000000903748

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.



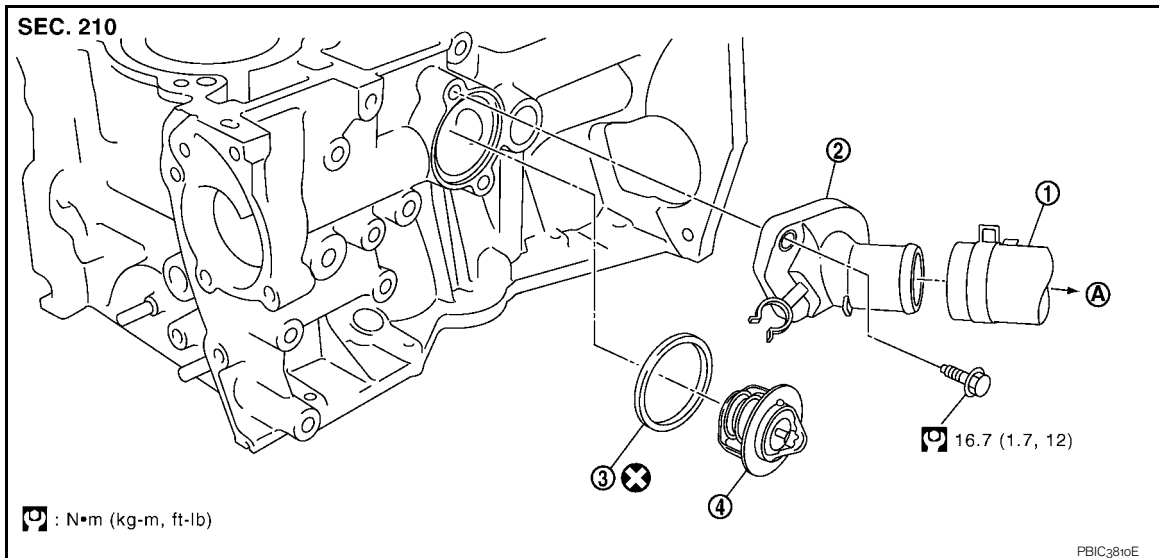
INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-9, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

THERMOSTAT

Exploded View

INFOID:000000000903749



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

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000000903750

REMOVAL

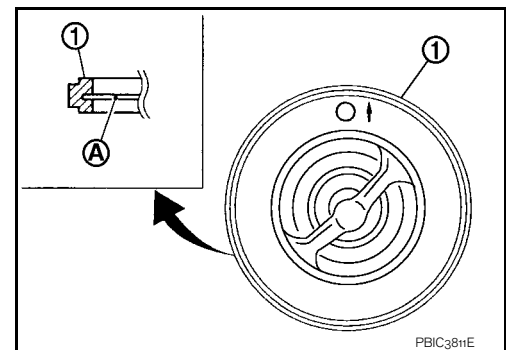
1. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#).
CAUTION:
 - Perform this step when engine is cold.
 - Never spill engine coolant on drive belt.
2. Add paint mark, then disconnect radiator hose (lower) from water inlet. Refer to [CO-13, "Exploded View"](#).
3. Remove water inlet and thermostat.
 - Engine coolant will leak from cylinder block, so have a receptacle ready below.

INSTALLATION

Note the following, and install in the reverse order of removal.

Thermostat

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



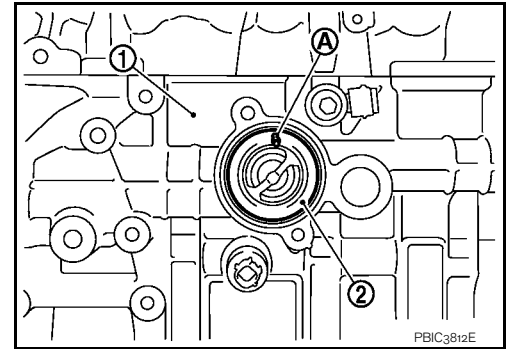
THERMOSTAT

< ON-VEHICLE REPAIR >

[HR16DE]

- Install thermostat (2) with jiggle valve (A) facing upwards.

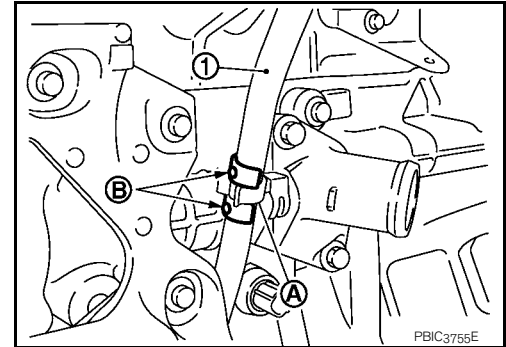
1 : Cylinder block



Water Inlet

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

B : Positioning



Inspection

INFOID:000000000903751

INSPECTION AFTER REMOVAL

WARNING:

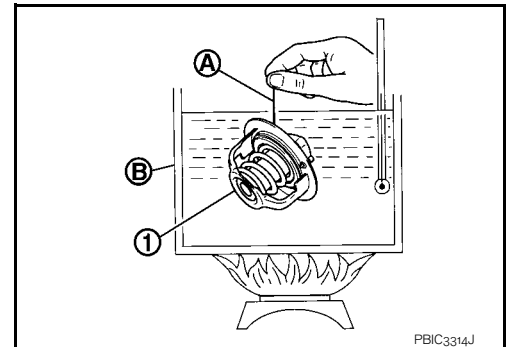
Use a protector to prevent a burn during the work.

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-23, "Thermostat"](#).

- If out of the standard, replace thermostat.



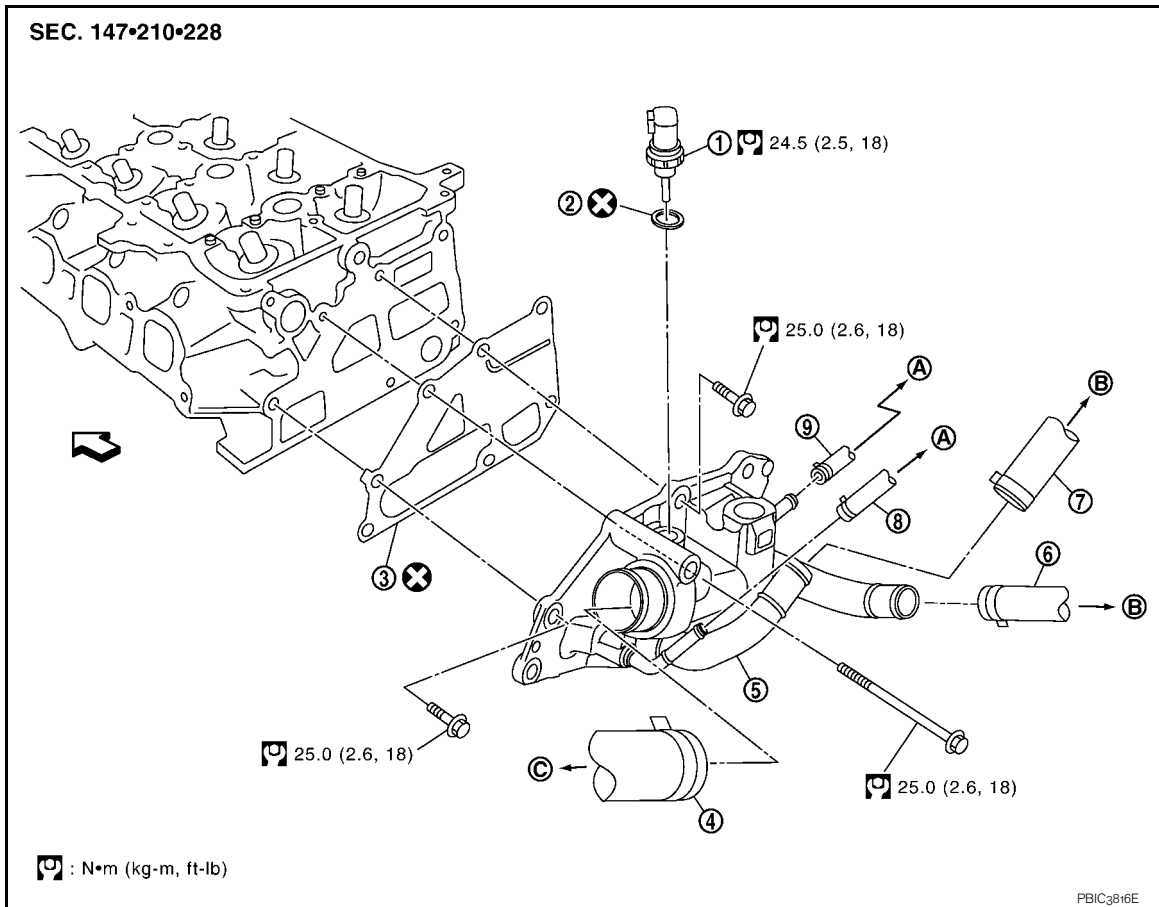
INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-9, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

WATER OUTLET

Exploded View

INFOID:000000000903752



- | | | |
|--|--|--|
| 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 electric throttle control actuator | B. To heater core | C. To radiator |

⇐ : Engine front

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000000903753

REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#).
CAUTION:
• Perform this step when engine is cold.
• Never spill engine coolant on drive belt.
2. Disconnect radiator hose (upper). Refer to [CO-13, "Exploded View"](#).
3. Disconnect harness connector from engine coolant temperature sensor.
4. Remove 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:000000000903754

INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-9, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

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:0000000000903759

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (Imp qt)

Engine coolant capacity [With reservoir tank ("MAX" level)]	5.9 (5-1/4)
Reservoir tank engine coolant capacity (At "MAX" level)	0.78 (5/8)

Radiator

INFOID:0000000000903760

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:0000000000903761

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)

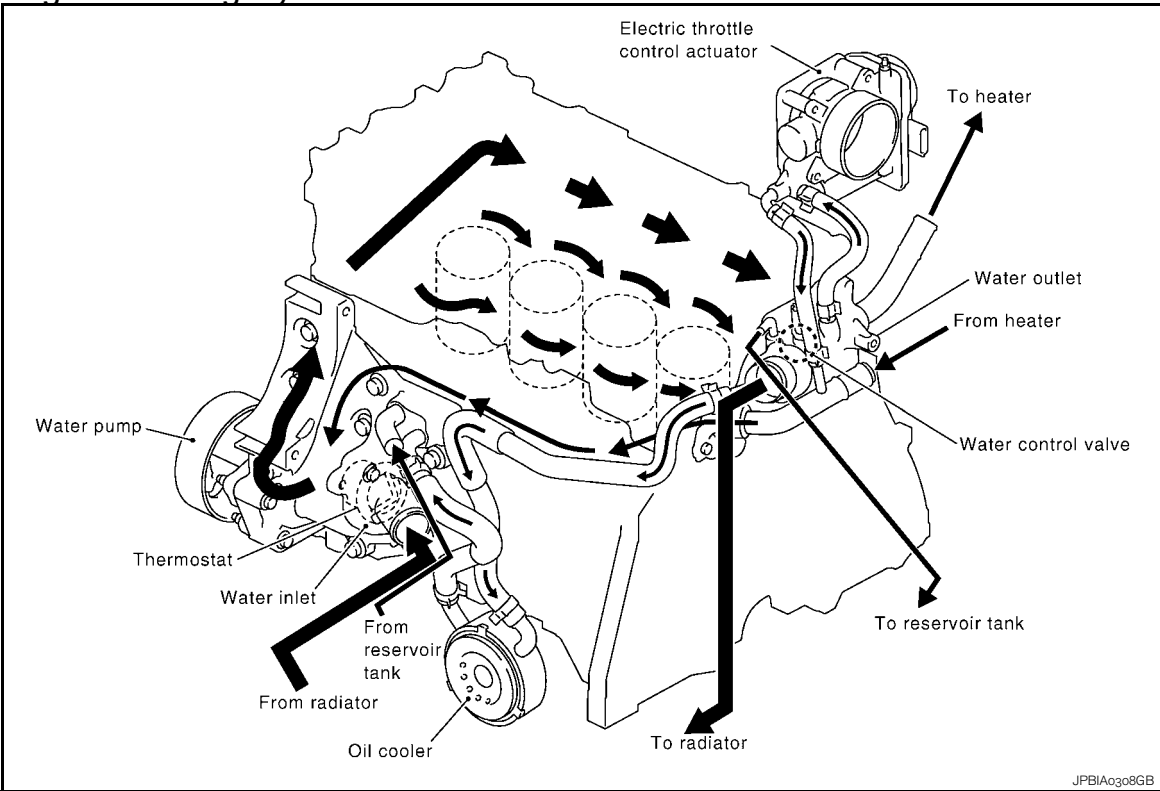
FUNCTION DIAGNOSIS

DESCRIPTION

M/T

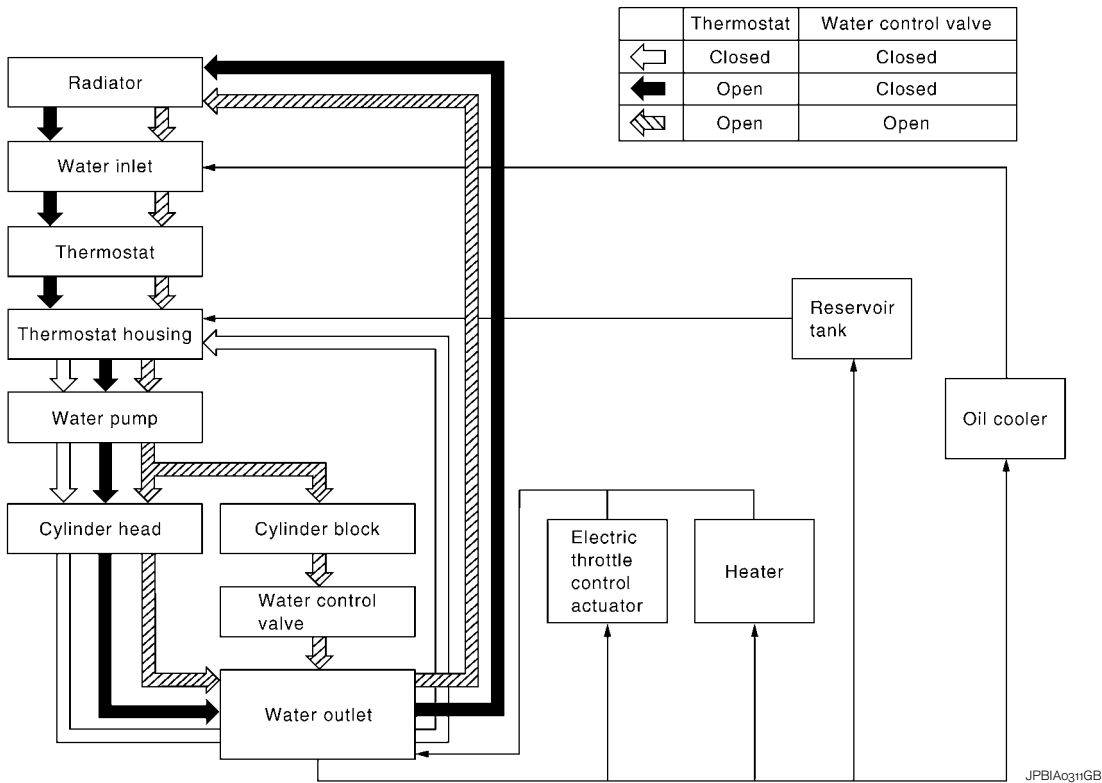
M/T : Engine Cooling System

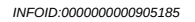
INFOID:000000000905183



M/T : Engine Cooling System Schematic

INFOID:000000000905186





INFOID:0000000000905184



OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[MR20DE]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000000905141

		Symptom	Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat and water control valve 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

cardiagn.com

OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[MR20DE]

	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:000000001094854

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

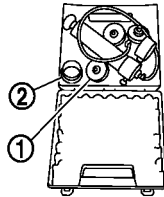
PREPARATION

PREPARATION

Special Service Tools

INFOID:000000000905135

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)	Checking radiator and reservoir tank cap



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ON-VEHICLE MAINTENANCE

ENGINE COOLANT

Inspection

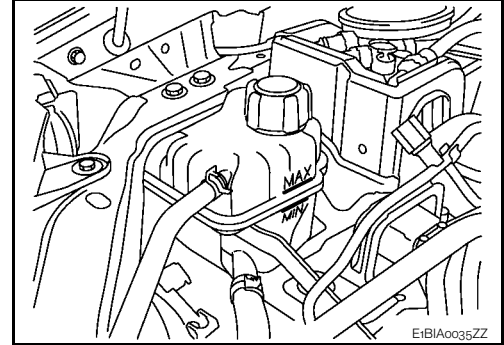
INFOID:000000000905143

LEVEL

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

WARNING:

Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.



LEAKAGE

- To check for leakage, fit the adapter to the reservoir tank, and then connect it to the reservoir tank cap tester [SST: — (M.S.554-07)] (A) as shown.

Testing pressure: Refer to [CO-46, "Radiator"](#).

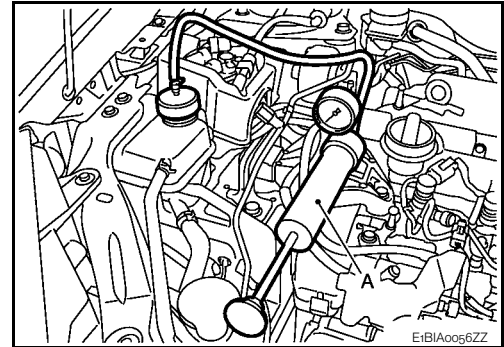
WARNING:

Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.

CAUTION:

Higher test pressure than specified may cause radiator damage.

- If anything is found, repair or replace damaged parts.



Draining

INFOID:000000000905144

WARNING:

- Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.
- Wrap a thick cloth around the reservoir tank cap. Slowly turn it a quarter of a turn to release built-up pressure. Then turn it all the way.

1. Disconnect radiator hose (lower) and reservoir tank cap.

When draining all of engine coolant in the system, open water drain plugs on cylinder block. Refer to [EM-210, "Exploded View"](#).

CAUTION:

- Perform this step when engine is cold.
 - Never spill engine coolant on drive belt.
2. Remove reservoir tank if necessary, and drain engine coolant and clean reservoir tank before installing.
 - Remove of engine mounting insulator (RH) is necessary. Refer to [EM-194, "M/T : Exploded View"](#) (M/T models) or [EM-198, "CVT : Exploded View"](#) (CVT models).
 3. Check drained engine coolant for contaminants such as rust, corrosion or discoloration. If contaminated, flush the engine cooling system. Refer to [CO-33, "RADIATOR : Inspection"](#).

Refilling

INFOID:000000000905145

1. Install reservoir tank if removed.
2. Connect radiator hose (lower).

If water drain plugs on cylinder block are removed, close and tighten them. Refer to [EM-210, "Exploded View"](#).

ENGINE COOLANT

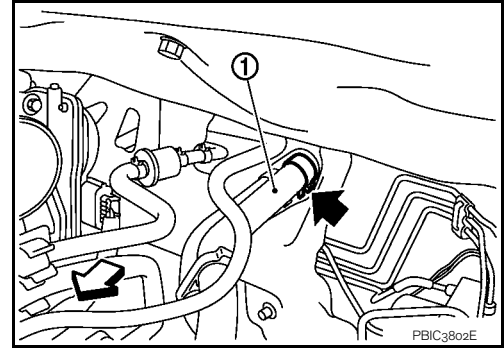
< ON-VEHICLE MAINTENANCE >

[MR20DE]

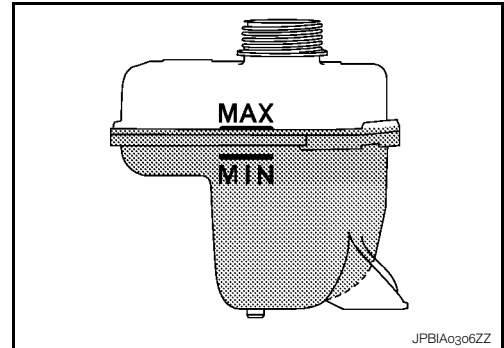
3. Make sure that each hose clamp has been firmly tightened.
4. Disconnect heater hose (1) at position (←) in the figure.

← : Vehicle front

- Enhance heater hose as high as possible, keeping heater hose end above reservoir tank MAX level.



5. Fill reservoir tank to specified level.
 - Pour coolant slowly of less than 2 (1-3/4 Imp qt) a minute to allow air in system to escape.
 - When coolant from heater unit starts to drain, connect heater hose and continue to fill up to reservoir tank MAX level.
 - Start engine without closing reservoir tank cap.
 - Keep engine racing at 1,500 rpm for about 2-3 minutes, filling reservoir tank up to MAX. Level, if necessary.
 - Use Genuine Nissan Engine Coolant or equivalent mixed with water (distilled or demineralized). Refer to [MA-21, "Fluids and Lubricants"](#).



Engine coolant capacity
(With reservoir tank at "MAX" level)

Refer to [:CO-46, "Periodical Maintenance Specification"](#)

Reservoir tank engine coolant capacity
(At "MAX" level)

Refer to [CO-46, "Periodical Maintenance Specification"](#).

6. Install reservoir tank cap.
7. Warm up engine until opening thermostat. Standard for warming-up time is approximately 10 minutes at 2,000 - 2,500 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 engine.
8. Stop the engine and cool down to less than approximately 50°C (122°F).
 - Cool down using fan to reduce the time.
9. Refill reservoir tank to "MAX" level line with engine coolant, if necessary.
10. Repeat steps 6 through 9 two or more times with reservoir tank cap installed until reservoir tank level no longer drops.
11. Check cooling system for leaks with engine running.
12. Warm up the 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.
13. Repeat step 12 three times.
14. If sound is heard, bleed air from cooling system by repeating step 6 through 9 until reservoir tank level no longer drops.
15. Check that the reservoir tank cap is tightened.

Flushing

INFOID:000000000905146

ENGINE COOLANT

[MR20DE]

< ON-VEHICLE MAINTENANCE >

1. Install reservoir tank if removed.
2. Disconnect radiator hose (lower) and reservoir tank cap.
If water drain plugs on cylinder block are removed, close and tighten them. Refer to [EM-210, "Exploded View"](#).
3. Fill reservoir tank with water and reinstall reservoir tank cap.
4. Run the engine and warm it up to normal operating temperature.
5. Rev the engine two or three times under no-load.
6. Stop the engine and wait until it cools down.
7. Drain water from the system. Refer to [CO-30, "Draining"](#).
8. Repeat steps 1 through 7 until clear water begins to drain from radiator.
9. Check that the reservoir tank cap is tightened.

RADIATOR

RESERVOIR TANK CAP

RESERVOIR TANK CAP : Inspection

INFOID:000000000905149

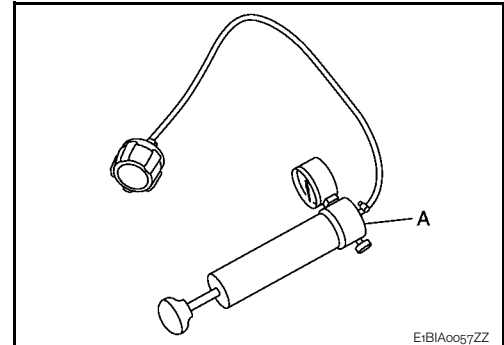
- Fit the adapter to the reservoir tank cap tester [SST: — (M.S.554-07)] (A) as shown.
- When connecting the reservoir tank cap to the reservoir tank cap tester, apply water or LLC to the reservoir tank cap seal part.
- Check reservoir tank cap relief pressure.

Standard and limit: Refer to [CO-46, "Radiator"](#).

- Replace the reservoir tank cap if the engine coolant passes through it, or if any fur signs is detected.

CAUTION:

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



RADIATOR

RADIATOR : Inspection

INFOID:000000000905151

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

CAUTION:

- **Be careful not to bend or damage radiator fins.**
 - **When radiator is cleaned without removal, remove all surrounding parts such as radiator cooling fan assembly 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 surfaces 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 (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.

RADIATOR

< ON-VEHICLE REPAIR >

[MR20DE]

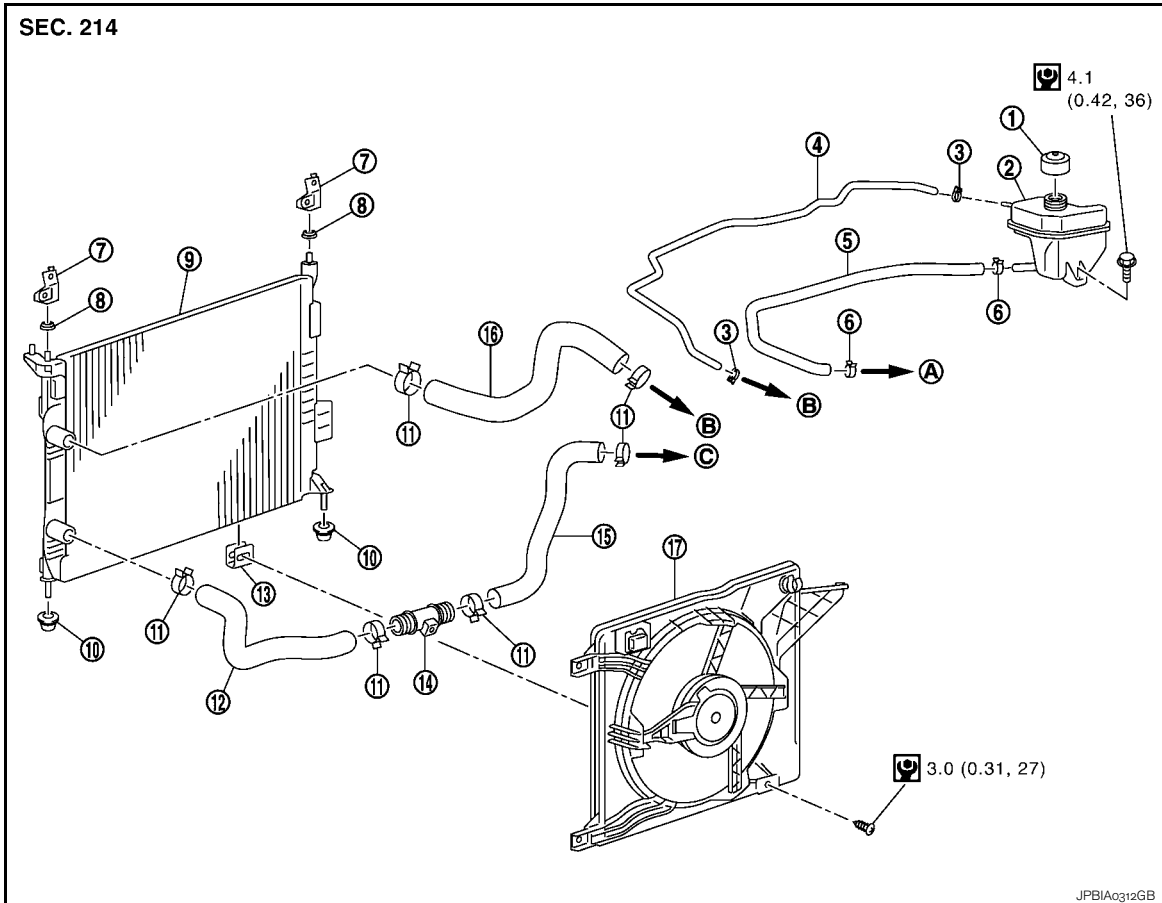
ON-VEHICLE REPAIR

RADIATOR

Exploded View

INFOID:000000000905153

M/T models



- | | | |
|-----------------------------|----------------------------|---------------------------|
| 1. Reservoir tank cap | 2. Reservoir tank | 3. Clamp |
| 4. Reservoir tank hose | 5. Reservoir tank hose | 6. Clamp |
| 7. Bracket | 8. Mounting rubber (upper) | 9. Radiator |
| 10. Mounting rubber (lower) | 11. Clamp | 12. Radiator hose (lower) |
| 13. Clip | 14. Radiator hose pipe | 15. Radiator hose (lower) |
| 16. Radiator hose (upper) | 17. Cooling fan assembly | |
| A. To thermostat housing | B. To water outlet | C. To water inlet |

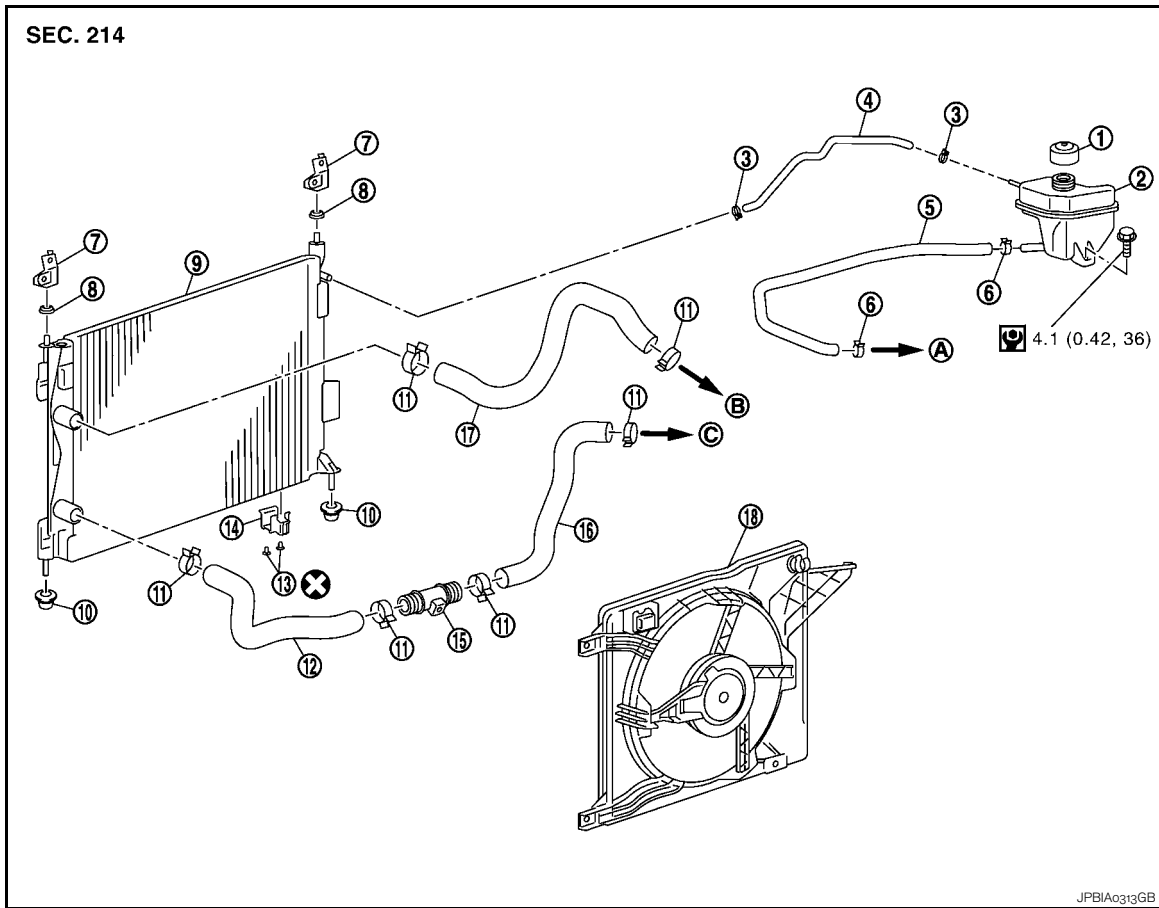
Refer to [GI-4, "Components"](#) for symbols in the figure.

CVT models

RADIATOR

< ON-VEHICLE REPAIR >

[MR20DE]



- | | | |
|-----------------------------|----------------------------|---------------------------|
| 1. Reservoir tank cap | 2. Reservoir tank | 3. Clamp |
| 4. Reservoir tank hose | 5. Reservoir tank hose | 6. Clamp |
| 7. Bracket | 8. Mounting rubber (upper) | 9. Radiator |
| 10. Mounting rubber (lower) | 11. Clamp | 12. Radiator hose (lower) |
| 13. Rivet | 14. Clip | 15. Radiator hose pipe |
| 16. Radiator hose (lower) | 17. Radiator hose (upper) | 18. Cooling fan assembly |
| A. To thermostat housing | B. To water outlet | C. To water inlet |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000000905154

REMOVAL

WARNING:

- Never remove reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from reservoir tank.
- Wrap a thick cloth around the reservoir tank cap. Slowly turn it a quarter of a turn to release built-up pressure. Then turn it all the way.

1. Drain engine coolant from radiator. Refer to [CO-30, "Draining"](#).

CAUTION:

- Perform this step when the engine is cold.
- Never spill engine coolant on drive belts.

2. Remove air duct (inlet). Refer to [EM-144, "Exploded View"](#).
3. Remove reservoir tank hose at radiator side (CVT models).
4. Disconnect connector from resistor and fan motor, and move harness to aside.
5. Remove cooling fan assembly. Refer to [CO-37, "Exploded View"](#).

CAUTION:

Be careful not to damage radiator core.

RADIATOR

[MR20DE]

< ON-VEHICLE REPAIR >

6. Remove radiator hose (upper and lower).
7. Remove liquid tank bracket mounting bolts. Refer to [HA-36, "Exploded View"](#).
8. Remove mounting bracket (upper).
9. Lift up the A/C condenser to disengage the radiator, and then remove the radiator.

CAUTION:

Be careful not to damage or scratch radiator and A/C condenser core.

INSTALLATION

Installation is the reverse order of removal.

Inspection

INFOID:000000000905155

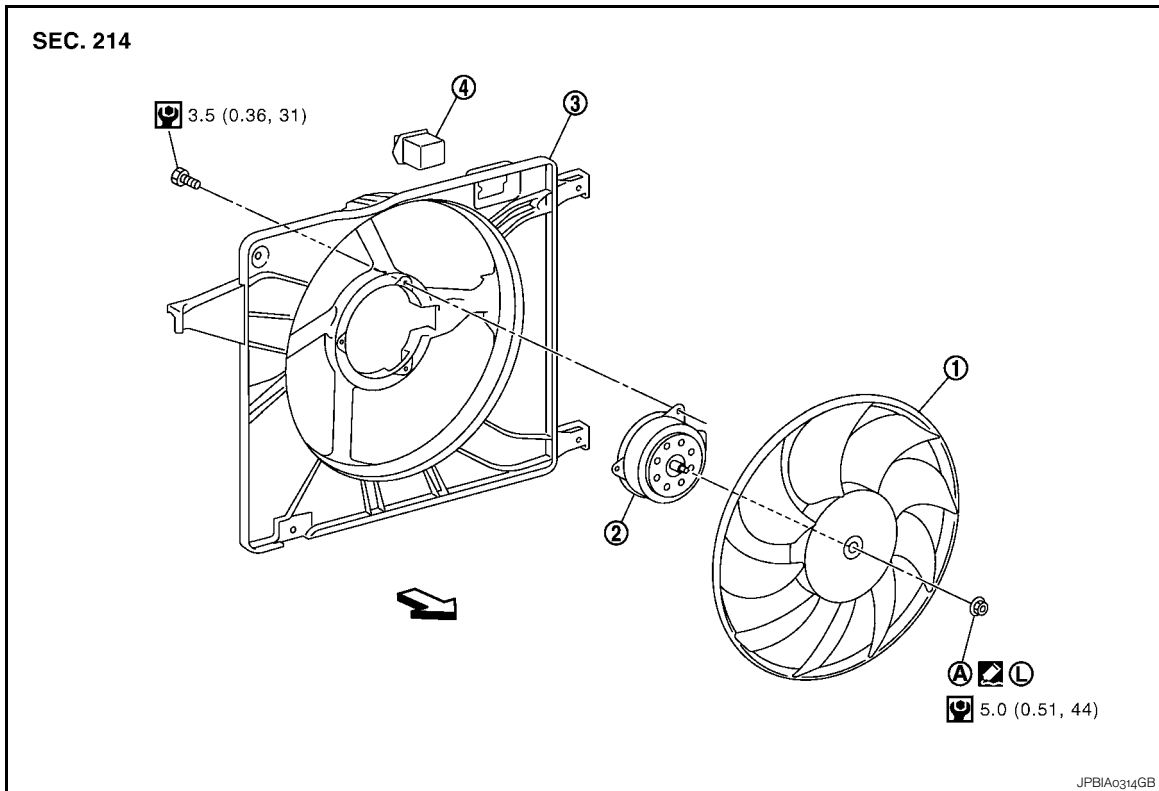
INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-30, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

COOLING FAN

Exploded View

INFOID:000000000905157



- 1. Cooling fan
- 2. Fan motor
- 3. Fan shroud
- 4. Resistor
- A. Reverse screw

L : Apply thread locking sealant.

: Vehicle front

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000000905158

REMOVAL

1. Remove air duct (inlet). Refer to [EM-144, "Exploded View"](#).
2. Disconnect harness connector from resistor and fan motor, and move harness to aside.
3. Remove cooling fan assembly.

CAUTION:

Be careful not to damage or scratch on radiator core.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

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

NOTE:

Cooling fan is controlled by ECM. For details, refer to [EC-918, "Description"](#).

Disassembly and Assembly

INFOID:000000000905174

DISASSEMBLY

COOLING FAN

< ON-VEHICLE REPAIR >

[MR20DE]

1. Remove resistor 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 screw is used for the fan attachment screw. When removing or attaching, turn the screw the opposite way as for a normal screw.

3. Remove fan motor.

ASSEMBLY

Assembly is the reverse order of disassembly.

- Apply thread locking sealant on fan motor shaft.

Inspection

INFOID:000000000905177

INSPECTION AFTER DISASSEMBLY

Cooling Fan

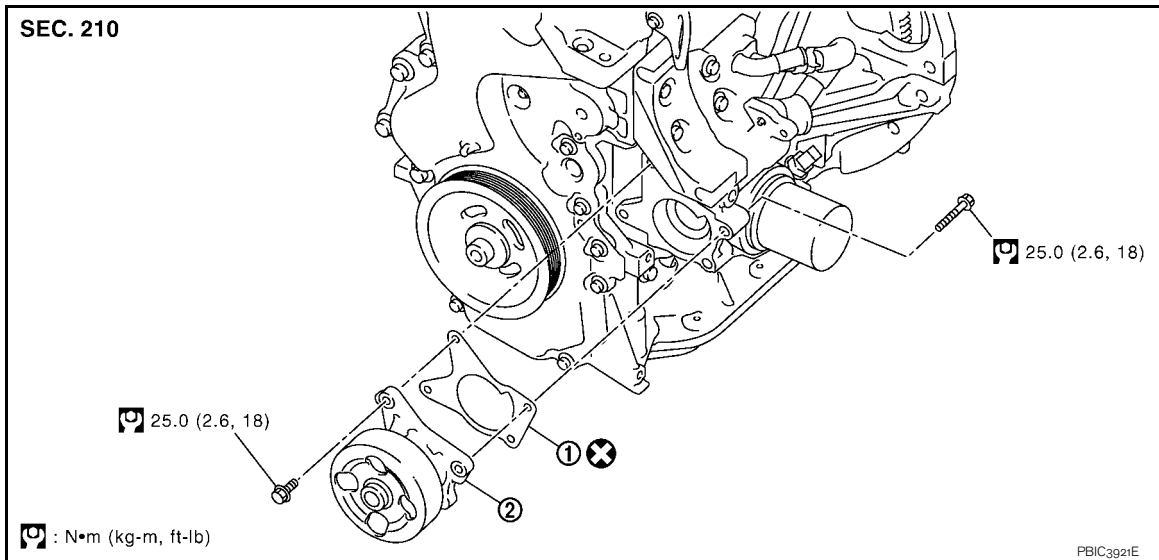
Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

WATER PUMP

Exploded View

INFOID:0000000000905161



1. Gasket
2. Water pump

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:0000000000905162

REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-30, "Draining"](#).
CAUTION:
 - Perform this step when the engine is cold.
 - Never spill engine coolant on drive belts.
2. Remove front fender protector (RH). Refer to [EXT-21, "Exploded View"](#).
3. Remove drive belt. Refer to [EM-143, "Removal and Installation"](#).
4. Remove water pump.
 - 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 disassemble and should replaced as a unit.

INSTALLATION

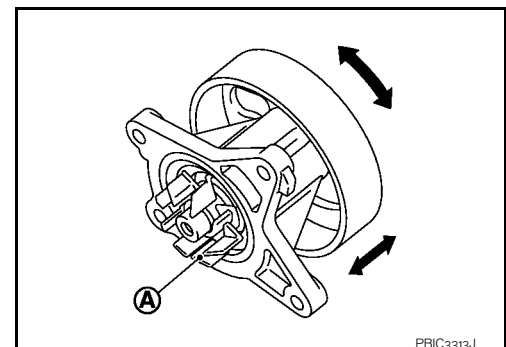
Install in the reverse order of removal.

Inspection

INFOID:0000000000905163

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 the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-30, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

THERMOSTAT

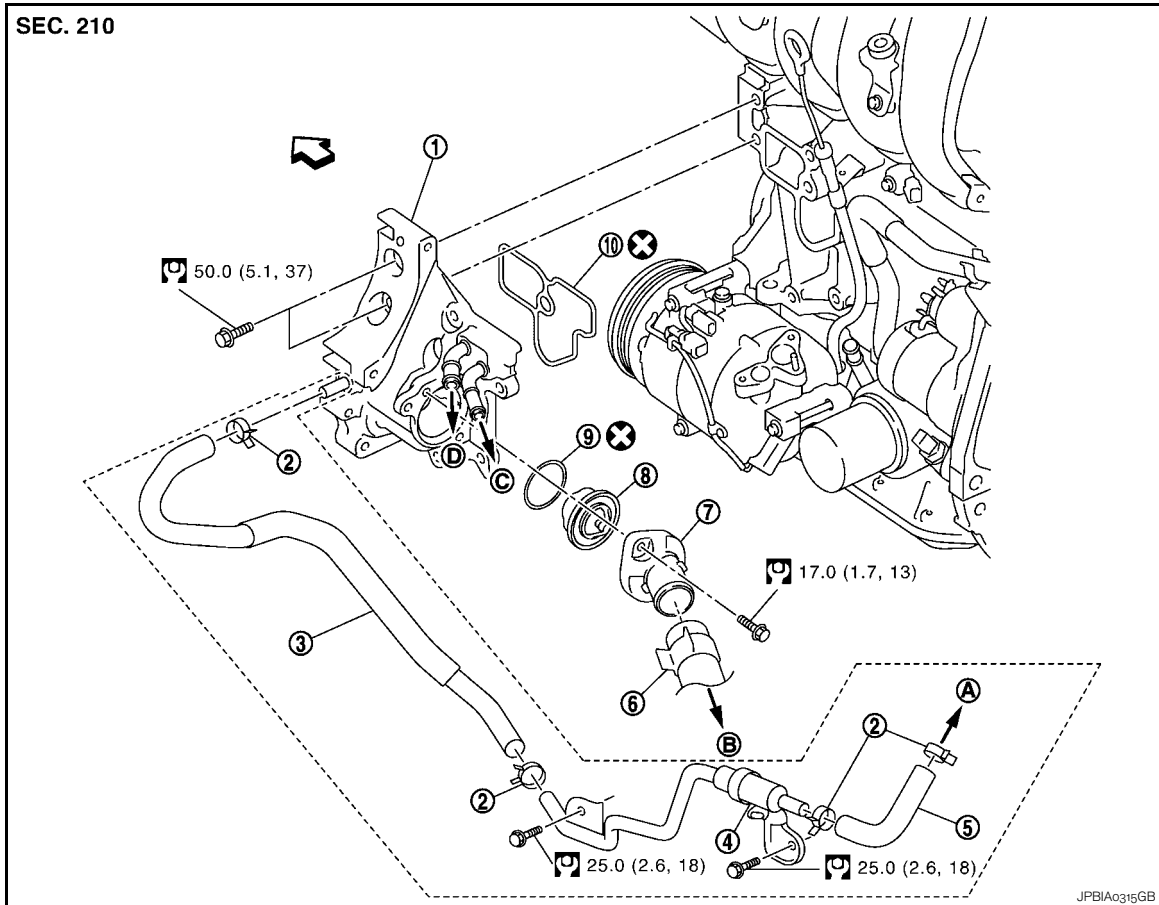
< ON-VEHICLE REPAIR >

[MR20DE]

THERMOSTAT

Exploded View

INFOID:000000000905165



- | | | |
|-----------------------------------|----------------------------|----------------------------|
| 1. Thermostat housing | 2. Clamp (CVT models) | 3. Water hose (CVT models) |
| 4. Heater thermostat (CVT models) | 5. Water hose (CVT models) | 6. Radiator hose (lower) |
| 7. Water inlet | 8. Thermostat | 9. Rubber ring |
| 10. Gasket | | |
| A. To CVT fluid cooler | B. To radiator | C. To oil cooler |
| D. To reservoir tank | | |

← : Engine front

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000000905166

REMOVAL

- Drain engine coolant from radiator. Refer to [CO-30, "Draining"](#).
CAUTION:
 - Perform this step when engine is cold.
 - Never spill engine coolant on drive belt.
- Disconnect the battery cable from the negative terminal. Refer to [PG-118, "Exploded View"](#).
- Add paint mark, then disconnect radiator hose (lower) from water inlet. Refer to [CO-34, "Exploded View"](#).
- Remove water inlet and thermostat.
 - Engine coolant will leak from cylinder block, so have a receptacle ready below.
- Remove thermostat housing with the following procedure:
 - Remove water pump. Refer to [CO-39, "Exploded View"](#).

THERMOSTAT

[MR20DE]

< ON-VEHICLE REPAIR >

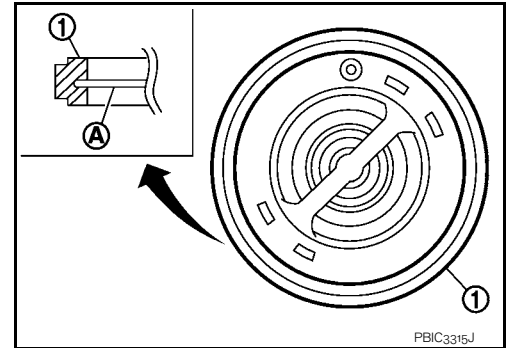
- b. Remove alternator. Refer to [CHG-29, "MR20DE MODELS : Exploded View"](#).
- c. Disconnect water hoses.

INSTALLATION

Note the following, and install in the reverse order of removal.

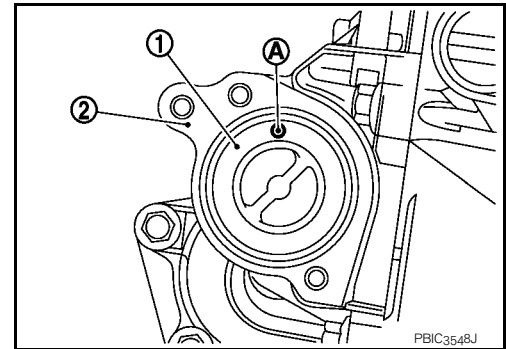
Thermostat

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



- Install thermostat (1) with jiggle valve (A) facing upwards.

2 : Cylinder block



Inspection

INFOID:000000000905167

INSPECTION AFTER REMOVAL

WARNING:

Use a protector to prevent a burn during the work.

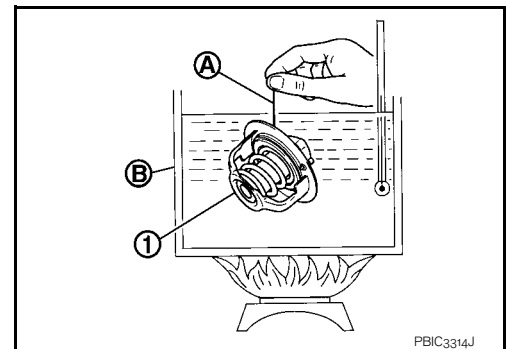
Thermostat

- 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-46, "Thermostat"](#).

- If out of the standard, replace thermostat.

Heater Thermostat (CVT models)

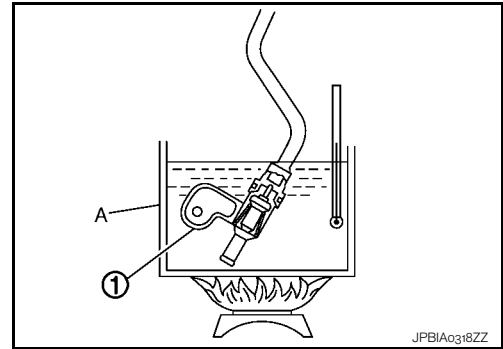


THERMOSTAT

[MR20DE]

< ON-VEHICLE REPAIR >

- Fully immerse the heater thermostat (1) in a container (A) filled with water. Continue heating the water while stirring.
- Continue heating the heater thermostat for 5 minutes or more after bringing the water to a boil.
- Quickly take the heater thermostat out of the hot water, measure the heater thermostat within 10 seconds.

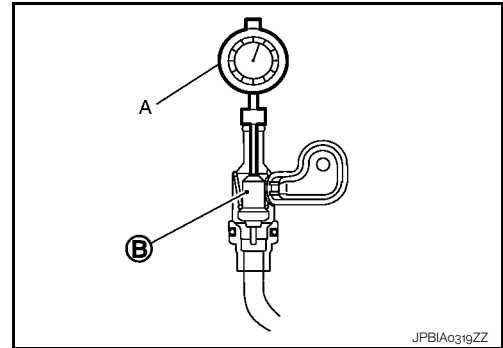


- Place dial indicator (A) on the pellet (B) and measure the elongation from the initial state.

Standard

: Refer to [CO-46, "Heater Thermostat \(CVT models\)"](#).

- If out of the standard, replace heater thermostat.



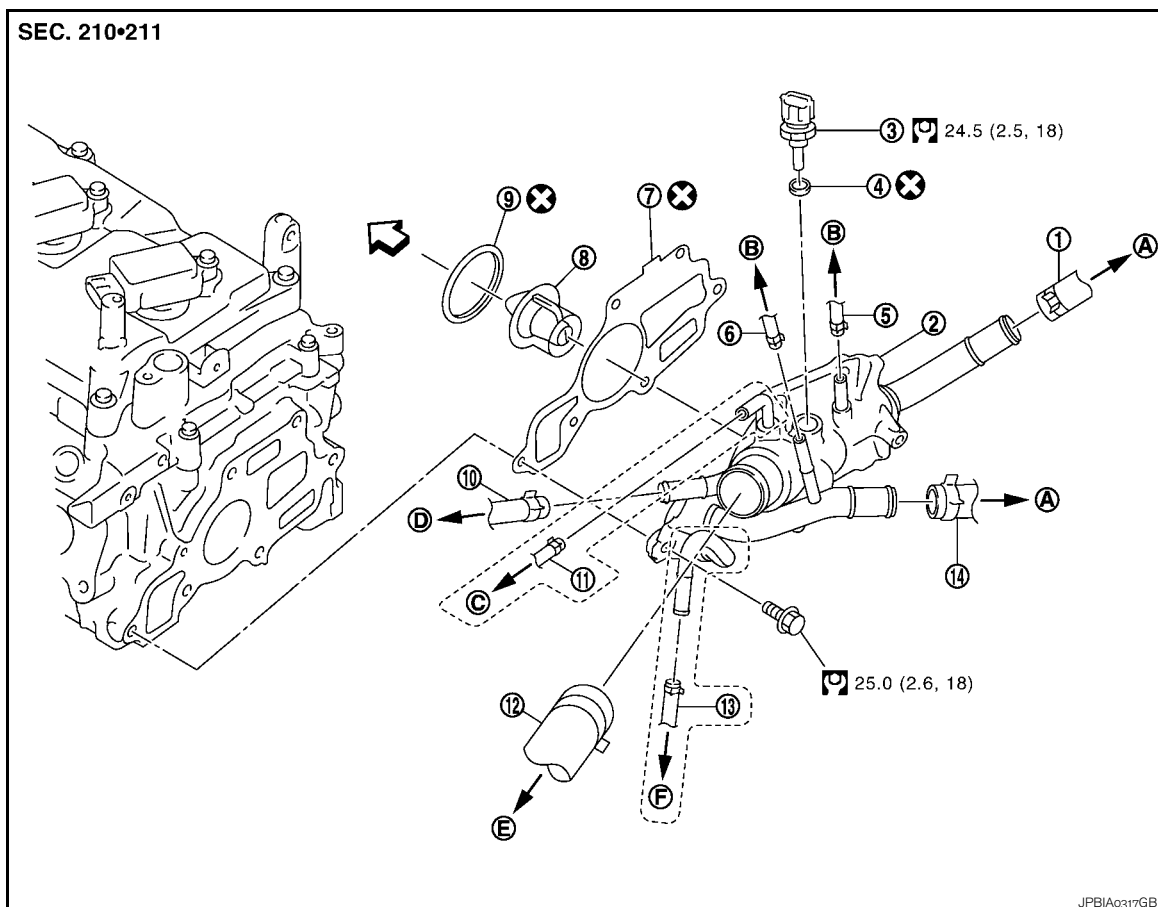
INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-30, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

WATER OUTLET

Exploded View

INFOID:000000000905169



- | | | |
|-----------------------------|--|--------------------------------------|
| 1. Heater hose | 2. Water outlet | 3. Engine coolant temperature sensor |
| 4. Washer | 5. Water hose | 6. Water hose |
| 7. Gasket | 8. Water control valve | 9. Rubber ring |
| 10. Water hose | 11. Reservoir tank hose (M/T models) | 12. Radiator hose (upper) |
| 13. Water hose (CVT models) | 14. Heater hose | |
| A. To heater | B. To electric throttle control actuator | C. To reservoir tank |
| D. To oil cooler | E. To radiator | F. To CVT fluid cooler |

↔ : Engine front

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000000905170

REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-30, "Draining"](#).
CAUTION:
• Perform this step when engine is cold.
• Never spill engine coolant on drive belt.
2. Disconnect radiator hose (upper). Refer to [CO-34, "Exploded View"](#).
3. Disconnect harness connector from engine coolant temperature sensor.
4. Remove reservoir tank hose (M/T models). Refer to [CO-34, "Exploded View"](#).
5. Remove water hoses and heater hoses.
6. Remove water outlet.

WATER OUTLET

< ON-VEHICLE REPAIR >

[MR20DE]

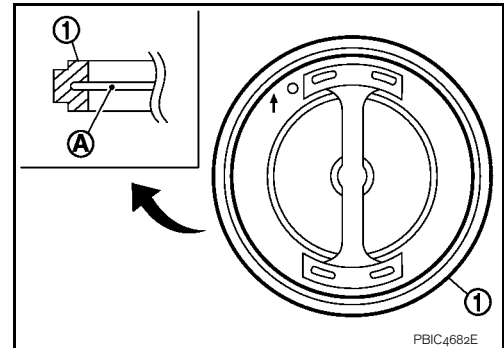
7. Remove engine coolant temperature sensor from water outlet, if necessary.

INSTALLATION

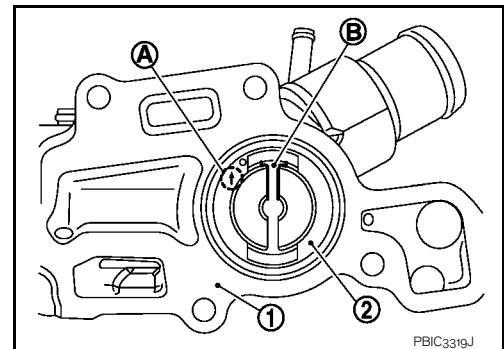
Note the following, and install in the reverse order of removal.

Water Control Valve

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



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



1 : Water outlet

Inspection

INFOID:000000000905639

INSPECTION AFTER REMOVAL

WARNING:

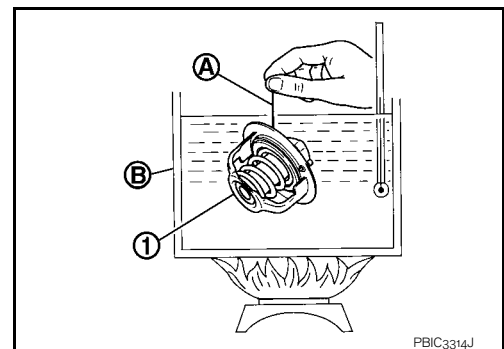
Use a protector to prevent a burn during the work.

Water Control Valve

- 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 continuous valve lifting toward maximum valve lift.

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.



Standard: Refer to [CO-46, "Water Control Valve"](#).

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

INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- Check for leaks of engine coolant using the adapter and the reservoir tank cap tester [SST: — (M.S. 554-07). Refer to [CO-30, "Inspection"](#).
- Start and warm up the engine. Visually make sure that there is no leaks of engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[MR20DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:000000000905179

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (Imp qt)

Engine coolant capacity (With reservoir tank at "MAX" level)	M/T models	7.6 (6-5/8)
	CVT models	8.9 (7-7/8)
Reservoir tank engine coolant capacity (At "MAX" level)		0.78 (5/8)

Radiator

INFOID:000000000905180

RESERVOIR TANK CAP

Unit: kPa (bar, kg/cm², psi)

Reservoir tank 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:000000000905181

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)

Heater Thermostat (CVT models)

INFOID:000000000905646

Standard

Valve lift	More than 4.5 mm (0.177 in)
------------	-----------------------------

Reference value

Valve opening temperature	82°C (180°F)
Maximum valve lift	5.0 mm/95°C (0.197 in/203°F)

Water Control Valve

INFOID:000000000905645

Standard

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

FUNCTION DIAGNOSIS

DESCRIPTION

Engine Cooling System

INFOID:000000001062324

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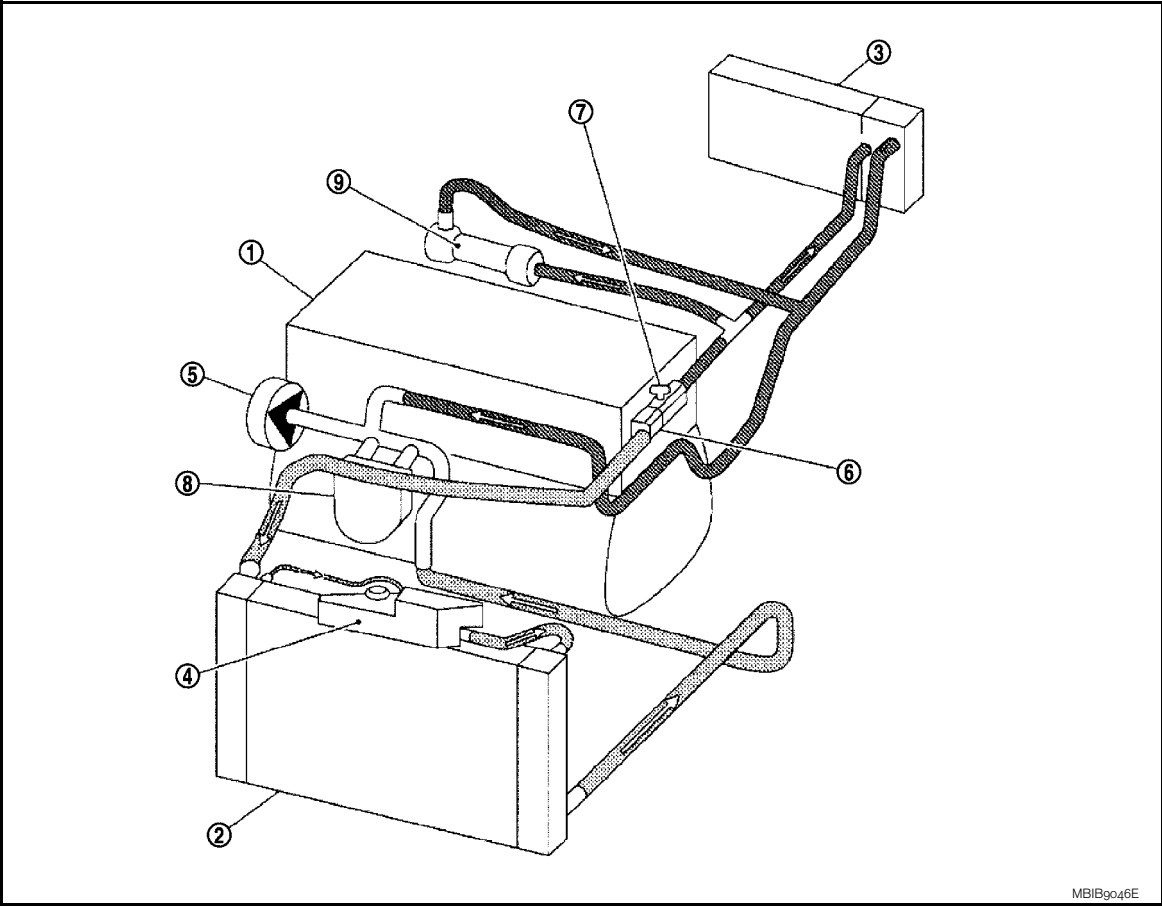
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- | | | |
|--------------------|---------------|----------------|
| 1. Engine | 2. Radiator | 3. Heater core |
| 4. Reservoir tank | 5. Water pump | 6. Thermostat |
| 7. Air relief plug | 8. Oil cooler | 9. EGR cooler |

OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[K9K]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000001062495

		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

cardiagn.com

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		

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PRECAUTION

PRECAUTIONS

Precaution for Liquid Gasket

INFOID:000000001062496

REMOVAL OF LIQUID GASKET

- After removing the mounting bolts and nuts, separate the mating surface using a seal cutter and remove the liquid gasket.

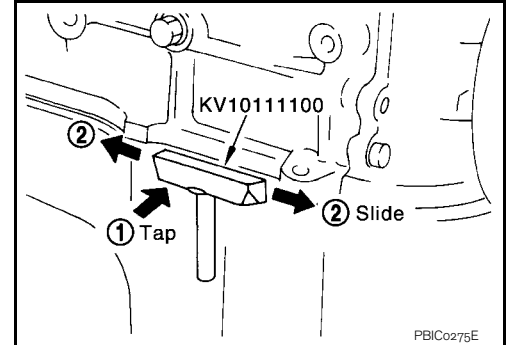
CAUTION:

Be careful not to damage the mating surfaces.

- In areas where the cutter is difficult to use, use a plastic hammer to lightly tap the gasket applied area.

CAUTION:

If for some unavoidable reason a tool such as a flat-bladed screwdriver is used, be careful not to damage the mating surfaces.

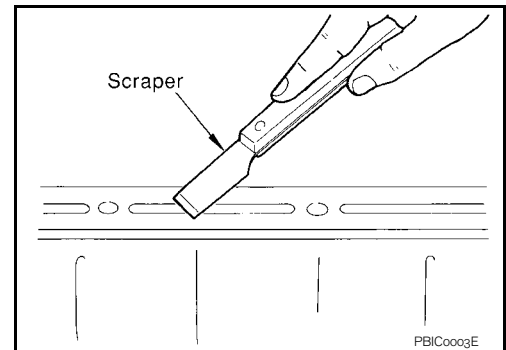


PBIC0275E

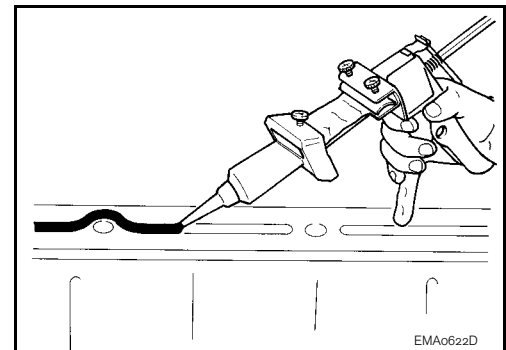
LIQUID GASKET APPLICATION PROCEDURE

- Using a scraper, remove the old liquid gasket adhering to the gasket application surface and the mating surface.
 - Remove the liquid gasket completely from the groove of the gasket application surface, mounting bolts and bolt holes.
- Wipe the gasket application surface and the mating surface with white gasoline (lighting and heating use) to remove adhering moisture, grease and foreign materials.
- Attach the liquid gasket to the tube presser.

Use Genuine Liquid Gasket or equivalent.
- Apply the gasket without breaks to the specified location with the specified dimensions.
 - If there is a groove for the liquid gasket application, apply the gasket to the groove.



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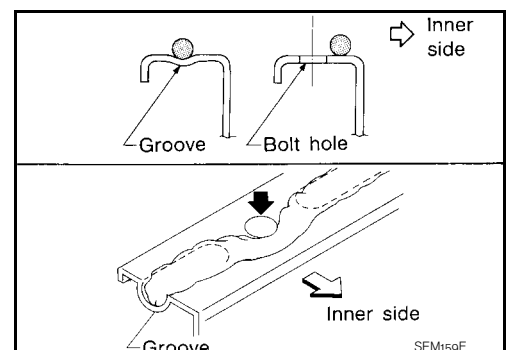


EMA0622D

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

CAUTION:

If there are instructions in this manual, observe them.



SEM159F

PREPARATION

< PREPARATION >

[K9K]

PREPARATION

PREPARATION

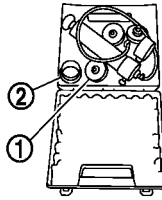
Special Service Tools

INFOID:000000001062497

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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



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C

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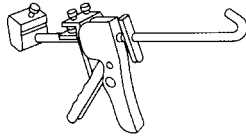
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Commercial Service Tools

INFOID:0000000001115768

NISSAN tool number Tool name	Description
WS39930000 Tube pressure	Pressing the tube of liquid gasket



S-NT052

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ON-VEHICLE MAINTENANCE

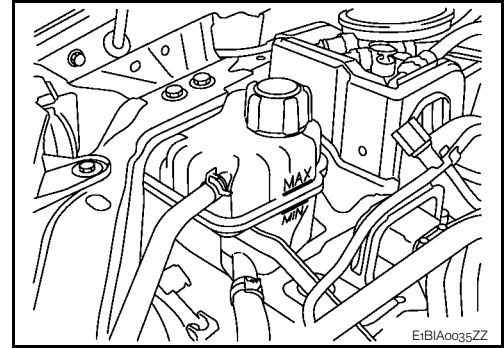
ENGINE COOLANT

Inspection

INFOID:000000001062331

LEVEL

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

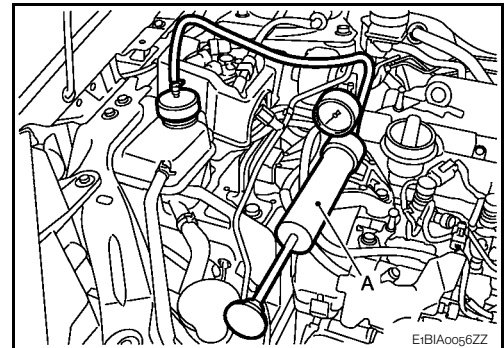


LEAKAGE

- To check for leakage, fit the adapter to the reservoir tank, and then connect it to the tester [SST: — (M.S. 554-07)] (A) as shown.
- Warm up the engine and turn it off.
- To check for leaks, apply pressure to the cooling system with the radiator cap tester and radiator reservoir cap tester adapter.

Testing pressure : Refer to [CO-64, "Radiator"](#).

- If the pressure drops, look for leakage.
- Unscrew slowly the adapter from the reservoir tank to reduce the pressure in cooling system, and install the reservoir tank cap.

**WARNING:**

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

CAUTION:

Higher pressure than specified may cause radiator damage.

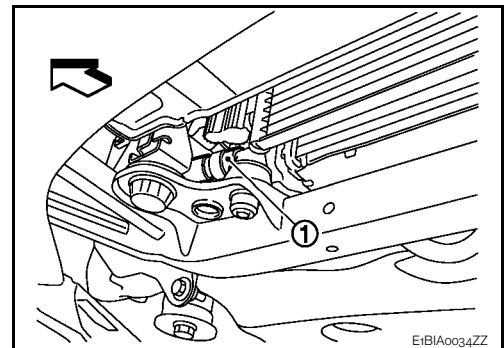
Draining

INFOID:000000001062332

WARNING:

- To avoid being scalded, never change the coolant when the engine is hot.
- Wrap a thick cloth around cap and carefully remove the cap. First, turn the cap a quarter of a turn to release built-up pressure. Then turn the cap all the way.

1. Remove engine undercover.
2. Disconnect reservoir tank hose (lower) (1) from radiator and remove reservoir tank cap.
3. Remove air relief plug from water outlet. Refer to [CO-62, "Exploded View"](#).
4. Remove reservoir tank, then clean reservoir tank.
5. Check drained coolant for contaminants such as rust, corrosion or discoloration.
If contaminated, flush engine cooling system. Refer to [CO-53, "Flushing"](#).



Refilling

INFOID:000000001062333

- Before start working, turn off the automatic air conditioner and the blower motor.

ENGINE COOLANT

< ON-VEHICLE MAINTENANCE >

[K9K]

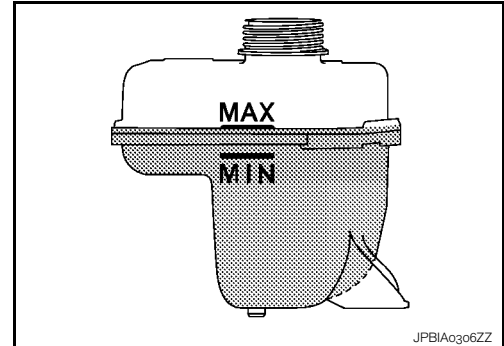
1. Install reservoir tank, lower radiator hose and air relief plug.
2. Fill reservoir tank slowly with coolant until coolant spills from the air relief hole. Refer to [CO-62, "Exploded View"](#).
 - Put a cloth under the air relief plug to prevent engine coolant to dampen the crankshaft position sensor.
 - Pour coolant to the MAX level line of the reservoir tank at a rate of 2 liter (1-3/4 Imp 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 Nissan Genuine Coolant L250 or equivalent mixed with water (distilled or demineralised). Refer to [MA-22, "Engine Coolant Mixture Ratio"](#).



Engine coolant capacity
(With reservoir tank)

: Refer to [CO-64, "Periodical Maintenance Specification"](#).

Reservoir tank capacity

: Refer to [CO-64, "Periodical Maintenance Specification"](#).

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 during all of the operation.

WARNING:

- Be careful not be scalded with hot engine coolant or vacuum pump when operating.
- Radiator fan blade can start at any time and make personal injuries.

5. Turn off the engine and loose 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 comes hot and radiator fan operates. Let 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, loose the air relief plug and check if coolant spills from the air relief hole. In other case, 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:0000000001062334

1. Fill reservoir tank with water until water spills from the air relief hole, then close air relief plug. Reinstall reservoir tank cap.
2. Run engine and warm it up to normal operating temperature.
3. Rev engine two or three times under no-load.
4. Stop engine and wait until it cools down.
5. Drain water.
6. Repeat steps 1 through 5 until clear water begins to drain from radiator.

ENGINE COOLANT

< ON-VEHICLE MAINTENANCE >

[K9K]

7. Blow compressed air into cooling circuit through the reservoir tank valve hole to drain all the water.

RADIATOR

< ON-VEHICLE MAINTENANCE >

[K9K]

RADIATOR

RADIATOR CAP

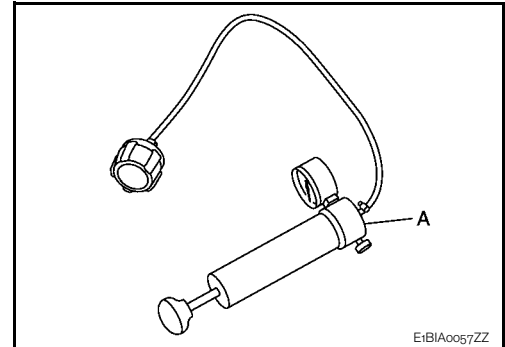
RADIATOR CAP : Inspection

INFOID:000000001062335

- Fit the adapter to the tester as shown.
- When connecting the reservoir tank cap to the tester [SST: — (M.S. 554-07)] (A), apply water or LLC to the cap seal part.
- Check reservoir tank cap relief pressure.

Standard : Refer to [CO-64, "Radiator"](#).

- Replace the reservoir tank cap if the engine coolant passes through it, or if any fur signs is detected.



RADIATOR

RADIATOR : Inspection

INFOID:000000001062336

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

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

RADIATOR

< ON-VEHICLE REPAIR >

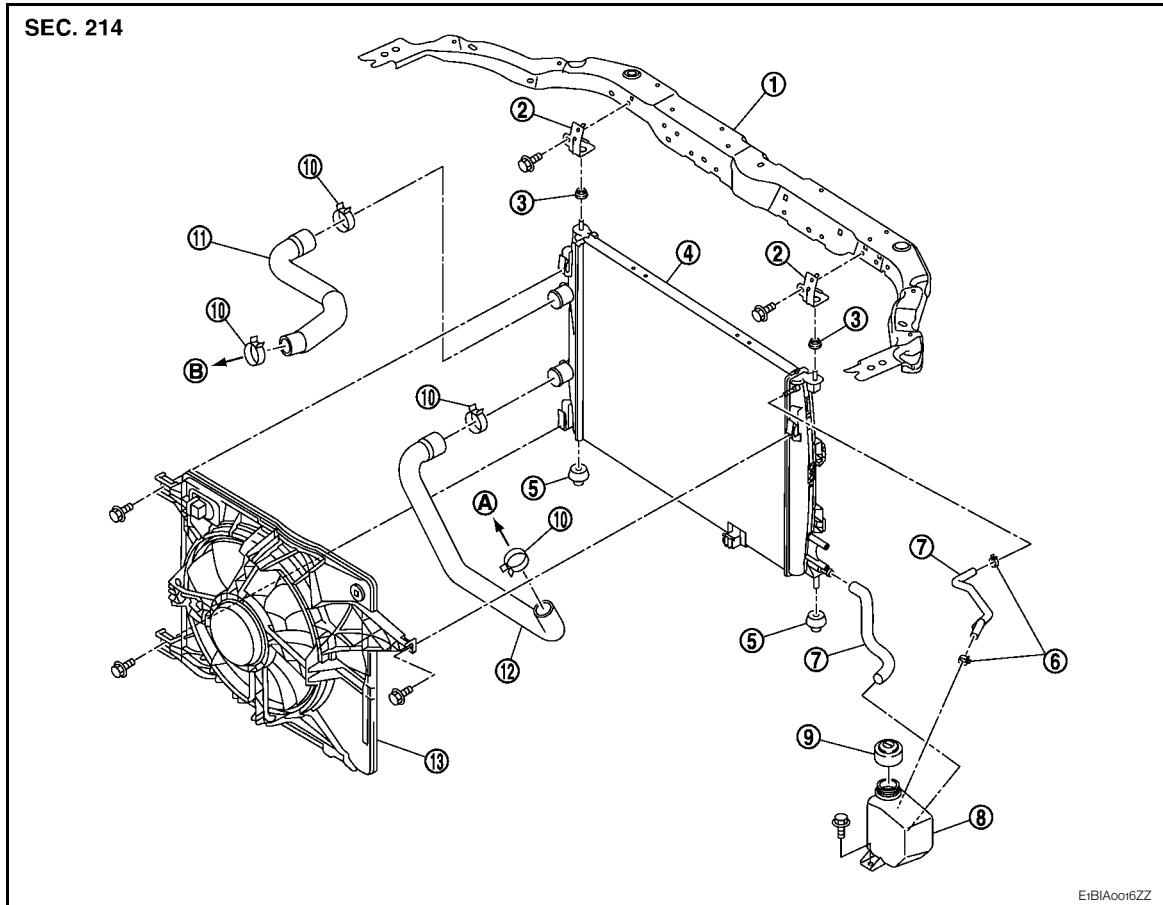
[K9K]

ON-VEHICLE REPAIR

RADIATOR

Exploded View

INFOID:000000001062337



- | | | |
|--------------------------|----------------------------|----------------------------|
| 1. Radiator core support | 2. Mounting bracket | 3. Mounting rubber (upper) |
| 4. Radiator | 5. Mounting rubber (lower) | 6. Clamp |
| 7. Reservoir tank hose | 8. Reservoir tank | 9. Reservoir tank cap |
| 10. Clamp | 11. Radiator hose (upper) | 12. Radiator hose (lower) |
| 13. Cooling fan assembly | | |
| A. To water inlet | B. To water outlet | |

Removal and Installation

INFOID:000000001062338

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 cover. Refer to [EM-266, "Removal and Installation"](#).
2. Remove air cleaner case and air duct (inlet). Refer to [EM-265, "Removal and Installation"](#).
3. Remove reservoir tank hose bracket bolt from radiator upper mounting bracket (RH side).
4. Remove radiator fan motor harnesses.
5. Remove engine undercover.
6. Drain engine coolant. Refer to [CO-52, "Draining"](#).

RADIATOR

< ON-VEHICLE REPAIR >

[K9K]

CAUTION:

Perform when engine is cold.

7. Disconnect radiator upper hose, reservoir tank hose and mounting bracket.
8. Release charge air cooler from the radiator. Refer to [EM-266, "Removal and Installation"](#).
9. Remove radiator and radiator fan assembly.

NOTE:

Remove radiator and condenser assembly. Refer to [HA-100, "Removal and Installation"](#) and [HA-202, "Removal and Installation"](#).

CAUTION:

- Do not damage or scratch radiator core when removing.

INSTALLATION

- Reinstall any parts removed in reverse order of removal.
- Check for engine coolant leaks. Refer to [CO-52, "Inspection"](#).

Inspection

INFOID:0000000001115351

INSPECTION AFTER INSTALLATION

- Check for engine coolant leaks using reservoir tank cap tester. Refer to [CO-52, "Inspection"](#).

COOLING FAN

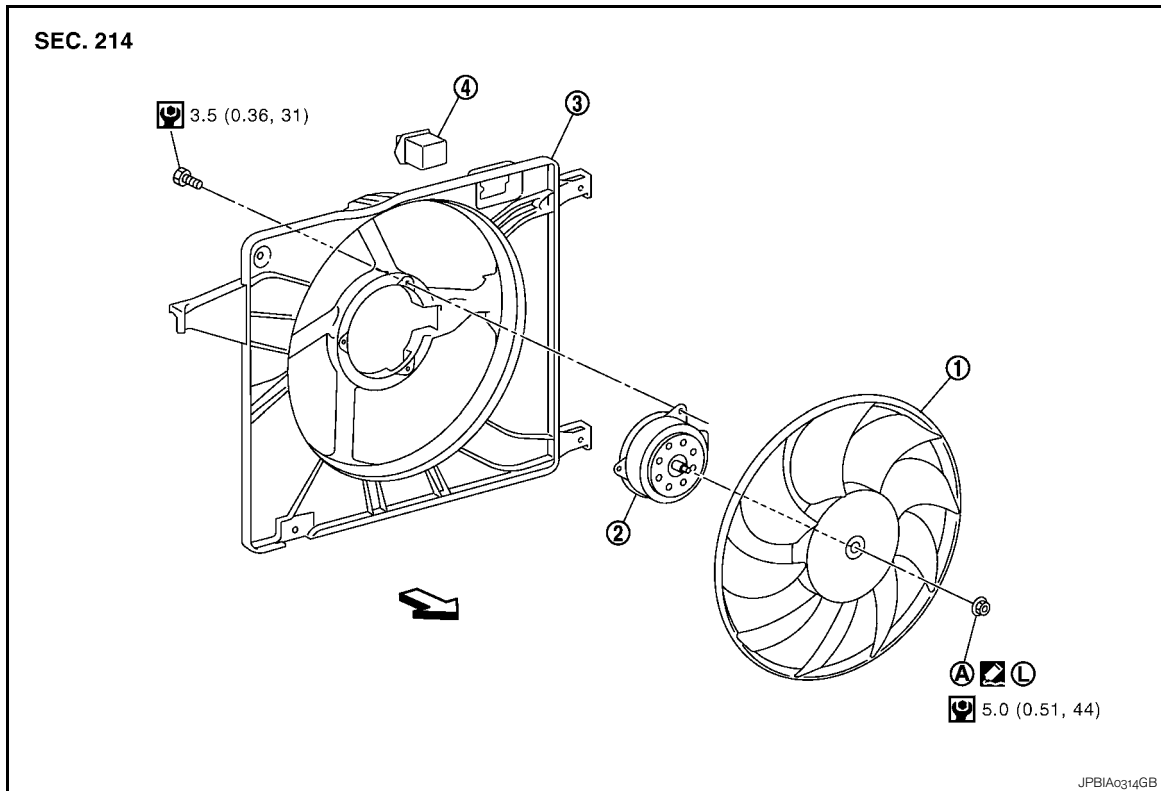
< ON-VEHICLE REPAIR >

[K9K]

COOLING FAN

Exploded View

INFOID:0000000001111177



- 1. Cooling fan
- 2. Fan motor
- 3. Fan shroud
- 4. Resistor
- A. Reverse screw

: Apply thread locking sealant.

: Vehicle front

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:0000000001111178

REMOVAL

1. Remove air duct (inlet). Refer to [EM-265, "Exploded View"](#).
2. Disconnect harness connector from resistor and fan motor, and move harness to aside.
3. Remove cooling fan assembly.

CAUTION:

Be careful not to damage or scratch on radiator core.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

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

NOTE:

Cooling fan is controlled by ECM. For details, refer to [EC-1309, "System Description"](#).

Disassembly and Assembly

INFOID:0000000001111179

DISASSEMBLY

COOLING FAN

< ON-VEHICLE REPAIR >

[K9K]

1. Remove resistor 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 screw is used for the fan attachment screw. When removing or attaching, turn the screw the opposite way as for a normal screw.

3. Remove fan motor.

ASSEMBLY

Assembly is the reverse order of disassembly.

- Apply thread locking sealant on fan motor shaft.

Inspection

INFOID:0000000001111180

INSPECTION AFTER DISASSEMBLY

Cooling Fan

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

A

CO

C

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WATER PUMP

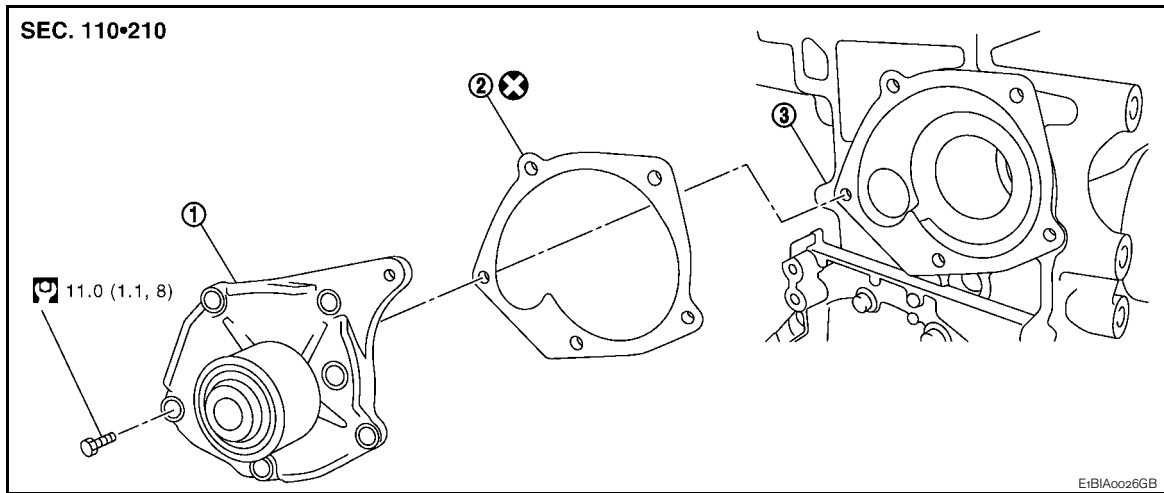
< ON-VEHICLE REPAIR >

[K9K]

WATER PUMP

Exploded View

INFOID:000000001062345



1. Water pump

2. Gasket

3. Cylinder block

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000001062512

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
 - Undercover
 - RH front wheel
2. Remove right side splash cover.
3. Remove drive belt. Refer to [EM-259, "Removal and Installation"](#).
4. Drain engine coolant. Refer to [CO-52, "Draining"](#).

CAUTION:

Perform when engine is cold.

5. Remove timing belt and inner cover. Refer to [EM-287, "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

Install in the reverse order of removal.

Inspection

INFOID:000000001062347

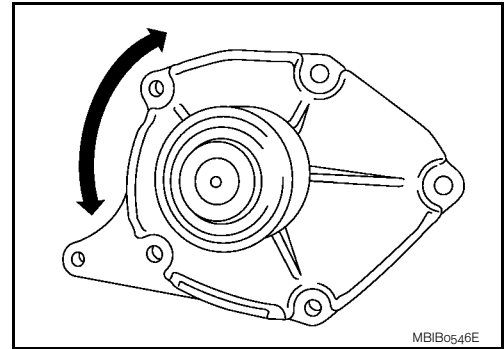
INSPECTION AFTER REMOVAL

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 unusualness, replace the water pump assembly.



INSPECTION AFTER INSTALLATION

- Check for engine coolant leaks using reservoir tank cap tester. Refer to [CO-52, "Inspection"](#).

WATER OUTLET AND THERMOSTAT ASSEMBLY

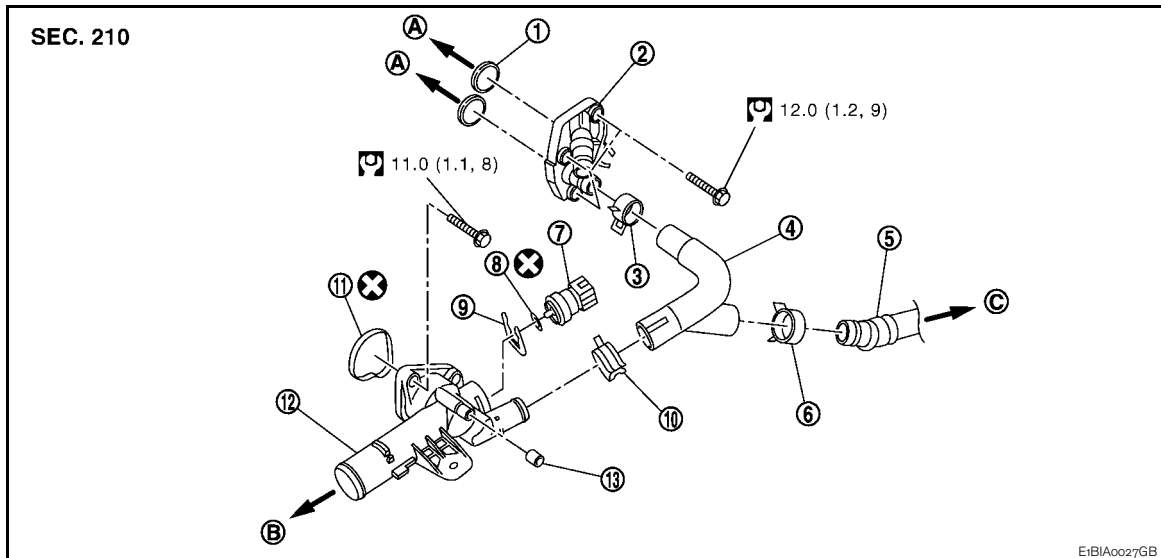
< ON-VEHICLE REPAIR >

[K9K]

WATER OUTLET AND THERMOSTAT ASSEMBLY

Exploded View

INFOID:000000001062351



- | | | |
|--|-----------------------------|--|
| 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 |

Refer to [GI-4, "Components"](#) for symbols not described on the above.

Removal and Installation

INFOID:000000001062517

REMOVAL

1. Remove engine cover. Refer to [EM-266, "Removal and Installation"](#).
 2. Remove air cleaner case and air duct (inlet). Refer to [EM-265, "Removal and Installation"](#).
 3. Remove rear engine slinger. Refer to [EM-302, "Exploded View"](#).
 4. Remove vacuum hose.
 5. Remove vacuum pump. Refer to [EM-276, "Removal and Installation"](#).
 6. Drain engine coolant. Refer to [CO-52, "Draining"](#).
- CAUTION:**
Perform when engine is cold.
7. Remove radiator upper hose. Refer to [CO-56, "Exploded View"](#).
 8. Remove heater hose.
 9. Disconnect reservoir tank hose. Refer to [CO-56, "Exploded View"](#).
 10. Remove water outlet.

INSTALLATION

Install in the reverse order of removal.

Inspection

INFOID:000000001062513

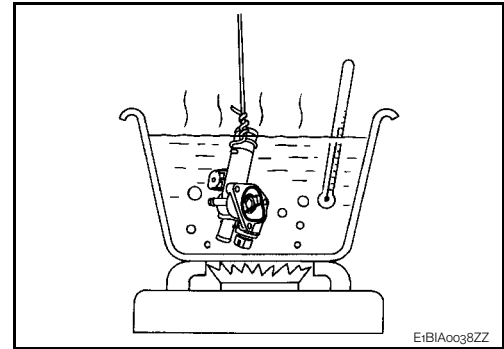
INSPECTION AFTER REMOVAL

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 in the figure 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 reservoir tank cap tester. Refer to [CO-52, "Inspection"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[K9K]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:0000000001062354

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:0000000001062355

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:0000000001062356

Unit: °C (°F)

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