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SECTION CO

ENGINE COOLING SYSTEM

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	SERVICE DATA AND SPECIFICATIONS (SDS)
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	Radiator
	Thermostat
	Water Control Valve

PRECAUTION

PRECAUTIONS

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

INFOID:000000005988450

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 "SRS AIR BAG" and "SEAT BELT" 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 that 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 "SRS AIR BAG".
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:000000005988451

NOTE:

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

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation 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. Turn the push-button ignition switch to ACC position.
(At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

PRECAUTIONS

[HR12DE]

< PRECAUTION >

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

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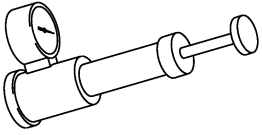
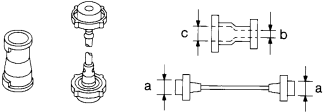
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PREPARATION

PREPARATION

Commercial Service Tools

INFOID:000000005988452

Tool name	Description
<p>Radiator cap tester</p>  <p>PBIC1982E</p>	<p>Checking radiator and radiator cap</p>
<p>Radiator cap tester adapter</p>  <p>S-NT564</p>	<p>Adapting radiator cap tester to radiator cap and radiator filler neck</p> <p>a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)</p>

SYSTEM DESCRIPTION

DESCRIPTION

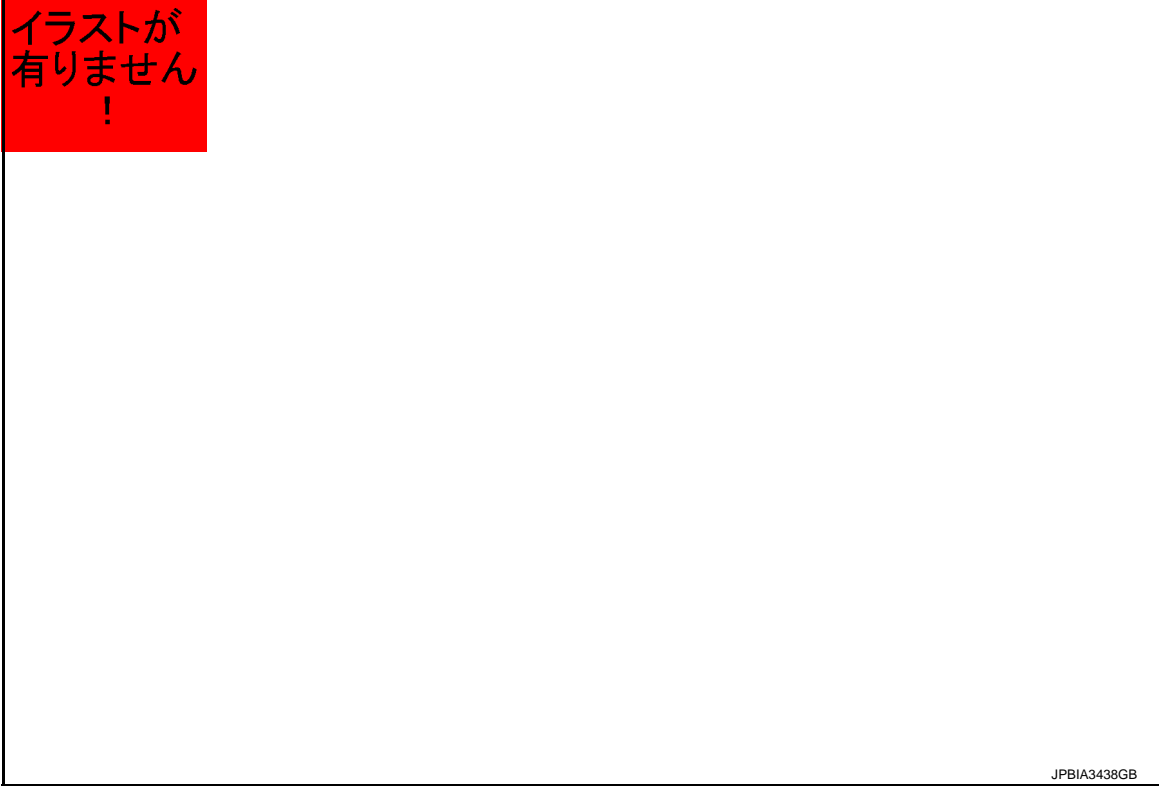
Engine Cooling System

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WITH EGR CONTROL VALVE



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WITHOUT EGR CONTROL VALVE



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DESCRIPTION

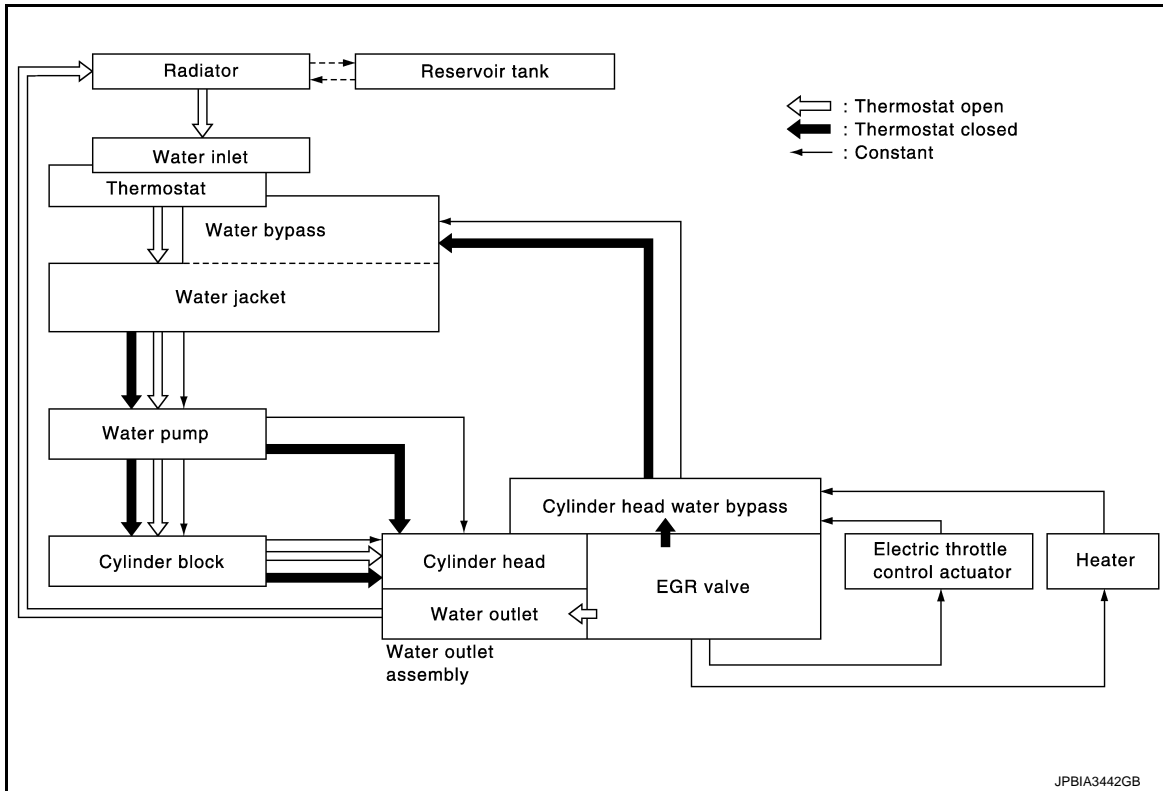
< SYSTEM DESCRIPTION >

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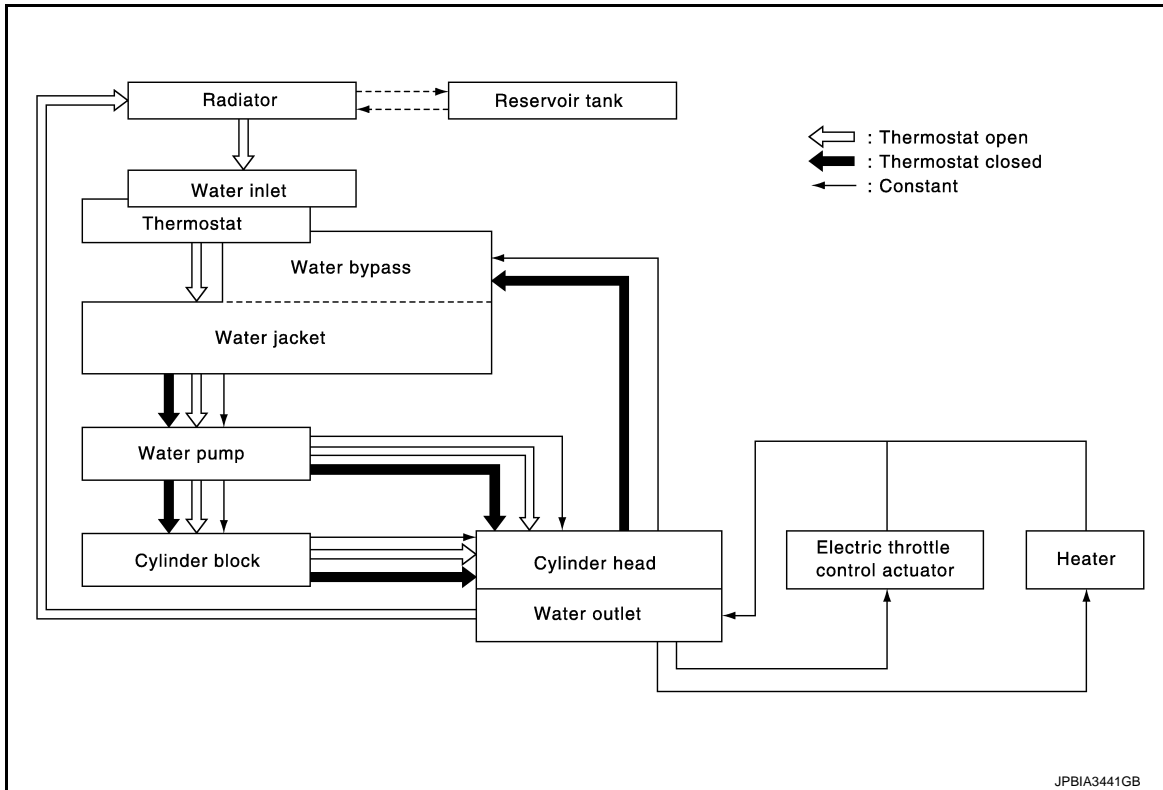
Engine Cooling System Schematic

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WITH EGR CONTROL VALVE



WITHOUT EGR CONTROL VALVE



OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[HR12DE]

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart

INFOID:000000005988455

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	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	—	—	
	Insufficient engine coolant	Engine coolant leakage	Cooling hose	Loose clamp	
				Cracked hose	
			Water pump	Poor sealing	
			Radiator cap	Loose	
				Poor sealing	
			Radiator	O-ring for damage, deterioration or improper fitting	
		Cracked radiator tank			
Cracked radiator core					
		Reservoir tank	Cracked reservoir tank		
Overflowing reservoir tank		Exhaust gas leakage into cooling system	Cylinder head deterioration		
	Cylinder head gasket deterioration				

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OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

[HR12DE]

		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				

PERIODIC MAINTENANCE

ENGINE COOLANT

Inspection

INFOID:000000005988456

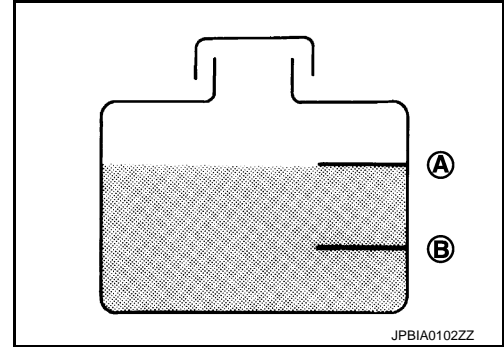
LEVEL

- Check that the reservoir tank engine coolant level is within the "MIN" to "MAX" when the engine is cool.

A : MAX

B : MIN

- Adjust the engine coolant level if necessary.



LEAKAGE

- To check for leakage, apply pressure to the cooling system with the radiator cap tester (commercial service tool) (A) and the radiator cap tester adapter (commercial service tool) (B).

Testing pressure: Refer to [CO-26, "Radiator"](#).

WARNING:

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

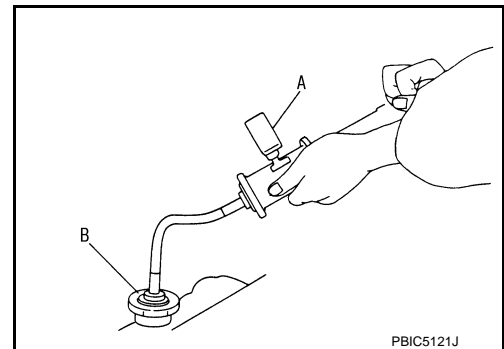
CAUTION:

Higher test pressure than specified may cause radiator damage.

NOTE:

In a case that engine coolant decreases, replenish radiator with engine coolant.

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



Draining

INFOID:000000005988457

WARNING:

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

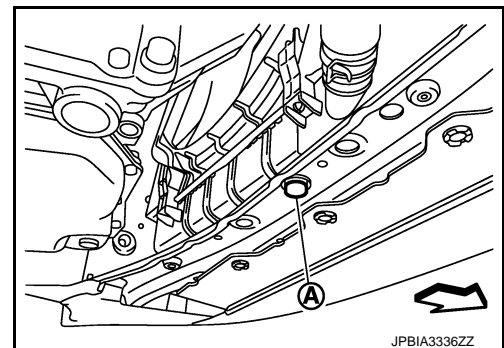
1. Open radiator drain plug (A) at the bottom of radiator, and then remove radiator cap.

← : Vehicle front

CAUTION:

Perform this step when engine is cold.

- When draining all of engine coolant in the system, open water drain plugs on cylinder block. Refer to EM.



2. Remove reservoir tank if necessary, and drain engine coolant and clean reservoir tank before installing. Refer to [CO-14, "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-11, "Flushing"](#).

ENGINE COOLANT

< PERIODIC MAINTENANCE >

[HR12DE]

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Refilling

1. Install reservoir tank if removed and radiator drain plug.

CAUTION:

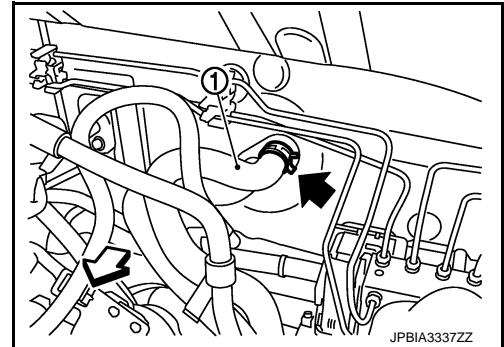
Be sure to clean drain plug and install with new O-ring.

Radiator drain plug : Refer to [CO-14, "Exploded View"](#).

- If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM.
2. Check that each hose clamp has been firmly tightened.
 3. Remove air duct inlet and air cleaner assembly. Refer to [EM-24, "Removal and Installation"](#).
 4. Disconnect heater hose (1) at position (←) in the figure.

← : Vehicle front

- Enhance heater hose as high as possible.

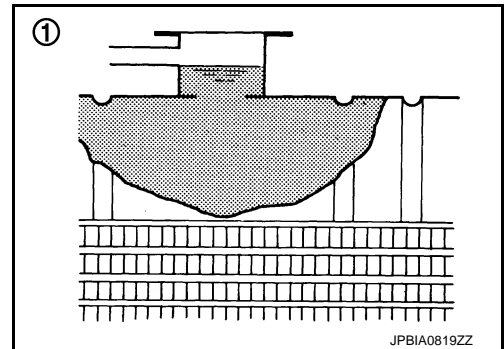


5. Fill radiator (1) to specified level.

CAUTION:

Never adhere the engine coolant to electronic equipments (alternator etc.).

- Pour coolant 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.
- When engine coolant overflows disconnected heater hose, connect heater hose, and continue filling the engine coolant.
- Use Genuine NISSAN Engine Coolant or equivalent in its quality mixed with water (distilled or demineralized). Refer to [MA-8, "Fluids and Lubricants"](#).



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

Refer to [CO-26, "Periodical Maintenance Specification"](#).

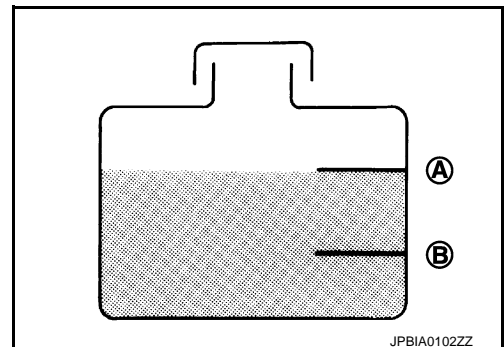
6. Refill reservoir tank to "MAX" level line with engine coolant.

A : MAX

B : MIN

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

Refer to [CO-26, "Periodical Maintenance Specification"](#).



7. Install air duct (between air cleaner case and electric throttle control actuator). Refer to [EM-24, "Removal and Installation"](#).
8. Install radiator cap.
9. Warm up engine until opening thermostat. Standard for warming-up time is approximately 10 minutes at 3,000 rpm.
 - Check thermostat opening condition by touching radiator hose (lower) to see a flow of warm water.

ENGINE COOLANT

< PERIODIC MAINTENANCE >

[HR12DE]

CAUTION:

Watch water temperature gauge so as not to overheat engine.

10. Stop the 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.

CAUTION:

Never adhere the engine coolant to electronic equipments (alternator etc.).

11. Refill reservoir tank to "MAX" level line with engine coolant.
12. Repeat steps 5 through 10 two or more times with radiator cap installed until engine coolant level no longer drops.
13. Check cooling system for leakage with engine running.
14. 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.
15. Repeat step 14 three times.
16. If sound is heard, bleed air from cooling system by repeating step 5 through 10 until reservoir tank level no longer drops.

Flushing

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1. Install reservoir tank if removed and radiator drain plug.

CAUTION:

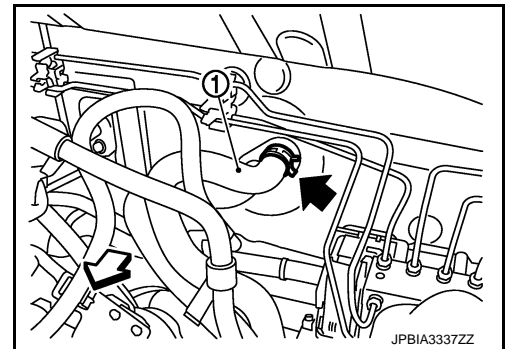
Be sure to clean drain plug and install with new O-ring.

Radiator drain plug : Refer to [CO-14, "Exploded View"](#).

- If water drain plugs on cylinder block are removed, close and tighten them. Refer to EM.
2. Remove air duct inlet and air cleaner case assembly. Refer to [EM-24, "Removal and Installation"](#).
 3. Disconnect heater hose (1) at position (←) in the figure.

← : Vehicle front

- Enhance heater as high as possible.



4. Fill radiator and reservoir tank with water and reinstall radiator cap.
 - When engine coolant over flows disconnected heater hose, connect heater hose, and continue filling the engine coolant.
5. Install air duct (between air cleaner case and electric throttle control actuator). Refer to [EM-24, "Removal and Installation"](#).
6. Run the engine and warm it up to normal operating temperature.
7. Rev the engine two or three times under no-load.
8. Stop the engine and wait until it cools down.
9. Drain water from the system. Refer to [CO-9, "Draining"](#).
10. Repeat steps 1 through 9 until clear water begins to drain from radiator.

RADIATOR RADIATOR CAP

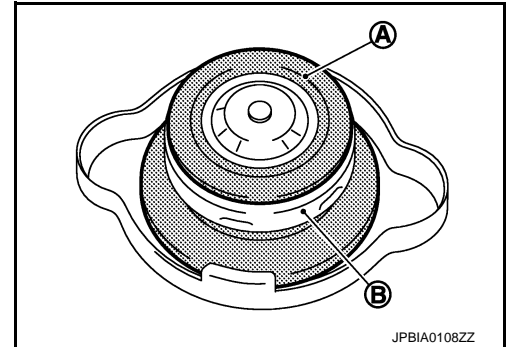
RADIATOR CAP : Inspection

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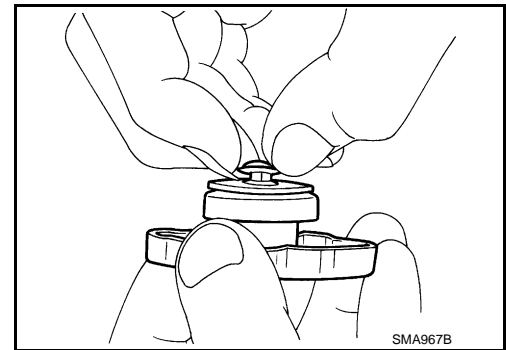
- Check valve seat (A) of radiator cap.

B : Metal plunger

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



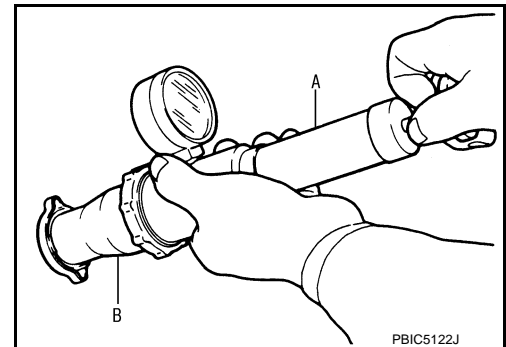
- Pull negative-pressure valve to open it, and that it close completely when released.
- Check that there is no dirt or damage on the valve seat of radiator cap negative-pressure valve.
- Check that there are no unusualness in the opening and closing conditions of negative-pressure valve.



- Check radiator cap relief pressure.

Standard and Limit : Refer to [CO-26, "Radiator"](#).

- When connecting radiator cap to the radiator cap tester (commercial service tool) (A) and the radiator cap tester adapter (commercial service tool) (B), apply engine coolant to the cap seal surface.



- Replace radiator cap if there is an unusualness related to the above three.

CAUTION:

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

RADIATOR

RADIATOR : Inspection

INFOID:000000005988461

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 harness 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.

RADIATOR

< PERIODIC MAINTENANCE >

[HR12DE]

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

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REMOVAL AND INSTALLATION

RADIATOR

Exploded View

INFOID:000000005988462



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- | | | |
|----------------------------|----------------------------|---------------------------|
| 1. Reservoir tank cap | 2. Reservoir tank | 3. Reservoir tank hose |
| 4. Radiator cap | 5. Mounting rubber (upper) | 6. Radiator |
| 7. Mounting rubber (lower) | 8. Clamp | 9. A/T fluid hose |
| 10. Clamp | 11. Radiator hose (upper) | 12. Radiator hose (lower) |
| 13. Fan shroud assembly | | |
| A. To water outlet | B. To water inlet | C. M/T models |

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

Removal and Installation

INFOID:000000005988463

REMOVAL

WARNING:

- Never remove radiator cap when engine is hot. Serious burns may occur from high-pressure engine coolant escaping from radiator.
- Wrap a thick cloth around the radiator 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 belt.
2. Remove air duct (inlet). Refer to [EM-24, "Removal and Installation"](#).

RADIATOR

[HR12DE]

< REMOVAL AND INSTALLATION >

3. Disconnect reservoir tank hose, and remove reservoir tank.
4. Disconnect harness connector from fan motor, and move harness aside.
5. Remove radiator hose (upper and lower).
6. Remove cooling fan assembly.

CAUTION:

Be careful not to damage or scratch the radiator core.

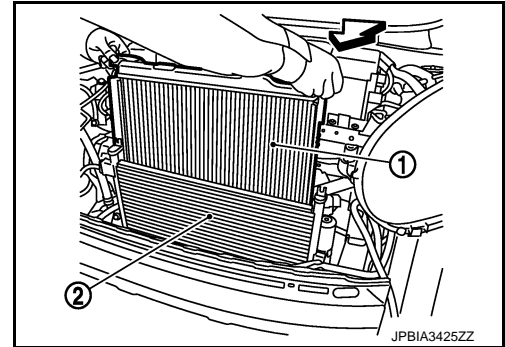
7. Remove front bumper fascia assembly. Refer to [EXT-11, "Removal and Installation"](#).
8. Remove radiator core support (upper). Refer to [DLK-114, "Removal and Installation"](#) (With Intelligent Key) or [DLK-219, "Removal and Installation"](#) (Without Intelligent Key).
9. Remove the radiator (1) from bottom of the vehicle.

2 : Condenser assembly

↔ : Vehicle front

CAUTION:

Be careful not to damage radiator core and condenser assembly core.



INSTALLATION

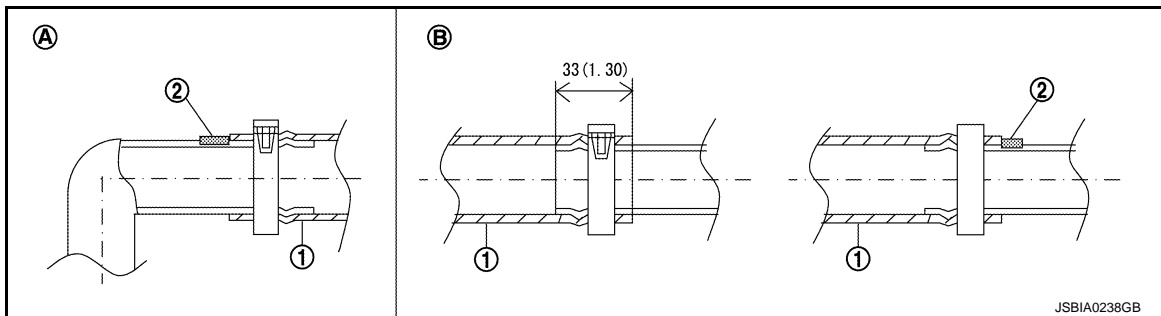
Note the following, and install in the reverse order of removal.

CAUTION:

- Replace water hose clamp if it is removed.
- Use genuine mounting bolts for the cooling fan assembly and strictly observe the tightening torque. (Breakage prevention for radiator)

NOTE:

- Insert the radiator hose (1) all the way to the stopper (2) or by 33 mm (1.30in) (hose without a stopper)



Unit mm (in)

A. Radiator side

B. Engine side

- For the orientation of the hose clamp pawl, refer to the figure.

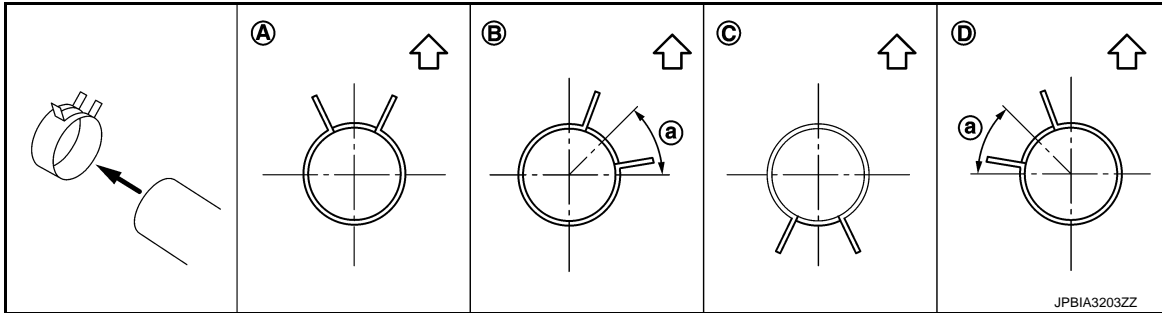
Radiator hose	Hose end	Paint mark	Position of hose clamp*
Radiator hose (upper)	Radiator side	Upper	A
	Engine side	Upper	B
Radiator hose (lower)	Radiator side	Lower	C
	Engine side	Upper	D

*Refer to the illustrations for the specific position each hose clamp tab.

RADIATOR

< REMOVAL AND INSTALLATION >

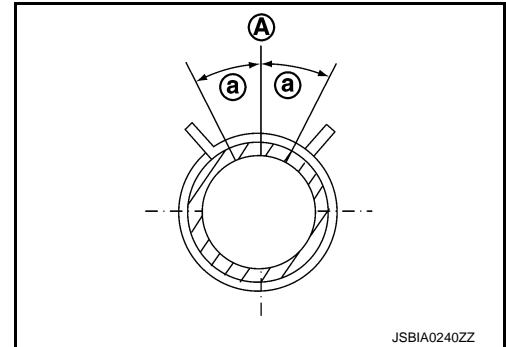
[HR12DE]



a. 45°

↖ Vehicle upper

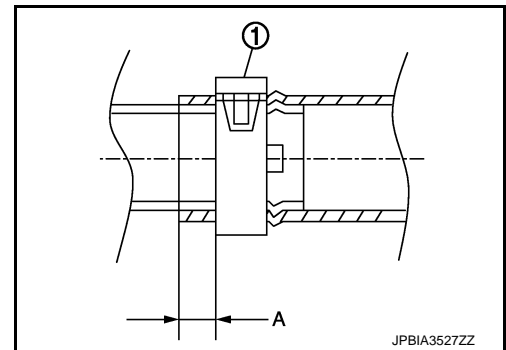
- The angle (a) created by the hose clamp pawl and the specified line (A) must be within $\pm 30^\circ$ as shown in the figure.



- To install hose clamps (1), check that the dimension (A) from the end of the hose clamp (1) on the radiator hose to the hose clamp is within the reference value.

Dimension "A"

(+3) – (+7)mm



Inspection

INFOID:000000005988464

INSPECTION AFTER INSTALLATION

- Check for leakage of engine coolant using the radiator cap tester adapter (commercial service tool) and the radiator cap tester (commercial service tool). Refer to [CO-9. "Inspection"](#).
- Start and warm up the engine. Check visually that there is no leakage of engine coolant.

COOLING FAN

< REMOVAL AND INSTALLATION >

[HR12DE]

2. Remove fan motor.

ASSEMBLY

Note the following, and assemble in the reverse order of disassembly.

- Apply genuine high strength thread locking sealant on fan motor shaft.

Inspection

INFOID:000000005988468

INSPECTION AFTER DISASSEMBLY

Cooling Fan

Inspect cooling fan for crack or unusual bend.

- If anything is found, replace cooling fan.

WATER PUMP

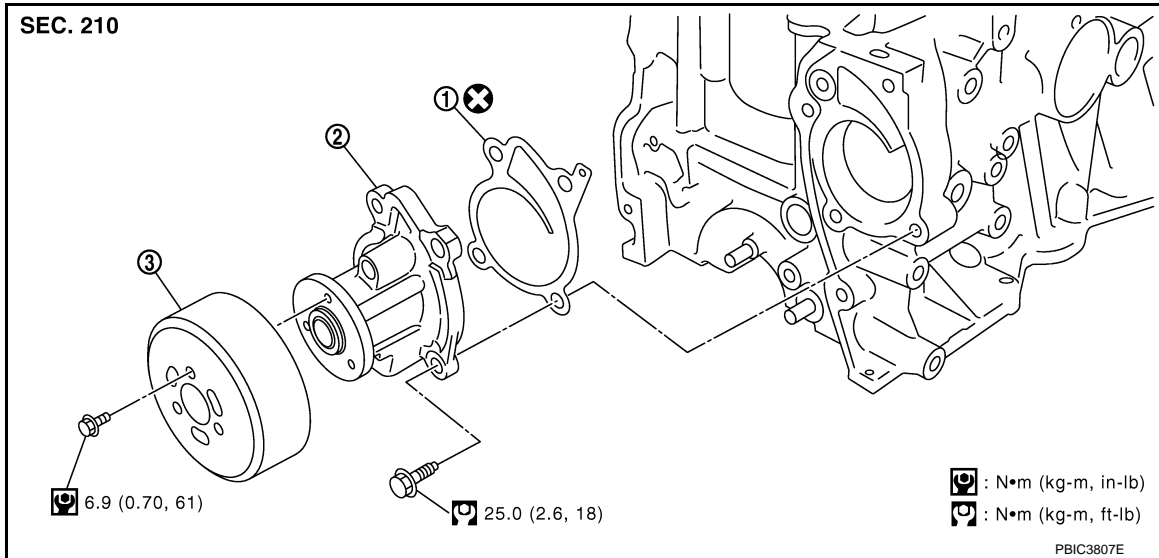
< REMOVAL AND INSTALLATION >

[HR12DE]

WATER PUMP

Exploded View

INFOID:000000005988469



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

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

Removal and Installation

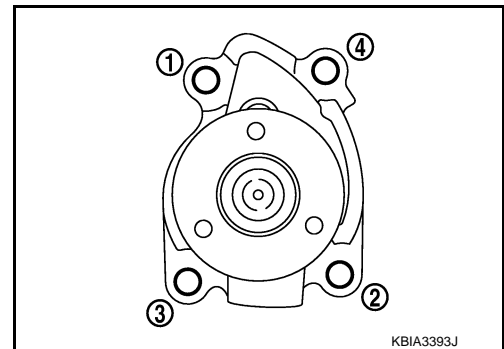
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REMOVAL

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 belt.
2. Steer front wheel to the right.
3. Remove front fender protector (RH). Refer to [DLK-221, "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-19, "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 disassembled and should be replaced as a unit.



INSTALLATION

Install in the reverse order of removal.

Inspection

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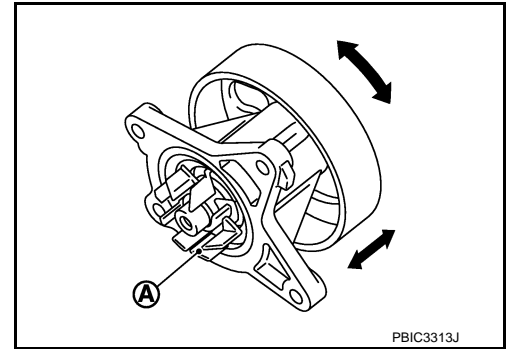
INSPECTION AFTER REMOVAL

WATER PUMP

[HR12DE]

< REMOVAL AND INSTALLATION >

- Check visually that there is no significant dirt or rusting on water pump body and vane (A).
- Check 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 for leakage of engine coolant using the radiator cap tester adapter (commercial service tool) and the radiator cap tester (commercial service tool). Refer to [CO-9. "Inspection"](#).
- Start and warm up the engine. Check visually that there is no leakage of engine coolant.

THERMOSTAT

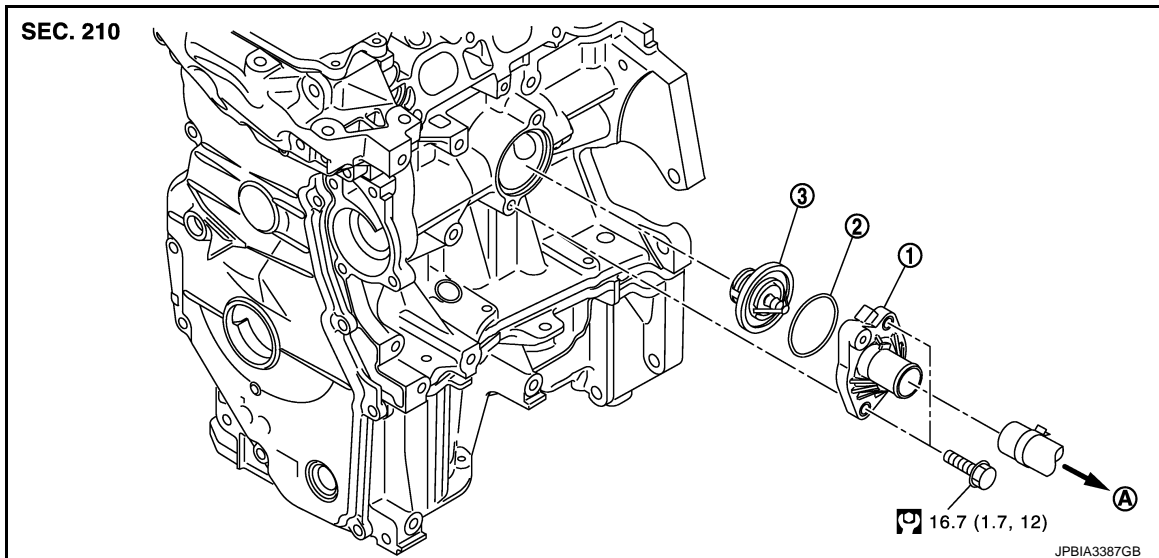
< REMOVAL AND INSTALLATION >

[HR12DE]

THERMOSTAT

Exploded View

INFOID:000000005988472



1. Water inlet
A. To radiator
2. Rubber ring
3. Thermostat

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

Removal and Installation

INFOID:000000005988473

REMOVAL

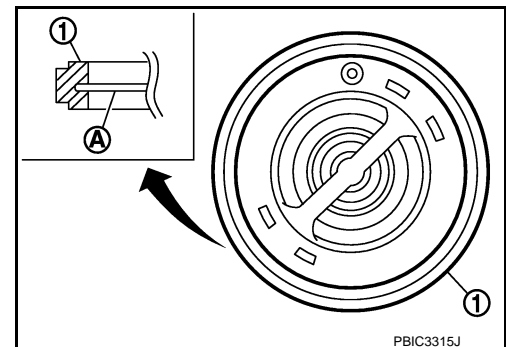
1. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#).
CAUTION:
Perform this step when engine is cold.
2. Remove air duct (inlet). Refer to [EM-24, "Removal and Installation"](#).
3. Disconnect radiator hose (lower) from water inlet. Refer to [CO-14, "Removal and Installation"](#).
4. Remove water inlet and thermostat.
 - Engine coolant leakage 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.



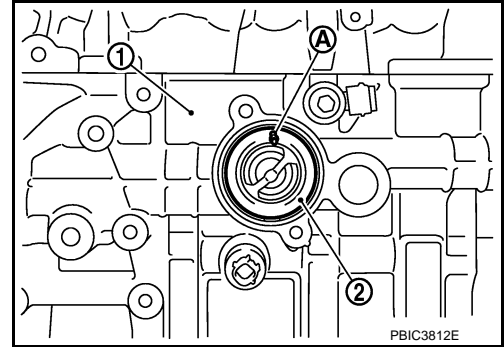
THERMOSTAT

[HR12DE]

< REMOVAL AND INSTALLATION >

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

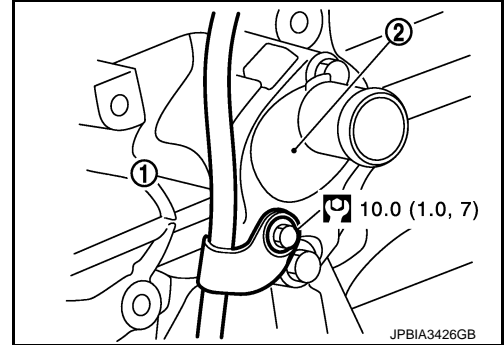
1 : Cylinder block



Water Inlet

After installation, install oil level gauge guide (1) as shown in the figure.

2 : Water inlet



Inspection

INFOID:000000005988474

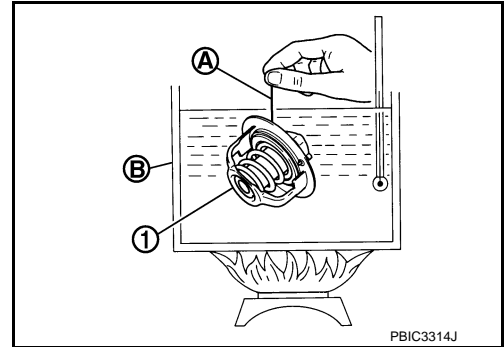
INSPECTION AFTER REMOVAL

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-26, "Thermostat"](#).

- If out of the standard, replace thermostat.



INSPECTION AFTER INSTALLATION

- Check for leakage of engine coolant using the radiator cap tester adapter (commercial service tool) and the radiator cap tester (commercial service tool). Refer to [CO-9, "Inspection"](#).
- Start and warm up the engine. Check visually that there is no leakage of engine coolant.

WATER OUTLET

< REMOVAL AND INSTALLATION >

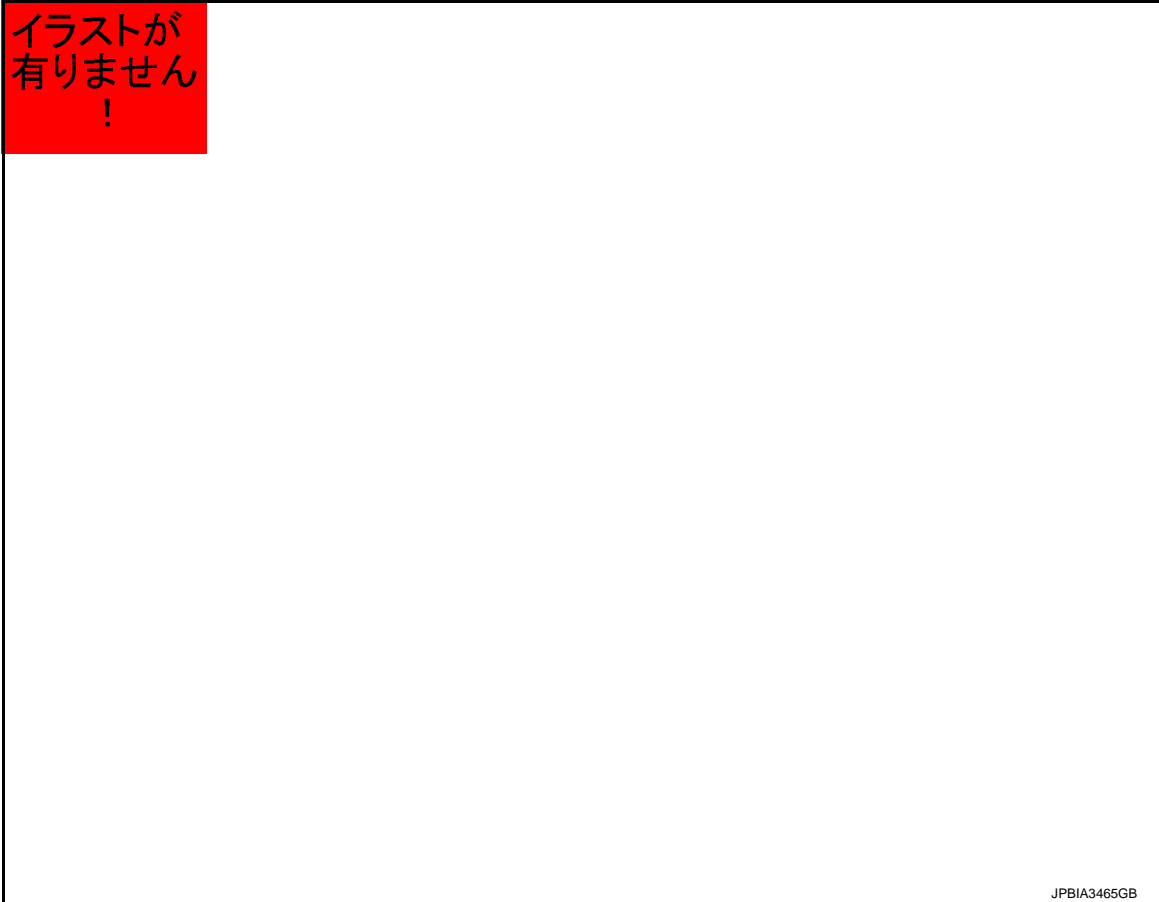
[HR12DE]

WATER OUTLET

Exploded View

INFOID:000000005988475

WITHOUT EGR CONTROL VALVE



- | | | |
|----------------------|--------------------------------------|-----------------|
| 1. Gasket | 2. Engine coolant temperature sensor | 3. O-ring |
| 4. EGR control valve | 5. EGR temp sensor | 6. Water outlet |

- | | |
|--------------|----------------|
| A. To heater | B. To radiator |
|--------------|----------------|

↶ : Engine front

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

A

CO

C

D

E

F

G

H

I

J

K

L

M

N

O

P

WATER OUTLET

< REMOVAL AND INSTALLATION >

[HR12DE]

WITH EGR CONTROL VALVE

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- | | | |
|--------------------------------------|-----------------|----------------|
| 1. Engine coolant temperature sensor | 2. Washer | 3. Gasket |
| 4. Radiator hose (upper) | 5. Water outlet | 6. Heater hose |
| 7. Heater hose | | |
| A. To heater | B. To radiator | |

⇐ : Engine front

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

Removal and Installation

INFOID:000000005988476

REMOVAL

1. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#).
CAUTION:
 - Perform this step when engine is cold.
2. Remove air duct (inlet) and air cleaner assembly. Refer to [EM-24, "Removal and Installation"](#).
3. Disconnect radiator hose (upper). Refer to [CO-14, "Removal and Installation"](#).
4. Disconnect harness connector from engine coolant temperature sensor.
5. Disconnect harness connector from EGR control valve and EGR temp sensor. (With EGR control valve)
6. Remove water hoses and heater hoses.
7. Remove water outlet.
8. Remove engine coolant temperature sensor from water outlet, if necessary.

INSTALLATION

Installation is the reverse order of removal.

WATER OUTLET

< REMOVAL AND INSTALLATION >

[HR12DE]

Inspection

INFOID:000000005988477

INSPECTION AFTER REMOVAL

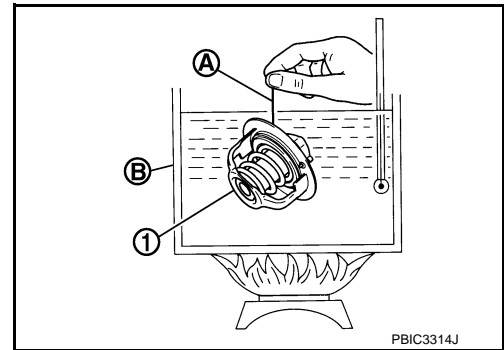
Water Control Valve

- 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-26, "Water Control Valve"](#).

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

INSPECTION AFTER INSTALLATION

- Check for leakage of engine coolant using the radiator cap tester adapter (commercial service tool) and the radiator cap tester (commercial service tool). Refer to [CO-9, "Inspection"](#).
- Start and warm up the engine. Check visually that there is no leakage of engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[HR12DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:000000005988478

ENGINE COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity (With reservoir tank at "MAX" level)	A/T models	5.5 (5-6/8, 4-7/8)
	M/T models (without EGR control valve)	
	M/T models (with EGR control valve)	
Reservoir tank engine coolant capacity (At "MAX" level)		0.7 (3/4, 5/8)

Radiator

INFOID:000000005988479

Unit: kPa (kg/cm², psi)

Cap relief pressure	Standard	78 - 98 (0.8 - 1.0, 11 - 14)
	Limit	59 (0.6, 9)
Leakage testing pressure		98 (1.0, 14)

Thermostat

INFOID:000000005988480

Standard

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

Water Control Valve

INFOID:000000005988481

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)