

SECTION CO

ENGINE COOLING SYSTEM

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DESCRIPTION

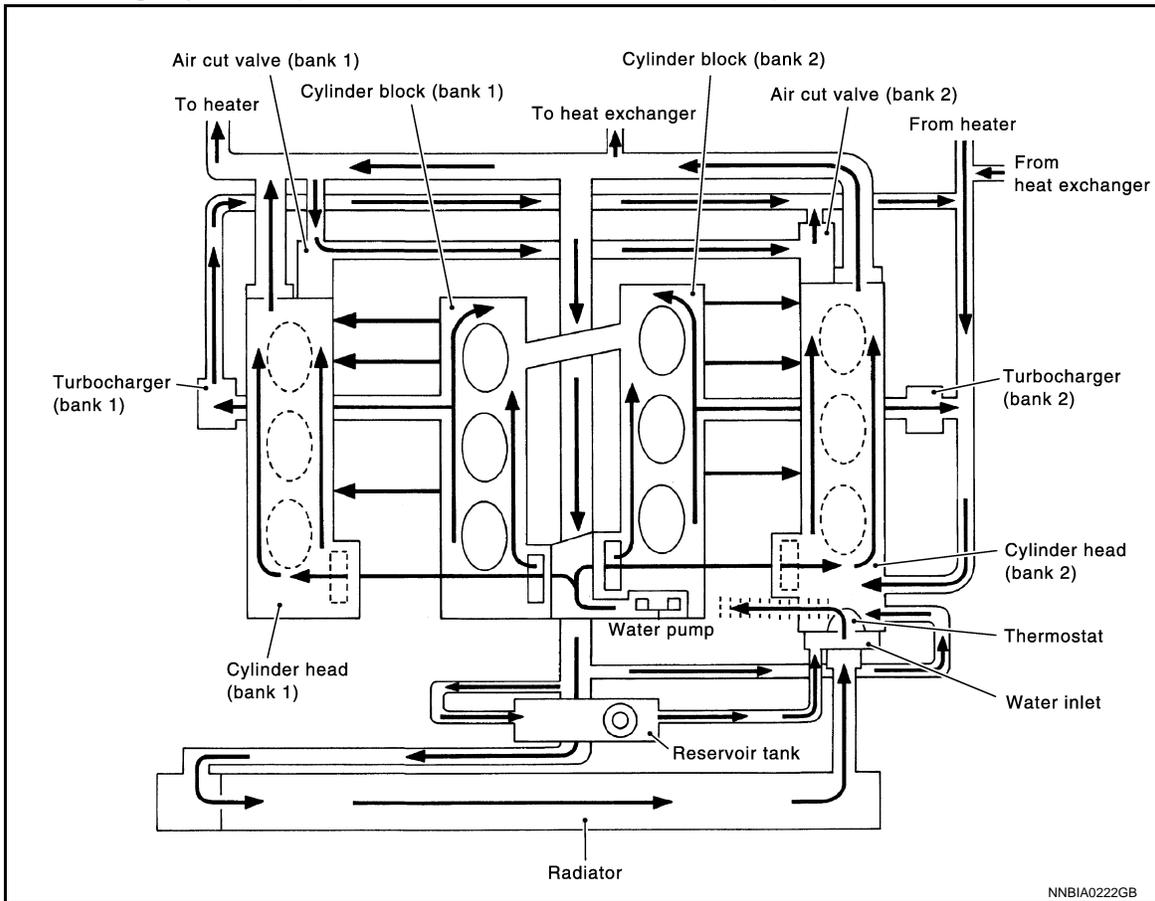
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

DESCRIPTION

Engine Cooling System (GT-R certified NISSAN dealer)

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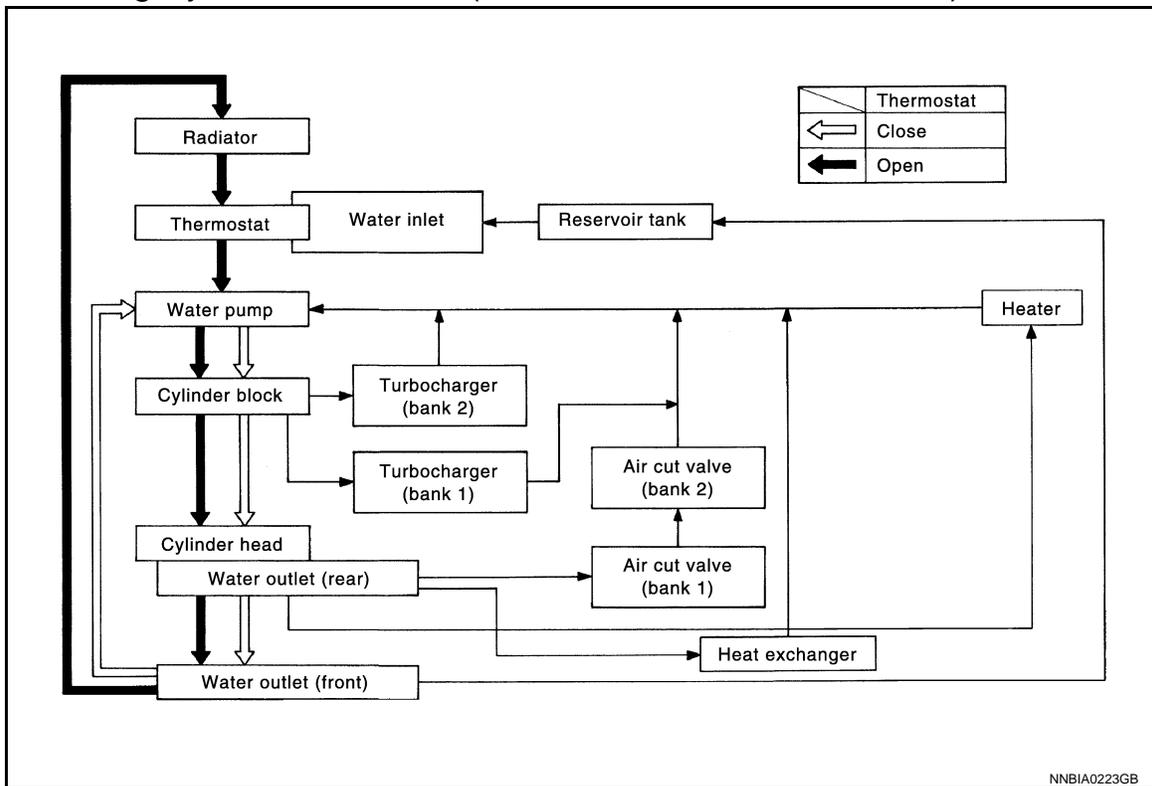
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DESCRIPTION

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Engine Cooling System Schematic (GT-R certified NISSAN dealer)

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OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

OVERHEATING CAUSE ANALYSIS

Troubleshooting Chart (GT-R certified NISSAN dealer)

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		Symptom	Check items			
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—	C	
		Thermostat stuck closed	—		D	
		Damaged fins	Dust contamination or paper clogging		—	E
			Physical damage			F
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)		G	
	Reduced air flow	Cooling fan does not operate	Fan assembly	—	H	
		High resistance to fan rotation			I	
		Damaged fan blades			J	
	Damaged radiator shroud	—	—	—	K	
	Improper engine coolant mixture ratio	—	—	—	L	
	Poor engine coolant quality	—	Engine coolant density	—	M	
	Insufficient engine coolant	Engine coolant leakage	Cooling hose	Loose clamp	—	N
				Cracked hose		O
			Water pump	Poor sealing		P
			Radiator cap	Loose	—	Q
				Poor sealing		R
			Radiator	O-ring for damage, deterioration or improper fitting	—	S
		Cracked radiator tank		T		
		Cracked radiator core		U		
		Reservoir tank	Cracked reservoir tank		V	
Reservoir tank cap		Loose	—	W		
	Poor sealing	X				
Overflowing reservoir tank	Exhaust gas leakage into cooling system	Cylinder head deterioration	—	Y		
		Cylinder head gasket deterioration		Z		

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OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

		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		
	Blocked or restricted air flow	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					

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000011486022

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:

Always observe the following items for preventing accidental activation.

- 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 "SRS AIR BAG".
- Never 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:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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.

Precautions for Removing Battery Terminal

INFOID:000000011486023

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

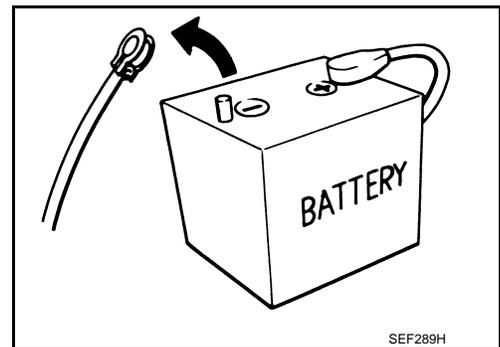
NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.



General Precautions

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CAUTION:

After finishing servicing, check that all the tools and waste are stored in a customary place.

PREPARATION

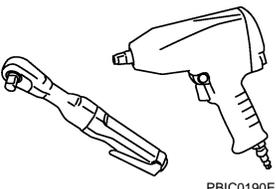
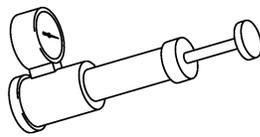
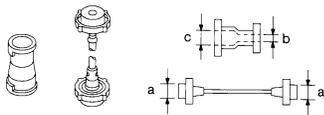
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PREPARATION

PREPARATION

Commercial Service Tools

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Tool name	Description
<p>Power tool</p>  <p>PBIC0190E</p>	<p>Loosening bolts and nuts</p>
<p>Radiator cap tester</p>  <p>PBIC1982E</p>	<p>Checking radiator and reservoir tank cap</p>
<p>Radiator cap tester adapter</p>  <p>S-NT564</p>	<p>Adapting radiator cap tester to reservoir tank cap and water outlet (front) filler neck a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)</p>

ENGINE COOLANT

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

ENGINE COOLANT

Inspection

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BASIC INSPECTION

Checking Engine Room

- Visually check engine room for smears*¹ and leakage*² of engine coolant when engine is cool.

NOTE:

- *¹: Engine coolant does not drop.
 - *²: Engine coolant drop.
- Check engine assembly and cooling system for smears and leakage of engine coolant.
 - Observe the clearance between the engine and radiator to check that there is no engine coolant collected on the front under cover.

Additional Inspection

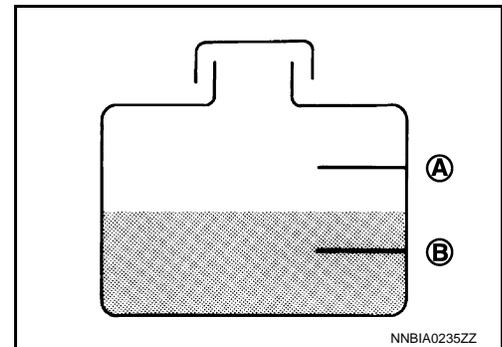
- Check that engine coolant temperature history is not stored in ECM. Refer to [EC-172, "CONSULT Function \(GT-R certified NISSAN dealer\)"](#).
 - Perform this additional inspection after driving under conditions listed below:
 - Higher-RPM (approaching redline) operation
 - Frequent high pedal force braking from moderate and higher speeds
 - Frequent throttle activation
 - Fast revving throughout the RPM range
1. Remove front under cover. Refer to [EXT-40, "FRONT UNDER COVER : Exploded View"](#).
 2. Visually check the bottom of the engine for smears and leakage of engine coolant.

LEVEL

- Check that the reservoir tank engine coolant level is at the mid-point between the "MIN" (B) to "MAX" (A) with the engine cold.

CAUTION:

- If engine coolant level exceeds the MAX line, leakage of engine coolant may occur during the rise in internal pressure in the engine coolant path. Therefore, thoroughly check that engine coolant level is below the MAX line.
 - Refill Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent in its quality mixed with water (distilled or demineralized). Refer to [MA-21, "Fluids and Lubricants"](#).
- Adjust the engine coolant level if necessary.
 - Check that the reservoir tank cap is tightened.



LEAKAGE

Engine Assembly

1. Visually check engine assembly and surround area for smears of engine coolant.
2. Wipe out smeared engine coolant using part cleaner or the equivalent.
3. Check again for engine coolant smears.

Radiator and Cooling System

ENGINE COOLANT

< PERIODIC MAINTENANCE >

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

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

WARNING:

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

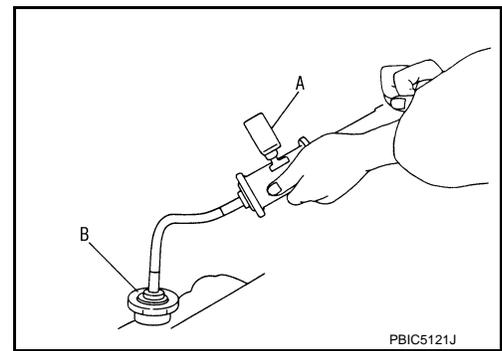
CAUTION:

Higher test pressure than that specified may cause radiator damage.

NOTE:

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

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



Draining

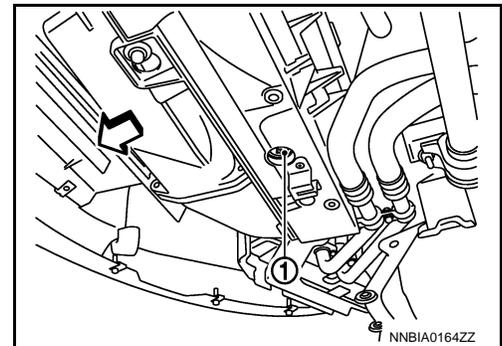
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WARNING:

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

1. Remove engine undercover. Refer to [EXT-37, "ENGINE UNDER COVER : Exploded View"](#).
2. Open radiator drain plug (1) at the bottom of radiator, and then remove reservoir tank cap.

↩ : Vehicle front



When draining all of engine coolant in the system, open water drain plugs on cylinder block. Refer to [EM-58, "Setting \(GT-R certified NISSAN dealer\)"](#).

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

Refilling

INFOID:000000011486028

CAUTION:

- Do not reuse O-rings.
- Do not put additive such as waterleak preventive, since it may cause cooling waterway clogging.
- When refilling use Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent in its quality mixed with water (distilled or demineralized). Refer to [MA-21, "Fluids and Lubricants"](#).

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

CAUTION:

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

Tightening torque : Refer to [CO-15, "Exploded View \(GT-R certified NISSAN dealer\)"](#).

If water drain plugs on cylinder block are removed, close and tighten them. Refer to [EM-114, "Disassembly and Assembly \(GT-R certified NISSAN dealer\)"](#).

3. Check that each hose clamp has been firmly tightened.

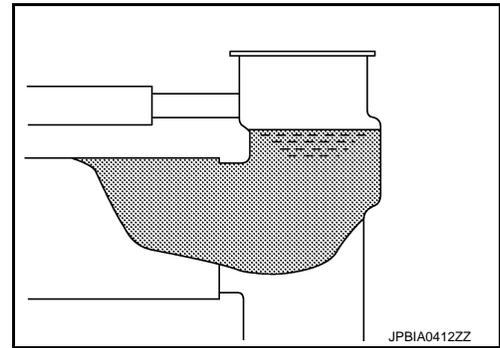
ENGINE COOLANT

< PERIODIC MAINTENANCE >

- Fill radiator to specified level.
 - Pour engine coolant through engine coolant filler neck slowly of less than 2 ℓ (2-1/8 US qt, 1-3/4 Imp qt) a minute to allow air in system to escape.

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

: Refer to [CO-28](#),
"Periodical Maintenance
Specification".

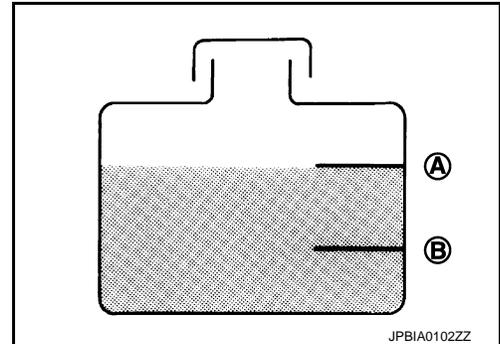


- Install radiator cap.
- Fill reservoir tank to "MAX" level line with engine coolant if necessary.

A : MAX
B : MIN

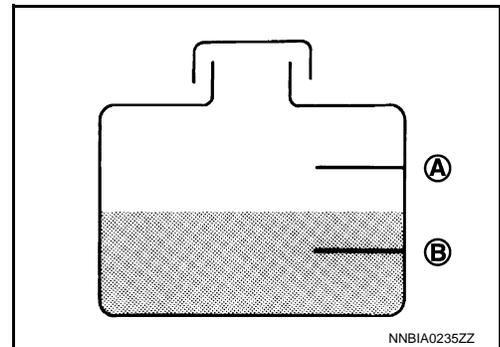
Reservoir tank engine coolant capacity
(At "MAX" level)

: Refer to [CO-28](#),
"Periodical Maintenance
Specification".



- Install reservoir tank cap, and then start the engine.
- Warm up engine until thermostat opens. 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.

CAUTION:
Watch water temperature gauge so as not to overheat engine.
- 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.
- Repeat steps 6 through 9 two or more times with radiator cap and reservoir tank cap installed until engine coolant level no longer drops.
- When the coolant level of the radiator stops lowering, refill reservoir tank to the midpoint between the "MIN" (B) and "MAX" (A) of the reservoir tank.



- Check cooling system for leakage with engine running.
- 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 positions between "COOL" and "WARM".
 - Sound may be noticeable at heater unit.
- Repeat step 13 three times.
- If sound is heard, bleed air from cooling system by repeating steps from 3 to 13 until engine coolant level no longer drops.
- Recheck reservoir tank engine coolant level with the engine completely cold. Refer to [CO-9](#), "Inspection".

Flushing

- Install reservoir tank if removed, and radiator drain plug.

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ENGINE COOLANT

< PERIODIC MAINTENANCE >

CAUTION:

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

Tightening torque : Refer to [CO-15, "Exploded View \(GT-R certified NISSAN dealer\)"](#).

If water drain plugs on cylinder block are removed, close and tighten them. Refer to [EM-114, "Dis-assembly and Assembly \(GT-R certified NISSAN dealer\)"](#).

2. Fill radiator and reservoir tank with water.
3. Run the engine and warm it up to normal operating temperature.
4. Rev the engine two or three times under no-load.
5. Stop the engine and wait until it cools down.
6. Drain water from the system. Refer to [CO-10, "Draining"](#).
7. Repeat steps 1 through 6 until clear water begins to drain from radiator.

RADIATOR

< PERIODIC MAINTENANCE >

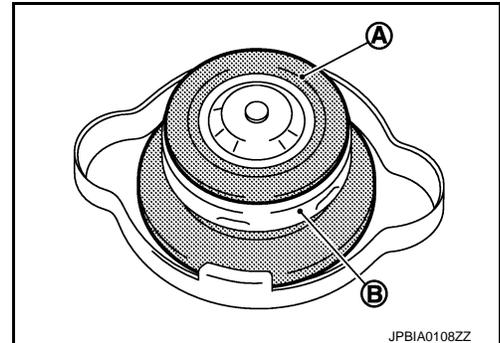
RADIATOR

RESERVOIR TANK CAP

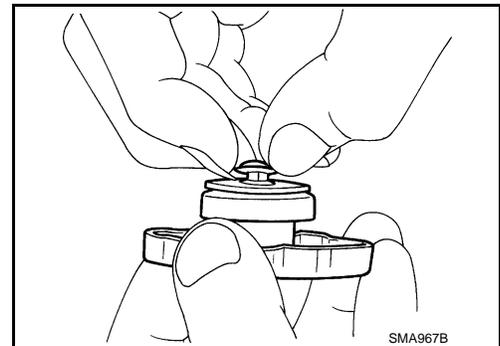
RESERVOIR TANK CAP : Inspection

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- Check valve seat of reservoir tank cap.
- Check if valve seat (A) is swollen to the extent that the edge of the metal plunger (B) cannot be seen when watching it vertically from the top.
- Check if valve seat has no soil and damage.

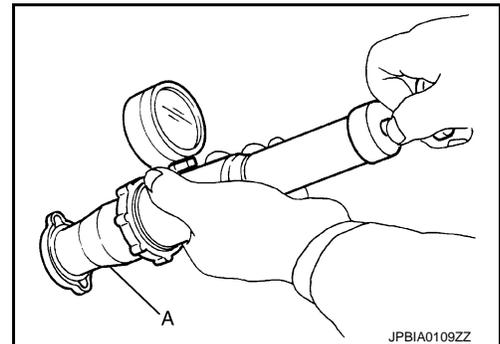


- Pull negative-pressure valve to open it, and check that it close completely when released.
- Check that there is no dirt or damage on the valve seat of reservoir tank cap negative-pressure valve.
- Check that there are no unusualness in the opening and closing conditions of negative-pressure valve.



- Check reservoir tank cap relief pressure.
- When connecting reservoir tank cap to the radiator cap tester (commercial service tool) and the radiator cap tester adapter (commercial service tool) (A), apply engine coolant to the cap seal surface.

Standard and limit : Refer to [CO-28, "Radiator"](#).



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

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

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

- Be careful not to bend or damage radiator fins.
 - 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.

RADIATOR

< PERIODIC MAINTENANCE >

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

< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

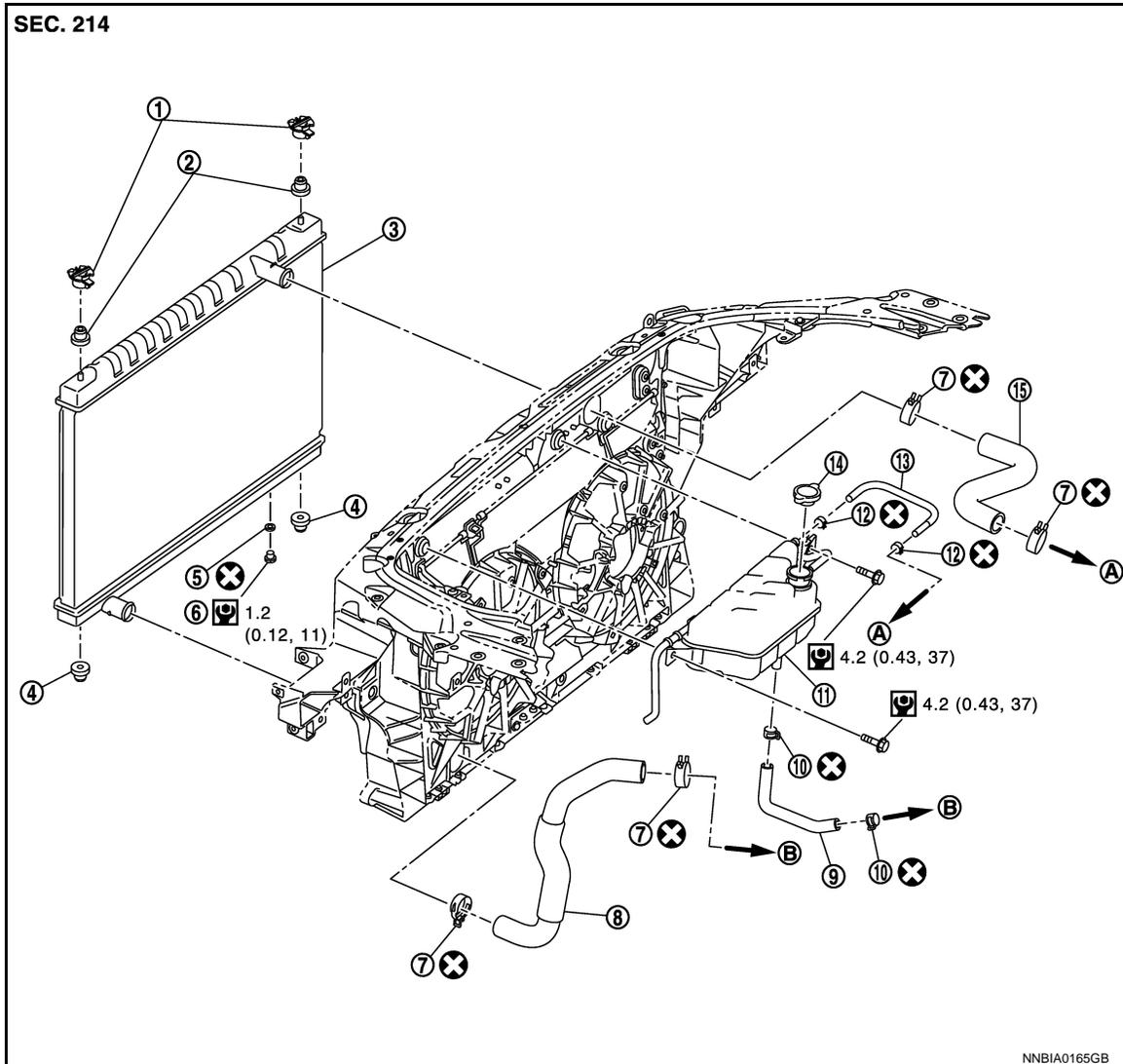
RADIATOR

Exploded View (GT-R certified NISSAN dealer)

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|---------------------------------|---|---------------------------|
| 1. Radiator upper mount bracket | 2. Mounting rubber (upper) | 3. Radiator |
| 4. Mounting rubber (lower) | 5. O-ring | 6. Drain plug |
| 7. Clamp | 8. Radiator hose (lower) | 9. Water hose |
| 10. Clamp | 11. Reservoir tank | 12. Clamp |
| 13. Water hose | 14. Reservoir tank cap | 15. Radiator hose (upper) |
| A. To water outlet (front) | B. To water inlet and thermostat assembly | |

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

Removal and Installation (GT-R certified NISSAN dealer)

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REMOVAL

WARNING:

Never remove radiator cap and reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from engine cooling system. Wrap a thick cloth around the

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RADIATOR

< REMOVAL AND INSTALLATION >

cap. Slowly turn it a quarter of a turn to release built-up pressure. Carefully remove cap by turning it all the way.

1. Drain engine coolant from radiator. Refer to [CO-10, "Draining"](#).

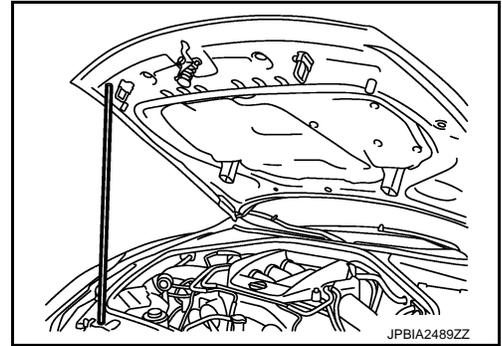
CAUTION:

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

2. Remove air cleaner case (RH and LH). Refer to [EM-28, "Exploded View"](#).
3. Remove air intake duct assembly 1 with charge air cooler. Refer to [DLK-221, "Exploded View \(GT-R certified NISSAN dealer\)"](#).
4. Remove condenser. Refer to [HA-47, "Exploded View \(GT-R certified NISSAN dealer\)"](#).
5. Remove reservoir tank if necessary.
6. Remove radiator hoses (upper and lower) and reservoir tank hose.
7. Support the hood with a proper tool to prevent the hood from falling.

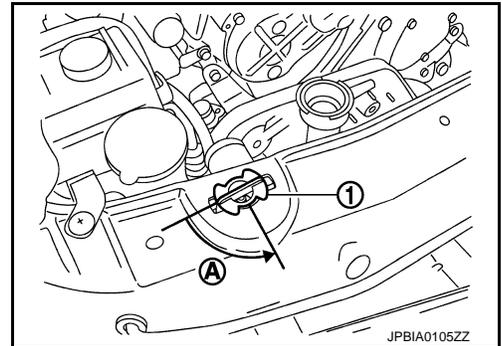
CAUTION:

Check that the tool surely supports the hood so as not to accidentally fall down during the work.



8. Remove hood support rod and hood lock bracket assembly. Refer to [DLK-218, "HOOD SUPPORT ROD : Exploded View"](#) and [DLK-221, "Exploded View \(GT-R certified NISSAN dealer\)"](#).
9. Rotate two radiator upper mount brackets 90 degrees in direction as shown in the figure, and remove them.

- 1 : Radiator upper mount bracket
- A : Turn 90° counterclockwise



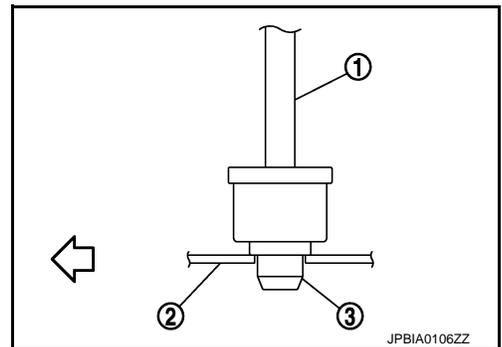
10. Remove radiator as follows:

CAUTION:

Be careful not to damage radiator core.

- a. Lift up and pull the radiator (1) forward, and then remove the mounting rubber (lower) (3) from the radiator core support (2).

- ← : Vehicle front

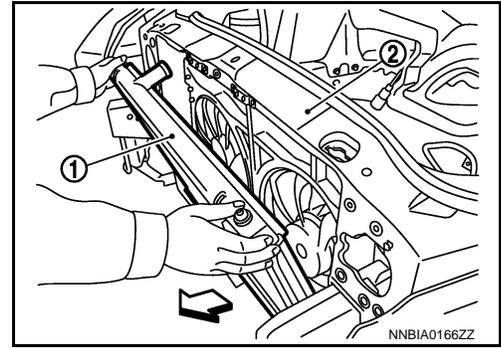


RADIATOR

< REMOVAL AND INSTALLATION >

b. Remove radiator (1) from front of radiator core support (2).

↶ : Vehicle front



INSTALLATION

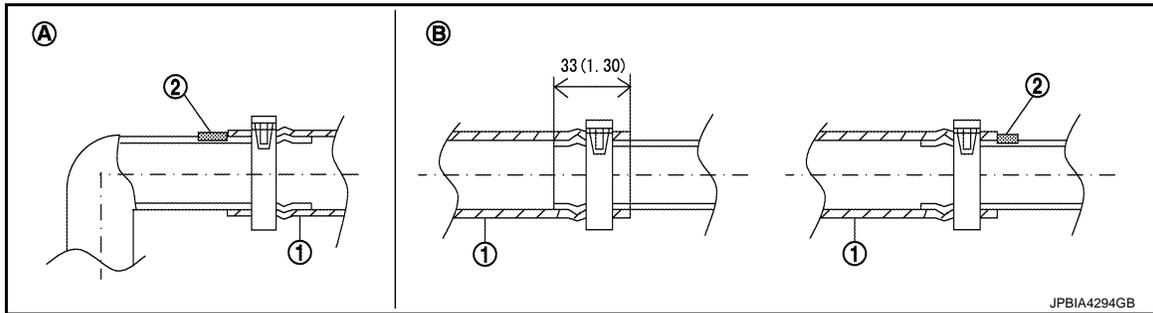
Note the following, and install in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- 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 33mm (hose without a stopper)



Unit mm (in)

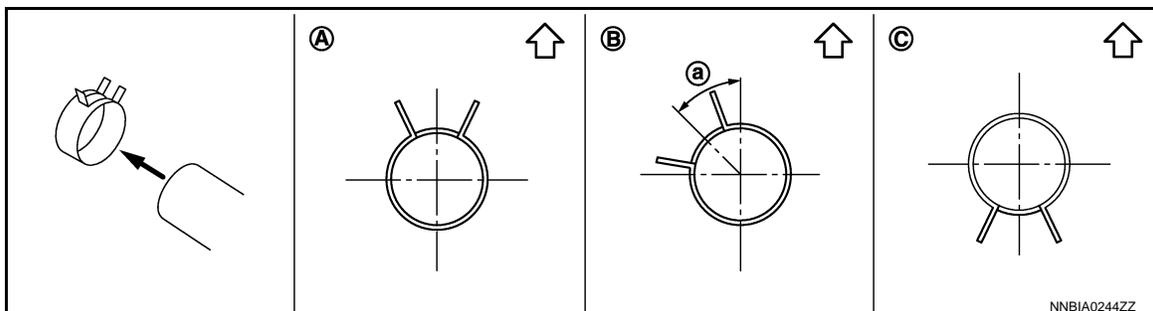
A. Radiator side

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	A
Radiator hose (lower)	Radiator side	Lower	C
	Engine side	Right side	B

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



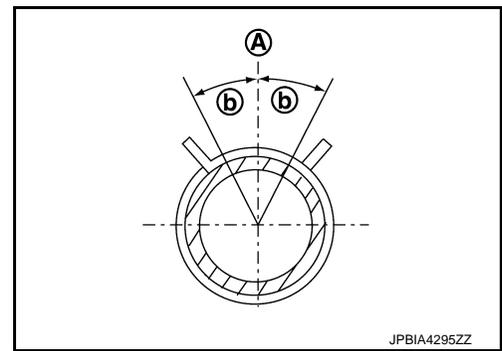
a. 45°

↶ Vehicle upper

RADIATOR

< REMOVAL AND INSTALLATION >

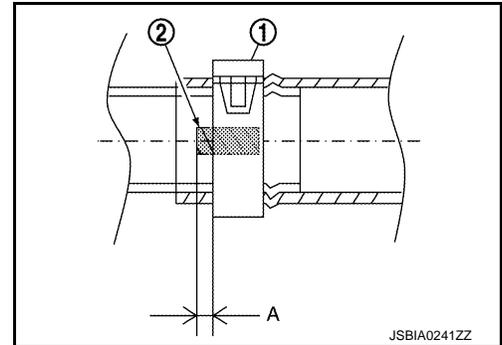
- The angle (b) created by the hose clamp pawl and the specified line (A) must be within $\pm 30^\circ$ as shown in the figure.



- To install hose clamps (1), check that the dimension (A) from the end of the paint mark (2) on the radiator hose to the hose clamp is within the reference value.

Dimension "A"

**(-1) – (+1) mm
(-0.04) – (+0.04) in**



Inspection (GT-R certified NISSAN dealer)

INFOID:000000011486034

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. Visually check that there is no leakage of engine coolant.

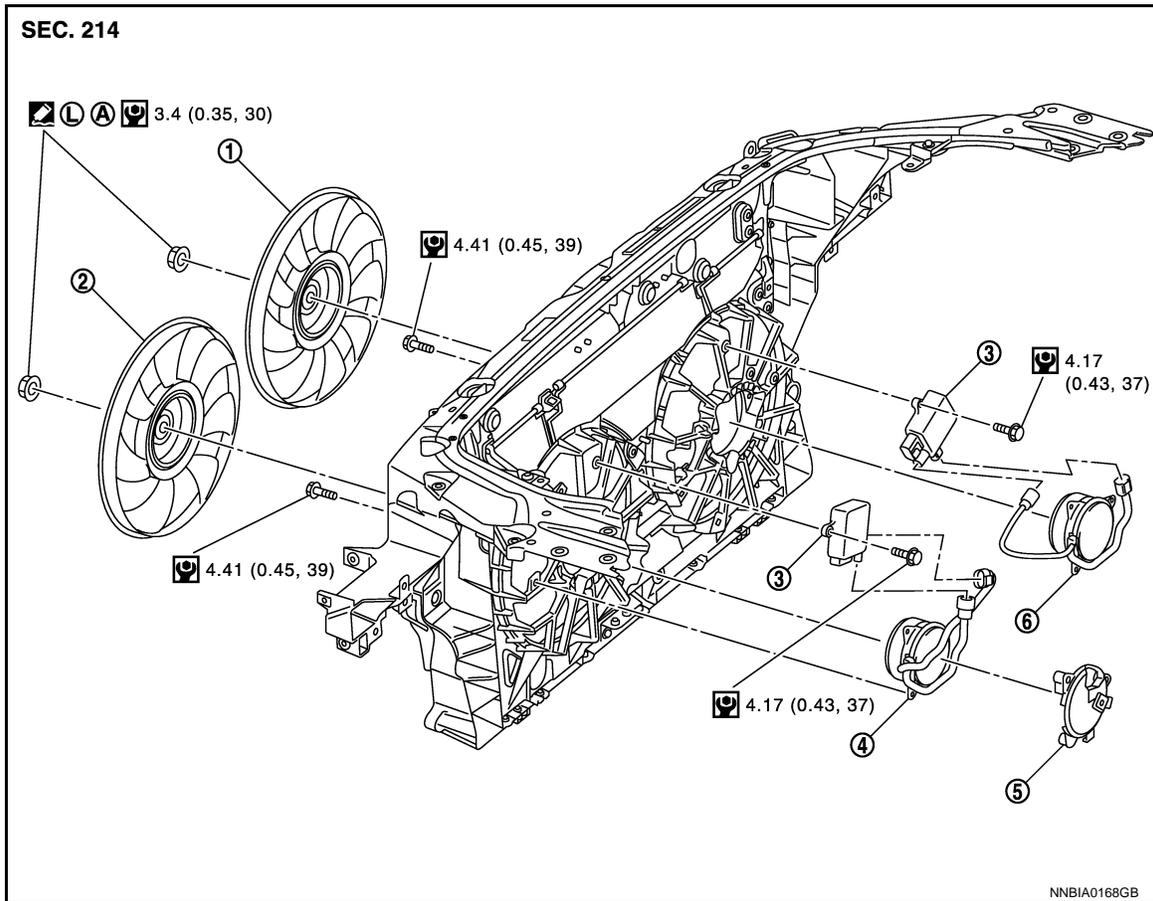
COOLING FAN

< REMOVAL AND INSTALLATION >

COOLING FAN

Exploded View (GT-R certified NISSAN dealer)

INFOID:000000011486035



- | | | |
|-----------------------------|---------------------|-------------------------------|
| 1. Cooling fan (RH) | 2. Cooling fan (LH) | 3. Cooling fan control module |
| 4. Fan motor (LH) | 5. Fan motor cover | 6. Fan motor (RH) |
| A. Apply on fan motor shaft | | |

  : Apply high strength thread locking sealant or equivalent.

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

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:000000011486036

REMOVAL

1. Remove radiator. Refer to [CO-15, "Exploded View \(GT-R certified NISSAN dealer\)"](#).
2. Disconnect harness connector from cooling fan control module, and move harness to aside.
3. Remove cooling fan control module.
CAUTION:
Handle carefully to avoid dropping and shocks.
4. Remove cooling fan mounting nuts, and then remove the cooling fans (RH and LH).
5. Remove fan motors (RH and LH).
 - Identify installation positions, and store them without mixing them up.

INSTALLATION

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

CAUTION:

RH and LH fan motors are different. Be careful not to misassemble them.

- Install each fan in the following position.

COOLING FAN

< REMOVAL AND INSTALLATION >

CAUTION:

RH and LH cooling fans are different. Be careful not to misassemble them.

Right side : 9 blades

Left side : 7 blades

- Apply high strength thread locking sealant on fan motor shaft.
- Secure the harness tightly to the fan shroud to prevent the fan rotation area from being loose.

Inspection (GT-R certified NISSAN dealer)

INFOID:000000011486037

INSPECTION AFTER REMOVAL

- Check that fan motors operate normally.

NOTE:

Cooling fans are controlled by cooling fan control module. For details, refer to [EC-94, "System Diagram \(GT-R certified NISSAN dealer\)"](#).

- Inspect cooling fan for crack or unusual bend.
- If anything is found, replace cooling fan.

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. Visually check that there is no leakage of engine coolant.

WATER INLET AND THERMOSTAT ASSEMBLY

< REMOVAL AND INSTALLATION >

- Be careful not to spill engine coolant over engine room. Use rag to absorb engine coolant.

Inspection (GT-R certified NISSAN dealer)

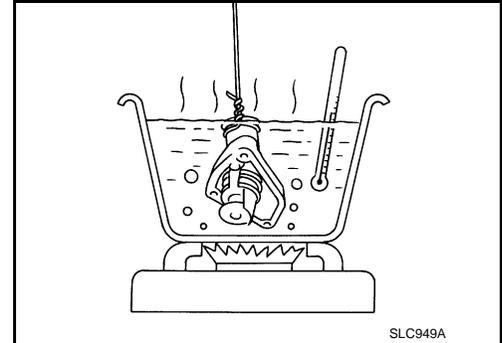
INFOID:000000011486040

INSPECTION AFTER REMOVAL

1. Check valve seating condition at ordinary room temperatures. It should seat tightly.
2. Check valve operation.

Thermostat (Standard) : Refer to [CO-28. "Thermostat \(GT-R certified NISSAN dealer\)"](#).

- If the malfunctioning condition, when valve seating at ordinary room temperature, or measured values are out of the standard, replace water inlet and thermostat assembly.



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. Visually check that there is no leakage of engine coolant.

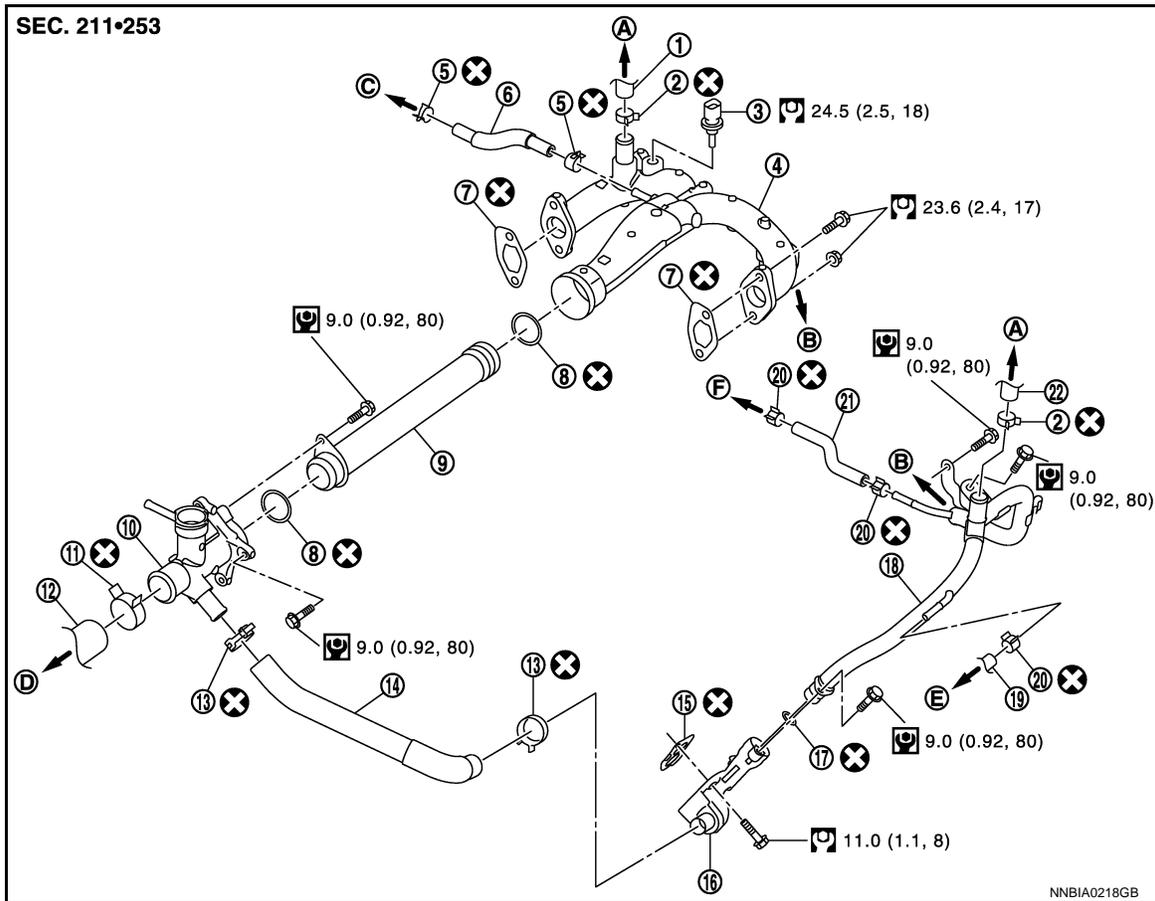
WATER OUTLET AND WATER PIPING

< REMOVAL AND INSTALLATION >

WATER OUTLET AND WATER PIPING

Exploded View (GT-R certified NISSAN dealer)

INFOID:000000011486041



- | | | |
|--------------------------|-----------------------------|---------------------------------------|
| 1. Heater hose | 2. Clamp | 3. Engine coolant temperature sensor |
| 4. Water outlet (rear) | 5. Clamp | 6. Water hose |
| 7. Gasket | 8. O-ring | 9. Water outlet pipe |
| 10. Water outlet (front) | 11. Clamp | 12. Radiator hose (upper) |
| 13. Clamp | 14. Water bypass hose | 15. Gasket |
| 16. Water connector | 17. O-ring | 18. Heater pipe |
| 19. Water hose | 20. Clamp | 21. Water hose |
| 22. Heater hose | | |
| A. To heater core | B. To heat exchanger | C. To air cut solenoid valve (bank 1) |
| D. To radiator | E. To turbocharger (bank 2) | F. To turbocharger (bank 1) |

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

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:000000011486042

REMOVAL

- Remove front undercover. Refer to [EXT-40, "FRONT UNDER COVER : Exploded View"](#).
- Drain engine coolant. Refer to [CO-10, "Draining"](#).
CAUTION:
 - Perform this step when the engine is cold.
 - Never spill engine coolant on drive belt.
- Remove the following parts:
 - Engine cover: Refer to [EM-26, "Exploded View"](#).
 - Air duct and air cleaner case assembly (RH and LH): Refer to [EM-28, "Exploded View"](#).

WATER OUTLET AND WATER PIPING

< REMOVAL AND INSTALLATION >

- Intake manifold collector: Refer to [EM-35. "Exploded View"](#).
 - Intake manifold: Refer to [EM-40. "Exploded View"](#).
 - Reservoir tank: Refer to [CO-15. "Exploded View \(GT-R certified NISSAN dealer\)"](#).
 - Oil level gauge and guide: Refer to [EM-69. "Exploded View \(GT-R certified NISSAN dealer\)"](#).
4. Remove radiator hose (upper) and water hose from water outlet (rear).
 5. Remove water outlet (front) and water outlet pipe.
 6. Remove air cut solenoid valve (bank 1 and bank 2). Refer to [EM-33. "Exploded View \(GT-R certified NISSAN dealer\)"](#).
 7. Disconnect engine coolant temperature sensor harness connector.
 8. Separate engine harness, removing their bracket from water outlet (rear).
 9. Remove water outlet tube mounting bolt [turbocharger (bank 1) side]. Refer to [EM-61. "Exploded View"](#).
 10. Remove water outlet (rear).
 11. Remove heater pipe.
 12. Remove engine coolant temperature sensor if necessary.

CAUTION:

Be careful not to damage engine coolant temperature sensor.

INSTALLATION

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

- Securely insert each hose, and install clamp at a position where it does not interfere with the pipe bulge.

CAUTION:

Replace water hose clamp if it is removed.

- When inserting water outlet pipe and water bypass pipe into water outlet, apply neutral detergent to O-ring.

CAUTION:

- **Do not reuse O-rings.**
- **Never allow water outlet (rear) to nip O-rings when installing water outlet pipe.**

Inspection (GT-R certified NISSAN dealer)

INFOID:000000011486043

INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- 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. Visually check that there is no leakage of engine coolant.

WATER PUMP

< UNIT DISASSEMBLY AND ASSEMBLY >

UNIT DISASSEMBLY AND ASSEMBLY

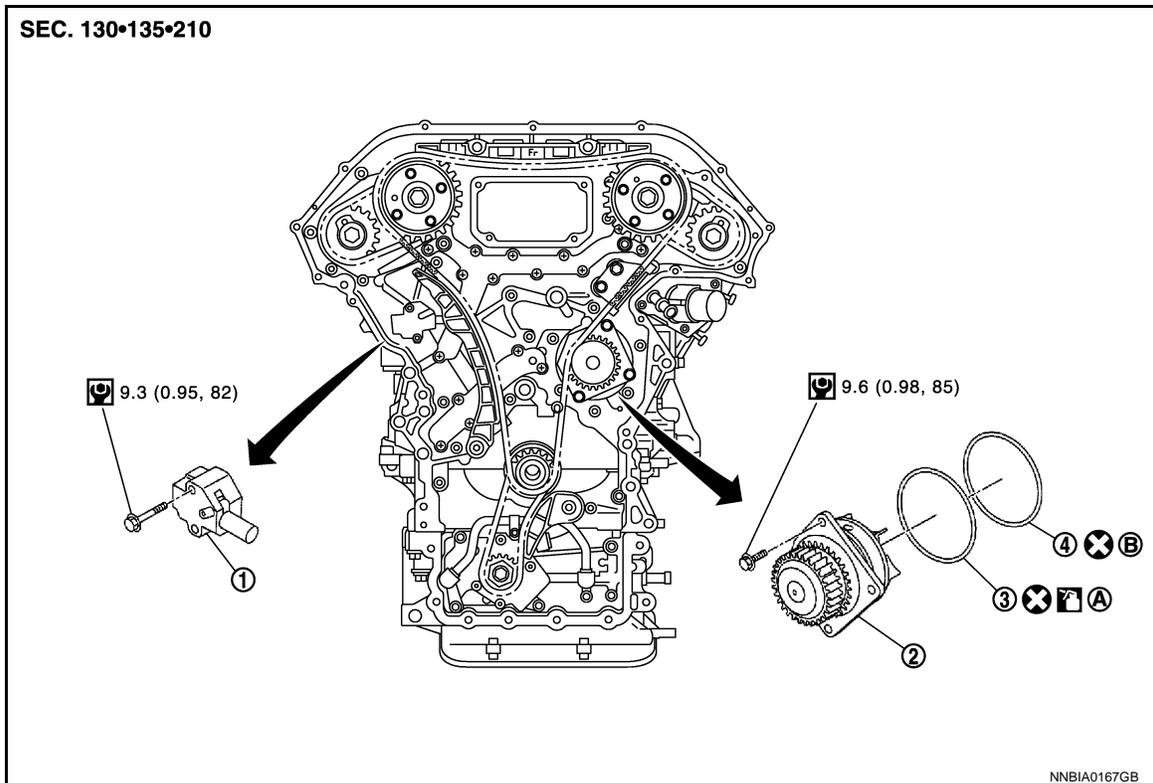
WATER PUMP

Exploded View (GT-R certified NISSAN dealer)

INFOID:000000011486044

A

CO



C

D

E

F

G

H

I

J

1. Timing chain tensioner (primary)
 2. Water pump
 3. O-ring
 4. O-ring
- A. Identify with yellow paint mark B. Identify with light blue paint mark
Apply engine coolant

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

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:000000011486045

CAUTION:

- When removing water pump assembly, be careful not to get engine coolant on drive belt.
- Water pump cannot be disassembled and should be replaced as a unit.
- After installing water pump, connect hose and clamp securely, then check for leakage using the radiator cap tester (commercial service tool) and the radiator cap tester adapter (commercial service tool).

REMOVAL

1. Remove engine assembly from the vehicle. Refer to [EM-53. "Exploded View \(GT-R certified NISSAN dealer\)"](#).
2. Remove front timing chain case. Refer to [EM-69. "Exploded View \(GT-R certified NISSAN dealer\)"](#).
3. Remove timing chain tensioner (primary) as follows:

L

M

N

O

P

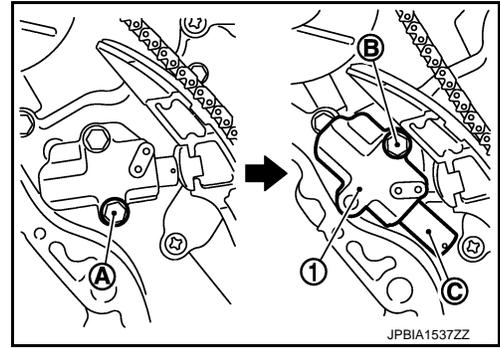
WATER PUMP

< UNIT DISASSEMBLY AND ASSEMBLY >

- a. Remove lower mounting bolt (A).
- b. Loosen upper mounting bolt (B) slowly, and then turn timing chain tensioner (primary) (1) on the upper mounting bolt so that plunger (C) is fully expanded.

NOTE:

Even if plunger is fully expanded, it is not dropped from the body of timing chain tensioner (primary).



- c. Remove upper mounting bolt, and then remove timing chain tensioner (primary).
4. Remove water pump as follows:
 - a. Remove three water pump mounting bolts. Secure a gap between water pump gear and timing chain, by turning crankshaft counterclockwise until timing chain looseness on water pump sprocket becomes maximum.

- b. Screw M8 bolts (A) [pitch: 1.25 mm (0.0492 in) length: approximately 50 mm (1.97 in)] into water pumps upper and lower mounting bolt holes until they reach timing chain case. Then, alternately tighten each bolt for a half turn, and pull out water pump (1).

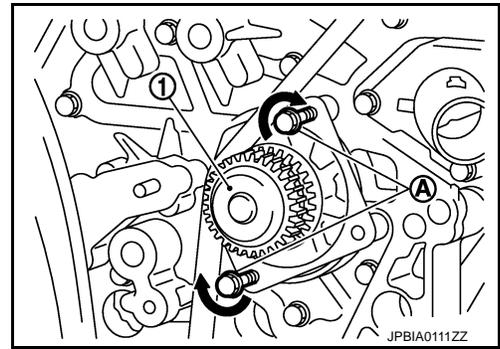
CAUTION:

- Pull straight out while preventing vane from contacting socket in installation area.
- Remove water pump without causing sprocket to contact timing chain.

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

CAUTION:

Never disassemble water pump.



INSTALLATION

CAUTION:

- Do not reuse O-rings.
- Replace water hose clamp if it is removed.

1. Install new O-rings to water pump.

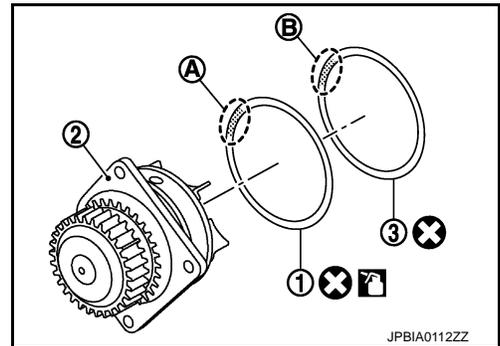
CAUTION:

Do not reuse O-rings.

- Apply engine oil to O-ring (1) and engine coolant to O-ring (3) as shown in the figure.

2 : Water pump

- Locate O-ring with yellow paint mark (A) to front side.
- Locate O-ring with light blue paint mark (B) to rear side.



2. Install water pump.

CAUTION:

Never allow cylinder block to nip O-rings when installing water pump.

- Check timing chain and water pump sprocket are engaged.
- Insert water pump by tightening mounting bolts alternately and evenly.

3. Install timing chain tensioner (primary) as follows:

- a. Turn crankshaft clockwise so that timing chain on the timing chain tensioner (primary) side is loose.

WATER PUMP

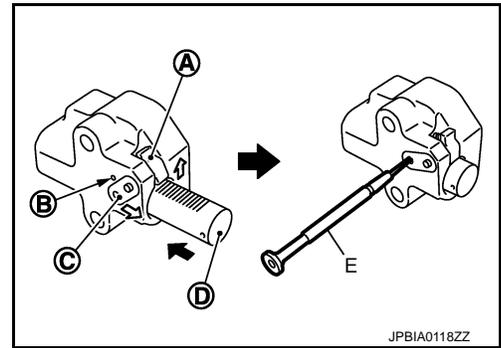
< UNIT DISASSEMBLY AND ASSEMBLY >

- b. Pull plunger stopper tab (A) up (or turn lever downward) so as to remove plunger stopper tab from the ratchet of plunger (D).

NOTE:

Plunger stopper tab and lever (C) are synchronized.

- c. Push plunger into the inside of tensioner body.
- d. Hold plunger in the fully compressed position by engaging plunger stopper tab with the tip of ratchet.
- e. To secure lever, insert stopper pin (E) through hole of lever into tensioner body hole (B).
- The lever parts and the tab are synchronized. Therefore, the plunger will be secured under this condition.



NOTE:

Figure shows the example of 1.2 mm (0.047 in) diameter thin screwdriver being used as the stopper pin.

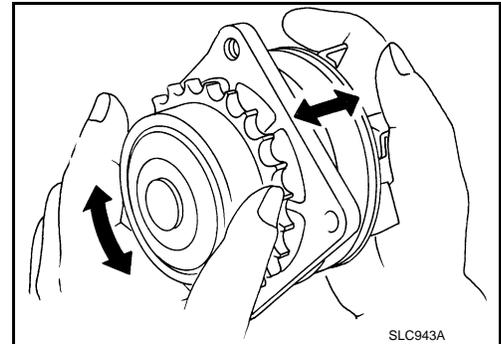
- f. Install timing chain tensioner (primary).
- Remove dust and foreign material completely from backside of timing chain tensioner (primary) and from installation area of rear timing chain case.
- g. Remove stopper pin.
- h. Check again that timing chain and water pump sprocket are engaged.
4. Install in the reverse order of removal for remaining parts.
- **After starting engine, let idle for three minutes, then rev engine up to 3,000 rpm under no load to purge air from the high-pressure chamber of chain tensioner. Engine may produce a rattling noise. This indicates that air still remains in the chamber and is not a matter of concern.**

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000011486046

INSPECTION AFTER REMOVAL

- Check for badly rusted or corroded water pump body assembly.
- Check for rough operation due to excessive end play.
- If anything is found, replace water pump.



INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap is tightened.
- 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. Visually check that there is no leakage of engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Periodical Maintenance Specification

INFOID:0000000011486047

ENGINE COOLANT CAPACITY (APPROXIMATELY)

Unit: ℓ (US qt, Imp qt)

Engine coolant capacity [With reservoir tank (Between MIN and MAX level)]	Except for NISMO	11.3 (12, 10)
	For NISMO	11.7 (12-3/8, 10-2/8)
Reservoir tank engine coolant capacity (Between MIN and MAX level)	Except for NISMO	1.4 (1-4/8, 1-2/8)
	For NISMO	1.8 (1-7/8, 1-5/8)

Radiator

INFOID:0000000011486048

Unit: kPa (kg/cm², psi)

Reservoir tank cap relief pressure	Except for NISMO	Standard	122.3 - 151.7 (1.2 - 1.5, 18 - 22)
		Lower limit	107 (1.1, 16)
	For NISMO	Standard	180 - 195 (1.84 - 1.99, 26 - 28)
		Lower limit	150 (1.53, 22)
Leakage testing pressure	Except for NISMO	157 (1.6, 23)	
	For NISMO	200 (2.04, 29)	

Thermostat (GT-R certified NISSAN dealer)

INFOID:0000000011486049

Thermostat	Standard
Valve opening temperature	76.5°C (170°F)
Maximum valve lift	8.6 mm/90°C (0.339 in/194°F)
Valve closing temperature	71°C (160°F)