

# SECTION **HCO**

## HIGH VOLTAGE COOLING SYSTEM

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HCO

### CONTENTS

<b>PRECAUTION</b> .....	2	<b>PERIODIC MAINTENANCE</b> .....	11	F
<b>PRECAUTIONS</b> .....	2	<b>COOLANT</b> .....	11	
Precaution for Technicians Using Medical Electric.....	2	Inspection .....	11	G
Point to Be Checked Before Starting Maintenance		Draining and Refilling .....	11	
Work .....	2	<b>DEGAS TANK CAP</b> .....	14	
Precaution for Supplemental Restraint System		Degas Tank Cap Inspection .....	14	H
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-		<b>REMOVAL AND INSTALLATION</b> .....	15	
SIONER" .....	2	<b>RADIATOR</b> .....	15	I
Precautions for Removing Battery Terminal .....	3	Exploded View .....	15	
<b>PREPARATION</b> .....	5	Removal and Installation .....	16	
<b>PREPARATION</b> .....	5	Inspection .....	19	J
Commercial Service Tools .....	5	<b>COOLING FAN</b> .....	20	
<b>SYSTEM DESCRIPTION</b> .....	6	Exploded View .....	20	K
<b>COMPONENT PARTS</b> .....	6	Removal and Installation .....	20	
Radiator .....	6	Disassembly and Assembly .....	22	
Cooling fan (electric fan) .....	6	<b>WATER PUMP</b> .....	23	L
Electric water pump .....	6	Exploded View .....	23	
<b>SYSTEM</b> .....	7	Removal and Installation .....	24	
High Voltage Cooling System .....	7	<b>WATER HOSE AND PIPING</b> .....	25	M
<b>BASIC INSPECTION</b> .....	9	Exploded View .....	25	
<b>RADIATOR</b> .....	9	<b>SERVICE DATA AND SPECIFICATIONS</b>		N
Inspection .....	9	<b>(SDS)</b> .....	27	
<b>SYMPTOM DIAGNOSIS</b> .....	10	<b>SERVICE DATA AND SPECIFICATIONS</b>		O
<b>OVERHEATING CAUSE ANALYSIS</b> .....	10	<b>(SDS)</b> .....	27	
Troubleshooting Chart .....	10	Periodical Maintenance Specification .....	27	
		Radiator .....	27	P

# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

#### Precaution for Technicians Using Medical Electric

INFOID:000000007632887

##### OPERATION PROHIBITION

###### **WARNING:**

- Parts with strong magnet is used in this vehicle.
- Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.

##### NORMAL CHARGE PRECAUTION

###### **WARNING:**

- If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.
- As radiated electromagnetic wave generated by on board charger at normal charge operation may effect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not enter the vehicle compartment (including luggage room) during normal charge operation.

##### PRECAUTION AT TELEMATICS SYSTEM OPERATION

###### **WARNING:**

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.

##### PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

###### **WARNING:**

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.

#### Point to Be Checked Before Starting Maintenance Work

INFOID:000000007632888

The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.

###### **NOTE:**

If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

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

INFOID:000000007632889

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

# PRECAUTIONS

## < PRECAUTION >

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 power switch ON, 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 power switch OFF, disconnect the 12V battery, and wait at least 3 minutes before performing any service.

## Precautions for Removing Battery Terminal

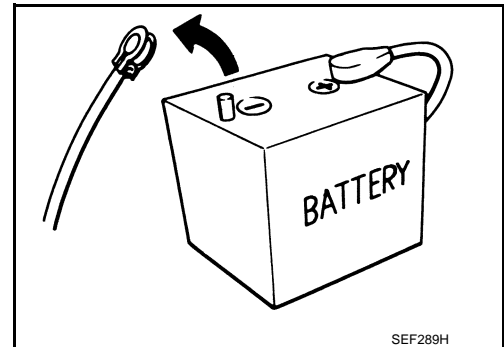
INFOID:000000007632891

- When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.

### **NOTE:**

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

- Always disconnect the battery terminal within 60 minutes after turning OFF the power switch. Even when the power switch is OFF, the 12V battery automatic charge control may automatically start after a lapse of 60 minutes from power switch OFF.
- Disconnect 12V battery terminal according to the following steps.



## WORK PROCEDURE

1. Check that EVSE is not connected.

### **NOTE:**

If EVSE is connected, the air conditioning system may be automatically activated by the timer A/C function.

2. Turn the power switch OFF → ON → OFF. Get out of the vehicle. Close all doors (including back door).
3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more.

### **NOTE:**

If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected.

4. Remove 12V battery terminal within 60 minutes after turning the power switch OFF → ON → OFF.

### **CAUTION:**

- After all doors (including back door) are closed, if a door (including back door) is opened before battery terminals are disconnected, start over from Step 1.
- After turning the power switch OFF, if "Remote A/C" is activated by user operation, stop the air conditioner and start over from Step 1.

### **NOTE:**

Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.

## PRECAUTIONS

### < PRECAUTION >

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- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the power switch.  
**NOTE:**  
If the power 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.

# PREPARATION

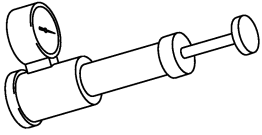
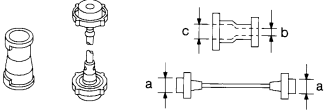
< PREPARATION >

## PREPARATION

### PREPARATION

#### Commercial Service Tools

INFOID:000000007632892

Tool name	Description
<p>Radiator cap tester</p>  <p>PBIC1982E</p>	<p>Cooling system leakage test</p>
<p>Radiator cap tester adapter</p>  <p>S-NT564</p>	<p>Adapting radiator cap tester to degas tank  <b>a: 28 (1.10) dia.</b>  <b>b: 31.4 (1.236) dia.</b>  <b>c: 41.3 (1.626) dia.</b>                      Unit: mm (in)</p>

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# COMPONENT PARTS

< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

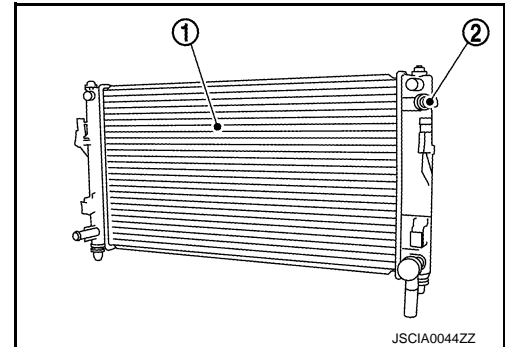
### COMPONENT PARTS

#### Radiator

INFOID:000000007805203

- This radiator is a side-flow type and made of aluminum.
- The radiator side tank has a water temperature sensor.

- 1 : Radiator assembly
- 2 : Water temperature sensor



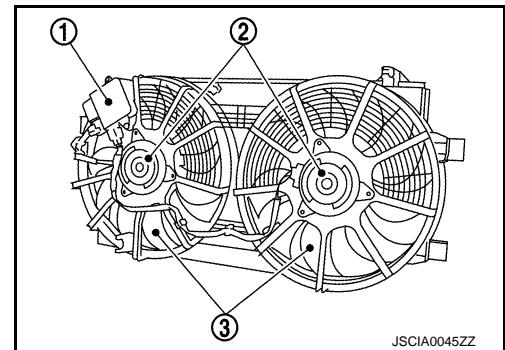
#### Cooling fan (electric fan)

INFOID:000000007805204

- This cooling fan has a resin shroud.

- 1 : Cooling fan control module
- 2 : Cooling fan motor
- 3 : Cooling fan

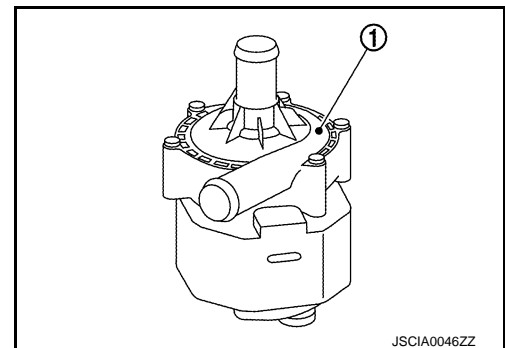
- The installation of shroud to the cooling fan control module allows the controlling of cooling fan motor revolutions.
- The cooling fan control module is controlled by a control signal transmitted from VCM (Vehicle Control Module), according to a coolant temperature, vehicle speed, and request from air conditioner.



#### Electric water pump

INFOID:000000007805205

- This is an electric water pump (1).
- Electric water pumps are installed in the left front fender and under the bleeder tank located on the right side of the motor room.
- The cooling path has two electric water pumps. VCM (Vehicle Control Module) controls coolant flow, according to water temperature and vehicle speed. And when one of the two electric water pumps has a breakdown, the other electric water pump is enhanced and used to make up for the deficiency in coolant flow.



# SYSTEM

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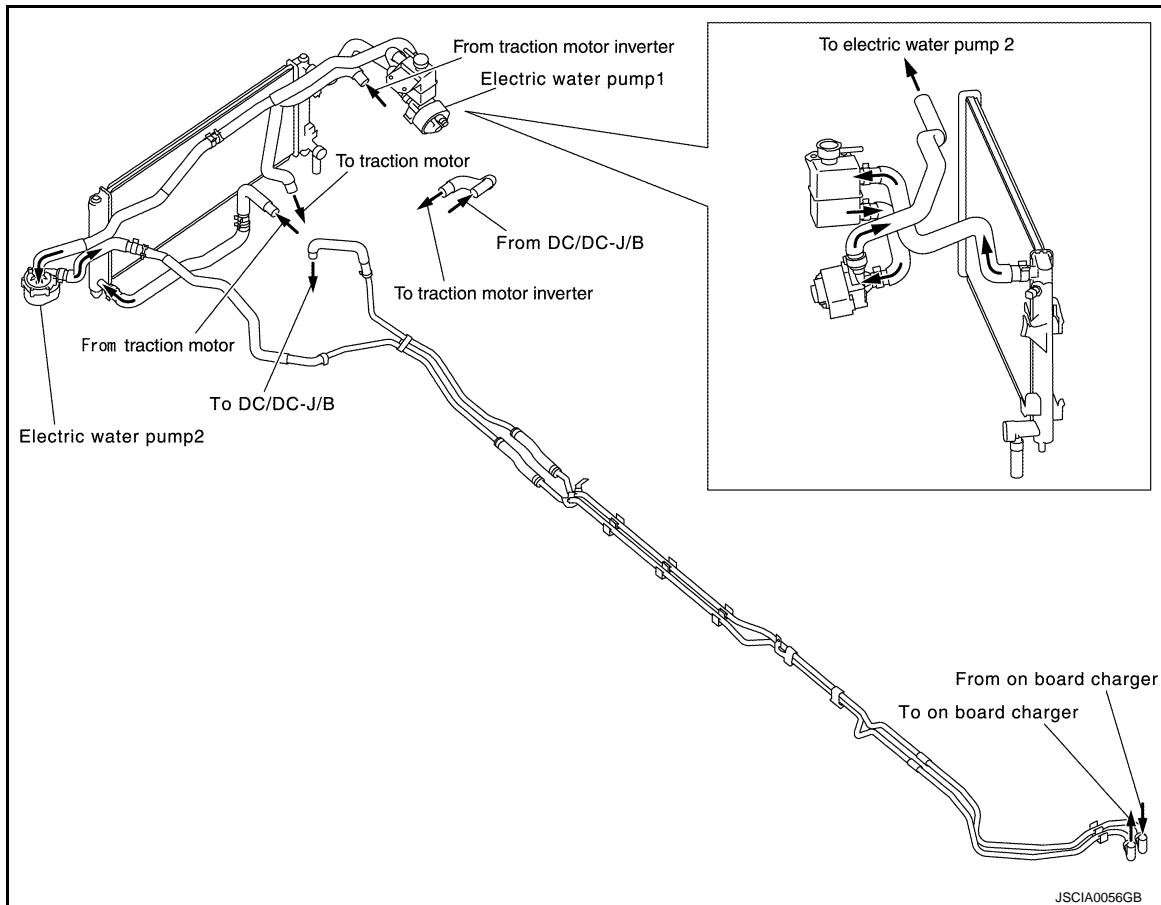
## SYSTEM

### High Voltage Cooling System

INFOID:000000007632893

- High voltage cooling system is a system which cools high voltage components below:
  - Traction motor
  - Traction motor inverter
  - DC/DC-J/B
  - On board charger
- Coolant is circulated by electric water pump, which is controlled by VCM (vehicle control module).

### HIGH VOLTAGE COOLING SYSTEM



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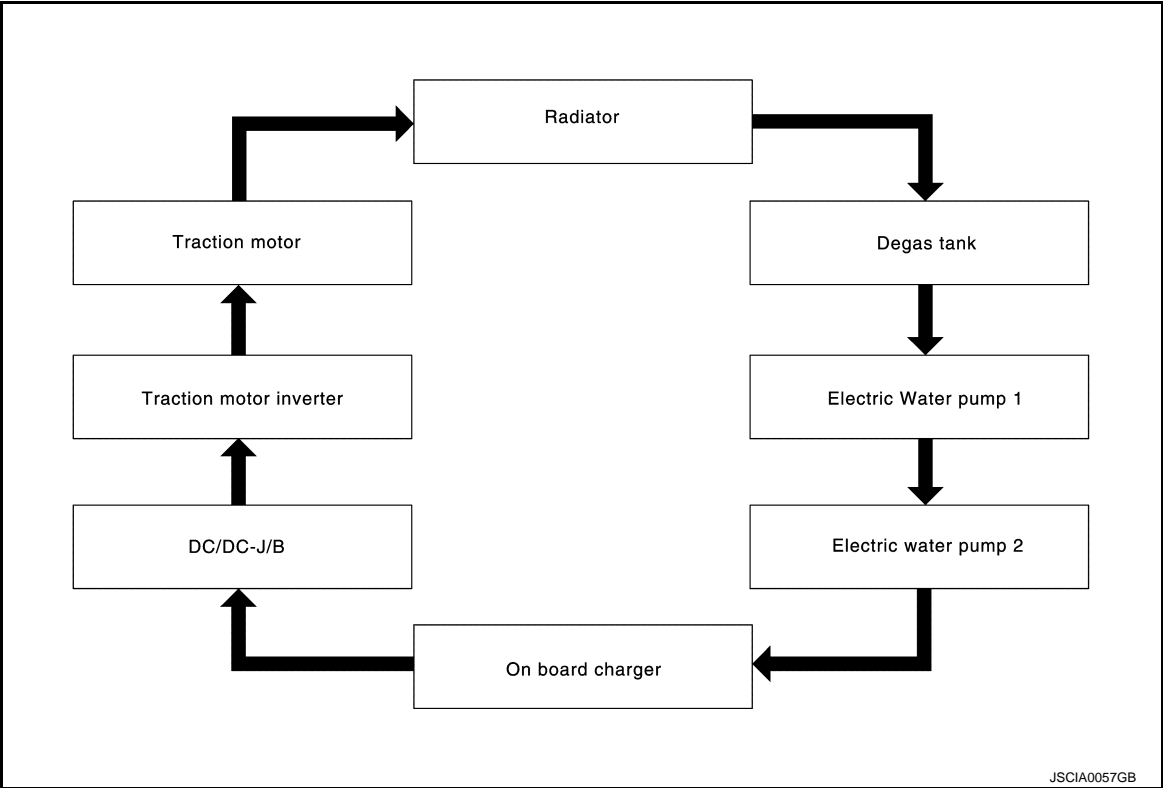
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# SYSTEM

< SYSTEM DESCRIPTION >

## HIGH VOLTAGE COOLING SYSTEM SCHEMATIC





# RADIATOR

< BASIC INSPECTION >

## BASIC INSPECTION

### RADIATOR

#### Inspection

INFOID:000000007632894

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.
4. Blow air into the back side of radiator core vertically downward.
  - Use compressed air lower than 490 kPa (5 kg/cm<sup>2</sup>, 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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# OVERHEATING CAUSE ANALYSIS

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### OVERHEATING CAUSE ANALYSIS

#### Troubleshooting Chart

INFOID:000000007632895

Symptom		Check items		
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	—	
		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 coolant mixture ratio		—	
	Poor coolant quality		Coolant viscosity	
	Insufficient coolant	Coolant leakage	Cooling hose	Loose clamp
				Cracked hose
			Water pump	Poor sealing
			Degas 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			
Degas tank	Cracked degas tank			
Except cooling system parts malfunction	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		

# COOLANT

< PERIODIC MAINTENANCE >

## PERIODIC MAINTENANCE

### COOLANT

#### Inspection

INFOID:000000007632896

#### COOLANT AMOUNT INSPECTION

- When coolant temperature is low (about 50°C or less), confirm that the coolant level of the reservoir tank is in the range from MIN (B) to MAX (A).

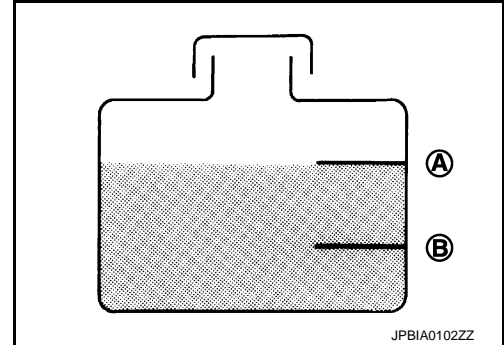
**A** : MAX

**B** : MIN

- Adjust level if it is outside the range.

**CAUTION:**

- Refill Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent in its quality mixed with water (distilled or demineralized). Refer to [MA-13, "FOR NORTH AMERICA : Fluids and Lubricants"](#)
- Confirm that the reservoir tank cap is tightened.



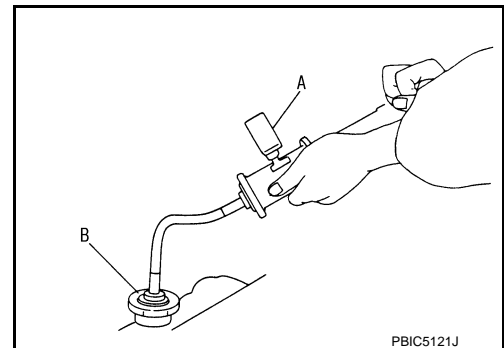
#### LEAKAGE CHECK

- Apply pressure to the cooling system using radiator cap tester (A) (commercial service tool). Check system for coolant leakage.

**Maximum pressure** : Refer to [HCO-27, "Radiator"](#).

**CAUTION:**

- Remove the degas tank cap when coolant temperature is low.
- Perform the inspection with the radiator filled with water.
- Use hose adapter (B) (commercial service tool) between radiator cap tester (A) (commercial service tool) and the filler neck so that the degas tank filler neck is not deformed.
- Be sure to observe the maximum pressure standards. Otherwise, radiator may be damaged.
- If there is a malfunction, repair and replace applicable part.



#### Draining and Refilling

INFOID:000000007632897

**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-13, "FOR NORTH AMERICA : Fluids and Lubricants"](#)

#### DRAIN

**CAUTION:**

- Be sure to drain when coolant temperature is cold.
- This should be performed so that coolant does not come in contact with surrounding parts.

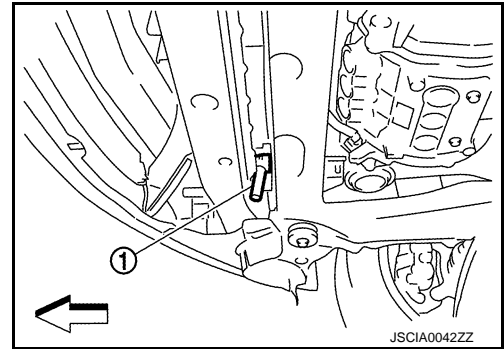
# COOLANT

## < PERIODIC MAINTENANCE >

1. Remove Li-ion battery undercover, radiator drain plug (1) and degas tank cap and drain coolant.

↔ : Vehicle front

2. Remove reservoir tank and drain the coolant as per the following procedure.
  1. Remove radiator upper grille cover.
  2. Remove reservoir tank hose and reservoir tank mounting bolts.
  3. Pull out the lower reservoir tank toward vehicle front. Remove the insertion area and raise the tank for removal.



## REFILLING

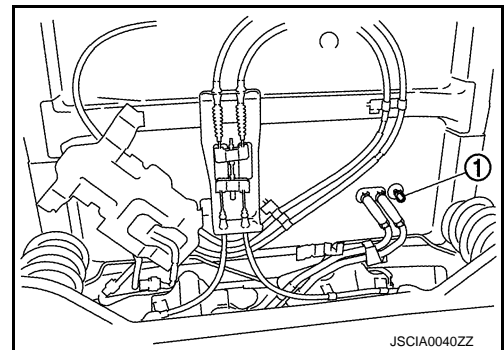
1. Install reservoir tank. (Install in the reverse order of removal.)
2. Install radiator drain plug.

### **CAUTION:**

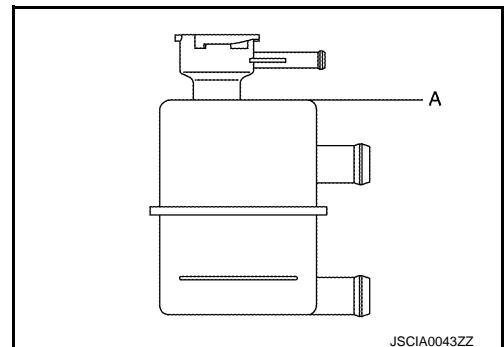
**Be sure to clean drain plug and install with new O-ring.**

**Tightening torque** : Refer to [HCO-15, "Exploded View"](#).

3. Check tightening of hose clamp.
4. Remove bleeder plug (1) of the on board charger.



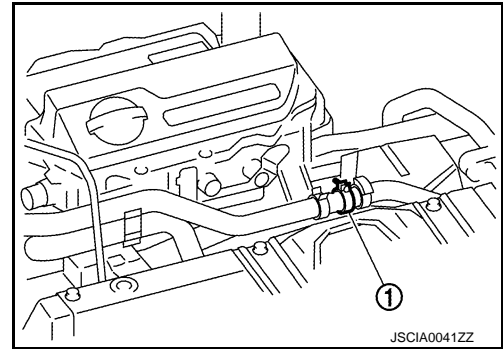
5. Fill coolant to line (A) from the degas tank cap.



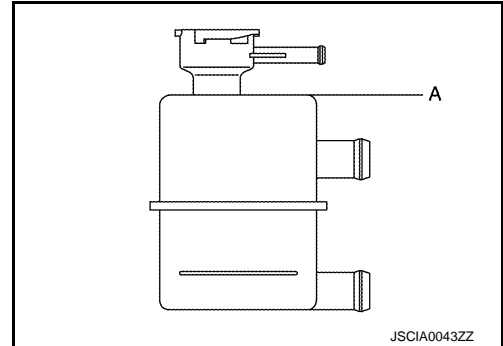
# COOLANT

## < PERIODIC MAINTENANCE >

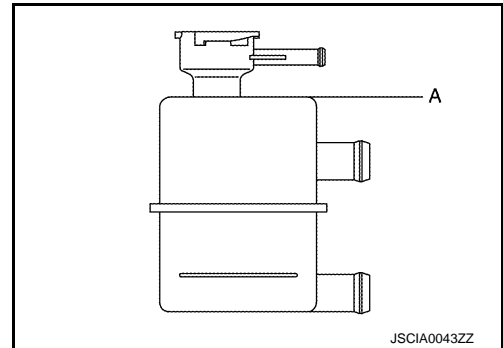
6. Remove the hose joint (1) at the traction motor inverter front and bleed air. Check coolant flow visually and reconnect the hose.



7. Fill coolant to line (A) from the degas tank cap.



8. Close the bleeder plug of the on board charger and close the degas tank cap.
9. Set the vehicle to READY and operate the electric water pump.
10. When the degas tank level is low, open the degas tank cap and refill the tank with coolant to line (A).



11. When the level is not lowered, close the degas tank cap and turn OFF the power switch (stop the electric water pump).

### NOTE:

If the electric water pump is stopped with the degas tank open, coolant may be spilled.

12. Refill coolant to "MAX" line of reservoir tank.

## CHECK WATER FLOW SOUND

### CAUTION:

**Prior to check, be sure to close windows, doors, and hood, and turn off audio system and other electrical loads.**

1. Set the vehicle to READY and operate the electric water pump.
2. Operate the electric water pump for 1 minute.
3. Check if water flow sound can be heard from the back of the compartment (near the on board charger).
4. If water flow sound is heard, operate the electric water pump until it cannot be heard.
5. When water flow sound cannot be heard, fill the reservoir tank up to "MAX" line.

### CAUTION:

- Insufficient coolant may cause low power or stop of vehicle due to insufficient cooling of the traction motor inverter. Be sure to bleed air thoroughly.
- Never operate the electric water pump without coolant.

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# DEGAS TANK CAP

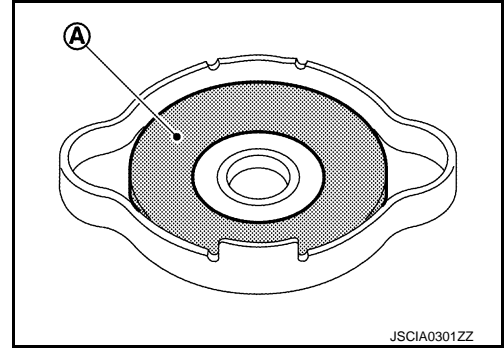
< PERIODIC MAINTENANCE >

## DEGAS TANK CAP

### Degas Tank Cap Inspection

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Visually check packing (A) of the degas tank cap for dirt and damage.



# RADIATOR

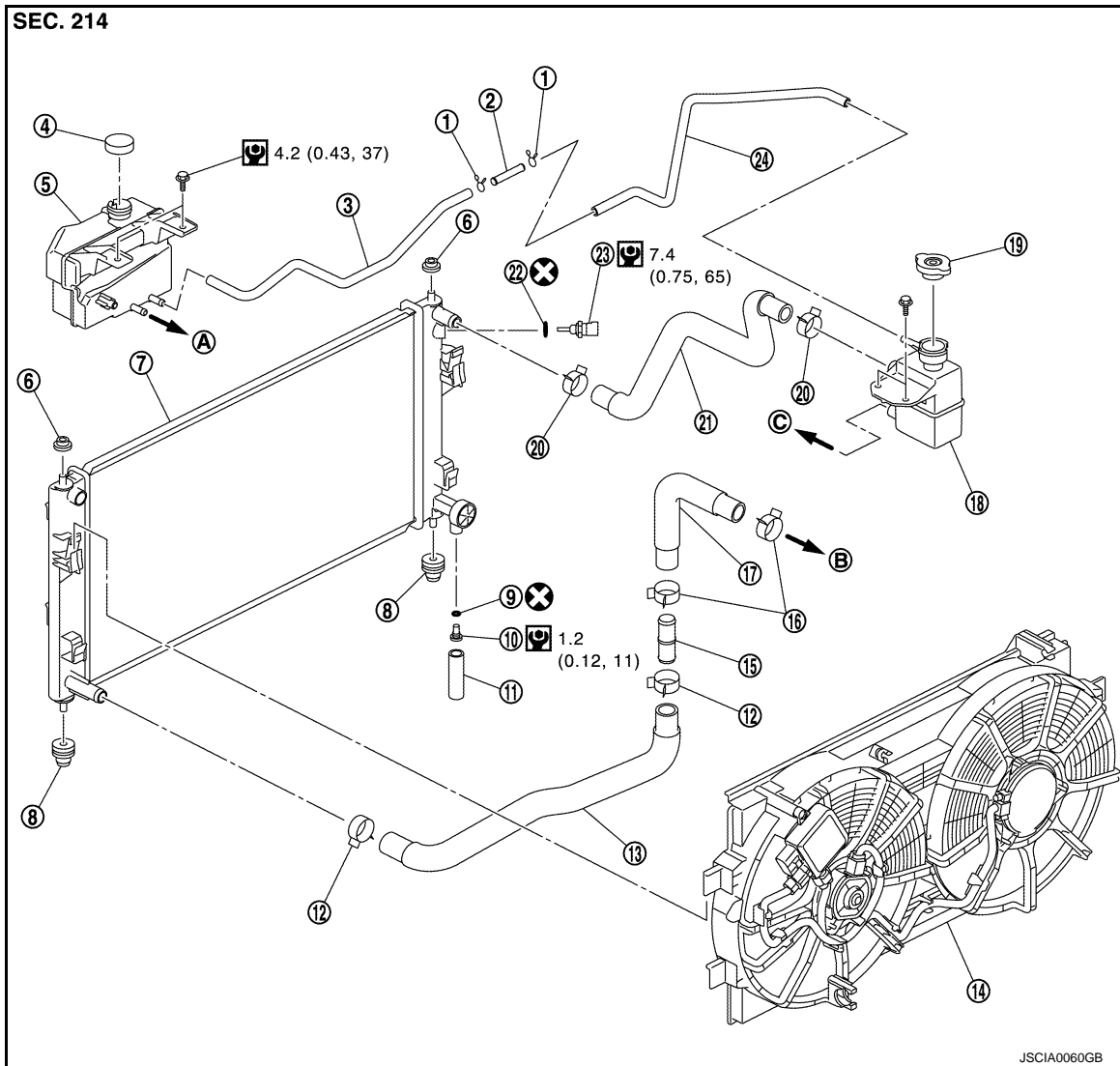
< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

### RADIATOR

Exploded View

INFOID:000000007632899



- |                           |                                   |                             |
|---------------------------|-----------------------------------|-----------------------------|
| 1. Clamp                  | 2. Adapter                        | 3. Reservoir tank hose      |
| 4. Reservoir tank cap     | 5. Reservoir tank                 | 6. Mounting rubber (upper)  |
| 7. Radiator               | 8. Mounting rubber (lower)        | 9. O-ring                   |
| 10. Drain plug            | 11. Water Drain tube              | 12. Clamp                   |
| 13. Radiator hose (lower) | 14. Radiator cooling fan assembly | 15. Adapter                 |
| 16. Clamp                 | 17. Water hose                    | 18. Degas tank              |
| 19. Degas tank cap        | 20. Clamp                         | 21. Radiator hose (upper)   |
| 22. O-ring                | 23. Water temperature sensor      | 24. Degas tank hose         |
| A. To degas tank (heater) | B. To traction motor              | C. To electric water pump 1 |

: N·m (kg-m, in-lb)

: Always replace after every disassembly.

# RADIATOR

## < REMOVAL AND INSTALLATION >

### Removal and Installation

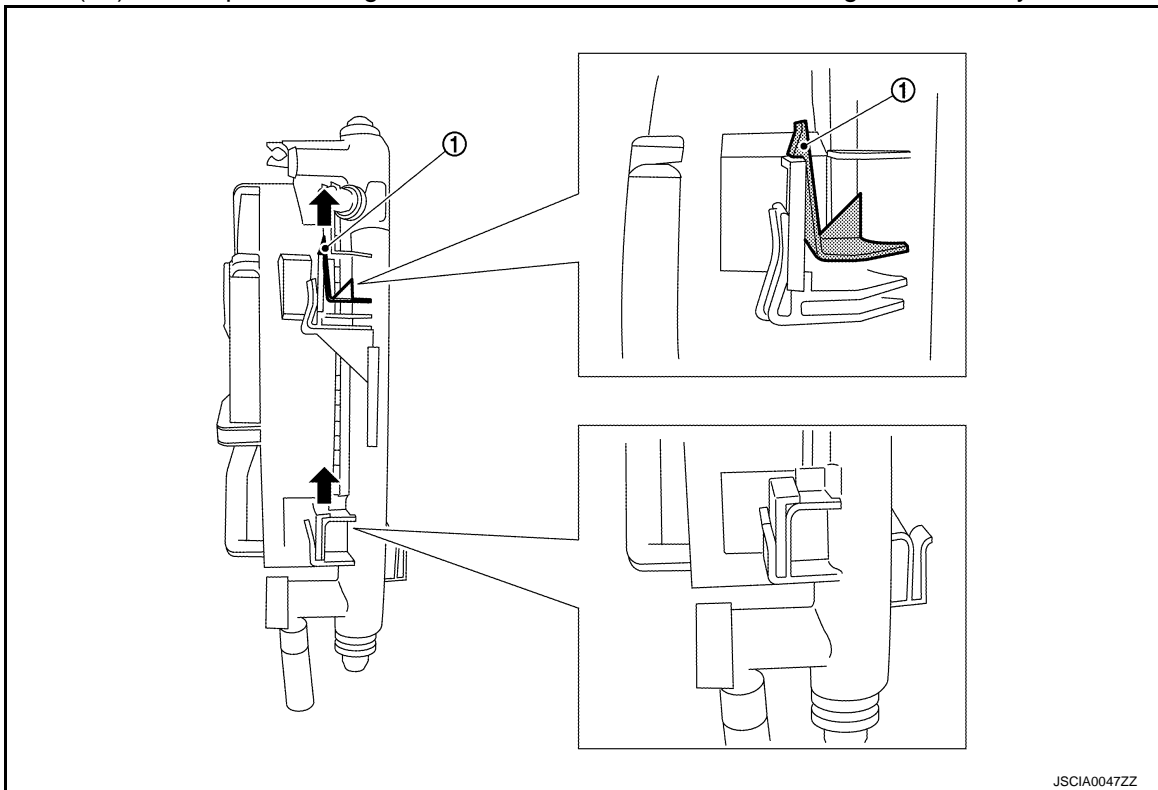
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#### REMOVAL

##### **WARNING:**

**Never remove the degas tank cap if a high voltage part including traction motor is hot. Hot liquid may spray out from the radiator, causing serious injury.**

1. Drain coolant from radiator drain plug. Refer to [HCO-11, "Draining and Refilling"](#).
2. Remove radiator core support upper. Refer to [DLK-141, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).
3. Remove radiator hoses (upper, lower) and reservoir tank hose. Refer to [HCO-15, "Exploded View"](#).
4. Remove cooling fan shroud with the following procedure.
  - a. Disconnect the harness between cooling fan and vehicle body at cooling fan control module.
  - b. While pressing left and right pawls (1) of the radiator, raise the radiator cooling fan assembly in upward direction (↑), and separate fitting of the radiator and the radiator cooling fan assembly.

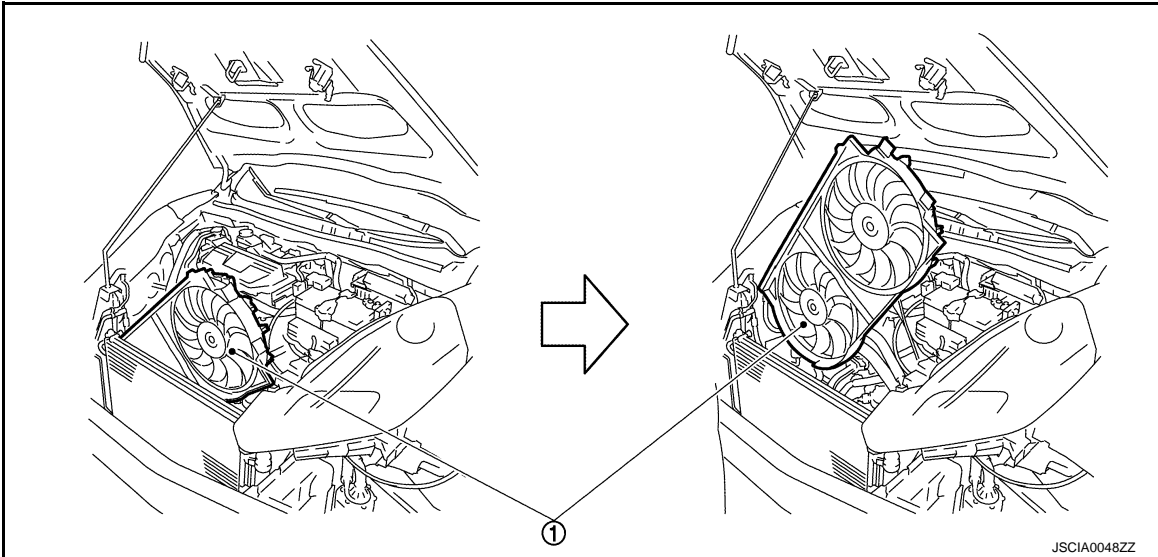




# RADIATOR

## < REMOVAL AND INSTALLATION >

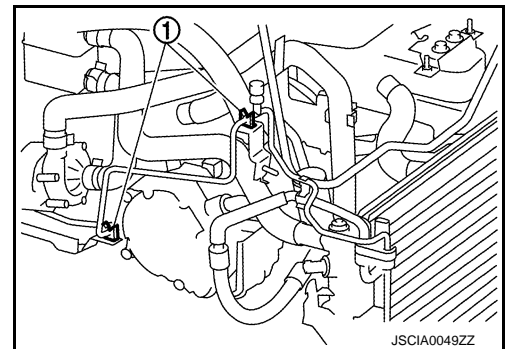
- c. Pull out and remove the cooling fan shroud with the left side of radiator cooling fan assembly (1) facing upward.



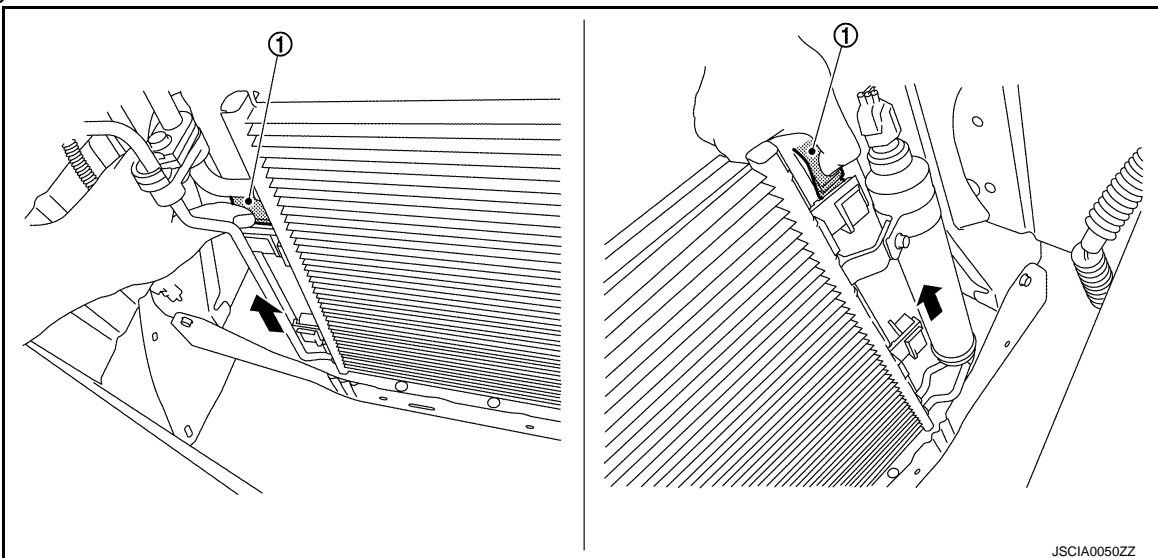
**CAUTION:**

**Be careful not to damage radiator core.**

5. Remove radiator assembly with the following procedure.  
a. Remove air conditioner pipe from clip (1). (2 positions)



- b. While pressing left and right pawls (1) of the radiator, raise the condenser upward (↕), and separate fitting of the radiator and the condenser.



**CAUTION:**

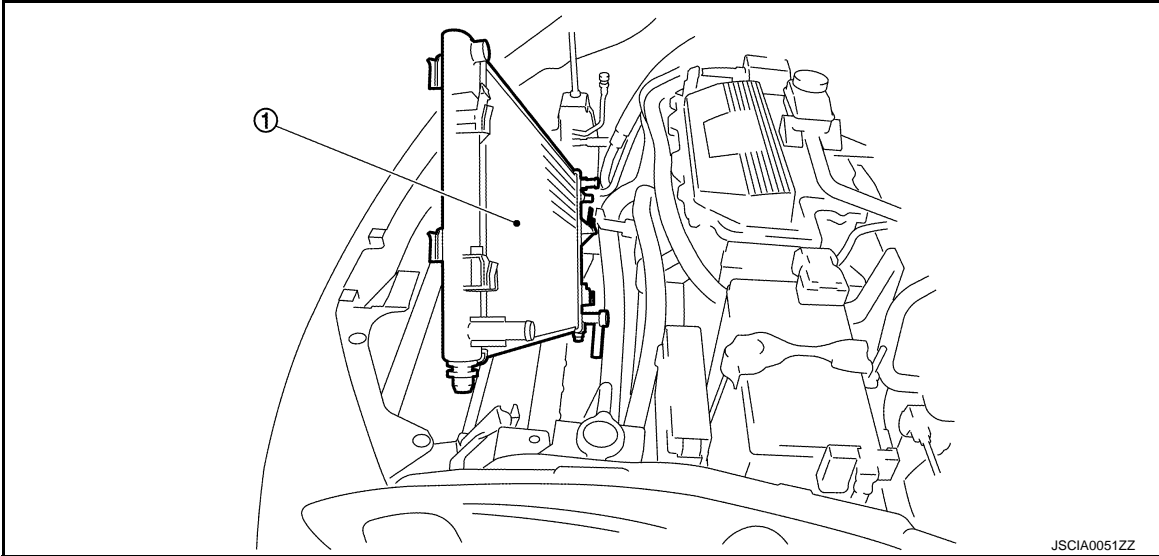
**Since the piping of air conditioner may be bent, never lift condenser more than necessary.**

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# RADIATOR

## < REMOVAL AND INSTALLATION >

- c. Pull out and remove the radiator with the left side of radiator (1) facing upward.



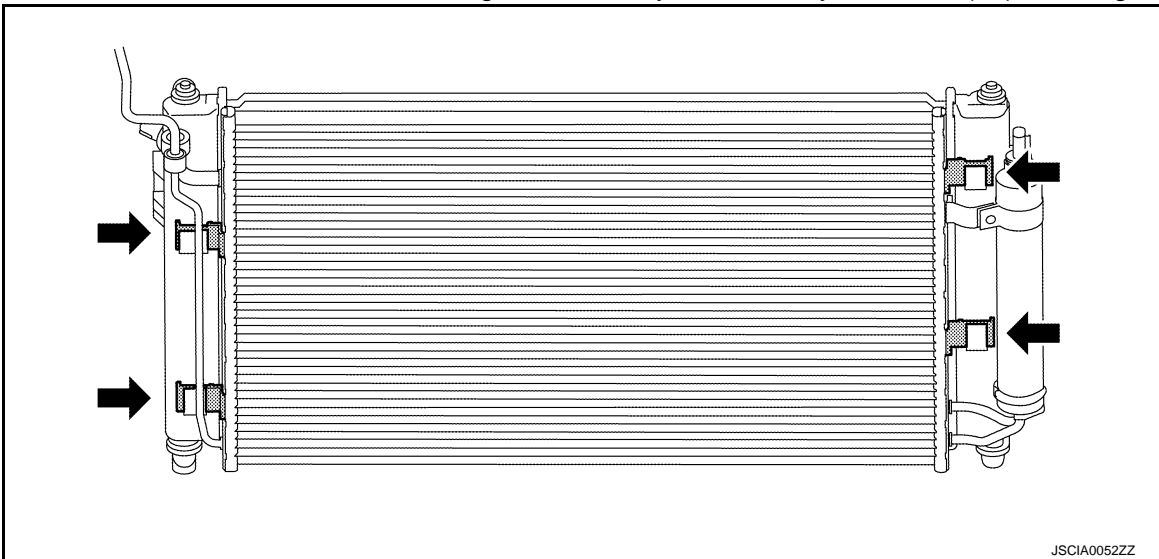
JSCIA0051ZZ

## INSTALLATION

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

### CAUTION:

- Do not reuse O-rings.
- Be sure to perform the air bleeding. Refer to [HCO-11, "Draining and Refilling"](#).
- When the radiator is installed, insert the fitting area securely as shown by the arrow (←) in the figure.

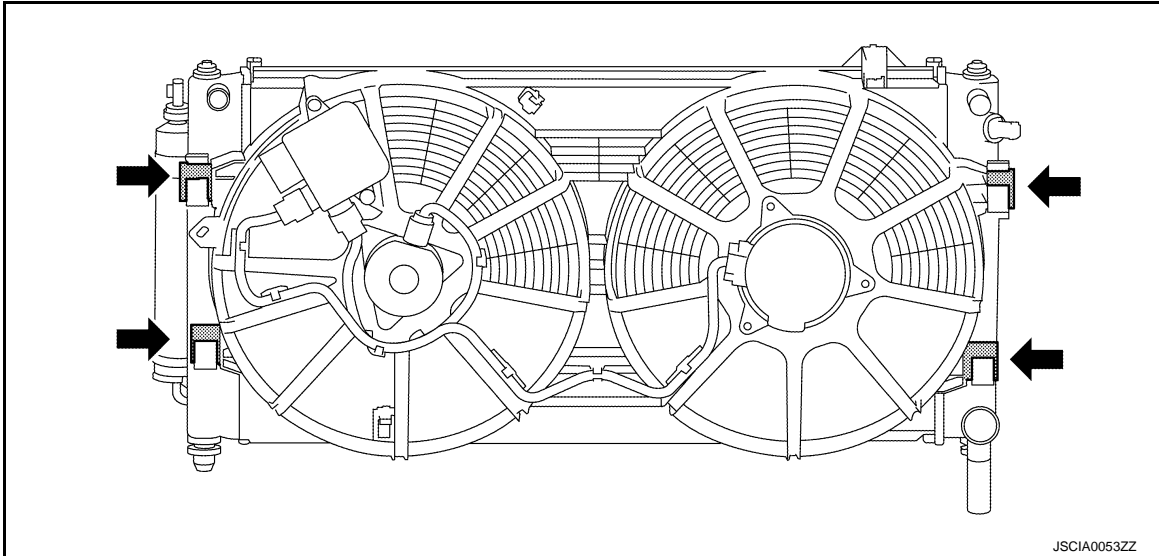


JSCIA0052ZZ

# RADIATOR

## < REMOVAL AND INSTALLATION >

- When the radiator cooling fan assembly is installed, insert the fitting area securely as shown by the arrow (←) in the figure.



## Inspection

INFOID:000000007632901

### INSPECTION AFTER INSTALLATION

- Check that the reservoir tank cap and the degas tank cap are tightened.
- With a radiator cap tester (commercial service tool), check that there is no leakage of coolant. [HCO-11. "Inspection"](#).
- Start the electric pump, and check the joints for coolant leakage.

A  
B  
HCO  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P

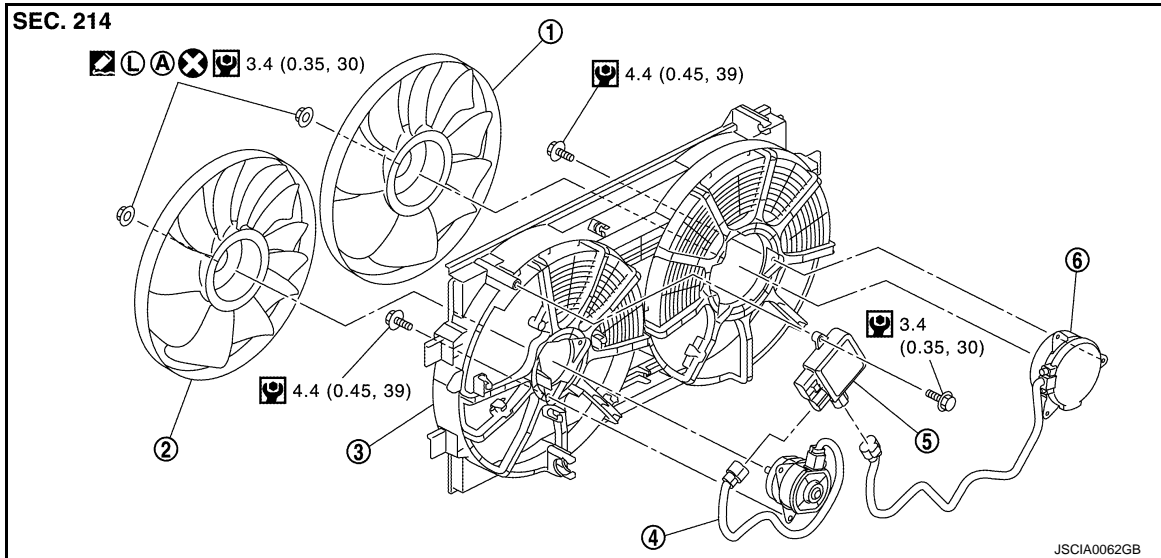
# COOLING FAN

< REMOVAL AND INSTALLATION >

## COOLING FAN

### Exploded View

INFOID:000000007632902



- |                           |                               |                           |
|---------------------------|-------------------------------|---------------------------|
| 1. Cooling fan (RH)       | 2. Cooling fan (LH)           | 3. Fan shroud             |
| 4. Cooling fan motor (LH) | 5. Cooling fan control module | 6. Cooling fan motor (RH) |

A: Apply on cooling fan motor shaft

: Apply high strength thread locking sealant or equivalent.

: N·m(kg·m, in·lb)

: Always replace after every disassembly.

### Removal and Installation

INFOID:000000007632903

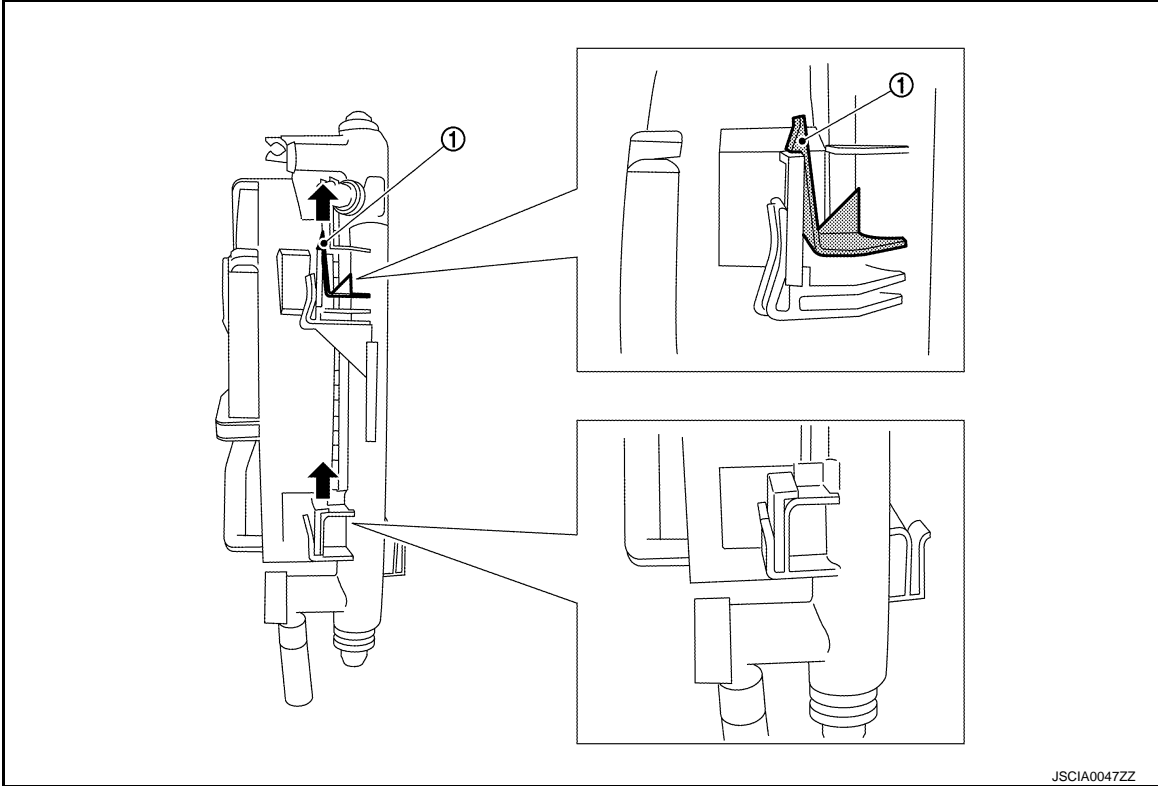
#### REMOVAL

1. Remove radiator core support upper. Refer to [DLK-141, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).
2. Remove water hose bracket from front side of traction motor inverter. Refer to [HCO-23, "Exploded View"](#).
3. Remove radiator cooling fan assembly with the following procedure.
  - a. Disconnect the harness between cooling fan and vehicle body at cooling fan control module.

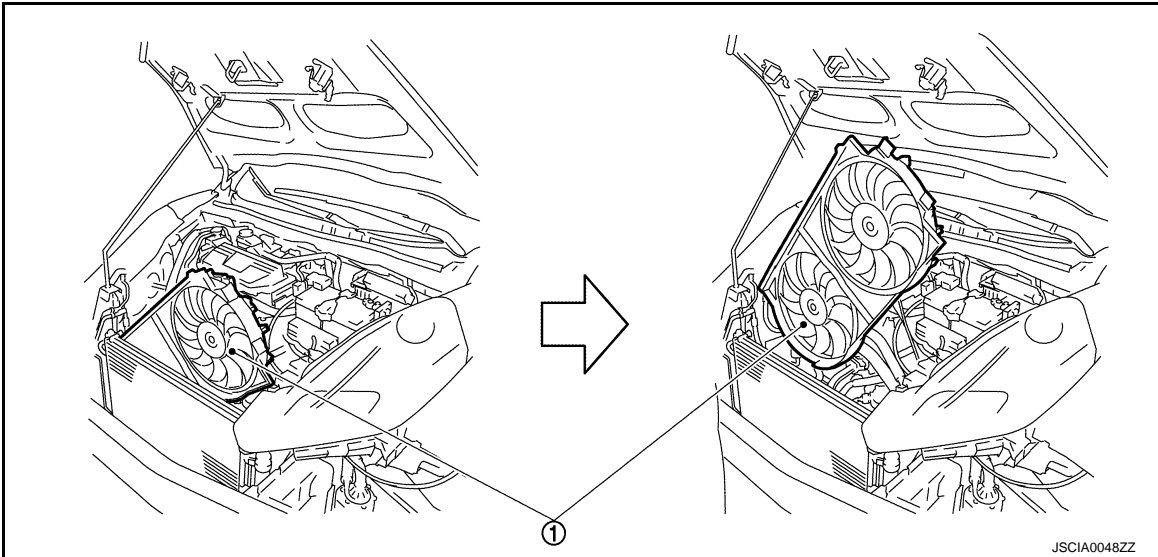
# COOLING FAN

## < REMOVAL AND INSTALLATION >

- b. While pressing left and right pawls (1) of the radiator, raise the radiator cooling fan assembly in upward direction (↕), and separate fitting of the radiator and the radiator cooling fan assembly.



- c. Pull out and remove the cooling fan shroud with the left side of cooling fan shroud (1) facing upward.



**CAUTION:**

**Be careful not to damage radiator core.**

### INSTALLATION

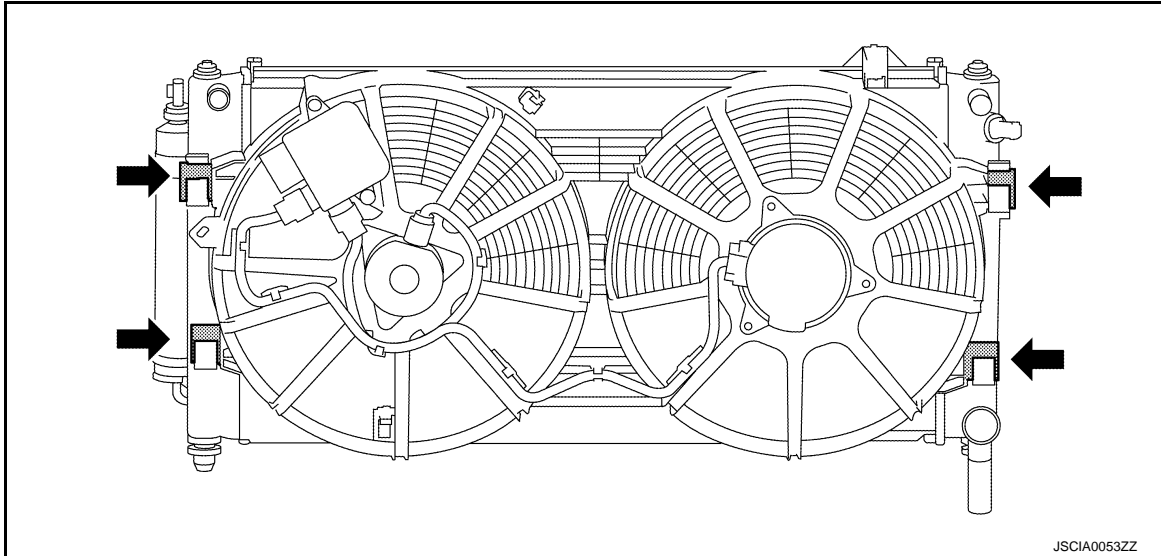
Note the following, and install in the reverse order of removal.

A  
B  
HCO  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P

# COOLING FAN

## < REMOVAL AND INSTALLATION >

- When the radiator cooling fan assembly is installed, insert the fitting area securely as shown by the arrow (←) in the figure.



## Disassembly and Assembly

INFOID:000000007632904

### DISASSEMBLY

1. Disconnect sub-harness from cooling fan motor and cooling fan control module.
2. Remove cooling fan control module from fan shroud.  
**CAUTION:**  
**Handle cooling fan control module carefully and never subjecting it to impact.**
3. Remove cooling fan mounting nuts, and then remove the fan.
4. Remove cooling fan motor.
  - Identify installation position of each valve. Arrange removed valves so that they cannot be mixed up.

### ASSEMBLY

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

#### **CAUTION:**

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

- If cooling fan motor is reused, install in its original position.
- Install each fan in the following position.

**Right side : 9 blades**

**Left side : 11 blades**

- Apply thread locking adhesive to the threads of the cooling fan motor shaft and tighten fan mounting nuts.
- Secure the sub-harness tightly to the fan shroud to prevent it from interfering with the fan rotation area.

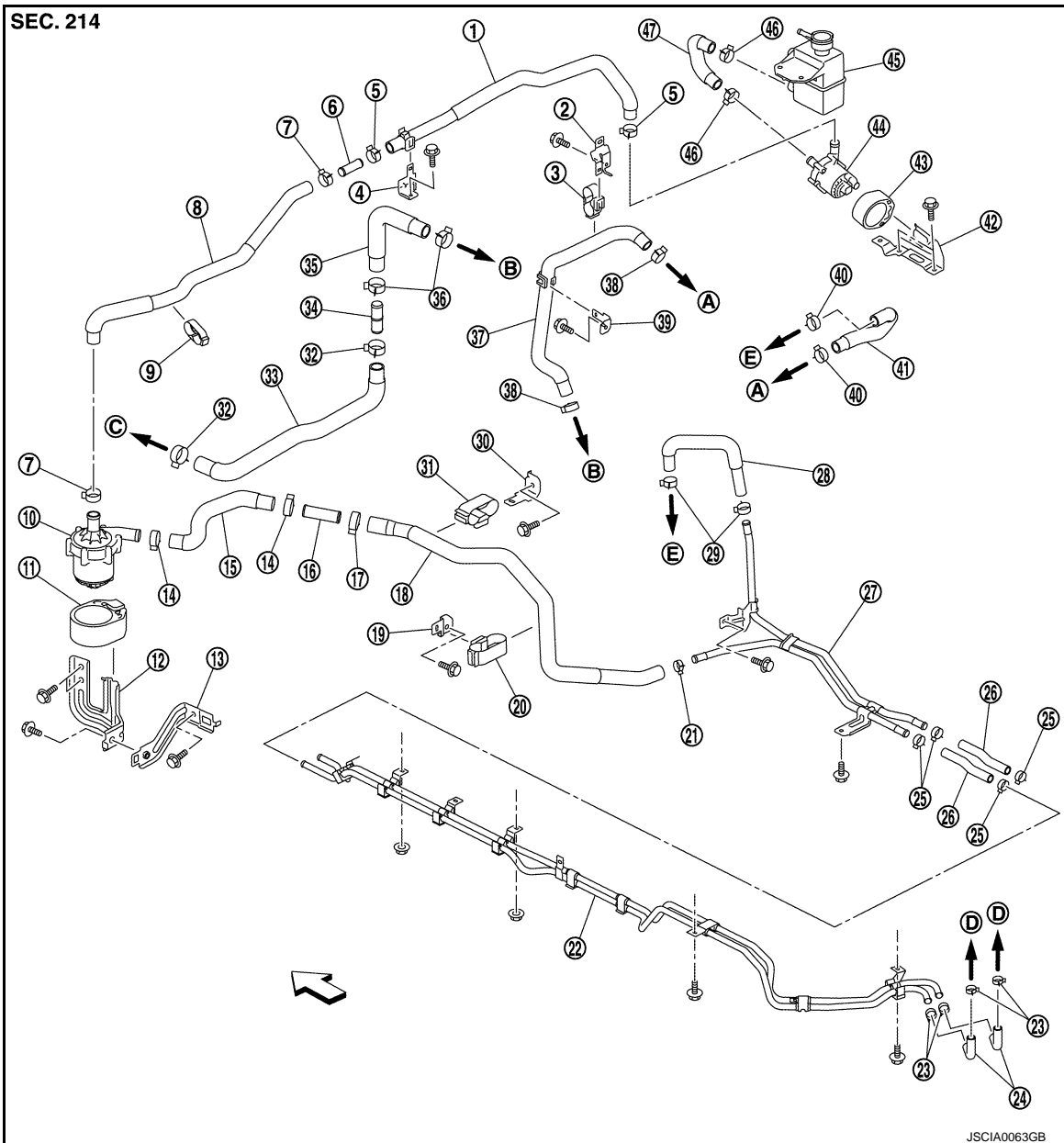
# WATER PUMP

< REMOVAL AND INSTALLATION >

## WATER PUMP

Exploded View

INFOID:000000007632905



A

B

HCO

D

E

F

G

H

I

J

K

L

M

N

O

P

- |                           |                     |                  |
|---------------------------|---------------------|------------------|
| 1. Water hose             | 2. Bracket          | 3. Hose clip     |
| 4. Bracket                | 5. Clamp            | 6. Adapter       |
| 7. Clamp                  | 8. Water hose       | 9. Hose clip     |
| 10. Electric water pump 2 | 11. Mounting rubber | 12. Pump bracket |
| 13. Bracket               | 14. Clamp           | 15. Water hose   |
| 16. Adapter               | 17. Clamp           | 18. Water hose   |
| 19. Bracket               | 20. Hose clip       | 21. Clamp        |
| 22. Water pipe            | 23. Clamp           | 24. Water hose   |
| 25. Clamp                 | 26. Water hose      | 27. Water pipe   |
| 28. Water hose            | 29. Clamp           | 30. Bracket      |
| 31. Hose clip             | 32. Clamp           | 33. Water hose   |
| 34. Adapter               | 35. Water hose      | 36. Clamp        |

# WATER PUMP

## < REMOVAL AND INSTALLATION >

37. Water hose	38. Clamp	39. Bracket
40. Clamp	41. Water hose	42. Pump bracket
43. Mounting rubber	44. Electric water pump 1	45. Degas tank
46. Clamp	47. Water hose	
A. To traction motor inverter	B. To traction motor	C. To radiator
D. To on board charger	E. To DC/DC-J/B	

⇐ : Vehicle front

## Removal and Installation

INFOID:000000007632906

### CAUTION:

Replace the electric water pump if it has been dropped or sustained an impact.

### REMOVAL

#### Water Pump 1 (Right)

1. Drain coolant from radiator. Refer to [HCO-11, "Draining and Refilling"](#).  
**CAUTION:**  
Perform the operation when the motor is cold.
2. Remove the connector and water hose of the water pump.  
**CAUTION:**
  - Take care that coolant does not contact the high voltage harness connectors.
  - If coolant contacts a high voltage harness connector, immediately use an air blow and fully remove the liquid.
3. Remove bolts, and remove the electric water pump together with bracket.  
**CAUTION:**
  - Take care that coolant does not contact the high voltage harness connectors.
  - If coolant contacts a high voltage harness connector, immediately use an air blow and fully remove the liquid.

#### Water Pump 2 (Left)

1. Remove the left fender protector. Refer to [EXT-21, "FENDER PROTECTOR : Removal and Installation"](#).
2. Drain coolant from radiator. Refer to [HCO-11, "Draining and Refilling"](#).  
**CAUTION:**  
Perform the operation when the motor is cold.
3. Remove the connector of the water pump.
4. Remove the connector and water hose of the water pump.
5. Remove bolts, and remove the electric water pump together with bracket.

### INSTALLATION

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

### CAUTION:

- When installing the water hose to electric water pump, be sure to hold the electric water pump by hand.
- Be sure to perform the air bleeding. Refer to [HCO-11, "Draining and Refilling"](#).



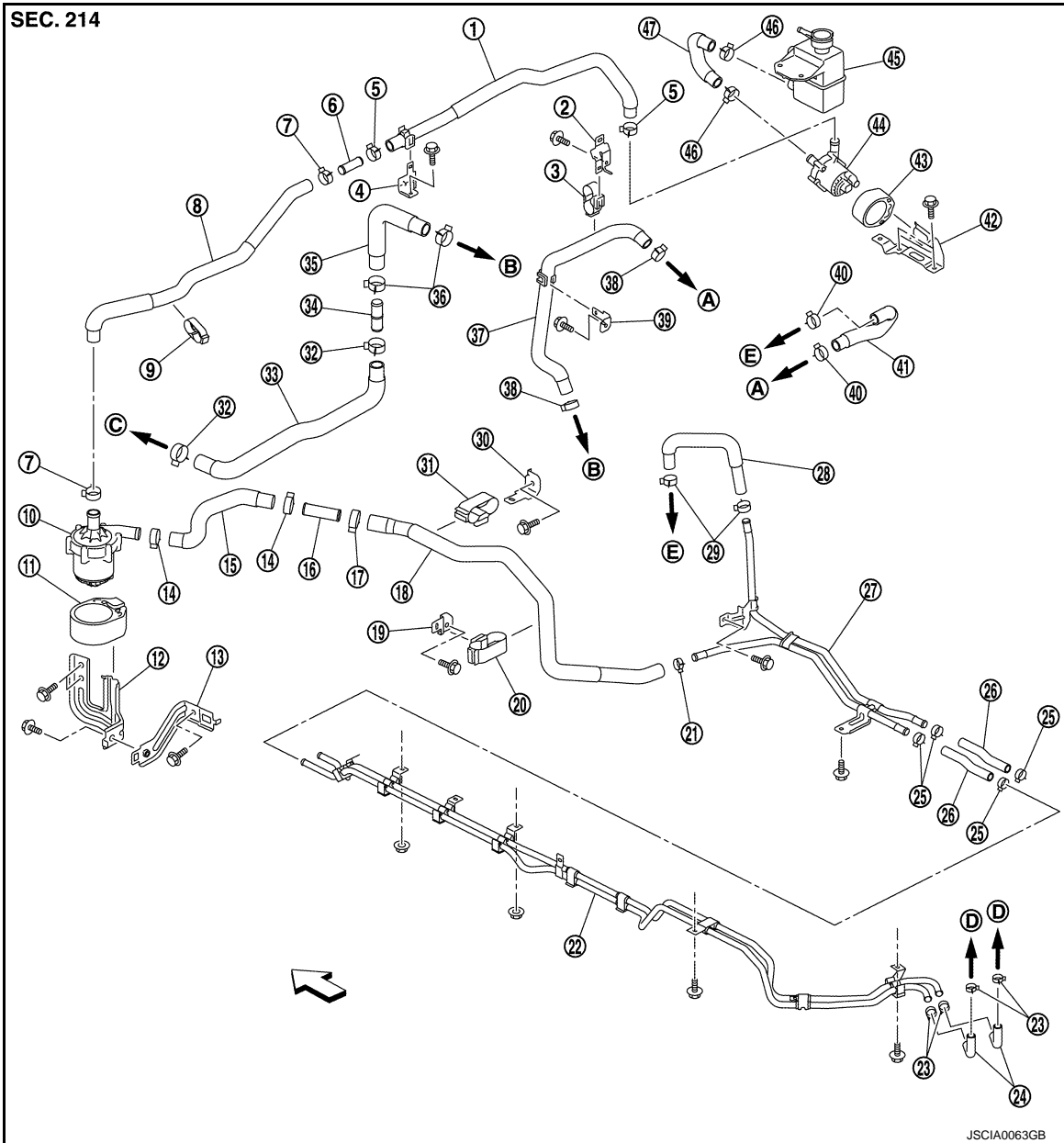
# WATER HOSE AND PIPING

< REMOVAL AND INSTALLATION >

## WATER HOSE AND PIPING

Exploded View

INFOID:000000007632907



A

B

**HCO**

D

E

F

G

H

I

J

K

L

M

N

O

P

- |                           |                     |                  |
|---------------------------|---------------------|------------------|
| 1. Water hose             | 2. Bracket          | 3. Hose clip     |
| 4. Bracket                | 5. Clamp            | 6. Adapter       |
| 7. Clamp                  | 8. Water hose       | 9. Hose clip     |
| 10. Electric water pump 2 | 11. Mounting rubber | 12. Pump bracket |
| 13. Bracket               | 14. Clamp           | 15. Water hose   |
| 16. Adapter               | 17. Clamp           | 18. Water hose   |
| 19. Bracket               | 20. Hose clip       | 21. Clamp        |
| 22. Water pipe            | 23. Clamp           | 24. Water hose   |
| 25. Clamp                 | 26. Water hose      | 27. Water pipe   |
| 28. Water hose            | 29. Clamp           | 30. Bracket      |
| 31. Hose clip             | 32. Clamp           | 33. Water hose   |
| 34. Adapter               | 35. Water hose      | 36. Clamp        |

## WATER HOSE AND PIPING

### < REMOVAL AND INSTALLATION >

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- |                               |                           |                  |
|-------------------------------|---------------------------|------------------|
| 37. Water hose                | 38. Clamp                 | 39. Bracket      |
| 40. Clamp                     | 41. Water hose            | 42. Pump bracket |
| 43. Mounting rubber           | 44. Electric water pump 1 | 45. Degas tank   |
| 46. Clamp                     | 47. Water hose            |                  |
| A. To traction motor inverter | B. To traction motor      | C. To radiator   |
| D. To on board charger        | E. To DC/DC-J/B           |                  |
- ⇐ : Vehicle front

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### Periodical Maintenance Specification

INFOID:0000000007632908

#### COOLANT CAPACITY (APPROXIMATE)

Unit: ℓ (US qt, Imp qt)

Coolant capacity (With reservoir tank at "MAX" level)	6.6 (7, 5-6/8)
Reservoir tank coolant capacity (At "MAX" level)	0.8 (7/8, 6/8)

#### Radiator

INFOID:0000000007632909

Unit: kPa (kg/cm<sup>2</sup>, psi)

Leakage testing pressure	32 (0.3, 5)
--------------------------	-------------

A  
B  
HCO  
D  
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F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P