SECTION CO
ENGINE COOLING SYSTEM

CONTENTS

QR25DE

VQ35DE

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

EBS00J7B

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 and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Liquid Gasket

EBS00M84

REMOVAL OF LIQUID GASKET SEALING

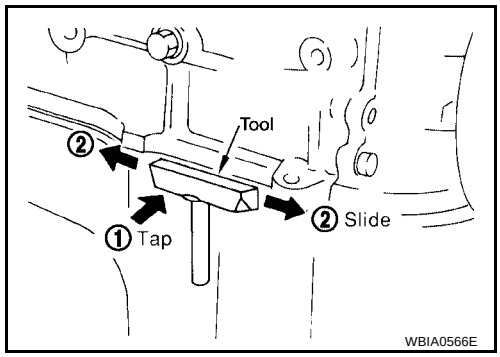
- After removing nuts and bolts, separate the mating surface, using Tool and remove old liquid gasket sealing.

Tool number : KV10111100 (J-37228)

CAUTION:
Be careful not to damage the mating surfaces.

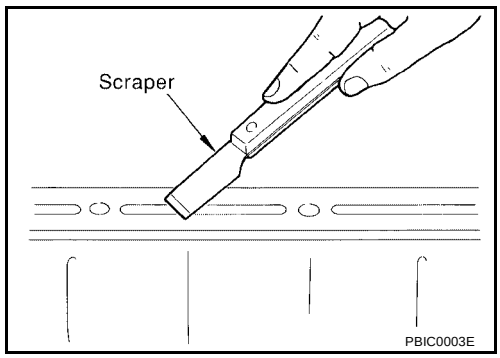
- Tap Tool to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where Tool is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

CAUTION:
If for some unavoidable reason suitable tool such as screwdriver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

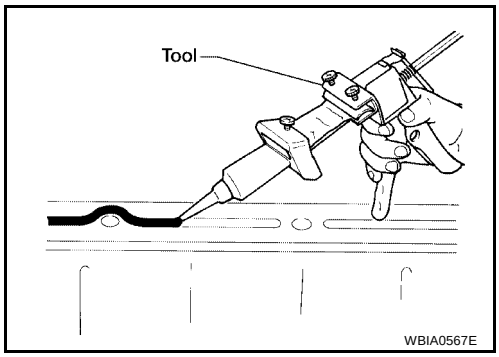
1. Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface, Using scraper.
   - Remove liquid gasket completely from the groove of the liquid gasket application surface, bolts, and bolt holes.
2. Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign materials.



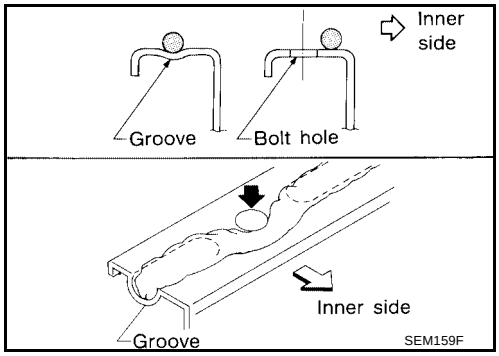
3. Attach liquid gasket tube to Tool.

Tool number : WS39930000 (—)

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .



4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for the liquid gasket application, apply liquid gasket to the groove.
   - As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten nuts or bolts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



CAUTION:

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

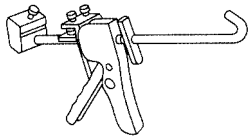
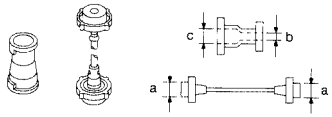
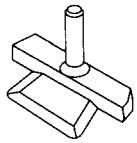
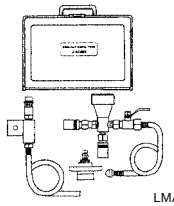
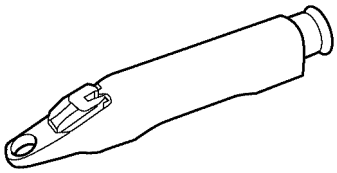
PREPARATION

PFP:00002

Special Service Tools

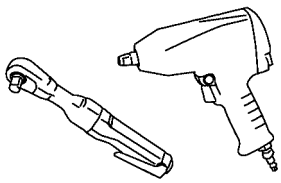
EBS00J7D

The actual shape of the Kent-Moore tools may differ from those tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
WS39930000 (—) Tube presser  S-NT052	Pressing the tube of liquid gasket
EG17650301 (J-33984-A) Radiator cap tester adapter  S-NT564	Adapting radiator cap tester to radiator filler neck: **a: 28 (1.10) dia.** **b: 31.4 (1.236) dia.** **c: 41.3 (1.626) dia.** Unit: mm (in)
KV10111100 (J-37228) Seal cutter  NT046	Removing chain tensioner cover and water pump cover
KV991J0070 (J-45695) Coolant Refill Tool  LMA053	Refilling engine cooling system
— (J-23688) Engine coolant refractometer  WBIA0539E	Checking concentration of ethylene glycol in engine coolant

Commercial Service Tools

EBS00J7E

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

OVERHEATING CAUSE ANALYSIS

PFP:00012

Troubleshooting Chart

EBS00J7F

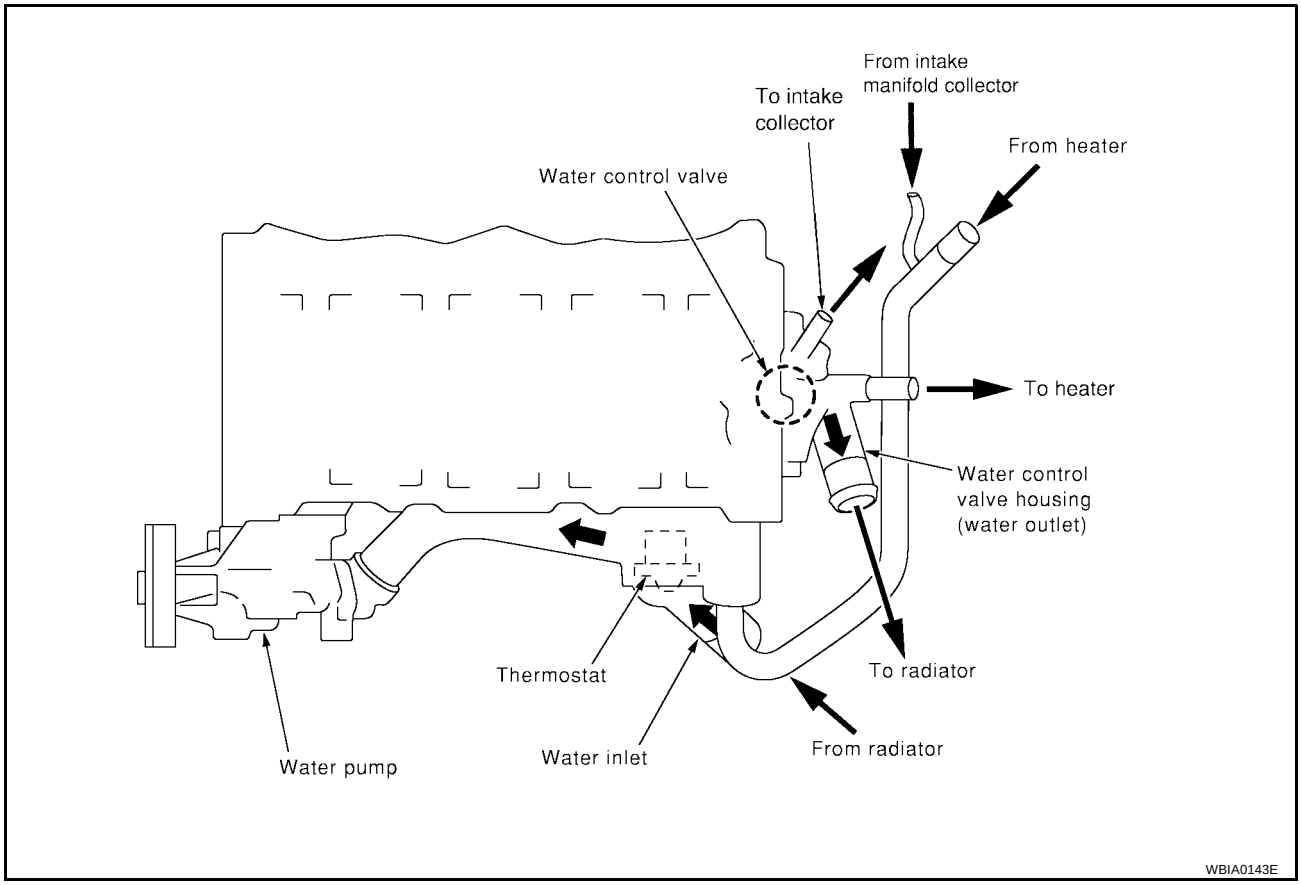
	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	Coolant circulation	
		Damaged fins	Dust contamination or rock clogging	
			Mechanical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Cooling fan does not operate	Engine cooling fans	—
		High resistance to fan rotation		
		Damaged fan blades		
	Damaged radiator shroud	—	—	—
	Improper coolant mixture ratio	—	—	—
	Poor coolant quality	—	Periodic maintenance	—
	Insufficient coolant	Coolant leaks	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 leaks into cooling system	Cylinder head deterioration
				Cylinder head gasket deterioration
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load
				Driving in low gear for extended time
				Driving at extremely high speed
			Powertrain system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes	
			Improper ignition timing	
	Blocked or restricted air flow	Blocked radiator grille	Installed car brassiere	—
		Blocked bumper	Mud contamination or paper clogging	
		Blocked radiator		
		Blocked condenser		
		Installed large fog lamp		

COOLING SYSTEM

PFP:21020

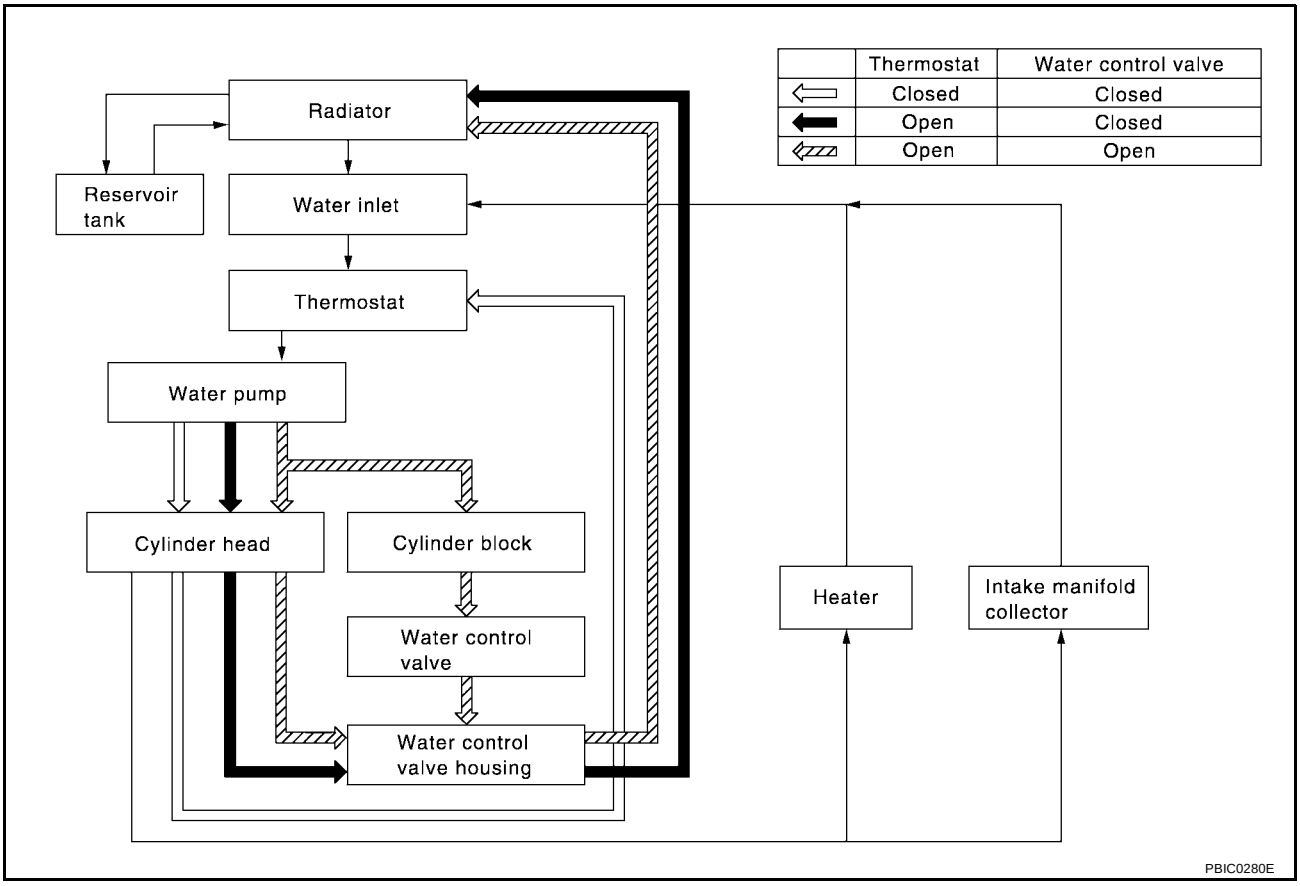
Cooling Circuit

EBS00J7G



System Drawing

EBS00M85



ENGINE COOLANT

PFP:KQ100

System Check

EBS00M86

WARNING:

- **Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure fluid escaping from the radiator.**
- **Wrap a thick cloth around the cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing down and turning it all the way.**

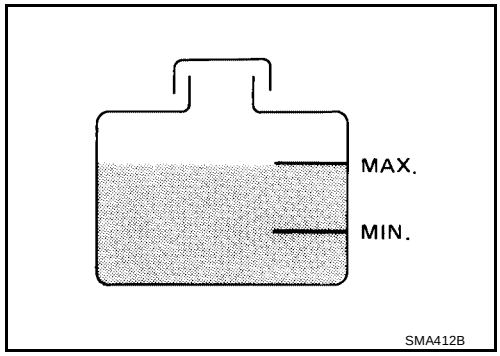
CHECKING COOLING SYSTEM HOSES

Check hoses for the following:

- Improper attachment
- Leaks
- Cracks
- Damage
- Loose connections
- Chafing
- Deterioration

CHECKING RESERVOIR LEVEL

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

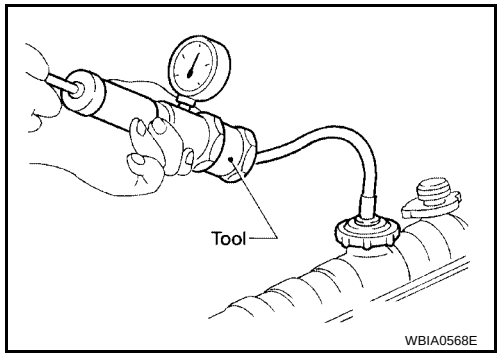


CHECKING COOLING SYSTEM FOR LEAKS

To check for leakage, apply pressure to the cooling system using Tool.

Tool number : EG17650301 (J-33984-A)

Testing pressure : 157 kPa (1.6 kg/cm^2 , 23 psi)



WARNING:

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

CAUTION:

Higher pressure than specified may cause radiator damage.

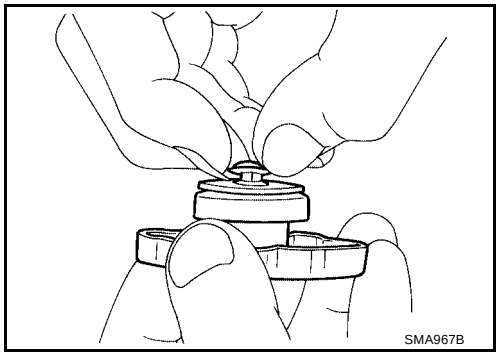
CHECKING RADIATOR CAP

1. Inspect the radiator cap.
   - Replace the cap if the metal plunger cannot be seen around the edge of the black rubber gasket.
   - Replace the cap if deposits of waxy residue or other foreign material are on the black rubber gasket or the metal retainer.

   NOTE:

   Thoroughly wipe out the radiator filler neck to remove any waxy residue or foreign material.

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


SMA967B

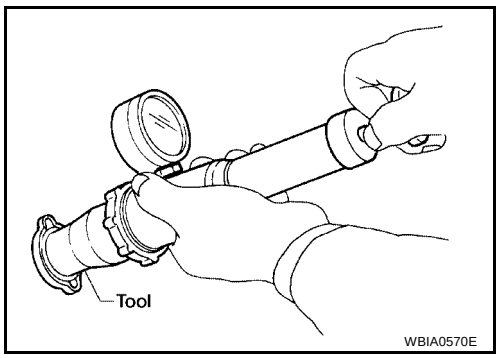
3. Check radiator cap relief pressure using Tool.

   Tool number : EG17650301 (J-33984-A)

   Standard: 78 – 98 kPa (0.8 – 1.0 kg/cm^2 , 11 – 14 psi)

   Limit: 59 kPa (0.6 kg/cm^2 , 9 psi)

   - When connecting the radiator cap to the tester, apply water or coolant to the cap seal surface.
   - Replace the radiator cap if there is an abnormality in the negative-pressure valve, or if the open-valve pressure is outside of the standard values.



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CHECKING RADIATOR

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

- Be careful not to bend or damage the radiator fins.
- When radiator is cleaned without removal, remove all surrounding parts such as cooling fan shroud and horns. Then tape the harness and electrical connectors to prevent water from entering.

1. Apply water by hose to the back side of the radiator core, with the hose pointed 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 the radiator.
4. Blow air into the back side of radiator core, with the air hose pointed vertically downward.

- Use compressed air lower than 490 kPa (5 kg/cm^2 , 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.
6. Check for leaks.

Changing Engine Coolant

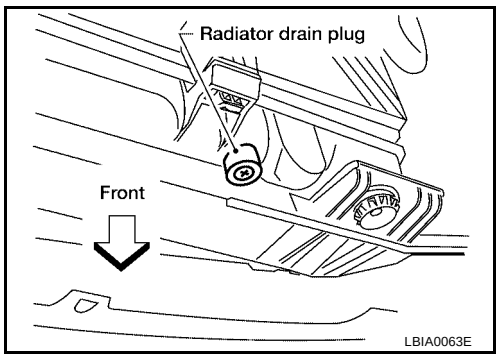
EBS00RBK

WARNING:

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

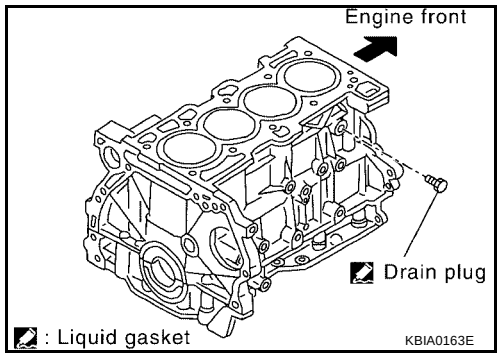
DRAINING ENGINE COOLANT

1. Remove the engine undercover using power tool.
2. Open the radiator drain plug at the bottom of the radiator, and remove the radiator filler cap. This is the only step required when partially draining the cooling system (radiator only).
   - Do not to allow the coolant to contact the drive belts.



LBIA0063E

3. Follow this step for heater core removal/replacement only. Disconnect the upper heater hose at the engine side and apply moderate air pressure [103.46 kPa (15 psi, 1.055 kg/cm^2) maximum air pressure] into the hose for 30 seconds to blow the excess coolant out of the heater core.
4. When draining all of the coolant in the system, remove the reservoir tank and drain the coolant, then clean the reservoir tank before installation.
5. When draining all of the coolant in the system for engine removal or repair, open the drain plug on the cylinder block.



6. Check the drained coolant for contaminants such as rust, corrosion or discoloration.
If the coolant is contaminated, flush the engine cooling system. Refer to CO-12, "FLUSHING COOLING SYSTEM" .

REFILLING ENGINE COOLANT

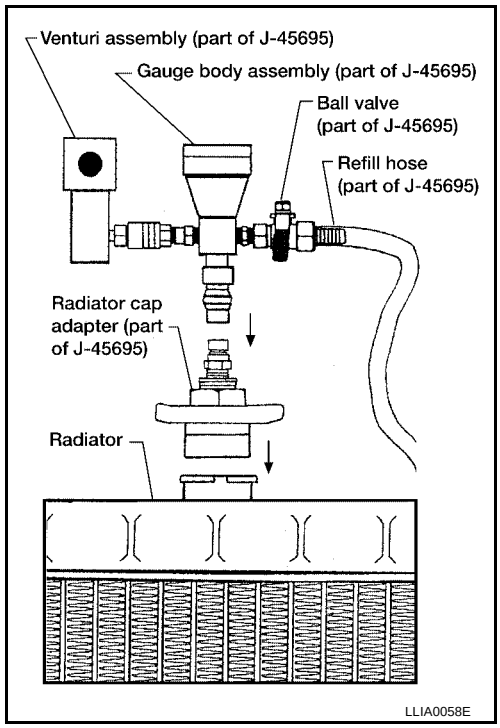
1. Install the radiator drain plug. Install the reservoir tank and cylinder block drain plug, if removed for a total system drain or for engine removal or repair.
   - **The radiator must be completely empty of coolant and water.**
   - **Apply sealant to the threads of the cylinder block drain plugs. Use Genuine High Performance Thread Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .**

   Radiator drain plug : Refer to CO-13, "Removal and Installation" .
   Cylinder block drain plug : Refer to EM-69, "Removal and Installation" .
2. If disconnected, reattach the upper radiator hose at the engine side.
3. Set the vehicle heater controls to the full HOT and heater ON position. Turn the vehicle ignition ON with the engine OFF as necessary to activate the heater mode.
4. Install the Tool by installing the radiator cap adapter onto the radiator neck opening. Then attach the gauge body assembly with the refill tube and the venturi assembly to the radiator cap adapter.

   Tool number : KV991J0070 (J-45695)
5. Insert the refill hose into the coolant mixture container that is placed at floor level. Make sure the ball valve is in the closed position.
   - **Use Genuine NISSAN Long Life Anti-freeze coolant or equivalent, mixed 50/50 with distilled water or demineralized water.**
     Refer to MA-14, "ANTI-FREEZE COOLANT MIXTURE RATIO".

   Engine coolant capacity (with reservoir tank) : Refer to MA-12, "Fluids and Lubricants" .
6. Install an air hose to the venturi assembly, the air pressure must be within specification.

   Compressed air supply pressure : 5.7 - 8.5 kPa (5.6 - 8.4 kg/cm^2 , 80 - 120 psi)

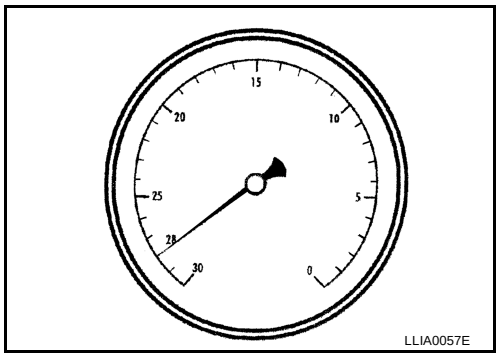


CAUTION:
The compressed air supply must be equipped with an air dryer.

7. The vacuum gauge will begin to rise and there will be an audible hissing noise. During this process open the ball valve on the refill hose slightly. Coolant will be visible rising in the refill hose. Once the refill hose is full of coolant, close the ball valve. This will purge any air trapped in the refill hose.

8. Continue to draw the vacuum until the gauge reaches 28 inches of vacuum. The gauge may not reach 28 inches in high altitude locations, refer to the vacuum specifications based on the altitude above sea level.

Altitude above sea level	Vacuum gauge reading
0 - 100 m (328 ft)	: 28 inches of vacuum
300 m (984 ft)	: 27 inches of vacuum
500 m (1,641 ft)	: 26 inches of vacuum
1,000 m (3,281 ft)	: 24 - 25 inches of vacuum



9. When the vacuum gauge has reached the specified amount, disconnect the air hose and wait 20 seconds to see if the system loses any vacuum. If the vacuum level drops, perform any necessary repairs to the system and repeat steps 6 - 8 to bring the vacuum to the specified amount. Recheck for any leaks.
10. Place the coolant container (with the refill hose inserted) at the same level as the top of the radiator. Then open the ball valve on the refill hose so the coolant will be drawn up to fill the cooling system. The cooling system is full when the vacuum gauge reads zero.

CAUTION:
Do not allow the coolant container to get too low when filling, to avoid air from being drawn into the cooling system.

11. Remove the Tool from the radiator neck opening.
12. Fill the cooling system reservoir tank to the specified level and install the radiator cap. Run the engine to warm up the cooling system and top up the system as necessary.

FLUSHING COOLING SYSTEM

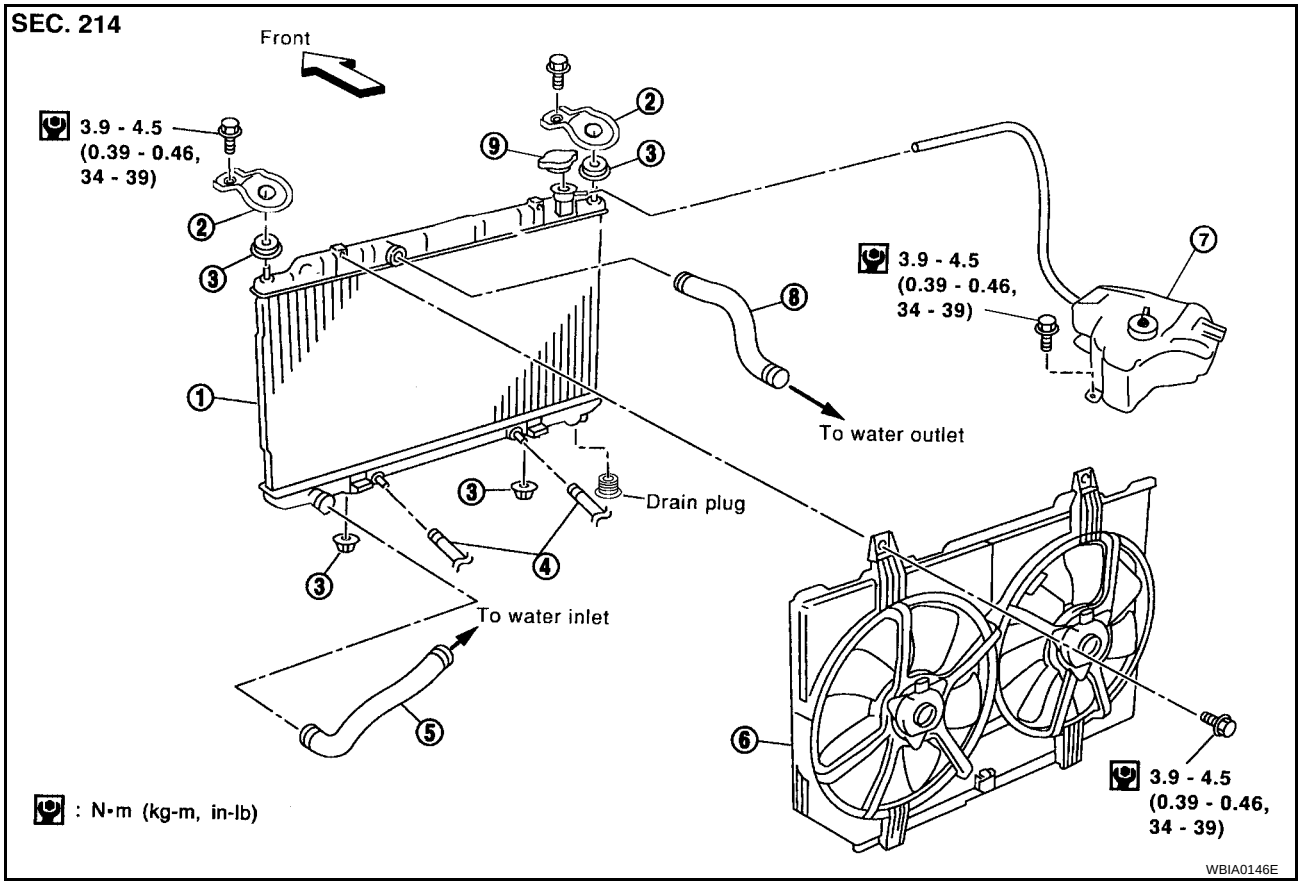
1. Fill the radiator from the filler cap above the radiator upper hose and reservoir tank, with water and reinstall the filler cap above the radiator upper hose.
2. Run the engine until it reaches normal operating temperature.
3. Press the engine accelerator two or three times under no-load.
4. Stop the engine and wait until it cools down.
5. Drain the water.
6. Repeat steps 1 through 5 until clear water begins to drain from the radiator.

RADIATOR

PFP:21400

Removal and Installation

EBS00J7J



1. Radiator	2. Bracket	3. Mounting rubber
4. A/T oil cooler hose (if equipped)	5. Radiator hose (lower)	6. Radiator fan assembly
7. Reservoir tank	8. Radiator hose (upper)	9. Radiator filler cap

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by turning it all the way.

REMOVAL

1. Drain the coolant from the radiator. Refer to CO-10, "DRAINING ENGINE COOLANT" .

   CAUTION:

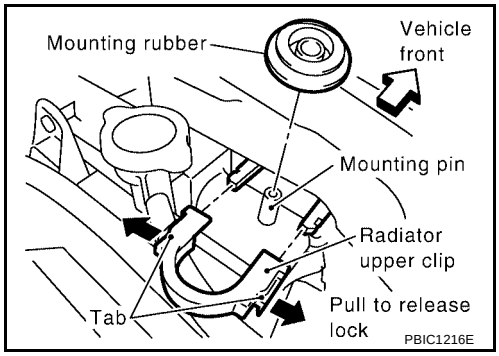
   Perform when engine is cold.
2. Remove fresh air duct. Refer to EM-118, "Removal and Installation" .
3. Disconnect radiator upper and lower hoses.
4. Remove the A/T fluid cooler hoses, if equipped.
   - Plug hoses to avoid leakage of A/T fluid.
5. Disconnect the reservoir tank hose.

6. Remove the radiator upper clips by pulling the tabs outside to release the lock, as shown.

CAUTION:
To prevent damage, do not pull lock tabs excessively.

7. Remove the cooling fan assemly to radiator bolts.
8. Remove the radiator.

CAUTION:
Do not damage or scratch air conditioner condenser and radiator core when removing.



INSTALLATION

- Installation is in the reverse order of removal.

INSPECTION

Radiator

1. Check radiator for mud or clogging. If necessary, clean radiator as follows:
   - Be careful not to bend or damage the radiator fins.
   - When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape the harness and electrical connectors to prevent water from entering.

a. Apply water by hose to the back side of the radiator core, point the hose vertically downward.
b. Apply water again to all radiator core surfaces once per minute.
c. Stop washing when no more dirt flows off the radiator.
d. Blow air into the back side of radiator core, point the air hose vertically downward.
   - Use compressed air lower than 490 kPa (5 kg/cm^2 , 71 psi) and keep distance more than 30 cm (11.8 in).

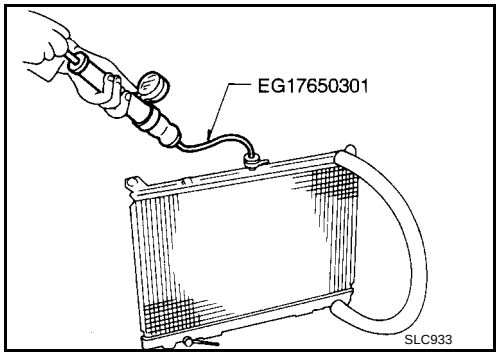
e. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

2. Inspect radiator for leaks as follows:

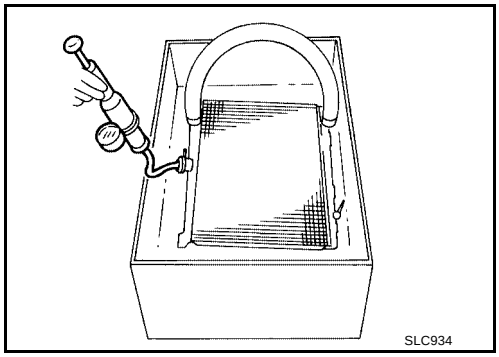
a. Apply pressure using Tool.

Specified pressure value **: 157 kPa (1.6 kg/cm^2 , 23 psi)**

WARNING:
To prevent the risk of the hose coming undone while under pressure, securely fasten it down with a hose clamp.
Attach a hose to the oil cooler as well (A/T model only).



b. Check for leakage.



COOLINGFAN

PFP:21060

Removal and Installation

EBS00J7M

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

REMOVAL

1. Drain engine coolant from radiator. Refer to CO-10, "DRAINING ENGINE COOLANT" .
   CAUTION:
   Perform when engine is cold.
2. Remove air cleaner duct assembly. Refer to EM-118, "Removal and Installation" .
3. Disconnect radiator upper hose.
4. Disconnect fan motor connectors.
5. Remove radiator cooling fan assembly.

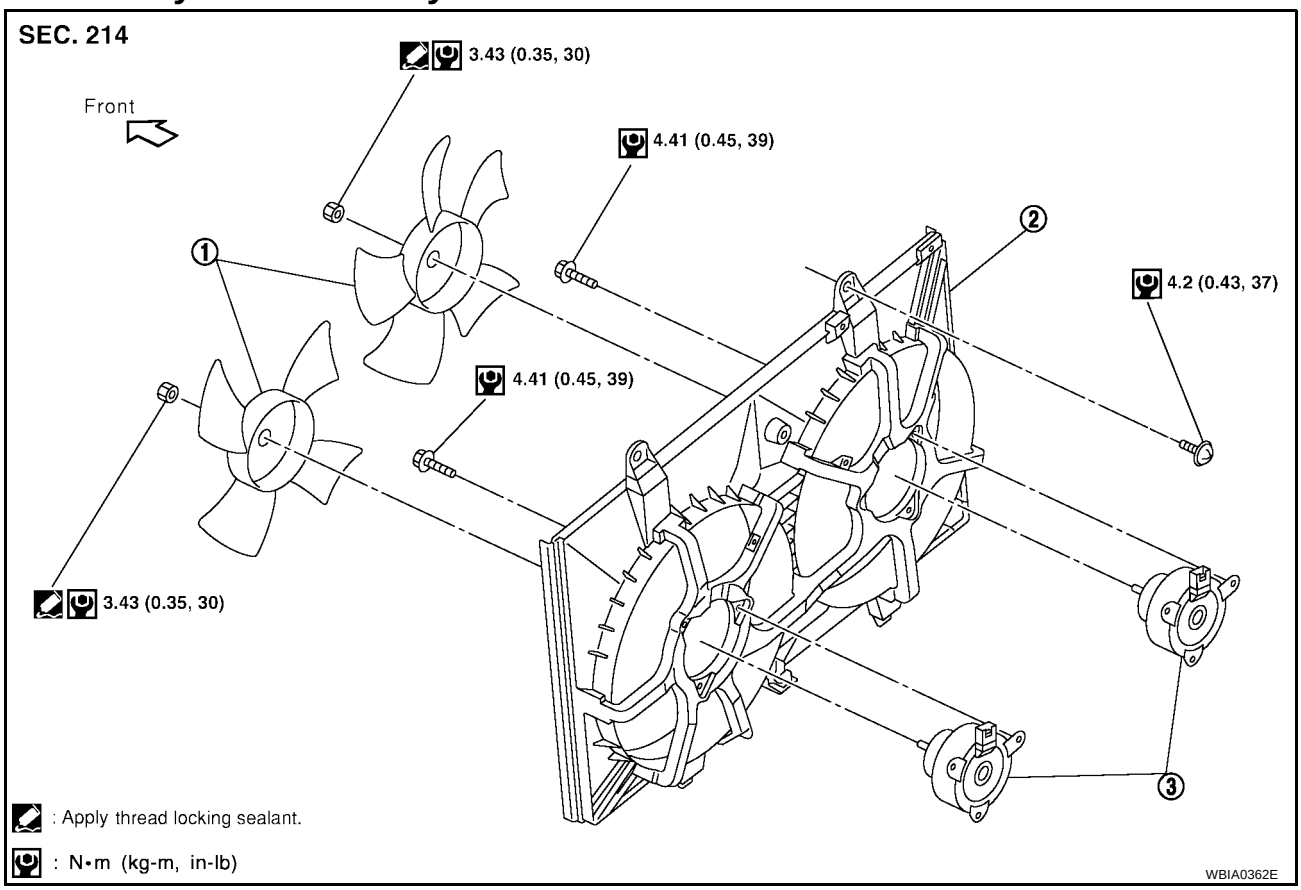
INSTALLATION

Install in the reverse order of removal.

- Cooling fan is controlled by ECM. For details, refer to EC-453, "DTC P1217 ENGINE OVER TEMPERATURE" .

Disassembly and Assembly

EBS00J7N



1. Fan blade
2. Fan shroud
3. Fan motor

DISASSEMBLY

1. Remove fans from fan motors.
2. Remove fan motors from fan shroud.

ASSEMBLY

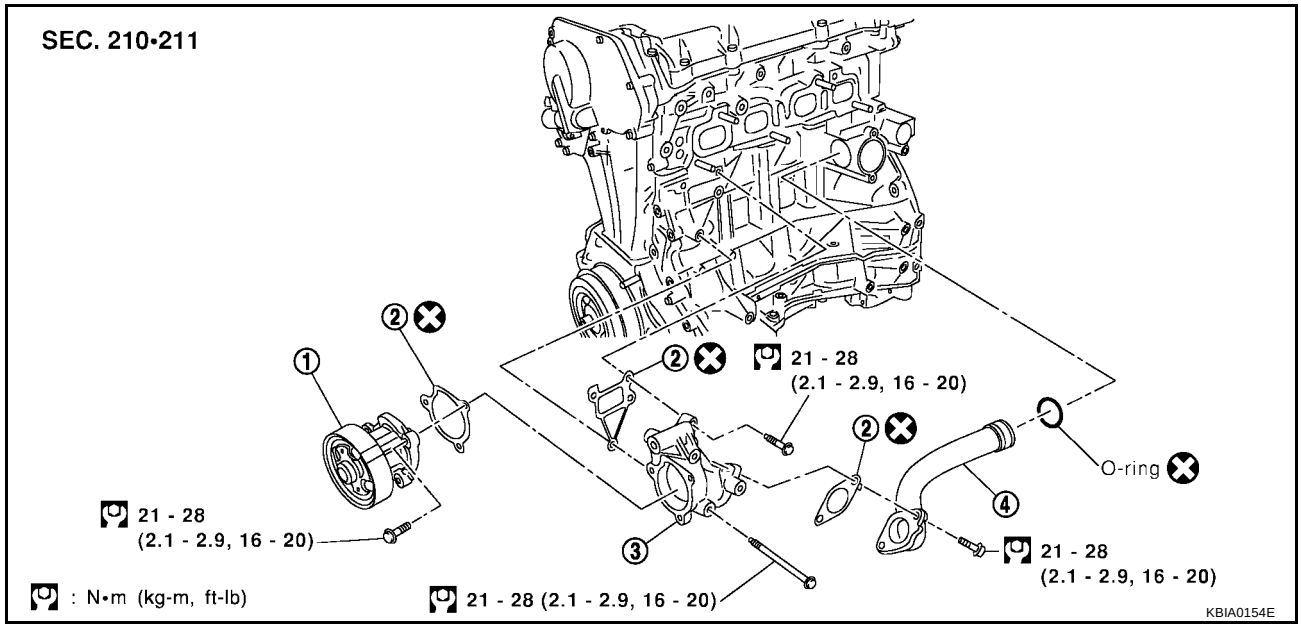
Install in the reverse order of disassembly.

WATER PUMP

PFP:21020

Removal and Installation

EBS00J7O



1. Water pump
2. Gasket
3. Water pump housing
4. Water pipe

WARNING:

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

REMOVAL

1. Drain coolant. Refer to CO-10, "Changing Engine Coolant" .

   CAUTION:

   Perform when the engine is cold.
2. Remove engine undercover using power tools.
3. Remove drive belt. Refer to EM-15, "Removal and Installation" .
4. Remove engine cover using power tools.
5. Remove engine coolant reservoir.
6. Remove IPDM E/R (set aside). Refer to PG-28, "Removal and Installation of IPDM E/R" .
7. Remove RH wheel and tire assembly.
8. Remove fender protector. Refer to EI-21, "Removal and Installation" .
9. Remove engine ground strap.
10. Remove the water pump.

    NOTE:

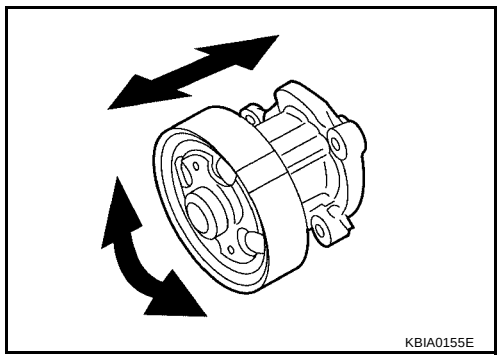
    If necessary, the generator and exhaust manifold catalytic convertor assembly must be removed to remove the water pipe.

    CAUTION:

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

INSPECTION AFTER REMOVAL

- Visually check that there is no significant dirt or rusting on the water pump body and vane.
- Check that there is no looseness in the vane shaft, and that it turns smoothly when rotated by hand.
- If the water pump does not perform properly, replace the water pump assembly.


KBIA0155E

INSTALLATION

- Installation is in the reverse order of removal.
- When inserting water pipe end to cylinder block, apply a neutral detergent to O-ring. Then insert it immediately.

INSPECTION AFTER INSTALLATION

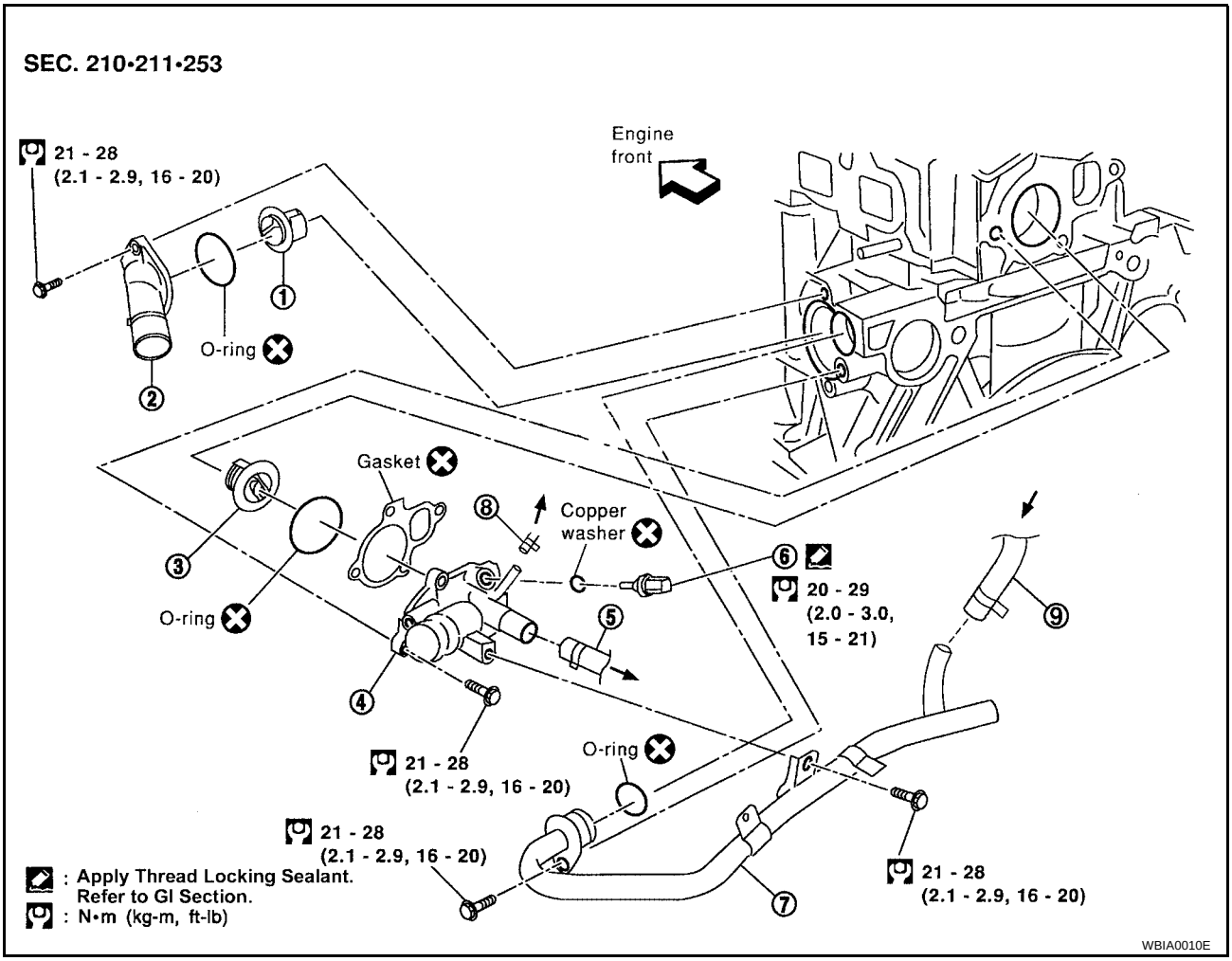
- After installing the water pump, check for leaks using the radiator cap tester. Refer to CO-14, "INSPECTION" .

THERMOSTAT AND THERMOSTAT HOUSING

PFP:21200

Removal and Installation

EBS00J7P



1. Thermostat
2. Engine coolant inlet
3. Water control valve
4. Engine coolant outlet
5. Heater hose
6. Engine coolant temperature sensor
7. Heater pipe
8. Electric throttle control actuator inlet hose
9. Electric throttle control actuator outlet hose

WARNING:

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

REMOVAL

CAUTION:

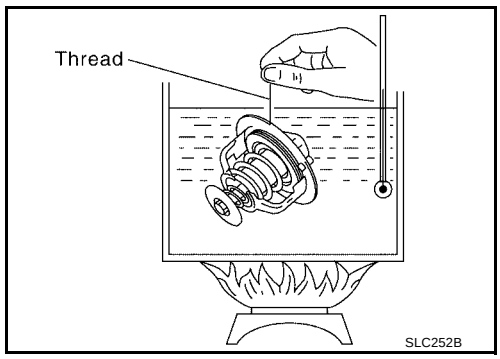
Perform when the engine is cold.

1. Drain engine coolant. Refer to CO-10, "Changing Engine Coolant" .
2. Remove radiator lower hose from the engine coolant inlet side.
3. Remove engine coolant inlet and thermostat.

INSPECTION AFTER REMOVAL

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

  NOTE:
  The full-open lift amount standard temperature for the thermostat is the reference value.
- After checking the full-open lift amount, lower the water temperature and check the valve closing temperature.

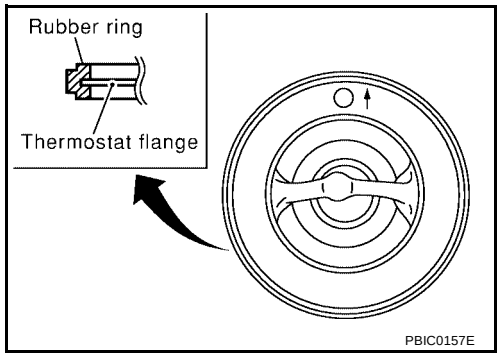


Thermostat	Standard Values
Valve opening temperature	80.5 – 83.5°C (177 – 182°F)
Valve lift	More than 8 mm / 95°C (0.315 in / 203°F)
Valve closing temperature	77°C (171°F) or higher

INSTALLATION

Installation is in the reverse order of removal.

- Install the engine coolant temperature sensor.
  Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
- Install the thermostat with the whole circumference of the flange part fitting securely inside the rubber ring.
- Install the thermostat with the jiggle valve facing upwards. The position deviation may be within the range of ±10°.
- If necessary, to install the heater pipe, first apply a mild detergent to the O-ring and then quickly insert the pipe into the housing.

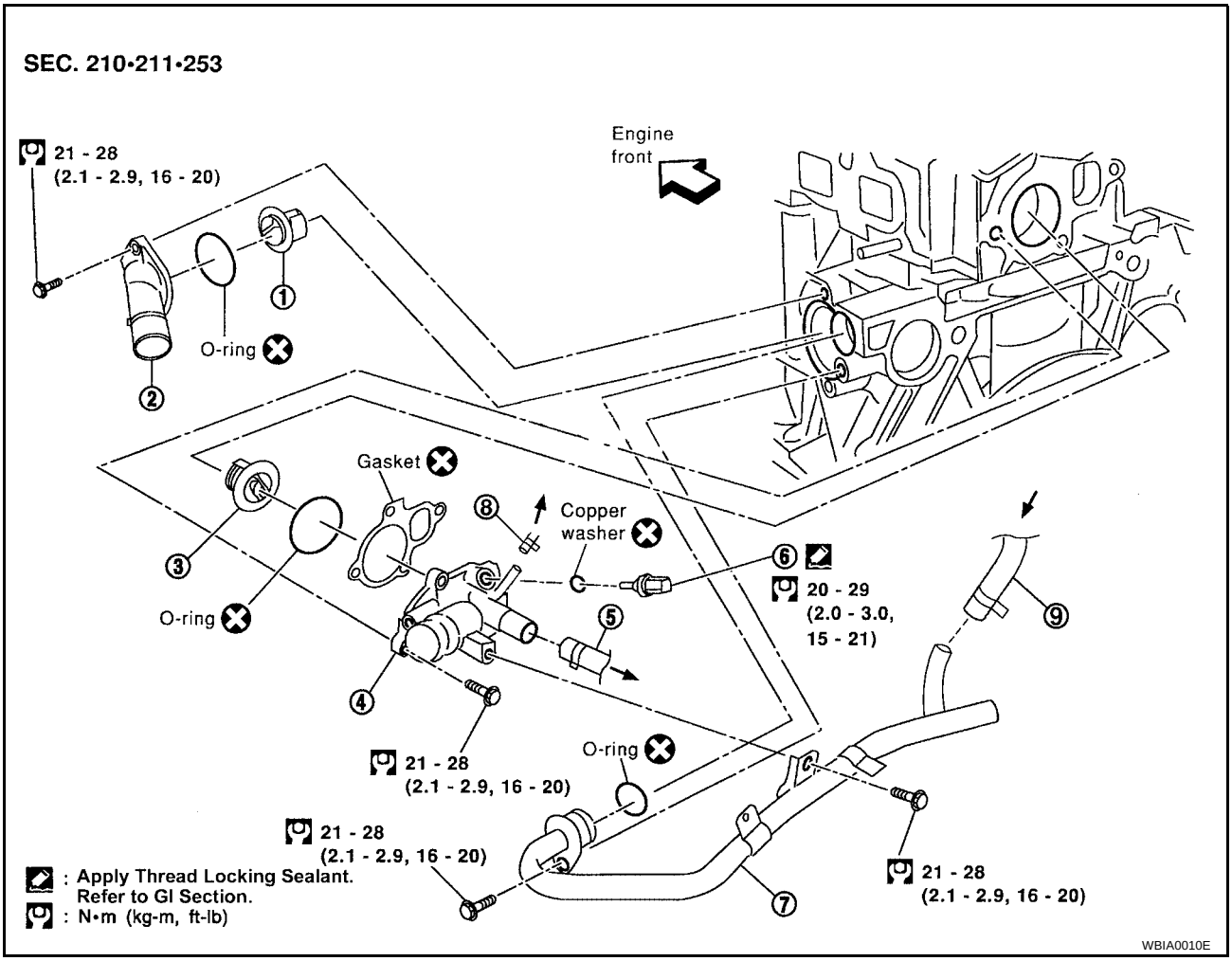


WATER CONTROL VALVE

PFP:21230

Removal and Installation

EBS00J7Q



1. Thermostat
2. Engine coolant inlet
3. Water control valve
4. Engine coolant outlet
5. Heater hose
6. Engine coolant temperature sensor
7. Heater pipe
8. Electric throttle control actuator inlet hose
9. Electric throttle control actuator outlet hose

WARNING:

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

REMOVAL

CAUTION:

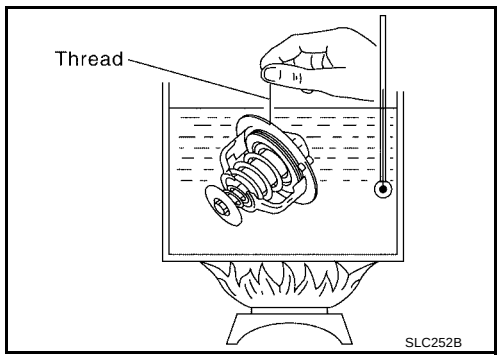
Perform when the engine cold.

1. Drain the engine coolant. Refer to CO-10, "Changing Engine Coolant" .
2. Remove the upper radiator hose, heater pipe, electric throttle control actuator inlet hose, and heater hose.
3. Remove the engine coolant outlet.
4. Remove the water control valve.

INSPECTION AFTER REMOVAL

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

  NOTE:
  The full-open lift amount standard temperature for the water control valve is the reference value.
- After checking the full-open lift amount, lower the water temperature and check the valve closing temperature.



Standard values

Water Control Valve	Standard Value
Valve opening temperature	93.5° - 96.5°C (200° - 206°F)
Full-open lift amount	More than 8 mm / 108°C (0.315 in / 226° F)
Valve closing temperature	90°C (194° F) or higher

INSTALLATION

Installation is in the reverse order of removal.

- Install the engine coolant temperature sensor.
  Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .
- Install the water control valve with the whole circumference of the flange part fitting securely inside the rubber ring.
- Install the water control valve with the up-mark facing up and the frame center part facing upwards. The position deviation may be within the range of ±10°.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Capacity

EBS00J7R

ℓ (US gal, Imp gal)

Coolant capacity (With reservoir tank at MAX level)	7.6 (2, 1 5/8)

Thermostat

EBS00J7S

Valve opening temperature	80.5 - 83.5°C (177 - 182°F)
Valve lift	More than 8 mm / 95°C (0.315 in / 203°F)

Water Control Valve

EBS00J7T

Valve opening temperature	93.5-96.5°C (200-206°F)
Valve lift	More than 8 mm / 108°C (0.315 in / 226°F)

Radiator

EBS00J7U

Unit: kPa (kg / cm^2 , psi)

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

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

EBS00J7V

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 and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Liquid Gasket

EBS00M88

REMOVAL OF LIQUID GASKET SEALING

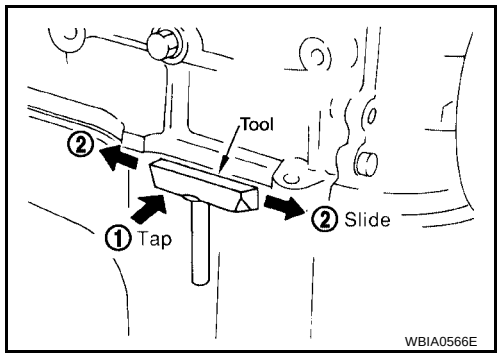
- After removing nuts and bolts, separate the mating surface, using Tool and remove old liquid gasket sealing.

  Tool number : KV10111100 (J-37228)

  CAUTION:
  Be careful not to damage the mating surfaces.

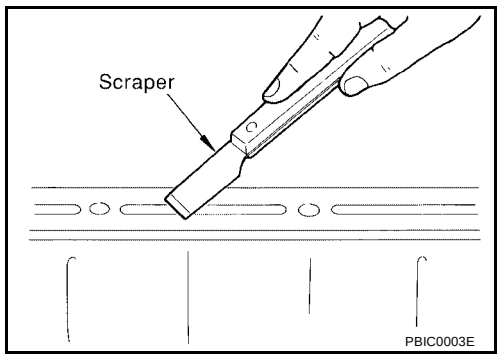
- Tap Tool to insert it, and then slide it by tapping on the side as shown in the figure.
- In areas where Tool is difficult to use, use plastic hammer to lightly tap the parts, to remove it.

  CAUTION:
  If for some unavoidable reason suitable tool such as screwdriver is used, be careful not to damage the mating surfaces.



LIQUID GASKET APPLICATION PROCEDURE

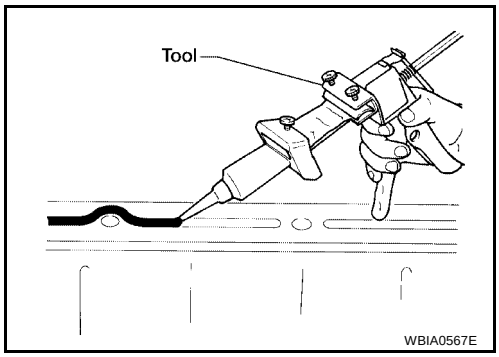
1. Remove old liquid gasket adhering to the liquid gasket application surface and the mating surface, Using scraper.
   - Remove liquid gasket completely from the groove of the liquid gasket application surface, bolts, and bolt holes.
2. Thoroughly clean the mating surfaces and remove adhering moisture, grease and foreign materials.



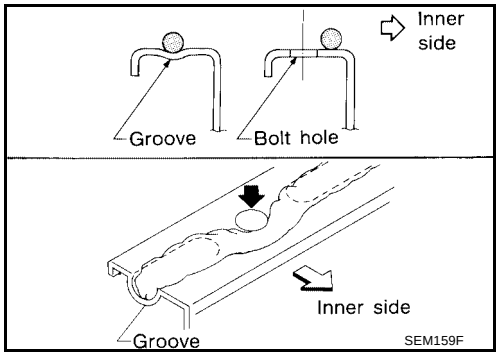
3. Attach liquid gasket tube to Tool.

Tool number : WS39930000 (—)

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-45, "Recommended Chemical Products and Sealants" .



4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for the liquid gasket application, apply liquid gasket to the groove.
   - As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten nuts or bolts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



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

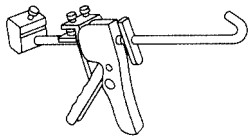
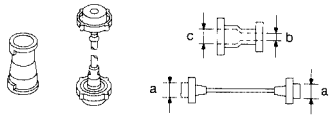
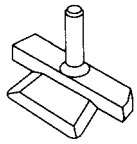
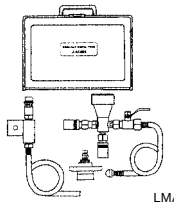
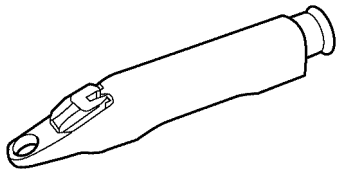
PREPARATION

PFP:00002

Special Service Tools

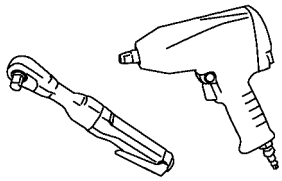
EBS00J7X

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

Tool number (Kent-Moore No.) Tool name	Description
WS39930000 (—) Tube pressure  S-NT052	Pressing the tube of liquid gasket
EG17650301 (J-33984-A) Radiator cap tester adapter  S-NT564	Adapting radiator cap tester to radiator cap and radiator filler neck **a: 28 (1.10) dia.** **b: 31.4 (1.236) dia.** **c: 41.3 (1.626) dia.** Unit: mm (in)
KV10111100 (J-37228) Seal cutter  NT046	Removing chain tensioner cover and water pump cover
KV991J0070 (J-45695) Coolant Refill Tool  LMA053	Refilling engine cooling system
— (J-23688) Engine coolant refractometer  WBIA0539E	Checking concentration of ethylene glycol in engine coolant

Commercial Service Tools

EBS00J7Y

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

OVERHEATING CAUSE ANALYSIS

PFP:00012

Troubleshooting Chart

EBS00J7Z

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

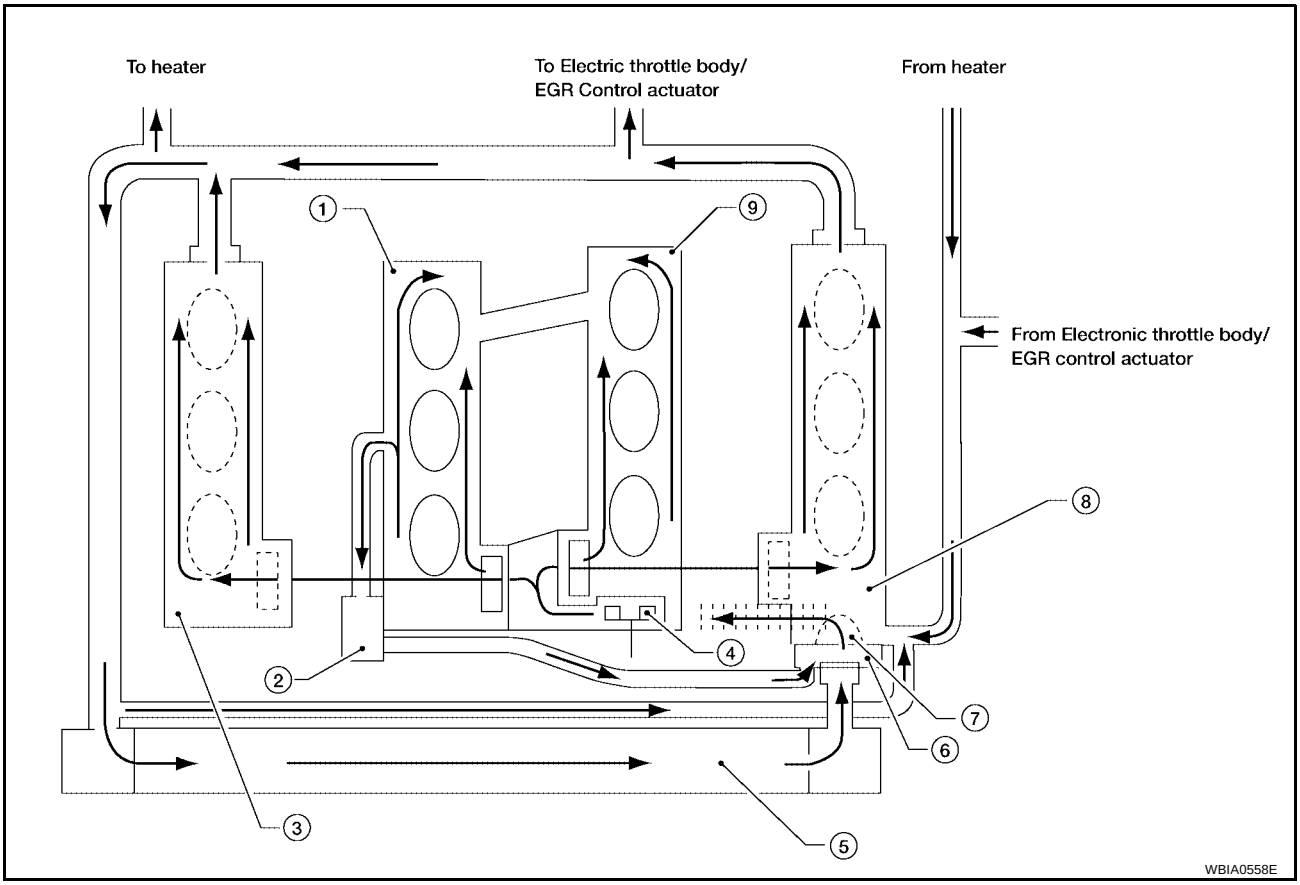
	Symptom		Check items	
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load
				Driving in low gear for extended time
				Driving at extremely high speed
			Powertrain system malfunction	—
			Installed improper size wheels and tires	
			Dragging brakes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

COOLING SYSTEM

PFP:21020

Cooling Circuit

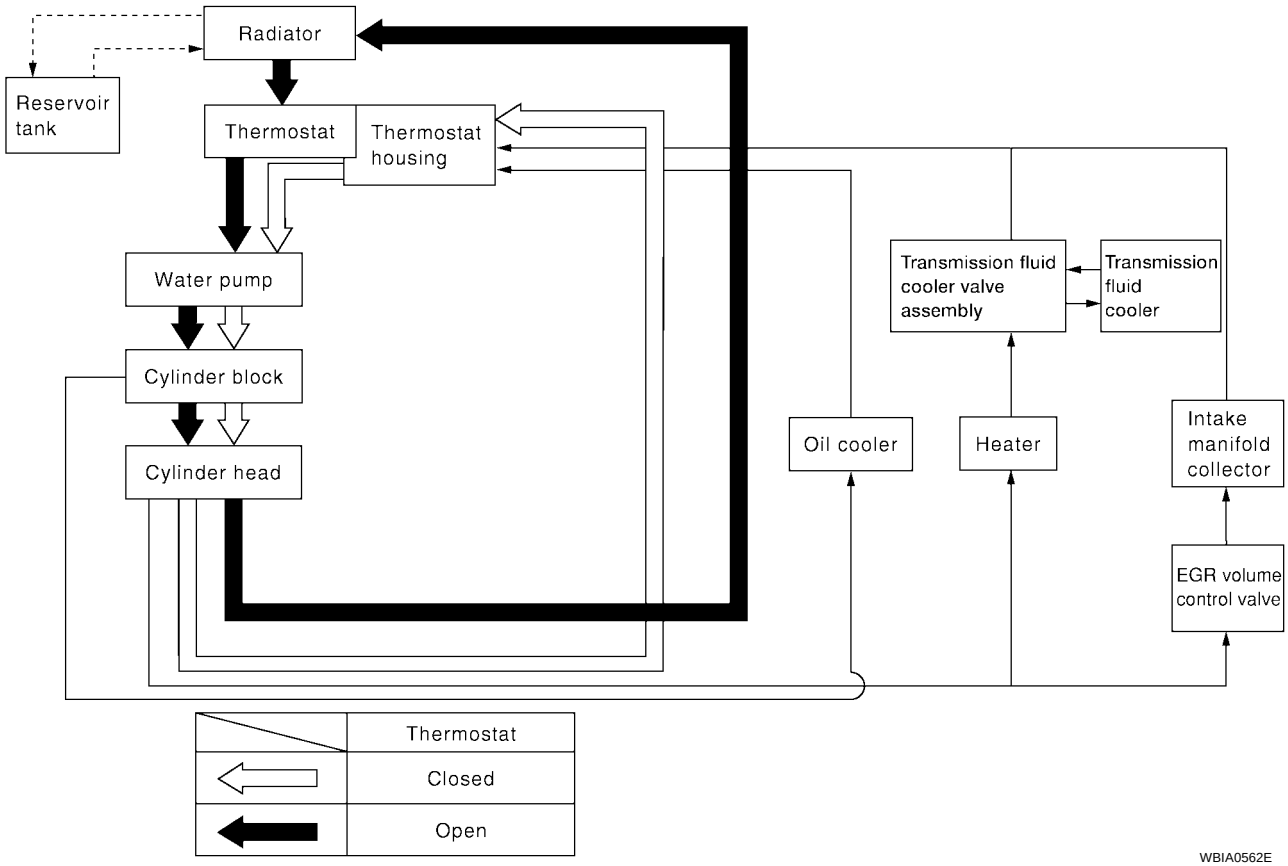
EBS00J80



1. Cylinder block (RH)
2. Oil cooler
3. Cylinder head (RH)
4. Water pump
5. Radiator
6. Water inlet
7. Thermostat
8. Cylinder head (LH)
9. Cylinder block (LH)

System Drawing

EBS00M89



ENGINE COOLANT

PFP:KQ100

System Check

EBS00M8A

WARNING:

- **Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure coolant escaping from the radiator.**
- **Wrap a thick cloth around the cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing down and turning it all the way.**

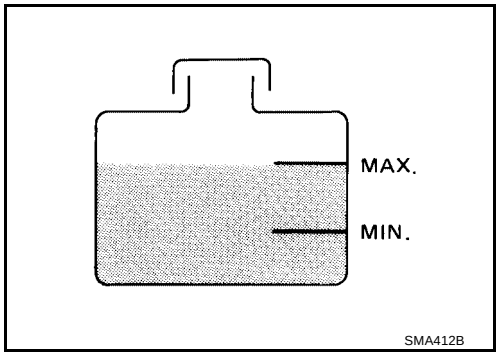
CHECKING COOLING SYSTEM HOSES

Check hoses for the following:

- Improper attachment
- Leaks
- Cracks
- Damage
- Loose connections
- Chafing
- Deterioration

CHECKING RESERVOIR LEVEL

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



CHECKING COOLING SYSTEM FOR LEAKS

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

Tool number : EG17650301 (J-33984-A)

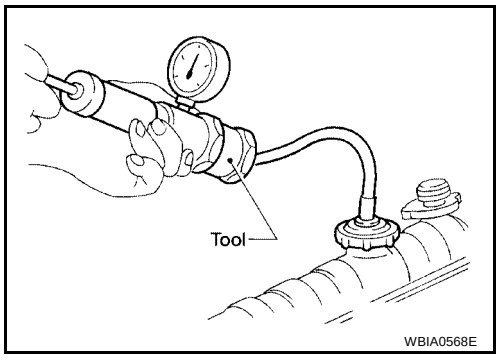
Testing pressure : 157 kPa (1.6 kg/cm^2 , 23 psi)

WARNING:

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

CAUTION:

Higher pressure than specified may cause radiator damage.

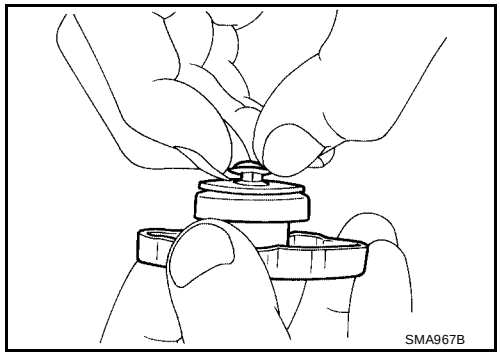


CHECKING RADIATOR CAP

1. Inspect the radiator cap.
   - Replace the cap if the metal plunger cannot be seen around the edge of the black rubber gasket.
   - Replace the cap if deposits of waxy residue or other foreign material are on the black rubber gasket or the metal retainer.

   NOTE:
   Thoroughly wipe out the radiator filler neck to remove any waxy residue or foreign material.

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



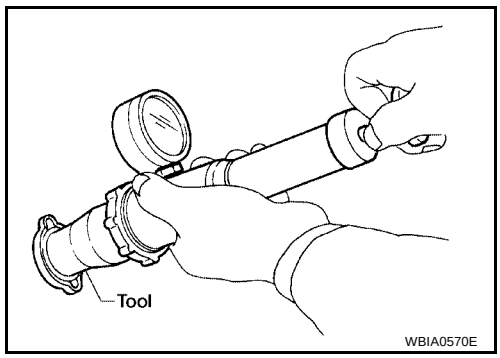
3. Check radiator cap relief pressure using Tool.

   Tool number : EG17650301 (J-33984-A)

   Standard: 78 – 98 kPa (0.8 – 1.0 kg/cm^2 , 11 – 14 psi)

   Limit: 59 kPa (0.6 kg/cm^2 , 9 psi)

   - When connecting the radiator cap to the tester, apply water or coolant to the cap seal surface.
   - Replace the radiator cap if there is an abnormality in the negative-pressure valve, or if the open-valve pressure is outside of the standard values.



CHECKING RADIATOR

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

- Be careful not to bend or damage the radiator fins.
- When radiator is cleaned without removing, remove all surrounding parts such as cooling fan shroud and horns. Then tape the harness and electrical connectors to prevent water from entering.

1. Apply water by hose to the back side of the radiator core, with the hose pointed vertically downward.
2. Apply water again to all radiator core surfaces once per minute.
3. Stop washing if any dirt no longer rinse out from the radiator.
4. Blow air into the back side of radiator core, with the air hose pointed vertically downward.
   - Use compressed air lower than 490 kPa (5 kg/cm^2 , 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.
6. Check for leaks.

Changing Engine Coolant

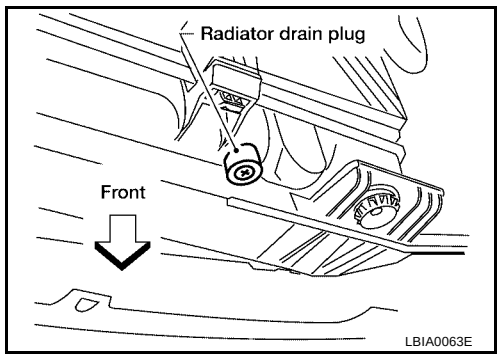
EBS00RBL

WARNING:

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

DRAINING ENGINE COOLANT

1. Remove engine undercover.
2. Open radiator drain plug at the bottom of radiator and remove the radiator filler cap. This is the only step required for a partial cooling system drain.
3. If removing the heater core, remove the upper heater hose from the engine coolant outlet and apply moderate air pressure of 15 psi (103.46 kPa, 1.055 kg-cm^2) maximum for 30 seconds into the hose to blow out excess coolant from the core.
4. For a complete cooling system drain, remove the reservoir tank and drain the coolant, and then clean the reservoir tank before installation.



- Do not allow coolant to spill on the drive belts.

5. When performing a complete cooling system drain (to remove the engine or for engine repair), remove the cylinder block front drain plug and the cylinder block RH drain plug.
6. Check the drained coolant for contaminants such as rust, corrosion or discoloration.
   - If contaminated, flush the engine cooling system. Refer to CO-33, "FLUSHING COOLING SYSTEM" .

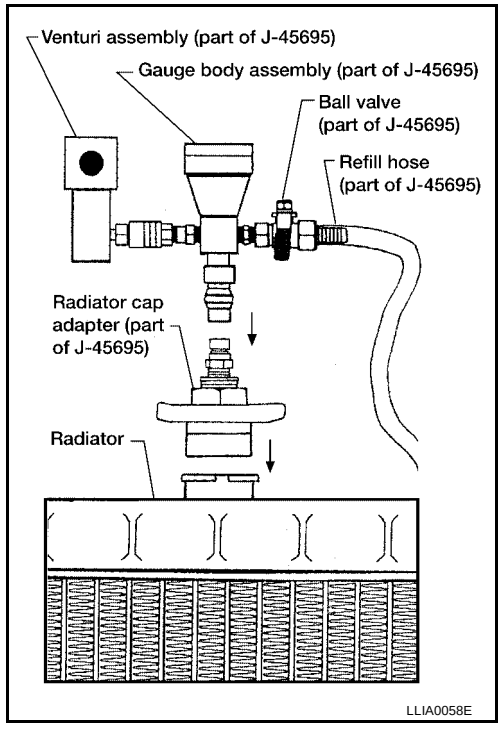
REFILLING ENGINE COOLANT

1. Install the radiator drain plug. If the cooling system was drained completely, install the reservoir tank and the cylinder block drain plugs.
   - The radiator must be completely empty of coolant and water.
   - Apply sealant to the threads of the cylinder block drain plugs. Use Genuine High Performance Thread Sealant or equivalent. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .

Radiator drain plug	**: Refer to CO-34, "Removal and Installation" .**
Cylinder block front drain plug	**: Refer to EM-215, "Removal and Installation" .**
Cylinder block RH drain plug	**: Refer to EM-215, "Removal and Installation" .**

2. If disconnected, reattach the upper radiator hose at the engine side.
3. Set the vehicle heater controls to the full HOT and heater ON position. Turn the vehicle ignition ON with the engine OFF as necessary to activate the heater mode.
4. Install the Tool by installing the radiator cap adapter onto the radiator neck opening. Then attach the gauge body assembly with the refill tube and the venturi assembly to the radiator cap adapter.

   Tool number : KV991J0070 (J-45695)



5. Insert the refill hose into the coolant mixture container that is placed at floor level. Make sure the ball valve is in the closed position.
   - Use Genuine NISSAN Long Life Anti-freeze coolant or equivalent, mixed 50/50 with distilled water or demineralized water. Refer to MA-14, "ANTI-FREEZE COOLANT MIXTURE RATIO" .

   Engine coolant capacity (with reservoir tank) : Refer to MA-12, "Fluids and Lubricants" .

6. Install an air hose to the venturi assembly, the air pressure must be within specification.

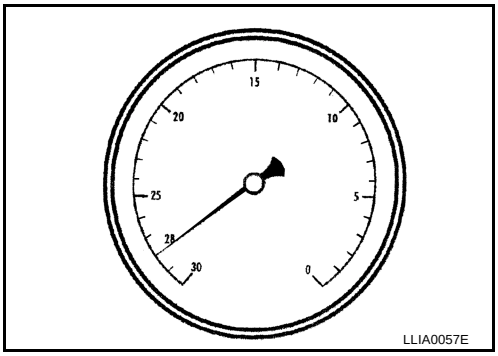
   Compressed air supply pressure : 5.7 - 8.5 kPa (5.6 - 8.4 kg/cm^2 , 80 - 120 psi)

   CAUTION:
   The compressed air supply must be equipped with an air dryer.

7. The vacuum gauge will begin to rise and there will be an audible hissing noise. During this process open the ball valve on the refill hose slightly. Coolant will be visible rising in the refill hose. Once the refill hose is full of coolant, close the ball valve. This will purge any air trapped in the refill hose.

8. Continue to draw the vacuum until the gauge reaches 28 inches of vacuum. The gauge may not reach 28 inches in high altitude locations, refer to the vacuum specifications based on the altitude above sea level.

Altitude above sea level	Vacuum gauge reading
0 - 100 m (328 ft)	: 28 inches of vacuum
300 m (984 ft)	: 27 inches of vacuum
500 m (1,641 ft)	: 26 inches of vacuum
1,000 m (3,281 ft)	: 24 - 25 inches of vacuum



LLIA0057E

9. When the vacuum gauge has reached the specified amount, disconnect the air hose and wait 20 seconds to see if the system loses any vacuum. If the vacuum level drops, perform any necessary repairs to the system and repeat steps 6 - 8 to bring the vacuum to the specified amount. Recheck for any leaks.
10. Place the coolant container (with the refill hose inserted) at the same level as the top of the radiator. Then open the ball valve on the refill hose so the coolant will be drawn up to fill the cooling system. The cooling system is full when the vacuum gauge reads zero.

CAUTION:
Do not allow the coolant container to get too low when filling, to avoid air from being drawn into the cooling system.

11. Remove the Tool from the radiator neck opening.
12. Fill the cooling system reservoir tank to the specified level and install the radiator cap. Run the engine to warm up the cooling system and top up the system as necessary.

FLUSHING COOLING SYSTEM

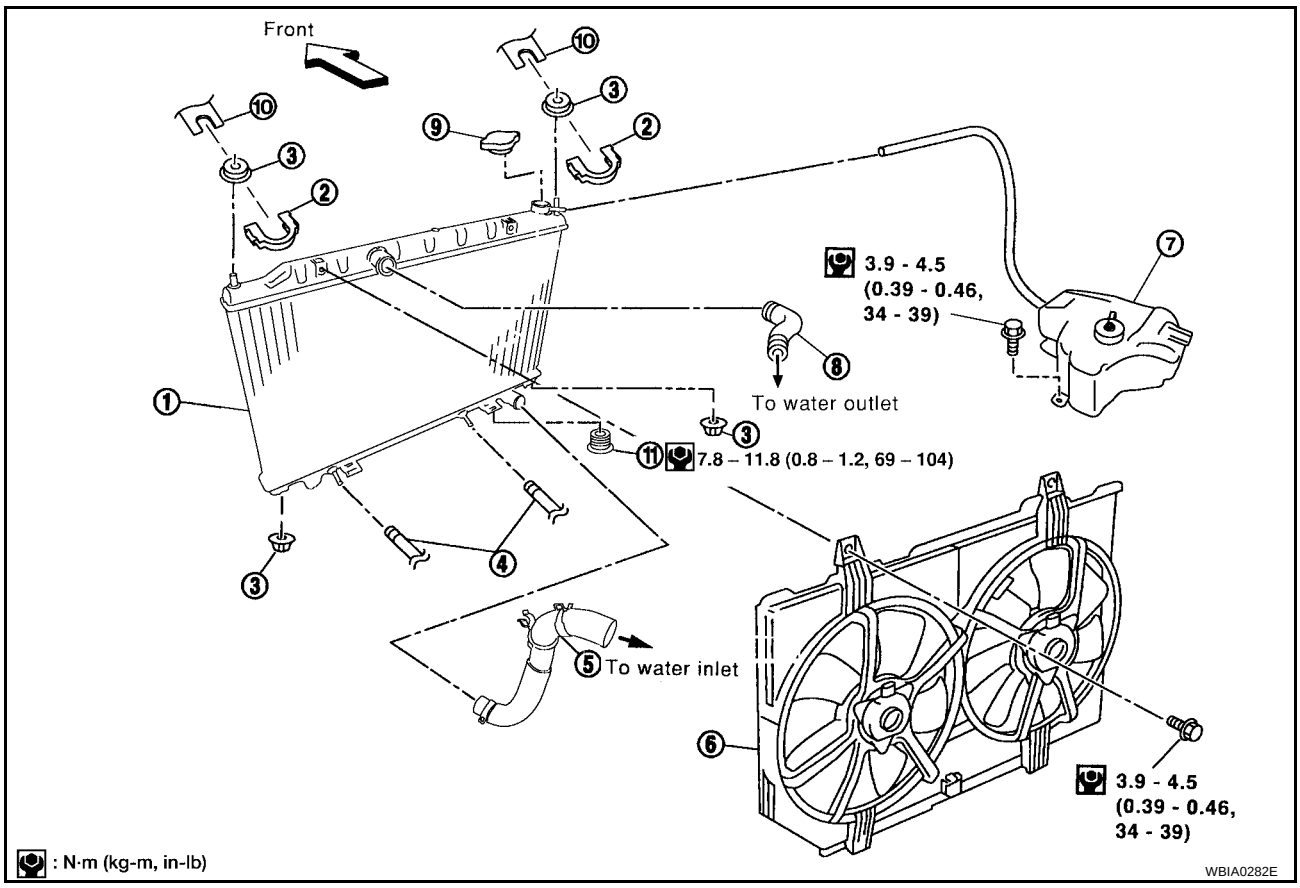
1. Fill the radiator from the filler neck above the radiator upper hose and reservoir tank with clean water and reinstall radiator filler cap.
2. Run the engine and warm it up to normal operating temperature.
3. Rev the engine two or three times under no-load.
4. Stop the engine and wait until it cools down.
5. Drain the water from the system. Refer to CO-31, "DRAINING ENGINE COOLANT" .
6. Repeat steps 1 through 5 until clear water begins to drain from the radiator.

RADIATOR

PFP:21400

Removal and Installation

EBS00RBQ



1. Radiator	2. Radiator upper clip	3. Mounting rubber
4. A/T fluid cooler hose (if equipped)	5. Radiator hose (lower)	6. Radiator fan assembly
7. Reservoir tank	8. Radiator hose (upper)	9. Radiator filler cap
10. Radiator core connection	11. Radiator drain plug	

WARNING:

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

REMOVAL

1. Drain the coolant from the radiator. Refer to CO-31, "DRAINING ENGINE COOLANT" .

   CAUTION:

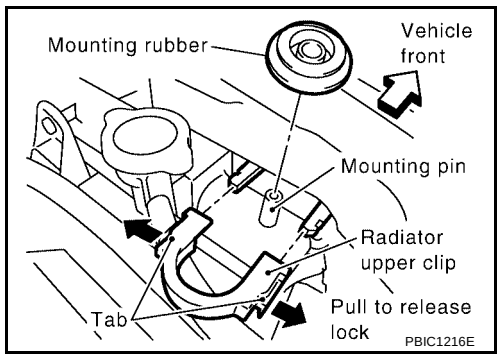
   Perform when engine is cold.
2. Remove fresh air duct. Refer to EM-118, "Removal and Installation" .
3. Disconnect radiator upper and lower hoses.
4. Remove the A/T fluid cooler hoses, if equipped.
   - Plug hoses to avoid leakage of A/T fluid.
5. Disconnect the reservoir tank hose.

6. Remove the radiator upper clips by pulling the tabs outside to release the lock, as shown.

CAUTION:
To prevent damage, do not pull lock tabs excessively.

7. Remove the cooling fan assembly to radiator bolts.
8. Remove the radiator.

CAUTION:
Do not damage or scratch air conditioner condenser and radiator core when removing.



INSTALLATION

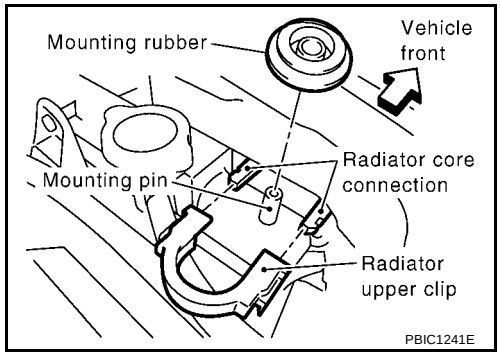
Installation is in the reverse order of removal, paying attention to the following.

- Fill the radiator with coolant. Refer to CO-32, "REFILLING ENGINE COOLANT" .

Installation of Radiator Upper Clip

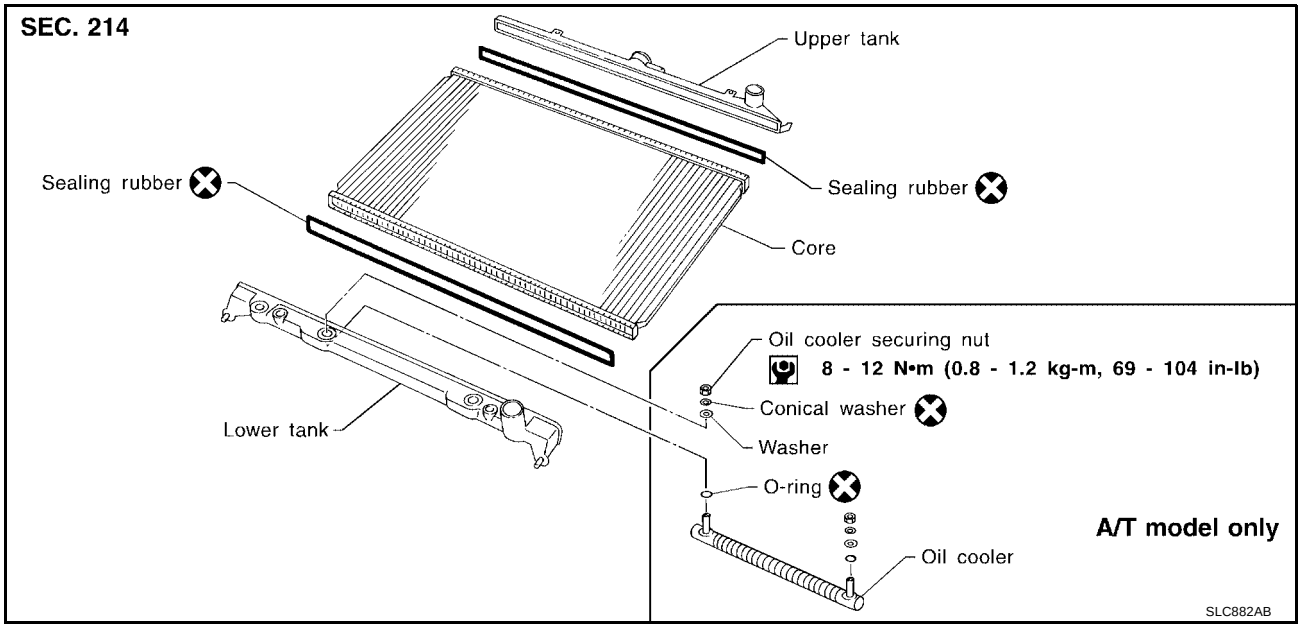
- Install radiator upper clip on radiator core connection with the following procedure:

1. Install the rubber on mounting pin of radiator core.
2. Align the radiator upper clip with the radiator core connector, then insert the radiator upper clip straight into the radiator core connections until a click is heard.
3. After connecting the radiator upper clip, use the following method to make sure it is fully connected.
   - Visually confirm that the two radiator upper clips are connected to the radiator core connections.
   - Move the radiator upper clip and the radiator core forward and backward to make sure they are securely connected.



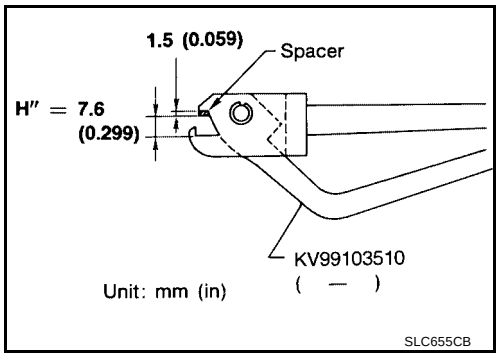
Disassembly and Assembly

EBS00RBR



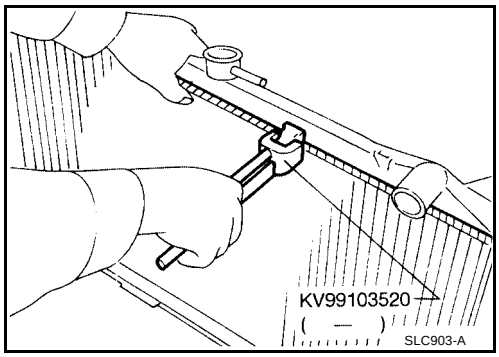
PREPARATION

1. Attach the spacer to the tip of the Tool.
   Spacer specification: 1.5 mm (0.059 in) thick x 18 mm (0.71 in) wide x 8.5 mm (0.335 in) long.
2. Make sure that when Tool is closed dimension H″ is approx. 7.6 mm (0.299 in).
3. Adjust dimension H″ with the spacer, if necessary.



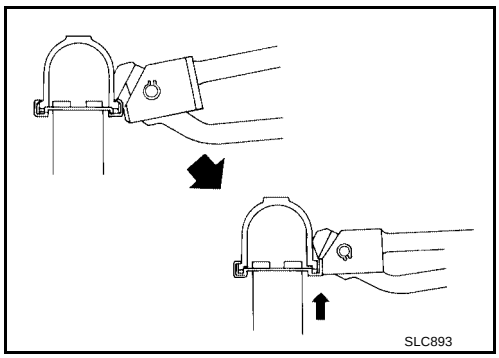
DISASSEMBLY

1. Remove the tank using Tool.



- Grip the crimped edge and bend it upwards so that Tool slips off.

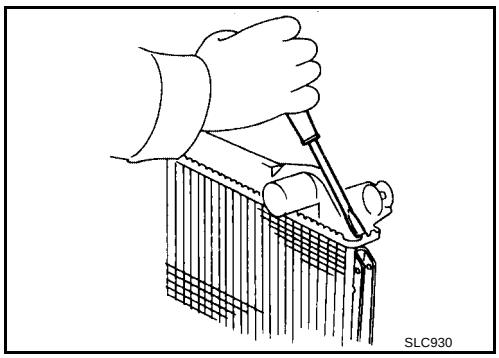
  CAUTION:
  Do not bend excessively.



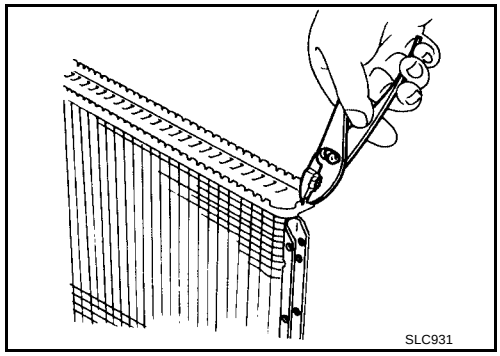
- In areas where the Tool cannot be used, use a screwdriver to bend the edge up.

  CAUTION:
  Be careful not to damage tank.

2. Remove sealing rubber.

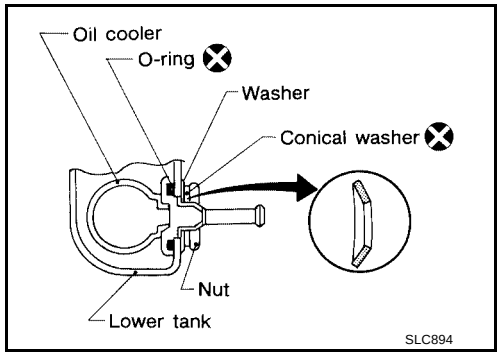


3. Using pliers, make sure the edge stands straight up.
4. Remove oil cooler from tank (if equipped).

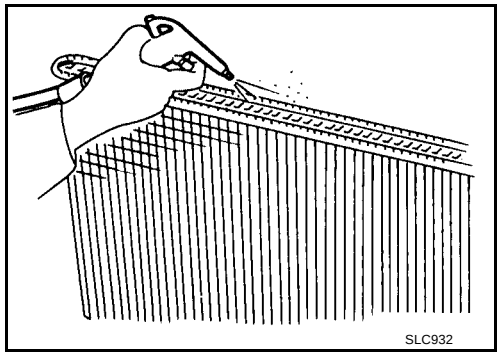


ASSEMBLY

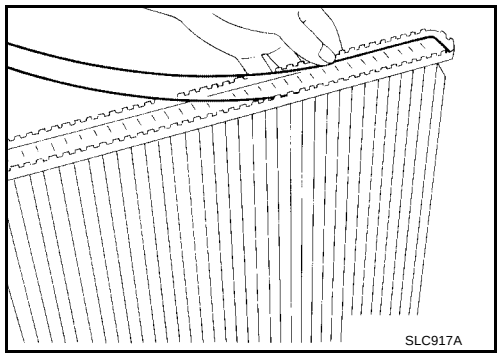
1. Install the oil cooler (if equipped).
   NOTE:
   Pay attention to direction of conical washer.



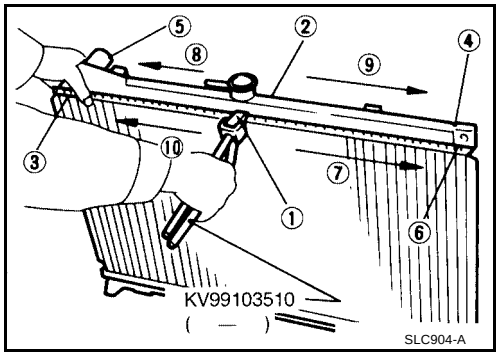
2. Clean the contact portion of the tank.

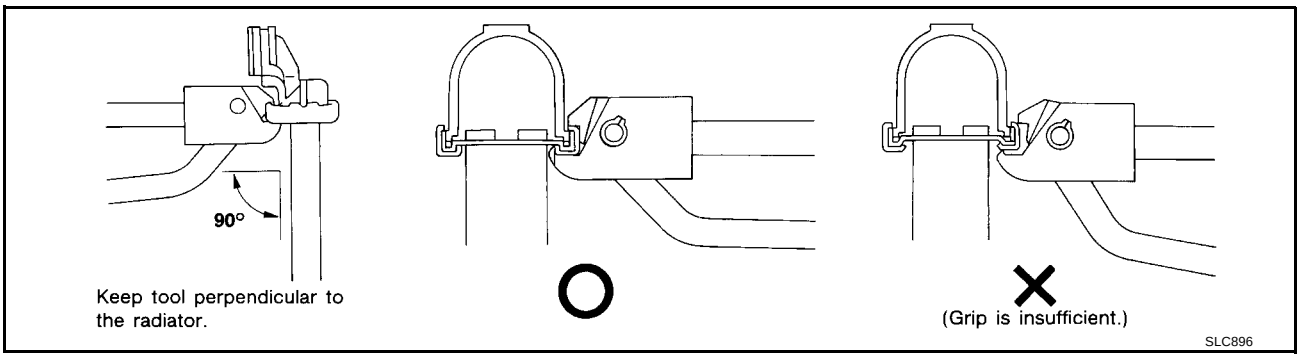


3. Install sealing rubber by pushing it in with your fingers.
   CAUTION:
   Be careful not to twist sealing rubber gasket.

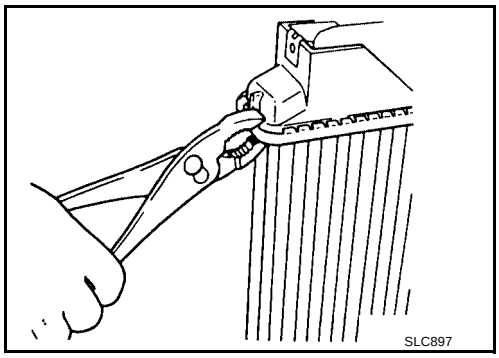


4. Crimp tank in specified sequence using Tool.





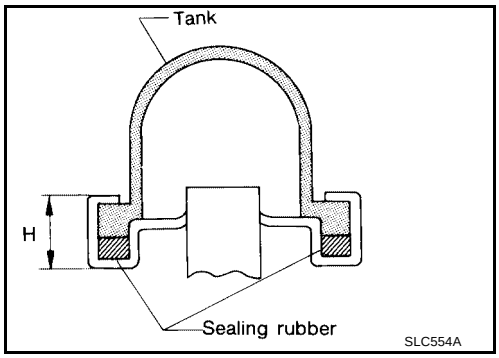
- Use pliers in the locations where Tool cannot be used.



5. Make sure that the rim is completely crimped down.

Standard height “H” : 8.0 – 8.4 mm (0.315 – 0.331 in)

6. Confirm that there is no leakage.
Refer to CO-39, "INSPECTION" .



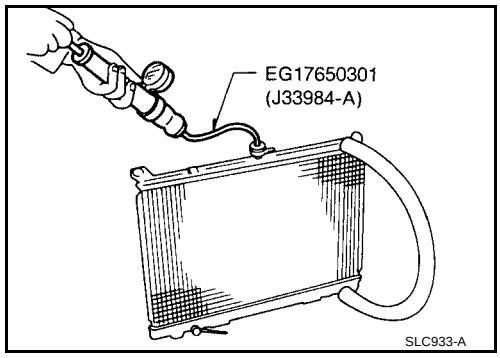
INSPECTION

1. Apply pressure using Tool.

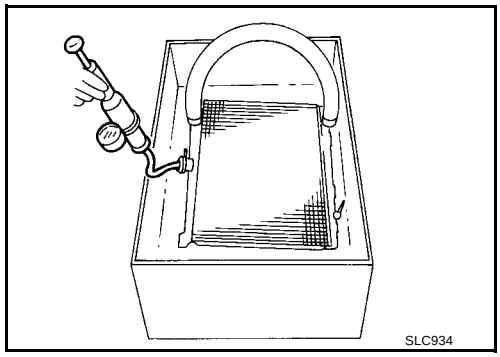
Specified pressure value : 157 kPa (1.6 kg/cm^2 , 23 psi)

WARNING:
To prevent the risk of the hose coming undone while under pressure, securely fasten it down with a hose clamp.

CAUTION:
Attach a hose to the oil cooler as well (if equipped).

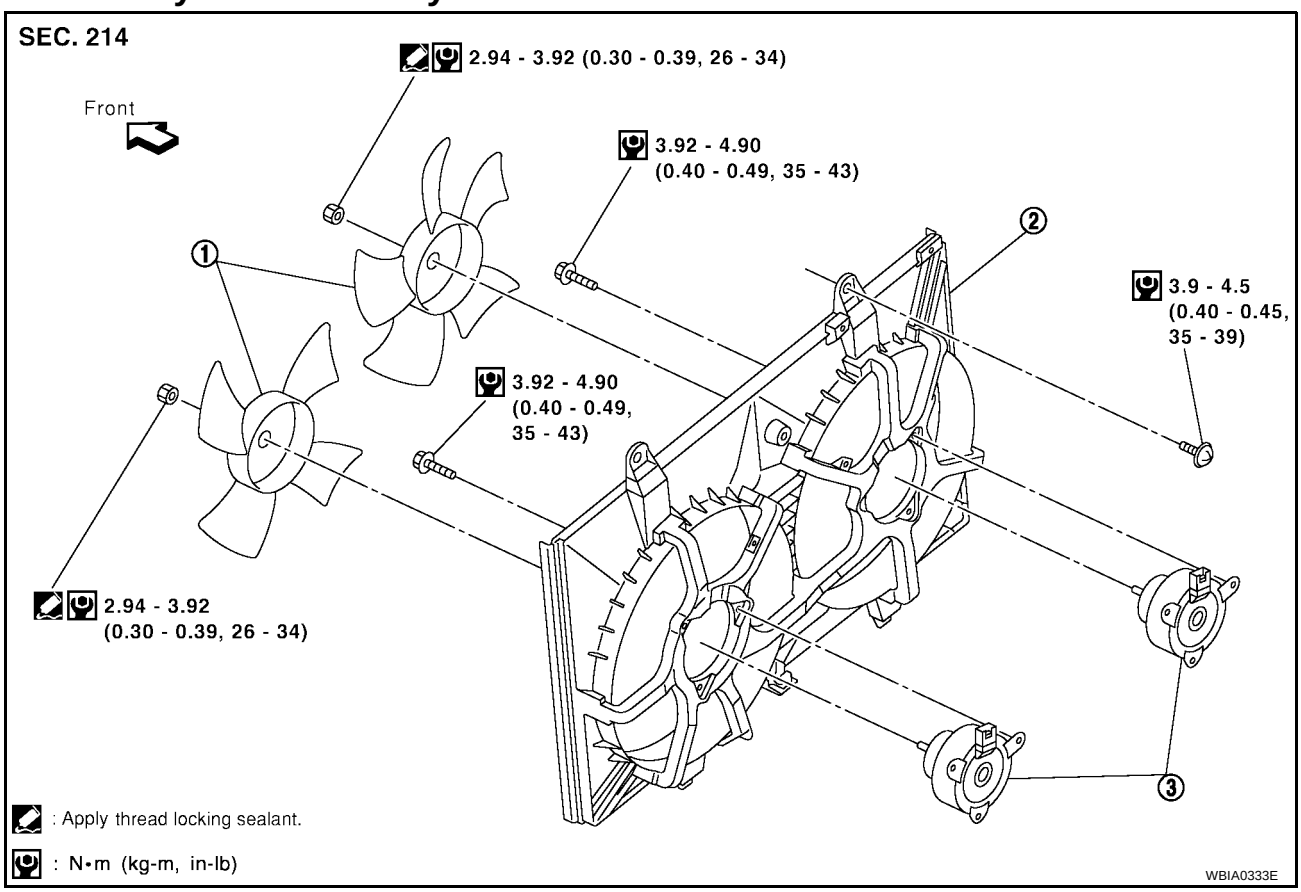


2. Place radiator in water filled tank and check for leakage.



Disassembly and Assembly of Radiator Fan

EBS00RBS



1. Fan blade
2. Fan shroud
3. Fan motor

DISASSEMBLY

1. Remove fan blade.

2. Remove fan motor from fan shroud.

ASSEMBLY

- Assemble in the reverse order of disassembly.

COOLING FAN

PFP:21140

Removal and Installation

EBS00RBT

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

REMOVAL

1. Drain engine coolant from radiator. Refer to CO-10, "DRAINING ENGINE COOLANT" .
   CAUTION:
   Perform when engine is cold.
2. Remove air cleaner duct assembly. Refer to EM-118, "Removal and Installation" .
3. Disconnect radiator upper hose.
4. Disconnect fan motor connectors.
5. Remove radiator cooling fan assembly.

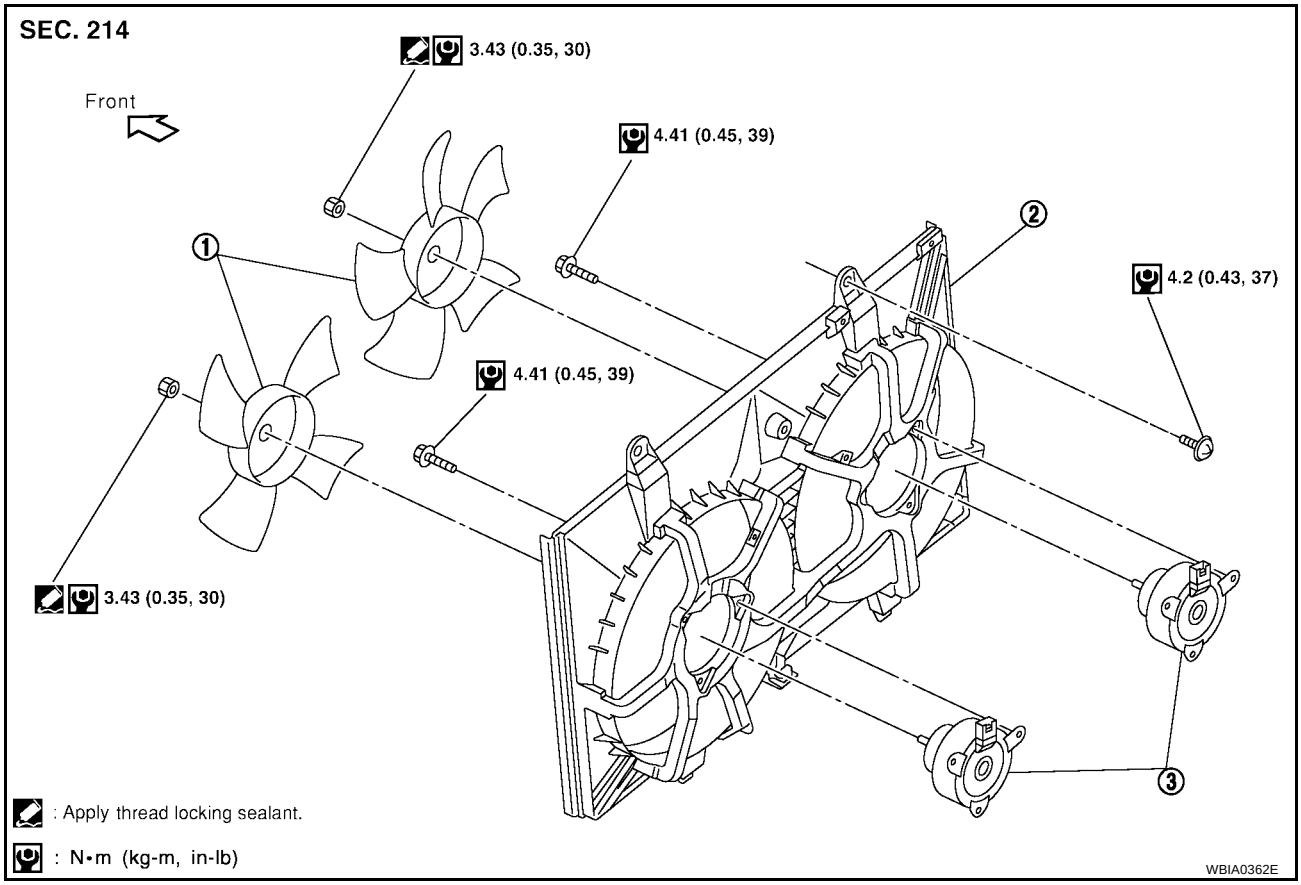
INSTALLATION

Install in the reverse order of removal.

- Cooling fan is controlled by ECM. For details, refer to EC-453, "DTC P1217 ENGINE OVER TEMPERATURE" .

Disassembly and Assembly of Radiator Fan

EBS00RBU



1. Fan blade
2. Fan shroud
3. Fan motor

DISASSEMBLY

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

ASSEMBLY

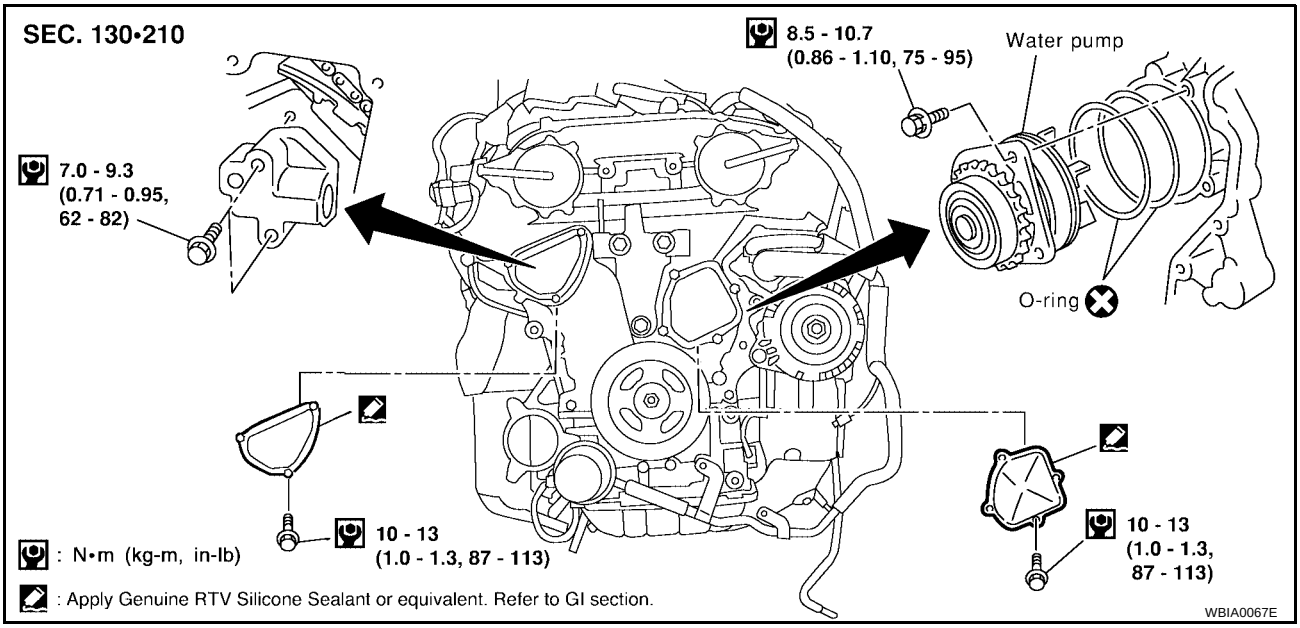
Assembly is in the reverse order of disassembly.

WATER PUMP

PFP:21020

Removal and Installation

EBS00J85



CAUTION:

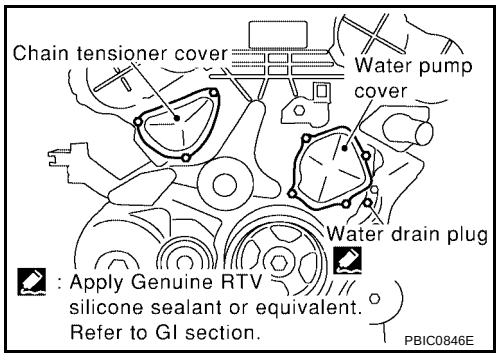
- **When removing water pump assembly, be careful not to get coolant on drive belt.**
- **Water pump cannot be disassembled and should be replaced as a unit.**
- **After installing water pump, connect hose and clamp securely, then check for leaks using radiator cap tester.**

REMOVAL

1. Drain coolant from radiator. Refer to CO-31, "Changing Engine Coolant" .

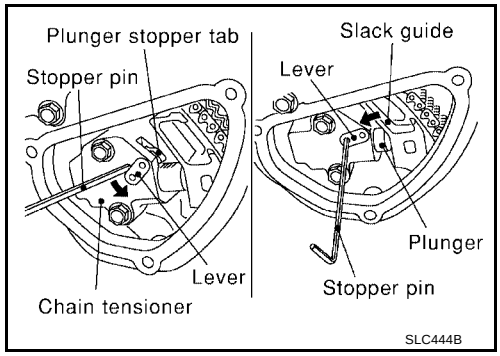
   CAUTION:
   Perform when the engine is cold.
2. Remove engine coolant reservoir tank. Refer to CO-34, "Removal and Installation" .
3. Reposition IPDM/ER aside. Refer to PG-28, "Removal and Installation of IPDM E/R" .
4. Remove RH wheel and tire and the splash shield.
5. Remove drive belts.
6. Remove idler pulley, then the power steering and generator adjusting bars.
7. Support engine and remove the front engine insulator and bracket. Refer to EM-215, "Removal and Installation" .
8. Remove water drain plug on water pump side of cylinder block.
9. Remove chain tensioner cover and water pump cover.
10. Remove the timing chain tensioner assembly.

a. Pull the lever down and release the plunger stopper tab.



b. Insert the stopper pin into the tensioner body hole to hold the lever and keep the stopper tab released.

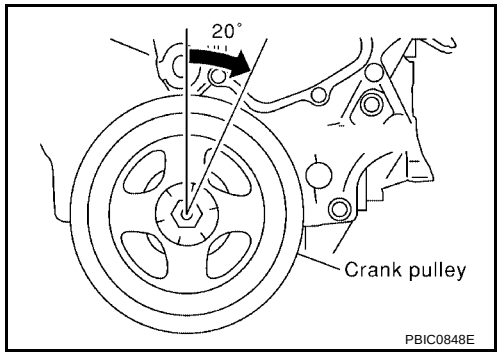
NOTE:
An allen wrench [(2.5 mm (0.98 in)] is used for a stopper pin as an example.



c. Insert the plunger into the tensioner body by pressing the timing chain slack guide.

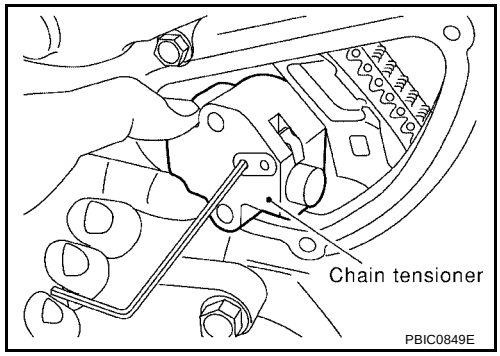
d. Keep the slack guide pressed and hold the plunger in by pushing the stopper pin deeper through the lever and into the tensioner body hole

e. Make a gap between water pump gear and timing chain, by turning the crankshaft pulley approximately 20° clockwise.

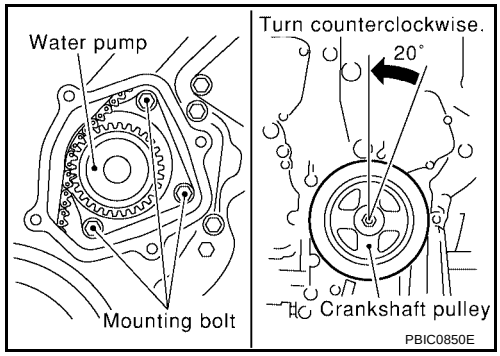


11. Remove chain tensioner.

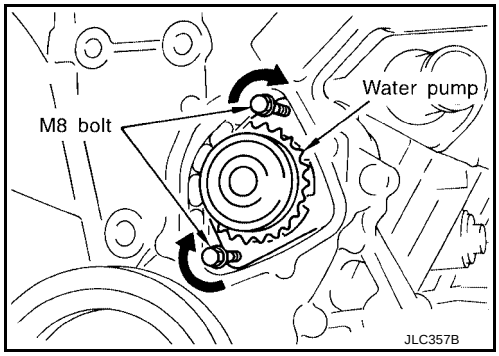
CAUTION:
Be careful not to drop bolts inside chain case.



12. Remove the three water pump bolts. Make a gap between water pump gear and timing chain, by turning crankshaft pulley counterclockwise until timing chain loosens on water pump sprocket.

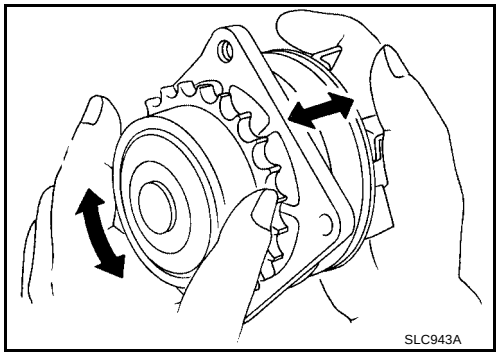


13. Screw M8 bolts [pitch: 1.25 mm (0.49 in) length: approx. 50 mm (1.97 in)] into water pumps upper and lower bolt holes until they reach the timing chain case. Then, alternately tighten each bolt for a half turn, and pull out the water pump.
    - Pull straight out while preventing vane from contacting socket in installation area.
    - Remove water pump without causing sprocket to contact timing chain.
14. Remove M8 bolts and O-rings from water pump.



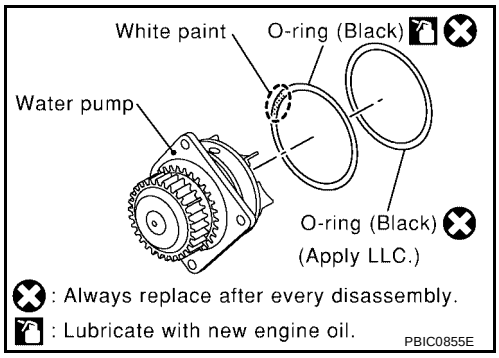
INSPECTION AFTER REMOVAL

1. Check for badly rusted or corroded water pump body assembly.
2. Check for rough operation due to excessive end play.



INSTALLATION

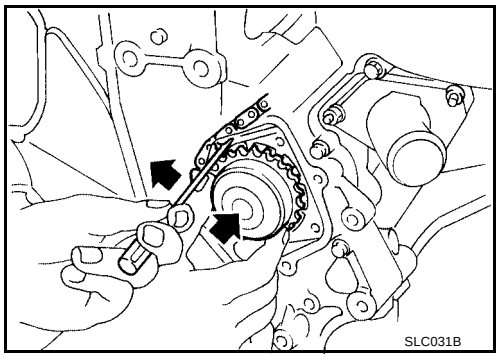
1. Install new O-rings to water pump.
2. Apply engine oil and coolant to the O-rings as shown.
    - Locate the O-ring with white paint mark to engine front side.



3. Install the water pump.

    CAUTION:
    Do not allow cylinder block to interfere with the O-rings when installing the water pump.
    - Check that timing chain and water pump sprocket are engaged.
    - Insert water pump by tightening bolts alternately and evenly.

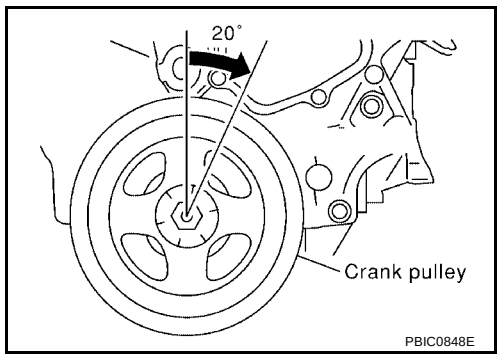
    Water pump bolts **8.5 – 10.7 N·m (0.86 – 1.10 kg-m, 75 – 95 in-lb)**



4. Remove dust and foreign material completely from backside of chain tensioner and from installation area of rear timing chain case.

5. Turn the crankshaft pulley approximately 20° clockwise so that the timing chain on the timing chain tensioner side is loose.

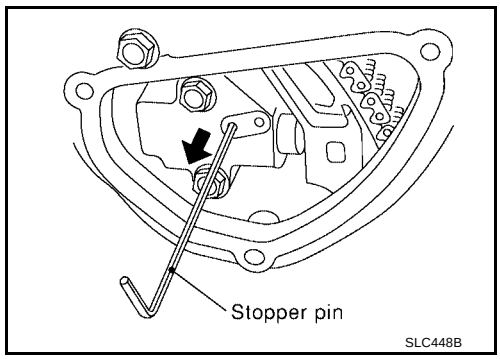
NOTE:
When installing the timing chain tensioner, engine oil should be applied to the oil hole and tensioner.



6. Install the timing chain tensioner.

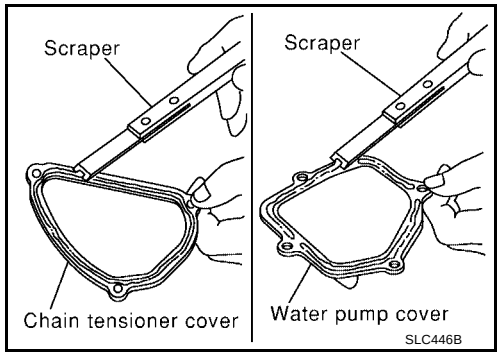
Timing chain tensioner bolts	**7.0 – 9.3 N·m (0.71 – 0.95 kg-m, 62 – 82 in-lb)**

7. Remove the stopper pin.

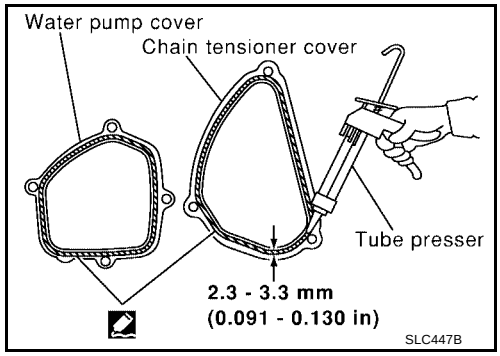


8. Install chain tensioner cover and water pump cover.

a. Before installing, remove all traces of sealant from mating surface of water pump cover and chain tensioner cover using a scraper.
Also remove traces of sealant from the mating surface of the front cover.



b. Apply a continuous bead of RTV Silicone Sealant or equivalent, to mating surface of chain tensioner cover and water pump cover. Refer to GI-45, "RECOMMENDED CHEMICAL PRODUCTS AND SEALANTS" .



9. Install water drain plug on water pump side of cylinder block. Refer to CO-31, "Changing Engine Coolant" .

10. Install idler pulley.

Idler pulley bolts	**: 28.4 N·m (2.9 kg-m, 21 ft-lb)**

11. Installation of remaining components is in the reverse order of removal.

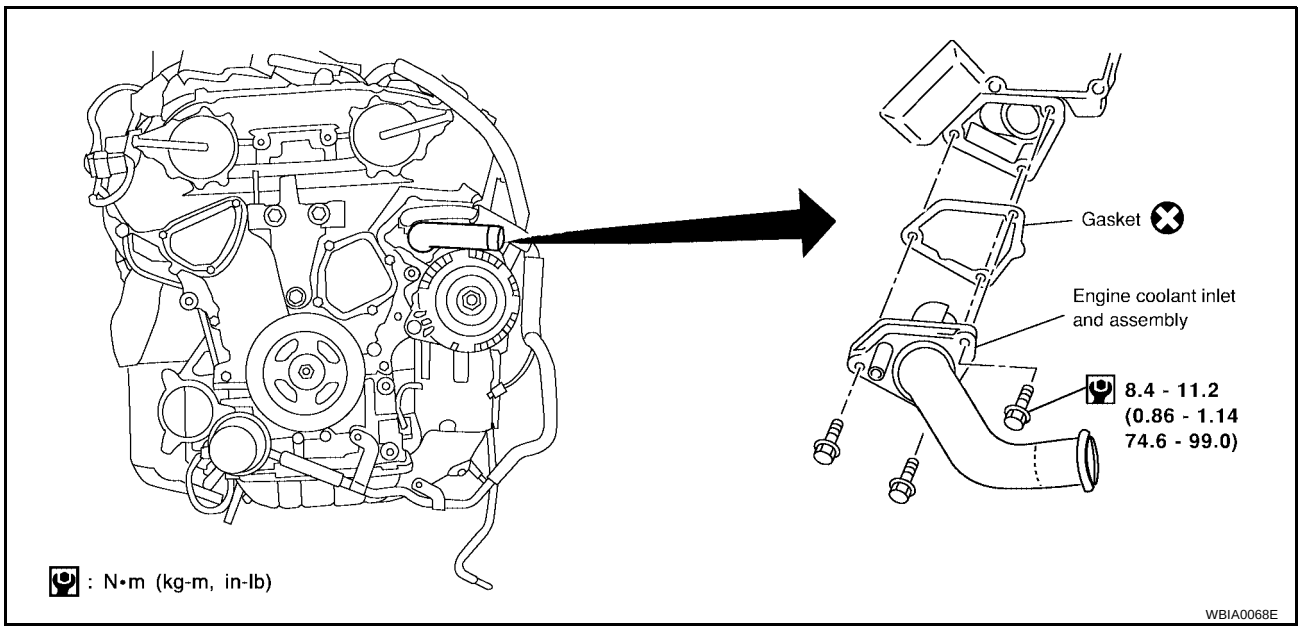
- Refill engine coolant. Refer to CO-32, "REFILLING ENGINE COOLANT" .
- After starting engine, let idle for three minutes, then rev engine up to 3,000 rpm under no load to purge air from the high-pressure chamber of the chain tensioner. The engine may produce a rattling noise. This indicates that air still remains in the chamber and is not a matter of concern.

THERMOSTAT AND THERMOSTAT HOUSING

PFP:21200

Removal and Installation

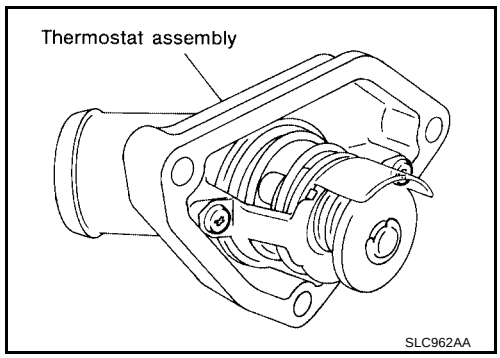
EBS00J86



REMOVAL

1. Remove engine undercover using power tool.
2. Drain coolant from radiator. Refer to CO-31, "Changing Engine Coolant" .

   CAUTION:
   Perform when engine is cool.
3. Remove drive belts. Refer to EM-117, "DRIVE BELTS" .
4. Remove water drain plug on water pump side of the engine. Refer to CO-31, "DRAINING ENGINE COOLANT" .
5. Disconnect lower radiator hose.
6. Remove engine coolant inlet and thermostat assembly.
   - **Do not disassemble engine coolant inlet and thermostat. Replace them as a unit, if necessary.**

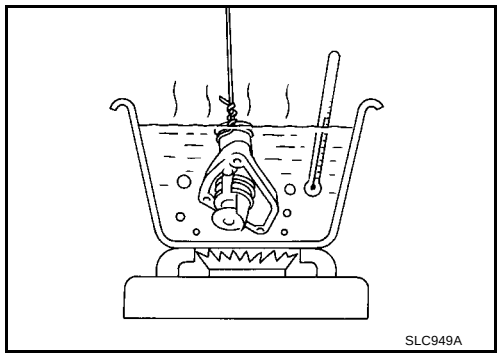


INSPECTION AFTER REMOVAL

1. Check valve seating condition at ordinary room temperatures. It should seat tightly.
2. Check valve opening temperature and maximum valve lift.

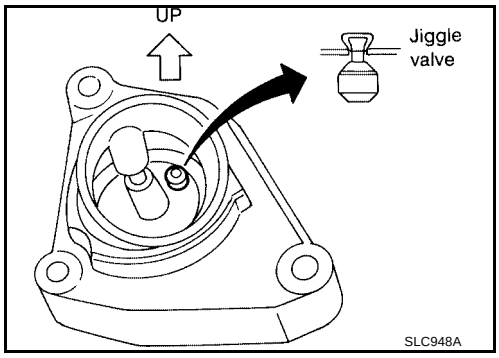
Thermostat	Standard Values
Valve opening temperature	82°C (180°F)
Valve lift	8.6 mm / 95°C (0.339 in / 203°F)

3. Then check if valve closes at 5°C (9°F) below valve opening temperature.



INSTALLATION

1. Install thermostat with jiggle valve facing upward.
   - **After installation, run engine for a few minutes, and check for leaks.**
   - **Be careful not to spill coolant over engine compartment. Use a rag to absorb coolant.**
2. Installation of the remaining components is in the reverse order of removal.

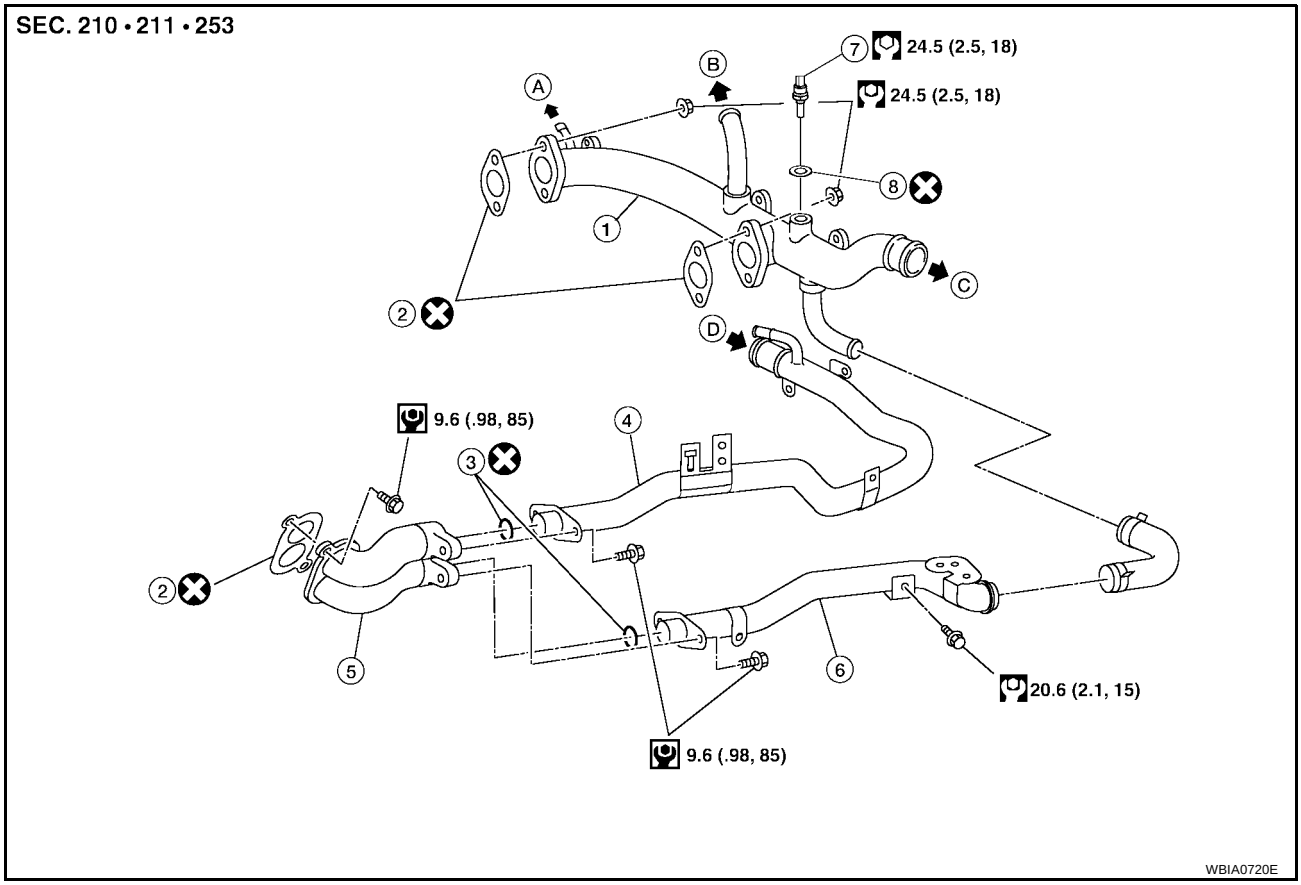


WATER OUTLET AND WATER PIPING

PFP:11060

Removal and Installation

EBS00J87



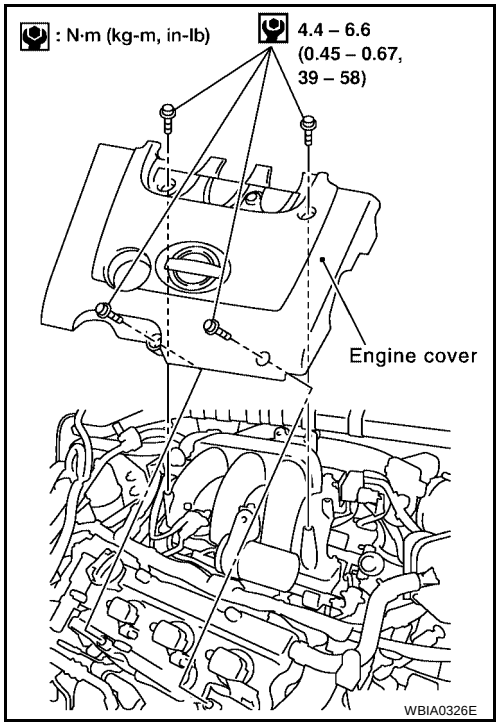
1.	Water outlet	2.	Gasket	3.	O-ring
4.	Heater pipe	5.	Water connector	6.	Water bypass pipe
7.	Engine coolant temperature sensor	8.	Washer	A.	To electric throttle control actuator
B.	To heater	C.	To radiator	D.	From heater or transmission oil cooler (if equipped)

REMOVAL

1. Drain coolant from drain plugs on radiator and both sides of cylinder block. Refer to CO-31, "DRAINING ENGINE COOLANT" .

   CAUTION:
   Perform when the engine is cold.

2. Remove engine cover using power tool.
3. Remove air duct and air cleaner case assembly. Refer to EM-118, "Removal and Installation" .
4. Remove radiator upper hose and heater hose.
5. Remove connector(s) from heater pipe.
6. Disconnect engine coolant temperature sensor electrical connector on water outlet.
7. Remove water outlet, heater pipe, water connector, and water bypass pipe nuts and bolts.



INSTALLATION

1. Installation is in the reverse order of removal.
   - Securely insert each hose, and install a clamp at a position where it does not interfere with the pipe bulge.

     CAUTION:
     Use new gasket for installation
   - When inserting heater pipe and water bypass pipe into water connector, apply neutral detergent to new O-rings.

     CAUTION:
     Use new O-rings for installation
   - Refill engine coolant. Refer to CO-32, "REFILLING ENGINE COOLANT" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00100

Capacity

EBS00J88

ℓ (US gal, Imp gal)

Coolant capacity (With reservoir tank at MAX level)	8.2 (2 1/8, 1 3/4)

Thermostat

EBS00J89

Valve opening temperature	82°C (180°F)
Valve lift	8.6 mm / 95°C (0.339 in / 203°F)

Radiator

EBS00J8A

Unit: kPa (kg/cm^2 , psi)

Cap relief pressure	Standard	78 – 98 (0.8 – 1.0, 11 – 14)
	Limit	59 (0.6, 9)
Leakage test pressure		157 (1.6, 23)