

DAIHATSU

F300

[HD-ENGINE]

COOLING SYSTEM

TROUBLE SHOOTING	CO- 2
PRECAUTIONS	CO- 2
CHECK & CHANGE OF ENGINE	
COOLANT	CO- 2
WATER PUMP	CO- 4
THERMOSTAT	CO- 7
RADIATOR	CO- 9

WN88E-CO001

CO

TROUBLE SHOOTING

Problem	Possible cause	Remedies	Page
Engine overheats	Poor quality coolant	Replenish coolant.	CO-2
	Water pump drive belt loose or missing	Adjust or replace belt.	CH-23
	Dirt, leaves or insects on radiator	Clean radiator.	CO-9
	Leaky hoses, water pump, the thermostat housing, radiator, heater, core plugs or head gasket	Repair as necessary.	
	Thermostat faulty	Check thermostat.	CO-7
	Ignition timing retarded	Set timing.	IG-22
	Radiator hose plugged or deteriorated	Replace hose.	
	Water pump faulty	Replace water pump.	CO-4
	Radiator plugged or cap faulty	Check radiator.	CO-9
Cylinder head or block cracked or plugged	Repair as necessary.	CO-10	

WN88E-CO002

PRECAUTIONS

- As regards water to be used as cooling water, use soft water which does not contain salts of minerals, calcium, magnesium and so forth.
- If the coolant gets to the vehicle body, immediately flush away the coolant using water.
- Never open the radiator cap when the cooling water is still hot.
- The inside of the radiator is under a pressurized condition when the cooling water is hot. Therefore, if the radiator cap should be removed, the cooling water will blow off, possibly causing injuries such as scald.

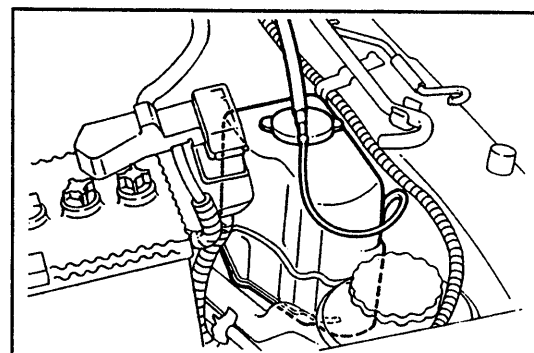
WR88-CO003

CHECK & CHANGE OF ENGINE COOLANT

1. Check of coolant level

Check to see if the coolant level is between the LOW and FULL lines of the reserve tank.

If the coolant level is near the low level or below the low level, add the coolant up to the full level.



WR88-CO004

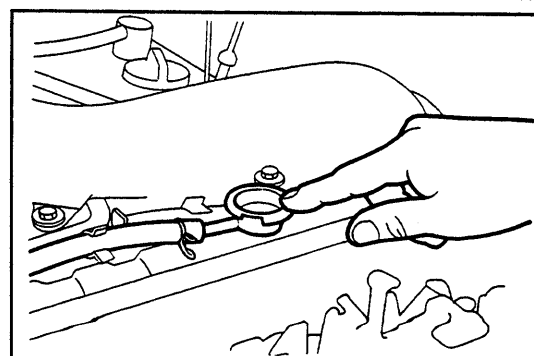
2. Check of coolant quality

There should not be any excessive deposits of rust or water scales around the radiator cap or the radiator filler hole. Also, the coolant should be free of oil.

Change the coolant if it is excessively dirty.

CAUTION:

Never open the radiator cap when the engine is still hot.



WR88-CO005

3. Change of engine coolant

(1) Remove the radiator cap.

CAUTION:

Never open the radiator cap and/or the drain plug when the engine is still hot. Care must be exercised to avoid getting scalded.

WR88-C0006

(2) Place an adequate container, below the radiator drain plug. Drain the coolant by removing the drain plug.

(3) Close the drain plug.

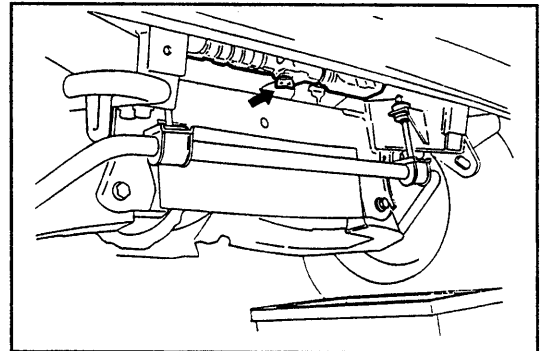
(4) Fill the system with water.

(5) Start the engine, and stop it.

(6) Repeat the steps (1) through (5) two to three times.

NOTE:

Replace the drain plug gasket with a new one.



WR88-C0007

(7) Fill the radiator and reserve tank with antifreeze solution in accordance with the instructions of the manufacturer of the antifreeze solution.

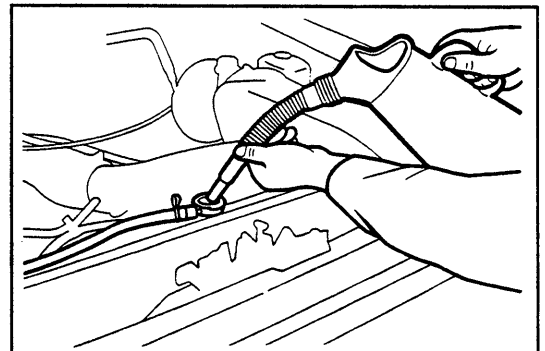
CAUTION:

Use a Good brand of ethylene-glycol base antifreeze solution.

Coolant capacity (Vehicle with front heater):

5.5 liter (4.8 IMP qt)

[excluding 1.0 liter (0.8 IMP qt) for reserve tank]



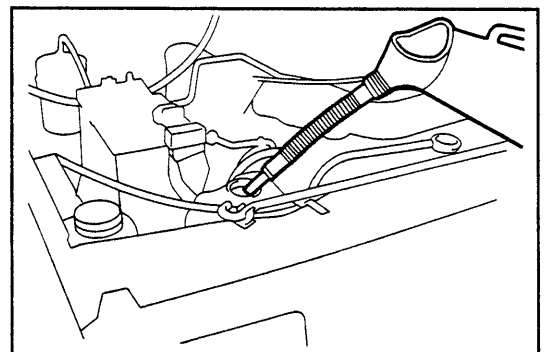
WN88E-C0003

(8) Fill the system with water.

(9) Start the engine. Check the coolant level. Add water, as required.

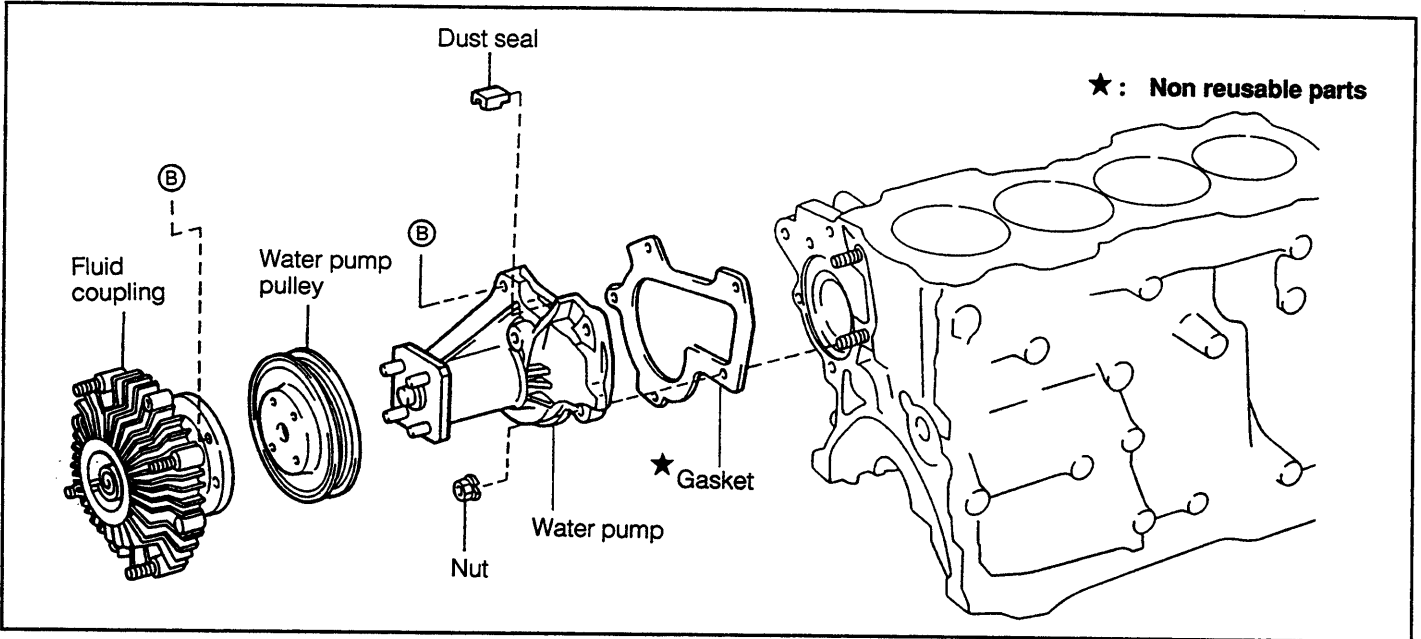
(10) Tighten the radiator cap.

(11) Warm the engine, until the radiator fan motor starts to rotate. Afterwards, allow the coolant to cool down to normal temperature. Recheck the coolant level at reserve tank. Add water to the full level, as required.



WR88-C0009

WATER PUMP COMPONENTS



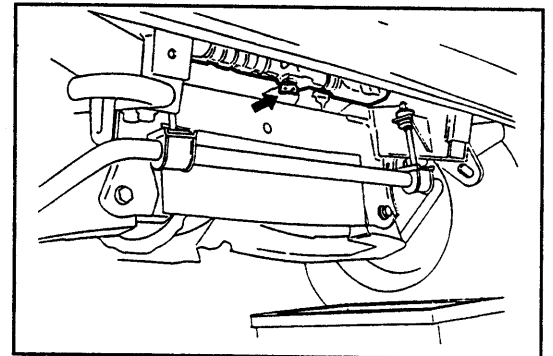
WN88E-CO004

REMOVAL OF WATER PUMP

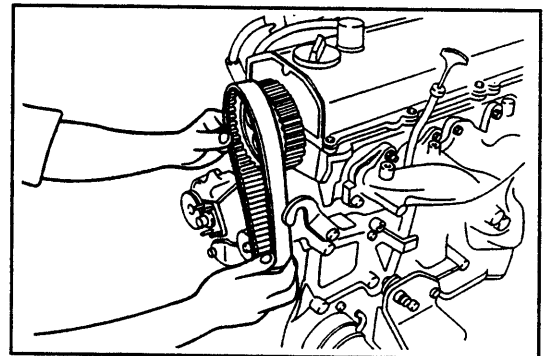
1. Disconnect the battery ground cable from the negative (-) terminal of the battery.
2. Drain the coolant as follows.
Open the radiator cap and drain plug, and allow the coolant to drain into a clean container.

CAUTION:

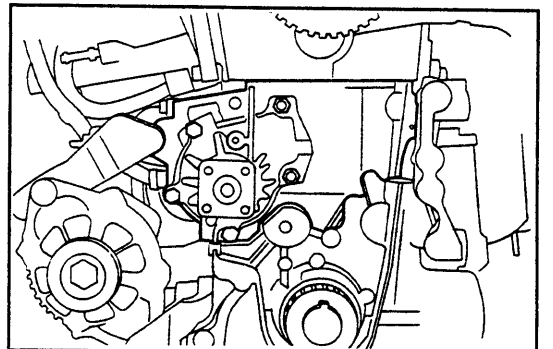
Never open the radiator cap and/or drain plug. When the engine is still hot.



3. Remove the timing belt.
(See pages EM-21)

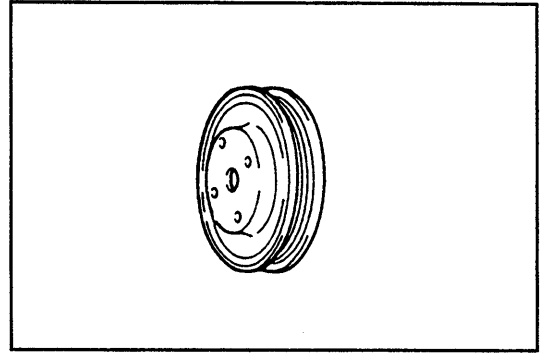


4. Remove the water pump by removing the attaching bolts and nuts of the water pump.

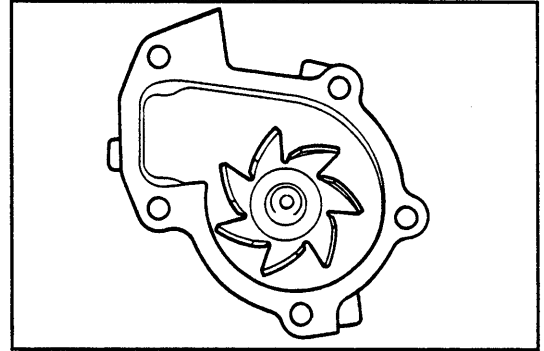


INSPECTION OF WATER PUMP-RELATED PARTS

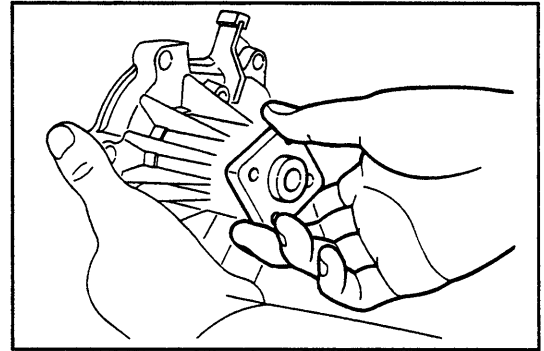
1. Check the water pump pulley for damage or deformation.
Replace the water pump if it exhibits damage or deformation.
2. Visually inspect the water pump rotor for damage or deformation.
Replace the water pump if the water pump rotor exhibits damage or deformation.
3. Ensure that the water pump rotates smoothly by hand.
Replace the water pump if it will not rotate smoothly.
4. Check the water pump cover section of the cylinder block for damage or wear.
Replace the cylinder block if the water pump cover section exhibits damage or wear.



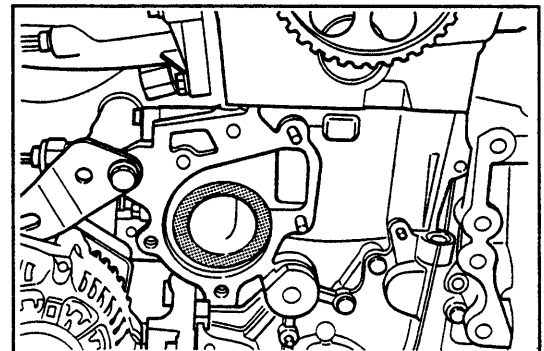
WR88-CO014



WR88-CO015



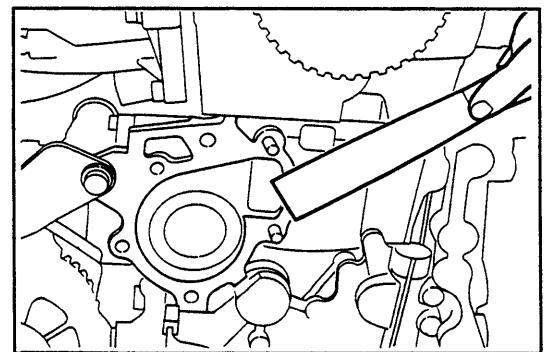
WR88-CO016



WN88E-CO006

INSTALLATION OF WATER PUMP

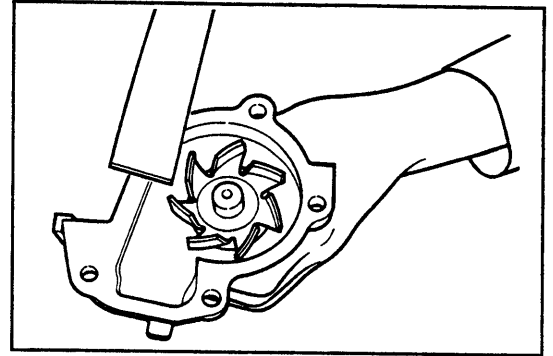
1. Remove the gasket material from the water pump installing surface of the cylinder block, using a gasket scraper.



WR88-CO018

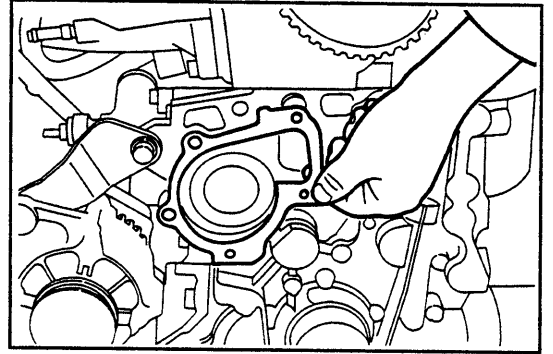
COOLING SYSTEM

2. Remove the gasket material from the water pump, using a gasket scraper.



WR88-CO019

3. Install a new gasket to the cylinder block.



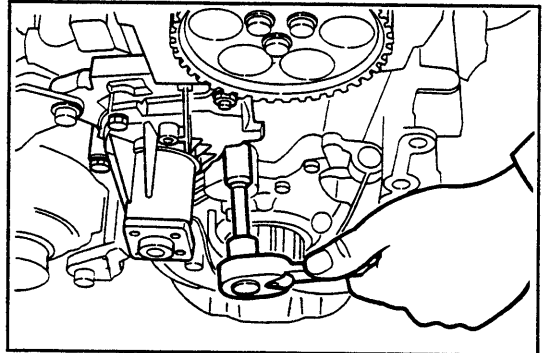
WR88-CO020

4. Install the water pump to the cylinder block. Tighten the attaching bolts evenly over two or three stages to the specified torque.

Tightening Torque: 1.5 - 2.2 kg-m (10.8 - 15.9 ft-lb)

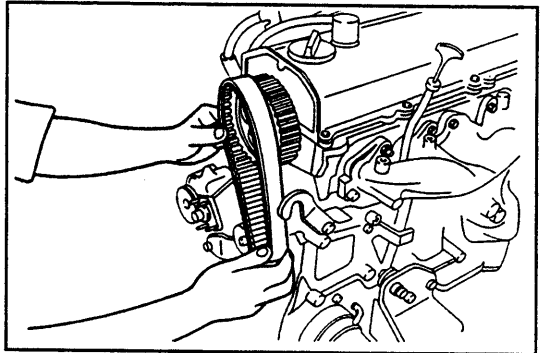
NOTE:

After tightening bolts, ensure that the water pump rotates smoothly by hand.



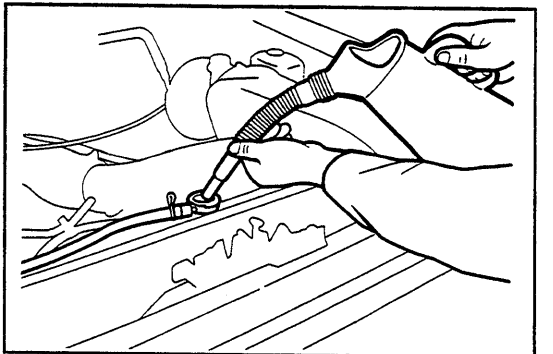
WR88-CO021

5. Install the timing belt.
(See page EM-29.)



WN88E-CO007

6. Fill coolant.
(See page CO-3.)



WN88E-CO008

THERMOSTAT

REMOVAL OF THERMOSTAT

1. Drain the coolant
(See page CO-3).

CAUTION:

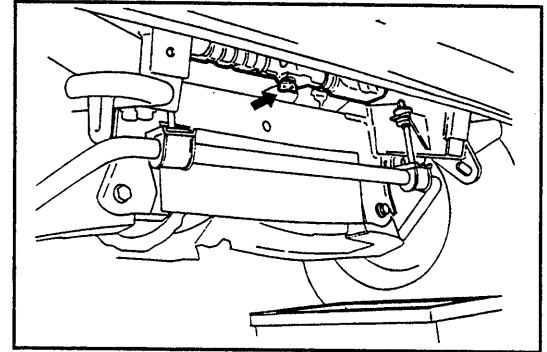
Never open the radiator cap and/or drain plug when the coolant is still hot.

2. Remove the radiator hose No. 2 from the water inlet.

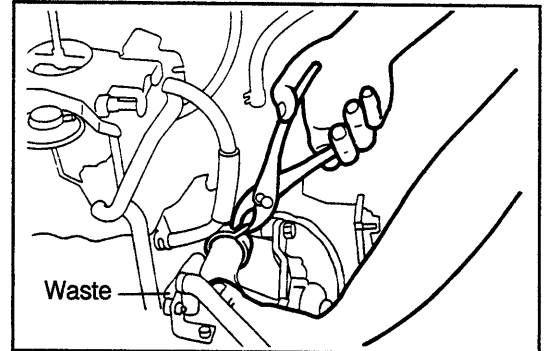
WARNING:

Cover the alternator to prevent entering the cooling water into the alternator.

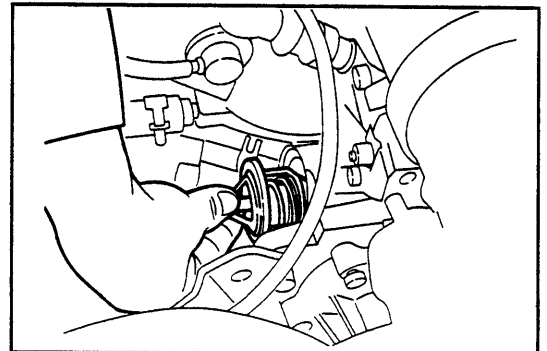
3. Remove the thermostat by removing the water inlet.



WN88E-CO009



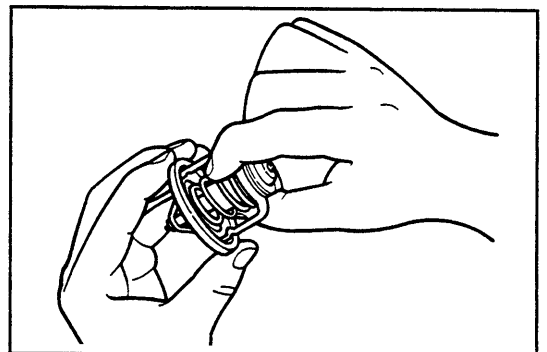
WN88E-CO010



WN88E-CO011

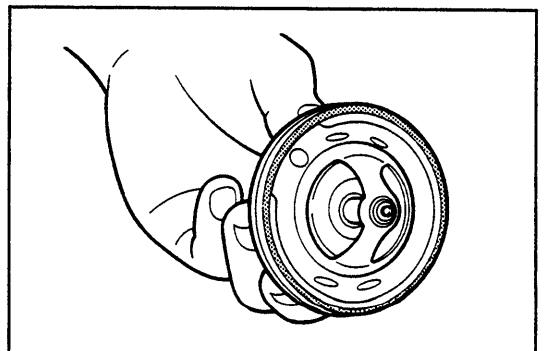
INSPECTION OF THERMOSTAT

1. Ensure that the thermostat valve is closed completely at room temperature 20°C (68°F) and the spring has no play. Replace the thermostat if the valve is open or the spring has a play.



WR88-CO028

2. Check the rubber grommet of the thermostat for damage or crack. Replace the thermostat if the rubber grommet exhibits damage or crack.



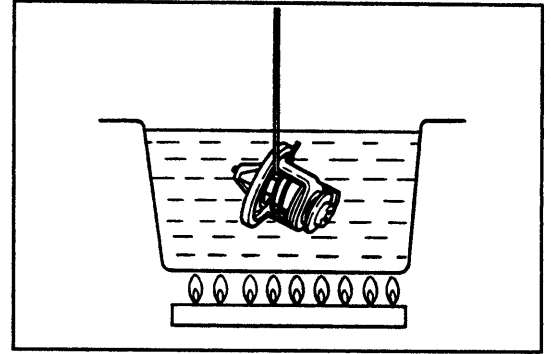
WR88-CO029

COOLING SYSTEM

3. Immerse the thermostat in water, and check the valve opening temperature by heating the water gradually.

Specifications	Valve opening temperature °C (°F)	Valve lift
General specifications	76 - 80 (168.8 - 176)	8.5 mm or more at 91°C (0.34 inch or more at 195.8°F)
ECE & EEC specifications	82 - 86 (179.6 - 186.8)	8.5 mm or more at 98°C (0.34 inch or more at 208.4°F)

Replace the thermostat if the valve operation fails to conform to the specifications.



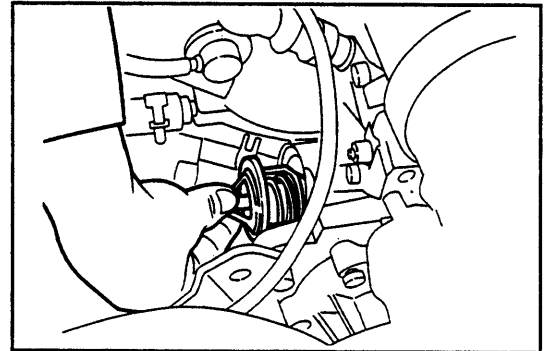
WR88-CO030

INSTALLATION OF THERMOSTAT

1. Assemble the thermostat in such a way that the jiggle pin comes exactly at the top of the engine.

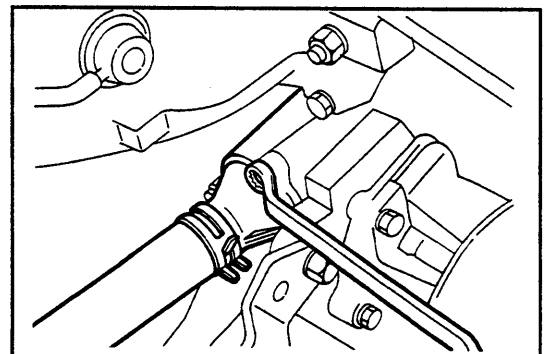
NOTE:

The thermostat should be installed in such a way the jiggle pin may face upward. Failure to observe this caution may cause engine malfunction.



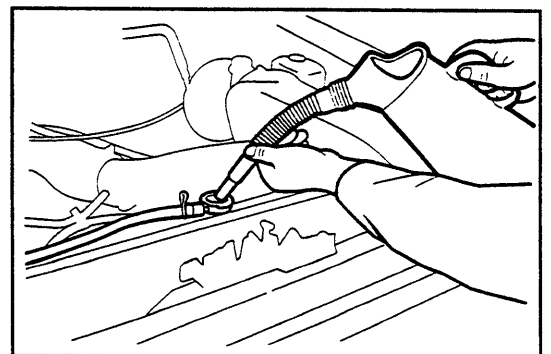
WR88-CO031

2. Install the water inlet.
Tightening Torque: 0.6 - 0.9 kg-m (4.3 - 6.5 ft-lb)



WR88-CO032

3. Fill coolant.
(See page CO-3.)
4. Start the engine and check it for leakage.
Repair the leaky point if the leakage exists.



WN88E-CO012

RADIATOR

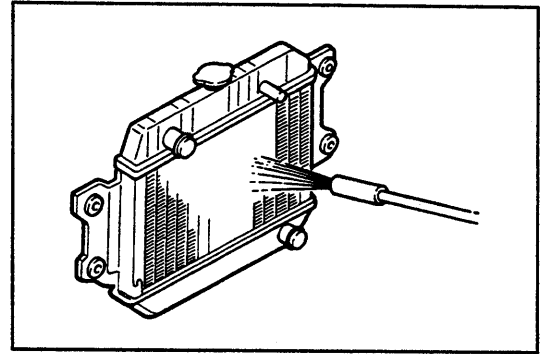
CLEANING OF RADIATOR

Using water or steam cleaner, remove mud and dirt from the radiator core.

CAUTION:

When using a high pressure type cleaner, be careful not to deform radiator core fins.

Keep a distance of more than 40 - 50 cm (15.75 - 19.69 inch) between the radiator core and cleaner nozzle when the cleaner nozzle pressure is 30 - 50 kg/cm² (427 - 711 psi). Also, the injection angle of pressurized water should be right angles to the radiator.



WR88-CO034

INSPECTION OF RADIATOR

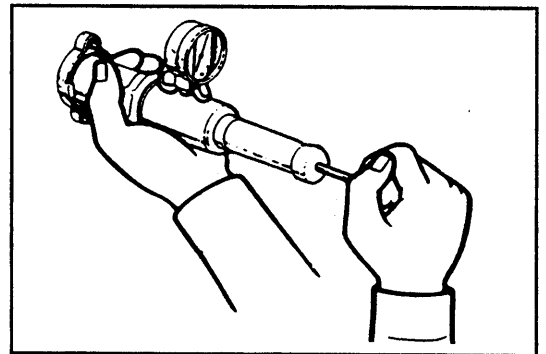
1. Check of radiator cap

(1) Check the radiator cap by means of a radiator cap tester to see if the relief valve opens at a pressure of 0.6 - 1.05 kg/cm² (8.53 - 14.9 psi).

If the radiator cap does not conform to the specification, replace the radiator cap.

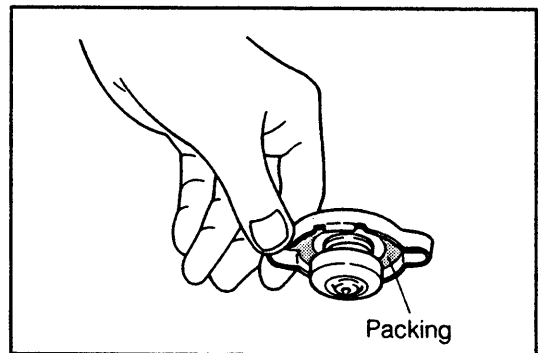
CAUTION:

Never open the radiator cap when the engine is still hot.



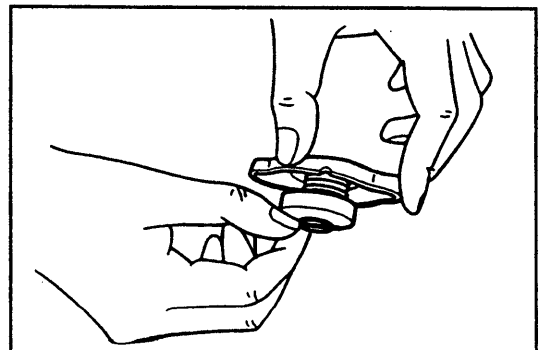
WR88-CO036

(2) Check the seal packing of the radiator cap for damage. Replace the radiator cap with a new one, if any damage exists.



WR88-CO037

(3) Lift the valve at the vacuum side with your fingers. Ensure that the valve is functioning properly. Replace the radiator cap with a new one, if the valve fails to function.



WR88-CO038

COOLING SYSTEM

2. Check of cooling system for leakage

- (1) Fill the radiator with coolant. Attach a radiator cap tester.
- (2) Warm up the engine.
- (3) Apply a pressure of 1.2 kg/cm² (17 psi) to the cooling system by means of a radiator tester.

If the pressure drops, check the hoses, radiator, water pump and heater for evidence of leakage.

If no external leakage is found, check the heater core, cylinder block, cylinder head, oil cooler and throttle body for evidence of leakage.

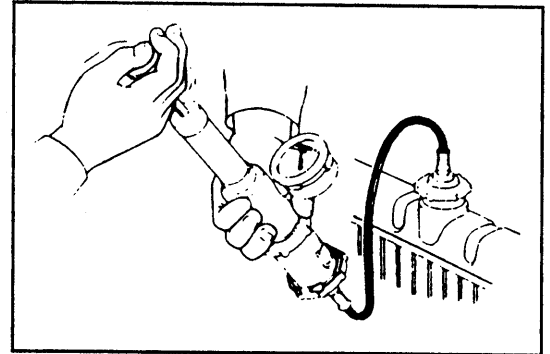
Check the hoses for deterioration, cracks, bulge or damage.

Replace the defective part(s) if necessary.

- (4) Remove the radiator cap tester from the radiator.

CAUTION:

Never remove the radiator cap tester when the coolant temperature is still high.



WR88-CO039

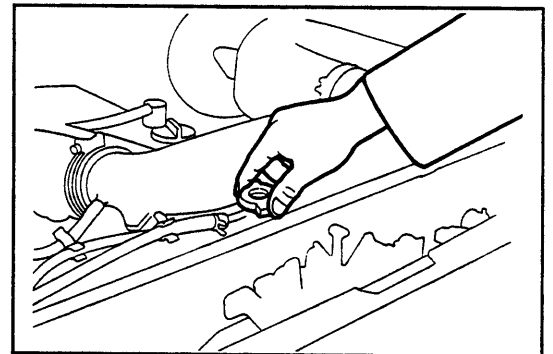
REMOVAL OF RADIATOR

1. Disconnect the ground cable terminal from the negative (-) terminal of the battery.
2. Drain the coolant as follows:
 - (1) Remove the radiator cap.

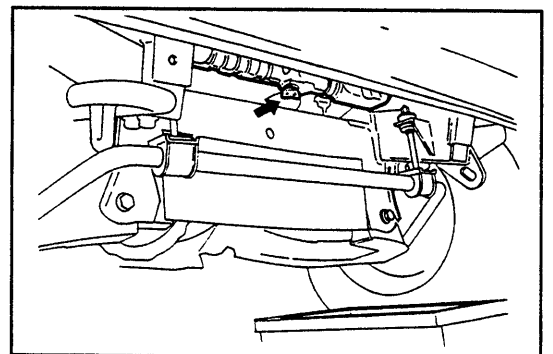
CAUTION:

Never open the radiator cap and/or drain cap when the coolant is still hot.

- (2) Place a suitable container below the radiator drain plug.
Drain the coolant by removing the drain plug.
- (3) Tighten the drain plug.



WR88-CO040

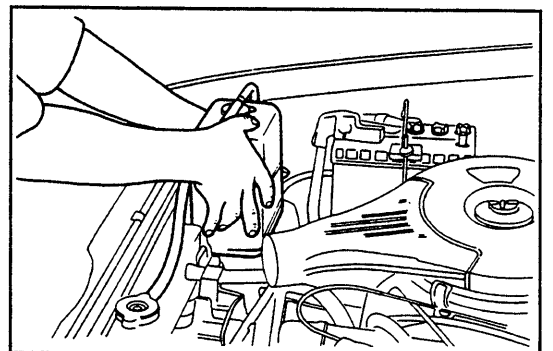


WR88-CO041

3. Removal of radiator
 - (1) Remove the reserve tank.
 - (2) Remove the radiator hose No. 1 and No. 3 at radiator side.

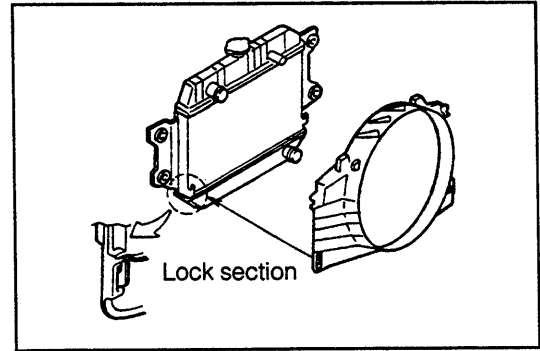
CAUTION:

When the radiator hose is loosened, be sure to protect the alternator because the coolant flows out.



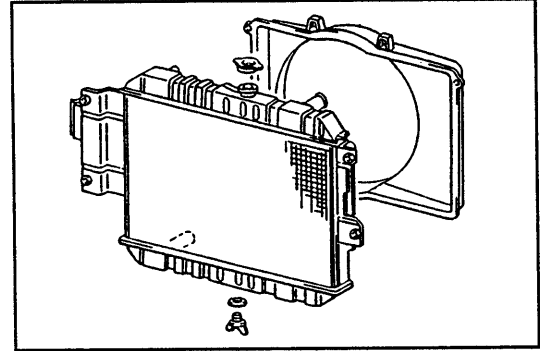
WN88E-CO013

- (3) Disconnect the small water hose from the radiator upper tank.
- (4) Remove the two clamps for clutch cable on the fan shroud.
- (5) Remove the two attaching bolts of the fan shroud. Then, disconnect the lock section of the fan shroud from radiator.



WN88E-CO014

- (6) Remove the radiator grill.
(See page CO-3).
- (7) Remove the radiator by removing the four attaching bolts.
- (8) Remove the fan shroud.

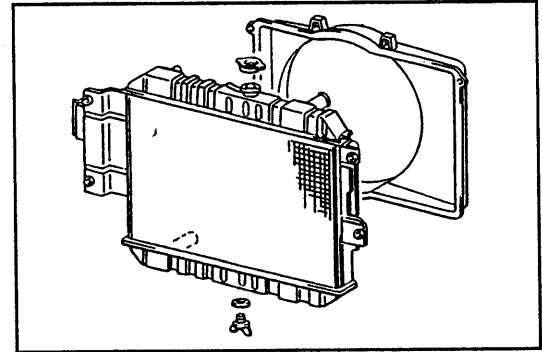


WN88E-CO015

INSTALLATION OF RADIATOR

1. Radiator installation

- (1) Place the radiator fan shroud to the cooling fan side.
- (2) Install the radiator in the engine room. Then, tighten the attaching bolts.

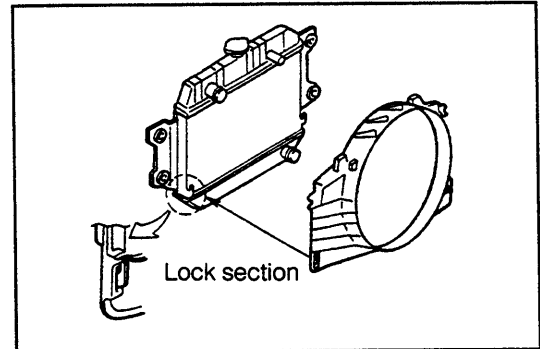


WN88E-CO016

- (3) Install the radiator fan shroud with two attaching bolts.

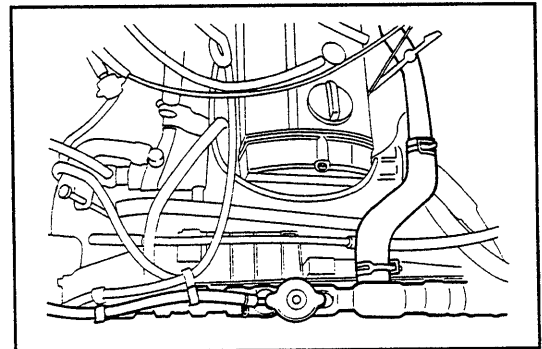
NOTE:

Before attaching the fan shroud to the radiator, insert the lock section of the fan shroud to the lower section of the radiator.



WN88E-CO017

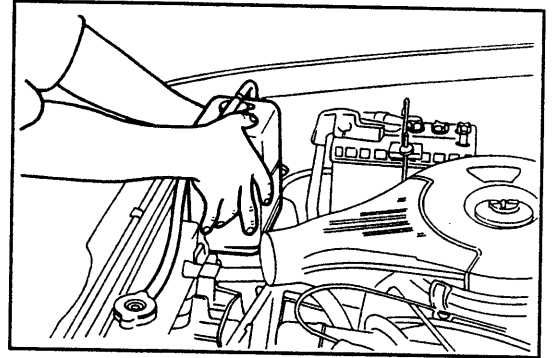
- (4) Connect the radiator hose No. 1 to the radiator upper tank.
- (5) Connect the radiator hose No. 3 from the intake manifold to the radiator upper tank.



WN88E-CO018

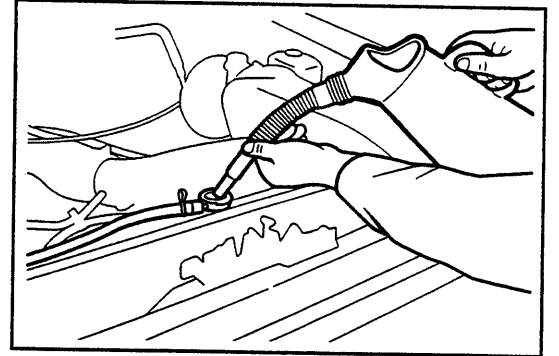
COOLING SYSTEM

- (6) Clamp the clutch cable on the fan shroud with the two clamps.
- (7) Install the reserve tank to the radiator.
- (8) Install the air cleaner hose into the position.



WN88E-CO019

2. Fill the coolant.
(See page CO-3).
3. Start the engine and check it for leakage.
Repair the leaky point if leakage exists.



WN88E-CO020