

Engine Cooling

Cooling System

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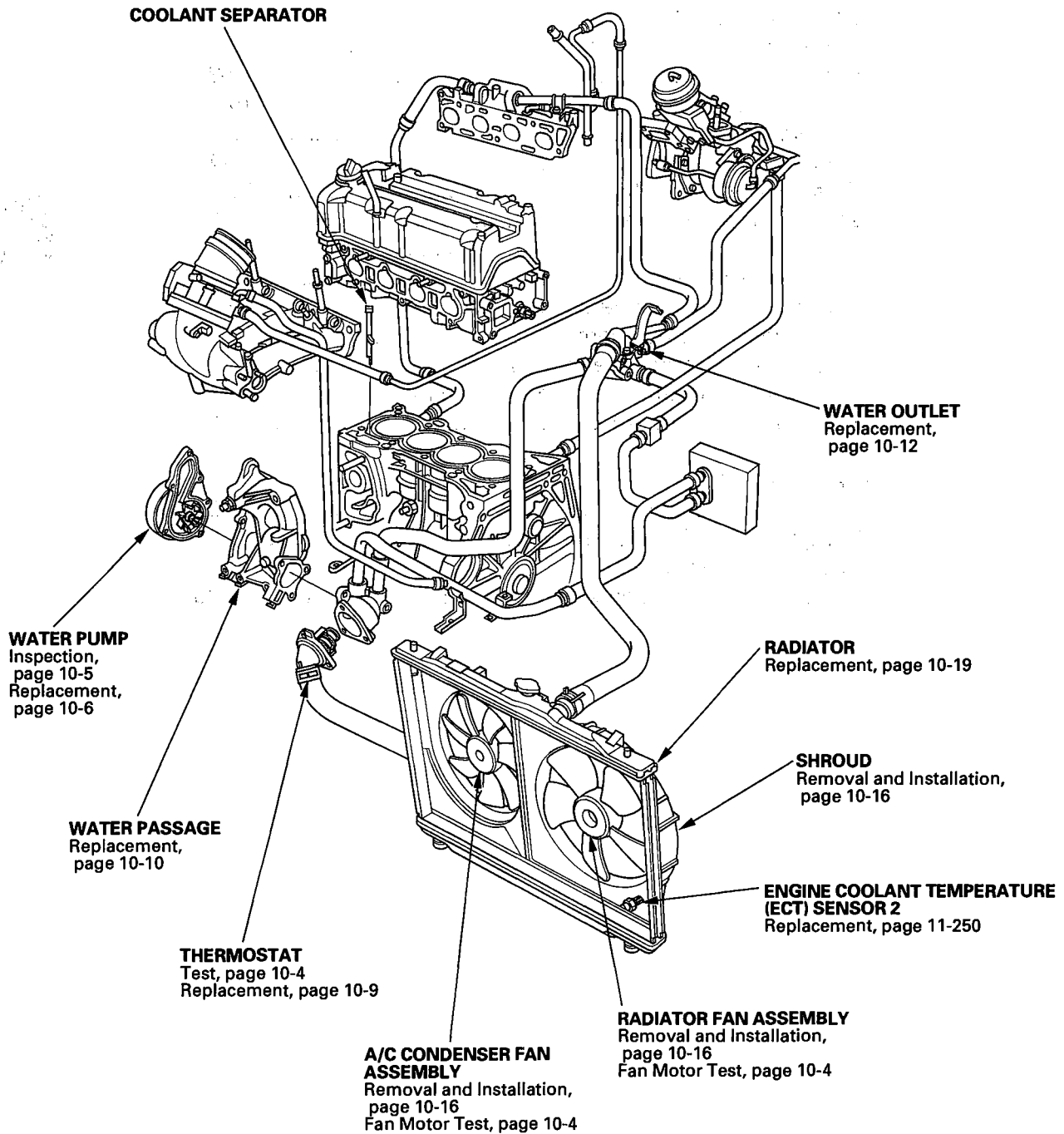
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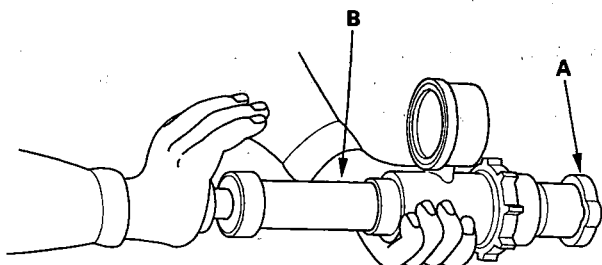
Component Location Index





Radiator Cap Test

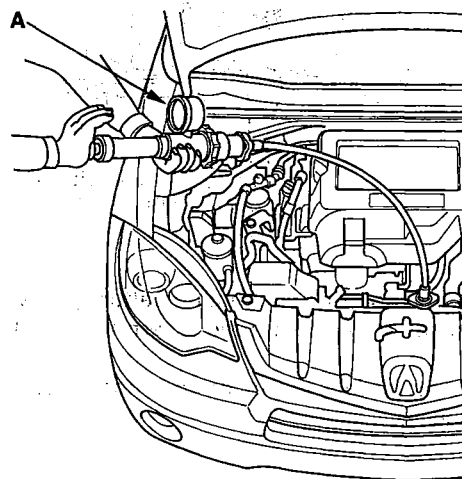
1. Remove the radiator cap (A). Wet the seal with engine coolant, then install it on a commercially available pressure tester (B).



2. Apply a pressure of 93—123 kPa (0.95—1.25 kgf/cm², 14—18 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.

Radiator Test

1. Wait until the engine is cool, then carefully remove the radiator cap, and fill the radiator with engine coolant to the top of the filler neck.
2. Attach a commercially available pressure tester (A) to the radiator, and apply a pressure of 93—123 kPa (0.95—1.25 kgf/cm², 14—18 psi).

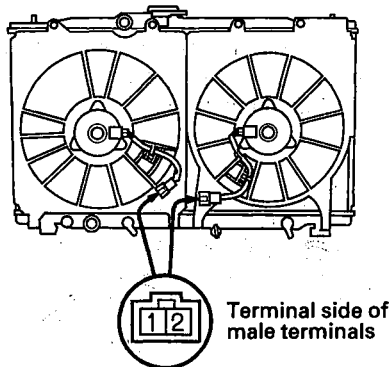


3. Inspect for engine coolant leaks, and a drop in pressure.
4. Remove the tester, then reinstall the radiator cap.

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Fan Motor Test

1. Disconnect the 2P connectors from the radiator fan motor and condenser fan motor.



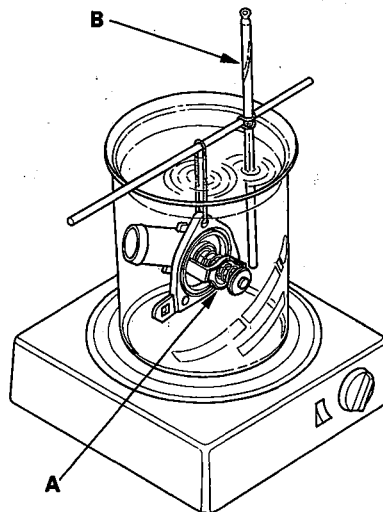
2. Test the motor by connecting battery power to terminal No. 2 and ground to terminal No. 1.
3. If the motor fails to run, or does not run smoothly, replace it.

Thermostat Test

Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat (A) in a container of water. Do not let the thermometer (B) touch the bottom of the hot container.



2. Heat the water, and check the temperature with a thermometer. Check the temperature where the thermostat first opens, and where it is fully open.
3. Measure the lift height of the thermostat when it is fully open. If the thermostat is not within the specification, replace it.

Standard Thermostat

Lift Height: Above 8.0 mm (0.31 in.)
Starts Opening: 169–176 °F (76–80 °C)
Fully Open: 194 °F (90 °C)

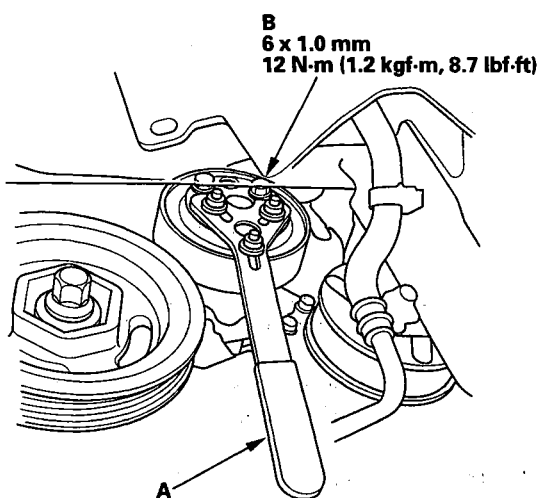


Water Pump Inspection

Special Tools Required

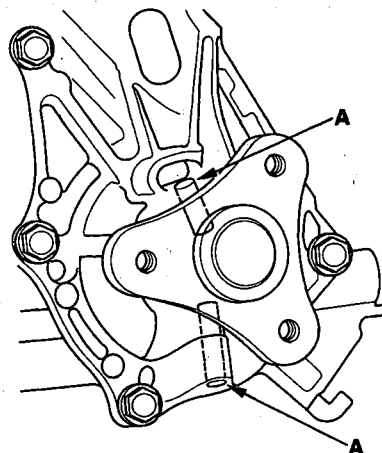
A/C clutch holder, Robinair 10204 or Kent-Moore J37872, or Honda Tool and Equipment KMT-J33939, commercially available

1. Remove the splash shield (see step 25 on page 5-6).
2. Remove the drive belt (see page 4-31).
3. Hold the water pump pulley using the A/C clutch holder (A), and remove the water pump pulley mounting bolts (B), then remove the water pump pulley.



4. Turn the water pump pulley counterclockwise. Check that it turns freely. If it doesn't, replace the water pump (see page 10-6).

NOTE: When you check the water pump, you may see a small amount of "weeping" from the bleed holes (A). This is normal.



5. Install the water pump pulley.
6. Install the drive belt (see page 4-31).
7. Install the splash shield (see step 30 on page 5-16).

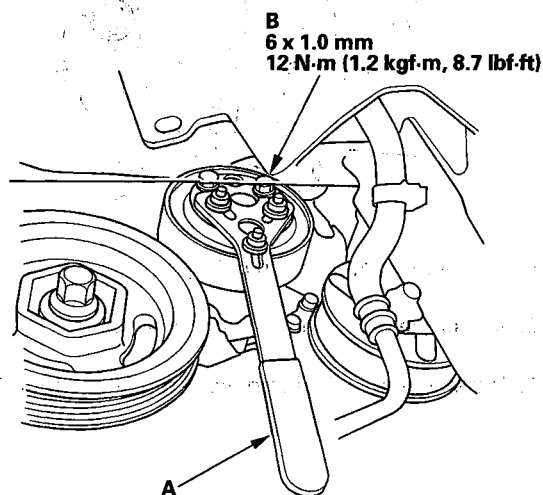
Cooling System

Water Pump Replacement

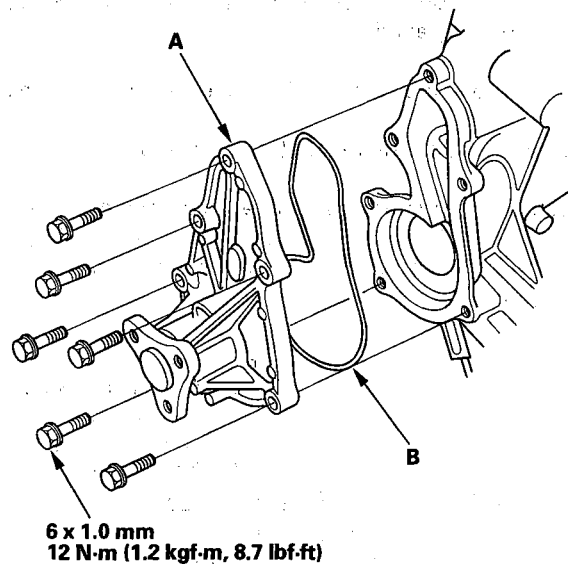
Special Tools Required

A/C clutch holder, Robinair 10204 or Kent-Moore J37872, or Honda Tool and Equipment KMT-J33939, commercially available

1. Drain the engine coolant (see page 10-7).
2. Remove the splash shield (see step 25 on page 5-6).
3. Remove the drive belt (see page 4-31).
4. Hold the water pump pulley using the A/C clutch holder (A), and remove the water pump pulley mounting bolts (B), then remove the water pump pulley.



5. Remove the water pump (A) by removing the six bolts.

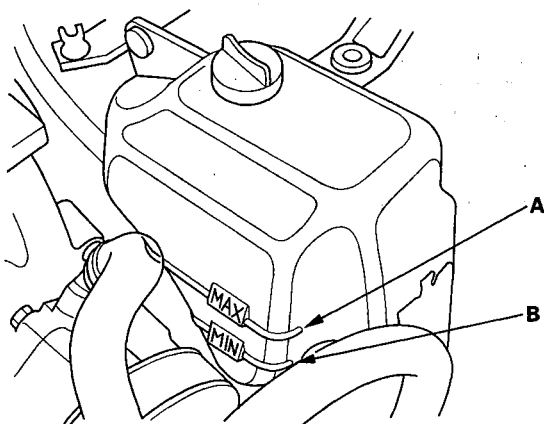


6. Inspect, and clean the O-ring groove and the mating surface of the engine block.
7. Install the water pump with a new O-ring (B) in the reverse order of removal.
8. Clean up any spilled engine coolant.
9. Install the water pump pulley.
10. Install the drive belt (see page 4-31).
11. Install the splash shield (see step 30 on page 5-16).
12. Refill the radiator with engine coolant, then bleed the air from the cooling system (see step 6 on page 10-7).



Coolant Check

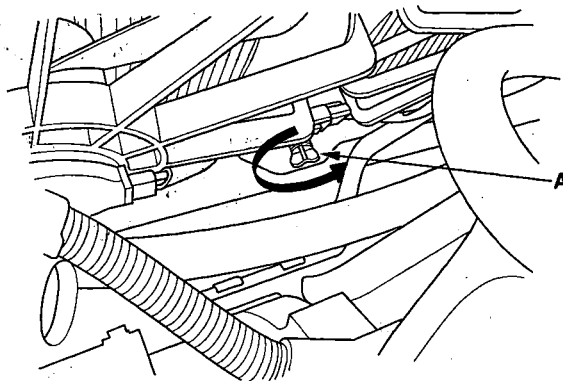
1. Look at the coolant level in the coolant reservoir. Make sure it is between the MAX mark (A) and MIN mark (B).



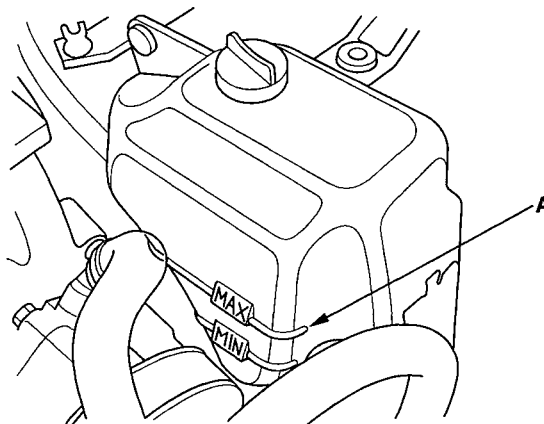
2. If the coolant level in the coolant reservoir is at or below the MIN mark, add coolant to bring it up to the MAX mark, and inspect the cooling system for leaks.

Coolant Replacement

1. Start the engine. Set the heater temperature control dial to maximum heat, then turn off the ignition switch. Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug (A), and drain the coolant.



4. After the coolant has drained, tighten the radiator drain plug.
5. Remove the coolant reservoir, and drain the coolant. Reinstall the coolant reservoir.
6. Fill the coolant reservoir to the MAX mark (A) with Honda Long Life Antifreeze/Coolant Type 2 (P/N OL999-9001).



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Cooling System

Coolant Replacement (cont'd)

7. Pour Honda Long Life Antifreeze/Coolant Type 2 (P/N OL999-9001) into the radiator up to the base of the filler neck.

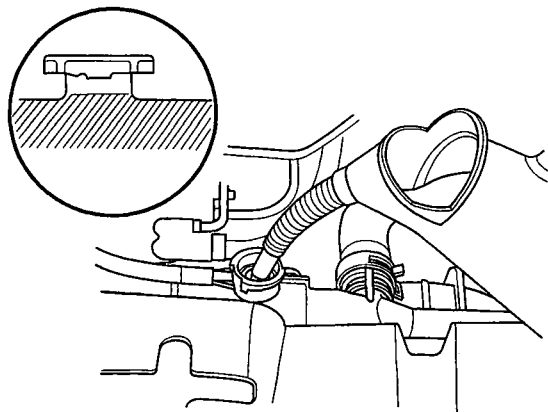
NOTE:

- Always use Honda Long Life Antifreeze/Coolant Type 2 (P/N OL999-9001). Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
- Honda Long Life Antifreeze/Coolant Type 2 is a mixture of 50 % antifreeze and 50 % water. Do not add water.

Engine Coolant Capacities (Including the reserve tank capacity of 0.7 L (0.18 US gal))

At Coolant Change: 6.5 L (1.72 US gal)

After Engine Overhaul: 8.4 L (2.22 US gal)

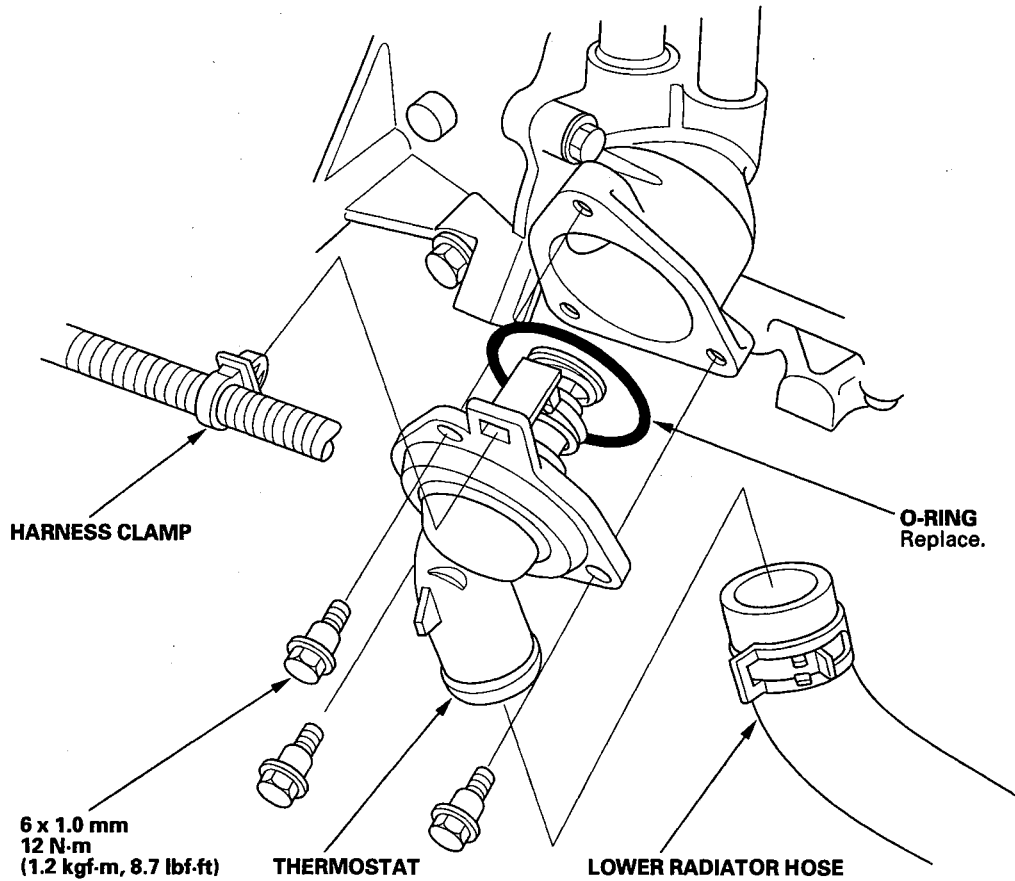


8. Loosely install the radiator cap.
9. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
10. Turn off the engine. Check the level in the radiator and add Honda Long Life Antifreeze/Coolant Type 2 if needed.
11. Put the radiator cap on tightly, then run the engine again, and check for leaks.



Thermostat Replacement

1. Drain the engine coolant (see page 10-7).
2. Remove the condenser fan shroud (see page 10-16).
3. Remove the lower hose, then remove the thermostat.

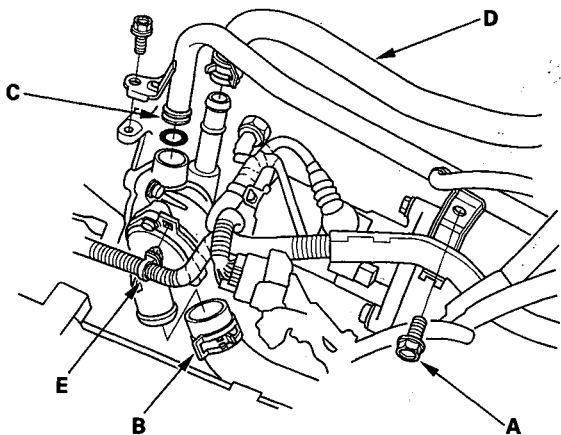


4. Install the thermostat with a new O-ring, then install the lower hose.
5. Install the condenser fan shroud (see page 10-17).
6. Refill the radiator with engine coolant, and bleed the air from the cooling system with the heater valve open (see step 6 on page 10-7).

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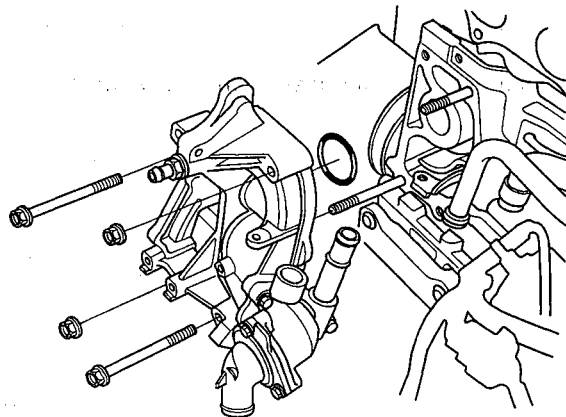
Water Passage Replacement

1. Drain the engine coolant (see page 10-7).
2. Remove the intake manifold (see page 9-3).
3. Remove the drive belt auto-tensioner (see page 4-33).
4. Remove the alternator (see page 4-34).
5. Remove the condenser fan shroud assembly.
6. Remove the A/C compressor without disconnecting the A/C hoses (see step 38 on page 5-7).
7. Remove the bolt (A) securing the connecting pipe.

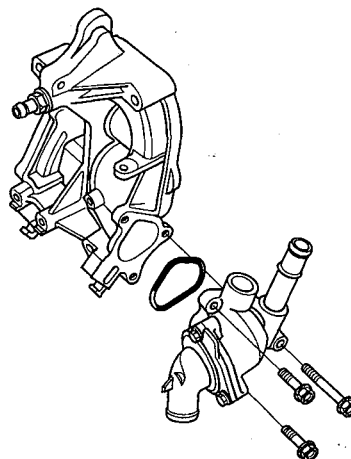


8. Remove the lower radiator hose (B), connecting pipe (C), water bypass hose (D), and harness clamp (E).

9. Remove the water passage.



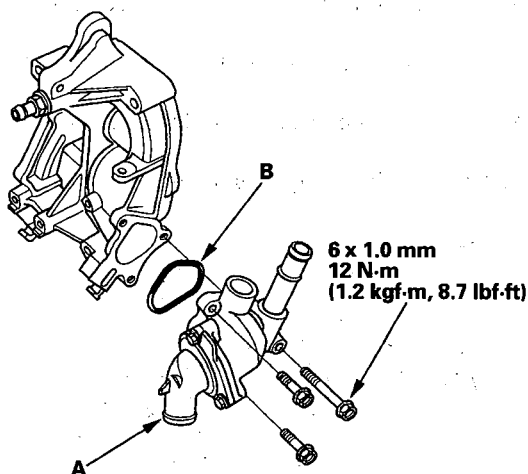
10. Remove the thermostat housing.



11. Remove the water pump (see page 10-6).



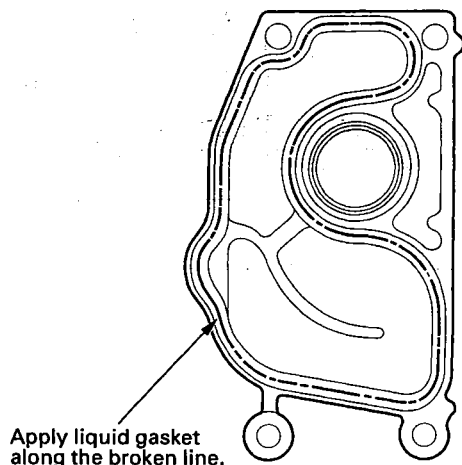
12. Install the water pump (see page 10-6).
13. Install the thermostat housing (A) with a new O-ring (B).



14. Clean, and dry the water passage mating surfaces.
15. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the engine block mating surface of the water passage. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be install within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

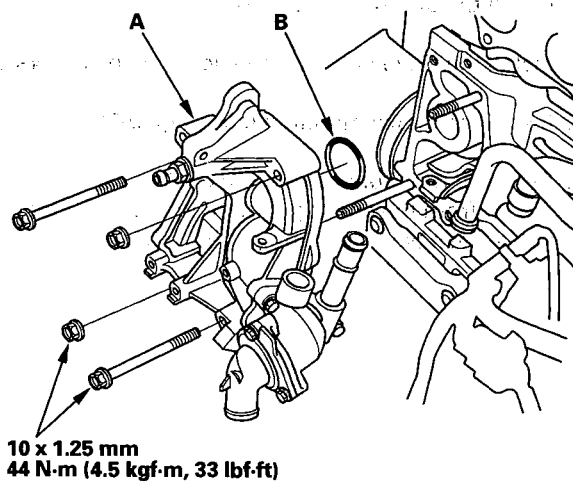


Apply liquid gasket along the broken line.

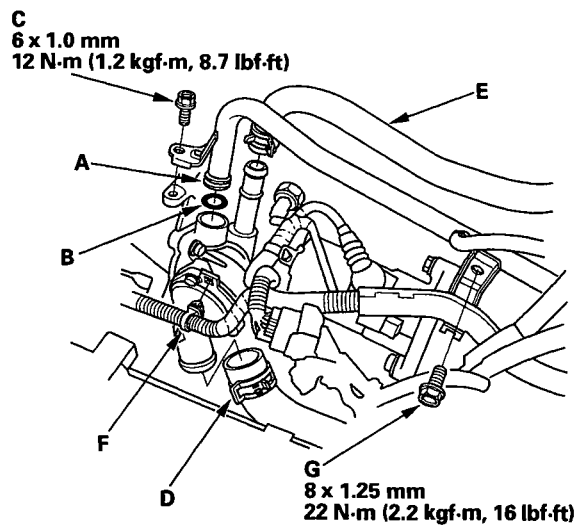
16. Install the water passage (A) with a new O-ring (B).

NOTE:

- Wait at least 30 minutes before filling the engine with oil.
- Do not run the engine for at least 3 hours after installing the water passage.



17. Install the connecting pipe (A) with a new O-ring (B), then tighten the bolt (C).



18. Install the lower radiator hose (D), water bypass hose (E), and harness clamp (F).
19. Tighten the bolt (G) securing the connecting pipe.

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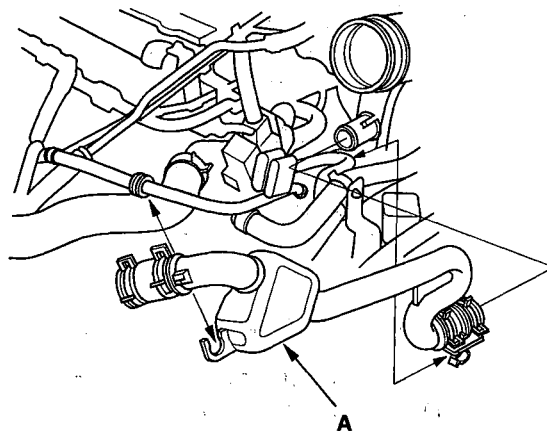
Water Passage Replacement (cont'd)

20. Install the A/C compressor (see step 36 on page 5-16).
21. Install the condenser fan shroud assembly.
22. Install the alternator (see page 4-35).
23. Install the drive belt auto-tensioner (see page 4-33).
24. Install the intake manifold (see page 9-5).
25. Refill the radiator with engine coolant, and bleed the air from the cooling system with the heater valve open (see step 6 on page 10-7).

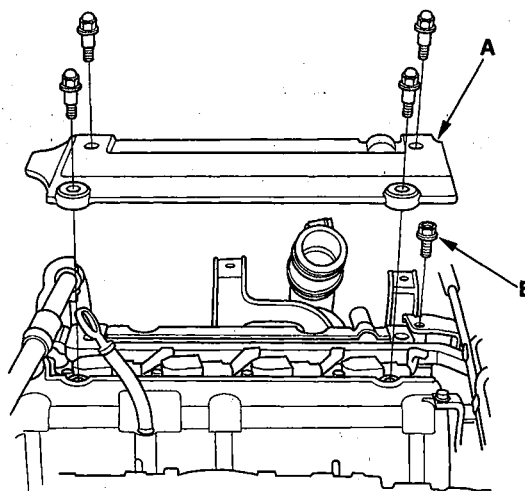
Water Outlet Removal and Installation

Removal

1. Drain the engine coolant (see page 10-7).
2. Remove the air cleaner housing (see page 11-394).
3. Remove the charge air cooler (see page 9-8).
4. Remove the air bypass outlet pipe (A).



5. Remove the ignition coil cover (A) and fuel feed pipe mounting bolt (B).

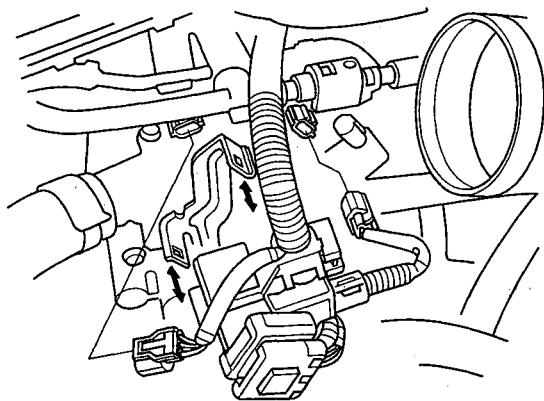




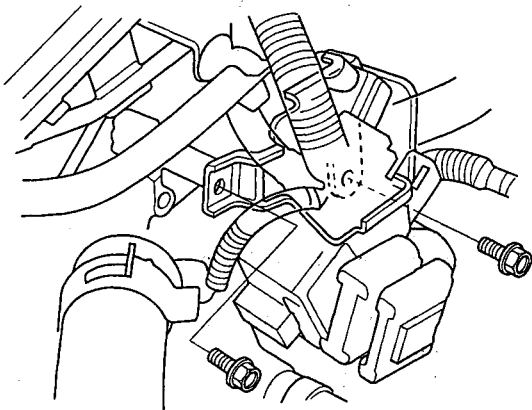
6. Remove the engine wire harness connectors and wire harness clamps from the cylinder head.

- Camshaft position (CMP) sensor A (Intake) connector
- Camshaft position (CMP) sensor B (Exhaust) connector
- EVAP canister purge valve connector

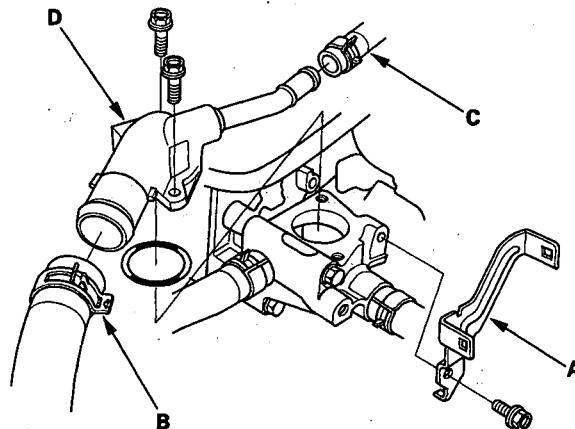
7. Remove the harness holder from the bracket.



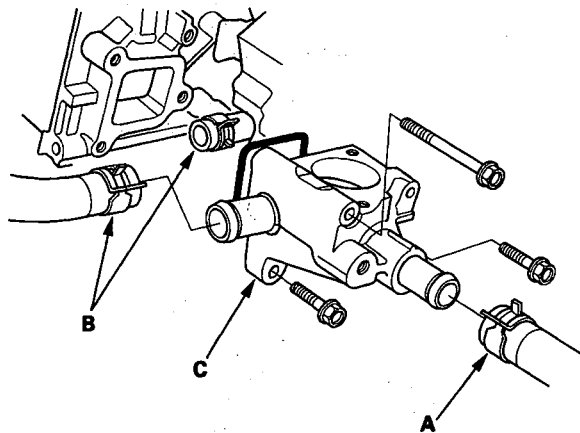
8. Remove the EVAP canister purge valve mounting bracket from the cylinder head.



9. Remove the harness holder bracket (A), upper radiator hose (B), and water bypass hose (C), then remove the upper water outlet (D).



10. Remove the heater hose (A) and water bypass hoses (B), then remove the lower water outlet (C).

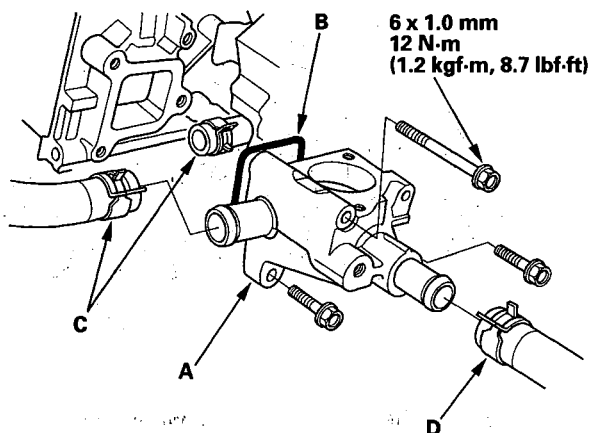


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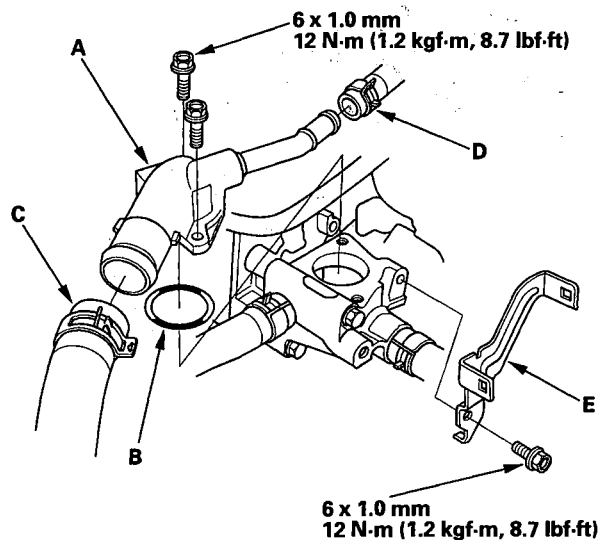
Water Outlet Removal and Installation (cont'd)

Installation

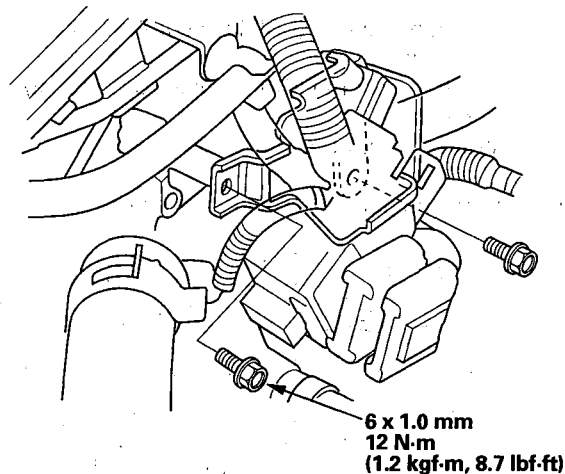
1. Install the lower water outlet (A) with a new O-ring (B), then install the water bypass hoses (C) and heater hose (D).



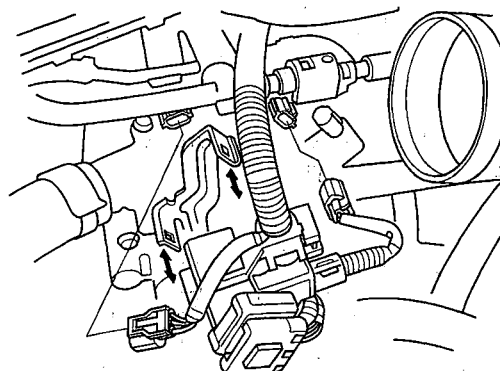
2. Install the upper water outlet (A) with a new O-ring (B), then install the upper radiator hose (C), water bypass hose (D), and harness holder bracket (E).



3. Install the EVAP canister purge valve mounting bracket.



4. Install the harness holder.

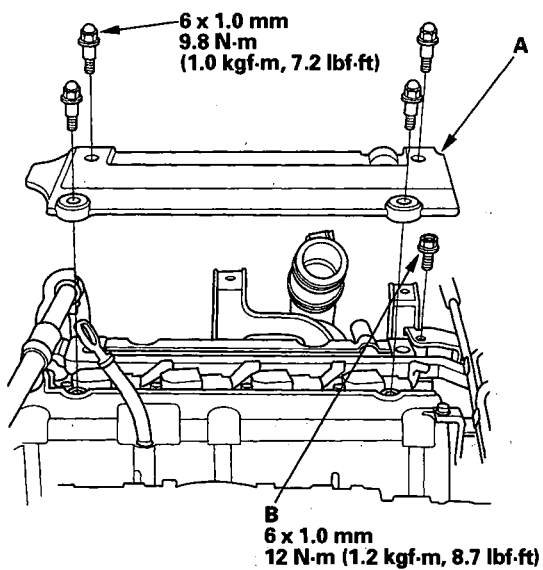


5. Install the engine wire harness connectors and wire harness clamps to the cylinder head.

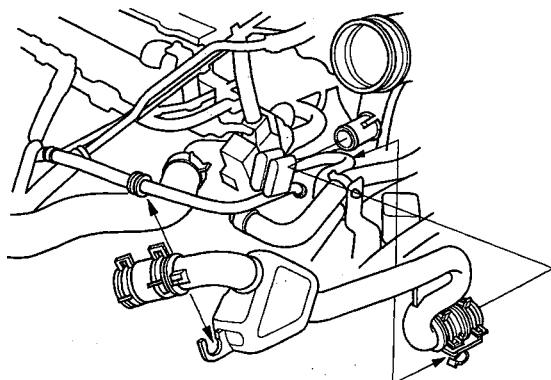
- Camshaft position (CMP) sensor A (Intake) connector
- Camshaft position (CMP) sensor B (Exhaust) connector
- EVAP canister purge valve connector



6. Install the ignition coil cover (A) and fuel feed pipe mounting bolt (B).



7. Install the air bypass outlet pipe.



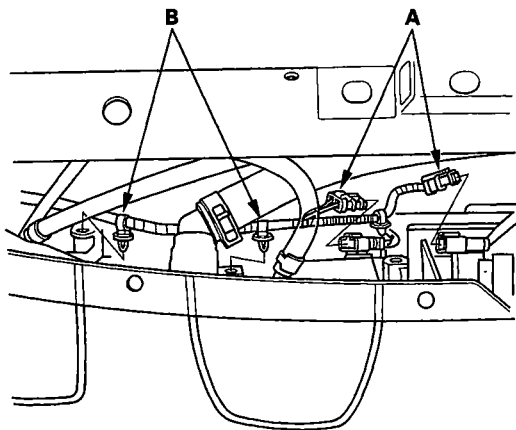
8. Install the charge air cooler (see page 9-9).
9. Install the air cleaner housing (see page 11-394).
10. Refill the radiator with engine coolant, and bleed the air from the cooling system with the heater valve open (see step 6 on page 10-7).

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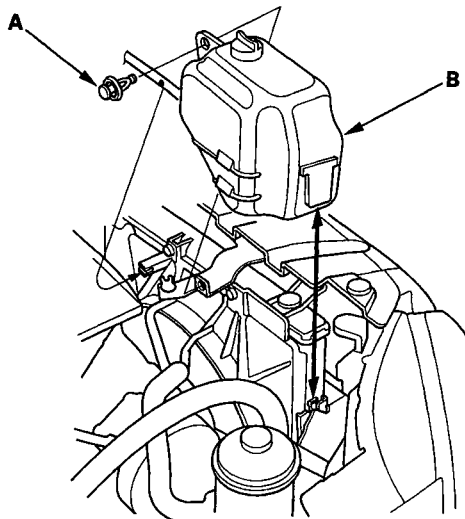
Fan, Fan Motor, Shroud Removal and Installation

Removal

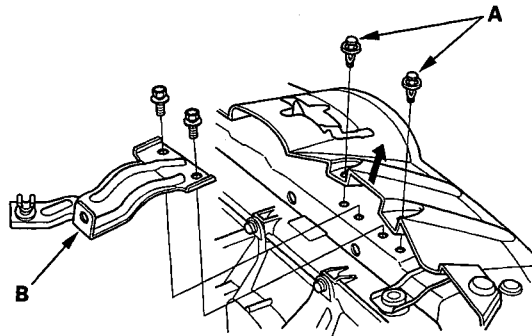
1. Remove the splash shield (see step 25 on page 5-6).
2. Disconnect the fan motor connectors (A), and remove the harness clamps (B).



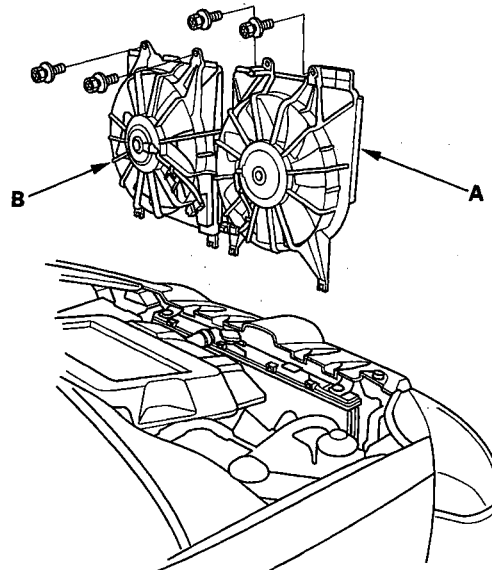
3. Remove the clip (A), then remove the coolant reservoir (B) from the holder.



4. Remove the clips (A), then remove the support rod clamp bracket (B).

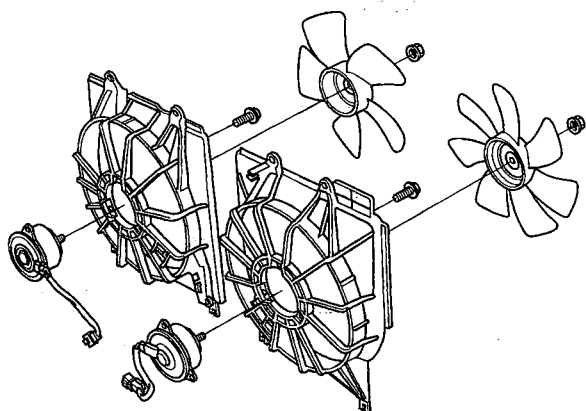


5. Remove the condenser fan shroud assembly (A), then remove the radiator fan shroud assembly (B) from the condenser fan shroud side.



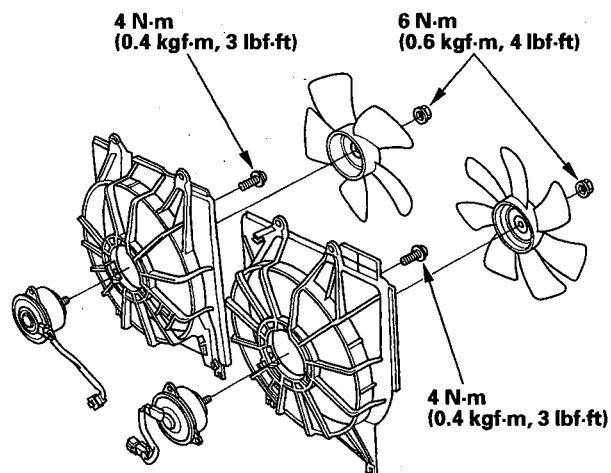


6. Disassemble the fan shrouds.



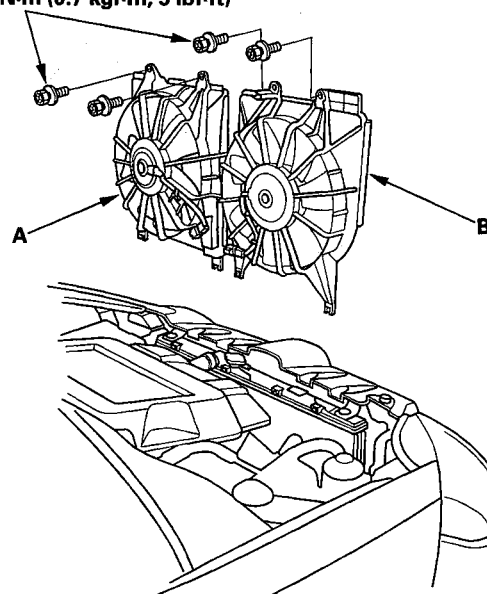
Installation

1. Assemble the fan shrouds.



2. Install the radiator fan shroud assembly (A), then install the condenser fan shroud assembly (B).

6 x 1.0 mm
7 N·m (0.7 kgf·m, 5 lbf·ft)



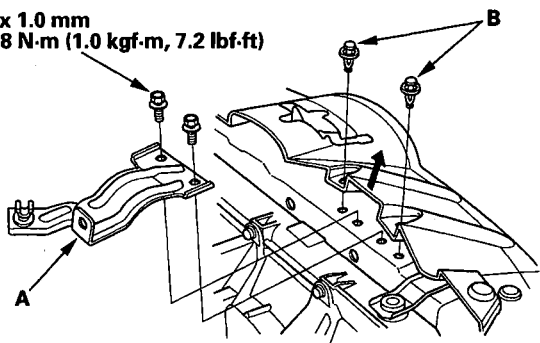
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Cooling System

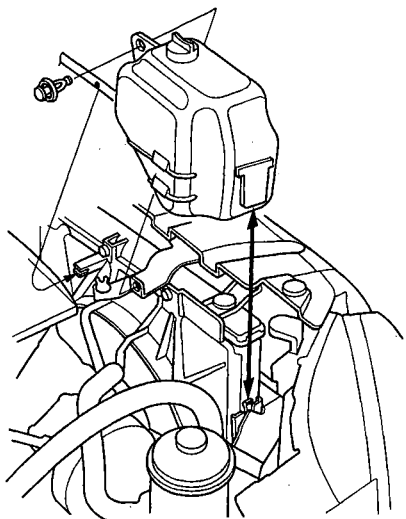
Fan, Fan Motor, Shroud Removal and Installation (cont'd)

3. Install the support rod clamp bracket (A), then install the clips (B).

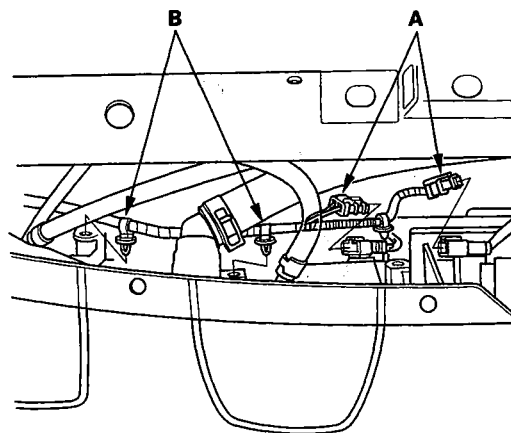
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



4. Install the coolant reservoir.



5. Connect the fan motor connectors (A), and install the harness clamps (B).

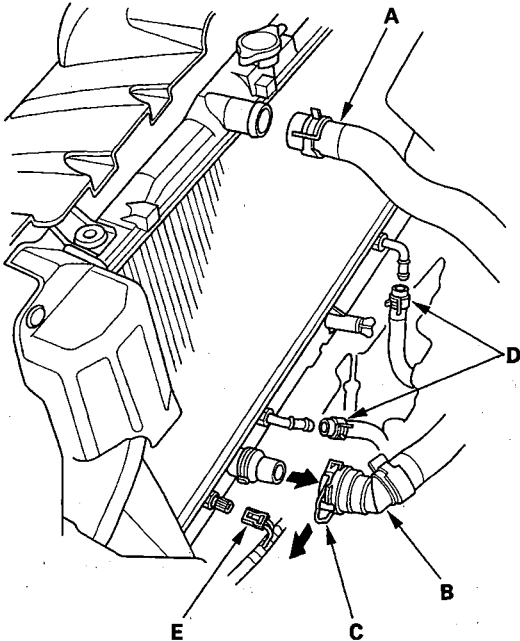


6. Install the splash shield (see step 30 on page 5-16).



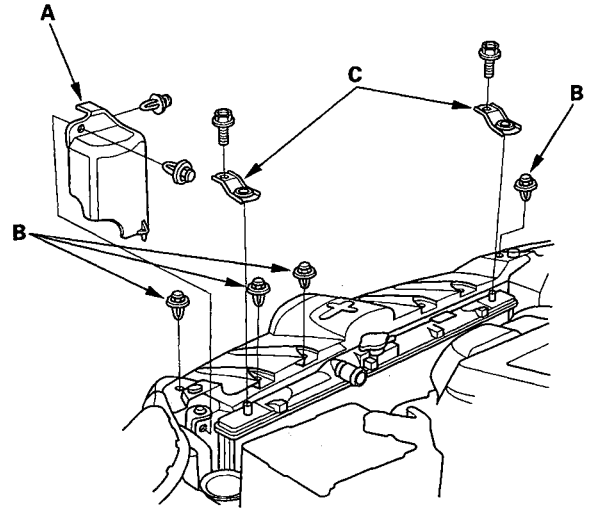
Radiator Replacement

1. Drain the engine coolant (see page 10-7).
2. Remove the condenser fan shroud assembly and radiator fan shroud assembly (see page 10-16).
3. Remove the upper radiator hose (A).

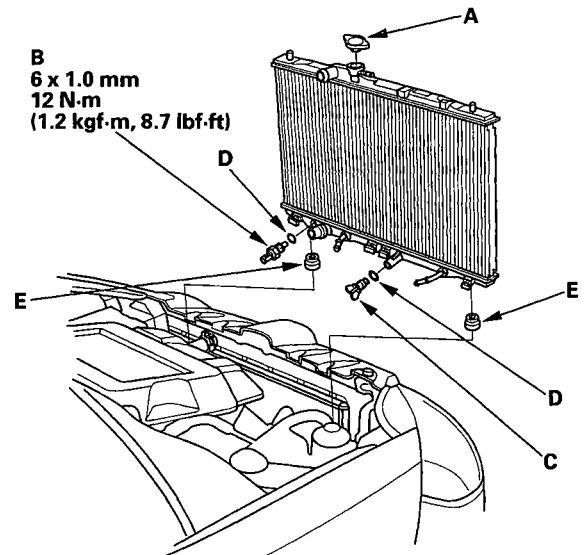


4. Clean any dirt off the quick connector (B), radiator, and lower radiator hose.
5. Pull out the lock (C) by hand, then wiggle the quick connector loose, and remove it from the radiator. Do not use any tools to remove the quick connector.
6. Remove the automatic transmission fluid (ATF) cooler hoses (D), then plug the hose and the line.
7. Disconnect the engine coolant temperature (ECT) sensor 2 connector (E).

8. Remove the intake air duct cover (A) and the four clips (B), then remove the upper radiator brackets (C).



9. Pull up the radiator, then remove the radiator cap (A), ECT sensor 2 (B), and drain plug (C).



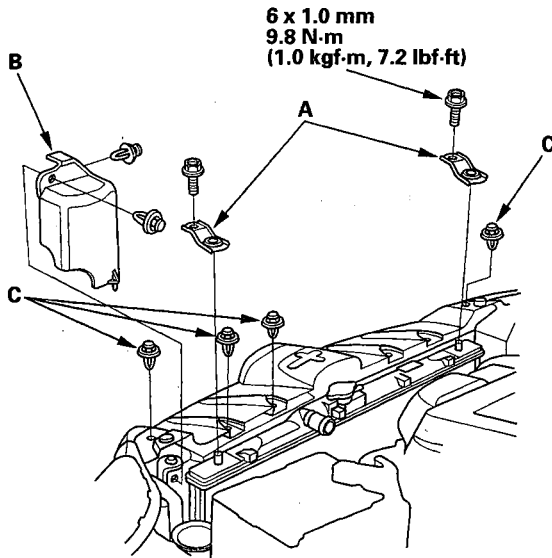
10. Reassemble the radiator with new O-rings (D).
11. Install the radiator. Make sure the lower cushions (E) are set securely.

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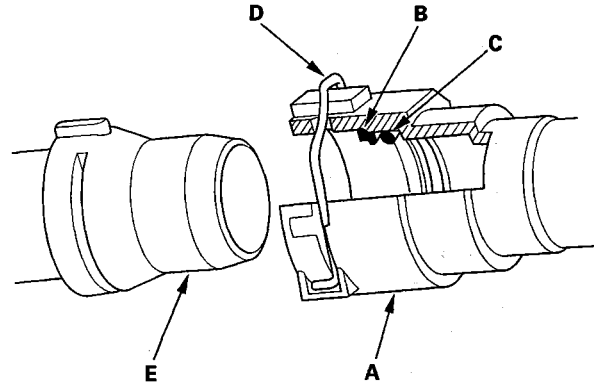
Cooling System

Radiator Replacement (cont'd)

12. Install the upper radiator brackets (A), then install the intake air duct cover (B) and the four clips (C).



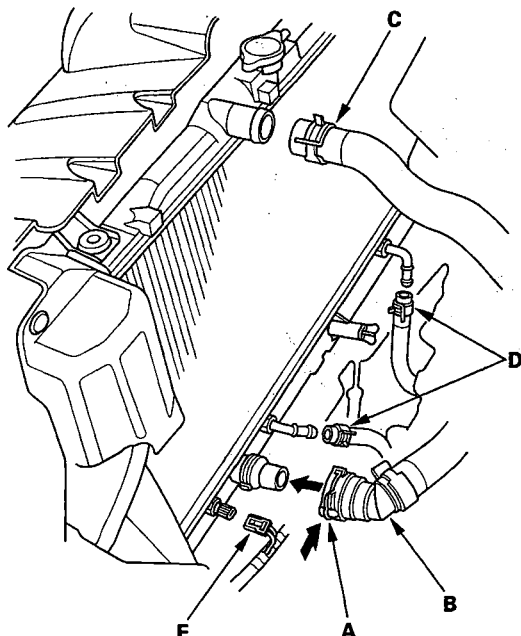
13. Check the quick connector (A) and set ring (B) for cracks or damage. If the connector and/or set ring are cracked or damaged, replace the connector.



14. Make sure the set ring is in place inside the quick connector. If the set ring is displaced or not properly seated in the connector, replace the quick connector.
15. Replace the O-ring (C) in the quick connector.
16. Check the lock (D). If the lock is damaged or deformed, replace it. When installing the new lock to the connector, slide it straight down along the groove.
17. Install a new lower radiator hose on the quick connector, and install the clamp.
18. Clean the connecting surface of the radiator (E), then apply clean engine coolant around the connecting surface.



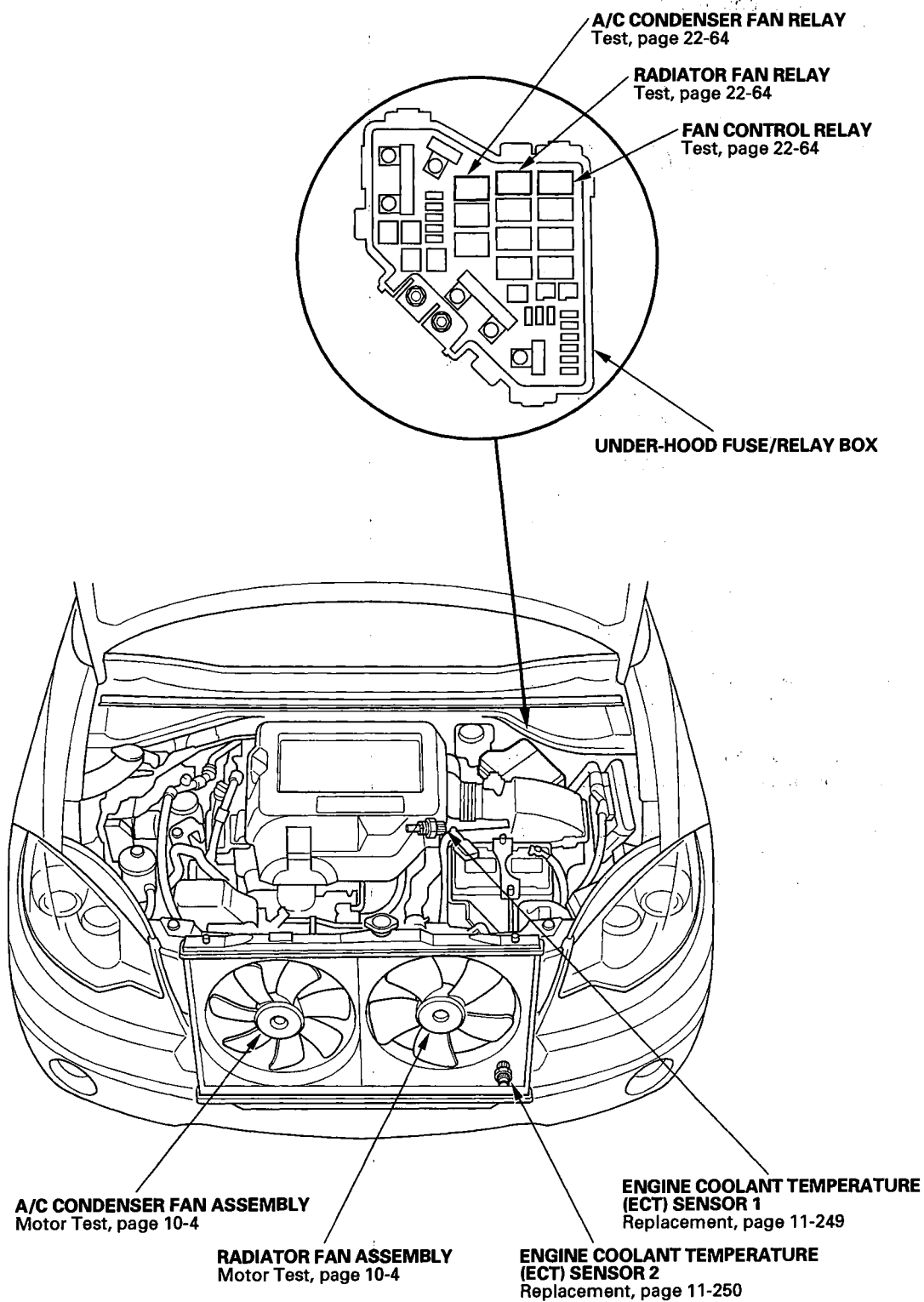
19. Push down the lock (A), then push the quick connector (B) onto the radiator until you hear it click.



20. Install the upper radiator hose (C).
21. Install the ATF cooler hoses (D), and connect the ECT sensor 2 connector (E).
22. Install the condenser fan shroud assembly and radiator fan shroud assembly (see page 10-17).
23. Refill the radiator with engine coolant, and bleed the air from the cooling system with the heater valve open (see step 6 on page 10-7).

Fan Controls

Component Location Index



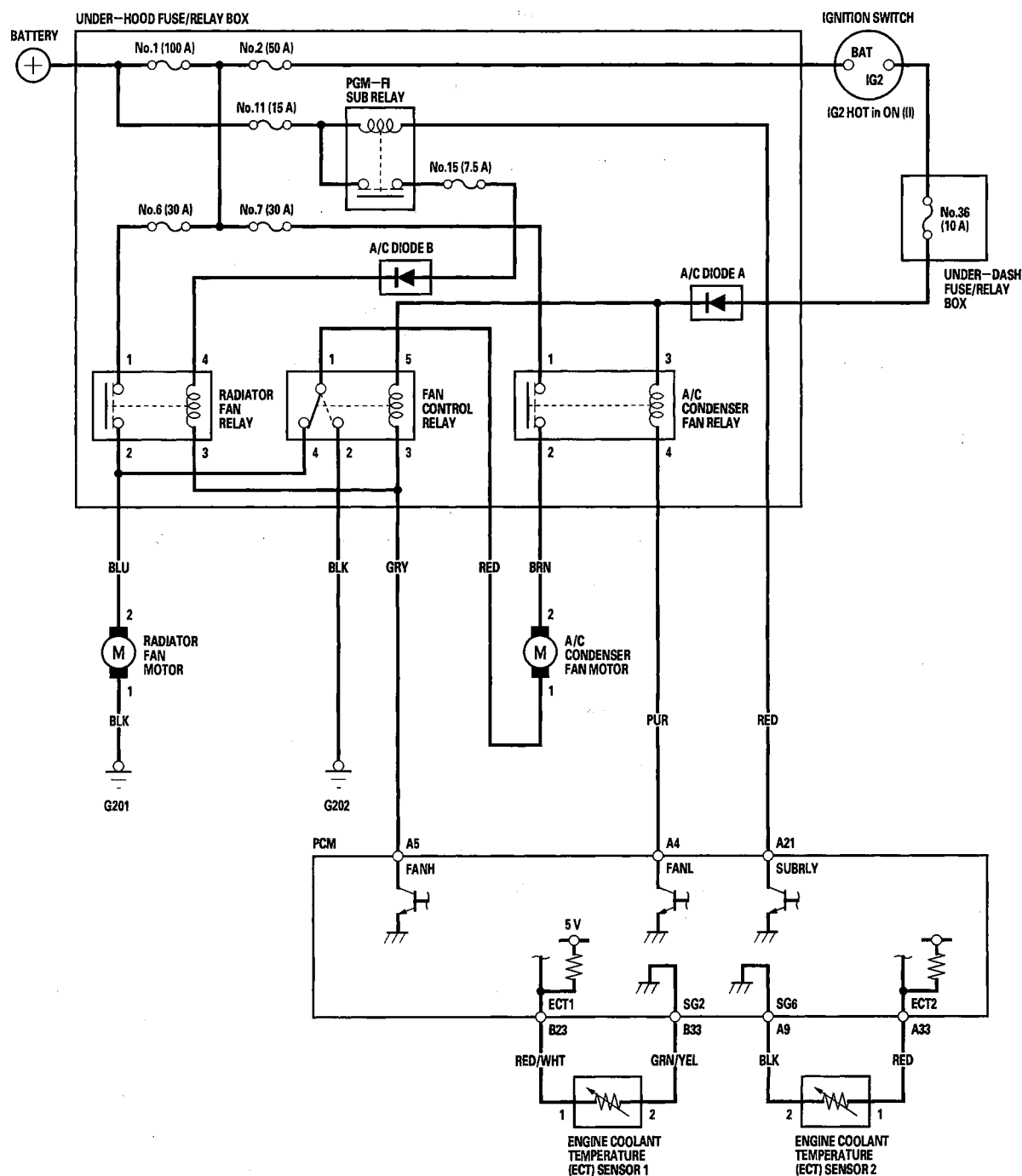


Symptom Troubleshooting Index

Symptom	Diagnostic Procedure	Also check for
Engine overheats	1. Check the coolant level. 2. Check for any engine coolant leakage (from gaskets, hoses, O-rings, etc.). 3. Check for dirt, leaves, or insects on radiator and condenser. 4. Check for deteriorated coolant. 5. Check for a damaged or deformed fan shroud. 6. Inspect the fan motors (see page 10-4) or fan relays (see page 22-64). 7. Check the radiator cap (see page 10-3). 8. Check the thermostat (see page 10-4). 9. Inspect the water pump (see page 10-5). 10. Check for a plugged or deteriorated radiator hoses. 11. Check for plugged heater core or hoses. 12. Check for a damaged cylinder head gasket.	
The radiator fan runs at low speed, but it does not run at high speed when the engine coolant temperature is above 199 °F (93 °C)	Radiator fan high speed circuit troubleshooting (see page 10-25).	Cleanliness and tightness of all connectors
With the A/C off and the engine coolant temperature at 199 °F (93 °C) or below, the A/C condenser fan runs at high speed and the radiator fan does not run. When the engine coolant temperature is above 199 °F (93 °C), both fans run at high speed	Remove the fan control relay, and test. • If the relay is faulty, replace it. • If the relay is OK, check for a short in the wire between fan control relay 5P socket terminal No. 1 and condenser fan motor 2P connector terminal No. 1.	Cleanliness and tightness of all connectors
The radiator fan and the A/C condenser fan run at high speed with the ignition switch ON (II), the A/C off, and the engine coolant temperature below 194 °F (90 °C)	Check for a short in the wire between radiator fan relay 4P socket terminal No. 3 and PCM connector terminal A5.	Cleanliness and tightness of all connectors
Both the radiator fan and the A/C condenser fan run at low speed with the ignition switch ON (II) and the A/C off	Check for a short in the wire between A/C condenser fan relay 4P socket terminal No. 4 and PCM connector terminal A4.	Cleanliness and tightness of all connectors
Both the radiator fan and the A/C condenser fan do not run at low speed with the A/C on	Radiator and A/C condenser fans low speed circuit troubleshooting (see page 21-65).	Cleanliness and tightness of all connectors
The A/C condenser fan does not run at all. The radiator fan does not run at low speed, but it runs at high speed	A/C condenser fans high speed circuit troubleshooting (see page 21-70).	Cleanliness and tightness of all connectors
Both the radiator fan and the A/C condenser fan do not run at high speed when the engine coolant temperature is above 199 °F (93 °C)	Check for an open in the wire between radiator fan relay 4P socket terminal No. 3 and PCM connector terminal A5.	Cleanliness and tightness of all connectors

Fan Controls

Circuit Diagram





Radiator Fan High Speed Circuit Troubleshooting

1. Check the No. 6 (30 A) fuse in the under-hood fuse/relay box, and the No. 15 (7.5 A) fuse in the under-hood fuse/relay box.

Are the fuses OK?

YES—Go to step 2.

NO—Replace the fuse(s) and recheck. ■

2. Remove the radiator fan relay from the under-hood fuse/relay box and test it (see page 22-64).

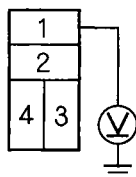
Is the relay OK?

YES—Go to step 3.

NO—Replace the radiator fan relay. ■

3. Measure the voltage between radiator fan relay 4P socket terminal No. 1 and body ground.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

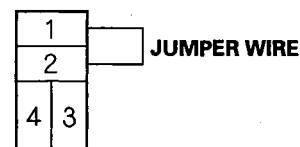
Is there battery voltage?

YES—Go to step 4.

NO—Replace the under-hood fuse/relay box. ■

4. Connect radiator fan relay 4P socket terminals No. 1 and No. 2 with a jumper wire.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

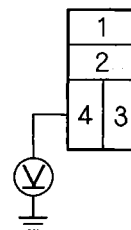
Does the radiator fan run at high speed?

YES—Go to step 5.

NO—Repair open in the wire between radiator fan relay 4P socket terminal No. 2 and radiator fan motor 2P connector terminal No. 2. ■

5. Turn the ignition switch ON (II).
6. Measure the voltage between radiator fan relay 4P socket terminal No. 4 and body ground.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

Is there battery voltage?

YES—Repair open in the wire between radiator fan relay 4P socket terminal No. 3 and the powertrain control module (PCM) (A5). ■

NO—Check the A/C diode B in the under-hood fuse/relay box. If the diode is OK, replace the under-hood fuse/relay box. ■