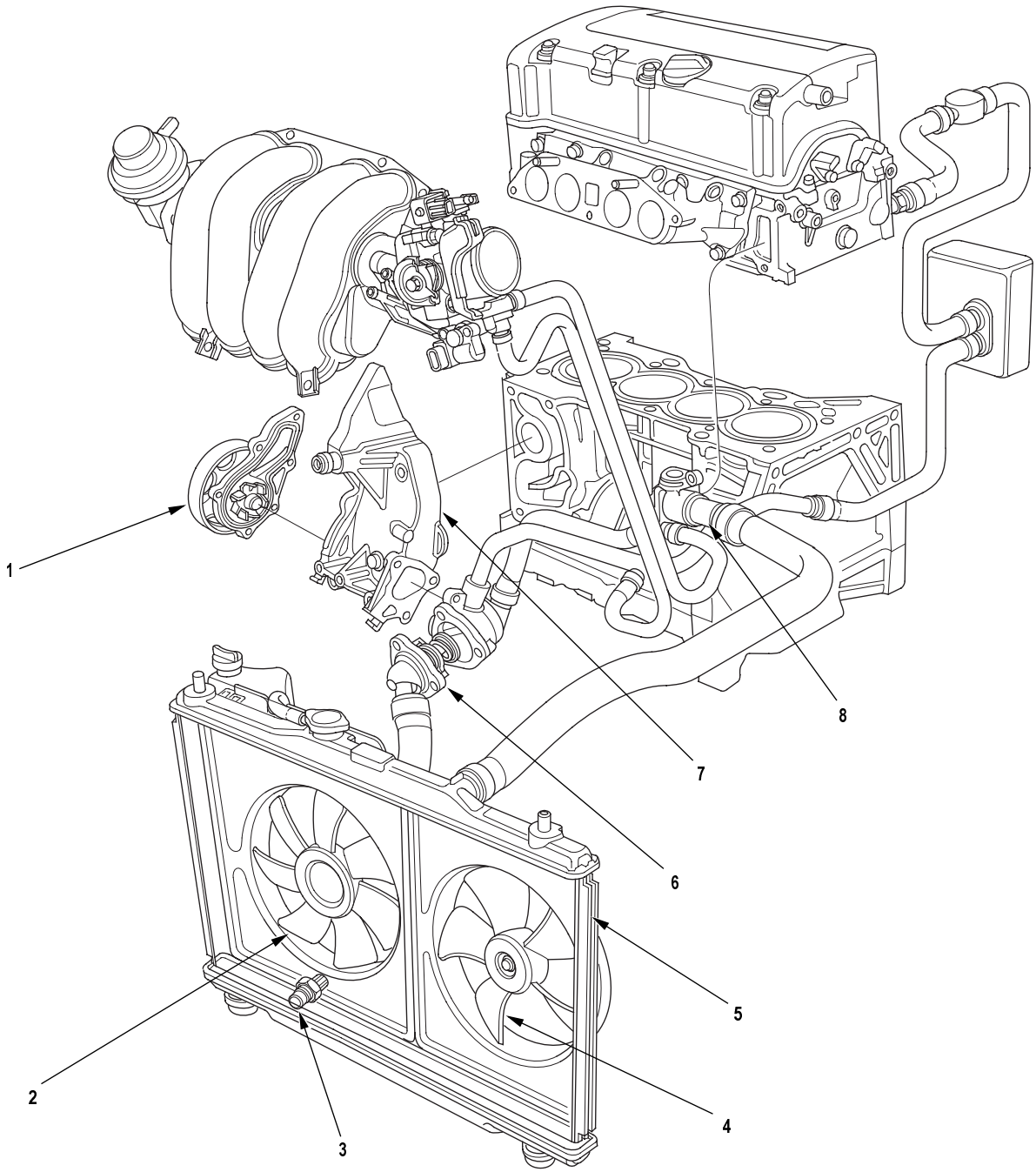
10

Engine Cooling

Cooling System

Component Location Index



1	WATER PUMP	Inspection, page 10-5; Replacement, page 10-5
2	A/C CONDENSER FAN ASSEMBLY	Replacement, page 10-10; Fan Motor Test, page 10-4
3	RADIATOR FAN SWITCH	Test, page 10-17; Replacement, page 10-17
4	RADIATOR FAN ASSEMBLY	Replacement, page 10-10; Fan Motor Test, page 10-4
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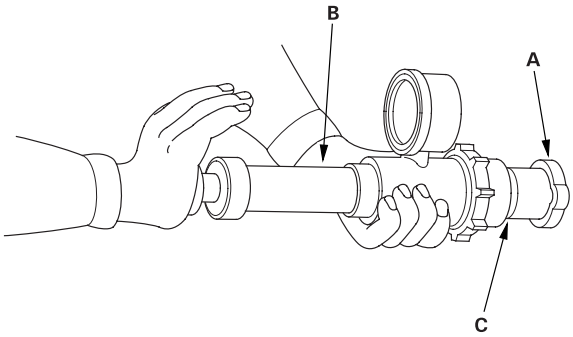
8	WATER OUTLET	Installation, page 10-9

Radiator Cap Test

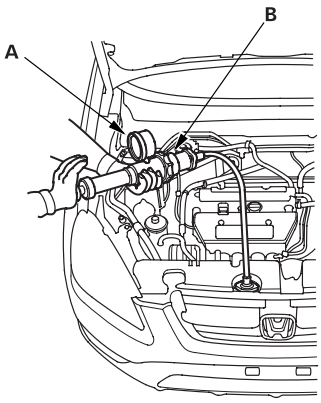
1. Remove the radiator cap (A), wet its seal with engine coolant, then install it on the pressure tester (B) (commercially available). Use a small adapter H-901122-09 (C) (commercially available) to install the radiator cap.



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

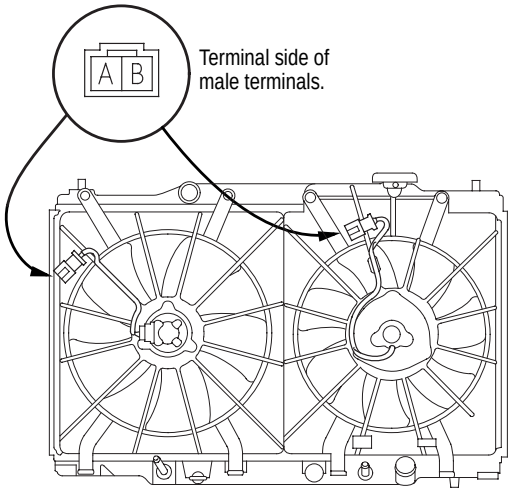
1. Wait until the engine is cool, then carefully remove the radiator cap and fill the radiator with engine coolant to the top of the filler neck.
2. Attach the pressure tester (A) (commercially available) to the radiator. Use a small adapter H-901122-09 (B) (commercially available) to attach the pressure tester.



3. Apply a pressure of 93 - 123 kPa (0.95 - 1.25 kgf/cm², 14 - 18 psi).
4. Inspect for engine coolant leaks and a drop in pressure.
5. Remove the tester, and reinstall the radiator cap.
6. Check for engine oil in the coolant and/or coolant in the engine oil.

Fan Motor Test

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



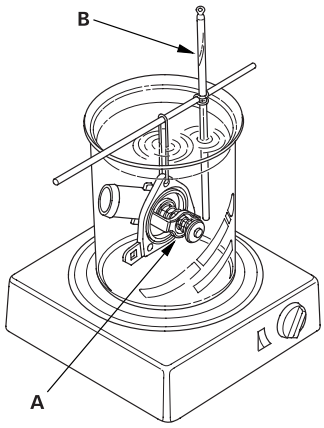
2. Test the motor by connecting battery power to the B terminal and ground to the A terminal.
3. If the motor fails to run or does not run smoothly, replace it.

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.



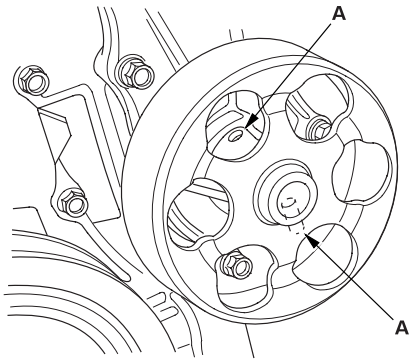
2. Heat the water, and check the temperature with a thermometer. Check the temperature at which the thermostat first opens, and at which it is fully open.
3. Measure the lift height of the thermostat when it is fully open.

STANDARD THERMOSTAT

Lift height:	**above 8.0 mm (0.31 in.)**
Starts opening:	**76 - 80°C (169 - 176°F)**
Fully open:	**90°C (194°F)**

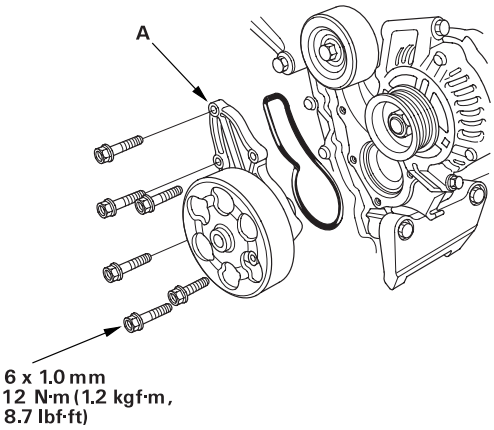
Water Pump Inspection

1. Remove the drive belt (see page 04-30).
2. Turn the water pump pulley counterclockwise. Check that it turns freely.
3. Check for signs of seal leakage. A small amount of ”weeping” from the bleed hole (A) is normal.



Water Pump Replacement

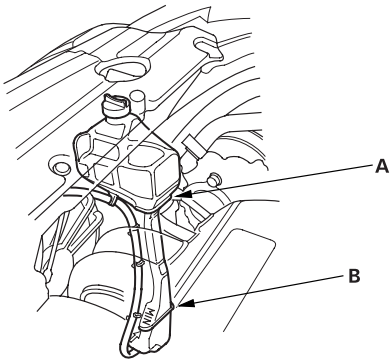
1. Remove the drive belt (see page 04-30).
2. Drain the engine coolant (see page 10-6).
3. Remove the crankshaft pulley (see page 06-11).
4. Remove the six bolts securing the water pump, then remove the water pump (A).



5. Inspect and clean the O-ring groove and mating surface with the water passage.
6. Install the water pump with new O-rings in the reverse order of removal.
7. Clean up any spilled engine coolant.
8. Install the crankshaft pulley (see page 06-12).
9. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).

Coolant Check

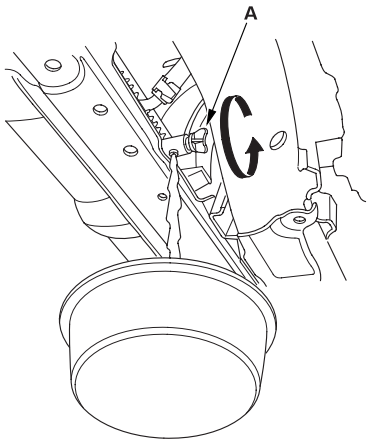
1. Look at the coolant level in the reserve tank. Make sure it is between the MAX mark (A) and MIN mark (B).



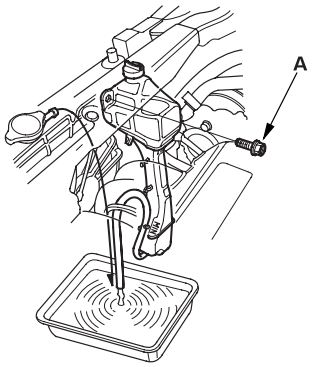
2. If the coolant level in the reserve tank is at or below the MIN mark, add coolant to bring it up to the MAX mark, and inspect the cooling system for leaks.

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 bulkhead cover (see step 7 on page 09-4).
3. Remove the splash shield (see step 21 on page 05-6).
4. Remove the radiator cap.
5. Loosen the drain plug (A), and drain the coolant.

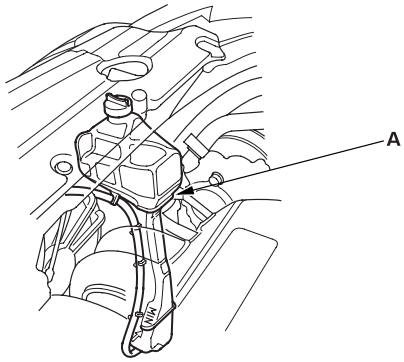


6. Remove the reserve tank mounting bolt (A), and remove the reserve tank.



7. Remove the coolant tube from the radiator, then put the end of the coolant tube lower the reserve tank and drain the coolant in the tank.

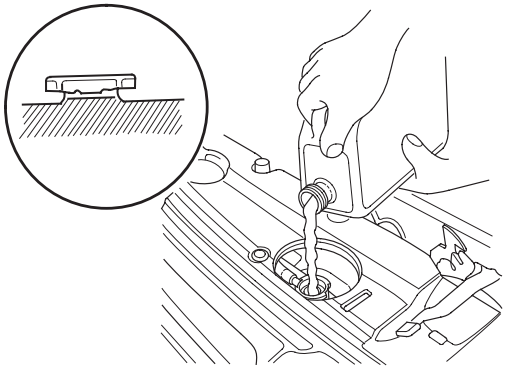
8. After the coolant has drained, tighten the radiator drain plug, and reinstall the coolant tube and reserve tank.
9. Install the splash shield (see step 22 on page 05-14).
10. Install the bulkhead cover (see step 4 on page 09-6).
11. Fill the reserve tank to the MAX mark (A) with genuine Honda All Season Antifreeze/Coolant Type 2.



12. Pour genuine Honda All Season Antifreeze/Coolant Type 2 into the radiator up to the base of the filler neck.

    NOTE:
    - Always use genuine Honda All Season Antifreeze/Coolant Type 2. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
    - Genuine Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50% antifreeze and 50% water. Pre-mixing is not required.

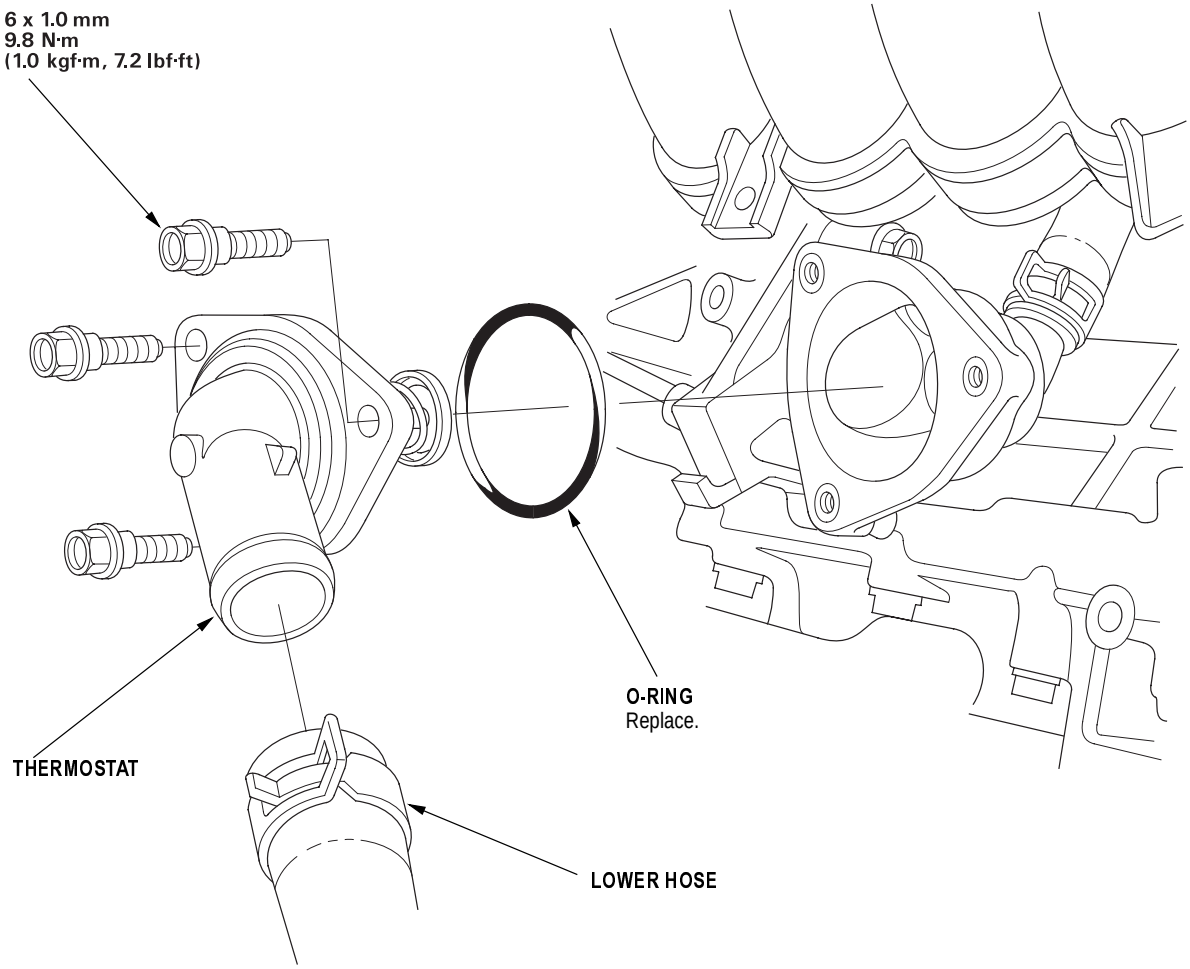
    Engine Coolant Refill Capacity [including the reserve tank capacity of 0.55 l (0.58 US qt, 0.48 Imp qt)]:
    K20A4, K20A5 engines:
    M/T: 5.4 l (5.7 US qt, 4.8 Imp qt)
    A/T: 5.3 l (5.6 US qt, 4.7 Imp qt)
    K24A1 engine:
    M/T: 5.5 l (5.8 US qt, 4.8 Imp qt)
    A/T: 5.4 l (5.7 US qt, 4.8 Imp qt)



13. Install the radiator cap loosely.
14. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
15. Turn off the engine. Check the level in the radiator and add genuine Honda All Season Antifreeze/Coolant Type 2 if needed.
16. Put the radiator cap on tightly, then run the engine again and check for leaks.

Thermostat Replacement

1. Drain the engine coolant (see page 10-6).
2. Remove the splash shield (see step 21 on page 05-6).
3. Remove the lower hose, then remove the thermostat.

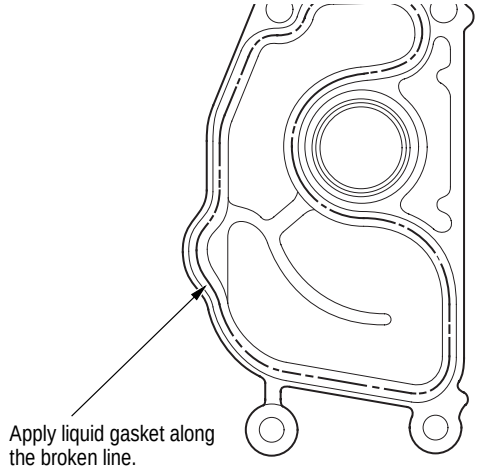


4. Install the thermostat with a new O-ring, then install the lower hose.
5. Install the splash shield (see step 22 on page 05-14).
6. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).

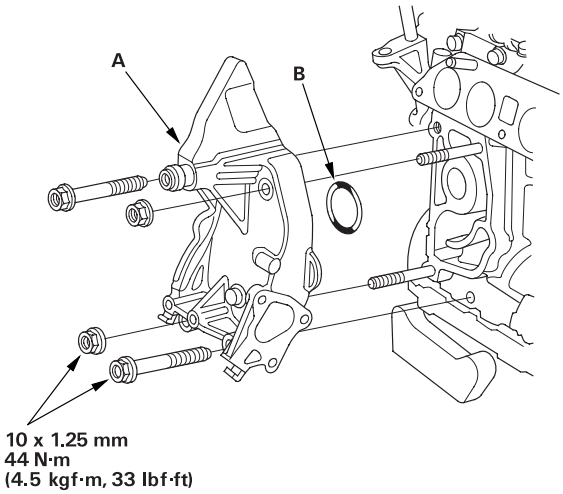
Water Passage Installation

1. Clean and dry the water passage mating surfaces.
2. Apply liquid gasket, 08C70-K0234M, 08C70-K0334M or 08C70-X0331S, evenly to the cylinder block mating surface of the water passage and to the inner threads of the bolt holes.

   NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.



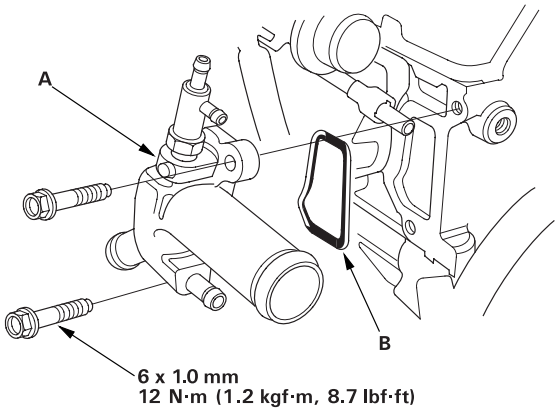
3. Install the water passage (A) with a new O-ring (B).



4. After assembly, wait at least 30 minutes before filling the engine with oil.

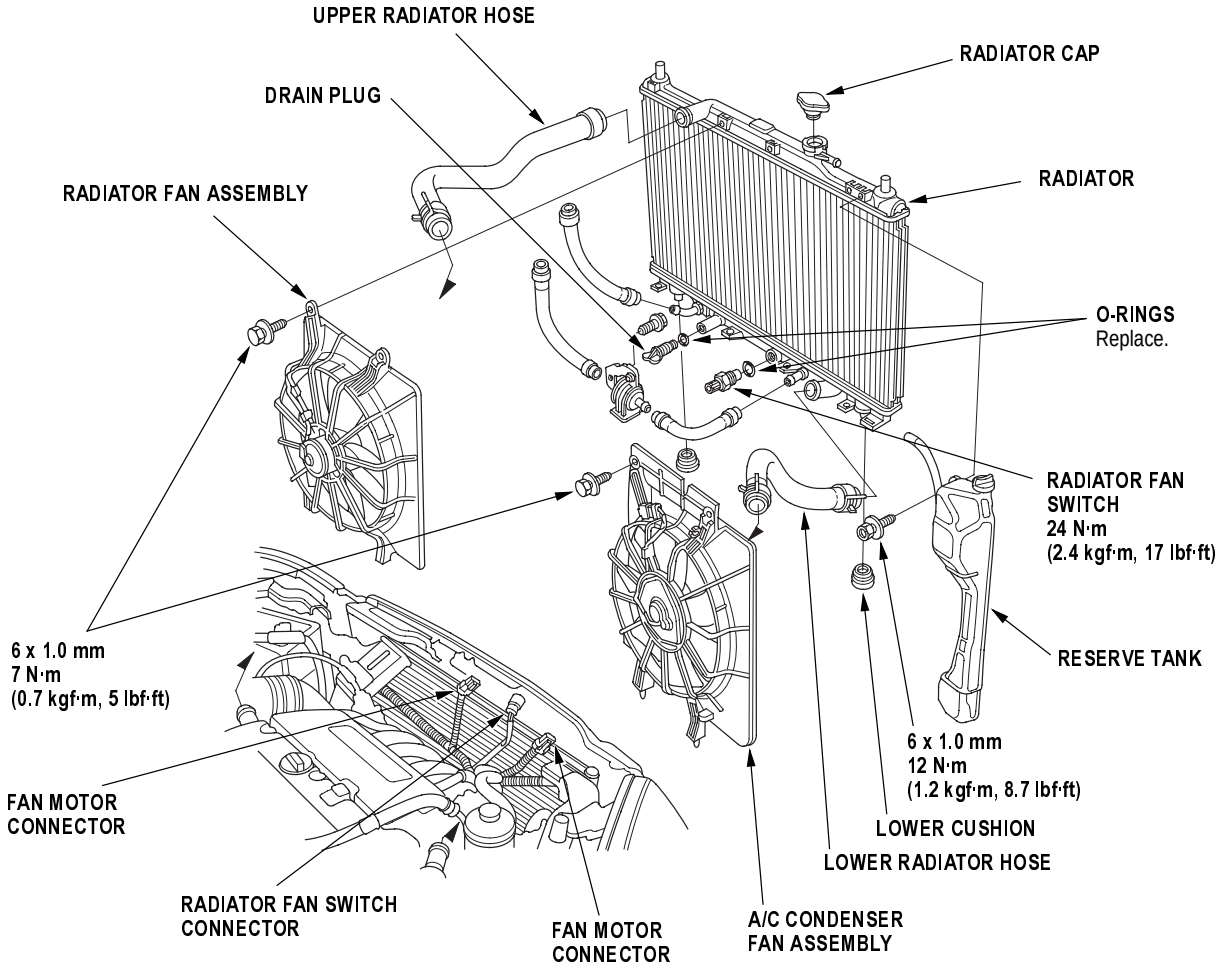
Water Outlet Installation

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



Radiator and Fans Replacement

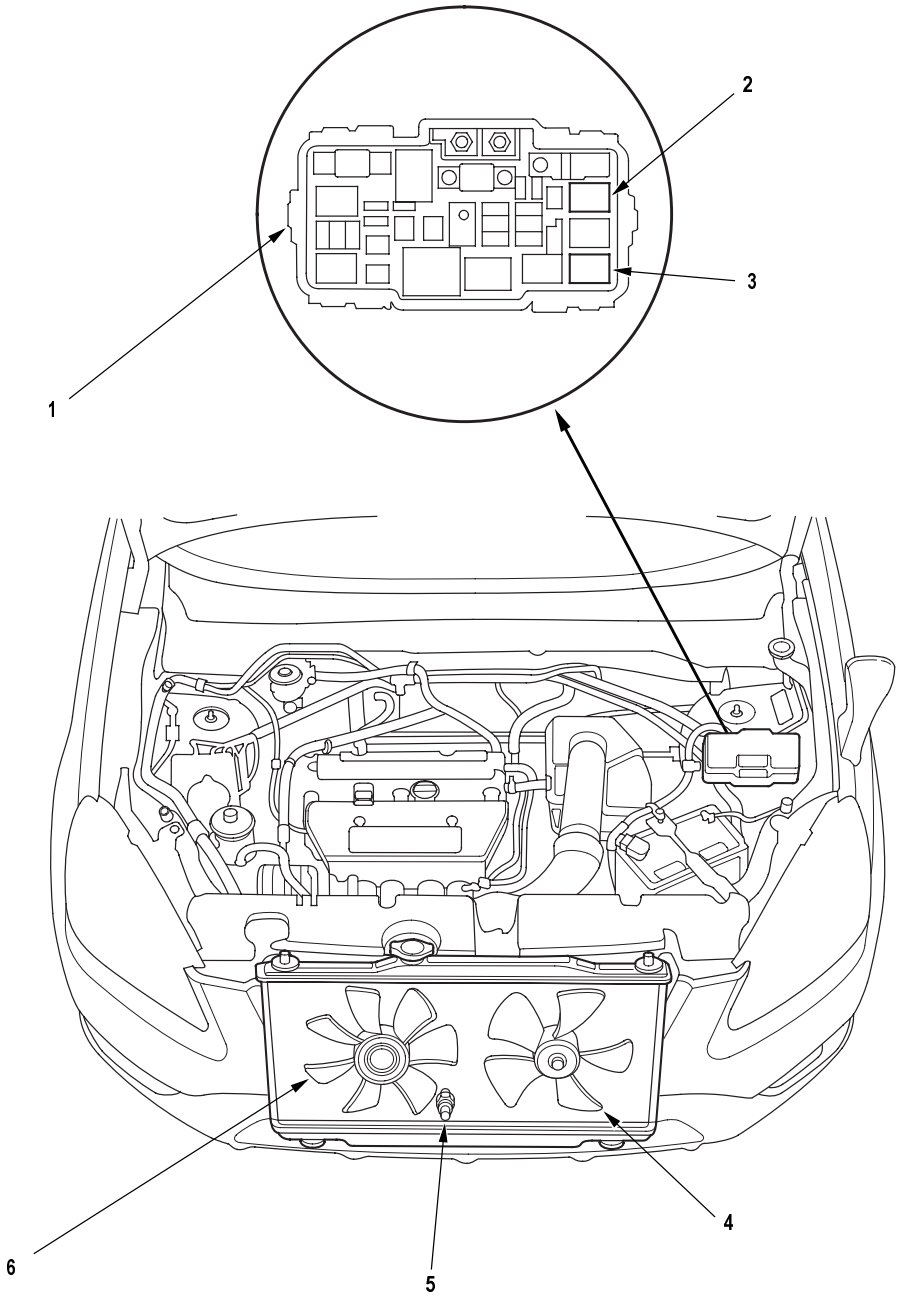
1. Drain the engine coolant (see page 10-6).
2. Remove the bulkhead cover (see step 7 on page 09-4).
3. Remove the upper bracket cushion, then remove the bulkhead (see step 9 on page 09-5).
4. Remove the upper radiator hose and lower radiator hose.



5. Disconnect the fan motor connectors and radiator fan switch connector, then pull up the radiator.
6. Remove the fan shroud assemblies and other parts from the radiator.
7. Install the radiator in the reverse order of removal. Make sure the upper and lower cushions are set securely.
8. Install the bulkhead in the reverse order of removal. Apply body paint to the bulkhead mounting bolts.
9. Fill the radiator with engine coolant and bleed the air (see page 10-6).

Fan Controls

Component Location Index



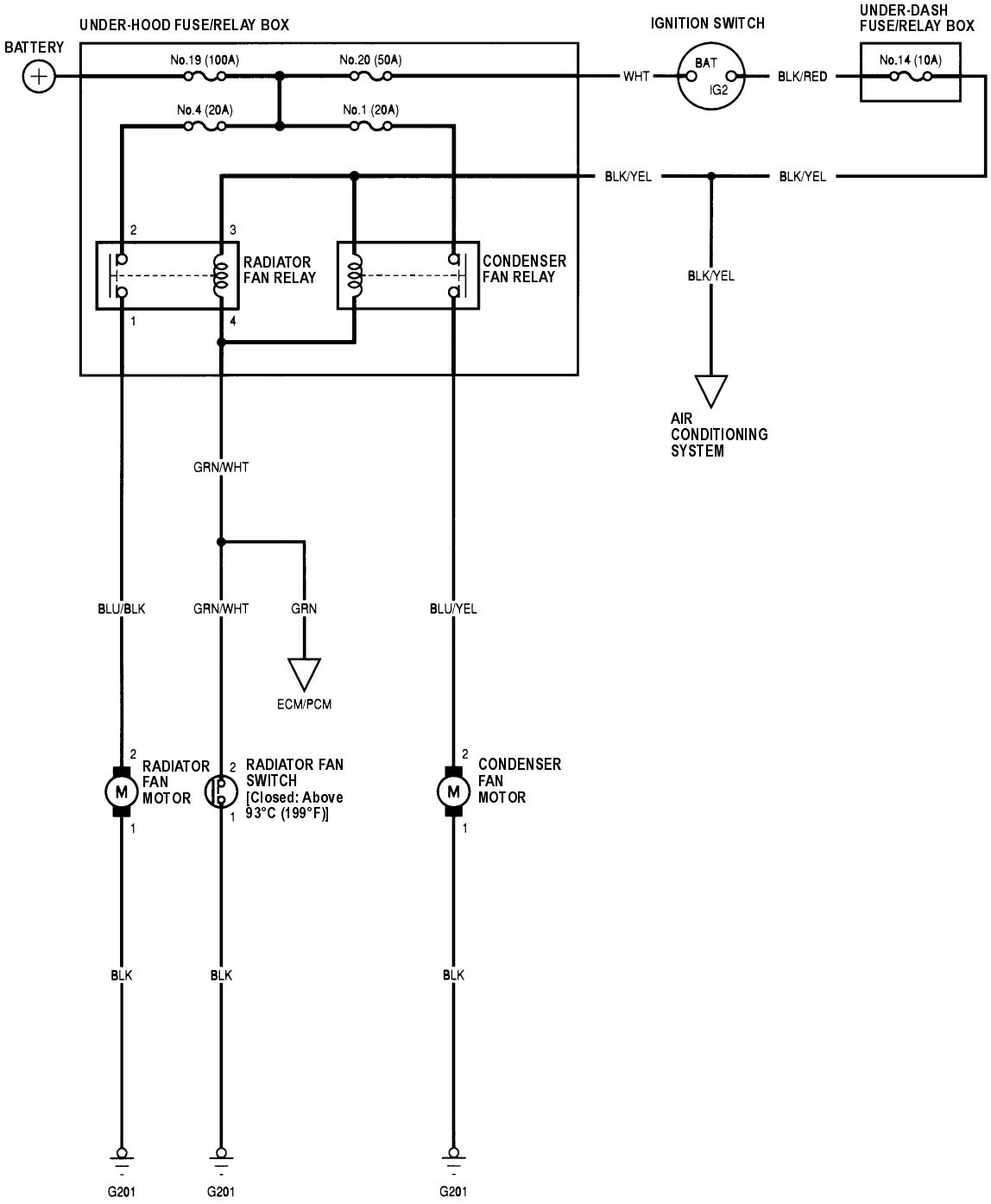
1	UNDER-HOOD FUSE/RELAY BOX	
2	CONDENSER FAN RELAY	Test, page 21-38
3	RADIATOR FAN RELAY	Test, page 10-14
4	CONDENSER FAN ASSEMBLY	Motor Test, page 10-4
5	RADIATOR FAN SWITCH	Test, page 10-17; Replacement, page 10-17
6	RADIATOR FAN ASSEMBLY	Motor Test, page 10-4

Symptom Troubleshooting Index

Before performing any troubleshooting procedures check:
- Fuses
- Grounds
- Cleanliness and tightness of all connectors

SYMPTOM	PROCEDURE
Radiator fan does not run at all	Radiator Fan Circuit Troubleshooting (see page 10-14).
Radiator fan does not run for engine cooling, but it runs with A/C on	Radiator Fan Switch Circuit Troubleshooting (Open) (see page 10-16).
Radiator fan runs with ignition switch ON (II), A/C off, and engine temperature below 93°C (199°F)	Radiator Fan Switch Circuit Troubleshooting (Short) (see page 10-16).

Circuit Diagram



Radiator Fan Circuit Troubleshooting

1. Check the No. 4 (20A) fuse in the under-hood fuse/relay box, and the No. 14 (10A) fuse in the under-dash fuse/relay box.

Is the fuse (s) 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 10-17).

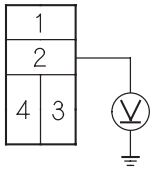
Is the relay OK?

Yes Go to step 3.

No Replace the radiator fan relay.■

3. Measure the voltage between the No. 2 terminal of the radiator fan relay 4P socket and body ground.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

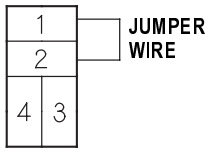
Is there battery voltage?

Yes Go to step 4.

No Replace the under-hood fuse/relay box.■

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

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

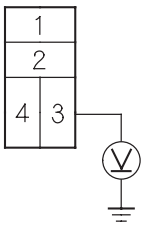
Does the radiator fan run?

Yes Go to step 5.

No Go to step 6.

5. Disconnect the jumper, and turn the ignition switch ON (II). Check for voltage between the No. 3 terminal of the radiator fan relay 4P socket and body ground.

RADIATOR FAN RELAY 4P SOCKET



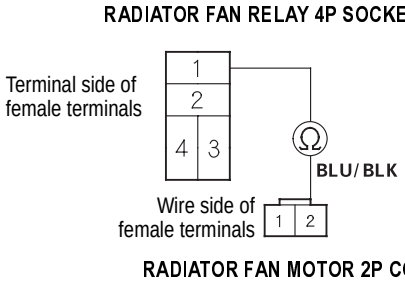
Terminal side of female terminals

Is there battery voltage?

Yes Go to step 9.

No Check for an open in the wire between the under-hood fuse/relay box and under-dash fuse/relay box.■

6. Disconnect the radiator fan motor 2P connector.
7. Check for continuity between the No. 1 terminal of the radiator fan relay 4P socket and the No. 2 terminal of the radiator fan motor 2P connector.

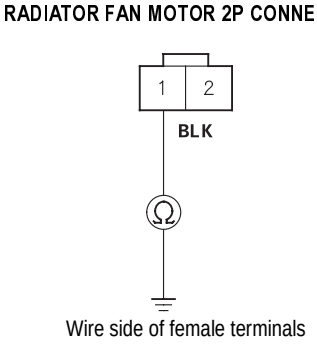


Is there continuity?

Yes Go to step 8.

No Repair open in the wire between the under-hood fuse/relay box and the radiator fan motor 2P connector terminal No. 2.■

8. Check for continuity between the No. 1 terminal of the radiator fan motor 2P connector and body ground.

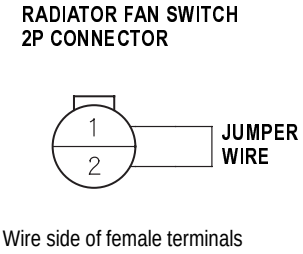


Is there continuity?

Yes Replace the radiator fan motor.■

No Check for an open in the wire between radiator fan motor 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G201.■

9. Reinstall the radiator fan relay.
10. Disconnect the radiator fan switch 2P connector.
11. Connect the No. 1 and No. 2 terminals, of the radiater fan switch 2P connector with a jumper wire.

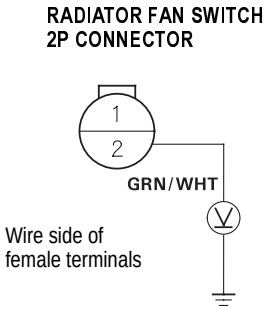


Does the radiator fan run?

Yes Replace the radiator fan switch.■

No Go to step 12.

12. Remove the jumper wire, and measure the voltage between the No. 2 terminal of the radiator fan switch connector and body ground.



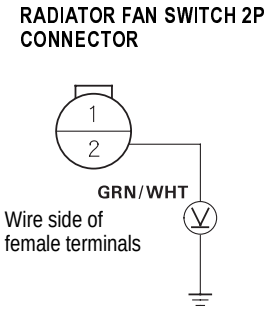
Is there battery voltage?

Yes Check for an open in the wire between radiator fan switch 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G201.■

No Repair open in the wire between the radiator fan switch terminal No. 2 and the under-hood fuse/relay box.■

Radiator Fan Switch Circuit Troubleshooting (Open)

1. Disconnect the radiator fan switch 2P connector.
2. Turn the ignition switch ON (II).
3. Measure voltage between the No. 2 terminal of the radiator fan switch 2P connector and body ground.

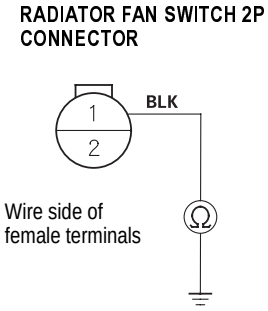


Is there battery voltage?

Yes Go to step 4.

No Repair open in the wire between the radiator fan switch 2P connector terminal No. 2 and under-hood fuse/relay box.■

4. Turn the ignition switch OFF, and check for continuity between the No. 1 terminal of the radiator fan switch 2P connector and body ground.



Is there continuity?

Yes Replace the radiator fan switch.■

No Check for an open in the wire between the radiator fan switch 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G201.■

Radiator Fan Switch Circuit Troubleshooting (Short)

1. Remove the radiator fan relay from the under-hood fuse/relay box, and test it (see page 10-17).

   Is the relay OK?

   Yes Go to step 2.

   No Replace the radiator fan relay.■

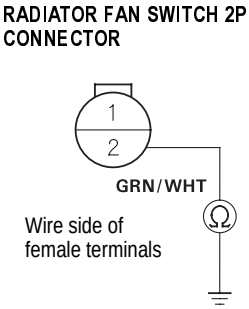
2. Remove the radiator fan switch, and test it (see page 10-17).

   Is the radiator fan switch OK?

   Yes Go to step 3.

   No Replace the radiator fan switch.■

3. Disconnect the negative cable from the battery.
4. Disconnect Engine Control Module (ECM)/ Powertrain Control Module (PCM) connector B (24P) and the under-hood fuse relay box 14P connector.
5. Check for continuity between the No. 2 terminal of the radiator fan switch 2P connector and body ground.



Is there continuity?

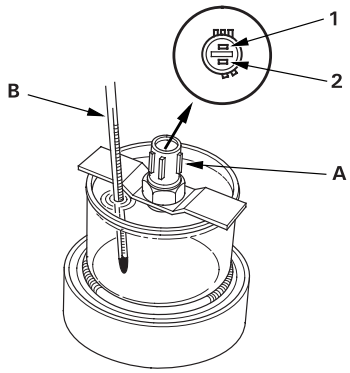
Yes Repair short in the wire between the radiator fan switch 2P connector terminal No. 2 and under-hood fuse/relay box.■

No Replace the under-hood fuse/relay box.■

Radiator Fan Switch Test

NOTE: Bleed air from the cooling system after installing the radiator fan switch (see page 10-6).

1. Remove the radiator fan switch from the radiator (see page 10-17).
2. Suspend the radiator fan switch (A) in a container of water as shown.

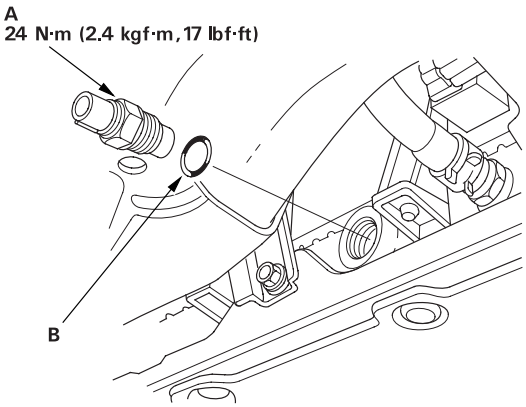


3. Heat the water, and check the temperature with a thermometer. Do not let the thermometer (B) touch the bottom of the hot container.
4. Measure the continuity between terminal No. 1 and terminal No. 2 according to the table.

Operation		Temperature	Terminal 1	Terminal 2
SWITCH	ON	91 - 95°C (196 - 203°F	○	○
	OFF	3 - 8°C (5 - 15°F) lower than the temperature when it goes on		

Radiator Fan Switch Replacement

5. Disconnect the radiator fan switch connector, then remove the radiator fan switch (A).



6. Install the radiator fan switch with a new O-ring (B).