

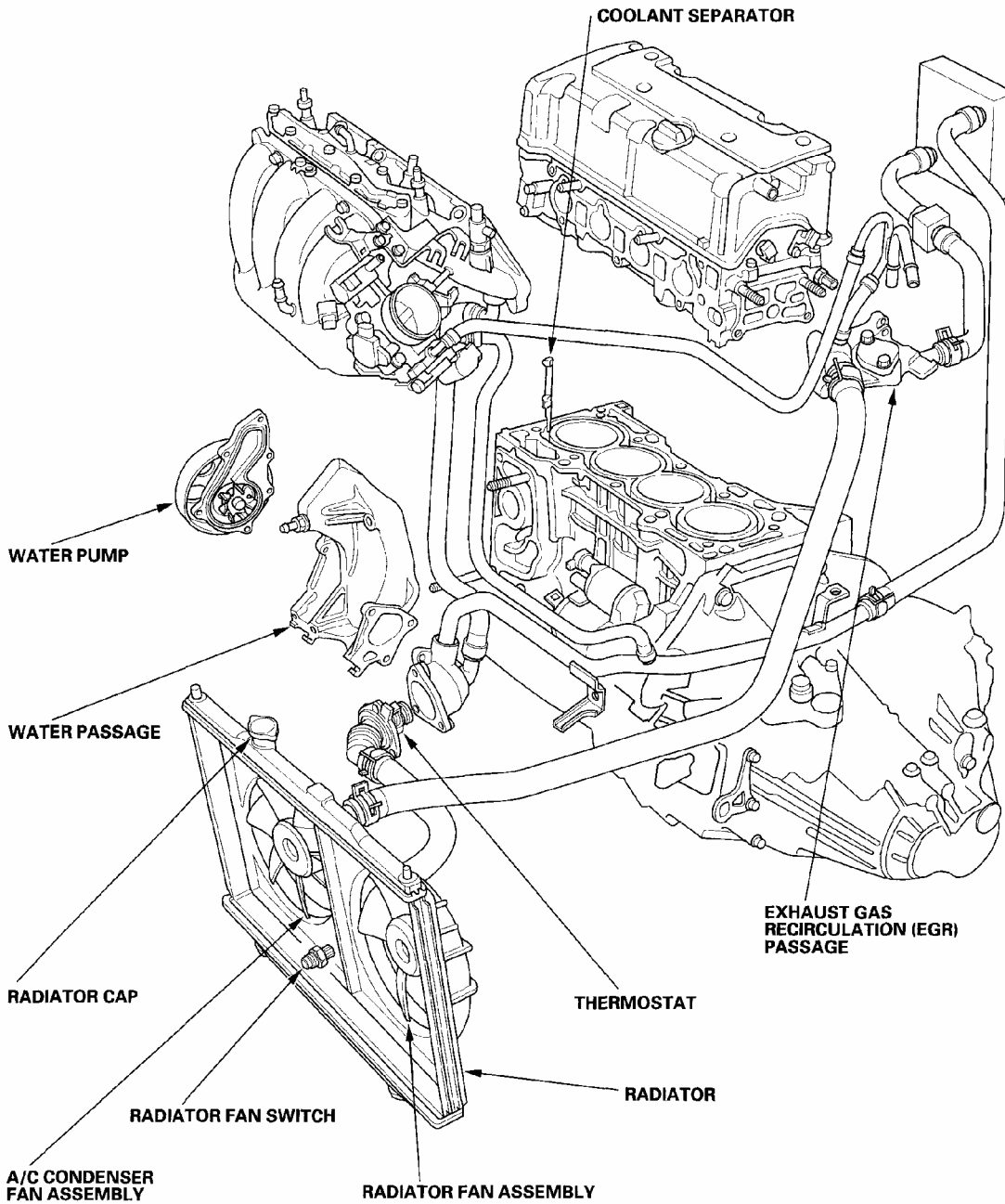
2004 Honda Element DX

2003-06 ENGINE Cooling System - Element

2003-06 ENGINE

Cooling System - Element

COMPONENT LOCATION INDEX

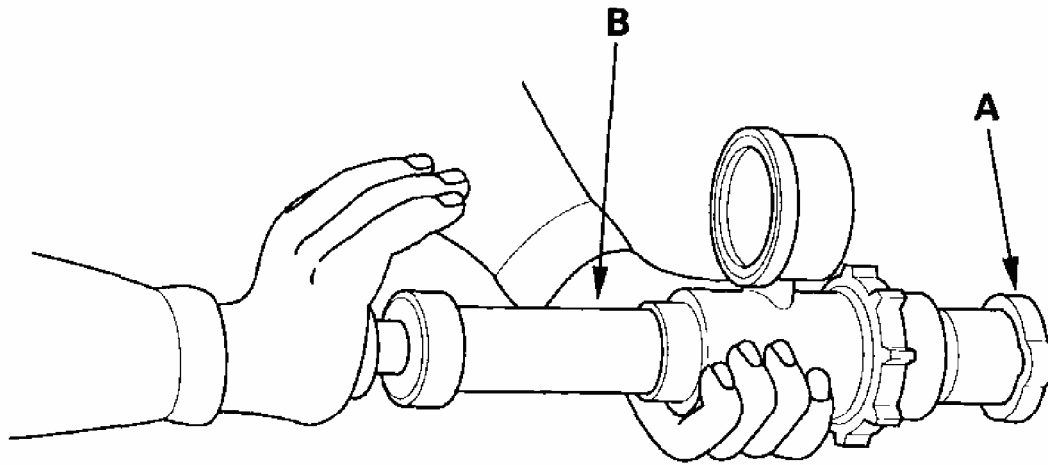


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Fig. 1: Identifying Cooling System Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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).



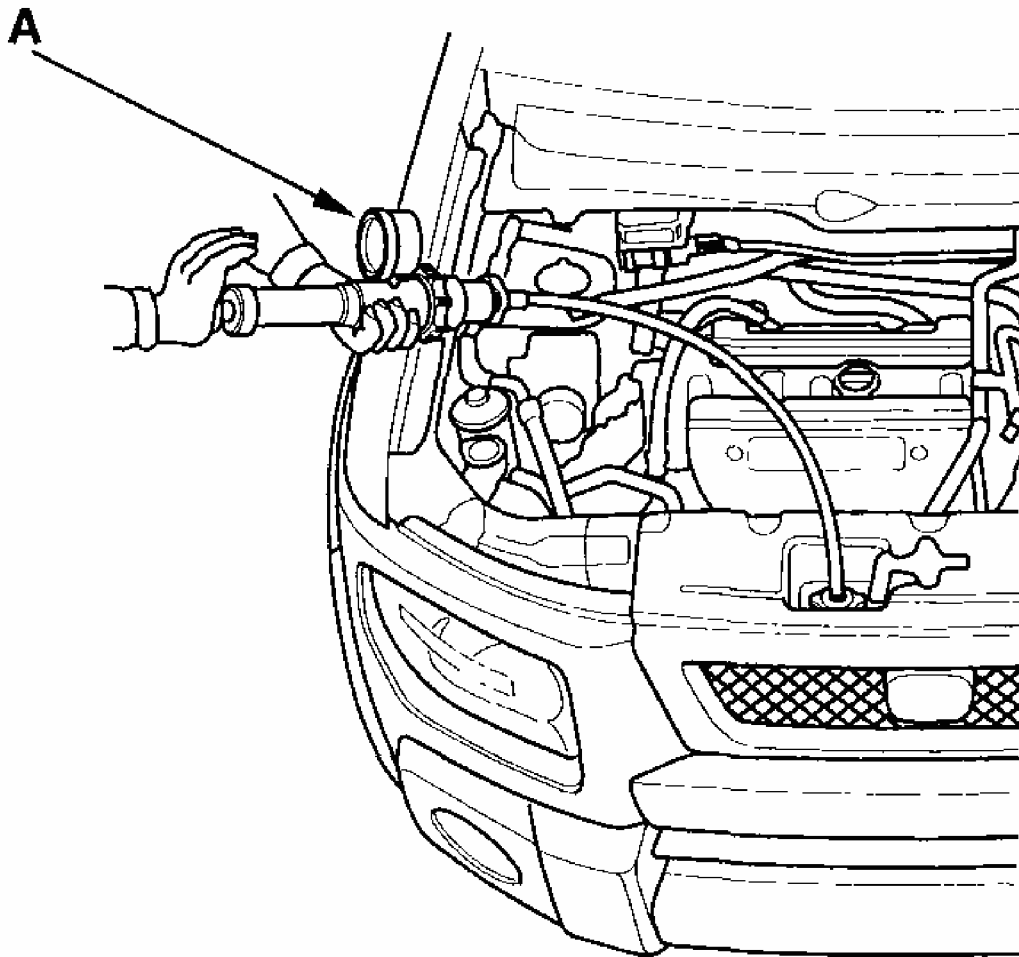
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Fig. 2: Removing Radiator Cap And Install On Pressure Tester
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.



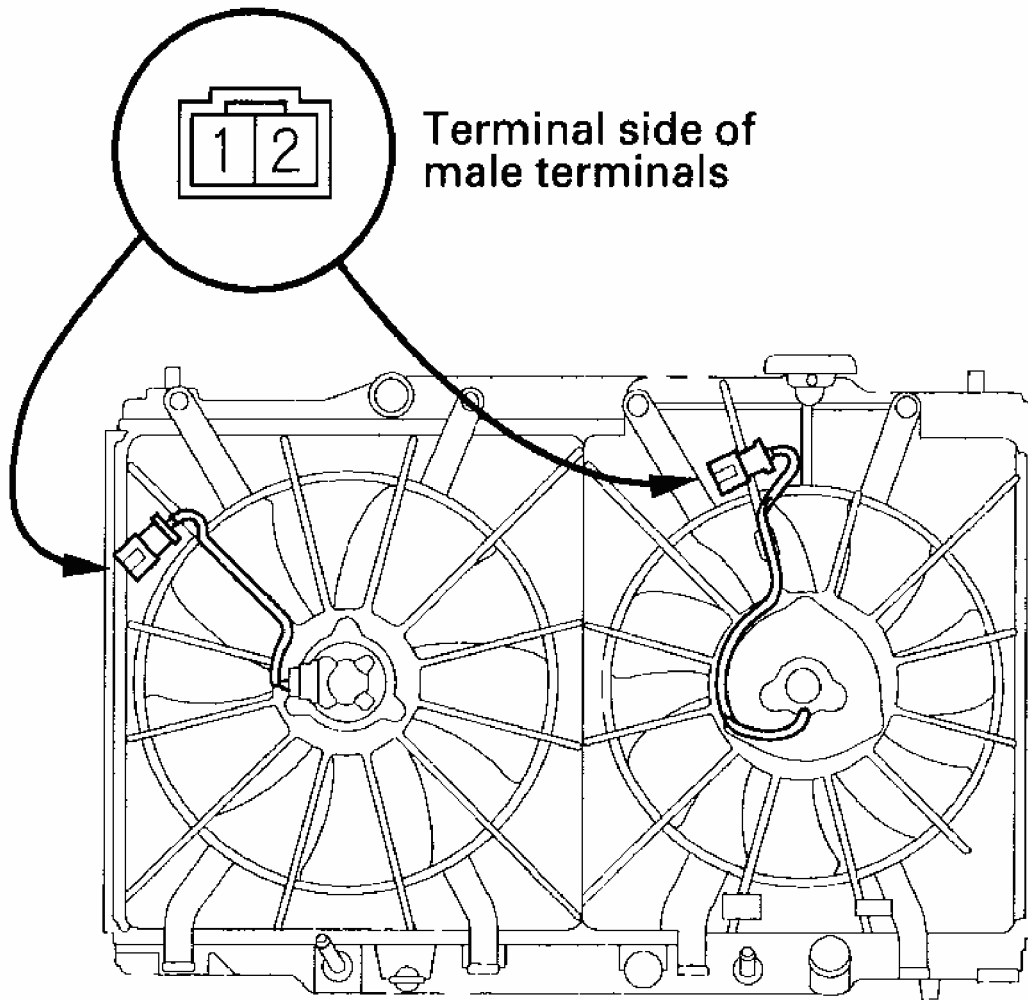
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Fig. 3: Attaching Pressure Tester To Radiator
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.



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Fig. 4: Disconnecting 2P Connectors From Radiator Fan Motor And Condenser Fan Motor

Courtesy of AMERICAN HONDA MOTOR CO., INC.

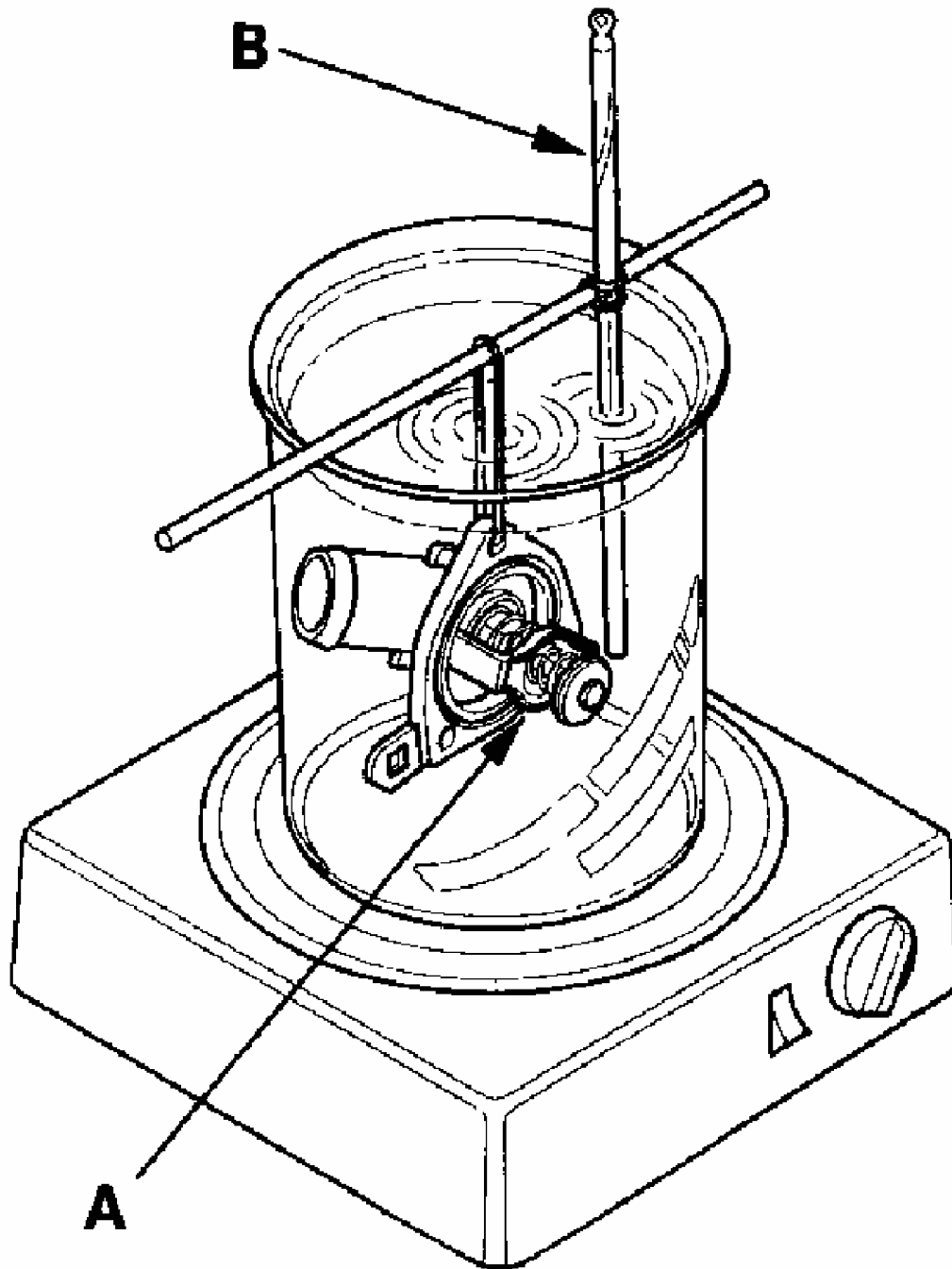
2. Test the motor by connecting battery power to the No. 2 terminal and ground to the No. 1 terminal.
3. If the motor fails to run or does not run smoothly, replace it.

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.



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Fig. 5: Suspending Thermostat In Container Of Water

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.)

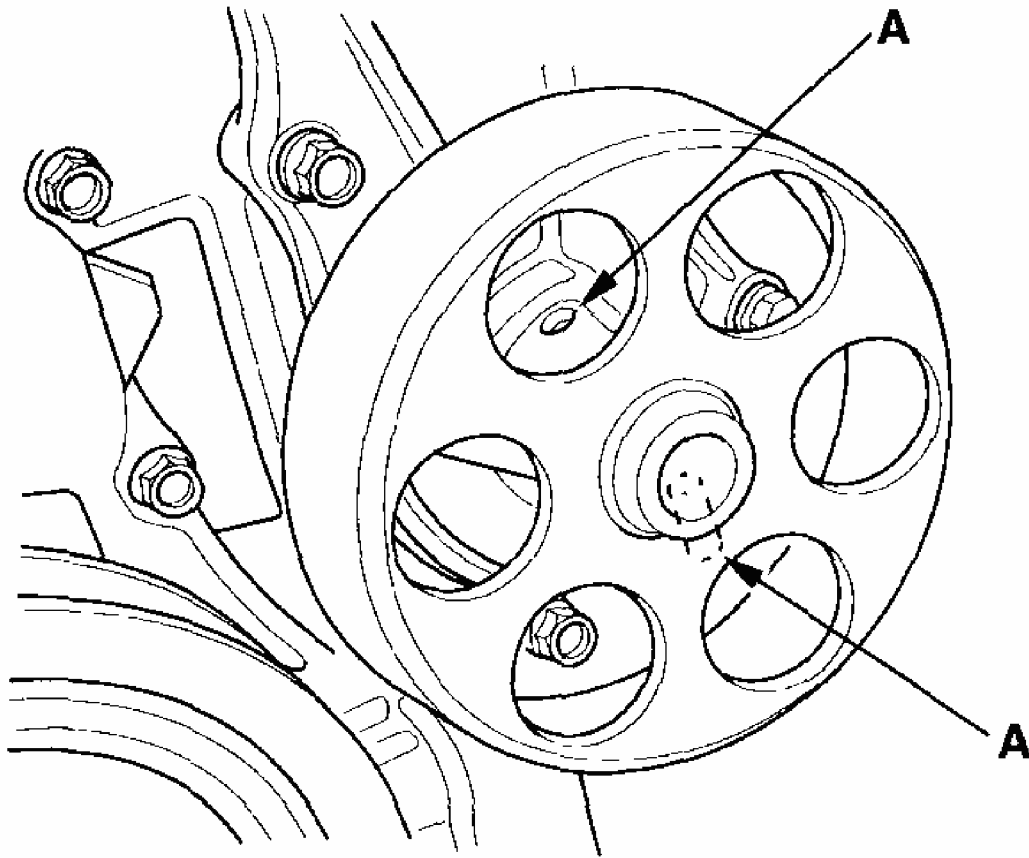
Starts Opening: 169-176°F (76-80°C)

Fully Open: 194°F (90°C)

WATER PUMP INSPECTION

1. Remove the drive belt (see **DRIVE BELT REPLACEMENT**).
2. Turn the water pump pulley counterclockwise. Check that it turns freely. If it doesn't turn smoothly, replace the water pump (see **WATER PUMP INSPECTION**).

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



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Fig. 6: Turning Water Pump Pulley

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the drive belt (see **DRIVE BELT REPLACEMENT**).

WATER PUMP REPLACEMENT

1. Remove the drive belt (see **DRIVE BELT REPLACEMENT**).
2. Drain the engine coolant (see **COOLANT CHECK**).
3. Remove the crankshaft pulley (see **CRANKSHAFT PULLEY REMOVAL AND INSTALLATION**).
4. Remove the six bolts securing the water pump, then remove the water pump (A).

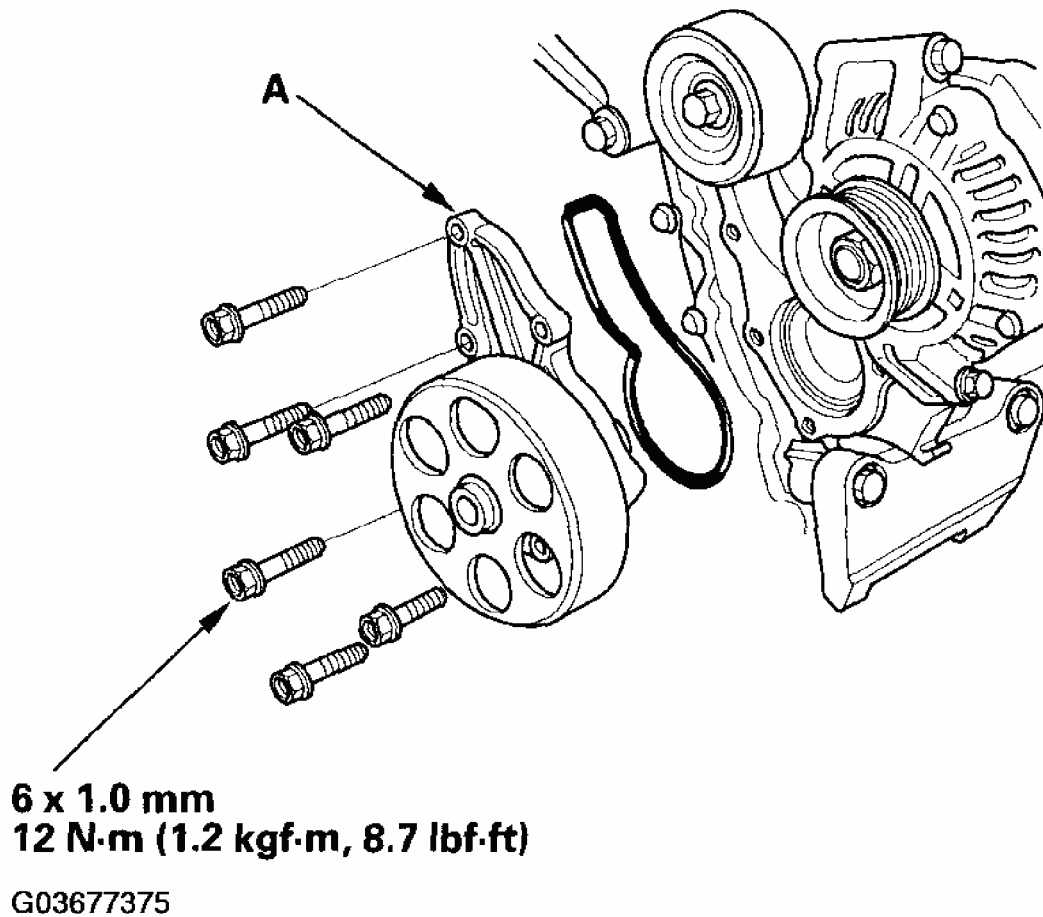
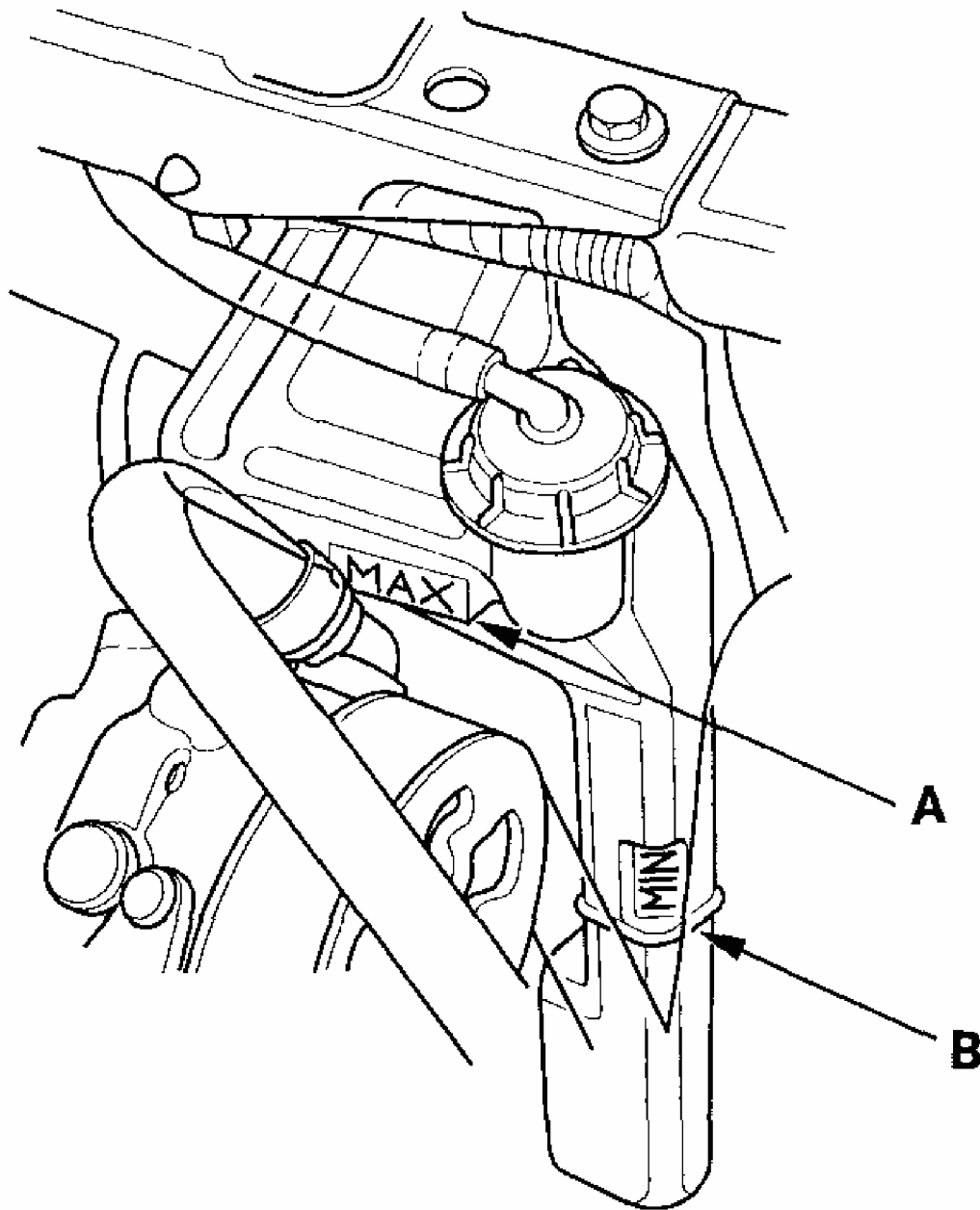


Fig. 7: Removing Water Pump And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 **INSTALLATION**).
9. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7).

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).



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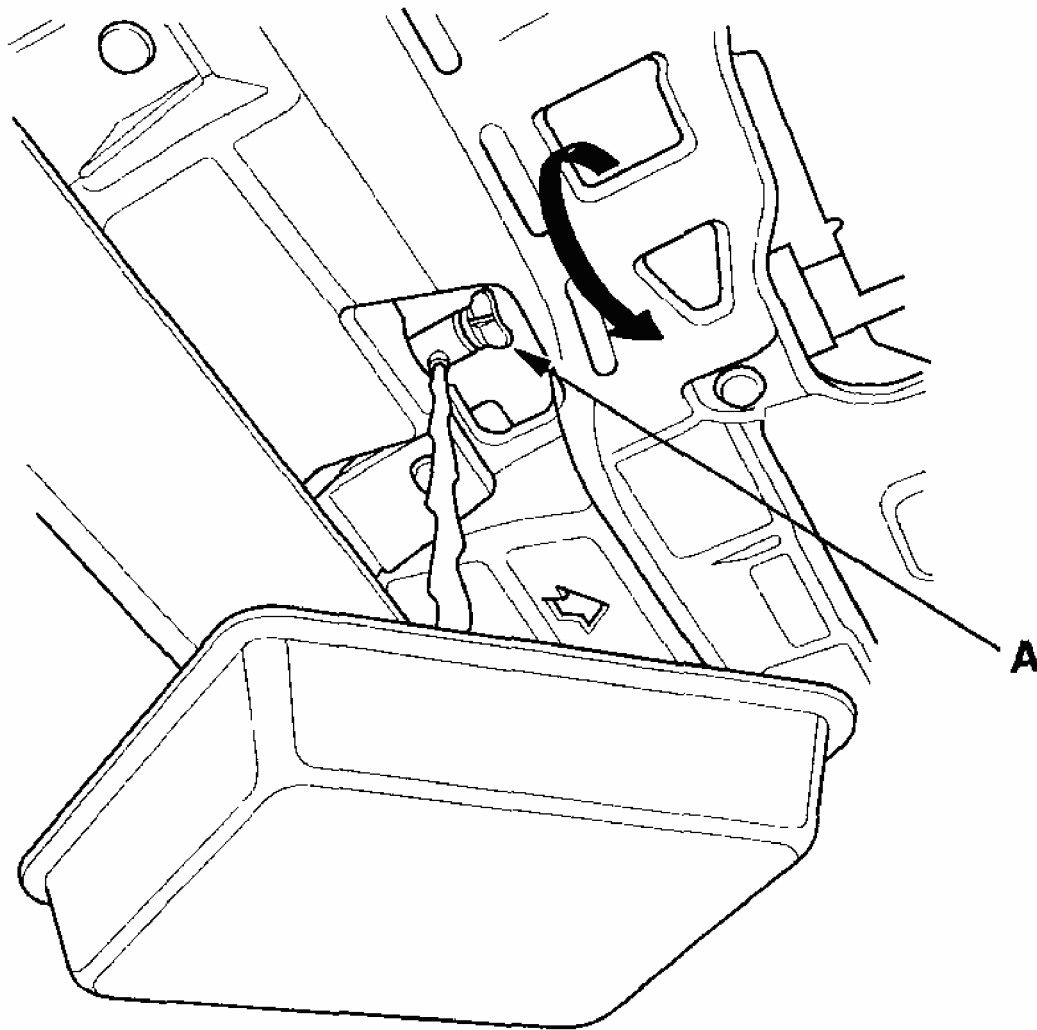
Fig. 8: Identifying Coolant Level Mark

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 the ignition switch OFF. 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.

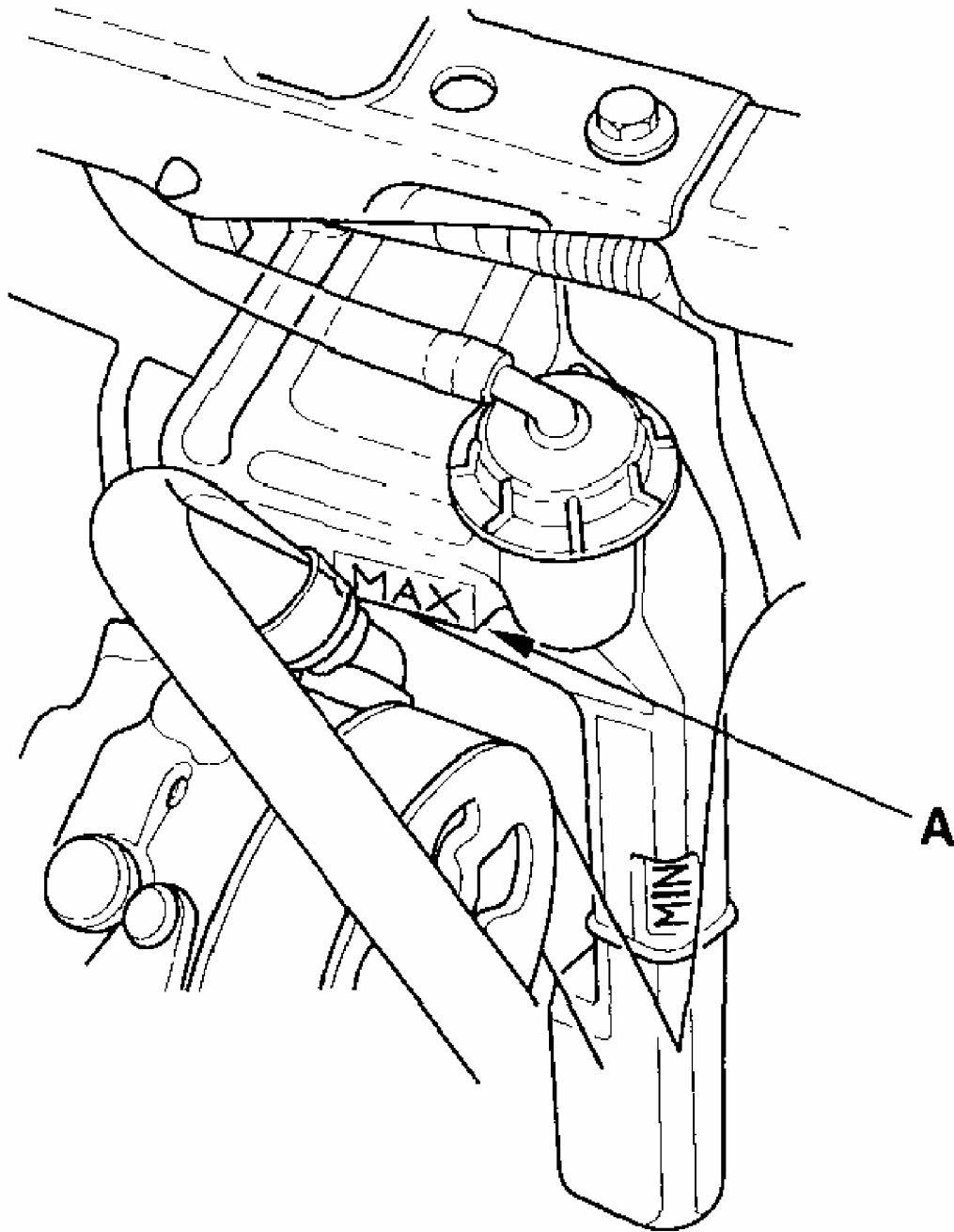


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Fig. 9: Loosening Drain Plug, And Drain Coolant
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. After the coolant has drained, tighten the radiator drain plug.
5. Remove, drain, and reinstall the reserve tank.

6. Fill the reserve tank to the MAX mark (A) with Honda Long Life Antifreeze/Coolant Type 2 (P/N OL999-9001).



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Fig. 10: Filling Reserve Tank To Max Mark

Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Pour Honda Long Life Antifreeze/Coolant Type 2 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 0.6L (0.16 US gal))

At Coolant Change:

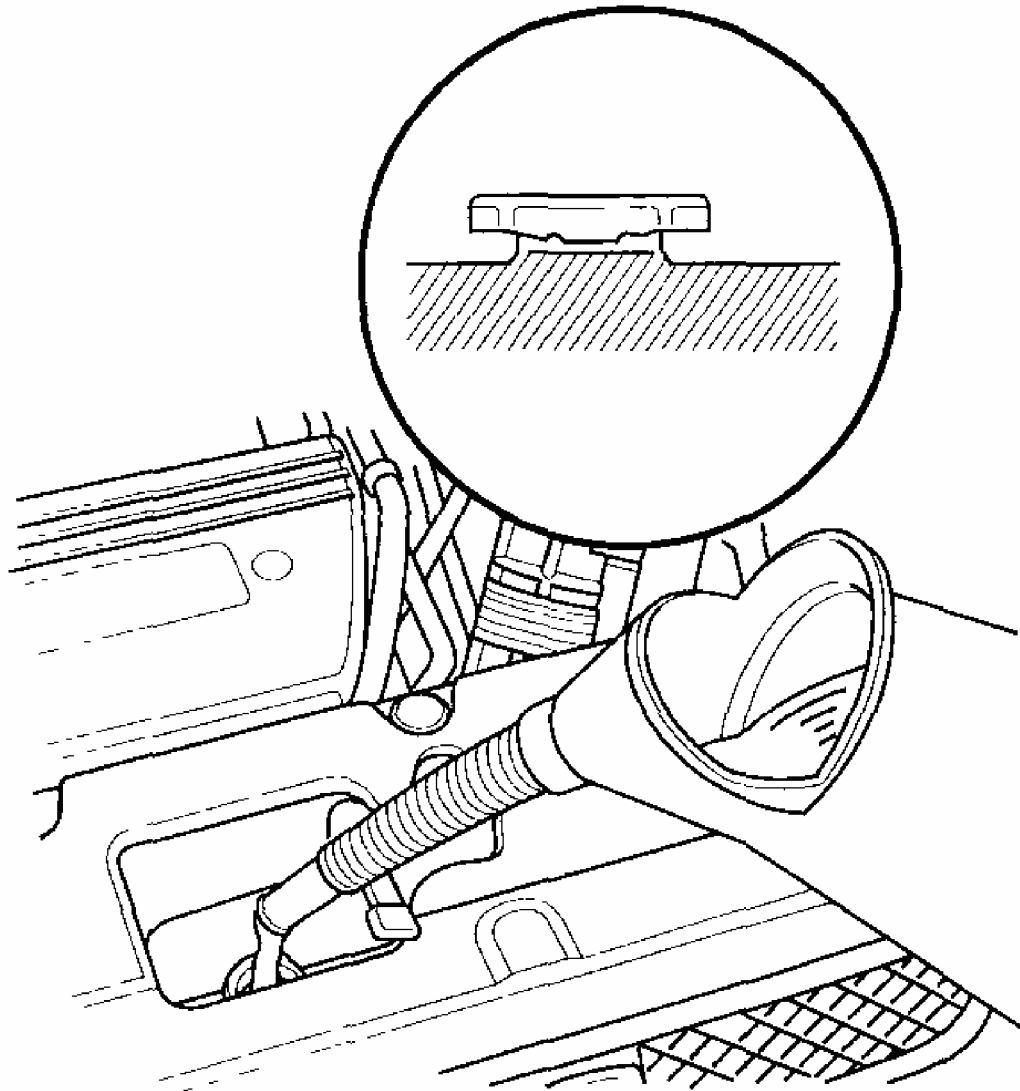
M/T: 5.1 L (1.35 US gal)

A/T: 5.0 L (1.32 US gal)

After Engine Overhaul:

M/T: 7.2 L (1.90 US gal)

A/T: 7.1 L (1.88 US gal)



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Fig. 11: Pouring Honda Long Life Antifreeze/Coolant Type 2 Into Radiator Up To Base Of Filler Neck

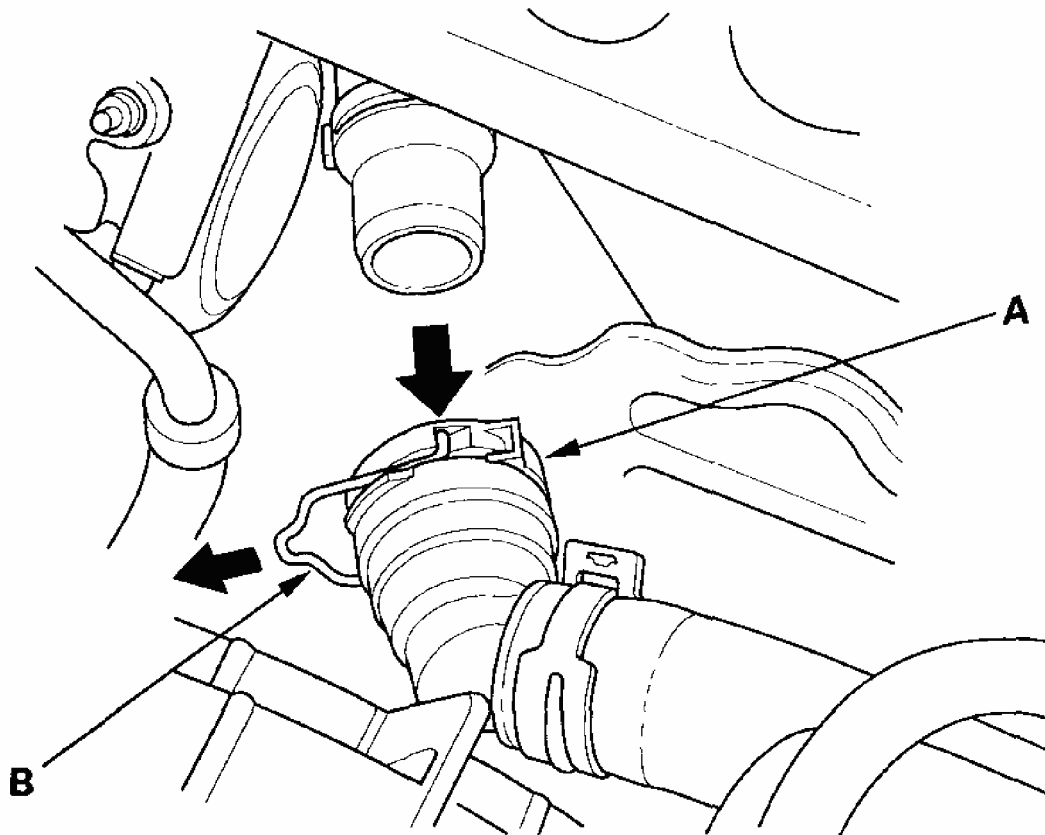
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Install the radiator cap loosely.
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.

12. Clean up any spilled engine coolant.

THERMOSTAT REPLACEMENT

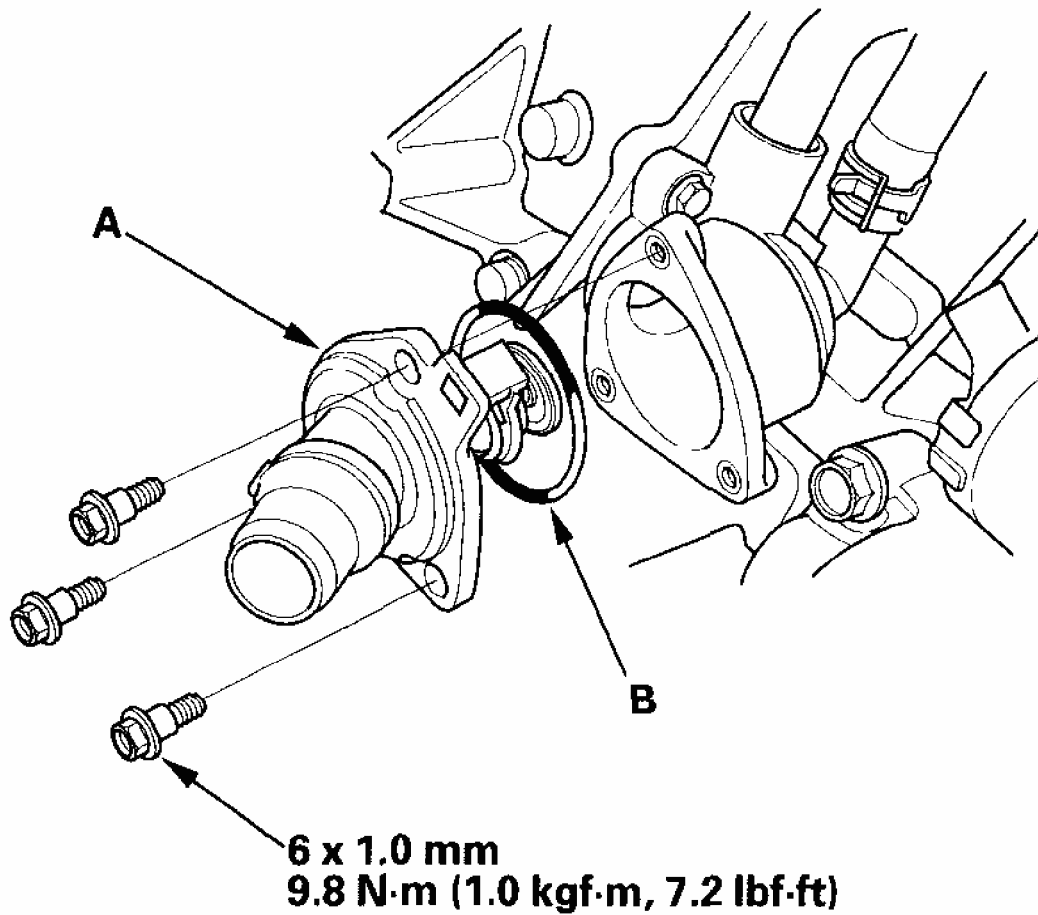
1. Drain the engine coolant (see **COOLANT CHECK**).
2. Clean any dirt off the quick connector (A), thermostat cover, and lower radiator hose.



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Fig. 12: Cleaning Quick Connector, Thermostat Cover, And Lower Radiator Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

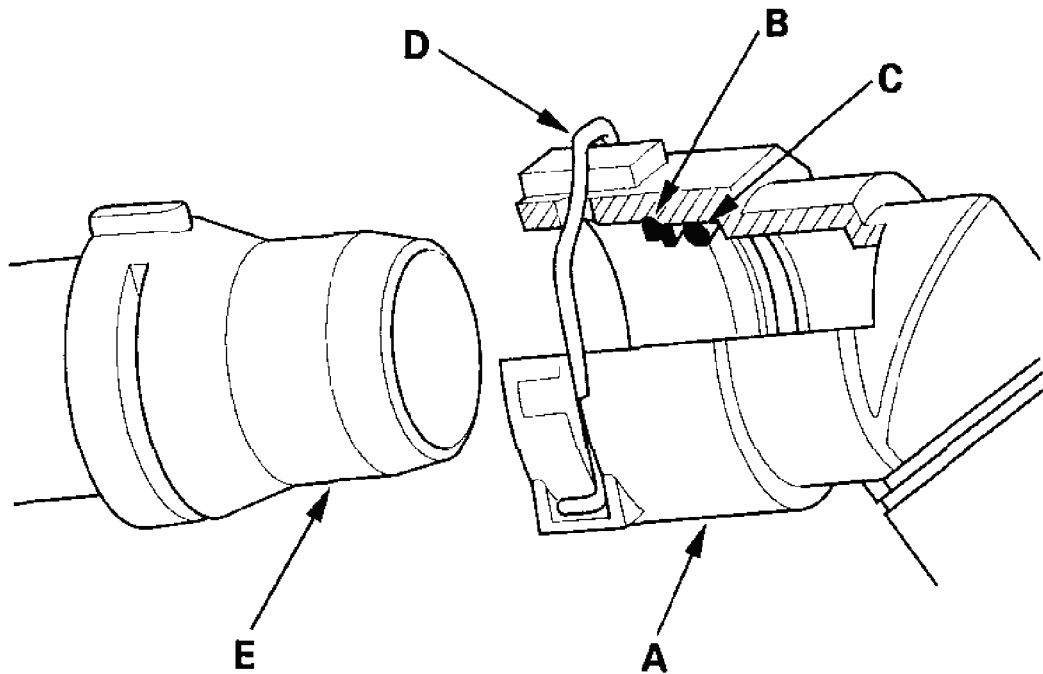
3. Pull out lock (B) by hand, then wiggle the quick connector loose, and remove it from the thermostat cover. Do not use any tools to remove the quick connector.
4. Remove the thermostat (A).



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Fig. 13: Removing Thermostat And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

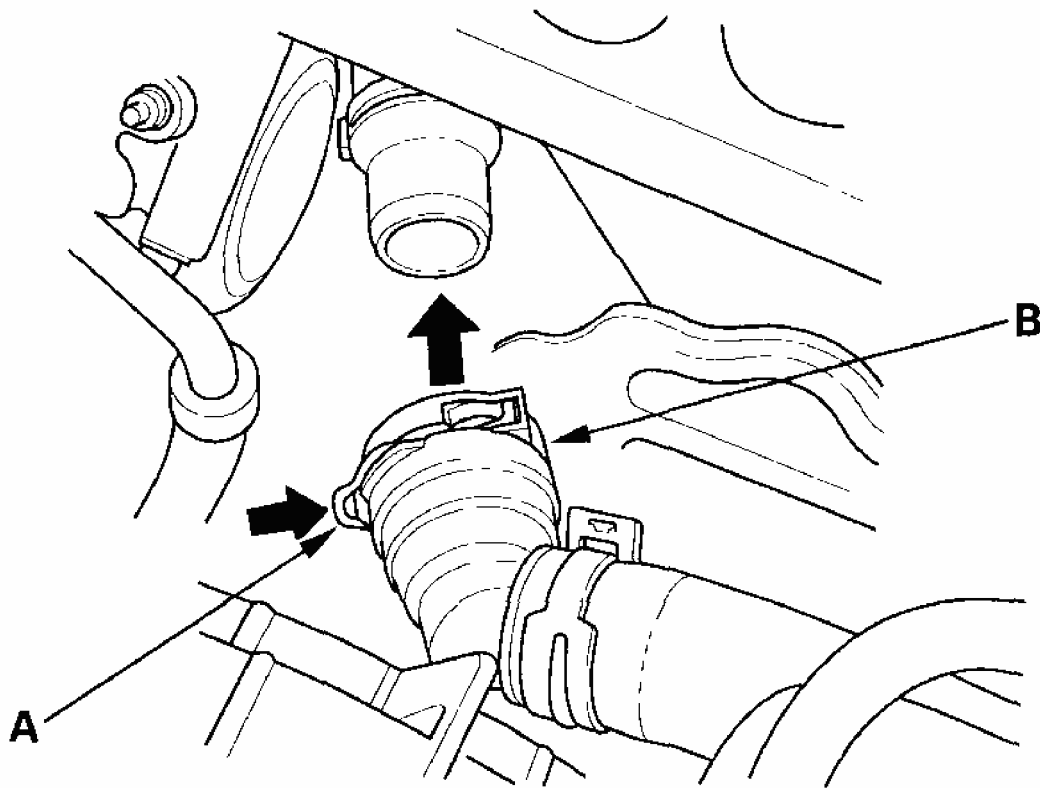
5. Install the thermostat with a new O-ring (B).
6. Check the quick connector (A) and set ring (B) for cracks or damage. If the connector and/or set ring are cracked or damaged, replace the connector.



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**Fig. 14: Checking Quick Connector And Setting Ring For Cracks Or Damage
Courtesy of AMERICAN HONDA MOTOR CO., INC.**

7. Make sure the set ring is in place inside the quick connector. If the set ring is off the connector, replace the quick connector.
8. Replace the O-ring (C) in the quick connector.
9. Check the lock (D). If the lock is damaged or deformed, replace it. When installing the new lock to the connector, push it straight down along the groove.
10. Clean the connecting surface of the thermostat cover (E), then apply clean engine coolant around the connecting surface.
11. Push the lock (A) down, then push the quick connector (B) onto the thermostat cover until you hear it click.



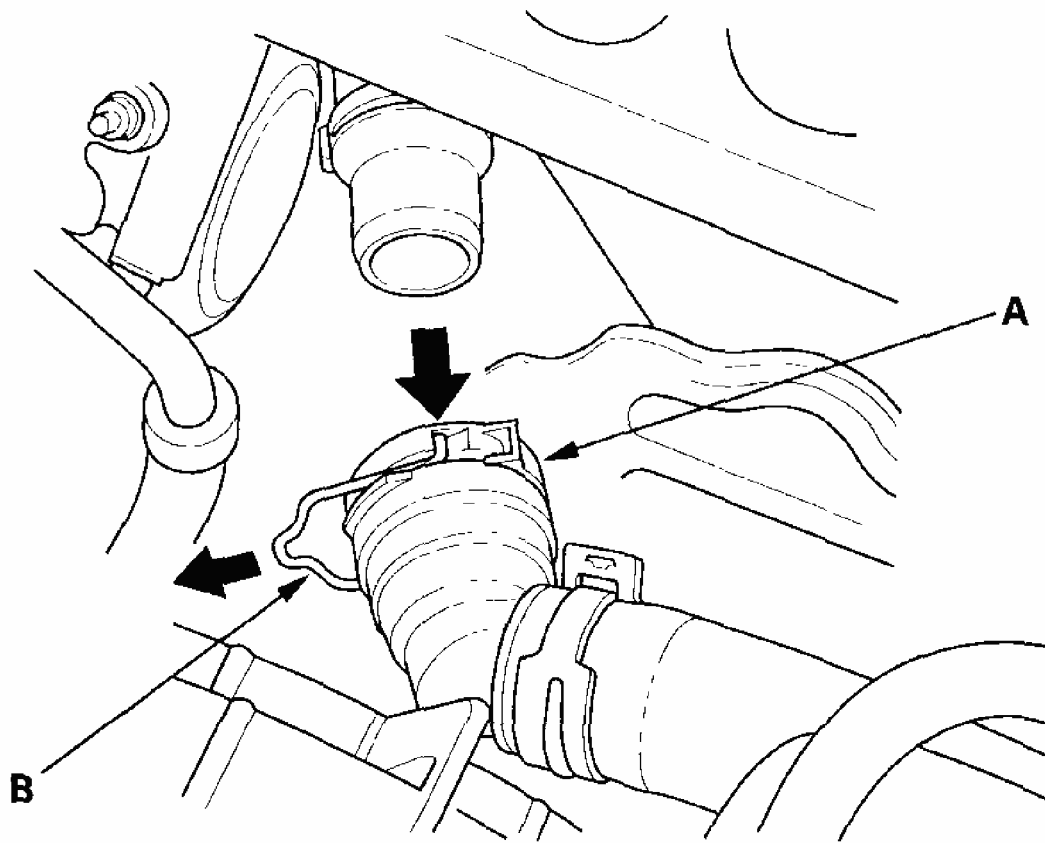
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Fig. 15: Pushing Lock Down, And Quick Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7).

WATER PASSAGE REPLACEMENT

1. Drain the engine coolant (see **COOLANT CHECK**).
2. Clean any dirt off the quick connector (A), thermostat cover, and lower radiator hose.

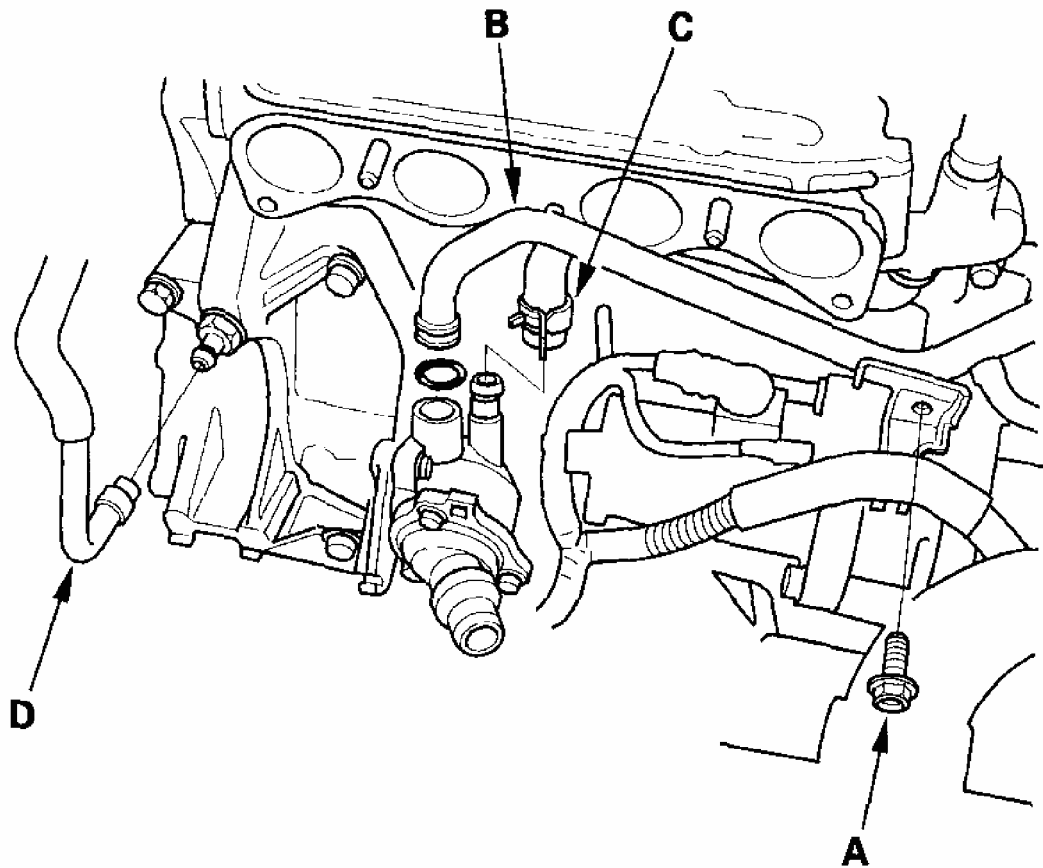


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Fig. 16: Cleaning Dirt Off Quick Connector, Thermostat Cover, And Lower Radiator Hose

Courtesy of AMERICAN HONDA MOTOR CO., INC.

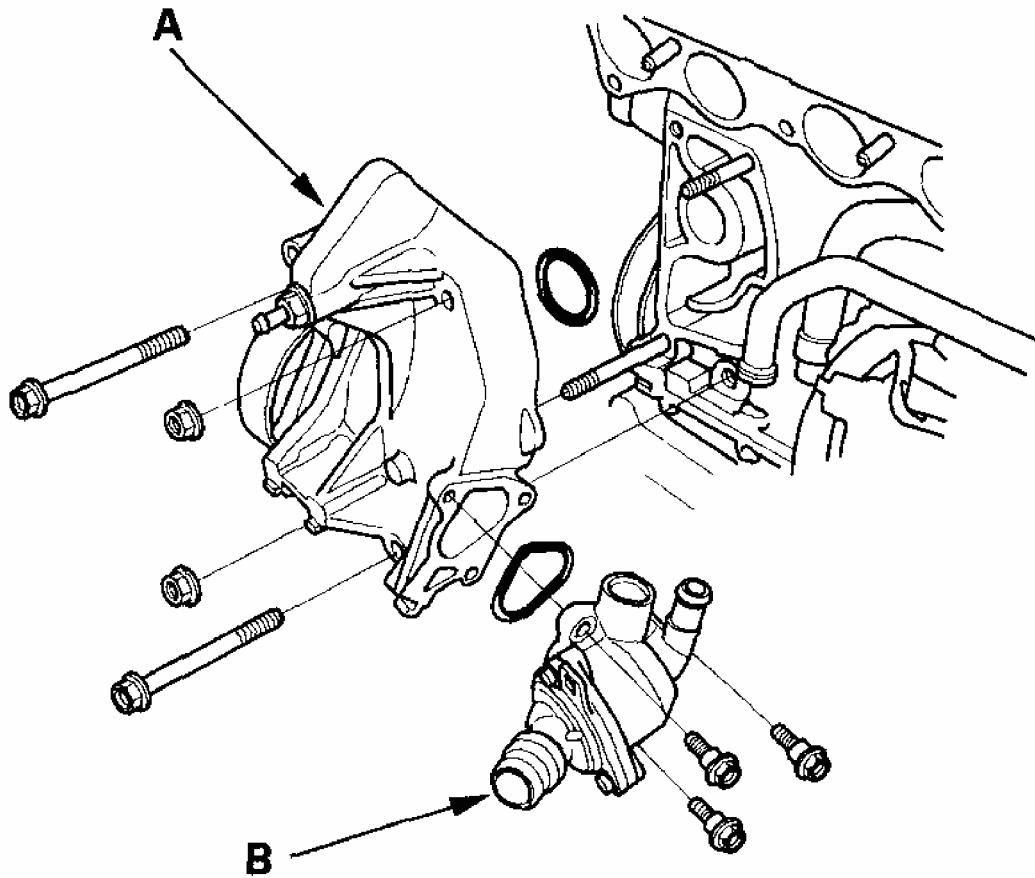
3. Pull out the lock (B) by hand, then wiggle the quick connector loose, and remove it from the thermostat cover. Do not use any tools to remove the quick connector.
4. Remove the alternator (see **ALTERNATOR OVERHAUL**).
5. Remove the splash shield (see step 26 on **ENGINE REMOVAL**).
6. Remove the A/C compressor without disconnecting the A/C hoses (see step 56 on **ENGINE REMOVAL**).
7. Remove the intake manifold (see **ENGINE REMOVAL**).
8. Remove a bolt (A) securing the connecting pipe.



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Fig. 17: Removing Bolt Securing Connecting Pipe
Courtesy of AMERICAN HONDA MOTOR CO., INC.

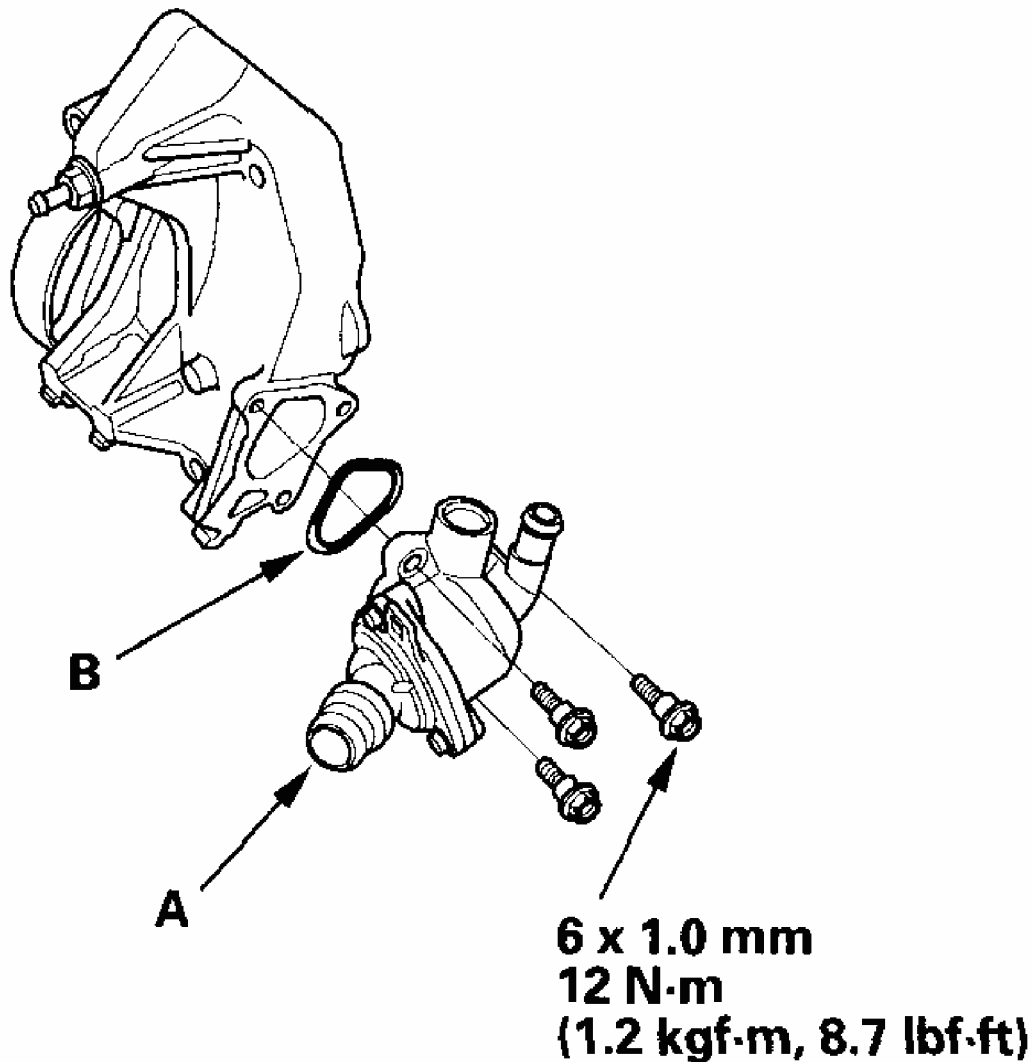
9. Remove the connecting pipe (B), water bypass hose (C), and positive crankcase ventilation (PCV) hose (D).
10. Remove the water passage (A).



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Fig. 18: Removing Water Passage
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Remove the thermostat housing (B).
12. Remove the water pump (see **WATER PUMP INSPECTION**).
13. Install the water pump (see **WATER PUMP INSPECTION**).
14. Install the thermostat housing (A) with a new O-ring (B).



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Fig. 19: Installing Thermostat Housing With O-Ring And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Clean and dry the water passage mating surfaces.
16. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0002, 08718-0003, or 08718-0009, evenly to the engine block mating surface of the water passage.

NOTE: Do not install components if too much time has passed after applying the liquid gasket (for P/N 08718-0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue and reapply the liquid gasket.

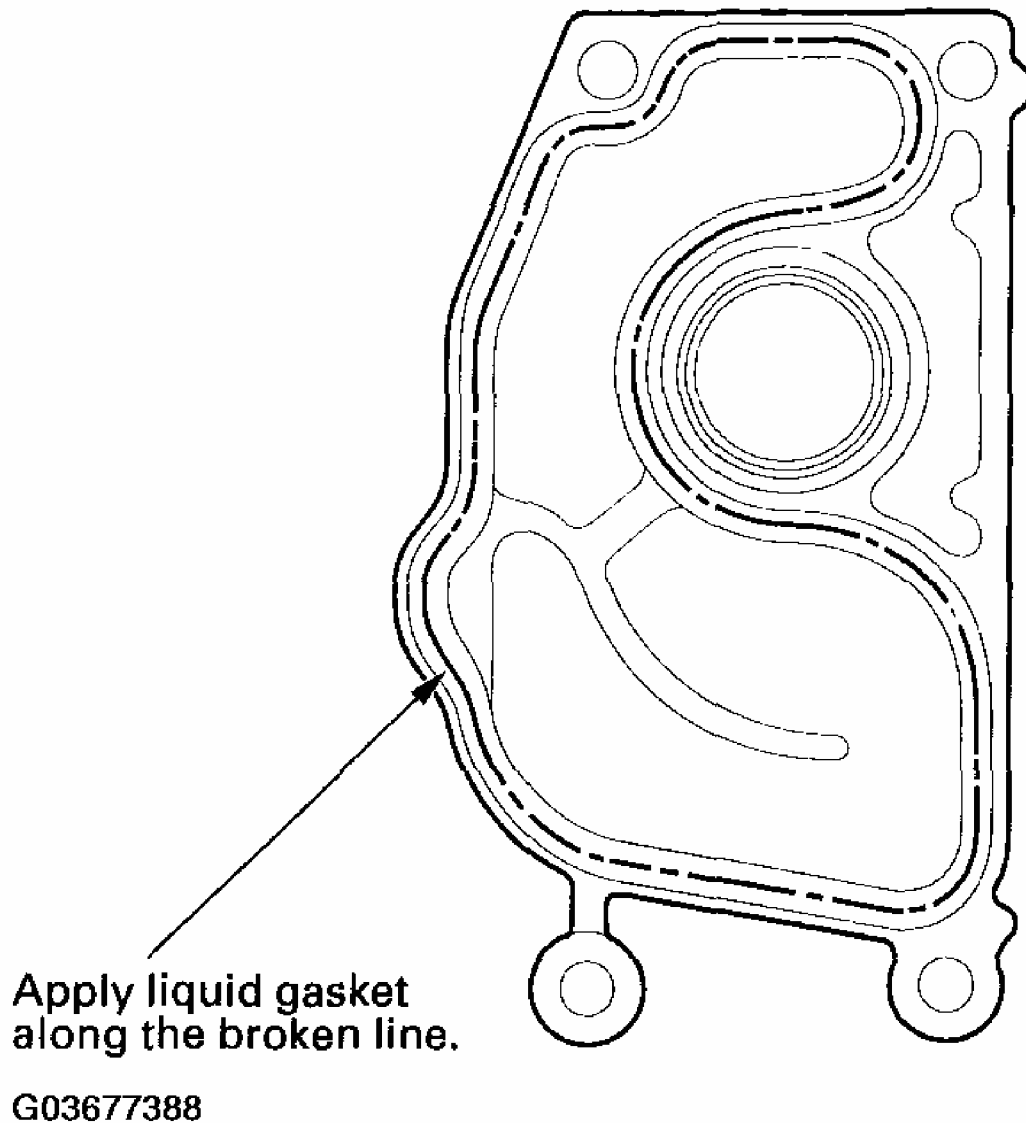


Fig. 20: Applying Liquid Gasket

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

NOTE:

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

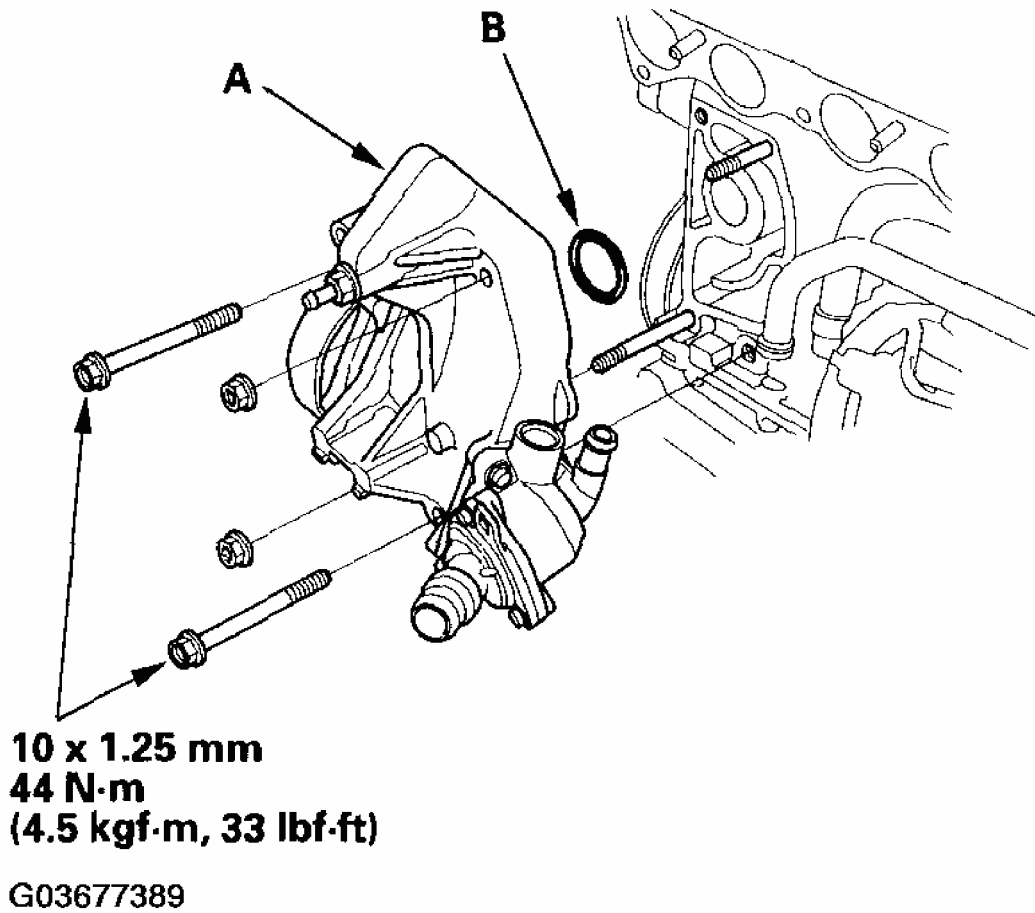
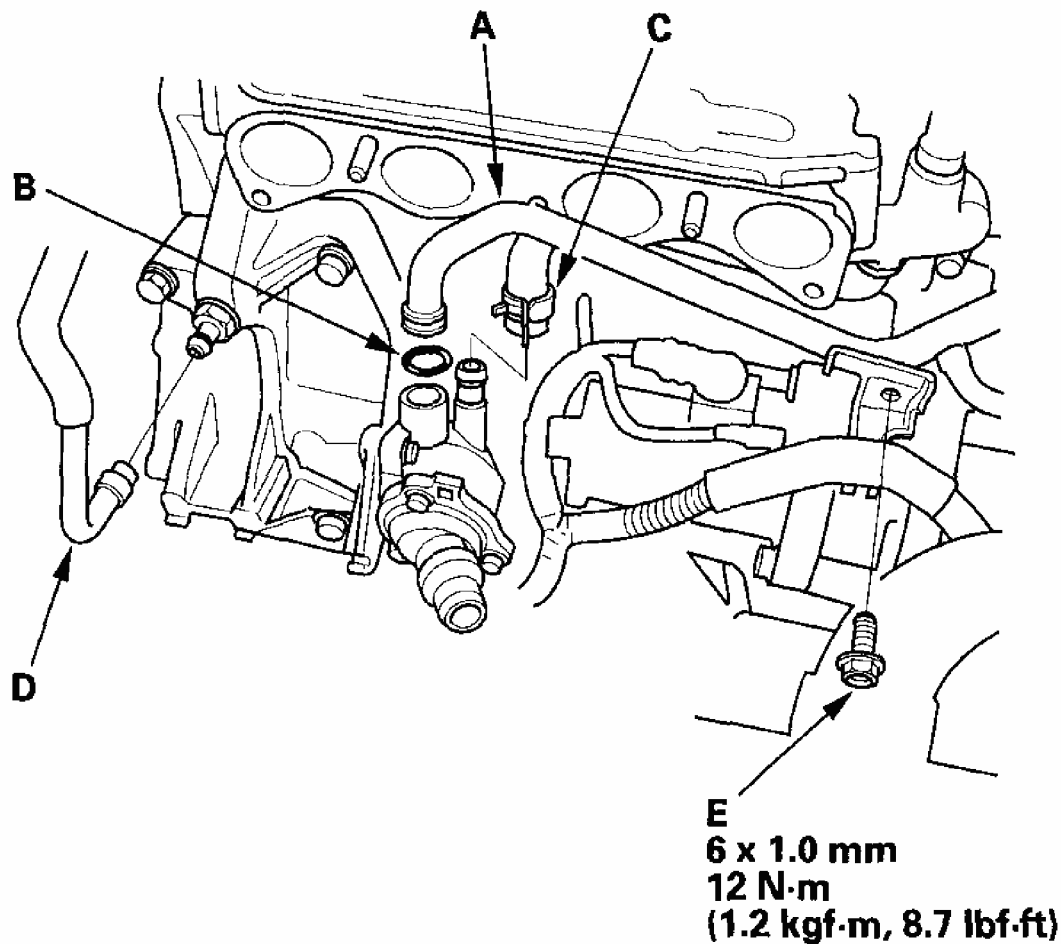


Fig. 21: Installing Water Passage With O-Ring And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

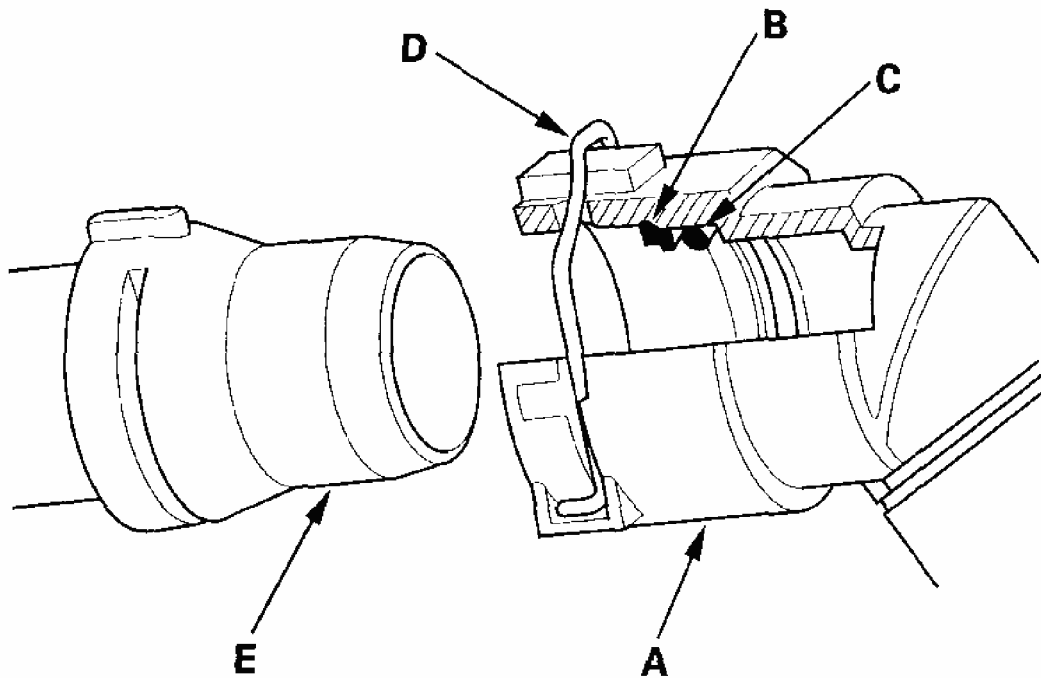
18. Install the connecting pipe (A) with a new O-ring (B).



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Fig. 22: Installing Connect Pipe With O-Ring And Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

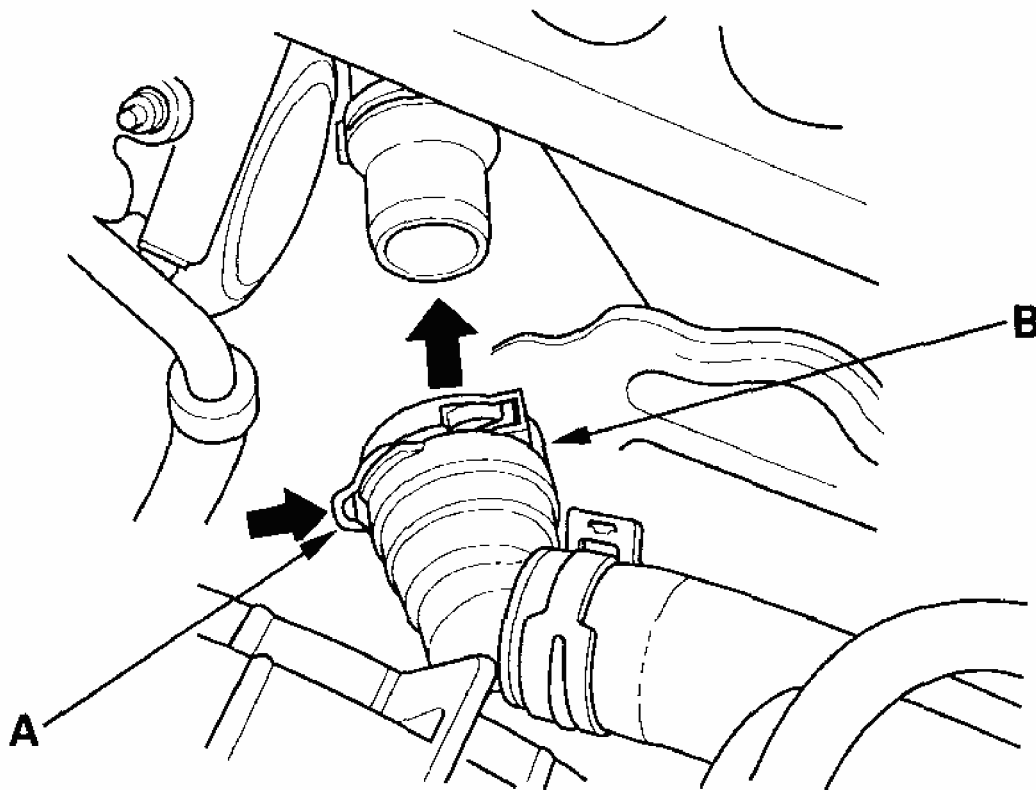
19. Install the water bypass hose (C) and PCV hose (D), then tighten a bolt (E) securing the connecting pipe.
20. Install the intake manifold (see **INSTALLATION**).
21. Install the A/C compressor (see step 3 on **ENGINE INSTALLATION**).
22. Install the splash shield (see step 26 on **ENGINE INSTALLATION**).
23. Install the alternator (see **INSTALLATION**).
24. 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.



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Fig. 23: Checking Quick Connector And Set Ring For Cracks or Damages
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Make sure the set ring is in place inside the quick connector. If the set ring is off the connector, replace the quick connector.
26. Replace the O-ring (C) in the quick connector.
27. Check the lock (D). If the lock is damaged or deformed, replace it. When installing the new lock on the connector, push it straight down along the groove.
28. Clean the connecting surface of the thermostat cover (E), then apply clean engine coolant around the connecting surface.
29. Push the lock (A) down, then push the quick connector (B) onto the thermostat cover until you here it click.



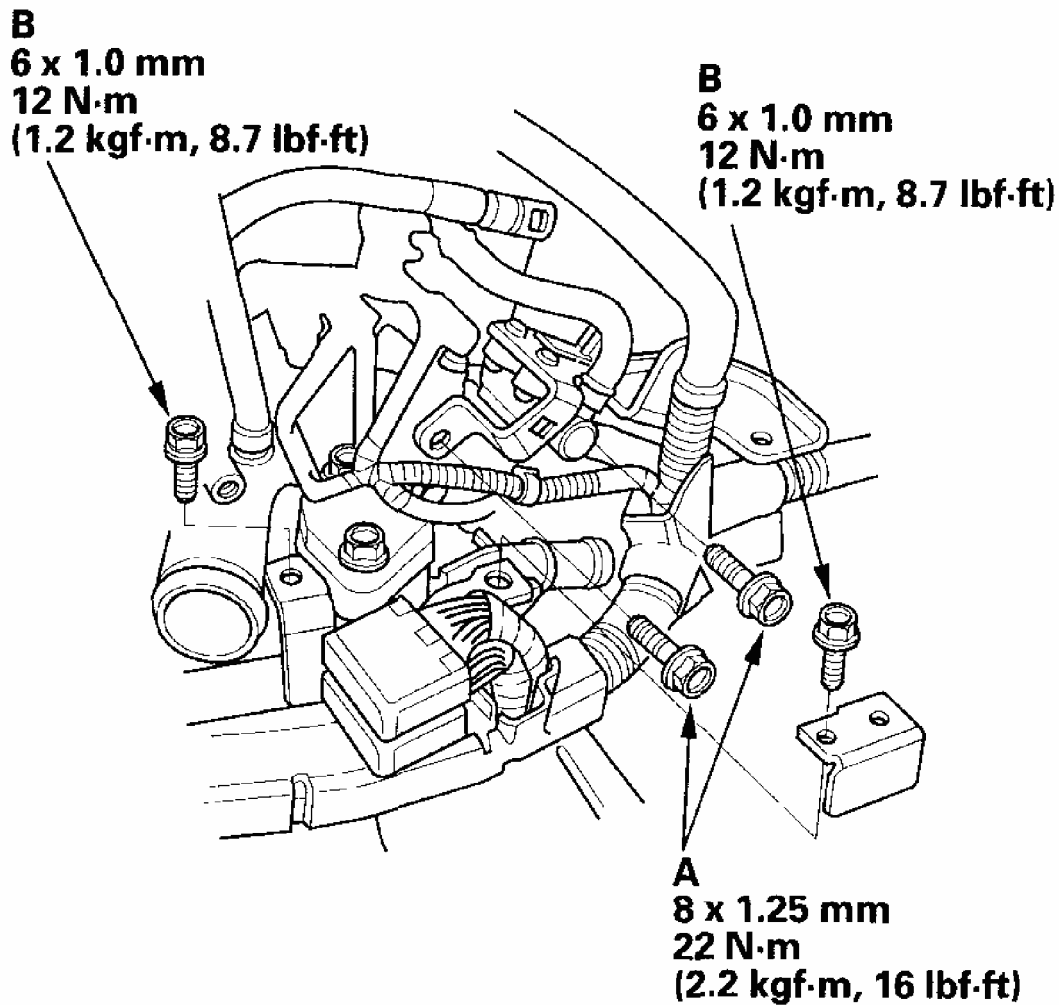
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Fig. 24: Pushing Lock Down And Quick Connector Onto Thermostat Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

30. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7).

EGR PASSAGE REPLACEMENT

1. Drain the engine coolant (see **COOLANT CHECK**).
2. Remove the two bolts (A) securing the evaporative emission (EVAP) canister purge valve bracket and remove the two bolts (B) securing the harness bracket.



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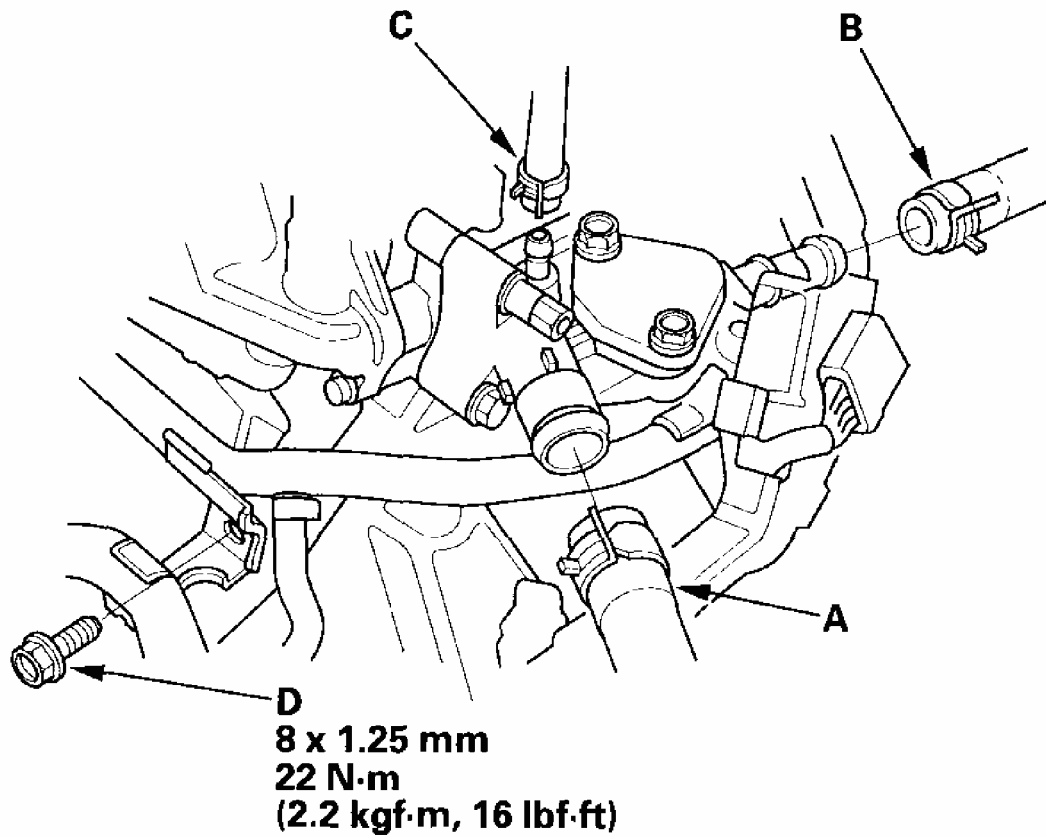
Fig. 25: Removing Bolts Securing Evaporative Emission Canister Purge Valve Bracket And Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the upper radiator hose (A), heater hose (B), water bypass hose (C), and connecting pipe mounting bolt (D).

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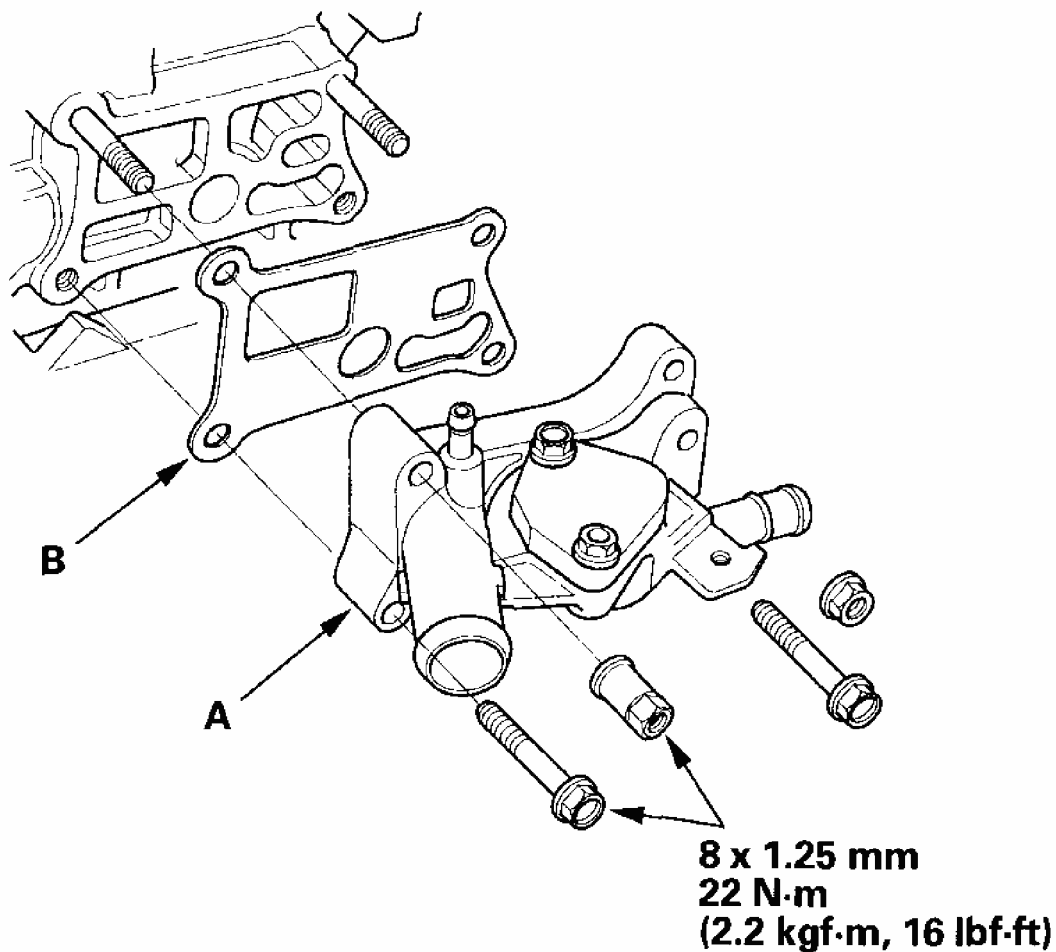
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Fig. 26: Removing Upper Radiator Hose, Heater Hose, Water Bypass Hose And Connecting Pipe Mounting Bolt And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the exhaust gas recirculation (EGR) passage (A).



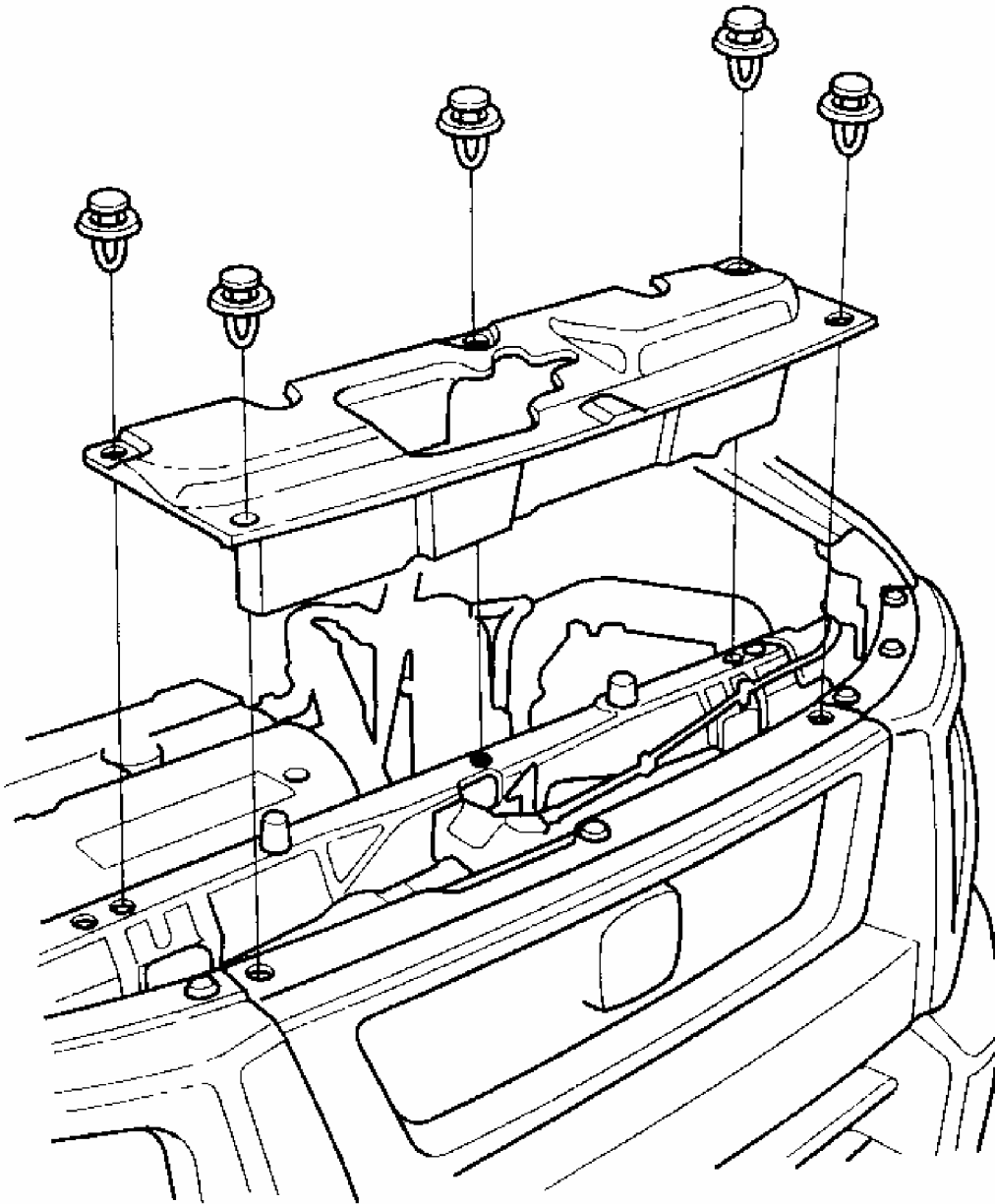
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Fig. 27: Removing Exhaust Gas Recirculation Passage And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the EGR passage with a new gasket (B).
6. Install the other parts in the reverse order of removal.
7. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7).

RADIATOR AND FAN REPLACEMENT

1. Drain the engine coolant (see **COOLANT CHECK**).
2. Remove the front grille cover.

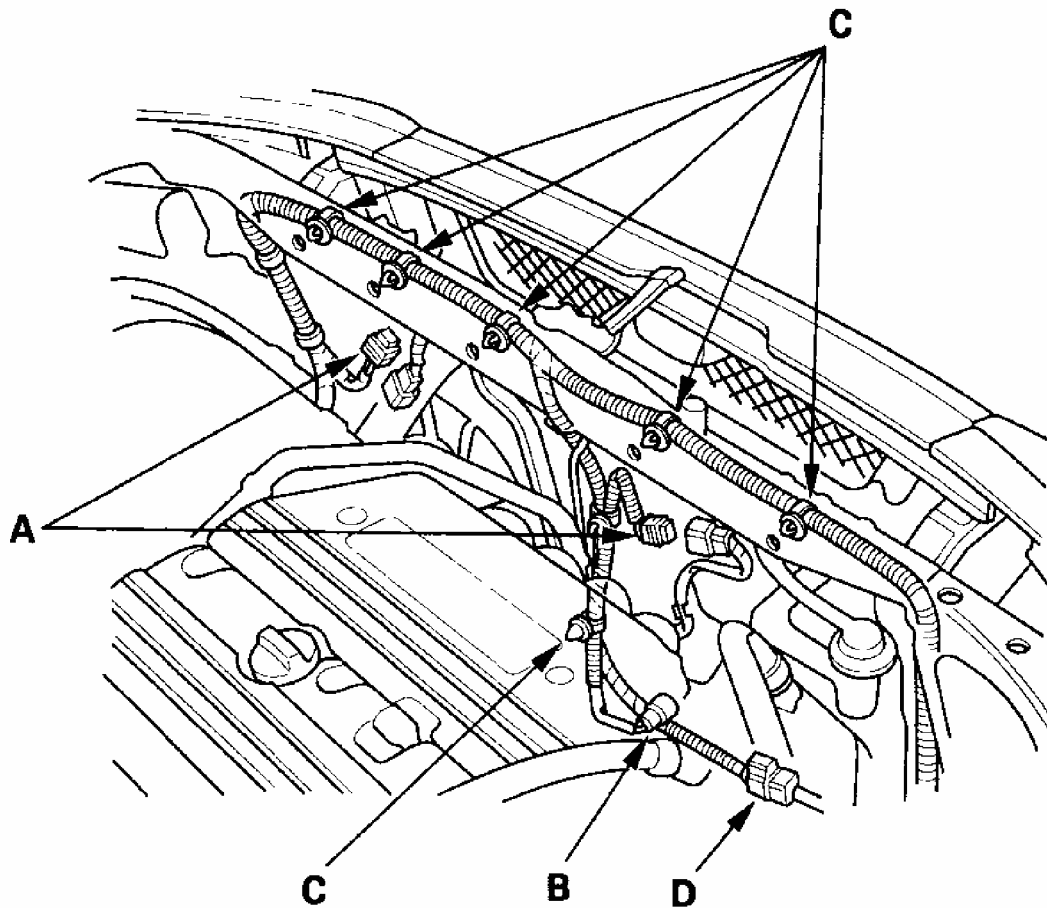


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Fig. 28: Removing Front Grille Cover

Courtesy of AMERICAN HONDA MOTOR CO., INC.

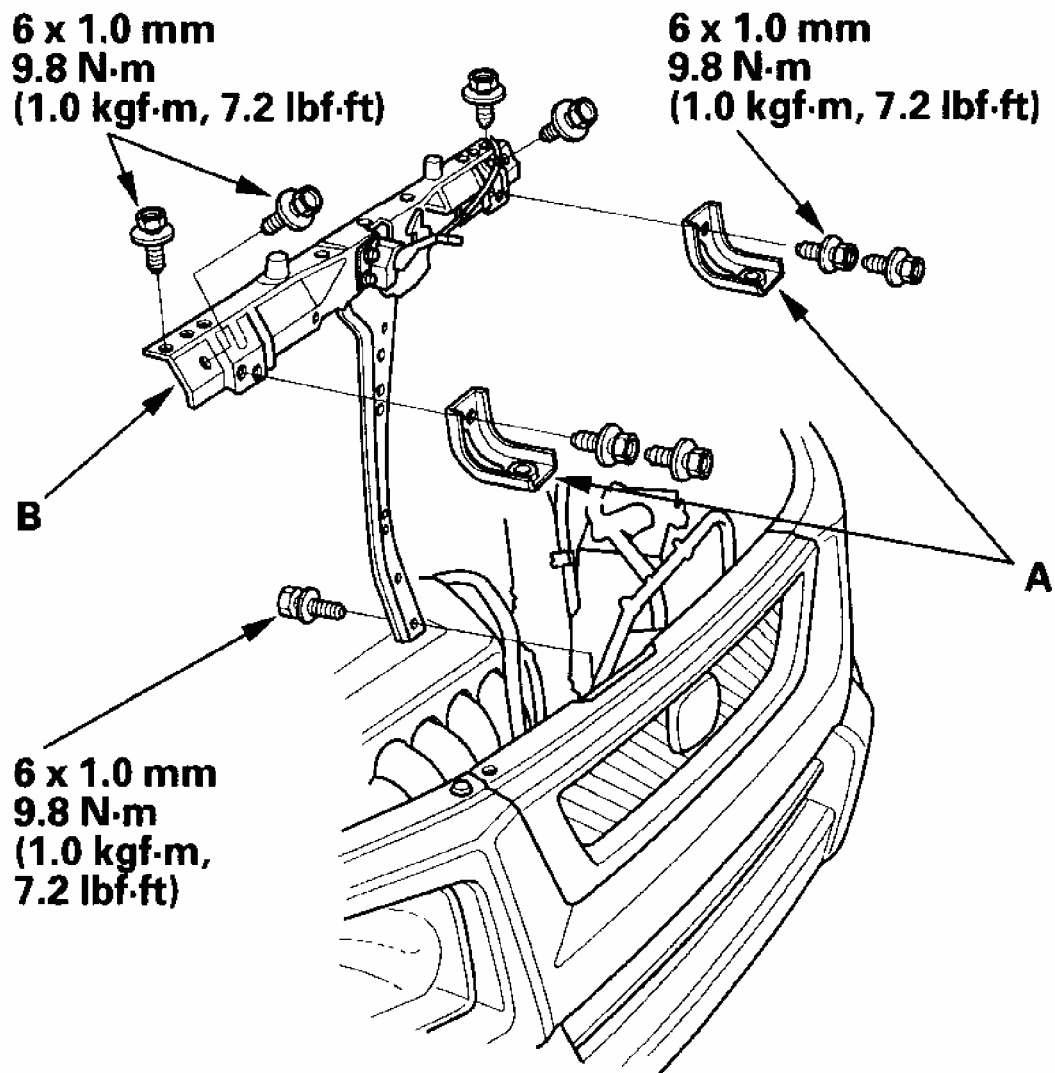
3. Disconnect the fan motor connectors (A) and radiator fan switch connector (B), then remove the harness clamps (C) and A/C compressor clutch connector (D).



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Fig. 29: Disconnecting Fan Motor Connectors
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the upper brackets and cushions (A), then remove the bulkhead (B).



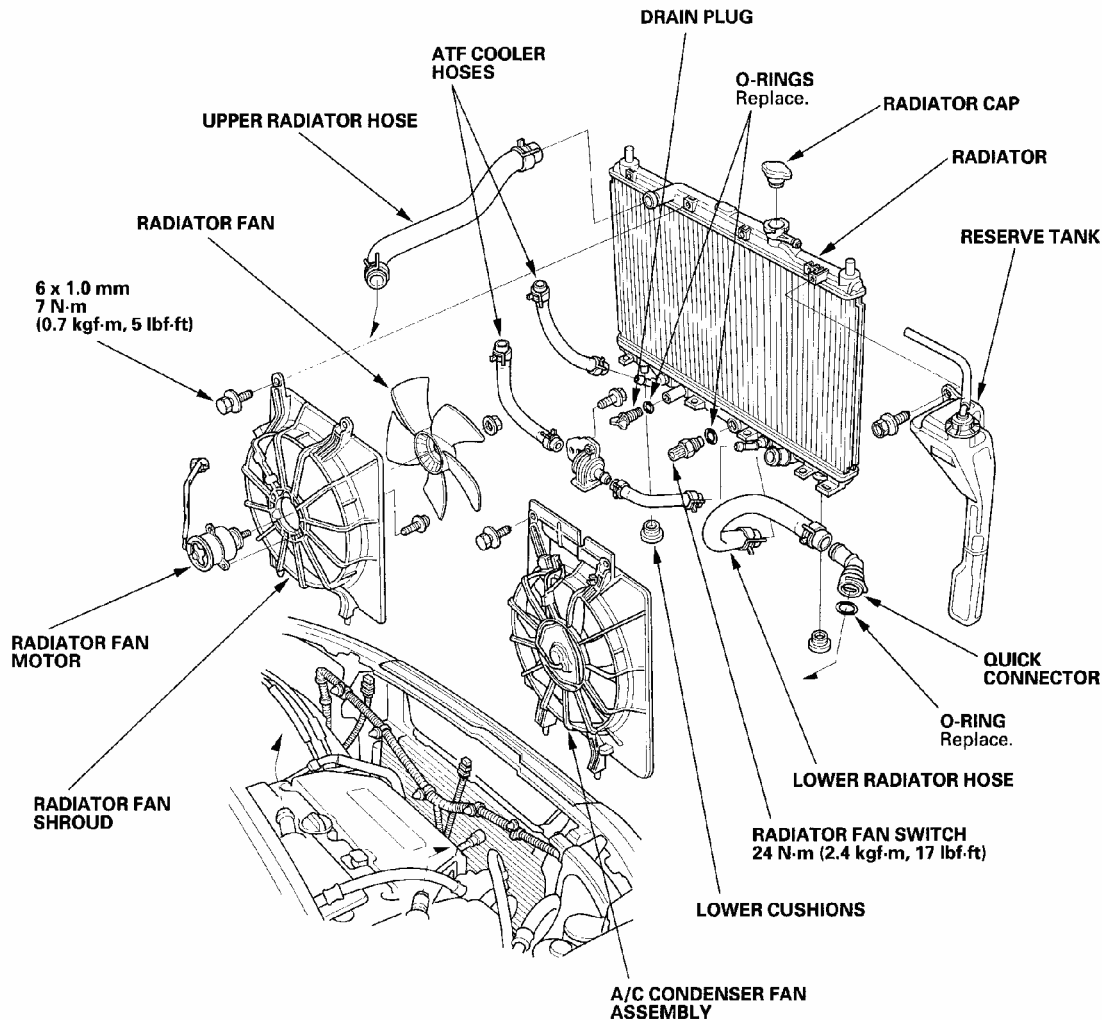
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Fig. 30: Removing Upper Brackets And Cushions And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. A/T model: Remove the automatic transmission fluid (ATF) cooler hoses (see **SHIFT LEVER REMOVAL**).

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Fig. 31: Exploded View Of Radiator And Fan
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the upper radiator hose and lower radiator hose from the radiator, then pull up the radiator.
7. Remove the fan shroud assemblies and other parts from the radiator.
8. Install the radiator in the reverse order of removal. Make sure the upper and lower cushions are set securely.
9. Install the bulkhead in the reverse order of removal. Apply touch-up paint to the bulkhead mounting bolts.
10. Fill the radiator with engine coolant, and bleed the air from the cooling system with the heater valve open (see step 7).