

<b>2006 Acura MDX</b>
2003-06 ENGINE Cooling System - MDX

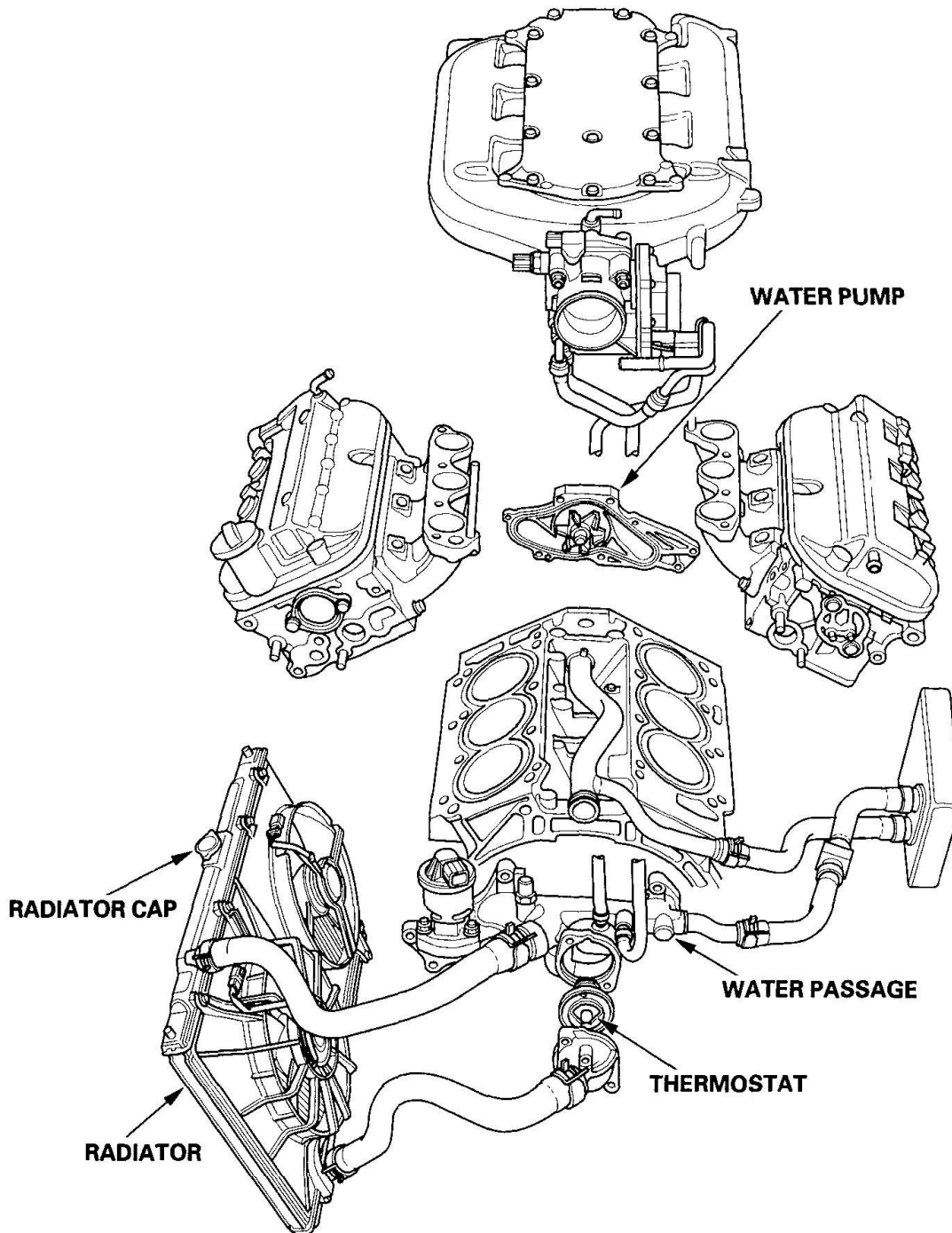
**2003-06 ENGINE**

**Cooling System - MDX**

**COMPONENT LOCATION INDEX**

## 2006 Acura MDX

2003-06 ENGINE Cooling System - MDX

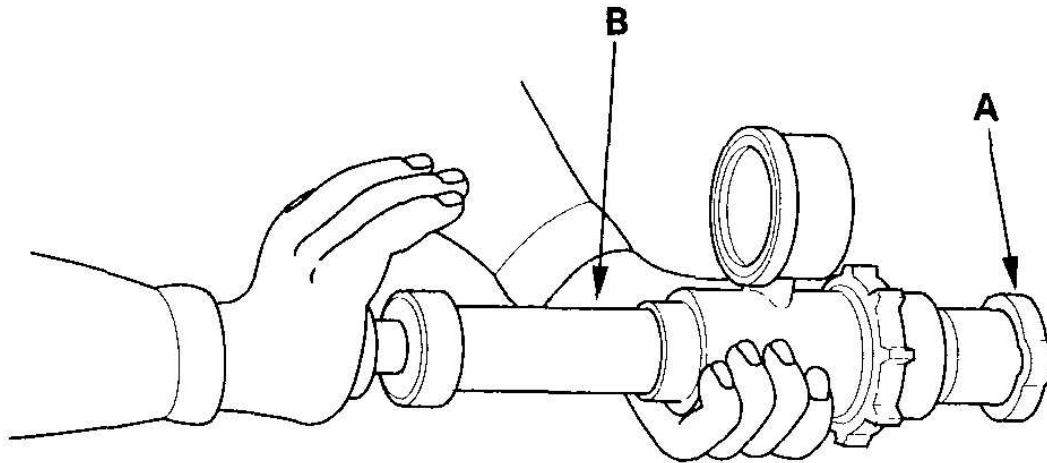


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**Fig. 1: Identifying Cooling System Components**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## RADIATOR CAP TEST

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



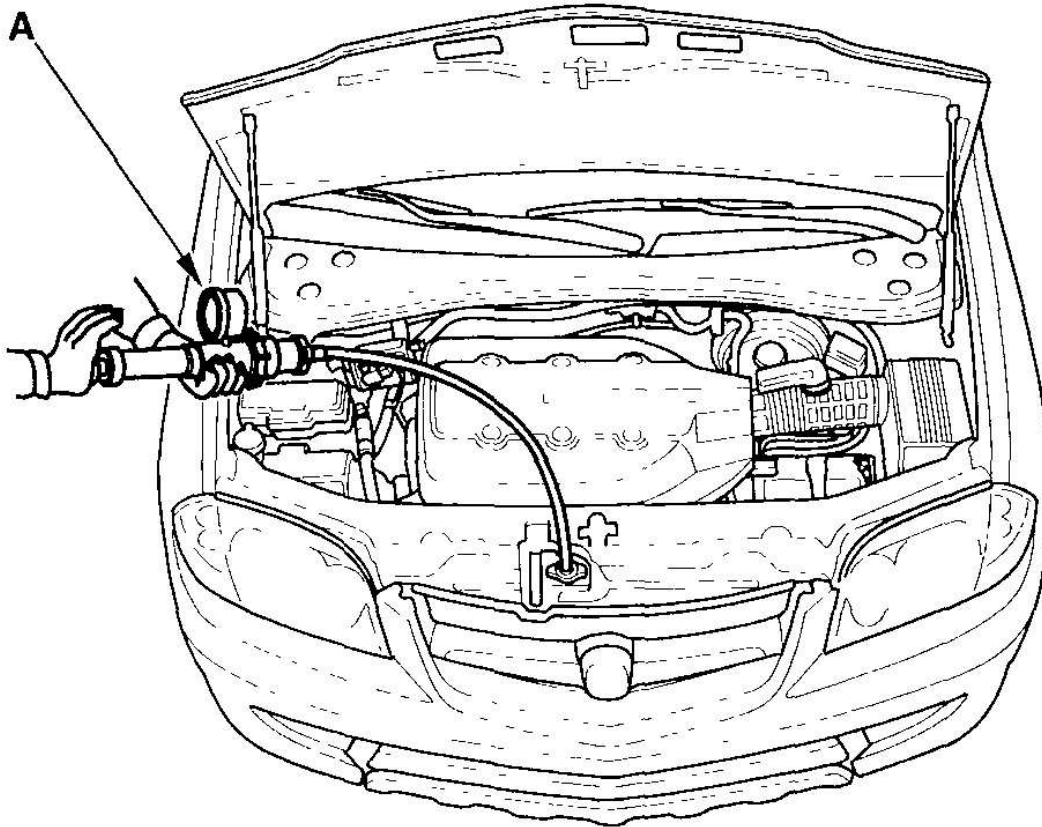
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**Fig. 2: Installing Radiator Cap On Commercially Available Pressure Tester**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Apply a pressure of 93-123 kPa (0.95- 1.25 kgf/cm<sup>2</sup> ,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/cm<sup>2</sup> ,14-18 psi).



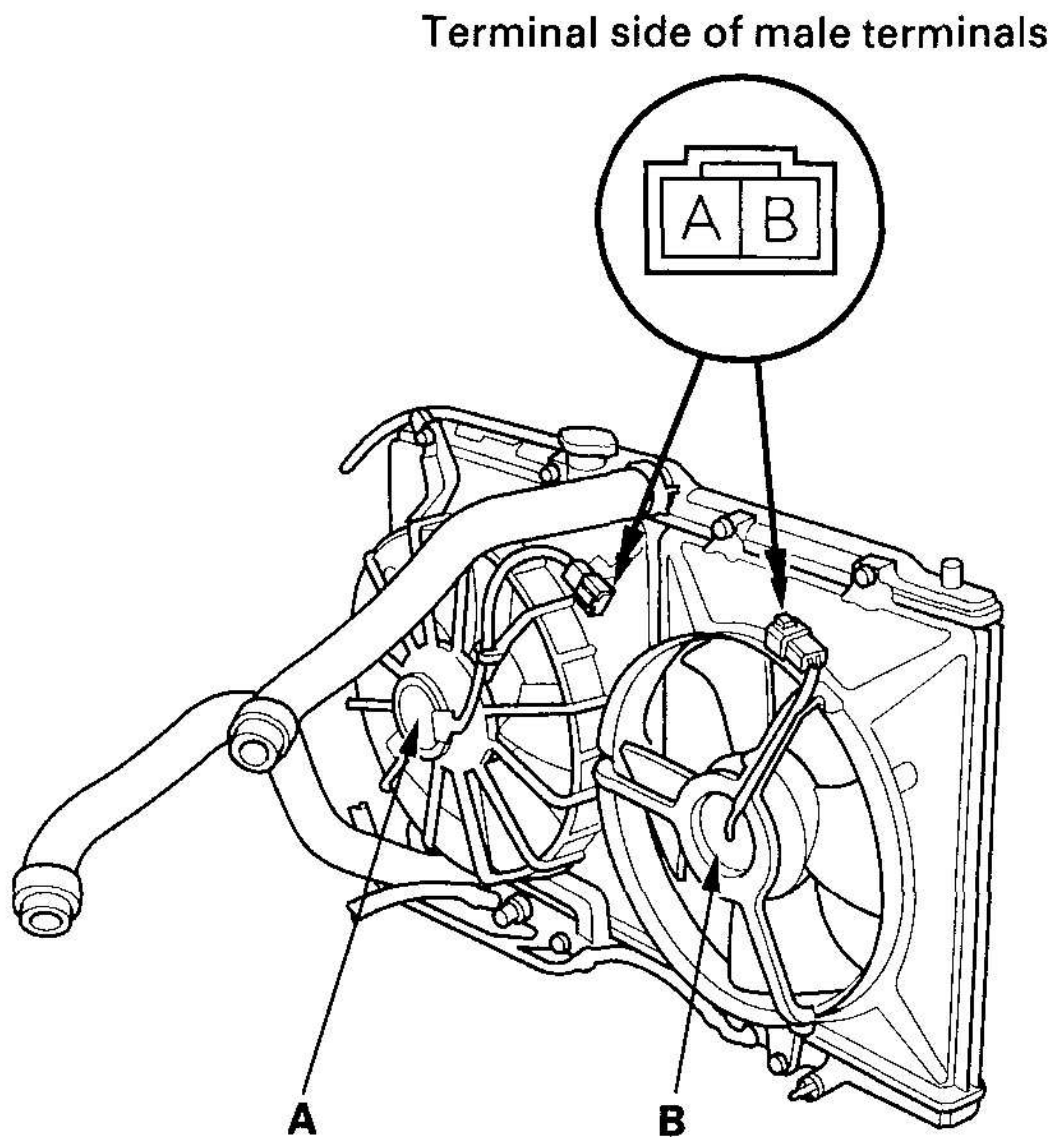
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**Fig. 3: Attaching Commercially Available Pressure Tester To Radiator**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

## FAN MOTOR TEST

1. Disconnect the 2P connectors from the radiator fan motor (A) and A/C condenser fan motor (B).



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**Fig. 4: Disconnecting 2P Connectors From Radiator Fan Motor And A/C Condenser Fan Motor**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Test each motor by connecting battery power to the B terminal and ground to the A terminal.
3. If either motor fails to run or does not run smoothly, replace it (see **RADIATOR AND FAN REPLACEMENT** ).

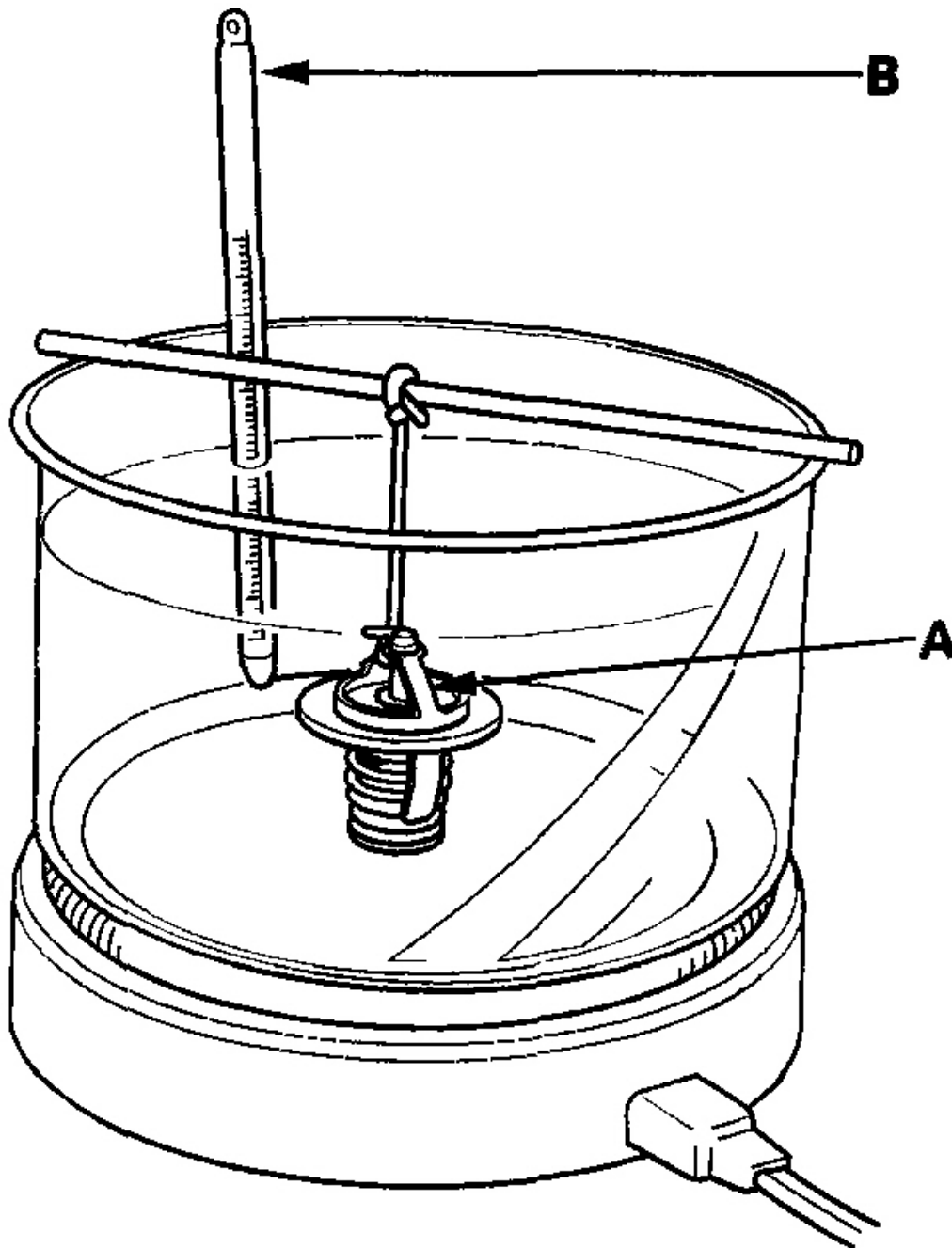
## THERMOSTAT TEST

<b>2006 Acura MDX</b>
2003-06 ENGINE Cooling System - MDX

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 10.0 mm (0.39 in.)**

**Starts Opening: 169-176°F (76-80°C)**

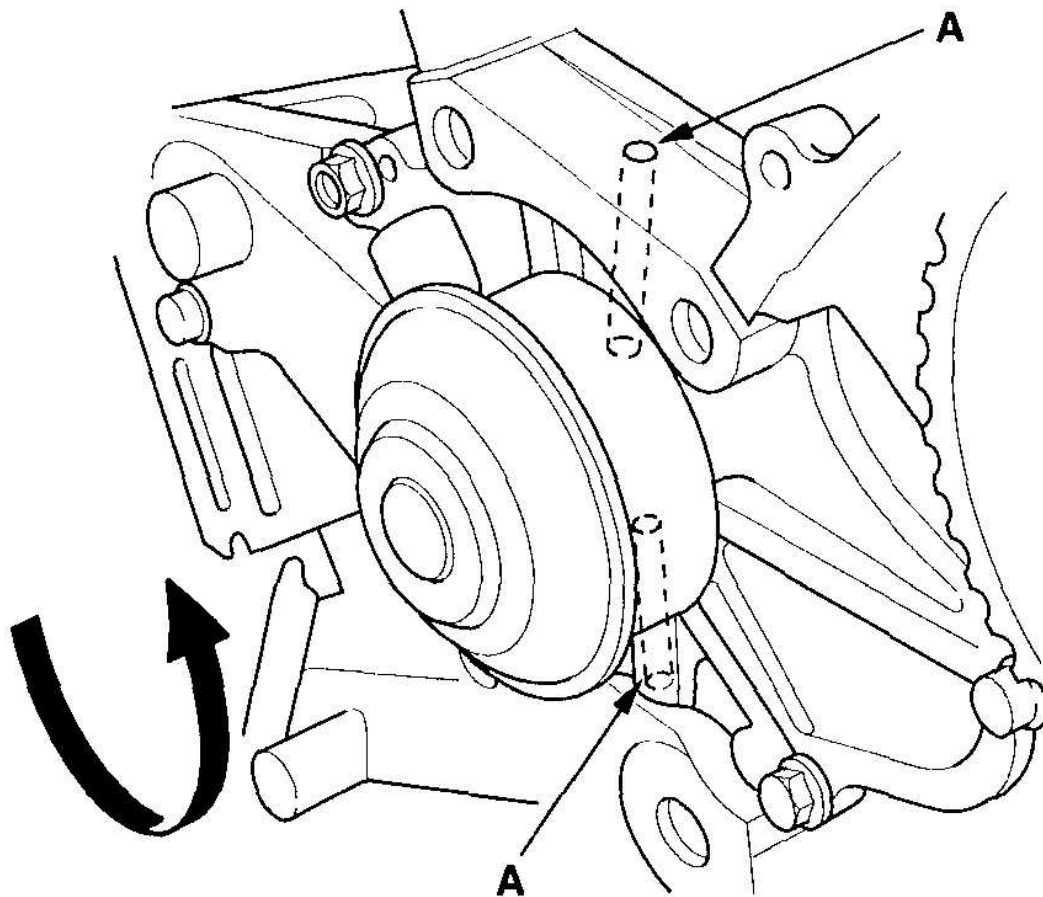
**Fully Open: 194°F (90°C)**

## **WATER PUMP INSPECTION**

1. Remove the timing belt (see **TIMING BELT REMOVAL** ).
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.**





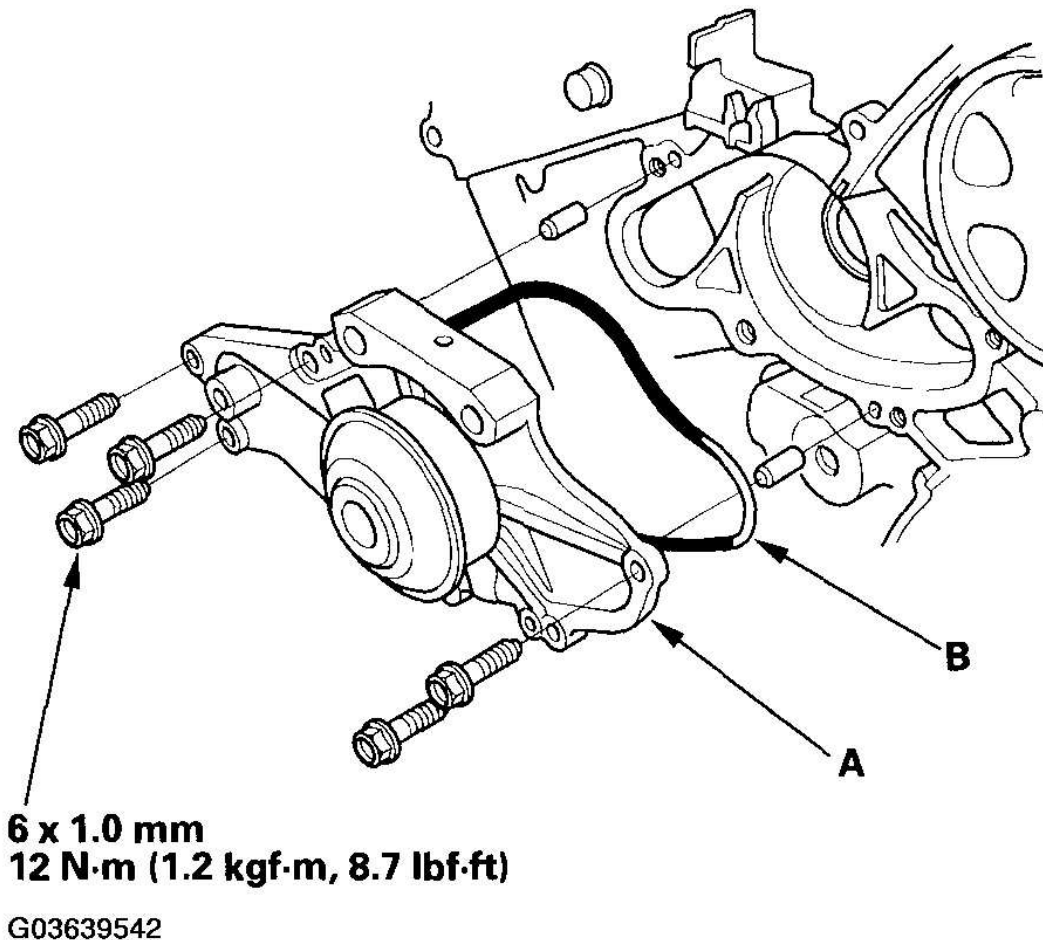
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**Fig. 6: Checking Water Pump Pulley For Small Amount Of "Weeping" From Bleed Holes**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the timing belt (see **TIMING BELT INSTALLATION** ).

## **WATER PUMP REPLACEMENT**

1. Drain the engine coolant (see **COOLANT REPLACEMENT** ).
2. Remove the timing belt (see **TIMING BELT REMOVAL** ).
3. Remove the timing belt adjuster (see **TIMING BELT ADJUSTER REPLACEMENT** ).
4. Remove the water pump (A) by removing the five bolts.



**Fig. 7: Removing Water Pump**

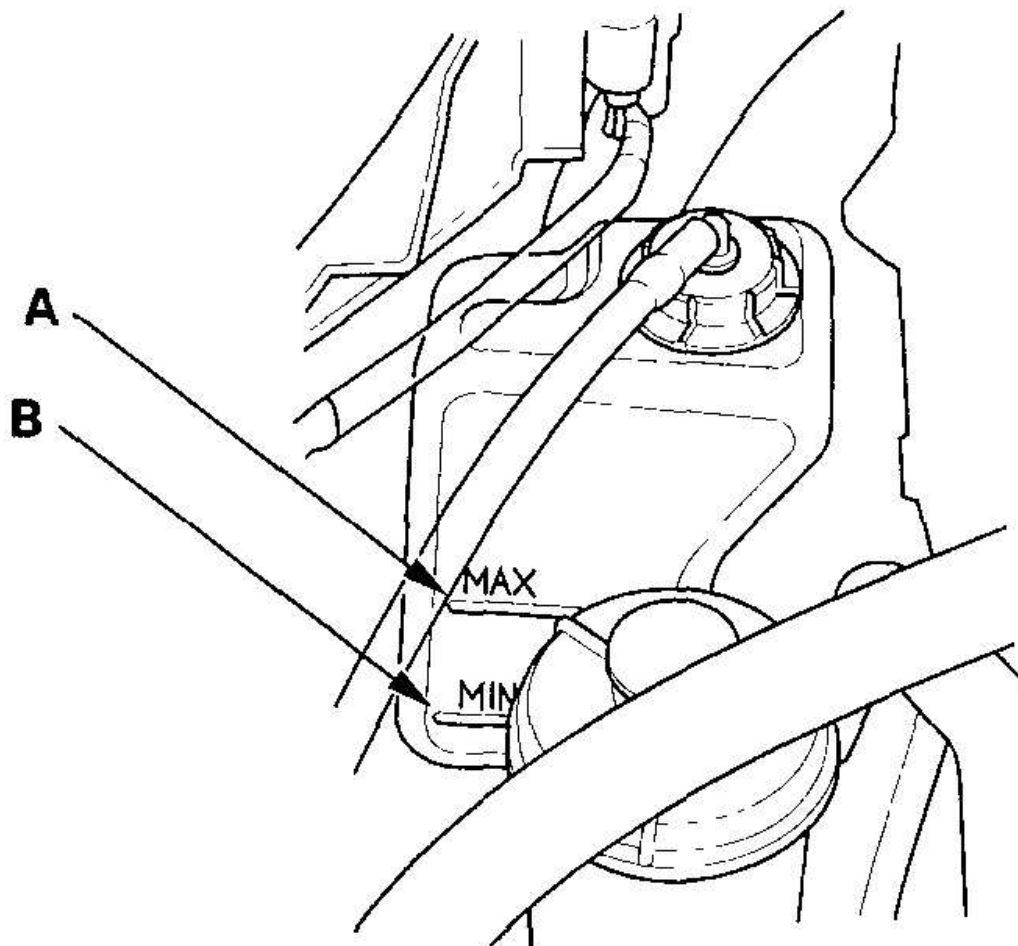
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Inspect and clean the O-ring groove and the mating surface with the engine block.
6. Install the water pump with a new O-ring (B) in the reverse order of removal.
7. Clean up any spilled engine coolant.
8. Install the timing belt adjuster (see **TIMING BELT ADJUSTER REPLACEMENT** ).
9. Install the timing belt (see **TIMING BELT INSTALLATION** ).
10. Refill the radiator with engine coolant, then bleed the air from the cooling system (see step 8 in **COOLANT REPLACEMENT** ).

## **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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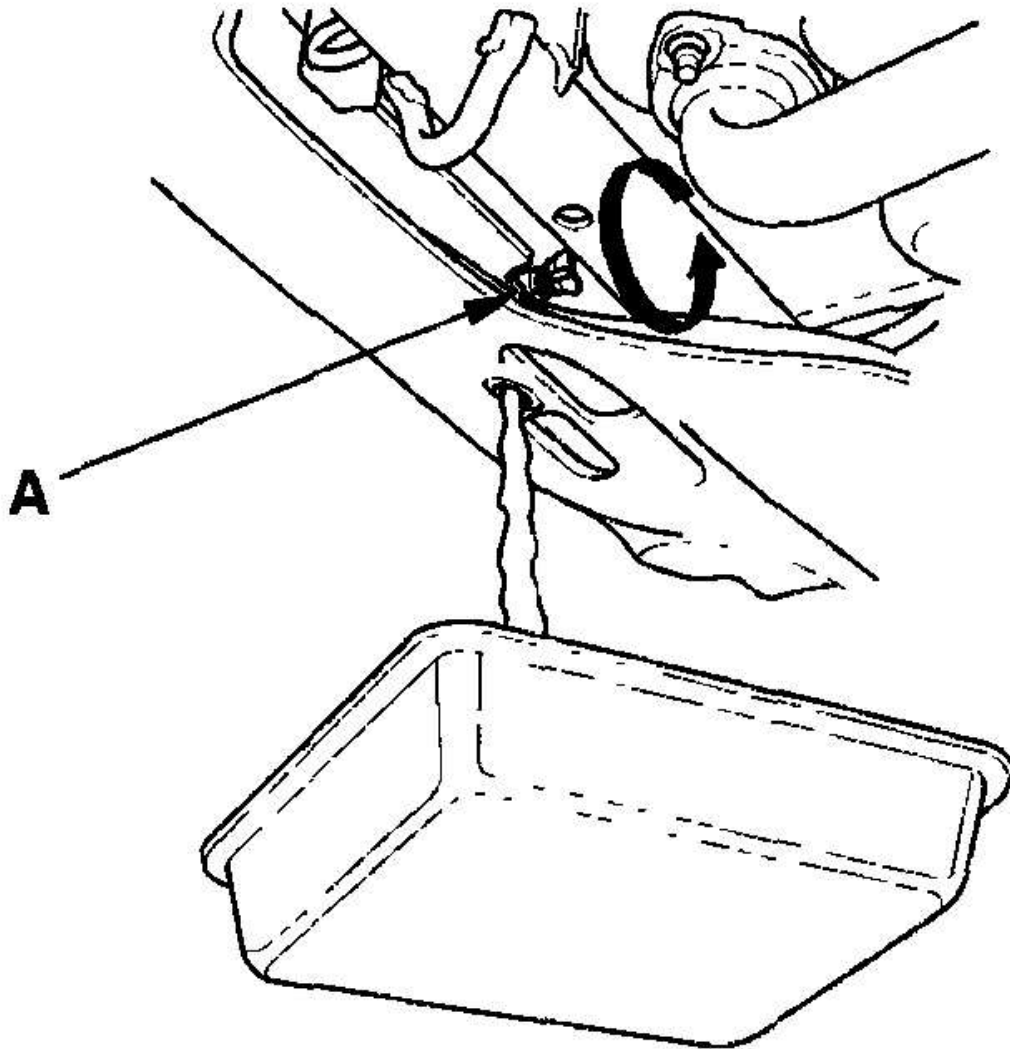
**Fig. 8: Making Sure Coolant Level Is Between MAX And MIN Mark**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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. Turn the ignition switch ON (II). Set the climate control system to 90°F (32°C) or heater controls to full hot, 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.

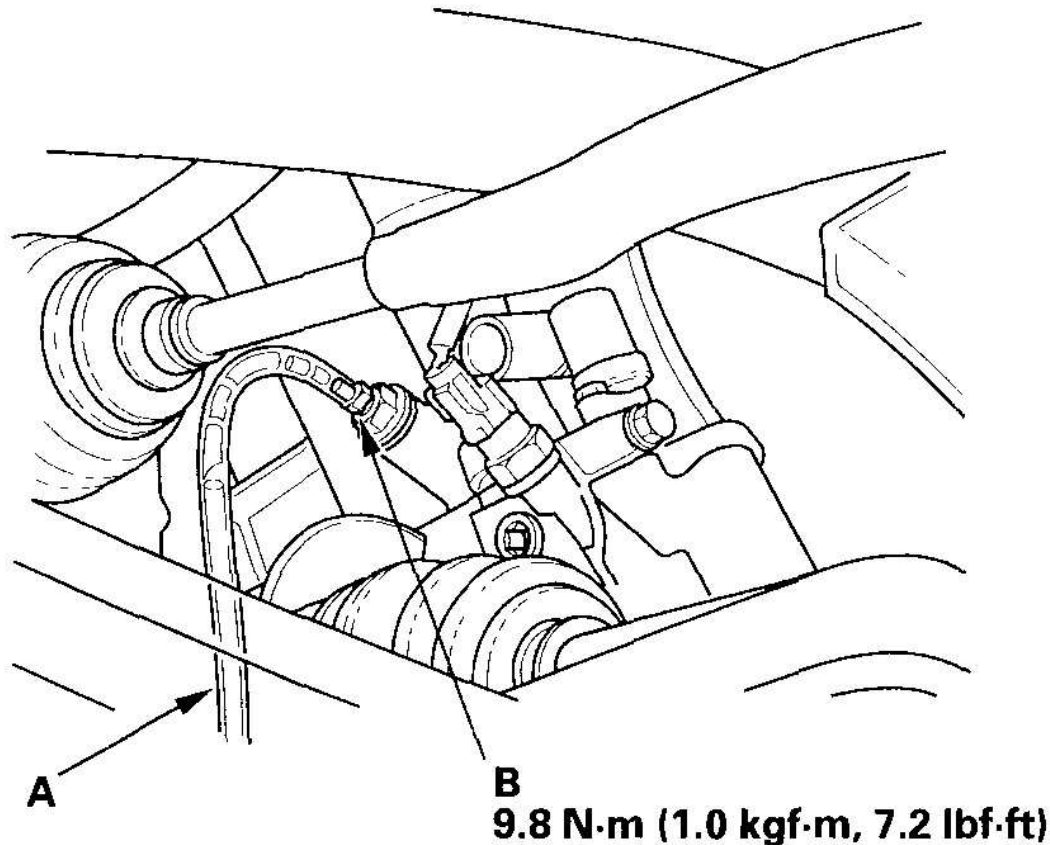


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**Fig. 9: Draining Coolant**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install a rubber hose (A) on the drain bolt (B) located at the rear of the engine block, then loosen the drain bolt.



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**Fig. 10: Installing Rubber Hose On Drain Bolt**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. When the coolant stops draining, tighten the drain bolt.
6. Tighten the radiator drain plug securely.
7. Remove, drain, and reinstall the coolant reservoir.
8. Pour Acura Long Life Antifreeze/Coolant Type 2 (P/N OL999-9001) into the radiator up to the base of the filler neck.

**NOTE:**

- Always use Acura 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.
- Acura Long Life Antifreeze/Coolant Type 2 is a mixture of 50% antifreeze and 50% water. Do not add water.

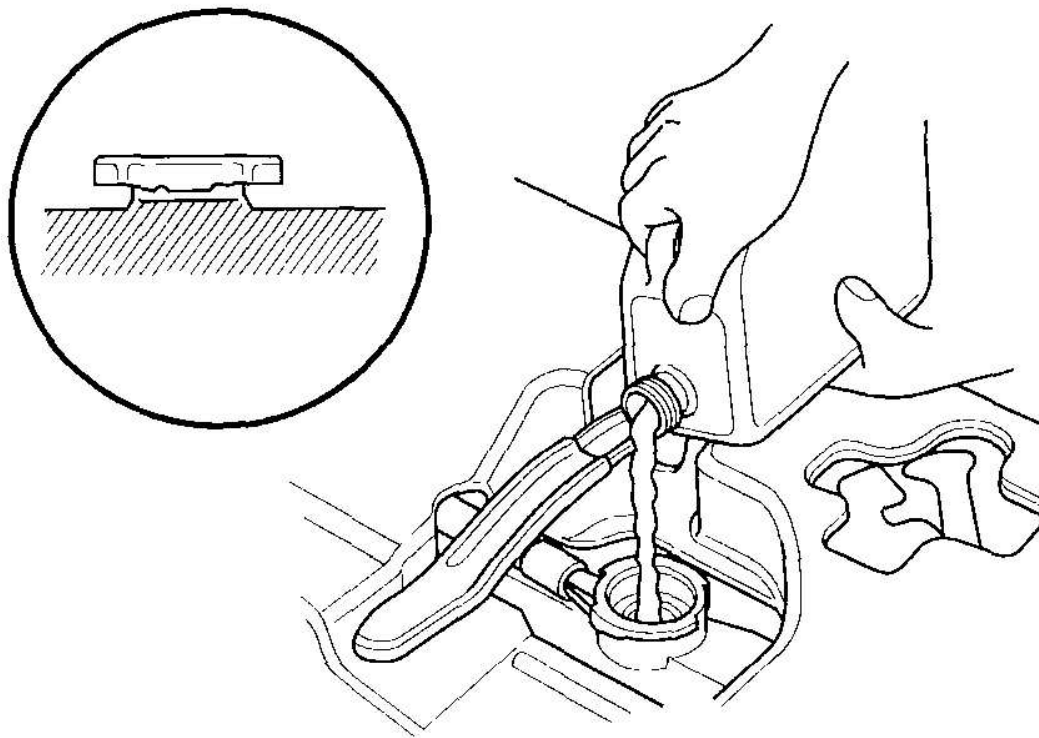
**Engine Coolant Capacities (Including the reserve tank capacity of 0.6 L (0.16 US gal)):**

**After Coolant Change:**

**7.1 L (1.88 US gal)**

**After Engine Overhaul:**

**9.0 L (2.38 US gal)**



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**Fig. 11: Filling Coolant**

**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

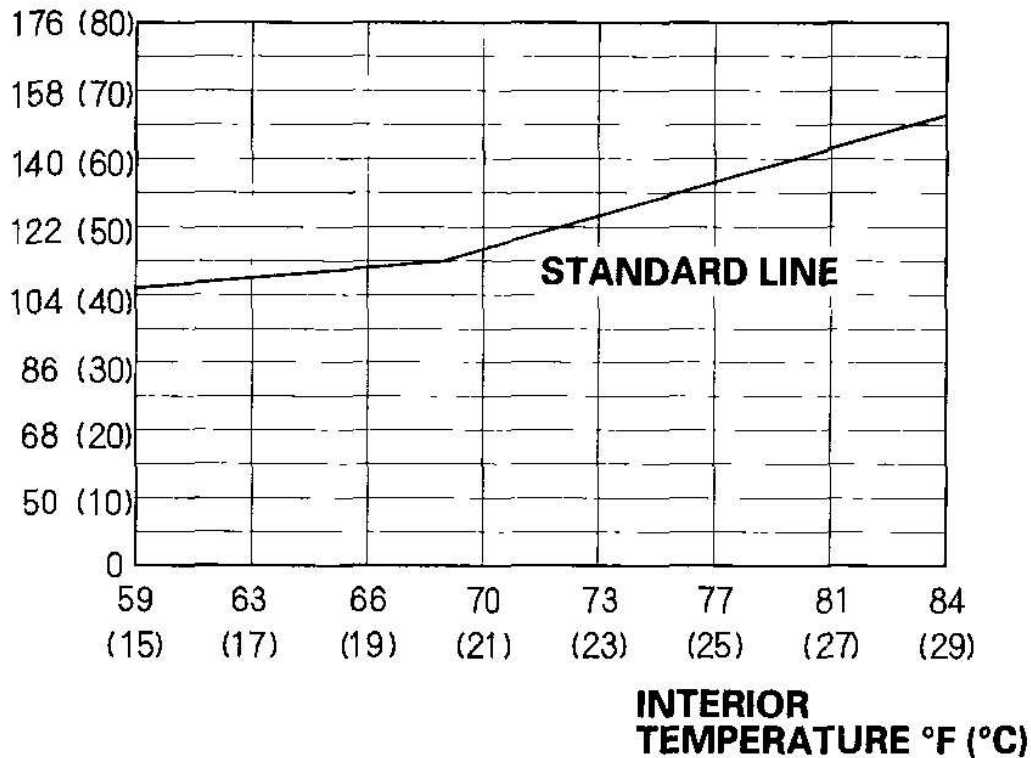
9. Start the engine. Hold the engine speed at 1,500 rpm until it warms up (the radiator fan comes on at least twice). Make sure the thermostat is open.
10. Turn off the engine. Check the level in the radiator, and add Acura Long Life Antifreeze/Coolant Type 2, if needed.
11. Set the climate control or heater control pane! to maximum cool. Start the engine. Hold the engine speed at 1,500 rpm for 5 minutes, then turn off the engine.



## 2006 Acura MDX

### 2003-06 ENGINE Cooling System - MDX

12. Check the level in the radiator, and add Acura Long Life Antifreeze/Coolant Type 2, if needed.
13. Set the climate control or heater control panel to maximum heat. Start the engine. Hold the engine speed at 1,500 rpm for 5 minutes, then turn off the engine.
14. Check the level in the radiator, and add Acura Long Life Antifreeze/Coolant Type 2, if needed.
15. Set the climate control or heater control panel to maximum cool. Start the engine. Hold the engine speed at 1,500 rpm for 3 minutes, then turn off the engine.
16. Check the level in the radiator, and add Acura Long Life Antifreeze/Coolant Type 2, if needed.
17. Set the climate control or heater control panel to maximum heat. Start the engine. Hold the engine speed at 1,500 rpm for 3 minutes, then turn off the engine.
18. Check the level in the radiator, and add Acura Long Life Antifreeze/Coolant Type 2, if needed.
19. Repeat steps 15 through 18 until the coolant level does not change in the radiator, then install the radiator cap loosely.
20. Set the climate control or heater control panel to maximum cool. Start the engine. Hold the engine speed at 2,500 rpm for 1 minute.
21. Set the climate control or heater control panel to maximum heat, and select high speed heat mode on the rear control panel. Measure the temperature of the air from the rear floor vent for 2 or 3 minutes. Make sure the temperature is above the standard line of the graph as shown. If the temperature is below the standard line, repeat steps 15 through 18 several more times. Then loosely install the radiator cap and recheck.

**AIR FLOW  
TEMPERATURE °F (°C)**

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**Fig. 12: Identifying Temperature Graph**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

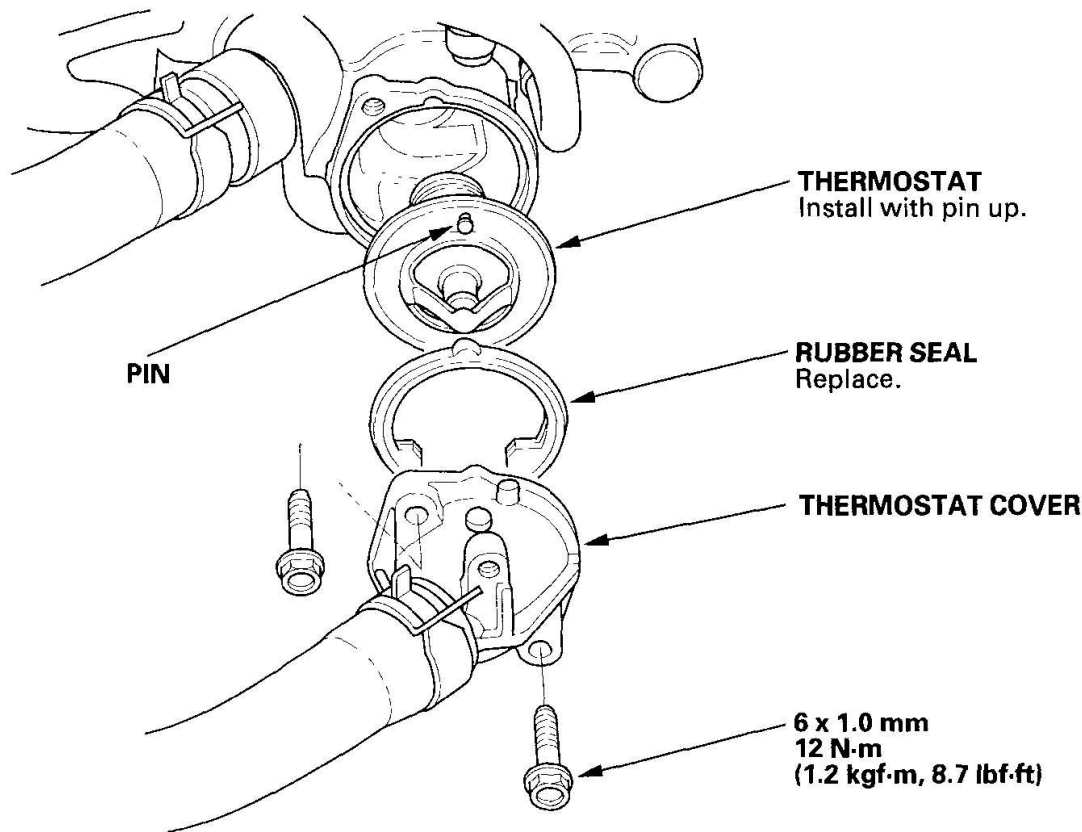
22. Loosely install the radiator cap and recheck. Make sure you do not hear the sound of water flowing near the rear heater unit. If you hear water flowing, repeat steps 15 through 18 several more times.
23. Install the radiator cap fully.
24. Fill the reserve tank with Acura Long Life Antifreeze /Coolant Type 2 up to the MAX mark on the tank, then add an extra 0.4 L (0.11 US gal) coolant.
25. Clean up any spilled engine coolant.

**THERMOSTAT REPLACEMENT**

1. Make sure you have the anti-theft codes for the radio and navigation system, then write down the customer's audio presets. Make sure the ignition switch is OFF.
2. Disconnect the negative cable from the battery first, then the positive cable.



3. Remove the battery.
4. Drain the engine coolant (see **COOLANT REPLACEMENT** ).
5. Remove the thermostat cover, then remove the thermostat.



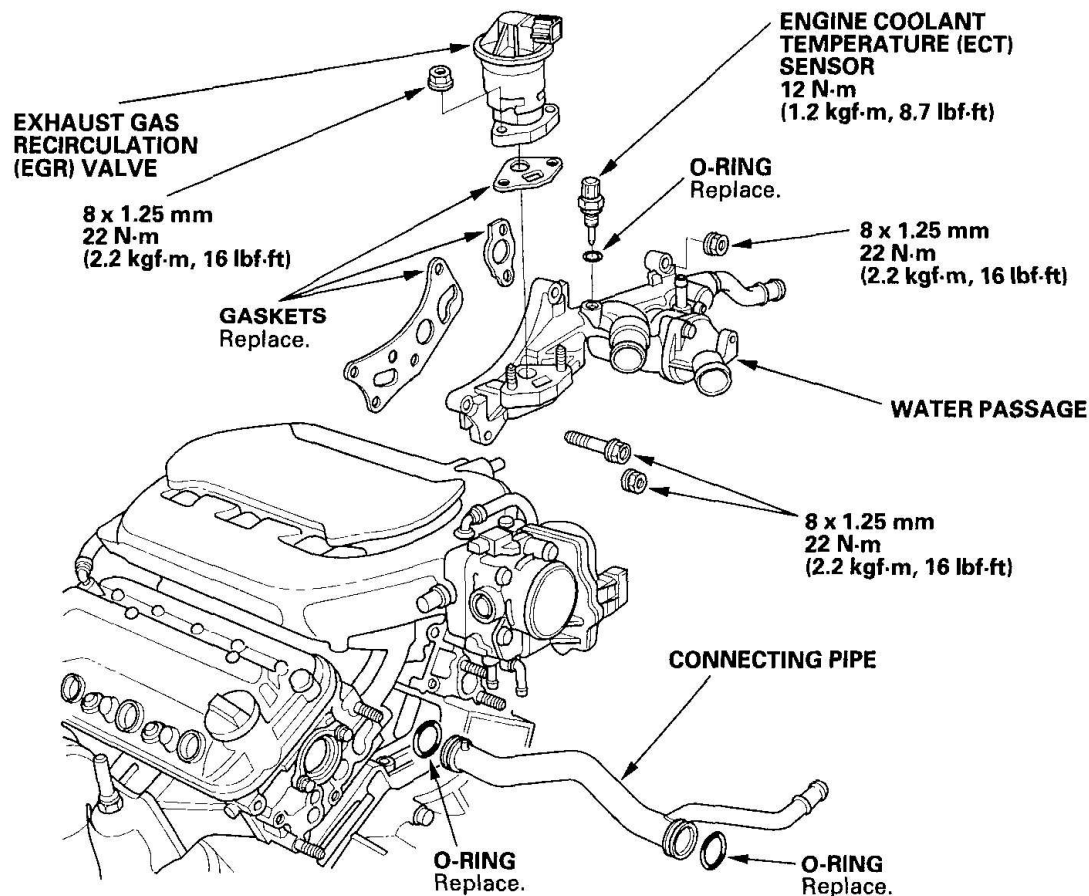
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**Fig. 13: Removing Thermostat**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the thermostat with a new rubber seal.
7. Install the battery. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.
8. Refill the radiator with engine coolant, then bleed air from the cooling system (see step 8 in **COOLANT REPLACEMENT** ).
9. Clean up any spilled engine coolant.
10. Reset the power window control unit (see **RESETTING THE POWER WINDOW CONTROL UNIT** ).
11. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's audio presets.
12. Set the clock.

## WATER PASSAGE REPLACEMENT

1. Make sure you have the anti-theft codes for the radio and navigation system, then write down the customer's audio presets. Make sure the ignition switch is OFF.
2. Disconnect the negative cable from the battery first, then disconnect the positive cable. Remove the battery.
3. Drain the engine coolant (see **COOLANT REPLACEMENT** ).
4. Disconnect the breather pipe, then remove the intake air duct.
5. Remove the upper radiator hose, lower radiator hose, heater hoses, and water bypass hoses from the water passage. Disconnect the engine coolant temperature (ECT) sensor connector and exhaust gas recirculation (EGR) valve connector.
6. Remove the water passage.



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**Fig. 14: Removing Water Passage**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## 2006 Acura MDX

### 2003-06 ENGINE Cooling System - MDX

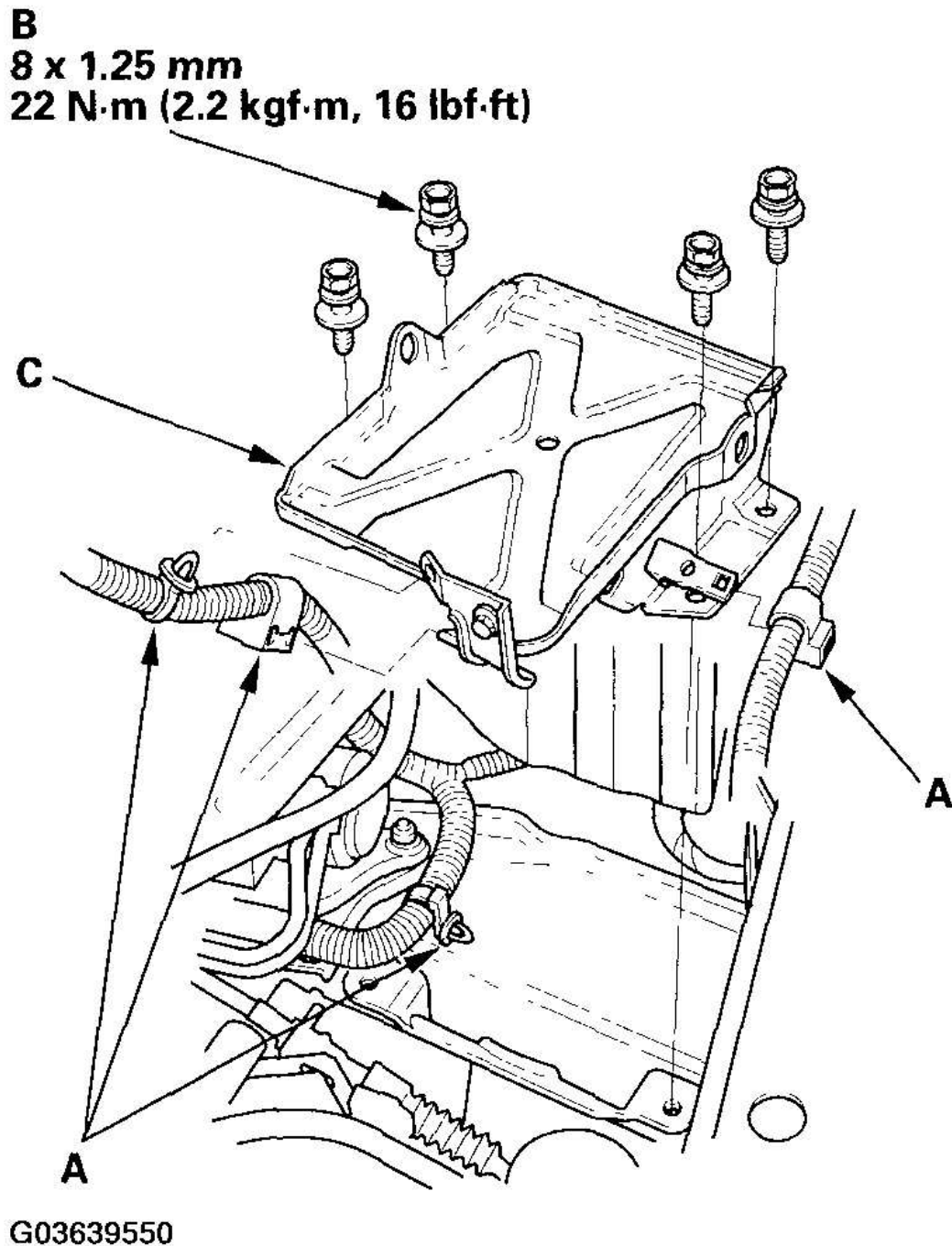
7. Install the water passage in the reverse order of removal.
8. Install the battery. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.
9. Refill the radiator with engine coolant, then bleed air from the cooling system (see step 8 in **COOLANT REPLACEMENT** ).
10. Clean up any spilled engine coolant.
11. Reset the power window control unit (see **RESETTING THE POWER WINDOW CONTROL UNIT** ).
12. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's audio presets.
13. Set the clock.

## RADIATOR AND FAN REPLACEMENT

### NOTE:

- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact any other wiring or hoses, or interfere with any other parts.

1. Make sure you have the anti-theft codes for the radio and navigation system, then wire down customer's audio presets. Make sure the ignition switch is OFF.
2. Disconnect the negative cable from the battery first, then disconnect the positive cable.
3. Remove the battery.
4. Remove the harness clamps (A).

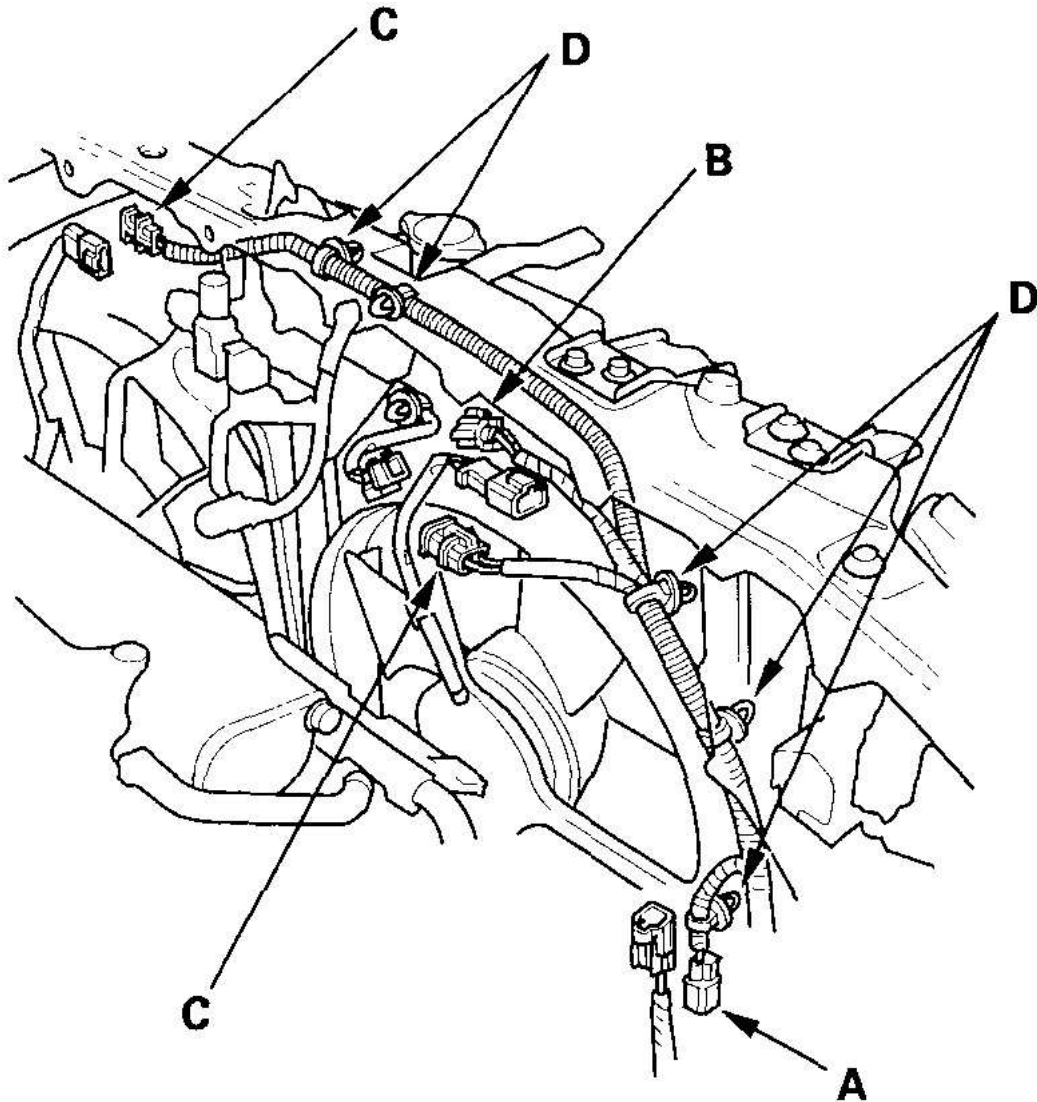


**Fig. 15: Removing Harness Clamps**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove four mounting bolts (B), then remove the battery base (C).

6. Remove the radiator cover.
7. Disconnect the A/C compressor clutch connector (A), hood switch connector (B), and fan motor connectors (C).



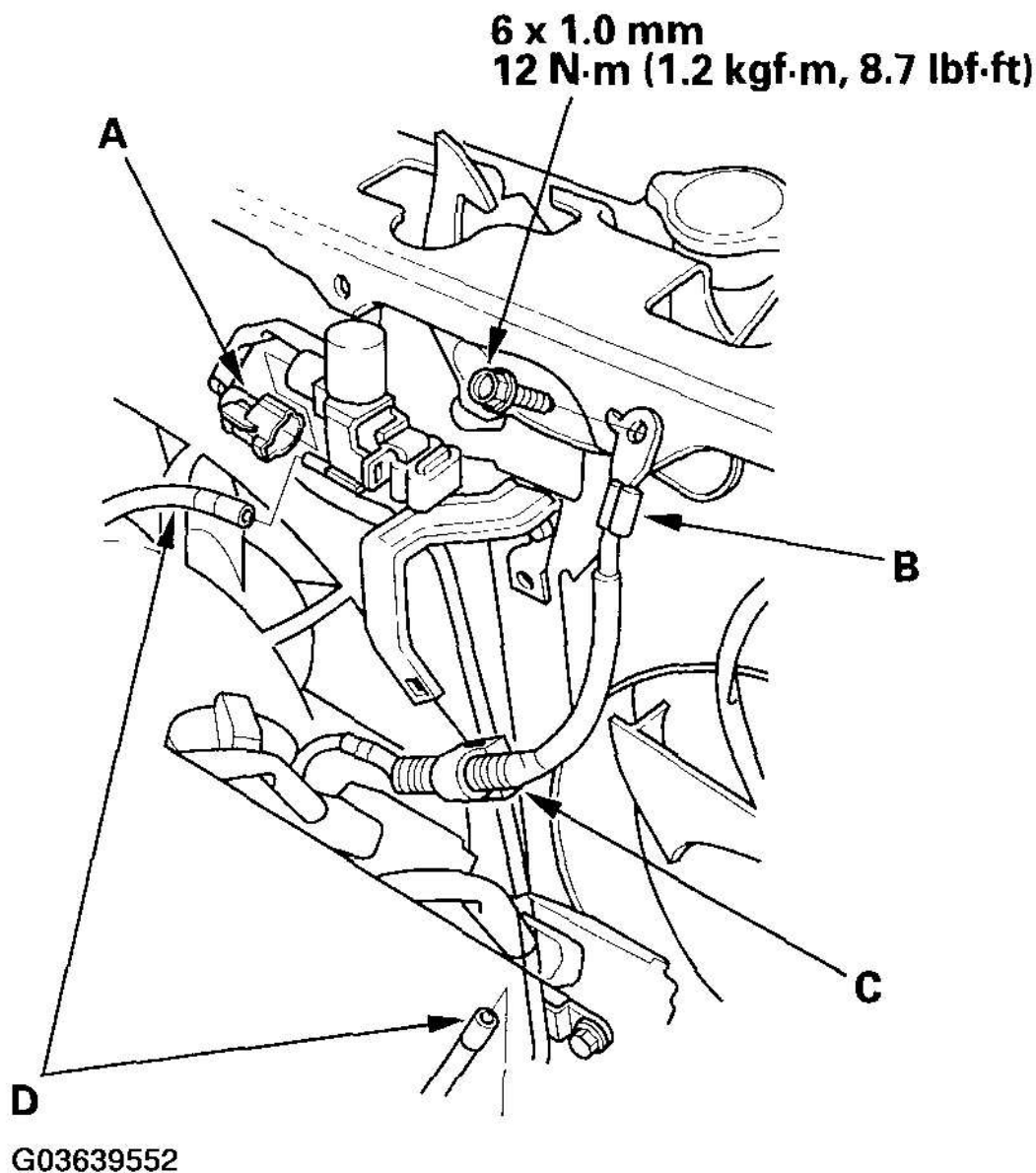
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**Fig. 16: Disconnecting A/C Compressor Clutch Connector**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Remove the harness clips (D).

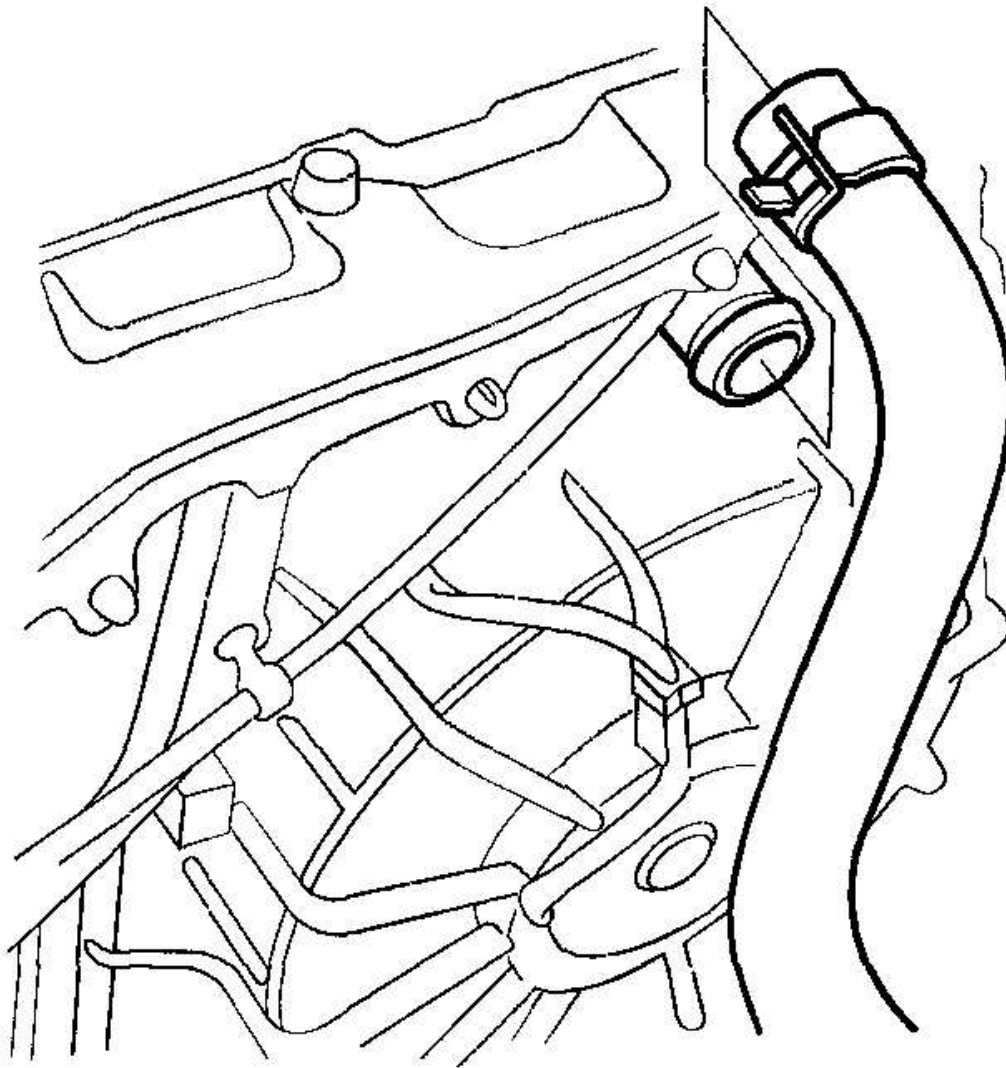


9. Disconnect the engine mount control solenoid valve connector (A).



**Fig. 17: Disconnecting Engine Mount Control Solenoid Valve Connector**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

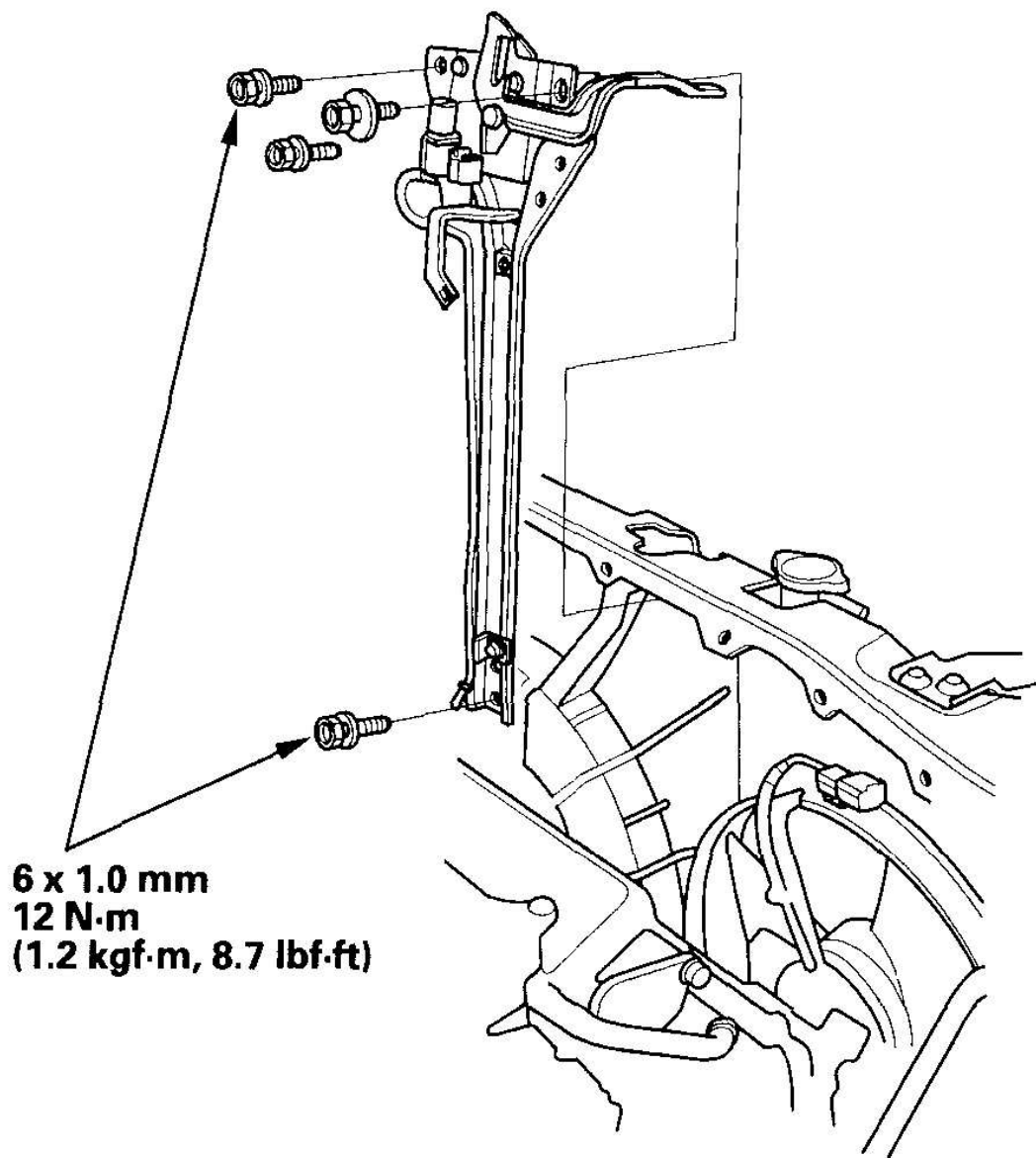
10. Remove the ground cable (B), harness clamp (C), and vacuum hoses (D).
11. Drain the engine coolant (see **COOLANT REPLACEMENT** ).
12. Remove the upper radiator hose.



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**Fig. 18: Removing Upper Radiator Hose**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Remove the bulkhead bracket.



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**Fig. 19: Removing Bulkhead Bracket**

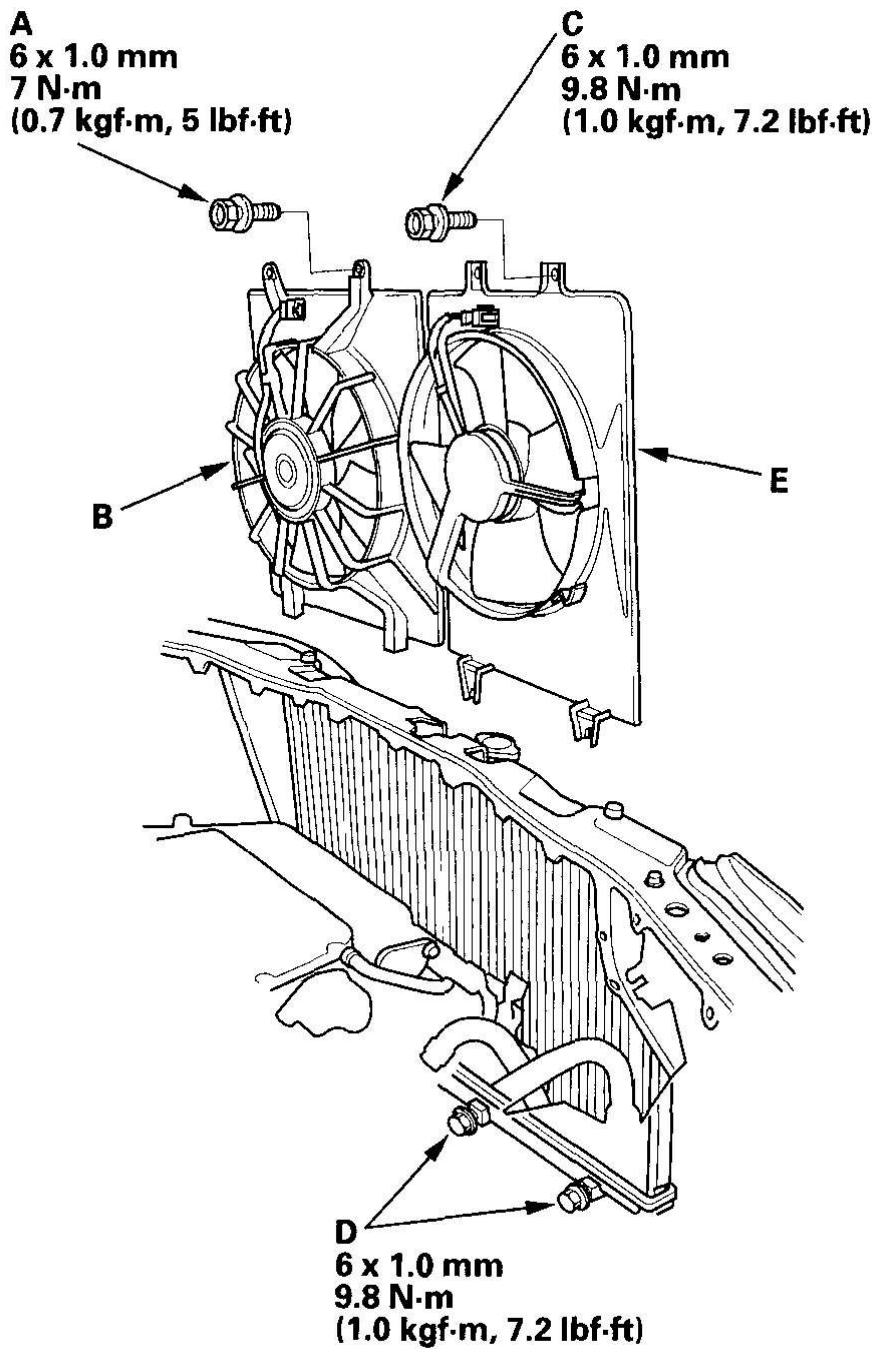
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the two bolts (A) securing the radiator fan shroud, then remove the radiator fan shroud assembly (B) from the battery side.



## 2006 Acura MDX

2003-06 ENGINE Cooling System - MDX



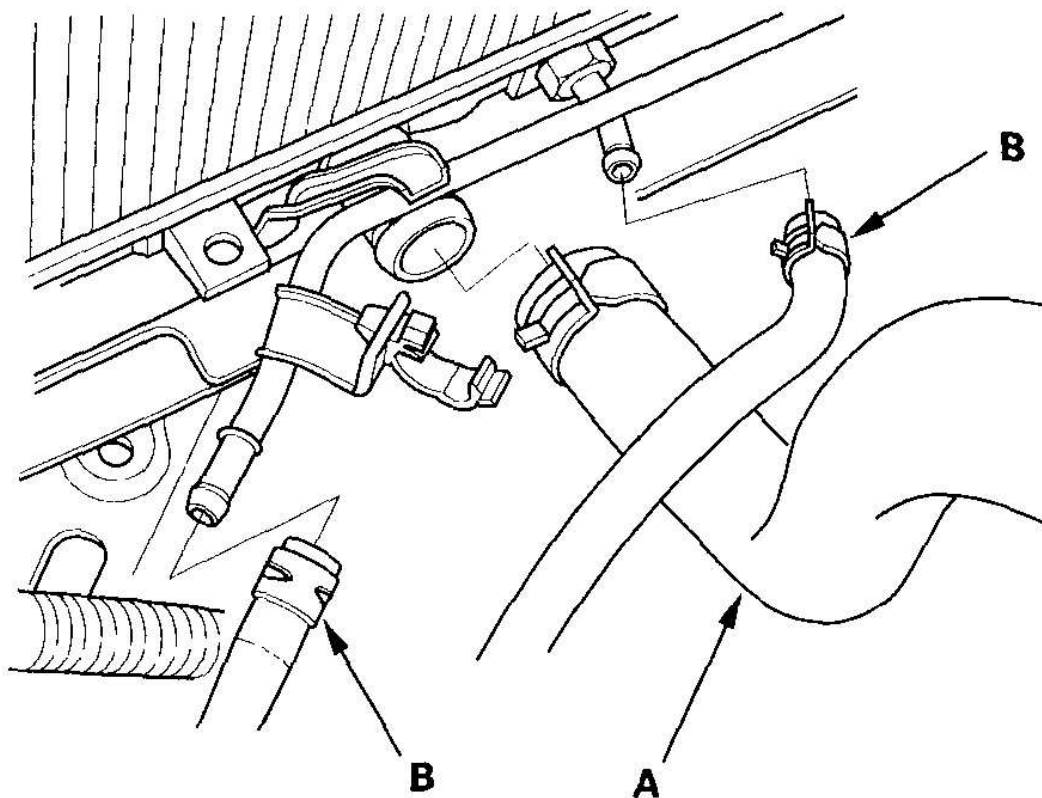
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**Fig. 20: Removing Radiator Fan Shroud Bolts**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Remove the two bolts (C), and loosen the two bolts (D) securing the A/C condenser fan shroud, then

remove the A/C condenser fan shroud assembly < E) from the battery side.

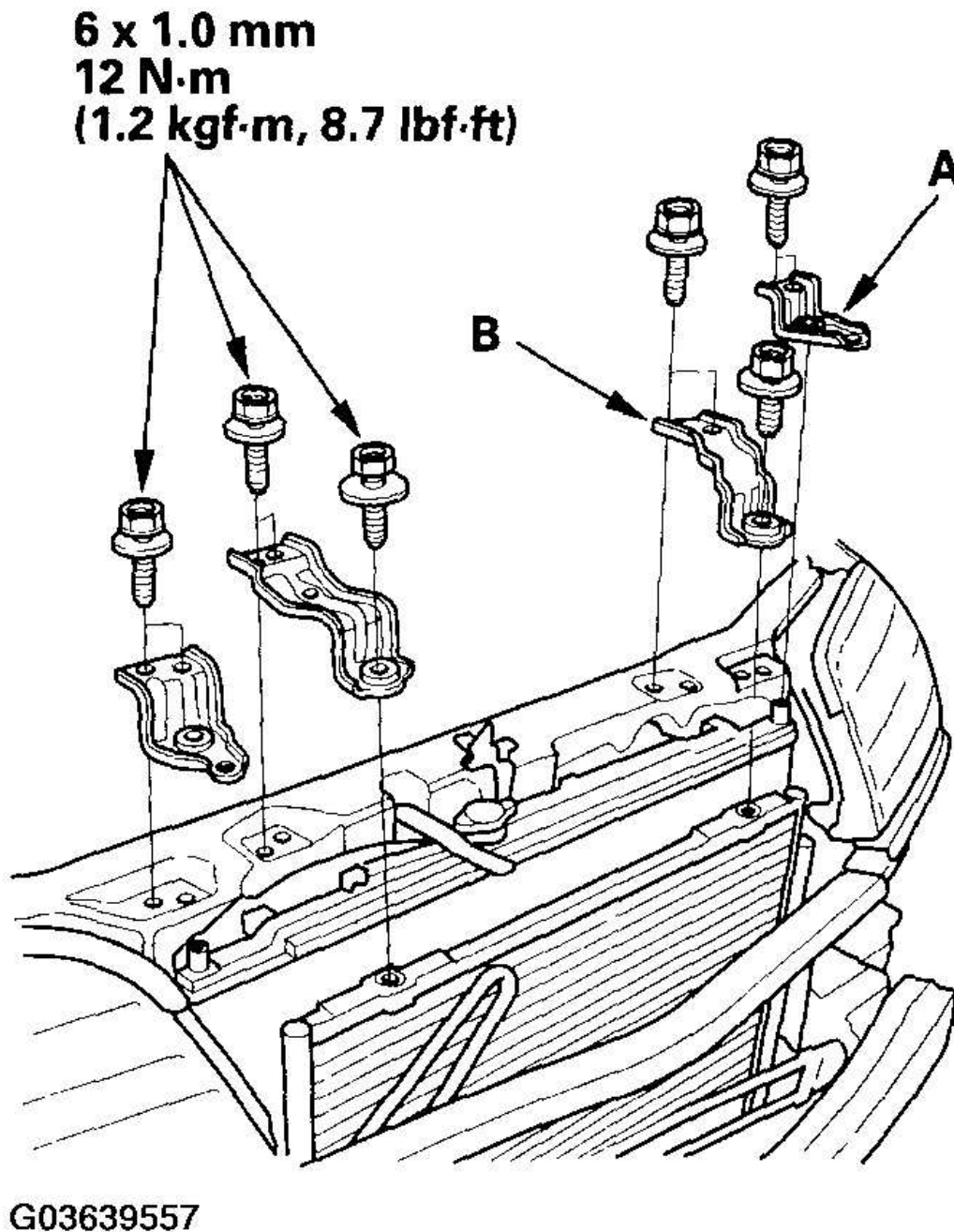
16. Remove the lower radiator hose (A) and automatic transmission fluid (ATF) cooler hoses (B). Plug the ATF cooler hoses and lines.



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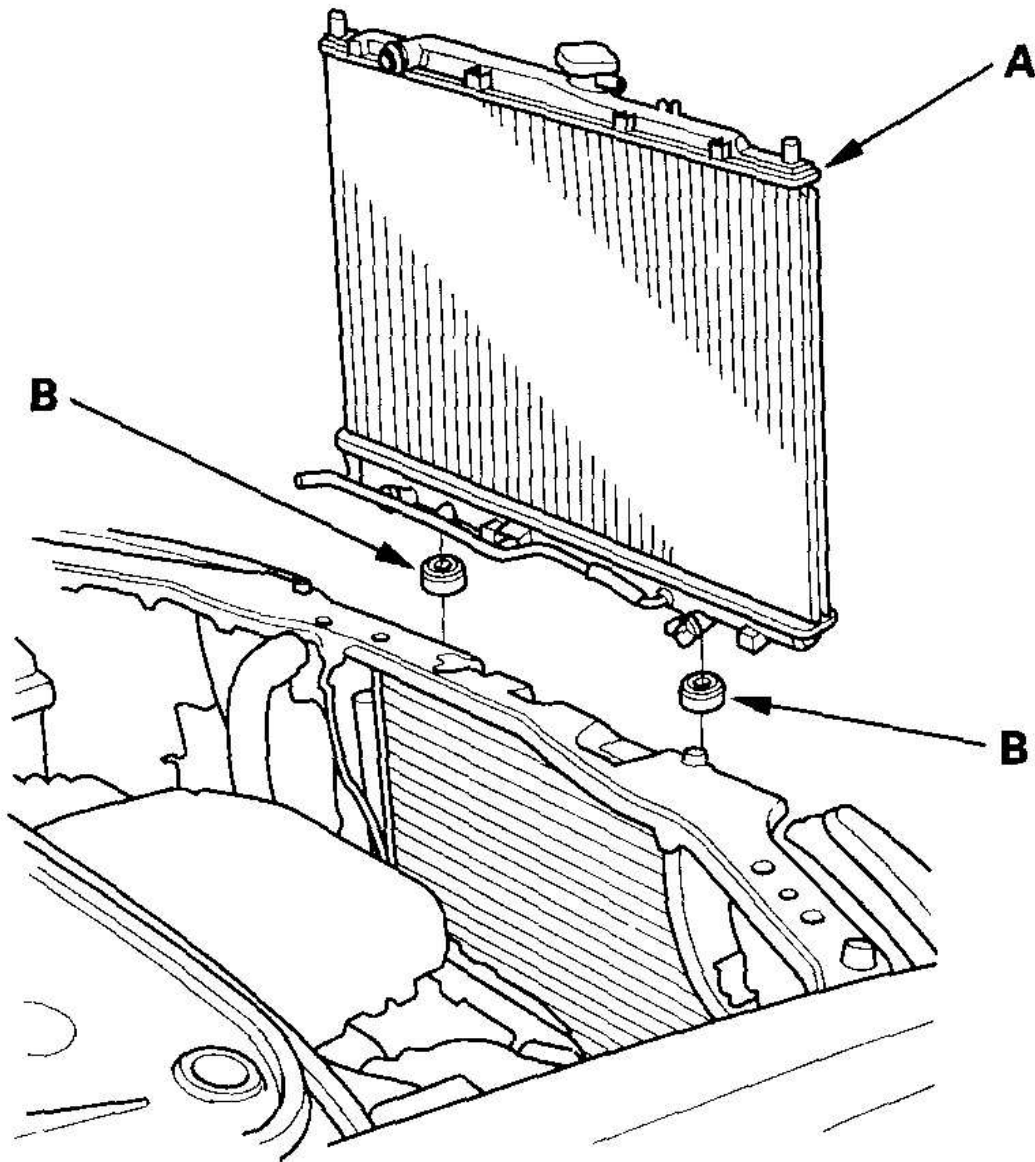
**Fig. 21: Removing Lower Radiator Hose And ATF Cooler Hoses**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Remove the radiator upper brackets/cushions (A) and condenser brackets (B).



**Fig. 22: Removing Radiator Upper Brackets/Cushions**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Pull up the radiator assembly (A), then remove the lower cushions (B).



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**Fig. 23: Pulling Radiator Assembly**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Install the radiator and fans in the reverse order of removal.
20. Install the bulkhead bracket in the reverse order of removal. Apply body paint to the bulkhead bracket mounting bolts.
21. Set the upper and lower cushions securely.

<b>2006 Acura MDX</b>
2003-06 ENGINE Cooling System - MDX

22. Fill the radiator with engine coolant and bleed the air from the system (see step 8 in **COOLANT REPLACEMENT** ).
23. Adjust the engine hood latch (see**ADJUSTMENT** ).
24. Install the battery. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.
25. Reset the power window control unit (see **RESETTING THE POWER WINDOW CONTROL UNIT** ).
26. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's audio presets.
27. Set the clock.