

SECTION : 7A

HEATING AND VENTILATION SYSTEM

CAUTION : Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.

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SPECIFICATIONS

HEATER TEMPERATURE SPECIFICATIONS

Ambient Air Temperature	Heater Outlet Air Temperature
–18°C (0°F)	54°C (129°F)
– 4°C (25°F)	59°C (138°F)
10°C (50°F)	64°C (147°F)
24°C (75°F)	68°C (154°F)

FASTENER TIGHTENING SPECIFICATIONS

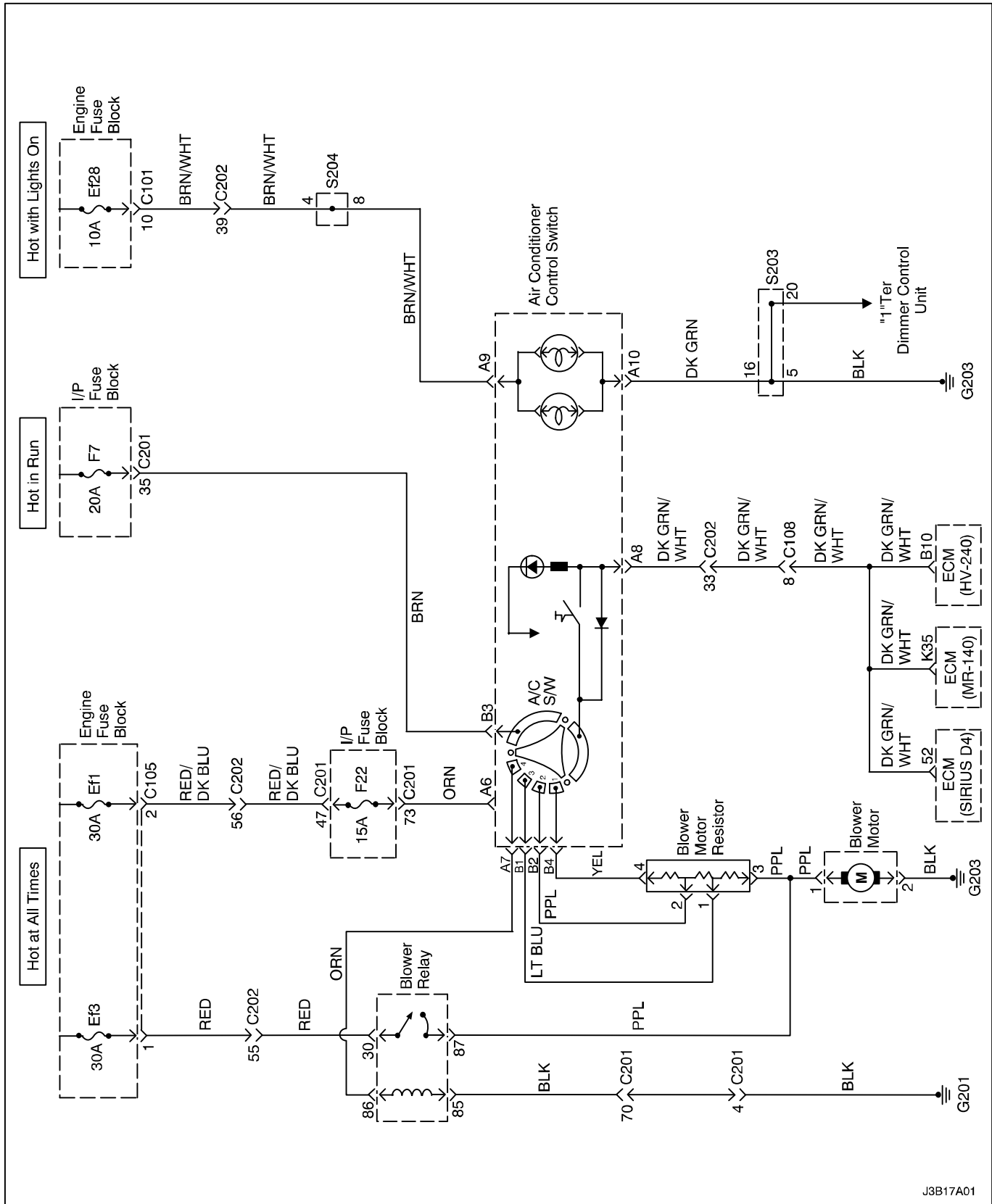
Application	N•m	Lb-Ft	Lb-In
Blower Motor-to-A/C Assembly Screws	1.2	–	11
Blower Motor Resistor Screws	1.2	–	11
Blower Motor Retaining Screws	1.2	–	11
Controller Retaining Screws	2	–	18
Heater/Air Distributor Case Assembly Screw	4	–	35

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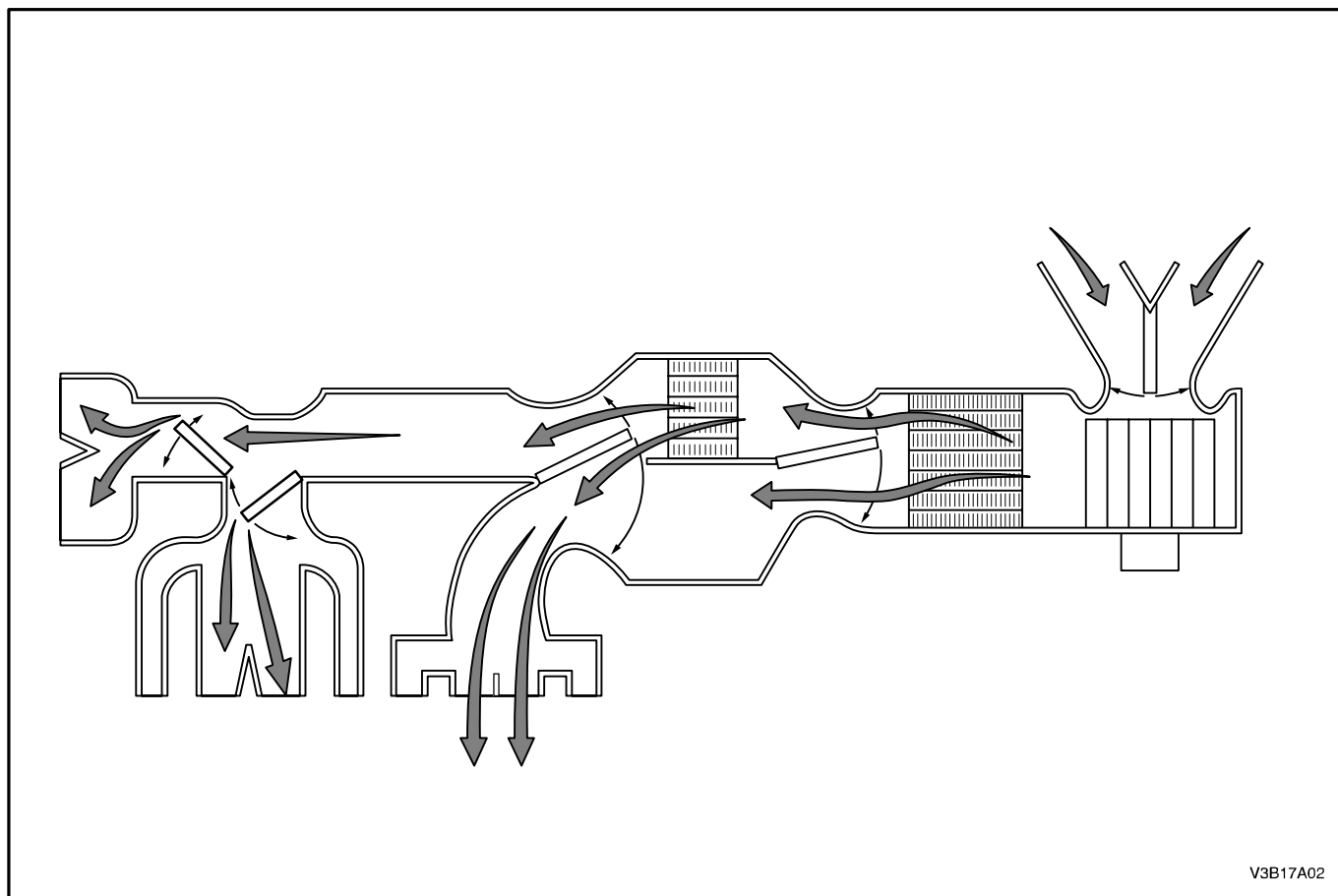
Application	N•m	Lb-Ft	Lb-In
Heater Core Cover Screws	1.2	–	11
Heater Core Housing-to-Evaporator Housing Screws	1.2	–	11

SCHEMATIC AND ROUTING DIAGRAMS

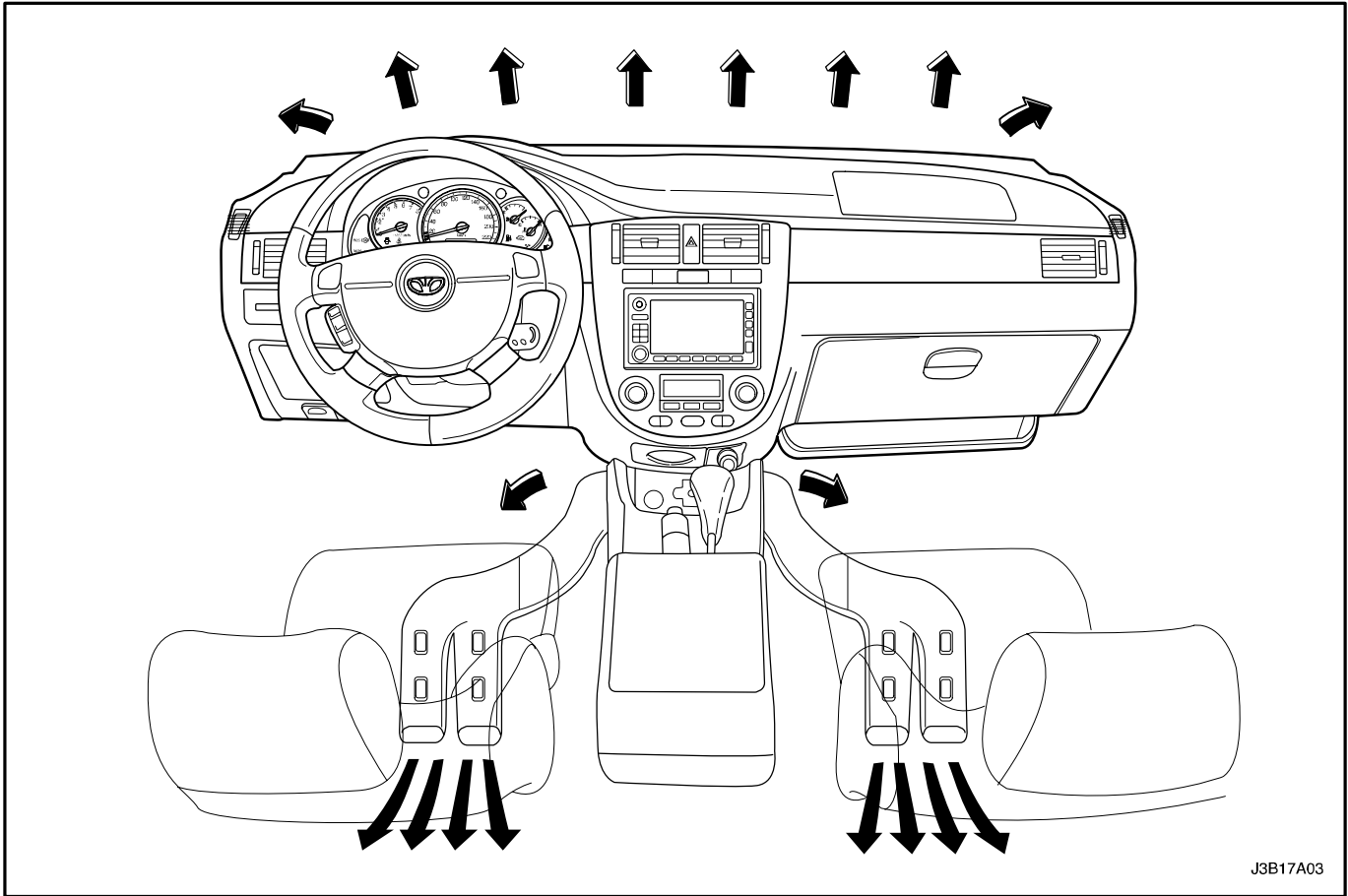
NON-A/C DIAGRAMS



AIRFLOW – TYPICAL



**AIRFLOW WITH REAR HEATING DUCT
(LEFT-HAND DRIVE SHOWN, RIGHT-HAND DRIVE
SIMILAR)**



DIAGNOSIS

HEATER SYSTEM

INSUFFICIENT HEATING OR DEFROSTING

CAUTION : *The cooling system is pressurized when hot. Injury can result from removing the surge tank cap before the engine is sufficiently cool.*

Step	Action	Value(s)	Yes	No
1	Verify the customer's complaint. Are the customer's concerns verified?	–	Go to <i>Step 2</i>	System OK
2	Check the coolant level. Is the coolant level correct?	–	Go to <i>Step 4</i>	Go to <i>Step 3</i>
3	Add coolant as needed. Is the repair complete?	–	System OK	Go to <i>Step 4</i>
4	Check the timing belt for tension or damage. Are the drive belts OK?	–	Go to <i>Step 6</i>	Go to <i>Step 5</i>
5	Correct any problem with the timing belt. Is the repair complete?	–	System OK	Go to <i>Step 6</i>
6	Check the coolant hoses for leaks or kinks. Are the coolant hoses OK?	–	Go to <i>Step 8</i>	Go to <i>Step 7</i>
7	Repair any problem with the coolant hoses. Is the repair complete?	–	System OK	Go to <i>Step 8</i>
8	Check the surge tank cap. Refer to <i>Section 2D, Engine Cooling</i> . Is the surge tank cap OK?	–	Go to <i>Step 10</i>	Go to <i>Step 9</i>
9	Repair or replace the surge tank cap as needed. Is the repair complete?	–	System OK	Go to <i>Step 10</i>
10	1. Turn the A/C switch OFF on vehicles equipped with air conditioning (A/C). 2. Set the blower motor switch on maximum speed. 3. Set the heater control to full hot. 4. Turn the ignition ON. 5. Check for airflow from the vent outlet. Is there heavy airflow from the heater outlet?	–	Go to <i>Step 11</i>	Go to <i>Step 26</i>
11	Check for a change in the airflow at various blower speeds. Does the blower speed increase as the switch is turned from 1 to 4.	–	Go to <i>Step 12</i>	Go to "Blower Electrical (Manual and Non-A/C)"
12	1. Turn the A/C switch OFF. 2. Set the temperature lever to full hot. 3. Set the blower motor switch on maximum speed. 4. With the engine sufficiently cool, remove the surge tank cap. 5. Start the vehicle and idle the engine. 6. Watch for the flow of the coolant. Is the coolant flow visible?	–	Go to <i>Step 14</i>	Go to <i>Step 13</i>

Step	Action	Value(s)	Yes	No
13	1. Check for the following problems: • Restriction in the cooling system. • Failed water pump impeller. • Faulty thermostat. 2. Make repairs to the cooling system, as needed. Are the repairs complete?	–	System OK	Go to <i>Step 14</i>
14	1. Install the surge tank cap. 2. With the ignition ON, allow the engine to warm up for about 20 minutes. Drive the vehicle at 48 km/h (30 mph). 3. Use a thermometer to measure the ambient air temperature and the discharge air temperature at the heater outlet. Does the heater output meet the minimum values given?	Go to "Heater Temperature Specifications"	Go to <i>Step 15</i>	Go to <i>Step 16</i>
15	1. Check the vehicle for cold air leaks at the following locations: • Dash. • Heater cases. • Vents. 2. Check under the seat for obstructions. 3. Repair any leaks or obstructions. Are the repairs complete?	–	System OK	–
16	1. Turn the ignition OFF. 2. Turn the temperature control knob to full cold, then rapidly to full hot. 3. Listen for the sound of the temperature door slam just before it reaches the end of the travel range of the control knob. Does the door slam?	–	Go to <i>Step 18</i>	Go to <i>Step 17</i>
17	1. Check the following aspects of the temperature door: • Travel. • Cables. • Linkage. 2. Verify the accuracy of the temperature controls at full hot. 3. Verify the accuracy of the temperature controls at full cold. Is the repair complete?	–	System OK	–
18	1. Set the temperature control knob to full hot. 2. Start the vehicle. 3. Check the temperature of the heater inlet hose and the heater outlet hose by feel. The air temperature around the hoses should be at least 29°C (84°F). Is the heater inlet hose hot and the heater outlet hose warm?	–	Go to <i>Step 19</i>	Go to <i>Step 22</i>
19	Check the thermostat. Refer to <i>2D, Engine Cooling</i> . Is the thermostat installed and seated properly?	–	Go to <i>Step 20</i>	Go to <i>Step 21</i>

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Step	Action	Value(s)	Yes	No
20	Replace the thermostat. Refer to <i>Section 2D, Engine Cooling</i> . Is the repair complete?	–	System OK	–
21	Reinstall the thermostat. Is the repair complete?	–	System OK	–
22	Inspect the heater hoses for proper installation. Are the heater hoses reversed?	–	Go to <i>Step 23</i>	Go to <i>Step 24</i>
23	Reinstall the heater hoses properly. Is the repair complete?	–	System OK	–
24	1. Back flush the heater core. 2. Drain the cooling system. 3. Replace the coolant. 4. Warm the engine to an average operating temperature. 5. Feel the heater inlet hose and the heater outlet hose. Is the heater inlet hose hot and the heater outlet hose warm?	–	System OK	Go to <i>Step 25</i>
25	Replace the heater core. Is the repair complete?	–	System OK	–
26	Recheck the system using the "Control Settings/Correct Results" tests. Refer to "Improper Air Delivery or No Mode Shift" in this section. Is the repair complete?	–	System OK	Go to <i>Step 27</i>
27	Check for airflow from the defroster or the vent outlets. Is there high airflow from the defroster or vent outlets?	–	Go to <i>Step 28</i>	Go to <i>Step 29</i>
28	1. Check the heater door at the floor and the vent door to get the proper airflow and to verify proper operation. 2. Repair as required. Is the repair complete?	–	System OK	–
29	Switch the mode knob to defrost. Is the defroster airflow OK?	–	Go to <i>Step 30</i>	Go to <i>Step 31</i>
30	1. Remove the heater outlet and check for obstructions. 2. Remove any obstructions in the heater outlet. Is the repair complete?	–	System OK	–
31	Check for airflow change at various blower speeds. Does the blower speed increase as the control is turned from 1 to 4?	–	Go to <i>Step 32</i>	Go to "Blower Electrical (Manual and Non-A/C)"
32	Check for obstructions in the system at the blower inlet and at the air filter, if the vehicle is equipped with one. Are there any obstructions?	–	Go to <i>Step 33</i>	Go to <i>Step 34</i>
33	Remove the obstructions in the system at the blower inlet or replace a clogged filter. Is the repair complete?	–	System OK	–

Step	Action	Value(s)	Yes	No
34	1. Set the blower on maximum speed. 2. Rotate the temperature control from full hot to full cold. 3. Listen for an airflow change. Does the airflow change?	–	Go to <i>Step 35</i>	Go to <i>Step 36</i>
35	1. Check the following aspects of the temperature door: • Travel. • Cables. • Linkage. • Control. 2. Verify the accuracy of the temperature control at full hot. Is the repair complete?	–	Go to <i>Step 1</i>	–
36	1. Check the system for any obstruction between the blower and the system outlets. 2. Remove any obstruction. Is the repair complete?	–	Go to <i>Step 1</i>	–

BLOWER ELECTRICAL

Step	Action	Value(s)	Yes	No
1	Verify the customer's complaint. Are the customer's concerns verified?	–	Go to <i>Step 2</i>	System OK
2	Turn the blower ON. Does the blower run at any speed?	–	Go to <i>Step 14</i>	Go to <i>Step 3</i>
3	1. Disconnect the power connector from the blower motor under the dashboard on the passenger side of the vehicle. 2. Turn the ignition ON. 3. Turn the blower ON. 4. Test for voltage on the connector. The terminal connected to the violet wire is positive and the terminal connected to the black wire is negative. Is this voltage present?	11–14v	Go to <i>Step 4</i>	Go to <i>Step 5</i>
4	Replace the blower motor. Is the repair complete?	–	System OK	–
5	Check fuse F7 in the I/P fuse block in the engine fuse block. Is the fuse blown?	–	Go to <i>Step 6</i>	Go to <i>Step 7</i>
6	1. Turn the ignition ON. 2. Use a short detector to locate a possible short in the following locations: • Fuse panel-to-blower speed switch. • Blower speed switch-to-heater resistor block. • Heater resistor block-to-blower motor. • Blower speed switch-to-blower HI relay. 3. Repair any short. 4. Replace any blown fuse. Is the repair complete?	–	System OK	–

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Step	Action	Value(s)	Yes	No
7	1. Turn the ignition ON. 2. Set the blower switch on 4. 3. Check the blower motor ground. Is ground OK?	–	Go to <i>Step 9</i>	Go to <i>Step 8</i>
8	Repair the blower motor ground. Is the repair complete?	–	System OK	–
9	Check the motor connector with a 12-volt test light. Does the test light come on?	–	Go to <i>Step 10</i>	Go to <i>Step 11</i>
10	Repair the open in the feed wire from the resistor block to the blower motor. Is the repair complete?	–	System OK	–
11	Use the 12-volt test light to check the power feed terminal on the blower speed switch. Does the light come on?	–	Go to <i>Step 12</i>	Go to <i>Step 13</i>
12	Replace the blower speed switch. Is the repair complete?	–	System OK	–
13	Repair the open in the power wire from the blower speed switch to the fuse panel. Is the repair complete?	–	System OK	–
14	Turn the blower on speed 4. Does the blower fail to operate at speed 4?	–	Go to <i>Step 15</i>	Go to <i>Step 21</i>
15	Check fuse EF3 in the engine fuse block. Is the fuse blown?	–	Go to <i>Step 16</i>	Go to <i>Step 17</i>
16	1. Turn the ignition ON. 2. Turn the blower motor switch to 4. 3. Use a short detector to locate a possible short in the following locations: • Engine fuse panel-to-blower HI relay. • Blower HI relay-to-blower motor. 4. Repair any short. 5. Replace the EF3 fuse. Is the repair complete?	–	System OK	–
17	1. Turn the ignition switch ON. 2. Set the blower switch to 4. 3. Check for 12 volts on the blower HI relay coil terminal from the blower speed switch terminal A7. Is this voltage present?	–	Go to <i>Step 18</i>	Go to <i>Step 19</i>
18	Replace the blower speed switch. Is the repair complete?	–	System OK	–
19	1. Turn the ignition OFF. 2. Check for opens in the following locations: • EF3 fuse-to-blower HI relay. • Blower speed switch-to-blower– HI relay. • Blower HI relay-to-ground. • Blower HI relay-to-blower motor. 3. Repair any opens. Is the repair complete?	–	System OK	Go to <i>Step 20</i>
20	Replace the blower HI relay. Is the repair complete?	–	System OK	–

Step	Action	Value(s)	Yes	No
21	1. Disconnect the resistor block connector. 2. Connect one lead of a self-powered test light to any single lead on the resistor block. Use the other lead to probe each of the other two terminals. Does the test light illuminate on all terminals?	–	Go to Step 23	Go to Step 22
22	Replace the resistor block. Is the repair complete?	–	System OK	–
23	1. Turn the ignition to LOCK. 2. Disconnect the connector from the resistor block. 3. Connect a jumper lead from the positive terminal on the battery to any wire terminal in the connector. 4. Use a 12-volt test light to check for voltage from the corresponding wire on the blower speed switch. 5. Repeat the same test on the other wires. Does the lamp light on all three wires?	–	Go to Step 25	Go to Step 24
24	Replace the blower speed switch. Is the repair complete?	–	System OK	–
25	Repair the open in the affected wire. Is the repair complete?	–	System OK	–

IMPROPER AIR DELIVERY OR NO MODE SHIFT

This procedure provides a test of all functions of the heater/defroster unit.

1. Warm up the vehicle.
2. Keep the engine running.
3. Perform the tests outlined in the table below and look for the results indicated.

CONTROL SETTINGS			CORRECT RESULTS				
Mode Knob	Temp Control	Blower Motor Switch	Blower Speed	Power Vent Outlet	Floor Outlet	Defrost Outlet	Side Window Outlet
Vent	Cold	Off	Off	No Airflow	No Airflow	No Airflow	No Airflow
Vent	Cold	4	High	Ambient Airflow	No Airflow	No Airflow	No Airflow
Floor	Cold to Hot	4	High	No Airflow	Cold to Hot Airflow	Minimum Cold to Hot Airflow	Minimum Cold to Hot Airflow
De-froster	Cold to Hot	4	High	No Airflow	Minimum Cold to Hot Airflow	Cold to Hot Airflow	Minimum Cold to Hot Airflow

If any of these settings does not produce the correct results, perform the following diagnostic procedure.

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Step	Action	Value(s)	Yes	No
1	Verify the customer's complaint. Are the customer's concerns verified?		Go to <i>Step 2</i>	System OK
2	- Examine the affected door in the unit for proper attachment to the vacuum actuator. - Check the actuator connection to the door. - Check that the vacuum hose is properly connected. Is everything connected properly?	–	Go to <i>Step 4</i>	Go to <i>Step 3</i>
3	Repair as necessary. Is the repair complete?	–	System OK	–
4	1. Disconnect the actuator at the door. 2. Check the range of the door travel and the effort required to move it. Does the door move freely through its entire range of travel so that it can close at both ends of the range?	–	Go to <i>Step 5</i>	Go to <i>Step 3</i>
5	Check the travel of the actuator by turning the control knob with the engine running. Is the actuator travel OK?	–	Go to <i>Step 6</i>	Go to <i>Step 7</i>
6	1. Reinstall the actuator. 2. Recheck the system using the "Control Settings/Correct Results" tests in this procedure. Does the system perform properly?	–	System OK	Go to <i>Step 9</i>
7	1. Check the vacuum hose at the control. 2. Check for a broken control. Is there a problem with the vacuum hose or the control?	–	Go to <i>Step 8</i>	Go to <i>Step 9</i>
8	Repair the vacuum hose or the control as necessary. Is the repair complete?	–	System OK	Go to <i>Step 9</i>
9	Recheck the system using the "Control Settings/Correct Results" tests in this procedure. Is the repair complete?	–	System OK	Go to <i>Step 10</i>
10	Check for airflow from the defroster or the vent outlets. Is there high airflow from the defroster or the vent outlets?	–	Go to <i>Step 11</i>	Go to <i>Step 12</i>
11	Adjust the heater door at the floor and the vent door to get the proper airflow. Is the repair complete?	–	System OK	–
12	Switch the mode knob to defrost. Is the defroster airflow OK?	–	Go to <i>Step 13</i>	Go to <i>Step 14</i>
13	1. Remove the heater outlet. 2. Check the heater outlet for obstructions. 3. Remove any obstructions in the heater outlet. Is the repair complete?	–	System OK	–
14	Check the blower speeds for change in the airflow. Does the blower speed increase as the control is turned from 1 to 4?	–	Go to <i>Step 15</i>	Go to "Blower Electrical (Manual and Non-A/C)"

Step	Action	Value(s)	Yes	No
15	1. Check for obstructions in the system at the blower inlet and check the air filter if the vehicle is so equipped. 2. Remove any obstructions at the blower inlet and replace the filter if it is clogged. Is the repair complete?	–	System OK	Go to <i>Step 16</i>
16	1. Set the blower on 4. 2. Rotate the temperature control from full hot to full cold. 3. Listen for an airflow change. Does the airflow change?	–	Go to <i>Step 17</i>	Go to <i>Step 18</i>
17	1. Check the temperature door, the cable, the linkage, and the control. 2. Adjust the temperature control to full hot. Is the repair complete?	–	System OK	–
18	1. Check the system for any obstruction between the blower and the system outlets. 2. Remove any obstruction between the blower and the system outlets. Is the repair complete?	–	System OK	–

TOO MUCH HEAT

Step	Action	Value(s)	Yes	No
1	Verify the customer's complaint. Are the customer's concerns verified?	–	Go to <i>Step 2</i>	System OK
2	Is there too much heat when the mode switch is in the floor position?	–	Go to <i>Step 3</i>	Go to <i>Step 9</i>
3	Is there objectionable defroster bleed?	–	Go to <i>Step 4</i>	Go to <i>Step 5</i>
4	1. Check the door travel, the cable, the vacuum actuators, and the linkage for the heater and the defroster. 2. Adjust or repair, as required. Is the repair complete?	–	System OK	–
5	1. In vehicles equipped with A/C, set the A/C switch OFF. 2. In all vehicles, set the blower speed to maximum. 3. Set the temperature to full hot. 4. Turn the ignition switch ON. 5. Check for airflow from the floor outlets. 6. Check the floor outlet attachment. Is the airflow high?	–	Go to <i>Step 6</i>	Go to <i>Step 8</i>
6	Check for a change in the airflow at different blower speeds. Does the airflow change as the setting for the blower–speed switch is scanned?	–	Go to <i>Step 7</i>	Go to "Blower Electrical (Manual and Non–A/C)"

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Step	Action	Value(s)	Yes	No
7	1. Check the temperature door travel, the cable, and the linkage. 2. Adjust to full cold. 3. Check for full hot. Is the repair complete?	–	System OK	–
8	Adjust or repair the floor/defroster and/or the vent/floor mode. Is the repair complete?	–	System OK	–
9	In the vent position, is the problem objectionable bleed?	–	Go to <i>Step 10</i>	Go to <i>Step 15</i>
10	1. Check the system case for leaks. 2. Check the floor outlet attachment. Are there problems?	–	Go to <i>Step 11</i>	Go to <i>Step 12</i>
11	Repair the system case or the floor outlet attachment as required. Is the repair complete?	–	System OK	Go to <i>Step 12</i>
12	1. Turn the ignition switch OFF. 2. Turn the temperature control knob to full hot, then rapidly to full cold. Do you hear the door slam just before you reach the end of the control travel?	–	Go to <i>Step 13</i>	Go to <i>Step 14</i>
13	Adjust the vent door to vent more. Is the repair complete?	–	System OK	–
14	1. Check the temperature door travel, the cables, and the linkage. 2. Verify that the temperature door goes to full cold. 3. Check the temperature door for full hot. Is the temperature door travel correct?	–	System OK	–
15	1. Set the fresh air/recirculating air control to fresh air (indicator lamp off). 2. Set the temperature control to full cold. 3. Start the vehicle and allow the engine to warm up. 4. Measure the air temperature at the blower inlet, or cowl, and at the vent air outlet inside the vehicle. Is the outlet air more than 5°C (41°F) warmer than the inlet air?	–	Go to <i>Step 16</i>	System OK
16	1. Check for hot air leaks from the engine compartment to the blower inlet. 2. Repair, as needed. Is the repair complete?	–	System OK	–

CONTROLS

Step	Action	Value(s)	Yes	No
1	Verify the customer's complaint. Are the customer's concerns verified?	–	Go to <i>Step 2</i>	System OK
2	Move controls other than the temperature adjustment. Is an excessive effort required to move the controls?	–	Go to <i>Step 15</i>	Go to <i>Step 3</i>
3	Move the temperature control. Is an excessive effort required to move the controls?	–	Go to <i>Step 6</i>	Go to <i>Step 4</i>
4	Move the temperature control. Does the temperature door move too easily?	–	Go to <i>Step 5</i>	System OK
5	Remove the cable from the controller. Does the control knob turn freely, without the click stops?	–	Go to <i>Step 15</i>	–
6	Check the cables for improper routing, kinks, wiring interference, or other instrument panel interference. Is there a problem?	–	Go to <i>Step 7</i>	Go to <i>Step 8</i>
7	Repair as needed. Is the repair complete?	–	System OK	–
8	1. Remove the cable from the temperature door. 2. Cycle the door manually. 3. Check for door binding. Is there any door binding?	–	Go to <i>Step 9</i>	Go to <i>Step 12</i>
9	Check a binding door for shaft alignment, a bent shaft, a bent door, or a warped case. Is the door seal OK?	–	Go to <i>Step 10</i>	Go to <i>Step 11</i>
10	1. Check a binding door for shaft alignment, a bent shaft, a bent door, or a warped case. 2. Repair, as needed. Is the repair complete?	–	System OK	–
11	Repair the door seal, as needed. Is the repair complete?	–	System OK	–
12	Check for control binding. Does the control bind?	–	Go to <i>Step 14</i>	Go to <i>Step 13</i>
13	1. Reinstall the cable to the door. 2. Check the clearance for the cable-to-dash components. 3. Repair any interference. Is the repair complete?	–	System OK	–
14	1. Remove the cable from the control. 2. Check the control for binding. Does the control bind?	–	Go to <i>Step 15</i>	Go to <i>Step 16</i>
15	Replace the control. Is the repair complete?	–	System OK	–
16	Replace the cable. Is the repair complete?	–	System OK	–

BLOWER NOISE

Step	Action	Value(s)	Yes	No
1	Verify the customer's complaint. Are the customer's concerns verified?	–	Go to <i>Step 2</i>	System OK
2	1. Sit inside the vehicle. 2. Close the doors and the windows. 3. Turn the ignition ON. 4. Start the engine. 5. Set the temperature to full cold. 6. Cycle through the blower speeds, the modes, and the temperature settings in order to find the noise. Is the blower noise constant at high blower speeds or certain modes, but absent at lower speeds or in other modes?	–	Go to <i>Step 11</i>	Go to <i>Step 3</i>
3	Check for vibrations from the blower motor and fan assembly at each blower speed by feeling the blower motor housing. Did you find excessive vibration?	–	Go to <i>Step 6</i>	Go to <i>Step 4</i>
4	1. Remove the blower motor and the fan assembly. Refer to "Blower Motor" in this section. 2. Check for foreign material at the opening of the blower inlet. Do you find any foreign material at the blower inlet?	–	Go to <i>Step 5</i>	Go to <i>Step 6</i>
5	Remove all foreign material. Is the repair complete?	–	System OK	Go to <i>Step 6</i>
6	1. Examine the blower fan for wear spots, cracked blades, a cracked hub, a loose fan retaining nut, or bad alignment. 2. Examine the blower case for wear spots. Did you find any problem?	–	Go to <i>Step 7</i>	Go to <i>Step 9</i>
7	Repair as required. Is the repair complete?	–	System OK	Go to <i>Step 8</i>
8	Replace the motor and the fan assembly. Is the repair complete?	–	System OK	Go to <i>Step 9</i>
9	If the noise is a click/tick or whine, replace the motor. Is the repair complete?	–	System OK	Go to <i>Step 10</i>
10	Reinstall the original motor. Is the problem still present?	–	Go to <i>Step 11</i>	System OK
11	1. Set the blower speed on maximum. 2. Check full-hot to full-cold temperature positions in the defrost, floor, and vent modes. Is the noise present in the defrost mode only?	–	Go to <i>Step 12</i>	Go to <i>Step 13</i>
12	1. Check the ducts for obstructions or foreign materials. 2. Remove any obstructions or foreign materials. 3. Check the floor/defroster door seals. 4. Repair or replace the components, as needed. Is the repair complete?	–	System OK	–
13	Is the noise present in the floor mode only?	–	Go to <i>Step 12</i>	Go to <i>Step 14</i>
14	Is the noise present in the vent mode only?	–	Go to <i>Step 15</i>	Go to <i>Step 16</i>

Step	Action	Value(s)	Yes	No
15	1. Check the ducts for obstructions or foreign materials. 2. Remove any obstructions or foreign materials. 3. Check the vent door seals. 4. Repair or replace as needed. Is the repair complete?	–	System OK	–
16	Is the noise present in all modes, but not all temperature positions?	–	Go to <i>Step 17</i>	Go to <i>Step 18</i>
17	1. Check the temperature door seals. 2. Repair or replace the seals, as needed. Is the repair complete?	–	System OK	–
18	1. Check the system for obstructions or foreign materials between the fan and the temperature door. 2. Repair or replace the components, as needed. Is the repair complete?	–	System OK	Go to <i>Step 2</i>

MAINTENANCE AND REPAIR

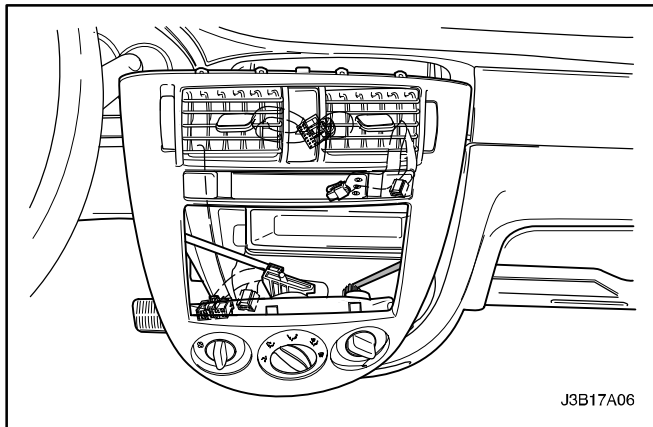
ON-VEHICLE SERVICE

TEMPERATURE CABLE ADJUSTMENT

Because the cable and the cable housings have fixed lengths, it is impossible to make a temperature cable adjustment.

In addition, the heater/air distributor case linkage cannot be adjusted.

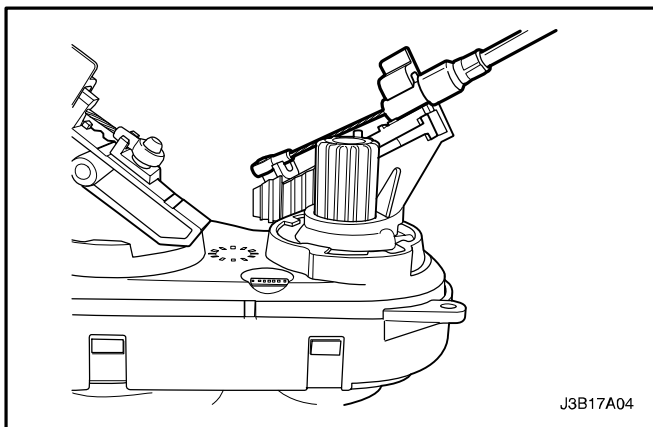
If a malfunction is suspected, verify the proper operation of the controller and the mechanical doors for the heater/air distributor case assembly.

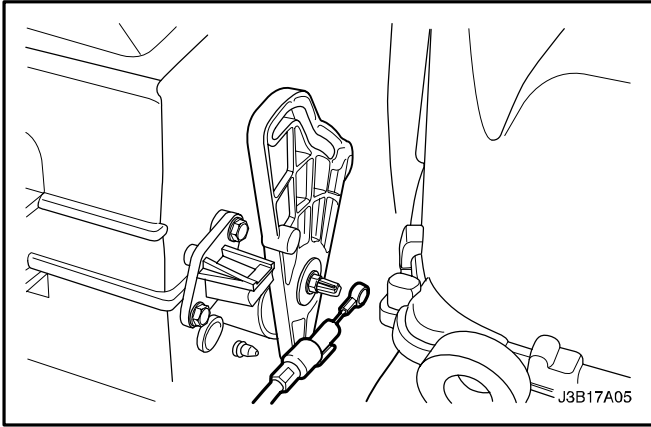


TEMPERATURE CONTROL CABLE (Left-Hand Drive Shown, Right-Hand Drive Similar)

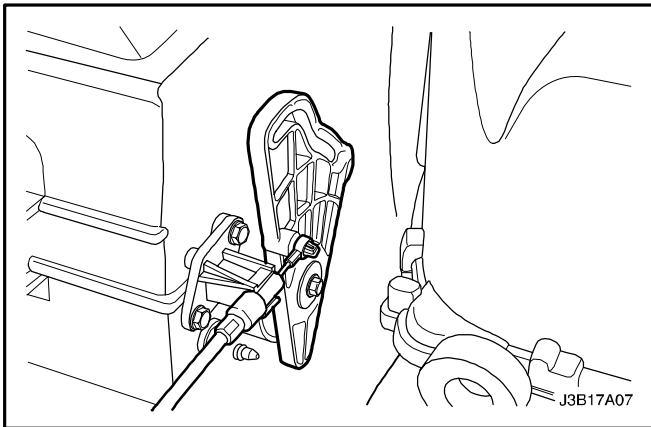
Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the center molding. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Disconnect the mode control cable from the mode door.
4. Disconnect the temperature control cable eyelet from the post on the controller.
5. Pry off the clip of the temperature control cable.



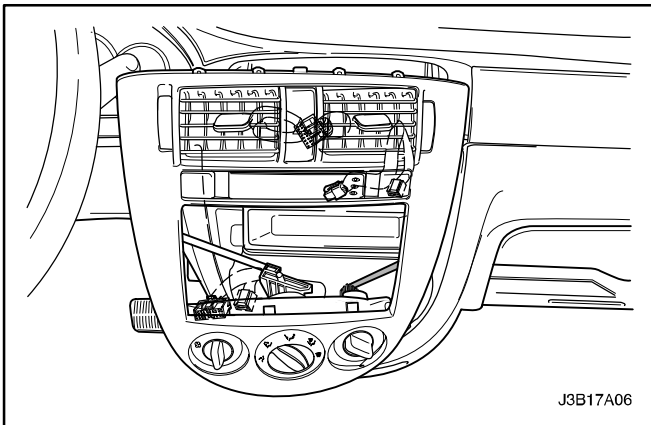


6. Slide the cable eyelet off the post on the temperature door lever.
7. Pry off the Clip of the temperature cable.

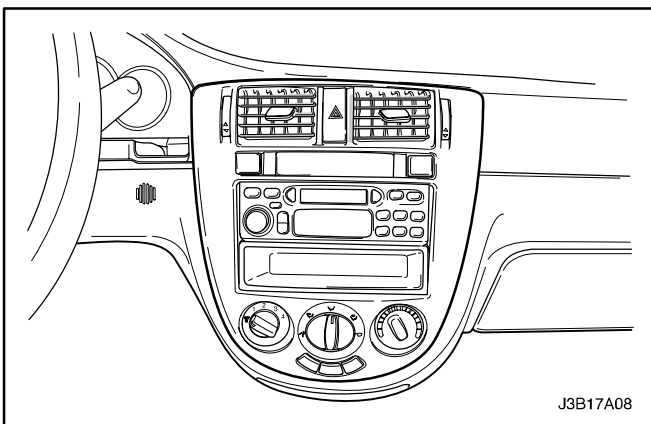


Installation Procedure

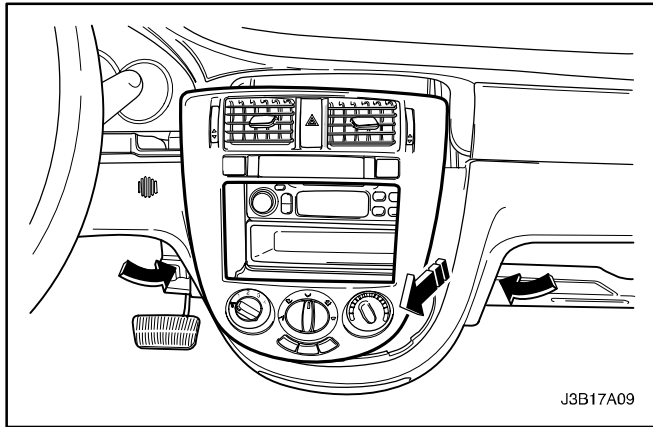
1. Install the temperature control cable eyelet to the post on the temperature door lever.
2. Install the clip of the temperature cable.



3. Install the temperature control cable eyelet to the post on the controller.
4. Install the clip of the temperature control cable.
5. Install the mode control cable to the mode door.



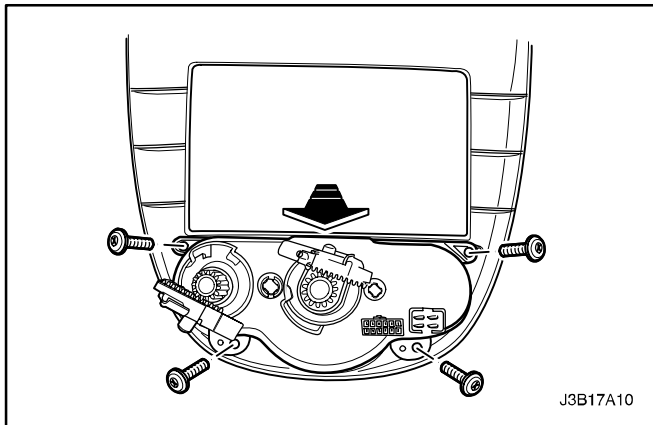
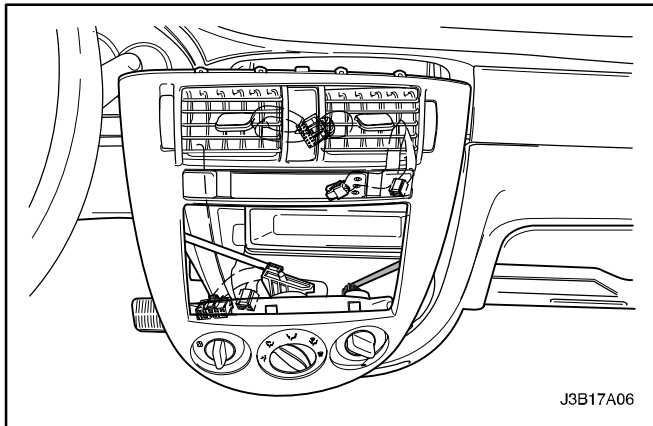
6. Insert the center molding into position on the instrument panel.
7. Move the temperature control to verify the smooth operation and function of the door and the cable.
8. Connect the negative battery cable.
9. Operate the heating and cooling systems to verify proper function.



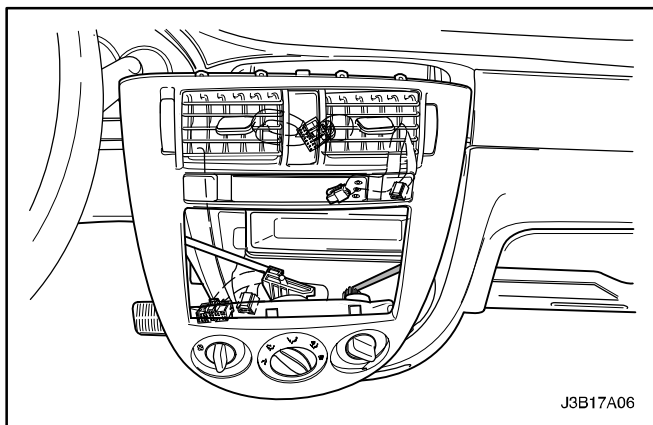
CONTROL ASSEMBLY

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the center molding. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Disconnect the mode control cable from the mode door.
4. Disconnect the electrical connectors.
5. Disconnect the temperature control cable by gently prying the cable eyelet from the post on the controller. Unsnap the cable housing from the mechanical slide. Note the location of the cable and the housing for ease of installation.
6. Pull out the center molding.



7. Remove the four controller retaining screws.
8. Remove the control assembly from the center molding.



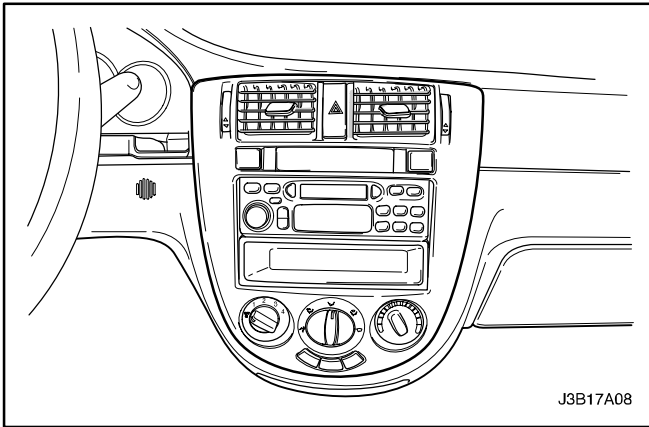
Installation Procedure

1. Install the control assembly with the retaining screws to the center molding.

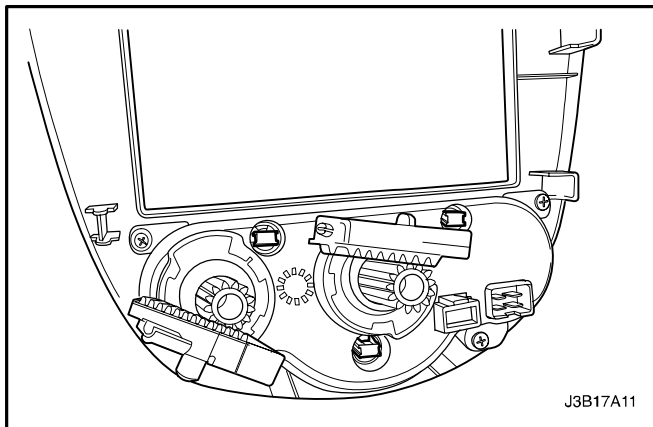
Tighten

Tighten the controller retaining screws to 2 N•m (18 lb-in).

2. Press the cable end eyelet onto the post on the controller.
3. Attach the mechanical cable housing to its original control position.
4. Connect the electrical connectors to the sockets on the back of the controller.



5. Gently insert the center molding into position on the instrument panel.
6. Connect the negative battery cable.
7. Confirm the proper operation of the controller by moving it through all of the controller's possible functioning positions.

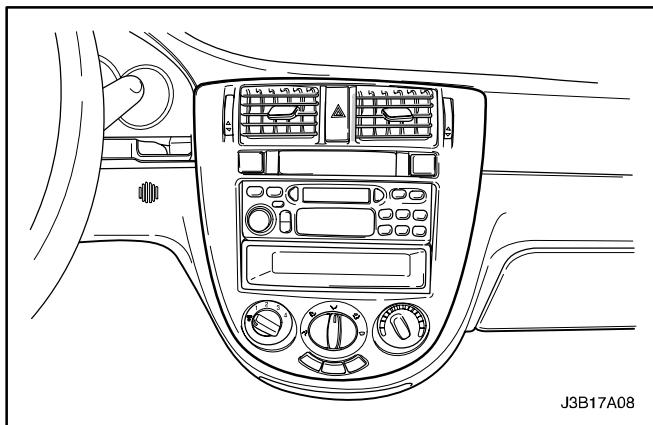


CONTROL ASSEMBLY KNOB LIGHTING

(Left-Hand Drive Shown, Right-Hand Drive Similar)

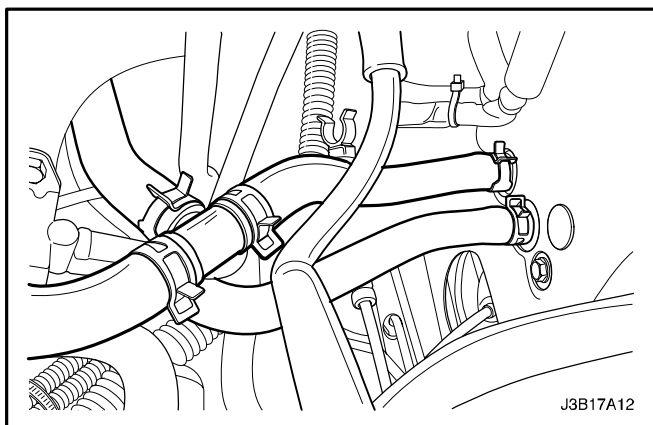
Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the center molding. Refer to "Control Assembly" in this section.
3. Turn the bulb holder to the left and pull out the bulb.



Installation Procedure

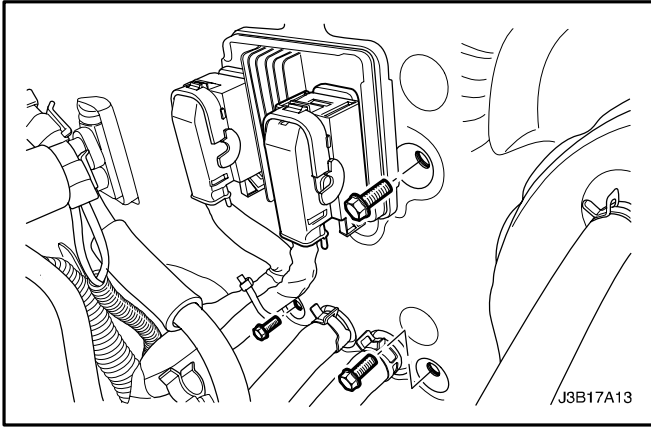
1. Install the bulb into the holder and turn the bulb to the right.
2. Install the control assembly. Refer to "Control Assembly" in this section.
3. Connect the negative battery cable.
4. Check the knob light for proper operation.



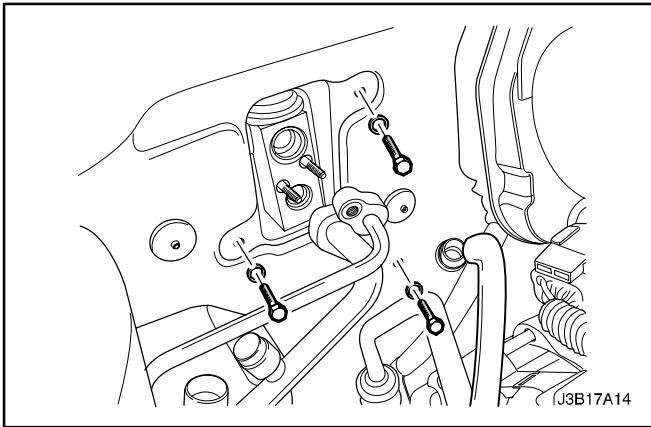
HEATER/AIR DISTRIBUTOR CASE ASSEMBLY

Removal Procedure

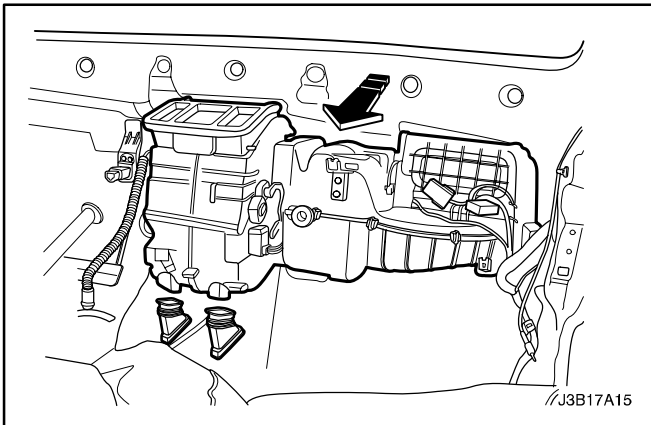
1. Disconnect the negative battery cable.
2. Remove the instrument panel and tie-bar. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Drain the cooling system. Refer to *Section 1D, Engine Cooling*.
4. Compress the heater hose clamps at the firewall and slide the clamps toward the engine.
5. Remove the two heater hoses from the core pipes at the firewall.



6. Remove the screws that secure the heater/air distributor case assembly to the firewall on the side of the heater core pipes.



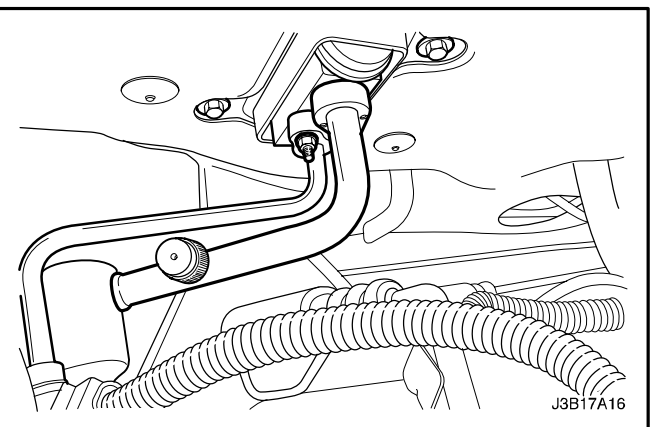
7. Remove the high-pressure and Low-pressure pipe from the A/C expansion valve.



8. Remove the evaporator drain hose.
9. Have an assistant support the heater/air distributor case from inside the vehicle.
10. Remove the screws that secure the heater/air distributor case assembly to the firewall on the side of the evaporator.
11. Disconnect the rear duct connector.

Notice : Handle the case carefully to avoid damage to the mechanical door operating linkage.

12. Remove the heater/air distributor case assembly from the vehicle.



Installation Procedure

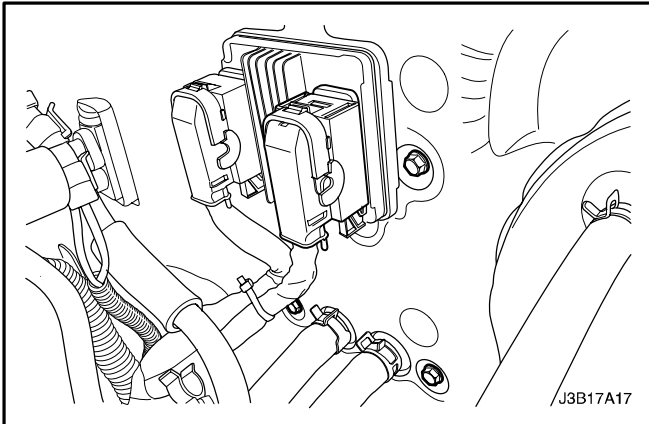
1. Position the heater/air distributor case assembly in the vehicle.

Notice : Avoid damaging the heater core pipes by making sure they do not contact the firewall opening.

2. Slowly raise the heater/air distributor case assembly into position against the firewall and hold it in position while the screws are installed and tightened from the engine side of the firewall.
3. Install the high-pressure and low-pressure pipe.
4. Install the heater/air distributor case assembly screws at the side of evaporator through the firewall from the engine compartment side.

Tighten

Tighten the heater/air distributor case assembly screws to 4 N•m (35 lb–in).

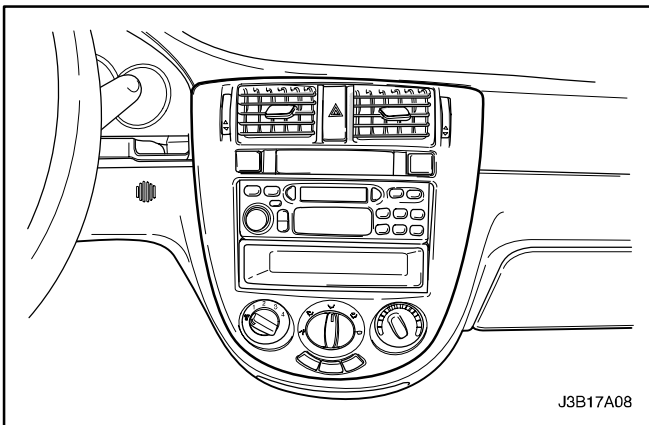


5. Install the heater/air distributor case assembly screws at the side of the heater core pipes through the firewall from the engine compartment side.

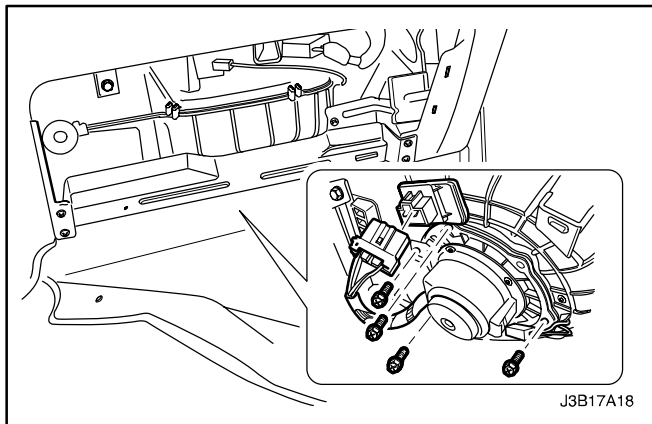
Tighten

Tighten the heater/air distributor case assembly screw to 4 N•m (35 lb–in).

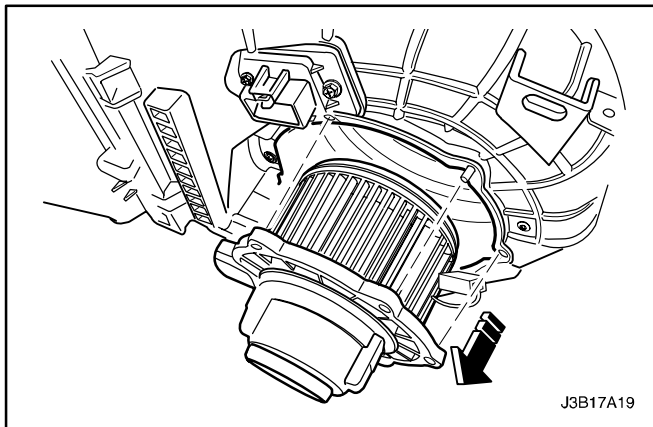
6. Install the two heater hoses.
7. Slide the heater hose clamps into position.
8. Connect the rear duct connector.



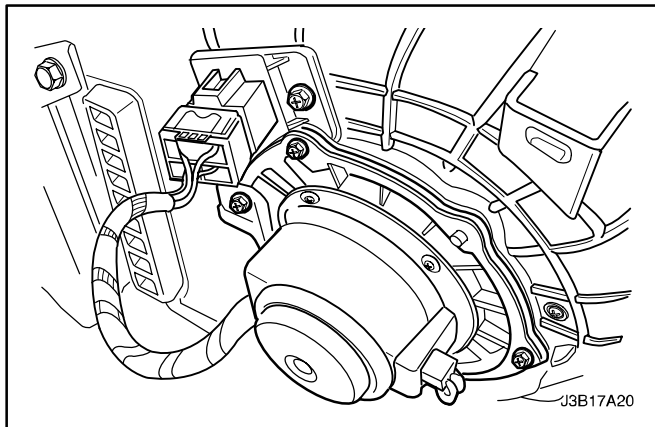
9. Install the instrument panel and tie–bar. Refer to *Section 9E, Instrumentation/Driver Information*.
10. Fill the cooling system. Refer to *Section 1D, Engine Cooling*.
11. Connect the negative battery cable.
12. Operate the controls to verify the proper function of the heating and ventilation systems.

**BLOWER MOTOR****Removal Procedure**

1. Disconnect the negative battery cable.
2. Remove the glove box. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Put the floor carpet aside for preventing stain.
4. Disconnect the blower motor electrical connector and resistor connector.
5. Remove the screws that secure the motor to the heater/air distributor case.



6. Remove the motor, the seal, and the shock mount pads from the heater/air distributor case by gently pulling the motor straight down and out.



Installation Procedure

1. Install the blower motor and the seal with the shock mount pads in the heater/air distributor case. Hold the blower motor in position.
2. Install the screws to secure the blower motor to the heater/air distributor case.

Tighten

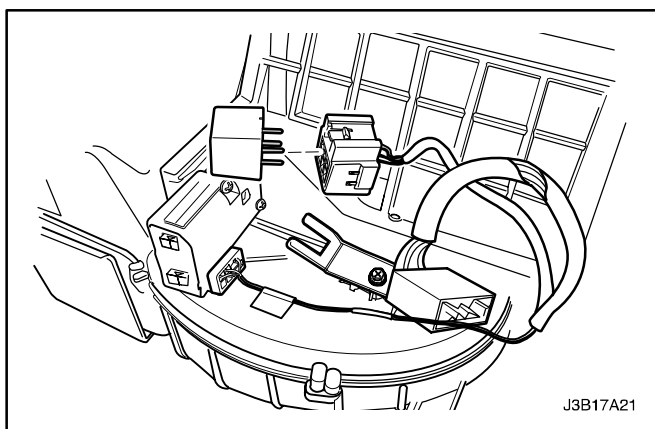
Tighten the blower motor retaining screws to 1.2 N•m (11 lb-in).

3. Connect the blower motor electrical connector and resistor connector.
4. Connect the negative battery cable.
5. Confirm that the blower motor operates properly.
6. Replace the glove box. Refer to *Section 9E, Instrumentation/Driver Information*.

HIGH-BLOWER RELAY

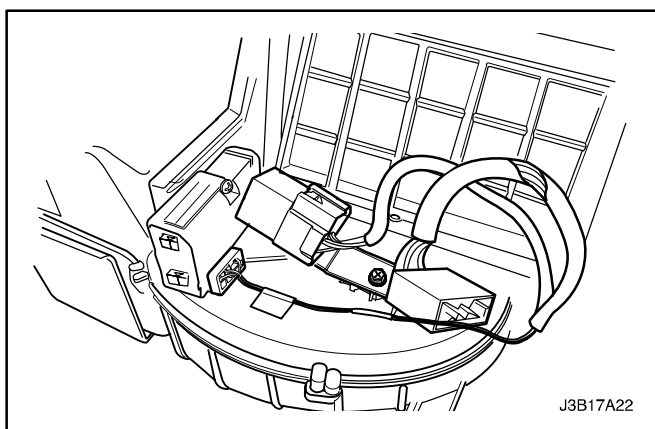
Removal Procedure

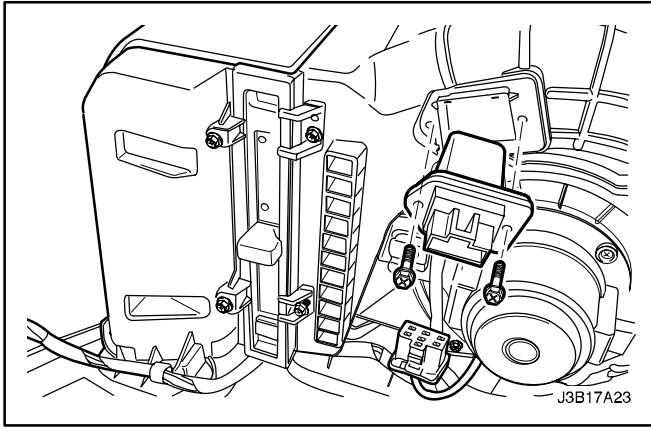
1. Disconnect the negative battery cable.
2. Remove the glove box housing. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Separate the connector from the bracket.
4. Disconnect the relay from the connector.



Installation Procedure

1. Connect the relay to the connector.
2. Insert the connector to the bracket.
3. Install the glove box. Refer to *Section 9E, Instrumentation/Driver Information*.

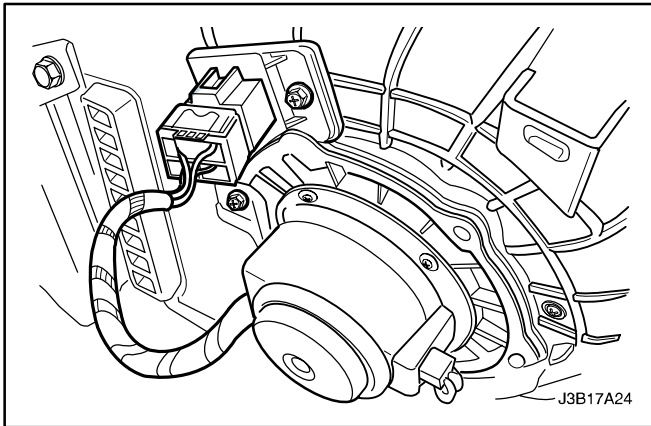




BLOWER RESISTOR

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the glove box. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Disconnect the electrical connector at the resistor.
4. Remove the mount screws from the resistor.
5. Remove the resistor from the heater/air distributor case by gently pulling the resistor downward.



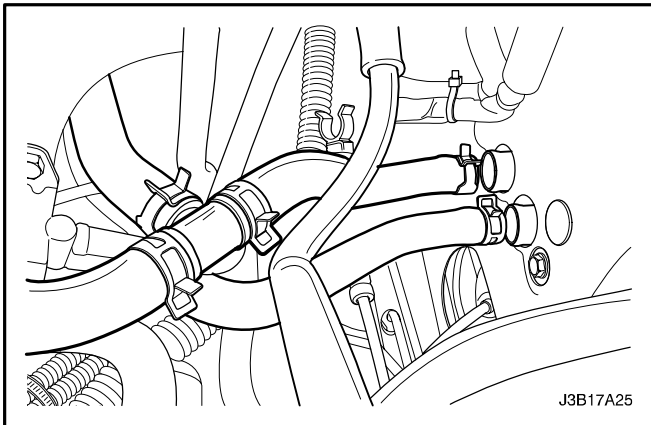
Installation Procedure

1. Install the resistor into the heater/air distributor case with the screws.

Tighten

Tighten the blower motor resistor screws to 1.2 N•m (11 lb-in).

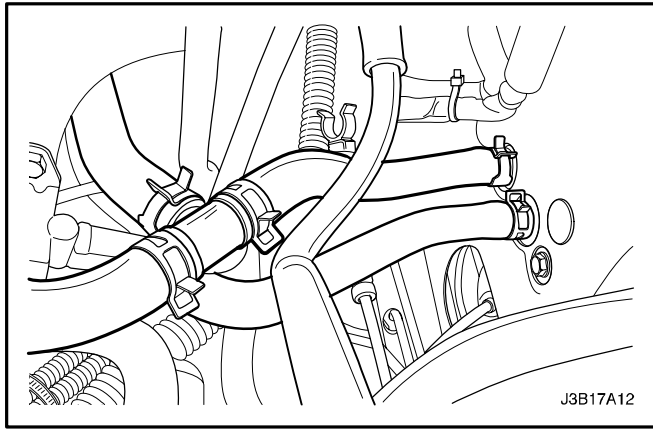
2. Connect the electrical connector at the resistor.
3. Connect the negative battery cable.
4. Confirm the proper performance of the blower.
5. Replace the glove box. Refer to *Section 9E, Instrumentation/Driver Information*.



HEATER HOSES

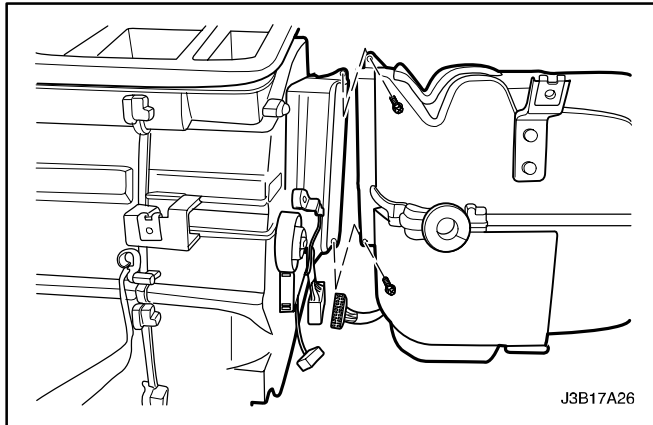
Removal Procedure

1. Partially drain the cooling system.
2. Raise and suitably support the vehicle.
3. Compress and slide rearward the two heater hose spring clamps at the firewall.
4. Gently twist the hose from the left to the right and back again to loosen the bond between the hose and the tube.
5. Remove the end of the hose from the tube.
6. Repeat Steps 3 and 4 with the other hose.
7. Compress the heater hose spring clamp on the inlet coolant line and slide the clamp rearward.
8. Remove the inlet heater hose from the vehicle.
9. Compress the heater hose spring clamp on the outlet coolant line and slide the clamp backward.
10. Remove the outlet heater hose from the vehicle.



Installation Procedure

1. Install the left heater hose to the coolant inlet line fitting. Slide the end of the heater hose over the coolant fitting until the hose is seated.
2. Install the right heater hose to the fitting below the intake manifold. Slide the end of the heater hose over the fitting until it is seated.
3. Install and seat the other end of each heater hose.
4. Compress and slide the spring clamps into position on the heater hoses and release the tension.
5. Fill the cooling system.
6. Check the hoses for leaks.
7. Lower the vehicle.

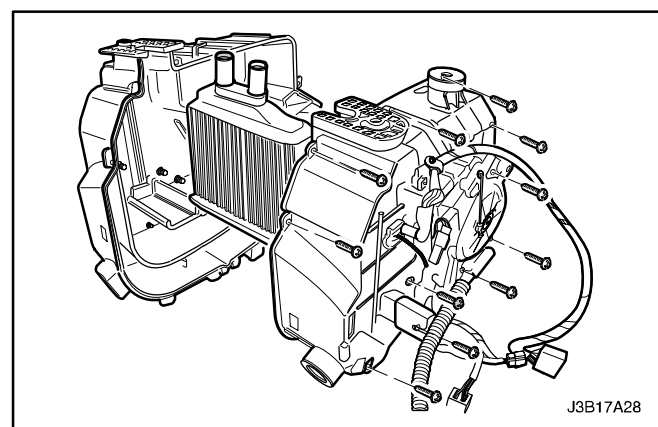
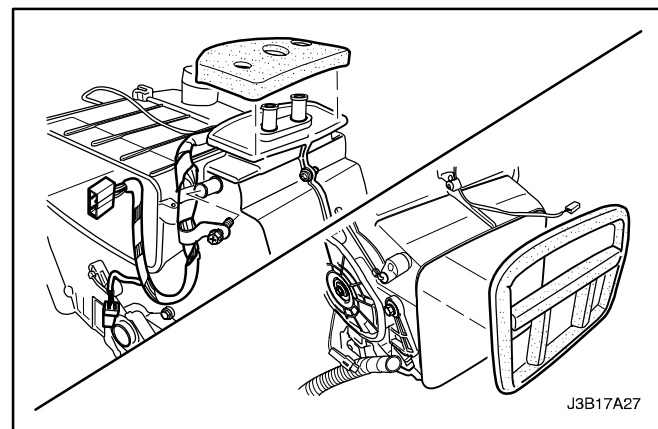


HEATER CORE

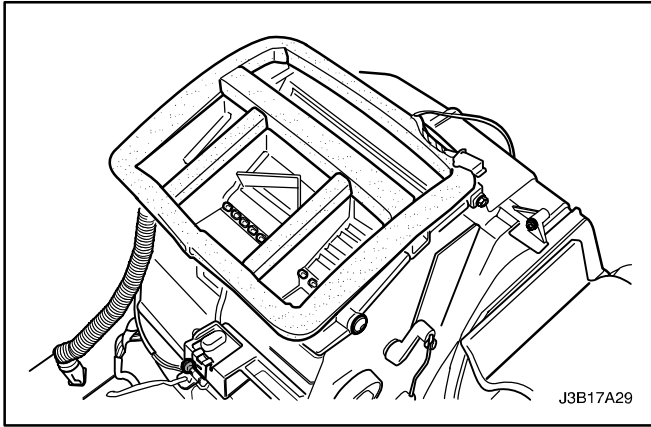
(Left-Hand Shown, Right-Hand Drive Similar)

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the instrument panel. Refer to *Section 9E, Instrumentation/Drive Information*.
3. Recover the refrigerant.
4. Remove the heater/air distributor case assembly. Refer to "Heater/air distributor case assembly" in this section.
5. Remove the wiring harness and electrical connectors from the heater/air distributor case assembly.
6. Remove the screws that connect the heater core housing and the evaporator housing.
7. Separate the sponge from heater/air distributor case assembly.



8. Remove the heater core cover screws from the heater core housing.
9. Remove the heater core.



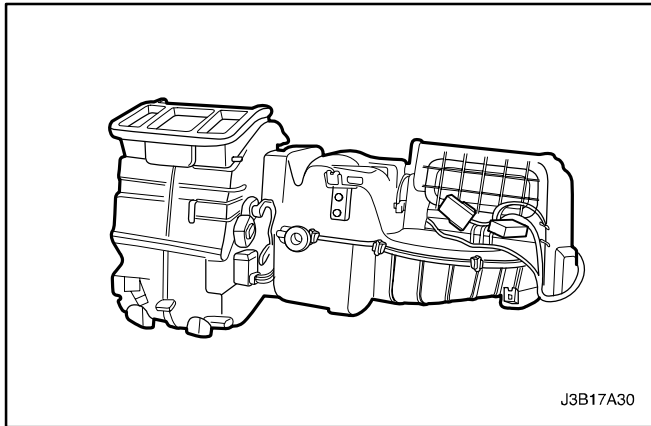
Installation Procedure

1. Install the heater core into the case.
2. Install the screws on the heater core housing.

Tighten

Tighten the heater core cover screws to 1.2 N•m (11 lb-in).

3. Install the sponge onto the heater/air distributor case assembly.



4. Install the screws that connect the heater core housing and the evaporator housing.

Tighten

Tighten the screws to 1.2 N•m (11 lb-in).

5. Connect the wiring harness and electrical connectors.
6. Install the heater/air distributor case assembly.
7. Install the instrument panel.
8. Fill the cooling system.
9. Evacuate and recharge the refrigerant.
10. Connect the negative battery cable.

GENERAL DESCRIPTION AND SYSTEM OPERATION

HEATING AND VENTILATION SYSTEMS

The base heater system is designed to provide heating, ventilation, windshield defrosting, side window defogging, and on some vehicles, heating directly to the rear seat area.

The heater and fan assembly blower regulates the airflow from the air inlet for further processing and distribution.

The heater core transfers the heat from the engine coolant to the inlet air.

The temperature door regulates the amount of the air that passes through the heater core. The temperature door also controls the temperature of the air by controlling the mix of the heated air and the ambient air.

The mode door regulates the flow and the distribution of the processed air to the heater ducts and to the defroster ducts.

This console-mounted heating and ventilation panel contains the following:

The Rotary Temperature Control Knob

1. The Rotary Temperature Control Knob
 - Actuates by cable.
 - Raises the temperature of the air entering the vehicle by rotation toward the right, or the red portion of the knob.
2. The Rotary Blower Control Knob
 - Turns ON to operate the blower motor at four speeds.
 - Turns OFF to stop the blower.
 - Operates completely independently both from the mode control that regulates the defroster door and from the temperature control knob.

- Changes the fan speed in any mode and at any temperature setting.
3. The Rotary Mode Control Knob
 - Actuates by cable.
 - Regulates the air distribution between the windshield, the instrument panel, and the floor vents.

Two Push Knobs

1. The Rear Window Defogger Push Knob
 - Controls the rear window defogger.
 - Turns ON the rear window defogger when the push knob is pressed and the indicator lamp is illuminated.
2. The A/C Push Knob (if the vehicle is equipped with air conditioning)
 - Controls the A/C.
 - Turns the A/C ON when the push knob is down. However, if the blower control knob is OFF, the A/C system is OFF, regardless of the position of the A/C knob.

Fresh Air Control Level Or Push Knob

1. The Fresh Air Control Level
 - Operates by cable.
 - Switches between recirculating passenger compartment air and bringing outside air into the passenger compartment.
 - Draws in outside air when the lever is moved to the right.
 - Recirculates inside air when the lever is moved to the left.
2. The Fresh Air Control Push Knob
 - Operates by cable.
 - Switches between recirculating passenger compartment air and bringing outside air into the passenger compartment.
 - Draws in outside air when knob is off.
 - Recirculates inside air when the knob is down with the indicator lamp illuminated.