

## Climate Control System

 **WARNING:** Take the following precautions when repairing an air conditioning system containing R-134a:

- Always wear safety goggles.
- Avoid contact with liquid refrigerant R-134a. R-134a vaporizes at approximately  $-25^{\circ}\text{C}$  ( $-13^{\circ}\text{F}$ ) under atmospheric pressure and will freeze skin tissue.
- Never allow refrigerant R-134a gas to escape in quantity in an occupied space. It will displace the oxygen needed to support life.
- Never use a torch in an atmosphere containing R-134a gas. R-134a is non-toxic at all normal conditions, but it decomposes when exposed to high temperatures such as a torch flame. During decomposition it releases irritating and toxic gasses (as described in the Material Safety Data Sheet from the manufacturer). Decomposition products are hydrofluoric acid, carbon dioxide and water.

Failure to follow these instructions may result in serious personal injury.

**NOTICE:** To avoid damaging the vehicle or air conditioning (A/C) components, the following precautions must be observed.

- The A/C refrigerant of all vehicles must be identified and analyzed prior to refrigerant charging. Failure to do so may contaminate the shop bulk refrigerant and other vehicles.
- Do not add R-12 refrigerant to an A/C system that requires the use of R-134a refrigerant. These 2 types of refrigerant must never be mixed. Doing so may damage the A/C system.
- Charge the A/C system with the engine running only at the low-pressure side to prevent refrigerant slugging from damaging the A/C compressor.
- Use only R-134a refrigerant. Due to environmental concerns, when the air conditioning system is drained, the refrigerant must be collected using refrigerant recovery/recycling equipment. Federal law **REQUIRES** that R-134a be recovered into appropriate recovery equipment and the process be conducted by qualified technicians who have been certified by an approved organization, such as MACS, ASI, etc. The use of a recovery machine dedicated to R-134a is necessary to reduce the possibility of oil and refrigerant incompatibility concerns. Refer to the instructions provided by the equipment manufacturer when removing refrigerant from or charging the air conditioning system.
- Refrigerant R-134a must not be mixed with air for leak testing or used with air for any other purpose above atmospheric pressure. R-134a is combustible when mixed with high concentrations of air and higher pressures.
- A number of manufacturers are producing refrigerant products that are described as direct substitutes for refrigerant R-134a. The use of any unauthorized substitute refrigerant may severely damage the A/C components. If repair is required, use only new or recycled refrigerant R-134a.

**NOTICE:** To avoid contamination of the air conditioning (A/C) system:

- Never open or loosen a connection before recovering the refrigerant.
- When loosening a connection, if any residual pressure is evident, allow it to leak out before opening the fitting.
- Evacuate a system that has been opened to install a new component, or one that has discharged through leakage before charging.
- Seal open fittings with a cap or plug immediately after disconnecting a component from the system.
- Clean the outside of the fittings thoroughly before disconnecting a component from the system.
- Do not remove the sealing caps from a new component until ready to install.
- Refrigerant oil will absorb moisture from the atmosphere if left uncapped. Do not open an oil container until ready to use and install the cap immediately after using. Store the oil in a clean, moisture-free container.
- Install a new O-ring seal before connecting an open fitting. Coat the fitting and O-ring seal with PAG oil before connecting.
- When installing a refrigerant line, avoid sharp bends. Position the line away from the exhaust or any sharp edges that may chafe the line.
- Tighten threaded fittings only to specifications. The steel and aluminum fittings used in the refrigerant system will not tolerate overtightening.
- When disconnecting a fitting, use a wrench on both halves of the fitting to prevent twisting the refrigerant lines or tubes.
- Do not open a refrigerant system or uncap a new component unless it is as close as possible to room temperature. This will prevent condensation from forming inside a component that is cooler than the surrounding air.

The Electronic Manual Temperature Control (EMTC) system heats or cools the vehicle depending on the function and temperature selected.

- The function selected on the climate control assembly determines heating or cooling, air distribution and enables blower motor operation.
- The temperature control setting determines the air temperature.
- The blower motor setting varies the blower motor speed.

The system components are the following:

- A/C compressor
- A/C compressor clutch assembly
- A/C condenser core
- A/C evaporator core
- Suction accumulator
- Connecting refrigerant lines
- A/C evaporator core orifice
- A/C cycling switch
- A/C pressure transducer (4.0L)
- A/C dual function pressure switch (4.6L)
- Heater core and evaporator core housing
- HVAC module
- Blower switch
- Temperature blend door actuator
- Panel/floor door actuator
- Defrost door actuator
- Air inlet door actuator
- Blower motor resistor
- Blower motor

### **Electronic Manual Temperature Control (EMTC) System**

The EMTC system operation is determined by the settings on the climate control assembly. The climate control assembly includes a serviceable blower motor switch.

The blower motor switch:

- sets the blower motor speed.
- directs the blower motor path to ground through the blower motor resistor to allow blower motor operation in LO, MED LO and MED HI.
- directs the blower motor path directly to ground, bypassing the blower motor resistor, to allow blower motor operation in HI.

The A/C request switch:

- can command the A/C compressor ON when the function selector switch is in PANEL, FLOOR/PANEL, FLOOR/DEFROST and FLOOR when the A/C request switch is pressed. Indicator illuminates when A/C request switch is toggled ON.
- can command the A/C compressor OFF in FLOOR/DEFROST if RECIRC is commanded OFF.
- is inoperative in MAX A/C, OFF and DEFROST.
- indicator illuminates when the function selector switch is in MAX A/C and cannot be toggled.
- indicator does not illuminate in OFF and cannot be toggled.
- indicator in FLOOR/DEFROST and DEFROST does not change. The A/C compressor will operate regardless of indicator status if the outside air temperature is above 2°C (35°F).
- is serviced only with the climate control assembly.

The function selector switch:

- selects airflow direction.

- is serviced only with the climate control assembly.

**NOTE:** *Recirculated air only is used when the EMTC mode selector is set in the MAX A/C or OFF modes or if the RECIRC request button is selected in any mode except MAX A/C, OFF or DEFROST.*

The air recirculation button:

- selects either recirculated or outside air source.
- is serviced only with the climate control assembly.

## **System Airflow Description — Electronic Manual Temperature Control (EMTC) System**

### **Max A/C**

When MAX A/C is selected:

- the air inlet door actuator closes off outside air and admits only recirculated air.
- the recirc button is disabled and the indicator is illuminated.
- the defrost door actuator is in the full closed position, directing airflow to the floor/panel door.
- the floor/panel door actuator is in the full panel position, directing airflow to the instrument panel A/C registers. A small amount of airflow from the floor duct will be present.
- blended air temperature is available.
- the A/C request button is illuminated and will be disabled.
- the A/C compressor will operate if the outside temperature is above approximately 2°C (35°F).
- the blower motor is ON.

### **PANEL**

When PANEL is selected:

- the recirc request button is enabled. If the recirc request button is selected (indicator ON), the air inlet door actuator closes off outside air from entering the passenger compartment. If the recirc request button is not selected (indicator OFF), the air inlet door actuator admits only outside air into the passenger compartment.
- the defrost door actuator is in the full closed position, directing airflow to the floor/panel door.
- the floor/panel door actuator is in the full panel position, directing airflow to the instrument panel A/C registers. A small amount of airflow from the floor duct will be present.
- blended air temperature is available.
- the A/C request button is enabled. The A/C compressor will operate and the indicator will illuminate if the A/C request button is selected and the outside temperature is above approximately 2°C (35°F).
- the blower motor is ON.

### **PANEL/FLOOR**

When PANEL/FLOOR is selected:

- the recirc request button is enabled. If the recirc request button is selected (indicator ON), the air inlet door actuator closes off outside air from entering the passenger compartment. If the recirc request button is not selected (indicator OFF), the air inlet door actuator admits only outside air into the passenger compartment.
- the defrost door actuator is in the full closed position, directing airflow to the floor/panel door.
- the floor/panel door actuator is positioned partially between the floor and panel position, directing airflow to the floor duct and the instrument panel A/C registers.
- blended air temperature is available.
- the A/C request button is enabled. The A/C compressor will operate and the indicator will illuminate if the A/C request button is selected and the outside temperature is above approximately 2°C (35°F).
- the blower motor is ON.

## OFF

When OFF is selected:

- the recirc request button is disabled.
- the air inlet door actuator closes off outside air.
- the defrost door actuator is in the full closed position and floor/panel door actuator is in the partially open position.
- the A/C request button is disabled.
- the blower motor is OFF.

## FLOOR

When FLOOR is selected:

- the recirc request button is enabled. If the recirc request button is selected (indicator ON), the air inlet door actuator closes off outside air from entering the passenger compartment. If the recirc request button is not selected (indicator OFF), the air inlet door actuator admits only outside air into the passenger compartment.
- the floor/panel door is in the floor position and the defrost door fully closes, directing airflow to the floor duct. A small amount of airflow from the defrost duct and side demisters will be present.
- blended air temperature is available.
- the A/C request button is enabled. The A/C compressor will operate and the indicator will illuminate if the A/C request button is selected and the outside temperature is above approximately 2°C (35°F).
- the blower motor is ON.

## FLOOR/DEFROST

When the FLOOR/DEFROST is selected:

- the recirc request button is enabled. If the recirc request button is selected (indicator ON), the air inlet door actuator closes off outside air from entering the passenger compartment. If the recirc request button is not selected (indicator OFF), the air inlet door actuator admits only outside air into the passenger compartment.
- the floor/panel door actuator is in the full floor position and the defrost door is partially open, directing airflow to the floor duct, the defroster duct and the side window demisters.
- blended air temperature is available.
- the A/C request button is enabled. The A/C compressor will operate and the indicator will illuminate if the A/C request button is selected and the outside temperature is above approximately 2°C (35°F).
- the blower motor is ON.

## DEFROST

When DEFROST is selected:

- the air inlet door actuator opens, admitting only outside air into the passenger compartment.
- the floor/panel door actuator is in the full floor position.
- the defrost door is in the fully open position, directing airflow to the defroster duct and side window demisters. A small amount of airflow from the floor duct will be present.
- blended air temperature is available.
- the A/C request button will illuminate and is enabled. To reduce fogging, the A/C compressor will operate automatically, regardless of indicator status, if the outside temperature is above approximately 2°C (35°F).
- the blower motor is ON.

