THEORY OF OPERATION

Temperature in the vehicle's forward driver/passenger area is monitored and controlled by a microcomputer which tells the system how to reach and maintain the desired set point temperature by varying fan speed and regulating the vehicle's heat and air conditioning systems. A dash mounted Interior Temperature Sensor is used to measure the ambient temperature in the vehicle's forward driver/passenger area. In order to measure accurately, the sensor must be mounted in a location which best approximates the conditions to which the front seat passengers are exposed, and which is protected from the influence of direct sunlight, or air from ventilation ducts. An aspirator fan inside the sensor housing is used to draw air through the Interior Temperature Sensor housing, pulling air from the entire passenger compartment rather than a localized area.

The operator enters the desired interior (pre-set) temperature by using the Up/Down Buttons on the Control Module (located in the Control Panel). The microcomputer located inside the Power Module compares the ambient temperature with the pre-set temperature and determines whether heating or cooling is required to reach the set point. If cooling is required, the air conditioner is turned on; if heat is required, the heater valve is opened to permit the flow of engine coolant into the vehicle's heater core in order to warm the driver/passenger area. The temperature of the heater core is regulated by varying the duty cycle (ratio of open to closed time) of the heater valve. A Coolant Temperature Threshold Thermostat is located in the body of the heater valve to monitor coolant temperature. This sensor will notify the microcomputer when the coolant has warmed to the point that it is able to supply heat to the passenger compartment. Until heat is available, the microcomputer prevents the fan from blowing thus avoiding occupant discomfort. The fan speed is varied by the microcomputer based on how far away from the set point the ambient compartment temperature is. The ambient temperature is constantly monitored and the fan speed and valve duty cycles are adjusted if the set point is being approached too quickly or slowly. This is an example of the system's "Closed Loop Logic" which means that the microcomputer continuously monitors and adjusts all system parameters to achieve system effectiveness.