

20 Automatic Temperature Control Systems

FIGURE 20.3 The outside air temperature is displayed on the navigation screen on this vehicle and uses the information from the outside air temperature sensor.

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FIGURE 20.4 The airflow from the blower causes airflow to flow past the in-vehicle temperature sensor.

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FIGURE 20.5 Sun load sensors are usually located at the top of the instrument panel.

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FIGURE 20.6 The engine coolant temperature sensor is usually located near the engine thermostat so it can accurately measure the temperature of the coolant.



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FIGURE 20.7 Some automatic HVAC system use the information from the factory navigation system to fine tune the interior temperature and airflow needs based on location and the direction of travel.



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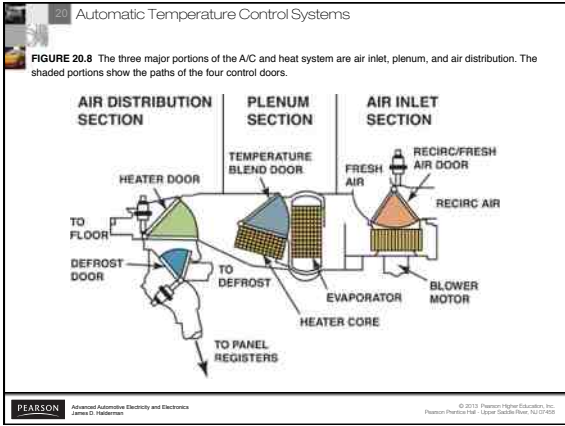
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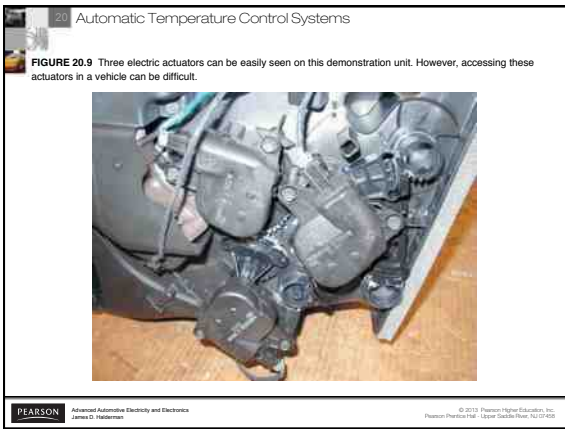
CHART 20.1 Sample refrigerant system pressures and possible causes as shown from the pressure sensors and displayed on a scan tool. Check service information for the exact procedures to follow if the pressures are not correct.

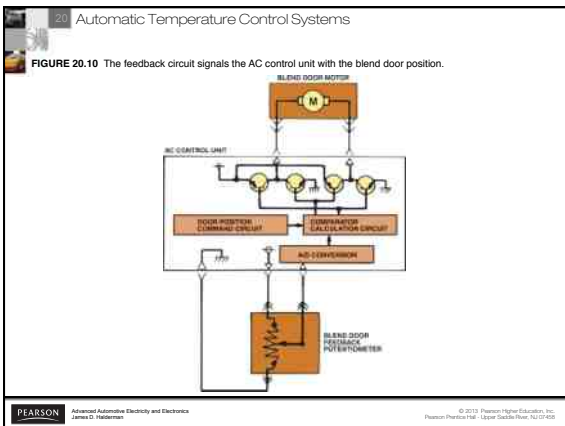
LOW SIDE PRESSURE	HIGH SIDE PRESSURE	CONDITION
25–35 PSI	170–200 PSI	Normal operation
Low	Low	Low refrigerant charge level
Low	High	Restriction in high-side line
High	High	System is overcharged.
High	Low	Restriction in the low-side line

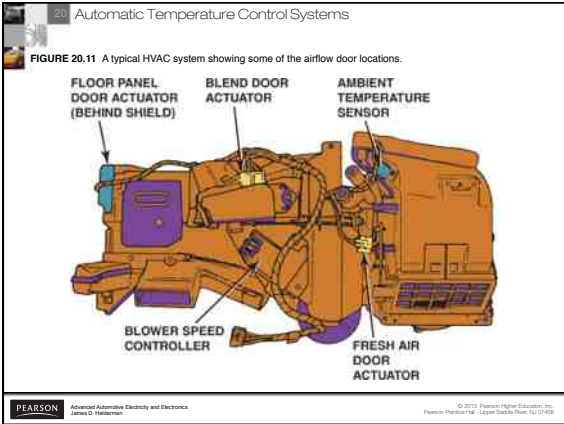
CHART 20-1

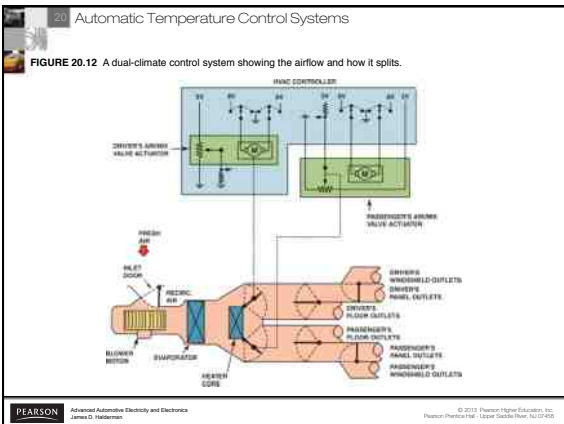
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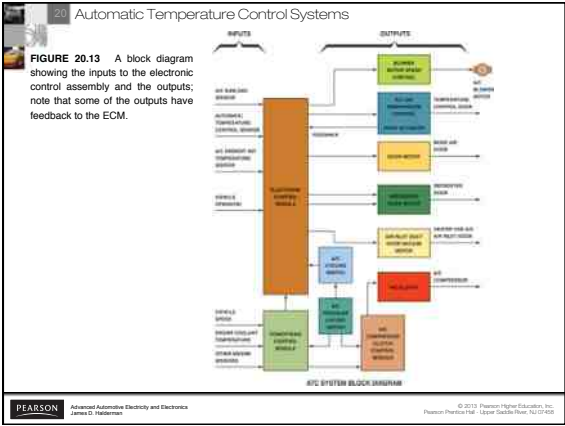
FREQUENTLY ASKED QUESTION

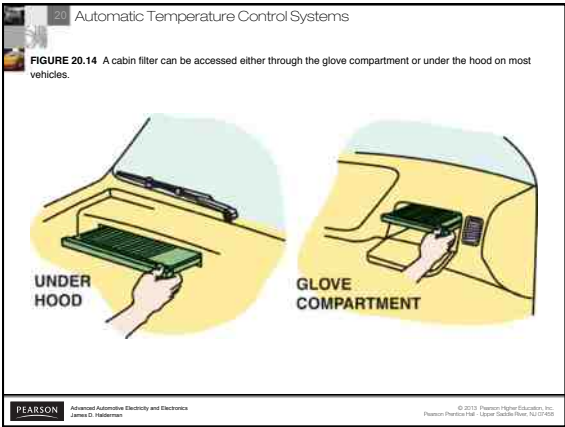
Why is the Blower Speed So High?

This question is often asked by passengers when riding in a vehicle equipped with automatic climate control. The controller does command a high blower speed if:

- The outside temperature is low and the engine coolant temperature is hot enough to provide heat. The high blower speed is used to warm the passenger compartment as quickly as possible. Then when the temperature has reached the preset level, then the blower speed is reduced to maintain the preset temperature.
- The outside temperature is hot and the air conditioning compressor is working to provide cooling. The high speed blower is used to circulate air through the evaporator in an attempt to cool the passenger compartment as quickly as possible. Once the temperature reaches close to the preset temperature, the blower speed is reduced to keep the temperature steady.

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REAL WORLD FIX

Cabin Filter Fault

The owner of a 2008 Ford Escape complained that the air conditioning system was not cooling the inside of the vehicle and there seemed to be no airflow from the dash vents yet the blower motor could be heard running. A quick visual inspection of the cabin air with access under the hood showed that the cabin filter was almost completely blocked with paper, leaves, and debris. The vehicle had almost 80,000 miles on the odometer and the way it looked, the air filter had never been replaced. Most vehicle manufacturers recommend replacement of the cabin air filter about every three years or every 36,000 miles. Replacing the cabin air filter restored proper operation of the A/C system.

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FIGURE 20.15 A TECH 2 scan tool is the factory scan tool used on General Motors vehicles.



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FIGURE 20.16 An OTC GeniSys being used to troubleshoot a vehicle. This scan tool can be used on most makes and models of vehicles and is capable of diagnosing other computer systems in the vehicles such as the automatic temperature control system as well as the antilock braking system (ABS) and airbag systems.



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CHART 20.3 Typical sensors and values that may be displayed on a scan tool. Check service information for the exact specifications for the vehicle being serviced.

SENSOR	TYPICAL VALUE
Inside air temperature sensor	-40°F to 120°F (-40°C to 49°C)
Ambient air temperature sensor	-40°F to 120°F (-40°C to 49°C)
Engine coolant temperature (ECT) sensor	40°F to 250°F (-40°C to 121°C)
Sun load Sensor	0.3 volts (dark) 3.0 volts (bright)
Evaporator temperature sensor	Usually 34°F to 44°F (1°C to 7°C)
Relative Humidity sensor	0% to 100%

CHART 20-3

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