

Section 5 Topics

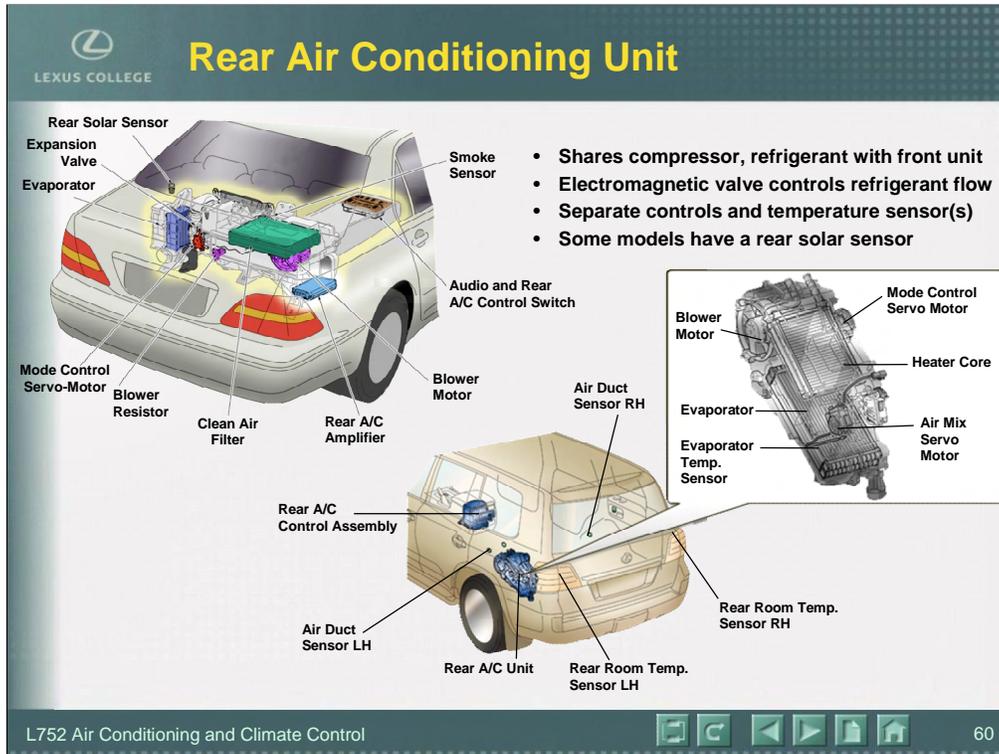
Additional Heating and Cooling Systems

- Rear Air Conditioning [Presentation](#)
- Cool Box [Presentation](#)
- Climate Control Seats [Presentation](#)

Presentation/Discussion Classroom Activity Shop Activity

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- Section Overview**
- Rear Air Conditioning
 - Air Quality Control
 - Cool Box
 - Climate Control Seat
 - Components
 - Operation
 - Model Differences
 - Diagnosis



Rear Air Conditioning Unit

Some Lexus vehicles have a separate rear air conditioning system to provide additional temperature control for rear passengers. The rear A/C unit is located behind the rear seat in sedan models, or behind an interior side trim panel in sport utility vehicles.

The A/C compressor supplies refrigerant to a separate expansion valve and evaporator in the rear unit. Therefore the rear A/C can only cool when the front A/C is ON. An electrically operated magnetic valve controls the flow of refrigerant to the rear A/C.

The rear unit also has its own controls, and one or more rear temperature sensors. It may also include a rear solar sensor mounted on the package tray.

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Cool Box Provides In-Vehicle Cold Storage



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Cool Box A cool box provides cold storage in some Lexus vehicles. Earlier models have a compartment in the rear console that is cooled by cold air output from the rear A/C.

Later models use refrigerant from the front A/C system and a separate expansion valve to circulate chilled refrigerant in the lines surrounding a compartment in the front console.

In some vehicles, a magnetic valve alternates refrigerant flow between the front expansion valve and the cool box expansion valve.

A later design uses a continuous flow to both expansion valves, and recycles the warmed refrigerant from the cool box through an ejector that re-cools it before entering the evaporator.

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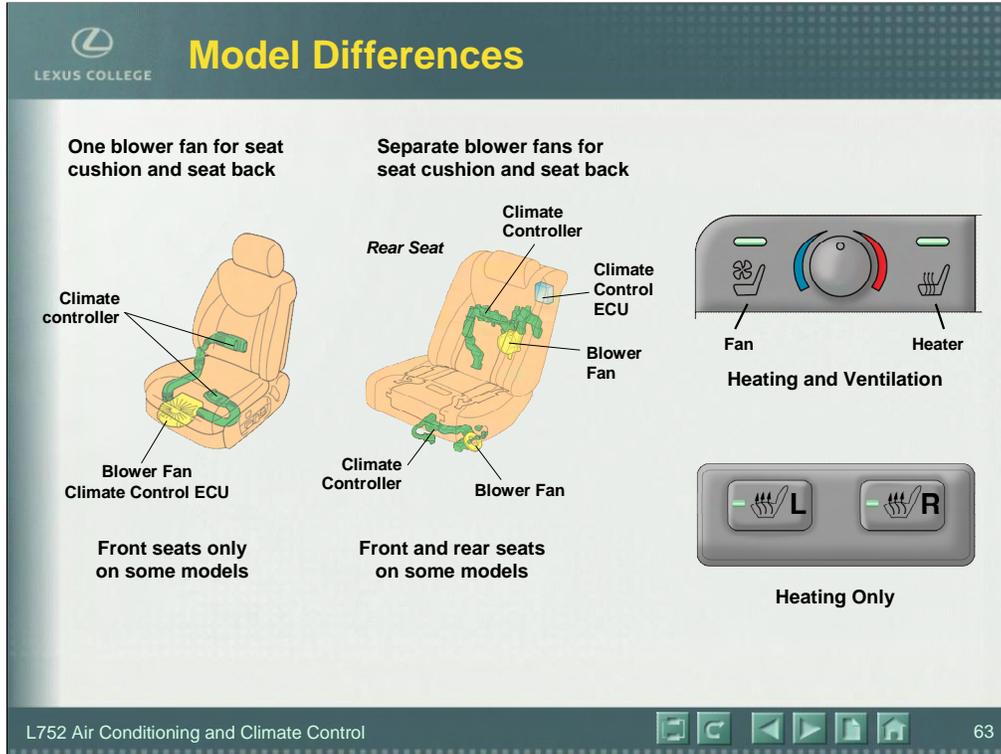
Peltier Element

- Heats or cools depending on direction of electrical current
- Also called a Thermo Electric Device (TED)

The diagram shows a cross-section of a seat ventilation system. At the bottom, a fan draws air upwards through a heat exchanger. The air then passes through a Peltier element. Red arrows indicate air being heated and directed 'To seat cushion or seat back'. Blue arrows indicate air being cooled and labeled 'Discharge air'.

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Peltier Element The Peltier element is a semi-conductor material that transfers heat from one side to the other when direct current is applied to it. This feature cools one side of the Peltier element and heats the other side. When the current is reversed, the direction of heat transfer is also reversed. In addition, varying the voltage changes the amount of heat exchange, and thus the temperature. In the Repair Manual, the Peltier element is referred to as a Thermo Electric Device (TED).



Differences in Climate Control Seat Systems

The first climate control seat system provided only electric heating, and was offered only for the driver and front passenger seats. Then seat heaters also became available for rear seats.

Fans were added next to improve seat warming, and to also offer non-heated seat ventilation to provide a limited cooling effect.

With the introduction of the TED, it then became possible to actually provide seat cooling. These systems were first offered on front seats only, then later became available for rear seats, as well.

You will find all of these various combinations of seat heating, ventilation, and cooling in a variety of Lexus models.

Blinking Light Diagnosis

Item	Description
Control switch indicator blinks a pattern	System failure: malfunction is detected
Failure Patterns: Pattern 1 	Excessive current in seat climate controller or fan motor
Pattern 2 	Open/short in climate control switch
Pattern 3 	Open/short in thermistor circuit (temperature sensor)
Pattern 4 	Open/short in climate control circuit
No indication	Climate control seat does not operate: <ul style="list-style-type: none"> • Excessive temperature • Temperature rises when set to cool • Voltage drops below 8 volts

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Blinking Light Diagnosis

On some Lexus models, DTCs cannot be retrieved with Techstream. When a failure condition is detected by the Climate Control ECU, it enters fail-safe mode and causes the indicator light on the climate control switch to begin blinking in a specific pattern.

The Repair Manual describes the blinking patterns and their meanings, as well as specific troubleshooting steps to take in each case.