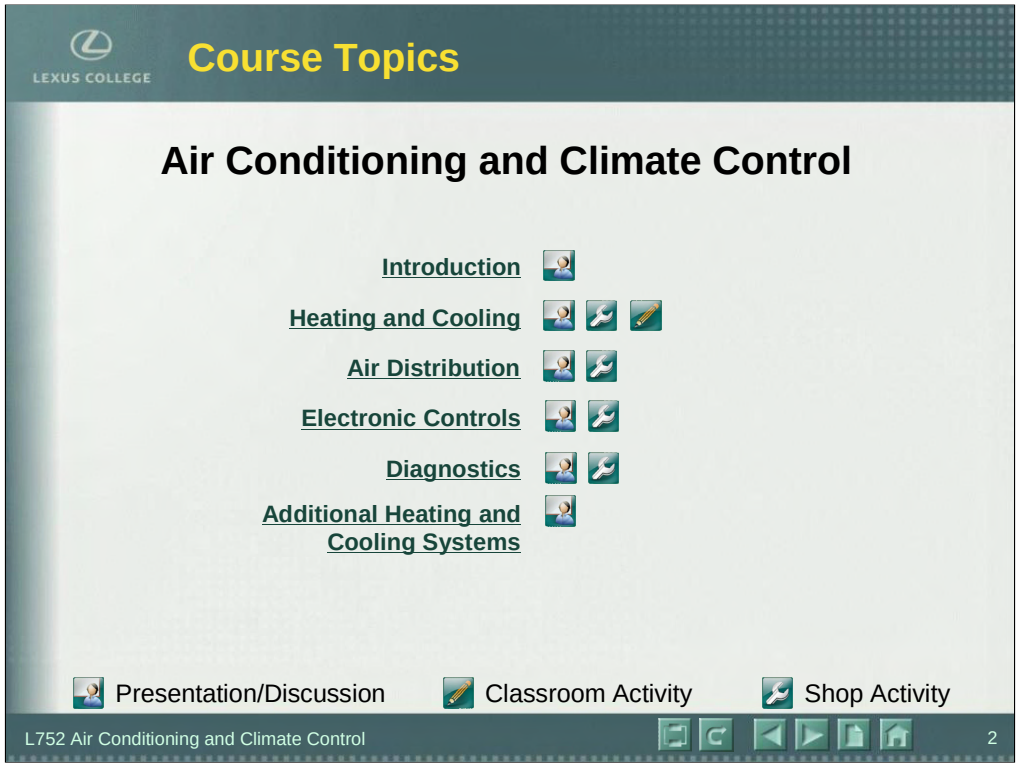


Course Overview

Introduction

Typical A/C Problems, Overview, Safety

Heating and Cooling Systems

Heating, Cooling, Normal System Operation, Refrigerant Recovery, Symptoms of Improper Charge, Compressor Clutch Replacement

Air Distribution Systems

Air Flow, Air Flow Dampers

Electronic Control Systems

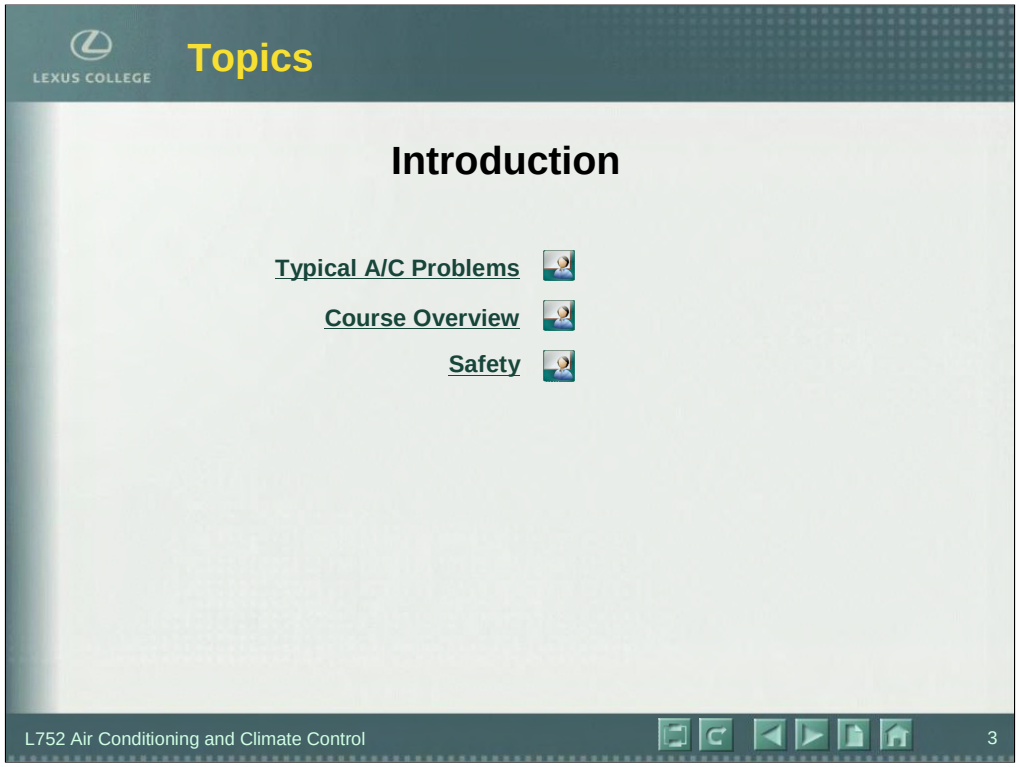
Inputs (Sensors), Outputs (Actuators)

Diagnostics

6-Step Diagnostic Process, Customizable Settings, Check Mode Procedure, DTCs, Repairs

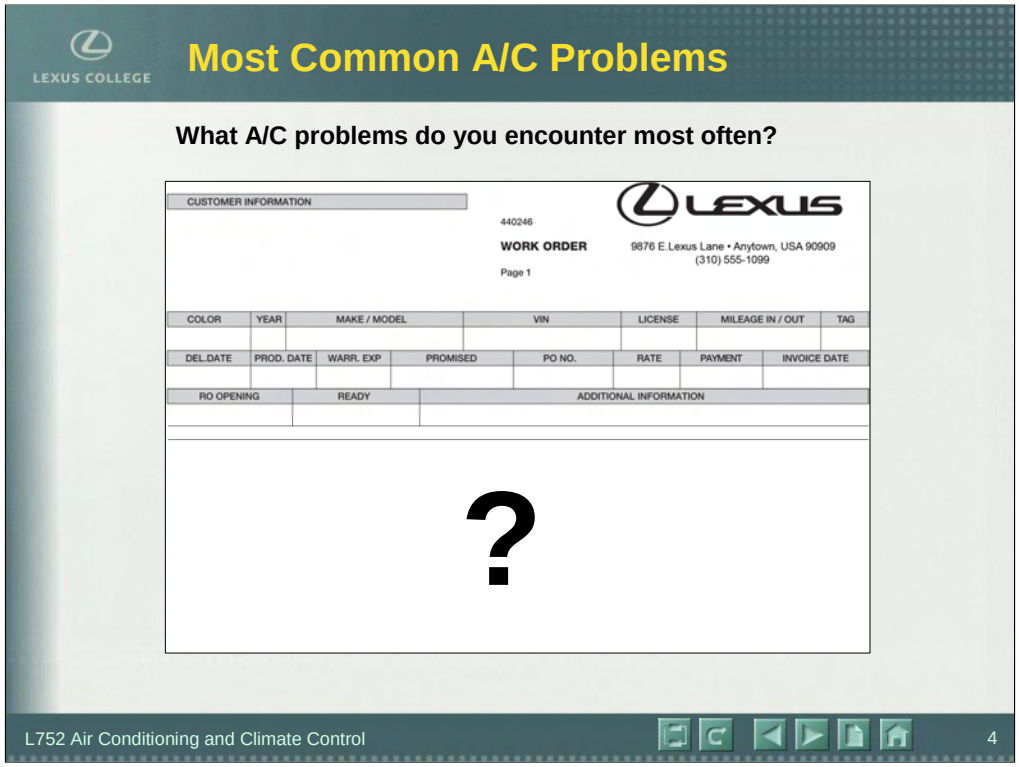
Additional Heating and Cooling Systems

Rear A/C, Cool Box, Climate Control Seats



Section Overview

- Typical A/C Problems
- Course Overview
- Safety



Typical A/C Problems

If you've had experience servicing air conditioning systems, you've probably encountered a variety of customer concerns.

What A/C problems do you encounter most often?

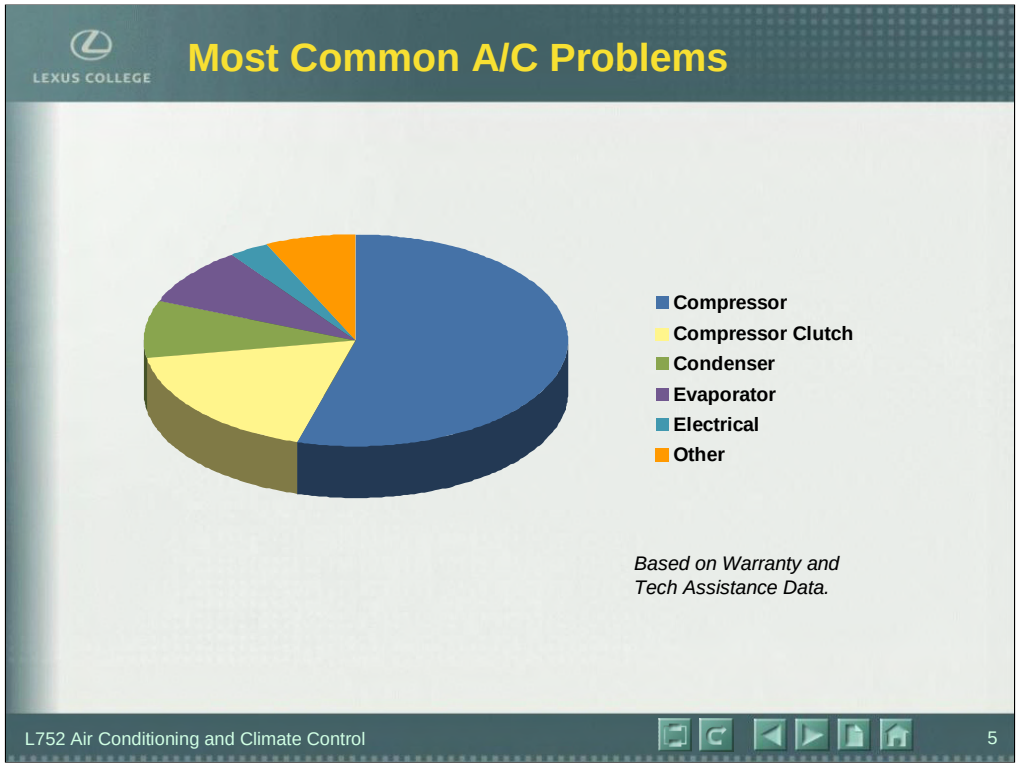
_____

_____

_____

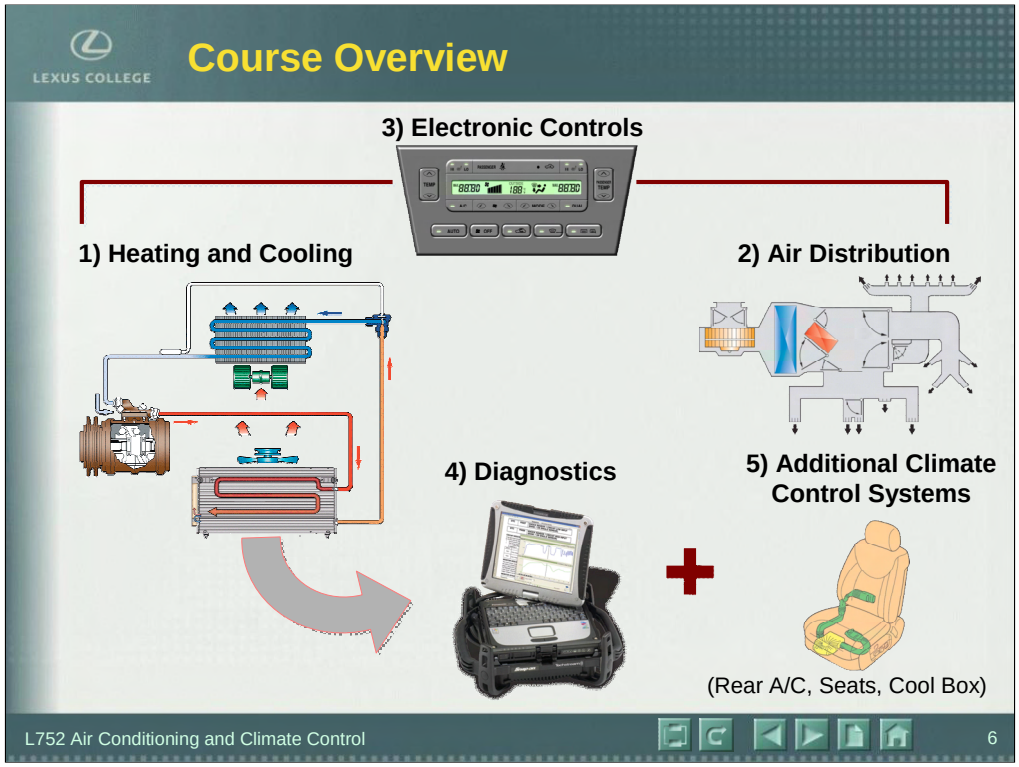
To provide exceptional interior comfort, climate control systems are becoming increasingly complex. In some cases, a customer's concern can be resolved simply by showing the customer how to adjust the controls to obtain the desired comfort settings.

In many cases, however, the concern results from a component not working properly, a leak, or an electrical problem.



Most Common Sources of Problems

Based on warranty data and technical assistance calls, compressor and compressor clutch problems make up the vast majority of air conditioning issues.



Course Overview

This course builds on your understanding of Lexus air conditioning and climate control systems by starting with the most basic heating and cooling components, then adding other systems and concepts one at a time. The course has five sections:

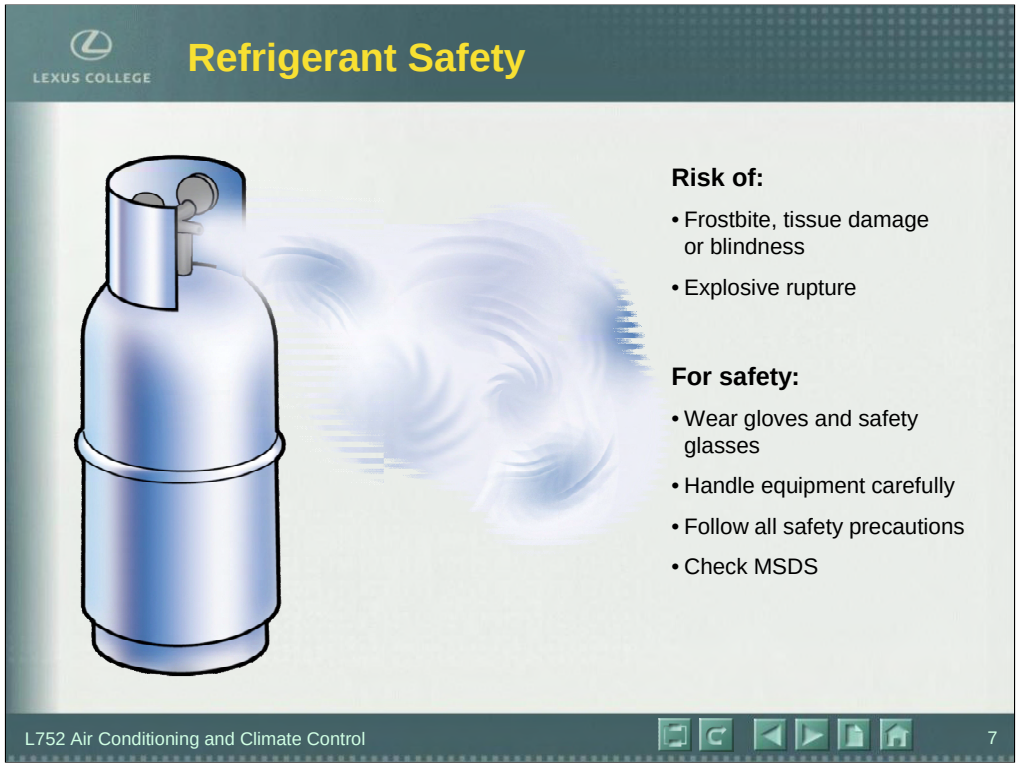
Heating and Cooling. We begin with a brief description of a simple heating system. Then we describe the refrigerant cycle and the basic components of a cooling system.

Air Distribution. On top of the basic heating and cooling system components, we add the components involved in air distribution such as blower motors, dampers, and distribution controls.

Electronic Controls. Building on a manual heating, cooling, and air distribution system, we add electronic controls. These automatic air conditioning systems use sensors, ECUs, and actuators to provide maximum passenger comfort.

Diagnostics. With an understanding of how all the components work, you'll next learn the techniques for quickly and accurately identifying the causes of system malfunctions and the correct repairs.

Additional Climate Control Systems. In addition to the typical electronically controlled heating and air conditioning system, many Lexus vehicles also have a rear air conditioning unit, climate controlled seats, and a refrigerated cool box for snacks and drinks. You'll learn how these systems are integrated with the overall vehicle climate control systems.



General Safety

Servicing any automotive system requires attention to safety. Always carefully follow general safety guidelines regarding SRS airbags, hybrid vehicle high-voltage circuits, and other precautions as described in the Repair Manuals.

Refrigerant Safety

Servicing air conditioning systems poses unique safety risks from:

- Contact with escaping refrigerant
- High pressure gas cylinders

Contact with Escaping Refrigerant. Under pressure, refrigerant is a liquid. When the pressure is released, it changes to a gas. That change absorbs heat, which is why it is used for cooling systems. But escaping refrigerant can also instantly freeze anything it comes in contact with.

When escaping refrigerant comes into contact with skin, it can cause frostbite and tissue damage. If it comes into contact with the eyes, it can cause blindness. For personal safety, wear gloves and safety glasses when servicing refrigerant systems.

High Pressure Gas Cylinders. Exposure to heat can cause gas pressure to rise to an unsafe level resulting in a cylinder or hose rupture with obvious potential harm. Damage to cylinders or hoses can weaken them to the point of failure under normal pressures. Protect high-pressure components from heat or damage that can lead to a dangerous rupture.