



AUTOMOTIVE A/C DIAGNOSIS AND SERVICE

Course Length

2.0 hours – 4.0 hours

Course Description

This course will teach learners the procedures for servicing automotive air conditioning systems. Users will learn the logical steps in automotive A/C troubleshooting, how to perform refrigerant-related and component-related service procedures, as well as learning about retrofitting existing R-12 A/C systems and other A/C upgrades.

Course Topics

Basics of A/C Service

- ◆ Logical troubleshooting of the A/C system
- ◆ Common A/C complaints
- ◆ Visual inspection of the A/C system
- ◆ Sight glass diagnosis
- ◆ Performance testing

Refrigerant-Related Service

- ◆ Refrigerant handling and safety
- ◆ Refrigerant analysis
- ◆ Refrigerant recovery and recycling
- ◆ System evacuation and charging

Component-Related Service

- ◆ Compressor and clutch service
- ◆ Evaporator and condenser service
- ◆ Service of other A/C components
- ◆ Control systems service

Retrofitting and Upgrades

- ◆ Need for retrofitting and upgrades
- ◆ General retrofit procedure

Course Objectives

In this course, users will learn to:

- ◆ Explain the preliminary inspections for A/C diagnosis and servicing
- ◆ Describe the procedure and safety precautions for handling refrigerants and lubricants
- ◆ Describe the procedures for system discharging, refrigerant recovery, and refrigerant recycling
- ◆ Describe the procedures for evacuation, charging, and system flushing

- ◆ Describe the procedures to diagnose and service various A/C components
- ◆ Describe the procedures to service the pressure relief devices and service valves
- ◆ Describe the procedures to service the A/C control system
- ◆ Explain the need for retrofitting and upgrades
- ◆ Explain the general retrofit procedure

Automotive A/C Diagnosis and Service


Automotive A/C Diagnosis and Service | GLOSSARY | RESOURCES | HELP | EXIT | 26 of 77

Compressor and Clutch Service | **Burnishing**

Burnishing helps to seat the opposing friction surface and provide higher clutch torque capability. Burnishing is a simple procedure.

Burnishing Procedure

- 1 After a new clutch has been installed, set the HVAC control head to RECIRC.
- 2 Set the blower to HIGH.
- 3 Set the engine speed at 1500-2000 RPM.
- 4 Cycle the A/C clutch approximately 20 times (5 seconds ON, then 5 seconds OFF).



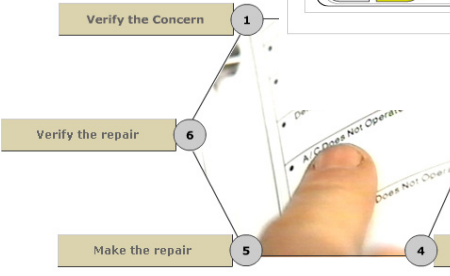
Automotive A/C Diagnosis and Service

Introduction to A/C Diagnostics | **A/C Logical Troubleshooting**

Logical troubleshooting helps you get to the root of an A/C customer's time and money. Click each step in the logical troubleshooting process.

The 6 Steps in Logical Troubleshooting

- 1 Verify the Concern
- 2 Diagnose the Problem
- 3 Determine the Cause
- 4 Determine the Repair
- 5 Make the repair
- 6 Verify the repair



Automotive A/C Diagnosis and Service | GLOSSARY | RESOURCES | HELP | EXIT | 30 of 37

A/C Inspections and Tests | **Evaluating Manifold Gauge Readings**


When manifold gauges do not read the specified pressures, there is a system malfunction. More than one problem may be associated with a particular gauge reading. Some abnormal readings and possible causes are given below. Click each number to learn about a condition, its diagnosis and remedy.

Evaluating Manifold Gauge Readings

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Low-Side Low and High Side Low

Condition 1	
Low Side	Low pressure
High Side	Low pressure
Evaporator Discharge Air	Only slightly cool
Sight Glass	Constant stream of bubbles
Diagnosis	Low refrigerant charge, possible leaks
Remedy	Locate leaks. Discharge system and repair leaks. Recharge.



Slide 1 of 1 | previous | next

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