LEVEL F

Air Conditioning Fundamentals

TC070-05-01S

SG

Mazda Motor Corporation
Technical Service Training

Masters

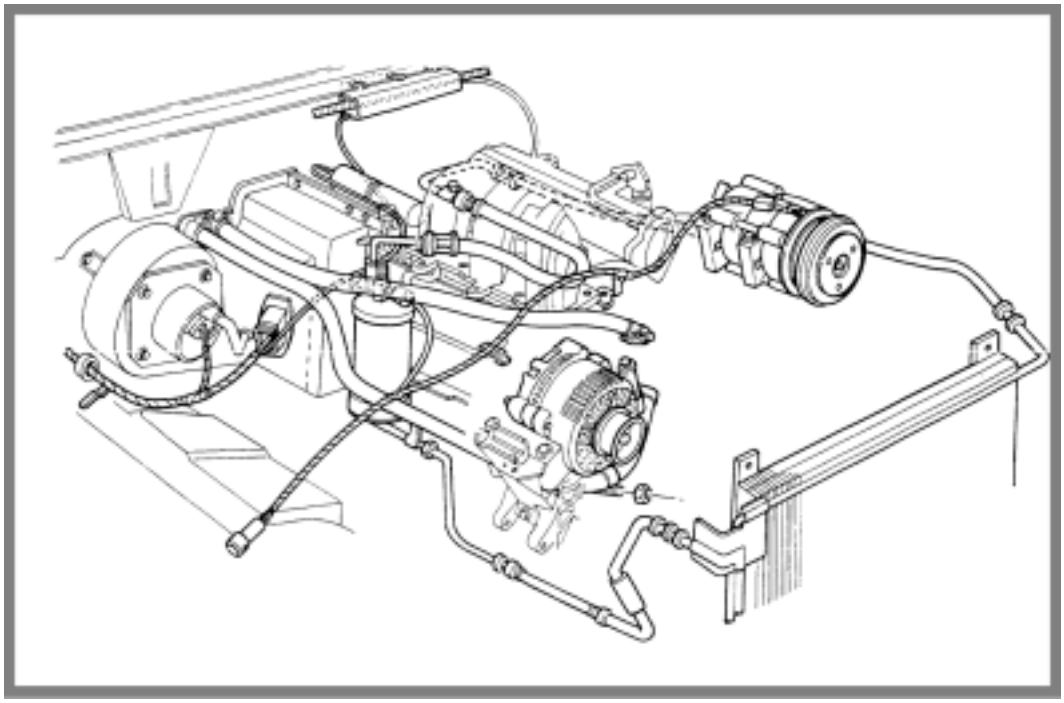
CONTENTS

CONTENTS

CONTENTS

CONTENTS

1 – INTRODUCTION



COURSE OVERVIEW

Welcome to the Mazda self-study guide, *Air Conditioning Fundamentals*. Before you begin, please read the following information.

Audience and Purpose

This guide is designed for entry-level automotive technicians. It introduces the basic principles of air conditioning (A/C) operation and describes major A/C components.

The guide assumes that you have little or no knowledge about automotive A/C operation. Mazda requires the information covered in this guide for more advanced A/C courses.

1 – INTRODUCTION

Course Content and Objectives

In addition to this Introduction (Section 1), this guide includes 9 major sections and a glossary. The objectives for each section follow:

Section 2 — What is Air Conditioning?

- Describe the purpose of automotive air conditioning.
- Describe how various A/C system components contribute to passenger comfort.

Section 3 — Air Conditioning Terms and Concepts

- Define basic terms and concepts related to air conditioning systems.

Section 4 — Principles of Refrigeration

- Describe the following basic principles of refrigeration systems:
  - Heat transfer
  - Relationship of temperature to mass
  - Latent heat of vaporization
  - Latent heat of condensation
  - Relationship of pressure to boiling point
  - Properties of compressed vapor

Section 5 — Manual Air Conditioning Components

- Identify and describe the function of the following A/C components:
  - Compressor
  - Condenser
  - Receiver/Dryer
  - Expansion Valve
  - Evaporator

1 – INTRODUCTION

Section 6 — Refrigeration Cycle

- Describe the changes that take place in refrigerant as it flows through the A/C system.
- Explain the role that each major A/C component plays in the refrigeration cycle.

Section 7 — Refrigerants

- Describe the chemical structure and properties of R-12 refrigerant.
- Describe the chemical structure and properties of R-134a refrigerant.
- Describe the differences between R-12 and R-134a.
- Define recycled, reclaimed, and extracted refrigerant.
- Follow safe procedures for storing recycled refrigerant.
- Describe the two approaches for retrofitting older A/C systems.
- Follow safety procedures and rules when working with A/C systems.

Section 8 — Air Conditioning Lubricants

- Explain the purpose of refrigeration lubrication.
- Identify the differences between mineral oil and PAG oil.
- Describe the characteristics of refrigeration oil.
- Explain why you must add oil to an A/C system when you replace components.

Section 9 — Air Discharge Management

- Describe how the following components direct air flow through the heating and A/C system:

  - Fresh/re-circulated air door
  - Blower fan
  - Temperature blend door
  - Defroster door
  - Vent/face and heater doors

1 – INTRODUCTION

Section 10 — Servicing A/C Systems

- Use a manifold gauge.
- Recover refrigerant.
- Evacuate an A/C system.
- Test for leaks.
- Charge an A/C system using liquid or vapor refrigerant.

Section 11 — Glossary

- Define terms used throughout this guide.