OBJECTIVES

• Locate and interpret vehicle and part identification numbers and labels.
• Locate vehicle service information from a variety of sources.
• Identify the strength and grades of various threaded fasteners.
• Identify the various kinds of hand tools and their uses.

OBJECTIVES

• Identify the various kinds of automotive tools and their uses.
• Describe personal protective equipment and safety precautions to be used when working on automobiles.
VEHICLE IDENTIFICATION

- Make, Model, And Year
- Vehicle Identification Number
  - VIN
- Vehicle Safety Certification Label
- VECI Label
- Calibration Codes
- Casting Numbers

SERVICE INFORMATION

- Included in most service manuals are the following:
  - Capacities and recommended specifications for all fluids
  - Specifications including engine and routine maintenance items
  - Testing procedures
  - Service procedures including the use of special tools when needed

SERVICE INFORMATION

- Electronic service information is available mostly by subscription
  - Provides access to an Internet site where service manual-type information is available.
- Technical service bulletins, often abbreviated TSB, sometimes called technical service information bulletins (TSIB)
SERVICE INFORMATION

- Issued by the vehicle manufacturer to notify service technicians of a problem and include the necessary corrective action.
- The Internet has opened the field for information exchange and access to technical advice.
- One of the most useful websites is the International Automotive Technician’s Network at www.iatn.net.

SERVICE INFORMATION

- A recall or campaign is issued by a vehicle manufacturer and a notice is sent to all owners in the event of a safety-related fault or concern.
- While these faults may be repaired by shops, it is generally handled by a local dealer.

THREADED FASTENERS

- Bolts and threads
- Fractional bolts
- Metric bolts
- Grades of bolts
- Tensile Strength of Fasteners
- Nuts
- Washers
HAND TOOLS

- Wrenches are used to grasp and rotate threaded fasteners
- A socket fits over the fastener and grips the points and/or flats of the bolt or nut
- A ratchet turns the socket in only one direction and allows the rotating of the ratchet handle back and forth in a narrow space

HAND TOOLS

- Torque wrenches are socket turning handles that apply a known amount of force to the fastener
- Always use the proper type and size screwdriver that matches the fastener
- Hammers and Mallets: used to force objects together or apart

HAND TOOLS

- A pliers is capable of holding, twisting, bending, and cutting objects and is an extremely useful classification of tools
- Files are used to smooth metal and are constructed of hardened steel with diagonal rows of teeth
- Snips: cutters used for a variety of material to fabricate sheet metal brackets or heat shields
HAND TOOLS

- Utility Knife: used to cut a variety of materials such as carpet, plastic, wood, and paper products, such as cardboard
- Punches: used to drive a pin out that is used to retain two components
- Chisels: used for cutting off rivets or to separate two pieces of an assembly

HAND TOOLS

- Hacksaws: used to cut metals, such as steel, aluminum, brass, or copper
  - Move the hacksaw slowly away from you, then lift slightly and return for another cut

ELECTRICAL WORK HAND TOOLS

- A test light is used to test for electricity
- Electric Soldering Guns
  - Usually powered by 110 volt AC and often has two power settings expressed in watts
- Electrical Work Hand Tools
- A digital meter is a necessary tool for electrical diagnosis and troubleshooting.
HAND TOOL MAINTENANCE

• Clean each tool before placing it back into the tool box.
• Keep tools separated.
• Line the drawers of the tool box with a material that will prevent the tools from moving with drawers opening.
• Release the tension on all “clicker-type” torque wrenches.
• Keep the tool box secure.

TROUBLE LIGHTS

• Incandescent
• Fluorescent
• LED Trouble Light

AIR AND ELECTRICALLY OPERATED TOOLS

• Impact Wrench
• Air Ratchet
• Die Grinder
• Bench-mounted Or Pedestal-mounted Grinder
PROTECTIVE EQUIPMENT AND VEHICLE PROTECTION

- Safety Glasses
- Steel-toed Safety Shoes
- Bump Cap
- Hearing Protection
- Gloves
- Fender Covers
- Interior Protection

FIGURE 1–61 Safety glasses should be worn at all times when working on or around any vehicle or servicing any component.

HOISTING A VEHICLE

- Center vehicle on the lift or hoist.
- The pads of the lift should be spread as far apart as possible to provide a stable platform.
- Each pad should be placed under a portion of the vehicle that is strong and capable of supporting the weight of the vehicle.

FLOOR JACKS

- Description
  - Floor jacks are used to lift one side or end of a vehicle. They are portable and relatively inexpensive and must be used with safety (jack) stands.
- Operating Principles
- Safe Use of a Floor Jack
  - Drive-on ramps
OTHER SAFETY

• Electrical Cord Safety
• Jump Starting and Battery Safety
• Fire Extinguishers
• Fire Blankets
• First Aid and Eye Wash Stations
• Hybrid Electric Vehicle Safety Issues

SUMMARY

• Whenever a vehicle is raised above the ground, it must be supported at a substantial section of the body or frame
• Wrenches: open end, box end, and combination open and box end
• Sockets are rotated by a ratchet or breaker bar, also called a flex handle

SUMMARY

• Sockets are rotated by a ratchet or breaker bar, also called a flex handle
• Hybrid electric vehicles should be de-powered if any of the high-voltage components are going to be serviced
• Screwdriver types include straight blade, Phillips, and Torx
• Hammers and mallets come in a variety of sizes and weights
SUMMARY

- Pliers are a useful tool and are available in many different types
- Torque wrenches measure the amount of torque applied to a fastener
- Other common hand tools include snap-ring pliers, files, cutters, punches, chisels, and hacksaws