

# Preparation

## Safety Practices

Throughout this course and during normal A/C service procedures, there is a possibility for dangerous contact with moving parts, pressurized gases, high current electrical circuits and accidental deployment of the supplemental restraint system (“airbags”). Consider the potential hazards involved and use the following safe working practices.

## Compressed Gases

Pressurized gases are present in vehicle air-conditioning systems, recovery/recycling equipment and even manifold test gauges. All pressurized gases exhibit two characteristics that can be hazardous:

1. When heated, internal pressure increases (rises).
2. When pressure is suddenly released, the temperature of the gas decreases (drops).

These properties of a compressed gas can be hazardous in two ways:

1. If heat is applied to a pressurized system (bright sunlight, lack of ventilation, use of steam cleaner or welder, etc.), system pressure can quickly increase beyond a safe limit. This could result in an explosion with the danger of injury from flying metal fragments.
2. If refrigerant gas rapidly escapes, there is a danger of frostbite. Frostbite is a serious injury that results in tissue damage caused by localized freezing and requires medical attention. Since the eyes are made of delicate tissue, they can be damaged by direct contact with even a small amount of escaping refrigerant. Always wear safety goggles when working with refrigerant.

### *Risk of Frostbite*

*Warning: Refrigerant is a compressed gas and can burn skin or eyes.*



Fig. 1-1  
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## Electrical Circuits

The low voltages used in vehicles generally pose little risk of electrical shock. However, many repairs require using equipment powered by 120 volts with high current. Accidental short circuits can damage components or test equipment. Touching a wire that is shorted to ground can burn you. Observe the following to reduce the risk of personal injury:

1. Verify all 120-volt equipment line cords are in good condition and properly grounded.
2. Before making resistance measurements with an ohmmeter, first confirm the circuit source voltage is OFF by testing the circuit with a meter set to measure voltage.
3. When bypassing components to test a circuit, use a fused jumper wire to protect against accidental short circuits.

## SRS/Airbag Systems

The **Supplemental Restraint Systems (SRS)** are designed to deploy only in response to a significant frontal or side impact. To prevent accidental deployment, disconnect the ground (negative) cable from the battery and wait for up to 60 seconds before performing any repairs which involve disconnecting any SRS wiring. SRS-related circuits are identified by bright yellow wire harnesses and connectors.

Before disconnecting the battery cable, make a note of the radio presets, Auto A/C panel settings and the display of any system fault codes.

### *Precautions for Airbags*

- Read all precautions in the Repair Manual prior to work.



Fig. 1-2  
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## Tools and Equipment

Accurate diagnosis and efficient repair depend on using the correct tools and information. In addition to *Vehicle Repair Manuals*, *Electrical Wiring Diagrams*, *Technical Service Bulletins* and a standard technician's tool set, the following Special Service Tools and other equipment may be needed:

| Recommended Tools (or equivalent)                                  | Part Number |
|--------------------------------------------------------------------|-------------|
| A/C Recovery/Charge Station                                        |             |
| Refrigerant Identifier                                             |             |
| Refrigerant Leak Detector                                          |             |
| Thermometer Dial Type — 0–220 degrees F                            |             |
| DVOM Meter                                                         |             |
| Dial Indicator with Magnetic Base                                  |             |
| Cooling System Pressure Tester                                     |             |
| Condenser Fin Straightener                                         |             |
| R-134a Valve Core Removers                                         |             |
| Magnetic Clutch Remover (SST)                                      | 07112-66040 |
| Magnetic Clutch Stopper (SST)                                      | 07112-76060 |
| A/C Quick Joint Puller #1 Suction Tube (SST)                       | 09870-00015 |
| A/C Quick Joint Puller #2 Liquid Tube (SST)                        | 09870-00025 |
| Toyota/Lexus Diagnostic Tester<br>(SST Hand Held Tester/SCAN Tool) | 01001270    |
| Belt Tension Gauge (SST) 09216-00021                               |             |
| Eye Protection Goggles/Safety Glasses with Side Panels             |             |
| Rubbers gloves                                                     |             |



## Notes