Modern Automotive Technology
Chapter 5
The Auto Shop and Safety
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- Describe the typical layout of an auto shop
- List the type of accidents that can happen in an auto shop
- Explain how to prevent accidents in the auto shop
- Describe the rules and regulations of the auto shop
Safety Rules

- Wear eye protection during any operation that could endanger your eyes
- Avoid anyone who does not take shop work seriously
- Keep your shop and work area clean & organized
- Dress in an appropriate manner
- Never carry sharp tools or parts in your pockets
- Wear full face protection when grinding, welding, or performing other hazardous operations
- Work like a professional
- Use the right tool for the job
1. The FRONT END RACK is a specialized stall used to work on a vehicle's steering and suspension system.

2. ASPHYXIATION is caused by breathing toxic or poisonous substances.
Alignment Rack

Specialized stall used when working on steering and suspension systems
Asphyxiation

Place an exhaust hose over the tailpipe of any car running in an enclosed shop.
3. PHYSICAL INJURIES can result from hundreds of different accidents.

4. Using an improperly grounded electric power tool can result in an ELECTRICAL SHOCK!
Potential Dangers

Just a few of the dangers present around an automobile
Electric Shock

- Result of electric current passing through parts of your body, causing injury or death
- Can occur when using improperly grounded electric power tools
- Never use an electric tool unless it has a third round prong on the plug socket
- Never use an electric tool on a wet shop floor
5. The result of a hot wire touching ground (vehicle frame or body) will be an ELECTRICAL FIRE!

6. CHEMICAL BURNS can be caused by solvents, battery acid, and other shop substances.
Electrical Fires

- Result when a current carrying wire touches ground
- Wire can heat up, melt the insulation, and burn
- Other wires can then do the same
- To prevent electrical fires, always disconnect the battery when instructed to do so in a service manual
Chemical Burns

Protective gear for preventing chemical burns
7. A SHOP STALL is an area where a vehicle can be pulled into the shop for repairs.

8. GASOLINE has the potential for causing tremendous fires.
Shop Stall

Work area where a car can be parked for repairs
Sometimes stalls are numbered and marked off with safety lines painted on the floor
Gasoline Safety Rules

- Wipe up gasoline spills immediately
- Keep any source of heat away from fuel system parts
- Never use gasoline as a cleaning solvent
- Store gasoline and other flammables in approved, sealed containers
- When disconnecting a fuel line or hose, wrap a shop rag around the fitting
- Disconnect the battery before working on a fuel system
9. OILY RAGS should be stored in an approved safety container to prevent fires.

10. When hydrogen gas surrounds the top of a battery being charged or discharged, the battery can EXPLODE!
Explosions

- Rapid, almost instant, combustion of a material that causes a powerful shock wave to travel through the shop.
- There are several potential causes of explosion in the shop:
  - hydrogen gas emitted by batteries
  - fuel tanks or containers
  - sodium-filled engine valves
  - welding tanks and propane bottles
Harmful Substances

This technician is wearing a respirator for protection from toxic welding fumes.
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- **MSDS = MATERIAL SAFETY DATA SHEETS**

- In our classroom, the MSDS book is located in the back of our classroom, near the door, in a **YELLOW** holder.

- Safety Glasses MUST always be worn in the shop

- Never throw anything in the shop or classroom

- Clean up any oil or water spills immediately
Safety Rules

Use a vacuum system to remove asbestos dust from parts.
Safety Rules

Jack up a vehicle slowly and safely
Safety Rules

Never work on a vehicle not supported by jack stands
### Material Safety Data Sheet

**Material:** HT 0801 AKRYA Cut

**Precautionary Statement:**

**WARNING**

**WEAR SAFETY GLASSES. MAY CAUSE EYE IRRITATION. IF EYE IRRITATION OCCURS, FLUSH EYES FOR 15 MINUTES WITH WATER. IF SWALLOWED, DO NOT INDUCE VOMITING. DRINK WATER OR MILK. IN EITHER CASE, CALL A PHYSICIAN IMMEDIATELY. REFER TO MSDS FOR CHEMICAL HAZARDOUS INFORMATION.**

**KEEP OUT OF THE REACH OF CHILDREN.**

**Hazardous Components:**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS NO</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl Alcohol</td>
<td>67-63-0</td>
<td>400</td>
<td>988</td>
<td>500</td>
</tr>
</tbody>
</table>

**Physical/Chemical Characteristics:**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>212°F</td>
</tr>
<tr>
<td>Specific Gravity (H₂O=1)</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Density (Air=1)</td>
<td>N/A</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Miscible</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Purple thick emulsion, banana odor</td>
</tr>
</tbody>
</table>

**Fire and Explosion Data:**

- Flash Point: N/A
- Combustible Limits: N/A
- LEL: N/A
- UEL: N/A

**Extinguishing Media:**

- WATER TO COOL DOWN CONTAINERS

**Special Fire Fighting Procedures:**

- N/A DIRECT FLAME FROM BUTANE TORCH

**Hazards:**

- WILL NOT IGNITE MATERIAL
- Unusual Fire and Explosion Hazards: N/A

**Health Hazard Information:**

- **SKIN:** MAY IRRITATE SKIN. CAUSE LIGHT REDDENING IN PATIENTS WITH PREEXISTING SKIN DISORDERS.
- **EYES:** MAY CAUSE EYE IRRITATION, BURNING, AND REDNESS.
- **SWALLOWING:** MAY CAUSE MOUTH AND THROAT IRRITATION, BURNING, AND POSSIBLE ABDOMINAL DISCOMFORT OR NAUSEA.
- **BREATHING:** PROLONGED BREATHING OF MIST MAY IRRITATE NASAL PASSAGES.

**Emergency and First Aid Procedures:**

- ON SKIN: WASH WITH SOAP AND WATER. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.
- IN EYES: FLUSH EYES WITH PLENTY OF RUNNING WATER FOR 15 MINUTES, LIFTING EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.
- SWALLOWED: CALL A PHYSICIAN IMMEDIATELY. DO NOT INDUCE VOMITING. IF CONSCIOUS, DRINK PLENTY OF WATER OR MILK.
- BREATHED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. SEEK IMMEDIATE MEDICAL ATTENTION.

**Toxicity Data:**

- **ORAL:** N/A
- **DERMAL:** N/A
- **INHALATION:** N/A
- **Carcinogenicity:** NOT CONSIDERED TO BE A CARCINOGEN BY IARC.
- **NTP:** N/A
- **IARC MONOGRAPHY:** N/A
- **OSHA REGULATED:** N/A

**Personal Protection:**

- **VENTILATION:** LOCAL OR MECHANICAL EXHAUST.
- **RESPIRATORY PROTECTION:** IF NECESSARY, WEAR A PARTICLE MASK OR AN OSHA APPROVED MASK FOR MIST CONCENTRATIONS.
- **EYE PROTECTION:** WEAR GOGGLES OR SAFETY GLASSES.
- **SKIN AND PROTECTIVE CLOTHING:** WEAR RUBBER GLOVES.

**Hazardous Reactivity:**

- **STABILITY:** UNSTABLE
- **Conditions to Avoid:** N/A
- **STABLE:** X

**Incompatibility:** N/A

**Hazardous Byproducts:** N/A

**Hazards:**

- **Polymerization:** MAY OCCUR
- **Conditions to Avoid:** N/A
- **WILL NOT OCCUR:** X
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