

# Continuing Education for the Fire Fighter



# Scene Lighting, Rescue Tools, Vehicle Extrication, and Technical Rescue Module 1



## *Chapter 10*

# LEARNING OBJECTIVES

Identify types of  
emergency scene  
lighting  
equipment.

Describe the types  
of rescue tools  
and equipment.

Explain  
considerations for  
maintenance of  
electric  
generators and  
lighting  
equipment.

Explain the uses  
and limitations of  
each type of  
rescue tool.



ALABAMA FIRE COLLEGE



# EMERGENCY SCENE LIGHTING EQUIPMENT IS REQUIRED AT CERTAIN INCIDENTS.

At night

In low light

Inside structures  
without normal  
lighting



# ALL FIREFIGHTERS MUST OPERATE THE FOLLOWING EQUIPMENT.

Lights

Electric generators

Auxiliary electrical equipment



ALABAMA FIRE COLLEGE

# ELECTRICAL GENERATORS POWER BOTH EMERGENCY SCENE LIGHTING AND PORTABLE RESCUE EQUIPMENT.



Portable



Vehicle-mounted



Apparatus electrical  
system



ALABAMA FIRE COLLEGE

# LIGHTING EQUIPMENT IS DIVIDED INTO TWO CATEGORIES.



Portable



Fixed

*Courtesy of Ron Moore and McKinney (TX) FD*



ALABAMA FIRE COLLEGE



# CAUTION

Never connect more lights than the power source can support.

Overtaxing the power source results in poor lighting and possible damage to the lights, generator, or electrical system.

It may also restrict the operation of other tools using the same power source.





# ALL AUXILIARY ELECTRICAL EQUIPMENT MUST BE WATERPROOF, INTRINSICALLY SAFE, AND DESIGNED FOR ITS INTENDED USE.

Cables,  
extension  
cords

Receptacles

Connectors

Junction boxes

Adapters

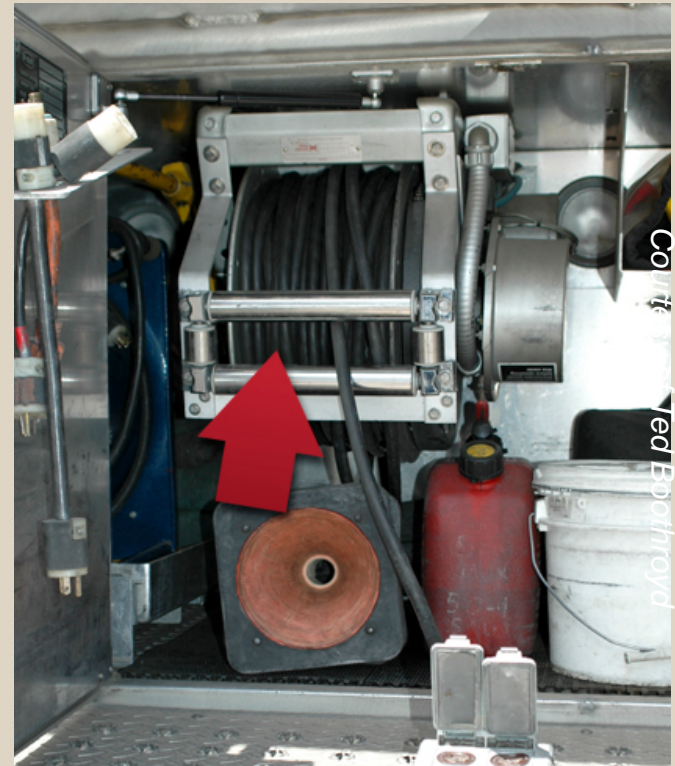
Ground fault  
circuit  
interrupter  
(GFCI) devices



ALABAMA FIRE COLLEGE



# DO NOT EXCEED THE POWER CAPACITY OF ELECTRICAL CABLES AND EXTENSION CORDS.



*Courtesy of Shad Cooper/ Wyoming State Fire Marshal's Office*



ALABAMA FIRE COLLEGE

# TWIST-LOCK RECEPTACLES AND CONNECTORS PROVIDE SAFE AND SECURE CONNECTIONS.



Safe until immersed in water



ALABAMA FIRE COLLEGE

# JUNCTION BOXES AND ADAPTER CONNECTIONS GIVE FIREFIGHTERS GREAT FLEXIBILITY.



Junction box with  
GFCI



Adapter connections

Courtesy of Shad Cooper/ Wyoming State Fire Marshal's Office



ALABAMA FIRE COLLEGE





# FOLLOW MANUFACTURER'S INSTRUCTIONS AND DEPARTMENTAL SOPS WHEN INSPECTING AND MAINTAINING EQUIPMENT.

Spark plugs

Carburetors

Oil and fuel

Generators

Electrical cords

Lighting equipment

Maintenance documentation



# RESCUE TOOLS ARE CLASSIFIED BY POWER SOURCE AND BY USE.



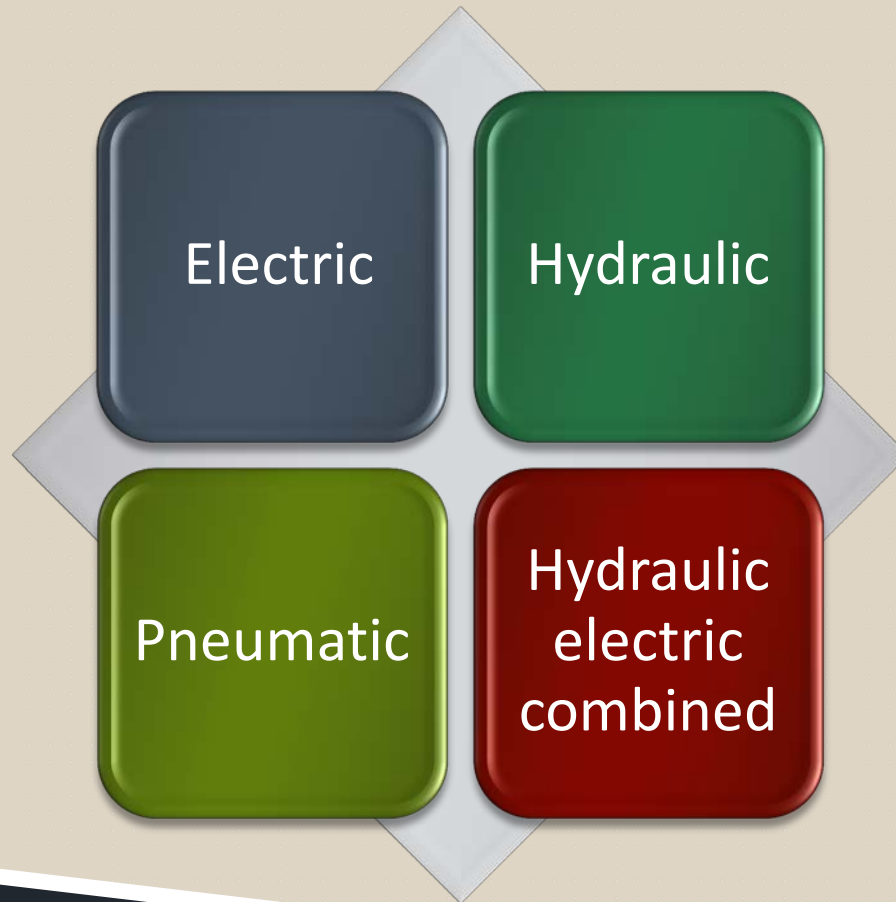
Power  
source



Uses



# NFPA® 1936 SETS CRITERIA FOR POWER SOURCES ON EMERGENCY EQUIPMENT.





# THERE ARE FOUR BASIC TYPES OF HYDRAULIC AND ELECTRIC POWERED RESCUE TOOLS.



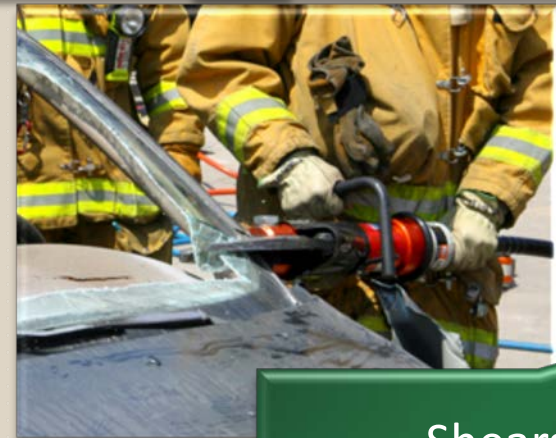
Spreaders



Combination  
spreader/shear



Extension rams



Shears

Courtesy of Shad Cooper  
Wyoming State  
Fire Marshal's Office



ALABAMA FIRE COLLEGE

# PNEUMATIC AND MANUAL TOOLS CAN ALSO BE USED FOR EXTRICATION INCIDENTS.



Pneumatic



Manual



# USE CUTTING TOOLS TO CUT MATERIAL AWAY FROM TRAPPED VICTIMS.



Most cutting tools  
are power saws



ALABAMA FIRE COLLEGE

# WARNING

Never use a power saw  
in a flammable  
atmosphere. The saw's  
motor or sparks from  
the cutting can ignite  
flammable gasses or  
vapors causing an  
explosion or fire.





# THERE ARE DIFFERENT TYPES OF POWER SAWS THAT HAVE SPECIFIC FEATURES AND USES.



Reciprocating



Rotary

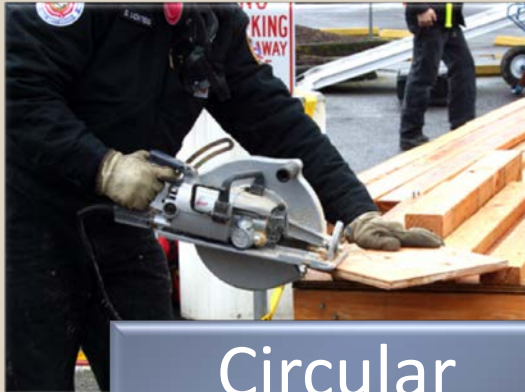


# WARNING

Never use a rotary saw to cut the shell of a flammable liquid or gas storage tank. Sparks can ignite flammable vapors.



# POWER SAWS COME IN A VARIETY OF FORMS WITH SEVERAL DIFFERENT FEATURES.



Circular



Whizzer



Air Chisel





# USE STABILIZING TOOLS TO ENSURE OBJECTS CANNOT MOVE BEFORE PERFORMING RESCUE OR EXTRICATION.



ALABAMA FIRE COLLEGE

# USE THE JACK APPROPRIATE FOR THE SITUATION REQUIRING STABILIZATION.

Hydraulic



Screw jack



Trench screw jack



Ratchet-lever (high-lift) jack



# WARNING

Never work under a load supported only by a jack. If the load shifts or the jack fails, you can be severely injured, or even killed. Loads should always be supported by properly placed cribbing. Live by the saying “lift an inch, crib an inch.” As the jack lifts the load one inch (25 mm), add one inch (25 mm) of cribbing.





# USE A BUTTRESS TENSION SYSTEM TO STABILIZE VEHICLES ON THEIR SIDE OR TOP.



ALABAMA FIRE COLLEGE

# USE WHEEL CHOCKS TO PREVENT VEHICLES FROM MOVING DURING EXTRICATION.



ALABAMA FIRE COLLEGE

# USE CRIBBING MATERIAL DURING EXTRICATION OR FOLLOWING STRUCTURAL COLLAPSE.





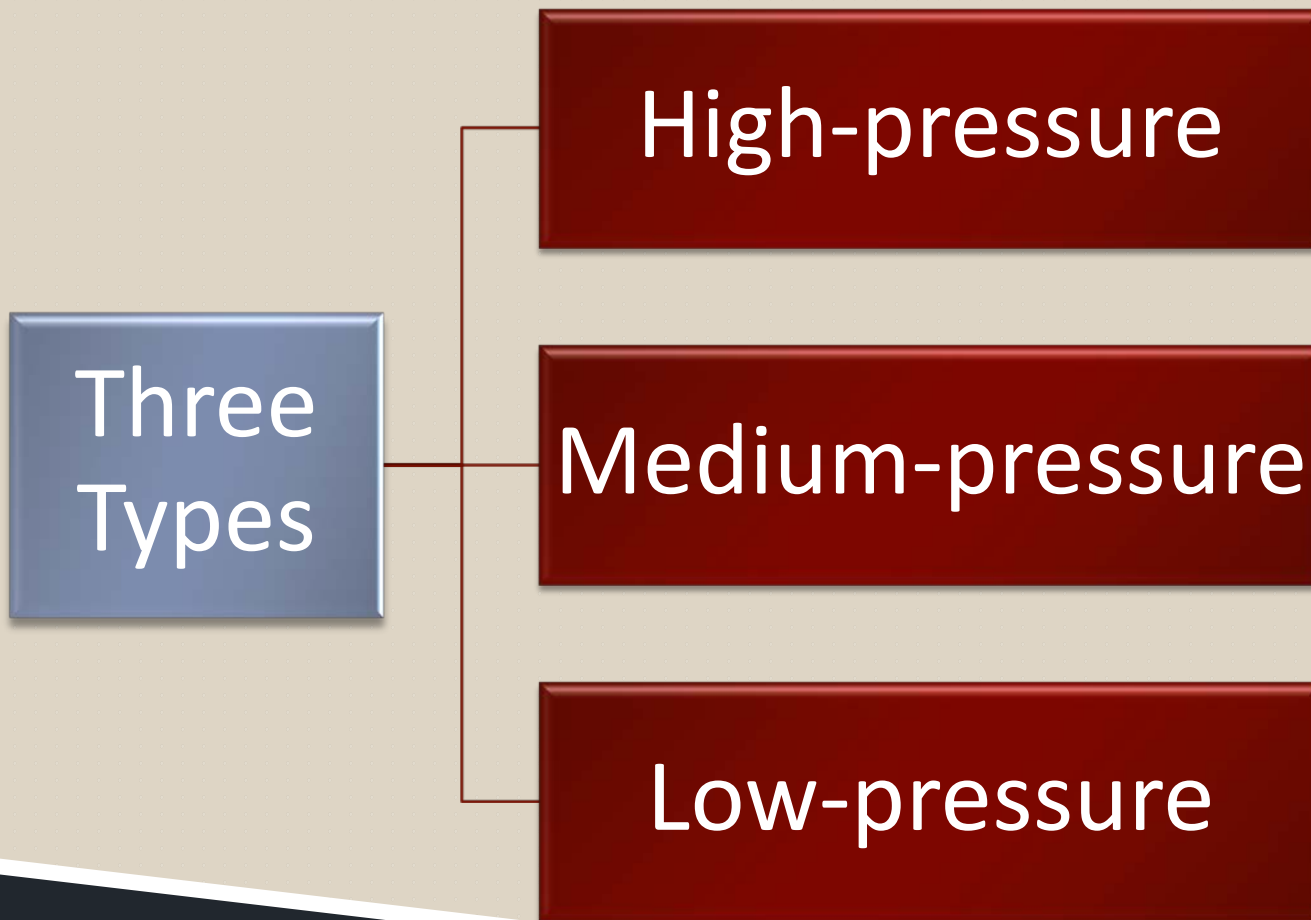
TRIPODS ARE USED TO LOWER RESCUERS AND  
RAISE VICTIMS FROM CONFINED SPACES.



ALABAMA FIRE COLLEGE



# USE PNEUMATIC LIFTING BAGS TO LIFT OR DISPLACE OBJECTS THAT CANNOT BE LIFTED WITH OTHER EQUIPMENT.




# FOLLOW THESE GENERAL SAFETY RULES WHEN USING PNEUMATIC LIFTING BAGS.

- Plan lifting operations – Have adequate air supply and cribbing
- Be familiar with equipment's capabilities and limitations
- Always follow manufacturer's recommendations
- Keep equipment in good operating condition
- Ensure safety seals are in place
- Position bag on or against solid surface
- Keep sharp objects away from bags
- Never inflate a bag without a load



# FOLLOW THESE GENERAL SAFETY RULES WHEN USING PNEUMATIC LIFTING BAGS.



Inflate slowly and continuously monitor
Never work under a load supported only by bags
Use enough cribbing for support
Use three pieces of cribbing per layer, and ensure top layer is solid
Never let bag contact material hotter than 220°F (104°C)
Inflate bottom bag first, and never use more than two
Avoid contact with petroleum products, which can weaken bags

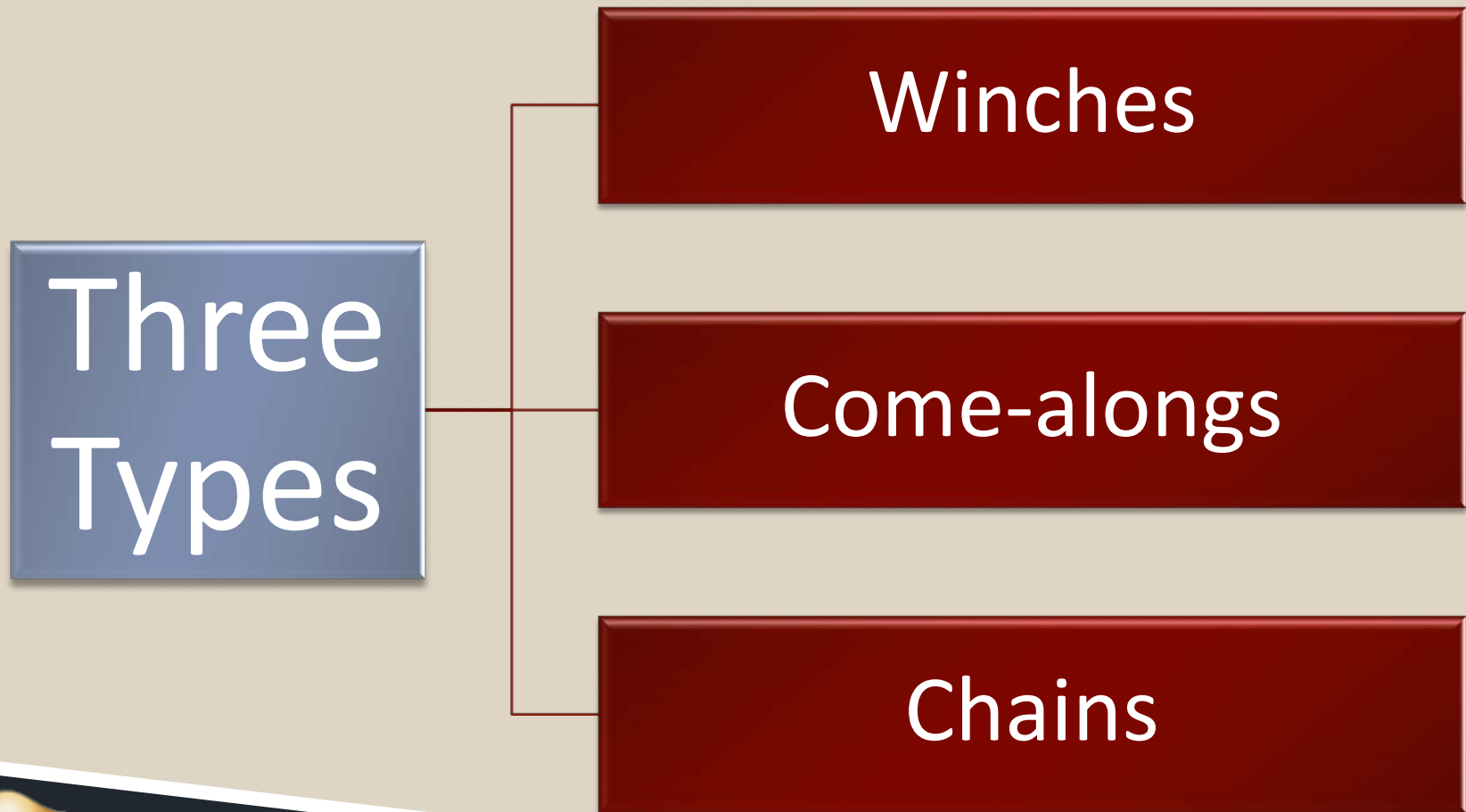


# WARNING!

If you place anything between the bag and the lifted object, it must be made of pliable material, such as a folded salvage cover. Plywood or other rigid material can be forcefully ejected if the bag distorts under pressure.



USE PULLING TOOLS TO PULL OBJECTS APART,  
AWAY FROM VICTIMS, OR TO STABILIZE VEHICLES.

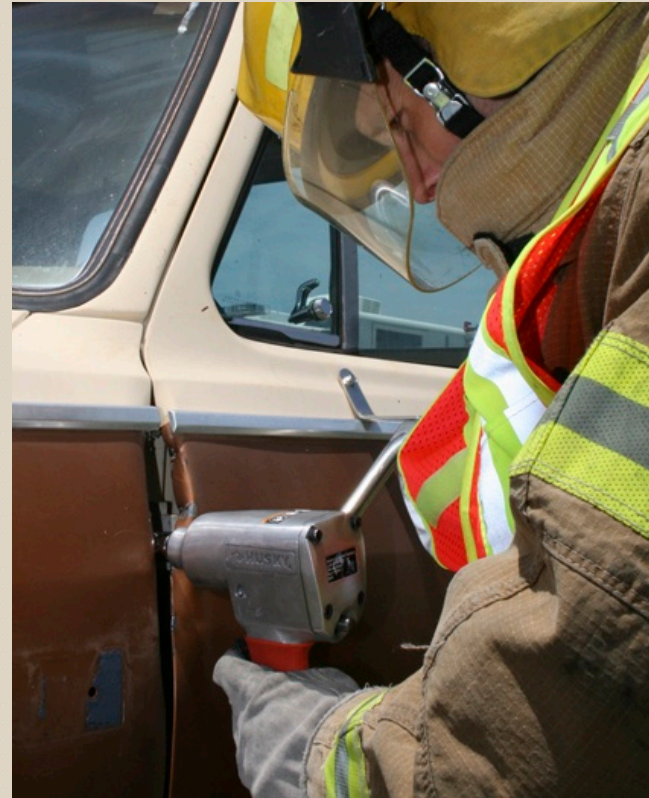


# WARNING

Only use the operating handles provided by the come-along's manufacturer. These handles are designed to fail before the cable. Never use a prybar or other tool instead.



# OTHER TOOLS USED IN RESCUE OPERATIONS INCLUDE PNEUMATIC NAILERS AND IMPACT TOOLS.



*Courtesy of Owasso (OK) Fire Department*



ALABAMA FIRE COLLEGE





# FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS AND DEPARTMENTAL SOPS WHEN MAINTAINING RESCUE TOOLS.

Fluids and  
fuels

Batteries,  
electrical  
equipment

Cutting blades  
and chisels



# SUMMARY

Your duties include using lighting equipment of all types while at emergency scenes.

Your duties include maintaining rescue tools and lighting equipment.

