



Missouri Division of Fire Safety
FIRE FIGHTER I & II



RESCUE
AND EXTRICATION



UNIT OBJECTIVES

Upon completion of this unit of study, the student should be able to:

1. Explain primary and secondary search procedures for victims in fire conditions with and without a rope or hoseline.
2. Demonstrate search and rescue operations for victims in a hostile environment.
3. Describe and demonstrate how to remove injured persons using carries, drags, and stretchers.
4. Describe extrication operations for victims of motor vehicle accidents.
5. Explain rescue and safety techniques for the following:
 - a. Structural collapses
 - b. Trench rescues
 - c. Caves and tunnels
 - d. Water and ice emergencies
 - e. Elevators and escalators
 - f. Energized electrical lines
 - g. Industrial accidents
6. Identify the following rescue tools:
 - a. Cribbing and shoring materials
 - b. Block and tackle
 - c. Hydraulic equipment
 - d. Pneumatic equipment
 - e. Ratchet device
7. Demonstrate extrication operations for victims of motor vehicle accidents.



NFPA STANDARDS

Successful completion of the information in this section is necessary to fulfill the requirements of the following sections of NFPA 1001-2008:

Fire Fighter I Standard

5.3.5* Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained.

(A) Requisite Knowledge. Personnel accountability systems, communication procedures, emergency evacuation methods, what constitutes a safe haven, elements that create or indicate a hazard, and emergency procedures for loss of air supply.

(B) Requisite Skills. The ability to operate as a team member in vision-obscured conditions, locate and follow a guideline, conserve air supply, and evaluate areas for hazards and identify a safe haven.

5.3.9* Conduct a search and rescue in a structure operating as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, hose lines, and ladders when necessary, so that ladders are correctly placed when used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety - including respiratory protection - is not compromised.

(A) Requisite Knowledge. Use of forcible entry tools during rescue operations, ladder operations for rescue, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods (including various carries), and considerations related to respiratory protection.

(B)* Requisite Skills. The ability to use SCBA to exit through restricted passages, set up and use different types of ladders for various types of rescue operations, rescue a fire fighter with functioning respiratory protection, rescue a fire fighter whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.

5.3.17 Illuminate the emergency scene, given fire service electrical equipment and an assignment, so that designated areas are illuminated and all equipment is operated within the manufacturer's listed safety precautions.

(A) Requisite Knowledge. Safety principles and practices, power supply capacity and limitations, and light deployment methods.

(B) Requisite Skills. The ability to operate department power supply and lighting equipment, deploy cords and connectors, reset ground-fault interrupter (GFI) devices, and locate lights for best effect.



NFPA STANDARDS

Fire Fighter II Standard

6.4.1* Extricate a victim entrapped in a motor vehicle as part of a team, given stabilization and extrication tools, so that the vehicle is stabilized, the victim is disentangled without further injury, and hazards are managed.

(A) Requisite Knowledge. The fire department's role at a vehicle accident, points of strength and weakness in auto body construction, dangers associated with vehicle components and systems, the uses and limitations of hand and power extrication equipment, and safety procedures when using various types of extrication equipment.

(B) Requisite Skills. The ability to operate hand and power tools used for forcible entry and rescue as designed; use cribbing and shoring material; and choose and apply appropriate techniques for moving or removing vehicle roofs, doors, windshields, windows, steering wheels or columns, and the dashboard.

6.4.2* Assist rescue operation teams, given standard operating procedures, necessary rescue equipment, and an assignment, so that procedures are followed, rescue items are recognized and retrieved in the time as prescribed by the AHJ, and the assignment is completed.

(A) Requisite Knowledge. The fire fighter's role at a technical rescue operation, the hazards associated with technical rescue operations, types and uses for rescue tools, and rescue practices and goals.

(B) Requisite Skills. The ability to identify and retrieve various types of rescue tools, establish public barriers, and assist rescue teams as a member of the team when assigned.

6.5.4 Maintain power plants, power tools, and lighting equipment, given tools and manufacturers' instructions, so that equipment is clean and maintained according to manufacturer and departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise.

(A) Requisite Knowledge. Types of cleaning methods, correct use of cleaning solvents, manufacturer and departmental guidelines for maintaining equipment and its documentation, and problem-reporting practices.

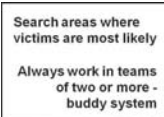
(B) Requisite Skills. The ability to select correct tools; follow guidelines; complete recording and reporting procedures; and operate power plants, power tools, and lighting equipment.

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
 With life safety as the first and most important tactical priority, rescue is the primary responsibility of any fire department "Rescue" implies that the victims cannot remove themselves from danger Fire fighters must be prepared for rescue or extrication in any situation  Rescue incidents involve removing victims from: ☛ Fire ☛ Collapse ☛ Confined spaces ☛ Elevated areas  Extrication incidents involve disentangling and removing victims from vehicles or machinery  Fire fighters must always remember the difference between a "rescue" and a "recovery"  Too many fire fighters have been killed or injured while trying to recover a dead victim	I. Rescue ➤ A. With life safety as the first and most important tactical priority, rescue is the primary responsibility of any fire department ➤ B. The very term "rescue" implies that the victims cannot remove themselves from danger 1. Fire fighters must be prepared for any rescue or extrication situation to which they might respond ➤ 2. Rescue incidents involve removing victims from: a. <i>Fire entrapment</i> b. <i>Collapse</i> c. <i>Confined spaces</i> d. <i>Elevated areas</i> ➤ 3. Extrication incidents involve disentangling and removing victims from vehicles or machinery ➤ C. Fire fighters must always remember the difference between a "rescue" and a "recovery" 1. Rescues can put fire fighters at extreme risk to save a life 2. Risks should be minimized to recover a body because there is no chance of saving a life ➤ 3. Too many fire fighters have been killed or injured while trying to recover a dead victim

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Rescuers must always consider their own safety when searching for fire victims Unsafe search and rescue operations endanger personnel and can further endanger victims Incident commanders must consider the hazards involved in any rescue attempt SEARCH SAFETY - Fire fighters must consider their own safety when conducting any search - Do not enter a building where the fire has progressed to the point where there are no survivable victims - If backdraft conditions exist, do not enter until ventilation has been done SEARCH SAFETY - Never freelance - Maintain radio contact with the sector supervisor - Be alert to fire conditions - Always use the personnel accountability system - Have backup and rapid intervention teams available SEARCH SAFETY - Always look for secondary means of escape - Feel doors for heat before entering - Fire fighters should stay to one side of a door before opening it - An inward-opening door may be difficult to open if a victim has collapsed just on the other side	II. Fireground Search and Rescue <i>(Essentials p. 306)</i> ➤ A. Rescuers must always consider their own safety when searching for fire victims ➤ 1. Unsafe search and rescue operations endanger personnel and can further endanger victims ➤ 2. Incident commanders must consider the hazards involved in any rescue attempt and continually size up the situation for changing conditions B. Search safety guidelines ➤ 1. <i>Fire fighters must consider their own safety first when conducting any search</i> ➤ 2. Do not enter a building where the fire has progressed to the point where there are no survivable victims ➤ 3. If backdraft conditions exist, do not enter until ventilation has been done ➤ 4. <i>Never freelance, work within the operational plan</i> ➤ 5. Maintain radio contact with the sector supervisor ➤ 6. Be alert to fire conditions ➤ 7. Always use the personnel accountability system ➤ 8. Have backup and rapid intervention teams available ➤ 9. <i>Always look for secondary means of escape</i> ➤ 10. Always work in teams of two or more ➤ 11. Stay low and move cautiously



SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
SEARCH SAFETY  2 Maintain contact with the walls 2 Have charged lines available 2 Coordinate with ventilation teams before opening windows 2 Inform the sector supervisor if any areas cannot be searched 2 Report to the sector supervisor when the search is completed A thorough search should be conducted at any structure fire if it is reasonable and safe to do so Before beginning a search, the entire building and its surroundings should be observed by all personnel to determine: • Structure integrity • Size of the fire • The probability of any occupants • Estimate of search time required • Possible emergency escape routes	➤ 12. Feel doors for heat before entering ➤ 13. Fire fighters should stay to one side of a door before opening it ➤ 14. An inward-opening door may be difficult to open if a victim has collapsed just on the other side ➤ 15. Maintain contact with the walls ➤ 16. <i>Have charged lines available</i> ➤ 17. Coordinate with ventilation teams before opening windows ➤ 18. Inform the sector supervisor if any areas cannot be searched ➤ 19. Report to the sector supervisor when the search is completed ➤ C. A thorough search should be conducted at any structure fire if it is reasonable and safe to do so 1. The consequences of failing to locate a victim can be devastating 2. Before beginning a search, the entire building and its surroundings should be observed by all personnel to help determine: a. Structure integrity b. Size of the fire c. The probability of any occupants inside d. Estimate of search time required

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 Any occupants who have escaped must be questioned about the possibility of anyone else inside and where they might be Regardless of this information, the building must still be searched to determine there are any victims trapped Fire fighters should report the fire extent and location while searching for victims If possible fire attack should be started with interior search operations to increase the safety of searchers and victims  PRIMARY SEARCH First search of an area done in a quick and systematic fashion Conducted as soon as possible if there is a chance a structure is occupied so it maybe carried out in severe conditions  Search areas where victims are most likely Always work in teams of two or more - buddy system  Full protective clothing including SCBA required Take a forcible entry tool and flashlight along on search 	e. Possible emergency escape routes ➤ 3. Any occupants who have escaped must be questioned about the possibility of anyone else inside and where they might be ➤ a. Regardless of this information, the building must still be searched to determine there are any victims trapped b. Victims will not always be located where others thought they would be ➤ 4. Fire fighters should report the fire extent and location while searching for victims ➤ 5. If possible fire attack should be started with interior search operations a. Increasing the safety of searchers and victims b. Fire control may be needed to begin a search D. Primary search ➤ 1. <i>First search of an area done in a quick and systematic fashion</i> ➤ 2. Conducted as soon as possible if there is a chance a structure is occupied so it maybe carried out in severe conditions 3. Performed before or during suppression ➤ 4. Search areas where victims are most likely to be 5. Always work in teams of two or more - buddy system

RESCUE AND EXTRICATION



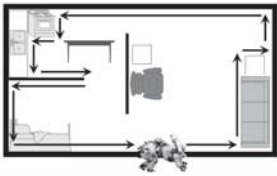
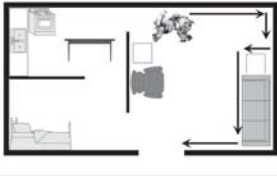
MISSOURI DIVISION OF FIRE SAFETY FIRE FIGHTER I & II

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 If available, take a thermal imaging camera on the search  Some departments require the search team to take a rope or tagline along in the hazard zone  Search closest to the fire first because victims further away are in less immediate danger  Search on hands and knees to stay below heat and smoke  Move up and down stairs on hands and knees When climbing stairs, proceed head first When descending, proceed feet first Call out from several locations as moving through the area Stop and listen for victim when searching People may try to hide from a fire and may be found in bathrooms, closets, under beds, or behind furniture	➤ 6. Full protective clothing including SCBA required ➤ 7. Take a forcible entry tool and flashlight along on search ➤ 8. If available, take a thermal imaging camera on the search ➤ 9. Some departments require the search team to take a rope or tagline along in the hazard zone ➤ 10. Search closest to the fire first because victims further away are in less immediate danger ➤ 11. <i>Search on hands and knees to stay below heat and smoke</i> ➤ 12. Move up and down stairs on hands and knees a. When climbing stairs, proceed head first b. When descending, proceed feet first ➤ 13. Call out from several locations as moving through the area ➤ 14. <i>Stop and listen for victim as searching</i> ➤ 15. People may try to hide or seek shelter from a fire and may be found in bathrooms, closets, under beds, or behind furniture 16. Maintain radio contact with the supervisor and report progress 17. Report fire locations and extension found during search

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
For large areas, some departments use a dedicated search line system for use during a primary search  Assists with thorough search techniques and prevents personnel from becoming disoriented and lost The search line is typically 200 feet of $\frac{3}{8}$-inch rope with a Kevlar sheath • After each ring, one or more knots are tied to indicate distance • After the first ring, one knot is tied to indicate the ring is 20 feet from the beginning of the line • After the second ring, two knots are tied to indicate the ring is 40 feet from the beginning of the line • The knots are always after the ring so they provide directional indications - knots are away from the exit, rings are toward the exit   Prior to entry, the search line is tied to a fixed point about 10-feet from the entrance The first searcher picks up the rope bag and enters the area with each team member closely behind As they move into the building, the search line pays out behind them and everyone maintains contact with the line	➤ E. For large areas, some departments use a dedicated search line system for use during a primary search ➤ 1. This assists with thorough search techniques and prevents personnel from becoming disoriented and lost ➤ 2. The search line is typically 200 feet of $\frac{3}{8}$-inch rope with a Kevlar sheath a. Every 20 feet along the line, a two-inch steel ring is tied onto the line b. After each ring, one or more knots are tied to indicate distance c. After the first ring, one knot is tied to indicate the ring is 20 feet from the beginning of the line d. After the second ring, two knots are tied to indicate the ring is 40 feet from the beginning of the line e. After the third ring, three knots are tied and so on down the line f. The knots are always after the ring so they provide directional indications - knots are away from the exit, rings are toward the exit ➤ 3. Prior to entry, the search line is tied to a fixed point about 10-feet from the entrance ➤ a. The first searcher, called the "Lead," picks up the rope bag and enters the area with each team member closely behind



SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 Each member of the search team carries a lateral tether Tethers are 20-foot lengths of rope with a carabiner on one end and a 3/4-inch steel ring tied on the other end If necessary to search perpendicular to the search line, a searcher snaps the tether onto one of the steel rings on the search line and can then search laterally from the main line  SECONDARY SEARCH Slower and more systematic search in an attempt to find any occupants not located during the primary search - Usually conducted after fire is controlled - Should be conducted by personnel who did not do the primary search - Deals more with thoroughness than speed	➤ b. As they move into the building, the search line pays out behind them and everyone maintains contact with the line ➤ 4. Each member of the search team carries a lateral tether ➤ a. Tethers are 20 foot lengths of rope with a carabiner or snap hook on one end and a 3/4-inch steel ring tied on the other end ➤ b. If necessary to search perpendicular to the search line, a searcher snaps the tether onto one of the steel rings on the search line and can then search laterally from the main line c. If there is more area to be searched beyond 20-feet, a second searcher can attached his or her tether to the ring on the end of the first searchers line ➤ F. Secondary search 1. Slower and more systematic search in an attempt to find any occupants not located during the primary search ➤ 2. <i>Usually conducted after fire is controlled and smoke and heat conditions have improved</i> ➤ 3. The secondary search should be conducted by personnel who did not do the primary search ➤ 4. The secondary search deals more with thoroughness than speed

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
 SEARCHING MULTISTORY BUILDINGS The fire floor, floor directly above the fire, and top floor should be searched first Close doors of areas not involved in fire Exits, halls, and stairs should be kept as clear as possible of equipment and hoses  When entering a room, fire fighters should turn right or left and follow the walls around the room By following the same wall on the same side, fire fighters will move through the entire area and eventually be lead back to the entrance  To retreat or leave the area, turn around and place the left hand on the same wall  Search under and around all furniture Probe under furniture with handle of tool  Sweep area with arm or leg	➤ G. Searching multistory buildings 1. The fire floor, floor directly above the fire, and top floor should be searched first ➤ 2. Close doors of areas not involved in fire ➤ 3. Exits, halls, and stairs should be kept as clear as possible of equipment and hoses H. Search methods ➤ 1. When entering a room, fire fighters should turn right or left and follow the walls around the room ➤ a. Following one wall will lead rescuers back to the starting point ➤ b. As a room is left, fire fighters must continue following the right or left lead they used into the next area ➤ c. If a victim is located, fire fighters need to turn around, place their opposite hand on the wall and follow it back to the entrance ➤ d. Moving forward with a victim may take fire fighters deeper into the structure or into other hazards ➤ e. Search perimeter of room and work to inside ➤ f. <i>Search under and around all furniture</i> (1) Probe under furniture with handle of tool (2) Sweep area with arm or leg

MISSOURI DIVISION OF FIRE SAFETY FIRE FIGHTER I & II

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Search closets and cupboards and shower stalls - children may attempt to hide from the fire  With small rooms, one fire fighter can remain at the door while the other searches  While searching, fire fighters must maintain physical and verbal contact with each other  The lead fire fighter should keep the other informed of what is encountered during the search If contact is lost, the lead should stop and wait until contact is regained Searched rooms should be marked to indicate a search has been completed of the area LATCH STRAPS  Placed over door knobs  Also can prevent a door from locking behind rescuers TWO-PART MARKING SYSTEM Half of an "X" is placed on a room's door with chalk or tape when the area is entered  The "X" is completed when the room is exited  Can help others find a lost rescue team	➤ 2. Search closets and cupboards and shower stalls - children may attempt to hide from the fire ➤ 3. With small rooms, one fire fighter can remain at the door while the other searches ➤ 4. <i>While searching, fire fighters must maintain physical and verbal contact with each other</i> ➤ a. The lead fire fighter should keep the other informed of what is encountered during the search ➤ b. If contact is lost, the lead should stop and wait until contact is regained ➤ 5. Marking systems ➤ a. Searched rooms should be marked to indicate a search has been completed of the area ➤ b. Latch straps (1) Placed over door knobs (2) Also can prevent a door from locking behind rescuers ➤ c. Two-part marking system (1) Half of an "X" is placed on a room's door with chalk or tape when the area is entered (2) The "X" is completed when the room is exited (3) Can help others find a lost rescue team

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Fire fighters must always be alert to weakened or hazardous structural conditions They must feel the floor in front of them as they move They must watch for stairways, elevator shafts, and holes in floors All doors should be checked for heat before opening Stay low and to one side when opening doors With outward swinging doors, stay on the hinge side so the door can provide some protection  Fire fighters may become trapped or disoriented • Structural collapse • Leaving a hose or search rope • Doors closing behind them Proper accountability, backup teams, and rapid intervention teams must be in place   IF TRAPPED OR DISORIENTED • Make every effort to remain calm and think • Control breathing to conserve air • Try to retrace your steps • Try to find an exit from the area on fire • Activate the PASS device • Radio a "MAYDAY" report • If a hose can be located, try to find a set of couplings • Stay close to walls	I. Search safety ➤ 1. Fire fighters must always be alert to weakened or hazardous structural conditions ➤ a. <i>They must feel the floor in front of them as they move</i> ➤ b. They must watch for stairways, elevator shafts, and holes in floors ➤ c. Any signs of sagging floors or hazardous conditions must be immediately reported to Command ➤ 2. <i>All doors should be checked for heat before opening</i> ➤ a. Stay low and to one side when opening doors ➤ b. With outward swinging doors, stay on the hinge side so the door can provide some protection J. Trapped fire fighters ➤ 1. Fire fighters may become trapped or disoriented a. Structural collapse b. Leaving a hose or search rope c. Doors closing behind them ➤ 2. Proper accountability, backup teams, and rapid intervention teams must be in place ➤ 3. If trapped or disoriented a. <i>Make every effort to remain calm and think</i>



SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
# Always try to retreat down to ground floor # If unable to retreat downward, go to a room with an exterior window and close the room's door 1. Open the window and straddle the windowsill and call for help 2. Drop articles of furnishings to draw attention 3. Do not remove any protective clothing or SCBA to drop for attention 	➤ b. <i>Control breathing to conserve air</i> ➤ c. Try to retrace your steps to the original location ➤ d. Try to find an exit from the area on fire ➤ e. Activate the PASS device ➤ f. Radio a "MAYDAY" report if trapped or lost ➤ g. If a hose can be located, try to find a set of couplings (1) The female coupling is toward the nozzle and the male toward the water supply (2) The male coupling has lugs, the female does not (3) Moving in the direction from the male coupling will lead to the outside ➤ h. <i>Stay close to walls</i> ➤ i. <i>Always try to retreat down to ground floor</i> ➤ j. If unable to retreat downward, go to a room with an exterior window and close the room's door (1) Open the window and straddle the window-sill and call for help (2) Drop articles of furnishings such as lamps, chairs, etc. to draw attention (3) Do not remove any protective clothing or SCBA to drop for attention

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
If conditions on an upper level will not allow a fire fighter to wait for help:  If you have a rescue rope, tie it around a heavy piece of furniture or solid object before lowering yourself From a second story window, remove SCBA and hang from the windowsill by your hands to minimize the distance to drop If unable to reach a door or window, breaching an interior wall may lead to an exit route  First feel the wall for heat and if cool, continue The sheetrock will have to be removed on both sides of a wall stud and the stud removed to create an opening large enough to pass through A rapid intervention crew (RIC) is composed of at least two fire fighters fully equipped to rescue a fire fighter in distress  RIC members may be assigned nonessential duties as long as those duties can be immediately abandoned Those other duties must be relatively close to the hazard zone LOCATING A DOWNED FIRE FIGHTER  Rescuers should first try to establish radio contact with a downed fire fighter Rescuers should attempt to determine a downed fire fighter's last location and start their search from that area Rescuers should stop during their search and quietly listen for a PASS device or calls for help	➤ k. If conditions on an upper level will not allow a fire fighter to wait for help: (1) If you have a rescue rope, tie it around a heavy piece of furniture or solid object before lowering yourself (2) From a second story window, remove SCBA and hang from the windowsill by your hands to minimize the distance to drop ➤ l. <i>If unable to reach a door or window, breaching an interior wall may lead to an exit route</i> (1) First feel the wall for heat and if cool, continue (2) The sheetrock will have to be removed on both sides of a wall stud and the stud removed to create an opening large enough to pass through ➤ K. Rapid intervention 1. A rapid intervention crew (RIC) is composed of at least two fire fighters fully equipped to rescue a fire fighter in distress ➤ a. <i>RIC members may be assigned nonessential duties as long as those duties can be immediately abandoned</i> ➤ b. Those other duties must be relatively close to the hazard zone ➤ 2. Locating a downed fire fighter a. Rescuers should first try to establish radio contact with a downed fire fighter

MISSOURI DIVISION OF FIRE SAFETY FIRE FIGHTER I & II

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
LOCATING A DOWNED FIRE FIGHTER  A thermal imaging camera should be used for the search if available LOCATING A DOWNED FIRE FIGHTER  If rescuing a fire fighter with a functioning breathing apparatus, use caution not to dislodge mask or compromise the victim's breathing Fire fighters should not remove their facepiece or compromise operation of their SCBA at any time to share it with a victim If rescuing a fire fighter without a functioning SCBA, connect his or her mask to rescuer's SCBA or remove the victim as quickly as possible  Report when the downed fire fighter has been located and is being removed  The need to exit a hostile environment may override the need to stabilize injuries  If the fire fighter is trapped or injured call for assistance Attempt to control any safety threats while waiting for help Help an uninjured fire fighter to safety	➤ b. Rescuers should first attempt to determine a downed fire fighter's last location and start their search from that area ➤ c. Rescuers should stop during their search and quietly listen for a PASS device or calls for help ➤ d. A thermal imaging camera should be used for the search if available ➤ e. If rescuing a fire fighter with a functioning breathing apparatus, use caution not to dislodge mask or compromise the victim's breathing ➤ f. If rescuing a fire fighter without a functioning breathing apparatus, connect his or her mask to rescuer's SCBA or remove the victim as quickly as possible ➤ g. <i>Fire fighters should not remove their facepiece or compromise operation of their SCBA at any time to share it with a victim</i> ➤ h. Report when the downed fire fighter has been located and is being removed ➤ i. <i>The need to exit a hostile environment may override the need to stabilize injuries</i> ➤ j. Check the downed fire fighter's vital signs ➤ k. If the fire fighter is trapped or injured call for assistance ➤ l. Attempt to control any safety threats while waiting for help ➤ m. Help an uninjured fire fighter to safety

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 If a victim has no injuries or minor injuries, he or she may only need help to walk to safety  Injured victims should not be moved before treatment unless there is immediate danger The need to exit quickly with a victim may override the need to stabilize injuries:  - Fire progression - Hazardous materials - Victim's medical condition - To gain access to other victims - It is not possible to protect the accident scene In an emergency move attempt to pull victims in the direction of the long axis of the body, not sideways  If on the floor, pull the victim's clothing in the neck/shoulder area If possible, put the victim on a blanket and drag the blanket Try to have two or more fire fighters lift or carry any adult victims  Guard against losing your balance Remember to keep your back straight and lift with your legs	II. Removing Victims <i>(Essentials p. 327)</i> ➤ A. If a victim has no injuries or minor injuries, he or she may only need help to walk to safety ➤ B. <i>Injured victims should not be moved before treatment unless there is immediate danger</i> ➤ C. The need to exit quickly with a victim may override the need to stabilize injuries: 1. Fire progression 2. Hazardous materials 3. Victim's medical condition 4. To gain access to other victims 5. It is not possible to protect the accident scene ➤ D. <i>In an emergency move attempt to pull victims in the direction of the long axis of the body, not sideways</i> ➤ 1. If on the floor, pull the victim's clothing in the neck/shoulder area ➤ 2. If possible, put the victim on a blanket and drag the blanket ➤ E. Try to have two or more fire fighters lift or carry any adult victims ➤ 1. Guard against losing your balance ➤ 2. <i>Remember to keep your back straight and lift with your legs</i>

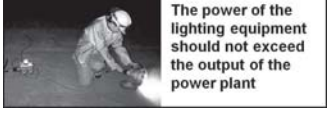
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
CRADLE-IN-ARMS LIFT AND CARRY For conscious children or small adults  Place one arm under the victim's arms and across the back Place the other arm under the victim's knees Keep the back straight Lift the victim to about waist high SEAT LIFT AND CARRY For two rescuers  Raise the victim to a sitting position Link arms across the victim's back Reach under the victim's knee to form a seat Stand and lift the victim TWO FIRE FIGHTER EXTREMITIES CARRY  Rescuer #1 rescuer kneels at victim's head, Rescuer #2 stands between the victim's knees Rescuer #1 uses one hand to support the victim's head and neck, with the other hand under the victim's shoulders Rescuer #2 grabs the victim's wrists and pull the victim to a sitting position	3. Lifting incorrectly is one of the most common causes of injuries to rescuers ➤ F. Cradle-in-arms lift and carry 1. <i>For conscious children or small adults</i> ➤ 2. Place one arm under the victim's arms and across the back 3. Place the other arm under the victim's knees 4. Keep the back straight 5. Lift the victim to about waist high ➤ G. <i>Seat lift and carry</i> 1. <i>For two rescuers</i> ➤ 2. Raise the victim to a sitting position ➤ 3. Link arms across the victim's back ➤ 4. Reach under the victim's knee to form a seat ➤ 5. Stand and lift the victim ➤ H. Two fire fighter extremities carry 1. Rescuer #1 rescuer kneels at victim's head, Rescuer #2 stands between the victim's knees ➤ 2. Rescuer #1 uses one hand to support the victim's head and neck, with the other hand under the victim's shoulders ➤ 3. Rescuer #2 grabs the victim's wrists and pull the victim to a sitting position

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
TWO FIRE FIGHTER EXTREMITIES CARRY Rescuer #1 slips his or her arms under victim's arms and around chest, grabbing victim's wrists Rescuer #2 turns around, kneels, and grabs just under victim's knees Both rescuers stand and carry victim  CHAIR LIFT AND CARRY One fire fighter lifts the victim until his or her buttocks and lower back is high enough for a second fire fighter to slip a chair under the victim The victim and chair are raised to a 45° angle The seated victim is lifted with one fire fighter carrying the chair's legs and the other carrying the back  INCLINE DRAG With the victim face up, kneel at the victim's head Supporting the victim's head, lift the victim's upper body into a sitting position Reach under the victim's arms and grasp the victim's wrists Stand while lifting the victim  BLANKET DRAG Lay the victim face up Place a blanket next to victim and roll victim onto blanket or coat Kneel at the victim's side opposite the blanket Extend the victim's arms above his or her head Pull the blanket against the victim, gathering it against his or her back Roll the victim onto the blanket 	➤ 4. Rescuer #1 slips his or her arms under victim's arms and around chest, grabbing victim's wrists ➤ 5. Rescuer #2 turns around, kneels, and grabs just under victim's knees ➤ 6. Both rescuers stand and carry victim ➤ I. Chair lift and carry 1. One fire fighter lifts the victim until his or her buttocks and lower back is high enough for a second fire fighter to slip a chair under the victim ➤ 2. The victim and chair are raised to a 45° angle ➤ 3. The seated victim is lifted with one fire fighter carrying the chair's legs and the other carrying the chair back ➤ J. Incline drag: to move a victim down stairs 1. With the victim face up, kneel at the victim's head ➤ 2. Supporting the victim's head, lift the victim's upper body into a sitting position ➤ 3. Reach under the victim's arms and grasp the victim's wrists ➤ 4. Stand while lifting the victim ➤ K. Blanket drag 1. Lay the victim face up ➤ 2. Place a blanket next to victim and roll victim onto blanket or coat

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
BLANKET DRAG Wrap the blanket around the victim Grab the blanket on both sides of victim's head, raise enough to clear head and shoulders Drag victim to safety  CLOTHES DRAG Crouch behind the victim's head and grab the shirt or jacket around the collar and shoulder area Lift with the legs and walk backwards dragging the victim  WEBBING DRAG Place the victim on his or her back Slide a large webbing loop under the victim's head and chest so the loop is even with the victim's armpits Position the victim's arms outside of the webbing Pull the top of the loop over victim's head so it is just past their head  WEBBING DRAG Reach down through the large loop and under the victim's back and grab the webbing Pull the webbing up through the loop so each webbing loop is drawn snugly around the victim's shoulders Adjust hand placement on the webbing to support the victim's head Drag the victim by pulling the webbing loop 	➤ 3. Knee at the victim's side opposite the blanket ➤ 4. Extend the victim's arms above his or her head ➤ 5. Pull the blanket against the victim, gathering it against his or her back ➤ 6. Roll the victim onto the blanket ➤ 7. Wrap the blanket around the victim ➤ 8. Grab the blanket on both sides of victim's head, raise enough to clear head and shoulders ➤ 9. Drag victim to safety ➤ L. Clothes drag 1. Crouch behind the victim's head and grab the shirt or jacket around the collar and shoulder area ➤ 2. <i>Lift with the legs and walk backwards dragging the victim</i> ➤ M. Webbing drag 1. Place the victim on his or her back ➤ 2. Slide a large webbing loop under the victim's head and chest so the loop is even with the victim's armpits ➤ 3. Position the victim's arms outside of the webbing ➤ 4. Pull the top of the loop over victim's head so it is just past their head ➤ 5. Reach down through the large loop and under the victim's back and grab the webbing

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
FIRE SERVICE ELECTRICAL EQUIPMENT Auxiliary lighting used at a fire scene can provide an extra measure of safety to all fire fighters - Provides additional visibility to avoid slips and falls - Enables personnel to see potential hazards and traps which may cause injuries   Used on emergency vehicles when large amounts of power are not required Converts vehicle's current to 110-volt or 220-volt AC current Disadvantages include limited power output and mobility of vehicle	➤ 6. Pull the webbing up through the loop so each webbing loop is drawn snugly around the victim's shoulders ➤ 7. Adjust hand placement on the webbing to support the victim's head ➤ 8. Drag the victim by pulling the webbing loop IV. Rescue and Extrication Equipment (<i>Essentials p. 330</i>) A. Fire service electrical equipment ➤ 1. Auxiliary lighting used at a fire scene can provide an extra measure of safety to all fire fighters ➤ a. <i>Lighting provides additional visibility to avoid slips and falls</i> ➤ b. <i>Lighting enables personnel to see potential hazards and traps which may cause injuries</i> ➤ 2. Power plants a. Inverters (1) <i>Used on emergency vehicles when large amounts of power are not required</i> (2) Converts vehicle's current to 110-volt or 220-volt AC current (3) <i>Disadvantages include limited power output and mobility of vehicle</i>



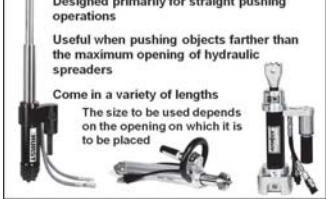
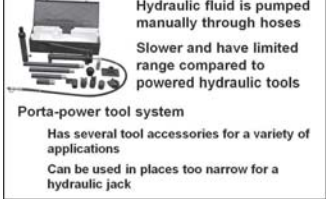
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 GENERATORS Can be portable or fixed to vehicles Powered by small gasoline or diesel engines and usually provide 110-volt and/or 220-volts  LIGHTING EQUIPMENT May be fixed on apparatus or portable  Portable lights range from 300-watts to 1,000-watts and may be on telescoping stands  LIGHTING EQUIPMENT Unless specially designed, lighting equipment must not be used in a flammable or explosive atmosphere Most lighting equipment operates at high temperatures and can cause burns to unprotected skin  Gloves should be worn when changing quartz bulbs as skin oil can cause a bulb to explode when turned on  The power of the lighting equipment should not exceed the output of the power plant  Cords and connectors are necessary to supply power to lighting equipment from the power plant Cords must be insulated, waterproof and have no exposed wires Damaged cords should be repaired or replaced Junction boxes may be used when it is necessary to connect multiple lights or tools Junction boxes should be waterproof with the outlets covered	➤ b. Generators (1) <i>Can be portable or fixed to vehicles</i> (2) Powered by small gasoline or diesel engines and usually provide 110-volt and/or 220-volts ➤ 3. Lighting equipment a. Lighting equipment may be fixed on apparatus or portable ➤ b. Portable lights range from 300-watts to 1,000-watts and may be on telescoping stands ➤ c. Unless specially designed lighting equipment is used, lighting equipment must not be used in a flammable or explosive atmosphere ➤ d. <i>Most lighting equipment operates at high temperatures and can cause burns to unprotected skin</i> ➤ e. <i>Gloves should be worn when changing quartz bulbs as skin oil can cause a bulb to explode when turned on</i> ➤ f. The power of the lighting equipment should not exceed the output of the power plant ➤ 4. Cords and connectors a. Cords and connectors are necessary to supply power to lighting equipment from the power plant



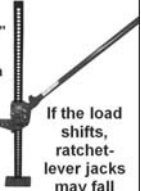
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
PORTABLE POWER PLANT MAINTENANCE AND SERVICING Review manufacturer's service manual for specific instructions Check fluid levels weekly - drain and replace fuel if the fuel is more than 3 weeks old Inspect the spark plug and spark plug wire for any visible damage, carbon buildup or cracked porcelain  PORTABLE POWER PLANT MAINTENANCE AND SERVICING Check the carburetor for any signs of leaks Start the generator  Gasoline should not be added to a generator while it is in operation or if exhaust and engine are hot	b. Cords should be stored in coils or reels and cleaned after use ➤ c. Cords must be insulated, waterproof and have no exposed wires ➤ d. Damaged cords should be repaired or replaced ➤ e. Junction boxes may be used when it is necessary to connect multiple lights or tools to a cord ➤ f. <i>Junction boxes should be waterproof with the outlets covered to avoid water or contamination by debris</i> 5. Maintenance and servicing of portable power plants (these procedures are not meant to overrule the manufacturer's guidelines) ➤ a. <i>Review manufacturer's service manual for specific instructions</i> ➤ b. Check fluid levels weekly - drain and replace fuel if the fuel is more than 3 weeks old ➤ c. Inspect the spark plug and spark plug wire for any visible damage, carbon buildup or cracked porcelain ➤ d. Check the carburetor for any signs of leaks ➤ e. Start the generator and run any tests outlined in the operator manual ➤ f. <i>Test lighting equipment for proper operation while unit is running</i>

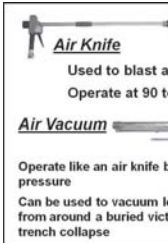


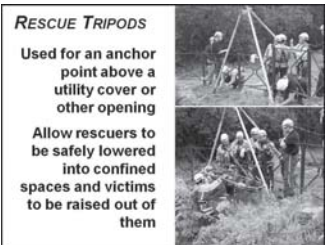
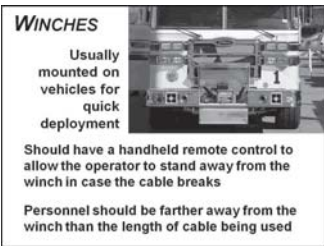
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 POWERED HYDRAULIC TOOLS Receive power from hydraulic fluid pumped by a motor through high-pressure hoses Most are powered by gasoline engines or electric motors May be portable or mounted to apparatus with hose reels for high-pressure hoses  SPREADERS "JAWS" First type of powered hydraulic tools in the fire service Capable of pushing or pulling Some can produce up to 22,000 psi of force Tips may spread up to 32-inches apart depending on the tool  SHEARS OR CUTTERS Capable of cutting almost any metal object Some can produce up to 30,000 psi of force at the tips May have an opening spread of about 7-inches	➤ g. Gasoline should not be added to a generator while it is in operation or if exhaust and engine are hot due to possibility of spilled gasoline and fumes contacting hot parts ➤ B. Hydraulic tools 1. The number of uses, speed, and power has made hydraulic tools indispensable in many rescue situation 2. Powered hydraulic tools a. <i>Receive power from hydraulic fluid pumped by a motor through high-pressure hoses</i> ➤ (1) Most are powered by gasoline engines or electric motors ➤ (2) May be portable or mounted to apparatus with hose reels for high-pressure hoses b. Spreaders - "Jaws" (1) First type of powered hydraulic tools in the fire service ➤ (2) <i>Capable of pushing or pulling</i> ➤ (3) Some can produce up to 22,000 psi of force at the tips ➤ (4) Tips may spread up to 32-inches apart depending on the tool c. Shears or cutters (1) <i>Capable of cutting almost any metal object</i>

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
COMBINATION SPREADER/SHEARS  Has spreader tips on the arms with cutting shears on the inside edges Typically have less capabilities than the individual units Good for a small rapid intervention vehicle EXTENSION RAMS  Designed primarily for straight pushing operations Useful when pushing objects farther than the maximum opening of hydraulic spreaders Come in a variety of lengths The size to be used depends on the opening on which it is to be placed MANUAL HYDRAULIC TOOLS  Hydraulic fluid is pumped manually through hoses Slower and have limited range compared to powered hydraulic tools Porta-power tool system Has several tool accessories for a variety of applications Can be used in places too narrow for a hydraulic jack	(2) Some can produce up to 30,000 psi of force at the tips (3) May have an opening spread of about 7-inches ➤ d. Combination spreader/shears (1) <i>Has spreader tips on the arms with cutting shears on the inside edges</i> (2) Typically have less capabilities than the individual units (3) <i>Good for a small rapid intervention vehicle</i> ➤ e. Extension rams (1) <i>Designed primarily for straight pushing operations</i> (2) Useful when pushing objects farther than the maximum opening of hydraulic spreaders ➤ (3) Come in a variety of lengths (a) The size to be used depends on the opening on which it is to be placed (b) Some of the larger rams can extend up to over 60-inches ➤ 3. Manual hydraulic tools a. Hydraulic fluid is pumped manually through hoses

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
MANUAL HYDRAULIC TOOLS Hydraulic jacks Designed for lifting Can be used in shoring or stabilization operations Must be used on a flat, level surface May have capacities of up to 20 tons   NON-HYDRAULIC JACKS Screw jacks Can be extended or retracted by turning a threaded shaft Bar screw jacks Not used for lifting, primarily used to hold an object in place Trench screw jacks Used to replace wooden cross braces in trench rescues   	b. Slower and have limited range compared to powered hydraulic tools ➤ c. Porta-power tool system (1) Has several tool accessories for a variety of applications (2) Can be used in places too narrow for a hydraulic jack ➤ d. <i>Hydraulic jacks</i> (1) <i>Designed for lifting</i> (2) Can be used in shoring or stabilization operations (3) Must be used on a flat, level surface (4) May have capacities of up to 20 tons C. Non-hydraulic jacks 1. Can be effective for certain purposes but are not as powerful as hydraulic jacks ➤ 2. Screw jacks a. Can be extended or retracted by turning a threaded shaft ➤ b. Bar screw jacks: not used for lifting, primarily used to hold an object in place ➤ c. Trench screw jacks: used to replace wooden cross braces in trench rescues

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
Ratchet-lever Jacks Also known as "high-lift" jacks Consist of a rigid I-beam with perforations on the web and a jacking cartridge with two ratchets on the geared side Can be dangerous because they are the least stable of jacks  If the load shifts, ratchet-lever jacks may fall over  Rescuers must never work under a load supported only by jacks The area under a raised load should be entered only when proper cribbing is in place  CRIBBING Commonly used to: ⊗ Stabilize vehicles ⊗ Support roofs and ceilings  WOODEN CRIBBING Must be solid, straight, and free of flaws Other than the ends, wooden cribbing should not be painted to avoid slips when wet  Commercially manufactured synthetic or plastic cribbing is becoming more common  Includes wedges, step chocks, struts, and pads for pneumatic lifting bags Although more expensive, plastic cribbing does not become contaminated by fuel, oil, or other substances	➤ 3. Ratchet-lever jacks a. Also known as "high-lift" jacks b. Consist of a rigid I-beam with perforations on the web and a jacking cartridge with two ratchets on the geared side c. Can be dangerous because they are the least stable of jacks d. <i>If the load shifts, ratchet-lever jacks may fall over</i> ➤ 4. Rescuers must never work under a load supported only by jacks, the area under a raised load should be entered only when proper cribbing is in place ➤ D. Cribbing 1. Commonly used to: a. <i>Stabilize vehicles</i> b. <i>Support roofs and ceilings</i> 2. Wooden cribbing a. Must be solid, straight, and free of flaws b. Normally made out of 6" x 6", 4" x 4", and 2" x 4" blocks about 16" to 24" long c. Other than the ends, wooden cribbing should not be painted to avoid slips when wet 3. Commercially manufactured synthetic or plastic cribbing is becoming more common

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 SHORING A series of timbers or jacks Used to stabilize walls or sides of a trench  PNEUMATIC TOOLS Use compressed air for power Can be supplied by SCBA cylinders, compressors, or apparatus air brake system compressors  AIR CHISELS Also called air or impact hammers Operate at pressures of 90 to 250 psi Used for cutting sheet metal and popping rivets and bolts Have a variety of tool bits  Air Knife Used to blast away dirt Operate at 90 to 100 psi Air Vacuum Operate like an air knife but at less pressure Can be used to vacuum loose soil from around a buried victim in a trench collapse	➤ a. May include wedges, step chocks, struts, and pads for pneumatic lifting bags ➤ b. Although more expensive, plastic cribbing does not become contaminated by fuel, oil, or other substances ➤ E. <i>Shoring</i> 1. A series of timbers or jacks 2. <i>Used to stabilize walls or sides of a trench</i> ➤ F. Pneumatic (air-powered) tools 1. Use compressed air for power 2. Can be supplied by SCBA cylinders, compressors, or apparatus air brake system compressors ➤ 3. Air chisels a. Also called air hammers or impact hammers b. Operate at pressures of 90 to 250 psi ➤ c. Used for cutting sheet metal and popping rivets and bolts ➤ d. Have a variety of tool bits ➤ 4. Air knife a. Used to blast away dirt b. Operate at 90 to 100 psi

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
PNEUMATIC CUT-OFF TOOL: "WHIZZER SAW" Much more maneuverable than larger circular saws Carbon blades can cut case-hardened locks and steel  Often used in delicate cutting operations, such as removing rings or removing fingers trapped in pipes RESCUE TRIPODS Used for an anchor point above a utility cover or other opening Allow rescuers to be safely lowered into confined spaces and victims to be raised out of them  WINCHES Usually mounted on vehicles for quick deployment Should have a handheld remote control to allow the operator to stand away from the winch in case the cable breaks Personnel should be farther away from the winch than the length of cable being used 	➤ 5. Air vacuum a. Operate like an air knife but at less pressure b. Can be used to vacuum loose soil from around a buried victim in a trench collapse ➤ 6. Pneumatic cut-off tool: "whizzer saw" a. Much more maneuverable than larger circular saws b. Operates at around 20,000 rpm c. Carbon blades can cut case-hardened locks and steel d. Often used in delicate cutting operations, such as removing rings or cutting pipes to remove trapped fingers G. Lifting and pulling tools ➤ 1. <i>Rescue tripods</i> a. <i>Used for an anchor point above a utility cover or other opening</i> b. Allow rescuers to be safely lowered into confined spaces and victims to be raised out of them ➤ 2. Winches a. Usually mounted on vehicles for quick deployment b. Winch drives maybe electric, hydraulic, or power take-off



SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
RATCHET DEVICE – “COME-ALONG”  Manually operated winch that uses a ratchet and pulley assembly The come-along is attached to a secure anchor point and the cable attached to the object to be moved As the lever is moved to rewind the cable, the object moves toward the anchor point PNEUMATIC LIFTING AIR BAGS Help lift or displace objects that cannot be lifted with other equipment  High-Pressure Bags Neoprene rubber exterior reinforced with steel wire or Kevlar fiber About 1-inch thick deflated Depending on the size, can inflate to 20-inches Typically filled using SCBA cylinders	➤ c. Should have a handheld remote control to allow the operator to stand away from the winch in case the cable breaks ➤ d. Whenever possible, personnel should be farther away from the winch than the length of cable being used ➤ 3. Ratchet device - "come-along" a. <i>Manually operated winch that uses a ratchet and pulley assembly</i> ➤ b. The come-along is attached to a secure anchor point and the cable attached to the object to be moved ➤ c. As the lever is moved to rewind the cable, the object moves toward the anchor point ➤ d. Winches and come-alongs typically use chains as part of the lifting and pulling system ➤ 4. Pneumatic lifting air bags a. Help lift or displace objects that cannot be lifted with other equipment ➤ b. High-pressure bags (1) Neoprene rubber exterior reinforced with steel wire or Kevlar fiber (2) About 1-inch thick when deflated (3) Depending on the size, can inflate to 20-inches (4) Typically filled using SCBA cylinders

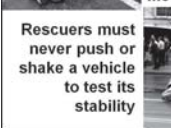
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Low- and Medium-Pressure Bags Larger than high-pressure bags and used to lift or stabilize large vehicles or objects Have greater lifting distance than high-pressure bags  AIR BAG GUIDELINES Plan any lifting operation before starting Operators must be familiar with the equipment and its limitations Have an adequate air supply and cribbing Position bags against a solid surface Never inflate against sharp objects AIR BAG GUIDELINES Inflate slowly and watch for any shifting Never work under a load supported only by air bags Continually place cribbing under the load Never stack bags more than two high with the smaller bag on top Inflate the bottom bag first	➤ c. Low- and medium-pressure bags (1) Larger than high-pressure bags and used to lift or stabilize large vehicles or objects (2) Have greater lifting distance than high-pressure bags ➤ d. Air bag guidelines (1) Plan any lifting operation before starting ➤ (2) Operators must be familiar with the equipment and its limitations ➤ (3) Have an adequate air supply and adequate cribbing before beginning ➤ (4) Position bags against a solid surface ➤ (5) <i>Never inflate against sharp objects</i> ➤ (6) Inflate slowly and watch for any shifting ➤ (7) <i>Never work under a load supported only by air bags</i> ➤ (8) Continually place cribbing under the load in case of bag failure ➤ (9) Never stack bags more than two high with the smaller bag on top ➤ (10) <i>Inflate the bottom bag first</i>

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Block and Tackle Systems Useful for lifting heavy loads because of the mechanical advantage of converting pull into greater working force Consists of two or more parts: Block - wood or metal frame containing one or more pulleys Tackle - assembly of ropes and blocks that the line passes through to multiply the pulling force  Block and Tackle Safety  Be sure rope is right size for the weight being lifted Use a steady pull on the rope Pull in a direct line, not to an angle Be sure the supports holding the block will support the load Stand in a safe position in case the tackle or support fails The majority of rescue incidents involve vehicle extrications Proper extrication is vital to prevent further injury and speed a victim's removal Any extrication should be coordinated with emergency medical personnel who are providing care to the victim	➤ 5. Block and tackle systems a. Useful for lifting heavy loads because of the mechanical advantage of converting pull into greater working force b. Consists of two or more parts (1) Block - wood or metal frame containing one or more pulleys (2) Tackle - assembly of ropes and blocks that the line passes through to multiply the pulling force c. Safety procedures (1) Be sure rope is right size for the weight being lifted (2) Use a steady pull on the rope (3) Pull in a direct line, not to an angle (4) Be sure the supports holding the block will support the load (5) Stand in a safe position in case the tackle or support fails V. Vehicle Extrication (<i>Essentials p. 346</i>) ➤ A. The majority of rescue incidents involve vehicle extrications ➤ 1. <i>Proper extrication is vital to prevent further injury and speed a victim's removal</i>

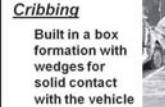
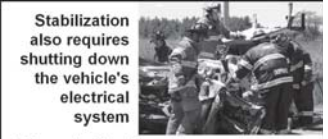


SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Scene safety must be the first consideration before starting any operations  Size-up begins with the dispatch and continues throughout the incident PROPER APPARATUS POSITIONING  In a location which does not interfere with on-scene activities To provide a barrier to protect the scene If possible, at least one traffic lane should be closed to nonemergency traffic in addition to the lanes where the vehicles involved are located SCENE SAFETY CONSIDERATIONS Traffic hazards How many and what type of vehicles are involved Is there a potential for fire Are hazardous materials involved Potential for utility involvement Additional resources needed	➤ 2. Any extrication should be coordinated with emergency medical personnel who are providing care to the victim ➤ B. Scene size-up 1. Scene safety must be the first consideration before starting any operations ➤ 2. Size-up begins with the dispatch and continues throughout the incident ➤ a. Proper apparatus positioning (1) <i>Close enough so equipment is readily available</i> (2) In a location which does not interfere with on-scene activities ➤ (3) <i>To provide a barrier to protect the scene</i> ➤ (4) If possible, at least one traffic lane should be closed to nonemergency traffic in addition to the lanes where the vehicles involved are located ➤ b. Scene safety considerations (1) Traffic hazards ➤ (2) How many and what type of vehicles are involved (a) Hybrids or alternative fuels (b) Where are they are positioned ➤ (3) Is there a potential for fire

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
EVALUATE THE NEED FOR EXTRICATION The area around each vehicle involved and the entire scene must be assessed in detail Rescuers should circle each involved vehicle to determine: • The vehicle's condition • Any required extrication • Any hazardous conditions • Number of victims EVALUATE THE NEED FOR EXTRICATION The area around the scene must be examined to determine: • Any vehicles not readily apparent • Any victims who have been thrown clear • Damage to utility services	➤ (4) Are hazardous materials involved ➤ (5) Potential for utility involvement ➤ (6) Additional resources needed ➤ 3. Evaluate the need for extrication a. The area around each vehicle involved and the entire scene must be assessed in detail b. Rescuers should circle each involved vehicle to determine: (1) The vehicle's condition (2) Any required extrication (3) Any hazardous conditions (4) The number of victims c. Vehicle conditions should be reported to the incident commander d. The area around the scene must be examined to determine: (1) Any vehicles not readily apparent (over an embankment) (2) <i>Any victims who have been thrown clear of the vehicles</i> (3) Damage to utility services

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Trained personnel should assess the conditions of victims and possible entrapments  More seriously injured victims should be treated and removed first Other victims may have to be removed before the more serious patients can be accessed Treatment should begin simultaneously with preparations for victim removal Stabilization is needed to prevent further injury to victims and injuries to rescuers  Proper support must be provided between the vehicle and the ground or other solid anchor points The purpose is to maximize the contact between the vehicle and the ground to prevent vehicle movement  Rescuers must never push or shake a vehicle to test its stability Stabilization is required for upright vehicles to prevent horizontal movement  Chock the vehicle's wheels Shut off the vehicle's engine Set the vehicle's emergency brake and place the transmission in park Do not rely on the vehicle's mechanical systems as the only stabilization source	➤ e. Trained personnel should assess the conditions of victims and possible entrapments ➤ (1) More seriously injured victims should be treated and removed first ➤ (2) Other victims may have to be removed before the more serious patients can be accessed ➤ f. Treatment should begin simultaneously with preparations for victim removal ➤ C. Stabilizing the vehicle 1. <i>Stabilization is needed to prevent further injury to victims and injuries to rescuers</i> ➤ 2. Proper support must be provided between the vehicle and the ground or other solid anchor points ➤ 3. The purpose is to maximize the contact between the vehicle and the ground to prevent vehicle movement ➤ 4. Rescuers must never push or shake a vehicle to test its stability ➤ 5. Stabilization is required for upright vehicles to prevent horizontal movement ➤ a. Chock the vehicle's wheels with wheel chocks or cribbing ➤ b. Shut off the vehicle's engine ➤ c. Set the vehicle's emergency brake and place the transmission in park

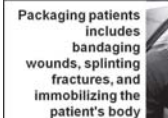


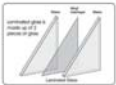
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
PREVENTING VERTICAL MOVEMENT <u>Jacks</u> Can be adjusted to the required height Can be time-consuming Air bags can be positioned on each side of the vehicle   PREVENTING VERTICAL MOVEMENT <u>Cribbing</u> Built in a box formation with wedges for solid contact with the vehicle Step blocks can be used for rapid stabilization   Rescuers must avoid placing any parts of their bodies under the vehicle when placing stabilization  Stabilization also requires shutting down the vehicle's electrical system Before shutting down the power, lower power windows, unlock doors, and move seats back Eliminates an ignition source Eliminates power to the restraint systems 	➤ d. <i>Do not rely on the vehicle's mechanical systems as the only stabilization source</i> ➤ 6. Preventing vertical movement a. Jacks (1) Can be adjusted to the required height (2) Can be time-consuming b. Air bags can be positioned on each side of the vehicle ➤ c. Cribbing (1) Built in a box formation with wedges for solid contact with the vehicle (2) Step blocks can be used for rapid stabilization ➤ d. Rescuers must avoid placing any parts of their bodies under the vehicle when placing stabilization ➤ 7. Combinations of cribbing, ropes, and chains may have to be used to stabilize vehicles on their sides or tops ➤ 8. Stabilization also requires shutting down the vehicle's electrical system a. <i>Before shutting down the power, lower power windows, unlock doors, and move seats back</i> b. Eliminates an ignition source c. Eliminates power to the restraint systems

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
If the ignition is not accessible, power should be shut down by disconnecting the vehicle's negative cables to the battery  Cut the negative cable first and then the positive Remove about 2" of each cable Some departments use a "terminal puller" instead of cutting the battery cables GAINING ACCESS TO VICTIMS First try the fastest and simplest methods  Through an unlocked operating door Through a window  The more severe the vehicle damage, the more complicated and time-consuming gaining access and extrication will be Wrecked vehicles pose additional hazards for rescuers  Oil- and air-filled struts for hoods, trunk lids, and bumpers Fuel and other flammable liquids or gases High pressure tires Unknown vehicle contents	d. Turning off the vehicle eliminates the conventional and the high-voltage systems ➤ e. If the ignition is not accessible, power should be shut down by disconnecting the vehicle's negative cables to the battery (1) Cut the negative cable first and then the positive (2) Remove about 2" of each cable ➤ f. Some departments use "terminal pullers" to remove the cables from the battery instead of cutting the cables to limit the damage D. Gaining access to victims ➤ 1. <i>The fastest and simplest methods should be tried first</i> a. Through an unlocked operating door b. Through a window ➤ 2. The more severe the vehicle damage, the more complicated and time-consuming gaining access and extrication will be ➤ 3. Rescuers must stay aware of additional hazards with wrecked vehicles ➤ a. <i>Oil- and air-filled struts for hoods, trunk lids, and bumpers</i> ➤ b. Fuel and other flammable liquids or gases ➤ c. High pressure tires

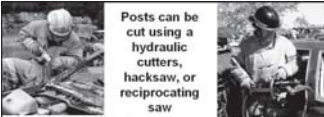


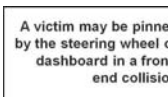
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Supplemental Restraint Systems (SRS) and Side-Impact Protection Systems (SIPS)  Air bags systems can deploy at over 200 mph with tremendous force Accidental activation has injured rescuers during extrication operations  Airbags typically activate through electronic sensors and powered by the vehicle's battery Have reserve energy supply capable of deployment after the battery is disconnected The duration of the reserve power supply varies by manufacturer Extrication activities can accidentally activate restraint systems  To prevent accidental activation on many vehicles: ➤ The ignition must be turned off and ➤ The battery cables disconnected and ➤ The reserve power supply allowed to drain  Side Impact Protection Systems may be mechanically operated with compressed gas cylinders and can deploy without the vehicle's electrical system 	➤ d. <i>Unknown vehicle contents</i> ➤ E. Supplemental Restraint Systems (SRS) and Side-Impact Protection Systems (SIPS) 1. Air bags systems can deploy at over 200 mph with tremendous force ➤ 2. Accidental activation has injured rescuers during extrication operations ➤ 3. Typically activate through electronic sensors and powered by the vehicle's battery ➤ a. <i>Have reserve energy supply capable of deployment after the battery is disconnected</i> ➤ b. The duration of the reserve power supply varies by manufacturer ➤ 4. Extrication activities can accidentally activate restraint systems ➤ a. To prevent accidental activation on many vehicles: (1) The ignition must be turned off and (2) The battery cables disconnected and (3) The reserve power supply allowed to drain b. Some vehicles have a key-operated switch to deactivate the passenger-side air bag ➤ 5. Side Impact Protection Systems may be mechanically operated and can deploy without the vehicle's electrical system

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 There are no industry standards on the locations that these side airbag inflator cylinders can be mounted  Can be located in any of the posts or along any part of the vehicle's supporting roof rail  All the posts should be exposed by pulling as much of the plastics as possible prior to making any cuts and to operate out of the deployment zones of the airbags If peeling the plastic is not possible, cutting high on the posts will give the best chance of avoiding any gas cylinders   Personal protective equipment must be worn and extreme care used when performing extrication on vehicles equipped with SRS or SIPS  Once access is gained, a rescuer with emergency medical training should enter the vehicle to stabilize and protect the patient  After patient assessment, treatment can be conducted as extrication progresses Packaging patients includes bandaging wounds, splinting fractures, and immobilizing the patient's body  Packaging protects the patient and helps with removal  Openings must be wide enough to remove the patient as smoothly as possible with a minimum of jostling	➤ 6. There are no industry standards on the locations that these side airbag inflator cylinders can be mounted ➤ a. These cylinders can be located in any of the posts or along any part of the vehicle's supporting roof rail ➤ b. All the posts should be exposed by pulling as much of the plastics as possible prior to making any cuts and to operate out of the deployment zones of the airbags ➤ c. If peeling the plastic is not possible, cutting high on the posts will give the best chance of avoiding any gas cylinders ➤ 7. Personal protective equipment must be worn and extreme care used when performing extrication on vehicles equipped with SRS or SIPS F. Patient management 1. The easiest route to gain access to the patients should be used ➤ a. Once access is gained, a rescuer with emergency medical training should enter the vehicle to stabilize and protect the patient ➤ b. <i>After patient assessment, treatment can be conducted as extrication progresses</i> 2. The vehicle is removed from around the patient, not the patient from the vehicle ➤ 3. Packaging patients includes bandaging wounds, splinting fractures, and immobilizing the patient's body

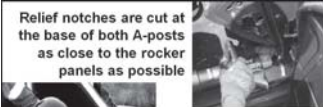
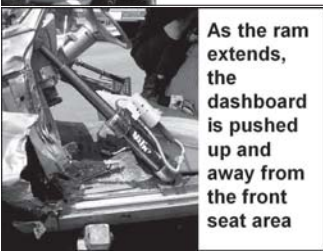
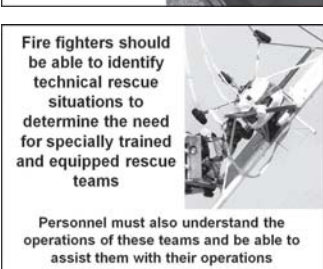
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Vehicle glass may have to be removed for patient access and to prevent injuries Rescuers must wear full protective equipment and eye protection Vehicle occupants must also be protected  SAFETY (LAMINATED) GLASS Formed from two sheets of glass bonded to a sheet of plastic between them Found in windshields and some rear windows When broken, the glass stays attached to the laminate and moves as a unit   In some newer vehicles, the windshield serves as structural component and removal can weaken the vehicle	a. Packaging protects the patient and helps with removal ➤ b. Openings must be wide enough to remove the patient as smoothly as possible with a minimum of jostling G. Removal of glass ➤ 1. Vehicle glass may have to be removed for patient access and to prevent injuries a. Rescuers must wear full protective equipment and eye protection b. <i>Vehicle occupants must also be protected</i> ➤ 2. Safety (laminated) glass a. Formed from two sheets of glass bonded to a sheet of plastic between them ➤ b. Found in windshields and some rear windows ➤ c. When broken, the glass stays attached to the laminate and moves as a unit ➤ d. In some newer vehicles, the windshield serves as structural component and removal can weaken the vehicle ➤ (1) Some departments are no longer removing windshields ➤ (2) If possible, leave the windshield intact

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
REMOVING LAMINATED GLASS Use an axe, hay hook, air chisel, reciprocating saw, handsaw, or glass saw The people inside a vehicle must be covered before starting the operation Windshield glass is cut down the short sides to the lower corners  REMOVING LAMINATED GLASS Another cut is made across the bottom of the windshield The windshield is then folded upward over the roof and removed entirely  TEMPERED GLASS Vehicle side windows and rear windows are typically tempered glass Use a sharp, pointed object to strike the glass in the lower corner of the window to shatter the glass  TEMPERED GLASS A spring-loaded center punch can be used in a lower corner to shatter the glass Rescuers and victims should be properly protected from the shattering glass Self-adhering contact paper, duct tape, or spray adhesive can be used on the window before breaking to contain the broken glass 	➤ e. Removing laminated glass (1) Use an axe, hay hook, air chisel, reciprocating saw, handsaw, or glass saw (2) The people inside a vehicle must be covered before starting the operation (3) Windshield glass is cut down the short sides to the lower corners (4) Another cut is made across the bottom of the windshield (5) The windshield is then folded upward over the roof and removed entirely ➤ 3. Tempered glass a. Vehicle side windows and rear windows are typically tempered glass ➤ b. Use a sharp, pointed object to strike the glass in the lower corner of the window to shatter the glass ➤ c. <i>A spring-loaded center punch can be used in a lower corner to shatter the glass</i> ➤ d. Rescuers and victims should be properly protected from the shattering glass ➤ e. Self-adhering contact paper, duct tape, or spray adhesive can be used on the window before breaking to contain the broken glass f. Remember that some rear windows are laminated glass instead of tempered

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
   	H. Removing a vehicle's roof ➤ 1. <i>Removal of a vehicle's roof can provide open access to victims</i> ➤ 2. Vehicle door post designations a. A-post: front post where front door is connected to the body b. B-post: between the front and rear doors on a four-door vehicle or the door handle end post on a two-door vehicle c. C-post: post nearest the rear door handle on a four-door vehicle or the rear roof post on a two-door ➤ 3. Posts can be cut using a hydraulic cutters, hacksaw, or reciprocating saw ➤ 4. For total roof removal, the A-posts are cut first and then the B-posts and C-posts ➤ 5. An alternative method is to cut the front posts and then fold the roof back onto itself or the trunk 6. Caution must be used when working around the cut posts still attached to the vehicle's body 7. Unibody vehicles may collapse when the roof is removed a. A third step block should be placed under the B-post before compromising the vehicle's body

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 Many extrications involve the removal of a vehicle's doors for patient access and removal Doors can be opened from the handle side or removed completely using a hydraulic spreader in the crack on the hinge side  The first step is to make a "purchase point" for the insertion of the spreaders A prying tool is inserted into the crack at the handle side or hinge side of the door The tool is used to widen the crack to a point where the spreader tips can be inserted  On the handle side, the spreaders are inserted into the crack above the lock mechanism and operated to spread the door away from the locking pin  On the hinge side, the spreaders are inserted above the top hinge and operated to break the hinge and then the bottom hinge  A victim may be pinned by the steering wheel or dashboard in a front-end collision  To displace the dash, the windshield must first be removed The front posts must then be cut and the roof folded back	➤ I. Removing doors 1. Many extrications involve the removal of a vehicle's doors for patient access and removal ➤ 2. Doors can be opened from the handle side or removed completely using a hydraulic spreader in the crack on the hinge side ➤ 3. <i>The first step is to make a "purchase point" for the insertion of the spreaders</i> ➤ a. A prying tool, such as a hooligan, is inserted into the crack at the handle side or hinge side of the door b. The tool is used to widen the crack to a point where the spreader tips can be inserted ➤ 4. On the handle side, the spreaders are inserted into the crack above the lock mechanism and operated to spread the door away from the locking pin ➤ 5. On the hinge side, the spreaders are inserted above the top hinge and operated to break the hinge and then the bottom hinge 6. Personnel must be ready for the door to spring violently away from the frame when opened ➤ J. Displacing the dashboard 1. A victim may be pinned by the steering wheel or dashboard in a front-end collision ➤ 2. To displace the dash, the windshield must first be removed



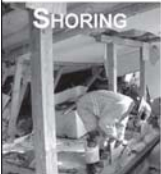
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 Relief notches are cut at the base of both A-posts as close to the rocker panels as possible  A hydraulic ram is placed in the door frame against the rocker panel with the extension post above the relief cut  As the ram extends, the dashboard is pushed up and away from the front seat area  A hydraulic spreader can also be used to push the dashboard upward and away from the front seat  Personnel must be aware that the bottom edge of the vehicle will be pushed downward during this operation and should remain out of this area  Fire fighters should be able to identify technical rescue situations to determine the need for specially trained and equipped rescue teams Personnel must also understand the operations of these teams and be able to assist them with their operations	➤ 3. The front posts must then be cut and the roof folded back ➤ 4. Relief notches are cut at the base of both A-posts as close to the rocker panels as possible ➤ 5. Using hydraulic ram a. The ram is placed in the door frame against the rocker panel with the extension post above the relief cut b. As the ram is extended, the dashboard is pushed up and away from the front seat area ➤ 6. A hydraulic spreader can also be used to push the dashboard upward and away from the front seat 7. Cribbing can be inserted into the cuts to keep the dash from settling ➤ 8. Personnel must be aware that the bottom edge of the vehicle will be pushed downward during this operation and should remain out of this area VI. Technical Rescue Situations (<i>Essentials p. 361</i>) ➤ A. Fire fighters should be able to identify technical rescue situations to determine the need for specially trained and equipped rescue teams ➤ B. Personnel must also understand the operations of these teams and be able to assist them with their operations

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Fire fighters assisting specialized rescue teams should: - Confirm the instructions to assist the rescue team - Gather the required tools and equipment as directed - Provide the assistance as requested - Maintain situational awareness - Not work outside of their level of training or they risk injuring themselves and others  Building collapse may result from fire, weather, earthquake, or age of structure Rescuers should always consider the possibility of secondary collapse of a weakened structure Rescue of heavily trapped victims should be left to specially trained and equipped personnel COLLAPSE CATEGORIES – PANCAKE COLLAPSE  Can occur when opposing exterior walls fail causing the roof and floors to collapse on top of each other Type of collapse least likely to contain voids where victims may be found	➤ C. Fire fighters assisting specialized rescue teams should: 1. First confirm the order and instructions to assist the rescue team ➤ 2. Gather the required tools and equipment as directed 3. <i>Provide the assistance as requested</i> ➤ 4. Maintain situational awareness ➤ 5. <i>Not work outside of their level of training or they risk injuring themselves and others</i> 6. Report to their officer when the assignment is completed ➤ D. Structural collapse rescue 1. Building collapse may result from fire, weather, earthquake, or age of structure ➤ 2. Rescuers should always consider the possibility of secondary collapse of a weakened structure 3. Victims on the surface and lightly trapped should be rescued first ➤ 4. Rescue of heavily trapped victims should be left to specially trained and equipped personnel ➤ 5. Categories of collapse a. Pancake collapse (1) Can occur when opposing exterior walls fail causing the roof and floors to collapse on top of each other

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
COLLAPSE CATEGORIES – V-TYPE COLLAPSE  Caused when the outer walls remain intact and the walls or roof fail in the middle May create habitable voids on both sides of the collapse  COLLAPSE CATEGORIES – LEAN-TO COLLAPSE  Occurs when one outer wall fails and the opposite wall remains The side of the roof or floor which was supported by the failed wall drops forming a triangular void underneath  COLLAPSE CATEGORIES – A-FRAME COLLAPSE  Occurs when the floors or roof on both sides of a center wall collapse into opposing lean-to collapses Provides a good chance for habitable voids COLLAPSE CATEGORIES – CANTILEVER COLLAPSE  Happens when one side wall of a multistory building collapses and leaves the floors attached and supported by the remaining wall Can create habitable voids under the supported ends Most vulnerable to secondary collapse	➤ (2) <i>Type of collapse least likely to contain voids where victims may be found</i> ➤ b. V-type collapse (1) Caused when the outer walls remain intact and the walls or roof fail in the middle (2) May create habitable voids on both sides of the collapse ➤ c. Lean-to collapse (1) <i>Occurs when one outer wall fails and the opposite wall remains</i> (2) The side of the roof or floor which was supported by the failed wall drops forming a triangular void underneath ➤ d. A-frame collapse (1) Occurs when the floors or roof on both sides of a center wall collapse into opposing lean-to collapses (2) <i>Provides a good chance for habitable voids</i> ➤ e. Cantilever collapse (1) Happens when one side wall of a multistory building collapses and leaves the floors attached and supported by the remaining wall (2) Can create habitable voids under the supported ends



SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Locating hidden victims in a structural collapse: - Calling out and listening for a response - Using seismic or short-distance radar devices to detect vibrations from victims - Using enhanced acoustic listening devices - Using search cameras - Using thermal imaging devices - Using search dogs  COLLAPSE HAZARDS Environmental hazards - Damaged utilities - Hazardous materials contamination - Temperature extremes - Fire Physical hazards - Secondary collapse - Working in unstable debris - Working in confined spaces - Working around wiring and rebar 	➤ (3) Most vulnerable to secondary collapse ➤ 6. Locating hidden victims in a structural collapse: a. Calling out and listening for a response b. Using seismic or short-distance radar devices to detect vibrations from victims c. Using enhanced acoustic listening devices d. Using search cameras e. Using thermal imaging devices f. Using search dogs ➤ 7. Hazards in collapses a. Environmental hazards (1) Damaged utilities (2) Hazardous materials contamination (3) Temperature extremes (4) Fire b. Physical hazards (1) Secondary collapse (2) Working in unstable debris (3) Working in confined spaces (4) Working around wiring and rebar

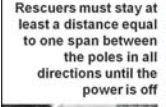
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Fire officials should seek assistance from structural engineers or construction experts when planning and conducting operations to secure area from further collapse  Remaining structure should be made as safe and secure as possible for rescuers and to prevent further collapse SHORING  Used to prevent sudden and unexpected movement of objects Uses a series of cribbing, timbers and jacks to prevent further collapse Shoring is difficult and requires proper training and practice TUNNELING  Involves moving smaller debris to create a path to victims Should only be done when other methods of reaching victims are not possible Tunnels must be large for rescuer and victim Tunnels should go along walls whenever possible Moving debris for tunneling can cause other debris to fall 	➤ 8. Fire officials should seek assistance from structural engineers or construction experts when planning and conducting operations to secure area from further collapse ➤ 9. Remaining structure should be made as safe and secure as possible for rescuers and to prevent further collapse ➤ a. Shoring (1) Used to prevent sudden and unexpected movement of objects (2) Not intended to move heavy objects but to stabilize them ➤ (3) Uses a series of cribbing, timbers and jacks to prevent further collapse ➤ (4) <i>Shoring is difficult and requires proper training and practice</i> ➤ b. Tunneling (1) Involves moving smaller debris to create a path to victims ➤ (2) Should only be done when other methods of reaching victims are not possible ➤ (3) Tunnels must be large for rescuer and victim ➤ (4) Tunnels should go along walls whenever possible ➤ (5) Moving debris for tunneling can cause other debris to fall

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
TRENCH COLLAPSE Can occur whenever excavation is going on in any jurisdiction Rescuers can be killed in a trench collapse because they failed to stabilize the trench before entering The first decision on a trench collapse is whether to consider it a rescue or body recovery Some departments have a rule of thumb that if the victim is not visible, it is a body recovery operation Most common problem is victim's reduced ability to breathe and the first priority must be to uncover victim's head and chest and supply additional air Air hose or smoke ejector may be used to introduce additional air into area Oxygen equipment may be used on the victim Personnel must not be sent into trench unless trained and their safety can be reasonably ensured Unnecessary personnel and heavy equipment must be moved away from trench edge Heavy equipment should not be used for digging unless the exact location of the victim is known	➤ E. Trench collapse 1. Can occur whenever excavation is going on in any jurisdiction ➤ a. Rescuers can be killed in a trench collapse because they failed to stabilize the trench before entering ➤ b. <i>The first decision on a trench collapse is whether to consider it a rescue or body recovery</i> ➤ c. Some departments have a rule of thumb that if the victim is not visible, it is a body recovery operation ➤ 2. Most common problem is victim's reduced ability to breathe and the first priority must be to uncover victim's head and chest and supply additional air ➤ a. Air hose or smoke ejector may be used to introduce additional air into area ➤ b. Oxygen equipment may be used on the victim ➤ 3. Personnel must not be sent into trench unless trained and their safety can be reasonably ensured ➤ 4. <i>Unnecessary personnel and heavy equipment should be moved away from trench edge to avoid a secondary collapse</i> ➤ 5. Heavy equipment should not be used for digging unless the exact location of the victim is known ➤ 6. A constant flow of air must be directed into the trench to avoid the rescuers being overcome

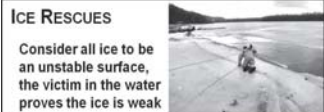
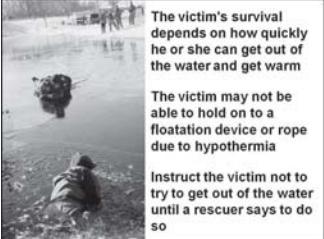
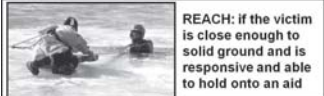
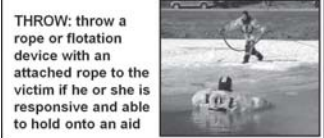
SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
TRENCH COLLAPSE SAFETY PROCEDURES Only rescuers trained in trench rescue should enter a trench  A trench must be safely shored before being entered Place exit ladders at each end of the trench TRENCH COLLAPSE SAFETY PROCEDURES Tools must be used with caution to avoid injuring victim or rescuers  Be alert to other possible hazards: • Electrical wiring • Water lines • Gas lines • Toxic or flammable gases  Common confined spaces where rescues may be necessary:  - Tanks/vessels - Silos - Storage bins - Utility vaults/pits - Sewers - Cisterns/wells - Storage tanks	➤ 7. Safety procedures a. Only rescuers trained in trench rescue should enter a trench ➤ b. <i>A trench must be safely shored before being entered</i> ➤ c. Place exit ladders at each end of the trench d. Proper protective equipment must be worn by all personnel ➤ e. Tools must be used with caution to avoid injuring victim or rescuers ➤ f. Be alert to other possible hazards in the trench (1) Electrical wiring (2) Water lines (3) Gas lines (4) Toxic or flammable gases ➤ F. Confined space rescuers 1. Common confined spaces where rescues may be necessary: a. Tanks/vessels b. Silos/grain elevators c. Storage bins/hoppers d. Utility vaults/pits

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Fire fighters without specific confined space rescue training should perform only non-entry rescues and serve only in support functions   CONFINED SPACE HAZARDS • Oxygen deficiencies • Flammable gases/vapors • Toxic gases • Extreme temperatures • Explosive dusts • Limited means of egress • Cave-ins or unstable supports • Standing water • Utility hazards Air monitoring and accountability are vital to the operation  Anyone entering a confined space must have a lifeline attached to his or her harness	e. Sewers f. Cisterns/wells g. Storage tanks ➤ 2. Fire fighters without specific confined space rescue training should perform only non-entry rescues and serve only in support functions ➤ 3. Confined space hazards a. <i>Oxygen deficiencies</i> b. <i>Flammable gases and vapors</i> c. Toxic gases d. Extreme temperatures e. Explosive dusts f. <i>Limited means of entry and egress</i> g. Cave-ins or unstable supports h. Standing water i. Utility hazards 4. The command post and staging must be located outside of the hot zone ➤ 5. Air monitoring and accountability are vital to the operation ➤ 6. Anyone entering a confined space must have a lifeline attached to his or her harness

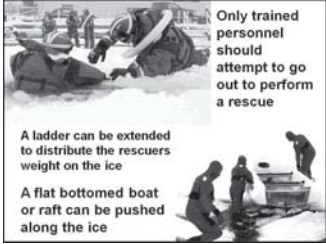


SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
TUNNELS AND CAVES Rescue requires very specially trained cave-rescue personnel  Unless specially trained, fire fighters must confine their activities to support functions aboveground CAVE RESCUE MAJOR PROBLEMS  Darkness Cave water temperature is about 55°F Irregular passages Victims and rescuers may develop hypothermia  ELECTRICAL EMERGENCIES  Always assume that all electrical equipment and wires are energized and dangerous Victims in contact with electrical equipment should also be considered as energized ELECTRICAL EMERGENCIES  The current must be shut off before any rescue can be done Contact the utility company to shut down the power ELECTRICAL EMERGENCIES Rescuers must stay at least a distance equal to one span between the poles in all directions until the power is off  Downed wires can energize fences, guard rails and other metal objects for some distance from the wires	➤ G. Tunnels and caves 1. <i>Rescue requires very specially trained cave-rescue personnel</i> ➤ 2. Unless specially trained, fire fighters must confine their activities to support functions aboveground ➤ 3. Major problems in cave rescue a. Darkness b. Water: cave water temperature is about 55°F c. Irregular passages d. Temperature: victims and rescuers may develop hypothermia ➤ H. Electrical emergencies 1. <i>Always assume that all electrical equipment and wires are energized and dangerous</i> ➤ 2. Victims in contact with electrical equipment should also be considered as energized ➤ 3. The current must be shut off to electrical equipment and wires before any rescue can be done 4. <i>Contact the utility company to shut down the power</i> ➤ 5. Rescuers must stay at least a distance equal to one span between the poles in all directions until the power is off

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Downed energized wires can cause current to flow across the ground in all directions  As the current flows away, the voltage drops Referred to as the "ground gradient" Depending on the voltage involved and ground moisture, the energized field can extend several feet from the downed wire WATER EMERGENCIES Personnel must always remember the difference between a rescue and a recovery  Rescue: where victim is stranded, floundering, or has been submerged for a short time Recovery: when victim has been submerged for such a long period that he or she is probably dead  All personnel should wear appropriate protective equipment • Water rescue helmet • Approved personal flotation device <u>Water rescue methods</u> REACH: extend a long pole to the victim THROW: throw a rope or flotation device with an attached rope to the victim ROW: use a boat GO: as a last resort, swim to the victim 	➤ 6. <i>Downed wires can energize fences, guard rails and other metal objects for some distance from the wires</i> ➤ 7. Downed energized wires can cause current to flow across the ground in all directions ➤ a. As the current flows away, the voltage drops ➤ b. Referred to as the "ground gradient" ➤ c. Depending on the voltage involved and ground moisture, the energized field can extend several feet from the downed wire ➤ I. Water emergencies 1. Personnel must always remember the difference between a rescue and a recovery ➤ a. Rescue: where victim is stranded, floundering, or has been submerged for a short time ➤ b. Recovery: <i>when victim has been submerged for such a long period that he or she is probably dead</i> ➤ 2. All personnel should wear appropriate protective equipment a. Water rescue helmet b. Approved personal flotation device ➤ 3. Water rescue methods a. REACH: extend a long pole to the victim

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
Place rescuers with rope bags down stream from the victim in case the victim or rescuers break free  ICE RESCUES Consider all ice to be an unstable surface, the victim in the water proves the ice is weak  Thermal protective suits and personal flotation devices are mandatory before attempting any rescue  The victim's survival depends on how quickly he or she can get out of the water and get warm The victim may not be able to hold on to a flotation device or rope due to hypothermia Instruct the victim not to try to get out of the water until a rescuer says to do so  REACH: if the victim is close enough to solid ground and is responsive and able to hold onto an aid  THROW: throw a rope or flotation device with an attached rope to the victim if he or she is responsive and able to hold onto an aid 	➤ b. THROW: throw a rope or flotation device with an attached rope to the victim c. ROW: use a boat to get the victim ➤ d. GO: as a last resort, swim to the victim ➤ e. <i>Place rescuers with rope bags down stream from the victim in case the victim or rescuers break free</i> ➤ J. Ice rescues 1. <i>Consider all ice to be an unstable surface, the victim in the water proves the ice is weak</i> ➤ 2. Thermal protective suits and personal flotation devices are mandatory before attempting any rescue ➤ 3. The victim's survival depends on how quickly he or she can get out of the water and get warm ➤ 4. The victim may not be able to hold on to a flotation device or rope due to hypothermia ➤ 5. Instruct the victim not to try to get out of the water until a rescuer says to do so ➤ 6. REACH: if the victim is close enough to solid ground and is responsive and able to hold onto an aid ➤ 7. THROW: throw a rope or flotation device with an attached rope to the victim if he or she is responsive and able to hold onto an aid



SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 Only trained personnel should attempt to go out to perform a rescue A ladder can be extended to distribute the rescuers weight on the ice A flat bottomed boat or raft can be pushed along the ice INDUSTRIAL ACCIDENTS  Entrapments in industrial machinery are some of the most challenging rescues Specific techniques cannot be listed because of the number of different types of industrial machinery in existence When surveying an industrial accident, consider: • The victim's medical condition and degree of entrapment • The number of rescuers required • The equipment needed • The need for specialized assistance • The presence of other hazards 	➤ 8. Only trained personnel should attempt to go out to perform a rescue ➤ a. A ladder can be extended to distribute the rescuers weight on the ice ➤ b. A flat bottomed boat or raft can be pushed along the ice ➤ K. Industrial accidents 1. Entrapments in industrial machinery are some of the most challenging rescues 2. Specific techniques cannot be listed because of the number of different types of industrial machinery in existence ➤ 3. When surveying the incident, rescuers must consider: a. The victim's medical condition and degree of entrapment b. The number of rescuers required c. The equipment needed d. The need for specialized assistance - may be available on site e. The presence of other hazards, such as hazardous materials, fire, utilities, etc. 4. If a victim is seriously entrapped and in danger of bleeding to death, a tourniquet should be applied



SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
When it is necessary to extricate the victim: The first priority is to identify how the machinery operates The machine may be operated normally to release the victim, if further injury will not result The machine may be disassembled If the machine cannot be disassembled, it may be necessary to force the machine, if this can be done without causing further injury  Use caution when turning off power supplies  Some machines, such as punch presses, operate in full cycle and may complete the cycle when power is shut off causing further injury Most elevator incidents involve a car stuck between floors due to mechanical or power failure and are not true emergencies An elevator mechanic should be dispatched to scene immediately  Unless there is a medical emergency in the car, always establish contact and reassure the occupants that help is coming and wait for elevator mechanic Fire fighters must never attempt to adjust an elevator's mechanical systems to move an elevator car  Elevator rescues require special rescue techniques and should not be attempted by untrained personnel	➤ 5. When it is necessary to extricate the victim: a. <i>The first priority is to identify how the machinery operates from people on scene</i> b. The machine may be operated normally to release the victim, if further injury will not result c. The machine may be disassembled d. If the machine cannot be disassembled, it may be necessary to force the machine, if this can be done without causing further injury e. Use caution when turning off power supplies - some machines such as punch presses operate in full cycle and may complete the cycle when power is shut off causing further injury ➤ L. Elevator emergencies 1. Most elevator incidents involve a car stuck between floors due to mechanical or power failure and are not true emergencies ➤ 2. <i>Rescuers should have an elevator mechanic dispatched to scene immediately</i> ➤ 3. Unless there is a medical emergency in the car, always establish contact and reassure the occupants that help is coming and wait for elevator mechanic ➤ 4. <i>Fire fighters must never attempt to adjust an elevator's mechanical systems to move an elevator car</i> ➤ 5. Elevator rescues require special rescue techniques and should not be attempted by untrained personnel

SLIDES	TEACHING OUTLINE Material in <i>italics> is NOT included in the Student Manual</i>
<i>If evacuation of the car is necessary:</i>  Determine the car's location and go to the floor nearest the stalled elevator Establish communications with the passengers Secure the elevator by opening the main power circuit to the elevator drive motor and remove the fuses and station a fire fighter with a radio at the panel <i>Opening the elevator doors</i>  Usually done with a special key  Use forcible entry tools as a last resort  Escalators are chain-driven mechanical stairways The steps are linked together on a track  The drive unit is usually at the upper landing and covered by a landing plate  Most escalators have an emergency stop control on a nearby wall or at the base of the escalator The switch stops the escalator and sets an emergency brake  The stairs should be stopped during rescues or if fire fighters are using the stairs to advance hose	➤ 6. If evacuation of the car is necessary: a. Determine the car's location and go to the floor nearest the stalled elevator ➤ b. <i>Establish communications with the passengers</i> ➤ c. Secure the elevator by opening the main power circuit to the elevator drive motor and remove the fuses and station a fire fighter with a radio at the panel ➤ d. Open the elevator doors (1) Usually done with a special key ➤ (2) Use forcible entry tools as a last resort ➤ M. Escalator emergencies 1. Escalators are chain-driven mechanical stairways ➤ a. The steps are linked together and ride a track b. The drive unit is usually at the upper landing and covered by a landing plate ➤ 2. Most escalators have an emergency stop control on a nearby wall or at the base of the escalator a. The switch stops the escalator and sets an emergency brake ➤ b. The stairs should be stopped during rescues or if fire fighters are using the stairs to advance hose

SLIDES	TEACHING OUTLINE Material in <i>italics</i> is NOT included in the Student Manual
 If a victim is entrapped between the stairs or in the mechanism, an escalator mechanic should be requested to assist in removing victim All fire fighters must be competent in search and rescue techniques in a fire situation Fire fighters must be thoroughly trained to perform rescue under extreme conditions Fire fighters must always consider their own safety first The majority of rescue incidents involve vehicle extrications Proper extrication is vital to prevent further injury and speed a victim's removal Scene safety must be the first consideration before starting any operations Fire fighters must be able to identify technical rescue situations to determine the need for specially trained and equipped rescue teams Personnel must also understand the operations of these teams and be able to assist with their operations	➤ 3. <i>If a victim is entrapped between the stairs or in the mechanism, an escalator mechanic should be requested to assist in removing victim</i> VII. Rescue and Extrication Summary ➤ A. All fire fighters must be competent in search and rescue techniques in a fire situation ➤ 1. Fire fighters must be thoroughly trained to perform rescue under extreme conditions ➤ 2. Fire fighters must consider their own safety first when conducting any search B. Fire fighters must always remember the difference between a "rescue" and a "recovery" ➤ C. The majority of rescue incidents involve vehicle extrications ➤ 1. Proper extrication is vital to prevent further injury and speed a victim's removal ➤ 2. Scene safety must be the first consideration before starting any operations ➤ D. Fire fighters must be able to identify technical rescue situations to determine the need for specially trained and equipped rescue teams ➤ 1. Personnel must also understand the operations of these teams and be able to assist them with their operations



RESCUE AND EXTRICATION QUIZ

Name: _____ Date: _____

1. A rapid but thorough search performed in a systematic fashion before or during fire suppression operations is a _____.
 - a. perimeter search
 - b. primary search
 - c. secondary search
 - d. scene search
2. A thorough search performed after initial fire suppression and ventilation operations have been completed is a _____.
 - a. perimeter search
 - b. primary search
 - c. secondary search
 - d. scene search
3. Which of the following actions is not recommended for a fire fighter who becomes disoriented in a fire?
 - a. Try to find an exit from the area on fire
 - b. Activate the PASS device
 - c. Try to get to an upper level of the structure
 - d. Follow a hoseline away from the nozzle
4. How should a fire fighter drag a victim during an emergency move?
 - a. Holding the feet or ankles
 - b. Grabbing the victim's clothing in the neck or shoulder area
 - c. "Jackknifing" the victim and pulling both the hands and feet
 - d. Placing the arms above the head and clasping the victim's wrists
5. What should emergency personnel do first upon arriving at a vehicle accident scene?
 - a. Begin extrication efforts
 - b. Cordon off the area
 - c. Reassure victims and bystanders
 - d. Assess the scene for safety and the need for extrication



RESCUE AND EXTRICATION QUIZ

6. _____ involves using a series of timbers and jacks to prevent further collapse of a structure or trench.
 - a. Shoring
 - b. Cribbing
 - c. Tunneling
 - d. Cinching
7. Usually the first and the most common problem encountered with a trench collapse is _____.
 - a. the collapse zone
 - b. encountering heavy equipment
 - c. the victim's reduced ability to breathe
 - d. a lack of needed equipment
8. What is the safest way to prevent horizontal movement of a vehicle involved in an accident?
 - a. Chock the wheels
 - b. Set the emergency brake
 - c. Put the transmission in park or neutral
 - d. Place fire apparatus at both ends of the vehicle
9. A _____ collapse occurs when opposing exterior walls fail causing the roof and floors to collapse on top of each other.
 - a. cantilever
 - b. V-shaped
 - c. lean-to
 - d. pancake
10. Unless there is a medical emergency involved with an elevator car stuck between floors, rescue personnel should _____.
 - a. force open the car's doors
 - b. reassure the occupants and wait for the repair person
 - c. manually move the elevator to the lower floor
 - d. lower trained personnel to the roof of the car



INSTRUCTOR'S GUIDE

PRACTICAL SKILLS

These Lead Instructor Practical Skills are designed to provide the Lead Instructor for a Fire Fighter I and II course with a more detailed overview of the practical skills required of all students.

The appropriate skills from NFPA 1001-2008 are listed at the front of each skill's section. Although the skills from NFPA 1001-2008 are written as Job Performance Requirements, these have been divided into individual skill elements. This is to allow for consistency in the evaluation of each skill element.

Students must successfully complete each step of each practical skill during the practical skills evaluation portion of a Fire Fighter I and II course. At the time of a Fire Fighter I and II Certification Examination, the skill steps have been prioritized to allow a student to miss a predetermined number of steps.



Rescue and Extrication

Successful completion of the practical skills in this section are necessary to fulfill the requirements of the following sections of NFPA 1001-2008:

Fire Fighter I Standard

5.3.5* Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained.

5.3.9* Conduct a search and rescue in a structure operating as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, hose lines, and ladders when necessary, so that ladders are correctly placed when used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety - including respiratory protection - is not compromised.

5.3.17 Illuminate the emergency scene, given fire service electrical equipment and an assignment, so that designated areas are illuminated and all equipment is operated within the manufacturer's listed safety precautions.

Fire Fighter II Standard

6.4.1* Extricate a victim entrapped in a motor vehicle as part of a team, given stabilization and extrication tools, so that the vehicle is stabilized, the victim is disentangled without further injury, and hazards are managed.

6.4.2* Assist rescue operation teams, given standard operating procedures, necessary rescue equipment, and an assignment, so that procedures are followed, rescue items are recognized and retrieved in the time as prescribed by the AHJ, and the assignment is completed.

6.5.4 Maintain power plants, power tools, and lighting equipment, given tools and manufacturers' instructions, so that equipment is clean and maintained according to manufacturer and departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise.



Rescue and Extrication - NFPA 1001-2008, 5.3.9
Demonstrate Lifts and Carries

Skill Objective: The candidate, wearing full protective equipment and SCBA and given a patient weighing between 100-150 pounds, shall demonstrate moving the patient a minimum of 20feet using a two-person extremities carry, a clothes drag, and a blanket drag without compromising his/her own respiratory protection. All three methods must be demonstrated.

Skill Procedure: The evaluator shall choose someone within the weight guidelines to simulate an unconscious patient. The evaluator should then find another person to assist the candidate with the two-person carry. The candidate shall give all orders and directions when moving the patient.

Students are allowed two chances at each skill for successful completion. Students are allowed to miss a maximum of two of the following steps and pass this skill.

Items to be checked

If the candidate:

Extremities Carry:

1. Stands at the patient's head and directs the other rescuer to patient's feet
2. Slips his arms under the victim's arms and around the chest, grasping the wrists
3. Directs the other rescuer to kneel between the patient's legs and grasp under the knees
4. Stands with other rescuer and carries the patient a minimum of 20 feet

Drag:

1. Kneels at the patient's head and grasps the patient's clothing near the shoulders
2. Supports the patient's head between his/her arms
3. Drags the patient a minimum of 20 feet

Blanket Drag:

1. Places a bunker coat or blanket beside the face-up victim and gathers one edge close to the victim's side
2. Rolls the victim towards him/her, gathers the coat or blanket underneath, and rolls the victim back onto the coat or blanket
3. Grasps the coat or blanket on each side of the victim's head and shoulders and lifts off the floor and drags the victim a minimum of 20 feet



Rescue and Extrication - NFPA 1001-2008, 5.3.5, 5.3.9
Exit a Hazardous Environment & Conduct a Search & Rescue

Skill Objective: The candidate, using a partner, shall demonstrate entering a smoke-filled, hostile environment within an enclosed structure of at least 20-feet by 20-feet and search for and locate a victim within 15 minutes. Full protective equipment, including SCBA shall be worn.

Skill Procedure: The evaluator shall locate a suitable room or structure and simulate a hostile environment using either a smoke machine or by covering the SCBA facepieces. No use of hand lights by the candidate or his or her partner is allowed. The evaluator shall place a victim to be located by the candidate within the structure. The skill begins when the candidate enters the door and ends when the victim is removed to the exit.

Students are allowed two chances at each skill for successful completion. Any step listed in *italics* missed shall result in failure of the skill. Otherwise, students are allowed to miss a maximum of two of the following steps and pass this skill.

Items to be checked

If the candidate:

1. States a portable radio would be used if available
2. Checks the door for heat conditions before entering
3. Enters the room on hands and knees
4. Starts search on outside wall and performs consistent turns (always to right or left)
5. *Completely searches one room before moving on to the next room*
6. Maintains contact with wall, hoseline or similar device
7. Moves and/or searches behind, on, under all furniture
8. Searches all closets and small crawl spaces
9. Communicates well with partner
10. Stops to periodically listen for sounds
11. *Performs a thorough search; doesn't overlook significant areas*
12. *Locates victim and properly removes victim to the exit using appropriate carry or drag*



Rescue and Extrication - NFPA 1001-2008, 5.3.17
Illuminate an Emergency Scene

Skill Objective: The candidate, given a portable power plant, lights, cords and connectors shall set up emergency lighting for fire ground operation and identify at least 3 potential safety hazards when working with electricity on the fireground.

Students are allowed two chances at each skill for successful completion. Students are allowed to miss a maximum of two of the following steps and pass this skill.

Items to be checked

If the candidate:

1. Checks the fuel and oil before starting power plant
2. Lifts equipment safely
3. Locates the power plant in a remote and well ventilated position
4. Arranges power cords neatly as to minimize someone accidentally tripping over them
5. Organizes lights in a useful position and illuminated area sufficiently
6. Starts the power plant without difficulty
7. Shuts equipment off properly
8. Allows equipment to cool before returning to service or verbally explained the need to do so
9. Cleans and refuels equipment as necessary
10. Identifies at least 3 potential safety hazards when working with electricity on fireground



Rescue and Extrication - NFPA 1001-2008, 6.5.4
Service & Maintain Power plants and Lighting Equipment

Skill Objective: The candidate, given a power plant and lighting equipment, shall demonstrate the proper procedures for servicing and maintaining the equipment to ensure reliable operation of the equipment.

Skill Procedure: The evaluator shall provide the candidate with a power plant, cords, and lighting equipment. The candidate shall either demonstrate or verbalize (when appropriate) the steps necessary for the servicing and maintenance of power plants and lighting equipment. The evaluator shall stop the skill if any hazard exists during the skill.

Students are allowed two chances at each skill for successful completion. Any step listed in *italics* missed shall result in failure of the skill. Otherwise, students are allowed to miss a maximum of two of the following steps and pass this skill.

Items to be checked

If the candidate:

1. States that power plants should be run at least once a week for 20 minutes, while powering an electrical device
2. Checks fluid level(s) on the power plant (i.e., gas, oil, etc.)
3. Checks the spark plug, spark plug wire, and carburetor
4. *Properly starts the power plant*
5. Inspects all electrical cords for damage or worn insulation
6. Inspects all electrical devices (i.e., junction boxes) and lights for damage
7. *States that gloves should be worn when changing quartz light bulbs*
8. Tests all electrical devices while power plant is running
9. *Lets engine cool before refueling*
10. States that fuel should be changed approximately every three (3) months



Rescue and Extrication - NFPA 1001-2008, 6.4.1
Vehicle Extrication: Windshield Removal

Skill Objective: The candidate, working as part of a team, shall demonstrate the use of the appropriate rescue tools to remove a vehicle windshield, which may be required to extricate an entrapped victim of a motor vehicle accident by removing a windshield.

Although this skill involves a team, each candidate must demonstrate each of the listed evolutions individually.

Skill Procedure: The evaluator shall provide a vehicle for the student to practice and demonstrate the use of rescue tools and extrication procedures for removing a trapped victim.

Students are allowed two chances at each skill for successful completion.

Any step missed shall result in failure of the skill.

Items to be checked

If the candidate:

1. Wears appropriate safety equipment
2. Properly identifies and retrieves various types of rescue tools
3. Positions cribbing and shoring material properly
4. Uses an axe, hay hook, air chisel, reciprocating saw, or glass saw to cut the windshield glass along the sides and then across the bottom
5. Folds the windshield upward for removal
6. Works effectively as part of the rescue team



Rescue and Extrication - NFPA 1001-2008, 6.4.1
Vehicle Extrication: Vehicle Door Removal

Skill Objective: The candidate, working as part of a team, shall demonstrate the use of the appropriate rescue tools to remove a vehicle door, which may be required to extricate an entrapped victim of a motor vehicle accident by removing a vehicle door.

Although this skill involves a team, each candidate must demonstrate each of the listed evolutions individually.

Skill Procedure: The evaluator shall provide a vehicle for the student to practice and demonstrate the use of rescue tools and extrication procedures for removing a trapped victim. The evaluator/instructor shall tell the candidate to open the door on either the handle or hinged side. The candidate need not complete both procedures.

Students are allowed two chances at each skill for successful completion.

Any step missed shall result in failure of the skill.

Items to be checked

If the candidate:

1. Wears appropriate safety equipment
2. Properly identifies and retrieves various types of rescue tools
3. Positions cribbing and shoring material properly
4. Inserts a prying tool, such as a hooligan, into the crack at the handle side or hinge side of the door
5. Uses the prying tool to widen the crack to a point where the spreader tips can be inserted
6. On the handle side, inserts the spreaders into the crack above the locked mechanism and operates to spread the door away from the locking pin, **OR**
7. On the hinge side, inserts the spreaders above the top hinge and operates to break the hinge and then the bottom hinge
8. Takes precautions for the door to spring violently away from the frame when opened
9. Works effectively as part of the rescue team



Rescue and Extrication - NFPA 1001-2008, 6.4.1
Vehicle Extrication: Roof Removal

Skill Objective: The candidate, working as part of a team, shall demonstrate the use of the appropriate rescue tools to remove a vehicle roof, which may be required to extricate an entrapped victim of a motor vehicle accident by removing a vehicle roof.

Although this skill involves a team, each candidate must demonstrate each of the listed evolutions individually.

Skill Procedure: The evaluator shall provide a vehicle for the student to practice and demonstrate the use of rescue tools and extrication procedures for removing a trapped victim.

Students are allowed two chances at each skill for successful completion.

Any step missed shall result in failure of the skill.

Items to be checked

If the candidate:

1. Wears appropriate safety equipment
2. Properly identifies and retrieves various types of rescue tools
3. Positions cribbing and shoring material properly
4. Removes windshield only if absolutely necessary to gain access to patient
5. Cuts all roof posts, starting with "A" posts, then "B" posts and finally "C" posts
6. Avoids cutting near dangerous zones such as side air bag gas cartridges and seat belt pretensioners
7. Works as part of a team to simultaneously lift the roof from the vehicle using legs, not backs
8. Moves the roof to an area where others will not be endangered
9. Works effectively as part of the rescue team



Rescue and Extrication - NFPA 1001-2008, 6.4.1
Vehicle Extrication: Displacing a Dashboard

Skill Objective: The candidate, working as part of a team, shall demonstrate the use of the appropriate rescue tools to displace a vehicle dashboard, which may be required to extricate an entrapped victim of a motor vehicle accident by displacing a dashboard.

Although this skill involves a team, each candidate must demonstrate each of the listed evolutions individually.

Skill Procedure: The evaluator shall provide a vehicle for the student to practice and demonstrate the use of rescue tools and extrication procedures for removing a trapped victim.

Students are allowed two chances at each skill for successful completion.

Any step missed shall result in failure of the skill.

Items to be checked

If the candidate:

1. Wears appropriate safety equipment
2. Properly identifies and retrieves various types of rescue tools
3. Positions cribbing and shoring material properly
4. Removes windshield
5. Removes roof
6. Makes a relief cut in "A" post
7. Positions the extension ram or other tools to move dashboard
8. Operates tools until dashboard is moved clear of passengers
9. Places cribbing or block in both relief cuts to hold displaced dashboard in position
10. Works effectively as part of the rescue team



Rescue and Extrication - NFPA 1001-2008, 6.4.2
Assist Technical Rescue Teams

Skill Objective: The candidate, given necessary rescue equipment and an assignment, shall recognize and retrieve rescue tools and equipment specified in the time as prescribed by the evaluator to provide the assistance which would be needed by a technical rescue team as determined by the evaluator.

Skill Procedure: The evaluator shall determine the type of technical rescue for which equipment will be required and explain the situation and what equipment is needed.

Students are allowed two chances at each skill for successful completion. Any step listed in *italics* missed shall result in failure of the skill. Otherwise, students are allowed to miss a only one of the following steps and pass this skill.

Items to be checked

If the candidate:

1. Wears appropriate safety equipment
2. Confirms with the officer the assignment to assist rescue teams
3. *Properly identifies and retrieves various types of rescue tools as required for the situation identified by the evaluator*
4. *Verbalizes that he or she is maintaining situational awareness and not becoming involved in tasks beyond their training*
5. Reports to officer on completion of assigned task