

# VMR

## Lesson One

# Stabilization and Extrication Techniques

**DOMAIN:** COGNITIVE / PSYCHOMOTOR

**LEVEL OF LEARNING:** COMPREHENSION /  
APPLICATION

### **MATERIALS**

IFSTA Principles of Vehicle Extrication, 2nd edition; IFSTA Essentials 5th edition; NFPA 1006 Standard for Technical Rescuer Professional Qualifications, 2008 edition; Vehicle Rescue and Extrication by Ronald E. Moore; NFPA1670 Operations and Training for Technical Rescue Incidents; Various types of rescue equipment used by the AHJ (Authority Having Jurisdiction) such as cribbing block, step chocks, shims, pneumatic lifting bags, pneumatic shoring struts, timber, rope and rigging material, crutches, high lift jacks, tow trucks are optional per instructor level of knowledge, basic hand tools, pneumatic and hydraulic and electric operated tools, both corded and cordless, and rated chains; generators and lighting equipment; and various types of vehicles available to the AHJ for practicing the proper use of the equipment covered in this lesson plan. Vehicles in the VMR lesson plans include passenger vehicles, trucks, buses, industrial moving machinery, and farm machinery. Laptop computer, multimedia projector and whiteboard or flipchart, and marking pens.

**NOTE: The mentioned vehicles and machinery are only suggestions. Practice on all of these types of vehicles and machinery is not mandatory to complete the objectives of the lesson plan. Selection should be based on availability and AHJ needs. Practical skills testing for the Technical Rescuer candidate is based on passenger vehicle extrication.**

**NFPA 1006, 2008 edition JPRs**

- 10.1.3 Establish fire protection and fire control support
- 10.1.4 Stabilize a vehicle or machine
- 10.1.5 Isolate potentially harmful energy sources
- 10.1.6 Determine vehicle access and egress points
- 10.1.7 Create access and egress openings for rescue
- 10.2.1 Plan for a heavy vehicle or large machinery incident
- 10.2.2 Stabilize heavy vehicles and large machinery
- 10.2.3 Determine access and egress points for heavy vehicles and large machinery
- 10.2.4 Create access and egress points for a rescue

**Junior Member Statement:**

Junior Member training activities should be supervised by qualified instructors to assure that the cognitive and psychomotor skills are completed in a safe and non-evasive manner. While it is critical that instructors be constantly aware of the capabilities of all students both mentally and physically to complete certain tasks safely and successfully, the instructor should take every opportunity to discuss with departmental leaders and students the maturity and job awareness each participant has for the hazards associated with fire and rescue training.

**TERMINAL OBJECTIVE**

The Technical Rescuer candidate shall correctly identify, describe the function, and demonstrate the operation of various tools and equipment commonly used for vehicle and machinery extrication rescue.

**ENABLING OBJECTIVES**

1. The Technical Rescuer candidate shall correctly identify the three levels of rescue vehicles, and the equipment most commonly carried on them.
2. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for stabilizing a vehicle or machinery.
3. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly

demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the vehicle roof.

4. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the vehicle door.
5. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the vehicle windshield.
6. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the steering wheel.
7. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the steering column.
8. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the dashboard.
9. The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the passenger seat.

# **VMR**

## **Lesson One**

# **Stabilization and Extrication Techniques**

### **MOTIVATION**

Stabilization is the platform in which we build the entire extrication. After a thorough scene size-up, stabilization is the next step in taking control of the vehicle. Once thought to be time consuming, stabilization is now on the forefront of most extrication classes. If practiced, the time required to properly stabilize a vehicle is minimal. What would happen if we did not take the time to stabilize the vehicle? Why would we place our rescuers into a more hazardous environment when we have the opportunity to lessen the chances of personal injury?

After stabilization we must now use our skills and knowledge to remove the vehicle from the patient. During the past several years new developments in vehicle construction have required us to modify our rescue techniques. These new technologies affect the way we operate on a scene. Therefore, we must learn and adapt our techniques to overcome these hurdles.

### **PRESENTATION**

#### **ENABLING OBJECTIVE #1**

The Technical Rescuer candidate shall correctly identify the three levels of rescue vehicles, and the equipment most commonly carried on them.

1. Identify the characteristics of a light rescue vehicle.
  - a) Light rescue vehicles are designed to handle basic extrication and life-support functions.

- b) They carry only basic hand tools and small equipment i.e. saws, jacks, pry bars, small hydraulic tools and basic medical supplies.
  - c) They function as a first response vehicle; begins scene and vehicle stabilization procedures.
  - d) These trucks are generally built on a 1 or 1 ½ ton chassis.
  - e) They resemble a standard utility truck.
  - f) Many fire departments utilize ladder or engine companies for this level of response.
  - g) Light rescue vehicles are usually capable of transporting two to seven personnel.
  - h) Vehicles transporting more than three personnel require a four-door cab or enclosed crew compartment in the body of the vehicle.
2. Identify the characteristics of a medium rescue vehicle.
- a) They carry all basic rescue tools plus powered hydraulic spreaders and cutters, pneumatic lifting bags, power saws, acetylene/exothermic cutting equipment, and ropes and rigging equipment.
  - b) These trucks are capable of handling the majority of vehicle rescue incidents.
  - c) Specialized units are often considered medium rescue vehicles. In conjunction with carrying generalized rescue equipment, they will carry specialized equipment for specific rescue incidents.
  - d) Specialized rescue vehicles may include hazmat units, aquatic rescue units, trench rescue units, and structural collapse units.
3. Identify the characteristics of a heavy rescue vehicle.
- a) A heavy rescue vehicle is capable of providing support to extricate a victim from almost any type of entrapment.
  - b) In addition to carrying light and medium duty rescue equipment, additional equipment may include tri-pods, A-frames, gin poles, cascade systems, specialized rescue equipment, large power plants, and quantities of lighting equipment.

Reference: IFSTA Principles of Vehicle Extrication, 2nd edition, pages 25 - 26.

# PRESENTATION

## ENABLING OBJECTIVE #2

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for stabilizing a vehicle or machinery.

1. Discuss the purpose of vehicle stabilization.
  - a) Vehicle stabilization prevents the sudden movement of a vehicle.
  - b) Stabilization techniques and equipment used will basically be the same for passenger vehicles, buses, trucks, or farming machinery.
  - c) Techniques will vary based on vehicle position.
2. Discuss assessment considerations for vehicle stabilization.
  - a) An unstable vehicle presents an unsafe environment for rescue personnel.
  - b) Determine how much stabilization is required.
  - c) Identify and mitigate any hazards that might put rescuers at risk during the stabilization process.
  - d) Determine which tool is most effective for the stabilization process.
3. Identify the five ways an unstable vehicle can move.
  - a) Vertical movement - in relationship to the ground moves up and down along its vertical axis.
  - b) Horizontal movement - moves forward or backwards on its longitudinal axis or side to side on its lateral axis.
  - c) Pitch movement - moves up and down the lateral axis causing front end to rise and fall.
  - d) Roll movement - rocks side to side while rotating about its longitudinal axis while maintaining a horizontal orientation.
  - e) Yaw movement - twist or turns about its vertical axis causing the front and rear end to move left or right.
4. Discuss the steps for stabilizing an upright vehicle.
  - a) Chock the wheels.
  - b) Install step chocks or crib boxes behind each front wheel and forward of each rear wheel.

- c) In some cases deflating the tires may add to stability. An exception would be split rims.
  - d) Instability of the middle of the undercarriage may require a third set of step chocks or crib box.
  - e) Vehicles upright and on an incline may require additional anchoring to a steadfast anchor.
5. Discuss the steps for stabilizing a vehicle on its side.
- a) Establish fire control for leaking fuels and fluids.
  - b) Shim all voids.
  - c) A buttress system or modified raker shore with a minimum of four contact points works well.
  - d) Ground base plates should be secured to a stable anchor point on the vehicle.
  - e) Tying all rakers together increases stability.
6. Discuss the steps for stabilizing a vehicle on its top.
- a) A buttress system works well.
  - b) If cribbing is used to fill voids, the height of the crib box should not exceed two times the length of cribbing material with a maximum height of 36". The two most common type of cribbing material used vehicle stabilization are wood and plastic.
  - c) When using a crib box as a base for a lifting tool, such as a lifting bag, spreader, or jack, the top of the box must be solid all the way across.
  - d) The most common dimensions are 4" x 4" x 18" - 24" long.
  - e) Chains, utility rope and come-a-longs rated for the load can provide added stabilization security.
  - f) When using pneumatic lifting bags to stabilize a vehicle, protect them from punctures, and exposure to excessive heat.
  - g) Follow the manufacturer guidelines for safe use.

Reference: IFSTA Principles of Vehicle Extrication, 2nd edition, pages 30 - 31, 59 - 62, and 91 - 92.

7. Discuss the steps for stabilizing an upright tractor.
- a) Tractors have a higher profile and are more prone to roll than other vehicles.
  - b) The narrow track and high ground clearance make it susceptible to lateral rollovers.
  - c) OSHA requires that all tractors manufactured after October 1976 be equipped with seat belts and rollover protection systems (ROPS).

- d) To give added stability many tractors have large cast weights mounted to the front end and the rear tires are filled 90% with Calcium Chloride or Ethyl Glycol and water for traction.
  - e) On flat ground the center of gravity is along the centerline halfway between the front and rear axles.
  - f) Stabilizing an upright tractor usually incorporates wheel chocks and box cribbing on the left and right side of front and rear axles.
  - g) On inclines the high side of the tractor should be secured to a steadfast anchor.
8. Discuss the steps for stabilizing a tractor on its side.
- a) Stabilization procedures are basically the same as for a vehicle on its side.
  - b) The wheels will need to be secured to keep them from turning.
  - c) All voids along the long axis of the body will have to be filled, use shims, wedges and or cribbing where needed.
  - d) Fire control should be established for leaking fuels and fluids.
  - e) Hydraulic fluid is under high pressure and extremely hot.
9. Discuss the steps for stabilizing a tractor on its top.
- a) Front and rear axles on both side of the body will have to be cribbed. All voids under the body must be filled.

Reference: IFSTA Principles of Extrication, 2nd edition, pages 165 - 166, 175 - 176.

10. Discuss the steps for stabilizing a bus.
- a) Procedures and tools for stabilizing a bus in any position should follow the same principles as for passenger vehicles.
  - b) The number of stabilization points is greater and the recommended guidelines is to stabilize a bus in three or more places.
11. Discuss the steps for stabilizing upright medium and heavy trucks.
- a) Secure wheels with large wheel chocks.

- b) Four point box cribbing placed under the front bumper and on both sides of the chassis should give sufficient stabilization allowing rescuers to begin access procedures.
  - c) The cabs of cab over trucks need to be secured with rope, webbing, or chain to prevent the cab from tilting forward.
12. Discuss the steps for stabilizing a medium or heavy truck on its side.
- a) Secure all voids with step chocks, shims, wedges, and/or crib boxes.
  - b) For angled cabs or trailers incorporate a buttress system and or secure vehicle to multiple steadfast anchors.
13. Discuss the steps for stabilizing a medium or heavy truck on its roof.
- a) Inverted step-chocks should be installed at the doorpost.
  - b) Install crib box or high lift jack under front bumper.
  - c) Crib truck bed or secure it to a steadfast anchor.

Reference: IFSTA Principles of Vehicle Extrication, 2nd edition, pages 140 - 142.

## **PRESENTATION**

### **ENABLING OBJECTIVE #3**

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the vehicle roof.

1. Discuss how the partial removal of a roof (flapping roof, front to rear) is an excellent means to gain access, treat and stabilize a patient in which the passenger compartment has been compromised by the accident.
2. Point out that corner posts are cut as low as possible, to prevent emergency service personnel from having to work around a sharp obstruction, and covered with a section of discarded fire hose. The windshield is removed prior to this evolution.

3. Explain that both the corner posts and relief cuts can be cut with a variety of tools, such as hacksaws or chisels.
4. Point out that if the corner posts are to be cut with hacksaws the following procedures should be followed:
  - a) Remove the plastic and chrome trim from around the corner posts as this type of metal is the kind most likely to break the blades.
  - b) Make the cut at a ninety degree angle to the ground which will be at a forty-five degree angle to the post. This will prevent the post from binding the blade.
  - c) A mixture of soapy water may be sprayed on the blade to facilitate cutting the post.
5. Describe how center posts ("B" posts) are also cut if the section of roof above them is to be folded back as well. Remember to cut the seat belts if this part of the roof is to be folded back as they will restrict the movement of the roof rearward.
6. Point out that relief cuts are placed in the roof rails. These typically extend approximately four inches along the sides of a roof, perpendicular to the roof.
7. Illustrate how a 51" pry bar, pike pole or other appropriate tool is extended across the roof in line with the relief cuts while two people exert downward pressure on each end.
8. Describe to the candidates how the roof is folded back by pulling at each front corner post.
9. Explain that this folded section of roof should be secured with a rope if there is any possibility that a gust of wind (e.g., a transfer truck passing by on an interstate highway) may cause it to be blown back on the passenger compartment.
10. Point out the roof may be folded from the side (e.g., the vehicle is against an embankment or a transfer truck which prevents emergency service personnel from reaching the corner posts on that side of the vehicle.)

11. Discuss how roofs may be removed entirely to gain access to the patient. The rear posts are usually thicker and may require the use of multiple cuts or "V" cuts with a hydraulic cutter.
12. Explain to the class that for vehicles on their side, a three-sided cut at the top and two sides, which will form somewhat of a ramp, may be made on the roof being sure not to catch the roof railing. Stabilize the vehicle with whatever means are available prior to making the above mentioned cuts.
13. Emphasize that no part of the patient's body should be in contact with that part of the roof that must be cut.
14. Describe how the above mentioned cut can be made with a variety of tools:
  - a) Panel cutter and 2 pound hammer.
  - b) Fire ax and eight pound sledge hammer.
  - c) "Can-opener" type metal cutter.
15. Explain to the class that after the headliner has been removed, cut the roof supports at the bottom, and fold them up at the top.
16. Illustrate how discarded sections of fire hose approximately three feet long cut along one side may be placed on the edges of the metal which has been cut to prevent injury.

Reference IFSTA 1st Edition Principles of Extrication, pages 131 through 137.

## **PRESENTATION**

### **ENABLING OBJECTIVE #4**

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the vehicle door.

1. Point out that doors are often used as a means of gaining access as well as extrication of the patient.

2. Explain how American automobiles have a latching device which closes around a strykor bolt ("Nader Nail.")
3. Point out that on passenger cars, multipurpose passenger vehicles and trucks; a door locking mechanism is required to withstand a minimum of 2,500 lbs. before separating when a longitudinal load is applied. A Toyota latch is rated at 3,500 lbs. while a Mercedes Benz is rated at 5,800 lbs.
4. Explain that foreign cars as well as older vehicles may have a door locking mechanism which pinches a pin.
5. Describe how plunger type door handles may be removed with a hammer with the locking mechanism disengaged with a screwdriver.
6. Point out that on a center post mid-mounted door handles the primary latching mechanism is higher than on a typical door.
7. Explain to the candidates that a secondary latch pin is located near the bottom of the door which is typically not as strong as the primary.
8. Discuss with the students locking mechanisms on vehicles with passive restraint seat belt systems.
9. Explain how these vehicles will also have a locking mechanism where the seat belt assembly attaches to the door frame to insure the effectiveness of the seat belt.
10. Describe how door hinges may be stamped steel or cast iron in construction and may break suddenly without warning as opposed to bending when a force is applied.
11. Point out that rivets which hold hinges in place may travel with the velocity of a bullet when broken off.
12. Discuss how the crash protection barrier is designed to protect occupants involved in side impact crashes.

13. Explain to the candidates that the crash protection barrier may be a piece of rolled steel much like a roll cage found in race cars.
14. Describe how on doors with push-button-type handles, the following procedure may be used quickly.
  - a) Knock the door handle off with a 2 pound hammer. Use caution that the hammer does not strike a lower extremity of the firefighter should they miss the handle with the hammer.
  - b) Insert the tip of a screwdriver to strike the bearing plate that engages the door-latching mechanism.
  - c) Pulling outward on the door as the bearing plate is depressed should open the door.
15. Describe how using any one of a number of tools, such as a panel cutter or an air chisels. An opening can be created around the door handle which will give the rescuer an opportunity to manually engage the door-latching mechanism.
16. Point out that hand tools such as pry bars are very ineffective against the strykor bolt ("Nader Nail") as they are designed to withstand several thousand pounds of pressure before releasing.

Reference IFSTA 1st. Edition Principles of Extrication, pages 138 through 148.

## **PRESENTATION**

### **ENABLING OBJECTIVE #5**

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the vehicle windshield.

1. Discuss with the candidates how mastic mounted windshields have an adhesive which may be cut with a piano wire or a Glazier's tool, but proves to be difficult as the adhesive often reseals.
2. Describe how a quicker and more effective method of removing a mastic mounted windshield is to cut the top

and two sides with an ax, pry-axe, bailing hook or other appropriate tool.

3. Explain to the class that rubber gasket windshields are found in older automobiles, newer trucks and vans and may be removed intact. This reduces the hazard of having to work around broken glass.

Reference IFSTA 1st. Edition Principles of Extrication, pages 166 through 168.

## **PRESENTATION**

### **ENABLING OBJECTIVE #6**

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the steering wheel.

1. Using basic hand tools, demonstrate the proper techniques including safety considerations for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the steering wheel.

**NOTE: Some vehicles have an entire console (speedometer and instrumentation) which tilts as the steering wheel is tilted. Other vehicles are equipped with a tilt mechanism which articulates at a point close to the firewall. These particular mechanisms do not pose as great a threat as the standard tilt mechanism in so much as it would be impossible to wrap a chain below the hinge.**

2. Discuss the need for wrapping the chain around the steering wheel in order to displace it forward, placing the chain in such a manner that the hook of the chain will not catch any objects as it comes forward, such as parts of the dashboard.
3. Have the candidates verbally describe how front-wheel-drive vehicles have rack-and-pinion steering systems that typically consist of a two-piece shaft coupled by two universal joints, a jacket assembly, and a two-piece shroud.

4. Describe how this same type of design may be found on some vehicles that do not have front-wheel-drive, such as recent Volkswagen van models.
5. Emphasize that forces generated during the displacement of a steering wheel forward in a horizontal pulling mode can cause the portion of the steering wheel closest to the floorboard to be lowered and actually trap or further injure the patient. Or it can be pulled so far as to snap the column in two.

Reference IFSTA 1st. Edition Principles of Extrication, pages 160 through 162.

## PRESENTATION

### ENABLING OBJECTIVE #7

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the steering column.

1. Using basic hand tools, demonstrate the proper techniques including safety considerations for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the steering column.
2. Convey to the candidates that prior to displacing the steering column forward; cut the bottom half of the steering wheel with either bolt cutters or a hacksaw. First break away the plastic covering with vice grip pliers.

**NOTE: Some texts suggest that this inner ring of steel inside a steering wheel may be made of sprung steel. In the event that this situation is encountered, it would be necessary to cut the spokes of the steering wheel with a hydraulic cutter. The procedure is somewhat difficult with a hacksaw.**

3. Point out to the candidates that you want to wrap a chain around the steering column one complete turn and bring the two ends under the spokes of the wheel

to form a loop which will accept a hook of the come-a-long when using a hydraulic spreader unit, simply wrap the chain around the steering column and back on itself.

4. Explain to the class that when displacing the tilt-wheel steering column forward with a come-a-long, simply wrap the chain around the column below the tilt mechanism.
5. Describe how the above procedure prevents the steering column from separating at the tilt mechanism which is simply a piece of "stamped" steel (very weak) and a plastic knuckle.

**NOTE: An alternative method to displacing the steering column forward on a front-wheel-drive vehicle is to displace it in an upward direction with a "High-Lift" tractor jack. The steering column is wrapped in the standard fashion with a chain brought tight to the front of the vehicle and secured to the chassis. The tractor jack is then placed under this chain with a cribbing support under it to lift the steering column upward. The chain around the steering column can also be placed onto that portion of the tractor jack which travels upward to raise the steering column upward. A second chain can be used from the top of the tractor jack to a secure joint on the chassis to stabilize the tractor jack and prevent it from twisting.**

Reference IFSTA 1st Edition Principles of Extrication, pages 149 through 157.

## **PRESENTATION**

### **ENABLING OBJECTIVE #8**

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the dashboard.

1. Pushing the dashboard using a hydraulic spreader

2. A hydraulic spreader may be used to push up the dashboard, one side at a time
3. Steps for pushing the dashboard.
  - a) Open and preferably remove the front door on the side where the dashboard will be pushed.
  - b) Remove the windshield, if this has been done already, and cut the "A" post at the windshield level.
  - c) Cut two notches low on the "A" post. Cut one notch as close to the floor as possible and the other about one foot above the first cut.
  - d) Place a solid platform of cribbing directly below the lifting area.
  - e) After cutting the notches, insert a spreader tip into each notch, keeping the spreader as parallel to the frame as possible.
  - f) After placing the spreader, open it.
  - g) The dashboard and "A" post should be forced up and toward the front of the vehicle.
  - h) Once the lift is complete, insert a piece of cribbing to hold the dash in place.
4. Pushing the dashboard and steering column using hydraulic rams
5. Steps for using rams.
  - a) Remove the windshield.
  - b) Cut the "A" posts and fold back or remove the roof to expose the inside of the vehicle.
  - c) Cut a "V" shaped notch into the "A" posts on both sides of the vehicle. This notch may be made on either side of the hinges, or in between the hinges. Most departments prefer to make the cut at the bottom, as close to the rocker panel as possible.
  - d) It is best to use two long (50" to 60") rams to do the pushing. Position one ram on each side of the vehicle.
  - e) Butt the foot end of the ram against the bottom of the "B" post.
  - f) Extend the pushing end until it is in contact the top of the "A" post.
  - g) Once the rams are in place, extend them to push up the dash assembly up and away from the front seat area of the vehicle.

- h) Once the dash assembly is pushed, the victim may be removed through the top of the vehicle.
- i) An alternative method is to place cribbing in the cut on the "A" post to allow the rams to be removed without the dashboard settling back into its original position.

## **PRESENTATION**

### **ENABLING OBJECTIVE #9**

The Technical Rescuer candidate, when given the appropriate rescue equipment, shall correctly demonstrate safe and efficient methods for extricating an entrapped or pinned patient of a motor vehicle accident by displacing the passenger seat.

1. Front seats may be pushed backwards with hydraulic spreading tools or hydraulic rams
2. Steps for using a hydraulic spreader.
  - a) Place one tip of the tool on the corner of the seat's lower frame directly above the seat runner.
  - b) Place the other tip against the "A" post at a point higher than the seat frame. It may be necessary to use a piece of cribbing between the tip of the tool and the post to prevent the post from buckling.
  - c) Once the tool is in place, open the spreader arms. This will move the seat toward the rear of the vehicle.
3. Steps for using a hydraulic ram
  - a) Position the ram between the corner of the seat's lower frame, directly above the seat runner and the fire wall or "A" post. Place a sturdy piece of cribbing between the fire wall and the heel of the ram to prevent the ram from pushing through the fire wall.
  - b) Extend the ram to force the seat backwards.
4. Pulling front seats.
  - a) Front seats can be pulled backward away from the steering column and dashboard using a hydraulic spreader or come-a-long.
  - b) Steps for pulling front seats.

- i. Remove the rear window.
- ii. Wrap the chain around the solid parts of the seat – not around the seat tracks that are secured to the floor.
- iii. Center the chain to create an equal pull on both sides of the seat so it will not bind on the tracks, especially when pulling bench type seats.
- iv. Pass the anchor chain over the trunk and fasten it to a sturdy structural support under the rear of the vehicle making sure to avoid the fuel tank.
- v. Use shoring blocks between the chain and the truck or other sheet metal to avoid buckling and snagging.
- vi. Once all chains and the pulling tool are connected, pull the seat backwards as far as necessary.
- vii. Do not disassemble the pulling apparatus until the victim has been removed.

## **SUMMARY**

This class introduces the Technical Rescuer to basic and some of the specialized equipment that the candidate may encounter in the field during a vehicle or machinery rescue. It is a general class, and the instructor should cover all the rescue possibilities, and the more equipment brought before the candidates, the sooner they will be effective in the field, and the more versatile each candidate will be.

This is the instructor's "show and tell" class. Gather as much available equipment as you can and put on a show. If possible arrange for dealers to come in and demonstrate their wares.

Keep in mind and continuously emphasize to the candidates that equipment is for speed and efficiency, but never neglect safety for the sake of speed.