

Vehicle and Machinery Rescue Technician Certification Course

(In accordance with NFPA 1670 chapter 4 and as outlined in NFPA 1006 chapter 6)

Presented by: Scene Of The Accident, Inc.

Course Objectives:

1. **Awareness level.** This level represents the minimum capability of organizations that provide response to technical search and rescue incidents.

- (1) Recognizing the need for a vehicle and machinery search and rescue
- (2) Identifying the resources necessary to conduct operations
- (3) Initiating the emergency response system for vehicle and machinery search and rescue incidents
- (4) Initiating site control and scene management
- (5) Recognizing general hazards associated with vehicle and machinery search and rescue incidents
- (6) Initiating traffic control

2. **Operations level.** This level represents the capability of organizations to respond to technical search and rescue incidents and to identify hazards, use equipment, and apply limited techniques specified in this standard to support and participate in technical search and rescue incidents.

- (1) Sizing up existing and potential conditions at vehicle and machinery search and rescue incidents
- (2) Identifying probable victim locations and survivability
- (3) Making the search and rescue area safe, including the stabilization and isolation (e.g., lockout/tagout) of all vehicles or machinery involved
- (4) Identifying, containing, and stopping fuel release
- (5) Protecting a victim during extrication or disentanglement
- (6) The packaging of a victim prior to extrication or disentanglement
- (7) Accessing victims trapped in a vehicle or machinery
- (8) Performing extrication and disentanglement operations involving packaging, treating, and removing victims trapped in vehicles or machinery through the use of hand and power tools
- (9) Mitigating and managing general and specific hazards (i.e., fires and explosions) associated with vehicle and machinery search and rescue incidents
- (10) Procuring and utilizing the resources necessary to conduct vehicle and machinery search and rescue operations
- (11) Maintaining control of traffic at the scene of vehicle and machinery search and rescue incidents

3. **Technician level.** This level represents the capability of organizations to respond to technical search and rescue incidents, to identify hazards, use equipment, and apply advanced techniques specified in this standard necessary to coordinate, perform, and supervise technical search and rescue incidents.

- (1) Evaluating existing and potential conditions at vehicle and machinery search and rescue incidents
- (2) Performing extrication and disentanglement operations involving packaging, treating, and removing victims injured or trapped in large, heavy vehicles or machinery
- (3) The advanced stabilization of unusual vehicle and machinery search and rescue situations
- (4) Using all specialized search and rescue equipment immediately available

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Course Outline:

1. Establish “scene” safety zones, given scene security barriers, incident location, incident information, and personal protective equipment, so that action hot, warm, and cold safety zones are designated, zone perimeters are consistent with incident requirements, perimeter markings can be recognized and understood by others, zone boundaries are communicated to incident command, and only authorized personnel are allowed access to the rescue scene.

(a) *Classroom Training:* Use and selection of personal protective equipment, traffic control flow and concepts, types of control devices and tools, types of existing and potential hazards, methods of hazard mitigation, and types of zones and staffing requirements.

(b) *Hands-On Skills:* Selection and use of personal protective equipment, application of traffic control concepts, positioning of traffic control devices, identification and mitigation of existing or potential hazards, application of zone identification, and personnel safety techniques.

2. Stabilize a vehicle or machine, given a basic extrication tool kit and personal protective equipment, so that the vehicle or machinery is prevented from moving during the rescue operations; entry, exit, and tool placement points are not compromised; anticipated rescue activities will not compromise vehicle or machinery stability; selected stabilization points are structurally sound; stabilization equipment can be monitored; and the risk to rescuers is minimized.

(a) *Classroom Training:* Types of stabilization devices, mechanism of vehicle and machinery movement, types of stabilization points, types of stabilization surfaces, policies and procedures, and types of vehicle and machinery construction components as they apply to stabilization.

(b) *Hands-On Skills:* The ability to apply and operate stabilization devices.

3. Determine the vehicle access and egress points, given the structural and damage characteristics and potential victim location(s), so that victim location(s) are considered; entry and exit points for victims, rescuers, and equipment are designated; flow of personnel, victim, and equipment is considered; existing entry points are used; time constraints are factored; selected entry/egress points do not compromise vehicle stability; chosen points can be made safe; equipment and victim stability is considered; and safety and emergency procedures are enforced.

(a) *Classroom Training:* Vehicle construction/features, entry and exit points, routes and hazards operating systems, and emergency evacuation/safety signals.

(b) *Hands-On Skills:* The ability to identify entry and exit points and probable victim locations and assess and evaluate impact of vehicle stability on the victim.

4. Create access and egress openings for rescue, given basic extrication tool kit, specialized tools and equipment, personal protective equipment, and an assignment, so that the orderly movement of rescuers and equipment complements victim care and removal, an emergency escape route is provided, the technique chosen is expedient, victim and rescuer protection is afforded, and vehicle stability is maintained.

(a) *Classroom Training:* Vehicle construction and features, electrical, mechanical, hydraulic, pneumatic, and alternative entry and exit equipment, points and routes of ingress and egress, techniques and hazards, and emergency evacuation and safety signals.

(b) *Hands-On Skills*: The ability to identify vehicle construction features, select and operate tools and equipment, apply tactics and strategy based on assignment, apply victim care and stabilization devices, perform hazard control based on techniques selected, and demonstrate safety procedures and emergency evacuation.

5. Isolate potentially harmful energy sources, given basic extrication tool kit and personal protective equipment, so that all hazards are identified, systems are managed, beneficial system use is considered, and hazards to rescue personnel and victims are minimized.

(a) *Classroom Training*: Types and uses of personal protective equipment, types of energy sources, system isolation methods, specialized system features, and tools for disabling hazards.

(b) *Hands-On Skills*: The ability to select and use task and incident specific personal protective equipment, identify hazards, operate beneficial systems in support of tactical objectives, and operate tools and devices for securing and disabling hazards.

6. Establish fire protection, given an extrication incident and fire control support, so that fire and explosion potential is managed and fire hazards and rescue objectives are communicated to the fire support team.

(a) *Classroom Training*: Types of fire and explosion hazards, incident management system, types of extinguishing devices, types of flammable and combustible substances and types of ignition sources, and extinguishment or control options.

(b) *Hands-On Skills*: The ability to identify fire and explosion hazards, operate within the incident management system, use extinguishing devices, apply fire control strategies, and manage ignition potential.

7. Disentangle victim(s), given an extrication incident, a basic extrication tool kit, personal protective equipment, and specialized equipment, so that undue victim injury is avoided, victim protection is provided, and stabilization is maintained.

(a) *Classroom Training*: Tool selection and application, stabilization systems, protection methods, disentanglement points and techniques, and dynamics of disentanglement.

(b) *Hands-On Skills*: The ability to operate disentanglement tools, initiate protective measures, identify and eliminate points of entrapment, and maintain incident stability and scene safety.

8. As a member of a team, remove a packaged victim to a safe area given a victim transfer device, designated egress route, and personal protective equipment, so that the team effort is coordinated, the designated egress route is used, the victim is removed without compromising victim packaging, undue injury is avoided, and stabilization is maintained.

(a) *Classroom Training*: Patient handling techniques, incident management system, types of immobilization, packaging and transfer devices, types of immobilization techniques, uses of immobilization devices, lifting and moving techniques, and safety.

(b) *Hands-On Skills*: Use of immobilization, packaging, and transfer devices for specific situations, immobilization techniques, application of medical protocols and safety features to immobilize, and package transfer and safe lifting techniques.

Course Content:

As part of the hazard identification and risk assessment, this course will identify different types of vehicles and machinery. These types can include, but are not limited to, cars, trucks, buses, trains, mass transit systems, aircraft, watercraft, agriculture implements, and industrial/construction machinery. The training provided in this course will help you develop procedures and provide training to personnel that is commensurate with the potential for search and rescue situations involving the above-mentioned vehicles and machinery.

The course will help to develop procedures to maintain control of the site and the perimeter to include management of all civilian and non-emergency personnel and the establishment of operational zones and site security.

General hazards associated with operations at vehicle and machinery search and rescue incidents in uniquely challenging situations will be presented. The following potential hazards will be covered:

(1) Utilities. Control of the utilities in and around a vehicle or machinery search and rescue incident is critical to ensure the safety of responding personnel and victims. The AHJ should provide its members with training in the control of these services to provide a safe environment in which to operate and to ensure the safety of victims. The following utilities will be outlined:

- (a) Electrical services (primary and secondary)
- (b) Gas, propane, fuel oil, or other alternative energy sources (primary systems)
- (c) Water
- (d) Sanitary systems
- (e) Communications
- (f) Secondary service systems (such as compressed, medical, or industrial gases)

(2) Hazardous Materials. Vehicle and machinery rescue incidents might include various materials that, when released during an incident, could pose a hazard to victims and responders. This course will provide training in the recognition of potential hazardous material releases, the determination of an existing hazard, and the methods used to contain, confine, or divert hazardous materials to conduct operations safely and effectively.

(3) Personal Hazards. At the site of any vehicle and machinery search and rescue incident, there are many dangers that pose personal injury hazards to the responders. This course will provide training to recognize the personal hazards that may be encountered and discuss the methods needed to mitigate these hazards to help ensure their safety. Awareness of hazards such as trips, falls, blows, cuts, abrasions, punctures, impalement, and so forth will be covered.

(4) Movement of Vehicle(s) and Machinery. Uncontrolled movement of vehicle(s) and machinery components can cause extremely hazardous and potentially fatal situations. Responding personnel will be familiarized in techniques for stabilizing and removing the potential for movement of vehicle(s) and machinery components.

(5) Release of High-Pressure Systems. Vehicles and machinery often include high-pressure systems (e.g., hydraulic, pneumatic) that can fail without warning. Such failure can cause extremely hazardous conditions, injury, and death of victims and responders. This course provides training in the recognition of potential high-pressure system hazards, the determination of an existing hazard, and the methods used to contain, confine, or divert such hazards to conduct operations safely and effectively.

(6) Other Hazards. There are numerous other hazards associated with vehicle and machinery search and rescue incidents. This course will help you identify the hazards that might be encountered and provide training and awareness of these other hazards to allow them to perform search and rescue operations safely and effectively.

This course will provide training in the initial size-up and continuous evaluation of the following:

- (1) Scope and magnitude of the incident
- (2) Risk/benefit analysis (body recovery versus rescue)
- (3) Number and size of vehicles or machines affected
- (4) Integrity and stability of vehicles or machines affected
- (5) Number of known or potential victims
- (6) Access to the scene
- (7) Hazards such as disrupted or exposed utilities, standing or flowing water, mechanical hazards, hazardous materials, electrical hazards, and explosives
- (8) Exposure to traffic
- (9) Environmental factors
- (10) Available versus necessary resources

This course will provide training in the search and rescue area immediately surrounding [within 20 ft, or so, radius of] the vehicle or machinery. Making the search and rescue area safe includes, but is not limited to, the following actions; however, specific actions based on the vehicle or machinery type and specific situation will also be covered.

- (1) Establishing operational zones (i.e., hot, warm, cold) and site security
- (2) Utilizing specific techniques and tools (including cribbing, chocks, and wedges) to stabilize the vehicle
- (3) Utilizing specific techniques and tools (i.e., lockout and tagout) to isolate the involved equipment
- (4) Making the search and rescue area (i.e., hot zone) safe for entry
- (5) Safely undertaking disentanglement and extrication operations using hand tools
- (6) Ventilating the search and rescue area and monitoring its atmosphere when necessary
- (7) Supporting any unbroken utilities
- (8) Providing protective equipment for any victims, if possible, when necessary
- (9) Prohibiting entry into an unsafe vehicle or machinery search and rescue area
- (10) Preventing the touching or operating of equipment or machinery involved until its safety has been established

To ensure a safe disentanglement or extrication operation, this course provides training on the following topics:

- (1) Types of passenger restraint systems
- (2) Frame and construction features of vehicles
- (3) Types of suspension systems in vehicles
- (4) Types and classification of impacts
- (5) Categories of mechanical injury
- (6) Various stabilization techniques
- (7) Center of gravity and its relationship to rollover
- (8) Use of cribbing and chocks
- (9) Building a crib box
- (10) Types and examples of levers for mechanical advantage
- (11) Proper and effective use of hand tools including a hammer, pry bar, hacksaw, glass punch, Halligan, knife or belt cutter, cable cutter, and come-along
- (12) Disentanglement through primary access points
- (13) Patient packaging prior to removal from a vehicle or machine

- (14) Protection of the victim during extrication or disentanglement operations
- (15) Proper and effective use of power tools such as hydraulic, pneumatic, and electrical spreading, cutting, lifting, and ram-type tools

To ensure that disentanglement or extrication from large, heavy vehicles or machines is performed safely, this course also provides training on the following topics:

- (1) Frame and construction features of heavy, large vehicles and machinery
- (2) Use and components of a search and rescue chain assembly
- (3) Pneumatic high-, medium-, and low-pressure lifting bags
- (4) Use, care, and maintenance of wire rope and its associated equipment
- (5) Large and heavy object weight estimation
- (6) Steps necessary to lift or move large objects
- (7) Use of cribbing and chocks with large and heavy objects
- (8) Use of commercial heavy wreckers and recovery services to assist at incidents involving large transportation vehicles
- (9) Use, care, and maintenance of both manual and power winches
- (10) Types and examples of lifting devices that use mechanical advantage principles
- (11) Proper and effective use of power tools including hydraulic, pneumatic, and electrical spreading, cutting, lifting, and ram-type tools
- (12) Disentanglement through both primary and secondary access points through the use of available power tools
- (13) Protection of the victim during this type of extrication or disentanglement operation
- (14) Lockout/tagout of machinery
- (15) Identification and use of various sling configurations

“Unusual” situations include, but are not limited to, extrication or disentanglement operations at incidents involving cars on their tops, cars on their sides, and cars on top of other cars, trucks, and large commercial vehicles. “Advanced stabilization” includes techniques using chains, cables, jack devices, and cribbing or shoring to stabilize vehicles of any size will be covered.

Power tools (e.g., air bags, hydraulic spreaders and rams, hand tools, and other power tools) and training necessary to remove, cut, and move components displaced at a vehicle or machinery search and rescue incident are also provided in this course. “Specialized rescue equipment” can include, but is not limited to, hydraulic, pneumatic, and electrical spreading, cutting, lifting, and ram-type tools immediately available and in use. .

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Presented by: Scene Of The Accident, Inc.

RESCUE TECHNICIAN PROFESSIONAL QUALIFICATION **SKILL STATION MENU**

- A. SCENE CONTROL, SAFETY AND HAZARD CONTROL MANDATORY STATION
- B. STABILIZATION MANDATORY STATION
- C. PATIENT ACCESS MANDATORY STATION
- D. PATIENT MANAGEMENT MANDATORY STATION
- E. PATIENT DISENTANGLEMENT MANDATORY STATION
- F. PATIENT EXTRICATION MANDATORY STATION

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STATION "A" – SCENE CONTROL, SAFETY, & HAZARD CONTROL "SITE OPERATIONS"

Date: Candidate #:

Reference NFPA 1006 (2000 Edition), Chapter 6, 6-1
Testing Requirement: 100%

Site: Evaluator Signature:

DIRECTIONS: Given an extrication incident with vehicular damage, victim injury and/or entrapment, the candidate will provide for safety of self and crew, establish safety zones, identify all present and potential hazards, establish a plan, and control all hazards.

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
1. Establishes and utilizes an Incident Management System. _____	_____	_____	
2. Ensures proper use of Personal Protective Equipment. _____	_____	_____	
3. Completes size-up using observations, victims, bystanders and/or site information. _____	_____	_____	
4. Identifies and safely controls all present and potential hazards. _____	_____	_____	
5. Establishes safe operating zones. _____	_____	_____	
6. Identifies stabilization issues and resources needed. _____	_____	_____	
7. Determines all potential victim locations. _____	_____	_____	
8. Hazards continuously monitored. _____	_____	_____	
9. Were all tasks completed in a SAFE manner? _____	_____	_____	

("NO" indicates automatic failure and requires documentation)

EVALUATION PASS FAIL

PASS/FAIL WILL BE DETERMINED BY "9" YES MARKS ON TASKS. _____

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STATION "B" – VEHICLE STABILIZATION "Site Operations"

Date: Candidate #:

Reference NFPA 1006 (2000 Edition), Chapter 6, 6-1 Site: Evaluator Signature:
Testing Requirement: 100%

DIRECTIONS: Given an extrication incident with vehicular damage, victim injury and/or entrapment, the candidate will provide for safety of self and crew, establish safety zones, identify all present and potential hazards, establish a plan, and control all hazards.

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
1. Ensures proper/continued use of Personal Protective Equipment.	_____	_____	
2. Stabilizes vehicle or machinery utilizing appropriate methods and available equipment with vehicle in following positions:			
- Vehicle on wheels (mandatory)	_____	_____	
- Vehicle on side (mandatory)	_____	_____	
- Vehicle on roof (mandatory)	_____	_____	
- Vehicle on hillside (optional)	_____	_____	
- Vehicle on vehicle (optional)	_____	_____	
- Other machinery (optional)	_____	_____	
3. Access and extrication pathways not obstructed.	_____	_____	
4. Were all tasks completed in a SAFE manner?	_____	_____	

("NO" indicates automatic failure and requires documentation)

EVALUATION PASS FAIL

PASS/FAIL WILL BE DETERMINED BY "4" YES MARKS ON TASKS. _____

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STATION "C" – PATIENT ACCESS

"Site Operations"

Date: Candidate #:

Reference NFPA 1006 (2000 Edition), Chapter 6, 6-1 Site: Evaluator Signature:
Testing Requirement: 100%

DIRECTIONS: Given all present and potential hazards are controlled and vehicle is properly stabilized, establish access priorities and safely gain access to entrapped victims.

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
1. Ensures proper/continued use of Personal Protective Equipment. _____	_____	_____	
2. Identifies quickest and safest route for patient access. _____	_____	_____	
3. Establishes appropriate contact with victim. _____	_____	_____	
4. Proper procedures followed for situation and vehicle position. _____	_____	_____	
5. All tools used in a safe and effective manner. _____	_____	_____	
6. Provide for safe entry of medical/rescue personnel. _____	_____	_____	
7. Interior and rescuer creates hazards identified. _____	_____	_____	
8. Were all tasks completed in a SAFE manner? _____	_____	_____	

("NO" indicates automatic failure and requires documentation)

EVALUATION PASS FAIL

PASS/FAIL WILL BE DETERMINED BY "8" YES MARKS ON TASKS. _____

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STATION "D" – PATIENT MANAGEMENT

"Site Operations"

Date: Candidate #:

Reference NFPA 1006 (2000 Edition), Chapter 6, 6-1 Site: Evaluator Signature:

Testing Requirement: 100%

DIRECTIONS: Given all hazards have been controlled and vehicle is properly stabilized, access has been gained, and patient care has been initiated, establish triage and patient care priorities.

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
1. Ensures proper/continued use of Personal Protective Equipment. _____			
2. Performs patient triage as needed . _____			
3. Provides for patient assessment and initiation of treatment priorities. _____			
4. Assess patient entanglement and/or need for disentanglement. _____			
5. Determines extrication pathway. _____			
6. Provides patient protection. _____			
7. Patient condition communicated to Incident Command. _____			
8. Determines need for patient packaging/immobilization. _____			
9. Follows established local medical protocols. _____			
10. Were all tasks completed in a SAFE manner? _____			

("NO" indicates automatic failure and requires documentation)

EVALUATION PASS FAIL

PASS/FAIL WILL BE DETERMINED BY "10" YES MARKS ON TASKS. _____

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STATION "E" – PATIENT DISENTANGLEMENT Date: Candidate #:
"Site Operations"

Reference NFPA 1006 (2000 Edition), Chapter 6, 6-1 Site: Evaluator Signature:
Testing Requirement: 100%

DIRECTIONS: Given that all hazards are controlled and vehicle is properly stabilized, access gained and patient care initiated, provide for the safe disentanglement of the entrapped patient.

- | | <u>YES</u> | <u>NO</u> | <u>COMMENTS</u> |
|--|------------|-----------|-----------------|
| 1. Ensures proper/continued use of Personal Protective Equipment. | _____ | _____ | |
| 2. Determines quickest and safest extrication pathway. | _____ | _____ | |
| 3. Selects appropriate tools and techniques. | _____ | _____ | |
| 4. All tools used in a safe and effective manner. | _____ | _____ | |
| 5. Provides pathway large enough to accommodate extrication of patient. | _____ | _____ | |
| 6. Provides space for proper patient packaging/immobilization. | _____ | _____ | |
| 7. Disentangles patient without further compromising or aggravating patient's injuries or condition. | _____ | _____ | |
| 8. Were all tasks completed in a SAFE manner? | _____ | _____ | |

("NO" indicates automatic failure and requires documentation)

EVALUATION PASS FAIL

PASS/FAIL WILL BE DETERMINED BY "8" YES MARKS ON TASKS. _____

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STATION "F" – PATIENT EXTRICATION "Site Operations"

Date: Candidate #:

Reference NFPA 1006 (2000 Edition), Chapter 6, 6-1 Site: Evaluator Signature:
Testing Requirement: 100%

DIRECTIONS: Given all hazards are controlled and the vehicle is properly stabilized, access gained, patient care initiated and disentanglement of the patient achieved, the candidate shall safely extricate the patient to a safe area.

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
1. Ensures proper/continued use of Personal Protective Equipment.	___	___	
2. Continues appropriate medical treatment.	___	___	
3. Applies appropriate patient packaging devices.	___	___	
4. Ensures proper patient immobilization.	___	___	
5. Provides for coordinated movement of patient.	___	___	
6. Extrication completed without further compromising patient condition or aggravating patient's injuries.	___	___	
7. Were all tasks completed in a SAFE manner?	___	___	

("NO" indicates automatic failure and requires documentation)

EVALUATION PASS FAIL

PASS/FAIL WILL BE DETERMINED BY "8" YES MARKS ON TASKS. ___