

NFPA®

1071

**Standard for
Emergency Vehicle Technician
Professional Qualifications**

2020



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NFPA® 1071

Standard for

Emergency Vehicle Technician Professional Qualifications

2020 Edition

This edition of NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications*, was prepared by the Technical Committee on Emergency Vehicle Technicians Professional Qualifications and released by the Correlating Committee on Professional Qualifications. It was issued by the Standards Council on April 10, 2019, with an effective date of April 30, 2019, and supersedes all previous editions.

This edition of NFPA 1071 was approved as an American National Standard on April 30, 2019.

Origin and Development of NFPA 1071

In July 1995, the Standards Council, after receipt of a request from the Maintenance Section of the International Association of Fire Chiefs for the development of a standard for the professional qualifications of emergency vehicle technician, approved the establishment of a Technical Committee on Emergency Vehicle Technician Professional Qualifications under the Professional Qualifications project. The committee developed the first edition of NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications*, which established the minimum job performance requirements for a person qualified as an emergency vehicle technician who is engaged in the inspection, diagnosis, maintenance, repair, and testing of an emergency response vehicle.

In the 2006 edition of the document, the committee added a new chapter for emergency vehicle technician III. The committee also revised the document to comply with the new requirements of the *Manual of Style for NFPA Technical Committee Documents*.

The 2011 edition added a skills maintenance requirement for each level of emergency vehicle technician (EVT). The committee updated the EVT requirements to address technological enhancements for new apparatus. The technical committee defined the three levels of EVT. Generally speaking, the EVT I is responsible for operational checks, the EVT II is responsible for performance checks, and the EVT III is responsible for supervision and managerial skills. The skills and knowledge requirements for each level of EVT were updated and brought in line with NFPA 1901, *Standard for Automotive Fire Apparatus*.

The technical committee revised several areas of the document for the 2016 edition. A number of *Manual of Style* and formatting changes were made to several job performance requirements (JPRs). Annex C, Qualifications and Certification, was updated to reflect changes to programs such as the following: Automotive Service Excellence (ASE); Emergency Vehicle Technicians (EVT) Certification Commission; and various Canadian provincial journeyman license and registered apprentice programs. In addition, the technical committee completed a job task analysis for emergency vehicle technicians.

The Correlating Committee on Professional Qualifications has been working to standardize all NFPA professional qualifications documents. Chapter 1, Administration, and Annex B, Explanation of the Professional Qualifications Standards and Concepts of JPRs, will be consistent for all professional qualifications documents.

For the 2020 edition, the committee reviewed all JPRs for accuracy and relevance. The requirements of NFPA 1911 are now incorporated in the professional qualifications for each position as required. Annex D has been added to include the National Fallen Firefighters Foundation's "16 Firefighter Life Safety Initiatives."

The committee did not receive any comments on first draft revisions; as a result, NFPA 1071 received early consent from the Standards Council. This does not change the edition year for the document, but it does allow the document to be released earlier to the public.

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Committee Scope: This Committee shall have primary responsibility for the management of the NFPA Professional Qualifications Project and documents related to professional qualifications for fire service, public safety, and related personnel.

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Committee Scope: This Committee shall have primary responsibility for documents on professional qualifications required of personnel engaged in the diagnosis, maintenance, and repair of systems and components that are unique to emergency response vehicles.

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NFPA 1071

Standard for

Emergency Vehicle Technician Professional
Qualifications

2020 Edition

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced and extracted publications can be found in Chapter 2 and Annex F.

Chapter 1 Administration

1.1* Scope. This standard identifies the minimum job performance requirements (JPRs) for emergency vehicle technicians.

1.2* Purpose. The purpose of this standard is to specify the minimum JPRs for service as an emergency vehicle technician.

1.2.1 This standard shall define Emergency Vehicle Technician I (EVT I), Emergency Vehicle Technician II (EVT II), and Emergency Vehicle Technician III (EVT III).

1.2.2 The intent of this standard shall be to ensure that personnel serving as EVT I, EVT II, and EVT III are qualified.

1.2.3* This standard shall not address organization or management responsibility.

1.2.4 It is not the intent of this standard to restrict any jurisdiction from exceeding or combining these minimum requirements.

1.2.5 JPRs for each level and position are the tasks personnel shall be able to perform to carry out the job duties.

1.2.6* An EVT I, EVT II, and EVT III shall remain current with the general knowledge and skills and JPRs addressed for each level or position of qualification.

1.2.6.1 To obtain and maintain qualification as an emergency vehicle technician, persons shall furnish documentation showing that they have completed 20 hours of initial or continuing education on an annual basis.

1.3 Application. The application of this standard is to specify which requirements within the document shall apply to EVT I, EVT II, and EVT III.

1.3.1 The JPRs shall be accomplished in accordance with the requirements of the authority having jurisdiction (AHJ) and all applicable NFPA standards.

1.3.2 It shall not be required that the JPRs be mastered in the order in which they appear. The AHJ shall establish instructional priority and the training program content to prepare personnel to meet the JPRs of this standard.

1.3.3* Performance of each requirement of this standard shall be evaluated by personnel approved by the AHJ.

1.3.4 The JPRs for each level or position shall be completed in accordance with recognized practices and procedures or as defined by law or by the AHJ.

Δ 1.3.5 Personnel assigned the duties of EVT I shall meet all the requirements defined in Chapter 4 prior to being qualified. Personnel assigned the duties of EVT II shall meet all the requirements defined in Chapter 5 prior to being qualified. Personnel assigned the duties of EVT III shall meet all the requirements defined in Chapter 6 prior to being qualified.

1.3.5.1 An EVT I meeting the requirements of this standard shall be able to perform inspections and maintenance duties as required by NFPA 1911.

1.3.5.2 An EVT II meeting the requirements of this standard shall be able to perform inspections, maintenance, repairs, diagnoses, and performance testing duties as required by NFPA 1911.

1.3.5.3 An EVT III meeting the requirements of this standard shall be able to perform inspections, maintenance, repairs, diagnoses, performance testing, and first-level supervisor duties as required by NFPA 1911.

1.3.6 The AHJ shall provide personal protective clothing and the equipment necessary to conduct assignments.

1.3.7 JPRs involving exposure to products of combustion shall be performed in approved PPE.

1.3.8 Prior to training to meet the requirements of this standard, personnel shall meet the following requirements:

- (1) Educational requirements established by the AHJ
- (2) Age requirements established by the AHJ
- (3) Medical requirements established by the AHJ
- (4) Job-related physical performance requirements established by the AHJ

1.3.9 Wherever in this standard the terms *rules, regulations, policies, procedures, supplies, apparatus, or equipment* are referred to, it is implied that they are those of the AHJ.

1.4 Units. In this standard, equivalent values in SI units shall not be considered as the requirement, as these values can be approximate. (See Table 1.4.)

Table 1.4 U.S.-to-SI Conversions

Quantity	U.S. Unit/Symbol	SI Unit/Symbol	Conversion Factor
Length	inch (in.)	millimeter (mm)	1 in. = 25.4 mm
	foot (ft)	meter (m)	1 ft = 0.305 m
Area	square foot (ft ²)	square meter (m ²)	1 ft ² = 0.0929 m ²

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1500™, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, 2020 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2016 edition.

NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles*, 2017 edition.

NFPA 1989, *Standard on Breathing Air Quality for Emergency Services Respiratory Protection*, 2019 edition.

2.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 1000, *Standard for Fire Service Professional Qualifications Accreditation and Certification Systems*, 2017 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2017 edition.

NFPA 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiner*, 2014 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2018 edition.

NFPA 1451, *Standard for a Fire and Emergency Service Vehicle Operations Training Program*, 2018 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety*, 2020 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2016 edition.

NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles*, 2017 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.4 Shall. Indicates a mandatory requirement.

3.2.5 Should. Indicates a recommendation or that which is advised but not required.

N 3.2.6 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Aerial Device. An aerial ladder, elevating platform, or water tower that is designed to position personnel, handle materials, provide continuous egress, or discharge water. [1901, 2016]

3.3.2 Breathing-Air System. The complete assembly of equipment such as compressors, a purification system, pressure regulators, safety devices, manifolds, air tanks or receivers, and interconnected piping required to deliver breathing air. [1901, 2016]

3.3.3 Defect. A discontinuity in a part or a failure to function that interferes with the service or reliability for which the part was intended. [1901, 2016]

3.3.4 Deficiency. A discontinuity in a part or a failure to function that interferes with the service or reliability for which the part was intended. [1911, 2017]

3.3.5 Deformation. Abnormal wear, defects, cracks or fractures, warpage, and deviations from the original condition that would affect safe and correct operation. [1911, 2017]

3.3.6 Diagnosis. The determination of the cause of a problem.

N 3.3.7 Diagnostic Check. An in-depth operational analysis of a system or component to verify that it is operating properly. [1911, 2017]

3.3.8 Documentation. Any written or electronic data or information relative to the apparatus, including information on its operational checks, diagnostic checks, inspection, maintenance, and performance testing. [1911, 2017]

3.3.9 Duty. A fire-related service, function, or task identified in the fire brigade organizational statement and assigned to a member to perform.

3.3.10 Emergency Response Vehicle. A motorized vehicle designated by an organization or agency to respond to emergency incidents where provisions have been made to include warning systems and specialized components such as pumps, aerial devices, and rescue equipment and are capable of transporting emergency response personnel.

3.3.11 Emergency Vehicle Technician (EVT).

3.3.11.1 Emergency Vehicle Technician (EVT) I. An individual who performs inspection, maintenance, and operational checks on emergency response vehicles and who, by possession of a recognized certificate, professional standing, or skill, has acquired the knowledge, training, and experience and has demonstrated the ability to deal with issues related to the subject matter, the work, or the project.

3.3.11.2 Emergency Vehicle Technician (EVT) II. An individual who performs inspection, maintenance, diagnosis, repair, and performance testing on emergency response vehicles and who, by possession of a recognized certificate, professional standing, or skill, has acquired the knowledge, training, and experience and has demonstrated the ability to deal with issues related to the subject matter, the work, or the project.

3.3.11.3* Emergency Vehicle Technician (EVT) III. An individual who is the first-level supervisor responsible for Emergency Vehicle Technician I and II personnel performance, scheduling, quality control of repairs and maintenance work, and the compiling and reviewing of initial documentation.

3.3.12 Fire Department. An organization providing rescue, fire suppression, and related activities, including any public, governmental, private, industrial, or military organization engaging in this type of activity. [1002, 2017]

3.3.13 Incident Management System (IMS). A system that defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions. [1561, 2020]

3.3.14 Inspect(ion). To determine the condition or operation of a component(s) by comparing its physical, mechanical, and/or electrical characteristics with established standards, recommendations, and requirements through examination by sight, sound, or feel. [1911, 2012]

3.3.15 Job. An organized segment of instruction designed to develop sensory motor skills or technical knowledge.

3.3.16 Job Performance Requirement (JPR). A written statement that describes a specific job task, lists the items necessary to complete the task, and defines measurable or observable outcomes and evaluation areas for the specific task. [1000, 2017]

Δ 3.3.17 Line Voltage Circuit, Equipment, or System. An ac or dc electrical circuit, equipment, or system where the voltage to ground or from line to line is greater than 30 V rms (ac), 42.4 V peak (ac), or 60 V dc. [1901, 2016]

3.3.18 Low Voltage Circuit, Equipment, or System. An electrical circuit, equipment, or system where the voltage does not exceed 30 V rms (ac) or 42.4 V peak (dc), or 60 V dc; usually 12 V dc in fire apparatus. [1901, 2016]

3.3.19 Maintenance. The act of servicing an emergency response vehicle or a component in order to keep the vehicle and its components in proper operating condition.

3.3.20 Manufacturer's Specifications. Any requirement or service bulletin an emergency response vehicle builder or component producer provides with regard to the use, care, and maintenance of its product(s).

N 3.3.21 Operational Checks. Observation of the operation of a component on an emergency vehicle to determine its operational readiness. [1911, 2017]

N 3.3.22 Performance Tests. Tests performed after an emergency vehicle has been put into service to determine whether its performance meets the predetermined specifications or standards.

3.3.23 Proper(ly). In accordance with the manufacturer's specifications or as recommended by the manufacturer. [1911, 2017]

3.3.24 Qualified Person. A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems related to the subject matter, the work, or the project. [1451, 2018]

3.3.25 Rebuild. To make extensive repairs in order to restore a component to like-new condition in accordance with the original manufacturer's specifications.

3.3.26 Repair. To restore to sound condition after failure or damage. [1911, 2017]

3.3.27 Requisite Knowledge. Fundamental knowledge one must have in order to perform a specific task. [1031, 2014]

3.3.28 Requisite Skills. The essential skills one must have in order to perform a specific task. [1031, 2014]

3.3.29 Standard Operating Procedures (SOPs). Written instructions that document and define the manner in which activities should be conducted. [1404, 2018]

3.3.30 Structural Integrity. An unimpaired condition of any component.

3.3.31 Task. A specific job behavior or activity. [1002, 2017]

3.3.32 Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards. [1911, 2017]

Chapter 4 Emergency Vehicle Technician I

4.1 General. To be considered qualified as an Emergency Vehicle Technician I, the individual shall have the general knowledge defined in 4.1.1 and the general skills defined in

4.1.2 and shall meet the job performance requirements of Sections 4.2 through 4.4 and at least one specialty area as defined in Section 4.5, Section 4.6, or Section 4.9.

4.1.1* General Knowledge Requirements. The organization of the fire department and the maintenance facility; the role of the EVT in the organization; the mission of the fire service; the fire department's standard operating procedures (SOPs) and rules and regulations as they apply to the EVT; the critical aspects of NFPA 1500, NFPA 1901, and NFPA 1911, as they apply to the EVT; federal motor carrier safety regulations; applicable federal, state, and local regulations; interpretation and use of manufacturer's specifications, inspection checklists, maintenance schedules, maintenance checklists, and department SOPs; selection of tools; fastener types and their usage; maintenance equipment and its usage; workplace safety practices; selection and use of cleaning products and procedures; housekeeping; and identification and handling of hazardous materials.

4.1.2 General Skill Requirements. The ability to use tools in a recognized safe manner; operate emergency response vehicles in compliance with applicable federal, state, and local regulations; and locate information in departmental documents and in standards and reference materials.

4.2* Chassis. This duty involves the inspection and preventive maintenance practices involved with an emergency response vehicle chassis and inter-related systems such as axles, engines, transmissions, drivelines, brakes, steering and suspension systems, and wheels and tires.

4.2.1 Inspect the chassis systems, given an emergency response vehicle, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the structural integrity, the operation, and the condition of the auxiliary drive systems, axles, driveline, steering and suspension system, wheels, and tires are verified to be within manufacturer's specifications; the mounting security is verified; the chassis components are operational and within manufacturer's specifications; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; inspections and services are documented; and any deficiencies found during the inspection and diagnostic check process are documented.

(A) Requisite Knowledge. Function, operation, and construction of chassis and vehicle systems; type of defects, deficiencies, and potential problems associated with chassis systems; use of a checklist; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify symptoms and conditions of the chassis and vehicle systems; determine defects, deficiencies, and potential problems; perform operational checks; and complete checklist and inspection documentation.

4.2.2 Perform maintenance on the chassis system, given an emergency response vehicle, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, test and calibration equipment, and tools, so that deformed, broken, loose, worn, or missing parts are repaired or replaced; components are lubricated; fluid levels are maintained; calibrations and adjustment are performed; the system's

operational condition is preserved or restored; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function, construction, and operation of chassis and vehicle systems; types of defects, deficiencies, and potential problems associated with chassis and vehicle systems; troubleshooting procedures; adjustment methods and procedures; selection of test and calibration equipment; role of a maintenance schedule and a maintenance checklist; record-keeping requirements; and inspection and maintenance procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Perform operational checks; evaluate reported conditions; recognize and correct deficiencies; use test and calibration equipment; perform all required maintenance, including all items on a maintenance checklist; and complete required documentation.

4.2.3 Inspect chassis systems and components unique to emergency response vehicles, given an emergency response vehicle, SOPs, manufacturer's specifications, tools, test and calibration equipment, an assignment, and an inspection checklist, so that the structural integrity of the frame is verified; the operation and condition of independent suspension systems, all-wheel steering systems, secondary braking systems, and auxiliary cooling systems are verified to be within manufacturer's specifications; multiplexing, interface electronics, and load management systems are operationally checked; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and operational checks are documented.

(A) Requisite Knowledge. Function, operation, construction, and interface of frames, independent suspension systems, all-wheel steering systems, secondary braking systems, and auxiliary cooling systems; the principles of electricity and operational theory of electronics; selection of test and calibration equipment; types of defects, deficiencies, and potential problems associated with chassis systems and components unique to emergency response vehicles; use of checklists; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Recognize and identify symptoms and conditions; use test and calibration equipment; determine defects, deficiencies, and potential problems; perform operational checks; and complete checklist and inspection documentation.

4.2.4 Perform maintenance on chassis systems and components unique to emergency response vehicles, given an emergency response vehicle, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, test and calibration equipment, and tools and diagnostic equipment, so that deformed, broken, loose, worn, or missing parts are repaired or replaced; components are lubricated; fluid levels are maintained; calibrations and adjustment are performed; the system's operational condition is preserved or restored; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function, construction, and operation of chassis and vehicle systems; types of defects, deficiencies, and potential problems associated with chassis and vehicle systems; the theory of electronics; selection of test, calibration, and diagnostic equipment; role of a maintenance schedule and

a maintenance checklist; troubleshooting procedures; adjustment methods and procedures; record-keeping requirements; and inspection and maintenance procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Perform operational checks; evaluate reported conditions; recognize and correct deficiencies; use test, calibration, and diagnostic equipment; perform all required maintenance, including all items on a maintenance checklist; and complete required documentation.

4.3 Cab and Body Components. This duty involves the inspection and maintenance of cabs (fixed and tilt) and the vehicle body, including compartments, warning systems, mounting racks, brackets, latches, and steps and ladders.

4.3.1 Inspect the cab, given an emergency response vehicle, applicable SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the operation of the cab and components is verified; the condition of finishes, signs, labels, and paint is determined; the operation and condition of the doors, latches, trays, glass, and associated hardware are verified to be within manufacturer's specifications; climate control systems are tested for proper operation; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented.

(A) Requisite Knowledge. Function, construction, and operation of doors and latches, seats, self-contained breathing apparatus (SCBA) mounting, safety restraints, instrumentation, window glass and mirrors, steps, handrails, and skid-resistant walking surfaces; types of defects, deficiencies, and potential problems associated with cabs; types of lubricants; failures of finishes, signs, labels, and paint; use of checklists; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

Δ (B) Requisite Skills. Perform operational checks; recognize and identify symptoms and conditions; determine defects, deficiencies, and potential problems; and complete checklist and inspection documentation.

4.3.2 Perform maintenance on the cab, given an emergency response vehicle, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, and tools and test equipment, so that the operational condition is preserved or restored; deformed, broken, loose, worn, or missing parts are repaired or replaced; components are lubricated; skid-resistant walking surfaces are intact; finishes and surfaces are clean and preserved; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function and construction of cab and components, including steps, handrails, skid-resistant walking surfaces, and storage areas; types of defects or deficiencies associated with cabs; role of a maintenance schedule and a maintenance checklist; troubleshooting procedures; adjustment methods and procedures; types of lubricants; operation of doors; common problems and failures of finishes, paint, signs, and labels; record-keeping requirements; and inspection and maintenance procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Perform operational checks; evaluate reported conditions; perform all required maintenance,

including all items on a maintenance checklist; and complete required documentation.

4.3.3 Inspect equipment mounting systems and mounting racks, brackets, and latches, given an emergency response vehicle and its assigned equipment, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the operation and condition of the mounting system and mounting racks are verified to be within manufacturer's specifications; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and operational checks are documented.

(A) Requisite Knowledge. Function, operation, and construction of assigned equipment mounting systems, warning systems, and mounting racks, brackets, and latches; types of defects, deficiencies, and potential problems associated with equipment mounting systems, warning systems, and mounting racks, brackets, and latches; use of checklists; selection of test and calibration equipment; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Recognize and identify symptoms and conditions of equipment mounting systems and mounting racks, brackets, and locks; use test and calibration equipment; perform operational checks; determine defects, deficiencies, and potential problems; and complete checklist and inspection documentation.

4.3.4 Perform maintenance on equipment mounting systems and mounting racks, brackets, and latches, given an emergency response vehicle, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, and tools and test equipment, so that warning system components function; all hoses are tight; leaks are stopped; latches are aligned and adjusted to operational condition; fluids are checked and filled; lubricants are applied; any electrical connections are clean and tight; worn pads are replaced; deformed, broken, loose, worn, or missing parts are repaired or replaced; operational condition is preserved or restored; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function, construction, and operation of equipment mounting systems and mounting racks, brackets, and latches; components of warning systems; common requirements of maintenance; role of a maintenance schedule and a maintenance checklist; types of defects or deficiencies associated with equipment mounting systems, warning systems, and mounting racks, brackets, and latches; adjustment methods and procedures; methods to stop leaks; types of fluids and lubricants; adjustment and calibration procedures; electrical connection theory and maintenance; record-keeping requirements; troubleshooting procedures; and inspection and maintenance procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Perform operational checks; evaluate reported conditions; perform all required maintenance, including all items on a maintenance checklist; correct deficiencies; and complete required documentation.

4.3.5 Inspect the operation of the cab tilt system and components, given an emergency response vehicle with a cab tilt system, SOPs, manufacturer's specifications, tools and test

equipment, an assignment, and an inspection checklist, so that the tilt mechanism is readied safe; the structural integrity is assessed; the operation and condition of all cab tilt components and warning systems are verified to be within manufacturer's specifications; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspections and checks are documented.

(A) Requisite Knowledge. Function, operation, and construction of the cab tilt system, safety and latch systems, and warning systems; types of defects, deficiencies, and potential problems associated with cab tilt systems; use of checklist; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Perform operational checks; recognize and identify symptoms and conditions of the cab tilt systems; determine defects, deficiencies, and potential problems; and complete checklist and inspection documentation.

4.3.6 Inspect body, compartments, and storage areas, given an emergency response vehicle, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the operation and condition of the body, compartments, doors, latches, trays, and associated hardware are verified to be within manufacturer's specifications; the condition of finishes, signs, labels, and paint is determined and documented; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, and operation of body, compartments, shelves and dividers, steps, ladders, platforms, handrails, and skid-resistant walking surfaces; operation of doors, latches, trays, and associated hardware; types of defects, deficiencies, and potential problems associated with the body, compartments, shelves and dividers, steps, ladders, platforms, handrails, and skid-resistant walking surfaces; use of checklists; common problems and failures of finishes and paint, signs, and labels; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Perform operational checks; recognize and identify symptoms and conditions; determine defects, deficiencies, and potential problems; and complete checklist and inspection documentation.

4.3.7 Perform maintenance on body, compartments, and storage areas, given an emergency response vehicle, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, and tools and test equipment, so that operational condition is preserved or restored; deformed, broken, loose, worn, or missing parts are repaired or replaced; components are lubricated; skid-resistant walking surfaces are intact; finishes and surfaces are clean and preserved; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function and construction of body, compartments, shelves and dividers, steps, ladders, platforms, handrails, skid-resistant walking surfaces, and storage areas; types of defects or deficiencies; troubleshooting procedures; role of a maintenance schedule and a maintenance checklist; adjustment methods and procedures; types of lubricants; oper-

ation of doors and trays; common problems and failures of finishes, paint, signs, and labels; record-keeping requirements; and inspection and maintenance procedures of the manufacturer and the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Perform operational checks; evaluate reported conditions; perform all required maintenance, including all items on a maintenance checklist; correct deficiencies; and complete required documentation.

4.4 Electronic and Electrical Systems (Low Voltage). This duty involves the operational checks of the vehicle's charging systems, starting systems, lighting system, electronic pump controls, and other low-voltage electronic and electrical systems and devices.

4.4.1* Inspect the low-voltage electrical system, given an emergency response vehicle; SOPs; manufacturer's specifications; tools and test equipment, including a belt tension gauge and a multimeter; an assignment; and an inspection checklist, so that the mounting security is verified; operation and condition of the low-voltage electrical system is verified to be within manufacturer's specifications; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, operation, and requirements of starting and charging systems, chassis lighting and electrical components, emergency lighting, and accessory lighting; selection of test and calibration equipment; principles of electricity (Ohm's law), magnetism, and voltage drop; types of defects, deficiencies, and potential problems associated with low-voltage electrical systems; mounting and adjustment requirements; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify symptoms and conditions of low-voltage electrical systems, determine defects and deficiencies, use test and calibration equipment, perform operational checks, and complete checklist and inspection documentation.

4.4.2* Perform maintenance on the low-voltage electrical system, given an emergency response vehicle, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, test and calibration equipment, and tools, so that deformed, broken, loose, worn, or missing parts are repaired or replaced; the operational condition is preserved or restored; calibration and adjustments are performed; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function, construction, operation, and requirements of starting and charging systems, chassis lighting and electrical components, emergency lighting, and accessory lighting; types of defects or deficiencies associated with low-voltage electrical systems; role of a maintenance schedule and a maintenance checklist; troubleshooting procedures; adjustment methods and procedures; selection of test and calibration equipment; principles of electricity (Ohm's law), magnetism, and voltage drop; record-keeping requirements; and inspection and maintenance procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Evaluate reported conditions; perform operational checks; perform all required maintenance, including all items on a maintenance checklist; correct deficiencies; use test and calibration equipment; and complete required documentation.

4.5 Fire Pump, Auxiliary Pump, and Tank Systems. This duty involves inspection, maintenance, and operational checking of the fire pump, wildland pump, ultra-high-pressure pump or industrial pump system, and onboard water/foam tank.

4.5.1 Inspect fire pumps or auxiliary pump and related components, given an emergency response vehicle with a fire pump or an auxiliary pump, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the security of the mounting of all system components (e.g., primer pump, plumbing and valves, pressure control devices, gauges) is verified; operation and condition of the system components, warning system, and interlocks are verified to be within manufacturer's specifications; adjustments are made where required; recommended fluid levels are verified; leaks and fluid contamination are identified and reported; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, and operation of fire pumps, auxiliary pumps, primer pumps, and related components; pressure control devices; plumbing and valves; packing and seals; types, grades, and viscosity of lubricating oils; pump packing adjustment methods and procedures; pump operational procedures; types of defects, deficiencies, and potential problems associated with fire pumps, auxiliary pumps, primer pumps, and related components; use of checklists; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify symptoms and conditions of pumps and components, determine defects and deficiencies, recognize characteristics of fluid contamination, perform operational checks, and complete checklist and inspection documentation.

4.5.2 Inspect water/foam agent tanks, given an emergency response vehicle with a water or foam tank, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the mounting and condition of the water/foam agent tank is verified; all coated and noncoated surfaces are free of corrosion; sacrificial anodes are evaluated for life-cycle condition and replaced if necessary; the tank is flushed; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspections and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, operation, and construction of water/foam tanks and related components; flushing procedures; sacrificial anode replacement procedures and schedules; types of defects, deficiencies, and potential problems associated with water/foam agent tanks; use of checklists; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify the effects of corrosion by different types of water and foam agents on selected tank materials, determine defects and deficiencies, perform operational checks, and complete checklist and inspection documentation.

4.5.3* Perform maintenance on a fire pump or auxiliary pump and related components, given an emergency response vehicle with a fire pump or an auxiliary pump, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, test and calibration equipment, and tools, so that deformed, broken, loose, worn, or missing parts are repaired or replaced; all packing and seals are adjusted to specification; hoses, valves, and fittings are in good condition and are leak-free; fluids are at recommended levels; recommended lubricants are applied; indicator lights are operational and electrical connections are clean and tight; instrumentation is operational; controls are adjusted, lubricated, and operational; the system's operational condition is preserved or restored; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function, construction, and operation of a fire pump, auxiliary pump-priming device, and related components; packing and seal adjustment procedures; instrumentation and controls; sacrificial anode replacement procedure and schedules; types of defects or deficiencies associated with fire pumps, auxiliary pumps, priming devices, and related components; role of a maintenance schedule and a maintenance checklist; troubleshooting procedures; record-keeping requirements; and inspection and maintenance procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Evaluate reported conditions; perform operational tests; use test and calibration equipment; perform all required maintenance, including all items on a maintenance checklist; correct deficiencies; and complete required documentation.

4.6 Aerial Systems. This duty involves inspection, maintenance, and operational checks of aerial ladder, elevating platform, and water tower systems.

4.6.1 Inspect the ladder sections of an aerial ladder, given an emergency response vehicle with an aerial ladder, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the operation and condition of the ladder sections and extension systems are verified to be within manufacturer's specification; the mounting security is verified; the alignment of the sections is checked for twists and bows; rails and rungs are checked for corrosion and dents; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, operation, construction, and inspection practices of aerial ladders; types of defects, deficiencies, and potential problems associated with aerial ladders; use of checklists; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Recognize and identify physical and operational conditions of ladder sections, components, and systems; determine defects and deficiencies; perform opera-

tional checks; and complete checklist and inspection documentation.

4.6.2 Inspect the sections of an elevating platform or water tower, given an emergency response vehicle with an elevating platform or water tower, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the operation and condition of the boom sections are verified to be within manufacturer's specifications; the mounting security of all components is verified; the alignment of the booms is checked for twists and bows; booms are checked for corrosion, dents, wear, and discontinuities; extension, elevation, and leveling systems are checked for damage; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, operation, and construction of elevating platforms or water towers; types of defects, deficiencies, and potential problems associated with elevating platforms; use of checklists; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

(B) Requisite Skills. Recognize and identify physical and operational conditions of elevating platforms or water towers and components, perform operational checks, determine defects and deficiencies, and complete checklist and inspection documentation.

4.6.3 Perform maintenance on aerial sections, booms, platforms and waterways, given an emergency response vehicle with an aerial device and waterway, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance checklist, SOPs, test and calibration equipment, and tools, so that the aerial sections, booms, platforms, and waterways are maintained in accordance with specifications, and are cleaned, lubricated, and adjusted; deformed, broken, loose, worn, or missing parts are repaired or replaced; the operational condition is preserved or restored; the aerial device is tested for proper operation; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function, construction, and operation of aerial device, components, and systems; fluid types and lubricants; role of a maintenance schedule and a maintenance checklist; types of defects or deficiencies associated with aerial devices; troubleshooting procedures; adjustment methods and procedures; record-keeping requirements; and apparatus inspection and maintenance procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Evaluate reported conditions; perform operational checks; perform all required maintenance, including all items on a maintenance checklist; use test and calibration equipment; correct deficiencies; and complete required documentation.

4.6.4 Inspect the hydraulic system components of an aerial device, given an emergency response vehicle with an aerial device, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the operation and condition of the hydraulic system components, warning systems, and gauges are verified to be within manufacturer's specifications; the security of the mounting of

components is verified; recommended fluid levels are verified; visible leakage or contamination is identified; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, operation, and inspection procedures of stabilizers, rotation motors, extension cylinders, elevation cylinders, leveling cylinders, gauges, and parts of an aerial device hydraulic system; normal operating condition; fluid requirements; types of defects, deficiencies, and potential problems associated with hydraulic systems; sources of contamination; use of checklists; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify the condition of the aerial device hydraulic system, recognize and identify recommended fluid levels and sources of contamination, determine defects and deficiencies, read and interpret gauges, perform operational checks, and complete checklist and inspection documentation.

4.6.5 Inspect all mechanical components of the stabilization system, given an emergency response vehicle with an aerial device stabilization system, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the security of the mounting is verified; operation and condition of the mechanical components of the stabilization system are verified to be within manufacturer's specifications; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, and operation of an aerial device stabilization system, including wheels, tires, axles, frame, torque box, turntable, and related components; normal operating condition; types of defects, deficiencies, and potential problems associated with stabilization systems; use of checklists; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify the condition of an aerial device stabilization system, determine defects and deficiencies, perform operational checks, and complete checklist and inspection documentation.

4.6.6 Perform maintenance on the aerial device stabilization system, given an emergency response vehicle with an aerial device stabilization system, a maintenance schedule or an assignment, manufacturer's specifications, a maintenance checklist, SOPs, test and calibration equipment, and tools, so that deformed, broken, loose, worn, or missing parts are repaired or replaced; the stabilization system is maintained in accordance with manufacturer's specifications; the operational condition is preserved or restored; the stabilization system is tested for proper operation; activities are documented; and additional repair needs are reported.

(A) Requisite Knowledge. Function, construction, and operation of the aerial device stabilization system; role of a maintenance schedule and a maintenance checklist; types of defects

or deficiencies associated with stabilization systems; troubleshooting procedures; adjustment methods and procedures; record-keeping requirements; selection of test and calibration equipment; and aerial device inspection and maintenance procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Evaluate reported conditions; perform operational tests; perform all required maintenance, including all items on a maintenance checklist; use test and calibration equipment; correct deficiencies; and complete required documentation.

4.6.7 Inspect all components of aerial device lifting, rotating, and extension systems, given an emergency response vehicle with an aerial device, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the operation and condition of the aerial device lifting, rotating, and extension systems, including the rotation motor and cables, and warning systems are verified to be within manufacturer's specifications; the security of mounting of the components is verified; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, and operation of components of lifting, rotating, and extension systems of an aerial device; normal condition; types of defects, deficiencies, and potential problems associated with aerial device lifting, rotating, and extension systems; use of checklists; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify conditions of components of lifting, rotating, and extension systems of an aerial device that are abnormal or operating outside manufacturer's requirements; determine defects and deficiencies; perform operational checks; and complete checklist and inspection documentation.

4.6.8 Inspect the components of the aerial device electrical system, given an emergency response vehicle with an aerial device, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the security of mounting is verified; operation and condition of the electrical system, interlocks, and warning systems are verified to be within manufacturer's specifications; the operation and the legibility of the gauges are verified; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, operation, and inspection of components of the aerial device electrical and warning systems; normal condition; types of defects, deficiencies, and potential problems of aerial device electrical systems; selection of test gauges and meters; use of checklists; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify conditions of components of aerial device electrical systems that are deficient or operating outside manufacturer's requirements, read and

interpret test gauges and meters, perform operational checks, and complete checklist and inspection documentation.

4.6.9 Inspect all components of an aerial device waterway system, given an emergency response vehicle with an aerial device and waterway system, SOPs, manufacturer's specifications, tools and test equipment, an assignment, and an inspection checklist, so that the security of mounting is verified; the operation and condition of the aerial device waterway system are verified to be within manufacturer's specifications; the operation and the legibility of the gauges are verified; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

(A) Requisite Knowledge. Function, construction, and operation of components of the waterway system; selection of test and calibration equipment; lubrication requirements; types of defects, deficiencies, and potential problems associated with aerial device waterway systems; use of checklists; record-keeping requirements; and inspection procedures of the manufacturer and the authority having jurisdiction.

(B) Requisite Skills. Recognize and identify symptoms and the condition of components of aerial device waterway systems that are deficient or operating outside manufacturer's requirements, use test and calibration equipment, read and interpret test gauges and flowmeters, perform operational checks, and complete checklist and inspection documentation.

N 4.7 Trailers.

N 4.7.1 Inspect trailers and components unique to emergency response trailers, given an emergency response trailer, appropriate SOPs, manufacturer's specifications, appropriate tools, test and calibration equipment, an assignment, and an inspection checklist, so that the structural integrity of the frame is verified; the operation and condition of independent suspension systems, the condition of the wheels and tires, braking systems, safety equipment, and lighting systems, is verified to be within manufacturer's specifications; interface electronics and load management systems are operationally tested; all checklist items are inspected; defects and deficiencies including broken, loose, worn, or missing parts are identified and reported; and inspections are documented.

N (A) Requisite Knowledge. Function, operation, construction, and interface of frames, suspension systems, braking systems, safety equipment and lighting systems; the principles of electricity and operational theory of electronics; selection of test and calibration equipment; types of defects, deficiencies, and potential problems associated with trailer systems and components unique to emergency response trailers; use of checklists; record-keeping requirements; and inspection procedures of the authority having jurisdiction and the manufacturer.

N (B) Requisite Skills. Recognize and identify symptoms and conditions; use test and calibration equipment; determine defects, deficiencies, and potential problems; perform operational checks; and complete checklist and inspection documentation.

N 4.7.2 Perform maintenance on chassis systems and components unique to emergency response vehicles, given an emergency response trailer, manufacturer's specifications, a maintenance schedule or an assignment, a maintenance check-