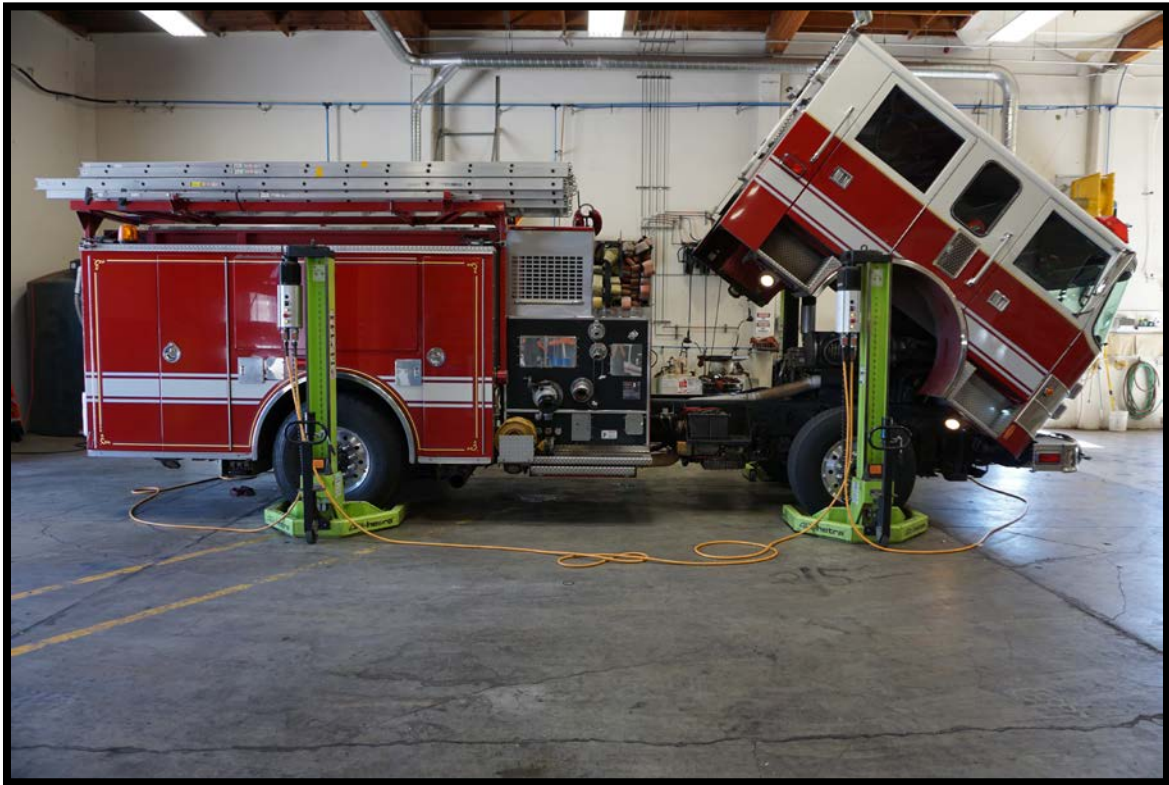


Emergency Vehicle 2 Technician

Certification Training Standards Guide (2020)



California Department of Forestry and Fire
Protection
Office of the State Fire Marshal
State Fire Training

Emergency Vehicle Technician 2

Certification Training Standards Guide (2020)

This CTS guide utilizes NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020) to provide the qualifications for State Fire Training's Emergency Vehicle Technician certification.

State Fire Training coordinated the development of this CTS guide. Before its publication, the Statewide Training and Education Advisory Committee (STEAC) and the State Board of Fire Services (SBFS) recommended this CTS guide for adoption by the Office of the State Fire Marshal (OSFM).

Published by State Fire Training.

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Cover photo courtesy of Lawrence Achen, Central Fire Protection District, Santa Cruz, CA

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State Fire Training

Mission

To enable the California Fire Service to safely protect life and property through education, training, and certification.

The California Fire Services Training and Education System

The California Fire Service Training and Education System (CFSTES) was established to provide a single statewide focus for fire service training in California. CFSTES is a composite of all the elements that contribute to the development, delivery, and administration of training for the California fire service. The authority for the central coordination of this effort is vested in the Training Division of the California State Fire Marshal's Office with oversight provided by the State Board of Fire Services.

CFSTES facilitates, coordinates, and assists in the development and implementation of standards and certification for the California fire service. CFSTES:

1. Administers the California Fire Academy System
2. Provides accredited courses leading to certification and approved standardized training programs for local and regional delivery
3. Administers the national accreditation process in California
4. Publishes certification training standards, course plans, and a capstone task book for each certified level in the California fire service

CFSTES is a fire service system developed by the fire service, for the fire service. It is only as successful and effective as the people involved in it.

Acknowledgments

State Fire Training appreciates the hard work and accomplishments of those who built the solid foundation on which this program continues to grow.

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Partners

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How to Read a CTS Guide

State Fire Training develops a Certification Training Standards (CTS) Guide for a variety of job functions in the fire service such as firefighter, driver/operator, fire instructor, and company officer. The CTS guide lists the requisite knowledge and skills and the job performance requirements a person is expected to complete in order to become certified in a specific function. CTS guides are appropriate for fire service personnel and individuals in related occupations pursuing State Fire Training certification.

Each CTS guide serves as a foundation for the certification programs recommended for adoption by the Office of the State Fire Marshal. Any certification program must be based on job-related knowledge and measurable performance standards. To master the knowledge and skills needed for specialized operations, individuals will require additional training to augment the performance standards included in the CTS guide.

Within the CTS guide, it is impossible to capture the different policies and procedures of each organization in the California fire service. Individuals aspiring to meet State Fire Training's certification training standards must do so in accordance with the codes, standards, regulations, policies, and standard operating procedures applicable within their own departments or jurisdictions.

Format

Each certification training standard included in the CTS guide includes the following:

Section Heading

The section heading describes a general category for a group of training standards. For example, the Fire Marshal CTS includes the following sections: Administration, Risk Management, Community Relations, Professional Development, Regulatory Programs, Fire and Life Safety, and Investigation. Each section contains one or more individual training standards.

Training Standard Title

The training standard title provides a general description of the performance requirement contained within the standard.

Authority

The CTS guide references each standard with one or more paragraphs of the corresponding National Fire Protection Association (NFPA) Professional Qualifications. This ensures that each fire service function within California's certification system meets or exceeds NFPA standards.

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How to Read a CTS Guide

When California requirements exceed the NFPA standard, the CTS guide cites the Office of the State Fire Marshal as the authority and prints the corresponding information in *italics*.

Given

This section lists the objects, equipment, materials, or facilities an individual needs in order to acquire the requisite knowledge and skills or to accomplish the job performance requirement(s) within a training standard.

Requisite Knowledge and Skills

This section lists the knowledge and skills that an individual must acquire in order to accomplish the job performance requirement(s) within a training standard.

This section does not include NFPA requisite knowledge or skills that are too general to teach or that individuals should develop through life experiences. For example, a training standard would not list “communicate orally and in writing” or “ability to relate interpersonally” unless they specifically apply to a job performance requirement about acquiring communication skills or developing interpersonal relationships.

Job Performance Requirements

This section includes one or more written statements that describe a specific job-related task and define measurable or observable outcomes. After an individual completes all coursework and requisite requirements, the capstone task book process verifies completion of job performance requirements.

Content

In addition to the individual certification training standards, the CTS guide also includes State Fire Training Revisions and Errata pages.

State Fire Training Content

Located at the back of the CTS guide, this table documents any significant revisions made by State Fire Training to the NFPA standards in the development of this CTS guide. This table is used to justify content additions and advise the course plan development team.

Errata

Located at the back of the CTS guide, this page documents any changes made to the CTS guide outside of the five-year NFPA revision cycle.

Emergency Vehicle Technician 2

Section 1: Definition of Duties

1-1: Definition of Duties for an Emergency Vehicle Technician 2

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.1.1
- Paragraph 5.1.2
- Paragraph 5.2
- Paragraph 5.3
- Paragraph 5.4
- Paragraph 5.5
- Paragraph 5.6
- Paragraph 5.7

Given

1. There are no givens identified for this training standard

Requisite Knowledge and Skills

1. Identify the repair, performance testing, and weight verification duties associated with chassis systems of an EVT 2
2. Identify the repair duties associated with cabs (fixed and tilt) and vehicle bodies of an EVT 2
3. Identify the repair, operational testing, and performance testing duties associated with electronic and electrical systems (low voltage) of an EVT 2
4. Identify the inspection, repair, maintenance, and operational testing duties associated with at least one of the following systems: pump and tank systems, aerial systems, or specialized (foam, line voltage electrical, breathing air, auxiliary air) systems of and EVT 2

Job Performance Requirements

There are no job performance requirements identified for this training standard.

Section 8: Electronic and Electrical Systems

8-1: Repairing Low-voltage Electrical Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.4.1

Given

1. An emergency response vehicle
2. Manufacturer specifications
3. An assignment or inspection report detailing a deficiency or deformation
4. Standard operating procedures (SOPs)
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of starting motors, alternators, and accessory electric motors, relays, solenoids, and regulators
2. *Describe* repair and overhaul procedures
3. *Describe the* theory of electricity
4. *Describe* operational, diagnostic, and performance tests
5. *Describe* adjustment and calibration procedures
6. *Describe how to* select test, calibration, *and diagnostic* equipment
7. *Identify* common defects
8. *Describe* electrical troubleshooting procedures
9. *Identify* record-keeping requirements
10. *Describe the* diagnostic and repair procedures of the manufacturer and the authority having jurisdiction
11. Recognize, evaluate, and identify reported conditions
12. Perform required repairs to resolve deficiencies
13. Use test, calibration, *and diagnostic* equipment
14. Measure voltage, amperage, and resistance
15. Distinguish defects and deficiencies
16. Operate and test system
17. Perform electrical calculations
18. Complete required documentation

Job Performance Requirements

Perform repairs on low-voltage electrical system components so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of low-voltage electrical system

Emergency Vehicle Technician 2

Section 8: Electronic and Electrical Systems

components are repaired, replaced, or rebuilt to manufacturer specifications; charging systems, starting systems, lighting systems, electrical accessories, and other electrical systems are returned to operation; correct test equipment is used; hazards are avoided; correct parts are used; diagnostic checks are conducted and performance is verified; and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

8-2: Testing Low-voltage Electrical System Components

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.4.3

Given

1. An emergency response vehicle
1. Manufacturer specifications
2. SOPs
3. Test, calibration, *and diagnostic* equipment
4. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of starting motors, alternators, relays, solenoids, and regulators
2. *Describe* repair and overhaul procedures
3. *Describe the* theory of electricity
4. *Describe* operational, diagnostic checks, and performance tests
5. *Describe* adjustment and calibration procedures
6. *Describe how to* select test, calibration, *and diagnostic* equipment
7. *Identify* common defects
8. *Describe* electrical troubleshooting procedures
9. *Identify* record-keeping requirements
10. *Describe the* diagnostic and repair procedures of the manufacturer and the authority having jurisdiction
11. Recognize, evaluate, and identify reported conditions
12. Perform required repairs to resolve deficiencies
13. Use test, calibration, *and diagnostic* equipment
14. Measure voltage, amperage, and resistance
15. Distinguish defects and deficiencies
16. Operate and diagnostically check system and complete performance tests
17. Perform electrical calculations
18. Complete required documentation in accordance with NFPA standards *and the authority having jurisdiction*

Job Performance Requirements

Complete performance testing on low-voltage electrical system components including batteries, charging systems, starting systems, onboard chargers, electrical loads, solenoids, and relay devices in accordance with NFPA 1911 so that components are performance tested to assure they are operating in accordance with manufacturer specifications and NFPA standards; performance tests are conducted to verify that repairs are completed; and all testing is

Emergency Vehicle Technician 2

Section 8: Electronic and Electrical Systems

documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

8-3: Inspecting Electronic Controls and Instrumentation

Authority

Office of the State Fire Marshal

Given

1. *An emergency response vehicle*
2. *SOPs*
3. *Manufacturer specifications*
4. *Tools*
5. *Test, calibration, and diagnostic equipment*
6. *Schematics*
7. *An inspection checklist*

Requisite Knowledge and Skills

1. *Describe how the principles of magnetism apply to electronic control devices*
2. *Describe how the principles of electricity apply to electronic control devices*
3. *Describe the principles of circuit analysis*
4. *Describe how to select test, calibration, and diagnostic equipment*
5. *Describe test, calibration, and diagnostic equipment to avoid*
6. *Use test, calibration, and diagnostic equipment*
7. *Describe the function, construction, operation, and requirements of electronic controls and instrumentation*
8. *List types of defects, deficiencies, and potential problems associated with electronic controls and instrumentation*
9. *Determine defects and deficiencies*
10. *Describe how to read and interpret schematics*
11. *Read and interpret schematics*
12. *Identify mounting and adjustment requirements*
13. *Recognize and identify potential failure symptoms and conditions of electronic controls and instrumentation*
14. *Describe the inspection procedures of the manufacturer and the AHJ*
15. *Recognize and identify symptoms and conditions of electronic control and instrumentation issues*
16. *Determine defects, deficiencies, and potential problems*
17. *Perform operational tests*
18. *Identify record-keeping requirements*
19. *Complete checklist and inspection documentation*

Job Performance Requirements

Inspect the electronic controls and instrumentation so that the mounting security is verified; operation and condition of the electronic control system is verified to be within manufacturer

Emergency Vehicle Technician 2

Section 8: Electronic and Electrical Systems

specifications; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and tests are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction (AHJ)

8-4: Maintaining Electronic Controls and Instrumentation

Authority

Office of the State Fire Marshal

Given

1. *An emergency response vehicle*
2. *Manufacturer specifications*
3. *A maintenance schedule or assignment*
4. *A maintenance checklist*
5. *SOPs*
6. *Test, calibration, and diagnostic equipment*
7. *Tools*

Requisite Knowledge and Skills

1. *Describe troubleshooting and adjustment methods and procedures*
2. *Evaluate reported conditions*
3. *Use test, calibration, and diagnostic equipment*
4. *Perform operational tests*
5. *Perform all required maintenance, including all items on a maintenance checklist*
6. *Correct deficiencies*
7. *Complete required documentation*

Job Performance Requirements

Perform maintenance on the electronic controls and instrumentation 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

8-5: Repairing Electronic Controls and Instrumentation

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.4.2

Given

1. An emergency response vehicle
2. Manufacturer specifications
3. An assignment or inspection report detailing a deficiency or deformation
4. SOPs
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, operation, and requirements of electronic engine, transmission, and brake controls, instrumentation, load control devices, onboard chargers, sequencers, interfaces, and interlocks
2. *Describe how to* select test, calibration, *and diagnostic* equipment
3. *Describe how to use a* digital volt-ohmmeter *and* electronic readers
4. *Describe how to interpret* fault codes
5. *Describe* safety procedures
6. *Identify* common deficiencies
7. *Describe* correct repair procedures
8. *Identify* record-keeping requirements
9. *Describe the* diagnostic and repair procedures of the manufacturer and the authority having jurisdiction
10. Recognize, evaluate, and analyze reported conditions, defects, and deficiencies
11. Perform required repairs to resolve deficiencies
12. Use test, calibration, *and diagnostic* equipment
13. Operate and test system(s)
14. Perform calculations
15. Use correct parts
16. Complete required documentation

Job Performance Requirements

Perform repairs on electronic controls and instrumentation so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an electronic control or instrumentation are repaired, replaced, or rebuilt to manufacturer specifications; engine, transmission, and brake electronic control units or electronic control modules, pump throttles and pressure control devices, and instrumentation are returned to operation; programming is correct; load control devices, sequencer, interfaces, and interlocks are operational; correct test

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Section 8: Electronic and Electrical Systems

equipment is used; correct parts are used; correct tests and programming procedures are followed; operational tests and diagnostic checks are conducted and performance is verified; and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

8-6: Testing Electronic Controls and Instrumentation

Authority

Office of the State Fire Marshal

Given

1. *An emergency response vehicle*
2. *Manufacturer specifications*
3. *SOPs*
4. *Test, calibration, and diagnostic equipment*
5. *Tools*

Requisite Knowledge and Skills

1. *Describe operational, diagnostic, and performance tests*
2. *Describe adjustment and calibration procedures*
3. *Describe how to select test, calibration, and diagnostic equipment*
4. *Describe how to test sensors, components, and systems*
 - *5-volt reference circuits*
 - *Throttle position sensor*
 - *Manifold absolute pressure sensor*
 - *Mass airflow sensor*
 - *Intake air temperature sensor*
 - *Coolant temperature sensor*
 - *Oxygen sensor*
5. *Identify common defects*
6. *Describe electronic troubleshooting procedures*
7. *Identify record-keeping requirements*
8. *Describe the diagnostic and repair procedures of the manufacturer and the AHJ*
9. *Recognize, evaluate, and identify reported conditions*
10. *Perform required repairs to resolve deficiencies*
11. *Use test, calibration, and diagnostic equipment*
12. *Measure voltage, amperage, and resistance*
13. *Distinguish defects and deficiencies*
14. *Operate and test system*
15. *Perform electrical calculations*
16. *Complete required documentation in accordance with NFPA standards and the AHJ*

Job Performance Requirements

Complete performance testing on electronic controls and instrumentation including electronic engine, pump control systems, transmission, brake controls, load control devices, sequencers, interfaces, and interlocks, in accordance with NFPA 1911 so that components are tested to assure they are operating in accordance with manufacturer specifications and NFPA standards;

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Section 8: Electronic and Electrical Systems

performance tests are conducted to verify that repairs are completed; and all testing is documented in accordance with the procedures of the manufacturer and the authority having jurisdiction (AHJ)

Section 9: Aerial Systems

9-1: Repairing Aerial Sections, Booms, and Platforms

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.6.1

Given

1. An emergency response vehicle with an aerial device
2. An assignment or inspection report detailing a deficiency or deformation
3. Manufacturer specifications
4. Standard operating procedures (SOPs)
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of aerial devices, components, and systems
2. *Describe how to* select test, calibration, *and complete diagnostic checks for proper operation of* equipment
3. *Identify* fluid types and lubricants
4. *Identify* record-keeping requirements
5. *Describe the* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
6. Identify and evaluate reported conditions
7. Interpret the manufacturer specifications
8. Perform required repairs to resolve deficiencies
9. Use test, calibration, *and diagnostic* equipment
10. Perform operational tests
11. Complete required documentation

Job Performance Requirements

Perform repair on aerial sections, booms and platforms so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an aerial section, boom, or platform are diagnostically checked and repaired, replaced, or rebuilt to manufacturer specifications; the aerial device is tested for proper operation and performance is verified; and the repairs are documented in accordance with the procedures of the authority having jurisdiction.

9-2: Repairing Aerial Device Stabilization Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.6.2

Given

1. An emergency response vehicle with an aerial device stabilization system
2. An assignment or inspection report detailing a deficiency or deformation
3. Manufacturer specifications
4. SOPs
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of the aerial device stabilization system
2. *Identify* record-keeping requirements
3. *Describe how to* select test, calibration, *and diagnostic* equipment
4. *Describe the* aerial device repair procedures of the manufacturer and the authority having jurisdiction
5. Identify and evaluate reported conditions
6. Interpret the manufacturer specifications
7. Perform required repairs to resolve deficiencies
8. Use required test, calibration, *and diagnostic* equipment
9. Perform operational tests and diagnostic checks
10. Complete required documentation

Job Performance Requirements

Perform repairs on the aerial device stabilization system so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an aerial device stabilization system are repaired, replaced, or rebuilt to manufacturer specifications; the stabilization system is diagnostically checked for proper operation and performance is verified; and the repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

9-3: Maintaining Aerial Device Lifting, Rotating, and Extension Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.6.3

Given

1. An emergency response vehicle with an aerial device
2. A maintenance schedule or an assignment
3. Manufacturer specifications
4. A maintenance checklist
5. SOPs
6. Test, calibration, *and diagnostic* equipment
7. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of the aerial device lifting, rotating, and extension systems
2. *Identify* lubrication and fluid types
3. *Describe* adjustment methods and procedures
4. *Describe* troubleshooting procedures
5. *Identify* types of defects and deficiencies
6. *Describe* principles of hydraulics
7. *Describe how to* select test, calibration, *and diagnostic* equipment
8. *Identify* record-keeping requirements
9. *Describe the* aerial device inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
10. Evaluate reported conditions
11. Perform all required maintenance, including all items on a maintenance checklist
12. Correct deficiencies
13. Use required test, calibration, *and diagnostic* equipment
14. Perform operational tests and diagnostic checks
15. Complete required documentation

Job Performance Requirements

Perform maintenance on an aerial device lifting, rotating, and extension system so that the lifting, rotating, and extension systems are maintained in accordance with manufacturer specifications; electrical connections are clean and tight; hoses, valves, and fittings are leak-free and in good condition; instrumentation is operational; controls are operational; lubricants are applied; fluids are at recommended levels; the operational condition is preserved or restored; deformed, broken, loose, worn, or missing parts are repaired or replaced; the aerial system is

Emergency Vehicle Technician 2

Section 9: Aerial Systems

diagnostically checked for proper operation and the performance is verified; additional repair needs are reported; and the maintenance is documented.

9-4: Repairing Aerial Device Lifting, Rotating, and Extension Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.6.4

Given

1. An emergency response vehicle with an aerial device
2. An assignment or inspection report detailing a deficiency or deformation
3. Manufacturer specifications
4. SOPs
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of the aerial device lifting, rotating, and extension systems
2. *Describe* troubleshooting procedures
3. *Describe how to* select test, calibration, *and diagnostic* equipment
4. *Identify* record-keeping requirements
5. *Describe the* aerial device repair procedures of the manufacturer and the authority having jurisdiction
6. Identify and evaluate reported conditions
7. Interpret manufacturer specifications
8. Perform required repairs to resolve deficiencies
9. Use required test, calibration, *and diagnostic* equipment
10. Perform operational tests and diagnostic checks
11. Complete required documentation

Job Performance Requirements

Perform repairs on an aerial device lifting, rotating, and extension system so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an aerial device lifting, rotating, and extension system are repaired, replaced, or rebuilt to manufacturer specifications; the aerial device is diagnostically checked for proper operation and the performance is verified; and the repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

9-5: Repairing Aerial Hydraulic Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.6.5

Given

1. An emergency response vehicle with an aerial device
2. An assignment or inspection report detailing a deficiency or deformation
3. Manufacturer specifications
4. SOPs
5. Tools
6. Test, calibration, *and diagnostic* equipment

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of the aerial device hydraulic system and components
2. *Describe* principles of hydraulics
3. *Identify* lubricants and fluid types
4. *Describe* troubleshooting procedures
5. *Describe how to* select test, calibration, *and diagnostic* equipment
6. *Describe* adjustment methods and procedures
7. *Identify* record-keeping requirements
8. *Describe the* aerial device repair procedures of the manufacturer and the authority having jurisdiction
9. Identify and evaluate reported conditions
10. Perform required repairs to resolve deficiencies
11. Use required test, calibration, *and diagnostic* checks for proper operation and performance
12. Perform operational tests
13. Complete required documentation

Job Performance Requirements

Perform repairs on an aerial hydraulic system so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an aerial hydraulic system are repaired, rebuilt, or replaced according to manufacturer specifications; fluids are restored to recommended levels; the aerial device is diagnostically checked for proper operation and the performance is verified; and the repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

9-6: Repairing Aerial Device Electrical and Electronic Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.6.6

Given

1. An emergency response vehicle with an aerial device
2. An assignment or inspection report detailing a deficiency or deformation
3. Manufacturer specifications
4. SOPs
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of the aerial device electrical or electronic system
2. *Describe* principles of electricity
3. *Describe* electronic theory
4. *Describe how to* select test, calibration, and diagnostic equipment
5. *Identify* record-keeping requirements
6. *Describe the* diagnostic, repair, and performance testing procedures of the manufacturer and the authority having jurisdiction
7. Identify and evaluate reported conditions
8. Interpret manufacturer specifications
9. Perform required diagnosis
10. Perform required repairs to resolve deficiencies
11. Use required test, calibration, and diagnostic equipment
12. Perform operational tests and diagnostic checks
13. Complete required documentation

Job Performance Requirements

Perform repairs on aerial device electrical and electronic systems so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an aerial device electrical or electronic system are repaired, rebuilt, or replaced to manufacturer specifications; the aerial device is diagnostically checked for proper operation and the performance is verified; and the repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

9-7: Repairing Aerial Device Waterway Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)

- Paragraph 5.6.7

Given

1. An emergency response vehicle with an aerial device and a pre-piped waterway system
2. An assignment or inspection report detailing a deficiency or deformation
3. Manufacturer specifications
4. SOPs
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of the aerial device waterway system
2. *Describe* principles of hydraulics
3. *Describe how to* select test, calibration, *and diagnostic* equipment
4. *Describe* adjustment and alignment procedures
5. *Identify* record-keeping requirements
6. *Describe the* aerial device waterway diagnostic, repair, and completes performance testing procedures of the manufacturer and the authority having jurisdiction
7. Identify and evaluate reported conditions
8. Interpret manufacturer specifications
9. Perform required repairs to resolve deficiencies
10. Use required test, calibration, *and diagnostic* equipment
11. Perform diagnostic checks
12. Complete required documentation

Job Performance Requirements

Perform repairs on an aerial device waterway system so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an aerial device waterway system are repaired, rebuilt, or replaced and tested according to manufacturer specifications; the aerial device and the waterway is diagnostically checked for proper operation and the performance is verified; and the repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

9-8: Testing Aerial Devices, Systems, and Related Components

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.6.8
2. *Office of the State Fire Marshal*

Given

1. *An emergency response vehicle with an aerial device, systems, and related components*
2. *Test, calibration, and diagnostic equipment*
3. *Tools*
4. *Facilities*
5. *Records*
6. *Forms*

Requisite Knowledge and Skills

1. *Describe the function, construction, and operation of aerial devices, controls, and instrumentation*
2. *Describe how to select test, calibration, and diagnostic equipment*
3. *Identify test equipment calibration requirements*
4. *Describe aerial device performance requirements and testing procedures*
5. *Identify hydraulic flow calculations*
6. *Identify record-keeping requirements*
7. *Evaluate conditions*
8. *Recognize deficiencies*
9. *Interpret and follow performance test procedures*
10. *Conduct required testing and performance tests*
11. *Use test, calibration, and diagnostic equipment*
12. *Complete test forms and required documentation*

Job Performance Requirements

Complete annual performance testing on fire department aerial devices, systems, and related components in accordance with NFPA 1911 and SOPs so that aerial device performance can be evaluated; defects and deficiencies are identified; operation of aerial device systems is verified; and performance test results are documented.

Section 10: Specialized Systems

10-1: Repairing Electrical Line Voltage Generation Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.5
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with an electrical line voltage system
2. Manufacturer specifications
3. An assignment or an inspection report detailing a deficiency or deformation
4. SOPs
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, operation, and requirements of generators, drive units, controls and instrumentation, interfaces, and interlocks
2. *Describe how to* select test, calibration, *and diagnostic* equipment
3. *Describe the principles of electricity*
4. *Describe* defects and deficiencies
5. *Describe* repair procedures
6. *Describe* troubleshooting procedures
7. *Describe* line voltage wiring procedures and requirements
8. *Identify* safety protection devices
9. *Identify* fluid and lubricant types
10. *Identify* required calibrations
11. *Identify* record-keeping requirements
12. *Describe the* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
13. Recognize, evaluate, and analyze conditions
14. Perform required diagnostic checks and repairs to resolve deficiencies
15. Use test, calibration, *and diagnostic* equipment
16. Perform system operational tests and diagnostic checks
17. Perform calculations
18. Complete required documentation

Job Performance Requirements

Repair all components of an electrical line voltage generation system, its controls, and its instrumentation so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an electrical line voltage generation system are repaired, replaced, or rebuilt to manufacturer specifications; fluids and lubricants are restored; the system is diagnostically checked for proper operation and performance is verified; and the repair and diagnostic checks results are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

10-2: Testing Electrical Line Voltage Electrical Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.6
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with a line voltage electrical system
2. Manufacturer specifications
3. SOPs
4. Test, *calibration*, and *diagnostic* equipment
5. Facilities and tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of a line voltage electrical system and its related components
2. *Describe the* principles of electricity
3. *Identify* generating systems
4. *Describe* wiring and grounding standards
5. *Describe* operational diagnostic checks and performance testing procedure and requirements
6. *Describe how to* select test, *calibration*, and *diagnostic* equipment
7. *Describe* safety procedures
8. *Describe* diagnostic procedures
9. *Identify* electrical load, grounding and insulation calculations
10. *Identify* record-keeping requirements
11. Conduct line voltage electrical performance tests
12. Use test, *calibration*, and *diagnostic* equipment
13. Identify defects and deficiencies
14. Perform GFCI, operational check and load bank testing, and dielectric voltage with-stand tests
15. Perform calculations
16. Complete required documentation

Job Performance Requirements

Complete performance testing on apparatus line voltage electrical system and related components in accordance with NFPA 1911 so that the line voltage electrical system is capable of meeting the performance testing and safety requirements of the original certification test; and all performance testing is documented in accordance with the procedures of NFPA standards and the authority having jurisdiction.

10-3: Repairing Line Voltage Appliances and Controls

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.7
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with line voltage appliances and controls
2. Manufacturer specifications
3. An assignment or inspection report detailing a deficiency or deformation
4. SOPs
5. Test, calibration, *and diagnostic* equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, operation, and requirements of ~~hardwired~~ line voltage appliances and controls, accessories, and equipment
2. *Describe how to* select test, calibration, *and diagnostic* equipment
3. *Identify* types of defects and deficiencies
4. *Describe* troubleshooting procedures
5. *Identify* record-keeping requirements
6. *Describe the* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
7. Recognize, identify, and evaluate reported conditions of line voltage components and accessories
8. Perform repairs to resolve deficiencies
9. Use test, calibration, *and diagnostic* equipment
10. Perform operational tests and diagnostic checks
11. Complete required documentation

Job Performance Requirements

Repair all line voltage appliances and controls so that defective components and accessories are diagnosed; deformed, broken, loose, worn, or missing parts of a line voltage appliance or control are repaired, replaced, or rebuilt to manufacturer specifications; systems are diagnostically checked for proper operation and performance verified; and repairs and test results are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

State Fire Training Content

Code Key

Blocks

- G = Given
- RKS = Requisite Knowledge and Skills
- JPR = Job Performance Requirements
- NCTS = New certification training standard

Certification: Emergency Vehicle Technician

CTS	Block	Addition	Justification	Source / Reference
8-2	RKS #18	Removed “and SOPS” and added “and the authority having jurisdiction” to “Complete required documentation in accordance with NFPA standards”	The AHJ outranks the department’s standard operating procedures.	
8-3	NCTS	Added standard for “Inspecting Electronic Controls and Instrumentation”	NFPA has a standard for repairing, but not for inspecting, maintaining, or testing. Cadre added to cover critical content.	
8-4	NCTS	Added standard for “Maintaining Electronic Controls and Instrumentation”	NFPA has a standard for repairing, but not for inspecting, maintaining, or testing. Cadre added to cover critical content.	
8-6	NCTS	Added standard for “Testing Electronic Controls and Instrumentation”	NFPA has a standard for repairing, but not for inspecting, maintaining, or testing. Cadre added to cover critical content.	
9-8	G #1	Add “An emergency response vehicle with an aerial device, systems, and related components”.	NFPA oversight. Necessary to complete job performance requirement.	
9-8	RKS #5	Replaced “fire flow calculations” with “hydraulic flow calculations”.	Fire flow is not accurate.	

Emergency Vehicle Technician 2

State Fire Training Content

CTS	Block	Addition	Justification	Source / Reference
10-1	G #1	Replaced "emergency response vehicle" with "apparatus".	California has electrical line voltage systems on units other than vehicles (portable trailers, etc.).	
10-1	RKS #3	Added "Describe the principles of electricity".	This task cannot be performed without this knowledge.	
10-2	G #1	Replaced "emergency response vehicle" with "apparatus".	California has electrical line voltage systems on units other than vehicles (portable trailers, etc.).	
10-3	G #1	Replaced "emergency response vehicle" with "apparatus". Removed "hardwired".	California has electrical line voltage systems on units other than vehicles (portable trailers, etc.). Not all appliances are hardwired anymore.	
10-3	JPR	Removed "hardwired" from both references to "line voltage appliances [and/or] controls".	Not all appliances are hardwired anymore.	

Errata

Code Key

Blocks

- G = Given
- RKS = Requisite Knowledge and Skills
- JPR = Job Performance Requirements
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Changes

- New text show in underline
- Deleted text shown in ~~strikeout~~