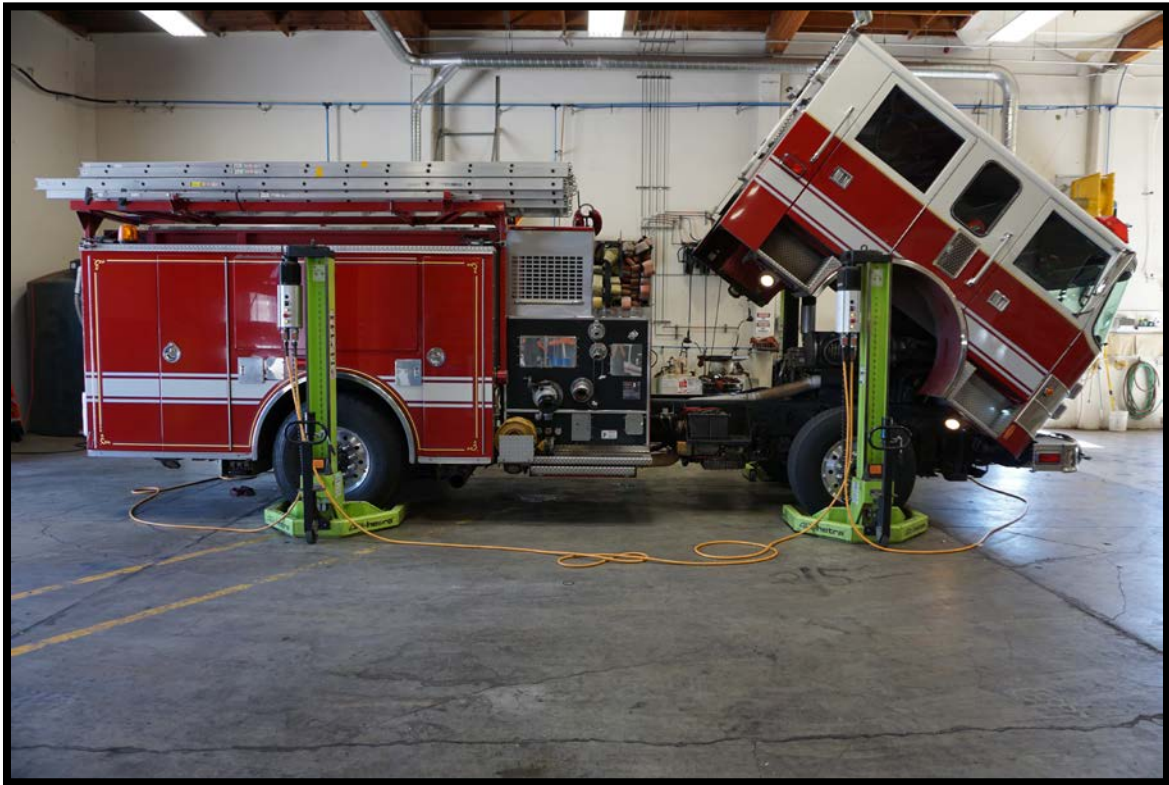


Emergency Vehicle Technician 1

Certification Training Standards Guide (2020)



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

Emergency Vehicle Technician 1

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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Table of Contents

State Fire Training	1
Acknowledgments.....	2
How to Read a CTS Guide.....	4
Emergency Vehicle Technician 1	6
Section 1: Definition of Duties	6
1-1: Definition of Duties for an Emergency Vehicle Technician 1	6
Section 2: Chassis Systems	7
2-1: Inspecting Chassis Systems and Components	7
2-2: Maintaining Chassis System Components	9
2-3: Inspecting Chassis Systems and Components Unique to Emergency Response Vehicles	10
2-4: Maintaining Chassis System Components Unique to Emergency Response Vehicles...	11
2-5: Repairing Chassis Systems and Components.....	12
2-6: Completing Axle Weight Performance Testing	14
2-7: Completing Brake Performance Testing.....	15
2-8: Completing Parking Brake Testing	16
2-9: Completing Road Performance Testing	17
Section 3: Cab and Body Components.....	18
3-1: Inspecting Cab and Body Components.....	18
3-2: Maintaining Cab and Body Components	20
3-3: Repairing Cabs	21
3-4: Inspecting Equipment Mounting Systems	23
3-5: Maintaining Equipment Mounting Systems	24
3-6: Repairing Equipment Mounting Systems	25
3-7: Inspecting Cab Tilt Systems and Components.....	27
3-8: Repairing Cab Tilt Systems.....	28
3-9: Inspecting Body, Compartments, and Storage Areas	29
3-10: Maintaining Body, Compartments, and Storage Areas	30
3-11: Repairing Cab Bodies, Compartments, and Storage Areas.....	31

Section 4: Electrical and Electronic Systems	33
4-1: Inspecting Low-voltage Electrical Systems	33
4-2: Maintaining Low-voltage Electrical Systems.....	35
Section 5: Fire Pump, Auxiliary Pump, and Tank Systems	36
5-1: Inspecting Fire Pumps and Auxiliary Pumps.....	36
5-2: Maintaining Fire Pumps and Auxiliary Pumps.....	38
5-3: Repairing Fire Pumps or Auxiliary Pumps.....	39
5-4: Inspecting Water/Foam/Agent Tanks	40
5-5: Repairing Water/Foam/Agent Tanks.....	41
5-6: Testing Apparatus Fire Pumps and Components.....	42
Section 6: Aerial Systems	43
6-1: Inspecting the Ladder Sections of an Aerial Ladder	43
6-2: Inspecting Sections of Elevating Platforms or Water Towers	44
6-3: Maintaining Aerial Sections, Booms, Platforms, and Waterways.....	45
6-4: Inspecting Hydraulic System Components of an Aerial Device	46
6-5: Inspecting Mechanical Components of the Stabilization System.....	48
6-6: Maintaining Aerial Device Stabilization Systems.....	49
6-7: Inspecting Aerial Device Lifting, Rotating, and Extension Systems	50
6-8: Inspecting Aerial Device Electrical Systems.....	51
6-9: Inspecting Aerial Device Waterway Systems	52
Section 7: Specialized Systems.....	53
7-1: Inspecting Foam-proportioning Systems.....	53
7-2: Maintaining Foam-proportioning Systems	55
7-3: Repairing Foam-proportioning System Components	56
7-4: Testing Apparatus Foam Systems and Related Components.....	57
7-5: Inspecting a Compressed Air Foam System (CAFS)	58
7-6: Maintaining a Compressed Air Foam System (CAFS).....	60
7-7: Repairing a Compressed Air Foam Systems (CAFS)	61
7-8: Testing Compressed Air Foam Systems (CAFS)	62
7-9: Inspecting Electrical Line Voltage Generation Systems	63
7-10: Maintaining Electrical Line Voltage Generation Systems	64
7-11: Inspecting Breathing-air and Purification Systems	65

7-12: Maintaining Breathing-air and Purification Systems	67
7-13: Repairing Breathing-air and Breathing Apparatus Systems.....	68
7-14: Testing Breathing-air Compressor Systems	69
7-15: Inspecting Auxiliary Air Compressors	70
7-16: Maintaining Auxiliary Air Compressors	72
7-17: Repairing Auxiliary Air Systems	73
State Fire Training Content.....	74
Errata.....	80

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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Emergency Vehicle Technician 1

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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.

Emergency Vehicle Technician 1

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 1

Section 1: Definition of Duties

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

Authority

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

- Paragraph 4.1.1
- Paragraph 4.1.2
- Paragraph 4.2
- Paragraph 4.3
- Paragraph 4.4
- Paragraph 4.5
- Paragraph 4.6
- Paragraph 4.7 (Not addressed in the Revision 2020)
- Paragraph 4.8 (Not addressed in the Revision 2020)
- Paragraph 4.9 (Was the old 4.7 in the 2016 version)

Given

1. There are no givens identified for this training standard

Requisite Knowledge and Skills

1. Identify the general knowledge requirements associated with the roles of responsibilities of an EVT I
2. Identify the general skill requirements associated with the roles and responsibilities of an EVT I
3. Identify the inspection and preventative maintenance duties associated with chassis systems
4. Identify the inspection and maintenance duties associated with cabs (fixed and tilt) and vehicle bodies
5. Identify the operational checks duties associate with a vehicle's electronic and electrical systems (low voltage)
6. Identify the inspection, maintenance, and operational testing duties associated with at least one of the following systems: fire pump, auxiliary pump, and tank systems; aerial systems; or specialized (foam, line-voltage electrical, breathing air, auxiliary air) systems

Job Performance Requirements

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

Section 2: Chassis Systems

2-1: Inspecting Chassis Systems and Components

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 4.2.1
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle
2. An assignment
3. An inspection checklist
4. Manufacturer specifications
5. Standard operating procedures (SOPs)
6. Tools
7. *Test, calibration, and diagnostic* equipment

Requisite Knowledge and Skills

1. *Describe the* function, operation, and construction of chassis and vehicle systems
2. *Identify the principles of electricity and operational theory of electronics*
3. *List* types of defects, deficiencies, and potential problems associated with chassis systems
4. *Describe how to select test, calibration, and diagnostic equipment*
5. *Describe how to* use a checklist
6. *Identify* record-keeping requirements
7. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
8. Recognize and identify symptoms and conditions of the chassis and vehicle systems
9. *Use test, calibration, and diagnostic equipment*
10. Determine defects, deficiencies, and potential problems
11. Perform operational checks
12. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the chassis systems so that the structural integrity, the operation, and the condition of the auxiliary drive systems, axles, driveline, steering and suspension system, brake systems, wheels, and tires are verified to be within manufacturer specifications; the mounting security is verified; the chassis components are operational and within manufacturer specifications; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or

Emergency Vehicle Technician 1

Section 2: Chassis Systems

missing parts, are identified and reported; inspections and services are documented; and any deficiencies found during the inspection and diagnostic check process are documented.

2-2: Maintaining Chassis System Components

Authority

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

- Paragraph 4.2.2

Given

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

Requisite Knowledge and Skills

1. *Identify* troubleshooting procedures
2. *Describe* adjustment methods and procedures
3. *Describe how to* select test, calibration, *and diagnostic* equipment
4. *Identify the* role of a maintenance schedule and a maintenance checklist
5. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
6. Perform operational checks
7. Evaluate reported conditions
8. Recognize and correct deficiencies
9. Use test, calibration, *and diagnostic* equipment
10. Perform all required maintenance, including all items on a maintenance checklist
11. Complete required documentation

Job Performance Requirements

Perform maintenance on the chassis system so that deformed, broken, loose, worn, or missing parts are repaired or replaced; components are lubricated; fluid levels are maintained; calibrations and adjustments are performed; the system's operational condition is preserved or restored; activities are documented; and additional repair needs are reported.

2-3: Inspecting Chassis Systems and Components Unique to Emergency Response Vehicles

Authority

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

- Paragraph 4.2.3

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, operation, construction, and interface of frames, independent suspension systems, all-wheel steering systems, secondary braking systems, and auxiliary cooling systems
2. *Describe how to* select test, calibration, *and diagnostic* equipment
3. *List* types of defects, deficiencies, and potential problems associated with chassis systems and components
4. *Identify* record-keeping requirements
5. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
6. Recognize and identify symptoms and conditions
7. Use test, calibration, *and diagnostic* equipment
8. Determine defects, deficiencies, and potential problems
9. Perform operational checks
10. Complete checklist and inspection documentation

Job Performance Requirements

Inspect chassis systems and components unique to emergency response vehicles so that the structural integrity of the frame is verified; the operation and condition of independent suspension systems, all-wheel steering systems, brake systems, secondary braking systems, and auxiliary cooling systems are verified to be within manufacturer specifications; multiplexing, interface electronics, and load management systems are operationally checked 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 operational checks are documented.

2-4: Maintaining Chassis System Components Unique to Emergency Response Vehicles

Authority

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

- Paragraph 4.2.4

Given

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

Requisite Knowledge and Skills

1. *Describe how to* select test, calibration, and diagnostic equipment
2. *Identify* troubleshooting procedures
3. *Describe* adjustment methods and procedures
4. *Identify* record-keeping requirements
5. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
6. Perform operational checks
7. Evaluate reported conditions
8. Recognize and correct deficiencies
9. Use test, calibration, and diagnostic equipment
10. Perform all required maintenance, including all items on a maintenance checklist
11. Complete required documentation

Job Performance Requirements

Perform maintenance on chassis systems and components unique to emergency response vehicles, so that deformed, broken, loose, worn, or missing parts are repaired or replaced; components are lubricated; fluid levels are maintained; calibrations and adjustments are performed; the system's operational condition is preserved or restored; activities are documented; and additional repair needs are reported.

2-5: Repairing Chassis Systems and Components

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.2.1
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle with an identified defective component(s)
2. Manufacturer specifications
3. Standard Operating Procedures (SOPs)
4. An assignment or inspection report detailing a deficiency or deformation
5. Test, calibration, and diagnostic checking equipment
6. Tools

Requisite Knowledge and Skills

1. *Describe the* function, operation, and construction of chassis and vehicle systems
2. *Identify* types of defects, deficiencies, and potential problems
3. *Describe how to* select test, calibration, *and diagnostic* equipment
4. *Describe* repair and overhaul procedures
5. *Describe* theory of electricity and electronics
6. *Identify* types of cooling systems
7. *Identify* types of suspension and steering systems
8. *Describe* basic principles of suspension and steering geometry
9. *Identify* types of brake systems, including secondary braking systems
10. *Describe* principles of hydraulics
11. *Describe* operational, diagnostic checks, and performance tests
12. *Describe* adjustment and calibration procedures
13. *Describe* electrical troubleshooting procedures
14. *Identify* record-keeping requirements
15. *Describe the* diagnostic and repair procedures of the manufacturer and the authority having jurisdiction
16. Identify and evaluate conditions
17. Recognize deficiencies
18. Perform required repairs to resolve deficiencies
19. Conduct required testing
20. Use test, calibration, *and diagnostic* equipment
21. Complete required documentation

Job Performance Requirements

Perform repairs on chassis systems and components so that the identified defective component is diagnosed; deformed, broken, loose, worn, or missing parts of a chassis system or its

Emergency Vehicle Technician 1

Section 2: Chassis Systems

components are repaired, rebuilt, or replaced to manufacturer specifications; applicable diagnostic checks are conducted and performance is verified; and the repairs are documented in accordance with the procedures of the *manufacturer and the authority having jurisdiction*.

2-6: Completing Axle Weight Performance Testing

Authority

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

- Paragraph 5.2.2

Given

1. An emergency response vehicle
2. An applicable driving license (if required)
3. A commercial certified scale

Requisite Knowledge and Skills

1. *Describe the* legal operation of fire apparatus
1. *Identify the* location of a certified scale
2. *Identify* record-keeping requirements of NFPA 1911 and the authority having jurisdiction
3. Operate fire apparatus
4. Complete required documentation

Job Performance Requirements

Complete axle weight performance test on apparatus in accordance with NFPA 1911 so that the apparatus weight is determined to ensure that the weight on the vehicle does not exceed the gross axle weight rating (GAWR) and the gross vehicle weight rating (GVWR) or gross combination weight rating (GCWR) as shown on the rating plate on the fire apparatus; and all testing is documented in accordance with the requirements of NFPA standards and the authority having jurisdiction.

2-7: Completing Brake Performance Testing

Authority

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

- Paragraph 5.2.3

Given

1. An emergency response vehicle
2. An applicable driving license (if required)
3. A calibrated driving course

Requisite Knowledge and Skills

1. *Describe the* legal operation of fire apparatus
2. *Demonstrate* familiarity with brake testing course
3. *Identify brake performance* requirements of NFPA 1911 *and* federal and state regulations
4. *Identify* record-keeping requirements of NFPA 1911 and the authority having jurisdiction
5. Operate fire apparatus
6. Recognize *the need for* and perform braking test
7. Complete required documentation

Job Performance Requirements

Complete braking performance test on apparatus in accordance with NFPA 1911 so that the apparatus braking system performance is verified to ensure that the braking ability of the apparatus complies with the requirements of NFPA 1911 and federal and state regulations; and all testing is documented in accordance with the requirements of NFPA standards and the authority having jurisdiction.

2-8: Completing Parking Brake Testing

Authority

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

- Paragraph 5.2.4

Given

1. An emergency response vehicle
2. An applicable driving license (if required)
3. An appropriate road grade

Requisite Knowledge and Skills

1. *Describe the* legal operation of fire apparatus
2. *Demonstrate* familiarity with park brake testing course
3. *Identify parking brake performance* requirements of NFPA 1911 and federal and state regulations
4. *Identify* record-keeping requirements of NFPA 1911 and the authority having jurisdiction
5. Operate of fire apparatus
6. Recognize *the need for* and perform parking brake test
7. Complete required documentation

Job Performance Requirements

Complete parking brake performance test on apparatus in accordance with NFPA 1911 so that the apparatus parking brake system performance is verified to ensure that the park braking ability of the apparatus complies with the requirements of NFPA 1911 and federal and state regulations; and all testing is documented in accordance with the procedures of NFPA standards and the authority having jurisdiction.

2-9: Completing Road Performance Testing

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.2.5
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle
2. An applicable driving license (if required)
3. An approved driving course

Requisite Knowledge and Skills

1. *Identify the difference between a road test and a performance test*
2. *Describe the legal operation of fire apparatus*
3. *Demonstrate familiarity with apparatus drivability*
4. *Identify road performance requirements of NFPA 1911 and federal and state regulations*
5. *Identify record-keeping requirements of NFPA 1911 and the authority having jurisdiction*
6. Operate fire apparatus
7. Recognize *the need for* and perform road test
8. Complete required documentation

Job Performance Requirements

Complete road performance test on apparatus in accordance with NFPA 1911 so that apparatus system performance is verified to ensure that the drivability of the apparatus complies with requirements of NFPA 1911 and federal and state regulations; and all testing is documented in accordance with the requirements of NFPA standards and the authority having jurisdiction.

Section 3: Cab and Body Components

3-1: Inspecting Cab and Body Components

Authority

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

- Paragraph 4.3.1

Given

1. An emergency response vehicle
2. Standard operating procedures (SOPs)
3. Manufacturer specifications
4. Tools
5. Test, *calibration, and diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of doors and latches, seats, *storage areas*, self-contained breathing apparatus (SCBA) mounting, safety restraints, instrumentation, window glass and mirrors, steps, handrails, and skid-resistant walking surfaces
2. *Describe how to select test, calibration, and diagnostic equipment*
3. *Identify* types of defects, deficiencies, and potential problems associated with cabs
4. *Identify* types of lubricants
5. *Identify* failures of finishes, signs, labels, and paint
6. *Identify* record-keeping requirements
7. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
8. Perform operational checks
9. Recognize and identify symptoms and conditions
10. *Use test, calibration, and diagnostic equipment*
11. Determine defects, deficiencies, and potential problems
12. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the cab 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 specifications; climate control systems are tested for proper operation; all checklist items are

Emergency Vehicle Technician 1

Section 3: Cab and Body Components

inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and checks are documented.

3-2: Maintaining Cab and Body Components

Authority

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

- Paragraph 4.3.2

Given

1. An emergency response vehicle
2. Manufacturer specifications
3. A maintenance schedule or an assignment
4. A maintenance checklist
5. SOPs
6. Tools and test equipment

Requisite Knowledge and Skills

1. *Describe* troubleshooting procedures
2. *Describe* adjustment methods and procedures
3. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
4. Perform operational checks
5. Evaluate reported conditions
6. Perform all required maintenance, including all items on a maintenance checklist
7. Complete required documentation

Job Performance Requirements

Perform maintenance on the cab 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.

3-3: Repairing Cabs

Authority

8. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.3.4
9. *Office of the State Fire Marshal*

Given

10. An emergency response vehicle
11. Manufacturer specifications
12. An assignment or inspection report detailing a deficiency or deformation
13. SOPs
14. Test, calibration, *and diagnostic* equipment
15. Tools

Requisite Knowledge and Skills

16. *Describe the* function, construction, and operation of doors and latches, seats, self-contained breathing apparatus (SCBA) mounting and safety restraints, instrumentation, window glass and mirrors, steps, handrails, and skid-resistant walking surfaces
17. *Identify materials used in cabs*
18. *Identify personnel safety restraint systems that may present hazards during cab repair*
19. *Identify* types of lubricants
20. *Identify* failures and restoration of finishes, signs, labels, and paint
21. *Describe* welding and fabrication procedures
22. *Describe how to* select test, calibration, *and diagnostic* equipment
23. *Describe* adjustment and alignment procedures
24. *Describe* troubleshooting procedures
25. *Identify* record-keeping requirements
26. *Describe the* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
27. Recognize, evaluate, and identify reported conditions
28. Use test, calibration, *and diagnostic* equipment
29. *Mitigate personnel safety restraint system hazards*
30. Apply paint and finish materials
31. Perform welding and fabrication
32. Perform required repairs to resolve deficiencies
33. Perform diagnostic checks
34. Complete required documentation

Job Performance Requirements

Perform repairs on a cab so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of a cab are repaired, replaced, or rebuilt to manufacturer

Emergency Vehicle Technician 1

Section 3: Cab and Body Components

specifications; 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.

3-4: Inspecting Equipment Mounting Systems

Authority

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

- Paragraph 4.3.3

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, operation, and construction of equipment mounting systems, warning systems, and mounting racks, brackets, and latches
2. *Identify* types of defects, deficiencies, and potential problems associated with equipment mounting systems, warning systems, and mounting racks, brackets, and latches
3. *Describe how to* select test, calibration, and *diagnostic* equipment
4. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
5. Recognize and identify symptoms and conditions of equipment mounting systems and mounting racks, brackets, and *latches*
6. Use test, calibration, and *diagnostic* equipment
7. Perform operational checks
8. Determine defects, deficiencies, and potential problems
9. Complete checklist and inspection documentation

Job Performance Requirements

Inspect equipment mounting systems and mounting racks, brackets, and latches so that the operation and condition of the mounting system and mounting racks are verified to be within manufacturer 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.

3-5: Maintaining Equipment Mounting Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 4.3.4
2. *Office of the State Fire Marshal*

Given

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

Requisite Knowledge and Skills

1. *Identify* common requirements of maintenance
2. *Describe* adjustment methods and procedures
3. *Describe* types of fluids and lubricants
4. *Identify leak classifications and methods to stop them*
5. *Describe* adjustment and calibration procedures
6. *Identify* electrical connection theory and maintenance
7. *Describe* troubleshooting procedures
8. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
9. Perform operational checks
10. Evaluate reported conditions
11. Perform all required maintenance, including all items on a maintenance checklist
12. Correct deficiencies
13. Complete required documentation

Job Performance Requirements

Perform maintenance on equipment mounting systems and mounting racks, brackets, and latches 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.

3-6: Repairing Equipment Mounting Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.3.1
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle
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 equipment-mounting systems, mounting racks, brackets, and locks
2. *Describe how to* select test, calibration, *and diagnostic* equipment
3. *Identify materials used in cabs and equipment-mounting systems, racks, brackets, and locks*
4. *Describe* principles of welding and fabrication
5. *Describe* principles of pneumatic, hydraulic, and electric operation
6. *Describe* troubleshooting procedures
7. *Describe* repairing, rebuilding, and replacement procedures
8. *Identify* required diagnostic checks
9. *Identify* types of fluids
10. *Identify* record-keeping requirements
11. *Describe* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
12. Recognize, evaluate, and identify reported conditions
13. Use test, calibration, *and diagnostic* equipment
14. Measure voltage, amperage, and resistance
15. Perform welding and fabrication
16. Perform required repairs to resolve deficiencies
17. Perform diagnostic checks
18. Complete required documentation

Job Performance Requirements

Perform repairs on equipment-mounting systems and racks so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an equipment-mounting system or rack are repaired, rebuilt, or replaced to manufacturer specifications; diagnostic checks are

Emergency Vehicle Technician 1
Section 3: Cab and Body Components

conducted and performance is verified; and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

3-7: Inspecting Cab Tilt Systems and Components

Authority

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

- Paragraph 4.3.5

Given

1. An emergency response vehicle with a cab tilt system
2. SOPs
3. Manufacturer's specifications
4. Tools
5. Test, *calibration*, and *diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, operation, and construction of the cab tilt system, safety and latch systems, and warning systems
2. *Identify* types of defects, deficiencies, and potential problems associated with cab tilt systems
3. *Identify* record-keeping requirements
4. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
5. Perform operational checks
6. Recognize and identify symptoms and conditions of the cab tilt systems
7. Determine defects, deficiencies, and potential problems
8. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the operation of the cab tilt system and components 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.

3-8: Repairing Cab Tilt Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.3.2
2. *Office of the State Fire Marshal*

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of cab tilt systems and safety locks
2. *Describe how to* select test, calibration, *and diagnostic* equipment
3. *Identify materials used in cab tilt systems*
4. *Describe* principles of welding and fabrication
5. *Describe* principles of pneumatic, hydraulic, and electric operation
6. *Describe* troubleshooting procedures
7. *Describe* repairing, rebuilding, and replacement procedures
8. *Describe* verification testing
9. *Identify* types of fluids
10. *Identify* record-keeping requirements
11. *Describe the* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
12. Recognize, evaluate, and identify reported conditions
13. Use testing, calibration, *and diagnostic* equipment
14. Measure voltage, amperage, and resistance
15. Perform welding and fabrication
16. Perform required repairs to resolve deficiencies
17. Perform diagnostic checks
18. Complete required documentation

Job Performance Requirements

Perform repairs on cab tilt systems so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of a cab tilt system are repaired, replaced, or rebuilt to manufacturer specifications; diagnostic checks are conducted and performance is verified; hazards are avoided; and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

3-9: Inspecting Body, Compartments, and Storage Areas

Authority

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

- Paragraph 4.3.6

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of body, compartments, shelves and dividers, steps, ladders, platforms, handrails, and skid-resistant walking surfaces
2. *Describe the* operation of doors, latches, trays, and associated hardware
3. *Identify* types of defects, deficiencies, and potential problems associated with the body, compartments, shelves and dividers, steps, ladders, platforms, handrails, and skid-resistant walking surfaces
4. *List* common problems and failures of finishes and paint, signs, and labels
5. *Identify* record-keeping requirements
6. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
7. Perform operational checks
8. Recognize and identify symptoms and conditions
9. Determine defects, deficiencies, and potential problems
10. Complete checklist and inspection documentation

Job Performance Requirements

Inspect body, compartments, and storage areas so that the operation and condition of the body, compartments, doors, latches, trays, and associated hardware are verified to be within manufacturer 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.

3-10: Maintaining Body, Compartments, and Storage Areas

Authority

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

- Paragraph 4.3.7

Given

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

Requisite Knowledge and Skills

1. *Describe* troubleshooting procedures
2. *Describe* adjustment methods and procedures
3. *Describe* types of lubricants
4. Perform operational checks
5. Evaluate reported conditions
6. Perform all required maintenance, including all items on a maintenance checklist
7. Correct deficiencies
8. Complete required documentation

Job Performance Requirements

Perform maintenance on body, compartments, and storage areas 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.

3-11: Repairing Cab Bodies, Compartments, and Storage Areas

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.3.3
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle
2. Manufacturer specifications
3. 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, and operation of doors, compartment shelves, trays, and dividers, steps, ladders, platforms, handrails, skid-resistant walking surfaces, and storage areas
2. *Identify materials used in cab bodies, compartments, and storage areas*
3. *Identify* types of lubricants
4. *Identify* failures and restoration of finishes, signs, labels, and paint
5. *Describe* welding and fabrication procedures
6. *Describe how to* select test, calibration, *and diagnostic* equipment
7. *Describe* adjustment and alignment procedures
8. *Describe* troubleshooting procedures
9. *Identify* record-keeping requirements
10. *Describe* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
11. Recognize, evaluate, and identify reported conditions
12. Use test, calibration, *and diagnostic* equipment
13. Apply paint and finish materials
14. Perform welding and fabrication
15. Perform required repairs to resolve deficiencies
16. Perform diagnostic checks
17. Complete required documentation

Job Performance Requirements

Perform repairs on body, compartments, and storage areas so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of a body, compartment, or storage area are repaired, replaced, or rebuilt to manufacturer specifications; components are fabricated, adjusted, aligned, and lubricated; hazardous conditions are resolved; diagnostic

Emergency Vehicle Technician 1

Section 3: Cab and Body Components

checks are conducted and performance is verified; and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

Section 4: Electrical and Electronic Systems

4-1: Inspecting Low-voltage Electrical Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 4.4.1
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle
2. Standard operating procedures (SOPs)
3. Manufacturer specifications
4. Tools
5. Test, *calibration, and diagnostic* equipment, including a belt tension gauge and a *digital* multimeter (*DVOM*)
6. *Schematics*
7. An assignment
8. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, construction, operation, and requirements of starting and charging systems, chassis lighting and electrical components, emergency lighting, and accessory lighting
2. *Describe how to* select test, calibration, and diagnostic equipment
3. *Describe the* principles of electricity (Ohm's law and Kirchhoff's law), magnetism, and voltage drop
4. *Describe how to* read and interpret schematics
5. *List* types of defects, deficiencies, and potential problems associated with low-voltage electrical systems
6. *Identify* mounting and adjustment requirements
7. *Identify* record-keeping requirements
8. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
9. Recognize and identify symptoms and conditions of low-voltage electrical systems
10. *Read and interpret* schematics
11. Determine defects and deficiencies
12. Use test, calibration, and diagnostic equipment
13. Perform operational checks
14. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the low-voltage electrical system so that the mounting security is verified; operation and condition of the low-voltage electrical system is verified to be within manufacturer 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.

4-2: Maintaining Low-voltage Electrical Systems

Authority

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

- Paragraph 4.4.2

Given

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

Requisite Knowledge and Skills

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

Job Performance Requirements

Perform maintenance on the low-voltage electrical system 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.

Section 5: Fire Pump, Auxiliary Pump, and Tank Systems

5-1: Inspecting Fire Pumps and Auxiliary Pumps

Authority

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

- Paragraph 4.5.1

Given

1. An emergency response vehicle with a fire pump or an auxiliary pump
2. Standard Operating Procedures (SOPs)
3. Manufacturer specifications
4. Tools
5. Test, *calibration, and diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of fire pumps, auxiliary pumps, primer pumps, and related components
2. *Identify* pressure control devices
3. *Identify* plumbing and valves
4. *Identify* packing and seals
5. *Identify* types, grades, and viscosity of lubricating oils
6. *Describe* pump packing adjustment methods and procedures
7. *Describe* pump operational procedures
8. *Identify* types of defects, deficiencies, and potential problems associated with fire pumps, auxiliary pumps, primer pumps, and related components
9. *Identify* record-keeping requirements
10. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
11. Recognize and identify symptoms and conditions of pumps and components
12. Determine defects and deficiencies
13. Recognize characteristics of fluid contamination
14. Perform operational checks
15. Complete checklist and inspection documentation

Job Performance Requirements

Inspect fire pumps or auxiliary pumps and related components so that the security of the mounting of all system components (e.g., primer pump, plumbing and valves, pressure control

Emergency Vehicle Technician 1

Section 5: Fire Pump, Auxiliary Pump, and Tank Systems

devices, gauges) is verified; operation and condition of the system components, warning system, and interlocks are verified to be within manufacturer 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.

5-2: Maintaining Fire Pumps and Auxiliary Pumps

Authority

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

- Paragraph 4.5.3

Given

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

Requisite Knowledge and Skills

1. *Describe* packing and seal adjustment procedures
2. *Identify* instrumentation and controls
3. *Describe* sacrificial anode replacement procedure and schedules
4. *Describe* troubleshooting procedures
5. Evaluate reported conditions
6. Perform operational tests
7. Perform all required maintenance, including all items on a maintenance checklist
8. Use test, calibration, *and diagnostic* equipment
9. Correct deficiencies
10. Complete required documentation

Job Performance Requirements

Perform maintenance on a fire pump or auxiliary pump and related components 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.

5-3: Repairing Fire Pumps or Auxiliary Pumps

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.5.1
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle with a fire pump or auxiliary pump
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 a pump and its related components
2. *Describe* overhaul procedures
3. *Describe* principles of pressure control devices
4. *Describe* packing and seal replacement and adjustment procedures
5. *Describe* diagnostic checks and performance testing procedure and requirements
6. *Describe how to* select test, calibration, *and diagnostic* equipment
7. *Describe* safety procedures
8. *Describe* 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. Use test, calibration, *and diagnostic* equipment
13. Identify defects and deficiencies
14. Complete required diagnostic checks and performance test systems
15. Perform required repairs to resolve deficiencies
16. Perform *hydraulic* flow calculations
17. Complete required documentation

Job Performance Requirements

Perform repairs on fire pumps or auxiliary pumps, wildland pump, ultra-high-pressure, or industrial pump, and related components so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts on a fire pump, auxiliary pumps, or related components are repaired, replaced, or rebuilt to manufacturer specifications; diagnostic checks and service tests are conducted and performance is verified; and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

5-4: Inspecting Water/Foam/Agent Tanks

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 4.5.2
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle with a water, foam, *or agent* tank
2. SOPs
3. Manufacturer specifications
4. Tools
5. Test, *calibration, and diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, operation, construction, *and mounting* of water/foam/agent tanks and related components
2. *Describe specialized pressure systems*
3. *Identify* flushing procedures
4. *Describe* sacrificial anode replacement procedures and schedules
5. *Identify* types of defects, deficiencies, and potential problems associated with water/foam /agent tanks
6. *Identify* record-keeping requirements
7. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
8. Recognize and identify the effects of corrosion by different types of water and foam agents on selected tank materials
9. Determine defects and deficiencies
10. Perform operational checks,
11. Complete checklist and inspection documentation

Job Performance Requirements

Inspect water/foam/agent tanks so that the mounting and condition of the water/foam/agent tank is verified; all coated and non-coated 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.

Emergency Vehicle Technician 1

Section 5: Fire Pump, Auxiliary Pump, and Tank Systems

5-5: Repairing Water/Foam/Agent Tanks

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.5.2
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle with a water, foam, *or agent* tank
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, and operation of water/*foam/agent* tanks
2. *Identify* flow requirements
3. *Describe* cleaning and coating procedures
4. *Describe* principles of welding and fabrication
5. *Describe types of* materials used in water/*foam/agent* tanks
6. *Describe how to* select test, calibration, and diagnostic equipment
7. *Describe* performance testing procedures
8. *Describe* 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 welding and fabrication
13. Perform required repairs to resolve deficiencies
14. Use test, calibration, and diagnostic equipment
15. Perform service flow tests
16. Complete required documentation

Job Performance Requirements

Perform repairs on water/foam/agent tanks so that leaks are repaired; interior and exterior surfaces are free of corrosion; coatings are renewed; deformed, broken, loose, worn, or missing parts are repaired, replaced, or rebuilt to manufacturer specifications; service flow test of the tank(s) is conducted; and the repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

5-6: Testing Apparatus Fire Pumps and Components

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.5.3
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle with a fire pump
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 pump and its related components
2. *Describe the* principles of pressure control devices
3. *Describe* operational and performance testing procedures and requirements
4. *Describe how to* select test, calibration, *and diagnostic* equipment
5. *Describe* safety procedures
6. *Describe* diagnostic checking and performance testing procedures
7. *Describe hydraulic* flow calculations
8. *Identify* record-keeping requirements
9. Conduct fire pump performance tests
10. Use test, calibration, *and diagnostic* equipment
11. Identify defects and deficiencies
12. Perform *hydraulic* flow calculations
13. Complete required documentation

Job Performance Requirements

Complete performance testing on apparatus fire pumps and related components in accordance with NFPA 1911 so that the pumping systems or combinations, wildland pump, ultra-high-pressure, or industrial pump is capable of meeting the performance requirements without exceeding 110 percent of the original certification test rpm; and all testing is documented in accordance with the procedures of NFPA standards and the authority having jurisdiction.

Section 6: Aerial Systems

6-1: Inspecting the Ladder Sections of an Aerial Ladder

Authority

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

- Paragraph 4.6.1

Given

1. An emergency response vehicle with an aerial ladder
2. Standard operating procedures (SOPs)
3. Manufacturer specifications
4. Tools
5. Test, *calibration*, and *diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, operation, construction, and inspection practices of aerial ladders
2. *List* types of defects, deficiencies, and potential problems associated with aerial ladders
3. *Identify* record-keeping requirements
4. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
5. Recognize and identify physical and operational conditions of ladder sections, components, and systems
6. Determine defects and deficiencies
7. Perform operational checks
8. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the ladder sections of an aerial ladder so that the operation and condition of the ladder sections and extension systems are verified to be within manufacturer 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.

6-2: Inspecting Sections of Elevating Platforms or Water Towers

Authority

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

- Paragraph 4.6.2

Given

1. An emergency response vehicle with an elevating platform or water tower
2. SOPs
3. Manufacturer specifications
4. Tools
5. Test, *calibration, and diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, operation, and construction of elevating platforms or water towers
2. *List* types of defects, deficiencies, and potential problems associated with elevating platforms
3. *Identify* record-keeping requirements
4. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
5. Recognize and identify physical and operational conditions of elevating platforms or water towers and components
6. Perform operational checks
7. Determine defects and deficiencies
8. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the sections of an elevating platform or water tower so that the operation and condition of the boom sections are verified to be within manufacturer 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.

6-3: Maintaining Aerial Sections, Booms, Platforms, and Waterways

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 4.6.3
2. *Office of the State Fire Marshal*

Given

1. An emergency response vehicle with an aerial device and waterway
2. Manufacturer specifications
3. *NFPA 1911 (current edition)*
4. A maintenance schedule or an assignment
5. A maintenance checklist
6. SOPs
7. Test, calibration, *and diagnostic* equipment
8. Tools

Requisite Knowledge and Skills

1. *Describe the* function, construction, operation, *and performance* of aerial device, components, and systems
2. *Identify* fluid types and lubricants
3. *List* types of defects or deficiencies associated with aerial devices
4. *Describe* troubleshooting procedures
5. *Describe* adjustment methods and procedures
6. *Identify* record-keeping requirements
7. *Describe the* apparatus inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
8. Evaluate reported conditions
9. Perform operational *and performance* checks
10. Perform all required maintenance, including all items on a maintenance checklist
11. Use test, calibration, *and diagnostic* equipment
12. Correct deficiencies
13. Complete required documentation

Job Performance Requirements

Perform maintenance on aerial sections, booms, platforms and waterways 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 *and NFPA performance standards*; activities are documented; and additional repair needs are reported.

6-4: Inspecting Hydraulic System Components of an Aerial Device

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 4.6.4
2. *Office of the State Fire Marshal*

Given

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

Requisite Knowledge and Skills

1. *Describe the* 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
2. *Describe* normal operating condition
3. *Identify* fluid requirements
4. *List* types of defects, deficiencies, and potential problems associated with hydraulic systems
5. *Identify* sources of contamination
6. *Describe how to read and interpret schematics*
7. *Identify* record-keeping requirements
8. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
9. Recognize and identify the condition of the aerial device hydraulic system
10. Recognize and identify recommended fluid levels and sources of contamination
11. Determine defects and deficiencies
12. Read and interpret gauges
13. *Read and interpret schematics*
14. Perform operational checks
15. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the hydraulic system components of an aerial device so that the operation and condition of the hydraulic system components, warning systems, and gauges are verified to be within manufacturer specifications; the security of the mounting of components is verified; recommended fluid levels are verified; visible leakage or contamination is identified; all

Emergency Vehicle Technician 1

Section 6: Aerial Systems

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.

6-5: Inspecting Mechanical Components of the Stabilization System

Authority

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

- Paragraph 4.6.5

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of an aerial device stabilization system, including wheels, tires, axles, frame, torque box, turntable, and related components
2. *Describe* normal operating condition
3. *List* types of defects, deficiencies, and potential problems associated with stabilization systems
4. *Identify* record-keeping requirements
5. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
6. Recognize and identify the condition of an aerial device stabilization system
7. Determine defects and deficiencies
8. Perform operational checks
9. Complete checklist and inspection documentation

Job Performance Requirements

Inspect all mechanical components of the stabilization system 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 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.

6-6: Maintaining Aerial Device Stabilization Systems

Authority

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

- Paragraph 4.6.6

Given

1. An emergency response vehicle with an aerial device stabilization system
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* troubleshooting procedures
2. *Identify* adjustment methods and procedures
3. *Identify* record-keeping requirements
4. *Describe how to* select test, calibration, *and diagnostic* equipment
5. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
6. Evaluate reported conditions
7. Perform operational tests
8. Perform all required maintenance, including all items on a maintenance checklist
9. Use test, calibration, *and diagnostic* equipment
10. Correct deficiencies
11. Complete required documentation

Job Performance Requirements

Perform maintenance on the aerial device stabilization system so that deformed, broken, loose, worn, or missing parts are repaired or replaced; the stabilization system is maintained in accordance with manufacturer 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.

6-7: Inspecting Aerial Device Lifting, Rotating, and Extension Systems

Authority

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

- Paragraph 4.6.7

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of components of lifting, rotating, and extension systems of an aerial device
2. *Describe* normal *operating* condition
3. *List* types of defects, deficiencies, and potential problems associated with aerial device lifting, rotating, and extension systems
4. *Identify* record-keeping requirements
5. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
6. Recognize and identify conditions of components of lifting, rotating, and extension systems of an aerial device
7. Determine defects and deficiencies
8. Perform operational checks
9. Complete checklist and inspection documentation

Job Performance Requirements

Inspect all components of aerial device lifting, rotating, and extension systems 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 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.

6-8: Inspecting Aerial Device Electrical Systems

Authority

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

- Paragraph 4.6.8

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, construction, operation, and inspection of components of the aerial device electrical and warning systems
2. *Describe* normal *operating* condition
3. *List* types of defects, deficiencies, and potential problems of aerial device electrical systems
4. *Describe how to* select test gauges and meters
5. *Identify* record-keeping requirements
6. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
7. Recognize and identify conditions of components of aerial device electrical systems
8. Read and interpret test gauges and meters
9. Perform operational checks
10. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the components of the aerial device electrical system 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 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.

6-9: Inspecting Aerial Device Waterway Systems

Authority

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

- Paragraph 4.6.9

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of components of the waterway system
2. *Describe how to* select test, calibration, and diagnostic equipment
3. *Identify* lubrication requirements
4. *List* types of defects, deficiencies, and potential problems associated with aerial device waterway systems
5. *Describe* record-keeping requirements
6. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
7. Recognize and identify symptoms and the condition of components of aerial device waterway systems
8. Use test, calibration, and diagnostic equipment
9. Read and interpret test gauges and flowmeters
10. Perform operational checks
11. Complete checklist and inspection documentation

Job Performance Requirements

Inspect all components of an aerial device waterway system so that the security of mounting is verified; the operation and condition of the aerial device waterway system are verified to be within manufacturer 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.

Section 7: Specialized Systems

7-1: Inspecting Foam-proportioning Systems

Authority

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

- Paragraph 4.9.1

Given

1. An *apparatus* with a foam-proportioning system
2. Standard Operating Procedures (SOPs)
3. Manufacturer specifications
4. Tools
5. Test, calibration, *and diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of foam-proportioning systems, including construction and operation of eduction, injection, and venturi proportioning systems and related components
2. *Describe* characteristics of system design, including foam concentrate agents
3. *Describe* characteristics of water flow and pressure
4. *Identify* flushing procedures
5. *Describe* backflow prevention
6. *Describe how to* use filters and strainers
7. *Describe* basic principles of operating controls, metering devices, and indicators
8. *Describe how to* select test, calibration, *and diagnostic* equipment
9. *List* types of defects, deficiencies, and potential problems associated with foam-proportioning systems
10. *Identify* record-keeping requirements
11. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
12. Identify and operate proportioning systems
13. Recognize symptoms and conditions
14. Determine defects and deficiencies
15. Use test, calibration, *and diagnostic* equipment
16. Perform operational checks
17. Complete checklist and inspection documentation

Job Performance Requirements

Inspect the foam-proportioning system so that the mounting security and structural integrity are verified; operation and condition of the system are verified to be within manufacturer specifications; recommended fluid levels 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.

7-2: Maintaining Foam-proportioning Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 4.9.2
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with a foam-proportioning system
2. A maintenance schedule or an assignment
3. A maintenance checklist
4. Manufacturer specifications
5. SOPs
6. Test, calibration, *and diagnostic* equipment
7. Tools

Requisite Knowledge and Skills

1. *Describe* troubleshooting procedures
2. *Describe how to use test, calibration, and diagnostic equipment*
3. *Describe* adjustment methods and procedures
4. *Identify* record-keeping requirements
5. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
6. Evaluate reported conditions
7. Perform all required maintenance, including all items on a maintenance checklist
8. Use test, calibration, *and diagnostic* equipment
9. Correct deficiencies
10. Perform operational checks
11. Complete required documentation

Job Performance Requirements

Perform maintenance on a foam-proportioning system so that deformed, broken, loose, worn, or missing parts are repaired or replaced; the system operates within manufacturer guidelines; fluid levels are maintained; activities are documented; and additional repair needs are reported.

7-3: Repairing Foam-proportioning System Components

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.1
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with a foam-proportioning system
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 foam-proportioning systems, including foam types, drive systems, foam concentrate pumps, flowmeters, proportioners, valves, eductors, and nozzles
2. *Describe how to* select testing, calibration, *and diagnostic* equipment
3. *Describe testing* methods and procedures
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 manufacturer specifications
8. Use required test, calibration, *and diagnostic* equipment
9. Perform diagnostic procedures
10. Perform required repairs to resolve deficiencies
11. Perform diagnostically checked
12. Complete required documentation of the manufacturer and the authority having jurisdiction.

Job Performance Requirements

Repair foam-proportioning system components so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of a foam-proportioning system, including component mounts, drive systems, pumps, plumbing, and valves, are repaired, replaced, or rebuilt to manufacturer specifications; the foam system is diagnostically checked for proper operation and performance is verified; and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

7-4: Testing Apparatus Foam Systems and Related Components

Authority

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

- Paragraph 5.7.2

Given

1. An apparatus with a foam 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 foam system and its related components
2. *Describe* principles of foam proportioning
3. *Describe* diagnostic checks and performance testing procedure and requirements
4. *Describe how to* select test, calibration, *and diagnostic* equipment
5. *Describe* safety procedures
6. *Describe* diagnostic procedures
7. *Identify state and local foam flow requirements and restrictions*
8. *Identify* foam flow calculations
9. *Identify* record-keeping requirements
10. Conduct foam system performance tests *in accordance with state and local requirements and restrictions*
11. Use test, calibration, *and diagnostic* equipment
12. Identify defects and deficiencies
13. Perform foam flow calculations
14. Complete required documentation

Job Performance Requirements

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

7-5: Inspecting a Compressed Air Foam System (CAFS)

Authority

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

- Paragraph 5.7.3

Given

1. An *apparatus* with a CAFS
2. SOPs
3. Manufacturer specifications
4. Tools
5. Test, *calibration, and diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. Describe the function, construction, and operation of CAFS, including foam types, drive systems, flow-meters, proportioners, valves, eductors, and nozzles
2. *Identify* warning and interlock systems
3. *Identify* common failure symptoms associated with component interfaces of related equipment
4. *List* types of defects, deficiencies, and potential problems associated with CAFS
5. *Describe how to use test, calibration, and diagnostic equipment*
6. *Describe* pressure-control devices
7. *Describe* packing and seals
8. *Identify* types, grades, and viscosity of lubricants
9. *Identify* record-keeping requirements
10. *Describe* operational testing requirements
11. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
12. Recognize and identify normal operating conditions of CAFS
13. Identify components that are damaged, worn, or missing
14. Determine defects and deficiencies
15. Use test, calibration, *and diagnostic* equipment
16. Perform diagnostic checks
17. Complete checklists and inspection documentation

Job Performance Requirements

Inspect the compressed air foam system (CAFS) and associated components so that the security of mounting of the system is verified; the operation and condition of the system and its associated components, including air tank, hoses, valves and fittings, warning and interlock systems, linkage, and drive shafts, are verified to be within manufacturer specifications;

Emergency Vehicle Technician 1

Section 7: Specialized Systems

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

7-6: Maintaining a Compressed Air Foam System (CAFS)

Authority

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

- Paragraph 5.7.4

Given

1. An *apparatus* with a compressed air foam system
2. Manufacturer specifications
3. A maintenance schedule or an assignment
4. A maintenance checklist
5. SOPs
6. Tools
7. Test, *calibration*, and *diagnostic* equipment

Requisite Knowledge and Skills

1. *Describe* troubleshooting procedures
2. *Describe* adjustment methods and procedures
3. *Identify* record-keeping requirements
4. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
5. Evaluate reported conditions
6. Perform all required maintenance, including all items on a maintenance checklist
7. Recognize and correct deficiencies
8. Interpret and follow operational diagnostic checks and test procedures
9. Use test, *calibration*, and *diagnostic* equipment
10. Complete required documentation

Job Performance Requirements

Perform maintenance on a CAFS and its components so that the operational condition of the CAFS is preserved or restored; CAFS compressor and system components function to the recommended specifications; all hoses are tight; adjustments are made to stop all fluid leaks; lubricants are applied; all electrical connections are clean and tight; system operation is verified; deformed, broken, loose, worn, or missing parts, including component mounts, drive system, pump, plumbing, and valves, are repaired or replaced; activities are documented; and additional repair needs are reported; and testing requirements and performance testing is documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

7-7: Repairing a Compressed Air Foam Systems (CAFS)

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.3
2. *Office of the State Fire Marshal*

Given

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

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of CAFS, including foam types, drive systems, air compressors, flowmeters, proportioners, valves, eductors, and nozzles
2. *Describe how to* select test, calibration, *and diagnostic* equipment;
3. *Describe* adjustment methods and procedures
4. *Identify state and local foam flow requirements and restrictions*
5. *Identify* lubrication and fluid types
6. *Identify* record-keeping requirements
7. *Describe the* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
8. Recognize, evaluate, and analyze reported conditions
9. Interpret manufacturer specifications
10. Use test, calibration, *and diagnostic* equipment
11. *Perform required repairs to resolve deficiencies*
12. Perform diagnostic checks and operational tests *in accordance with state and local requirements and restrictions*
13. Complete required documentation of the manufacturer and the authority having jurisdiction

Job Performance Requirements

Repair compressed air foam system (CAFS) so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of a CAFS, including component mounts, drive systems, pumps, plumbing, and valves, are repaired, replaced, or rebuilt to manufacturer specifications; fluid levels are restored; the CAFS is tested for proper operation and its performance is verified; and diagnostic checks and repairs are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

7-8: Testing Compressed Air Foam Systems (CAFS)

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.4
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with a CAFS
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 CAFS and its related components
2. *Describe the* principles of compressed air systems
3. *Describe* foam-proportioning systems
4. *Describe* operational and performance testing procedure and requirements
5. *Describe how to* select test, calibration, *and diagnostic* equipment
6. *Describe* safety procedures
7. *Describe* diagnostic checks and test procedures
8. *Identify state and local foam flow requirements and restrictions*
9. *Identify* foam and compressed air flow calculations
10. *Identify* record-keeping requirements
11. Conduct CAFS performance tests *in accordance with state and local requirements and restrictions*
12. Use test, calibration, *and diagnostic* equipment
13. Identify defects and deficiencies
14. Perform foam and compressed air flow calculations
15. Complete required documentation

Job Performance Requirements

Complete performance testing on apparatus compressed air foam system (CAFS) and related components in accordance with NFPA 1911 so that the CAFS is capable of meeting the performance requirements of the original certification test; and all testing requirements and performance testing is documented in accordance with the requirements of NFPA standards and the authority having jurisdiction.

7-9: Inspecting Electrical Line Voltage Generation Systems

Authority

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

- Paragraph 4.9.5

Given

1. An *apparatus* with a line voltage electrical system
2. SOPs
3. Manufacturer specifications
4. Tools
5. Test, *calibration*, and *diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe* electricity safety and inspection procedures
2. *Demonstrate* knowledge of local, state, and federal regulation regarding inspection of line voltage installations
3. *Describe the* function, construction, operation, and inspection of components of electrical line voltage *generators*, controls, instrumentation, and *drive units*
4. *List* types of defects, deficiencies, and potential problems associated with electrical line voltage generation systems
5. *Identify* required labels, plates, and signs
6. *Identify* record-keeping requirements
7. *Describe the* inspection procedures of the manufacturer and the authority having jurisdiction
8. Recognize and identify the symptoms and conditions of components of electrical line voltage generation, including controls and instrumentation
9. Determine defects and deficiencies
10. Perform operational checks
11. Complete checklist and inspection documentation

Job Performance Requirements

Inspect all components and accessories of the electrical line voltage generation system, controls, and instrumentation so that the security of mounting is verified; the operation and condition of the system and drive units, cord reels, lighting, accessories and equipment, safety and protection devices, and instrumentation are verified to be within manufacturer specifications; the condition and correct placement of information and warning signs and labels 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.

7-10: Maintaining Electrical Line Voltage Generation Systems

Authority

NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2002)

- Paragraph 4.9.6

Given

1. An apparatus with a line voltage electrical system
2. Manufacturer specifications
3. A maintenance schedule or an assignment
4. A maintenance checklist
5. SOPs
6. Test, calibration, *and diagnostic* equipment
7. Tools

Requisite Knowledge and Skills

1. *Demonstrate* knowledge of local, state, and federal regulation regarding maintenance of line voltage installations
2. *Identify* lubrication requirements and types
3. *Describe* troubleshooting procedures
4. *Describe* adjustment methods and procedures
5. *Identify* record-keeping requirements
6. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
7. Evaluate reported conditions
8. Perform operational checks
9. Perform all required maintenance, including all items on a maintenance checklist
10. Use test, calibration, *and diagnostic* equipment
11. Correct deficiencies
12. Complete required documentation

Job Performance Requirements

Perform maintenance on electrical line voltage generation system, controls, and instrumentation so that the operational condition of generators, system components, instrumentation, controls, safety and load protection devices, and the drive unit is preserved or restored; lubrication and fluid levels are checked; deformed, broken, loose, worn, or missing parts are repaired or replaced; activities are documented; and additional repair needs are reported.

7-11: Inspecting Breathing-air and Purification Systems

Authority

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

- Paragraph 4.9.7

Given

1. An *apparatus* with a breathing-air and purification system
2. SOPs
3. Manufacturer specifications
4. Tools
5. Test, *calibration*, and *diagnostic* equipment
6. Quality sample kits
7. An assignment
8. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of a breathing-air purification system
2. *Demonstrate* understanding of cascading operations, high-pressure air regulation, and purification testing
3. *List* types of defects, deficiencies, and potential problems associated with breathing-air and purification systems
4. *Identify* record-keeping requirements
5. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
6. *Describe how to* select test, calibration, and *diagnostic* equipment
7. *Describe* test methods and troubleshooting procedures
8. Evaluate reported conditions
9. Recognize symptoms and conditions
10. Determine defects and deficiencies
11. Perform operational checks
12. Use test, calibration, and *diagnostic* equipment
13. Complete checklist and inspection documentation

Job Performance Requirements

Inspect all components of a breathing-air and purification system so that the security of mounting is verified; operation and condition of the breathing-air and purification system, including the drive unit and compressors, electrical protection devices, safety devices, interlocks, and instrumentation, are verified to be within manufacturer specifications; the condition of the separator filters is verified; recommended fluid levels of drive units and compressors are verified; the condition and adjustment of drive belts are verified to be within manufacturer specifications; all checklist items are inspected; defects and deficiencies,

Emergency Vehicle Technician 1

Section 7: Specialized Systems

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.

7-12: Maintaining Breathing-air and Purification Systems

Authority

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

- Paragraph 4.9.8

Given

1. An *apparatus* with a breathing-air and purification system
2. Manufacturer specifications
3. A maintenance schedule or an assignment
4. A maintenance checklist
5. SOPs
6. Test, calibration, *and diagnostic* equipment
7. Tools

Requisite Knowledge and Skills

1. *Identify* lubricants and lubrication systems
2. *List* types of defects or deficiencies associated with breathing-air and purification systems
3. *Describe* troubleshooting procedures
4. *Describe* adjustment methods and procedures
5. *Identify* inspection, repair, or replacement of system components
6. *Identify* record-keeping requirements
7. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
8. Evaluate reported conditions ~~of the compressor and drive unit~~
9. Perform all required maintenance, including all items on a maintenance checklist
10. Recognize and correct deficiencies
11. Interpret and follow that the system is operationally checked operational test methods and procedures
12. Use test, calibration, *and diagnostic* equipment
13. Complete required documentation

Job Performance Requirements

Perform maintenance on a breathing-air and purification system so that drive units and compressors are maintained; breathing air is within purification standards; deformed, broken, loose, worn, or missing parts are repaired or replaced; the operational condition is preserved or restored; the system is tested for proper operation checking methods; activities are documented; and additional repair needs are reported.

7-13: Repairing Breathing-air and Breathing Apparatus Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.8
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with a breathing-air and air purification 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 complete breathing-air system and high-pressure air regulation
2. *Describe* purification testing
3. *Identify* record-keeping requirements
4. *Describe the* system diagnostic and repair procedures of the manufacturer and the authority having jurisdiction
5. *Describe how to* select test, calibration, *and diagnostic* equipment
6. *Describe* troubleshooting procedures
7. *Describe* test procedures
8. Identify and evaluate reported conditions
9. Use test, calibration, *and diagnostic* equipment
10. Complete performance procedures
11. Perform required repairs to resolve deficiencies
12. Calibrate equipment
13. Perform diagnostic checks
14. Complete required documentation

Job Performance Requirements

Repair a breathing-air and air purification system so that all defective components are diagnosed; deformed, broken, loose, worn, or missing parts of a breathing-air and air purification system, including mounts, drive systems, pumps, piping, valves, fittings, tanks, and other components, are repaired, replaced, or rebuilt to manufacturer specifications; the system is diagnostic checked for proper operation and performance is verified; and the repairs and test results are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

7-14: Testing Breathing-air Compressor Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.9
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with a breathing-air compressor system
2. Manufacturer specifications
3. SOPs
4. *Test, calibration, and diagnostic equipment*
5. *Tools*

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of a breathing-air compressor system and its related components
2. *Identify* compressor manufacturer or manufacturer representative
3. *Identify* compressed breathing-air quality standards and air quality testing agencies
4. *Identify* record-keeping requirements
5. Schedule and verify completion of breathing-air compressor testing
6. Schedule and verify compressed breathing-air quality testing
7. Complete required documentation

Job Performance Requirements

Complete performance testing on breathing-air compressor system and related components in accordance with NFPA 1911 and NFPA 1989 so that the breathing-air compressor system is tested to ensure that the compressor performs to the compressor manufacturer original requirements; compressed breathing air is tested to ensure breathing-air quality standards are met; and all results are documented in accordance with the requirements of NFPA standards, the compressor manufacturer, and the authority having jurisdiction.

7-15: Inspecting Auxiliary Air Compressors

Authority

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

- Paragraph 5.7.10

Given

1. An *apparatus* with an auxiliary air compressor
2. SOPs
3. Manufacturer specifications
4. Tools
5. Test, *calibration*, and *diagnostic* equipment
6. An assignment
7. An inspection checklist

Requisite Knowledge and Skills

1. *Describe the* function, construction, and operation of auxiliary air compressors, drive units, and related components
2. *Identify* warning and interlock systems
3. *Describe* common failure symptoms associated with component interfaces of related equipment
4. *List* types of defects, deficiencies, and potential problems associated with auxiliary air compressors, drive units, and related components
5. *Identify* types of instrumentation
6. *Describe how to* select test, calibration, and *diagnostic* equipment
7. *Identify* pressure control and safety devices, packing, and seals
8. *Identify* types, grades, and viscosity of lubricants
9. *Identify* record-keeping requirements
10. *Describe the* inspection and operational testing requirements and procedures of the manufacturer and the authority having jurisdiction
11. Recognize and identify symptoms and conditions of compressors, drive units, and related components
12. Determine defects and deficiencies
13. Use test, calibration, and *diagnostic* equipment
14. Perform diagnostic checks
15. Complete checklists and inspection documentation

Job Performance Requirements

Inspect an auxiliary air compressor so that the operation and condition of the auxiliary air compressor, warning systems, instrumentation, and interlock systems are verified to be within manufacturer specifications; the security of mounting of the system and its associated components is verified; linkage and drive shafts are inspected for wear and alignment; the

Emergency Vehicle Technician 1

Section 7: Specialized Systems

condition of air tank, dryer, reels, hoses, piping, valves, and fittings is assessed; recommended fluid levels are verified and fluids are inspected for any visible contamination; all checklist items are inspected; defects and deficiencies, including broken, loose, worn, or missing parts, are identified and reported; and inspection and diagnostic checks are documented in accordance with the procedures of the manufacturer and the authority having jurisdiction.

7-16: Maintaining Auxiliary Air Compressors

Authority

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

- Paragraph 5.7.10

Given

16. An *apparatus* with an auxiliary air compressor
17. Manufacturer specifications
18. A maintenance schedule or an assignment
19. A maintenance checklist
20. SOPs
21. Tools
22. Test, *calibration*, and *diagnostic* equipment

Requisite Knowledge and Skills

1. *Identify* lubricants and lubrication systems
2. *Describe* troubleshooting procedures
3. *Describe* adjustment methods and procedures
4. *Identify* inspection, repair, or replacement of system components
5. *Identify* record-keeping requirements
6. *Describe the* inspection and maintenance procedures of the manufacturer and the authority having jurisdiction
7. Evaluate the reported conditions
8. Perform diagnostic checks
9. Perform all required maintenance, including all items on a maintenance checklist
10. Determine and correct defects and deficiencies
11. Use test, *calibration*, and *diagnostic* equipment
12. Complete checklists and required documentation

Job Performance Requirements

Perform maintenance on auxiliary air compressors, drive units, and related components so that the compressor, drive unit, and related components are operational and functioning within the manufacturer specifications; filters are replaced; any leaks in hoses, piping, valves, and fittings are repaired; lubricants are applied; all electrical connections are clean and tight; deformed, broken, loose, worn, or missing parts are repaired or replaced; system operations and diagnostic checks are verified; activities are documented; and additional repair needs are reported.

7-17: Repairing Auxiliary Air Systems

Authority

1. NFPA 1071 Standard for Emergency Vehicle Technician Professional Qualifications (2020)
 - Paragraph 5.7.10
2. *Office of the State Fire Marshal*

Given

1. An *apparatus* with an auxiliary air system
2. An assignment or an 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 auxiliary air system, low-pressure regulation, valves, and controls
 2. *Describe* testing procedures
 3. *Describe how to* select test, calibration, *and diagnostic* equipment
 4. *Describe* adjustment and calibration methods and procedures
 5. *Identify* record-keeping requirements
 6. *Describe the* repair and diagnostic procedures of the manufacturer and the authority having jurisdiction
 7. Identify and evaluate reported conditions
 8. Use test, calibration, *and diagnostic* equipment
 9. Perform diagnostic procedures
 10. Perform tests and calibrations
- Perform required repairs to resolve deficiencies
11. Perform diagnostic checks
 12. Complete required documentation

Job Performance Requirements

Repair an auxiliary air system and its components so that defective components are diagnosed; deformed, broken, loose, worn, or missing parts of an auxiliary air system, including mounts, drive systems, pumps, piping, valves, fittings, and tanks, and other components, are repaired, replaced, or rebuilt to manufacturer specifications; the auxiliary air system is diagnostically checked for proper operation and its performance is verified; and the repair 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
2-1	RKS #2	Added "Describe how to select test, calibration, and diagnostic equipment".	An EVT has to use be able to select and use the appropriate test, calibration, and diagnostic equipment as part of the inspection process.	
2-1	RKS #9	Added "Use test, calibration, and diagnostic equipment".	An EVT has to use be able to select and use the appropriate test, calibration, and diagnostic equipment as part of the inspection process.	
2-1	JPR	Added "brake systems" to the list of chassis system components "...auxiliary drive systems, axles, driveline, steering and suspension system, <i>brake systems</i> , wheels, and tires...".	NFPA 1071 does not address brakes as a separate vehicle system or component. This addition ensures that California EVTs receive adequate brake training.	
2-1	RKS #2	Added "Identify the principles of electricity and operational theory of electronics".	This originally appeared in CTS 2-3 as part of 4.2.3 but cadre requested relocation to CTS 2-1 because it applies to all chassis systems, not just those in emergency vehicles.	
2-3	JPR	Added "brake systems" to the list of chassis system	NFPA 1071 does not address brakes as a separate vehicle	

Emergency Vehicle Technician 1

State Fire Training Content

CTS	Block	Addition	Justification	Source / Reference
		components "...independent suspension systems, all-wheel steering systems, <i>brake systems</i> , secondary braking systems, and interface electronics, and load management systems...".	system or component. This addition ensures that California EVT's receive adequate brake training.	
2-5	JPR	Added "manufacturer and the authority having" to the last segment which now reads "and the repairs are documented in accordance with the procedures of the <i>manufacturer and the authority having jurisdiction</i> ".	NFPA oversight. All repairs are done to manufacturer standards and procedures first.	
2-9	RKS #1	Added "Identify the difference between a road test and a performance test"	Not all performance tests are road tests. Cadre wanted a distinction.	
3-1	RKS #2	Added "Describe how to select test, calibration, and diagnostic equipment".	An EVT has to use be able to select and use the appropriate test, calibration, and diagnostic equipment as part of the inspection process.	
3-1	RKS #10	Added "Use test, calibration, and diagnostic equipment".	An EVT has to use be able to select and use the appropriate test, calibration, and diagnostic equipment as part of the inspection process.	
3-3	RKS #2	Changed "Recognize metals" to "Identify metals used in cabs"	Cadre didn't feel "metals" was broad enough category of the types of materials encountered in this task.	
3-3	RKS #3	Added "Identify personnel safety restraint systems that may present hazards during cab repair".	Cadre wanted attention placed on air bag safety considerations.	

Emergency Vehicle Technician 1

State Fire Training Content

CTS	Block	Addition	Justification	Source / Reference
3-3	RKS #14	Added "Mitigate personnel safety restraint system hazards".	Cadre wanted attention placed on air bag safety considerations.	
3-5	RKS #4	Added "Identify leak classifications and methods to stop them".	Original language didn't include classification.	
3-6	RKS #9	Changed "Recognize metals" to "Identify materials used in cabs and equipment-mounting systems, racks, brackets, and locks"	Cadre didn't feel "metals" was broad enough category of the types of materials encountered in this task.	
3-8	RKS #3	Changed "Recognize metals" to "Identify materials used in cab tilt systems"	Cadre didn't feel "metals" was broad enough category of the types of materials encountered in this task.	
3-11	RKS #8	Changed "Recognize metals" to "Identify materials used in cab bodies, compartments, and storage areas"	Cadre didn't feel "metals" was broad enough category of the types of materials encountered in this task.	
4-1	G #6	Added "Schematics".	Cadre felt the JPR couldn't be performed without them but NFPA did not include.	
4-1	G #5	Added "digital" to "including a belt tension gauge and a multimeter".	Cadre requested clarification to ensure correct equipment.	
4-1	RKS #3	Added "Kirchhoff's law" to "Ohm's law".	Almost everything in vehicles now runs on electronic systems.	
4-1	RKS #4	Added "Describe how to read and interpret schematics".	NFPA omission. This is a necessary skill to complete the JPR.	
4-1	RKS #10	Added "Read and interpret schematics".	NFPA omission. This is a necessary skill to complete the JPR.	
5-3	RKS #16	Replaced "fire flow calculations" with "hydraulic flow calculations"	Fire flow is not accurate.	
5-4	G #1	Added "or agent" to types of tanks listed.	Curriculum should cover tanks with contents other than water and foam.	

Emergency Vehicle Technician 1

State Fire Training Content

CTS	Block	Addition	Justification	Source / Reference
5-4	RKS #1	Added "and mounting" to "function, operation, construction of water/foam tanks".	This is a critical element of this part of the vehicle. The JPR lists it, but the RKS doesn't address it.	
5-4	RKS #1, #5	Combined "agent" with "water/foam" to address all three types of tanks.	NFPA writing read as if water/foam modified agent and it doesn't. Agent is also a noun: water/foam/agent.	
5-4	RKS #2	Added "Describe specialized pressure systems".	This is a very unique system that is becoming more popular but is not yet included in the NFPA standard.	
5-5	G #1	Expanded "water or foam" tank to "water, foam, or agent" tank	California has three tank types and students need to be able to repair all three types.	
5-5	G #5	Added: "Test, calibration, and diagnostic equipment"	NFPA oversight. Selecting and using the equipment was listed in the RKS.	
5-5	RKS #1, #5	Expanded "water" tanks to include "water/foam/agent" tanks.	California has three tank types and students need to be able to repair all three types.	
5-5	JPR	Expanded "water/foam" tanks to include "water/foam/agent" tanks.	California has three tank types and students need to be able to repair all three types.	
5-6	RKS #7, #12	Replaced "fire flow calculations" with "hydraulic flow calculations".	Fire flow is not accurate.	
6-3	JPR	Added "and NFPA performance standards" to "the aerial device is tested for proper operation".	Just because it's operational does not mean it meets minimal requirements. Cadre requested more specificity.	
6-3	RKS #1	Added "and performance" to "Describe the function, construction, and operation of an aerial device".	Just because it's operational does not mean it meets minimal requirements. Cadre requested more specificity.	
6-3	RKS #9	Added "and performance" to "Perform operational tests".	Just because it performs does not mean it meets minimal requirements. Cadre requested more specificity.	
6-3	G #3	Added "NFPA 1911 (current edition)".	Corresponds to addition in JPR.	

Emergency Vehicle Technician 1

State Fire Training Content

CTS	Block	Addition	Justification	Source / Reference
6-4	RKS #6	Added "Describe how to read and interpret schematics".	This is a critical skill not covered by NFPA.	
6-4	RKS #13	Added "Read and interpret schematics".	This is a critical skill not covered by NFPA.	
6-4	G #8	Added "Schematics".	Corresponds to addition in RKS.	
7-2	RKS #2	Added "Describe how to use test, calibration, and diagnostic equipment".	NFPA listed the skill component, but not the knowledge component. Added for consistency and because it's necessary.	
7-3	G #1	Replaced "emergency response vehicle" with "apparatus".	California has foam-proportioning systems on units other than vehicles (portable trailers, etc.).	
7-4	RKS #7	Added "Identify state and local foam flow requirements and restrictions".	Each jurisdiction has requirements. The individual performing testing is responsible for knowing and abiding by them.	
7-4	RKS #10	Added "in accordance with state and local requirements and restrictions".	Each jurisdiction has requirements. The individual performing testing is responsible for knowing and abiding by them.	
7-7	G #1	Replaced "emergency response vehicle" with "apparatus".	California has compressed air foam systems (CAFS) on units other than vehicles (portable trailers, etc.).	
7-7	RKS #4	Added "Identify state and local foam flow requirements and restrictions".	Each jurisdiction has requirements. The individual performing testing is responsible for knowing and abiding by them.	
7-7	RKS #12	Added "in accordance with state and local requirements and restrictions".	Each jurisdiction has requirements. The individual performing testing is responsible for knowing and abiding by them.	
7-8	G #1	Replaced "emergency response vehicle" with "apparatus".	California has compressed air foam systems (CAFS) on units other than vehicles (portable trailers, etc.).	
7-8	RKS #8	Added "Identify state and local foam flow	Each jurisdiction has requirements. The individual	

Emergency Vehicle Technician 1

State Fire Training Content

CTS	Block	Addition	Justification	Source / Reference
		requirements and restrictions".	performing testing is responsible for knowing and abiding by them.	
7-8	RKS #11	Added "in accordance with state and local requirements and restrictions".	Each jurisdiction has requirements. The individual performing testing is responsible for knowing and abiding by them.	
7-13	G #1	Replaced "emergency response vehicle" with "apparatus".	California has breathing-air and air purification systems on units other than vehicles (portable trailers, etc.).	
7-14	G #1	Replaced "emergency response vehicle" with "apparatus".	California has breathing-air compressor systems on units other than vehicles (portable trailers, etc.).	
7-14	G #4	Added "Test, calibration, and diagnostic equipment".	Required to perform JPR but NFPA didn't include it.	
7-14	G #5	Added "Tools".	Required to perform JPR but NFPA didn't include it.	
7-17	G #1	Replaced "emergency response vehicle" with "apparatus".	California has auxiliary air systems on units other than vehicles (portable trailers, etc.).	

Errata

Code Key

Blocks

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Changes

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