

Fire Apparatus Driver/Operator – Pumping Apparatus

Certification Training Standards Guide August 2015



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

Fire Apparatus Driver/Operator – Pumping Apparatus

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This CTS guide utilizes NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014) to provide the qualifications for State Fire Training's Fire Apparatus Driver/Operator – Pumping Apparatus 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).

**CALIFORNIA
STATE FIRE**



TRAINING

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State Fire Training

Mission

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

The California Fire Services Training and Education System

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

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

- Administers the California Fire Academy System

- Provides accredited courses leading to certification and approved standardized training programs for local and regional delivery

- Administers the national accreditation process in California

- Publishes certification training standards, course plans, and a certification 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.

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CAL FIRE

Ken Pimlott

Director, CAL FIRE

Tonya Hoover

State Fire Marshal

Mike Richwine

Assistant State Fire Marshal

Vacant

Chief, State Fire Training

Ron Coleman

Chair, STEAC

Cadre Leadership

Mark Romer

Cadre Leader

Fire Service Training Specialist III, Office of the State Fire Marshal

Alicia Hamilton

Cadre Editor

Sacramento State

Cadre Members

Jonathan Black

Captain, Santa Clara County Fire Department

Development and Validation Cadre

Acknowledgments

Bruce Fosdike

*Captain, CAL FIRE (Retired), San Luis Obispo Unit
Development Cadre*

Daniel Hoy

*Engineer, Sacramento Metropolitan Fire District
Development Cadre*

Timothy McIntyre

*Engineer, Los Angeles County Fire Department
Development and Validation Cadre*

Drew Oliphant

*Engineer, Los Angeles Fire Department
Development and Validation Cadre*

Ann Johnston Rosales

*Battalion Chief, CAL FIRE/Fire Academy
Development and Validation Cadre*

Steve Walton

*Engineer, Larkspur Fire Department
Development Cadre*

Karen Wilson

*Lieutenant, Mariposa County Fire Department
Development and Validation Cadre*

Validation Members

Craig Berchtold

*Engineer, Livermore-Pleasanton Fire Department
Validation Cadre*

Bret Black

*Captain, Clovis Fire Department
Validation Cadre*

Steve Castagnola

*Engineer, San Bernardino County Fire Department
Validation Cadre*

Acknowledgments

Boyd Clegg

*Assistant Chief, Vacaville Fire Protection District
Validation Cadre*

Jim Colston

*Captain, San Marcos Fire Department
Validation Cadre*

DeWayne Felkins

*Captain, Sacramento Fire Department
Validation Cadre*

John Malone

*Captain, Dixon Fire Department
Validation Cadre*

Kelly Tassone

*Captain (Retired), Sacramento Metropolitan Fire District
Validation Cadre*

Tanisha Tucker

*Engineer, Oakland Fire Department
Validation Cadre*

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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.

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 certification 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.

Fire Apparatus Driver/Operator – Pumping Apparatus

Section 1: Preventive Maintenance

1-1: Perform Routine Tests, Inspections, and Servicing Functions

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.2.1

Office of the State Fire Marshal

Given

1. *Fire apparatus*
2. *Tools and equipment*
3. *Manufacturer's specifications and requirements*
4. *Policies and procedures of the jurisdiction*

Requisite Knowledge and Skills

1. *Recognize manufacturer specifications and requirements*
2. *Review policies and procedures of the jurisdiction*
3. *Use tools and equipment*
4. *Recognize system problems and out-of-service criteria*
5. *Correct any deficiency noted according to policies and procedures and/or manufacturer specifications and requirements*

Job Performance Requirements

Perform routine tests, inspections, and servicing functions on the systems and components of a fire apparatus to verify operational status.

1-2: Document Routine Tests, Inspections, and Servicing Functions

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.2.2

Given

1. Maintenance and inspection forms

Requisite Knowledge and Skills

1. *Identify jurisdictional* requirements for documenting maintenance performed
2. *Describe* the importance of keeping accurate records
3. Complete related *jurisdictional* forms

Job Performance Requirements

Document routine tests, inspections, and servicing functions by checking all items for proper operation and reporting any deficiencies.

1-3: Perform and Document Routine Tests, Inspections, and Servicing Functions Unique to Pumping Apparatus

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 5.1.1

Office of the State Fire Marshal

Given

1. Pumping *apparatus*
2. *Tools and equipment*
3. Manufacturer's specifications *and requirements*
4. Policies and procedures of the jurisdiction

Requisite Knowledge and Skills

1. *Recognize* manufacturer specifications and requirements
2. *Review* policies and procedures of the jurisdiction, *including documentation requirements*
3. Use tools *and equipment*
4. Recognize system problems *and out-of-service criteria*
5. Correct any deficiency noted according to policies and procedures *and/or manufacturer specifications and requirements*

Job Performance Requirements

Perform and document routine tests, inspections, and servicing functions on the systems and components of a pumping apparatus to verify their operational status.

Section 2: Driving/Operating

2-1: Operate a Fire Apparatus

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraphs 4.3.1 and 4.3.6

Office of the State Fire Marshal

Given

1. *Fire apparatus*
2. *Applicable state and local laws*
3. *Policies and procedures of the jurisdiction*
4. A predetermined route on a public way that incorporates the maneuvers and features that the driver/operator is expected to encounter during normal operations

Requisite Knowledge and Skills

1. *Describe the importance of wearing passenger restraint devices to ensure crew safety*
2. *Identify the common causes of fire apparatus accidents*
3. *Recognize that fire apparatus driver/operators are responsible for the safe and prudent operation of the apparatus under all conditions*
4. *Explain the effects of liquid surge, braking reaction time, and load factors*
5. *Explain the effects of high center of gravity on roll-over potential, general steering reactions, speed, and centrifugal force*
6. *Describe applicable laws and regulations*
7. *Explain the principles of skid avoidance, night driving, shifting, and gear patterns*
8. *Explain negotiating intersections, railroad crossings, and bridges*
9. *Describe the weight and height limitations for both roads and bridges*
10. *Discuss automatic braking systems in wet and dry conditions*
11. *Identify automotive gauges and their operation*
12. *Discuss the operational limits of the various types of fire apparatus*
13. Operate passenger restraint devices
14. Maintain safe following distances
15. Maintain control of the fire apparatus while accelerating, decelerating, and turning, given road, weather, and traffic conditions
16. Operate under adverse environmental or driving surface conditions
17. Use automotive gauges and controls

Job Performance Requirements

Operate a fire apparatus following a predetermined route on a public way in compliance with all applicable state and local laws and policies and procedures of the jurisdiction.

2-2: Back a Fire Apparatus from a Roadway into a Restricted Space

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.3.2

Given

1. Fire apparatus
2. Spotter
3. A restricted space requiring 90-degree right- and left-hand turns from the roadway (12 feet wide)

Requisite Knowledge and Skills

1. *Identify fire apparatus dimensions*
2. *Describe turning characteristics*
3. *Discuss spotter signaling*
4. *Explain principles of safe fire apparatus operation during this exercise*
5. *Use mirrors to judge fire apparatus clearance*

Job Performance Requirements

Back a fire apparatus from a roadway and park into a space with restrictions on both the right and left sides of the apparatus without stopping, pulling forward, and without striking any obstructions.

2-3: Maneuver a Fire Apparatus around Obstructions on a Roadway While Moving Forward and in Reverse

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.3.3

Given

1. Fire apparatus
2. Spotter
3. A roadway with obstructions

Requisite Knowledge and Skills

1. *Identify fire apparatus dimensions*
2. *Explain principles of safe fire apparatus operation during this exercise*
3. *Use mirrors to judge fire apparatus clearance*

Job Performance Requirements

Maneuver a fire apparatus around obstructions on a roadway while moving forward and in reverse without stopping to change the direction of travel and without striking any obstructions.

2-4: Turn a Fire Apparatus 180 Degrees within a Confined Space

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.3.4

Given

1. Fire apparatus
2. Spotter
3. An area in which the fire apparatus cannot perform a U-turn without stopping and backing up

Requisite Knowledge and Skills

1. *Explain* principles of safe *fire apparatus* operation *during this exercise*
2. Use mirrors to judge *fire apparatus* clearance

Job Performance Requirements

Turn a fire apparatus 180 degrees within a confined space without striking any obstructions.

2-5: Maneuver a Fire Apparatus in Areas with Restricted Horizontal and Vertical Clearances

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.3.5

Given

1. Fire apparatus
2. A course with restricted horizontal and vertical clearances

Requisite Knowledge and Skills

1. *Identify* fire apparatus dimensions
2. *Explain* principles of safe *fire apparatus* operation *during this exercise*
3. Use mirrors to judge *fire apparatus* clearance

Job Performance Requirements

Maneuver a fire apparatus in areas with restricted horizontal and vertical clearances and accurately judge the ability of the apparatus to pass through the openings without striking any obstructions.

2-6: Operate a Fire Apparatus Using Defensive Driving Techniques

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.3.6

Office of the State Fire Marshal

Given

1. Fire apparatus
2. Applicable laws and regulations
3. *Policies and procedures of the jurisdiction*
4. An assignment

Requisite Knowledge and Skills

1. *Describe applicable laws and regulations related to emergency response*

Job Performance Requirements

Operate a fire apparatus during emergency and nonemergency responses using defensive driving techniques while maintaining control of the apparatus.

2-7: Operate All Fixed Systems and Equipment on a Fire Apparatus

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 4.3.7

Office of the State Fire Marshal

Given

1. *Fixed* systems and equipment
2. Manufacturer's specifications *and requirements*
3. Policies and procedures for the jurisdiction

Requisite Knowledge and Skills

1. *Recognize* manufacturer's specifications *and requirements*
2. *Review* policies and procedures of the jurisdiction
3. Deploy, energize, and monitor the system or equipment
4. Recognize and correct *any deficiency according to policies and procedures and/or manufacturer specifications and requirements*

Job Performance Requirements

Operate all fixed systems and equipment on a fire apparatus not specifically addressed elsewhere in this standard in accordance with the applicable instructions and policies.

2-8: Produce an Effective Hand or Master Stream

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 5.2.1

Office of the State Fire Marshal

Given

1. Internal *water* tank
2. Pressurized *water* source
3. Static *water* source

Requisite Knowledge and Skills

1. *Explain* hydraulic calculations for friction loss and flow using both written formulas and estimation methods
2. *Describe the* safe operation of the pump
3. *Identify the* problems related to small-diameter or dead-end mains
4. *Discuss* low-pressure and private water supply systems
5. *Recognize* hydrant coding systems
6. *Discuss the* reliability of static sources
7. Position a *pumping apparatus* to operate at a fire hydrant and at a static water source
8. Power transfer from apparatus engine to pump
9. Draft
10. Operate pumper pressure control systems
11. Operate the volume/pressure transfer valve (multistage pumps only)
12. Operate auxiliary cooling systems
13. Make the transition between internal and external water sources
14. Assemble hose lines, nozzles, valves, and appliances

Job Performance Requirements

Produce an effective hand or master stream by engaging the pump, setting all pressure control and apparatus safety devices, achieving and maintaining the rated flow of the nozzle, while continuously monitoring the apparatus for potential problems.

2-9: Relay Pumping Operation

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 5.2.2

Office of the State Fire Marshal

Given

1. *Pumping apparatus (2 or more)*
2. *Water source*
3. *2½" or larger supply line*
4. Relay pumping evolution

Requisite Knowledge and Skills

1. *Explain* hydraulic calculations for friction loss and flow using both written formulas and estimation methods
2. Position a *pumping apparatus* to operate at a fire hydrant and a static water source
3. Power transfer from *apparatus* engine to pump
4. Draft
5. Operate pumper pressure control systems
6. Operate the volume/pressure transfer valve (multistage pumps only)
7. Operate auxiliary cooling systems
8. Make the transition between internal and external water sources
9. Assemble hose lines, nozzles, valves, and appliances

Job Performance Requirements

Pump a 2½" or larger supply line to provide the correct pressure and flow to the next pumping apparatus in the relay.

2-10: Produce a Foam Fire Stream

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 5.2.3

Office of the State Fire Marshal

Given

1. *Pumping apparatus*
2. *Foam-producing equipment*
3. *Foam concentrate*
4. *Manufacturer's specifications and requirements*

Requisite Knowledge and Skills

1. *Describe* proportioning rates and concentrations
2. *Explain* equipment *and* assembly procedures
3. *Identify* foam system limitations
4. *Discuss* manufacturer's specifications *and* requirements
5. Operate foam proportioning equipment
6. Connect foam stream equipment

Job Performance Requirements

Produce a foam fire stream to provide properly proportioned foam.

2-11: Supply Water to Fire Sprinkler and Standpipe Systems

Authority

NFPA 1002 Standard for Fire Apparatus Driver/Operator Professional Qualifications (2014)

- Paragraph 5.2.4

Office of the State Fire Marshal

Given

1. Pumping apparatus
2. *Sprinkler and standpipe systems*
3. Specific system information

Requisite Knowledge and Skills

1. *Explain* pump discharge pressure calculations
2. *Discuss* hose layouts
3. *Identify the* location of fire department connections
4. *Discuss* alternative supply procedures if fire department connection is not usable
5. *Describe* operating principles of sprinkler systems as defined in NFPA 13, NFPA 13D, and NFPA 13R
6. *Explain* fire department operations in sprinklered properties as defined in NFPA 13E
7. *Describe the* operating principles of standpipe systems as defined in NFPA 14
8. Position a *pumping apparatus* to operate at a fire hydrant
9. Power transfer from pumping apparatus engine to pump
10. Operate pumper pressure control systems
11. Operate the volume/pressure transfer valve (multistage pumps only)
12. Operate auxiliary cooling systems
13. Make the transition between internal and external water sources
14. Assemble hose lines, nozzles, valves, and appliances

Job Performance Requirements

Supply water to fire sprinkler and standpipe systems at the correct volume and pressure.

State Fire Training Content

Code Key

Blocks

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

Certification: Fire Apparatus Driver/Operator – Pumping Apparatus

CTS	Block	Addition	Justification	Source/Reference
1-1	G	Tools and equipment	Needed to perform the JPR	N/A
1-3	G	Tools and equipment	Needed to perform the JPR	N/A
2-1	G	Fire apparatus	Needed to perform the JPR	N/A
2-1	G	Applicable state and local laws	Needed to perform the JPR	N/A
2-1	G	Policies and procedures of the jurisdiction	Needed to perform the JPR	N/A
2-6	G	Policies and procedures of the jurisdiction	Needed to perform the JPR	N/A
2-9	G	Pumping apparatus (2 or more)	Needed to perform the JPR	N/A
2-9	G	Water source	Needed to perform the JPR	N/A
2-9	G	2½" or larger supply line	Needed to perform the JPR	N/A
2-10	G	Pumping apparatus	Needed to perform the JPR	N/A
2-10	G	Foam concentrate	Needed to perform the JPR	N/A
2-10	G	Manufacturer's specifications and requirements	Needed to perform the JPR	N/A
2-11	G	Sprinkler and standpipe systems	Needed to perform the JPR	N/A