

**Suggested Reference Materials**

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

NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*, 2017 edition  
National Fire Protection Association (800) 344-3555 or [www.nfpa.org](http://www.nfpa.org)

**Manuals:**

- **Any Fire Apparatus Operators Manual for Chassis, Pump and Aerial Device.**
- **Cummins Drivers tips for Fire & Emergency Vehicles** <http://cumminsengines.com/brochure-download.aspx?brochureid=307>
- **Selective Catalytic Reduction,** <http://www.dieselforum.org/about-clean-diesel/what-is-scr>

**Electronic Code of Federal Regulations - 49CFR Federal Regulations for trucks**

- **49CFR 393 Subpart B, 393.11** - Lamps and Reflective Devices  
<https://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol5/xml/CFR-2011-title49-vol5-sec393-11.xml>
- **49CFR 399.211 appendix G to Subchapter B of Chapter III** - Minimum Periodic Inspection Standards  
<https://www.gpo.gov/fdsys/pkg/CFR-1999-title49-vol4/xml/CFR-1999-title49-vol4-subtitleB-chapIII-subchapB-appG.xml>
- **49CFR 570.60 Subpart B 570.51 through 570.63** - Vehicle in Use Inspection  
<https://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol6/xml/CFR-2011-title49-vol6-part570.xml#seqnum570.51>

**Learning Objectives****A. NFPA 1901:**

1. The Driver / Operator must understand the definition and / or the regulations of the following
  - a. Definitions
    - (1). Acceptance tests
    - (2). Chassis
  - b. Regulations:
    - (1). Items that must be secured in the cab
    - (2). Gross Axle Weight Rating (GAWR)
    - (3). Gross Vehicle Weight Rating (GVWR)
    - (4). Gross Combination Weight Rating (GCWR)
2. The Driver / Operator must know the function and operation of the Electrical system & cab and body items listed below:
  - a. The Driver / Operator must know the proper operation of the seat belt warning system.
  - b. The Driver / Operator must know the proper operation the hazard warning lights and what is connected to it.
3. The Driver / Operator must know the function and operation of the Fire Pumps & Aerial items listed below:
  - a. The Driver / Operator must know how system function to perform the Operational checks
    - (1). The Driver / Operator must know what is controlled by the fast idle throttle interlock.
    - (2). The Driver / Operator needs to know how to engage and operate the fire pump
      - (a). Types of pump drives and how the “ok to pump” light functions.
      - (b). What could trap pressure in a discharge line.
      - (c). The relationship of increased rpm to pressure
4. The Driver / Operator must know the function and operation of the power train items listed below.
  - a. The proper type of engine oils for diesels and gasoline engines

**B. NFPA 1911:**

1. The Driver / Operator must understand the following:
  - a. Terms:
    - (1). Line Voltage
    - (2). Documentation
    - (3). Visual inspections
    - (4). Operational Checks
    - (5). NFPA
    - (6). Aerial ladder ironing
    - (7). Fire pump
    - (8). The different class of leaks as defined in 1911:
      - (a). Class 1
      - (b). Class 2
      - (c). Class 3
      - (d). Systems that are designed to leak.
  - b. Regulations:
    - (1). Local, state and national regulation as they apply to fire apparatus
    - (2). Regulations on work place safety when performing visual and operational checks.
    - (3). NFPA’s use of the word “shall” and “should”
    - (4). When a visual inspection is required
    - (5). What documentation must be kept and for how long
    - (6). Qualifications of visual inspector.

- (7). What needs to be done when the wheel chocks are missing?
- (8). Exceeding gross vehicle weight

2. Out-of-service criteria:

- a. Declaring components or systems out-of-service
    - (1). How to identify an out-of-service vehicle.
    - (2). How to report and out-of-service system.
  - b. The Driver / Operator must know what out-of-service criteria needs to be evaluated by a qualified technician for the following systems:
    - (1). Fire pumps
    - (2). Aerials
    - (3). Brakes
    - (4). Tires
    - (5). "Check Engine" light is on after start up.
    - (6). "Stop Engine" light is on after start up.
  - c. What is the requirement for out-of-service when the below systems have a Class 2 or 3 leak:
    - (1). Fuel system
    - (2). Coolant system
    - (3). Engine oil leak
    - (4). Hydraulic brake system
    - (5). Transmission
    - (6). Air brake air system leaks
  - d. What physical defects or fluid contaminations to system components or fluids listed below shall place the unit out-of-service:
    - (1). Defects:
      - (a). Loose or failed mounting
      - (b). Wiper system
      - (c). Windshield
      - (d). Seat belts
      - (e). Aerial torque box
      - (f). Mirrors
      - (g). Door latches or strikers
      - (h). Aerial outriggers
      - (i). Aerial hydraulic fluid level
      - (j). Aerial ladder cables
      - (k). Inoperative engine starter motor.
      - (l). Transmission overheating.
      - (m). Loose or missing wheel lug nuts.
      - (n). Wheel that is not seated properly.
      - (o). Cracked wheel
      - (p). Broken or cracked leaf springs
      - (q). Trailer hitch and safety chains
    - (2). Fluids:
      - (a). Discolored engine oil
      - (b). Coolant system contamination
      - (c). Burnt transmission fluid
  - e. What lights or defects to lighting systems shall place the apparatus out-of-service
    - (1). DOT lighting
    - (2). Emergency warning light system
  - f. The Driver / Operator must know what inoperative audible alarms shall place the unit out-of-service:
    - (1). Backup alarm
    - (2). Seat warning system
    - (3). Audible warning device (siren)
  - g. The Driver / Operator must know what warnings shall place the unit out-of-service:
    - (1). "Do Not Shift" transmission warning.
    - (2). Low air warning or inoperative air gauge.
  - h. The Driver / Operator must know what air brake system defects shall place the unit out-of-service.
    - (1). How much time is allowed to build air pressure enough to release the parking brake.
    - (2). Air system build up times.
    - (3). Sudden drop in air pressure
  - i. The Driver/Operator must know what patient compartment deficiencies shall place the compartment out of service
3. The Driver / Operator must know the function and operation of the Electrical & cab and body items listed below:
- a. Fully charged battery voltage.
  - b. Charging system:
    - (1). Alternator operation
  - c. The Driver / Operator must know what the dash gauges listed below are suppose to do and read after the engine is started.
    - (1). Voltmeter
    - (2). Oil pressure
    - (3). Engine temperature gauge
    - (4). Transmission temperature gauge

- (5). Air and air restriction gauges
4. The Driver / Operator must know the function and operation of the Fire Pumps & Aerial items listed below:
  - a. The Driver / Operator must know the function and operation of the fire pump systems and components listed below:
    - (1). Visual inspection:
      - (a). Pressure on the gauges with pump off.
      - (b). Water tank level shown on indicator to actual level.
      - (c). Intake system leaks
      - (d). What could be the results of a blocked radiator?
    - (2). Operational checks:
      - (a). Primer
      - (b). Pressure governor
      - (c). Relief valve
  - b. The Driver / Operator must know the function and operation of the aerial device and components listed below:
    - (1). Aerial device
  - c. The Driver / Operator must know if the fast idle system can operate while in pump.
  - d. The Driver / Operator must know when the hazard warning light should operate for the below systems:
    - (1). Door ajar
    - (2). Ladder rack
    - (3). Telescoping scene lights
5. The Driver / Operator must know the function and operation of the power train items listed below:
  - a. The proper level of the coolant in the radiator sight glass.
  - b. The Driver / Operator must know the proper starting procedure for the engine.
  - c. The Driver / Operator must know the proper procedure for checking the radiator when it is hot.
6. The Driver / Operator must know the function and operation of the Steering/Suspension & Brakes.
  - a. Visual inspections
    - (1). Check front wheel wells for rub marks from the tires.
    - (2). Check steering and suspension components
  - b. Tires
    - (1). The Driver / Operator must know how to check tire air pressure and where to find correct pressure.
    - (2). The Driver / Operator must know the maximum age tires can be in-service and how to check DOT dates.
    - (3). The Driver / Operator must know the minimum tread depth on steering axle and drive axle tires.
    - (4). The Driver / Operator must know the minimum tread depth on trailer axle tires.
  - c. The Driver / Operator must know how the perform operation checks on the following systems
    - (1). Air brake system applied brake leak down check.
    - (2). Air brake system build-up time
    - (3). Park brake application

### C. Manufacturer's manuals:

1. **Fire apparatus operators manual:**
  - a. The Driver / Operator must understand the Definition of the following words/acronyms:
    - (1). DPF
  - b. The Driver / Operator must know the function and operation of the Electrical & cab and body items listed below.
    - (1). Where are the exhaust regeneration (Regen) instructions posted on the vehicle?
  - c. The Driver / Operator must know the function and operation of the Fire Pumps & Aerial items listed below:
    - (1). The proper procedure for checking an aerial hydraulic tank level
  - d. The Driver / Operator must know the operation and function of the power train items listed below:
    - (1). Transmission fluid check
    - (2). "Do Not Shift" light
    - (3). Effect of temperature on trans fluid
    - (4). Determining the fluid type leaking on the floor
    - (5). What methods can be used to identify the fluid?
    - (6). Proper method for checking engine oil
    - (7). Proper condition of engine oil on dipstick.
    - (8). Proper procedure for checking the radiator level with the engine hot.
    - (9). Proper procedure for checking power steering fluid.
    - (10). Proper antifreeze to water ratio for the cooling system.
    - (11). At what point on the dipstick does oil need to be added?
  - e. The Driver / Operator must know what the dash gauges, listed below, are suppose to do and read after the engine is started.
    - (1). Engine coolant temperature.
2. **Cummins operator manual:**
  - a. The Driver / Operator must know what Cummins Engine recommends for the following items:
    - (1). Causes of black engine oil in diesel engines
    - (2). What is the purpose and definition of a diesel particle filter (DPF)
    - (3). What should the Driver / Operator do when the DPF indicator light goes on?

- (4). When can the high exhaust temperature (HEST) come on?
- (5). What color is the DEF fluid tank cap?
- (6). What system is the DEF tank part of?
- (7). Properties of DEF and the shelf life.
- (8). What color is the “Check Engine” light?
- (9). What color is the “Stop Engine” light?
- (10). What system is the DPF located in?

3. **Selective Catalytic Reduction:**

- a. The definition of DEF

**D. 49CFR Federal Regulations for trucks:**

1. The Driver / Operator must understand the definition of the following words.
  - a. DOT
2. The Driver / Operator must know the function and operation of the Electrical & cab and body items listed below.
  - a. Required DOT lights
    - (1). Marker and cab lights
    - (2). Brake lights
3. The Driver / Operator must know the function and operation of the Steering/Suspension & Brakes.
  - a. Air brake system
    - (1).
    - (2). Manual and automatic brake slack adjusters
    - (3). Steering wheel excessive backlash