

Suggested Reference Materials

NFPA 1900: Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances (**NFPA 1901 CHAPTERS**) 2024 edition (800) 344-3555 or www.nfpa.org

NFPA 1910: Standard for the Inspection, Maintenance, Refurbishment, Testing and Retirement of In-Service Emergency Vehicles and Marine Firefighting Vessels (**NFPA 1911 CHAPTERS**) 2024 edition (800) 344-3555 or www.nfpa.org

Manuals:

- **Any Fire Apparatus Operators Manual for Chassis, Pump and Aerial Device.**
- **Cummins Drivers tips for Fire & Emergency Vehicles**
<https://mart.cummins.com/imagelibrary/data/assetfiles/0059413.pdf>
- **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 1900:**

1. The Driver / Operator must understand the definition and / or the regulations of the following
 - a. Definitions
 - (1). Acceptance tests
 - (2). Chassis
 - (3). Rated capacity
 - 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)
 - (5). Required Manufacturer Safety Signage
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.
 - c. The Driver / Operator must know the proper operation of the cab tilt.
 - d. The Driver / Operator must know the length, height and weight of the apparatus.
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. Understanding cab switch functions.

B. NFPA 1910:

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
 - (a). Gallon per minute/revolution per minute
 - (8). Person qualified to operate an emergency vehicle
 - (9). The different class of leaks as defined in 1910:
 - (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 | (k). Inoperative engine starter motor. |
| (b). Wiper system | (l). Transmission overheating. |
| (c). Windshield | (m). Loose or missing wheel lug nuts. |
| (d). Seat belts | (n). Wheel that is not seated properly. |
| (e). Aerial torque box | (o). Cracked wheel |
| (f). Mirrors | (p). Broken or cracked leaf springs |
| (g). Door latches or strikers | (q). Trailer hitch and safety chains |
| (h). Aerial outriggers | (r). GAWR |
| (i). Aerial hydraulic fluid level | |
| (j). Aerial ladder cables | |

(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?
- (11). What causes DEF and "Check Engine" light illumination
- (12). Park regen operation

3. **Selective Catalytic Reduction:**

- a. The definition of DEF
- b. Freeze point 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). Manual and automatic brake slack adjusters
 - (2). Steering wheel excessive backlash