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.
      (10). GAWR
      (11). GVWR
      (12). GCWR
      (13). Interlock
      (14). Modification

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
         (r). GAWR

      (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