

Suggested Reference Material:

NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*, including annexes National Fire Protection Association (800) 344-3555 or www.nfpa.org

OSHA 1926.552 Crane and Derricks wire rope section 1926.552(a)(3)(i)

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10762

Meritor Preventive Maintenance and Lubrication MM1. Sections 2, 4, 6, 7 & 8

Meritor Maintenance Manual MM4M Sections 8 & 13

Download the Meritor documents for no charge at:

<http://www.meritor.com/customer/northamerica/lod/default.aspx> , then in *Search by Keyword/Publication #* box enter **MM1**, then scroll down to the list. Then the same for **MM4M**.

Selective Catalytic Reduction <http://www.dieselforum.org/about-clean-diesel/what-is-scr>

Cummins Drivers tips for Fire & Emergency Vehicles <http://cumminsengines.com/brochure-download.aspx?brochureid=307>

LEARNING OBJECTIVES

1. Definitions and Terms

- a. Shall
- b. Should
- c. Documentation
- d. Deflection
- e. Deformation
- f. Drive Train
- g. Interlock
- h. Ironing
- i. Leak
- j. Leakage
- k. Class 1 Liquid Leakage
- l. Class 2 Liquid Leakage
- m. Class 3 Liquid Leakage
- n. Qualified Person
- o. Non-Destructive Test (NDT)
- p. Magnetic Particle Inspection
- q. Out of Service
- r. Retired Fire Apparatus
- s. Reserve Fire Apparatus
- t. In-Service Fire Apparatus
- u. Ultrasonic Inspection
- v. Preventive Maintenance
- w. Instability
- x. Fire Pump
- y. SCR-Selective Catalytic Reduction-
- z. DEF-Diesel Exhaust Fluid
(1) components
- aa. HEST - High Exhaust System Temp.
- bb. Diverter Valve
- cc. Performance test

2. General Requirements

- a. Federal, State & Local Laws
- b. Personal Protection
- c. Inspections & Maintenance
- d. Qualification of Personnel to NFPA 1071
- e. Lubrication-frequency, grade, amount
- f. Safety

3. Out-of-Service Criteria

- a. Steering Components
 - (1) 49 CFR Part 399.211, Appendix G, "Minimum Periodic Inspection Standards"
- b. Out-of-Service Indicators
- c. Minimum Brake Lining Thickness
- d. Fluid Leak Classifications
- e. Brake system
 - (1) Air Brakes
 - (a) Air pressure drop
 - (b) Compressor air build up
 - (2) Hydraulic Brakes
 - (3) Wheel Chocks
- f. Low Air Warning
- g. Component Out-of-Service
- h. Seat Belts
- i. Wheel & Tire Deficiencies
- j. Engine Oil Leakage
- k. Transmission and clutch
 - (1) Oil Leakage & Contamination
 - (2) Deficiencies
- l. Coolant System
 - (1) Leakage
 - (2) Deficiencies
- m. Axle Oil Leakage
- n. Brake Fluid Leakage
- o. Fuel Leaking
- p. Power Steering Leakage
- q. Wire Rope
- r. Emergency Lights
- s. Fire pump system
 - (1) Deficiencies
- t. Driving and Crew Areas, Body, Compartmentation
- u. Aerial Device Systems
 - (1) Audible Alarm Systems
 - (2) Intercom
 - (3) Emergency Hydraulic Systems
- v. Low-Voltage and Line Voltage Electrical System
- w. Horn Audible Warning Devices
- x. Stop Engine Light
- y. Wheel Chocks
- z. Engine out of service
- aa. Trailer
 - (1) Out of service
 - (2) Tires
 - (3) Inspection

4. Inspection, Diagnostic Checks and Maintenance

a. Chassis

- (1) King Pins
 - (a) Lubrication of Meritor King Pin Bushing
- (2) Steering Gear Box
- (3) Steering Stops
- (4) Drive Belts
- (5) Alternator
- (6) Ignition System
- (7) Work Lights
- (8) Air Leak Down Rates
- (9) Wheels & Tires
 - (a) tread depth
- (10) Tire coding
- (11) Battery Conditioner
- (12) Frame Rails
- (13) Engine Cooling
- (14) Engine Air Intake and Exhaust Systems
- (15) Engine Service Intervals
 - (a) severe service
 - (b) oil
- (16) Transmission Heat Exchanger
- (17) Drive Line
- (18) Brake Lining, Drums & Rotors
- (19) Filter Intervals
 - (a) air
 - (b) hydraulic
- (20) U-Joint Movement & Lubrication
- (21) Axle
 - (a) Driving
 - (i) Fluid Level
 - (b) Steering
- (22) Tie rod ends
- (23) Automatic Slack Adjuster (ASA)
- (24) Packing drip rate
- (25) Idle RPM
- (26) Battery
- (27) Steering wheel free play
- (28) Instruction plates and warning signage
- (29) Slip Yokes
- (30) Steering troubleshooting
- (31) Spring Brake Travel
- (32) Brake Diagnosis
- (33) ABS Historic Codes
- (34) Pressure Maintaining Valve
- (35) Turbo
- (36) Characteristics of DEF
 - (a) solution of purified water & urea
 - (b) non-toxic, non-hazardous
 - (c) freezing point
- (37) Engine ECM

b. Low Voltage

- (1) Components
- (2) Alarm
- (3) Apparatus Lighting
- (4) Voltage Drop Test
- (5) Starting system

c. Water Pumping Systems and Water Tanks

- (1) Transfer valve
- (2) Priming System
- (3) Pressure Controls
 - (a) Test for Fire Pumps

d. Aerial Devices

- (1) Deformation
- (2) Nondestructive Testing
- (3) Breathing Air

e. Foam Proportioning Systems

- (1) Foam Sampling
- (2) Inspection
- (3) Foam Concentration Inspection

f. Line Voltage

- (1) Testing
- (2) Power Sources
- (3) GFCI

g. Utility Air and Breathing Air

- (1) Hydrostatic Bottle Testing
- (2) Maintenance Requirements

h. Winch Systems

- (1) Wire Rope
- (2) Inspections
- (3) Out of service criteria as stated in OSHA 1926.552 (a)(3)(I)

i. Service criteria for out of business manufacturers

5. Road Tests

a. Fire Apparatus Axle Weight Test

- (1) Weight Verification
- (2) Fully Loaded State

b. Braking System

- (1) Braking Test
- (2) ABS Braking
- (3) Performance Test
- (4) Air Brake Alarm

c. Parking Brake System

- (1) Testing

d. Road Test

- (1) Requirements
- (2) Recording

e. Hest Lamp Operation

f. DPF Lamp Operation

6. Performance Testing

a. Low Voltage Electrical Systems

- (1) Voltage Regulator Testing
- (2) Battery Testing
- (3) Conductivity Test
- (4) Voltage Drop Test
- (5) Alternator Test
- (6) Continuous Electrical Load
- (7) Solenoid Voltage Drop Test
- (8) Load Testing
- (9) Battery conditioner test

b. Fire Pumps & Industrial Supply Pumps

- (1) Gauges - Master
- (2) Gauges Discharge
- (3) Flow meter
- (4) Automatic Transmission
- (5) Hydro testing time

c. Aerial Device

- (1) Wire Rope inspection (OSHA 1926.552)
- (2) Inspections
- (3) Testing Intervals

(4) Horizontal Load Testing

- (5) Elevation load test
- (6) Dye Penetrate Testing
- (7) Breathing Air Supply
- (8) Hydraulic Components
- (9) Nondestructive Test

d. Foam Proportioning Systems

- (1) Operational testing
- (2) Testing Methods

e. Compressed Air Foam Systems (CAFS)

- (1) Test Procedures
- (2) Compressor Test
- (3) Performance

f. Line Voltage Electrical Systems

- (1) Testing Procedures
- (2) Full Load Test