

Suggested Reference Material:

**NFPA 1911, Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus**

2007 edition, including annexes National Fire Protection Association (800) 344-3555 or www.nfpa.org

**OSHA 1926.552(a)(3) 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](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10762)

**Meritor Preventive Maintenance and Lubrication.** Chapters 2, 4, 6, 7 & 8, Download for no charge at:

[http://www.meritorhvs.com/MeritorHVS\\_Documents/mm1.pdf](http://www.meritorhvs.com/MeritorHVS_Documents/mm1.pdf)

**Meritor Maintenance Manual 4M** Chapter 8, Download for no charge at:

[http://www.meritorhvs.com/MeritorHVS\\_Documents/MM4M.PDF](http://www.meritorhvs.com/MeritorHVS_Documents/MM4M.PDF)

**Pumping Apparatus DRIVER/OPERATOR Handbook**, 2nd edition, Oklahoma State University, Stillwater, OK. (800) 654-4055

or [www.ifsta.org](http://www.ifsta.org) ; Chapters 2, 3,10, 16, & appendix C

**LEARNING OBJECTIVES**

**1. Definitions and Terms**

- |                  |                                 |                              |
|------------------|---------------------------------|------------------------------|
| a. Shall         | i. Leak                         | q. Out of Service            |
| b. Should        | j. Leakage                      | r. Retired Fire Apparatus    |
| c. Documentation | k. Class 1 Liquid Leakage       | s. Reserve Fire Apparatus    |
| d. Deflection    | l. Class 2 Liquid Leakage       | t. In-Service Fire Apparatus |
| e. Deformation   | m. Class 3 Liquid Leakage       | u. Ultrasonic Inspection     |
| f. Drive Train   | n. Qualified Person             | v. Preventive Maintenance    |
| g. Interlock     | o. Non-Destructive Test (NDT)   | w. Instability               |
| h. Ironing       | p. Magnetic Particle Inspection | x. Fire Pump                 |

**2. General Requirements**

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

**3. Out-of-Service Criteria**

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|--|--|
| a. Steering Components<br>(1) 49 CFR Part 399.211, Appendix G, "Minimum Periodic Inspection Standards" | k. Transmission Oil Leakage                          |
| b. Out-of-Service Indicators   | l. Coolant System<br>(1) Leakage<br>(2) Deficiencies |
| c. Minimum Brake Lining Thickness  | m. Axle Oil Leakage                                  |
| d. Fluid Leak Classifications  | n. Brake Fluid Leakage                               |
| e. Air brake system<br>(1) Air pressure drop<br>(2) Compressor air build up                            | o. Fuel Leaking                                      |
| f. Low Air Warning   | p. Power Steering Leakage                            |
| g. Component Out-of-Service  | q. Wire Rope   |
| h. Seat Belts  | r. Emergency Lights                                  |
| i. Wheel & Tire Deficiencies   | s. Fire pump system<br>(1) Deficiencies              |
| j. Engine Oil Leakage  | t. Driving and Crew Areas, Body, Compartmentation    |
|  | u. Aerial Device Systems                             |

**4. Inspection, Diagnostic Checks and Maintenance**

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

- b. Low Voltage
  - (1) Components (3) Apparatus Lighting
  - (2) Alarm (4) Voltage Drop Test
- c. Water Pumping Systems and Water Tanks
  - (1) Transfer valve (3) Pressure Controls
  - (2) Priming System
- d. Aerial Devices
  - (1) Deformation (3) Breathing Air
  - (2) Nondestructive Testing
- e. Foam Proportioning Systems
  - (1) Foam Sampling
- 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 1926.550 (a)(7)

## 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

## 6. Performance Testing

- a. Low Voltage Electrical Systems
  - (1) Voltage Regulator Testing (5) Alternator Test
  - (2) Battery Testing (6) Continuous Electrical Load
  - (3) Conductivity Test (7) Solenoid Voltage Drop Test
  - (4) Voltage Drop Test (8) Load Testing
  - (9) CAFS Test
- b. Fire Pumps & Industrial Supply Pumps
  - (1) Gauges - Master (3) Interlocks
  - (2) Gauges Discharge (4) Flow meter
  - (5) Automatic Transmission
- c. Aerial Device
  - (1) Wire Rope inspection (OSHA 1926-550) (6) Dye Penetrate Testing
  - (2) Interlocks (7) Breathing Air Supply
  - (3) Inspections (8) Hydraulic Components
  - (4) Testing Intervals (9) Nondestructive Test
  - (5) Practical Testing
- 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) Dielectric Test
  - (2) testing Procedures
  - (3) Full Load Test