

**Reference Material:** Note: Exam may contain “accepted practice” type questions not found in the reference material listed below  
 NFPA 1901, **Standard for Automotive Fire Apparatus**, Chapters 20, 21 and appropriate annex  
 NFPA 1911 **Standard for Inspections, Maintenance, Testing and Retirement of In-Service Automotive Fire Apparatus**  
 Chapters 11, 12, 18 and appropriate annex  
 IFSTA **Principals of Foam Firefighting** 2<sup>nd</sup> edition Chapters 2, 3, 4, 5, glossary and appendix  
 IFSTA Pumping Apparatus, **Driver/Operator Handbook**, 2<sup>nd</sup> edition Chapters 15, 16, glossary and appendix.  
 Contact IFSTA at 800-654-4055

Fire pump manufacturer’s operations manual

Hale CAFS Pro System User Operation Training Manual. To download, go to [www.haleproducts.com](http://www.haleproducts.com), then downloads, manuals, CAFS ProManual.

Hale FoamLogix Rotary Gear Manual Page I-19: [www.haleproducts.com/Downloads/hale/product\\_manuals/FoamLogix%20Manual.pdf](http://www.haleproducts.com/Downloads/hale/product_manuals/FoamLogix%20Manual.pdf)

Waterous “Eclipse” CAFS System Operation and Maintenance Form F1031 Section 2121 and 2412. To download go to:  
[www.waterousco.com/servicemanual/Eclipse/SEC2412.PDF](http://www.waterousco.com/servicemanual/Eclipse/SEC2412.PDF)

Waterous 200P PTO Driven Compressor Kit Installation and Operations Instructions. To download go to:  
[www.pneumaxcfs.com/manuals/operations/200-P%20Ops.pdf](http://www.pneumaxcfs.com/manuals/operations/200-P%20Ops.pdf)

Manufacturer’s web sites go to [www.waterousco.com](http://www.waterousco.com) or [www.wsdarley.com](http://www.wsdarley.com) or [www.foampro.com](http://www.foampro.com)

### LEARNING OBJECTIVES FOR THE F7 EXAM

1. **Principals of Foam:** The Fire Apparatus Technician should understand the principals of foam firefighting
  - a. Foam Types
  - b. Characteristics
    - (1) Expansion
    - (2) Safety
      - (a) environmental impact
    - (3) Benefits
    - (4) Concentrate
  - c. Application/Uses
    - (1) Induction
    - (2) Injection
    - (3) Pre-mix
    - (4) Batch-mix
  - d. Limitations
  - e. Storage
  - f. Definitions
    - (1) Proportioning
    - (2) Scrubbing
    - (3) Foam Generators
    - (4) Mixing Chamber
    - (5) Foam Solution
2. **Foam Systems and Operations:** The Fire Apparatus Technician should understand the requirements for foam systems and operations
  - a. Systems
    - (1) Eductor Type
      - (a) Characteristics
      - (b) Requirements
    - (2) Installed In-line Eductor System
    - (3) Around the Pump Proportioners
    - (4) By-pass Balanced Pressure Proportioners
      - (a) Requirements
    - (5) Variable Flow - Demand Type Pressure Proportioner
    - (6) Variable Flow - Variable Rate Direct
    - (7) C.A.F.S.
      - (a) Compressor Engagements
    - (8) Direct injection
  - b. Operations
    - (1) Cleaning and Flushing
    - (2) Labeling
    - (3) Safety
    - (4) Injections rates
    - (5) Pressure
  - c. Foam Concentrate Storage
3. **Mechanical Components:** The Fire Apparatus Technician should understand the requirements for mechanical components
  - a. Nozzles
  - b. Tanks
    - (1) Atmosphere
    - (2) Pressure
  - c. Hose
  - d. Strainers
  - e. Check Valves
  - f. Flow Meters
  - g. Controllers
    - (1) Electronics
  - h. Proportioners
    - (1) Eductors
    - (2) Venturi
    - (3) Flush Line
  - i. Manifolds
  - j. Water Filters
  - k. Oil Separators
  - l. Compressors
  - m. Injectors
  - n. Pressure Indicating Devices & Gauges
  - o. Compressor control circuit

4. **Maintenance and Testing:** The Fire Apparatus Technician should understand the proper maintenance and testing procedures
  - a. Maintenance
    - (1) Air Compressor Systems
      - (a) Frequency
      - (b) Filters/Strainers
      - (c) Fluids
      - (d) Adjustments
      - (e) Compressor Drives
    - (2) Proportioning System
      - (a) Flushing
      - (b) Calibration
      - (c) Strainers
      - (d) Frequency
  - b. Testing
    - (1) Air Compressor systems
      - (a) Air Flow
      - (b) Pressure Balance
      - (c) Frequency
      - (d) Methods
    - (2) Proportioning Systems
      - (a) Test Methods
      - (b) Concentration Flows
      - (c) Flow Meters
    - (3) Gauges
    - (4) Service pump Test
  - c. Troubleshooting guides
    - (1) Air compressor systems
    - (2) Proportioning systems
    - (3) Foam Solutions
    - (4) Contaminated Foam
  - d. Repairs
    - (1) Air compressor drives
    - (2) Proportioning systems
    - (3) Out of service criteria