

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 3, 6, 12, 13, 21, 23, 24 and appropriate annex
 IFSTA **Principals of Foam Firefighting** 2nd edition Chapters 2, 3, 4, 5, glossary and appendix
 IFSTA Pumping Apparatus, **Driver/Operator Handbook**, 3rd edition Chapters 14, 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.
<http://fireresearch.com/foampro-lit/manuals/Form-829.pdf>
 Hale FoamLogix Rotary Gear Manual 3.3/5.0/6.5
<http://haleproducts.com/resource/440?title=HaleFoamLogix+3.3-5.0-6.5+Electronic+Foam+Proportioning+System+Installation+and+Operations+Manual>
 Waterous “Eclipse” CAFS System Operation and Maintenance Form F1031 Section 2412. To download go to;
<http://www.waterousco.com/media/wysiwyg/pdfs/cafsystems/eclipse/sec2412.pdf>
 Waterous 200P PTO Driven Compressor Kit Installation and Operations Instructions. To download go to:
www.pneumaxcafs.com/manuals/operations/200-P%20Ops.pdf
 Manufacturer’s web sites go to www.waterousco.com or www.wsdarley.com or 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
 - (5) Adding Foam to Tank
 - 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
 - (a) Low energy
 - (4) Mixing Chamber
 - (5) Foam Solution
 - (6) Surfactant
 - (7) Milspec
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
 - (1) Poor foam solution
 - b. Tanks
 - (1) Atmosphere
 - (2) Pressure
 - (3) Fill tower opening
 - c. Hose
 - d. Strainers
 - e. Check Valves
 - f. Flow Meters
 - g. Controllers
 - (1) Electronics
 - h. Proportioners
 - (1) Eductors
 - (a) inline
 - (b) foam class
 - (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
 - p. Pressure vessel tank
 - (1) Fill cap
 - q. Foam pump
 - r. Air control circuit
 - s. Compressor Hydraulic 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
 - (i) accuracy
- (b) Flow Meters

(2) Gauges

(3) Performance Test

b. Troubleshooting guides

- (1) Air compressor systems
- (2) Proportioning systems
- (3) Foam Solutions
- (4) Contaminated Foam

c. Repairs

- (1) Air compressor drives
- (2) Proportioning systems
- (3) Out of service criteria