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://www.manualsdir.com/manuals/545153/hale-cafspro.html

Hale FoamLogix Rotary Gear Manual 3.3/5.0/6.5
https://smhttp-ssl-61500.nexcesscdn.net/media/pdf/FoamLogix_Digital_3.3-5.0_Manual.pdf

Waterous "Eclipse" CAFS System Operation and Maintenance Form F1031 Section 2412
http://www.waterousco.com/media/wysiwyg/pdfs/cafsystems/eclipse/sec2412.pdf

Waterous 200P PTO Driven Compressor Kit Installation (3036) and Operations (2422) Instructions.
http://www.waterousco.com/media/wysiwyg/pdfs/cafsystems/pto-driven-air-compressor-kits/sec3036.pdf
http://www.waterousco.com/media/wysiwyg/pdfs/cafsystems/pto-driven-air-compressor-kits/sec2422_200-P_.pdf

FoamPro Form 829 Installation and Operation Manual
http://fireresearch.com/foampro-lit/manuals/Form-829.pdf

Manufacturer's web sites go to www.waterousco.com/ or www.wsdarley.com 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 Properties
      (5) Adding Foam to Tank
      (6) Freezing and Thawing
   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/Static Mixer
      (5) Foam Solution
      (6) Surfactant
      (7) Milspec
      (8) CAFS
      (9) Slug Flow

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
         (b) Operation & Schematics
            (i) Air Flow
            (ii) Hydraulic
      (8) Direct injection
   b. Operations
      (1) Cleaning and Flushing
      (2) Labeling
      (3) Safety
      (4) Proportioning
         (a) mixing proportions
         (b) Injections rates
      (5) Pressure
   c. Foam Concentrate Storage

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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
    t. Valves

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
            (c) Flow Meters
        (3) Gauges
        (4) Performance Test
            (a) Engine Driven Accessories
    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