LEARNING OBJECTIVES FOR THE F-2 EXAM

1. Definitions: The technician shall define the terms and phrases commonly used in connection with fire apparatus to include the following:
   a. Acceptance/ acceptance tests
   b. Angle of approach
   c. Angle of departure
   d. Authority having jurisdiction
   e. Automatic electrical load management
   f. Auxiliary braking system
   g. Bonding
   h. Cascade system
   i. Cavitation
   j. Certification test
   k. Combination fire apparatus
   l. Compound gauge
   m. Continuous electrical load
   n. Contractor

2. General: The Technician shall understand the design & performance requirements for Aerial, Pumper, and Initial Attack Fire Apparatus such as:
   a. General Design requirements
   b. Apparatus
   c. Chassis and Vehicle Components
   d. Low Voltage Systems
   e. Driver and Crew area
   f. Body, Compartments & Equipment Mounting

Section 2. General Continued
g. Fire Pumps and Associated Equipment
   (1) Pumps < 1500 gpm suction discharge time
   (2) Pumping Engine drain for heat exchanger
      (a) Heat exchanger
   (3) Intake Strainers requirements
      (a) minimum valve & piping size
      (b) bleeder valve minimum size
      (c) pressure relief for >3” valve
   (4) Pump discharge Outlets
      (a) minimum # outlets
      (b) Connections size
      (c) Slow Operation Valve size
      (d) Location
   (5) Pump Drains access
   (6) Pump Controls
      (a) Engine brake disengagement
      (b) Speedometer operation during pump
   (7) Pressure Control System
   (8) Pump Operator Panel
      (a) required Instrumentation
      (b) Minimum Numeral Size Master Gauges
      (c) Test Gauges
      (i) Discharge pressure gauge range
   (9) Ultra High Pressure Pumps
      (a) engine governor system
      (b) engine control throttle
      (c) gauges & instruments
      (d) pump body integrity test

h. Auxiliary Pumps & Associated Equipment
   (1) Pump Drive Systems
      (a) Pump Engine Running Light
   (2) Engine Control
      (a) Throttle control location
   (3) baffle and swash partitions
      (a) distance between walls and/or baffles
      (b) partition arrangement
   (4) Tank-to-Pump rate
      (a) <500 gal (2000L)
      (b) >500 gal (2000L)
   (5) Tank Fill Line
      (a) <1000 gal (4000L)
      (b) >1000 gal (4000L)

i. Water Tanks
   (1) obstructions Below Ladder
      (a) folding step load
      (b) ladder rotation
      (i) rated height and seconds of rotation
   (2) Aerial Ladder Rated Capacity
   (3) Aerial Ladder Water Delivery flow
   (4) Hydraulics System bursting strength

j. Aerial Devices
   (1) Obstructions Below Ladder
   (2) Swash Partitions
      (a) pressure vacuum vent
      (b) Test Points
      (a) flow capacity at minimum pressure
   (3) Test Gauges
      (i) Discharge pressure gauge range

k. Foam Proportioning Systems
   (1) Water Backflow Prevention
   (2) Swash Partitions
   (3) Test Points
   (a) flow capacity at minimum pressure

l. Line Voltage Electrical Systems
   (1) AC current Hz
   (2) Maximum voltage to portable equipment
   (3) Instrumentation on Operator’s Panel
   (4) Power Supply Assembly
      (a) Overcurrent protection
      (b) Branch Circuit Overcurrent Protection
   (5) Cord reels
      (a) Distribution Box
   (6) Power-Operated Light Masts
      (a) Sustained wind requirement
   (7) Line Bonding & Grounding

m. Command and Communications
   (1) Location
   (2) Climate Control
   (3) Noise Levels
   (4) Lighting

n. Air Systems
   (1) General Piping & Installation
      (a) threads
   (2) Compressor Drive System, Controls, Air Monitoring
   (3) Audible and Visual Alarms
   (4) SCBA/SCUBA Fill Station protection
   (5) Piping Systems low air warning %
   (6) Breathing Air Quality Std. NFPA 1989
      (a) charging requirements of delivery

o. Winches
   (1) Winch Wire length
   (2) Load rating/line pull capacity

p. Trailers
   (1) Classification
      (a) Type I, II & III
   (2) Wheel Chocks grade %
   (3) Power Supply
      (a) Combined electrical load for Type II & III trailer
   (4) Wheel chocks mounting

3. Test requirements: The Technician shall understand the test and delivery data requirements for a Pumper Fire Apparatus
a. Fire Pumps and Associated Equipment
   (1) Pumping System Capacity
      (a) Pumps 3000 gpm or less
         (i) 100% rated capacity at 150 psi
      (b) Pumps < 1500 gpm
         (i) suction hose length and lift for 1250 gpm
   (2) Vacuum loss %
b. Construction Requirements
   (1) Hydrostatic Test gauge pressure & time
c. Discharge Outlet Connections
   (1) Hydrostatic gauge pressure reading
d. Required Testing
   (1) Apparatus Pump System Certification
      (a) > 750 gpm
   (b) Third Party Certification
   (2) Pump Test Conditions for Test
      (a) depth of water
      (b) Water temperature
      (c) engine-driven accessories
   (3) Test Gauges for certification test
      (a) calibration time requirement
   (4) Engine Speed Check
      (a) % change allowed of Manufacturer no-load governed speed
   (5) Pumps rated at <750 gpm, 750 to <3000 gpm, & >3000 gpm,
      (a) total time of pump test
      (b) time & % at rated capacity of 150psi, 200 psi and 250 psi
   (6) Ultra high pressure pumps
      (a) Water tank capacity test
      (b) Gauge & Flowmeter test accuracy
      (c) Priming system test
      (d) Conditions for test
e. Pumping Engine Overload Test
   (1) Pump Rated Capacity of 750 or greater but <3000
      (a) test for net pump pressure at 165 psi for 10 min

f. Pressure Control System Test
   (1) Pumps rated at 3000 gpm or less
      (a) gauge pressure at 90 psi, 150 psi, 250 psi
      (b) time allowance to prime pump
      (c) additional time for 4” intake pipe
g. Vacuum Test
   (1) vacuum
   (2) vacuum drop
h. Volume Discharge Calculation
   (1) Rated Tank-to-flow till what % of discharge
i. Gauge and Flowmeter Test
   (1) Test capacity
   (2) re-calibration requirement
j. Manufacturer’s Pre-delivery Test
   (1) Hydrostatic test requirements