Reference Material:
NFPA 1901, Standard for Automotive Fire Apparatus, Chapters 1-26 www.nfpa.org or call (800) 344-3555
Pumping Apparatus DRIVER/OPERATOR Handbook, 3rd edition. International Fire Service Training Association (IFSTA) Chapters 2,9,10, Glossary

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 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
   (a) Drafting operation
   (b) Electric Fuel Priming Systems operation
   (c) Diesel Particulate Filter
   (d) Wiring
   (e) Braking Systems
   (f) pressure protection valve ,pressure drop
   (g) quick build-up time
   (h) parking brake inter-locks
   (i) HEST icon for regen
   (j) Vehicle Components
   (k) Parking Brakes
   (l) GVWR & auxiliary braking system
   (m) Angle of Approach and Departure
   (n) Vehicle Stability
   (o) parking brake-20% grade requirement
   (p) Vehicle Components
   (q) Axle housing road clearance
   (r) Angle of Approach and Departure
   (s) Steering
   (t) radius of axes
   (u) power steering provision
   (v) Fuel Tank
   (w) labeling
   (x) capacity and time
   (y) maintenance
   (z) Optical Warning Device

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. 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
   (a) Minimum rated capacity
   (b) Minimum Continuous Electrical Load
   (c) Batteries
   (d) Optical Warning Device
   (e) Driver and Crew area
   (f) & Warning Equipment mounting
   (g) Electric Fuel Priming Systems operation
   (h) Minimum CCA
   (i) Minimum size of suction and supply hoses
   (j) Suction strainer
   (k) Minimum rated capacity for fire pump
   (l) Cooling System
   (m) Air intake system
   (n) separate water and embers
   (o) Fuel Systems
   (p) Diesel Engines
   (q) Net pump discharge pressure
   (r) Override
   (s) Pre-service test
   (t) Pressure governor
   (u) Manufacture’s tests
   (v) Permissible/Non Permissible Colors
   (w) Upper-level Location
   (x) Lower-Level Location
   (y) Midship Location
   (z) conformance with SAE J845 criteria
   aa. Intake relief valve
   bb. Interlock
   cc. Line voltage circuits
   dd. Lugging
   ee. Standard for Automotive Fire Apparatus
   ff. Net pump discharge pressure
   gg. Override
   hh. Pre-service test
   ii. Pressure governor
   jj. Pressure relief device
   kk. Pump and roll
   ll. Pumper
   mm. Ramp breakover angle
   nn. Relay pumping
   oo. Responsibility of purchaser
   pp. Shall
   qq. Slow operating valve
   rr. Split shaft PTO
   ss. Static water source
   tt. Vehicle carrying capacity
   uu. Anti-Electrocution platform

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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
   (2) Pressure 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 or greater but <3000 gpm
      (a) total time of pump test
      (b) time & % at rated capacity of 150 psi
      (c) time & % at rated capacity of 200 psi
      (d) time & % at rated capacity of 250 psi
   (6) Pumps rated at >3000 gpm
      (a) total time of pump test
      (b) time & % at capacity of 100 psi
      (c) time & % at capacity of 150 psi
      (d) time & % at capacity of 200 psi
      (e) time allowed to stop for cleaning of suction strainer
   (7) Pumps rated at <750 gpm
      (a) total time of pump test
      (b) time & % at capacity of 150 psi
      (c) time & % at capacity of 200 psi
      (d) time & % at capacity of 250 psi

f. Body, Compartments & Equipment Mounting
   (1) Powered Equipment Racks
      (a) locking requirements
   (2) SCBA cylinder mounting
   (3) Pump Plumbing Access size
   (4) Stepping, Walking Surface minimum load
   (5) Access Handrails size and clearance
   (6) Reflective Striping coverage and size

3. Test requirements: The Technician shall understand the test and delivery data requirements for a Pumper Fire Apparatus

i. Water Tanks
   (1) baffles and swash partitions
      (a) distance between walls and/or baffles
      (b) partition arrangement
   (2) Tank-to-Pump rate
      (a) <500 gal (2000L)
      (b) >500 gal (2000L)
   (3) Tank Fill Line
      (a) <1000 gal (400L)
      (b) >1000 gal (400L)

j. Aerial Devices
   (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

k. Foam Proportioning Systems
   (1) Water Backflow prevention
   (2) Swash Partitions
      (a) pressure vacuum vent
      (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

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) Pipping Systems low air warning system %
   (6) Breathing Air Quality standard NFPA 1989
      (a) charging requirements of delivery

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

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

q. 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
   (3) manufacturer’s pre-delivery Test
   (4) Hydrostatic test requirements