

# EVT I Study Guides (Rev 09-2022)

- **NFPA Study Guide for 1901, 1911, 1071**

## EVT 1A Class Study Guide

- Identify the various courses required for EVT 1 from SFT
- Identify the certifications required for EVT 1 from ASE and DOT
- Identify additional experience requirements for Emergency Vehicle Technician 1 per SFT
- Understand the SFT task book process
- Identify the general knowledge requirements of an EVT 1
  - Fire agency's (SOPs) and rules and regulations as they apply to the EVT
  - Critical aspects of NFPA 1500, NFPA 1901, and NFPA 1911, as they apply to the EVT
  - Federal motor carrier safety regulations
  - Applicable federal, state, and local regulations
  - Interpretation and use of manufacturer specifications, inspection checklists, maintenance schedules, maintenance checklists, and agency SOPs
  - Selection of tools
  - Maintenance equipment and its usage
  - Workplace safety practices
- Identify the inspection and preventative maintenance duties associated with chassis systems
- Identify the inspection and maintenance duties associated with cabs bodies
- Identify the operational checks duties associate with a vehicle's low voltage electrical systems
- Identify the inspection, maintenance, and operational testing duties associated with
  - Tank systems
  - Line voltage systems
- Understand the difference between a road test and a performance test
- Identify road performance requirements of NFPA 1911 & Title 49
  - Out of service Criteria
- Identify record-keeping requirements of NFPA 1911 and the AHJ
- Understand how to perform apparatus and component operational tests
- Identify how to report defects and deficiencies and how to complete checklist and document findings
- Understand the function, construction, and operation of the steering system
  - Auxiliary steering systems
  - All wheel steering systems
  - Tractor-drawn aerials (TDA)

- Understand the function, construction, and operation of the suspension system
  - Conventional
  - Independent
  - Air
  - Spring Leaf
  - Coil
  - Torsion bar
  - Combination leaf/air spring
  
- Understand the function, construction, and operation of the brake system
  - Hydraulic
  - Air
  - Electric
  
- Understand the function, construction, and operation of the tires
  
- Understand the function, construction, and operation of the cooling systems Engine
  - Transmission
  - Pump transmission
  - Fuel
  - Power steering
  - Compressed air foam system (CAFS)
  - Hydraulic
  - Auxiliary
    - Direct cooling
    - Indirect cooling
  
- Identify the principles of electricity and the operational theory of electronics
  - Ohm's law
  - Watt's law
  - Kirchhoff's law
  
- Electrical systems in a chassis
  - Low voltage
  - Line voltage
  - Electronic
  
- Understand the use of a DVOM in chassis inspections and how to test voltage drop.
  
- Understand the various classes of leaks
  - Class I
  - Class II
  - Class III
  
- Understand the various required performance testing
  - Axle weight
  - Service Brakes
  - Parking Brake
  - Low and Line voltage

Understand the potential problems associated with water and foam tanks and related components.

## EVT 1B Class Study guide

- 1) The principles of magnetism
  - Magnetic fields
  - Impacts of magnetic fields
- 2) The principles of electricity
  - Kirchhoff's laws (Voltage and Amperge)
  - Watt's law
  - Ohm's law
  - Series and parallel circuits
- 3) Describe the principles of circuit analysis
  - Difference in potential (flowing vs. not flowing)
  - Parasitic drain
- 4) Circuit Protection
  - Fuses
  - Fusible links
  - Circuit breakers
  - PTC (positive temperature coefficient)
- 5) Meters and Tools
  - Carbon pile Load tester
  - Conductance / battery impedance testers
  - Digital voltmeter (DVOM)
  - Ammeter
  - Test Light
  - Digital storage oscilloscopes (DSO)
  - Scanners
  - Code readers
- 6) Circuit Problems
  - Open circuit
  - Short to power
  - Short to ground
  - Cross short
  - Excessive resistance
- 7) Starting and Charging Systems
  - Operation and Testing
  - Voltage
  - Amperage
  - Voltage Drop
- 8) Difference between Low Voltage Systems and Line Voltage Systems

## EVT 1C Class Study Guide (Pumps)

Identify circumstances that initiate the inspection process

- Acceptance test of new vehicle
- Meeting manufacturer and/or AHJ inspection cycle
- Responding to a suspected or reported problem
- Acceptance test of repaired vehicle

Required tools/equipment

Test, calibration, and diagnostic

- Pitot gauge
- Flowmeter
- External test vacuum
- External pressure gauge

Function and construction of a pump.

Move water

- Move by volume
- Move by pressure

Identify types of pumps

- Centrifugal
- Positive displacement
- Fire Pump (Centrifugal) and Auxiliary Pump
  - Impeller
  - Volute
  - Cutwater
  - Clearance rings
  - Shaft
  - Bearings
  - Packing/seals
  - Housing/casing
  - Pump drive
    - Hydraulic
    - PTO (power take off unit)
    - Crankshaft
    - Midship
    - Fly wheel
    - Direct engine drive
      - Diesel
      - Gas
  - Single-stage pump
  - Multi-stage pump
    - Transfer valve and controls

Describe the function, construction, and operation of the valves

- Circulating valve
- Booster line cooling valve
- Ball-type valve
- Gate valve
- Butterfly valve

- Drain valve
- Bleeder valve
- Transfer valve
- Check valve
- Thermal valve
- Indirect cooling valve
- Valve actuators
  - Push/pull (manual) handle
  - Hydraulic
  - Pneumatic
  - Electric
  - Manual rotary/crank
- Pressure control devices
  - Internal and/or external relief valve
  - Engine governor
  - Controlled manually or electronically
- Valve operation
  - Manual
  - Air
  - Water
  - Electric
- Valve parts
  - Housing
  - Actuator
  - O-rings
  - Ball or butterfly/keystone
  - Seals

Describe the function, construction, and operation of the packing

- Adjustable
  - Rope
  - Pellets

Gauges,

- Types
- Usage

Indicator/Warning Systems

- Types
- Usage

Interlocks

- Types
- Usage