

**Reference Material:** This exam may contain some "accepted practice" type questions not found in the reference material.  
When an inconsistency arises between NFPA 414 and FAA 10E, NFPA 414 will take precedence

**NFPA 1910:** Standard for the Inspection, Maintenance, Refurbishment, Testing and Retirement of In-Service Emergency Vehicles and Marine Firefighting Vessels (**NFPA 1911 Chapters**) 2024 edition

**NFPA 1900:** Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances (**NFPA 414 Chapters**) 2024 edition

FAA Advisory Circular, AC No: 150/5220-10E, **Guide Specification for Water/Foam Aircraft Rescue and Firefighting Vehicle**, U.S. Department of Transportation, Federal Aviation Administration.

**Any hydraulic reference material with symbols such as Fluid Power Designers' Lightning Reference Handbook**, - Graphical Symbols Section - 856-489-8983 <http://www.hydraulicsliteraturestore.com/trma.html>

Clean Diesel Forum, about clean diesel section <http://www.dieselforum.org/about-clean-diesel/clean-diesel-glossary>

TheAA.com <http://www.theaa.com/driving-advice/fuels-environment/diesel-particulate-filters>

Cummins After Treatment System <https://cumminsengines.com/cummins-aftreatment-system>

**Any recognized manufacturer's training manuals**

### Learning Objectives for the A-2 Exam

1. **Definitions:** The Aircraft Rescue Vehicle Technician shall define the terms and phases commonly used in connection with the operation and/or testing of ARFF Vehicles, to include the following:
  - a. **Vehicle Chassis:**

(1) Frame	(7) Power Divider	(13) Quick Build Up/ Air System
(2) Axles	(8) Wheels and Tires	(14) Tubing-hoses-fittings
(3) Brake Systems	(9) Engines	
(4) Suspension	(10) Transmission	
(5) Steering	(11) Electrical Systems	
(6) Transfer Case	(12) Fuel System	
  - b. **Vehicle Components:**

(1) Body and Cab	(4) Foam Agent Pump (not transfer pump)	(8) MADAS
(a) warning lights		(9) Generators
(2) Eductor	(5) Dual Agent Nozzle & Turret	(a) Bonding
(3) Proportioner	(6) Built in battery Charger	(10) Lateral Acceleration Indicator (LAI)
	(7) Valves and plumbing	(11) Elevated Waterway Nozzles
  - c. **Emissions**

(1) SCR - Selective catalytic reduction	(4) CCF - Closed Crankcase Filter	(7) Regeneration
(2) DEF - Diesel Exhaust Fluid	(5) DPF - Diesel Particulate Filter	(a) Active
(3) DOC -Diesel Oxidation Catalysts	(6) Dosing Valve	(b) Passive
		(c) Forced
		(8) Ultra Low Sulfur Diesel Fluid
2. **Principles of operation:** Understand the basic operating principles of the chassis and its components.
  - a. **Identify Hydraulic and Air system symbols, such as:**
    - (1) Hydraulic Pump
    - (2) Pressure Protection Valve
  - b. **Describe the Function and Application of the following:**

(1) Engine Governors	(6) Built in battery charger	(12) Exhaust system
(2) All Wheel Drive	(7) Air Mechanical Brakes	(13) Pressure relief valves
(3) Pump and Roll	(8) Air-over Hydraulic Brakes	(14) Side Slope (SAEJ2180)
(4) Quick build up air systems	(9) Dual Agent Nozzle & Turret	(15) Water tank
(5) Steering and Suspension	(10) Windshield deluge system	(16) Dry chemical propellant
	(11) Winterization system	(17) Clean Agent
3. **Principles of Repair, Maintenance & Troubleshooting:** The Aircraft Rescue Vehicle Technician shall understand the principles of service of Aircraft Rescue and Fire-Fighting Vehicles.
  - a. **Identify Service and Preventative Maintenance Activities:**

(1) Types of inspections & procedures	(4) Use of maintenance schedules
(2) Purpose of visual inspections	(5) Manufacturers "Accepted Practice" methods
(3) Maintenance records	(6) Procedures
	(7) Vehicle retirement
  - b. **Troubleshooting and repair procedures:**

(1) Diagnose common problems	(5) Understand operational test requirements
(2) Interpret schematics/diagrams	(6) Identify "Accepted Practice" repair procedures
(3) Retrieve and interpret diagnostic codes	(7) Identify Out-of-Service criteria
(4) Describe use of diagnostic equipment	