

ARFF-1 Design & Performance Standards and Preventive Maintenance of Aircraft Rescue and Fire-Fighting Vehicles

Reference Material: Note: 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.

FAA Advisory Circular, AC No: 150/5220-10E, Guide Specification for Aircraft Rescue and Firefighting Vehicle, U.S. Department of Transportation, Federal Aviation Administration, available at www.faa.gov

NFPA 414 Standard for Aircraft Rescue and Fire-Fighting Vehicles, www.nfpa.org or 1-800-344-3555

NFPA 1911 Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus, www.nfpa.org or 1-800-344-3555

Selective Catalytic Reduction <http://truckscr.com/how-scr-works.aspx>

Any recognized Manufacturer's Training manual, Operator's manual or Service manuals. Must cover recommended methods, procedures, work instructions and maintenance intervals.

LEARNING OBJECTIVES FOR THE A-1 EXAM

1. Definitions: The Aircraft Rescue Vehicle Technician shall be familiar with the definition of terms and phrases commonly used in connection with the design, performance, testing and preventative maintenance of Aircraft Rescue and Fire-Fighting vehicles to include the following:

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|---|-----------------------------------|---------------------------------------|
| a. Operational tests | q. Fully loaded vehicle | gg. Preventive maintenance |
| b. ARFF | r. Ramp angle | hh. Service |
| c. Vehicle classification | s. Listed | ii. Manufacturer's certification test |
| d. Vehicle types | t. Off-pavement performance | jj. No load condition |
| e. Ambient temperature | u. Percent grade | kk. Foam expansion ratio |
| f. Angle of approach | v. | ll. LSG-Limiting Speed Governor |
| g. Angle of departure | w. Halotron I | mm. VSG-Variable Speed Governor |
| h. Authority having jurisdiction | x. Dry chemical | nn. AHJ-Authority Having Jurisdiction |
| i. AFFF foam concentrate | y. All wheel drive | oo. Driver's enhanced vision system |
| j. Center of gravity | z. Under chassis clearance | pp. Forward looking infrared |
| k. Combined agent vehicle | aa. Wall to wall turning diameter | qq. Interior access vehicle |
| l. Component manufacturer's certification | bb. water agent fire pump | rr. Power source rating |
| m. Prototype vehicle | cc. Side slope stability | |
| n. In service condition | dd. Gradeability | |
| o. Structural kit | ee. Cornering stability | |
| p. Radio Suppression | ff. Pump and roll | |

2. General Requirements of Aircraft Rescue and Fire-Fighting Vehicles: The Aircraft Rescue Vehicle Technician shall understand the Design & Performance Requirements for Aircraft Rescue and Fire-Fighting Vehicles as stated in the reference material listed above:

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|---|---|
| a. General design requirements
(1) Engine coolant preheater system
(2) Engine Emissions
(3) Fuel Systems | j. Complimentary agent system
(1) Dry Chemical
(2) Pressure Regulator |
| b. Chassis, Cab & Vehicle components
(1) Power assist steering
(2) Crew allowance | k. Water systems |
| c. Water agent pump and pump drive | l. Hand lines |
| d. Water (tank) reservoir | m. Nozzles and turrets |
| e. Performance requirements
(1) Suspension system | n. Independent suspension |
| f. Foam systems | o. Documentation |
| g. Foam (tank) reservoir | p. Approved Options |
| h. Braking systems
(1) Reservoir capacity | q. Lateral acceleration indicator |
| i. Winterization systems | r. Interior Access Vehicle |
| | s. Lighting & electrical |
| | t. Additional Vehicle Options |

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3. Test Requirements for Aircraft Rescue and Fire-Fighting Vehicles: The Aircraft Rescue Vehicle Technician shall understand the operational test procedures and delivery data requirements for Aircraft Rescue and Fire-Fighting Vehicles.

- a. Piping, valves and fittings
- b. Pump tests
- c. Road tests
- d. Complimentary agent tests
- e. Water agent discharge tests
- f. Halotron I discharge test
- g. Water tank flow tests
- h. Pump and roll tests
- i. Brake system performance tests
- j. Foam concentration/Foam quality test
- k. Electrical charging system tests
- l. Body and chassis flexibility tests
- m. Test requirements & procedures
 - (1) Water tank fill and overflow test
- n. Test instrument requirements
- o. Low voltage & warning devices
- p. Cab interior noise test
- q. Acceleration
- r. Water tank fill & overflow test
- s. Air system/air compressor test

4. Principles of Service and Preventive Maintenance: The Aircraft Rescue Vehicle Technician shall understand the principles of service and preventive maintenance as applied to Aircraft Rescue and Fire-Fighting Vehicles.

a. Identify the elements of service and maintenance:

- (1) Types of inspections and procedures
- (2) Visual inspections (define)
- (3) Maintenance records
- (4) Use of maintenance schedules
- (5) Manufacturer's "Accepted Practice" methods
- (6) Operational tests
 - (a) hydraulic fluid

b. Identify the frequency of service and preventive maintenance activities to include the following:

- (1) Daily inspections
- (2) Weekly inspections
- (3) Monthly inspections
- (4) Periodic inspections
- (5) Annual inspections

c. Identify areas where maintenance problems are most commonly found:

- (1) Electrical system (low voltage)
 - (a) starter wiring test
- (2) Engine system
- (3) Vehicle air system
- (4) Hydraulic system
- (5) Fire/Water pump system
- (6) Fire fighting system
- (7) Drive train system
- (8) Water/Foam agent systems
- (9) Foam pump system
- (10) Chassis and Body
- (11) Complimentary agent system
- (12) Control valve and plumbing
- (13) Brake system