

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

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.

- Piping, valves and fittings
- Pump tests
- Road tests
- Complimentary agent tests
- Water agent discharge tests
- Halotron I discharge test
- Water tank flow tests
- Pump and roll tests
- 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
- 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

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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:

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