

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 10D, NFPA 414 will take precedence.

FAA Advisory Circular, AC No: 150/5220-10D, Guide Specification for Water/Foam 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, 2007 edition
NFPA 412 Standard for Evaluating Aircraft Rescue and Fire-Fighting Foam Equipment, 2003 edition
 National Fire Protection Association, Quincy, MA (800) 344-3555 or www.nfpa.org

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

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 | i. Winterization systems |
| b. Chassis & vehicle components | j. Complimentary agent system |
| c. Water agent pump and pump drive | k. Water systems |
| d. Water (tank) reservoir | l. Hand lines |
| e. Performance requirements | m. Nozzles and turrets |
| f. Foam systems | n. Independent suspension |
| g. Foam (tank) reservoir | o. Documentation |
| h. Braking 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.

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| a. Piping, valves and fittings | h. Pump and roll tests |
| b. Pump tests | i. Brake system performance tests |
| c. Road tests | j. Foam quality standards tests |
| d. Complimentary agent tests | k. Electrical charging system tests |
| e. Water agent discharge tests | l. Body and chassis flexibility tests |
| f. Halotron I discharge test | m. Test requirements & procedures |
| g. Water tank flow tests | n. Test instrument requirements |

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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.

4.1 Identify the elements of service and maintenance

- a. Types of inspections and procedures
- b. Purpose of visual inspections
- c. Maintenance records
- d. Use of maintenance schedules
- e. Manufacturer's "Accepted Practice" methods

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

- a. Daily inspections
- b. Weekly inspections
- c. Monthly inspections
- d. Periodic inspections
- e. Annual inspections

4.3 Identify areas where maintenance problems are most commonly found:

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| a. Electrical system (low voltage) | g. Drive train system |
| b. Engine system | h. Water/Foam agent systems |
| c. Vehicle air system | i. Foam pump system |
| d. Hydraulic system | j. Chassis and Body |
| e. Fire/Water pump system | k. Complimentary agent system |
| f. Fire fighting system | l. Control valve and plumbing |
| | m. Brake system |