

Types and Construction of Fire Apparatus

Terms

Write the definition of the terms below on the blanks provided.

1. Aerial Device (46)
2. Aerial Ladder (46)
3. Tractor-Drawn Apparatus (48)
4. Footplate (48)
5. Base (58)
6. Fly Sections (58)
7. Base Rails (58)
8. Rails (58)
9. Rungs (58)

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10. Hydraulic Pump (61)

11. Hydraulic Reservoir (61)

12. Valve (62)

13. Check Valve (62)

14. Relief Valve (62)

15. Counterbalance Valve (62)

16. Actuator Valve (63)

17. Monitor Valve (63)

18. Stack Valve (63)

19. Double-Acting Cylinder (63)

20. Trunnion (63)

21. Loss Control (83)

True/False

Write True or False on the blanks provided; if false, write the correct statements on the lines provided.

- _____ 1. Most aerial apparatus reach from 150 to 200 feet (46 m to 61 m). (46)
- _____ 2. Tractor-drawn aerial apparatus are more maneuverable than single-straight vehicles. (48)
- _____ 3. A kickplate 4 inches (100 millimeters) high is required at floor level of a platform. (48)
- _____ 4. All elevating platforms must have three operator control stations. (49)
- _____ 5. Aerial ladder platform apparatus are very different from aerial ladder apparatus. (51)
- _____ 6. Water towers are telescoping or articulating aerial devices whose primary function is to deploy elevated master streams. (54)
- _____ 7. The second and subsequent sections of a ladder are the fly sections. (58)

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- _____ 8. The operator's control pedestals stand about 2 feet (0.6 m) high. (67)
- _____ 9. Communication systems are required on all apparatus regardless of age. (73)
- _____ 10. NFPA® 1901 does not require aerial devices to be equipped with breathing air systems. (74)
- _____ 11. Portable generators typically have a larger capacity than vehicle-mounted generators. (76)
- _____ 12. Electric power cords must be adequately insulated and waterproof. (78)

Short Answer

Write the correct answers on the blanks provided.

1. What are the three categories of aerial devices as defined by IFSTA? (46)

2. What are the main uses of aerial ladders? (47)

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3. What are the criteria for qualifications as a quint apparatus? (56)

 4. What are the three main components of a hydraulic system? (61)

 5. List six items that may be located on a control pedestal. (68)

 6. What are the requirements of NFPA® 1901 regarding breathing air systems? (74)

 7. What are five of the NFPA® 1901 requirements for forcible entry equipment? (81)

 8. What additional equipment is required by NFPA® 1901 to be carried on aerial apparatus? (84)

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Matching

Write the correct answers on the blanks provided.

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|-------|---|--|
| _____ | 1. Nontelescopng section of pipe attached to the underside of the base section of the aerial ladder (69) | A. Bed ladder systems |
| _____ | 2. Consists of 3 or 4 sections that reduce in diameter – the largest is attached to the base section and the smallest is attached to the fly section (69) | B. Detachable ladder pipe systems |
| _____ | 3. Generally stored on the truck in a convenient location and attached to the ladder only when needed (70) | C. Elevating platform waterway systems |
| _____ | 4. Similar to pre-piped systems but nozzle is located in the platform (71) | D. Telescoping waterway systems |
| _____ | 5. Devices designed specifically for the deployment of elevated master streams (72) | E. Water tower systems |

Multiple Choice

Write the correct answers on the blanks provided.

- _____ 1. The working height for aerial ladders is measured ____ with the ladder at maximum elevation and extension. (46)
- A. from the platform to the ground
 - B. from the ground to the lowest ladder rung
 - C. from the ground to the highest ladder rung
 - D. from the platform to the lowest ladder rung
- _____ 2. What is the required minimum floor area of a platform? (48)
- A. 10 square feet (0.9 square meters)
 - B. 12 square feet (1.1 square meters)
 - C. 14 square feet (1.3 square meters)
 - D. 16 square feet (1.5 square meters)

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- _____ 3. Each platform must have a rail completely enclosing the floor area with no opening under the railing greater than ___ inches (mm). (48)
- A. 12 (305)
 - B. 18 (457)
 - C. 24 (610)
 - D. 30 (762)
- _____ 4. NFPA® 1901 requires a ___ on the bottom of a platform. (50)
- A. booster reel
 - B. breathing air system
 - C. communication system
 - D. water fog curtain nozzle
- _____ 5. All elevating platforms must have a minimum load capacity of ___ pounds (kg) when the aerial device is fully extended at any elevation, and with no water in the piping system. (50)
- A. 500 (227)
 - B. 750 (340)
 - C. 1,000 (454)
 - D. 1,250 (567)
- _____ 6. The water delivery system on a platform must be capable of discharging at least ___ gallons (liters) per minute when the aerial device is in any position. (50)
- A. 500 (1 892)
 - B. 1,000 (3 785)
 - C. 1,500 (5 676)
 - D. 2,000 (7 569)
- _____ 7. Elevating platforms 110 feet (34 meters) or shorter should be able to be raised from the bedded position to maximum elevation and extension and be rotated 90° in ___ seconds or less. (50)
- A. 30
 - B. 60
 - C. 90
 - D. 150
- _____ 8. What type of platform construction consists of four sides of steel or aluminum welded together to form a box shape with a hollow center? (52)
- A. Welded construction
 - B. All-steel construction
 - C. Box-beam construction
 - D. Tubular truss-beam construction

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- _____ 9. What is the difference between a telescoping and articulating platform apparatus? (54)
- A. The size of the water pump
 - B. The length of the aerial device
 - C. The weight limit of the platform
 - D. The operation of the aerial device
- _____ 10. The bottom section of the aerial ladder is called the: (58)
- A. base.
 - B. rung.
 - C. base rail.
 - D. fly section.
- _____ 11. Which parts of a ladder are the top chords to which the opposite ends of the trussing are attached? (58)
- A. Rails
 - B. Rungs
 - C. Base rails
 - D. Fly sections
- _____ 12. Which part of an aerial device hydraulic system is a three-way valve that directs fluid to either the stabilizer control valves or the aerial device control valves? (62)
- A. Relief valve
 - B. Check valve
 - C. Selector valve
 - D. Counterbalance valve
- _____ 13. Which type of cylinders are used to extend the second section of the aerial device? (65)
- A. Stabilizer cylinders
 - B. Auxiliary cylinders
 - C. Aerial device hoisting cylinders
 - D. Aerial device extension cylinders
- _____ 14. The ___ is the rotational structure component of the aerial device. (65)
- A. platform
 - B. turntable
 - C. control pedestal
 - D. ladder waterway

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- _____ 15. What are the most common power source used for emergency services? (75)
- A. Inverters
 - B. Generators
 - C. Step-up transformers
 - D. Gasoline-powered systems
- _____ 16. Portable lights range from: (76)
- A. 300 to 1,000 watts (0.3 kW to 1 kW).
 - B. 500 to 1,000 watts (0.5 kW to 1 kW).
 - C. 1,000 to 1,500 watts (1 kW to 1.5 kW).
 - D. 1,500 to 2,000 watts (1.5 kW to 2 kW).
- _____ 17. Which type of power distribution equipment may be used when multiple connections are needed? (78)
- A. Adapters
 - B. Generators
 - C. Power cords
 - D. Junction boxes
- _____ 18. Hose distances of ___ feet (m) or greater from hydraulic tool pumps to hydraulic tools may have diminishing effect on tool operation. (79)
- A. 50 (15)
 - B. 75 (23)
 - C. 100 (30)
 - D. 125 (38)
- _____ 19. Which of the following is NOT a ground ladder that should be carried on aerial apparatus? (81)
- A. Attic
 - B. Roof
 - C. Pompier
 - D. Extension
- _____ 20. Which type of ventilation equipment is used to increase the air pressure in a structure and force out the by-products of combustion? (83)
- A. Smoke ejectors
 - B. Smoke inverters
 - C. Negative-pressure fans
 - D. Positive-pressure blowers