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NFPA 1002 Fire Apparatus Driver/Operator Professional Qualifications 1988 Edition

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Policy Adopted by NFPA Board of Directors on December 3, 1982

The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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National Professional Qualifications System

established by the

Joint Council of National Fire Service Organizations

Constituent Members of the
Joint Council of National Fire Service Organizations

Fire Marshals Association of North America
International Association of Arson Investigators
International Association of Black Professional Fire Fighters
International Association of Fire Chiefs
International Association of Fire Fighters
International Fire Service Training Association
International Municipal Signal Association
International Society of Fire Service Instructors
Metropolitan Committee of International Association of Fire Chiefs
National Fire Protection Association
National Volunteer Fire Council

The Joint Council of National Fire Service Organizations consists of leaders of the principal national organizations representing the Fire Service of the United States. It meets periodically to review current developments and to establish areas of common interest where cooperative efforts of member organizations can be used for maximum results.

An important step in the establishment of national standards of professional competence for the fire service was taken by the Joint Council on October 25, 1972.

The Council decided that one area of common interest in which national collective action was desirable was in the establishment of standards upon which the levels of competency within the fire service could be determined.

A committee of the Council was delegated the responsibility of preparing an acceptable system for the development of the standards. Following several months of work, during which the suggestions of constituent organizations were incorporated, the Committee submitted the final proposal to the Joint Council and the following system was approved and established:

1. Committees to develop standards of professional competency, made up of peer group representation; and

2. An independent Board to oversee and validate standards developed and the implementation of such standards in a nationally coordinated continuing professional development program for the fire service.

The Secretariat for Committees and Board is to be provided by the staff of the National Fire Protection Association.

1. Fire Service Professional Standards Development Committees

There are four committees, each of which is made up of representatives of organizations which are constituent members of the Joint Council and certain other persons nominated by the Joint Council, collectively.

The four committees are respectively responsible for the development and preparation of recommended minimum standards of professional competence required of:

1. Fire Fighters
2. Fire Inspectors and Investigators

3. Fire Service Instructors
4. Fire Service Officers.

Each committee is established and operated under NFPA standards-making procedures with one important variation, which is that no draft standard shall be submitted to NFPA for final adoption until it has been approved by the National Professional Qualifications Board for the Fire Service.

Standards are prepared for use after final adoption as a basis for nationally standardized examinations by authorized agencies and the standards are available for adoption by federal, state and local authorities.

Committees do not determine, or become involved in, actual certification procedures or the direct implementation of the standards; they do assist implementing agencies by a continuing review and revision of the standards.

The authorized representation on each committee is as follows:

1. Fire Fighter Qualifications Committee

International Association of Fire Chiefs
International Association of Fire Fighters
International Fire Service Training Association
International Society of Fire Service Instructors
Metropolitan Committee of the International Association of Fire Chiefs
National Fire Protection Association
Joint Council of National Fire Service Organizations

2. Fire Inspector and Investigator Qualifications Committee

Fire Marshals Association of North America
International Association of Arson Investigators
International Association of Fire Chiefs
International Association of Fire Fighters
National Fire Protection Association
Joint Council of National Fire Service Organizations

3. Fire Service Instructor Qualifications Committee

International Association of Fire Chiefs
International Association of Fire Fighters
International Fire Service Training Association
International Society of Fire Service Instructors
National Fire Protection Association
Joint Council of National Fire Service Organizations

4. Fire Service Officer Qualifications Committee

Fire Marshals Association of North America
International Association of Fire Chiefs
International Association of Fire Fighters
International Association of Black Professional Fire Fighters
International Society of Fire Service Instructors
Metropolitan Committee of the International Association of Fire Chiefs
National Fire Protection Association
Joint Council of National Fire Service Organizations

2. National Professional Qualifications Board for the Fire Service

A nine-person Board appointed by the Joint Council to act on behalf of the Council in the following duties and responsibilities:

(i) The Board is constituted to supervise a nationally coordinated continuing professional development program for the Fire Service.

(ii) The Board shall be responsive to the needs and opinions of all groups involved with the Fire Service and of others, including individuals who have related interests.

(iii) It shall identify and define levels of professional progression.

(iv) It shall correlate, review and validate draft standards prepared by the Technical Committees established to produce professional standards for each level of fire service responsibility.

(v) It shall approve all draft standards before such are submitted for final adoption procedures.

(vi) It shall be responsible for the accreditation and supervision of any national programs of certification and shall coordinate with implementing agencies to ensure validity and reliability of the evaluation criteria used in connection with such programs.

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STATEMENT BY THE BOARD AS TO THE APPLICABILITY OF STANDARDS DEVELOPED UNDER THE SYSTEM

Application to Existing Positions

It is not the intent of the Board that these standards shall have the effect of rendering invalid any rank, qualification and appointment acquired prior to the adoption of this standard.

Upon adoption of any standard, the authority having jurisdiction shall classify its existing ranks, qualifications, and appointments to determine equivalency with an appropriate level of the standard.

An incumbent of a position established prior to adoption of a standard shall be considered qualified and eligible for future progression in accordance with the standards.

Existing Systems

Those existing systems of qualifications which meet or exceed these minimum standards should continue in force.

It is the intent, however, that existing systems of qualifications that fail to meet these standards be discontinued after adoption of the standard, so that all persons acquiring qualification thereafter do so in accordance with this standard.

The Board recognizes that, at present, wide variations exist in the standards of competence required of members of the fire service; and, that due to geographic considerations and the differing requirements of the many organizations providing fire protection, higher levels of competence than those provided in the standards produced under the National System may be desirable in certain areas.

The Board considers it essential that all members of the fire service eventually achieve the minimum standards.

Performance Objectives

The Board directed all committees to develop standards in terms of terminal performance objectives, which are considered the *minimum* necessary for a person to be considered competent to engage in providing fire service at the respective level and in the role specified by the standard, no matter where that person is serving.

In this connection, it is pointed out that the statement of performance objectives contained in the standards is not a training program outline. A number of instructional steps are required for mastery of an objective. Teaching outlines will be more detailed and extensive, as a single objective can require many hours of instruction and may interrelate to instruction for other objectives.

The Standards

The standards are designed so that any member of the fire service can achieve the level required by various means; these include participation in state and local training programs, self-study, attendance at colleges offering suitable courses, and by combinations of these means.

The standards are the first step: there must also be a controlled testing procedure by which personnel can be officially certified when they have demonstrated their competency. The Board stresses that such testing procedures are essential to a meaningful program of professionalism and, accordingly, is prepared, in conformance with the directions of the Joint Council of National Fire Service Organizations, to review the validity and quality of testing procedures established by state and local authorities, and to accredit such procedures.

The Board strongly recommends that certification procedures be established on a statewide basis in every state where no such system exists at present, and that every fire department participate in the program.

The establishment of standards and testing procedures will not, in themselves, ensure that all personnel will achieve the required levels of competency. It follows that training programs should be developed to prepare members of the fire service to acquire the skills and knowledge necessary to achieve the terminal performance objectives of the standards.

Throughout the standards, levels of numerical ascending sequence have been used to denote increasing degrees of responsibility: e.g., Fire Investigator I, II, III, the lowest or basic level being I. A similar sequence will be used in each standard; the total number of levels varying in accordance with the number of steps involved in the individual standard.

Approval of Standard

This version of NFPA 1002, *Standard for Fire Apparatus/Driver Professional Qualifications*, was approved by the National Professional Qualifications Board for the Fire Service in August, 1987, with the recommendation that it be submitted for adoption at the NFPA Fall Meeting to be held in Portland, Oregon in November, 1987.

NFPA 1002

Standard for

Fire Apparatus Driver/Operator Professional Qualifications

1988 Edition

This edition of NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, was prepared by the Technical Committee on Fire Fighter Professional Qualifications, and acted on by the National Fire Protection Association, Inc. at its Fall Meeting held November 9-11, 1987 in Portland, Oregon. It was issued by the Standards Council on December 2, 1987, with an effective date of December 22, 1987, and supersedes all previous editions.

The 1988 Edition of this standard has been approved by the American National Standards Institute.

Origin and Development of NFPA 1002

This Standard is the second in a series of Fire Fighter Professional Qualifications Standards. The format and philosophy of this Standard are intended to be compatible to NFPA 1001, *Fire Fighter Professional Qualifications*.

The intent of the Committee was to develop performance standards in such a clear and concise manner that they can be used to determine without doubt that any person so measured does truly possess the skills to be a fire apparatus driver/operator. The committee further contends that these performance objectives can be used in any fire department in any city, town, or private organization throughout the North American continent.

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Rep. National Fire Protection Association

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This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred.

NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or any document developed by the Committee on which the member serves.

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Standard for

Fire Apparatus Driver/Operator Professional Qualifications

1988 Edition

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Chapter 6 and Appendix B.

Chapter 1 Administration

1-1 Scope. This standard identifies the professional levels of competence required of the fire apparatus driver/operator.

1-2 Purpose. The purpose of this standard is to specify, in terms of performance objectives, the minimum requirements of professional competence required for service as a fire apparatus driver/operator.

It is not the intent of this standard to restrict any jurisdiction from exceeding these minimum requirements.

This standard shall cover the requirements for driver/operators of fire department pumpers; mobile water supply, aerial and tiller-equipped apparatus.

1-3 General.

1-3.1 The fire apparatus driver/operator shall be legally licensed to drive fire department vehicles.

1-3.2* The fire apparatus driver/operator shall be subject to periodic medical evaluation, as specified by the authority having jurisdiction, to determine physical ability adequate for performance of duties as an operator of fire department vehicles.

1-3.3 All fire fighters who drive fire department vehicles or apparatus under emergency response conditions shall meet the objectives specified in Chapter 2 of this standard.

1-3.4 All fire fighters who drive fire department vehicles as tiller wheel operators shall meet the objectives specified in Chapters 2 and 5 of this standard.

1-3.5* The fire fighter shall also meet the requirements of Fire Fighter II as specified in NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, before being certified as a fire apparatus driver/operator.

1-3.6 The fire fighter shall meet all the requirements of Chapters 1 and 2 of this standard before being certified as a fire apparatus driver/operator, under Chapter 3, 4, or 5.

1-3.7 The fire apparatus driver/operator who is required to operate an apparatus equipped with an aerial device shall also meet the requirements of Chapter 4 of this standard.

1-3.8 The fire apparatus driver/operator who is required to operate a tiller-equipped apparatus shall also meet the requirements of Chapter 5 of this standard.

1-3.9 Each of the performance objectives for the fire apparatus driver/operator shall meet the following criteria: each objective shall be performed swiftly, safely, with competence, and in its entirety.

1-3.10 It is not required for the objectives to be mastered in the order they appear. The local or state training program shall establish the instructional priority and the training program content to prepare individuals to meet the performance objectives of this standard.

1-3.11 Performance of objectives for qualifications covered by this standard shall be evaluated by three approved individuals from the fire service, one of whom may be from the state or regional fire service training agency.

1-3.12 Performance of objectives for qualification, when the word "demonstrate" is used in this standard, shall require that actual performance and operation be accomplished, unless otherwise indicated within the specific objective. Simulation, explanation, and illustration may be substituted when actual operation is not feasible.

1-4 Definitions.

Aerial Apparatus.* A piece of fire apparatus with a permanently mounted, power-operated elevating device.

Approved. Acceptable to the "authority having jurisdiction."

NOTE: The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment, or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

Authority Having Jurisdiction. The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For in-

surance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

Demonstrate. To show by actual use.

Explain. To define by providing the disclosure of underlying meaning through the application of special knowledge or insight.

Fire Apparatus. Emergency vehicles used for fire department operations which, in this standard, include fire department pumpers, mobile water supply apparatus, and aerial apparatus.

Fire Apparatus Driver/Operator. The Fire Fighter II who has demonstrated the knowledge of and the ability to perform the objectives specified in 1-3.3 of this standard.

Fire Brigade. The organization that provides fire rescue and fire suppression services, and may provide fire prevention services to nongovernmental agencies.

Fire Department. The organization that provides fire rescue, fire suppression, and fire prevention services to governmental or nongovernmental agencies.

Fire Department Pumper. A piece of fire apparatus with a permanently mounted fire pump that has a rated discharge capacity of 500 gpm (1892.5 Lpm) or greater.

Fire Department Vehicle. Any motorized vehicle assigned to the fire department.

Fire Fighter II. The member of a fire department or a fire brigade who has fulfilled the requirements of Fire Fighter II, as specified in NFPA 1001, *Standard for Fire Fighter Professional Qualifications*.

Fire Pump. Any pump mounted permanently on a piece of fire apparatus, with a rated discharge capacity of 500 gpm (1892.5 Lpm) or greater.

Identify. To physically select, indicate, or explain verbally or in writing, using standard terms recognized by the fire service.

Mobile Water Supply Apparatus. A piece of fire apparatus whose primary purpose is to transport water in a tank with 1000 gal (3785 L) or greater capacity. It shall include a pump and have a limited hose body capacity as specified in NFPA 1901, *Standard on Automotive Fire Apparatus*.

Objective. A goal achieved through the attainment of a skill, knowledge, or both, which can be observed or measured.

Qualified. Having satisfactorily completed the requirements of the objectives.

Safely. To perform the objective without injury to self or to others, or damage to fire department vehicles and equipment.

Shall. Indicates a mandatory requirement.

Swiftly. The time, as determined by the authority having jurisdiction, that it takes a qualified fire apparatus driver/operator to perform the objective satisfactorily.

Tiller Aerial Apparatus. A tractor-trailer aerial apparatus with a steering wheel connected to the rear axle for maneuvering the rear portion of the apparatus.

With Competence. Possessing knowledge, skills, and judgment needed to perform the indicated objective satisfactorily.

Chapter 2 Basic Driver/Operator Requirements

2-1 Preventive Maintenance.

2-1.1* The fire apparatus driver/operator shall demonstrate the performance of routine tests, inspections, and servicing functions required to assure the operational status of fire department vehicles, including:

(a) battery check
(b) braking system
(c) coolant system
(d) electrical system
(e) fueling
(f) hydraulic fluids
(g) lubrication
(h) oil levels
(i) tire care
(j) steering system
(k) tools, appliances, and equipment.

2-1.2 The fire apparatus driver/operator shall demonstrate the recording and reporting, as specified by the authority having jurisdiction, of all servicing functions.

2-2 Driving/Operating.

2-2.1 The fire apparatus driver/operator shall identify all applicable state and local laws of the authority having jurisdiction, including rules and regulations governing the safe driving and operating of fire department vehicles.

2-2.2 The fire apparatus driver/operator, given a fire department vehicle, shall identify all automotive gauges and demonstrate their usage.

2-2.3* The fire apparatus driver/operator, given a fire department vehicle, shall demonstrate the following driving skills:

(a) serpentine

(b) alley dock
(c) opposite alley pull in
(d) diminishing clearance
(e) straight line
(f) turn around
(g) lane change
(h) stopping procedures
(i) parking procedures.

2-2.4* The fire apparatus driver/operator shall identify and demonstrate the theory and principles of defensive driving techniques, both emergency and nonemergency.

2-2.5 The fire apparatus driver/operator shall, according to the authority having jurisdiction, identify all applicable state and local laws, including rules and regulations, governing the safe driving and operation of all fire department vehicles of the authority having jurisdiction, on emergency response.

2-2.6 The fire apparatus driver/operator, under emergency response conditions, shall demonstrate the legal and safe driving, positioning, and operating of assigned fire department vehicles of the authority having jurisdiction.

2-2.7* The fire apparatus driver/operator shall describe the safety precautions necessary when driving during adverse environmental conditions.

2-2.8* The fire apparatus driver/operator shall describe the effects on vehicle control of (a) braking reaction time (b) load control factors (c) general steering reactions.

Chapter 3 Apparatus Equipped with a Fire Pump

3-1 General.

3-1.1* The fire apparatus driver/operator shall demonstrate the performance of routine tests, inspections, and servicing functions required to assure the operational status of fire department pumpers, including:

(a) battery check
(b) booster tank level (if applicable)
(c) braking system
(d) coolant system
(e) electrical system
(f) hydraulic fluids
(g) fueling
(h) lubrication
(i) oil levels
(j) pumping system
(k) steering systems
(l) tire care
(m) tools, appliances, and equipment.

3-1.2 The fire apparatus driver/operator shall identify the operating principles of single-stage and multiple-stage centrifugal fire pumps.

3-1.3 The fire apparatus driver/operator, given pump models or diagrams, shall identify the major components and trace the flow of water through single-stage and multiple-stage centrifugal pumps.

3-1.4 The fire apparatus driver/operator shall identify the percentages of rated capacity, rated pressures, and the capacity in gallons per minute (gpm) at the rated pressures a fire department pumper is designed to deliver.

3-1.5* The fire apparatus driver/operator, given a fire department pumper and the necessary equipment, shall demonstrate an annual pumper service test.

3-1.6 The fire apparatus driver/operator shall identify the following conditions that may result in possible pumper apparatus damage or unsafe operation, and identify corrective measures:

(a) cavitation
(b) leaking fuel, oil, or water
(c) overheating
(d) unusual noises
(e) vibrations
(f) water hammer.

3-1.7* The fire apparatus driver/operator, given a fire department pumper, shall demonstrate the following driving tests:

(a) serpentine
(b) alley dock
(c) opposite alley pull in
(d) diminishing clearance
(e) straight line
(f) turn around
(g) lane change
(h) stopping procedures
(i) parking procedures.

3-2 Water Supply.

3-2.1 The fire apparatus driver/operator shall identify incrustation, tuberculation, and sedimentation, and their effects on the carrying capacities of water mains.

3-2.2 The fire apparatus driver/operator shall identify the types of hydrants used within the jurisdiction, including descriptions of:

(a) connection size and type of thread of discharge openings
(b) construction and operation of drain valve
(c) direction of operation of the main valve
(d) internal diameter of hydrant barrel
(e) hydrant discharge outlet coefficient
(f) procedures and policies of hydrant locations.

3-2.3 The fire apparatus driver/operator shall identify the available fire flows in various areas specified by the authority having jurisdiction.

3-2.4 The fire apparatus driver/operator shall identify problems related to flows from dead-end water mains.

3-2.5 The fire apparatus driver/operator, given reference material, shall identify and explain the approximate pressure-discharge relationship for various water pipe sizes.

3-2.6 The fire apparatus driver/operator shall identify the pipe sizes used in water distribution systems for residential, business, and industrial districts served by the authority having jurisdiction.

3-2.7 The fire apparatus driver/operator shall identify at least two causes of increased resistance or friction loss with water flowing in water mains.

3-2.8* The fire apparatus driver/operator shall identify the NFPA recommended color code system for fire hydrants, or the color code system used in that particular community.

3-2.9 The fire apparatus driver/operator shall identify who is responsible for water system maintenance, use, and testing.

3-2.10 The fire apparatus driver/operator shall identify private water supply systems and shall explain the operation, care, and maintenance of those systems.

3-2.11* The fire apparatus driver/operator shall identify three alternative emergency water supply sources.

3-2.12* The fire apparatus driver/operator shall identify the components of mobile water supply operations.

3-3 Sprinklers and Standpipes.

3-3.1 The fire apparatus driver/operator, given a check valve on the fire department connection to an automatic sprinkler system, shall demonstrate the direction of water flow through the valve.

3-3.2 The fire apparatus driver/operator shall demonstrate the method specified by the authority having jurisdiction for augmenting water supplies to sprinkler systems.

3-3.3 The fire apparatus driver/operator, given specific information on a sprinkler system, shall identify the number of sprinkler heads that can be adequately supplied by various capacity fire department pumpers.

3-3.4 The fire apparatus driver/operator, given specific information on a sprinkler system, shall calculate the hose layouts, pump discharge pressure, and procedures to adequately supply water to that sprinkler system.

3-3.5 The fire apparatus driver/operator, given specific information on a dry standpipe system, shall calculate the hose layouts, pump discharge pressure, and procedures to adequately supply water to that dry standpipe system.

3-3.6 The fire apparatus driver/operator, given specific information on a standpipe system, shall calculate the hose layouts, pump discharge pressure, and procedures to adequately supply water to that standpipe system.

3-3.7 The fire apparatus drivers/operators shall identify the proper methods and procedures to supply a standpipe system if the fire department connection is not usable.

3-4 Hydraulic Calculations.

3-4.1 The fire apparatus driver/operator shall demonstrate the principles of friction loss as they relate to:

(a) internal diameter of hose
(b) length of hose line
(c) manner in which hose lines are laid
(d) physical condition of hose
(e) pressure
(f) use of appliances
(g) use of multiple hose lines
(h) use of various nozzles
(i) velocity of flow.

3-4.2 The fire apparatus driver/operator shall identify the following types of fluid pressure encountered in the fire service:

(a) flow pressure
(b) negative pressure
(c) normal operating pressure
(d) residual pressure
(e) static pressure.

3-4.3 The fire apparatus driver/operator shall identify the following terms that relate to the basic principles of fire service hydraulics:

(a) atmospheric pressure
(b) capacity
(c) displacement
(d) flow (gpm)
(e) friction loss
(f) head pressure (gain or loss)
(g) hydrant pressure
(h) net engine pressure
(i) nozzle reaction
(j) pounds per square inch (psi)
(k) pump discharge pressure
(l) vacuum
(m) velocity
(n) water hammer.

3-4.4* The fire apparatus driver/operator shall demonstrate the use of proportions in mathematical calculations as required to solve fire department pumper hydraulics problems.

3-4.5 The fire apparatus driver/operator shall identify and demonstrate the determination and use of square roots as required to solve fire department pumper hydraulic problems.

3-4.6 The fire apparatus driver/operator shall identify and demonstrate the use of fractions, percentages, and decimal fractions in mathematical calculations as required to solve fire department pumper hydraulic problems.

3-4.7 The fire apparatus driver/operator shall demonstrate the use of algebraic formulas to solve fire department pumper hydraulic problems.

3-4.8* The fire apparatus driver/operator, given a series of fireground situations and using the written formulas specified by the authority having jurisdiction, shall determine:

(a) nozzle or pump discharge pressures when the length and size of hose, and size of nozzle are given

(b) water flow in gallons per minute (gpm) when the diameter of the orifice and pressure at the orifice are given

(c) friction loss in the supply and attack lines, used by the authority having jurisdiction, when the gpm flow is given

(d) friction loss in siamesed lines when size of hose and gpm flow are given

(e) friction loss in wyed lines when size of hose and gpm flow are given

(f) friction loss in multiple lines when the size of hose and gpm flow are given

(g) an estimated remaining available volume from a hydrant while pumping a given volume.

3-4.9* The fire apparatus driver/operator, given a series of fireground situations, shall mentally calculate correct pump discharge pressure, gpm, friction loss, and nozzle pressure, using formulas specified by the authority having jurisdiction.

3-4.10 The fire apparatus driver/operator, given a series of fireground situations involving various operating pressures, shall demonstrate the calculation of nozzle reaction of hand and master streams used by the authority having jurisdiction.

3-4.11 The fire apparatus driver/operator, given the necessary information, shall compute the maximum lift of a fire department pumper.

3-5 Apparatus Systems.

3-5.1 The fire apparatus driver/operator shall identify three methods of power transfer from the vehicle engine to the pump.

3-5.2 The fire apparatus driver/operator shall identify the theory and principles of pumper priming systems.

3-5.3 The fire apparatus driver/operator shall identify the theory and principles of pumper pressure relief systems and pressure control governors.

3-5.4 The fire apparatus driver/operator, given a fire department pumper, shall identify all pump gauges and demonstrate their use.

3-5.5 The fire apparatus driver/operator shall identify the auxiliary cooling systems and explain their function.

3-6 Operations.

3-6.1 The fire apparatus driver/operator, given a fire department pumper used by the authority having jurisdiction, shall demonstrate the method(s) of power transfer from vehicle engine to pump.

3-6.2 The fire apparatus driver/operator, given a fire department pumper and a series of fireground situations, shall produce effective hand and master streams specified by the authority having jurisdiction.

3-6.3 The fire apparatus driver/operator, given a fire department pumper, shall draft water, and demonstrate a systems check when the pumper will not draft.

3-6.4 The fire apparatus driver/operator shall demonstrate the operations of the different types of fire department pumpers used by the authority having jurisdiction.

3-6.5 The fire apparatus driver/operator, given a fire department pumper, shall properly position, set up the apparatus, and perform the following operations:

(a) pump at maximum delivery rate from the apparatus water tank

(b) pump at maximum rated capacity from a hydrant

(c) pump at maximum rated capacity from draft

(d) pump in a relay operation

(e) pump in a tandem pumping operation

(f) pump in a dual pumping operation.

3-6.6 The fire apparatus driver/operator, given a fire department pumper and a simulated fire scene, shall demonstrate proper maneuvering and positioning of the apparatus to function from the given source of water.

3-6.7 The fire apparatus driver/operator, given a fire department pumper with a multiple-stage pump, shall demonstrate the operation of the volume/pressure transfer valve under actual pumping conditions.

3-6.8 The fire apparatus driver/operator, given a fire department pumper, shall locate, identify, and demonstrate the operation of all equipment carried on or attached to that pumper.

3-6.9 The fire apparatus driver/operator shall identify the characteristics and limitations of hard and soft pumper supply hose.

3-6.10 The fire apparatus driver/operator, given a selection of nozzles and tips, shall identify the type, design, operation, nozzle pressure, and flow in gpm for proper operation of each.

3-6.11 The fire apparatus driver/operator, given a fire department pumper, shall demonstrate the operation of

the pumper pressure relief system, or the pressure control governor, or both.

3-6.12 The fire apparatus driver/operator, given a fire department pumper, shall demonstrate the operation of the auxiliary cooling system.

3-6.13 The fire apparatus driver/operator, given a series of fireground situations, shall identify the capabilities and limitations of the water supply operation.

Chapter 4 Apparatus Equipped with an Aerial Device

4-1* General.

4-1.1* The fire apparatus driver/operator shall demonstrate the performance of routine tests, inspections, and servicing functions required to assure the operational status of fire department aerial ladder apparatus, including:

(a) battery check
(b) booster tank level (if applicable)
(c) braking system
(d) cable systems (if applicable)
(e) coolant system
(f) electrical system
(g) fueling
(h) hydraulic systems
(i) lubrication
(j) stabilizing systems
(k) steering systems
(l) oil levels (engine and hydraulic)
(m) tire care
(n) tools, appliances, and equipment.

4-1.2 The fire apparatus driver/operator shall identify the following conditions indicating possible aerial apparatus malfunction(s) and identify corrective measures for overcoming the malfunction(s):

(a) leaking fuel, motor oil, hydraulic fluid, or water
(b) overheating
(c) unusual noises
(d) vibrations.

4-1.3 The fire apparatus driver/operator shall identify the factors affecting the effective range of elevated master streams.

4-1.4 The fire apparatus driver/operator shall identify the causes and hazards of nozzle reaction of elevated master streams.

4-1.5 The fire apparatus driver/operator shall identify the type of aerial device test and the necessary test equipment, and shall explain the aerial device test procedures according to NFPA 1904, *Standard for Testing Fire Department Aerial Ladders and Elevating Platforms.*

4-1.6* The fire apparatus driver/operator, given an aerial apparatus, shall demonstrate the following driving tests:

(a) serpentine
(b) alley dock
(c) opposite alley pull in
(d) diminishing clearance
(e) straight line
(f) turn around
(g) lane change
(h) Stopping procedures
(i) Parking procedures.

4-2 Apparatus Systems.

4-2.1 The fire apparatus driver/operator, given an aerial apparatus, shall identify the principles of that aerial apparatus hydraulic pressure relief system.

4-2.2 The fire apparatus driver/operator, given an aerial apparatus, shall identify all gauges and demonstrate their use.

4-2.3 The fire apparatus driver/operator shall identify the theory and principles and demonstrate the operating procedures of aerial apparatus in use by the authority having jurisdiction, in the following areas:

(a) cable systems (if applicable)
(b) communication systems
(c) electrical systems
(d) emergency operating systems
(e) hydraulic systems
(f) locking devices
(g) manual systems
(h) stabilizing systems.

4-2.4 The fire apparatus driver/operator, given an aerial apparatus, shall identify the theory and principles of the safety systems for the aerial device as specified by the manufacturer.

4-2.5 The fire apparatus driver/operator, given an aerial ladder apparatus, shall identify system overrides and the hazards involved in overriding the systems.

4-3 Operations.

4-3.1 The fire apparatus driver/operator shall demonstrate safe operational limitations of aerial ladder apparatus, in use by the authority having jurisdiction, in the following areas:

(a) angle of inclination
(b) angle from chassis axis
(c) ground conditions
(d) jackknife angle
(e) master stream
(f) reach
(g) topography
(h) weather conditions

(i) weight load supported
(j) weight load unsupported
(k) working height.

4-3.2 The fire apparatus driver/operator shall demonstrate all safety procedures for any given operation involving an aerial apparatus specified by the authority having jurisdiction.

4-3.3 The fire apparatus driver/operator, given an aerial apparatus in use by the authority having jurisdiction and a simulated emergency scene, shall demonstrate proper maneuvering and positioning of the apparatus for emergency operations.

4-3.4 The fire apparatus driver/operator, given an aerial ladder apparatus and a simulated emergency scene with the apparatus properly positioned, shall demonstrate the applicable procedures for stabilizing the apparatus in the following areas:
(a) axle locks (spring locks)
(b) braking
(c) outriggers or ground jacks
(d) wheel chocks.

4-3.5 The fire apparatus driver/operator, given an aerial apparatus and a simulated emergency scene with the apparatus properly positioned, shall demonstrate operating the aerial device in:
(a) raising
(b) lowering
(c) extending
(d) retracting
(e) locking
(f) unlocking
(g) rotating
(h) placing to roof
(i) positioning to window.

4-3.6 The fire apparatus driver/operator shall demonstrate the emergency operating procedures necessary to control the aerial device following equipment or power failure.

4-3.7 The fire apparatus driver/operator, given an aerial apparatus, shall demonstrate the method of power transfer from the vehicle or auxiliary engine to the hydraulic or power take-off system for operation of the device.

4-3.8* The fire apparatus driver/operator, given an aerial apparatus, shall demonstrate the proper application of lifting and positioning equipment using the aerial device.

4-3.9 The fire apparatus driver/operator, given an aerial apparatus, shall locate, identify, and demonstrate the operation of all equipment carried on or attached to that aerial apparatus.

Chapter 5 Apparatus Equipped with a Tiller

5-1 Operations.

5-1.1 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus, shall demonstrate the signaling system between the tiller operator's position and the driver's compartment.

5-1.2 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus, shall demonstrate the operation of the tiller as the apparatus is driven from quarters, and is backed into quarters.

5-1.3 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus, shall demonstrate the operation of the tiller as the apparatus is driven both forward and in reverse, including both right and left 90-degree turns in both forward and reverse.

5-1.4 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus and simulated or actual on-street and off-street conditions, shall demonstrate the operation of the tiller as the apparatus is driven both forward and in reverse in both on-street and off-street conditions.

5-1.5 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus and several different simulated emergency situations, shall demonstrate how to operate the tiller for positioning the apparatus for use of the aerial ladder.

5-1.6 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus with a removable tiller operator's position, if this type of tiller apparatus is used by the authority having jurisdiction, shall demonstrate how to clear the tiller assembly in preparation for raising the aerial ladder.

5-1.7 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus, shall identify and demonstrate the operations of the tiller operator when the aerial device is being lowered into its bed.

5-1.8 The fire apparatus driver/operator, given a tiller-equipped aerial apparatus with a removable tiller operator's position, if this type of tiller apparatus is used by the authority having jurisdiction, shall demonstrate restoring the tiller assembly for road operation after the aerial ladder has been bedded.

Chapter 6 Referenced Publications

6-1 The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

6-1.1 NFPA Publications. National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NFPA 1001-1987, *Standard for Fire Fighter Professional Qualifications*

NFPA 1901-1985, *Standard on Automotive Fire Apparatus*

NFPA 1904-1980, *Standard for Testing Fire Department Aerial Apparatus and Elevating Platforms.*

Appendix A

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

A-1-3.2 Although the frequency of the medical evaluation is not specified, it is recommended that the medical evaluation be given on at least an annual basis.

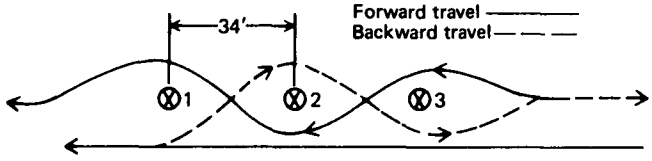
A-1-3.5 Part of the requirements of Chapter 1 of this standard states that the fire fighter shall meet the requirements of Fire Fighter II as specified in NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, before being certified as a fire apparatus driver/operator. This means that the individual applying for certification as a fire apparatus driver/operator has met all of the objectives in Chapters 1, 2, 3, and 4 of NFPA 1001, *Standard for Fire Fighter Professional Qualifications*. These objectives from NFPA 1001 include further requirements in areas such as: fire hose, nozzles, and appliances; fire streams; water supplies; and sprinklers, among others. These of course, are in addition to the requirements of this standard. Any fire fighter who has already been certified as a Fire Fighter II should review the requirements of the stated chapters in NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, as the person may be tested on the requirements included therein.

A-1-4 Aerial apparatus shall include: aerial ladders, aerial ladder towers, telescoping aerial towers, articulating aerial towers, and elevating water delivery systems.

A-2-1.1 Routine tests, inspections, and servicing functions should be performed on a daily, weekly, monthly, or other periodic basis as determined by departmental policy.

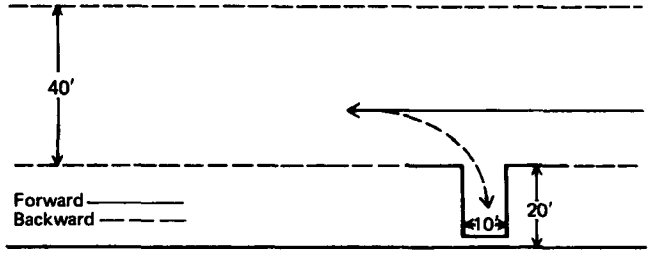
A-2-2.3

(a) *Serpentine.* The serpentine exercise measures a driver's ability to steer the apparatus in close limits without stopping. The exercise should be conducted with the apparatus moving first backward, then forward. The course or path of travel for this exercise can be established by placing three barrels each spaced 34 ft (10.4 m) apart, in a line. Adequate space must be provided on each side of the barrels for the apparatus to move freely. A driver is required to drive the apparatus along the left side of the barrels in a straight line and stop just beyond the last barrel. The driver then must back the apparatus between the barrels by passing to the left of No. 1, to the right of No. 2, and to the left of No. 3. At this point, the driver must stop the vehicle and then drive it forward between the barrels by passing to the right of No. 3, to the left of No. 2, and to the right of No. 1.



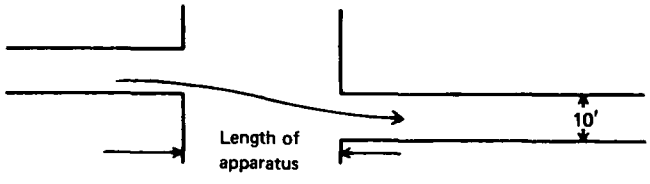
Serpentine Exercise

(b) *Alley Dock.* The alley dock exercise measures a driver's ability to drive past a simulated dock or stall and then back the apparatus into the space provided and stop smoothly. A dock or stall can be simulated by arranging barricades 40 ft (12.2 m) from a boundary line. These barricades should be 10 ft (3 m) apart and the length should be approximately 20 ft (6.1 m). The requirement should cause the driver to pass the barricades with the dock on the left and then back the apparatus, by a left turn, into the stall.



Alley Dock Exercise

(c) *Opposite Alley.* The opposite alley exercise measures a driver's ability to steer the apparatus within close limits. This exercise is performed without stopping until a straight line of travel is resumed. Simulated barricades or stanchions may be arranged to provide two alleys 10 ft wide (3 m) which are separated by a distance equal to the overall length of the apparatus. The 10-ft (3-m) alley from which the driver must exit is arranged 10 ft (3 m) out of line to the opposite 10-ft (3-m) alley into which the driver must maneuver the apparatus. No set speed should be established for this exercise but the driver shall not stop or back the apparatus during the maneuver.

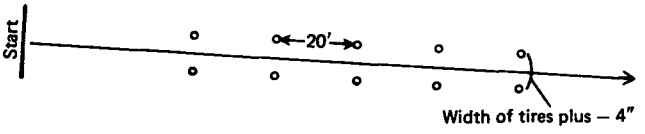


Opposite Alley Exercise

(d) *Diminishing Clearance.* This driving exercise measures a driver's ability to steer the apparatus in a straight line, to judge distances from wheel to object, and to stop at a finish line. The speed at which a driver is required to operate the apparatus is optional, but it should be adequate to necessitate quick judgment. The course for this exercise is formed by arranging two rows of stanchions to form a lane 75 ft (22.9 m) long. The lane varies in width from 9 ft 6 in. (2.9 m) to a diminishing clearance of 8 ft 2 in. (2.5 m). A driver must maneuver the apparatus through this lane without touching stanchions. Fifty ft (15.2 m) beyond the last stanchion, the driver must stop with the front bumper on the finish line.

Diminishing Clearance Exercise

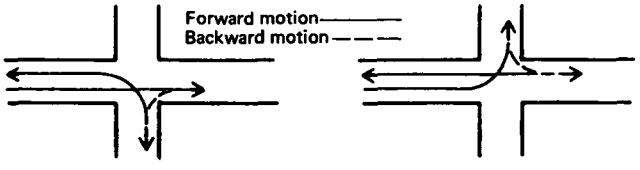
(e) *Straight Line.* The straight line exercise further measures a driver's ability to travel continuously in one direction without weaving. The driver must steer the apparatus between two rows of rubber balls or stanchions that are spaced every 20 ft (6.1 m). The distance between the balls shall be 4 in. (0.1 m) wider than the width of the rear of the apparatus. The direction or run shall be slanted slightly so that the driver must judge the distances and direction by the rubber balls or stanchions as a guide. A minimum distance of 100 ft (30.5 m) should be used for this exercise and the driver must accelerate through the gears without stopping.



Straight Line Exercise

(f) *Turning Around.* Fire apparatus, particularly fire department pumpers, often need to turn around to complete an operation. Turning around exercises further develop a driver's ability to properly spot the apparatus for operation procedures. Although turning fire apparatus around may not be difficult in adequate space, it becomes more complicated in streets or intersections. Turning around in streets is preferable. Turning around is frequently necessary when laying fire hose and care must be taken not to back over the hose. If streets are adequately wide and if traffic permits, the U-turn may be used. The following illustrated methods of turning around are suggested for an intersection turn around.

Reference source for this material is IFSTA Manual 106, *Fire Apparatus Practices.*



Turning Around Exercise

(g) *Lane Change.* In the lane-change exercise, the driver's ability to change lanes while moving at a constant speed is tested. Sets of markers are set up as shown, with each set being 50 ft (15.2 m) long and 10 ft (3 m) wide. The distance from one set of markers to the next is 30 ft (9.1 m). This area is called the change space. Judges stand on both sides of each change space and hold up flash cards telling the driver which lane to take. The judges may change the lane required any time the vehicle is still between the set of markers. The driver must adjust accordingly and take the designated lane. Grading for this exercise is as follows (50 points are possible):

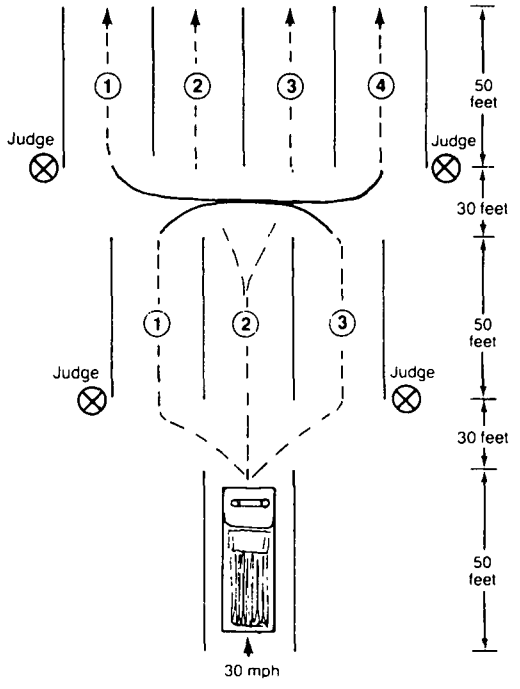
1. The driver approaches the first lane at a speed of 30 miles an hour and maintains this speed throughout the entire exercise. Ten points will be subtracted for failure to maintain a semiconstant speed.

2. Five points will be subtracted each time a course marker is hit or run over.

3. Any time the driver stops the vehicle during the exercise, 25 points will be subtracted.

4. Twenty-five points will be subtracted for failure to take the lane marked by the judges.

5. No score will be given if the driver fails to maintain control of the vehicle.



Lane Change Exercise

(h) *Stopping Procedures Exercise.*

(i) *Parking Procedures Excercise.*

A-2-2.4 An emergency vehicle operating course equivalent to the U.S. Department of Transportation Emergency Vehicle Operating Course should be used.

A-2-2.7 Adverse environmental conditions may include weather hazards, street or road conditions, social unrest, traffic congestion, etc.

A-2-2.8 It is recommended that special instruction from qualified individuals be given on steering out of skids, control of vehicles after a tire failure at high speed, and accident avoiding techniques.

A-3-1.1 See A-2-1.1.

A-3-1.5 An annual fire department pumper service test is outlined in *Fire Department Pumper Tests and Fire Stream Tables.*

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