First Revision No. 23-NFPA 1912-2014 [Section No. 2.3.1]

2.3.1 ~~NEMA~~ ANSI Publications.

~~National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.~~ American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI A14.2, *Ladders — Portable Metal — Safety Requirements*, 2007.

ANSI A14.5, *Ladders — Portable Reinforced Plastic — Safety Requirements*, 2007.

ANSI/NEMA Z535.4, *Product Safety Signs and Labels*, 2011.

~~NEMA Z535.4, *Standard for Product Safety Signs and Labels*, 2002.~~

2.3.2 FAMA Publications.

Fire Apparatus Manufacturer's Association, P.O. Box 397, Lynnfield, MA 01940-0397. www.fama.org

FAMA, *Fire Apparatus Safety Guide*, 2014.

FAMA TC010, *Standard Product Safety Sign Catalog for Automotive Fire Apparatus*, 2012.

2.3.3 ISO Publications.

International Standards Organization, 1 rue de Varembé, Case Postale 56, CH-1211 Genéve 20, Switzerland, www.standardsinfo.net.

ISO 9244, *Earth-moving machinery — Machine safety labels — General principles*, 2008.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 10:59:47 EDT 2014

Committee Statement

Committee Statement: Updating Reference
Response Message:

First Revision No. 2-NFPA 1912-2014 [Section No. 2.4]

2.4 References for Extracts in Mandatory Sections.
NFPA 58, *Liquefied Petroleum Gas Code,* ~~2011~~ 2014 edition.
NFPA 1901, *Standard for Automotive Fire Apparatus,* ~~2009~~ 2016 edition.
NFPA 1906, *Standard for Wildland Fire Apparatus,* ~~2006~~ 2016 edition.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 13:56:23 EDT 2014

Committee Statement

Committee Statement: Updating document edition dates for extract references.
Response Message:

First Revision No. 33-NFPA 1912-2014 [New Section after 3.2.4]

3.2.5 Standard.
An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

Submitter Information Verification

Submitter Full Name: Ryan Depew
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 29 09:07:35 EDT 2014

Committee Statement

Committee Statement: Adding NFPA definition of "Standard" per Manual of Style.
Response Message:

First Revision No. 3-NFPA 1912-2014 [Section No. 3.3.17]

3.3.17 Final-Stage Manufacturer.
~~A person who~~ Any entity that performs such manufacturing operations on an incomplete vehicle that it becomes a completed vehicle. [**1906,**~~2006~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 13:59:10 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 4-NFPA 1912-2014 [Section No. 3.3.18]

3.3.18 Fire Apparatus.
A vehicle designed to be used under emergency conditions to transport personnel and equipment ~~, and~~ or to support the suppression of fires ~~and~~ or mitigation of other hazardous situations. [**1901,** ~~2009~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:00:58 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 5-NFPA 1912-2014 [Section No. 3.3.19]

3.3.19 Fire Pump.
A water pump with a rated capacity of at least 250 gpm (1000 L/min) ~~or greater~~ but less than 3000 gpm (12,000 L/min) at 150 psi (1000 kPa) net pump pressure, or a water pump with rated capacity of 3000 gpm (12,000 L/min) or greater at 100 psi (700 kPa) net pump pressure that is mounted on a fire apparatus and ~~used~~ intended for fire fighting. [**1901,** ~~2009~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:03:09 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 29-NFPA 1912-2014 [Section No. 3.3.25]

3.3.25* GVWR (Gross Vehicle Weight Rating).
The final-stage manufacturer's specified maximum load-carrying capacity of a ~~vehicle having two axle systems (a multiaxle axle installation is one system).~~ single vehicle. [**1901,** 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 12:09:24 EDT 2014

Committee Statement

Committee Statement: Updated definition to remain consistent with NFPA 1901.
Response Message:

First Revision No. 6-NFPA 1912-2014 [Section No. 3.3.26]

3.3.26 Initial Attack Apparatus.
Fire apparatus with a ~~permanently mounted~~ fire pump of at least 250 gpm (1000 L/min) capacity, water tank, and hose body whose primary purpose is to initiate a fire suppression attack on structural, vehicular, or vegetation fires, and to support associated fire department operations. [**1901,** ~~2009~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:07:57 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 7-NFPA 1912-2014 [Section No. 3.3.27]

3.3.27 Line-Voltage Circuit, Equipment, or System.
An ac or dc electrical circuit, equipment, or system where the voltage to ground or from line to line is greater than 30 ~~volts (~~ V~~)~~ rms (ac) ~~or~~ , 42.4 V peak (~~dc~~ ac), or ~~greater~~ 60 V dc . [**1901,** ~~2009~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:10:03 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 8-NFPA 1912-2014 [Section No. 3.3.30]

3.3.30 Mobile Foam Fire Apparatus.
Fire apparatus with a permanently mounted fire pump, foam proportioning system, and foam concentrate tank(s) whose primary purpose is ~~for use~~ ~~in~~ the control and extinguishment of flammable and combustible liquid fires in storage tanks and ~~other flammable liquid~~ spills. [**1901,** ~~2009~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:13:17 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 9-NFPA 1912-2014 [Section No. 3.3.40]

3.3.40 Rated Capacity (Aerial Device).
The total amount of weight of all personnel and equipment that can be supported at the outermost rung of an aerial ladder or on the platform of an elevating platform with the ~~waterway uncharged.~~ aerial device placed in the horizontal position at its maximum horizontal extension when the stabilizers are fully deployed. [**1901,** ~~2009~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:16:20 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 10-NFPA 1912-2014 [Section No. 3.3.53]

3.3.53 Wildland Fire Suppression Apparatus.
~~Fire~~ A fire apparatus designed for fighting wildland fires that is equipped with a pump ~~having a capacity normally between 10 gpm and 500 gpm (38 L/min and 1900 L/min)~~ , a water tank, limited hose and equipment, and ~~that has~~ pump-and-roll capability. [**1906,** ~~2006~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:19:40 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

First Revision No. 24-NFPA 1912-2014 [Section No. 4.4.2]

4.4.2 Auxiliary Pump.
If the fire apparatus is equipped with a new auxiliary pump, the pump and its associated equipment shall meet the requirements for auxiliary pumps in the current edition of NFPA 1901 ~~or NFPA 1906 , whichever is applicable~~ .

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 11:01:12 EDT 2014

Committee Statement

Committee Statement: Auxiliary pumps are not addressed in NFPA 1906.
Response Message:

First Revision No. 25-NFPA 1912-2014 [Section No. 4.7.4]

4.7.4*

~~Safety-related (e.g., caution, warning, danger) tags and labels shall meet the requirements~~ Safety signs with text shall conform to the general principles of NEMA Z535.4, ~~*Standard for*~~ *Product Safety Signs and Labels.* Safety signs without text shall conform to the general principles for two-panel safety signs of ISO 9244, *Earth-moving machinery — Machine safety labels — General principles* . [**1901,** 2016]

4.7.4.1

Apparatus built for sale in the United States shall employ safety signage that complies with ANSI/NEMA Z535.4. [**1901,** 2016]

4.7.4.2

Apparatus built for sale outside the United States shall employ safety signage that complies with either ANSI/NEMA Z535.4 or ISO 9244. [**1901,** 2016]

Supplemental Information

File Name	Description
A.4.7.4_edited.docx	

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 11:02:25 EDT 2014

Committee Statement

Committee Statement: Updating safety sing requirements and adding annex material to remain consistent with NFPA 1901.
Response Message:

A.4.7.4

Uniformity of safety signage is a desirable objective. Examples of common safety sign solutions are depicted in FAMA TC010, *Standard Product Safety Sign Catalog for Automotive Fire Apparatus*, and should be considered where deemed applicable by the manufacturer. [**1901,** 2016]

First Revision No. 31-NFPA 1912-2014 [Section No. 4.8.2]

4.8.2

The estimated in-service weight shall include the following:

(1) The chassis, body, and tank(s)

(2) Full fuel, lubricant, and other chassis or component fluid tanks or reservoirs

(3) Full water and other agent tanks

(4)* 200 lb (90 kg) in each seating position

(5) 70 lb (32 kg) for each seating position for personal gear unless specified as not applicable

(6) Fixed equipment such as pumps, aerial devices, generators, reels, and air systems as installed

(7) Ground ladders, suction hose, designed hose load in their hose beds and on their reels

(8) An allowance for miscellaneous equipment ~~that is the greatest of the values shown in Table 4.8.2 , a purchaser-provided list of equipment to be carried with weights, or a purchaser-specified miscellaneous equipment allowance~~ as provided by the purchaser

~~Table 4.8.2 Miscellaneous Fire Apparatus Equipment Allowance~~

Fire Apparatus Type	Size	Equipment Allowance lb	kg
Pumper	Less than 250 ft^3 (7 m^3) compartment space*	2,000	910
	250 ft^3 (7 m^3) or more of compartment space*	2,500	1,135
Initial attack	10,000 lb–15,000 lb (4,500 kg–7,000 kg) GVWR	900	410
	15,001 lb–20,000 lb (7,001 kg–9,000 kg) GVWR	1,500	680
	>20,000 lb (>9,000 kg) GVWR	2,000	910
Mobile water supply	All	1,000	455
Aerial	All	2,500	1,135
Quint	All	2,500	1,135
Special service	10,000 lb–15,000 lb (4,500 kg–7,000 kg) GVWR	2,000	910
	15,001 lb–20,000 lb (7,001 kg–9,000 kg) GVWR	2,500	1,135
	20,001 lb–30,000 lb (9,001 kg–14,000 kg) GVWR	3,000	1,350
	30,001 lb–40,000 lb (14,001 kg–18,000 kg) GVWR	4,000	1,800
	40,001 lb–50,000 lb (18,001 kg–23,000 kg) GVWR	6,000	2,700
	50,001 lb–60,000 lb (23,001 kg–27,000 kg) GVWR	8,000	3,600
	>60,000 lb (>27,000 kg) GVWR	10,000	4,500
Mobile foam	All	2,000	910
Wildland	5,000 lb–10,000 lb (2,200 kg–4,500 kg) GVWR	300	136
	10,001 lb–15,000 lb (4,501 kg–7,000 kg) GVWR	500	227
	15,001 lb–20,000 lb (7,001 kg–9,000 kg) GVWR	1,000	454
	20,001 lb–26,000 lb (9,001 kg–12,000 kg) GVWR	1,500	680
	>26,000 lb (>12,000 kg) GVWR	2,000	910

*Compartment space for pumpers is calculated based on the inside dimensions of the enclosed compartment.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 12:41:02 EDT 2014

Committee Statement

Committee Statement: Based on the complexity of refurbishing, it is not practical to provide specific minimum equipment weights and should be left up to the purchaser. Delete Table 4.8.2

Response Message:

First Revision No. 27-NFPA 1912-2014 [Section No. 5.18.1]

5.18.1
If new ground ladders are furnished, they shall meet the requirements of NFPA 1931~~, *Standard for Manufacturer's Design of Fire Department Ground Ladders*~~ .

5.18.1.1
Stepladders and other types of multipurpose ladders meeting ANSI A14.2, *Ladders — Portable Metal — Safety Requirements* , or ANSI A14.5, *Ladders — Portable Reinforced Plastic — Safety Requirements* , with duty ratings of Type 1A or 1AA shall be permitted to be substituted for a folding ladder.

5.18.1.2
Stepladders and other types of multipurpose ladders shall be permitted to be carried in addition to the minimum fire department ground ladders specified in NFPA 1901 provided they meet either ANSI A14.2 or ANSI A14.5 with duty ratings of Type 1A or 1AA.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 11:16:43 EDT 2014

Committee Statement

Committee Statement: Updating ladder requirements to remain consistent with NFPA 1901.
Response Message:

First Revision No. 20-NFPA 1912-2014 [Section No. 5.20.2]

5.20.2

The contractor shall supply, at the time of delivery, at least one copy of the following:

(1) Engine manufacturer's certified brake horsepower curve for a new engine installation showing the maximum governed speed

(2) Contractor's record of fire apparatus refurbishing, including, if applicable, all technical information required for inspection to comply with NFPA 1911

(3) Pump manufacturer's certification of suction capabilities for new pump installations

(4) Pump manufacturer's certification of hydrostatic test for new pump installations

(5) Certification of inspection and test

(6) If the apparatus is equipped with a pump, a copy of the chassis manufacturer's approval for stationary pumping applications

(7) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full but without personnel, equipment, and hose) to determine compliance with Section 4.8

(8) The latest edition of the FAMA *Fire Apparatus Safety Guide*

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 16 11:02:31 EDT 2014

Committee Statement

Committee Statement: Adding requirement for the FAMA Safety Guide to be provided with refurbished apparatus as a reference for the user.
Response Message:

First Revision No. 21-NFPA 1912-2014 [New Section after 5.20.4.2]

5.21 Safety Signs.

The contractor shall ensure that safety signs as appropriate to the apparatus type and features, substantially similar to the following FAMA signs, and as described and located per FAMA TC010, *Standard Product Safety Sign Catalog for Automotive Fire Apparatus*, shall be on the apparatus prior to delivery:

(1) FAMA01 — Battery Explosion
(2) FAMA02 — Rotating Shafts
(3) FAMA05 — Spinning Fan
(4) FAMA06 — Seats Without Belts Not Occupied
(5) FAMA07 — Seated and Belted
(6) FAMA10 — Cab Equipment Mounting
(7) FAMA12 — Fire Service Tire Rating
(8) FAMA14 — Cab Seating
(9) FAMA15 — Helmet Worn in Cab (1901 Municipal Apparatus)
(10) FAMA17 — Vehicle Backing
(11) FAMA18 — Intake and Discharge Cap Pressure
(12) FAMA22 — Hose Restraint Required
(13) FAMA23 — Access Step Method
(14) FAMA24 — Riding on Exterior
(15) FAMA25 — Trained Personnel Only — NFPA Required
(16) FAMA26 — No-Step
(17) FAMA28 — Rope Tie-Down 9000
(18) FAMA30 — Stabilizer Crush
(19) FAMA31 — Stabilizer Pins & Pads
(20) FAMA32 — Stabilizer Pads
(21) FAMA34 — Fall Restraint Required
(22) FAMA35 — Aerial Electrocution
(23) FAMA36 — Aerial Electrocution
(24) FAMA37 — Aerial Device Load Capacity
(25) FAMA38 — Aerial Ladder Rung Pinch
(26) FAMA39 — Aerial Inspection
(27) FAMA41 — Cab Tilt
(28) FAMA42 — Siren Noise
(29) FAMA43 — Helmet Worn in Cab (1906 Wildlands Apparatus)

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 16 11:04:28 EDT 2014

Committee Statement

Committee Statement: Adding requirement for the use of FAMA safety symbols. This is consistent with changes to the upcoming editions of NFPA 1901 and NFPA 1906.

Response Message:

First Revision No. 28-NFPA 1912-2014 [Section No. 6.18.1]

6.18.1
If new ground ladders are furnished, they shall meet the requirements of NFPA 1931~~, *Standard for Manufacturer's Design of Fire Department Ground Ladders*~~ .

6.18.1.1
Stepladders and other types of multipurpose ladders meeting ANSI A14.2, *Ladders — Portable Metal — Safety Requirements* , or ANSI A14.5, *Ladders — Portable Reinforced Plastic — Safety Requirements* , with duty ratings of Type 1A or 1AA shall be permitted to be substituted for a folding ladder.

6.18.1.2
Stepladders and other types of multipurpose ladders shall be permitted to be carried in addition to the minimum fire department ground ladders specified in NFPA 1901 provided they meet either ANSI A14.2 or ANSI A14.5 with duty ratings of Type 1A or 1AA.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 11:20:19 EDT 2014

Committee Statement

Committee Statement: Updating ladder requirements to remain consistent with NFPA 1901.
Response Message:

First Revision No. 19-NFPA 1912-2014 [Section No. 6.20.1]

6.20.1

If applicable, the contractor shall supply, at the time of delivery, at least one copy of the following:

(1) Engine manufacturer's certified brake horsepower curve for a new engine installation showing the maximum governed speed

(2) Contractor's record of fire apparatus refurbishing including, if applicable, all technical information required for inspection to comply with NFPA 1911

(3) Pump manufacturer's certification of suction capabilities for new pump installations

(4) Pump manufacturer's certification of hydrostatic test for new pump installations

(5) Certification of required inspections and tests

(6) If equipped with a pump, a copy of the chassis manufacturer's approval for stationary pumping applications

(7) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full but without personnel, equipment, and hose) supplied with the completed vehicle to determine compliance with Section 4.8

(8) The latest edition of the FAMA *Fire Apparatus Safety Guide*

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 16 10:56:28 EDT 2014

Committee Statement

Committee Statement: Adding requirement for the FAMA Safety Guide to be provided with refurbished apparatus as a reference for the user.
Response Message:

First Revision No. 22-NFPA 1912-2014 [New Section after 6.20.3.1]

6.21 Safety Signs.

The contractor shall ensure that safety signs as appropriate to the apparatus type and features, substantially similar to the following FAMA signs, and as described and located per FAMA TC010, *Standard Product Safety Sign Catalog for Automotive Fire Apparatus*, shall be on the apparatus prior to delivery:

(1) FAMA01 — Battery Explosion
(2) FAMA02 — Rotating Shafts
(3) FAMA05 — Spinning Fan
(4) FAMA06 — Seats Without Belts Not Occupied
(5) FAMA07 — Seated and Belted
(6) FAMA10 — Cab Equipment Mounting
(7) FAMA12 — Fire Service Tire Rating
(8) FAMA14 — Cab Seating
(9) FAMA15 — Helmet Worn in Cab (1901 Municipal Apparatus)
(10) FAMA17 — Vehicle Backing
(11) FAMA18 — Intake and Discharge Cap Pressure
(12) FAMA22 — Hose Restraint Required
(13) FAMA23 — Access Step Method
(14) FAMA24 — Riding on Exterior
(15) FAMA25 — Trained Personnel Only — NFPA Required
(16) FAMA26 — No-Step
(17) FAMA28 — Rope Tie-Down 9000
(18) FAMA30 — Stabilizer Crush
(19) FAMA31 — Stabilizer Pins & Pads
(20) FAMA32 — Stabilizer Pads
(21) FAMA34 — Fall Restraint Required
(22) FAMA35 — Aerial Electrocution
(23) FAMA36 — Aerial Electrocution
(24) FAMA37 — Aerial Device Load Capacity
(25) FAMA38 — Aerial Ladder Rung Pinch
(26) FAMA39 — Aerial Inspection
(27) FAMA41 — Cab Tilt
(28) FAMA42 — Siren Noise
(29) FAMA43 — Helmet Worn in Cab (1906 Wildlands Apparatus)

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 16 11:08:03 EDT 2014

Committee Statement

Committee Statement: Adding requirement for the use of FAMA safety symbols. This is consistent with changes to the upcoming editions of NFPA 1901 and NFPA 1906.

Response Message:

First Revision No. 11-NFPA 1912-2014 [Section No. A.3.3.39]

A.3.3.39 Quint.
The primary purpose of this type of fire apparatus is to combat structural and associated fires~~,~~ and to support fire-fighting and rescue operations by positioning personnel~~,~~ handling materials, providing continuous egress, or discharging water at positions elevated from the ground. [**1901,**~~2009~~ 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:22:24 EDT 2014

Committee Statement

Committee Statement: Updating extracted definition.
Response Message:

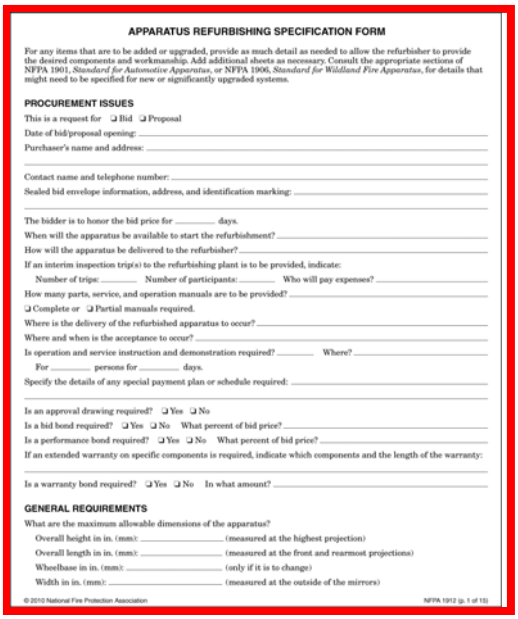
First Revision No. 16-NFPA 1912-2014 [Section No. B.1 [Excluding any Sub-Sections]]

Fire apparatus refurbishing can range from simple cosmetic–type restorations to complete Level I refurbishing. Therefore, the amount of information that the contractor and purchaser require can vary greatly. Depending on the scope of the proposed work, consideration should be given to the details discussed in some or all of the following paragraphs. It is recommended that the form in Figure B.1 be used to identify the information needed to properly develop specifications for those portions of the fire apparatus that are to be modified or upgraded during the refurbishing.

The local fire chief and fire department staff know the conditions under which the apparatus will be used. However, competent advice should also be obtained from knowledgeable and informed sources such as other experienced fire service personnel, trade journals, training instructors, maintenance personnel, and fire equipment and component manufacturers. The fire insurance rating authority should also be consulted.

The study should look not only at current operations and risks protected but also at how these might change over the life of the fire apparatus.

Figure B.1 Specification Form for Fire Apparatus Refurbishing.



APPARATUS REFURBISHING SPECIFICATION FORM

For any items that are to be added or upgraded, provide as much detail as needed to allow the refurbisher to provide the desired components and workmanship. Add additional sheets as necessary. Consult the appropriate sections of NFPA 1901, *Standard for Automotive Apparatus*, or NFPA 1906, *Standard for Wildland Fire Apparatus*, for details that might need to be specified for new or significantly upgraded systems.

PROCUREMENT ISSUES

This is a request for ❑ Bid ❑ Proposal
Date of bid/proposal opening: _____
Purchaser's name and address: _____
_____
Contact name and telephone number: _____
Sealed bid envelope information, address, and identification marking: _____
_____
The bidder is to honor the bid price for _____ days.
When will the apparatus be available to start the refurbishment? _____
How will the apparatus be delivered to the refurbisher? _____
If an interim inspection trip(s) to the refurbishing plant is to be provided, indicate:
Number of trips: _____ Number of participants: _____ Who will pay expenses? _____
How many parts, service, and operation manuals are to be provided? _____
❑ Complete or ❑ Partial manuals required.
Where is the delivery of the refurbished apparatus to occur? _____
Where and when is the acceptance to occur? _____
Is operation and service instruction and demonstration required? _____ Where? _____
For _____ persons for _____ days.
Specify the details of any special payment plan or schedule required: _____
_____
Is an approval drawing required? ❑ Yes ❑ No
Is a bid bond required? ❑ Yes ❑ No What percent of bid price? _____
Is a performance bond required? ❑ Yes ❑ No What percent of bid price? _____
If an extended warranty on specific components is required, indicate which components and the length of the warranty:
_____
Is a warranty bond required? ❑ Yes ❑ No In what amount? _____

GENERAL REQUIREMENTS

What are the maximum allowable dimensions of the apparatus?
Overall height in in. (mm): _____ (measured at the highest projection)
Overall length in in. (mm): _____ (measured at the front and rearmost projections)
Wheelbase in in. (mm): _____ (only if it is to change)
Width in in. (mm): _____ (measured at the outside of the mirrors)

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APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Maximum weight on the front axle in lb (kg): _____ (only if it is different from current front GAWR)
Maximum weight on the rear axle in lb (kg): _____ (only if it is different from current rear GAWR)
What is the maximum wall-to-wall turning radius allowable? _____ ft (m)
Maximum elevation at which the apparatus will operate if over 2000 ft (600 m): _____
Maximum grade that the apparatus will climb if over 6 percent (across 20 percent, up/down 25 percent, stationary 10 percent grades for wildland fire apparatus): _____
Specify the minimum ambient air temperature in which the apparatus is to operate: _____ (°F) (°C)
Specify the maximum ambient air temperature in which the apparatus is to operate: _____ (°F) (°C)
Specify the apparatus road performance if it is to exceed the minimum specified in this standard: _____
Specify maximum road speed required (only if upgrading engine, transmission, drive axle, or tires): _____
Specify the maximum number of persons to ride on the apparatus: _____

Hose Thread Size Information (required if changing or upgrading intakes or discharges)

TPI ¥ OD or size and type (e.g., 2½ in. NH or 4 in. Storz)	
1 in. =	1½ in. =
2 in. =	2½ in. =
3 in. =	3½ in. =
4 in. =	4½ in. =
5 in. =	6 in. =
Hydrant =	

Testing and Acceptance

If independent certification of tests is required for the pump system, aerial device, line-voltage power source, or other systems, what independent testing organization is to certify the tests? _____
Is anyone representing the purchaser to witness the refurbisher's pre-delivery tests? ❑ Yes ❑ No
If yes, who? _____
Where are the road tests to be conducted? _____
What tests will the contractor be required to perform on delivery? _____

APPARATUS TYPE

This apparatus is to be used as a(n):
❑ Pumper
❑ Initial attack apparatus
❑ Mobil water supply apparatus
❑ Aerial fire apparatus
❑ Quint fire apparatus
❑ Special service apparatus
❑ Mobil foam fire apparatus
❑ Wildland fire apparatus

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

What functions or services is this apparatus to perform? _____

Suction Hose

Hose: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new
Soft or hard: _____
Size and length: _____
Connection type and size: _____
Mounting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new
Arrangement, bracket style, and location: _____

Ground Ladders

Number	**Length**	**Type**	**Mounting Location and Bracket**	**Source**
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition

Indicate whether a specific type or make of ladder is desired for replacements and additions: _____

Breathing Apparatus

Quantity	**Make/Model**	**Mounting Location**	**Source**
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply

Special requirements for breathing apparatus or its mounting, including diameters of SCBA cylinders to be utilized: _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Equipment Carried on Apparatus

Miscellaneous equipment allowance if it exceeds the standard's minimum weight: ..... lb (kg)

Attach a list of equipment and tools to be supplied by the contractor with the apparatus, stating the item, quantity, where it is to be mounted or carried, the weight of each item, and its dimensions (L ¥ W ¥ D).

Attach a list of equipment and tools to be supplied by the fire department to be carried on the apparatus, stating the item, quantity, where it is to be mounted or carried, contractor's responsibility for mounting, the weight of each item, and its dimensions (L ¥ W ¥ D).

Attach a list of equipment and tools that might be carried on the apparatus in the future, stating the item, quantity, the desired mounting location or compartment where it is likely to be carried, the weight of each item, and its dimensions (L ¥ W ¥ D).

Attach a list of fixed equipment and permanent components required on the apparatus, stating the item, quantity, where it is to be mounted or carried, the weight of each item, and its dimensions (L ¥ W ¥ D).

If additional compartment space is required in addition to what is necessary to store the equipment on the attached four lists, indicate space requirements: .....

CHASSIS AND VEHICLE COMPONENTS

Engine:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Transmission:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Traction control system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Antilock braking system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Drive shaft(s) :	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Front axle:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Rear axle:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Braking system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Auxiliary braking system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Parking brakes:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Suspension:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Wheels:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Tires:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Cooling system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Engine speed control:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Lubrication system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Air intake system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Fuel system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Fuel tank:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Exhaust system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Steering:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Tow hooks/eyes:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Automatic tire chains:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Provide details required on components to be added or upgraded: .....

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: .....

Are rear fender liners required? .....

Specify whether the apparatus is designed to operate off paved roads: .....

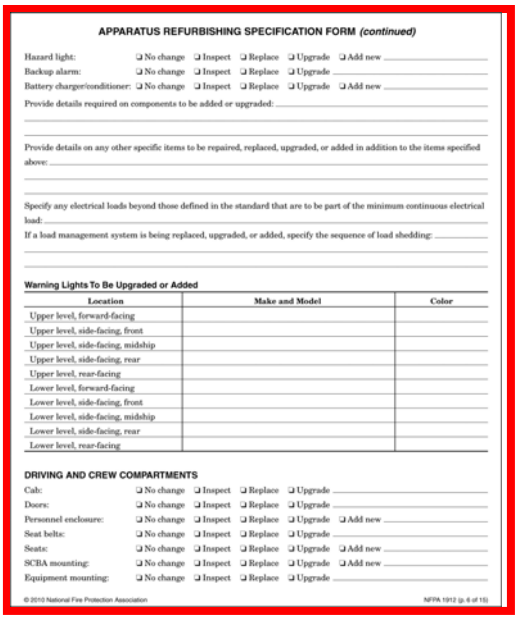
Specify whether an increased angle of approach is required: .....

Specify whether an increased angle of departure is required: .....

Specify whether a specific ramp breakover angle is required: .....

LOW-VOLTAGE ELECTRICAL SYSTEMS AND WARNING DEVICES

Alternator:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Alternator wiring:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Batteries:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Battery wiring:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Starter:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Starter wiring:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Chassis wiring harness:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Body wiring harness:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Load manager:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Low-voltage alarm:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Warning lights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Headlights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Stop, taillights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Turn signal lights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Cab handlights or mounted adjustable spotlights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Traffic horn:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	.....
Air horns:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Siren(s):	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Ground lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Hose bed lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Surface lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Interior lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....
Compartment lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new .....



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Hazard light: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Backup alarm: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Battery charger/conditioner: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Specify any electrical loads beyond those defined in the standard that are to be part of the minimum continuous electrical load: _____
If a load management system is being replaced, upgraded, or added, specify the sequence of load shedding: _____

Warning Lights To Be Upgraded or Added

Location	Make and Model	Color
Upper level, forward-facing		
Upper level, side-facing, front		
Upper level, side-facing, midship		
Upper level, side-facing, rear		
Upper level, rear-facing		
Lower level, forward-facing		
Lower level, side-facing, front		
Lower level, side-facing, midship		
Lower level, side-facing, rear		
Lower level, rear-facing		

DRIVING AND CREW COMPARTMENTS

Cab: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Doors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Personnel enclosure: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Seat belts: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Seats: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
SCBA mounting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Equipment mounting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Cab tilt: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Mirrors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Rear view camera system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Instrumentation: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Intercom system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Heating: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Air conditioning: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Steps or handrails: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Steering wheel/column: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Maximum number of seating positions in the apparatus: _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

BODY, COMPARTMENTS, AND EQUIPMENT MOUNTING

Entire body: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Compartment doors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Door stays: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Door latches/locks: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Compartment floors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Pump enclosure: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Compartment lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Body trim: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Steps/walkways/ladders: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Handrails: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Hose bed(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Hose bed covers: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Equipment storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Suction hose storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Powered equipment racks: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Radio compartment: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Computer equip. provisions: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
SCBA storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

SCBA bottle storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Pump panel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Receivers/anchors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Body material: _____
Tread plate material: _____
Color scheme of apparatus: _____
Paint number(s) and manufacturer, if known: _____
Striping, decoration, and lettering required: _____
List any areas not to be painted: _____
Is rustproof treatment required? ❑ Yes ❑ No
Provide details of locations to be treated: _____

Hose To Be Carried for Preconnected Lines

Length	Size	Location	Bed or Reel

Hose To Be Carried in Hose Bed or on Reels

Length	Size	Location	Bed or Reel

Specify any requirements for anchoring and lifting a slip-on fire-fighting unit: _____

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APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

FIRE PUMP, WATER PUMP, OR INDUSTRIAL SUPPLY PUMP

Pump: ❑ Use existing pump ❑ Overhaul ❑ Replace ❑ Upgrade _____
Pump drive engine: ❑ Not applicable ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Discharges: ❑ No changes
❑ Add new discharges _____
❑ Remove discharges _____
❑ Upgrade discharges _____
Deck gun: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Booster reel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Intakes: ❑ No changes
❑ Add new intakes _____
❑ Remove intakes _____
❑ Upgrade intakes _____
Valves: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Valve controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Intake relief system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Pressure control system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Priming system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Gauges: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Flowmeters: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Pump-rated capacity: _____ gpm (L/min) at _____ psi (kPa) with _____ stages
Pump-and-roll capacity, if required: _____ gpm (L/min) at _____ psi (kPa) at vehicle speed _____ mph (km/hr)
Specify pump performance requirements:
If altitude over 2000 ft (600 m), specify altitude: _____
If lift over 10 ft (3 m) (less for large pumps, see NFPA 1901), specify lift: _____
If through more than 20 ft (6 m) of suction hose, specify length: _____
Do local water conditions require special materials for pump and related piping? _____
Is pump panel color-coding required? _____

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APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

AUXILIARY PUMP

Pump: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Pump drive engine: ❑ Not applicable ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Discharges: ❑ No changes
❑ Add new discharges _____
❑ Remove discharges _____
❑ Upgrade discharges _____
Booster reel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Intakes: ❑ No changes
❑ Add new intakes _____
❑ Remove intakes _____
❑ Upgrade intakes _____
Valves: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Valve controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Intake relief system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Pressure control system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Drains: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Priming system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Gauges: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Flowmeters: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

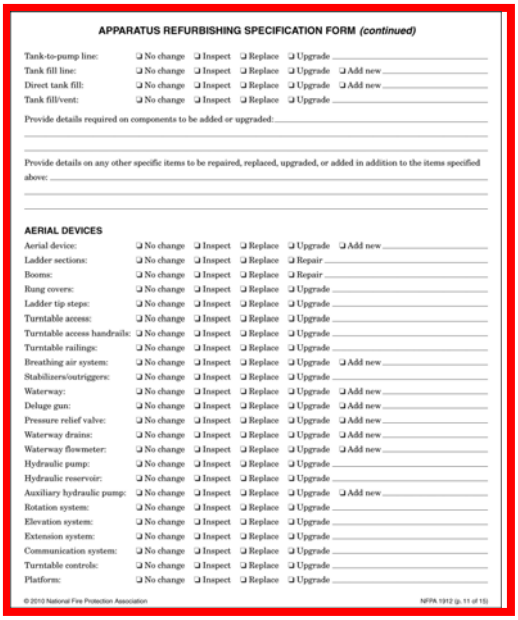
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Pump-rated capacity: _____ gpm (L/min) at _____ psi (kPa)
Pump-and-roll capacity, if required: _____ gpm (L/min) at _____ psi (kPa) at vehicle speed _____ mph (km/hr)
Specify pump performance requirements:
If altitude over 2000 ft (600 m), specify altitude: _____

WATER TANK

Water tank: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Baffles: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Foam cell: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Tank level gauge: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

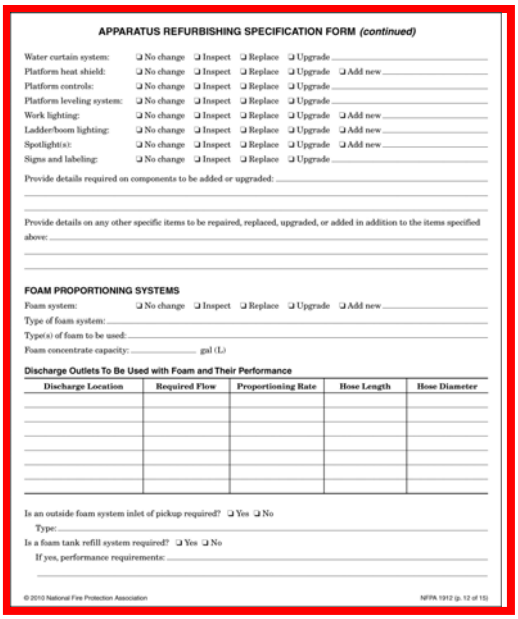
Tank-to-pump line: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Tank fill line: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Direct tank fill: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Tank fill/vent: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

AERIAL DEVICES

Aerial device: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Ladder sections: ❑ No change ❑ Inspect ❑ Replace ❑ Repair _____
Booms: ❑ No change ❑ Inspect ❑ Replace ❑ Repair _____
Rung covers: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Ladder tip steps: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Turntable access: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Turntable access handrails: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Turntable railings: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Breathing air system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Stabilizers/outriggers: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Waterway: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Deluge gun: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Pressure relief valve: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Waterway drains: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Waterway flowmeter: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Hydraulic pump: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Hydraulic reservoir: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Auxiliary hydraulic pump: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Rotation system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Elevation system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Extension system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Communication system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Turntable controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Platform: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Water curtain system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Platform heat shield: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Platform controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Platform leveling system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Work lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Ladder/boom lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Spotlight(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Signs and labeling: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be required, replaced, upgraded, or added in addition to the items specified above: _____

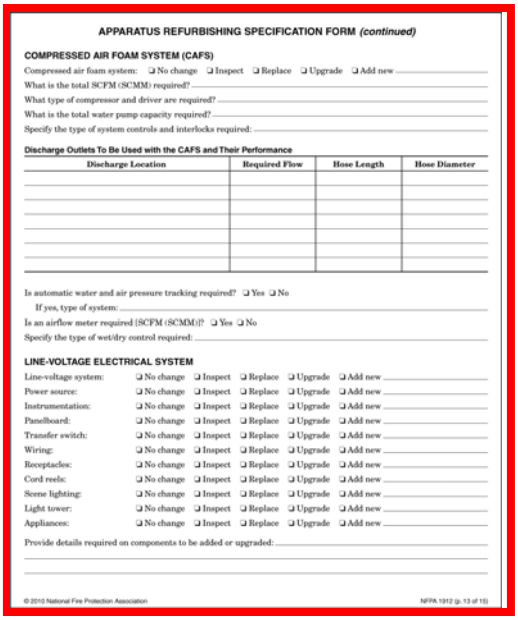
FOAM PROPORTIONING SYSTEMS

Foam system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Type of foam system: _____
Type(s) of foam to be used: _____
Foam concentrate capacity: _____ gal (L)

Discharge Outlets To Be Used with Foam and Their Performance

Discharge Location	Required Flow	Proportioning Rate	Hose Length	Hose Diameter

Is an outside foam system inlet of pickup required? ❑ Yes ❑ No
Type: _____
Is a foam tank refill system required? ❑ Yes ❑ No
If yes, performance requirements: _____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

COMPRESSED AIR FOAM SYSTEM (CAFS)

Compressed air foam system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
What is the total SCFM (SCMM) required? _____
What type of compressor and driver are required? _____
What is the total water pump capacity required? _____
Specify the type of system controls and interlocks required: _____

Discharge Outlets To Be Used with the CAFS and Their Performance

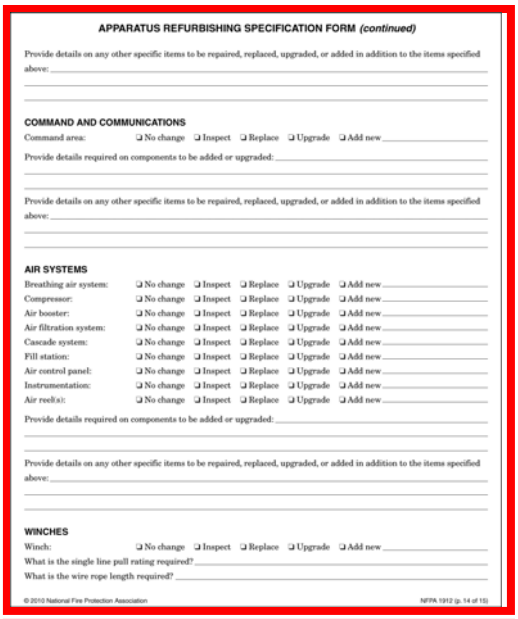
Discharge Location	Required Flow	Hose Length	Hose Diameter

Is automatic water and air pressure tracking required? ❑ Yes ❑ No
If yes, type of system: _____
Is an airflow meter required (SCFM (SCMM))? ❑ Yes ❑ No
Specify the type of wet/dry control required: _____

LINE-VOLTAGE ELECTRICAL SYSTEM

Line-voltage system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Power source: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Instrumentation: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Panelboard: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Transfer switch: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Wiring: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Receptacles: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Cord reels: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Scene lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Light tower: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Appliances: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

COMMAND AND COMMUNICATIONS

Command area: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

AIR SYSTEMS

Breathing air system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Compressor: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air booster: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air filtration system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Cascade system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Fill station: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air control panel: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Instrumentation: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air reel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

WINCHES

Winch: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
What is the single line pull rating required? _____
What is the wire rope length required? _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Power source: ❑ Electric ❑ Hydraulic
Specify winch location: _____
Type of control required: _____
Location of control: _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

VEHICLE PROTECTION SYSTEM

Brush guards and rails: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Grille guard: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Skid plates ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

APPARATUS REFURBISHING SPECIFICATION FORM

For any items that are to be added or upgraded, provide as much detail as needed to allow the refurbisher to provide the desired components and workmanship. Add additional sheets as necessary. Consult the appropriate sections of NFPA 1901, *Standard for Automotive Apparatus*, or NFPA 1906, *Standard for Wildland Fire Apparatus*, for details that might need to be specified for new or significantly upgraded systems.

PROCUREMENT ISSUES

This is a request for ❑ Bid ❑ Proposal

Date of bid/proposal opening: _____

Purchaser's name and address: _____

_____

Contact name and telephone number: _____

Sealed bid envelope information, address, and identification marking: _____

_____

The bidder is to honor the bid price for _____ days.

When will the apparatus be available to start the refurbishment? _____

How will the apparatus be delivered to the refurbisher? _____

If an interim inspection trip(s) to the refurbishing plant is to be provided, indicate:

Number of trips: _____ Number of participants: _____ Who will pay expenses? _____

How many parts, service, and operation manuals are to be provided? _____

❑ Complete or ❑ Partial manuals required.

Where is the delivery of the refurbished apparatus to occur? _____

Where and when is the acceptance to occur? _____

Is operation and service instruction and demonstration required? _____ Where? _____

For _____ persons for _____ days.

Specify the details of any special payment plan or schedule required: _____

_____

Is an approval drawing required? ❑ Yes ❑ No

Is a bid bond required? ❑ Yes ❑ No What percent of bid price? _____

Is a performance bond required? ❑ Yes ❑ No What percent of bid price? _____

If an extended warranty on specific components is required, indicate which components and the length of the warranty:

_____

Is a warranty bond required? ❑ Yes ❑ No In what amount? _____

GENERAL REQUIREMENTS

What are the maximum allowable dimensions of the apparatus?

Overall height in in. (mm): _____ (measured at the highest projection)

Overall length in in. (mm): _____ (measured at the front and rearmost projections)

Wheelbase in in. (mm): _____ (only if it is to change)

Width in in. (mm): _____ (measured at the outside of the mirrors)

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Maximum weight on the front axle in lb (kg): _____ (only if it is different from current front GAWR)

Maximum weight on the rear axle in lb (kg): _____ (only if it is different from current rear GAWR)

What is the maximum wall-to-wall turning radius allowable? _____ ft (m)

Maximum elevation at which the apparatus will operate if over 2000 ft (600 m): _____

Maximum grade that the apparatus will climb if over 6 percent (across 20 percent, up/down 25 percent, stationary 10 percent grades for wildland fire apparatus): _____

Specify the minimum ambient air temperature in which the apparatus is to operate: _____ (°F) (°C)

Specify the maximum ambient air temperature in which the apparatus is to operate: _____ (°F) (°C)

Specify the apparatus road performance if it is to exceed the minimum specified in this standard: _____

_____

Specify maximum road speed required (only if upgrading engine, transmission, drive axle, or tires): _____

Specify the maximum number of persons to ride on the apparatus: _____

Hose Thread Size Information (required if changing or upgrading intakes or discharges)

TPI x OD or size and type (e.g., 2½ in. NH or 4 in. Storz)	
1 in. =	1½ in. =
2 in. =	2½ in. =
3 in. =	3½ in. =
4 in. =	4½ in. =
5 in. =	6 in. =
Hydrant =	

Testing and Acceptance

If independent certification of tests is required for the pump system, aerial device, line-voltage power source, or other systems, what independent testing organization is to certify the tests? _____

Is anyone representing the purchaser to witness the refurbisher's pre-delivery tests? ❑ Yes ❑ No

If yes, who? _____

Where are the road tests to be conducted? _____

What tests will the contractor be required to perform on delivery? _____

APPARATUS TYPE

This apparatus is to be used as a(n):

❑ Pumper
❑ Initial attack apparatus
❑ Mobil water supply apparatus
❑ Aerial fire apparatus
❑ Quint fire apparatus
❑ Special service apparatus
❑ Mobil foam fire apparatus
❑ Wildland fire suppression apparatus
❑ Wildland mobile water supply fire apparatus
❑ Wildland fire crew carrier apparatus

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

What functions or services is this apparatus to perform? _____

_____

_____

Suction Hose

Hose: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new

Soft or hard: _____

Size and length: _____

Connection type and size: _____

Mounting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new

Arrangement, bracket style, and location: _____

_____

Ground Ladders

Number	Length	Type	Mounting Location and Bracket	Source
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition
				❑ Use existing ❑ Replace ❑ Addition

Indicate whether a specific type or make of ladder is desired for replacements and additions: _____

_____

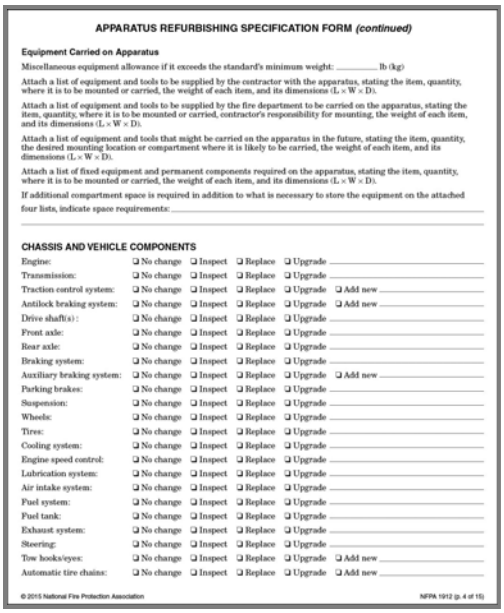
Breathing Apparatus

Quantity	Make/Model	Mounting Location	Source
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply
			❑ Use existing ❑ Contractor supply ❑ Purchaser supply

Special requirements for breathing apparatus or its mounting, including diameters of SCBA cylinders to be utilized:

_____

_____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Equipment Carried on Apparatus

Miscellaneous equipment allowance if it exceeds the standard's minimum weight: _____ lb (kg)

Attach a list of equipment and tools to be supplied by the contractor with the apparatus, stating the item, quantity, where it is to be mounted or carried, the weight of each item, and its dimensions (L × W × D).

Attach a list of equipment and tools to be supplied by the fire department to be carried on the apparatus, stating the item, quantity, where it is to be mounted or carried, contractor's responsibility for mounting, the weight of each item, and its dimensions (L × W × D).

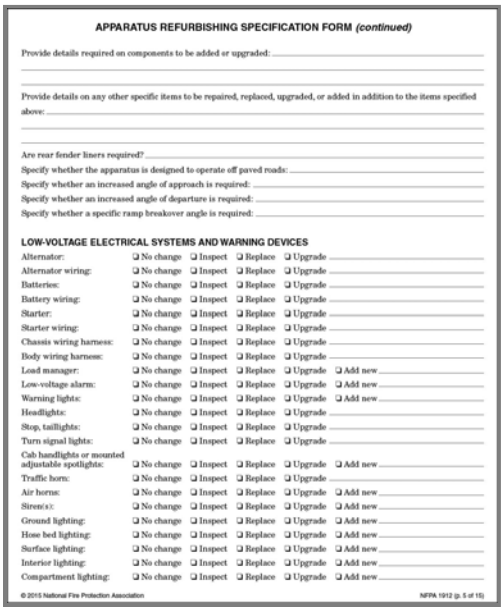
Attach a list of equipment and tools that might be carried on the apparatus in the future, stating the item, quantity, the desired mounting location or compartment where it is likely to be carried, the weight of each item, and its dimensions (L × W × D).

Attach a list of fixed equipment and permanent components required on the apparatus, stating the item, quantity, where it is to be mounted or carried, the weight of each item, and its dimensions (L × W × D).

If additional compartment space is required in addition to what is necessary to store the equipment on the attached four lists, indicate space requirements: _____

CHASSIS AND VEHICLE COMPONENTS

Engine:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Transmission:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Traction control system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Antilock braking system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Drive shaft(s) :	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Front axle:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Rear axle:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Braking system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Auxiliary braking system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Parking brakes:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Suspension:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Wheels:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Tires:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Cooling system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Engine speed control:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Lubrication system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Air intake system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Fuel system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Fuel tank:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Exhaust system:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Steering:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Tow hooks/eyes:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Automatic tire chains:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Are rear fender liners required? _____

Specify whether the apparatus is designed to operate off paved roads: _____

Specify whether an increased angle of approach is required: _____

Specify whether an increased angle of departure is required: _____

Specify whether a specific ramp breakover angle is required: _____

LOW-VOLTAGE ELECTRICAL SYSTEMS AND WARNING DEVICES

Alternator:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Alternator wiring:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Batteries:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Battery wiring:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Starter:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Starter wiring:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Chassis wiring harness:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Body wiring harness:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Load manager:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Low-voltage alarm:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Warning lights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Headlights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Stop, taillights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Turn signal lights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Cab handlights or mounted adjustable spotlights:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Traffic horn:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	_____
Air horns:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Siren(s):	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Ground lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Hose bed lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Surface lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Interior lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Compartment lighting:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Hazard light: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Backup alarm: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Battery charger/conditioner: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Specify any electrical loads beyond those defined in the standard that are to be part of the minimum continuous electrical load: _____
If a load management system is being replaced, upgraded, or added, specify the sequence of load shedding: _____

Warning Lights To Be Upgraded or Added

Location	Make and Model	Color
Upper level, forward-facing		
Upper level, side-facing, front		
Upper level, side-facing, midship		
Upper level, side-facing, rear		
Upper level, rear-facing		
Lower level, forward-facing		
Lower level, side-facing, front		
Lower level, side-facing, midship		
Lower level, side-facing, rear		
Lower level, rear-facing		

DRIVING AND CREW COMPARTMENTS

Cab: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Doors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Personnel enclosure: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Seat belts: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Seats: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
SCBA mounting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Equipment mounting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

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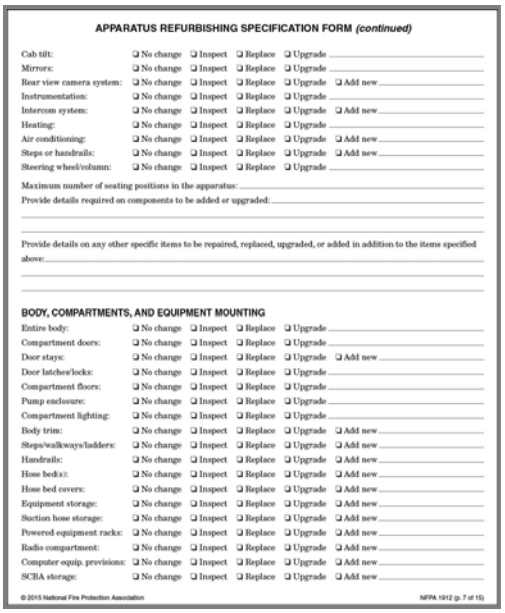

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Cab tilt: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Mirrors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Rear view camera system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Instrumentation: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Intercom system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Heating: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Air conditioning: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Steps or handrails: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Steering wheel/column: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Maximum number of seating positions in the apparatus: _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

BODY, COMPARTMENTS, AND EQUIPMENT MOUNTING

Entire body: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Compartment doors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Door stays: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Door latches/locks: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Compartment floors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Pump enclosure: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Compartment lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Body trim: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Steps/walkways/ladders: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Handrails: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Hose bed(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Hose bed covers: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Equipment storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Suction hose storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Powered equipment racks: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Radio compartment: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Computer equip. provisions: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
SCBA storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

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APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

SCBA bottle storage: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Pump panel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Receivers/anchors: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Body material: _____
Tread plate material: _____
Color scheme of apparatus: _____
Paint number(s) and manufacturer, if known: _____
Striping, decoration, and lettering required: _____
List any areas not to be painted: _____
Is rustproof treatment required? ❑ Yes ❑ No
Provide details of locations to be treated: _____

Hose To Be Carried for Preconnected Lines

Length	Size	Location	Bed or Reel

Hose To Be Carried in Hose Bed or on Reels

Length	Size	Location	Bed or Reel

Specify any requirements for anchoring and lifting a slip-on fire-fighting unit: _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

FIRE PUMP, WATER PUMP, OR INDUSTRIAL SUPPLY PUMP

Pump: ❑ Use existing pump ❑ Overhaul ❑ Replace ❑ Upgrade _____
Pump drive engine: ❑ Not applicable ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Discharges: ❑ No changes
❑ Add new discharges _____
❑ Remove discharges _____
❑ Upgrade discharges _____
Deck gun: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Booster reel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Intakes: ❑ No changes
❑ Add new intakes _____
❑ Remove intakes _____
❑ Upgrade intakes _____
Valves: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Valve controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Intake relief system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Pressure control system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Priming system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Gauges: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Flowmeters: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Pump-rated capacity: _____ gpm (L/min) at _____ psi (kPa) with _____ stages
Pump-and-roll capacity, if required: _____ gpm (L/min) at _____ psi (kPa) at vehicle speed _____ mph (km/hr)
Specify pump performance requirements:
If altitude over 2000 ft (600 m), specify altitude: _____
If lift over 10 ft (3 m) (less for large pumps, see NFPA 1901), specify lift: _____
If through more than 20 ft (6 m) of suction hose, specify length: _____
Do local water conditions require special materials for pump and related piping? _____
Is pump panel color-coding required? _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

AUXILIARY PUMP

Pump: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Pump drive engine: ❑ Not applicable ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Discharges: ❑ No changes

❑ Add new discharges _____

❑ Remove discharges _____

❑ Upgrade discharges _____

Booster reel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Intakes: ❑ No changes

❑ Add new intakes _____

❑ Remove intakes _____

❑ Upgrade intakes _____

Valves: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Valve controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Intake relief system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Pressure control system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Drains: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Priming system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Gauges: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Flowmeters: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Pump-rated capacity: _____ gpm (L/min) at _____ psi (kPa)

Pump-and-roll capacity, if required: _____ gpm (L/min) at _____ psi (kPa) at vehicle speed _____ mph (km/hr)

Specify pump performance requirements:

If altitude over 2000 ft (600 m), specify altitude: _____

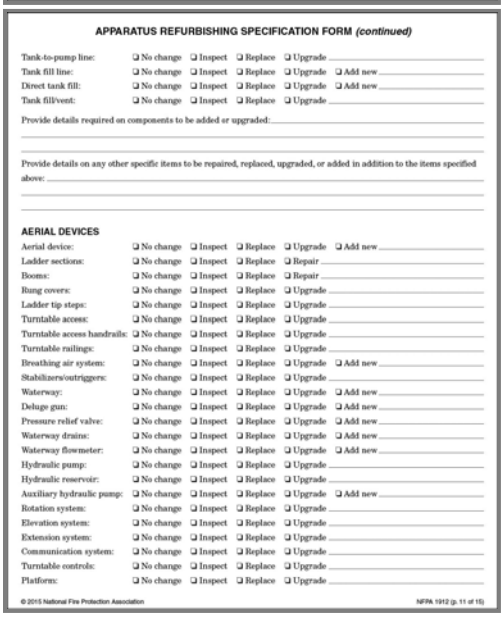
WATER TANK

Water tank: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Baffles: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Foam cell: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Tank level gauge: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Tank-to-pump line: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Tank fill line: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Direct tank fill: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Tank fill/vent: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

AERIAL DEVICES

Aerial device: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Ladder sections: ❑ No change ❑ Inspect ❑ Replace ❑ Repair _____

Booms: ❑ No change ❑ Inspect ❑ Replace ❑ Repair _____

Rung covers: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Ladder tip steps: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Turntable access: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Turntable access handrails: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Turntable railings: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Breathing air system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Stabilizers/outriggers: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Waterway: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Deluge gun: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Pressure relief valve: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Waterway drains: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Waterway flowmeter: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Hydraulic pump: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Hydraulic reservoir: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Auxiliary hydraulic pump: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Rotation system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Elevation system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Extension system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Communication system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Turntable controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Platform: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Water curtain system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Platform heat shield: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Platform controls: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Platform leveling system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____
Work lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Ladder/boom lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Spotlight(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Signs and labeling: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

FOAM PROPORTIONING SYSTEMS

Foam system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Type of foam system: _____
Type(s) of foam to be used: _____
Foam concentrate capacity: _____ gal (L)

Discharge Outlets To Be Used with Foam and Their Performance

Discharge Location	Required Flow	Proportioning Rate	Hose Length	Hose Diameter

Is an outside foam system inlet of pickup required? ❑ Yes ❑ No
Type: _____
Is a foam tank refill system required? ❑ Yes ❑ No
If yes, performance requirements: _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

COMPRESSED AIR FOAM SYSTEM (CAFS)

Compressed air foam system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
What is the total SCFM (SCMM) required? _____
What type of compressor and driver are required? _____
What is the total water pump capacity required? _____
Specify the type of system controls and interlocks required: _____

Discharge Outlets To Be Used with the CAFS and Their Performance

Discharge Location	Required Flow	Hose Length	Hose Diameter

Is automatic water and air pressure tracking required? ❑ Yes ❑ No
If yes, type of system: _____
Is an airflow meter required (SCFM (SCMM))? ❑ Yes ❑ No
Specify the type of wet/dry control required: _____

LINE-VOLTAGE ELECTRICAL SYSTEM

Line-voltage system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Power source: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Instrumentation: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Panelboard: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Transfer switch: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Wiring: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Receptacles: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Cord reels: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Scene lighting: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Light tower: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Appliances: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

COMMAND AND COMMUNICATIONS

Command area: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

AIR SYSTEMS

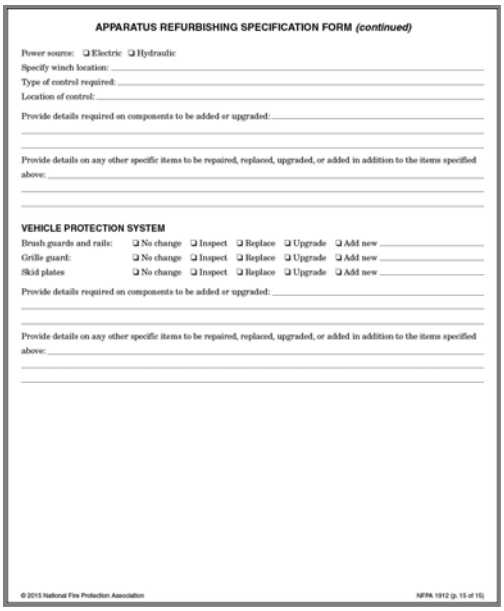
Breathing air system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Compressor: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air booster: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air filtration system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Cascade system: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Fill station: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air control panel: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Instrumentation: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
Air reel(s): ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

WINCHES

Winch: ❑ No change ❑ Inspect ❑ Replace ❑ Upgrade ❑ Add new _____
What is the single line pull rating required? _____
What is the wire rope length required? _____



APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Power source: ❑ Electric ❑ Hydraulic
Specify winch location: _____
Type of control required: _____
Location of control: _____
Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

VEHICLE PROTECTION SYSTEM

Brush guards and rails:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Grille guard:	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____
Skid plates	❑ No change	❑ Inspect	❑ Replace	❑ Upgrade	❑ Add new _____

Provide details required on components to be added or upgraded: _____

Provide details on any other specific items to be repaired, replaced, upgraded, or added in addition to the items specified above: _____

Supplemental Information

File Name	Description
Figure_B.1_-_p.2_of_15.pdf	

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 13 14:50:49 EDT 2014

Committee Statement

Committee Statement: Updating Figure B.1 only. Updating terminology from "wildland fire apparatus" to "wildland fire suppression apparatus" in accordance with changes made to section 3.3.53 and terminology changes in NFPA 1906, Standard for Wildland Fire Apparatus, 2016 edition. Also, adding check boxes for "Wildland Mobile Water Supply Fire Apparatus" and "Wildland Fire Crew Carrier Apparatus" to be consistent with terminology in NFPA 1906.

Response Message:

APPARATUS REFURBISHING SPECIFICATION FORM *(continued)*

Maximum weight on the front axle in lb (kg): _____ (only if it is different from current front GAWR)

Maximum weight on the rear axle in lb (kg): _____ (only if it is different from current rear GAWR)

What is the maximum wall-to-wall turning radius allowable? _____ ft (m)

Maximum elevation at which the apparatus will operate if over 2000 ft (600 m): _____

Maximum grade that the apparatus will climb if over 6 percent (across 20 percent, up/down 25 percent, stationary 10 percent grades for wildland fire apparatus): _____

Specify the minimum ambient air temperature in which the apparatus is to operate: _____ (°F) (°C)

Specify the maximum ambient air temperature in which the apparatus is to operate: _____ (°F) (°C)

Specify the apparatus road performance if it is to exceed the minimum specified in this standard: _____

_____

Specify maximum road speed required (only if upgrading engine, transmission, drive axle, or tires): _____

Specify the maximum number of persons to ride on the apparatus: _____

Hose Thread Size Information (required if changing or upgrading intakes or discharges)

TPI × OD or size and type (e.g., 2½ in. NH or 4 in. Storz)	
1 in. =	1½ in. =
2 in. =	2½ in. =
3 in. =	3½ in. =
4 in. =	4½ in. =
5 in. =	6 in. =
Hydrant =	

Testing and Acceptance

If independent certification of tests is required for the pump system, aerial device, line-voltage power source, or other systems, what independent testing organization is to certify the tests? _____

Is anyone representing the purchaser to witness the refurbisher's pre-delivery tests? ❑ Yes ❑ No

If yes, who? _____

Where are the road tests to be conducted? _____

What tests will the contractor be required to perform on delivery? _____

APPARATUS TYPE

This apparatus is to be used as a(n):

- ❑ Pumper
- ❑ Initial attack apparatus
- ❑ Mobil water supply apparatus
- ❑ Aerial fire apparatus
- ❑ Quint fire apparatus
- ❑ Special service apparatus
- ❑ Mobil foam fire apparatus
- ❑ Wildland fire apparatus SUPPRESSION

❑ WILDLAND MOBILE WATER SUPPLY FIRE APPARATUS

❑ WILDLAND FIRE CREW CARRIER APPARATUS

FIGURE B.1 *Continued*

First Revision No. 32-NFPA 1912-2014 [Chapter C]

Annex C Weights and Dimensions for Common Equipment

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

C.1

~~NFPA in cooperation with the~~ The Fire Apparatus Manufacturers Association (FAMA) ~~has provided~~ provides the worksheet ~~shown as~~ ~~Figure C.1~~ for use by the purchaser in calculating the portable equipment load anticipated to be carried on the apparatus. To ensure that the apparatus chassis is capable of carrying the installed equipment (pump, tank, aerial device, etc.) plus the specified portable equipment load with an appropriate margin of safety, the purchaser should use this worksheet to provide apparatus vendors with the weight of the equipment they anticipate carrying when the apparatus is placed in service. [**1901,** 2016]

~~**Figure C.1 Worksheet for Determining Equipment Weight on Fire Apparatus.**~~

DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Ground Ladders					
Ladder, A-frame combo, 14 ft	20.5 × 6.25 × 116	33			
Ladder, attic	2.5 × 1.5 × 137	14			
Ladder, combo folding (Little Giant-type)	20 × 7.75 × 102	28			
Ladder, extension, 2 section, 14 ft	21 × 5 × 115	53			
Ladder, extension, 2 section, 16 ft	23 × 5 × 129	59			
Ladder, extension, 2 section, 20 ft	21 × 5 × 144	66			
Ladder, extension, 2 section, 24 ft	21 × 5 × 171	75			
Ladder, extension, 2 section, 28 ft	22 × 5.75 × 199	114			
Ladder, extension, 3 section, 28 ft	25 × 8.25 × 160	145			
Ladder, extension, 3 section, 30 ft	25 × 8.25 × 174	156			
Ladder, extension, 3 section, 35 ft	25 × 8.25 × 188	170			
Ladder, folding, 8 ft	22.5 × 5.5 × 96	38			
Ladder, folding, 10 ft	30.75 × 5.5 × 120	47			
Ladder, Fresno, 10 ft	13.5 × 5 × 87	41			
Ladder, Fresno, 12 ft	13.5 × 5 × 101	46			
Ladder, Fresno, 14 ft	13.5 × 5 × 115	51			
Ladder, roof, 12 ft, with hooks	19.25 × 2.75 × 144	36			
Ladder, roof, 14 ft, with hooks	19.25 × 2.75 × 166	42			
Ladder, roof, 16 ft, with hooks	19.25 × 2.75 × 192	48			
Pike Poles					
Hook, dry wall, 6 ft	Head 7.25 × 5.5 × 5, handle 64.75 × 1.5 ID	8			
Hook, dry wall, 8 ft	Head 7.25 × 5.5 × 5, handle 88.75 × 1.5 ID	10			
Pike pole, 6 ft	1.5 × 72	6			
Pike pole, 8 ft	1.5 × 96	8			
Pike pole, 10 ft	1.5 × 120	10			
Pike pole, 12 ft	1.5 × 144	12			
Pike pole, closet hook, 3 ft	1.5 × 36	5			
Hose					
Hose, booster, 0.75 in. × 100 ft	0.75 × 1200	59			
Hose, booster, 0.75 in. × 50 ft	0.75 × 600	30			
Hose, booster, 1 in. × 100 ft	1 × 1200	79			
Hose, booster, 1 in. × 50 ft	1 × 600	41			
Hose, DJ, 1.5 in. × 50 ft (roll)	3 × 18.5	18			
Hose, DJ, 1.75 in. × 50 ft, w/ 1.5 in. couplings (roll)	3.25 × 18.5	19			
Hose, DJ, 2.5 in. × 50 ft (roll)	4.5 × 20	32			

For SI units, 1 in. = 25.4 mm; 1 lb = 0.45 kg

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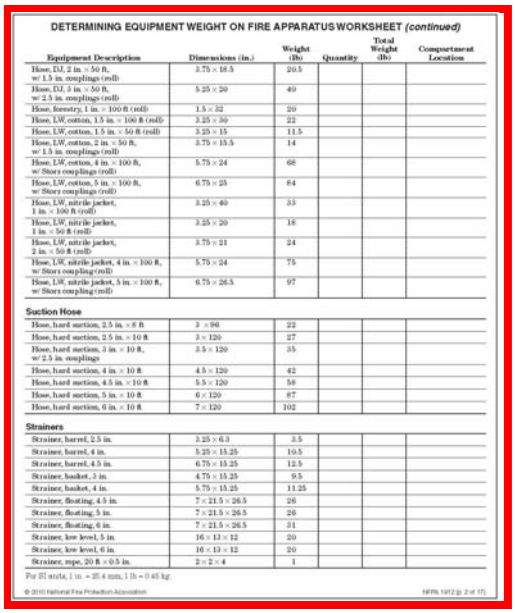
~~**Figure C.1 *Continued***~~



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Hose, DJ, 2 in. × 50 ft, w/ 1.5 in. couplings (roll)	3.75 × 18.5	20.5			
Hose, DJ, 3 in. × 50 ft, w/ 2.5 in. couplings (roll)	5.25 × 20	40			
Hose, forestry, 1 in. × 100 ft (roll)	1.5 × 32	20			
Hose, LW, cotton, 1.5 in. × 100 ft (roll)	3.25 × 30	22			
Hose, LW, cotton, 1.5 in. × 50 ft (roll)	3.25 × 15	11.5			
Hose, LW, cotton, 2 in. × 50 ft, w/ 1.5 in. couplings (roll)	3.75 × 15.5	14			
Hose, LW, cotton, 4 in. × 100 ft, w/ Storz couplings (roll)	5.75 × 24	68			
Hose, LW, cotton, 5 in. × 100 ft, w/ Storz couplings (roll)	6.75 × 25	84			
Hose, LW, nitrile jacket, 1 in. × 100 ft (roll)	3.25 × 40	33			
Hose, LW, nitrile jacket, 1 in. × 50 ft (roll)	3.25 × 20	18			
Hose, LW, nitrile jacket, 2 in. × 50 ft (roll)	3.75 × 21	24			
Hose, LW, nitrile jacket, 4 in. × 100 ft, w/ Storz coupling (roll)	5.75 × 24	75			
Hose, LW, nitrile jacket, 5 in. × 100 ft, w/ Storz coupling (roll)	6.75 × 26.5	97			
Suction Hose					
Hose, hard suction, 2.5 in. × 6 ft	3 × 96	22			
Hose, hard suction, 2.5 in. × 10 ft	3 × 120	27			
Hose, hard suction, 3 in. × 10 ft, w/ 2.5 in. couplings	3.5 × 120	35			
Hose, hard suction, 4 in. × 10 ft	4.5 × 120	42			
Hose, hard suction, 4.5 in. × 10 ft	5.5 × 120	56			
Hose, hard suction, 5 in. × 10 ft	6 × 120	87			
Hose, hard suction, 6 in. × 10 ft	7 × 120	102			
Strainers					
Strainer, barrel, 2.5 in.	3.25 × 6.5	3.5			
Strainer, barrel, 4 in.	5.25 × 15.25	10.5			
Strainer, barrel, 4.5 in.	6.75 × 15.25	12.5			
Strainer, basket, 3 in.	4.75 × 15.25	9.5			
Strainer, basket, 4 in.	5.75 × 15.25	11.25			
Strainer, floating, 4.5 in.	7 × 21.5 × 26.5	26			
Strainer, floating, 5 in.	7 × 21.5 × 26.5	26			
Strainer, floating, 6 in.	7 × 21.5 × 26.5	31			
Strainer, low level, 5 in.	16 × 13 × 12	20			
Strainer, low level, 6 in.	16 × 13 × 12	20			
Strainer, rope, 20 ft × 0.5 in.	2 × 2 × 4	1			

For SI units, 1 in. = 25.4 mm, 1 lb = 0.45 kg.

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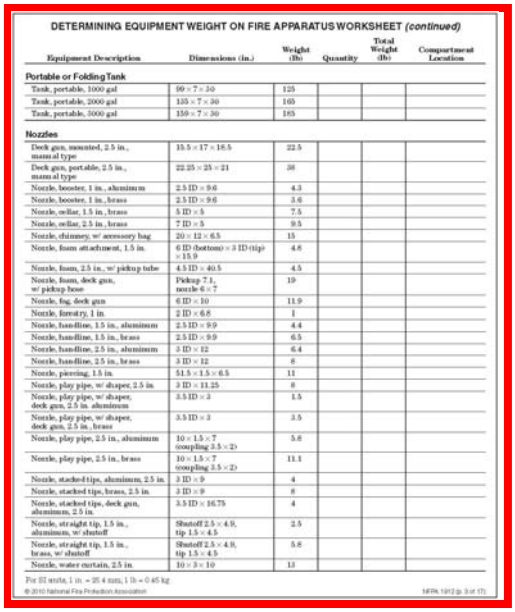
Figure C.1 *Continued*



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Portable or Folding Tank					
Tank, portable, 1000 gal	99 × 7 × 30	125			
Tank, portable, 2000 gal	135 × 7 × 30	165			
Tank, portable, 3000 gal	159 × 7 × 30	165			
Nozzles					
Deck gun, mounted, 2.5 in., manual type	13.5 × 17 × 16.5	22.5			
Deck gun, portable, 2.5 in., manual type	22.25 × 25 × 21	38			
Nozzle, booster, 1 in., aluminum	2.5 ID × 9.6	4.3			
Nozzle, booster, 1 in., brass	2.5 ID × 9.6	3.6			
Nozzle, cellar, 1.5 in., brass	5 ID × 5	7.5			
Nozzle, cellar, 2.5 in., brass	7 ID × 5	9.5			
Nozzle, chimney, w/ accessory bag	20 × 12 × 6.5	13			
Nozzle, foam attachment, 1.5 in.	6 ID (bottom) × 3 ID (tip) × 15.9	4.8			
Nozzle, foam, 2.5 in., w/ pickup tube	4.5 ID × 40.5	4.5			
Nozzle, foam, deck gun, w/ pickup hose	Pickup 7.1, nozzle 6 × 7	19			
Nozzle, fog, deck gun	6 ID × 10	11.9			
Nozzle, forestry, 1 in.	2 ID × 6.8	1			
Nozzle, handline, 1.5 in., aluminum	2.5 ID × 9.9	4.4			
Nozzle, handline, 1.5 in., brass	2.5 ID × 9.9	6.5			
Nozzle, handline, 2.5 in., aluminum	3 ID × 12	6.4			
Nozzle, handline, 2.5 in., brass	3 ID × 12	6			
Nozzle, piercing, 1.5 in.	31.5 × 1.5 × 6.5	11			
Nozzle, play pipe, w/ shaper, 2.5 in.	3 ID × 11.25	8			
Nozzle, play pipe, w/ shaper, deck gun, 2.5 in. aluminum	3.5 ID × 3	1.5			
Nozzle, play pipe, w/ shaper, deck gun, 2.5 in., brass	3.5 ID × 3	3.5			
Nozzle, play pipe, 2.5 in., aluminum	10 × 1.5 × 7 (coupling 3.5 × 2)	5.8			
Nozzle, play pipe, 2.5 in., brass	10 × 1.5 × 7 (coupling 3.5 × 2)	11.1			
Nozzle, stacked tips, aluminum, 2.5 in.	3 ID × 9	4			
Nozzle, stacked tips, brass, 2.5 in.	3 ID × 9	8			
Nozzle, stacked tips, deck gun, aluminum, 2.5 in.	3.5 ID × 16.75	4			
Nozzle, straight tip, 1.5 in., aluminum, w/ shutoff	Shutoff 2.5 × 4.9, tip 1.5 × 4.5	2.5			
Nozzle, straight tip, 1.5 in., brass, w/ shutoff	Shutoff 2.5 × 4.9, tip 1.5 × 4.5	5.8			
Nozzle, water curtain, 2.5 in.	10 × 3 × 10	13			

For SI units, 1 in. = 25.4 mm, 1 lb = 0.45 kg.

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Figure C.1 *Continued*

DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Adapters, Fittings, Caps					
Adapter, 4 in. F × 4 in. Storz, aluminum	3.75 × 6 ID	2.5			
Adapter, 4 in. F × 5 in. Storz, aluminum	3.5 × 7.75 ID	2.5			
Adapter, 4 in. F × 5 in. Storz, aluminum	3.75 × 7.75 ID	2.5			
Adapter, 4.5 in. F × 4 in. Storz, aluminum	3.75 × 6.5 ID	2.5			
Adapter, 4.5 in. F × 5 in. Storz, aluminum	3.5 × 7.75 ID	2.5			
Adapter, 5 in. F × 4 in. Storz, aluminum	3.5 × 6 ID	2.5			
Adapter, 5 in. F × 5 in. Storz, aluminum	4 × 7.75 ID	2.5			
Adapter, 6 in. F × 4 in. Storz, aluminum	3.5 × 6.75 ID	2.5			
Adapter, 6 in. F × 5 in. Storz, aluminum	4 × 6.75 ID	2.5			
Adapter, 6 in. F × 6 in. Storz, aluminum	4 × 6.75 ID	2.5			
Adapter, double female, 1.5 in., aluminum	3 × 2.5 ID	1			
Adapter, double female, 1.5 in., brass	3 × 2.5 ID	2			
Adapter, double female, 2.5 in., aluminum	3.25 × 4 ID	1			
Adapter, double female, 2.5 in., brass	3.25 × 4 ID	4			
Adapter, double male, 1.5 in., aluminum	2.5 × 2 ID	0.5			
Adapter, double male, 1.5 in., brass	2.5 × 2 ID	1			
Adapter, double male, 2.5 in., aluminum	3 × 4 ID	2			
Adapter, double male, 2.5 in., brass	3 × 4 ID	1			
Adapter, reducer, 1.5 in. F × 1 in. M, aluminum	1.5 × 3 ID	0.5			
Adapter, reducer, 1.5 in. F × 1 in. M, brass	1.5 × 3 ID	1			
Adapter, reducer, 2.5 in. F × 1.5 in. M, aluminum	2 × 4 ID	0.5			
Adapter, reducer, 2.5 in. F × 1.5 in. M, brass	2 × 4 ID	3			
Elbow, 2.5 in. F × 2.5 in. M, 30 degree, brass	6.5 × 4.5 ID	4.5			
Elbow, 2.5 in. F × 4 in. Storz, 30 degree, aluminum	7.5 × 6 ID	6			
Elbow, 2.5 in. F × 5 in. Storz, 30 degree, aluminum	7.5 × 7.5 ID	6.5			

For SI units, 1 in. = 25.4 mm; 1 lb = 0.45 kg

 NFPA 1912 (p. 4 of 17)

Figure C.1 *Continued*

DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Elbow, 3 in. F × 4 in. Storz, 30 degree, aluminum	7.5 × 6 ID	6.5			
Elbow, 3 in. F × 5 in. Storz, 30 degree, aluminum	7.5 × 7.5 ID	7			
Elbow, 4 in. F × 4 in. Storz, 30 degree, aluminum	8 × 6 ID	8			
Elbow, 4 in. F × 5 in. Storz, 30 degree, aluminum	8 × 7.5 ID	8.5			
Intake Valves					
Intake valve, external, 5 in. F × 4 in. Storz, w/ relief valve, aluminum	11 × 8.5 ID, 8 × 6.75 ID, 6 × 3 × 2.75	22.5			
Intake valve, external, 5 in. F × 4 in. Storz, w/ relief valve, brass	11 × 8.5 ID, 8 × 6.75 ID, 6 × 3 × 2.75	63.5			
Intake valve, external, 5 in. F × 5 in. M, w/ relief valve, aluminum	11 × 8.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	22.5			
Intake valve, external, 5 in. F × 5 in. M, w/ relief valve, brass	11 × 8.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	63.5			
Intake valve, external, 5 in. F × 5 in. Storz, w/ relief valve, aluminum	11 × 8.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	22.5			
Intake valve, external, 5 in. F × 5 in. Storz, w/ relief valve, brass	11 × 8.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	63.5			
Intake valve, external, 6 in. F × 4 in. Storz, w/ relief valve, aluminum	11 × 9.5 ID, 8 × 6.75 ID, 6 × 3 × 2.75	22.5			
Intake valve, external, 6 in. F × 4 in. Storz, w/ relief valve, brass	11 × 9.5 ID, 8 × 6.75 ID, 6 × 3 × 2.75	63.4			
Intake valve, external, 6 in. F × 5 in. Storz, w/ relief valve, aluminum	11 × 9.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	22.5			
Intake valve, external, 6 in. F × 5 in. Storz, w/ relief valve, brass	11 × 9.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	63.5			
Intake valve, external, 6 in. F × 6 in. M, w/ relief valve, aluminum	11 × 9.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	22.5			
Intake valve, external, 6 in. F × 6 in. M, w/ relief valve, brass	11 × 9.5 ID, 8 × 7.75 ID, 6 × 3 × 2.75	63.5			
Hose Equipment					
Intake, valve, gated, 4.5 in. F × 2.5 in. M, aluminum	11 ID × 7	11.5			
Siamese, gated, 5 in. F × (2) 2.5 in. F	10.5 × 12 × 6	29			
Siamese, gated, 6 in. F × (2) 2.5 in. F	10.5 × 12 × 7	29			
Valve, hydrant, 2.5 in. F × 2.5 in. M, aluminum	10.75 × 4.75 × 7.75	5.5			
Valve, hydrant, 2.5 in. F × 2.5 in. M, brass	10.75 × 4.75 × 7.76	14			
Water thief, gated, 2.5 in. F × 2.5 in. M, × (2) 1.5 in. M, aluminum	10.25 × 10 × 6	11			
Water thief, gated, 2.5 in. F × 2.5 in. M, × (2) 1.5 in. M, brass	10.25 × 10 × 6	23.5			

For SI units, 1 in. = 25.4 mm; 1 lb = 0.45 kg

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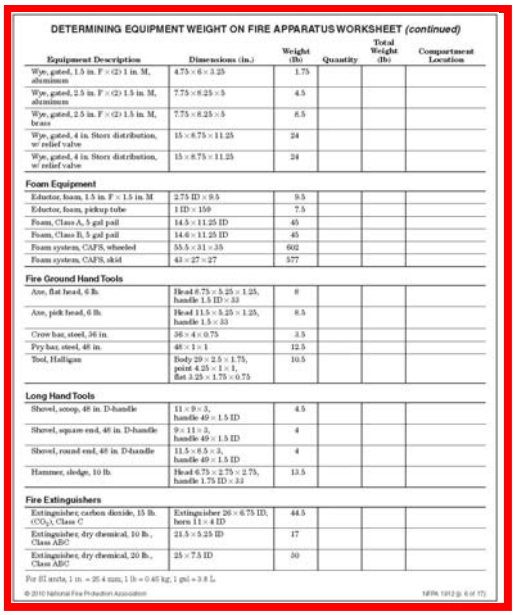
Figure C.1 *Continued*



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Wye, gated, 1.5 in. F × (2) 1 in. M, aluminum	4.75 × 6 × 3.25	1.75			
Wye, gated, 2.5 in. F × (2) 1.5 in. M, aluminum	7.75 × 8.25 × 5	4.5			
Wye, gated, 2.5 in. F × (2) 1.5 in. M, brass	7.75 × 8.25 × 5	8.5			
Wye, gated, 4 in. Storz distribution, w/ relief valve	15 × 8.75 × 11.25	24			
Wye, gated, 4 in. Storz distribution, w/ relief valve	15 × 8.75 × 11.25	24			
Foam Equipement					
Eductor, foam, 1.5 in. F × 1.5 in. M	2.75 ID × 9.5	9.5			
Eductor, foam, pickup tube	1 ID × 159	7.5			
Foam, Class A, 5 gal pail	14.5 × 11.25 ID	45			
Foam, Class B, 5 gal pail	14.6 × 11.25 ID	45			
Foam system, CAFS, wheeled	55.5 × 31 × 35	602			
Foam system, CAFS, skid	43 × 27 × 27	377			
Fire Ground Hand Tools					
Axe, flat head, 6 lb.	Head 6.75 × 5.25 × 1.25, handle 1.5 ID × 33	8			
Axe, pick head, 6 lb.	Head 11.5 × 5.25 × 1.25, handle 1.5 × 33	8.5			
Crow bar, steel, 36 in.	36 × 4 × 0.75	3.5			
Pry bar, steel, 48 in.	48 × 1 × 1	12.5			
Tool, Halligan	Body 29 × 2.5 × 1.75, point 4.25 × 1 × 1, flat 3.25 × 1.75 × 0.75	10.5			
Long Hand Tools					
Shovel, scoop, 48 in. D-handle	11 × 9 × 3, handle 49 × 1.5 ID	4.5			
Shovel, square end, 48 in. D-handle	9 × 11 × 3, handle 49 × 1.5 ID	4			
Shovel, round end, 48 in. D-handle	11.5 × 8.5 × 3, handle 49 × 1.5 ID	4			
Hammer, sledge, 10 lb.	Head 6.75 × 2.75 × 2.75, handle 1.75 ID × 33	13.5			
Fire Extinguishers					
Extinguisher, carbon dioxide, 15 lb. (CO_2), Class C	Extinguisher 26 × 6.75 ID, horn 11 × 4 ID	44.5			
Extinguisher, dry chemical, 10 lb., Class ABC	21.5 × 5.25 ID	17			
Extinguisher, dry chemical, 20 lb., Class ABC	25 × 7.5 ID	30			

For SI units, 1 in. = 25.4 mm; 1 lb = 0.45 kg; 1 gal = 3.8 L.

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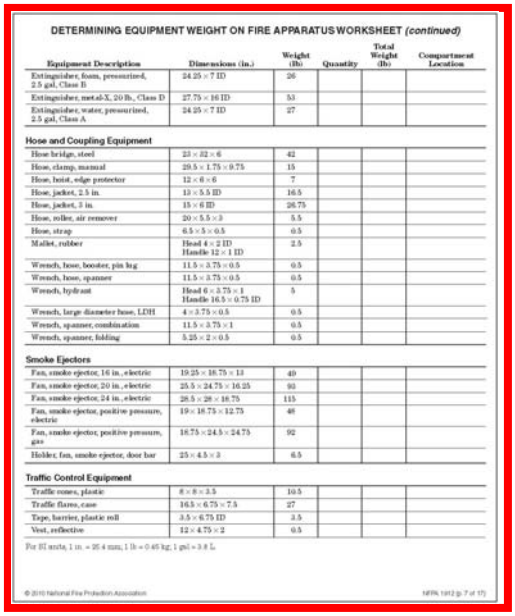
Figure C.1 *Continued*



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Extinguisher, foam, pressurized, 2.5 gal, Class B	24.25 × 7 ID	26			
Extinguisher, metal-X, 20 lb., Class D	27.75 × 16 ID	53			
Extinguisher, water, pressurized, 2.5 gal, Class A	24.25 × 7 ID	27			
Hose and Coupling Equipment					
Hose bridge, steel	23 × 32 × 6	42			
Hose, clamp, manual	29.5 × 1.75 × 9.75	15			
Hose, hoist, edge protector	12 × 6 × 6	7			
Hose, jacket, 2.5 in.	13 × 5.5 ID	16.5			
Hose, jacket, 3 in.	15 × 6 ID	26.75			
Hose, roller, air remover	20 × 5.5 × 3	5.5			
Hose, strap	6.5 × 3 × 0.5	0.5			
Mallet, rubber	Head 4 × 2 ID Handle 12 × 1 ID	2.5			
Wrench, hose, booster, pin lug	11.5 × 3.75 × 0.5	0.5			
Wrench, hose, spanner	11.5 × 3.75 × 0.5	0.5			
Wrench, hydrant	Head 6 × 3.75 × 1 Handle 16.5 × 0.75 ID	5			
Wrench, large diameter hose, LDH	4 × 3.75 × 0.5	0.5			
Wrench, spanner, combination	11.5 × 3.75 × 1	0.5			
Wrench, spanner, folding	5.25 × 2 × 0.5	0.5			
Smoke Ejectors					
Fan, smoke ejector, 16 in., electric	19.25 × 16.75 × 13	49			
Fan, smoke ejector, 20 in., electric	25.5 × 24.75 × 16.25	90			
Fan, smoke ejector, 24 in., electric	28.5 × 28 × 16.75	115			
Fan, smoke ejector, positive pressure, electric	19 × 16.75 × 12.75	46			
Fan, smoke ejector, positive pressure, gas	16.75 × 24.5 × 24.75	92			
Holder, fan, smoke ejector, door bar	25 × 4.5 × 3	6.5			
Traffic Control Equipment					
Traffic cones, plastic	8 × 8 × 3.5	10.5			
Traffic flares, case	16.5 × 6.75 × 7.5	27			
Tape, barrier, plastic roll	3.5 × 6.75 ID	3.5			
Vest, reflective	12 × 4.75 × 2	0.5			

For SI units, 1 in. = 25.4 mm; 1 lb = 0.45 kg; 1 gal = 3.8 L.

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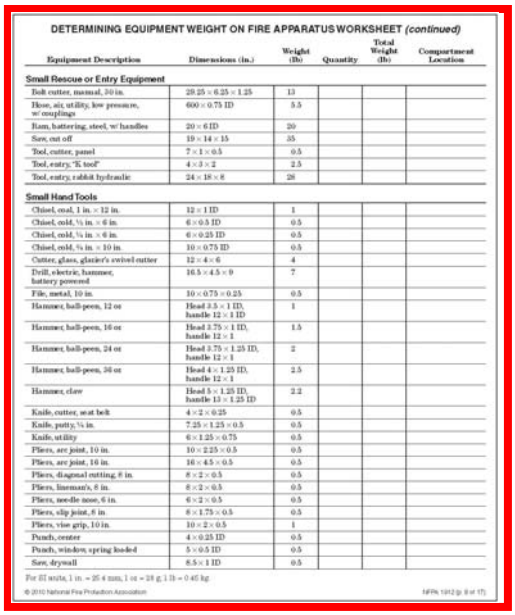
Figure C.1 *Continued*



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Small Rescue or Entry Equipment					
Bolt cutter, manual, 30 in.	29.25 × 6.25 × 1.25	13			
Hose, air, utility, low pressure, w/ couplings	600 × 0.75 ID	5.5			
Ram, battering, steel, w/ handles	20 × 6 ID	20			
Saw, cut off	19 × 14 × 15	35			
Tool, cutter, panel	7 × 1 × 0.5	0.5			
Tool, entry, "K tool"	4 × 3 × 2	2.5			
Tool, entry, rabbit hydraulic	24 × 18 × 8	28			
Small Hand Tools					
Chisel, cval, 1 in. × 12 in.	12 × 1 ID	1			
Chisel, cold, ½ in. × 6 in.	6 × 0.5 ID	0.5			
Chisel, cold, ¼ in. × 6 in.	6 × 0.25 ID	0.5			
Chisel, cold, ¾ in. × 10 in.	10 × 0.75 ID	0.5			
Cutter, glass, glazier's swivel cutter	12 × 4 × 6	4			
Drill, electric, hammer, battery powered	16.5 × 4.5 × 9	7			
File, metal, 10 in.	10 × 0.75 × 0.25	0.5			
Hammer, ball-peen, 12 oz	Head 3.5 × 1 ID, handle 12 × 1 ID	1			
Hammer, ball-peen, 16 oz	Head 3.75 × 1 ID, handle 12 × 1	1.5			
Hammer, ball-peen, 24 oz	Head 3.75 × 1.25 ID, handle 12 × 1	2			
Hammer, ball-peen, 36 oz	Head 4 × 1.25 ID, handle 12 × 1	2.5			
Hammer, claw	Head 5 × 1.25 ID, handle 13 × 1.25 ID	2.2			
Knife, cutter, seat belt	4 × 2 × 0.25	0.5			
Knife, putty, ¼ in.	7.25 × 1.25 × 0.5	0.5			
Knife, utility	6 × 1.25 × 0.75	0.5			
Pliers, arc joint, 10 in.	10 × 2.25 × 0.5	0.5			
Pliers, arc joint, 16 in.	16 × 4.5 × 0.5	0.5			
Pliers, diagonal cutting, 8 in.	8 × 2 × 0.5	0.5			
Pliers, lineman's, 8 in.	8 × 2 × 0.5	0.5			
Pliers, needle nose, 6 in.	6 × 2 × 0.5	0.5			
Pliers, slip joint, 6 in.	8 × 1.75 × 0.5	0.5			
Pliers, vise grip, 10 in.	10 × 2 × 0.5	1			
Punch, center	4 × 0.25 ID	0.5			
Punch, window, spring loaded	5 × 0.5 ID	0.5			
Saw, drywall	8.5 × 1 ID	0.5			

For SI units, 1 in. = 25.4 mm, 1 oz = 28 g, 1 lb = 0.45 kg

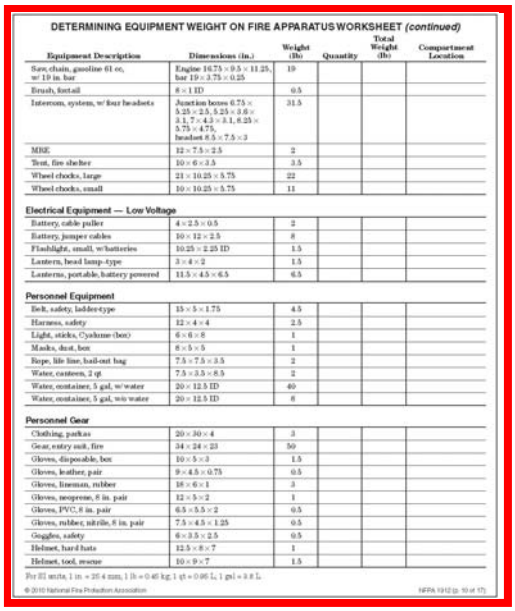
~~Figure C.1 *Continued*~~

DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Saw, hand hacksaw, w/ spare blades and wire blades	18.5 × 4 × 1	1.5			
Saw, hand, crosscut	28 × 6 × 1	1.5			
Screwdriver, Phillips, #2 × 6	8 × 1.25 ID	0.5			
Screwdriver, Phillips, #3 × 8	10.25 × 1.25 ID	0.5			
Screwdriver, slotted, ¼ × 2.5	2.5 × 1 ID	0.5			
Screwdriver, slotted, ¼ × 6	8 × 1 ID	0.5			
Screwdriver, slotted, ⅜ × 12	12 × 1.25 ID	0.5			
Screwdriver, slotted, ⅜ × 8	10 × 1.25 ID	0.5			
Shears, metal, snips	9.5 × 2.5 × 0.75	0.5			
Socket, spark plug	2.75 × 1 ID	0.5			
Tape, measure, roll	3.25 × 3.25 × 1.25	0.5			
Tool box, metal, 20 in., hand tools	20 × 8 × 9	10.5			
Tool, axe, hand	Head 5.5 × 3.75 × 0.75, handle 11.75 × 1.5 × 1	3.5			
Wrench, adjustable, 12 in.	12 × 3 × 0.25	1.5			
Wrench, adjustable, 8 in.	8 × 2 × 0.25	0.5			
Wrench, adjustable, 10 in.	10 × 2.5 × 0.25	1			
Wrench, combination, metric, open end, 8 mm to 18 mm (11 piece)	13 × 12 × 1	2.5			
Wrench, combination, SAE, open end, 5/16 in. to 1 in. (11 piece)	13 × 12 × 1	2.5			
Wrench, gas, shutoff	8 × 1.5 × 0.5	0.5			
Wrench, hand chain	12 × 2 × 1	1.75			
Wrench, pipe, adjustable, 18 in.	18 × 3 × 0.5	6			
Wrench, ratchet, ½ in. drive, metric 8 mm to 18 mm (24 piece)	9.75 × 7.5 × 3	3.5			
Wrench, ratchet, ½ in. drive, SAE ⅜ in. to ¾ in. (24 piece)	9.75 × 7.5 × 2	3.5			
Wrench, tire, lug	27.75 × 1 ID	4.5			
Miscellaneous Equipment					
Gauge, air pressure, tires	6.25 × 1 × 0.5	0.5			
Sprinkler, wedges, set	3 × 0.75 × 1	0.5			
Elevator, key	6.25 × 0.25 ID	0.5			
Hooks, hay bail	Hook 10 × 0.5 ID, handle 3 × 4.5 × 0.5	1.5			
Tool, hand, fork, four-tine	Tines 12 × 6.75 × 0.5, handle 48 × 1.5 ID	3.5			
Wrench, water main, shutoff	8 × 1.5 × 0.5	0.5			
Tool, manhole cover lifter	44.1 × 10.2 × 6.7	35.5			
Pump, portable, water, small gasoline	17.5 × 16 × 19.5	50			

For SI units, 1 in. = 25.4 mm, 1 lb = 0.45 kg

~~Figure C.1 *Continued*~~



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Saw, chain, gasoline 61 cc, w/ 19 in. bar	Engine 16.75 × 9.5 × 11.25, bar 19 × 3.75 × 0.25	19			
Brush, foot-all	8 × 1 ID	0.5			
Intercom, system, w/ four headsets	Junction boxes 6.75 × 5.25 × 2.5, 5.25 × 3.6 × 3.1, 7 × 4.3 × 3.1, 8.25 × 5.75 × 4.75, headset 8.5 × 7.5 × 3	31.5			
MRE	12 × 7.5 × 2.5	2			
Tent, fire shelter	10 × 6 × 3.5	3.5			
Wheel chocks, large	21 × 10.25 × 5.75	22			
Wheel chocks, small	10 × 10.25 × 5.75	11			
Electrical Equipment — Low Voltage					
Battery, cable puller	4 × 2.5 × 0.5	2			
Battery, jumper cables	10 × 12 × 2.5	8			
Flashlight, small, w/batteries	10.25 × 2.25 ID	1.5			
Lantern, head lamp-type	3 × 4 × 2	1.5			
Lanterns, portable, battery powered	11.5 × 4.5 × 6.5	6.5			
Personnel Equipment					
Belt, safety, ladder-type	15 × 5 × 1.75	4.5			
Harness, safety	12 × 4 × 4	2.5			
Light, sticks, Cyalume (box)	6 × 6 × 8	1			
Masks, dust, box	8 × 5 × 5	1			
Rope, life line, ball-out bag	7.5 × 7.5 × 3.5	2			
Water, canteen, 2 qt.	7.5 × 3.5 × 8.5	2			
Water, container, 5 gal, w/ water	20 × 12.5 ID	40			
Water, container, 5 gal, w/o water	20 × 12.5 ID	8			
Personnel Gear					
Clothing, parkas	20 × 30 × 4	3			
Gear, entry suit, fire	34 × 24 × 23	50			
Gloves, disposable, box	10 × 5 × 3	1.5			
Gloves, leather, pair	9 × 4.5 × 0.75	0.5			
Gloves, lineman, rubber	18 × 6 × 1	3			
Gloves, neoprene, 8 in. pair	12 × 5 × 2	1			
Gloves, PVC, 8 in. pair	6.5 × 5.5 × 2	0.5			
Gloves, rubber, nitrile, 8 in. pair	7.5 × 4.5 × 1.25	0.5			
Goggles, safety	6 × 3.5 × 2.5	0.5			
Helmet, hard hats	12.5 × 8 × 7	1			
Helmet, tool, rescue	10 × 9 × 7	1.5			

For SI units, 1 in. = 25.4 mm, 1 lb = 0.45 kg, 1 qt = 0.95 L, 1 gal = 3.8 L.

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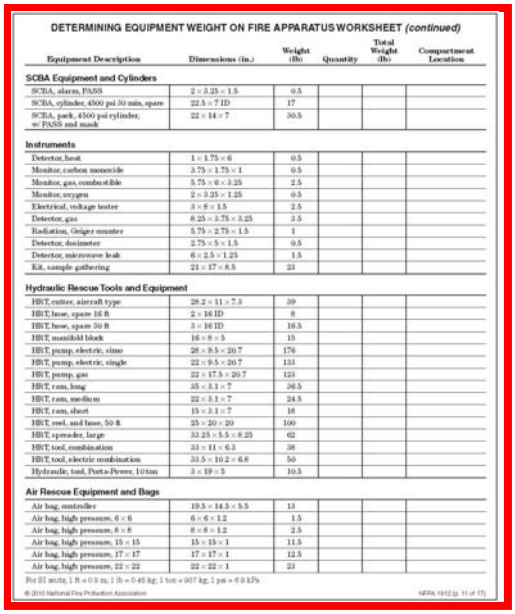
Figure C.1 *Continued*



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
SCBA Equipment and Cylinders					
SCBA, alarm, PASS	2 × 3.25 × 1.5	0.5			
SCBA, cylinder, 4500 psi 30 min, spare	22.5 × 7 ID	17			
SCBA, pack, 4500 psi cylinder, w/ PASS and mask	22 × 14 × 7	30.5			
Instruments					
Detector, heat	1 × 1.75 × 6	0.5			
Monitor, carbon monoxide	3.75 × 1.75 × 1	0.5			
Monitor, gas, combustible	5.75 × 6 × 3.25	2.5			
Monitor, oxygen	2 × 3.25 × 1.25	0.5			
Electrical, voltage tester	3 × 8 × 1.5	2.5			
Detector, gas	6.25 × 3.75 × 3.25	3.5			
Radiation, Geiger counter	5.75 × 2.75 × 1.5	1			
Detector, dosimeter	2.75 × 5 × 1.5	0.5			
Detector, microwave leak	6 × 2.5 × 1.25	1.5			
Kit, sample gathering	21 × 17 × 8.5	23			
Hydraulic Rescue Tools and Equipment					
HRT, cutter, aircraft type	28.2 × 11 × 7.3	39			
HRT, hose, spare 16 ft	2 × 16 ID	8			
HRT, hose, spare 30 ft	3 × 16 ID	16.5			
HRT, manifold block	16 × 8 × 5	15			
HRT, pump, electric, simo	28 × 9.5 × 20.7	176			
HRT, pump, electric, single	22 × 9.5 × 20.7	133			
HRT, pump, gas	22 × 17.5 × 20.7	123			
HRT, ram, long	35 × 3.1 × 7	36.5			
HRT, ram, medium	22 × 3.1 × 7	24.5			
HRT, ram, short	15 × 3.1 × 7	16			
HRT, reel, and hose, 50 ft	25 × 20 × 20	100			
HRT, spreader, large	33.25 × 5.5 × 8.25	62			
HRT, tool, combination	33 × 11 × 6.3	38			
HRT, tool, electric combination	33.5 × 10.2 × 6.8	50			
Hydraulic, tool, Porta-Power, 10 ton	3 × 19 × 3	10.5			
Air Rescue Equipment and Bags					
Air bag, controller	19.5 × 14.5 × 5.5	13			
Air bag, high pressure, 6 × 6	6 × 6 × 1.2	1.5			
Air bag, high pressure, 8 × 8	8 × 8 × 1.2	2.5			
Air bag, high pressure, 15 × 15	15 × 15 × 1	11.5			
Air bag, high pressure, 17 × 17	17 × 17 × 1	12.5			
Air bag, high pressure, 22 × 22	22 × 22 × 1	23			

For SI units, 1 ft = 0.3 m, 1 lb = 0.45 kg, 1 ton = 907 kg, 1 psi = 6.9 kPa

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Figure C.1 *Continued*

ANNEX C 1912–55

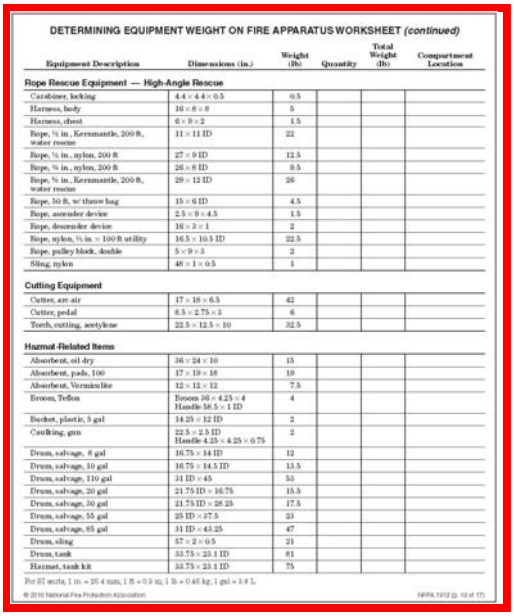
DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Air bag, high pressure, 24 × 24	24 × 24 × 1	26			
Air bag, high pressure, 27 × 27	27 × 27 × 1.2	33.5			
Air bag, high pressure, 30 × 30	31 × 31 × 1.2	41			
Air bag, high pressure, 36 × 36	36 × 36 × 1.2	57			
Air bag, low pressure	27.5 × 27.5 × 2.5	20			
Air bag, pressure regulator	7 × 6 × 4.5	3			
Air chisel, set, w/air cylinder	28 × 11.5 × 11.5	32			
Air tool, drill	8.5 × 6.5 × 3.5	5			
Air tool, hammer	8.5 × 2.5 ID, 7.75 × 2.25 ID	3.5			
Hose, air, low pressure, 50 ft	22 × 11 × 3	3.5			
Tool, air, low pressure, with 100 ft hose	20.5 × 18 × 19.5	12			
Shoring and Cribbing Equipment — Trench Rescue					
Cribbing, wood, 2 × 4 × 16	1.5 × 3.25 × 16	1.5			
Cribbing, wood, 4 × 4 × 16	3.25 × 3.25 × 16	3.5			
Cribbing, wood, 2 × 4 × 36	1.5 × 3.25 × 36	3			
Wedges, wood, 4 × 4 × 16	3.25 × 3.25 × 16	1.5			
Water Rescue Equipment					
Harness, rescue, body type	16 × 8 × 8	5			
Harness, rescue, chest type	6 × 9 × 2	1.5			
Life preserver, personal flotation device	21 × 15 × 3	2.5			
Jacks, Come-Along, Block and Tackle, Chains					
Jack, mechanical, long highlift	40 × 8 × 3	30			
Jack, hydraulic, bottle type 5 ton	4.5 × 5 × 9	12			
Jack, hydraulic, bottle type 12 ton	5.5 × 5.5 × 9.5	18			
Jack, hydraulic, bottle type 20 ton	6 × 6.5 × 11	33			
Plate, outrigger	24 × 24 × 0.5	30			
Pulley, swivel side	6 × 4 × 1.5	1			
Tool, figure 8	7 × 6 × 0.75	1.5			
Chain, steel, 6 ft with hooks	11 × 7 × 3.5	16.5			
Chain, steel, 10 ft with hooks	14 × 7.5 × 4	21.5			
Chain, shortener	6.75 × 2.5 × 0.75	2			
Chain, shackle	6 × 4 × 1.5	1			
Chain, steel, 20 ft with hooks	8.5 × 5.75 × 5.25	34			
Chain, shackle kit	21 × 14 × 8	13.5			
Winch, manual, come-along	18.5 × 7 × 8	12.5			
Straps, extrication, w/quick release buckles	7 × 8 × 2	2			

For SI units, 1 in. = 25.4 mm, 1 ft = 0.3 m, 1 lb = 0.45 kg, 1 ton = 907 kg

FIGURE C.1 *Continued*

Figure C.1 *Continued*

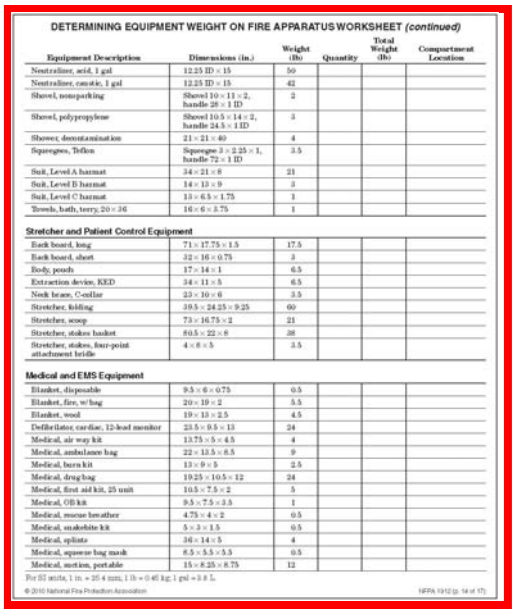


DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Rope Rescue Equipment — High-Angle Rescue					
Carabiner, locking	4.4 × 4.4 × 0.5	0.5			
Harness, body	16 × 8 × 8	5			
Harness, chest	6 × 9 × 2	1.5			
Rope, ½ in., Kernmantle, 200 ft, water rescue	11 × 11 ID	22			
Rope, ½ in., nylon, 200 ft	27 × 9 ID	12.5			
Rope, ⅝ in., nylon, 200 ft	26 × 8 ID	9.5			
Rope, ⅝ in., Kernmantle, 200 ft, water rescue	29 × 12 ID	26			
Rope, 50 ft, w/ throw bag	15 × 6 ID	4.5			
Rope, ascender device	2.5 × 9 × 4.5	1.5			
Rope, descender device	16 × 3 × 1	2			
Rope, nylon, ½ in. × 100 ft utility	16.5 × 10.5 ID	22.5			
Rope, pulley block, double	5 × 9 × 3	2			
Sling, nylon	48 × 1 × 0.5	1			
Cutting Equipment					
Cutter, arc air	17 × 18 × 6.5	42			
Cutter, pedal	6.5 × 2.75 × 3	6			
Torch, cutting, acetylene	22.5 × 12.5 × 10	32.5			
Hazmat-Related Items					
Absorbent, oil-dry	36 × 24 × 10	15			
Absorbent, pads, 100	17 × 19 × 16	19			
Absorbent, Vermiculite	12 × 12 × 12	7.5			
Broom, Teflon	Broom 16 × 4.25 × 4 Handle 56.5 × 1 ID	4			
Bucket, plastic, 5 gal	14.25 × 12 ID	2			
Caulking, gun	22.5 × 2.5 ID Handle 4.25 × 4.25 × 0.75	2			
Drum, salvage, 8 gal	16.75 × 14 ID	12			
Drum, salvage, 10 gal	16.75 × 14.5 ID	13.5			
Drum, salvage, 110 gal	31 ID × 45	55			
Drum, salvage, 20 gal	21.75 ID × 16.75	15.5			
Drum, salvage, 30 gal	21.75 ID × 26.25	17.5			
Drum, salvage, 55 gal	25 ID × 37.5	23			
Drum, salvage, 85 gal	31 ID × 43.25	47			
Drum, sling	57 × 2 × 0.5	21			
Drum, tank	33.75 × 23.1 ID	61			
Hazmat, tank kit	33.75 × 23.1 ID	75			

For SI units, 1 in. = 25.4 mm, 1 ft = 0.3 m, 1 lb = 0.45 kg, 1 gal = 3.8 L

Figure C.1 *Continued*

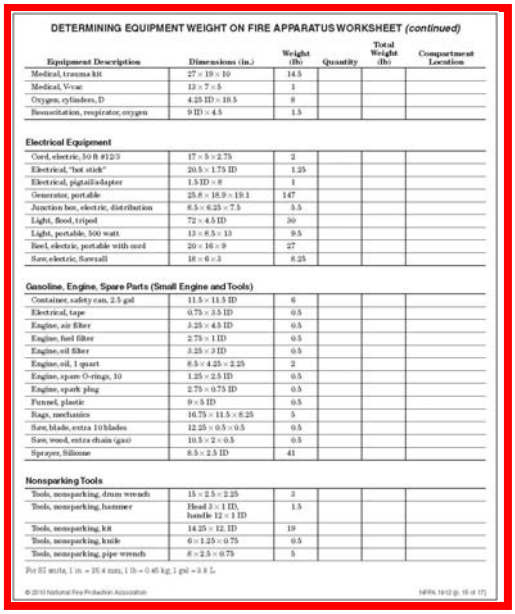


DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Neutralizer, acid, 1 gal	12.25 ID × 15	50			
Neutralizer, caustic, 1 gal	12.25 ID × 15	42			
Shovel, nonsparking	Shovel 10 × 11 × 2, handle 28 × 1 ID	2			
Shovel, polypropylene	Shovel 10.5 × 14 × 2, handle 24.5 × 1 ID	3			
Shower, decontamination	21 × 21 × 40	4			
Squeegee, Teflon	Squeegee 3 × 2.25 × 1, handle 72 × 1 ID	3.5			
Suit, Level A hazmat	34 × 21 × 8	21			
Suit, Level B hazmat	14 × 13 × 9	3			
Suit, Level C hazmat	13 × 6.5 × 1.75	1			
Towels, bath, terry, 20 × 36	16 × 6 × 3.75	1			
Stretcher and Patient Control Equipment					
Back board, long	71 × 17.75 × 1.5	17.5			
Back board, short	32 × 16 × 0.75	3			
Body, pouch	17 × 14 × 1	6.5			
Extraction device, KED	34 × 11 × 5	6.5			
Neck brace, C-collar	23 × 10 × 6	3.5			
Stretcher, folding	30.5 × 24.25 × 9.25	60			
Stretcher, scoop	73 × 16.75 × 2	21			
Stretcher, stokes basket	60.5 × 22 × 8	38			
Stretcher, stokes, four-point attachment bridle	4 × 8 × 5	3.5			
Medical and EMS Equipment					
Blanket, disposable	9.5 × 6 × 0.75	0.5			
Blanket, fire, w/ bag	20 × 19 × 2	5.5			
Blanket, wool	19 × 13 × 2.5	4.5			
Defibrillator, cardiac, 12-lead monitor	23.5 × 9.5 × 13	24			
Medical, air way kit	13.75 × 5 × 4.5	4			
Medical, ambulance bag	22 × 12.5 × 8.5	9			
Medical, burn kit	13 × 9 × 5	2.5			
Medical, drug bag	19.25 × 10.5 × 12	24			
Medical, first aid kit, 25 unit	10.5 × 7.5 × 2	5			
Medical, OB kit	9.5 × 7.5 × 3.5	1			
Medical, rescue breather	4.75 × 4 × 2	0.5			
Medical, snakebite kit	5 × 3 × 1.5	0.5			
Medical, splints	36 × 14 × 5	4			
Medical, squeeze bag mask	6.5 × 5.5 × 5.5	0.5			
Medical, suction, portable	15 × 8.25 × 8.75	12			

For SI units, 1 in. = 25.4 mm, 1 lb = 0.45 kg, 1 gal = 3.8 L

Figure C.1 *Continued*

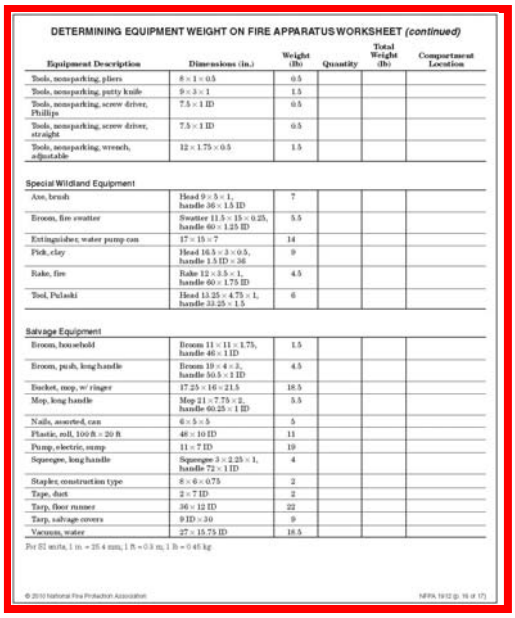


DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Medical, trauma kit	27 × 19 × 10	14.5			
Medical, V-vac	13 × 7 × 5	1			
Oxygen, cylinders, D	4.25 ID × 10.5	8			
Resuscitation, respirator, oxygen	9 ID × 4.5	1.5			
Electrical Equipment					
Cord, electric, 50 ft #12/3	17 × 5 × 2.75	2			
Electrical, "hot stick"	20.5 × 1.75 ID	1.25			
Electrical, pigtail/adapter	1.5 ID × 8	1			
Generator, portable	25.8 × 18.9 × 19.1	147			
Junction box, electric, distribution	8.5 × 6.25 × 7.5	5.5			
Light, flood, tripod	72 × 4.5 ID	30			
Light, portable, 500 watt	13 × 8.5 × 13	9.5			
Reel, electric, portable with cord	20 × 16 × 9	27			
Saw, electric, Sawzall	18 × 6 × 3	8.25			
Gasoline, Engine, Spare Parts (Small Engine and Tools)					
Container, safety can, 2.5 gal	11.5 × 11.5 ID	6			
Electrical, tape	0.75 × 3.5 ID	0.5			
Engine, air filter	3.25 × 4.5 ID	0.5			
Engine, fuel filter	2.75 × 1 ID	0.5			
Engine, oil filter	3.25 × 3 ID	0.5			
Engine, oil, 1 quart	8.5 × 4.25 × 2.25	2			
Engine, spare O-rings, 10	1.25 × 2.5 ID	0.5			
Engine, spark plug	2.75 × 0.75 ID	0.5			
Funnel, plastic	9 × 8 ID	0.5			
Rags, mechanics	16.75 × 11.5 × 8.25	5			
Saw, blade, extra 10 blades	12.25 × 0.5 × 0.5	0.5			
Saw, wood, extra chain (gas)	10.5 × 2 × 0.5	0.5			
Sprayer, Silicone	8.5 × 2.5 ID	41			
Nonsparking Tools					
Tools, nonsparking, drum wrench	15 × 2.5 × 2.25	3			
Tools, nonsparking, hammer	Head 3 × 1 ID, handle 12 × 1 ID	1.5			
Tools, nonsparking, kit	14.25 × 12 ID	19			
Tools, nonsparking, knife	6 × 1.25 × 0.75	0.5			
Tools, nonsparking, pipe wrench	8 × 2.5 × 0.75	5			

For SI units, 1 in. = 25.4 mm, 1 lb = 0.45 kg, 1 gal = 3.8 L

Figure C.1 *Continued*

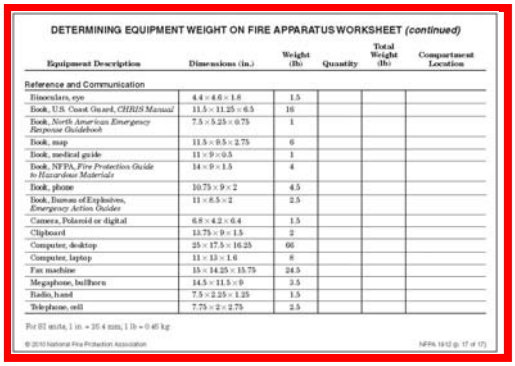


DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Tools, nonsparking, pliers	8 × 1 × 0.5	0.5			
Tools, nonsparking, putty knife	9 × 3 × 1	1.5			
Tools, nonsparking, screw driver, Phillips	7.5 × 1 ID	0.5			
Tools, nonsparking, screw driver, straight	7.5 × 1 ID	0.5			
Tools, nonsparking, wrench, adjustable	12 × 1.75 × 0.5	1.5			
Special Wildland Equipment					
Axe, brush	Head 9 × 5 × 1, handle 36 × 1.5 ID	7			
Broom, fire swatter	Swatter 11.5 × 15 × 0.25, handle 60 × 1.25 ID	5.5			
Extinguisher, water pump can	17 × 15 × 7	14			
Pick, clay	Head 16.5 × 3 × 0.5, handle 1.5 ID × 36	9			
Rake, fire	Rake 12 × 3.5 × 1, handle 60 × 1.75 ID	4.5			
Tool, Pulaski	Head 13.25 × 4.75 × 1, handle 33.25 × 1.5	6			
Salvage Equipment					
Broom, household	Broom 11 × 11 × 1.75, handle 46 × 1 ID	1.5			
Broom, push, long handle	Broom 19 × 4 × 3, handle 50.5 × 1 ID	4.5			
Bucket, mop, w/ ringer	17.25 × 16 × 21.5	18.5			
Mop, long handle	Mop 21 × 7.75 × 2, handle 60.25 × 1 ID	5.5			
Nails, assorted, can	6 × 5 × 5	5			
Plastic, roll, 100 ft × 20 ft	48 × 10 ID	11			
Pump, electric, sump	11 × 7 ID	19			
Squeegee, long handle	Squeegee 3 × 2.25 × 1, handle 72 × 1 ID	4			
Stapler, construction type	6 × 6 × 0.75	2			
Tape, duct	2 × 7 ID	2			
Tarp, floor runner	36 × 12 ID	22			
Tarp, salvage covers	9 ID × 30	9			
Vacuum, water	27 × 15.75 ID	18.5			

For SI units, 1 in. = 25.4 mm; 1 ft = 0.3 m; 1 lb = 0.45 kg

~~Figure C.1 *Continued*~~



DETERMINING EQUIPMENT WEIGHT ON FIRE APPARATUS WORKSHEET *(continued)*

Equipment Description	Dimensions (in.)	Weight (lb)	Quantity	Total Weight (lb)	Compartment Location
Reference and Communication					
Binoculars, eye	4.4 × 4.6 × 1.8	1.5			
Book, U.S. Coast Guard, *CHRIS Manual*	11.5 × 11.25 × 6.5	16			
Book, *North American Emergency Response Guidebook*	7.5 × 5.25 × 0.75	1			
Book, map	11.5 × 9.5 × 2.75	6			
Book, medical guide	11 × 9 × 0.5	1			
Book, NFPA, *Fire Protection Guide to Hazardous Materials*	14 × 9 × 1.5	4			
Book, phone	10.75 × 9 × 2	4.5			
Book, Bureau of Explosives, *Emergency Action Guides*	11 × 8.5 × 2	2.5			
Camera, Polaroid or digital	6.8 × 4.2 × 6.4	1.5			
Clipboard	13.75 × 9 × 1.5	2			
Computer, desktop	25 × 17.5 × 16.25	66			
Computer, laptop	11 × 13 × 1.6	6			
Fax machine	15 × 14.25 × 15.75	24.5			
Megaphone, bullhorn	14.5 × 11.5 × 9	3.5			
Radio, hand	7.5 × 2.25 × 1.25	1.5			
Telephone, cell	7.75 × 2 × 2.75	2.5			

For SI units, 1 in. = 25.4 mm; 1 lb = 0.45 kg

C.1.1

The approximate measurements and weights of equipment that are commonly available and used during fire department operations are listed on the worksheet. The purchaser should fill in the number of units of each piece of anticipated equipment ~~they anticipate carrying~~ in the column titled "Quantity" and multiply that by the weight per unit to get the total weight. The dimensions of each piece of equipment are given to assist in planning compartment size or the location on the fire apparatus. Where the purchaser ~~desires~~ wants to carry specific equipment in a specific compartment, that compartment designation should be shown in the column titled "Compartment Location." [**1901,** 2016]

C.1.2

~~An Excel spreadsheet that contains the information shown in~~ ~~Figure C.1~~ The worksheet can be downloaded as an Excel spreadsheet from the FAMA website, www.fama.org, and customized to show only the equipment a department expects to carry. There are additional columns on the spreadsheet to assist the fire department in maintaining records of the equipment it carries on the apparatus. [**1901,** 2016]

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 18 13:11:46 EDT 2014

Committee Statement

Committee Statement: Deleting Figure C.1 worksheets and extracting language from NFPA 1901 to remain consistent.
Response Message:

First Revision No. 17-NFPA 1912-2014 [Chapter D]

Annex D Guidelines for First Line and Reserve Apparatus

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

D.1 General.

To maximize fire fighter capabilities and minimize risk of injuries, it is important that fire apparatus be equipped with the latest safety features and operating capabilities. In the last 10 to 15 years, much progress has been made in upgrading functional capabilities and improving the safety features of fire apparatus. Apparatus ~~manufactured prior to 1991 usually included~~ more than 15 years old might include only a few of the safety upgrades required by the 1991 and subsequent editions of the NFPA fire department apparatus standards or the equivalent Underwriters' Laboratories of Canada (ULC) standards. Because the changes, upgrades, and fine tuning to NFPA 1901~~, *Standard for Automotive Fire Apparatus* ~~ , since 1991 have been truly significant, especially in the area of safety, fire departments should seriously consider the value (or risk) to fire fighters by keeping ~~pre-1991~~ fire apparatus more than 15 years old in first-line service.

~~The 1991 editions of the NFPA fire department apparatus standards included, among many other things, requirements for fully enclosed driving and riding areas, auxiliary braking systems, reflective striping, improved warning lights, and prohibition of roof-mounted audible warning devices. The minimum tip load for an aerial ladder was set at 250 lb (114 kg), and other requirements, such as a minimum rail height, were added to make the aerial ladder safer for fire fighters to use. The 1991 editions have been recognized as the benchmark from which improved and safer fire apparatus have evolved.~~ It is recommended that ~~only~~ apparatus ~~that were designed and manufactured to meet the 1991 or later editions of the NFPA fire department apparatus standards, or apparatus that have been refurbished in accordance with NFPA 1912 , *Standard for Fire Apparatus Refurbishing,* to meet the 1991 or later editions of the NFPA fire department apparatus standards, be permitted to operate in first-line service.~~ more than 15 years old that have been properly maintained and that are still in serviceable condition be placed in reserve status, be upgraded in accordance with NFPA 1912, and incorporate as many features as possible of the current fire apparatus standard (see Section D.3). This will ensure that, while the apparatus ~~may~~ might not totally comply with the current editions of the automotive fire apparatus standards, many of the improvements and upgrades required by the current editions of the standards ~~since 1991~~ are available for the fire fighters who use the apparatus.

~~It is recommended that an apparatus manufactured prior to 1991 that is less than 25 years old, that has been properly maintained, and that is still in serviceable condition should be placed in reserve status and upgraded to incorporate as many features of the post-1991 fire apparatus as possible. *(see Section D.3)* .~~ Apparatus that were not manufactured to the applicable NFPA fire apparatus standards or that are over 25 years old should be replaced.

D.2 ~~How the Standards Have Changed.~~ Evaluating Fire Apparatus.

It is a generally accepted fact that fire apparatus, like all types of mechanical devices, have a finite life. ~~How long that is~~ The length of that life depends on many factors~~. Some of those factors are~~ , including vehicle mileage and engine hours, quality of the preventative maintenance program, quality of the driver training program, whether the fire apparatus was used within the design parameters, whether the apparatus was manufactured on a custom or commercial chassis, quality of workmanship by the original manufacturer, quality of the components used, and availability of replacement parts, to name a few . ~~In the fire service, there are fire apparatus with 8 to 10 years of service that are simply worn out. There are also fire apparatus that were manufactured with quality components, that have had excellent maintenance, and that have responded to a minimum number of incidents that are still in serviceable condition after 20 years. Most would agree that the care of fire apparatus while it is being used and the quality and timeliness of maintenance are perhaps the most significant factors in determining how well a fire apparatus ages.~~

In the fire service, there are fire apparatus with 8 to 10 years of service that are simply worn out. There are also fire apparatus that were manufactured with quality components, that have had excellent maintenance, and that have responded to a minimum number of incidents that are still in serviceable condition after 20 years. Most would agree that the care of fire apparatus while it is being used and the quality and timeliness of maintenance are perhaps the most significant factors in determining how well a fire apparatus ages.

~~Prior to 1991, the single fire department apparatus standard was~~ NFPA 1901 ~~. It was basically a "reactive standard." If something worked well in field use for a few years, it might have been suggested for inclusion in~~ NFPA 1901 ~~. It was a very basic standard. In the late 1980s, the Technical Committee on Fire Department Apparatus decided to become proactive and greatly enhance the value of the standard for the fire service. Task groups were appointed to develop reasonable requirements for the various components that made up a fire apparatus, and a safety task group was charged with looking at issues across the board that would improve the safety of the fire fighters who have to use the apparatus.~~

~~The completely revised 1991 edition of the fire department apparatus standards was the result of these efforts and the full committee's strong desire to make the automotive fire apparatus standards not only more "safety oriented" but also more user friendly. In 1991, four standards were actually issued:~~ NFPA 1901 ~~,~~ *~~Standard for Automotive Fire Apparatus~~* ~~,~~ NFPA 1902 ~~,~~ *~~Standard for Initial Attack Fire Apparatus~~* ~~,~~ NFPA 1903 ~~,~~ *~~Mobile Water Supply Fire Apparatus~~* ~~, and~~ NFPA 1904 ~~,~~ *~~Standard for Aerial Ladder and Elevating Platform Fire Apparatus~~* ~~.~~

~~Contained within the 1991 editions of the fire department apparatus standards were requirements for such items as increased battery capacity to ensure starting under most conditions; intersection lights for increased visibility; removal of all roof-mounted audible warning devices to reduce hearing problems; a flashing light in the cab to warn if a cab or body door is open; a backup alarm; an automatic transmission to make it easier to drive (unless the purchaser had a specific reason for a manual transmission); fully enclosed riding areas with reduced noise (dBA) levels to keep the crew members safe and informed; seats and seat belts for all crew members riding on the apparatus; fail-safe door handles so the sleeve of a coat will not inadvertently catch a handle and open a door; and signs requiring everyone to be seated and belted.~~

~~In the pump area, the standard specified that 3 in. (75 mm) or larger valves be "slow close," that caps on intakes and discharge outlets be tested to 500 psi (3400 kPa), that an intake relief valve be provided to help manage incoming pressure, that 30 degree sweep elbows be provided on the discharges to eliminate hose kinking, and that all 3 in. (75 mm) and larger discharges be eliminated from the pump panel to reduce the possibility of injuries to the pump operator.~~

Fire apparatus equipped with electronic or electric engine throttle controls were required to include an interlock system to prevent engine speed advancement, unless the chassis transmission is in neutral with the parking brake engaged; or unless the parking brake is engaged, the fire pump is engaged, and the chassis transmission is in the correct pumping gear. Starting with the 1999 edition of NFPA 1901 , all apparatus were required to include an interlock system to control engine speed advancement at the operators' panel.

In the body area, the minimum step surface size and load-carrying capabilities were increased, handrails were required to be slip resistant, and reflective striping was required on all four sides of the apparatus. Electrical system requirements for line-voltage systems were added to include the use of "listed" components that were grounded.

Many requirements were added to increase the operating capabilities of all aerial devices. For aerial ladders, the minimum design strength of the rungs was increased, a height requirement for the hand rails was specified, a minimum load-carrying requirement for folding steps was specified, and the aerial ladder had to have a minimum carrying capacity of 250 lb (114 kg) at the tip when the aerial ladder is at 0 degrees elevation and maximum extension. Where a water tower was equipped with a ladder, the same requirements that applied to an aerial ladder were required of the ladder on the water tower.

The carrying capacity of elevating platforms at 0 degrees elevation and maximum extension was raised to 750 lb (340 kg). Elevating platforms were also required to have handrails, breathing air available in the platform (with low air warning capability) for at least two fire fighters, and a water curtain cooling system under the platform.

All aerial devices had to be capable of supporting a static load of 1 ½ times their rated capacity in any position. A requirement for a stabilizer movement alarm and reflective striping with warning lights was added. Interlocks to prevent inadvertent movement to an unsupported side and to prevent raising the aerial device prior to the stabilizers being deployed were specified. One hundred percent nondestructive tests became a requirement. All these requirements were included in the 1991 editions of the NFPA fire department apparatus standards.

In 1996, the four fire department apparatus standards (NFPA 1901, NFPA 1902, NFPA 1903, and NFPA 1904) were again combined into a single standard, NFPA 1901 , *Standard for Automotive Fire Apparatus* . The 1996 and 1999 editions of NFPA 1901 further enhanced the safety and operating characteristics of all the apparatus. For example, the 1999 edition included chapters on quints and mobile foam apparatus, further defined slip resistance of stepping and walking surfaces, required better mounting of equipment in the driving and crew compartment, required predelivery testing of foam proportioning systems, and specified that fill stations for breathing-air cylinders be designed to totally contain a rupturing cylinder.

The 2003 edition continued to refine the requirements in the driving and crew riding areas with increased head height requirements at seating positions and additional requirements for storage of SCBAs in seatbacks, both aimed at reducing fire fighter injuries. The test protocol for slip resistance of standing and walking surfaces was better defined. There was a general cleanup of the requirements throughout the document to enhance the operational usefulness of the apparatus.

Critical enhancements in design, safety, and technology should also play a key role in the evaluation of an apparatus' life cycle. Previous editions of the fire department apparatus standards featured many requirements advancing the level of automotive fire apparatus safety and friendliness. Contained within the 2009 edition were requirements for rollover stability; tire pressure indicators; seat belt warning systems requiring all occupants be properly seated and belted; extended seat belt length requirements resulting from an in-depth anthropometric study evaluating the average size of today's fully dressed firefighter; roadability, including minimum accelerations and top speed limitations; enhanced step and work surface lighting; cab integrity testing; increased use of retroreflective striping in the rear of the apparatus, providing a consistent identifiable set of markings for all automotive fire apparatus; and enhanced aerial control technologies, enabling short jacking and envelope controls.

D.3 Upgrading Fire Apparatus.

Any apparatus, whether in first-line or reserve service, should be upgraded in accordance with NFPA 1912, as necessary to ensure that the following features are included at a minimum:

(1) ~~Fully enclosed seating is provided for all members riding on the fire apparatus.~~ Seat belts with seat belt warning systems are available for every seat and are new or in serviceable condition.

(2) Warning lights meet or exceed the current standard.

(3) Reflective striping meets or exceeds the current standard.

(4) Slip resistance of walking surfaces and handrails meets the current standard.

(5) A low-voltage electrical system load manager is installed if the total connected load exceeds the alternator output.

(6) The alternator output is capable of meeting the total continuous load on the low-voltage electrical system.

(7) Where the gross vehicle weight rating (GVWR) is 36,000 lb (16,000 kg) or more, an auxiliary braking system is installed and operating correctly.

(8) Ground and step lighting meets or exceeds the current standard.

(9) Noise levels in the driving and crew compartment(s) meet the current standard, or appropriate hearing protection is provided.

(10) All horns and sirens are relocated to a position as low and as far forward as possible.

~~Seat belts are available for every seat and are new or in serviceable condition.~~

(11) Sign plates are present stating no riding on open areas.

(12) A pump shift indicator system is present and working properly for vehicles equipped with an automatic chassis transmission.

(13) For vehicles equipped with electronic or electric engine throttle controls, an interlock system is present and working properly to prevent engine speed advancement at the operator's panel, unless the chassis transmission is in neutral with the parking brake engaged~~;~~ , or the parking brake is engaged, the fire pump is engaged, and the chassis transmission is in pumping gear.

(14) All loose equipment in the driving and crew areas is securely mounted ~~to prevent its movement in case of an accident.~~ in accordance with the current standard.

D.4 Proper Maintenance of Fire Apparatus.

In addition to needed upgrades to older fire apparatus, it is imperative that all fire apparatus be checked and maintained regularly to ensure that they will be reliable and safe to use. The manufacturers' instructions should always be followed when maintaining the fire apparatus. Special attention should be paid to ensure that the following ~~items, as they are particularly critical to having a reliable unit:~~ conditions, which are particularly critical to maintaining a reliable unit, exist:

(1) Engine belts, fuel lines, and filters have been replaced in accordance with the manufacturers' maintenance schedule(s).

(2) Brakes, brake lines, and wheel seals have been replaced or serviced in accordance with the manufacturers' maintenance schedule.

(3) Tires and suspension are in serviceable condition, and tires are not more than 7 years old.

(4) The radiator has been serviced in accordance with the manufacturers' maintenance schedule, and all cooling system hoses are new or in serviceable condition.

(5) The alternator output meets its rating.

(6) A complete weight analysis shows the fire apparatus is not over individual axle or total ~~GVWRs~~ GVWR .

(7) The fire pump meets or exceeds its original pump rating.

(8) Water tank and baffles are not corroded or distorted.

(9) If the apparatus is equipped with an aerial device, a complete test to original specifications has been conducted and certified by a certified testing laboratory.

(10) If so equipped, the generator and line-voltage accessories have been tested and meet the current standard.

D.5 Refurbishing or Replacing Fire Apparatus.

Fire department administrators and fire chiefs should exercise special care when evaluating the cost of refurbishing or updating an apparatus versus the cost of a new fire apparatus. Apparatus that are refurbished should comply with the requirements of NFPA 1912. A thorough cost-benefit analysis of the value of upgrading or refurbishing a fire apparatus should be conducted. In many instances, it will be found that refurbishing costs will greatly exceed the current value of similar apparatus. ~~Experience has also shown that refurbishing fire apparatus that is over 20 years old, other than to paint or repair the apparatus, is a very poor investment.~~

Some of the factors to evaluate when ~~considering~~ determining whether to refurbish or replace a fire apparatus include the following:

(1) What is the true condition of the existing apparatus? Has it been in a major accident, or has something else happened to it that would make spending significant money on it ill advised?

(2) What advancements in design, safety, and technology have improved the efficiency and safety of personnel?

(3) Does the current apparatus meet the program needs of the area it is serving? Is it designed for the way the fire department operates today and is expected to operate ~~into~~ in the foreseeable future, or is it functionally obsolete? Can it carry everything that is needed to do the job without being overloaded?

(4) If the apparatus is refurbished, will it provide the level of safety and operational capability of a new fire apparatus? ~~Remember, in~~ It should be kept in mind that in many cases, refurbishing does not mean increasing the GVWR, so it is not possible to add a larger water tank or additional foam agent tanks, or to plan to carry massive amounts of additional equipment. Enclosing personnel riding areas ~~may~~ might add enough weight to the chassis that existing equipment loads need to be reduced ~~so as~~ to ~~not overload~~ avoid overloading the chassis. ~~An aerial ladder that does not have a 250 lb (114 kg) tip load rating at 0 degrees elevation and maximum extension cannot be made stronger.~~

(5) What is the anticipated cost per year to operate the apparatus if it were refurbished ~~and what~~ ? What would the cost per year be for a new apparatus? ~~Do not forget insurance~~ Insurance costs, downtime costs, maintenance costs, depreciation, reliability, and the safety of the users and the public all have to be considered . At what rate are those costs rising each year? Are parts still readily available for all the components on the apparatus? A refurbished 15-year-old apparatus still has 15-year-old parts in it. How long can the fire department operate without the apparatus if it suddenly needed major repairs?

(6) Is there a current trade-in value ~~today~~ that will not be there tomorrow? Most apparatus over 12 years old have little trade-in value. Are there creative financing plans or leasing options that can provide a new fire apparatus for little more than the cost of refurbishing or maintaining an older apparatus?

D.6 Conclusion.

A fire apparatus is an emergency vehicle that must be relied on to transport fire fighters safely to and from an incident and to operate reliably and properly to support the mission of the fire department. A piece of fire apparatus that breaks down at any time during an emergency operation not only compromises the success of the operation but ~~may~~ might jeopardize the safety of the fire fighters relying on that apparatus to support their role in the operation. ~~Old~~ An old , worn out, or poorly maintained fire apparatus ~~have~~ has no role in providing emergency services to a community.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Apr 16 09:23:23 EDT 2014

Committee Statement

Committee Statement: Updated Annex D to reflect the changes to the standards in recent year and Industry changes in technology. This language is consistent with recent changes in Annex D of NFPA 1901 and NFPA 1906.

Response Message:

First Revision No. 30-NFPA 1912-2014 [New Section after E.1.2.1]

E.1.2.1 FAMA Publications.

Fire Apparatus Manufacturer's Association, P.O. Box 397, Lynnfield, MA 01940-0397. www.fama.org

FAMA TC010, *Standard Product Safety Sign Catalog for Automotive Fire Apparatus* , 2012.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
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First Revision No. 34-NFPA 1912-2014 [Section No. E.1.2.1]

~~**E.1.2.1** Bureau of Explosives Publication.~~
~~Bureau of Explosives, PO Box 1020, Sewickley, PA 15143.~~
~~*Emergency Action Guides* , 2003.~~

Submitter Information Verification

Submitter Full Name: Michael Beady
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 29 11:36:22 EDT 2014

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First Revision No. 35-NFPA 1912-2014 [Section No. E.1.2.2]

E.1.2.2 U.S. Government Publications.
U.S. Government Printing Office, Washington, DC 20402.

~~U.S. DOT, *North American Emergency Response Guidebook* , 2004.~~

Title 49, Code of Federal Regulations, Part 571, Federal Motor Vehicle Safety Standards (FMVSS), Sec. 571.7(e), “Combining new and used components.”

Title 49, Code of Federal Regulations, Part 571, Federal Motor Vehicle Safety Standards (FMVSS), No. 209, “Seat belt assemblies.”

~~U.S. Coast Guard, *CHRIS Manual* (http://www.chrismanual.com/)~~

Submitter Information Verification

Submitter Full Name: Michael Beady
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Apr 29 11:37:32 EDT 2014

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First Revision No. 13-NFPA 1912-2014 [Section No. E.3]

E.3 References f xtracts in Informational Sections.
NFPA 1901, *Stand for Automotive Fire Apparatus*, ~~2009~~ 2016 edition.

Submitter Information Verification

Submitter Full Name: [Not Specified]
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
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