MEMORANDUM

TO:       NFPA Technical Committee on Fire Department Apparatus
FROM:     Yvonne Smith, Project Administrator
DATE:     May 13, 2011
SUBJECT:  NFPA 1906 ROC TC Letter Ballot (F2011 Cycle)

The ROC letter ballot for NFPA 1906 is attached. The ballot is for formally voting on whether or not you concur with the committee’s actions on the comments. Reasons must accompany all negative and abstention ballots.

Please do not vote negatively because of editorial errors. However, please bring such errors to my attention for action.

Please complete and return your ballot as soon as possible but no later than June 1, 2011. As noted on the ballot form, please return the ballot to Yvonne Smith either via e-mail to ysmith@nfpa.org or via fax to 617-984-7056. You may also mail your ballot to the attention of Yvonne Smith at NFPA, 1 Batterymarch Park, Quincy, MA 02169.

The return of ballots is required by the Regulations Governing Committee Projects.

Attachments: Comments
             Letter Ballot
1906-1     Log #99  Final Action: Accept in Principle
(Entire Document)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Some of the text that was pulled from NFPA 1901 into the NFPA 1906 draft was pulled from NFPA 1901-2003.  Anywhere there were changes made in the 2003 wording to make the 2009 version of NFPA 1901, and that text was pulled into NFPA 1906; make the same change to NFPA 1906.
Substantiation:  Some text was pulled from an obsolete document.  Changes already made and approved in NFPA 1901-2009 should be incorporated in 1906 so it does not start out with obsolete or incorrect text. The document references NFPA 1901-2009 in chapter 2, but that is not where many of the text references were pulled from.
Committee Meeting Action:  Accept in Principle
Committee Statement:  The same submitter submitted individual comments on each reference to the older edition and the committee accepted those comments to the specific sections and accepted in principle on this global comment.

1906-2     Log #102  Final Action: Reject
(Entire Document)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-10
Recommendation:  Change the term “wildland fire pump” to “wildland water pump” throughout the document.
Substantiation:  The current standard uses the term water pump to reference the pump on a wildland fire apparatus. This was done intentionally so as to not cause confusion with “fire pumps” which have very specific characteristics and are designed to support structural fire fighting. The term “wildland fire pump” will cause confusion as the adjective “wildland” will get left off the term resulting in misunderstandings. The committee can assist the user of the document by not using the term “fire pump”, once with a modifier and once without the modifier in the same standard to designate 2 entirely different types of pumps.
Committee Meeting Action:  Reject
Committee Statement:  The committee feels that Wildland Fire Pump is clear and is defined in Chapter 3.

1906-3     Log #100  Final Action: Reject
(Document Title)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-1
Recommendation:  Change the title of the document to read “Standard for Wildland Fire Apparatus and Wildland Mobile Water Supply Apparatus.”
Substantiation:  The committee has expanded the scope of the standard to include wildland mobile water supply apparatus which are different than wildland fire apparatus but the title of the standard still just says wildland fire apparatus.
Committee Meeting Action:  Reject
Committee Statement:  The title is simple already and the work is not needed.
<table>
<thead>
<tr>
<th>Log #</th>
<th>Submission Date</th>
<th>Final Action</th>
<th>Comment on Proposal No</th>
<th>Submitter</th>
<th>Recommendation</th>
</tr>
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| 1906-4 | 145             | Accept in Principle | 1906-1                 | David V. Haston, US Forest Service | Revise text to read as follows:  
1.3.1 This standard shall apply to new fire apparatus that meet the following criteria:  
(1) Rated at a minimum 10,001 lb gross vehicle weight rating (GVWR).  
Substantiation: The minimum GVWR for wildland apparatus should be 10,001 lbs (class 3 vehicle), NFPA 1906 should not apply to smaller vehicles. See comment on table 5.5 and table 12.1.2.  
Committee Meeting Action: Accept in Principle  
Committee Statement: The committee accepts this comment and is also modifying Table 12.3.2.2 to eliminate the top row. |
| 1906-5 | 101             | Reject              | 1906-5                 | Carl E. Peterson, Hingham, MA | Delete Section 1.3.2.  
Substantiation: As stated in my proposal, Paragraph 1.3.2 is a contract issue and persons can use any or all of a standard before the date stated in 1.3.1(3) by including the requirements in their specifications. If a bidder does not agree with what is in the specifications they can take exception or not bid. A standard for a product should state the minimum requirements for the product, not who can use it and when. The committee provides no rational for leaving 1.3.2 in the standard, just a statement that they are not taking it out.  
The purpose of 1.3.1(3) is to give manufacturers and purchasers an opportunity to get the revised standard and make changes as necessary to their manufacturing procedures and procurement specifications. If they can do that faster, the standard does not need to tell them they can use it. NFPA 1906 will actually become effective as an NFPA standard in early January of 2012.  
Committee Meeting Action: Reject  
Committee Statement: This section is useful to clarify that early use of the standard is permitted. |
Comment on Proposal No: 1906-1

Recommendation: Revise text to read as follows:

2.3.7 SAE Publications

Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001


SAE J541, Voltage Drop for Starting Motor Circuits. 1996.


SAE J551/1, Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz), 2006 2010.


SAE J554, Electric Fuses (Cartridge Type), 1987.


SAE J683, Tire Chain Clearance — Trucks, Buses (except Suburban, Intercity, and Transit Buses), and Combinations of Vehicles. 1985.


SAE J1127, Low Voltage Battery Cable, 2000 2010.

SAE J1128, Low Tension Low Voltage Primary Cable, 2000 2011.


SAE J1690, Flashers. 1996.


SAE J2077, Miniature Blade Type Electrical Fuses, 1990.

SAE J2180, A Tilt Table Procedure for Measuring the Static Rollover Threshold for Heavy Trucks. 1998.


13.2.1.3 All circuits shall otherwise be wired in conformance with SAE-J1292, Automobile, Truck, Tractor-Trailer, and Motor Coach Wiring. (1991-13.2.1.3) SAE J2202, Heavy Duty Wiring Systems for On Highway Trucks

Substantiation: SAE J551/2 document has been replaced. References in the text have been changed.

SAE J1128 has been retitled (2006) and updated (2011)

Other documents have been updated.

NOTE: J335 and J2077 are in the process of revision. New versions may be available before 1906-2012 goes to press.

SAE J2202 has replaced SAE J1292 for truck wiring.

Committee Meeting Action: Accept
Add text to read as follows:

**3.3.XX Auxiliary Engine-Driven Pumps.** Pumps whose power is provided by engines that are independent of the vehicle engine.

**Substantiation:** This term was defined and used in the 2006 edition of NFPA 1906 and is currently used in the draft, see 16.5.1.1. Wildland firefighters call separate engine driven pumps "auxiliary engine driven pumps."

**Committee Meeting Action:** Accept in Principle
**Committee Statement:** See Committee Action on 1906-10 (Log #8).

Add text to read as follows:

**3.3.XX Final-Stage Manufacturer.** A person who performs such manufacturing operations on an incomplete vehicle that it becomes a completed vehicle.

**Substantiation:** This term was defined and used in the 2006 edition of NFPA 1906 and is currently used in the draft, see 12.1.4 and A.12.1.4.

**Committee Meeting Action:** Accept in Principle
**Committee Statement:** See Committee Action on 1906-10 (Log #8).

Add text to read as follows:

**3.3.XX Slip-On Fire-Fighting Module.** A self-contained unit that includes an auxiliary engine-driven pump, piping, a tank, and hose storage that is designed to be placed on a truck chassis, utility bed, flatbed, or trailer of sufficient carrying capacity.

**Substantiation:** This term was defined and used in the 2006 edition of NFPA 1906 and is currently used in the draft, see 15.13.

**Committee Meeting Action:** Accept in Principle
**Committee Statement:** See Committee Action on 1906-10 (Log #8).
1906-10 Log #8

Final Action: Accept

(3.3.x Slip-On Fire-Fighting Module, Auxiliary Engine Drive Pumps, Final-Stage Manufacturer, and A.3.3.x (New))

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

3.3.xxx* Slip-On Fire-Fighting Module. A self contained unit that includes an auxiliary-driven pump, piping, a tank, and hose storage that is designed to be placed on a truck chassis, utility bed, flatbed, or trailer of sufficient carrying capacity.

A.3.3.xxx* Slip-On Fire-Fighting Module. Slip-on fire-fighting modules typically can be placed on and removed from the vehicle with a minimum of time and effort.

3.3.xxx Auxiliary Engine Driven Pumps. Pumps whose power is provided by engines that are independent of the vehicle engine.

3.3.xxx Final-Stage Manufacturer. A person who performs such manufacturing operations on an incomplete vehicle that it becomes a complete vehicle.

Substantiation: These definitions were removed, but they are used in 15.13, 3.3.48, 3.3.51, and possible other locations.

This is not original material; its reference/source is as follows:
NFPA 1906-2006
Committee Meeting Action: Accept

1906-11 Log #3

Final Action: Accept in Principle

(3.3.x Wet Location and A.3.3.x (New))

Submitter: Marcelo M. Hirschler, GBH International
Comment on Proposal No: 1906-9
Recommendation: Revise text to read as follows:

3.3.Xxx* Wet Location. A nonsheltered location inside a compartment with a door or cover that, while open, exposes the electrical enclosure or panelboard to the same environmental conditions as the exterior of the fire apparatus. A location on a nonenclosed, exterior surface of a fire apparatus body or driving and crew compartment where the enclosure or panel is exposed to the environment: (See also 3.3.102, Road Spray Location.)

A.3.3.xxx A location on a nonenclosed, exterior surface of a fire apparatus body or driving and crew compartment where the enclosure or panel is exposed to the environment.

Substantiation: The proposed definition conflicts with the Manual of Style as it has multiple sentences. The second sentence is not part of the definition but is information that can be placed into an annex or somewhere in the body of the standard.

Committee Meeting Action: Accept in Principle

3.3.X Wet Location. A location on fire apparatus subject to saturation with water or other liquids and in unprotected locations exposed to the weather.
(See also 3.3.102, Road Spray Location.)

Committee Statement: This revised definition is based on NFPA 70 (NEC)-2011. This wording is used in 1901 primarily in reference to line voltage equipment. The only reference on 1906 is to testing of work lighting. This definition would apply to exterior lights but not compartment and cab lights.
1906-12  Log #103  Final Action: Reject  
(3.3.4 Angle of Approach, 3.3.5 Angle of Departure, and 3.3.80 Ramp Breakover Angle)  

Submitter: Carl E. Peterson, Hingham, MA  
Comment on Proposal No:  1906-17  
Recommendation:  Reconsider the committee action and accept the proposal.  
Substantiation:  The submitter is correct in the changes being proposed and consistency with NFPA 1901 is not a valid reason for rejecting the proposal. If something is wrong or unclear in one document is no reason to continue it in another document.  
Committee Meeting Action:  Reject  
Committee Statement:  Committee feels that the current wording is clear both in 1901 and 1906.

1906-13  Log #5  Final Action: Accept  
(3.3.51 GVWR (Gross Vehicle Weight Rating))  

Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No:  1906-1  
Recommendation:  Revise text to read as follows:  
3.3.51* GVWR (Gross Vehicle Weight Rating). The final stage manufacturer's specified maximum load-carrying capacity of a single vehicle, having two axle systems (a multiaxle axle installation is one system):  
Substantiation:  This revised definition is based on the NHTSA definition of GVWR in 49 CFR 571.3. This change was approved and published, and got lost.  
This is not original material; its reference/source is as follows:  
NFPA 1901-2009  
Committee Meeting Action:  Accept

1906-14  Log #146  Final Action: Reject  
(3.3.52 In-Service Weight)  

Submitter: Dan W. McKenzie, US Forest Service  
Comment on Proposal No:  1906-1  
Recommendation:  Revise text to read as follows:  
3.3.52 In-Service Weight. The maximum actual vehicle weight under any conditions of mobile operation, sometimes referred to as gross vehicle weight.  
Substantiation:  Gross vehicle weight is what the vehicle weights. Gross vehicle weight has no maximum or minimum. "Maximum" and "Mobile" are unnecessary words.  
Committee Meeting Action:  Reject  
Committee Statement:  Current wording is identical to 1901 and revisions are not substantial enough to warrant a difference.
1906-15  Log #104  Final Action: Reject
(3.3.100 Reserved)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-1

Recommendation: Revise text to read as follows:

3.3.100 Reserved. A chapter number maintained for consistency of chapter numbering with NFPA 1901. Standard for Automotive Fire Apparatus, when other NFPA documents, this section number is maintained but the contents that would go in that chapter this section are not applicable to this document.

Delete all sections, paragraphs, subparagraphs and items in a list that are marked as reserved unless the committee intends to use those sections, paragraphs, subparagraphs or items in a list in a future edition of the standard for requirements that will be the same subject as that in NFPA 1901.

Substantiation: While I disagree with trying to match chapter numbers with another standard, that is where the matching should stop. Having reserved sections, paragraphs, subparagraphs and even items in a list creates confusion and is not user friendly. NFPA 1906 is a separate standard, not a partial clone of NFPA 1901 with a few changes. The NFPA extract policy requires paragraphs that are extracted from another NFPA standard to be marked as such so a user can see that they are the same requirement as in another standard. If NFPA 1906 needs to mimic the numbering in NFPA 1901 down to the subparagraph and list numbering, make it part of NFPA 1901 and not a separate standard. A section can be marked as reserved if it has a title and the committee intends to provide requirements against that title in a future edition of the standard. Otherwise the sections and paragraphs should be numbered consecutively without reserved sections and paragraphs. NFPA 1901 will change in the future requiring renumbering of sections and paragraphs within that document. That will create even further confusion as the two documents are revised over the years.

The proposed change to the definition supports other comments I have submitted to delete all sections, paragraphs, subparagraphs and items in lists that are designated as reserved and relate to text in NFPA 1901 that is not and will not be appropriate in a wildland apparatus standard.

The definition as shown in the draft does not relate the use of "reserved" to NFPA 1901. How is someone seeing section 4.3 or paragraph 4.5.8 or list item 4.20.1(2) with just "reserved" supposed to know what standard the reserved is based on.

Committee Meeting Action: Reject
Committee Statement: The committee feels that it is useful to have 1901 and 1906 similarly numbered. The NFPA manual of style permits this.

1906-16  Log #6  Final Action: Accept
(3.3.116 Ultimate Strength)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1

Recommendation: Revise text to read as follows:

3.3.116 Ultimate Strength. The strength of a material in tension, compression, or shear, respectively, that is the maximum tensile, compressive, or shear stress respectively that the material can sustain, calculated on the basis of the ultimate load and the original or unrestrained dimensions.

Substantiation: Correction of the grammar. The word was in the wrong place.

Committee Meeting Action: Accept
1906-17  Log #7  Final Action: Accept
(3.3.121 Wildland Fire Pump)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:

3.3.121 Wildland Fire Pump.  A water pump with a rated capacity of 30 gpm (115 L/min) through 250 gpm (1000 L/min) at 100 psi (700 kPa) to 400 psi (2800 kPa) net pump pressure, that is mounted on a fire apparatus and used for wildland fire fighting.

Substantiation:  Correct SI conversion for consistency with the remainder of this document and other NFPA documents.

Committee Meeting Action:  Accept

1906-18  Log #105
(3.3.122 Wildland Mobile Water Supply Apparatus)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-13
Recommendation:  Revise text to read as follows:

A fire apparatus designed for transporting water (pickup, transporting, and delivering) and fighting wildland fires on and off road that is equipped with a wildland fire pump, water tank with a minimum capacity of 1000 gal (4000 L), and limited hose and equipment, and pump-and-roll capability.

Substantiation:  I disagree with adding a chapter on wildland mobile water supply apparatus in this standard. The committee has essentially established requirements for an apparatus that is the same as a wildland fire apparatus but with a large water tank. There is nothing to prevent a wildland fire apparatus from having a 1000 gal tank. If the standard for wildland mobile water supply apparatus requires it to have a water pump and have pump-and-roll capability for fire fighting, it should meet the same requirement as the wildland fire apparatus. Either delete the chapter on wildland mobile water supply apparatus or delete the requirements that it have fire fighting capability. Mobile water supply apparatus that meet NFPA 1901 are not required to have a pump or fire fighting capabilities.

Committee Meeting Action:  Reject
Committee Statement:  The standard requires a pump for pump and roll.

1906-19  Log #106  Final Action: Reject
(Chapter 4)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-20
Recommendation:  Number the sections, subsections and paragraphs consecutively, avoiding the use of reserved sections, subsections and paragraphs.

Substantiation:  Trying to match sections in NFPA 1901 is confusing and will lead to problems in the future. This standard sets the requirements for wildland fire apparatus and if it is that important that it match NFPA 1901, it should be part of NFPA 1901 and not a separate document. The text of Section 4.2 was deleted by action on proposal 1906-22 but new text was added using that section number, thus making it inconsistent with NFPA 1901. The text of Section 4.3 was deleted by action on proposal 1906-232 but this section shows as reserved. In processing the next edition of NFPA 1901, the committee should take similar action to remove current sections 4.2 and 4.3. Will this leave those sections shown as reserved in NFPA 1901?

NFPA 1906 needs to be its own standard and it should be numbered accordingly.

Committee Meeting Action:  Reject
Committee Statement:  See Committee Statement on 1906-15 (Log #104).
Revise text to read as follows:

4.1 General.

All wildland fire apparatus and wildland mobile water supply fire apparatus shall meet the requirements of Chapters 1 through 4 and 12 through 15.

If a tow vehicle is to respond while calling for right-of-way under emergency conditions, it shall meet the requirements of 4.1.1. [1901:4.1.2]

4.2 Requirements by Apparatus Type and Component. In addition to the requirements in Section 4.1, the following also shall apply:

4.2.1 (†) Wildland fire apparatus shall comply with Chapter 5.

4.2.2 (†) Wildland mobile water supply fire apparatus shall comply with Chapter 7.

4.5 Fire Apparatus Components:

4.5.1 The pump for wildland fire fighting and its associated equipment shall meet the requirements of Chapter 16.

4.5.5 If the apparatus is equipped with a foam proportioning system, the system shall meet the requirements of Chapter 20. [1901:4.5.5]

4.5.6 If the apparatus is equipped with a compressed air foam system (CAFS), the system shall meet the requirements of Chapter 21. [1901:4.5.6]

4.5.7 If the apparatus is equipped with a line voltage electrical system, the system shall meet the requirements of Chapter 22 of NFPA 1901. [1901:4.5.7]

4.5.10 If the apparatus is equipped with a winch system, the system shall meet the requirements of Chapter 25. [1901:4.5.10]

4.2.7.4.5.11 If a trailer is towed as a component of an emergency vehicle, the trailer shall meet the requirements of Chapter 26 of NFPA 1901.

4.2.8.4.5.12 If the apparatus is equipped with a vehicle protection system, the system shall meet the requirements of Chapter 27.

Revise 4.11 to read: Vehicle Data Recorder. Reserved.

Subsection 4.20.1(1)(q), 4.20.1(1)(s), 4.20.1(2), 4.20.1(10), 4.20.1(13), 4.20.1(15), 4.20.1(16), 4.20.2.3(9).

Substantiation: Section 4.1 as shown in the proposal and Section 4.1 as shown in the draft are different. The above recommendations are based on the text in the draft.

While I disagree with including wildland mobile water supply fire apparatus in this standard, if it is to be included, it needs to meet chapters 1 through 4 and chapters 12-15.

4.5.1 is being deleted as the option to use either a wildland water pump or a fire pump currently in chapter 16 needs to move to chapter 5, and chapter 7 if the committee insists on requiring a pump on a wildland mobile water supply vehicle.

As such, the requirement is covered by 4.2.1 and 4.2.2. See comment to revise chapters 5 and section 16.1.

The other changes to 4.1 through 4.5 are basically editorial to eliminate the confusion with multiple reserved sections and subsections and consolidate the general requirements in sections 4.1 and 4.2.

The change to 4.11 is a legitimate use of the reserved section as vehicle data recorders can be expected to be added in future editions and retaining a section for them now allows them to be added later without extensive renumbering.

Subparagraphs 4.20.1(1)(q), 4.20.1(1)(s), 4.20.1(2), 4.20.1(10), 4.20.1(13), 4.20.1(15), 4.20.1(16), 4.20.2.3(9) deal with aerial devices and auxiliary pumps in NFPA 1901 which do not apply to this standard and should not be reserved.

It causes confusion to have reserved subparagraphs in the middle of lists.

Committee Meeting Action: Reject

Committee Statement: See Committee Statement on 1906-15 (Log #104).
Illumination shall be provided for controls, switches, instruction plates, labels, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it. (1901:4.10.1)

All required signs, instruction plates, and labels shall be permanent in nature and securely attached and shall meet the requirements of 4.9.4 and ANSI/UL 969, Standard for Marking and Labeling Systems. (1901:4.10.2)

The signs, instruction plates, and labels shall have resistance to damage from temperatures between -30°F and 176°F (-35°C and 80°C) and exposure to oil, fuel, water, hydraulic fluids, or other fluids used on the apparatus. (1901:4.10.2.1)

A permanent plate label in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle:

... Foam proportioning systems that incorporate foam concentrate metering valves shall have each metering valve calibrated and marked with a plate label to indicate the rate(s) of the foam concentrate proportioning available as determined by the design of the system. (1901:20.4.3)

The materials of construction for the foam concentrate pump shall be corrosion resistant and compatible with the type of foam concentrate(s) listed on the plate label required in 20.9.3. (1901:20.7.2)

Drivetrain components that transmit power to the foam concentrate pump shall be in accordance with the fire apparatus manufacturer's design performance provided on the plate label required in 20.9.3. (1901:20.7.3)

A plate label, located at the operator's position, shall provide the following information pertaining to the performance operating specifications of the foam proportioning system:

(1) Foam classification type
(2) Maximum and minimum proportioning rate rates (percent)
(3) Maximum and minimum waterflow (gpm) (gpm (L/min))
(4) Maximum and minimum operating pressure pressures
(5)* The statement “Only use concentrates that are compatible with this foam proportioning system. Refer to the foam proportioning system manufacturer's operating manual.” (1901:20.9.3)

If an in-line eductor system is provided on the apparatus, the following information shall also be provided on the plate label:

... If an around-the-pump system is provided on the apparatus, the following information shall also be provided on the plate label:

... All compressed air system controls shall be located such that they can be reached from the pump operator's position and shall be identified with a plate, an instruction plate in accordance with the requirements of 21.8.1.

21.8 Labels; and Instruction Plates, and Instructions.

21.8.1 An instruction label plate indicating the identification, function, and operation shall be provided for each control, gauge, and indicator required to operate the CAFS. (1901:21.8.1)

A.12.1.5.1 It is important for fire apparatus drivers to understand the height, length, and weight of the vehicle compared to their personally owned vehicles. It is also important that this information be accurate. The height of the apparatus could change after delivery, depending on what equipment might be added; therefore, the fire department should note such changes on the label. Suggested wording for the plate label is shown in Figure A.12.1.5.1.

Substantiation: These terms were updated in NFPA 1901-2009, and were missed in updating the terminology on NFPA 1906.

This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept
Report on Comments – November 2011

1906-22 Log #10 Final Action: Accept

(4.12.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

4.12.1* Hydraulic hose lines, air system tubing, control cords, and electrical harnesses shall be mechanically attached to the frame or body structure of the apparatus. (1901:4.12.1)

Substantiation: Correct wording to match NFPA 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

1906-23 Log #108 Final Action: Reject

(4.13.1.1.3)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-27
Recommendation: Revise text to read as follows:

4.13.1.1.3 For purposes of 4.13.1.1, the apparatus shall be loaded with fuel, fire-fighting agents, hose, ladders, a weight of 250 lb (114 kg) in each seating position, and weight equivalent to the miscellaneous equipment allowance used for the design of the apparatus as defined in Table 12.1.2. [1901:4.13.1.1.3]

Substantiation: The miscellaneous equipment allowance used in the test needs to be what was used in the apparatus design, not just what is in Table 12.1.2. The miscellaneous equipment allowance used in the design may be substantially greater than the value in the table.
Committee Meeting Action: Reject
Committee Statement: The current wording allows the manufacturer to design based on a consistent approach. The proposed change leaves the test weight open to interpretation.

1906-24 Log #185 Final Action: Reject

(4.13.1.1.3 and 12.1.2)

Submitter: Kirk Bradley, Michigan Department of Natural Resources and Environment
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

4.13.1.1.3 For purposes of 4.13.1.1, the apparatus shall be loaded with fuel, fire-fighting agents, hose, ladders, a weight of 250 lb (114 kg) in each seating position . . .

12.1.2* The estimated in-service weight shall include the following:

. . .

(4)* 250 lb (114 kg) 200 lb (91 kg) in each seating position

Substantiation: Data for wildland fire fighter weights does not support a need for a 250 lb per person allowance without gear, 250 lb represents the 95th percentile but not all occupants will be 95th percentile. See attached.
Note: Supporting material is available for review at NFPA Headquarters.
Committee Meeting Action: Reject
Committee Statement: Current value is consistent with the data.
<table>
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<tr>
<th>Log #</th>
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</tr>
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| 186   | Kirk Bradley, Michigan Department of Natural Resources and Environment | 1906-1 | Revise text to read as follows:  
4.13.1.3.1 If the apparatus is designed to meet a specified higher equipment loading or larger hose bed capacity or to carry additional ground ladders equipment, ...  
| Substantiation: | Ground ladders are required in this standard so "addition ground ladders" is not relative. | Accept in Principle | Ground ladders are not used on 1906 Trucks. Revised wording removes confusion. |
| 11    | Thomas A. Stalnaker, Goshen Fire Company | 1906-1 | Revise text to read as follows:  
4.13.3.1 Using the information supplied by the purchaser, the apparatus manufacturer shall calculate the load distribution for the apparatus, and that load distribution plan shall be delivered with the apparatus.  
| Substantiation: | Make the text match NFPA 1901-2009. The manufacturer cannot meet the requirement of Section 4.13.1.1.2 without doing this, so there is no reason not to provide this information to the purchaser with the apparatus. This change removes the requirement that the calculation be adjusted for each customer using information from them (the customer might not be known at the time the apparatus is designed and built), and requires that this generic load distribution, that they have to prepare anyway, be delivered with the apparatus. | Accept |
| 109   | Carl E. Peterson, Hingham, MA | 1906-28 | Revise text to read as follows:  
4.13.3.1 The apparatus manufacturer shall calculate the load distribution for the apparatus and that load distribution plan shall be delivered with the fire apparatus. [1901:4.13.3.]  
| Substantiation: | The committee’s statement for rejecting my original proposal is that the apparatus manufacturer does not have enough detail to propose a specific plan. That is a purchase specification issue, not an apparatus standard issue. If they do not have the detail, they cannot build the apparatus to meet the purchaser’s requirements. A statement in a product standard requiring the purchaser to provide information is not going to solve that problem. If the purchaser does not provide the information, the manufacturer should still be required to provide a load distribution plan. The change proposed above would pickup the wording in NFPA 1901 by extract and is essentially the wording of my proposal. That requires a plan to be delivered based on the design regardless of whether the purchaser has specific requirements or the apparatus is built without knowing who the final purchaser will be (e.g. a demonstrator). The annex already extracts the wording from NFPA 1901. | Accept |
1906-28 Log #187 Final Action: Accept
4.13.3.2

Submitter: Kirk Bradley, Michigan Department of Natural Resources and Environment
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
4.13.3.2 The manufacturer shall engineer the fire apparatus to comply with the all gross axle weight ratings (GAWR) the overall gross vehicle weight rating (GVWR), and the chassis manufacturer's load balance guidelines.
Substantiation: There are more than one GAWR per chassis.
Committee Meeting Action: Accept

1906-29 Log #12 Final Action: Accept
4.15.1

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
4.15.1 The fire apparatus, when loaded to its estimated in-service weight, shall be capable of the following performance while on dry, paved roads that are in good condition:
(1) From a standing start, the apparatus shall be able to attain a speed of 35 mph (55 km/hr) within 25 seconds on a level road.

This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

1906-30 Log #13 Final Action: Reject
4.15.2

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
4.15.2 The maximum top speed of fire apparatus with a GVWR over 26,000 lb (11,800 kg) shall not exceed either 68 mph (105 km/hr) or the manufacturer’s maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.
Substantiation: These are the speed limits in NFPA 1901-2009. The off road nature of a wildland truck certainly does not make it more stable at high speeds than a 1901 truck. If anything, they would tend to be less stable and so the limit should be lower , if anything, not higher.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Reject
Committee Statement: The committee is maintaining similar requirements between NFPA 1901 and 1906 for speed limits as discussed during the ROP.
1906-31 Log #188 Final Action: Accept in Principle
(4.17.8 and 4.17.9)

Submitter: Kirk Bradley, Michigan Department of Natural Resources and Environment

Comment on Proposal No: 1906-1

Recommendation: Revise text to read as follows:

4.17.8 If the apparatus is equipped with an air brake system, the service brakes shall bring the apparatus, when loaded to its GVWR, to a complete stop from an initial speed of 20 mph (32.2 km/hr) in a distance not exceeding 35 ft (10.7 m) by actual measurement on a paved, level, dry surface road that is free of loose material, oil, or grease.

4.17.9 If the apparatus is equipped with a hydraulic brake system, the service brakes shall bring the apparatus, when loaded to its GVWR, to a complete stop from an initial speed of 30 mph (48.2 km/hr) in a distance not exceeding 88 ft (26.8 m) by actual measurement on a paved, level, dry surface road that is free of loose material, oil, or grease.

[1901-4.17.9]

Substantiation: This is a safety based standard why have two different testing scenarios based on the brake actuation system. Nothing seems to be equivalent between the two scenarios including the deceleration rates. If this is intended to distinguish between small vehicles with hydraulic brakes and larger vehicles with air brakes then it should be based on GVWR not control systems. And braking performance should be equivalent.

Committee Meeting Action: Accept in Principle

Add new Annex material tied to section 4.17.8 as follows:

A.4.17.8 The variations in the brake performance testing requirements reflect the differences found in Federal Motor Vehicle Safety Standards 105 (hydraulic & electric brake systems) and 121 (air brake systems).

Committee Statement: The current language matches the FMVSS standards. Add annex material to explain that they are different.

1906-32 Log #14 Final Action: Accept (4.20.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company

Comment on Proposal No: 1906-1

Recommendation: Revise text to read as follows:

4.20.1 Fire Apparatus Documentation. The contractor shall supply, at the time of delivery, at least one copy of the following documents:

(1) The manufacturer’s record of apparatus construction details, including the following information:

... (h) For each engine: make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio

... (17) If the apparatus has a foam proportioning system, the foam proportioning system manufacturer’s certification of accuracy (see 20.10.4.2) and the final installer’s certification that the foam proportioning system meets this standard (see 20.11.2)

Substantiation: Added to 1901, should be included here as well.

Foam system is not required, so its certification should be conditional.

This is not original material; its reference/source is as follows:
NFPA 1901-2009

Committee Meeting Action: Accept
If the pump on the apparatus is designed to pump rated capacity at rated net pump pressure from draft under either of the additional suction conditions specified in 16.2.4.2, special conditions are specified by the purchaser for the wildland fire pump; the pump manufacturer’s certification of suction capacity under those special conditions (see 16.2.4.2).

Substantiation: The change requires the contractor to supply, at the time of delivery, at least one copy of the pump manufacturer’s certification of pump suction capability under certain additional conditions regardless of who decides the design needs to meet those additional conditions and eliminates the inappropriate wording in the standard that makes a requirement contingent on a purchaser specifying something.

Committee Meeting Action: Reject
Committee Statement: Current wording is sufficient as it is the option of the purchasers to identify these special conditions when they exist. Special conditions are above the minimum standard.
Report on Comments – November 2011

1906-34  Log #111
(4.21.1) Final Action: Reject

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-31
Recommendation: Revise text to read as follows:

4.21 Statement of Exceptions. The entity responsible for final assembly of the apparatus or the contractor shall deliver with the fire apparatus either a certification that the apparatus fully complies with all requirements of this standard or, alternatively, a Statement of Exceptions specifically describing each aspect of the completed apparatus that is not fully compliant with the requirements of this standard at the time of delivery. [1901:4.21]

Delete 4.21.3 and A.4.21.3.
Add new text to read as follows:

A.4.21.1 If the purchaser accepts the vehicle with a statement of exception they are assuming responsibility for ensuring that the apparatus will not be placed in emergency service until the apparatus has been modified to accomplish full compliance with this standard or they are assuming responsibility for allowing operation of an emergency vehicle that is not in compliance with this standard. Operating a wildland fire apparatus that is not in compliance with this standard can prove dangerous to the safety of those fire fighters who must use the apparatus.

Substantiation: The change to 4.21.1 is to include the contractor as a responsible party as the contractor often is responsible for providing equipment that might not be considered part of the final assembly.

Paragraph 4.21.1(4) is being deleted as that is an issue between the purchase and whoever they are going to use to make the apparatus compliant. The manufacturer or contractor, in delivering the apparatus, is delivering a statement of exception stating that the apparatus does not meet the standard and why. If the purchaser accepts the apparatus with that statement of exception, they then become responsible for the apparatus and anything that is done to it from that time forward. It is not the purpose of this standard to identify who is going to make post delivery changes.

Paragraph 4.21.3 is being deleted as it is not the purpose of this standard to tell the purchaser how to recognize its apparatus. The entity responsible for final assembly of the apparatus is required to tell the purchaser that the apparatus is not in compliance with the standard and what is required to make it compliant but it is then up to the purchaser/user to decide what to do. Note that the second sentence of 4.21.3 in the proposal appears as A.4.21.3 in the draft.

If the purchase contract requires the apparatus to be compliant with the standard and it is delivered with a statement of exception, then that is a contractual issue, not a standard issue.

The addition of an annex to A.4.21.1 is to warn the purchaser that they need to make the apparatus compliant or risk the safety of those who use the apparatus.

Committee Meeting Action: Reject

Committee Statement: Apparatus manufacturers who wish to deliver an apparatus that fully complies with the standard are frequently asked by purchasers to omit certain required design features of the apparatus (e.g. reflective striping) because the purchaser prefers to have that aspect of the apparatus completed locally or provided by another vendor, or provided internally by the purchaser itself. This section allows a manufacturer/seller to deliver an apparatus that is, in part, incomplete, and thus non-compliant, although certain documentation and disclosure requirements must be met by the manufacturer, and the apparatus may not be placed into emergency service by the purchaser until the required work is completed in a manner that results in a fully compliant apparatus. NFPA 1906 has made editorial changes to 4.21.3 extracted from NFPA 1901 so that the purchaser can accept their truck with one or two exceptions with the knowledge that his truck will not be fully compliant, and without having to sign a document that states he will be making changes before it is placed in service. With the current 1901 wording a chief who has no intention of making his truck compliant with an exception is forced to sign a document that says he will. NFPA 1901 is forcing him to lie just to accept his apparatus.
An apparatus that is delivered subject to a Statement of Exceptions shall be recognized as non-compliant by the purchaser. The purchaser either accepts the vehicle as non-compliant or accepts responsibility that the apparatus will not be placed in emergency service until the apparatus has been modified as necessary to accomplish full compliance with this standard.

This text was in the original approved and published proposal and got lost in the final published draft.

Apparatus manufacturers who wish to deliver an apparatus that fully complies with the standard are frequently asked by purchasers to omit certain required design features of the apparatus (e.g. reflective striping) because the purchaser prefers to have that aspect of the apparatus completed locally or provided by another vendor, or provided internally by the purchaser itself. This section allows a manufacturer/seller to deliver an apparatus that is, in part, incomplete, and thus non-compliant, although certain documentation and disclosure requirements must be met by the manufacturer, and the apparatus may not be placed into emergency service by the purchaser until the required work is completed in a manner that results in a fully compliant apparatus. NFPA 1906 has made editorial changes to 4.21.3 extracted from NFPA 1901 so that the purchaser can accept their truck with one or two exceptions with the knowledge that his truck will not be fully compliant, and without having to sign a document that states he will be making changes before it is placed in service. With the current 1901 wording a chief who has no intention of making his truck compliant with an exception is forced to sign a document that says he will. NFPA 1901 is forcing him to lie just to accept his apparatus.
If the apparatus is to function as a wildland fire apparatus, it shall meet the requirements of this chapter. The apparatus shall be equipped with a wildland water pump for wildland fire fighting that meets the requirements of Chapter 16 or a fire pump that meets the requirements of NFPA 1901, Standard for Automotive Fire Apparatus.

5.3 Reserved.

5.3.5 Water Tank. The apparatus shall be equipped with a water tank(s) that meets the requirements of Chapter 18 and that has a minimum certified capacity (combined, if applicable) of 50 gal (200 L).

5.4 Equipment Storage. A minimum volume as shown in Table 5.4 of enclosed weather-resistant compartmentation that meets the requirements of Section 15.1 shall be provided for the storage of equipment.

5.5.6 Hose Storage. If the apparatus is equipped with a dedicated hose storage area(s), such area(s) shall comply with Section 15.10.

5.6 Equipment.

5.6.1 The following equipment shall be furnished by the contractor:

(1) Two solid bottom wheel chocks, mounted in readily accessible locations, each designed to hold the apparatus, when loaded to its GVWR, on a 20 percent grade with the transmission in neutral and the parking brake released

(2) One set of tire tools including a jack and lug wrench, if a spare tire is carried on the apparatus

5.6.2 The following additional equipment shall be carried on the apparatus:

(1) One of the following traffic warning devices:

(a) Five fluorescent orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) band

(b) One reflective triangle kit

(2) Five illuminated warning devices such as highway flares, unless the traffic cones or reflective triangles specified in 5.7.2(1) have illuminating capabilities

(3) One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and that have a fivepoint breakaway feature that includes two at the shoulders, two at the sides, and one at the front

(4) One approved, dry chemical portable fire extinguisher with a minimum rating of 2A-80-B:C capacity in accordance with the following

(a) Below 33,000 lb GVWR requires a 2A-10-B:C extinguisher

(b) 33,000 lb GVWR and above requires a 3A-40-B:C extinguisher

(5) One first-aid kit

(6) One reflective triangle kit

5.6.3 Brackets or compartments shall be furnished so as to organize and mount the equipment.

5.7 A detailed list of who is to furnish the items and the method for organizing and mounting these items shall be supplied by the purchasing authority.

Renumber A.5.6.1 as A.5.5 and revise the text to read:

A.5.5 Hose storage areas are not required to be contiguous. The purchaser should consider arrangements for hose storage that will best support operational procedures particularly if hose is to be carried preconnected to the tank inlet or a pump discharge. The purchaser should also consider specifying some type of cover for the hose compartment(s). Hinged or removable covers might be advantageous for wildland fire operations.

Printed on 5/12/2011
If the apparatus is to carry suction hose or supply hose, the purchaser needs to provide the manufacturer with details on the size and length of that hose and what arrangement for storage of the hose is desired. The manufacturer can then provide appropriate accommodations for the hose.

**Substantiation:** The text is different between the proposal and the draft. The above is based on the draft of chapter 5.

Section 5.3 is being deleted and the remainder of the chapter renumbered. The concept of tracking the chapter numbering with NFPA 1901 is OK if the chapters cover the same subject but there are 7 chapters in NFPA 1901 that cover the requirement for various types of apparatus and wildland fire apparatus is completely different than pumpers (Chapter 5 in NFPA 1901. Reserving a section from another standard that is used to cover aerial devices makes no sense and creates confusion as to why there is no requirement. It also sets the stage for a conflict in the future if NFPA 1901 changes and is renumbered. There is nothing marked as extracted from NFPA 1901 in this chapter.

Part of the text for 5.5 did not get transferred from the proposal to the draft.

The change to table 5.5, renumbered as 5.4 is suggested as 1.3.1(1) states that the standard applies to vehicles with a minimum GVWR of 9000 lb so there is no need to be talking about compartment volume for vehicles down to 5000 GVWR. With only vehicles between 9000 and 10,000 lb GVWR left in that category, it makes sense to combine everything of 15,000 lb and below into a single category. Most stock class 2 trucks have maximum GVWR ratings below 9000 lb so most small vehicles will be class 3 which starts at 10,001 lb. GVWR.

5.6.2(1) is being changed because 5.6.2(1)(b) and 5.6.2(6) are duplicates. Something cannot be an option in one place and a requirement elsewhere in the same list.

5.6.2(4) is being modified to correspond to the requirement in NFPA 1901 as stated in the substantiation for proposal 1906-84. All apparatus covered by NFPA 1901 is required to have an extinguisher with an 80B:C rating and a 2 1/2 gallon water extinguisher which typically carries a 2A rating. Also requiring a dry chemical extinguisher is product restrictive.

Paragraph 5.7.4 should be deleted for the reason stated in Proposal 1906-87. See comment on that proposal.

A.5.6.1 is being renumbered to correspond with the renumbering of chapter 5 and the added text alerts the purchaser to think about suction hose and how they may want to carry it.

**Committee Meeting Action: Accept in Principle**

Revise text to read as follows:

Chapter 5 Wildland Fire Apparatus

5.1 General. If the apparatus is to function as a wildland fire apparatus, it shall meet the requirements of this chapter.

5.2 Pump for Wildland Fire Fighting. The apparatus shall be equipped with a pump for wildland fire fighting that meets the requirements of Chapter 16 or a fire pump that meets the requirements of NFPA 1901, Standard for Automotive Fire Apparatus.

5.3 Reserved.

5.4 Water Tank. The apparatus shall be equipped with a water tank(s) that meets the requirements of Chapter 18 and that has a minimum certified capacity (combined, if applicable) of 150 gal (2600 L).

5.5* Equipment Storage. A minimum volume as shown in Table 5.5 of enclosed weather-resistant compartmentation that meets the requirements of Section 15.1 shall be provided for the storage of equipment.

**** Insert Table 5.5 Equipment Storage Requirements here ****

5.6* Hose Storage. If the apparatus is equipped with a dedicated hose storage area(s), such area(s) shall comply with Section 15.10.

5.7 Equipment.

5.7.1 The following equipment shall be furnished by the contractor:

1. Two solid bottom wheel chocks, mounted in readily accessible locations, each designed to hold the apparatus, when loaded to its GVWR, on a 20 percent grade with the transmission in neutral and the parking brake released.

2. One set of tire tools including a jack and lug wrench, if a spare tire is carried on the apparatus.

5.7.2* The following additional equipment shall be carried on the apparatus:

1. One of the following traffic warning devices:

   a. Five fluorescent orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retro-reflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retro-reflective white band 2 in. (51 mm) below the 6 in. (152 mm) band

   b. One reflective triangle kit
(2) Five illuminated warning devices such as highway flares, unless the traffic cones or reflective triangles specified in 5.7.2(1) have illuminating capabilities.

(3) One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and that have a five point breakaway feature that includes two at the shoulders, two at the sides, and one at the front.

(4) One approved, dry chemical portable fire extinguisher with a minimum capacity in accordance with the following:
   (a) Below 33,000 lb GVWR requires a 2A-10-B:C extinguisher
   (b) 33,000 lb GVWR and above requires a 3A-40-B:C extinguisher

(5) One first-aid kit

(6) One reflective triangle kit

5.7.3 Brackets or compartments shall be furnished so as to organize and mount the specified equipment.

5.7.4 A detailed list of who is to furnish the items and the method for organizing and mounting these items shall be supplied by the purchasing authority.

Committee Statement: Committee accepts part of the commentors suggestions. Annex reworded to conform to the manual of style and clarify intent.
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<th>Chassis GVWR</th>
<th>Storage Area</th>
<th>ft³</th>
<th>M³</th>
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<td>5,000–10,000</td>
<td>2,200–4,500</td>
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<td>&gt;12,000</td>
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<td>Area ($\text{ft}^3$)</td>
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<tr>
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<tr>
<td>&gt;26,000</td>
<td>&gt;12,000</td>
<td>75</td>
<td>2.12</td>
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</table>
1906-39  Log #152  Final Action: Accept

Submitter: David V. Haston, US Forest Service
Comment on Proposal No: 1906-1
Recommendation: Revise table as follows:

Table 5.5 Equipment Storage Requirements

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<th>lb</th>
<th>kg</th>
<th>ft^3</th>
<th>m^3</th>
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</thead>
<tbody>
<tr>
<td>5,000-10,000</td>
<td>2,200-4,500</td>
<td>10</td>
<td>.28</td>
</tr>
</tbody>
</table>

Substantiation: The minimum GVWR for wildland apparatus should be 10,001 lbs (class 3 vehicle), NFPA 1906 should not apply to smaller vehicles. See comment on 1.3.1 and table 12.1.2.

Committee Meeting Action: Accept

1906-40  Log #114  Final Action: Reject

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-85
Recommendation: Revise text to read as follows:

5.7.2* The following additional equipment shall be carried on the apparatus:

1. One of the following traffic warning devices:
   (a) Five fluorescent orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) band
   (b) One reflective triangle kit

2. Five illuminated warning devices such as highway flares, unless the traffic cones or reflective triangles specified in 5.7.2(1) have illuminating capabilities

3. One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and that have a fivepoint breakaway feature that includes two at the shoulders, two at the sides, and one at the front

4. One approved, dry chemical portable fire extinguisher with a minimum rating of 2A-80-B:C capacity in accordance with the following
   (a) Below 33,000 lb GVWR requires a 2A-10-B:C extinguisher
   (b) 33,000 lb GVWR and above requires a 3A-40-B:C extinguisher

5. One first-aid kit

6. One reflective triangle kit

Substantiation: 5.7.2(1) is being changed because 5.7.2(1)(b) and 5.7.2(6) are duplicates. Something cannot be an option in one place and a requirement elsewhere in the same list.

5.7.2(4) is being modified to correspond to the requirement in NFPA 1901 as stated in the committee substantiation for proposal 1906-84. The substantiation that trucks of 33,000 and below GVWR only needs a 1A-10B:C is inconsistent with NFPA 1901. All apparatus covered by NFPA 1901 is required to have an extinguisher with an 80 B:C rating and a 2½ gallon water extinguisher which typically carries a 2A rating. Paragraph 1.3.1(1) excludes trucks under 9000 GVWR which are essentially class 1 and 2 pickup trucks. By setting the upper range value of 33,000 for smaller extinguishers basically puts all trucks through class 7 trucks in this category. This is the vast majority of wildland fire apparatus. Also requiring a dry chemical extinguisher is product restrictive. Wildland fire apparatus typically operate in remote areas and separated from other support. It is also used in areas where it can be overcome by fast moving fires. The portable fire extinguisher should be larger rather than smaller on these apparatus to protect both the apparatus and the fire fighters.

Committee Meeting Action: Reject

Committee Statement: See Committee Action on 1906-36 (Log #112).
Kirk Bradley, Michigan Department of Natural Resources and Environment

Comment on Proposal No: 1906-1

Recommendation: Delete text to read as follows:

5.7.2* The following additional equipment shall be carried on the apparatus:

(1) One of the following traffic warning devices:

(a) Fire fluorescent orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) band

(b) One reflective triangle kit

...(6) One reflective triangle kit

Substantiation: In (1) there is an option of a reflective triangle kit or something else but in (6) a reflective triangle kit is required. Not consistent. This is the same for 7.7.2.

Committee Meeting Action: Accept in Principle

Committee Statement: See Committee Action on 1906-36 (Log #112).

Thomas A. Stalnaker, Goshen Fire Company

Comment on Proposal No: 1906-1

Recommendation: Revise text to read as follows:

5.7.2 and 7.7.3.2* The following additional equipment shall be carried on the apparatus:

(1) One of the following traffic warning devices:

(a) Five fluorescent orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) band

(b) One reflective triangle kit

...(6) One reflective triangle kit

Substantiation: (1) and (6) are contradictory or redundant. (1) says either cones or triangles, (6) says triangles are required, whether there are cones or not. Triangles should be listed in only one of these two places. This proposal makes the requirement one or the other, which I believe was the intent when this text was last revised.

NOTE that this same change applies to Sections 5.7.2 and 7.7.3.2.

Committee Meeting Action: Accept in Principle

Committee Statement: See Committee Action on 1906-36 (Log #112).
Reconsider the committee action and accept the proposal that deletes the paragraph. Note that 5.7.4 is 12.2.3 in the existing edition of NFPA 1906.

There are many issues that are helpful to both the purchaser and the manufacturer in clarifying responsibility but the purpose of a standard is to specify the minimum requirements, not guide the procurement process. Annex A and B are designed to assist the purchaser understand the options available and how they need to work with a contractor to get the apparatus they desire. I stand by my original substantiation as published in the ROP to delete this paragraph.

Committee Meeting Action: Accept in Principle

Renumber and edit 5.7.4 to A.5.7 to read as follows:

A.5.7 A detailed list of who is to furnish the items and the method for organizing and mounting these items should be supplied by the purchasing authority.

Committee Statement: The committee deleted the requirement and moved text to the annex.
Revise text read as follows:

7.4 Equipment Storage. A minimum of 20 ft³ (0.57 m³) of enclosed weather resistant compartmentation that meets the requirements of Section 15.1 shall be provided for the storage of equipment.

7.5 Hose Storage.

7.5.1 If the apparatus is equipped with a hose storage area, it shall meet the requirements of Section 15.10.

7.5.2 Storage shall be provided that will accommodate a minimum of 20 ft (6 m) of suction hose and 15 ft (4.5 m) of supply hose.

7.6 Reserved.

7.7.1 Minor Equipment.

7.7.1.1 Brackets or compartments shall be furnished so as to organize and mount the specified equipment.

7.7.1.2 A detailed list of who is to furnish the items and the method for organizing and mounting these items shall be supplied by the purchasing authority.

7.6.1.1.2 Equipment:

7.7.2.1 The following equipment shall be furnished by the contractor:

1. Two or more solid bottom wheel chocks, mounted in readily accessible locations, each designed to hold the apparatus, when loaded to its GVWR, on a 20 percent grade with the transmission in neutral and the parking brake released

2. One set of tire tools including a jack and lug wrench, if a spare tire is carried on the apparatus

7.6.2.2 The following additional equipment shall be carried on the apparatus:

1. Traffic warning devices:
   (a) Five fluorescent orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) band
   (b) One reflective triangle kit

2. Five illuminated warning devices such as highway flares, unless the traffic cones or reflective triangles specified in 7.7.2.1(1) have illuminating capabilities

3. One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and that have a fivepoint breakaway feature that includes two at the shoulders, two at the sides, and one at the front

4. One approved, dry chemical portable fire extinguisher with a minimum rating of 2A-80-B:C capacity in accordance with the following:
   (a) Below 33,000 lb GVWR requires a 2A-10-B:C extinguisher
   (b) 33,000 lb GVWR and above requires a 3A-40-B:C extinguisher

5. One first-aid kit

6. One reflective triangle kit

7.6.3 Brackets or compartments shall be furnished so as to organize and mount the specified equipment.

Renumber A.7.5.1 as A.7.5 and revise it to read as follows:

A.7.5.1 The purchaser should specify the location and the arrangement of the hose storage area particularly if hose is to be carried to allow carrying the hose preconnected to the tank inlet or a pump discharge. The purchaser should also consider specifying some type of cover for the hose compartment. Hinged or removable covers might be desirable for wildland fire operations. If the apparatus is to carry suction hose or supply hose, the purchaser needs to provide the
The manufacturer can then provide appropriate accommodations for the hose.

If the requirement remains in the standard that wildland mobile water supply apparatus have a pump and fire fighting capability, then modify 7.4 above to require the same equipment allowance for wildland mobile water supply apparatus as wildland fire apparatus.

**Substantiation:** Section 7.2 currently would not allow a fire pump meeting the requirements of NFPA 1901 as it calls for a wildland fire pump. A pump on this apparatus should be an option. As currently written, the draft would require a wildland mobile water supply apparatus to have a pump that can be as small as 30 gpm and no way of off loading the water other than through that pump. If the apparatus is to do wildland fire fighting, it should meet the requirements for a wildland fire apparatus (chapter 5). A wildland fire apparatus can have a water tank of 1000 gal or greater. The committee’s rational for making a pump mandatory in chapter 7 is not explained in the substantiation for the proposal. If wildland mobile water supply apparatus is required to have a pump and fire fighting capability, then it should have the same equipment storage requirement as a wildland fire apparatus.

7.5.2 is being deleted as there is no similar requirement in chapter 5 for suction and supply hose storage and there is nothing to indicate what the manufacturer is supposed to accommodate for hose. The revised language in A.7.5 provides guidance to the purchaser to work with the manufacturer on hose storage arrangements regardless of the type of hose to be carried.

7.7.2.2(1) is being changed because 7.7.2.2(1)(b) and 5.7.2.2(6) are duplicates. Also note that the wording is different between proposal 1906-44 and the draft. The triangle kit is an option in 7.7.2.2(1)(b) in the proposal and a requirement in the draft. Something cannot be an option in one place and a requirement elsewhere in the same list.

7.7.2.2(4) is being modified to correspond to the requirement in NFPA 1901 as stated in the committee substantiation for proposal 1906-84. The requirement that trucks of 33,000, and below GVWR only needs a 1A-10B:C is inconsistent with NFPA 1901. All apparatus covered by NFPA 1901 is required to have an extinguisher with an 80 B:C rating and a 2 ½ gallon water extinguisher which typically carries a 2A rating. Wildland fire apparatus typically operate in remote areas and separated from other support. It is also used in areas where it can be overcome by fast moving fires. The portable fire extinguisher should be larger rather than smaller on these apparatus to protect both the apparatus and the fire fighters.

Section 7.7 is being renumbered to 7.6 to eliminate the reserved section and is being reorganized to track with the organization of Chapter 5. Reserved sections within a chapter cause confusion and, if used, should be designated with a title of what the committee intends to use the reserved section for in the future.

**Committee Meeting Action: Accept in Principle**

Revise Chapter 7 text to read as follows:

Chapter 7: Wildland Mobile Water Supply Fire Apparatus

7.1* General. If the apparatus is to function as a wildland mobile water supply apparatus, it shall meet the requirements of this chapter.

7.2 Pump. The apparatus shall be equipped with a pump for wildland fire fighting that meets the requirements of Chapter 16 or a fire pump that meets the requirements of NFPA 1901, Standard for Automotive Fire Apparatus.

7.3 Reserved.

7.4 Water Tank. The apparatus shall be equipped with a water tank(s) that meets the requirements of Chapter 18 and that has a minimum certified capacity (combined, if applicable) of 1000 gal (4000 L).

7.5* Equipment Storage. A minimum of 20 ft³ (0.57 m³) of enclosed weather resistant compartmentation that meets the requirements of Section 15.1 shall be provided for the storage of equipment.

7.6* Hose Storage.

7.6.1 The apparatus shall be equipped with a hose storage area that complies with Section 15.10.

7.6.2 Storage shall be provided to accommodate a minimum of 20 ft (6 m) of suction hose and 15 ft (4.5 m) of supply hose.

7.7 Equipment.

7.7.1 The following equipment shall be furnished by the contractor:

1* Two solid bottom wheel chocks, mounted in readily accessible locations, each designed to hold the apparatus, when loaded to its GVWR, on a 20 percent grade with the transmission in neutral and the parking brake released

(2) One set of tire tools including a jack and lug wrench, if a spare tire is carried on the apparatus

7.7.2* The following additional equipment shall be carried on the apparatus:

1 One of the following traffic warning devices:

(a) Five fluorescent orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retro-reflective white band no more than 4 in. (102 mm) from the top of the cone, and an additional 4 in. (102 mm) retro-reflective white band 2 in. (51 mm) below the 6 in. (152 mm) band

(b) One reflective triangle kit
(2) Five illuminated warning devices such as highway flares, unless the traffic cones or reflective triangles specified in 5.7.2(1) have illuminating capabilities

(3) One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and that have a five point breakaway feature that includes two at the shoulders, two at the sides, and one at the front

(4) One approved, dry chemical portable fire extinguisher with a minimum capacity in accordance with the following:
   (a) Below 33,000 lb GVWR requires a 2A-10-B:C extinguisher
   (b) 33,000 lb GVWR and above requires a 3A-40-B:C extinguisher

(5) One first-aid kit

7.7.3 Brackets or compartments shall be furnished so as to organize and mount the specified equipment.

7.7.4 A detailed list of who is to furnish the items and the method for organizing and mounting these items shall be supplied by the purchasing authority.

A.7.6 Hose storage areas are not required to be contiguous. The purchaser should consider arrangements for hose storage that will best support operational procedures particularly if hose is to be carried preconnected to the tank inlet or a pump discharge. The purchaser should also consider specifying some type of cover for the hose compartment(s). Hinged or removable covers might be advantageous for wildland fire operations. The purchaser should provide the apparatus manufacturer with details regarding the size and length of suction or supply hose and what arrangement for storage of the hose is desired so that the manufacturer can more accurately provide appropriate accommodations for the hose.

Committee Statement: Made chapters 5 and 7 consistent with line numbers. Clarified wording.
Revise text to read as follows:

12.1.2* The estimated in-service weight shall include the following:

(7) An allowance for miscellaneous equipment that is at least as great as the greatest of the values shown in Table 12.1.2, a purchaser-provided list of equipment to be carried with weights, or a purchaser-specified miscellaneous equipment allowance.

Combine the first 2 lines in Table 12.1.2 for wildland fire apparatus to include all apparatus with a GVWR of 15,000 or less in one category.

If the requirement remains that wildland mobile water supply apparatus to have a pump and fire fighting capability, then require the same equipment allowance for wildland mobile water supply apparatus as wildland fire apparatus.

Move the asterisk attached to 12.1.2 to 12.1.2(7).

Add a 12.1.2(8) to read: If the apparatus is designed to accommodate SCBA, an additional 25 lbs per seating position shall be added to the miscellaneous equipment allowance.

Add an A.12.1.2(8) to read: Wildland fire apparatus is not required to carry SCBA units. However if the purchaser intends to carry SCBA units, accommodations need to be made for them and their weight included in the miscellaneous equipment allowance. The purchaser needs to work with the manufacturer on where the units will be carried, whether in seat backs or in compartments and how they will be mounted.

Renumber 12.1.2(8) as 12.1.2(9).

Substantiation: 12.1.2(7) is being revised to state a minimum that the manufacturer needs to design for. Purchase specifications can raise that minimum and the addition of an annex provides advice to the purchaser to consider equipment weight. A product standard should not have language in the body of the standard that makes compliance with the standard contingent upon the purchaser specifying something.

With regard to wildland mobile water supply apparatus, if it is going to be doing the same function as a wildland fire apparatus, it should carry the same miscellaneous equipment.

The change to Table 12.1.2 is suggested as 1.3.1(1) states that the standard applies to vehicles with a minimum GVWR of 9000 lb so there is no need to be talking about equipment weights for vehicles down to 5000 GVWR. With only vehicles between 9000 and 10,000 lb GVWR left in that category, it makes sense to combine everything of 15,000 lb and below into a single category. Most stock class 2 trucks have maximum GVWR ratings below 9000 lb so most small vehicles will be class 3 which starts at 10,001 lb GVWR.

Paragraph A.12.1.2(4) states that the 250 lb (114 kg) per person does not include the weight of SCBA and tools carried by a fire fighter and that such weight is accounted for elsewhere. The allowances given in Table 12.1.2 are not high enough to have included SCBA. As not all apparatus is designed to carry SCBA, proposed 12.1.2(8) allows for increasing the weight allowance if SCBA units are to be carried and A.12.1.2(8) advises the purchaser to work with the manufacturer on the accommodations for SCBA units if they are to be carried.
# Table 12.1.2 Minimum Miscellaneous Equipment Allowance

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<th>Chassis GVWR</th>
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<td>Kg</td>
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<td>&gt;12,000</td>
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1906-46 Log #153
(12.1.2)

Submitter: David V. Haston, US Forest Service
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
12.1.2* The estimated in-service weight shall include the following:
(8) 70 lb (32 kg) for each seating position for personal gear unless the purchaser specifies that personal gear is not
   carried on the apparatus

Substantiation: This requirement is unnecessary in a minimum standard as personal gear is not carried on all wildland
apparatus. If personal (out of county) gear is carried on the apparatus it should be included in the miscellaneous
equipment allowance as specified by the purchaser. See 12.1.2(7) (preceding requirement).
250 lbs per seat position represents the 60th percentile for wildland firefighters (n=444) which includes the firefighter
weight, PPE and gear. The 250 lb per seat position requirement in NFPA 1901 represents the 50th percentile weight for
the firefighter, turnouts, and SCBA.

Note: Supporting material is available for review at NFPA Headquarters.

Committee Meeting Action: Accept

1906-47 Log #154
(Table 12.1.2)

Submitter: David V. Haston, US Forest Service
Comment on Proposal No: 1906-37
Recommendation:

***Insert 1906_L154_R_Tb12.1.2 here***

Substantiation: The minimum GVWR for wildland apparatus should be 10,001 lbs (class 3 vehicle), NFPA 1906 should
not apply to smaller vehicles. See comment on 1.1.3(1) and table 5.5.

The equipment weights are unrealistic and are inadequate as minimum requirements. The equipment allowances from
the 2006 edition of NFPA 1906 are reflected above and should be used as minimum requirements.

Committee Meeting Action: Accept in Part
Committee Statement: Remove the top line as shown in the comment but leave the misc equip weight values in the
remaining rows as is.
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<tr>
<th>Wildland Fire Apparatus</th>
<th>Chassis GVWR</th>
<th>Equipment Weight</th>
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<tr>
<td>Wildland Mobile Water Supply Fire Apparatus</td>
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<td>All</td>
<td>200</td>
</tr>
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</table>
1906-48  Log #118  Final Action: Accept in Principle
(12.1.2(8))

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-33
Recommendation:  Reconsider the proposal to modify 5.1.2(5) in the existing standard and accept it.
Substantiation:  The committee's substantiation for rejecting this proposal is to see the committee action on proposal 1606-28. That action is also a reject. See my comment to reconsider the committee action on proposal 1906-28.

The revised wording in proposal 1906-33 eliminates the wording "unless the purchaser specifies" which is not appropriate wording in a product standard. The proposed annex material provides guidance to the purchaser and by tying the requirement to the load distribution, the weight, if it going to be present, is considered in the design of the apparatus.

Committee Meeting Action:  Accept in Principle
Committee Statement:  See Committee Action on 1906-46 (Log #153).

1906-49  Log #119  Final Action: Reject
(12.1.6 (New ))

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-34
Recommendation:  Reconsider the proposal and accept it.
Substantiation:  The committee's rational for rejecting this proposal is not based on any technical justification. NFPA 1906 is not NFPA 1901 and each proposal needs to be evaluated on its own merit regardless of what might be in another NFPA standard. If NFPA 1906 has to mimic NFPA 1901, the two documents should be merged.

Overloading of fire apparatus is a major problem in the fire service leading to premature brake and tire wear as well as steering and handling problems. The ultimate user of the apparatus needs to have a way of quickly seeing what miscellaneous equipment allowance was used in the design of the apparatus. Adding this information to a permanent label on the apparatus will provide that information in a consistent manner. Without this requirement, the standard does not require the miscellaneous equipment allowance used in the design of the apparatus to be recorded anywhere. The committee's comment of maintaining consistency with NFPA 1901 is not a technical reason for the rejection. NFPA 1906 is not NFPA 1901 and each proposal needs to be evaluated on its own merit regardless of what might be in another NFPA standard. If NFPA 1906 has to mimic NFPA 1901, the two documents should be merged.

Committee Meeting Action:  Reject
Committee Statement:  The best way to determine if a vehicle is over-loaded is to weigh it. A label relating data used in the design is not needed or useful by the time the vehicle is built and delivered.

1906-50  Log #17  Final Action: Accept
(12.2.1.4.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Delete text to read as follows:
12.2.1.4.1  The installation of the engine, transmission, and engine- and transmission-driven accessories (PTOs, etc.) shall meet the engine and transmission manufacturers' installation recommendations for the service intended.
Substantiation:  This section has nothing to do with engine derate programming (Section 12.2.1.4), and it is duplicated in Section 12.2.1.6, where it belongs.

Committee Meeting Action:  Accept
Report on Comments – November 2011

1906-51  Log #18  Final Action: Accept
(12.2.3.3)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
12.2.3.3 A permanent label in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle:
Substantiation: Correct terminology, was corrected in 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

1906-52  Log #19  Final Action: Accept
(12.2.5)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
12.2.5 Fuel System.
Substantiation: Word got lost.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

1906-53  Log #20  Final Action: Accept
(12.2.5.1.6.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
12.2.5.1.6.1* Where an electric fuel priming system is furnished, the valving and piping shall be arranged and marked with a label so that it can be operated only to reprime the fuel system. (1901:12.5.1.6.1)
Substantiation: Correct wording to match NFPA 1901-2009. Label requirement is duplicated in Section 12.2.5.1.6.3 where it better belongs.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept
1906-54  Log #21  Final Action: Accept
(12.3.1.5)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:
12.3.1.5* Any time a secondary braking device such as transmission retarders and or exhaust restriction devices are used, they shall have a switch to turn them off during adverse road conditions. (1901:12.3.1.5)
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

1906-55  Log #155  Final Action: Reject
(12.3.2.x (New) )

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No:  1906-1
Recommendation:  Insert after existing 12.3.2.3 and renumber the remaining paragraphs.
12.3.2.4 On commercial chassis excluding skid plates the ramp breakover angle shall be maintained with the installation of the fire package.
Substantiation:  When the ramp breakover angle is not maintained (with the installation of the fire package) damage can and often does result from a reduced ramp breakover angle. The proposed language accounts for skid plates, both OEM and aftermarket. This is a critical requirement and should be included in a minimum standard for wildland apparatus.
Committee Meeting Action: Reject
Committee Statement: Standard should not have criteria that discriminates depending on who manufactures the product. Other criteria in this standard such as minimum step heights may conflict with the proposed wording. Also the criteria is arbitrary because it will vary by commercial chassis OEM. Purchaser can specify if they wish.

1906-56  Log #22  Final Action: Accept
(13.2.2.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:
13.2.2.1  All insulated wire and cable shall conform to SAE J1127, Low Voltage Battery Cable; or SAE J1128, Low Tension Voltage Primary Cable, type SXL, GXL, or TXL. (1901:13.2.2.1)
Substantiation:  Correct titles of these SAE documents. These were corrected in NFPA 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept
1906-57  Log #23  Final Action: Accept

(13.3.3)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

13.3.3 Minimum Continuous Electrical Load. The minimum continuous electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode during emergency operations:

(1901:13.3.3)

Substantiation: Title from NFPA 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

1906-58  Log #120  Final Action: Accept in Principle

(13.3.3(7))

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-28
Recommendation: Revise text to read as follows:

(7)* Other warning devices and electrical loads that are designed into or added to the apparatus because they are defined by the purchaser as critical to the mission of the apparatus.

Substantiation: This revised wording eliminates the wording “defined by the purchaser” which is not appropriate in a product standard and includes the electrical loads in the minimum continuous electrical load calculation regardless of who designates it. A manufacturer could have a design that provides something they feel is critical to the mission of the apparatus that is not covered by (1) through (6) and include it under the revised (7). The finished apparatus should be able to be evaluated by an independent evaluator as compliant with the standard regardless of what is called for in a procurement specification.
A.13.3.3(7) provides good advice to the purchaser on extra electrical loads.
Committee Meeting Action: Accept in Principle

Revise text to read as follows:

(7)* Other warning devices and electrical loads that are designated as critical to the mission of the apparatus.

Committee Statement: Loads can be designed into the apparatus that are not mission critical. This change meets the intent of the comment while fixing this problem. Either the purchaser or the manufacturer could designate something as mission critical.

1906-59  Log #24  Final Action: Accept

(13.3.4)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

13.3.4* The condition of the low-voltage electrical system shall be monitored by a warning system that provides both an audible and a visual signal to persons on, in, or near the apparatus of an impending electrical system failure caused by the excessive discharge of the battery set. (1901:13.3.4)

This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept
Revise text to read as follows:

If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery drops below 11.8 V for 12 V nominal systems, or 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds. (1901:13.3.4.2)

Correct grammar, per NFPA 1901-2009.

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

13.3.4.2 If electrical system voltage is monitored, the alarm shall sound if the system voltage at the battery drops below 11.8 V for 12 V nominal systems, or 23.6 V for 24 V nominal systems, or 35.4 V for 42 V nominal systems for more than 120 seconds. (1901:13.3.4.2)

Substantiation: Correct grammar, per NFPA 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

Revise text to read as follows:

With the engine off, the battery system shall be able to provide the minimum continuous electrical load for 10 minutes without discharging more than 50 percent of the reserve capacity; and then to restart the engine. (1901:13.4.2)

Correct to NFPA 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

Revise text to read as follows:

Electronic control systems and similar devices shall be permitted to be directly otherwise connected to the batteries if so specified by their manufacturer. (1901:13.4.6.2)

This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept
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<tr>
<th>Log #</th>
<th>Final Action</th>
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<th>Recommendation</th>
<th>Submitter</th>
<th>Substantiation</th>
<th>Committee Meeting Action</th>
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</thead>
<tbody>
<tr>
<td>28</td>
<td>Accept</td>
<td>1906-1</td>
<td>Revise text to read as follows: 13.4.6.3 The alternator shall be wired directly to the batteries through the ammeter shunt(s) if one is provided and not through the master load disconnect switch. (1901:13.4.6.3)</td>
<td>Thomas A. Stalnaker, Goshen Fire Company</td>
<td>1906 apparatus does not have a master load disconnect switch, they have a master body disconnect stitch.</td>
<td>Accept</td>
</tr>
<tr>
<td>156</td>
<td>Reject</td>
<td>1906-1</td>
<td>Delete text as follows: A green &quot;Master Body Disconnect On&quot; indicator that is visible from the driver's position shall be provided. The light is not necessary as the operator will know if the battery switch is on or off when operating the apparatus. The light is distracting, especially in small commercial cabs which are typical on wildland apparatus (e.g. type 6 engine). Due to the safety concern of driver distraction operators typically disable the light or cover it with tape. Unlike the 1901 Master Load Disconnect switch, the truck (chassis) will operate with this switch off, but fire truck operations will not function, so it is important to have this light to insure the switch is on. It does not have to be bright enough to distract the driver. There are many other indicator lights in the cab and this light should not be more of a problem.</td>
<td>David V. Haston, US Forest Service</td>
<td></td>
<td>Reject</td>
</tr>
<tr>
<td>29</td>
<td>Accept</td>
<td>1906-1</td>
<td>Revise text to read as follows: 13.8 Optical Warning Devices. Each apparatus that responds on public roads as an emergency vehicle by calling for or blocking the right-of-way from other traffic shall have a system of optical warning devices that meets or exceeds the requirements of this section. 13.8.17 If the vehicle is not equipped to call for or block the right-of-way on a public highway, a sign shall be affixed on the dashboard that reads as follows: “This apparatus is not equipped to call for or block right-of-way on public highways.” Move this text into Section 13.8, not a separate Section 13.8.17. If the second sentence is Section 13.8.17 (which would be at the end of Section 13.8’s sub sections) it would not be seen and would not apply since Section 13.8 says this section only applies if the vehicle is an emergency vehicle. If the vehicle is an emergency vehicle, then Section 13.8.17 would not apply. As a result, the current numbering makes the text never apply.</td>
<td>Thomas A. Stalnaker, Goshen Fire Company</td>
<td></td>
<td>Accept</td>
</tr>
</tbody>
</table>
The optical warning system shall consist of an upper and a lower warning level. (1901:13.8.1)
For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four warning zones. (1901:13.8.3)
The four zones shall be determined by drawing lines through the geometric center of the apparatus at 45 degrees to a line drawn lengthwise through the geometric center of the apparatus. (1901:13.8.3.1)
If the apparatus has a bumper-to-bumper length of 25 ft (7.6 m) or more or has an optical center on any optical warning device greater than 8 ft (2.4 m) above level ground, the requirements of 13.8.12.2 through 13.8.13.6 shall apply. (1901:13.8.13.1)
The upper-level optical warning devices shall be mounted as high and as close to the corner points of the apparatus as is practical in order to define the clearance lines of the apparatus. (1901:13.8.13.2.1)
The upper-level optical warning devices shall not be mounted above the maximum height specified by the device manufacturer, which gives an intensity value at 4 ft (1.2 m) above level ground and at 100 ft (30.5 m) from the optical warning device of less than 50 percent of that required at the optical center. (1901:13.8.13.2.2)
To define the clearance lines of the apparatus, the optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on forward of the front axle centerline and as close to the front corner points of the apparatus as is practical. (1901:13.8.13.3.1)
The optical center of the lower-level optical warning devices at the rear of the vehicle shall be mounted on or behind the rear axle centerline and as close to the rear corner points of the apparatus as is practical. (1901:13.8.13.3.2)
The optical center of the lower-level optical warning devices in the front of the vehicle shall be mounted on or forward of the front wheel centerline and as close to the front corner points of the apparatus as is practical. (1901:13.8.14.3.2)
Substantiation: Correct wording, per NFPA 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept
For each operating mode, the combined optical power of all the optical sources shall meet or exceed the zone total optical power requirements shown in Table 13.8.13.5. (1901:13.8.13.5)

*****Insert Table 13.8.13.5 Here*****

For each operating mode, the combined optical power of all the optical sources mounted on both the upper and lower levels shall meet or exceed the zone's total optical power requirements shown in Table 13.8.14.4. (1901:13.8.14.4)

*****Insert Table 13.8.14.4 Here*****

Substantiation: These changes were made in NFPA 1901-2009 to improve understanding and readability. They do not make any change in requirements.

This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept

The results of the testing shall be used by the apparatus builder or purchaser to determine compliance with this standard and all required photometric data shall be available, upon request, from the optical warning device manufacturer. (1901:13.8.15.2.1.2) (1901:13.8.15.2.1.1)


This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action: Accept in Principle

Committee Statement: Clarify that the results are not just that the device passes, but that the photometric data also be available.
<table>
<thead>
<tr>
<th>Zone</th>
<th>Level</th>
<th>Mode of Operation</th>
<th>Clearing Right-of-Way</th>
<th>Blocking Right-of-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>At any H Total</td>
<td>At any H Point 5° Up or 5° Down from H</td>
</tr>
<tr>
<td>A</td>
<td>Upper</td>
<td></td>
<td>1,000,000</td>
<td>10,000</td>
</tr>
<tr>
<td>B</td>
<td>Upper</td>
<td></td>
<td>400,000</td>
<td>10,000</td>
</tr>
<tr>
<td>C</td>
<td>Upper</td>
<td></td>
<td>400,000</td>
<td>10,000</td>
</tr>
<tr>
<td>D</td>
<td>Upper</td>
<td></td>
<td>400,000</td>
<td>10,000</td>
</tr>
<tr>
<td>A</td>
<td>Lower</td>
<td></td>
<td>150,000</td>
<td>3,750</td>
</tr>
<tr>
<td>B</td>
<td>Lower</td>
<td></td>
<td>150,000</td>
<td>3,750</td>
</tr>
<tr>
<td>C</td>
<td>Lower</td>
<td></td>
<td>150,000</td>
<td>3,750</td>
</tr>
<tr>
<td>D</td>
<td>Lower</td>
<td></td>
<td>150,000</td>
<td>3,750</td>
</tr>
</tbody>
</table>

Notes:
1. All values are in candela-seconds/minute.
2. H = Horizontal plane passing through the optical center.
3. The values in the H Total columns are the total of 19 data point values for each light, with datapoints on the boundary between zones counted in both zones.
Table 13.8.14.4 Minimum Optical Power Requirements for Small Apparatus

<table>
<thead>
<tr>
<th>Zone</th>
<th>Mode of Operation</th>
<th>Clearing Right-of-Way</th>
<th>Blocking Right-of-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H Total</td>
<td>At any H Point</td>
<td>At any Point 5° Up or 5° Down from H</td>
</tr>
<tr>
<td>A</td>
<td>1,000,000</td>
<td>10,000</td>
<td>3,500</td>
</tr>
<tr>
<td>B</td>
<td>200,000</td>
<td>8,000</td>
<td>3,500</td>
</tr>
<tr>
<td>C</td>
<td>400,000</td>
<td>10,000</td>
<td>3,500</td>
</tr>
<tr>
<td>D</td>
<td>200,000</td>
<td>8,000</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Notes:
(1) All values are in candela-seconds/minute.
(2) H = Horizontal plane passing through the optical center.
(3) The values in the H Total columns are the total of 19 data point values for each light, with datapoints on the boundary between zones counted in both zones.
1906-69  Log #121  Final Action: Accept in Principle
(13.8.15.2.1.1)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-39
Recommendation:  Revise text to read as follows:
13.8.15.2.1.1 The results of the testing shall be used by the apparatus builder or purchaser to determine compliance with this standard, and all required photometric data shall be available upon request from the optical warning device manufacturer. \[1901:13.8.15.2.1.1\]
Substantiation:  Paragraph 13.8.16 requires the manufacturer of the apparatus to demonstrate compliance of the warning system by one of 3 methods. If they need the test data to accomplish that, 13.8.15.2.1.1 as modified accomplishes making that data available. Paragraph 13.8.15.2.1.1 should not tell the manufacturer or purchaser that the data needs to be used to determine compliance as one of the options in 13.8.16 does not use the test data.
Committee Meeting Action:  Accept in Principle
Committee Statement:  See Committee Action on 1906-68 (Log #32).

1906-70  Log #33  Final Action: Accept
(13.8.15.2.5)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:
13.8.15.2.5 Measurements shall be repeated at 5 degrees up and 5 degrees down from the horizontal plane that passes through the optical center, beginning at a point on a line the vertical plane passing through the optical center and perpendicular to the horizontal center. (1901:13.8.15.2.5)
13.8.15.2.5.1 The measurements shall be repeated at 5 degree intervals to the left and to the right of this vertical plane throughout the active horizontal angle of light emission of the optical source. (1901:13.8.15.2.5.1)
Substantiation:  Correct wording to NFPA 1901-2009.
This is not original material; its reference/source is as follows:
NFPA 1901-2009
Committee Meeting Action:  Accept
Audible warning equipment in the form of at least one automotive traffic horn shall be provided. If the apparatus responds as an emergency vehicle on public roads, one electric or electronic siren shall be provided. The siren manufacturer shall certify the siren as meeting the requirements of SAE J1849, *Emergency Vehicle Sirens* (1901:13.9.1.1). A means shall be provided to allow the activation of the siren within convenient reach of the driver. (1901:13.9.1.2)

As written in the draft, 13.9.1 requires a horn, then in its sub paragraphs, 13.9.1.1 puts certification requirements on THE siren (what siren??) and 13.9.1.2 puts requirements on the activation of THE siren (what siren??), and then 13.9.1.3 requires the siren (in some cases). The requirement for the siren needs to come before the details on the siren. The proposed wording maintains the desired paragraph numbering while putting the pieces in the correct order. Another possibility would be:

13.9 Audible Warning Devices.
13.9.1 Audible warning devices shall be provided.
13.9.1.1 At least one automotive traffic horn shall be provided.
13.9.1.2 If the apparatus responds as an emergency vehicle on public roads, one electric or electronic siren shall be provided.
13.9.1.2.1 The siren manufacturer shall certify the siren as meeting the requirements of SAE J1849, *Emergency Vehicle Sirens* (1901:13.9.1.1)
13.9.1.2.2 A means shall be provided to allow the activation of the siren within convenient reach of the driver. (1901:13.9.1.2)

Committee Meeting Action: Accept in Principle
Revise text to read as follows:
13.9 Audible Warning Devices.
13.9.1 Audible warning devices shall be provided.
13.9.1.1 At least one automotive traffic horn shall be provided.
13.9.1.2 If the apparatus responds as an emergency vehicle on public roads, one electric or electronic siren shall be provided.
13.9.1.2.1 The siren manufacturer shall certify the siren as meeting the requirements of SAE J1849, *Emergency Vehicle Sirens* (1901:13.9.1.1)
13.9.1.2.2 A means shall be provided to allow the activation of the siren within convenient reach of the driver. (1901:13.9.1.2)

Committee Statement: The alternate proposal is more consistent with the Manual of Style.
Revise text to read as follows:

13.10 Work Lighting. All light level measurements shall be made with a light meter with a hemispherical light sensor held against the surface, facing perpendicular to the surface, and not deliberately pointed toward the light source.

[1901:13.10]

13.10.1 Ground Lighting. 

13.10.1.1 The work area immediately behind the vehicle shall be illuminated to a level of at least 3 fc (30 lx) within a 10 ft × 10 ft (3 m × 3 m) square to the rear of the vehicle. [1901:13.10.1.1]

13.10.1.2 The fire apparatus shall be equipped with lighting that is capable of providing illumination at a minimum level of 2 fc (20 lx) on ground areas within 30 in. (800 mm) of the edge of the apparatus in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level. [1901:13.10.1.2]

13.10.1.3 Lighting designed to provide illumination on areas under the driver and crew riding area exits shall be switchable but activated automatically when the exit doors are opened. [1901:13.10.1.3]

13.10.1.4 All other ground area lighting shall be switchable. [1901:13.10.1.4]

13.10.2 Hose Bed Lighting. Reserved

13.10.3 Surface Lighting. The apparatus shall have sufficient lighting to provide a minimum level of 2 fc (20 lx) on all work surfaces, steps, and walkways. [1901:13.10.3]

13.10.4 Interior Lighting. The apparatus shall have sufficient lighting to provide an average level of 2 fc (20 lx) at each seating surface in the driving and crew compartments. [1901:13.10.4]

13.10.5 Compartment Lighting. Reserved.

13.10.6 Switching. Switches for all work lighting shall be readily accessible. [1901:13.10.6]

13.10.7 Protection. The lights shall be arranged or protected to minimize accidental breakage. [1901:13.10.7]

13.10.8 Testing. All work lights mounted in wet locations shall be tested in conformance with SAE J575, Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less Than 2032 mm in Overall Width, and shall comply with the following performance requirements of that standard:

(1) Vibration
(2) Moisture
(3) Dust
(4) Corrosion
(5) High temperature
(6) Low temperature
(7) Durability
(8) Warpage. [1901:13.10.8]

Add annex material to support changes to 13.10 to read as follows:

A.13.10.1.1 The purchaser might want to specify work area (scene) lighting along the side of the vehicle. This can be provided by low voltage or line voltage lighting. [1901:A.13.10.1.1]

A.13.10.4 The user may want to consider a map light or additional task lighting in the cab. [1901:A.13.10.4]

A.13.10.5 The purchaser should consider compartment lighting for larger compartments. Where provided, it is suggested that the lighting level be a minimum of 2 fc (20 lx) at any location on the floor of the compartment without any shelves, dividers, or equipment in the compartment.

Substantiation: Work lighting is important for fire fighter safety. Wildland fire apparatus operates in remote areas and uneven terrain and foot and ankle injuries increase when fire fighters cannot see what they are stepping on as they dismount from the apparatus and work around it. Also if a fire fighter needs to climb onto the apparatus, which is often the case with larger apparatus and mobile water supply apparatus, the stepping and walking surfaces need to be illuminated to reduce slips and falls. Wildland apparatus needs to meet the same requirements as other apparatus on issues of fire fighter safety.

The text shown is extracted from NFPA 1901 with the exception of A.13.10.5 which moves the concepts from the requirements in 13.10.5 of NFPA 1901 to an annex item.

Committee Meeting Action: Reject

Committee Statement: In the wildland firefighting application, the usage of the apparatus is very different. The wildland fighting conditions are much less truck-centric and thus lighting at the truck does little good for firefighter safety.
In night situations, the wildland firefighter would normally have a headlamp to meet their lighting needs.

1906-73 Log #35
(13.10.8, 13.14.4.4, and 13.15)

Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company

Comment on Proposal No: 1906-1

Recommendation: Revise text to read as follows:

13.10.8 Testing. All work lights mounted in wet locations shall be tested in accordance conformance with SAE J575, Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less Than 2032 mm in Overall Width, (this standard is applicable for larger vehicles as well) and shall comply with the following performance requirements of that standard:

... (1901:13.10.8)

13.14.4.4 The test shall be considered a failure if the alarm has not yet sounded sound in less than 140 seconds after the voltage drops to 11.70 V for a 12 V nominal system, 23.4 V for a 24 V nominal system, or 35.1 V for a 42 V nominal system. (1901:13.14.4.4)

13.15 Documentation. At the time of delivery, the manufacturer shall provide the following with the fire apparatus:

(1) Documentation of the electrical system performance tests

(2) A written electrical load analysis, including the following:

(a) The nameplate rating of the alternator

(b) The alternator rating under the conditions specified in 13.3.2

(c) Each of the component loads specified in 13.3.3 that make up the minimum continuous electrical load

(d) Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load

(e) Each individual intermittent electrical load (1901:13.15)

Substantiation: Correct wording to NFPA 1901-2009.

This is not original material; its reference/source is as follows:

NFPA 1901-2009

Committee Meeting Action: Accept
Revise text to read as follows:

13.11 Hazard Light.

13.11.1 A red flashing or rotating light, located in the driving compartment, shall be illuminated automatically whenever the apparatus's parking brake is not fully engaged and any of the following conditions exist:

1. Any passenger compartment door other than the two front doors is not closed.
2. Any equipment compartment door other than those exempted by 13.11.2 is not closed.
3. Any equipment rack is not in the stowed position.
4. Any device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

Compartments meeting all of the following conditions shall be permitted to be exempt from the requirements of 13.11.1:

1. The volume is less than or equal to 4 ft$^3$ (0.1 m$^3$).
2. The compartment has an opening less than or equal to 144 in.$^2$ (92900 mm$^2$).
3. The open door does not extend sideways beyond the mirrors or up above the top of the fire apparatus.
4. All equipment in the compartment is restrained so that nothing can fall out if the door is open while the apparatus is moving. [1901:13.11.2]

13.11.3 The hazard light shall be marked with a sign that reads “Do Not Move Apparatus When Light Is On.” [1901:13.11.4]

Substantiation: The committee apparently contemplates powered equipment racks on some wildland apparatus as it has stated requirements for them if they are provided (see 15.4). Also on larger wildland fire apparatus and wildland mobile water supply apparatus, passenger doors and compartment doors could be open without the driver realizing it. While the 2 front passenger compartment doors are readily visible to the driver, other open doors may not be visible enough for the driver to realize they are open. The hazard light is required on other types of fire apparatus and should be required on wildland apparatus as well.

Committee Meeting Action: Reject

Committee Statement: Compartment lights are not required, so the switches to drive this light are not present. It would add significant maintenance requirements to these trucks.
**Revise text to read as follows:**

1906-76 Log #144
(14.1.1 and 2.3.4)

**Final Action: Hold**

**Submitter:** Greg Blanchat, Blanchat Mrg., Inc.
**Comment on Proposal No:** N/A

**Recommendation:** Revise text to read as follows:

14.1 General.
14.1.1 Each crew riding shall be within a full enclosed personnel area for transit to and from the scene.

14.4.1 An exterior fire attack position may be provided for rolling fire attack on the fire scene. If provided, it shall meet the requirements of this section.
14.4.2 The positions shall be located behind the cab.
14.4.3 The design of the position shall allow the firefighter to move across the vehicle from one side to the other without exiting the protected area.
14.4.4 The position shall include a Roll Over Protection Structure tested using the test procedures and requirements for side impact only from SAE J1194 Section 6.
14.4.5 A door or gate shall be provided on each side of the vehicle to allow for the firefighter to exit to either side.
14.4.6 The door or gate shall be designed to prevent outward swing even in the event of failure of the latching mechanism.
14.4.7 The door or gate shall be at least 48 inches (1200 mm) high from the firefighter's standing surface.
14.4.8 A harness and restraint system shall be provided.
14.4.9 The harness and restraint system shall allow the firefighter to move from the side firefighting position at least to the centerline of the apparatus without releasing the harness or restraints.
14.4.10 In the event of sudden stops or lateral acceleration, the restraint system shall lock to prevent the firefighter from being thrown forward, sideward, or out of the vehicle.
14.4.11 The harness shall be equipped with a quick release that allow the firefighter to release the harness with a single action with one hand.
14.4.12 The position shall have a sign that reads "WARNING: Do not occupy this position during on-road travel or at speeds greater than 15 mph. Serious injury or death may result."

Add new text to Section 2.3.4:

SAE J1194 Rollover Protective Structures (ROPS) for Wheeled Agricultural Tractors, 2009.

**Substantiation:** THE NFPA NEEDS TO RECOGNIZE REASONS TO “RIDE WHILE PUMP AND ROLLING”

The National Fire Protection Agency (NFPA) states that a firefighter should ride within a “fully enclosed personnel area”. The NFPA defines a “fully enclosed personnel area” as “a driver or passenger compartment on the fire apparatus that provides total enclosure on all sides, top, and bottom and has positive latching on all access doors”. Basically, it is saying that the firefighter should be inside the cab while the truck is in motion. This recommendation originated from the dangerous situation of firefighters riding and falling off the tailboard of fire trucks in route to a scene. Ever since, the NFPA recommends that you should not ride a truck outside the cab under any circumstances without consideration.

The only way to effectively fight a wild land fire is to stop the head fire. There are four methods to stopping the head fire: Terrain, Mother Nature, Back-Firing and Flanking. In woodland areas, these four methods are utilized by the ground crew. Aircraft may be used to slow down the head fire giving the ground crews time to Flank the fire. In the windy Midwest during a fast-moving fine fuel fire, the Terrain and Mother Nature often don’t cooperate. Because the fire is moving too fast, driven by high winds, fire personnel lose the option to Back Fire, therefore the only alternative is to Flank the fire and aircraft are often inadequate or unavailable to slow down the head fire.

The NFPA needs to recognize the importance to ride pump and roll apparatus in the fine fuel windy conditions:

- To be able to fight a fast-moving fine fuel fire that mainly occurs in the windy prairie lands of the Midwest.

A person in good shape can walk 1-2 miles per hour walking a fire line while the fire may be moving 2-10 miles per hour. The only effective way to Flank the fire is to use the ride while pump and rolling method. With a man on a nozzle, three times more fire can be put out with the same amount of water versus a remote control front monitor. This is

Printed on 5/12/2011
accomplished with a rapid sweeping motion (hit the head fire, sweep back to overhaul, sweep forward to hit the head fire, sweep back to overhaul).

• To avoid over-exertion and stress due to walking the fire line.
The average age of the rural volunteer firefighter is rising. The majority of these firefighters are in their upper 40’s and 50’s. I am 52, about the average age in the fire department of which I am a member. Needless to say, I am not in the physical shape that I was in my 20’s and 30’s. A majority of fire personnel aren’t in the physical shape necessary to walk the fire line alongside a fire truck. The NFPA reports that in 2007, 39% of firefighting-related fatalities were due to over-exertion and stress. Of that 39%, 37% of the deaths were directly attributed to sudden cardiac arrest. The NFPA also reports that of that 37%, all of the individuals were over 31 with the majority over 40. The U.S. Fire Administration (USFA) states that of the 114 firefighting-related fatalities in 2008, 50 (43.8%) were caused by stress and over-exertion.
• To provide protection while riding and pump and rolling.
Fire personnel are riding on trucks not adequately designed to ride while pump and rolling. A perfect example of this is the incident in Abilene, Texas in February 2009.

Caught on video, a truck with an inadequate design overturned alongside of a railroad track. The side rail crushed against the tank on the driver’s side. Fortunately, the firefighters were riding on the passenger side and escaped major injuries. Had the firefighters been riding on the driver’s side or walking alongside the driver’s side, they could have been seriously injured or killed. If the firefighters would have been walking alongside the apparatus, Flanking the fire, the fire truck could have rolled over and crushed them. In my over 25 years of fighting these types of fires, I have almost been injured in an incident where I was riding on a truck that wasn’t designed to ride while pump and rolling. It is this reason that makes each time a firefighter loses their life very personal.

Midwest City, OK made national news in the spring of 2009 because wild land fire destroyed numerous homes and property. Not one firefighter was walking the fire line. Because of the speed in which the fire was advancing due to high winds, walking the fire line was ineffective. Riding while pump and rolling is happening out of necessity. I asked a ranking individual in the U.S. Forest Service, stationed in the grasslands, how he fights a fine fuel fire under high wind conditions.

With a very serious facial expression he stated, off the record, we call in the volunteer firefighters that ride their trucks while pump and rolling and that it is the only method we have found that has a chance in putting out the fire.

I see resentment against the NFPA from rural Midwest fire departments. The issue of fine fuels and high winds along with the tactics used when fighting this type of fire are not being addressed. The NFPA needs to recognize these issues and produce a set of provisions for fire apparatus manufacturers that build trucks designed to ride while pump and rolling.

Greg Blanchat
The firefighter on the left in Figure #7 is not aware of an impending collision. He is about to become a statistic. The firefighter on the right in Figure #7 has a much better chance of avoiding serious injury or death upon a collision. Just last year, Kansas lost a fire chief because the pump controls were on the rear of the truck. The location of the controls at the rear is another issue that needs to be addressed because there have been many serious injuries and deaths.

This is not original material; its reference/source is as follows:
14.4 by Tom Stainaker of Goshen Fire Company West Chester, PA.

Committee Meeting Action: Hold

Committee Statement: This comment represents new material, because it was never published for the public to comment on prior to this meeting. The committee sees merit in pursuing this commentor's concerns, but cannot act on it this late in the cycle.

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1906-77  Log #37  Final Action: Accept
(14.1.3, 14.1.3.10, 14.1.3.10.1, 14.1.3.10.2, 14.1.6, 14.1.8.1, and 14.1.9.3)

Submitter: Thomas A. Stalnaker, Goshen Fire Company

Comment on Proposal No:  1906-1

Recommendation:  Revise text to read as follows:

14.1.3* Each crew riding position shall be provided with a seat and an approved seat belt designed to accommodate a person with or and without heavy clothing. (1901:14.1.3)

14.1.3.10* A seat belt warning device system shall be provided. (1901:14.1.3.10)

14.1.3.10.1 The warning device system shall consist of an audible alarm warning device that can be heard at all seating positions designed to be occupied while the vehicle is in motion, and a visual display visible to the driver or the officer showing the condition of each seating position. (1901:14.1.3.10.1)

14.1.3.10.2 The warning device shall be activated any time the parking brake is released or the automatic transmission is not in park. (1901:14.1.3.10.2)

14.1.6 Any Door of the apparatus designed to allow persons to enter or exit the apparatus shall have at least 96 in. \(^2\) (62,000 mm\(^2\)) of reflective retroreflective material affixed to the inside of the door. (1901:14.1.6)

14.1.8.1* The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be as follows:

... (3) For nonsuspension-style seats, the minimum vertical dimension shall be 35 in. \((889\ mm)\) measured with the seat adjusted to its lowest position. (1901:14.1.8.1)

14.1.9.3 A back cushion that extends from the face of the seat vertically at least 18 in. \((460\ mm)\) and that is a minimum of 18 in. \((460\ mm)\) wide at the base shall be provided. (1901:14.1.9.3)

Substantiation:  Correct to NFPA 1901-2009 wording.

This is not original material; its reference/source is as follows:
NFPA 1901-2009

Committee Meeting Action: Accept
Report on Comments – November 2011

1906-78 Log #125 Final Action: Reject
(14.1.3.7)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-52
Recommendation: Delete 14.1.3.7 and renumber 14.1.3.8 through 14.1.3.10.5 as 14.1.3.7 through 14.1.3.9.5.
Substantiation: Sections and paragraphs within chapter should not be reserved unless they carry a title and the committee intends to fill in the section or paragraph with a requirement in a subsequent edition. In the case of 14.1.3.7, the corresponding text in NFPA 1901 deals with tiller seats which will never be part of a wildland fire apparatus so there is no need to keep a reserved paragraph.
Committee Meeting Action: Reject
Committee Statement: See Committee Statement on 1906-15 (Log #104).

1906-79 Log #190 Final Action: Accept in Principle
(14.1.3.10)

Submitter: Kirk Bradley, Michigan Department of Natural Resources and Environment
Comment on Proposal No: 1906-1
Recommendation: Delete text to read as follows:

14.1.3.10 A seat belt warning device shall be provided. [1901.14.1.3.10]
14.1.3.10.1 The warning device shall consist of an audible alarm that can be heard at all seating positions designed to be occupied while the vehicle is in motion, and a visual display visible to the driver or the officer showing the condition of each seating position. [1901.14.1.3.10.1]
14.1.3.10.2 The warning device shall be activated any time the parking brake is released or the automatic transmission is not.
14.1.3.10.4 The display indication shall be permitted to consist of lights, text, graphical indicators, digital displays, or other methods. [1901.14.1.3.10.4]
14.1.3.10.5 The warning system shall not show an affirmative indication unless it has determined that the seat was occupied before the seat belt was buckled.

Substantiation: System that monitors all seating positions in smaller chassis is not available through OEM. Standard should not require something that is not readily available.
Committee Meeting Action: Accept in Principle

Add new annex text to A.14.1.3 to read as follows:

A.14.1.3 The purchaser will need to define how many seating positions are required to carry personnel and might wish to specify the arrangement of the seating positions. Canopy cab extensions with patio door–type closures or separate telephone booth–type personnel enclosures are acceptable means for providing fully enclosed seating positions. The ultimate mission of wild land fire apparatus is dependent upon the apparatus responding and arriving on incidents safely. To this end it is essential that the wild land fire apparatus be driven in a safe manner and that all occupants are seated and belted while the apparatus is in motion. To encourage safe practices, fire department management should consider employing methods of monitoring driving and safety habits of the personnel onboard. Several methods of monitoring compliance of all safety precautions by personnel in the apparatus have been developed including available live video monitoring, video recording, and vehicle data recording. Any monitoring method should include monitoring the use of seat belts and an indication of the characteristics of how carefully the apparatus is being driven. Purchasers may wish to consider specifying seat belt colors such as bright red or orange that contrast with personnel clothing that easier to observe for compliance.

Committee Statement: The committee deleted text and added new text to the annex.
Revise text to read as follows:

**Materials used within the driving and crew compartment(s) shall exhibit a fire performance that, as a minimum, comply with Federal Motor Vehicle Safety Standard (FMVSS) No. 302, “Flammability of interior materials.”** *(1901:14.1.4)*

**A 14.1.4 NFPA 556, Guide on Methods for Evaluating Fire Hazard to Occupants of Passenger Road Vehicles, has shown that FMVSS 302 offers an insufficient level of fire safety, and recommends that materials used in vehicle passenger compartments, such as seats, be assessed in accordance with a more severe fire test. An example of adequate fire performance would be obtained by providing materials with lower heat release rate and more difficult ignitability when assessed by means of ASTM E 1354, Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter.**

**Standards Council asked the NFPA Technical Committee on Hazard and Risk of Contents and Furnishings to develop NFPA 556 based on the fact that a few NFPA documents, including NFPA 1906 and NFPA 1901, use FMVSS 302 as the mandatory fire test for vehicle passenger compartment materials.**

It has been shown that FMVSS 302 is unsuitable for that purpose. It was designed to protect against cigarette ignition of interior materials and was developed in the 1960s, before modern fire safety technology was available. NFPA 556 points out that, as long as FMVSS 302 continues being the only fire safety tool, vehicular fire losses are likely to remain high.

**ASTM E 1354, cone calorimeter, is a modern fire safety test that assesses heat release and ignitability. It is understood that this change will not cause a requirement but will start highlighting that fire department apparatus should use adequate materials. This change may even lead to specifications that require material testing to ASTM E 1354. One goal might be to require peak heat release rates not exceeding 300 kW/m² when the materials are tested in the horizontal orientation at an incident heat flux of 50 kW/m². This value was obtained from requirements for large fuel packages (such as garbage cans) in the Uniform Fire Code.**

**The problem of unsafe materials inside the passenger compartments of fire department vehicles is particularly critical in the case of wildland fire apparatus.**

It is understood that this is, at present, an extract section. However, it need not be so and that is why the extract section reference is proposed to be deleted.

**Committee Meeting Action: Reject**

**Committee Statement:** Standard is already a minimum standard so the body text does not need to change. The suggested annex material seeks to set a different standard.

---

Revise text to read as follows:

**If the SCBA unit is mounted in the seatback, the release mechanism shall be accessible to the user while seated unless the release is fully automatic.**

**Brackets which lock automatically either in the event of impact or when the parking brake is released, but are not locked at other times, are acceptable.**

**This allows for electric released SCBA brackets and inertial locking brackets, both of which are being used now and meet the intent, but not the letter, of the original requirement.**

This proposal was approved and published in the both ROPs as approved, but was not included in the draft.

**This is not original material; its reference/source is as follows:**

Proposal 1906-50 Log #8

**Committee Meeting Action: Accept**
Revised text to read as follows:

(17) Master electrical load body disconnect switch

Substantiation: NFPA 1906 trucks have a body disconnect switch, not a master load switch.

Committee Meeting Action: Accept

Revise text to read as follows:

The outward ends of the equipment rack that protrude beyond the body of the apparatus shall have reflective retroreflective material to indicate a hazard or obstruction. (1901:15.4.7)

15.7.1 Steps, platforms, or permanently attached access ladders shall be provided so that fire fighters have access to all working and storage areas of the fire apparatus. (1901:15.7.1)

15.7.1.4 All access ladders shall have at least 8 in. (200 mm) of clearance between any rung and the body of the fire apparatus or other obstruction. (1901:15.7.1.4)

15.7.2 All steps, platforms, or access ladders shall be designed and installed to sustain a minimum static load of 500 lb (227 kg) without deformation. (1901:15.7.2)

15.8 Access Handrails or Handholds.

15.8.1 Access handrails or handholds shall be provided at each entrance to a driving or crew compartment and at each position where steps or ladders for climbing are located. (1901:15.8.1)

Substantiation: Correct wording to NFPA 1901-2009.

This is not original material; its reference/source is as follows:
NFPA 1901-2009

Committee Meeting Action: Accept
1906-85     Log #191 (15.9.2.1)  Final Action: Accept in Principle

Submitter: Kirk Bradley, Michigan Department of Natural Resources and Environment
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:
15.9.2.1* All exposed ferrous metal surfaces that are not plated or stainless steel shall be cleaned and prepared and
sh 15.9.3* Reflective Striping.
Substantiation:  15.9.2.1 ends abruptly without completion and 15.9.3 should start new paragraph.
Committee Meeting Action:  Accept in Principle
Committee Statement:  This appears to be an editorial error in the published draft.  This has been corrected.

1906-86     Log #41 (15.9.3)  Final Action: Accept in Principle

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-52
Recommendation:  Add new text to read as follows:
15.9.3* Reflective Striping.
Substantiation:  This section number and title got lost.
This is not original material; its reference/source is as follows:
Proposal 1906-52 Log #CP43.
Committee Meeting Action:  Accept in Principle
Committee Statement:  See Committee Statement in 1906-85 (Log #191).
A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, at least 50 percent of the width of the rear and at least 25 percent of the width of the front of the apparatus.

The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width or as wide as possible if 4 inches (100 mm) of flat surface is not available. (1901:15.9.3.1.1)

The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll-up doors) provided the full stripe is seen as continuous when approaching the apparatus.

A graphic design shall be permitted to replace all or part of the required striping material if the design or combination thereof covers at least the same perimeter length(s) required by Section 15.9.3.1. (1901:15.9.3.1.3)

At least 50 percent of the rear-facing vertical surfaces, visible from the rear of the apparatus, excluding any pump panel areas not covered by a door, shall be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees.

Each stripe in the chevron shall be a single color alternating between red and either yellow, fluorescent yellow, or fluorescent yellow-green.

Each stripe shall be 6 in. (150 mm) in width.

All retroreflective materials required by Sections 15.9.3.1 and 15.9.3.2 shall conform to the requirements of ASTM D 4956, Standard Specification for Retroreflective Sheeting for Traffic Control, Section 6.1.1 for Type I Sheeting.

All retroreflective materials used to satisfy the requirements of 15.9.3.1 that are colors not listed in ASTM D 4956, Section 6.1.1, shall have a minimum coefficient of retroreflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees. (1901:15.9.3.3.1)

Fluorescent yellow and fluorescent yellow-green retroreflective materials used to meet the requirements of Section 15.9.3.2 shall conform to the minimum requirements specified for yellow Type I Sheeting in ASTM D 4956, Section 6.1.1.

Any printed or processed retroreflective film construction used to meet the requirements of Sections 15.9.3.1 and 15.9.3.2 shall conform to the standards required of an integral colored film as specified in ASTM D 4956, Section 6.1.1.

A.15.9.3.1.1 Purchaser may wish to consider adding the chevron requirement from NFPA 1901 if there is sufficient vertical surface at the rear of the apparatus.

Substantiation: Rear chevrons improve safety and should be required on all emergency vehicles. The argument that “there is often not enough surface area on the back of these vehicles” is not valid since the requirement is not for a specific area, but 50% of the available area. While it would be hard to conceive of such a vehicle, even a vehicle with no “rear-facing vertical surfaces” could meet this requirement since 50% of 0 is 0. Even chevrons on the back edge of a flatbed truck are a significant contribution to visibility. Many police departments are putting chevrons on the back bumpers of police cars, which is also a relatively small area.

This is not original material; its reference/source is as follows:

NFPA 1901-2009

Committee Meeting Action: Reject

Committee Statement: Chevon in the rear is not practical on some wildland trucks because there is not enough surface area on the back of all the trucks.
1906-88 Log #43

(15.9.3.1.2)

Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company

Comment on Proposal No: 1906-1

Recommendation: Revise text to read as follows:

15.9.3.1.2 The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll-up doors) provided the full stripe is seen as continuous when approaching the apparatus.

Substantiation: This was added to NFPA 1901 (except that a word was misspelled there).

Committee Meeting Action: Accept

1906-89 Log #126

(15.9.3.2 and 15.9.3.3)

Final Action: Reject

Submitter: Carl E. Peterson, Hingham, MA

Comment on Proposal No: 1906-55

Recommendation: Revise text to read as follows:

15.9.3.2 At least 50 percent of the rear-facing vertical surfaces, visible from the rear of the apparatus, excluding any pump panel areas not covered by a door, shall be equipped with retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees.

15.9.3.2.1 Each stripe in the chevron shall be a single color alternating between red and either yellow, fluorescent yellow, or fluorescent yellow-green.

15.9.3.2.2 Each stripe shall be 6 in. (150 mm) in width.

15.9.3.3 All retroreflective materials required by 15.9.3.1 and 15.9.3.2 shall conform to the requirements of ASTM D 4956, Standard Specification for Retroreflective Sheeting for Traffic Control, Section 6.1.1 for Type I Sheeting.

15.9.3.3.1 All retroreflective materials used to satisfy the requirements of 15.9.3.1 that are colors not listed in ASTM D 4956, Section 6.1.1, shall have a minimum coefficient of retroreflection of 10 with observation angle of 0.2 degrees and entrance angle of -4 degrees.

15.9.3.3.2 Fluorescent yellow and fluorescent yellow-green retroreflective materials used to meet the requirements of 15.9.3.2 shall conform to the minimum requirements specified for yellow Type I Sheeting in ASTM D4956, Section 6.1.1.

15.9.3.3.3 Any printed or processed retroreflective film construction used to meet the requirements of 15.9.3.1 and 15.9.3.2 shall conform to the standards required of an integral colored film as specified in ASTM D4956, Section 6.1.1.

Delete proposed A.15.9.3.1.1.

Substantiation: I support the explanation of the negative vote of committee member Robert Baraclough. The committee spent considerable time discussing the merits of chevron striping on the rear of fire apparatus when the requirement was put into NFPA 1901. This is both a vehicle and fire fighter safety issue and should be uniform for all fire apparatus. As far as how much vertical surface is available to adhere chevron striping to, the committee addressed that issue with only requiring it on 50 percent of the vertical surface. The following is the committee statement from the ROC for the 2009 edition of NFPA 1901, comment 1901-112.

“The 50 percent value was established after considerable discussion about the vertical surfaces that are available on apparatus. The chevron pattern was chosen because of its proven track record throughout the European Fire Service. The colors are restricted so that a standard image will emerge across the nation. Just as there are standards for temporary traffic control in the Manual on Uniform Traffic Control Devices, there should be a standard appearance of vehicles that typically are the first to arrive at roadway emergencies.”

With this proposed change, A.15.9.3.1.1 is not required.

Committee Meeting Action: Reject

Committee Statement: Committee feels that the majority of the 1906 trucks will not have enough surface area at the rear of the truck to make chevron striping practical or useful.
1906-90  Log #44  
(15.12.1, 15.13, 15.13.1, and 15.13.3)  
Final Action: Accept  

Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No:  1906-1  
Recommendation: Revise text to read as follows:  
15.12.1 Receivers or anchors installed at any location on the apparatus for use as removable winch anchors shall be designed and affixed to provide at least a 2.0-to-1 straight line pull no-yield safety factor over the load rating of the removable winch. (1901:15.12.1)  
15.13 Slip-On Fire-Fighting Module. If the pump, piping, and tank are built as a slip-on, self-contained module unit, it shall meet the requirements of Section 15.13.1 through Section 15.13.3 and shall be mounted on the fire apparatus in accordance with Section 15.13.4. (1901:15.13)  
15.13.1 The major components of the slip-on module, including the pump, pumping engine, water and agent tank(s), plumbing system, and electrical system shall meet the requirements of the applicable chapters of this standard covering those components. (1901:15.13.1)  
...  
15.13.3 The manufacturer of a slip-on fire-fighting module shall provide the following data with the module:  
(1) Weight without water but with all other tanks or reservoirs for liquids full  
(2) Weight full of water and other liquids, including foam concentrate, fuel, and lubricants  
(3) Horizontal center of gravity when full of water and other liquids  
Substantiation: Correct wording to NFPA 1901-2009.  
This is not original material; its reference/source is as follows:  
NFPA 1901-2009  
Committee Meeting Action: Accept  

1906-91  Log #128  
(Chapter 16)  
Final Action: Reject  

Submitter: Carl E. Peterson, Hingham, MA  
Comment on Proposal No:  1906-56  
Recommendation: Delete all paragraphs designated as reserved and renumber as appropriate.  
Substantiation: This chapter is the requirements for wildland water pumps, not fire pumps. The NFPA extract policy provides the user with notice that the language has been extracted from another NFPA document. Having reserved paragraphs throughout the chapter while some paragraph numbers are used to state requirements totally different than chapter 16 in NFPA 1901 is confusing. NFPA 1906 should be its own standard, not a clone of NFPA 1901 with changes. A wildland water pump and a fire pump have different characteristics and requirements. While some of the requirements for fire pumps may apply to wildland water pumps, trying to use the fire pump chapter from NFPA 1901 with additions, changes, deletions and reserved sections and paragraphs is confusing and unnecessary. If NFPA 1906 needs to mimic NFPA 1901 to the extent of having reserved paragraphs throughout it where NFPA 1901 requirements do not apply, it should be integrated into NFPA 1901. Otherwise, make chapter 16 in NFPA 1906 the requirements for wildland water pumps and number the requirements consecutively.  
Committee Meeting Action: Reject  
Committee Statement: See Committee Statement on 1906-15 (Log #104).
Revise text to read as follows:

Chapter 16 Wildland Water Pumps for Wildland Fire Fighting and Associated Equipment

Revise text to read as follows:

16.1 Application.

If the apparatus is equipped with a wildland water pump, the pump shall meet the requirements of this chapter.

An NFPA 1906-compliant wildland fire apparatus shall be equipped with either a "wildland fire pump" as defined in this chapter, or a fire pump as defined in NFPA 1901, Standard for Automotive Fire Apparatus.

16.1.2 The purchaser shall refer to the standards applicable to the pump selected.

Substantiation: The change of title is to avoid confusion with the term fire pump since the committee has introduced the fire pump as an allowable alternative on wildland fire apparatus. Also, as written, the "associated equipment" would apply to wildland fire fighting and not the pump.

The place to allow for the alternative of either a wildland water pump or a fire pump is in chapters 5 and 7, not here.

The committee revised for clarity. See Committee Action on 1906-96 (Log #45) for Table 16.2.1

Committee Meeting Action: Reject

Committee Statement: Requirements of Chapter 16 are presented in a clearer manner for the user with this information.

Substantiation: All of the text from the proposal is not reflected in the draft. Paragraphs at the 3 digit level normally do not have titles unless they are just a title but if they do, all paragraphs within that section at the 3 digit level need titles. Other changes are editorial to clarify understanding of the requirement. As written, the text and table title could be interpreted to require all wildland apparatus to have a wildland water pump. This would include apparatus that has a fire pump.

The columns in Table 16.2.1 have been reversed as all the other tables in chapter 16 put the rated capacity or flow in the left most columns. Presenting the columns as shown will lessen possible confusion. The blank cells have been filled in to aid use of the table and the title corrected.

Committee Meeting Action: Accept in Principle in Part

Committee Statement: The committee revised for clarity. See Committee Action on 1906-96 (Log #45) for Table 16.2.1
<table>
<thead>
<tr>
<th>gpm</th>
<th>(L/min)</th>
<th>Psi</th>
<th>(kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>190</td>
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<td>700</td>
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<td>150</td>
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<td>100</td>
<td>700</td>
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<tr>
<td>50</td>
<td>190</td>
<td>150</td>
<td>1000</td>
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<td>150</td>
<td>1000</td>
</tr>
<tr>
<td>50</td>
<td>190</td>
<td>250</td>
<td>1700</td>
</tr>
<tr>
<td>150</td>
<td>375</td>
<td>300</td>
<td>2000</td>
</tr>
<tr>
<td>200</td>
<td>750</td>
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<td>2000</td>
</tr>
<tr>
<td>30</td>
<td>115</td>
<td>400</td>
<td>2800</td>
</tr>
</tbody>
</table>
1906-94 Log #179  Final Action: Accept in Principle

(16.2.1)

Submitter: Tom Mettler, Waterous Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

**16.2.1 Wildland Fire Pump Rated Capacity.** One or more wildland fire pumps shall be mounted on the apparatus and rated at one or more of the ratings in Table 16.2.1.

Substantiation: Editorial: Sentence was truncated when the complete 1906 ROP draft was prepared. The words underscored appear in Proposal 1906-56.

This is not original material; its reference/source is as follows:


Committee Meeting Action: Accept in Principle

Committee Statement: See Committee Action on 1906-93 (Log #129).

1906-95 Log #1  Final Action: Accept in Principle

(Table 16.2.1)

Submitter: Gary Handwerk, Hale Products Inc.
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

The rated capacities that line up with 250 psi pump pressure are 50gpm and 150gpm

The rated capacities that line up with 300 psi pump pressure are 200 gpm only

Substantiation: The ratings will now match the NWCG with above change

NWCG does not have a 300psi 150gpm rating as the draft implies

Based on my notes from past meetings the draft has a typo mistake

Committee Meeting Action: Accept in Principle

Committee Statement: See Committee Action on 1906-96 (Log #45).

1906-96 Log #45  Final Action: Accept

(Table 16.2.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

*****Insert Table 16.2.1 Here*****

Substantiation: Correct metric conversions to agree with all other GPM to L/min conversions in this document, and in accordance with the manual of style.

250 psi 150 gpm rating was incorrectly put on 300 psi line. It was correct in proposal 1906-55 (Log #CP15).

Committee Meeting Action: Accept
Table 16.2.1 Wildland Fire Apparatus Pump Rating Chart

<table>
<thead>
<tr>
<th>Psi</th>
<th>kPa</th>
<th>Gpm</th>
<th>L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>700</td>
<td>50</td>
<td>490 200</td>
</tr>
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<td>150</td>
<td>375 600</td>
</tr>
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<td>150</td>
<td>1000</td>
<td>50</td>
<td>490 200</td>
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<td>1700</td>
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<tr>
<td>400</td>
<td>2800</td>
<td>30</td>
<td>445 120</td>
</tr>
</tbody>
</table>
Table 16.2.1

<table>
<thead>
<tr>
<th>psi</th>
<th>kPa</th>
<th>gpm</th>
<th>L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>1700</td>
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<td>190</td>
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<td>150</td>
<td>575</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200</td>
<td>750</td>
</tr>
</tbody>
</table>

Substantiation: Editorial - 150 gpm should be aligned with 250 psi, not 300 psi.
Committee Meeting Action: Accept in Principle
Committee Statement: See Committee Action on 1906-96 (Log #45).

16.2.2.1* The vehicle drive engine and drive train shall be arranged so that the pump can deliver at least its rated capacity or 20 gpm (76 80 L/min); whichever is less at a gauge pressure of 80 psi (552 550 kPa), while the fire apparatus is moving at 2 mph (3.2 km/hr) or less.

Substantiation: There are no allowed pump ratings less than 20 gpm.
Correct metric conversions to agree with all other GPM to L/min conversions in this document, and in accordance with the manual of style.
Committee Meeting Action: Accept
1906-99     Log #47     (Table 16.2.3.3)  Final Action: Accept
Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:

******Insert Table 16.2.3.3 Here******

Substantiation:  Correct metric conversions to agree with all other GPM to L/min conversions in this document, and in accordance with the manual of style.
There is no pump rating point at 100 gpm.
Committee Meeting Action:  Accept

1906-100     Log #159  (Table 16.2.3.3)  Final Action: Accept in Part
Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No:  1906-1
Recommendation:

***Insert Table 1906_L159_Tb16.2.3.3_R***

Substantiation:  Table 16.2.3.3 does not match up with Table 16.2.4.1(a) and (b).
Committee Meeting Action:  Accept in Part
Revise Table 16.2.3.3 and renumber as Table 16.2.4.1(a)

**** Insert Table 16.2.4.1(a) here****
<table>
<thead>
<tr>
<th>gpm</th>
<th>L/min</th>
<th>Suction Hose Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>115</td>
<td>1½ in. 38 mm</td>
</tr>
<tr>
<td>50</td>
<td>190</td>
<td>2 in. 51 mm</td>
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<td>100</td>
<td>375</td>
<td>2½ in. 65 mm</td>
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<td>150</td>
<td>568</td>
<td>3 in. 75 mm</td>
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<tr>
<td>200</td>
<td>750</td>
<td>4 in. 100 mm</td>
</tr>
<tr>
<td>250</td>
<td>950</td>
<td>4 in. 100 mm</td>
</tr>
</tbody>
</table>
### Table 16.2.3.3 Suction Hose Size by Rated Capacity

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>L/min</th>
<th>Suction Hose Size</th>
<th>in.</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>115</td>
<td>1½ or 2</td>
<td>38</td>
<td>51</td>
</tr>
<tr>
<td>50</td>
<td>190</td>
<td>2 or 2 ½</td>
<td>51</td>
<td>65</td>
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<tr>
<td>100</td>
<td>375</td>
<td>2 or 2 ½</td>
<td>51</td>
<td>65</td>
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<td>150</td>
<td>568</td>
<td>2½ or 2 ½</td>
<td>75</td>
<td>65</td>
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<td>200</td>
<td>750</td>
<td>2½ or 3</td>
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</tr>
<tr>
<td>250</td>
<td>950</td>
<td>2½ or 3</td>
<td>100</td>
<td>65</td>
</tr>
</tbody>
</table>
Table 16.2.4.1(a) Suction Hose Size by Rated Capacity

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>Suction Hose Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPM</td>
<td>LPM</td>
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<tr>
<td>30</td>
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<td>568</td>
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<tr>
<td>200</td>
<td>750</td>
</tr>
<tr>
<td>250</td>
<td>950</td>
</tr>
</tbody>
</table>
1906-101     Log #50                          Final Action: Accept
(16.2.3.3, 16.2.4.1, 16.6.1, 16.13.2.2.1.1, and 16.13.2.2.1.2)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:

16.2.3.3* When dry, the pump system (in both parallel and series operation where pumps are of the parallel/series type) shall be capable of taking suction under the conditions specified in Section 16.2.4.1 through 20 ft (6 m) of suction hose of the size specified in Table 16.2.3.3 16.2.4.1(a) and a strainer, and discharging water in not more than 30 seconds.

*****Insert Table 16.2.4.1(a) Here*****

16.2.4.1 The pump manufacturer shall certify that the pump can deliver its rated capacity at rated net pump pressure from draft, under the following conditions:
(1) An altitude of 2000 ft (600 m) above sea level
(2) Through a single intake with 20 ft (6 m) of suction hose of the size specified in Table 16.2.4.1(a) and equipped with a suction hose strainer
(3) With a lift of 10 ft (3 m)
(4) At 29.9 in. Hg (101 kPa) atmospheric pressure (corrected to sea level)
(5) At a water temperature of 60°F (16°C)
(6) Entrance and friction loss for the 20 ft of suction hose and strainer listed in Table 16.2.4.1(a) or entrance and friction loss for the 6 m of suction hose and strainer listed in Table 16.2.4.1(b)

Table 16.2.4.1(a) Friction and Entrance Loss in 20 ft. of Suction Hose, Including Strainer...

Table 16.2.4.1(b) Friction and Entrance Loss in 6 m of Suction Hose, Including Strainer...

16.6.1* Intakes of the same or larger size as specified in Table 16.2.3.3 16.2.4.1(a) for suction hose size shall be provided.

16.13.2.2.1.1 Suction hose shall be of the size specified in Table 16.2.3.3 16.2.4.1(a) for the rated capacity of the pump.

16.13.2.2.1.2 A suction hose and strainer that will allow flow with total entrance and friction loss not greater than that specified in Table 16.2.4.1(a) or Table 16.2.4.1(b) shall be used.

Substantiation:  This change was made in NFPA 1901-2009 to resolve some conflicts, and the new text in the draft uses some of the old and some of the new arrangement.  This change corrects those problems and makes it consistent with NFPA 1901.  Note that the first reference in Section 16.2.4.1 was incorrect and now is correct without changing it.  There are other places where incorrect references in the draft become correct with this change.

Committee Meeting Action:  Accept
<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>L/min</th>
<th>Suction Hose Size</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>115</td>
<td>1½</td>
<td>38</td>
</tr>
<tr>
<td>50</td>
<td>190</td>
<td>2</td>
<td>51</td>
</tr>
<tr>
<td>100</td>
<td>375</td>
<td>2½</td>
<td>65</td>
</tr>
<tr>
<td>150</td>
<td>568</td>
<td>3</td>
<td>75</td>
</tr>
<tr>
<td>200</td>
<td>750</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>250</td>
<td>950</td>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>
1906-102    Log #160
(16.2.3.4.1)  Final Action: Accept

Submitter:  Dan W. McKenzie, US Forest Service
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:

16.2.3.4.1  The completed pumping system shall be capable of developing a vacuum of 22 in Hg (75 kPa) at altitudes up to 2000 ft (600 m), by means of the pump priming system and sustaining the vacuum for at least 5 minutes, with a loss not to exceed 10 in. Hg (34 kPa).

Substantiation:  The 2006 Edition of NFPA 1906 required the primer to develop 17 in Hg. The requirement in the 2006 Edition of NFPA 1906 has proven adequate in field use and as this is a minimum standard and 17 Hg is adequate it should be maintained. Also for years (50 plus) the Forest Service specification for engine-driven pumps (5100-273) has only required the primer to develop a vacuum of 17 in. Hg.

Committee Meeting Action:  Accept

1906-103    Log #180
(16.2.3.4.1)  Final Action: Accept

Submitter:  Tom Mettler, Waterous Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:

16.2.3.4.1  The completed pumping system shall be capable of developing a vacuum of 22 in. Hg (75 kPa) at altitudes up to 2000 ft ...............

Substantiation:  Editorial: Incorrect vacuum reading was used when the complete 1906 ROP draft was prepared. The numbers underscored appear in Proposal 1906-56 and are the requirements of the 2006 edition (and earlier editions) of NFPA 1906.

This is not original material; its reference/source is as follows:
Committee Meeting Action:  Accept
1906-104 Log #48
(Table 16.2.4.1(a))

Final Action: Accept in Part

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

******Insert Table 16.2.4.1(a) Here******

Substantiation: Add clarification to table title, consistent with NFPA 1901.
There is no pump rating point at 100 GPM. It should be 150 GPM.
Columns for 4 1/2 inch hose are not used and should be removed. If for some reason these columns are needed, then they need numbers to be useful.
4 inch hose is used for 200 and 250 gpm pumps, so numbers are needed there.
2 1/4 inch is not a rating size for any pump rating. It may be that it should also be removed.

Committee Meeting Action: Accept in Part

******Insert Table 16.2.4.1(b) here****

Committee Statement: The committee renumbered this table to 16.2.4.1(b). See Committee Action on 1906-100 (Log #159).

1906-105 Log #161
(Table 16.2.4.1(a))

Final Action: Reject

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No: 1906-1
Recommendation: Revise Table as follows:

2 in 2-1/2

\[
\begin{array}{cccc}
gpm & ft & in & ft & in \\
150 & 9.3 & 8.21 & 3.0 & 2.64 \\
\end{array}
\]

Substantiation: 150 gpm information is missing from table

Committee Meeting Action: Reject

Committee Statement: Data from the commentor was from the 2003 version of 1906 which was not accurate. See Committee Action on 1906-104 (Log #48).
### Table 16.2.4.1(a) Friction and Entrance Loss in 20 ft of Suction Hose, Including Strainer (inch-pound Units)

<table>
<thead>
<tr>
<th>Flow Rate (gpm)</th>
<th>1½ ft</th>
<th>1½ in.</th>
<th>2 ft</th>
<th>2 in.</th>
<th>2½ ft</th>
<th>2½ in.</th>
<th>3 ft</th>
<th>3 in.</th>
<th>4 ft</th>
<th>4 in.</th>
<th>4½ ft</th>
<th>4½ in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>2.7</td>
<td>2.38</td>
<td>0.75</td>
<td>0.66</td>
<td>1.7</td>
<td>1.50</td>
<td>0.5</td>
<td>0.44</td>
<td>4.5</td>
<td>3.97</td>
<td>6.2</td>
<td>5.47</td>
</tr>
<tr>
<td>50</td>
<td>1.7</td>
<td>1.50</td>
<td>0.5</td>
<td>0.44</td>
<td>2.0</td>
<td>1.86</td>
<td>1.9</td>
<td>1.64</td>
<td>4.5</td>
<td>3.97</td>
<td>6.2</td>
<td>5.47</td>
</tr>
<tr>
<td>100 150</td>
<td>6.2</td>
<td>5.47</td>
<td>2.0</td>
<td>1.86</td>
<td>4.5</td>
<td>3.97</td>
<td>1.9</td>
<td>1.64</td>
<td>4.5</td>
<td>3.97</td>
<td>6.2</td>
<td>5.47</td>
</tr>
<tr>
<td>200</td>
<td>8.0</td>
<td>7.06</td>
<td>3.3</td>
<td>2.91</td>
<td>8.0</td>
<td>7.06</td>
<td>3.3</td>
<td>2.91</td>
<td>0.8</td>
<td>0.72</td>
<td>1.3</td>
<td>1.13</td>
</tr>
<tr>
<td>250</td>
<td>13.0</td>
<td>11.47</td>
<td>5.2</td>
<td>4.59</td>
<td>1.3</td>
<td>1.13</td>
<td>1.3</td>
<td>1.13</td>
<td>1.3</td>
<td>1.13</td>
<td>1.3</td>
<td>1.13</td>
</tr>
</tbody>
</table>
Table 16.2.4.1(a, b) Friction and Entrance Loss in 20 ft of Suction Hose, Including Strainer (inch-pound Units)

<table>
<thead>
<tr>
<th>Flow Rate (gpm)</th>
<th>Suction Hose Size (in.)</th>
<th>1(\frac{1}{2})</th>
<th>2</th>
<th>2(\frac{1}{2})</th>
<th>3</th>
<th>4</th>
<th>4(\frac{1}{2})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ft water</td>
<td>in. Hg</td>
<td>ft water</td>
<td>in. Hg</td>
<td>ft water</td>
<td>in. Hg</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>2.7</td>
<td>2.38</td>
<td>0.75</td>
<td>0.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>1.7</td>
<td>1.50</td>
<td></td>
<td></td>
<td>0.5</td>
<td>0.44</td>
</tr>
<tr>
<td>400</td>
<td>150</td>
<td>6.2</td>
<td>5.47</td>
<td>2.0</td>
<td>1.77</td>
<td>1.9</td>
<td>1.64</td>
</tr>
<tr>
<td>200</td>
<td></td>
<td>8.0</td>
<td>7.06</td>
<td>3.3</td>
<td>2.91</td>
<td>0.8</td>
<td>0.72</td>
</tr>
<tr>
<td>250</td>
<td></td>
<td>13.0</td>
<td>11.47</td>
<td>5.2</td>
<td>4.59</td>
<td>1.3</td>
<td>1.13</td>
</tr>
</tbody>
</table>
1906-106     Log #183
(Table 16.2.4.1(a), Friction and Entrance Loss)

Final Action: Accept

Submitter: Tom Mettler, Waterous Company
Comment on Proposal No: 1906-1, 1906-56

Recommendation: Under 4-in. Suction Hose Size, add values 0.8 ft water and 0.71 in. Hg for 200 gpm flow rate, and
1.3 ft water and 1.1 in. Hg for 250 gpm flow rate. Delete columns for 4-1/2 in. hose size.

Substantiation: The ROP 1906-1 does not include values for the 4-inch hose size and ROP 1906-56 shows them deleted. The 2006 edition for 1906 includes them. Values are needed for the 4-inch hose size since this is the hose size that 16.2.2.3 and Table 16.2.2.3 specifies for lift capability for 200 and 250 gpm flow rates. The tables in the 2006 edition of 1906 and the 1906 ROP’s noted also include columns for 4-1/2 in. hose size but this is not a size required in Table 16.2.2.3. The NFPA Fire Apparatus Committee may wish to consider including the 4-1/2 inch hose size information.

This is not original material; its reference/source is as follows:
Committee Meeting Action: Accept

1906-107     Log #49
(Table 16.2.4.1(b))

Final Action: Accept in Principle

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

******Insert Table 16.2.4.1(b) Here*****

Substantiation: Correct metric conversions to agree with all other GPM to L/min conversions in this document, and in accordance with the manual of style.
There is no pump rating point at 375 or 400 L/min.
The line for 190 (200) L/min is repeated.
There is no pump rating that requires 110 mm suction hose, so no columns for 110 mm are needed. If for some reason this hose size is needed, then numbers are needed in the columns.
Committee Meeting Action: Accept in Principle
******Insert Table 16.2.4.1(c) here*****
Committee Statement: The committee accepts the comment but change the number to 16.2.4.1(c) and change the 52 mm to 51 mm.
Table 16.2.4.1(b) Friction and Entrance Loss in 6 m of Suction Hose, Including Strainer (SI Units)

<table>
<thead>
<tr>
<th>Flow Rate (L/min)</th>
<th>Suction Hose Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>m</td>
</tr>
<tr>
<td>115 120</td>
<td>0.82</td>
</tr>
<tr>
<td>190 200</td>
<td>0.52</td>
</tr>
<tr>
<td>375</td>
<td>1.89</td>
</tr>
<tr>
<td>490</td>
<td>0.52</td>
</tr>
<tr>
<td>575 600</td>
<td>2.83</td>
</tr>
<tr>
<td>750 800</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>
### 1906-108  Log #162

| Submitter: Dan W. McKenzie, US Forest Service |
| Comment on Proposal No: 1906-1 |
| Recommendation: Revise Table as follows: |

<table>
<thead>
<tr>
<th>51 mm</th>
<th>65 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>L/min</td>
<td>m</td>
</tr>
<tr>
<td>190.5</td>
<td>.52</td>
</tr>
</tbody>
</table>

Substantiation: 190 lpm information repeated twice
Committee Meeting Action: Accept in Principle
Committee Statement: See Committee Action on 1906-107 (Log #49).

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### 1906-109  Log #184

| Submitter: Tom Mettler, Waterous Company |
| Comment on Proposal No: 1906-1, 1906-56 |
| Recommendation: Under 100 mm Suction Hose Size, add values 0.24 m water and 2.4 kPa for 750 L/min flow rate, and develop loss values for 1000 L/min flow rate. Delete columns for 110 mm hose size. |
| Substantiation: The ROP 1906-1 does not include values for the 100 mm hose size and ROP 1906-56 shows them deleted for 750 L/min and has no entries, deleted or otherwise, for 1000 L/min. The 2006 edition for 1906 does not include metric hose loss information. Values are needed for the 100 mm hose size since this is the metric hose size for metric flow rates that are shown as equivalent for 200 and 250 gpm flow rates in Table 16.2.1. The tables in the 1906 ROP’s noted also include columns for 110 mm hose size but this is not a metric equivalent to the hose sizes required in Table 16.2.2.3. The NFPA Fire Apparatus Committee may wish to consider developing and including the 110 mm hose size information. |
| This is not original material; its reference/source is as follows: |
| F2011 ROP 1906-56. |
| Committee Meeting Action: Accept in Principle |
| Committee Statement: See Committee Action on 1906-107 (Log #49). |

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Printed on 5/12/2011
<table>
<thead>
<tr>
<th>Log #130</th>
<th>1906-110</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Submitter:</strong> Carl E. Peterson, Hingham, MA</td>
<td><strong>Final Action:</strong> Reject</td>
</tr>
<tr>
<td><strong>Comment on Proposal No:</strong> 1906-56</td>
<td><strong>Recommendation:</strong> Revise text to read as follows:</td>
</tr>
<tr>
<td><em><em>16.2.4.2</em> The pump manufacturer shall certify that the pump is capable of pumping rated capacity at rated net pump pressure from draft at any of the following special conditions when the pump is designed to meet either of the following special suction conditions when these conditions are specified by the purchaser:</em>*</td>
<td><em><em>16.2.4.2</em> The pump manufacturer shall certify that the pump is capable of pumping rated capacity at rated net pump pressure from draft at any of the following special conditions when the pump is designed to meet either of the following special suction conditions when these conditions are specified by the purchaser:</em>*</td>
</tr>
<tr>
<td>(1) At an elevation above 2000 ft (600 m)</td>
<td>(1) At an elevation above 2000 ft (600 m)</td>
</tr>
<tr>
<td>(2) At lift higher than 10 ft (3 m), through more than 20 ft (6 m) of suction hose, or both.</td>
<td>(2) At lift higher than 10 ft (3 m), through more than 20 ft (6 m) of suction hose, or both.</td>
</tr>
<tr>
<td><strong>Substantiation:</strong> The change requires the pump manufacturer to certify the pump capability under certain conditions regardless of who specifies those conditions and eliminates the inappropriate wording in the standard that makes a requirement contingent on a purchaser specifying something. Note also that not all of the text from the proposal is reflected in the draft.</td>
<td><strong>Substantiation:</strong> The change requires the pump manufacturer to certify the pump capability under certain conditions regardless of who specifies those conditions and eliminates the inappropriate wording in the standard that makes a requirement contingent on a purchaser specifying something. Note also that not all of the text from the proposal is reflected in the draft.</td>
</tr>
<tr>
<td><strong>Committee Meeting Action:</strong> Reject</td>
<td><strong>Committee Meeting Action:</strong> Reject</td>
</tr>
<tr>
<td><strong>Committee Statement:</strong> Current wording is sufficient as it is the option of the purchasers to identify these special conditions when they exist. Special Conditions are above the minimum standard.</td>
<td><strong>Committee Statement:</strong> Current wording is sufficient as it is the option of the purchasers to identify these special conditions when they exist. Special Conditions are above the minimum standard.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Log #163</th>
<th>1906-111</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Submitter:</strong> Dan W. McKenzie, US Forest Service</td>
<td><strong>Final Action:</strong> Reject</td>
</tr>
<tr>
<td><strong>Comment on Proposal No:</strong> 1906-1</td>
<td><strong>Recommendation:</strong> Revise text to read as follows:</td>
</tr>
<tr>
<td><strong>16.3.10.1.1.3 For engines greater than 18 hp and larger, if approved by the engine manufacturer, the air inlet shall be equipped with a means of separating water and burning embers from the air intake system such that burning particulate matter larger than 0.039 in. (1.0 mm) in diameter cannot reach the air filter element.</strong></td>
<td><strong>16.3.10.1.1.3 For engines greater than 18 hp and larger, if approved by the engine manufacturer, the air inlet shall be equipped with a means of separating water and burning embers from the air intake system such that burning particulate matter larger than 0.039 in. (1.0 mm) in diameter cannot reach the air filter element.</strong></td>
</tr>
<tr>
<td><strong>Substantiation:</strong> This is a safety item and needs to be on all wildland fire apparatus; therefore, should not require an additional approver. 18 hp engines are typical on slip on units and therefore should include this protection.</td>
<td><strong>Substantiation:</strong> This is a safety item and needs to be on all wildland fire apparatus; therefore, should not require an additional approver. 18 hp engines are typical on slip on units and therefore should include this protection.</td>
</tr>
<tr>
<td><strong>Committee Meeting Action:</strong> Reject</td>
<td><strong>Committee Meeting Action:</strong> Reject</td>
</tr>
<tr>
<td><strong>Committee Statement:</strong> The standard is currently written as a minimum standard and this would potentially VOID engine manufacturers warranty.</td>
<td><strong>Committee Statement:</strong> The standard is currently written as a minimum standard and this would potentially VOID engine manufacturers warranty.</td>
</tr>
</tbody>
</table>
16.3.11.3 The exhaust system shall meet the requirements of SAE J335 or USDA Forest Service specifications 5100-1 (36 CFR 261-52) unless 100 percent of the exhaust gases pass through a turbo charger. An engine with a turbo charger with 100 percent of the exhaust gases passing through turbo charger is an excellent spark arrester and meets Forest Service requirements. SAE J335 previously included spark arrester requirements but has been subsequently revised and now only specifies spark arrester test procedures. Since SAE J335 does not include spark arrester requirements it is no longer appropriate to reference in the standard.

Committee Meeting Action: Accept in Part

Revise text to read as follows:

16.3.11.3 The exhaust system shall meet the requirements of SAE J335 or USDA Forest Service specifications 5100-1 (36 CFR 261-52) unless 100 percent of the exhaust gases pass through a turbo charger.

Committee Statement: The committee removed the reference to (36 CFR 261-52). Also remove the reference to SAE J335 from Chapter 2.

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All components in the power train from the engine to the wildland fire pump shall be capable of transmitting the torque necessary to power the pump, as installed in the apparatus, for the pump performance points specified in Table 16.2.1.1, if applicable,

rated capacity without exceeding the component manufacturer’s continuous duty torque rating.

When pumping continuously at each of the pump performance points specified in Table 16.2.1.1, if applicable, rated capacity, lubricant temperatures in any power train component installed in the apparatus from the engine to the pump shall not exceed the component manufacturer’s recommendation for maximum temperature.

Substantiation: The draft wording was for pumps with multiple rating points. All pumps now have 1 rating point.

Committee Meeting Action: Accept

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16.5.1.1 Where an auxiliary pump more than one pump is provided in combination with a water pump and where the pumps are interconnected so that pressure from one pump can be transmitted to the other pump, check valves, intake or discharge relief valves, pump drive gear ratios, or other automatic means shall be provided to avoid pressurizing either pump beyond the hydrostatic pressure referenced in Section 16.5.2.1.

Substantiation: The term auxiliary pump is not used in 1906, and the revised wording is actually more general. It does not matter if the other pump is another wildland fire pump, an NFPA 1901 fire pump, or an NFPA 1901 auxiliary pump.

Committee Meeting Action: Accept
Thomas A. Stalnaker, Goshen Fire Company

Comment on Proposal No: 1906-1

Recommendation: Revise text to read as follows:

16.5.1.2 The entire discharge and intake piping system, valves, drain cocks and lines, and intake and outlet closures, excluding the tank fill and tank-to-pump lines on the tank side of the valves in those lines, shall be capable of withstanding the same hydrostatic pressure as required in 16.5.2.1 for the pump:

16.5.1.3 Add text to read as follows:

Pump intake plumbing shall be capable of withstanding a minimum vacuum of 17 in. Hg (57.4 kPa) without deforming.

16.5.3 Reserved

16.5.3 The entire discharge and intake piping system, valves, drain cocks and lines, and intake and outlet closures, excluding the tank-to-pump lines on the tank side of the valve in those lines, shall be capable of withstanding a hydrostatic gauge pressure of 300 psi (2000 kPa), whichever is higher.

Substantiation: Section 16.5.1 relates to pump moving parts, not hydrostatic test. The hydrostatic test requirement belongs under Section 16.5.3 (after Hydrostatic Test) and the vacuum requirement belongs under Section 16.2.3.4 Vacuum. This change makes the wording and placement more consistent with NFPA 1901, with the pressure changed for 1906 pumps.

Committee Meeting Action: Accept in Principle

Revise text as follows:

16.5.1.2 The entire discharge and intake piping system, valves, drain cocks and lines, and intake and outlet closures, excluding the tank fill and tank-to-pump lines on the tank side of the valves in those lines, shall be capable of withstanding the same hydrostatic pressure as required in 16.5.2.1 for the pump:

16.5.1.3 Add text to read as follows:

Pump intake plumbing shall be capable of withstanding a minimum vacuum of 17 in. Hg (57.4 kPa) without deforming.

16.5.3 The entire discharge and intake piping system, valves, drain cocks and lines, and intake and outlet closures, excluding the tank-to-pump lines on the tank side of the valve in those lines, shall be subjected to a hydrostatic test pressure of 100 psi (700 kPa) above the maximum close-off pressure or to a gauge pressure of 300 psi (2000 kPa), whichever is higher, for 5 minutes.

Committee Statement: The committee clarified that the hydrostatic test in 16.5.3 be done for 5 minutes.

Dan W. McKenzie, US Forest Service

Comment on Proposal No: 1906-1

Recommendation: Add text to read as follows:

16.6.1.3 The intake shall have a male thread unless specified otherwise.

Substantiation: This requirement was part of the 2006 edition of NFPA 1906 and should remain part of the 2011 edition as most wildland fire apparatus have and prefer male inlet connections.

Committee Meeting Action: Accept in Principle

Revise text as follows:

16.6.1.3 Any intake shall have male threads and any 2 1/2 in. (65 mm) or larger shall have National Hose Thread (NH).

Committee Statement: The committee reworded 16.6.1.1 to clarify intakes have male threads and that intakes 2 1/2 in. or larger have National Hose Thread.
Intake valves larger than 3 in. (75 mm) shall be a slow operating valve.

Intakes on wildland fire apparatus are mostly used for drafting and do not need a slow operating valve. This requirement adds unnecessary expenses to the cost of the apparatus.

When fed by a pressurized water source a slow close is a necessary safety feature.

Each intake shall be provided with piping and a closure that is capable of withstanding 100 psi (690 kPa) over the maximum pump close-off pressure or 300 psi (2070 kPa) gauge pressure, whichever is higher.

This requirement is already stated in Sections 16.5.1.2 and 16.5.2.1, and there it has the correct metric conversions consistent with the manual of style and the rest of this document and NFPA 1901.

If a 2½ in. (65 mm) or larger valved appliance is attached to an intake, the appliance shall be equipped with a bleeder valve.

The bleeder valve should be used prior to the removal of a hose or a cap or other closure connected to an intake. The bleeder valve should also be used while filling a hose connected to an intake with water. Failure to use the bleeder valve in these situations might result in serious injury or death.

The requirement for bleeder valves on intakes was removed by proposal 1906-66 (Log #CP9) on the basis that wildland apparatus do not need bleed off valves on intakes. If this is true, there would not seem to be a reason for bleed off valves on intake appliances either.

If 16.6.5 is deleted (reserved), the annex material should be deleted or moved to A.16.6 and revised as:

The bleeder valve, if available, should be used prior to the removal of a hose or a cap or other closure connected to an intake. The bleeder valve should also be used while filling a hose connected to an intake with water. Failure to use the bleeder valve in these situations might result in serious injury or death.

This does sound a little strange, to say failure to use it may result in injury or death, but it is not really needed on wildland apparatus.
1906-120  Log #131  Final Action: Accept
(16.6.10)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-56
Recommendation: Revise text to read as follows:

16.6.10 If the manufacturer or contractor provides a valve, siamese, or adapter on a suction inlet(s) are to be equipped
with a valve, siamese, or adapter that will remain in place while the apparatus is in motion, that valve, siamese, or
adapter shall not project beyond the apparatus running board. [1901.16.6.10]

Add an annex to 16.6.10 to read as follows:

A.16.6.10 If the purchaser plans to carry a valve, siamese, or adapter on a suction inlet while the apparatus is in
motion, the manufacturer needs to know the details of the valve, siamese, or adapter so the manufacturer can
accommodate the size of that valve, siamese, or adapter without it extending beyond the running board.

Delete 16.6.11.

Substantiation: The change to 16.6.10 ties the requirement to what the manufacturer or contractor provides for valves,
siameses and adapters as the manufacturer cannot control what happens after the apparatus is delivered.

16.6.11 is being deleted as it is language that is not appropriate in a product standard. That type language belongs in
the annex to advise a purchaser what to include in their procurement documents. If the purchaser does not specify
anything and later adds valves, siameses or adapters that extend beyond the running boards, does that make the
manufacturer responsible if something is damaged? The purchaser needs to specify how they are going to use the
apparatus so they get the product they desire but a product standard needs to specify the minimum requirements and
details of the product and not tie the requirements to required input from a purchaser.

Committee Meeting Action: Accept

1906-121  Log #132  Final Action: Accept
(16.7.1)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-56
Recommendation: Revise text to read as follows:

Sufficient discharge outlets, including any discharge outlets located in hose storage areas, shall be provided to
discharge the rated capacity of the pump at the flow rates as shown in Table 16.7.1.

Substantiation: The text is incomplete in both the proposal and the draft.

Committee Meeting Action: Accept
1906-122 Log #56 (16.7.4 and 16.7.4.2) Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

16.7.4 Each discharge outlet, except an outlet to which a hose is to be preconnected, shall be equipped with a suitable cap or closure that is capable of withstanding 100 psi (700 kPa) over the maximum rated pump close-off pressure or 300 psi (2000 kPa) gauge pressure, whichever is higher.

16.7.4.2 If a cap or closure is provided, it shall be secured to the pumping unit with a suitable chain or cable.

A.4.18 Where the point of delivery is over 2000 ft (600 m) of elevation, it is important to test the pump and pumping engine performance to ensure that the engine can develop adequate power at point of delivery. This test can be performed with the pump supplied from a suitable fire hydrant, or at draft, with the discharge and net pressure maintained at rating for the pump. The net pressure (P), when the pump is supplied from a hydrant with positive intake pressure, is the discharge gauge pressure (D) minus the intake gauge pressure (S).

A.16.13.2.1.2 Where tests are performed inside a structure or other location having limited air circulation, carbon monoxide monitoring equipment should be used. Such equipment should be checked and calibrated regularly and should include a suitable warning device.

A.16.13.2.3.2 Where an engine is operating at or near full power while stationary, the heat generated could raise the temperature of certain chassis or pumping system components above the level that, when touched, can cause extreme discomfort or injury. However, as long as the apparatus could be operated and used satisfactorily for the required duration of the test under such conditions, it should be considered acceptable.

The suction lift can be determined either by measuring the negative pressure (vacuum) in the pump intake manifold with a manometer or other suitable test gauge that measures vacuum accurately or by adding the vertical lift and the value of friction and entrance loss from Table 16.2.4.1(b) or Table 16.2.4.1(c). To be accurate, gauge readings should be corrected for the difference between the height of the gauge and the centerline of the pump intake, but usually this is not large and therefore not significant, allowing this correction to be ignored. It is best to place the gauges at the same level or very close to the same level as the pump intake. If the gauges are at a different level from the pump intake, the correction is 0.433 psi per foot (9.8 kPa per meter) of difference.

Suitable means to attach the cover to the fill tower could include use of a threaded cap or a hinged cover with a mechanical latching device.

Substantiation: The word “suitable” is vague and unenforceable as it is subject to interpretation. The NFPA Manual of Style advises against using the word in requirements. See MOS 2.2.2.3.
The reference to using a manometer was removed from the main body text, so it should have been removed here as well.

Committee Meeting Action: Accept

1906-123 Log #57 (16.7.5) Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-68
Recommendation: Revise text to read as follows:

16.7.5 Each discharge outlet shall be equipped with a valve that can be opened and closed smoothly at the flows shown in Table 16.7.1 at pump discharge gauge pressures of 250 psi (1700 kPa) or 100 psi (700 kPa) over the pump rating pressure, whichever is greater. *(1901:16.7.5)*

Substantiation: With pumps rated at up to 400 psi, the valves should operate at the pressures to be expected at those valves.

This change was approved and published previously, but got lost.

Committee Meeting Action: Accept
1906-124  Log #58  Final Action: Accept
(16.7.6 through 16.7.9)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:

16.7.6  Any 2½ in. (65 mm) or larger discharge outlet that is located more than 42 in. (1070 mm) above the ground and to which a hose is to be connected, but which is not in a hose storage area, shall be equipped with a sweep elbow of at least 30 degrees downward.

16.7.7  A pump cooling/recirculation line of sufficient size to prevent the pump from overheating when no discharge lines are open shall be provided between the pump discharge and into the water tank.

16.7.8  Where a foam proportioning system is provided, this line shall be plumbed so the water returning to the water tank is free of foam solution.

16.7.9  All discharge valves 1 in. (25 mm) or over in size shall be quarter-turn types.

16.8.1  Where the valve operating mechanism does not indicate the position of the valve, an indicator shall be provided to show when the valve is closed. (1901:16.7.10)

16.8.2  Visible quarter-turn valves shall be installed so they are open when the handle is parallel with the run of the pipe and are closed when the handle is perpendicular to the run of the pipe.

16.8.3  Blind valves (valves behind panels) shall have their open and closed positions marked — “Open” and “Closed.”

16.8.4  Operating mechanisms for valves used on the fireground shall be marked as to their function, such as “Intake,” “Tank to Pump,” “Pump to Tank,” and “Discharge.”

16.8.5  If the apparatus is equipped with a booster reel, the piping, valves, and swivel between the pump and booster reel shall be nominally the same size or larger than the nominal inside diameter of the hose to be carried on the reel.

16.8.6  A shutoff valve shall be provided between the pump and the reel.

16.8.7  High-pressure booster hose of the same nominal size shall be permitted in place of piping.

16.9.1  No discharge outlet larger than 2½ in. (65 mm) shall be located at the pump operator’s panel. (1901:16.7.9.1)

16.9.2  If the apparatus has a top console–type pump operator’s panel, vertical discharge outlets larger than 2½ in. (65 mm) shall be permitted at the top midship position of apparatus where the outlets are used for directly connected deck guns or monitors and no fire hose is used for coupling the components. (19.1:16.7.9.2)

Substantiation:  Adjust numbering for consistency with NFPA 1901-2009 and to put sub sections under the proper section.

Committee Meeting Action:  Accept
1906-125 Log #166  
(16.7.7.3.1 and 16.7.7.3.2 (New) )  

Final Action: Reject

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No: 1906-1

Recommendation: Add text to read as follows:

16.7.7.3.1  A check valve shall be included to facilitate priming.
16.7.7.3.2  Where a foam proportioning system is provided, this line shall be plumbed so the water returning to the water tank is free of foam solution.

Substantiation: This requirement was part of the 2006 edition of NFPA 1906 and should remain part of the 2011 edition with respect to the pump cooler line requirement.

Committee Meeting Action: Reject
Committee Statement: Not needed for a minimum standard.

1906-126 Log #167  
(16.7.7.12 and A.16.7.7.12 (New) )  

Final Action: Accept in Principle

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No: 1906-1

Recommendation: Add text to read as follows:

16.7.7.12*  When a foam proportioning system is installed, a water-only (no foam) discharge shall be provided.
A.16.7.7.12  The water-only (no foam) discharge valve is used to off-load water, without any foam concentrate in it, to another unit or to operate an ejector and keep foam solution out of the unit's water tank and to insure water only is used on an assignment where the use of foam is restricted such as near a watercourse or lake.

Substantiation: This requirement was a part of the 2006 Edition of NFPA Standard 1906. This is a very important requirement for the safety of the wildland firefighter for when transferring water to another apparatus as the water tank can be contaminated by foam, potentially rendering the apparatus out of service. A tank contaminated with foam may preclude the operator from using an ejector and would not be allowed to operate in restricted foam use areas such as sensitive riparian areas. A contaminated water tank may result in a false water level reading, cavitation and loss of prime of the pump, inability to operate an ejector and the baring of an assignments requiring the restriction on the use of foam such as near a watercourse or lake. As this is a minimum standard, a water-only valve can be very important to firefighter safety. As such, the water-only valve should be maintained in the NFPA 1906 Standard.

Committee Meeting Action: Accept in Principle
Add new Annex as follows:

A.20.1  When a foam system is installed, the purchaser should consider specifying a water-only (no foam) discharge. A water-only discharge can be used to off-load clear water to another apparatus or portable water tank, to prevent foam solution from re-entering the water tank when operating an ejector, and for operation near sensitive environmental areas.

Committee Statement: Not required for a minimum standard, however the committee added new Annex material that a water-only discharge should be considered.
<table>
<thead>
<tr>
<th>Log #</th>
<th>Final Action</th>
<th>Submitter</th>
<th>Comment on Proposal No.</th>
<th>Recommendation</th>
<th>Substantiation</th>
<th>Committee Meeting Action</th>
<th>Committee Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>168</td>
<td>Reject</td>
<td>Dan W. McKenzie, US Forest Service</td>
<td>1906-1</td>
<td>Add text to read as follows:</td>
<td>Drafting is a critical operational need for wildland firefighting. As such, all discharges should be checked on wildland engines to facilitate priming.</td>
<td>Not needed for a minimum standard.</td>
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<tr>
<td>59</td>
<td>Accept</td>
<td>Thomas A. Stalnaker, Goshen Fire Company</td>
<td>1906-1</td>
<td>Revise text to read as follows:</td>
<td>Text is from NFPA 1901-2009 16.9.1. THE manual of Style would say that it should be a separate section. This is just as important with a 1906 truck as it is with a 1901 truck.</td>
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16.7.7.9 A check valve shall be included in all pump discharge outlets to facilitate priming.

A.16.7.7.9* This requirement can be satisfied with one check valve on the pump discharge.
16.10* Pump Controls.
16.10.1 General Provisions. Provisions shall be made for placing the pump drive system in operation using controls and switches that are identified and within convenient reach of the operator.

16.10.2 When the pump is driven by the chassis engine, the requirements of Section 16.10.2.1 through Section 16.10.2.5 shall apply.

16.10.2.1 Where the pump is driven by the chassis engine, and engine compression brakes or engine exhaust brakes are furnished, these engine brakes shall be automatically disengaged for pumping operations.

16.10.2.2* Any control device used in the pumping system power train between the engine and the pump, except a manual pump shift override device if provided, shall be equipped with a means to prevent unintentional movement of the control device from its set position in the pumping mode.

16.10.2.3* A label indicating the chassis transmission shift selector position to be used for pumping shall be provided in the driving compartment and located so that it can be read from the driver’s position.

16.10.2.4* Where the pump is driven by the chassis engine and transmission through a split-shaft PTO, the driving compartment speedometer shall register when the pump drive system is engaged.

16.10.2.5 Where chassis transmission retarders are furnished, they shall be automatically disengaged for pumping operations.

16.10.3 When the pump is driven by the chassis engine, an interlock shall be provided to insure that the pump drive system components are engaged in the pumping mode of operation so that the pumping system can be operated from the pump operator’s position.

16.10.3.1 A “Pump Engaged” indicator shall be provided in the driving compartment that indicates when the pump shift process has been successfully completed.

16.10.3.1.1 When the pump is driven through a transmission-mounted PTO, front-of-engine crankshaft PTO, or engine flywheel PTO; a second “Pump Engaged” indicator shall be provided on the pump operator’s panel.

16.10.3.1.2 When the apparatus is equipped with “Pump-and-roll” capability, a second “Pump Engaged” indicator shall be provided on the pump operator’s panel.

16.10.3.2 An “OK to Pump” indicator shall be provided in the driving compartment that indicates when:

1) the pump is engaged and
2) the parking brake is engaged and
3) if the transmission is automatic, the chassis transmission is in neutral or pump gear as required for pumping and
4) if the pump is driven through a transfer case PTO, the transfer case drive to the chassis wheels is in neutral.

16.10.3.3 If the apparatus is designed to have the “pump and roll” pumping mode, an “OK to Pump and Roll” indicator shall be provided in the driving compartment that indicates when:

1) the pump is engaged and
2) the parking brake is engaged and
3) if the transmission is automatic, the chassis transmission is in road gear.

16.10.3.3.1 When the “OK to Pump and Roll” indicator is energized, the “OK to Pump” indicator shall not be energized.

16.10.4 Reserved.

16.10.5 Reserved.

16.10.6 Reserved.

16.10.7 Reserved.

16.10.8 Reserved.

16.10.9 Reserved.

16.10.2 Stationary Pump Driven Through Split-Shaft PTO — Automatic Chassis Transmission. Where the apparatus is equipped with an automatic chassis transmission, the water pump is driven by the chassis engine through the transmission’s main driveline, and the apparatus is to be used for stationary pumping only; an interlock system shall be provided to ensure that the pump drive system components are engaged in the pumping mode of operation so that the pumping system can be operated from the pump operator’s position:

16.10.2.1* A “Pump Engaged” indicator shall be provided in the driving compartment to indicate that the pump shift process has been successfully completed.
10.10.2.2 An “OK to Pump” indicator shall be provided in the driving compartment to indicate that the pump is engaged; the chassis transmission is in pump gear, and the parking brake is engaged.

10.10.3 Stationary Pump Driven Through Split-Shaft PTO — Manual Chassis Transmission. Where the apparatus is equipped with a manual chassis transmission, the water pump is driven by the chassis engine through the transmission's main drive line, and the apparatus is to be used for stationary pumping only, an interlock system shall be provided to ensure that the pump drive system components are engaged in the pumping mode of operation so that the pumping system can be operated from the pump operator's position.

10.10.3.1 A “Pump Engaged” indicator shall be provided in the driving compartment to indicate that the pump shift process has been successfully completed.

10.10.3.2 An “OK to Pump” indicator shall be provided in the driving compartment to indicate that the pump is engaged and the parking brake is engaged.

10.10.4 Stationary Pump Driven Through Transmission-Mounted PTO, Front-of-Engine Crankshaft PTO, or Engine Flywheel PTO — Automatic Chassis Transmission. Where the apparatus is equipped with an automatic chassis transmission, the water pump is driven by a transmission-mounted (SAE) PTO, front-of-engine crankshaft PTO, or engine flywheel PTO, and the apparatus is to be used for stationary pumping only with the chassis transmission in neutral, an interlock system shall be provided to ensure that the pump drive system components are engaged in the pumping mode of operation so that the pump system can be operated from the pump operator's position.

10.10.4.1 A “Pump Engaged” indicator shall be provided both in the driving compartment and on the pump operator's panel to indicate that the pump shift process has been successfully completed.

10.10.4.2 An “OK to Pump” indicator shall be provided in the driving compartment to indicate that the pump is engaged; the chassis transmission is in neutral, and the parking brake is engaged.

10.10.5 Stationary Pump Driven Through Transmission-Mounted PTO, Front-of-Engine Crankshaft PTO, or Engine Flywheel PTO — Manual Chassis Transmission. Where the apparatus is equipped with a manual chassis transmission, the water pump is driven by a transmission-mounted (SAE) PTO, front-of-engine crankshaft PTO, or engine flywheel PTO, and the apparatus is to be used for stationary pumping only with the chassis transmission in neutral, an interlock system shall be provided to ensure that the pump drive system components are engaged in the pumping mode of operation so that the pump system can be operated from the pump operator's position.

10.10.5.1 A “Pump Engaged” indicator shall be provided both in the driving compartment and on the pump operator's panel to indicate that the pump shift process has been successfully completed.

10.10.5.2 An “OK to Pump” indicator shall be provided in the driving compartment to indicate that the pump is engaged and the parking brake is engaged.

10.10.6 Stationary and “Pump and Roll” Pump — Automatic Chassis Transmissions. Where the water pump is driven by a transmission-mounted (SAE) PTO, front-of-engine crankshaft PTO, or engine flywheel PTO, and the apparatus is designed to be used in both the stationary pumping mode and the “pump and roll” pumping mode with the automatic chassis transmission in neutral for stationary pumping and in a road gear for pump-and-roll pumping, an interlock system shall be provided to ensure that the pump drive system components are properly engaged in the pumping mode of operation so that the apparatus can be operated in either stationary or pump-and-roll pumping mode.

10.10.6.1 A “Pump Engaged” indicator shall be provided both in the driving compartment and on the pump operator's panel to indicate that the pump shift process has been successfully completed.

10.10.6.2 An “OK to Pump” indicator shall be provided in the driving compartment to indicate that the pump is engaged; the chassis transmission is in neutral, and the parking brake is engaged.

10.10.6.3 An “OK to Pump and Roll” indicator shall be provided in the driving compartment and shall be energized when the pump is engaged; the chassis transmission is in road gear, and the parking brake is released.

10.10.6.4 When the “OK to Pump and Roll” indicator is energized, the “OK to Pump” indicator shall not be energized.

10.10.7 Stationary and “Pump and Roll” Pumps — Manual Chassis Transmissions. Where the water pump is driven by a transmission-mounted (SAE) PTO, front-of-engine crankshaft PTO, or engine flywheel PTO, and the apparatus is designed to be used in both the stationary pumping mode and the “pump and roll” pumping mode with the chassis transmission in neutral for stationary pumping or in a road gear for pump-and-roll pumping, an interlock system shall be provided to ensure that the pump drive system components are properly engaged in the pumping mode of operation so that the apparatus can be operated in either stationary or pump-and-roll pumping mode.

10.10.7.1 A “Pump Engaged” indicator shall be provided both in the driving compartment and on the pump operator's panel to indicate that the pump shift process has been successfully completed.

10.10.7.2 An “OK to Pump” indicator shall be provided in the driving compartment to indicate that the pump is engaged and the parking brake is engaged.


Printed on 5/12/2011
An "OK to Pump and Roll" indicator shall be provided in the driving compartment and shall be energized when the pump is engaged and the parking brake is released.

16.10.7.4 When the "OK to Pump and Roll" indicator is energized, the "OK to Pump" indicator shall not be energized.

16.10.8 Stationary Pumps Driven Through Transfer Case PTOs — Automatic Chassis Transmissions.

Where the apparatus is equipped with an automatic chassis transmission, the water pump is driven by the chassis engine through the transmission's main driveline and through a transfer case, and the apparatus is to be used for stationary pumping only, an interlock system shall be provided to ensure that the pump drive system components are engaged in the pumping mode of operation so that the pumping system can be operated from the pump operator's position.

16.10.8.1 A "Pump Engaged" indicator shall be provided in the driving compartment to indicate that the pump shift process has been successfully completed.

An "OK to Pump" indicator shall be provided in the driving compartment to indicate that the pump is engaged, the chassis transmission is in pump gear, the transfer case drive to the chassis wheels is in neutral, and the parking brake is engaged.

16.10.8.2 An "OK to Pump" indicator shall be provided in the driving compartment to indicate that the pump is engaged, the chassis transmission is in pump gear, the transfer case drive to the chassis wheels is in neutral, and the parking brake is engaged.

16.10.9 Stationary Pumps Driven Through Transfer Case PTOs — Manual Chassis Transmissions.

Where the apparatus is equipped with a manual chassis transmission, the water pump is driven by the chassis engine through the transmission's main driveline and through a transfer case, and the apparatus is to be used for stationary pumping only, an interlock system shall be provided to ensure that the pump drive system components are engaged in the pumping mode of operation so that the pumping system can be operated from the pump operator's position.

16.10.9.1 A "Pump Engaged" indicator shall be provided in the driving compartment to indicate that the pump shift process has been successfully completed.

An engine speed control shall be provided at the pump operator's panel.

A "Throttle Ready" indicator that lights when the pump is in the "OK to Pump" mode shall be provided on the pump operator's panel.

The "Throttle Ready" indicator at the pump operator's panel shall be permitted to light when the chassis transmission is in neutral and the parking brake is engaged and, if the transmission is automatic, the chassis transmission is in neutral.

16.10.10 An interlock system shall be provided to prevent advancement of the engine speed at the pump operator's panel unless the apparatus has "Throttle Ready" indication.

16.10.10.4 Loss of power to the interlock system in Section 16.10.4 shall return the engine speed to idle and prevent advancement from the pump operator's panel.


16.10.11.1 An engine speed control shall be provided on the pump operator's panel.

16.10.11.2 A "Throttle Ready" indicator that lights when the pump is in the "OK to Pump" mode shall be provided on the pump operator's panel.

16.10.11.3 The "Throttle Ready" indicator on the pump operator's panel shall be permitted to light when the parking brake is engaged.

16.10.11.4 Loss of power to the interlock system in 16.10.11.3 shall return the engine speed to idle and prevent advancement from the pump operator's panel.

Substantiation: The only requirement change in the text is to clarify that most of these requirements only apply if the chassis engine drives the pump. In most, but not all, 1906 trucks the chassis engine does not drive the pump, so none of these provisions would be applicable anyway. In the process, it reduces the verbiage to define these requirements from 1707 to 607 words, greatly improving readability and reducing repetitive redundancy and duplication. The exact same wording could be applicable to NFPA 1901.

Committee Meeting Action: Reject
Committee Statement: Maintain clarity and avoid confusion in interpretation by the reader.
<table>
<thead>
<tr>
<th>Log #</th>
<th>Final Action</th>
<th>Comment and Action</th>
</tr>
</thead>
</table>
| **1906-130** Log #60 | Accept | **16.10.1.3**  
Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No: 1906-1  
Recommendation: Revise text to read as follows:  
16.10.1.3 Where the pump is driven by the chassis engine, a label indicating the chassis transmission shift selector position to be used for pumping shall be provided in the driving compartment and located so that it can be read from the driver's position. (1901:16.10.1.3)  
Substantiation: This statement is not relevant if the pump is not driven by the chassis engine.  
Committee Meeting Action: Accept |
| **1906-131** Log #61 | Accept | **16.10.1.5**  
Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No: 1906-1  
Recommendation: Revise text to read as follows:  
16.10.1.5 Where chassis transmission retarders are furnished and the pump is driven through the chassis transmission, they shall be automatically disengaged for pumping operations. (1901:16.10.1.5)  
Substantiation: If the pump is not driven through the chassis, this statement is not relevant.  
Committee Meeting Action: Accept |
| **1906-132** Log #62 | Reject | **16.10.2 and 16.10.3**  
Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No: 1906-1  
Recommendation: Delete these sections dealing with split shaft PTOs. Make the section numbers reserved.  
Substantiation: Since the largest pump covered by this chapter is 250 GPM at 150 PSI, and pump-and-roll is required, there would be no reason to use a split shaft PTO.  
Committee Meeting Action: Reject  
Committee Statement: Split shaft pumps can be used with an auxiliary wildland fire pump meeting the requirements for pump and roll. |
| **1906-133** Log #63 | Reject | **16.10.10**  
Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No: 1906-1  
Recommendation: Revise text to read as follows:  
16.10.10 Pump Operator's Panel Engine Speed Advancement — Automatic Chassis Transmission. An interlock system shall be provided to prevent advancement of the engine speed at the pump operator's panel unless the chassis transmission is in neutral and the parking brake is engaged or the apparatus is in the “OK to Pump” mode.  
Substantiation: This requirement is stated better in Section 16.10.4. It is redundant here, and should only apply to the pump engine if the same engine drives the chassis. This was corrected in NFPA 1901-2009.  
Committee Meeting Action: Reject  
Committee Statement: Current wording is required for user clarity |
1906-134    Log #65
(16.10.14.1)  Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:   1906-1
Recommendation:  Revise text to read as follows:

16.10.14.1*  On pumps with a rated capacity of 200 gpm (750 800 L/min) or 250 gpm (1000 L/min) a means shall be provided that, when set in accordance with the manufacturer's instructions, will automatically control the discharge pressure to a maximum of 60 psi (400 kPa) pressure rise above the set pressure(s) when all discharge valves are closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds during the following conditions:

1. Over a range of pressures from 70 psi to 300 psi (500 kPa to 2000 kPa) net pump pressure with intake gauge pressure between -10 psi and 185 psi (-70 kPa and 1300 kPa) and discharge gauge pressure between 90 psi and 300 psi (620 kPa and 2000 kPa)

2. With initial engine and pump controls set to produce a range of flows from 150 gpm (550 600 L/min) to the rated capacity of the pump

Substantiation:  Correct SI conversions for consistency with others in NFPA 1901 and NFPA 1906.
Committee Meeting Action:  Accept

1906-135    Log #66
(16.10.15.1)  Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:   1906-1
Recommendation:  Revise text to read as follows:

16.10.15.1 The priming system shall be capable of meeting the requirements of Section 16.2.3.3 and 16.2.3.4.

Substantiation:  Section 16.2.3.4 is the requirements on the priming system developing, and the pump holding, vacuum.
Committee Meeting Action:  Accept

1906-136    Log #169
(16.10.15.4 and 16.10.15.4.1 (New))  Final Action: Reject

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No:   1906-1
Recommendation:  Add text to read as follows:

16.10.15.4 When priming will be performed with the pump running the prime shall be taken at the eye of the impeller or at the top of the inlet to the pump as close to the impeller as possible.

16.10.15.4.1 If there is a hump in the intake piping, an additional prime shall be taken at the up most top of the hump in the intake piping.

Substantiation:  Not priming at the eye of the impeller or top of the intake to the pump and not taking a prime at the top of a hump has resulted in poor priming or failed priming. It is very important for the safety of the wildland firefighter that the apparatus that he is operating be able to prime and prime consistently.
Committee Meeting Action:  Reject
Committee Statement:  This information is provided in the Annex and is a minimum standard. The priming performance test will prove this condition & compliance.
1906-137 Log #181
(16.12.2.1)

Submitter: Tom Mettler, Waterous Company
Comment on Proposal No: 1906-1, 1906-73
Recommendation: Revise text to read as follows:

16.12.2.1 A master pump discharge pressure gauge shall be provided. If one or more 3 in. (75 mm) or larger external pump intakes are provided, a pump intake gauge shall be provided, and a master intake compound gauge shall be provided.

Substantiation: As written in ROP, sentence structure is improper. Proposed wording provides proper sentence structure and is thought to reflect the intent of the committee when addressed in 1906-73 (Log #CP20).

Committee Meeting Action: Accept in Principle
Committee Statement: See Committee Action on 1906-138 (Log #67).

1906-138 Log #67
(16.12.2.1 and 16.12.2.1.2)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

16.12.2.1 A master pump discharge pressure gauge shall be provided and, if one or more 3 in. (75 mm) or larger external pump intakes are provided, a pump intake gauge shall be provided, and a master intake compound gauge shall be provided.

16.12.2.1.2 The master discharge pressure gauge shall read from 30 in. Hg (100 kPa) vacuum to at least a gauge pressure of 300 psi (2000 kPa) or 100 psi (700 kPa) over maximum pump pressure, whichever is greater.

Substantiation: Corrections to wording. Add missing SI unit conversion.

Committee Meeting Action: Accept in Part
Revise text to read as follows:

1.2.1 The following shall be provided:

1) A master pump discharge gauge
2) A master intake compound gauge (if one or more 3 in. (75 mm) or larger external pump intakes are provided).

Committee Statement: The committee revised text recommended in 1906-137 (Log #181) for 16.12.2.1 and accepted text in this comment for 16.12.2.1.2 to combine sections for clarity.

1906-139 Log #170
(16.12.2.1.6 (New))

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No: 1906-1
Recommendation: Add text to read as follows:

16.12.2.1.6 The master intake gauge, the master discharge gauge and any other gauge shall have a drain (vent) at the connection of the line to the gauge and gauge connection.

Substantiation: These drains (vents) will enable the draining of the gauge lines preventing water freezing in the lines and damaging the pressure gauges by over pressurizing them. Gauges damaged by not drained gauge lines freezing have been a major cause of damaged (ruined) gauges on wildland fire apparatus.

Committee Meeting Action: Reject
Committee Statement: The committee feels that this is not required as a minimum standard.
Revise text to read as follows:

16.12.2.2 Analog Gauges. If analog gauges are used, they shall meet the requirements of Section 16.12.2.1 through Section 16.12.2.7. (1901:16.12.2.2)

Substantiation: Make plural. There could be both intake and discharge gauges.

Committee Meeting Action: Accept

Revise text as follows:

16.12.2.2 Analog gauges displaying the vacuum portion in 120 degrees of arc or less shall have an accuracy complying with Grade 1A as defined by ASME B40.100, Pressure Gauges and Gauge Attachments.

16.12.2.3 Analog gauges displaying the vacuum portion in greater than 120 degrees of arc shall have an accuracy of 3 1/2 percent or better on vacuum and 3 1/2 percent or better or pressure over their entire respective scale complying with Grade B as defined by ASME B40.100, Pressure Gauges and Gauge Attachments.

Substantiation: The 2006 edition of NFPA 1906 called for Grade B gauges. Grade B gauges accuracy has proven to be satisfactory for wildland fire apparatus.

Committee Meeting Action: Accept in Part

Revise text as follows:

16.12.2.2 Analog gauges displaying the vacuum portion in 120 degrees of arc or less shall have an accuracy complying with Grade 1A as defined by ASME B40.100, Pressure Gauges and Gauge Attachments.

Committee Statement: The committee accepted changes to 16.12.2.2 but did not want to change the accuracy for vacuum/pressure for gauges displaying greater than 120 degrees of arc.

Committee Meeting Action: Accept

Revise text as follows:

16.12.2.4 Cab Gauges. If the pump on the apparatus is driven by the chassis engine through a PTO, and the apparatus is designed for pump-and-roll operations using that chassis engine-driven pump, a second gauge that meets the same requirements as the compound discharge pressure gauge required by Section 16.12.2.1.2 shall be mounted in the driving compartment in view of the driver.

Substantiation: Wording correction. This change was previously approved and published, but got lost.

Committee Meeting Action: Accept
1906-143 Log #70
(16.12.2.4.1)

Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-72
Recommendation: Revise text to read as follows:
16.12.2.4.1 The gauge shall read from 30 in. Hg (100 kPa) vacuum to at least 300 psi (2000 kPa) or 100 psi over maximum pump pressure, whichever is greater.

Substantiation: As written, there is a contradiction. The gauge must meet the same requirements as the gauge in Section 16.12.2.1.2, which has the requirement as revised above. This prevents a high pressure pump from damaging the gauge. For most pumps, the change has no effect, a 400 psi rated pump could easily damage a 300 psi gauge.

Committee Meeting Action: Accept

1906-144 Log #71
(16.12.3.3)

Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
16.12.3.3 The pressure gauge or flowmeter display shall be located adjacent to the corresponding valve control with no more than 6 in. (150 mm) separating the pressure gauge or flowmeter bezel and the valve control midpoint or centerline. (1901:16.12.3.3)

Substantiation: Section 16.12.3.4 always defines the location requirements for the flowmeter since if there is a flowmeter there must also be a pressure gauge.

Committee Meeting Action: Accept

1906-145 Log #172
(16.12.3.7.3)

Final Action: Accept

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
16.12.3.7.3 Analog pressure gauges shall be vibration and pressure pulsation dampened; by resistant to corrosion, condensation, and shock; be freeze protected; and have internal mechanisms that are factory lubricated for the life of the gauge.

Substantiation: Wildland fire apparatus need pressure gauges to be freeze protected to prevent damage to the gauge from cold weather.

Committee Meeting Action: Accept

1906-146 Log #72
(16.12.3.8.2)

Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
16.12.3.8.2 Digital pressure gauges shall display pressure in increments of not more than 10 psi (70 kPa).
(1901:16.12.3.8.2)

Substantiation: Correct wording per NFPA 1901-2009. This is consistent with all other similar requirements in NFPA 1901 and NFPA 1906.

Committee Meeting Action: Accept
1906-147     Log #73  
(Table 16.12.3.9, 16.13.9.3, and 18.4.3.1)  

Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No:  1906-1  
Recommendation: Revise text to read as follows:

******Insert Table 16.12.3.9 Here******

******Insert Table 16.13.9.3 Here******

******Insert Table 18.4.3.1 Here******

Substantiation: Correct pipe (not fire hose) metric trade sizes to the names used in the DN (Diametre Nominal) or DIN metric system.
Committee Meeting Action: Accept

1906-148     Log #74  
(16.12.4 and 16.12.5)  

Submitter: Thomas A. Stalnaker, Goshen Fire Company  
Comment on Proposal No:  1906-71  
Recommendation: Revise text to read as follows:

16.12.4 RESERVED
16.12.5 Connections for test gauges shall be provided.

Substantiation: This text was added by ROP 1906-71 Log #59 but did not make it into the draft. It was originally to go in Section 16.12.1.6 under Pump Operator’s Panel (Section 16.12.1) but Section 16.12.5 is probably a better place for it since it since they are not necessarily on the pump operators panel. Section 16.12.5 is the section for these connections in NFPA 1901.
Committee Meeting Action: Accept
<table>
<thead>
<tr>
<th>Pipe Size Flow</th>
<th>in.</th>
<th>mm</th>
<th>gpm</th>
<th>L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>40</td>
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<tr>
<td>1½</td>
<td>38</td>
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<td>340</td>
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<td>2</td>
<td>50</td>
<td>160</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>375</td>
<td>1400</td>
<td></td>
</tr>
<tr>
<td>Discharge Size</td>
<td>Test Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
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<tr>
<td>1 in. (25 mm)</td>
<td>40 gpm (160 L/min)</td>
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<td></td>
</tr>
<tr>
<td>1½ in. (38 mm)</td>
<td>90 gpm (360 L/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ½ in. (65 mm)</td>
<td>250 gpm (1000 L/min)</td>
<td></td>
<td></td>
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</tr>
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</table>
Table 18.4.3.1 Size of Tank Fill Line (Pump to Tank)

<table>
<thead>
<tr>
<th>Pump Size</th>
<th>250 gal or less (950 L or less)</th>
<th>251 gal to 999 gal (951 L to 3784 L)</th>
<th>1000 gal or more (3785 L or more)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tank Size</td>
<td>Gpm</td>
<td>L/min</td>
</tr>
<tr>
<td>50 or less</td>
<td>250 gal or less</td>
<td>50 or less</td>
<td>190 or less</td>
</tr>
<tr>
<td>51–199</td>
<td>251 gal to 999 gal</td>
<td>51–199</td>
<td>191–753</td>
</tr>
<tr>
<td>200 or greater</td>
<td>1000 gal or more</td>
<td>200 or greater</td>
<td>754 or greater</td>
</tr>
</tbody>
</table>
Report on Comments – November 2011

1906-149 Log #75
(16.13.1.1.4, 16.13.1.1.5, and 16.13.1.1.6)
Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
16.13.1.1.4 Reserved
16.13.1.1.5 Reserved
16.13.1.1.6 On pumps with a rated flow of 200 GPM or more and 2 or more discharges of 1½ in. (38 mm) or larger, the pressure control test (Section 16.13.4) shall be included.
16.13.4.1 At the pump rated flow and pressure for 200 gpm (750 L/min) or 250 gpm (1000 L/min) pumps with two or more discharges equal to or exceeding 1½ in. (38 mm), the pump system shall be tested for pressure rise as follows:
Substantiation: Section 16.13.1.1 is the section that defines what tests are to be included, so this requirement should be stated there. This is consistent with the wording in NFPA 1901.
Committee Meeting Action: Accept

1906-150 Log #173
(16.13.2.1.1, 16.13.2.2.2(4), and A.16.13.2.1.2(4))
Final Action: Reject

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
16.13.2.1.1 The test site shall be adjacent to a supply of clear water, with the water level not more than 10 ft (3 m), or less than 5 ft (1.5 m) below the center of the pump intake, and close enough to allow the suction strainer to be submerged at least 2 ft (0.6 m) below the surface of the water, when connected to the pump by 20 ft (6 m) of suction hose.
16.13.2.2.2(4)* Minimum life: 3 ft (1 m), 5 ft (1.5 m) from the center of the pump intake to the surface of the water.
A.16.13.2.1.2(4) The suction lift capability of a fire pump is certified by the pump manufacturer for specific conditions of altitude above sea level, atmospheric pressure, water temperature, and friction and entrance loss caused by the flow of water through the intake strainers and hose as stated in 16.2.4.1. As the temperature of the water increases and barometric pressures decreases, the suction lift capability of the fire pump is reduced. While the minimum lift of the test site for the pumping test is 3 ft (1 m), 5 ft (1.5 m), the test site configuration must not provide a vertical lift that exceeds the suction lift capability of the pump as a result of elevated water temperatures and reduced barometric pressure. See Table A.16.13.2.1.2(4).
Substantiation: The 2006 edition of NFPA Standard 1906 called for water surface to be at least 5 ft. Many specifications for wildland fire apparatus call for a 5 foot lift because the pump and auxiliary driving engine are mounted on a platform truck body and the lift from the water surface (stream, lake, etc) are 5 feet or more. NFPA 1906 has had a 5 foot lift requirement for some time. NFPA 1901 did not have a lift requirement for testing installed pump performance until recently when a 3 foot lift was selected because if the lift selected were any greater a large number of fire apparatus would have to modify their installed pump test pits to meet any lift requirements greater than 3 foot.
Committee Meeting Action: Reject
Committee Statement: Tests of some apparatus would be difficult at 5’. This is a minimum standard.
Discharge shall be measured using a smoothbore nozzle and pitot tube, a square-edged orifice and pressure gauge, or other equipment such as flowmeters, volumetric tanks, or weigh tanks.

Square-edged orifice and pressure gauge is a very accurate method of measuring low pump flows found on wildland fire apparatus. Flow through a square-edge orifice can be determined using the following formula:

\[ Q = \frac{C \cdot D^2 \cdot P}{2 \cdot 144} \]

Where:
- \( Q \) = flow in gallons per minute
- \( C \) = orifice discharge coefficient (.62 recommended)
- \( D \) = orifice diameter in inches
- \( P \) = pressure in psi

For best accuracy the line to the square-edge orifice should be three times the diameter of the orifice.

Substantiation: This change was previously approved and published. Somewhere it got lost.

Committee Meeting Action: Accept in Principle

Committee Statement: See Committee Action on 1906-152 (Log #174).

Discharge shall be measured using a smoothbore nozzle and pilot tube, a square-edged orifice and pressure gauge, or other equipment such as flowmeters, volumetric tanks, or weigh tanks.

Square-edged orifice and pressure gauge is a very accurate method of measuring low pump flows found on wildland fire apparatus. Flow through a square-edge orifice can be determined using the following formula:

\[ Q = \frac{C \cdot D^2 \cdot P}{2 \cdot 144} \]

Where:
- \( Q \) = flow in gallons per minute
- \( C \) = orifice discharge coefficient (.62 recommended)
- \( D \) = orifice diameter in inches
- \( P \) = pressure in psi

For best accuracy the line to the square-edge orifice should be three times the diameter of the orifice.

Substantiation: The log (1906-76 Log #60) was inadvertently not included in the updated draft and now should be. The square-edged round orifice and pressure gauge fixtures provide accurate and repeatable discharge measurements and are quick and easy to use. Annex information on how to use a square-edge round orifice is very useful.

Committee Meeting Action: Accept
Q = 29.8*C*d^2* \sqrt{P}
\[ Q = 29.8* C * d^2 * \sqrt{P} \]
The ambient air temperature, water temperature, vertical lift, elevation of test site, and atmospheric pressure (corrected to sea level) shall be determined and recorded prior to the pump test. (1901:16.13.2.3.1)

The engine, pump, transmission, and all parts of the fire apparatus shall exhibit no undue heating, loss of power, over-speed, leaks, or other defect during the entire test. (1901:16.13.2.3.2)

The pump shall be subjected to a 30-minute pumping test consisting of continuous pumping at rated capacity at rated net pump pressure. If the pump is stopped before the test is completed, the entire pump test shall be repeated.

The capacity, discharge pressure, intake pressure, and engine speed shall be recorded at least every 15 minutes but not fewer than three times for each test sequence. (1901:16.13.2.3.4.3)

The average net pump pressure shall be calculated and recorded based on the average values for discharge and intake pressure. (1901:16.13.2.3.4.4)

These changes put the paragraphs at the correct level. The numbering in this area does not match NFPA 1901 so there is no reason to reserve paragraph numbers that do not match anything else.

---

The vacuum test shall consist of subjecting the interior of the pump, with all intake valves open, all intakes capped or plugged, and all discharge caps removed with all discharge valves open, to a vacuum of 17 in. Hg (57.6 kPa) by means of the pump priming system.

With all discharge valves open the pump discharge check valve integrity is tested. A vacuum test will not be capable with the discharge valves in the open position. This was intended as a discharge check valve test which was rejected previously.

---

The hydrostatic test shall be conducted with the tank fill line valve, the tank-to-pump valve closed, and the pump bypass line return to the water tank valve closed if equipped, or the line disconnected and capped. Some apparatus may have a valve in the bypass line, for example if the pump has an around-the-pump foam system. If there is a valve, there is no reason to disconnect and cap the line.

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1906-156  Log #133  Final Action: Accept in Principle
(18.1)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-81
Recommendation:  Delete 18.1 and renumber 18.2 through 18.6 as 18.1 though 18.5.
Substantiation:  With the reorganization of the document, the requirements for water tank size now belong in chapters 5 and 7. Section 18.1 will create confusion with the requirement in Chapter 7 which requires a minimum of 1000 gal tank.
Committee Meeting Action: Accept in Principle
Revise text as follows:
18.1 The apparatus shall be equipped with a water tank that meets the requirements of this chapter.
Committee Statement: The committee deleted minimum tank size from this section so that the chapter applies to all size water tanks.

1906-157  Log #134  Final Action: Accept in Principle
(18.2.5)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-81
Recommendation:  The committee should review 18.2.5 to be sure it intends that all water tanks meet the requirement.
Substantiation:  The standard allows water tanks as small as 50 gallons on wildland fire apparatus. A tank that is 36 inches by 36 inches by 9 inches high will hold 50 gallons. Does that need baffles?
Committee Meeting Action: Accept in Principle
Committee Statement: Committee increased the minimum tank size to 150 gallons.

1906-158  Log #177  Final Action: Reject
(18.2.5.1.3 and 18.2.5.2.4)

Submitter: Dan W. McKenzie, US Forest Service
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:
18.2.5.1.3 There shall be a maximum distance of 46 in. (1220 mm) 52 in. (1320 mm) between any combination of tank vertical walls and baffles, or between parallel baffles.
18.2.5.2.4 The partitions shall be arranged in such a manner that the vertical plane of each partition shall create cells for which no dimension shall exceed 46 in. (1220 mm) 52 in. (1320 mm).
Substantiation:  The current requirement results in a single longitudinal baffle for trucks that are 96 in. (8 ft) wide. Trucks can now be as wide as 102 in. and the current 48 in. requirement would result in two longitudinal baffles. Changing the requirement from 48 in. to 52 in. will maintain the requirement of a single longitudinal baffle for trucks with 102 in. wide tanks.
Committee Meeting Action: Reject
Committee Statement: The committee does not wish to allow wider tanks with only one baffle.
<table>
<thead>
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<th>Final Action: Accept</th>
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</thead>
<tbody>
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<td>1906-159</td>
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<td>Log #192</td>
</tr>
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<td>Log #193</td>
</tr>
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</table>

**Submitter:** Carl E. Peterson, Hingham, MA

**Comment on Proposal No:** 1906-80

**Recommendation:** Revise text to read as follows:

18.2.6 Cleanout Sumps.
18.2.6.1 If the water tank is greater than 500 gal (2000 L), one or more cleanout sumps shall be provided.
18.2.6.2 A 3 in. (75 mm) or larger removable pipe plug shall be furnished in each sump.
18.2.6.3 If the sump is used for the tank-to-pump line connection, the design shall prevent sludge or debris in the sump from entering the pump.

**Substantiation:** Larger water tanks need cleanout sumps to allow removal of debris and sludge that can get into the tank. This is particularly true with wildland apparatus where the water tanks are often refilled from natural water sources that can introduce foreign material. This standard now covers wildland mobile water supply apparatus with tanks of 1000 gal or greater. Water tanks as small as 200 gal on apparatus that complies with NFPA 1901 are required to have cleanout sumps.

**Committee Meeting Action:** Accept

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<th>Log #</th>
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<tbody>
<tr>
<td>1906-160</td>
<td>Log #178</td>
</tr>
<tr>
<td>1906-161</td>
<td>Log #192</td>
</tr>
</tbody>
</table>

**Submitter:** Dan W. McKenzie, US Forest Service

**Comment on Proposal No:** 1906-1

**Recommendation:** Revise text to read as follows:

18.4.2.2* The vent/overflow outlet shall be designed to direct any water over flow behind the rear axle so as not to interfere with rear tire traction. (1901:18.4.2.2)

**Substantiation:** typo

**Committee Meeting Action:** Accept

<table>
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<tr>
<th>Log #</th>
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<tbody>
<tr>
<td>1906-162</td>
<td>Log #193</td>
</tr>
</tbody>
</table>

**Submitter:** Kirk Bradley, Michigan Department of Natural Resources and Environment

**Comment on Proposal No:** 1906-1

**Recommendation:** Revise text to read as follows:

18.4.2.2* The vent/overflow outlet shall be designed to direct any water over flow behind the rear axle so as not to interfere with rear tire traction.

**Substantiation:** Correct spelling

**Committee Meeting Action:** Accept

<table>
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<tr>
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<tbody>
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<td>Log #193</td>
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</tbody>
</table>

**Submitter:** Kirk Bradley, Michigan Department of Natural Resources and Environment

**Comment on Proposal No:** 1906-1

**Recommendation:** Revise text to read as follows:

18.4.3.1* A valve

**Substantiation:** Incomplete text?

**Committee Meeting Action:** Accept
Revise text to read as follows:

If the apparatus is designed to be a wildland mobile water supply apparatus, the requirements of this section shall apply.

18.5.1 External Fill. An external fill connection leading directly to the tank shall be provided. [1901:18.5.1]

18.5.1.1* The external fill connection shall permit a minimum filling rate of 1000 gpm (4000 L/min) from sources external to the unit. [1901:18.5.1.1]

18.5.1.2 The external fill connection shall be provided with a removable or accessible strainer, a shutoff valve capable of being throttled, a minimum 30-degree sweep elbow positioned downward, and a closure cap or plug. [1901:18.5.1.2]

18.5.1.3 Any 3 in. (75 mm) or larger valve shall be a slow-operating valve. [1901:18.5.1.3]

18.5.1.4 A check-type device shall be permitted to be substituted for the modulating and slow-operating valve in those operations where the flow rate is to be controlled at the source. [1901:18.5.1.4]

18.5.2* Water Transfer. Single or multiple tank connections that meet the requirements of 18.5.2.1 and 18.5.2.2 shall be provided.

18.5.2.1 The tank connection(s) shall be capable of allowing water to be transferred from the tank to an external use to the right, left, and rear of the fire apparatus. [1901:18.5.2.1]

18.5.2.2* Each tank connection shall be capable of emptying 90 percent of the tank capacity at a minimum average rate of 1000 gpm (4000 L/min) with the apparatus on level ground. [1901:18.5.2.2]

Add text as A.18.5.1.1 to read as follows:

A.18.5.1.1 Where large filling rates are used, fill connections should be equipped with a diffuser inside the tank to minimize potential structural damage. It is important that the purchaser evaluate how the apparatus will be used and define the location and type of fittings desired on this tank fill. Where rapid filling of the water tank on another type of apparatus from an external use is desired, the purchaser should consider an inlet directly into the tank that is capable of allowing the tank to be filled at a rate of 1000 gpm (4000 L/min). Where such a fill connection is provided, it should conform to the requirements of 18.5.1. [1901:A.18.5.1.1]

Add text as A.18.5.2 to read as follows:

A.18.5.2 It is important that the purchaser evaluate how the apparatus will be used and define the location(s) and types of fittings for these outlets.

Where rapid dumping of the contents of the water tank to an external use is desired on other types of apparatus, the purchaser should consider an outlet directly into the tank that is capable of allowing water to be transferred from the tank at an average rate of at least 1000 gpm (4000 L/min). [1901:A.18.5.2]

Add text as A.18.5.2.2 to read as follows:

A.18.5.2.2 Additional methods might be desired to improve the off-loading rate of gravity dumps. These methods include a jet assist or a pneumatic pump. Control should be from the pump operator's position. Two types of jet assists can be used, one directed into the throat of the gravity dump and the other a peripheral jet system. Figure A.18.5.2.2(a) shows how the traditional jet is installed. A smooth-tipped "jet" nozzle is supplied by a pump that is capable of delivering at least 250 gpm (1000 L/min) at a gauge pressure of 150 psi (1000 kPa). Nozzle jets range in size from ¾ in. to 1½ in. (19 mm to 33 mm). The diameter of the tip will be determined by the capacity of the pump being used and the diameter of the discharge piping and dump valve.

[Pick up figure A.18.5.2.2(a) from NFPA 1901, 2009 edition]

FIGURE A.18.5.2.2(a) Traditional Internal Jet Dump.

The peripheral application of jet assist nozzles has proved highly effective. This approach utilizes two or more jets installed in the sides of the discharge piping just outside the quick dump valve. In addition to the reported discharge advantages of peripheral discharge streams, the externally fed system is easier to plumb and has fewer maintenance problems. The jets, installed 25 degrees to 30 degrees from the piping wall, contact more surface area of the discharging water, thereby increasing water discharge efficiency. Because the water is drawn through the dump valve,
less turbulence is created, and the eddy effect often present with traditional in-line jets is overcome. Nozzles made by welding reducer pipe fittings work very effectively as jets. Flow rates of 2000 gpm (8000 L/min) have been obtained using a 300 gpm (1100 L/min) pump to supply two ¾ in. (19 mm) nozzles in a 6 in. (150 mm) dump valve configuration. Figure A.18.5.2.2(b) shows a diagram of a peripheral jet assist arrangement. A pneumatic system can be used to pressurize a tank and assist in expelling water. The vacuum pumps can also be used for filling the tank. [1901:A.18.5.2.2]

[Pick up figure A.18.5.2.2(b) from NFPA 1901, 2009 edition]

FIGURE A.18.5.2.2(b) Peripheral Jet Assist Arrangement (Top View).

Substantiation: The draft of NFPA 1906 as presented by the committee requires a wildland mobile water supply apparatus to have a pump with a minimum capacity of 30 gpm and no requirement for rapid filling or offloading of water. Requiring fire fighters to climb onto the top of a tank and hold a hose line in a fill opening is dangerous and unnecessary when a ground level means of filling can be provided. Also having a 1000 gal or greater water tank and the only means of off-loading the water is through a 30 gpm pump is operationally inefficient. This change is part of the comments I have submitted that will remove the requirement that mobile water supply apparatus have a pump and require a means of quickly fill and off-load the water. Wildland mobile water supply apparatus is not wildland firefighting apparatus which can also have water tanks in excess of 1000 gal but are not intended for moving large quantities of water for application using portable pumps or pumps on wildland fire apparatus.

Committee Meeting Action: Reject
Committee Statement: The committee feels that as a minimum standard that it does not require this.

1906-164 Log #79 Final Action: Accept
(18.6.2)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-83
Recommendation: Revise text to read as follows:
18.6.2 The certified capacity shall be recorded on the manufacturer’s record of construction (see Section 4.20.1), and the certification shall be provided to the purchaser when the apparatus is delivered. (1901:18.6.2)
Substantiation: This change was previously approved and published. It got lost somewhere.
Committee Meeting Action: Accept

1906-165 Log #137 Final Action: Accept in Principle
(18.6.2)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-83
Recommendation: The accepted text is not reflected properly in the draft.
Substantiation: The draft should reflect the complete document with all accepted proposals incorporated.
Committee Meeting Action: Accept in Principle
Committee Statement: See Committee Action on 1906-164 (Log #79).
Review the chapter to be sure all requirements are reasonable for small proportioning systems for Class A foam concentrate.

Section 20.1 states that this chapter applies to proportioning system for Class A foam concentrate. The chapter was written initially for Class B foam systems that require proportioning rates of 3% to 6% or greater. Class A foam is generally proportioned at 3 tenths to 5 tenths of one percent so less concentrate is often carried on the apparatus. At 0.3%, 10 gallons of concentrate will provide 3333 gallons of foam. Small apparatus may well have concentrate tanks of 10 gal or less. Do tanks of this size need swash partitions, fill towers etc.? A tank 15 in × 15 in × 12 in holds 11.5 gallons of concentrate.

No specific comment was presented.

Revise text to read as follows:

If the wildland fire apparatus is equipped with a foam proportioning system for Class A foam concentrate, the foam proportioning system shall comply with the applicable sections of this chapter. References in this chapter to foam proportioning systems shall include systems to proportion all water additives.

Paragraph 20.1.1 as shown in the proposal is redundant with the text associated with 20.1.

Revise text to read as follows:

Water-Powered Direct Injection Foam Proportioning System. A water motor or water turbine foam proportioning system shall meet the requirements of Sections 13.3, 13.4, 13.5, 13.6, 13.7, 13.9, 13.10, and 13.11 through 20.7 and Sections 20.9 through 20.11.
1906-169  Log #140  Final Action: Reject
(20.3.2)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-95
Recommendation: Reconsider the committee action and accept the proposal that deletes 13.3.2.
Substantiation: Note that 20.3.2 is 13.3.2 in the existing edition of NFPA 1906.

The committee statement says that “Since there is no minimum standard for the foam system, the manufacturer needs
guidance as to what type and performance of foam system should be provided to ensure the user gets what they
require.” Even if there was a minimum standard, the manufacturer would still need guidance from the purchaser to
ensure the user gets what they desire. There are many requirements in the standard that need purchaser input to
ensure the user gets what they desire. That is the purpose of purchase specifications. Annex A and B are designed to
assist the purchaser understand the options available and how they need to work with a contactor to get the apparatus
they desire. Language requiring the purchaser to specify something does not belong in the body of a product standard.
Paragraph 20.9.3 in the draft requires the manufacturer to provide the operation specifications for the foam system so
the user knows what has been provided.
Committee Meeting Action: Reject
Committee Statement: Current verbiage is consistent with NFPA 1901 and is necessary to provide specific critical
information to the end user and OEM.

1906-170  Log #81  Final Action: Accept
(20.4.3)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

20.4.3 Foam proportioning systems that incorporate foam concentrate metering valves shall have each metering valve
calibrated and marked with a plate label to indicate the rate(s) of the foam concentrate proportioning available as
determined by the design of the system (1901:20.4.3)
Substantiation: Correct wording to NFPA 1901-2009.
Committee Meeting Action: Accept

1906-171  Log #82  Final Action: Accept
(20.5.2.3 and 20.5.3.2)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-96, 1906-97
Recommendation: Revise text to read as follows:

20.5.2.3 There shall be graduation lines showing at least every 10 psi (70 50 kPa), with major and intermediate
graduation lines emphasized and figures at least every 100 psi (700 500 kPa). (1901:20.5.2.3)
20.5.3.2 Digital pressure gauges shall display pressure in increments of not more than 10 psi (70 50 kPa).
(1901:20.5.3.2)
Substantiation: Gauges in kPa would not have steps of at 70, 140, 210, 280, 350, 420, 490, 560, 630, and 700 kPa.
They would be 50, 100, 150, 200, 250, 300, 350, 400, 450, and 500. This is consistent with the SI conversions
described in the manual of style, and the rest of the document.
These corrections were made in NFPA 1901-2009. They were made, approved, and published for NFPA 1906. They
somehow got lost each time.
Committee Meeting Action: Accept
1906-172     Log #83
(20.5.2.4) Final Action: Accept in Principle

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation:  Add new text to read as follows:
20.5.2.4 Analog pressure gauges shall be vibration and pressure pulsation dampened; be resistant to corrosion, condensation, and shock; and have internal mechanisms that are factory lubricated for the life of the gauge.
Substantiation:  This wording is in the pump chapter section on gauges, and in NFPA 1901 Chapter 20, but not in the NFPA 1906 Chapter 20.
Committee Meeting Action: Accept in Principle
Revise text as follows:
20.5.2.4 Analog pressure gauges shall be vibration and pressure pulsation dampened; be resistant to corrosion, condensation, and shock; be freeze protected; and have internal mechanisms that are factory lubricated for the life of the gauge.
Committee Statement: The committee accepted this comment but added freeze protection which was accepted within the pump section 1906-145 (Log #172).

1906-173     Log #84
(20.6.3.4) Final Action: Accept in Principle

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-89, 1906-98
Recommendation:  Revise text to read as follows:
20.6.3.4* The fill tower shall be arranged so that foam concentrate from a 5 gal (19-25 L) container can be dumped directly into the tank without the use of funnels or other special devices.
Substantiation:  Correct to the text approved in ROP 1906-89 (Log #CP46) and 1906-89 (Log #CP24).
While foam concentrate in the U.S. comes in 5 gal. containers, vendors selling foam concentrate in metric (liter) units package it in 19L, 20L, and 25L containers, with 25 being the most common. All are handled the same way and might be dumped into a foam concentrate tank.
Committee Meeting Action: Accept in Principle
Revise text as follows:
20.6.3.4* The fill tower shall be arranged so that foam concentrate from a standard container (5 gallons, or up to 25L), can be poured directly into the tank without the use of funnels or other special devices.
Committee Statement: The committee accepted the comment but added more information for clarification of standard container sizes.

1906-174     Log #85
(20.6.10.2) Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation:  Revise text to read as follows:
20.6.10.2* A label that specifies the following shall be placed at or near any foam concentrate tank fill opening that specifies the following:
Substantiation:  Correct grammar to agree with NFPA 1901-2009.
Committee Meeting Action: Accept
Revise text to read as follows:

20.9.4.2 The manual shall include a complete diagram of the system, operating instructions, system foam concentrate capabilities, original system calibration, and details outlining all recommended maintenance procedures. (1901:20.9.4.2)

20.10.4.2 The final-stage apparatus manufacturer shall provide a deliver copy of the certification with the final apparatus to the final user. (1901:20.10.4.2)

20.11.2 The final installer shall furnish deliver documentation with the apparatus declaring the foam proportioning system as installed meets the requirements of Section 20.10.2 or 20.10.3 across the foam proportioning system manufacturer's declared range of water flow, water pressure, foam percentage (or foam proportioning system capacity) and concentrate viscosity at the test points defined in Table 20.11.1. (1901:20.11.2)

Revise text as follows:

20.9.4.2 The manual shall include a complete diagram of the system, operating instructions, system foam concentrate capabilities, original system calibration, and details outlining all recommended maintenance procedures. [1901:20.9.4.2]

20.10.4.2 The final-stage apparatus manufacturer shall deliver a copy of the certification with the fire apparatus. [1901:20.10.4.2]

20.11.2 The final installer shall deliver documentation with the fire apparatus declaring the foam proportioning system as installed meets the requirements of Section 20.10.2 or 20.10.3 across the foam proportioning system manufacturer's declared range of water flow, water pressure, foam percentage (or foam proportioning system capacity), and concentrate viscosity at the test points defined in Table 20.11.1. [1901:20.11.2]

The committee extracted text from NFPA 1901 for consistency.

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

20.9.4.2 The manual shall include a complete diagram of the system, together with operating instructions, system foam concentrate capabilities, original system calibration, and details outlining all recommended maintenance procedures. (1901:20.9.4.2)

20.10.4.2 The final-stage apparatus manufacturer shall provide a deliver copy of the certification with the final apparatus to the final user. (1901:20.10.4.2)

20.11.2 The final installer shall furnish deliver documentation with the apparatus declaring the foam proportioning system as installed meets the requirements of Section 20.10.2 or 20.10.3 across the foam proportioning system manufacturer's declared range of water flow, water pressure, foam percentage (or foam proportioning system capacity) and concentrate viscosity at the test points defined in Table 20.11.1. (1901:20.11.2)

Substantiation: Correct wording to NFPA 1901-2009.
Committee Meeting Action: Accept in Principle
Revise text as follows:

20.9.4.2 The manual shall include a complete diagram of the system, operating instructions, system foam concentrate capabilities, original system calibration, and details outlining all recommended maintenance procedures. [1901:20.9.4.2]

20.10.4.2 The final-stage apparatus manufacturer shall deliver a copy of the certification with the fire apparatus. [1901:20.10.4.2]

20.11.2 The final installer shall deliver documentation with the fire apparatus declaring the foam proportioning system as installed meets the requirements of 20.10.2 or 20.10.3 across the foam proportioning system manufacturer's declared range of water flow, water pressure, foam percentage (or foam proportioning system capacity), and concentrate viscosity at the test points defined in Table 20.11.1. [1901:20.11.2]

Committee Statement: The committee extracted text from NFPA 1901 for consistency.

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No: 1906-89
Recommendation: Revise text to read as follows:

20.11.1 The final installer shall test and certify the following:

(1) The foam proportioning system, as installed, complies with the foam equipment manufacturer's installation recommendations.

(2) The foam proportioning system has been calibrated and tested to meet the foam equipment manufacturer’s and the apparatus manufacturer’s designed purchaser’s performance specifications.

Substantiation: This change is another required to get “purchaser” stated requirements out of the standard and link the requirements to something measurable regardless of what the purchase specifications state. Paragraph 20.9.3 requires the manufacturer to post on a plate in the apparatus the performance specifications. The manufacturer needs to calibrate and test the system to the performance specifications regardless of who determines what those requirements are.

Committee Meeting Action: Reject
Committee Statement: The standard is currently written as a minimum standard and this language is necessary to verify the purchasers’ requirements are met.
1906-177  Log #87  Final Action: Accept
(21.2.4)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:
21.2.4* On a CAFS, the air pressures shall be automatically balanced to the water pressure to within -0/+10 percent throughout the operational range of the CAFS.
Substantiation:  Correct wording to NFPA 1901-2009.
Committee Meeting Action:  Accept

1906-178  Log #142  Final Action: Accept
(21.9)

Submitter: Carl E. Peterson, Hingham, MA
Comment on Proposal No:  1906-101
Recommendation:  Revise text to read as follows:
21.9* Manufacturer’s Predelivery Tests.  The manufacturer shall conduct the following tests in 21.9.1 and 21.9.2 prior to delivery of the fire apparatus and provide documentation of the test results to the purchaser at delivery of with the fire apparatus.  [1901:21.9]
Substantiation:  This change makes the wording consistent with NFPA 1901, 2009 edition and allows it to be extracted text as most of the rest of the chapter is.  No explanation was provided for changing the text and not just extracting this text.
Committee Meeting Action:  Accept

1906-179  Log #88  Final Action: Accept
(25.2.3, 25.3.1, and 25.3.2)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation:  Revise text to read as follows:
25.2.3 The wire rope or synthetic rope assembly, including all hardware such as clevises, hooks, and snatch blocks provided for attachment to the winch, shall have a design load rating greater than the line pull capacity of the winch.  (1901:25.2.3)

…
25.3.1 This control The free spooling clutch shall be accessible without reaching under the fire apparatus.
25.3.2 If the winch is installed under the fire apparatus or not visible to the operator, it the free spooling clutch shall be remotely controlled.
Substantiation:  Correct wording to NFPA 1901-2009.
Committee Meeting Action:  Accept
1906-180 Log #195 Final Action: Accept

(25.5.2)

Submitter: Kirk Bradley, Michigan Department of Natural Resources and Environment
Comment on Proposal No: 1906-1
Recommendation: Delete text to read as follows:
25.5.2 The forward-neutral-reverse hydraulic control for the winch shall be electrically operated to permit remote control of the hydraulic winch operations.

Substantiation: Electrically controlled is not the only method of remote control.
Committee Meeting Action: Accept

1906-181 Log #194 Final Action: Accept in Principle

(27.3.4)

Submitter: Kirk Bradley, Michigan Department of Natural Resources and Environment
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
27.3.4 Skid plates shall not impede the normal function of the vehicle or any of its systems.

Substantiation: Incomplete text?
Committee Meeting Action: Accept in Principle
Revise text to read as follows:
27.3.4 Skid plates shall not impede the normal function of the vehicle or any of its systems.

Committee Statement: This appears to be a typo in the published ROP draft. The committee provided text that did not display. See committee action for complete text of 27.3.4.

1906-182 Log #150 Final Action: Reject

(A.4.13.1.1(1))

Submitter: David V. Haston, US Forest Service
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:
A.4.13.1.1(1) When a vehicle is on a tilt table, the point of instability is when the vehicle is “balanced” on the verge of rollover, and very little constraining force, if any, is required to restrain the vehicle. This can occur with the front wheels still in contact with the surface of the tilt table or with other wheels in contact with the surface of the tilt table if a front or rear tire or tire set is lifted.

Substantiation: When a vehicle is on tilt table and a front or rear tire set is lifted the vehicle has reached a state of instability. This is the standard that has been used on wildland fire apparatus since vehicle stability requirements (using a tilt table) were placed in NFPA 1906. It is unnecessary to roll the vehicle up onto the safety chains on both axles and introduces unnecessary risks to the vehicle and the test facility.

Committee Meeting Action: Reject
Committee Statement: The current wording is verbatim from SAE J2180 - The test specified in this standard.
1906-183  Log #89  Final Action: Accept
(A.12.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation: Revise text to read as follows:

A.12.1

Overloading. Overloading of the vehicle by the manufacturer through design or by the purchaser adding a great deal of
equipment after the vehicle is in service will materially reduce the life of the vehicle and will undoubtedly result in
increased maintenance costs, particularly with respect to the springs, tires, axles, transmissions, clutches, and brakes.
Overloading can also seriously affect handling characteristics, making steering particularly difficult.

Substantiation: Springs, tires and axles are particularly susceptible to over loading.

This change was approved in Baltimore as was in the original ROP. It got missed in the second ROP.

Committee Meeting Action: Accept

1906-184  Log #90  Final Action: Accept
(A.13.7)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation: Revise text to read as follows:

A.13.7 SAE J551/2, Test Limits and Methods of Measurement of Radio Disturbance Characteristics of Vehicles,
Motorboats, and Spark-Ignited Engine-Driven Devices; SAE J551/1, Performance Levels and Methods of Measurement
Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 16 GHz) provides test
procedures and recommended levels to assist engineers in the control of broadband electromagnetic radiation and in
the control of radio interference resulting from equipment installed on the apparatus. Adherence to the recommended
levels will minimize the degradation effects of potential interference sources on fireground communication equipment or
other devices susceptible to electromagnetic interference.

Procedures are included to measure the radiation from a single device or the entire apparatus. Compliance could be
determined through actual tests on the completed apparatus or predictions based on tests previously conducted on
similarly equipped apparatus. If compliance certification is required, it should be so indicated in the apparatus
specifications.

Substantiation: Corrections to match NFPA 1901-2009 text and use the current document.

Committee Meeting Action: Accept

1906-185  Log #91  Final Action: Accept
(A.16.2.1)

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No:  1906-1
Recommendation: Revise text to read as follows:

A.16.2.1 Some of the pump performance requirements listed in Table 16.2.1 are the same as the pump requirements
of certain fire or insurance organizations in the United States. Table A.16.2.1 ties the performances required by Table
16.2.1 to that required by the National Wildland Coordinating Group (NWCG), the Insurance Services Office
(ISO), and the U.S. Forest Service for agency engines.

Substantiation: Correct the name of the NWCG.

Committee Meeting Action: Accept

Printed on  5/12/2011
1906-186 Log #92
(See Table A.16.2.1)
Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

*****Insert Table A.16.2.1 Here*****

Substantiation: Add grid lines to table to make it more readable.
Correct SI conversions to agree with the rest of this document and NFPA 1901.
Committee Meeting Action: Accept

1906-187 Log #93
(A.16.2.4)
Final Action: Accept

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Delete text to read as follows:

A.16.2.4 Where the community to which the apparatus is to be delivered is at a considerably higher altitude than the factory or other test location, sufficient excess power should be provided to compensate for the fact that the power of a naturally aspirated internal combustion engine decreases with elevation above sea level. The performance of a fire pump can be adversely affected by the design of the suction piping or the addition of valves to the suction side of the pump. Losses due to additional piping or valves that are added to the fire pump suction can be calculated and used to determine pump performance:

Substantiation: This information is repeated in A.16.2.4.2 which is a more appropriate place for it since Section 16.2.4.2 is the section that talks about performance at altitudes above 2000 ft.
Committee Meeting Action: Accept

1906-188 Log #182
(A.16.10.14.1)
Final Action: Accept

Submitter: Tom Mettler, Waterous Company
Comment on Proposal No: 1906-1
Recommendation: Editorial: End paragraph (4) and start a new paragraph for Pressure governors as shown below:

(4) Properly selected pump, PTO ratio, and discharge sizes to limit pressure rise to less than 30 psi

(begin new paragraph)

Pressure governors control the engine........

Substantiation: As written in the ROP, the sentence structure is incorrect and runs on. The pressure governor paragraph is a separate paragraph in NFPA 1901 and 2006 edition of 1906 with paragraph (4) added in this revision of NFPA 1906. Editorial mistake in placement of the new text.
This is not original material; its reference/source is as follows:
NFPA 1901 and NFPA 1906.
Committee Meeting Action: Accept
Table A.16.2.1 Water Pump Performance When Installed in Wildland Apparatus Engine

<table>
<thead>
<tr>
<th>Pump Pressure</th>
<th>Rated Capacity or Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psi</td>
<td>kPa</td>
</tr>
<tr>
<td>100</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>2800</td>
</tr>
</tbody>
</table>

<sup>1</sup> NWCG rating for type 4, 5, and 6 engines (50 gpm @ 100 psi) (490 200 L/min @ 700 kPa)
<sup>2</sup> ISO8 rating (250 gpm @ 150 psi) (490 200 L/min @ 1000 kPa) and also NWCG Tactical Water Tender T2
<sup>3</sup> U.S. Forest Service type 4, 5, and 6 engine (50 gpm @ 250 psi)(490 200 L/min @ 1700 kPa)
<sup>4</sup> NWCG rating for type 3 engine (150 gpm @ 250 psi)(520 600 L/min @ 1700 kPa)
<sup>5</sup> U.S. Forest Service type 3 agency engines (200 gpm @ 300 psi)(250 800 L/min @ 2000 kPa)
A.16.13.2.3.2 The suction lift can be determined either by measuring the negative pressure (vacuum) in the pump intake manifold with a monometer or other suitable test gauge that measures vacuum accurately or by adding the vertical lift and the value of friction and entrance loss from Table 16.2.4.1(b) or Table 16.2.4.1(c). To be accurate, the vacuum gauge must be at the same level as the intake of the pump with no gauge line or very short gauge line. If a long gauge line is used, a purge valve at the gauge connection to the gauge line must be installed and open and closed when running to purge the gauge line of any water. If the vacuum gauge and the pump intake are at different levels with water in the gauge line, an incorrect reading will result. By opening and closing the purge valve at the vacuum gauge when operating will purge the gauge line. For every foot of water in the vacuum gauge line will result in an almost an inch of mercury error of vacuum. Gauge readings should be corrected for the difference between the height of the gauge and the centerline of the pump intake, but usually this is not large and therefore not significant, allowing this correction to be ignored. It is best to place the gauges at the same level or very close to the same level as the pump intake. If the gauges are at a different level from the pump intake, the correction is 0.433 psi per foot (9.8 kPa per meter) of difference.

Correct intake must be determined when testing. With water in the vacuum gauge line an error can occur. The procedure prevented will eliminate this error.

**Committee Meeting Action:** Accept

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**Recommendation:** Revise text to read as follows:

Table A.16.13.8(a), A.16.13.8(b), A.16.13.8(c), and A.16.13.8(d) are correct and address apparatus with No Throttle Ready Indicator for those conditions in the tables. The committee accepted Table A.16.13.8(d)
<table>
<thead>
<tr>
<th>Chassis Transmission Gear Selected</th>
<th>Transfer Case Status</th>
<th>Parking Brake Status</th>
<th>Pump Shift Status (Driving Compartment)</th>
<th>Engine Speed Control at Pump Operator’s Panel</th>
<th>Required Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>Neutral or engaged</td>
<td>On</td>
<td>Road</td>
<td>Yes*</td>
<td>X</td>
</tr>
<tr>
<td>Neutral</td>
<td>Neutral</td>
<td>Off</td>
<td>Road</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>Engaged</td>
<td>Off</td>
<td>Road</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>Neutral or engaged</td>
<td>On</td>
<td>Engaged</td>
<td>Yes*</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>Neutral or engaged</td>
<td>Off</td>
<td>Engaged</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Pump gear†</td>
<td>Neutral</td>
<td>On</td>
<td>Engaged, OK to pump</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Pump gear†</td>
<td>Engaged</td>
<td>On</td>
<td>Engaged, OK to pump</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Pump gear†</td>
<td>Neutral or engaged</td>
<td>Off</td>
<td>Engaged</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Pump gear†</td>
<td>Neutral or engaged</td>
<td>On</td>
<td>Road</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pump gear†</td>
<td>Neutral or engaged</td>
<td>Off</td>
<td>Road</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Any gear other than neutral and pump gear†</td>
<td>Neutral or engaged</td>
<td>On or off</td>
<td>Road or engaged</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

†Chassis transmission shift selector is placed in position for pumping as indicated on the label provided in the driving compartment.

*Applies only for those apparatus that have “Throttle Ready” indication on the pump operator’s panel when the chassis transmission is in neutral and the parking brake is engaged. If there is no “Throttle Ready” indication, there is no engine speed control at the pump operator’s panel.
This standard provides the minimum technical requirements that new wildland fire apparatus are expected to meet. It is recognized that many purchasers will want additional features of operation over and above these minimum requirements. The requirements in this standard, together with the annex material, should be studied carefully. Details, such as anywhere that the apparatus being specified needs to exceed the minimum requirements or where a specific arrangement is desired, should be carefully defined in the specifications for the apparatus. These specifications might include special performance requirements, defining the number of seats and the seating arrangement for fire fighters riding on the apparatus, or providing space for extra hose or equipment the apparatus will be required to carry.

Completion of the form shown in Figure B.2 should assist the purchaser in developing their specifications and provide the information required in the various sections of this document. The purchaser should fill in only sections where there are specific requirements over and above the standard. Care must be taken not to specify incompatible requirements, such as a 3000 gal (11,400 L) water tank, which weighs approximately 30,000 lb (13,600 kg), and a 10,000 lb (4500 kg) GVWR chassis. When more restrictive details are specified, fewer manufacturers will be able to bid, and the cost of the apparatus may be higher.

****INSERT FIGURE HERE****

**FIGURE B.2 Specification Form for Purchasing Apparatus. (p 12 of 14 provided)**

**Substantiation:** Text and numbering has undergone major revision and both are referred to significantly in the figures.

**Committee Meeting Action:** Accept in Principle

**Revise text to read as follows:**

**B.2 Writing the Specifications.**

This standard provides the minimum technical requirements that new wildland fire apparatus are expected to meet. It is recognized that many purchasers will want additional features of operation over and above these minimum requirements. The requirements in this standard, together with the annex material, should be studied carefully. Details, such as anywhere that the apparatus being specified needs to exceed the minimum requirements or where a specific arrangement is desired, should be carefully defined in the specifications for the apparatus. These specifications might include special performance requirements, defining the number of seats and the seating arrangement for fire fighters riding on the apparatus, or providing space for extra hose or equipment the apparatus will be required to carry.

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**Committee Statement:** Figure B.2 needs to be updated to match the new chapters and requirements in the updated 1906. Staff will have to update figures.
APPARATUS PURCHASING SPECIFICATION FORM

PROCUREMENT ISSUES

* Date of bid 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.

* Are interim inspection trip(s) to the assembly plant to be provided?  □ Yes  □ No

  If yes, indicate number of trips ________ number of participants ________

  Who will pay expenses? 

  How many service and operation manuals are to be provided? 

* Where is the delivery of the apparatus to occur? 

* Where and when is the acceptance to occur? 

* The operation and service instruction and demonstration is to be conducted at 

  for ________ persons for ________ days.

  Is a special payment plan or schedule required?  □ Yes  □ No

  If yes, what are the requirements? 

  Is an approval drawing required?  □ Yes  □ No

  Is a bid bond required?  □ Yes  □ No

  If yes, what percent of the bid price? 

  Is a performance bond required?  □ Yes  □ No

  If yes, what percent of the bid price? 

  Is an extended warranty on specific components required?  □ Yes  □ No

  If yes, indicate which components are to be covered and the length of the warranty: 

  Is a warranty bond required?  □ Yes  □ No

  If yes, in what amount?

* Generally required for manufacturer to bid on and build apparatus.

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FIGURE B.2 Specification Form for Purchasing Apparatus.

NFPA 1906, Log 95, F2011, Figure B.2 121
APPARATUS PURCHASING SPECIFICATION FORM (continued)

GENERAL REQUIREMENTS

Special design features required on this apparatus:

What are the maximum allowable dimensions of the apparatus?

- Overall height in inches (millimeters): _____ (measured at the highest projection)
- Overall length in inches (millimeters): _____ (measured at the front and rearmost projections)
- Wheel base in inches (millimeters): _____ (measured from the center of the front axle to the center of the rear axle)
- Width in inches (millimeters): _____ (measured at the outside of the mirrors)

Gross vehicle weight in pounds (kilograms):

- Maximum weight on the front axle in pounds (kilograms):
- Maximum weight on the rear axle in pounds (kilograms):

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

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

* Maximum grade for stationary operation if over 10 percent:

* Maximum grade that apparatus must be able to maneuver on if more than across a 20 percent grade and up and down a 25 percent grade:

Apparatus road performance if it is to exceed the minimum specified in this standard:

* Maximum road speed required:

* Minimum ambient air temperature in which the apparatus is to operate:

* Maximum ambient air temperature in which the apparatus is to operate:

* Maximum number of persons to ride on the apparatus:

* Hose Thread Size Information

(TPI x OD or size and type) (i.e., 3½ in. NH or 1 in. NPSH)

- ½ in. =
- 1½ in. =
- 2½ in. =
- 3½ in. =
- 4½ in. =
- 6 in. =

Hydrant =

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FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

Testing and Acceptance
Is independent third-party certification of test results required for the pump system?  ☐ Yes ☐ No
Is anyone representing the purchaser to witness the manufacturer's predelivery 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?

CHASSIS AND VEHICLE COMPONENTS
Desired chassis make and model or style:

Desired location of the engine:
Type of propulsion engine:
Is an electric fuel pump or repriming pump required?  ☐ Yes ☐ No
Special lubrication system requirements:

Special cooling system requirements:

Is an automatic throttle control device required?  ☐ Yes ☐ No
Is a manual emergency engine shutdown required?  ☐ Yes ☐ No
Type of fuel filters required:

Type of air filters required:

Enhanced performance ember separator requirements:

Existing location of the exhaust system:

Type of brake system required:

Is an auxiliary brake system required?  ☐ Yes ☐ No
If yes, type and control:

FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

Style and type of tires required:______________________________________________________
______________________________________________________________________________

Indicate whether cast spoke, hub piloted, stud piloted, steel disc, or aluminum wheels are required:
______________________________________________________________________________

Are rear fender liners required? □ Yes □ No
Are automatic tire chains required? □ Yes □ No
Minimum axle housing and ground clearance required:______________________________
______________________________________________________________________________

Increased underbody clearance required greater than the standard's minimum:
______________________________________________________________________________

Angle of approach required if greater than 20 degrees: ______________________________
Angle of departure required if greater than 20 degrees: ______________________________
Ramp breakover angle required: ________________________________________________
Specify the steering system cramp angle if it exceeds the standard's minimum:
______________________________________________________________________________

Is a drive axle traction control or no-slip differential required? □ Yes □ No
If yes, what design or style? ____________________________________________________
______________________________________________________________________________

Is rear wheel steering required? □ Yes □ No
If yes, what design or style? ____________________________________________________
______________________________________________________________________________

Is a special suspension system required? □ Yes □ No
If yes, what design or style? ____________________________________________________
______________________________________________________________________________

Is an automatic or manual transmission required?
Fuel tank capacity required: ________________________ gal (L)
Must tow hooks be accessible without opening compartment doors? □ Yes □ No
Is a rear license plate bracket and light required? □ Yes □ No
Special cab trim features: ________________________________________________________
______________________________________________________________________________

LOW-VOLTAGE ELECTRICAL SYSTEMS AND WARNING DEVICES
* Indicate whether a battery charger, conditioner, or polarized receptacle is to be provided:
______________________________________________________________________________

If a built-in battery charger or conditioner is provided, indicate the required charging rate:
______________________________________________________________________________

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FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

Specify the location of the receptacle for the battery charger or conditioner:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Is a second "master body disconnect" indicator on the outside of the vehicle required?

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 required, specify the sequence of control (shutdown):

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Is certification of the testing of the low-voltage electrical system by an independent third-party certification organization required?

Is the vehicle to be equipped to cue or block right-of-way on a public highway?

If yes, specify warning light and siren information:

### Warning Light Information

<table>
<thead>
<tr>
<th>Location</th>
<th>Make and Model</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper forward-facing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-level side-facing near front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-level side-facing near midship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-level side-facing near rear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper-level rear-facing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower-level forward-facing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower-level side-facing near front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower-level side-facing near midship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower-level side-facing near rear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower-level rear-facing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Make, model, location, and controls of the sirens:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Are air horns required?

If yes, make preferred, type of control, and their location:

Special emergency lighting or warning features or equipment required:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Are cab hand lights or mounted adjustable spotlights required?

Additional work lighting required:

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FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

Specify if additional driving or crew compartment lighting is required:

Are provisions needed for rechargeable equipment? ☐ Yes ☐ No
If yes, make and model of equipment:

Is a backup camera system required? ☐ Yes ☐ No
If yes, make and model:

DRIVING AND CREW AREAS
Special seating requirements or arrangements for the driver:

Special seating requirements or arrangements for the officer:

Special seating requirements or arrangements for the crew:

Is an intercom system required? ☐ Yes ☐ No
Make, model, or type:
Locations:
Radio interface:
Special requirements:

Special requirements for carrying tools or equipment within the driving or crew compartment:

Special requirements for carrying EMS equipment within the driving or crew compartments:

Special step or handrail arrangements required:

Is a tilt or telescoping steering column required? ☐ Yes ☐ No
If yes, what design or style:

Extra driving compartment instrument panel features required:

Type and style of driving compartment mirrors:

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FIGURE B.2 Continued
**APPARATUS PURCHASING SPECIFICATION FORM (continued)**

**BODY, COMPARTMENTS, AND EQUIPMENT MOUNTING**

Body material:

Compartment capacity required: \( \text{m}^3 \)

Special compartment features and finish required:

Compartment floor material or covering required:

Type and style of compartment doors required:

Style of door latches, locks, or stays required:

Type of compartment lighting required:

Radio equipment to be used:

- Is the manufacturer to provide the radio? \( \square \) Yes \( \square \) No
- Is the manufacturer to install the radio? \( \square \) Yes \( \square \) No
  
  Make and model:
  Mounting location for radio:
  Mounting location for control(s) and speaker(s):

Provisions required for computer equipment or electronics:

Type of body tread plate material required:

Type of step and platform material required:

* Color of apparatus:
  
  Paint number and manufacturer, if known:
  Stripping, decoration, and lettering required:

Areas not to be painted:

Miscellaneous body trim:

Is rustproof treatment required? \( \square \) Yes \( \square \) No

If yes, locations to be treated:

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FIGURE B.2 Continued
**APPARATUS PURCHASING SPECIFICATION FORM (continued)**

* Hose to Be Carried for Preconnected Lines

<table>
<thead>
<tr>
<th>Length</th>
<th>Size</th>
<th>Location</th>
<th>Bed or Reel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

* Hose to Be Carried in Hose Bed or on Reels

<table>
<thead>
<tr>
<th>Length</th>
<th>Size</th>
<th>Location</th>
<th>Bed or Reel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Is a hose bed cover(s) required?  □ Yes  □ No
If yes, specify type:

Is the fire-fighting system to be a slip-on unit?  □ Yes  □ No
If yes, lifting arrangement required:

Anchoring system required:

**WATER PUMP**

* Pump-rated capacity: __________ gpm (L/min) at __________ psi (kPa)
* Number of pump stages required: __________

Pump type:

Pump location:

Is the pump to be driven by the chassis propulsion engine?  □ Yes  □ No
If no, how is the pump to be driven?

Pump testing authority:

Pump and roll performance required:

Flow: __________ gpm (L/min) at __________ psi (kPa)
Vehicle speed: __________ mph (km/hr)

Type of priming system:

**FIGURE B.2 Continued**
APPARATUS PURCHASING SPECIFICATION FORM (continued)

Special pump performance requirements:
- If altitude over 2000 ft (600 m), specify altitude:__________________________
- If lift over 10 ft (3 m), specify lift:______________________________
- If through more than 20 ft (6 m) of suction hose, specify length:__________________________
- Do local water conditions require special materials for pump construction and piping?______________

Location of pump operator's position:______________________________

Pump panel and gauge panel material, if required:______________________________

Type of intake and discharge valve controls desired:______________________________

Size of the master gauges:______________________________

Are individual line pressure gauges required?  □ Yes □ No
- If yes, are there any special requirements?______________________________

Are individual line flow meters required?  □ Yes □ No
- If yes, are there any special requirements?______________________________

Are any special gauges, instruments, or other features required at the pump operator's position?______________________________

Are special pump and piping features required to deal with extremely low temperatures?______________________________

Is an intake relief system required?  □ Yes □ No
- Special requirements:______________________________

Is a pump pressure governor or a relief valve to be supplied?______________________________

* Pump intake connections

Indicate the following for each pump intake:

<table>
<thead>
<tr>
<th>Size</th>
<th>Type of Connection</th>
<th>Location</th>
<th>Valved T/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</table>

Are specific flow rates required for auxiliary intakes?  □ Yes □ No
- If yes, specify details:______________________________

Is certification of intake flow rates required?  □ Yes □ No

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FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

Are special adapters required on the pump intakes?  □ Yes  □ No
   If yes indicate type:

Will a valve, siamese, or adapter be carried on any intakes?  □ Yes  □ No
   If yes, specify where, make, and model:

* Pump Discharge Outlets Without Preconnected Hose Lines

<table>
<thead>
<tr>
<th>Size</th>
<th>Type of Connection</th>
<th>Location</th>
<th>Flow Requirement</th>
<th>Valved Y/N</th>
</tr>
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<tbody>
<tr>
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</table>

* Pump Discharge Outlets for Preconnected Hose Lines

<table>
<thead>
<tr>
<th>Size</th>
<th>Type of Connection</th>
<th>Location</th>
<th>Flow Requirement</th>
<th>Valved Y/N</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Is a deck gun required?  □ Yes  □ No
   Type:
   Mounting location:
   Piping size and arrangement:

Is pump panel color or number coding required?  □ Yes  □ No
   Specify details:

Is a booster reel required?  □ Yes  □ No
   How many reels?
   Location:
   Hose size and length:
   Reel rewind type:
   Piping to reel:

FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

PUMP ENGINE
Is a separate engine required to drive the pump? □ Yes □ No
Specify the desired location of the engine:

Type of engine:
Is the engine to draw its fuel from the vehicle’s fuel system? □ Yes □ No
Specify the fuel tank capacity required: __________ gal
Is an electric fuel pump or regaining pump required? □ Yes □ No
Specify any special lubrication system requirements:

Specify any special cooling system requirements:

Type of coolant required:
Is an automatic throttle control device required? □ Yes □ No
Is a manual emergency engine shutdown required? □ Yes □ No
Type of fuel filters required:
Type of air filters required:
Specify the exiting location of the exhaust system:

WATER TANK
Water tank capacity:
Tank construction material:

Is an internal coating required? □ Yes □ No
Is a removable tank lid required? □ Yes □ No
Type of tank level indicator(s):
Location of additional tank level indicator(s):

Tank-to-pump flow rate required:
Pump-to-tank fill rate required:
Is a tank dump valve required? □ Yes □ No
Style of valve:
Size:
Performance required:
Location:
Type of connector:

FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

Is a direct tank fill required? ☐ Yes ☐ No

- Style of valve:
- Size:
- Performance required:
- Location:
- Type of connector:

EQUIPMENT CARRIED ON APPARATUS

* Suction Hose
  * Is suction hose required? ☐ Yes ☐ No
    - Soft or hard:
    - Size and length:
    - Connection type and size:
    - Mounting arrangement, bracket style, and location:

* Breathing Apparatus

Is self-contained breathing apparatus (SCBA) required? ☐ Yes ☐ No

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Make/Model</th>
<th>Mounting Location</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

* The SCBA is to be supplied by the ☐ contractor ☐ purchaser.

Special requirements for the SCBA or its mounting:

Miscellaneous Equipment

Is the allowance for 70 MI (3-1/2 hours) of personal gear for each seating position required? ☐ Yes ☐ No

Miscellaneous equipment allowance if it exceeds the standards' minimum weight:

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 x W x 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 x W x 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 x W x D).

Attach a list of fixed and permanent components required on the apparatus, showing the item, quantity, weight of each, and dimensions (L x W x D), as well as the location where it is to be carried.

Indicate the reserve CAVR required on each sale (from 0 percent to 20 percent):

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

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FIGURE B.2 Continued
APPARATUS PURCHASING SPECIFICATION FORM (continued)

CLASS A FOAM CONCENTRATE PROPORTIONING SYSTEM

* Is a Class A foam proportioning system required? □ Yes □ No
* Type of foam proportioning system required:

* Type of foam(s) to be used:

* Built-in foam concentrate storage capacity: ______ gal (L)

* Discharge Outlets to Be Used with Foam and Their Performance

<table>
<thead>
<tr>
<th>Discharge Outlet Location</th>
<th>Required Flow</th>
<th>Proportioning Rate</th>
<th>Hose Length</th>
<th>Hose Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</tr>
</tbody>
</table>

* Is an outside foam proportioning system inlet or pickup required? □ Yes □ No
   If yes, type: __________

Is a foam tank refill system required? □ Yes □ No
   If yes, performance requirements:

Indicate the size and location of water-only discharge outlets:

COMPRESSED AIR FOAM SYSTEM

* Is a CAFS required? □ Yes □ No
* Total SCFM (SCMM) required: ______
Type of compressor and driver required:

Total water pump capacity required:

Type of system controls and interlocks required:

* Discharge Outlets to Be Used with the CAFS and Their Performance

<table>
<thead>
<tr>
<th>Discharge Outlet Location</th>
<th>Required Flow</th>
<th>Hose Length</th>
<th>Hose Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

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FIGURE B.3: Continued
FIGURE B.2 Continued

B.2.1 The first consideration in the design of a fire apparatus is a definition of the mission of the apparatus. The purchaser should define the basic specifications as follows:

(1) The type of apparatus to be purchased
(2) Types of responses
(3) The response environment (level terrain, hilly terrain, on-road, off-road, responses of hundreds of miles,
B.5.1 When the apparatus is ready for delivery and acceptance, the purchaser has a responsibility to check the completed apparatus carefully against the specifications, the contract, and the requirements of this document to ensure that all that was required is being delivered. This includes witnessing any required acceptance tests and verifying that the gross vehicle weight and the axle weight distribution are within the chassis and axle ratings. The delivery inspection form shown as Figure B.5.1(a) and the as-delivered weight analysis calculation worksheet shown as Figure B.5.1(b) can be useful in the inspection process. The weight distribution of in-service fire apparatus is critical to the safe operation of the apparatus. Figure B.5.1(b) and Table B.5.1 can help evaluate weight issues to confirm that the apparatus weight and distribution are within the chassis manufacturer’s safe limits.

Substantiation: Current figure B.5.1(a) apparently did not get updated to reflect all the changes due to the expansion and reorganization of the standard as a revised figure is not shown in the draft. The existing figure is no longer appropriate. The existing figure can also be misleading as there are many things beyond what are shown in the figure that should be checked as part of delivery inspection. Providing a form can lead a user to overlook a complete inspection in favor of just what is on the form.

Committee Meeting Action: Reject
Committee Statement: See committee action on 1906-194 (Log #96).

Substantiation: This is a trade size available. It is 52 mm in all other places in NFPA 1901 and NFPA 1906.

Committee Meeting Action: Reject
Committee Statement: NFPA 1961 uses 51 mm for this size hose.
1906-194 Log #96
(208.5.1(a))

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

****INSERT FIGURE HERE****

FIGURE 208.5.1(a) Inspection Form for Delivery and Acceptance.

This figure will have to undergo major revision to agree with the new text. Since they were not included in the ROP draft, it has to be assumed that this will be done by staff and that it will have to be done perfectly since there is no opportunity for public comment and correction.

Substantiation: Text and numbering has undergone major revision and both are referred to significantly in the figures.
Committee Meeting Action: Accept

1906-195 Log #97
(208.5.1(b))

Submitter: Thomas A. Stalnaker, Goshen Fire Company
Comment on Proposal No: 1906-1
Recommendation: Revise text to read as follows:

****INSERT FIGURE HERE****

FIGURE 208.5.1(b) Worksheet for As-Delivered Weight Analysis Calculation and Evaluation.

Change personnel weight allowance from 200 to 250 pounds per 208.1.2(4). Also make change in instructions in 208.5.2.
Change section reference on line n from Section 208.1.2.8 to Section 12.1.2.
Substantiation: Personnel weight allowance changed (unless it is changed again).
Sections renumbered.
Committee Meeting Action: Accept in Principle
Committee Statement: Staff will update figure to change the weight allowances.
**DETECTION INSPECTION FORM**

<table>
<thead>
<tr>
<th>NFPA 1098 Paragraph</th>
<th>Topic</th>
<th>Description</th>
<th>Yes (Pass)</th>
<th>No (Fail)</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6.1.4.9.1</td>
<td>Personnel protection</td>
<td>Guards or shields are provided around hot, moving or rotating parts.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.6.6.4.9.2</td>
<td>Personnel protection</td>
<td>Isolation or insulation is provided to protect personnel from electrical shock.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.7.1.16.1</td>
<td>Controls and gauges</td>
<td>All controls, switches, instructions, gauges, and instruments needed for operation are illuminated.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.6.4.17.8</td>
<td>Brakes</td>
<td>Stopping distance measurement is provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.6.4.17.7</td>
<td>Documentation and manuals</td>
<td>Required manufacturer's data are provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.8.4.20.1</td>
<td>Documentation and manuals</td>
<td>Chassis operation and maintenance manual is provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.8.4.20.2</td>
<td>Documentation and manuals</td>
<td>Pump operation and maintenance manual is provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.8.4.20.3(4)</td>
<td>Documentation and manuals</td>
<td>Parts replacement information is provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.8.4.20.3(6)</td>
<td>Documentation and manuals</td>
<td>Wiring diagram is provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.8.4.20.7</td>
<td>Documentation and manuals</td>
<td>Lubrication chart is provided.</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.10.8.4.20.7.7</td>
<td>Documentation and manuals</td>
<td>Major component manufacturer's manuals are provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.1.4.12.1.4</td>
<td>Federal National Highway Traffic Safety Administration, Department of Transportation 49 CFR, Part 680 weights certification label is provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8.1.5.12.1.5.1</td>
<td>Information plate</td>
<td>Plate indicating the height, length, and GVWR of the vehicle is visible to the driver.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.1.7.12.1.5.1</td>
<td>Brakes</td>
<td>Anti-lock braking system is provided.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.1.4.7.12.1.5.1</td>
<td>Brakes</td>
<td>Auxiliary braking system functions (required above 56,000 lb (16,000 kg) GVWR).</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.5.2.8.13.2.2</td>
<td>Ramp breakover angle</td>
<td>Meets ramp breakover angle (if specified).</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.2.3.13.2.3</td>
<td>Ground clearance</td>
<td>Meets ground clearance.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.2.2.8.13.2.3</td>
<td>Approach angle</td>
<td>Angle of approach is at least 20 degrees (vertical/horizontal greater than 0.3640).</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.2.2.8.13.2.3</td>
<td>Departure angle</td>
<td>Angle of departure is at least 20 degrees (vertical/horizontal greater than 0.3640).</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.9.4.3.12.1.4.2</td>
<td>Engine and fuel tank</td>
<td>Label is provided at the fuel fill to indicate type of fuel.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.6.10.4.1.12.1.4</td>
<td>Warning lights responding</td>
<td>No yellow lights are in Zone A in the &quot;hitting for right-of-way&quot; mode.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**FIGURE B.5.1(a) Inspection Form for Delivery and Acceptance.**
<table>
<thead>
<tr>
<th>NFPA 1906 Paragraph</th>
<th>Topic</th>
<th>Description</th>
<th>Yes (Pass)</th>
<th>No (Fail)</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4.12-1</td>
<td>Warning lights — responding</td>
<td>No white lights are in Zone C in the “calling for right-of-way” mode.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6.4.12-1</td>
<td>Warning lights — blocking</td>
<td>No white lights are in any zone in the “blocking right-of-way” mode.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6.4.16 13.8 &amp; 9.2</td>
<td>Warning lights</td>
<td>Compliance documentation provided.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6.4.13.9.1</td>
<td>Audible warning</td>
<td>Sirens are certified to SAE J1849.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6.4.13.9.2</td>
<td>Driving and crew compartment occupant protection</td>
<td>Audible warning devices and sirens are mounted low and in front of vehicle.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4.5.4 14.1.3</td>
<td>Driving and crew compartment occupant protection</td>
<td>Seat belts are provided for each driving and crew compartment occupant.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7.3.3.3-9</td>
<td>Warning signs</td>
<td>A “Seat Belts Required” sign is visible from every seating position.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4.5.4 14.1.6</td>
<td>Driving and crew compartment occupant protection</td>
<td>Headroom at each seating position meets 7.1.8 requirement.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7.4.10.1</td>
<td>Driving and crew compartment occupant protection</td>
<td>Each SCBA bracket is provided with a positive retaining mechanical retention device.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7.4.11.1</td>
<td>Driving and crew compartment occupant protection</td>
<td>All equipment required to be used during a response is fastened.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7.4.12-2</td>
<td>Driving and crew compartment occupant protection</td>
<td>Equipment not required to be used during a response is contained or fastened.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.4.2 15.7.1</td>
<td>Powered equipment rack</td>
<td>The rack has a device to lock it in the stowed position.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.4.2 15.7.2</td>
<td>Powered equipment rack</td>
<td>Operator can watch the rack from the controls while it is being deployed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.4.2 15.7.3</td>
<td>Powered equipment rack</td>
<td>The rack is equipped with lights that flash when it is not stowed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.4.2 15.7.4</td>
<td>Powered equipment rack</td>
<td>The rack has reflective devices to make it more visible when deployed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.4.2 15.7.5</td>
<td>Pump compartment</td>
<td>Pump compartment access — no dimension is less than 38 in. (965 mm).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>15.7.1.1</td>
<td>Step height</td>
<td>First step is no more than 24 in. (610 mm), no more than 18 in. (450 mm) between any other step.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>15.7.1.2</td>
<td>Step size</td>
<td>All steps have minimum area of 85 in.² (22,860 mm²).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>15.7.1.3</td>
<td>Step size</td>
<td>All steps have at least 8 in. (200 mm) clearance between leading edge and any obstruction.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>15.7.1.4</td>
<td>Step size</td>
<td>All steps can have a 6 in. (152 mm) diameter disk placed on them without overlapping the edge.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

FIGURE B.5.1(s) Continued
<table>
<thead>
<tr>
<th>NFPA 1906 Paragraph</th>
<th>Topic</th>
<th>Description</th>
<th>Yes (Pass)</th>
<th>No (Fail)</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.6.1.3</td>
<td>Platform size</td>
<td>All platforms have at least 8 in. (200 mm) clearance between leading edge and any obstruction.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.4.1.4</td>
<td>Ladder rungs</td>
<td>All ladder rungs have at least 6 in. (150 mm) between them and the body or other obstruction.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.6.1.2</td>
<td>Step surfaces</td>
<td>Steps, platforms, and ladders are properly mounted.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.6.3.5</td>
<td>Step surfaces</td>
<td>Step surface slip-resistance documentation is provided.</td>
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<tr>
<td>8.6.4.1</td>
<td>Warning signs</td>
<td>Signs warning that walking is prohibited are visible at rear platform.</td>
<td></td>
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<tr>
<td>8.6.4.5</td>
<td>Warning signs</td>
<td>Signs warning that walking is prohibited are visible at crossover.</td>
<td></td>
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<tr>
<td>15.6.1</td>
<td>Handrails</td>
<td>Handrails are provided at each entrance to a driving or crew compartment.</td>
<td></td>
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<tr>
<td>15.6.2</td>
<td>Handrails</td>
<td>Handrails are provided at each position where steps or ladders are climbing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.6.3</td>
<td>Handrails</td>
<td>All handrails have a diameter between 1 in. and 1 3/4 in. (25 mm and 43 mm).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.7.3</td>
<td>Handrails</td>
<td>All handrails have a minimum of 2 in. (50 mm) clearance to any other surface.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.4.4</td>
<td>Reflective trim</td>
<td>Side of vehicle has a stripe at least 4 in. (100 mm) wide and 60 percent of vehicle length.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.9.3</td>
<td>Reflective trim</td>
<td>Front of vehicle has a stripe at least 4 in. (100 mm) wide and 60 percent of the front width.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.9.7</td>
<td>Reflective trim</td>
<td>Rear of vehicle has a stripe at least 4 in. (100 mm) wide and 60 percent of the rear width.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16.8.1</td>
<td>Tank and piping capacity</td>
<td>Water tank-to-pump flow documentation is provided.</td>
<td></td>
<td></td>
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<tr>
<td>16.8.3</td>
<td>Tank and piping capacity</td>
<td>Hydrostatic piping test documentation is provided.</td>
<td></td>
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<tr>
<td>16.8.2</td>
<td>Tank and piping capacity</td>
<td>Tank capacity certification is provided.</td>
<td></td>
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</tr>
<tr>
<td>16.9.4</td>
<td>Documentation and manuals</td>
<td>Foam proportioning system operations and maintenance manuals are provided.</td>
<td></td>
<td></td>
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<tr>
<td>16.10.2</td>
<td>Calibration and testing</td>
<td>Foam proportioning system calibration and testing documentation is provided.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.6.4</td>
<td>Documentation and manuals</td>
<td>CAPS operation and maintenance manuals are provided.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>16.7.4</td>
<td>Testing</td>
<td>CAPS testing documentation is provided.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

FIGURE B.5.1(s) Continued
### AS-DELIVERED WEIGHT ANALYSIS CALCULATION WORKSHEET

**Axle Rating Reserve Capacity Determination**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Weight at delivery (with water)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td></td>
<td><strong>Hose Length</strong> (m or ft)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td></td>
<td><strong>Weight per Unit Length</strong> (m or ft)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>b</td>
<td>Hose allowance</td>
<td>Main hose bed</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>c</td>
<td>Hose allowance</td>
<td>Main hose bed</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>d</td>
<td>Hose allowance</td>
<td>Main hose bed</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>e</td>
<td><strong>Hose allowance</strong></td>
<td>Cross lay</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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<tr>
<td>f</td>
<td><strong>Hose allowance</strong></td>
<td>Cross lay</td>
<td>[ ]</td>
<td>[ ]</td>
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<td>[ ]</td>
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<td>[ ]</td>
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<tr>
<td>g</td>
<td><strong>Hose allowance</strong></td>
<td>Cross lay</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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<tr>
<td>h</td>
<td><strong>Hose allowance</strong></td>
<td>Front bumper</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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</tr>
<tr>
<td>i</td>
<td><strong>Hose allowance</strong></td>
<td>Suction hose</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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<td>[ ]</td>
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<tr>
<td>j</td>
<td><strong>Hose allowance</strong></td>
<td>Other</td>
<td>[ ]</td>
<td>[ ]</td>
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<td>k</td>
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<td>Other</td>
<td>[ ]</td>
<td>[ ]</td>
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<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td></td>
<td><strong>Seating Capacity</strong> (persons)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td></td>
<td><strong>Weight per Person</strong> (lb)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>l</td>
<td>Personnel allowance</td>
<td>[ ]</td>
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<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>m</td>
<td>Personal gear allowance</td>
<td>[ ]</td>
<td>[ ]</td>
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<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>n</td>
<td>Miscellaneous equipment allowance</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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</tr>
<tr>
<td>o</td>
<td>Total expected in-service weight (sum of rows a through n)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>p</td>
<td>Axle weight ratings (from chassis manufacturer's data label)</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>q</td>
<td>Expected reserve axle capacity</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

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**FIGURE B.5.1(b) Worksheet for As-Delivered Weight Analysis Calculation and Evaluation.**

NFPA 1906, Log 97, F2011, Figure B.5.1(b)