Public Input No. 1067-NFPA 1900-2020 [Global Input]

Delete all sections (such as 60.14.1 and 60.14.2) that do nothing more than restate 48 CFR 571, FMVSS requirements. All highway vehicles must meet all applicable federal motor vehicle standards. Restating those requirements in this standard adds unhelpful volume and does nothing to change the construction requirements. On the other hand, we should keep the sections (such as 60.14.5 and60.14.6) that appropriately specify a requirement in relation to a federal motor vehicle safety standard.

Statement of Problem and Substantiation for Public Input

Delete all sections (such as 60.14.1 and 60.14.2) that do nothing more than restate 48 CFR 571, FMVSS requirements. All highway vehicles must meet all applicable federal motor vehicle standards. Restating those requirements in this standard adds unhelpful volume and does nothing to change the construction requirements. On the other hand, we should keep the sections (such as 60.14.5 and60.14.6) that appropriately specify a requirement in relation to a federal motor vehicle safety standard.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
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Submittal Date: Fri Nov 13 15:43:19 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: This has been addressed through the work of the individual task groups for chapters 57 through 63 and related annex A material.

Public Input No. 105-NFPA 1900-2020 [Section No. 57.1.3.1]

57.1.3.1

Chapters 57 through 63 shall apply to new and remounted ambulances that are contracted for on or after ~~January~~ July 1, ~~2019~~ 2023 .

Statement of Problem and Substantiation for Public Input

Update effective date for new document.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
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Street Address:
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Submittal Date: Sun Aug 23 16:16:25 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-19-NFPA 1900-2021
Statement: This change is being made in order to update the effective date for new document.

Public Input No. 106-NFPA 1900-2020 [Section No. 57.1.3.2]

57.1.3.2

Chapters 57 through 63 shall not apply to the following:

(1) Vehicles that are used for transport of more than two stretcher-bound patients at the same time

(2) Mass casualty vehicles

(3) Military field ambulances

(4) Vehicles intended for use as fire apparatus as specified in ~~NFPA 1901 or NFPA 1906~~ chapters 4 through 56

(5) Wheeled chair transport vehicles

(6) Refurbished vehicles without a remount

(7) Repairs

Statement of Problem and Substantiation for Public Input

Update references due to document consolidation.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Sun Aug 23 16:17:51 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-20-NFPA 1900-2021
Statement: This change is being made in order to update cross references due to document consolidation.

Public Input No. 446-NFPA 1900-2020 [Section No. 57.1.6.1]

57.1.6.1

In ~~this standard~~ chapters 57 through 63 , values for measurement in U.S. customary units shall be followed by equivalents in SI units.

Statement of Problem and Substantiation for Public Input

This statement is only true for part of the standard. Chapters 4-6 are in metric(US) units.

Submitter Information Verification

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Submittal Date: Fri Oct 02 13:01:26 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-21-NFPA 1900-2021
Statement: This change is being made as this is only true for part of the standard. Chapters 4-6 are in metric(US) units.

Public Input No. 1036-NFPA 1900-2020 [Section No. 57.7 [Excluding any Sub-Sections]]

The following type tests ~~shall be required to be~~ , when required by this standard, shall be witnessed or performed by an independent third-party organization, that organization shall meet the requirements of this section:

(1) AMD 001, *Static Load Test for Ambulance Body Structure*

(2) AMD 006, *Patient Compartment Sound Level Test*

(3) AMD 008, *Handrail Static Load Test*

(4) AMD 011, *Equipment Temperature Test*

(5) AMD 012, *Interior Climate Control Test*

(6) AMD 016, *Patient Compartment Lighting Level Test*

(7) AMD 018, *Rear Stepping Surface Load Test*

(8) AMD 024, *Perimeter Illumination Test*

(9) SAE J3026, *Ambulance Patient Compartment Seating Integrity and Occupant Restraint*

(10) SAE J3027, *Ambulance Litter Integrity, Retention, and Patient Restraint*

(11)

(12) SAE J3043, ~~*Ambulance Equipment Mounts*~~

(13) ~~SAE J3057, *Ambulance Modular Body Evaluation-Quasi-Static Loading For Type I and Type III Modular Ambulance Bodies*~~

(14) ~~SAE J3058, *Ambulance Interior Storage Compartment Integrity*~~

(15) ~~SAE J3102, *Ambulance Patient Compartment Structural Integrity Test to Support SAE J3027 Compliant Litter Systems*~~

(16)

Statement of Problem and Substantiation for Public Input

The edits to the opening statement are simply meant to clarify the statement.
The reasoning for the deletion of SAE J3043 and SAE J3102:
1) The SAE standards committee was very intentional with their inclusion of static testing options in these two standards. The objective was to promote innovation by enabling manufacturers to self test new products and certify them to the new standard. Inclusion of these standards in this list circumvents the intent of the SAE standards committee and discourages innovation by adding significant unnecessary cost.
2) FMVSS, which covers millions of vehicles, provides a clear example that third party verification is not always necessary and that self certification can and does work.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
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Submittal Date: Fri Nov 13 12:00:20 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: See committee action by the creation of FR-26.

Public Input No. 107-NFPA 1900-2020 [Section No. 57.7 [Excluding any Sub-Sections]]

The following type tests shall be required to be witnessed or performed by an independent third-party organization, that organization shall meet the requirements of this section:

(1) ~~AMD 001, *Static Load Test for Ambulance Body Structure*~~ *SAE J3057, Ambulance Modular Body Evaluation-Quasi-Static Loading for Type I and Type III Modular Ambulance Bodies*

(2) AMD 006, *Patient Compartment Sound Level Test*

(3) AMD 008, *Handrail Static Load Test*

(4) AMD 011, *Equipment Temperature Test*

(5) AMD 012, *Interior Climate Control Test*

(6) AMD 016, *Patient Compartment Lighting Level Test*

(7) AMD 018, *Rear Stepping Surface Load Test*

(8) AMD 024, *Perimeter Illumination Test*

(9) SAE J3026, *Ambulance Patient Compartment Seating Integrity and Occupant Restraint*

(10) SAE J3027, *Ambulance Litter Integrity, Retention, and Patient Restraint*

(11) SAE J3043, *Ambulance Equipment Mounts*

(12) SAE J3057, *Ambulance Modular Body Evaluation-Quasi-Static Loading For Type I and Type III Modular Ambulance Bodies*

(13) SAE J3058, *Ambulance Interior Storage Compartment Integrity*

(14) SAE J3102, *Ambulance Patient Compartment Structural Integrity Test to Support SAE J3027 Compliant Litter Systems*

Statement of Problem and Substantiation for Public Input

AMD 001 has been withdrawn and replaced by SAE J3057.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
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Submittal Date: Sun Aug 23 16:19:40 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: AMD 001, 2014 edition can still be used and referenced so the committee has chosen to

keep it referenced. The SAE document is already in the list and thus there is no need to add it again.

Public Input No. 1037-NFPA 1900-2020 [Section No. 57.7.1]

57.7.1

~~Testing~~ AMD testing listed in section 4.6 shall be witnessed or performed by an organization that is accredited for inspection of ambulances in accordance with ISO/IEC 17020, *General Criteria for the Operation of Various Types of Bodies Performing Inspection,* or accredited for testing ambulances to this standard in accordance with ISO/IEC 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*.

Statement of Problem and Substantiation for Public Input

The list of tests, in section 57.7, requiring third-party verification includes multiple SAE tests. There is no lab in the country that can complete all the listed SAE tests and is ISO accredited. So as the standard is currently written, there is no way to comply. The objective of requiring ISO accreditation is to ensure that the lab completing the testing is legitimate and competent. Due to the nature and complexity of the SAE tests the caliber of lab that is required to complete these tests ensures a level of competence that renders the need to specify a specific accreditation standard unnecessary. The AMD tests on the other hand are much simpler to complete and thus specifying a standard for the lab completing them makes sense. The suggested edits correct the first problem while ensuring the original objective is still met.

Submitter Information Verification

Submitter Full Name: Andrew Conway
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Submittal Date: Fri Nov 13 12:23:41 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-26-NFPA 1900-2021

Statement: The edits to the opening statement are simply meant to clarify the statement. The reasoning for the deletion of SAE J3043 and SAE J3102:

1) The SAE standards committee was very intentional with their inclusion of static testing options in these two standards. The objective was to promote innovation by enabling manufacturers to self-test new products and certify them to the new standard. Inclusion of these standards in this list circumvents the intent of the SAE standards committee and discourages innovation.

2) FMVSS, which covers millions of vehicles, provides a clear example that third-party verification is not always necessary and that self-certification can and does work.

The list of tests, in section 57.7, requiring third-party verification includes multiple SAE tests. There is no lab in the country that can complete all the listed SAE tests and is ISO accredited. So as the standard is currently written, there is no way to comply. The

objective of requiring ISO accreditation is to ensure that the lab completing the testing is legitimate and competent. Due to the nature and complexity of the SAE tests the caliber of lab that is required to complete these tests ensures a level of competence that renders the need to specify a specific accreditation standard unnecessary. The AMD tests on the other hand are much simpler to complete and thus specifying a standard for the lab completing them makes sense. The suggested edits correct the first problem while ensuring the original objective is still met.

The text in 57.7.5 and 57.7.6 is being deleted as the labs conducting the testing are required to be accredited. Thus, it is unnecessary and potentially problematic, to dictate how they operate.

Public Input No. 1041-NFPA 1900-2020 [Sections 57.7.5, 57.7.6]

Sections 57.7.5, 57.7.6

~~**57.7.5** –~~

~~Forms or data sheets shall be provided and used during the testing. [**1901:** 4.7.6]~~

~~**57.7.6** –~~

~~Programs shall be in place for training, proficiency testing, and performance verification of any staff involved with certification. [**1901:** 4.7.7]~~

Statement of Problem and Substantiation for Public Input

The labs conducting the testing are required to be accredited. Thus it is unnecessary and potentially problematic, to dictate how they operate.

Submitter Information Verification

Submitter Full Name: Andrew Conway
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Submittal Date: Fri Nov 13 12:57:38 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-26-NFPA 1900-2021

Statement: The edits to the opening statement are simply meant to clarify the statement. The reasoning for the deletion of SAE J3043 and SAE J3102:

1) The SAE standards committee was very intentional with their inclusion of static testing options in these two standards. The objective was to promote innovation by enabling manufacturers to self-test new products and certify them to the new standard. Inclusion of these standards in this list circumvents the intent of the SAE standards committee and discourages innovation.

2) FMVSS, which covers millions of vehicles, provides a clear example that third-party verification is not always necessary and that self-certification can and does work.

The list of tests, in section 57.7, requiring third-party verification includes multiple SAE tests. There is no lab in the country that can complete all the listed SAE tests and is ISO accredited. So as the standard is currently written, there is no way to comply. The objective of requiring ISO accreditation is to ensure that the lab completing the testing is legitimate and competent. Due to the nature and complexity of the SAE tests the caliber of lab that is required to complete these tests ensures a level of competence that renders the need to specify a specific accreditation standard unnecessary. The AMD tests on the other hand are much simpler to complete and thus specifying a standard for the lab

completing them makes sense. The suggested edits correct the first problem while ensuring the original objective is still met.

The text in 57.7.5 and 57.7.6 is being deleted as the labs conducting the testing are required to be accredited. Thus, it is unnecessary and potentially problematic, to dictate how they operate.

Public Input No. 1042-NFPA 1900-2020 [Sections 57.8.2, 57.8.3]

Sections 57.8.2, 57.8.3

57.8.2

Where the standard requires a component to be tested, the ambulance manufacturer shall either test individual components themselves or rely on the component manufacturer's testing and certification on any individual component used in the ambulance.

57.8.3

~~A representative of the manufacturer shall witness all tests and shall~~ The ambulance manufacture shall refuse to certify any test results for a system unless all components of that system requiring testing pass the testing required by this standard.

Statement of Problem and Substantiation for Public Input

In the original language in section 57.8.3 the term, "manufacturer" is ambiguous. Clearly, the ambulance manufacturer cannot witness the testing completed by the component manufacturer or visa versa. Nor is it either manufacturers power to control or dictate to the other how, when, or what is tested; each is responsible for testing that they themselves complete. The suggested language simply attempts to clarify the objective that the complete system is what is certified. That being said, this objective is already implicit in the relevant tests thus rendering this entire section somewhat redundant.

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Submittal Date: Fri Nov 13 13:17:04 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-22-NFPA 1900-2021

Statement: In the original language in section 57.8.3 the term, "manufacturer" is ambiguous. Clearly, the ambulance manufacturer cannot witness the testing completed by the component manufacturer or visa versa. Nor is it either manufacturers power to control or dictate to the other how, when, or what is tested; each is responsible for testing that they themselves complete. The suggested language simply attempts to clarify the objective that the complete system is what is certified. That being said, this objective is already implicit in the relevant tests thus rendering this entire section somewhat redundant.

Public Input No. 788-NFPA 1900-2020 [Section No. 57.10.2 [Excluding any Sub-Sections]]

All required signs, instruction plates, and labels shall be permanent in nature, securely attached, and meet the requirements of 57.10.2.1 and ~~ANSI/~~ UL 969, ~~*Standard for*~~ *Marking and Labeling Systems*.

Statement of Problem and Substantiation for Public Input

Update document title.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Zip:
Submittal Date: Tue Nov 03 15:54:16 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-23-NFPA 1900-2021
Statement: This change was made in order to update document title.

Public Input No. 1044-NFPA 1900-2020 [Section No. 57.15.2]

57.15.2

Certification from OEM and individual equipment manufacturers are acceptable, provided ~~they are~~ the equipment has not been altered in a way that would jeprodize the original certification .

Statement of Problem and Substantiation for Public Input

The original language inferred that the certification was the item being altered. The suggested language change clarifies the intent that the equipment is the subject that the word altered is being directed at.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
City:
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Submittal Date: Fri Nov 13 13:55:52 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-24-NFPA 1900-2021
Statement: The original language inferred that the certification was the item being altered. The suggested language change clarifies the intent that the equipment is the subject that the word altered is being directed at.

Public Input No. 1046-NFPA 1900-2020 [Section No. 57.17.1]

57.17.1 Ambulance Documentation.

The contractor shall deliver with the ambulance at least one copy of the following documents:

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

(2) Owner's name and address

(3) Ambulance manufacturer, model, and serial number

(4) Chassis make, model, and vehicle identification number (VIN)

(5) GAWR of front and rear axles and GVWR

(6) Front tire size and total rated capacity in pounds (kilograms)

(7) Rear tire size and total rated capacity in pounds (kilograms)

(8) Type of fuel and fuel tank capacity

(9) Electrical system voltage and alternator output in amps

(10) Paint manufacturer and paint number(s)

(11) Company name and signature of responsible company representative

(12) Documents from a certified scale showing curb weight on the front axle and rear axle(s) (without personnel and equipment)

(13) Certification of compliance of the optical warning system *(see 60.9.16)*

(14) Siren manufacturer's certification of the siren *(see 60.10.1.1)*

(15) Written load analysis and results of the electrical system performance tests

(16) ~~Certification of slip resistance of all exterior stepping, standing, and walking surfaces~~

(17)

Statement of Problem and Substantiation for Public Input

The test apparatus listed in section 59.10.1 (English XL tester and the Brungraber Mark II) have both been proven to provide unreliable and inconsistent results. As such their use has been largely abandoned. The subject of slip resistance testing is currently under ongoing research and hopefully in the not to distant future a better system for testing will be developed. However, in the mean time maintaining a requirement for a test apparatus/process that has been proven to result in inconstant and unreliable results is counter productive and possibly deceptive as it communicates something it cannot deliver and adds cost without adding any value.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
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Submittal Date: Fri Nov 13 14:05:25 EST 2020

Committee: AMB-AAA

Committee Statement

Resolution: FR-25-NFPA 1900-2021

Statement: The test apparatus listed in section 59.10.1 (English XL tester and the Brungraber Mark II) have both been proven to provide unreliable and inconsistent results. As such their use has been largely abandoned. The subject of slip resistance testing is currently under ongoing research and hopefully in the not too distant future a better system for testing will be developed. However, in the meantime maintaining a requirement for a test apparatus/process that has been proven to result in inconstant and unreliable results is counterproductive and possibly deceptive as it communicates something it cannot deliver and adds cost without adding any value. The only change in this revision is that the last statement is being deleted. Terra is showing a bunch of new text, but that is actually existing text.

Public Input No. 963-NFPA 1900-2020 [Section No. 58.2.2]

58.2.2* Lateral Weight Distribution.

The vehicle, when loaded to its GVWR, shall have a side-to-side tire load variation of no more than 5 percent of the total tire load for that axle when calculated in accordance with AMD 013 and using the calculated weight of 171 lb (78 kg) per occupant .

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that the method of calculating the lateral weight distribution needs to be specified. AMD 013 includes an industry accepted method of calculation.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1038-NFPA 1900-2020 [Section No. 2.3.14]	
Public Input No. 1038-NFPA 1900-2020 [Section No. 2.3.14]	

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
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Submittal Date: Wed Nov 11 13:26:53 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-59-NFPA 1900-2021

Statement: It has been concluded that the method of calculating the lateral weight distribution needs to be specified and where AMD 013 includes an industry accepted method of calculation, it is now being referenced and included as part of the requirement.

Public Input No. 977-NFPA 1900-2020 [Section No. 58.2.3]

~~58.2.3~~ –

~~The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer under full load and all other loading conditions.~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section duplicates what is already said in 58.2.1.

Submitter Information Verification

Submitter Full Name: Jerry Allen
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Street Address:
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Submittal Date: Wed Nov 11 16:12:32 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-60-NFPA 1900-2021
Statement: This is being deleted because a) for the full load scenario, this section duplicates what is already said in 58.2.1. and b) the ambulance manufacturer cannot control all of the other loading conditions that might be created by the end user.

Public Input No. 978-NFPA 1900-2020 [Section No. 58.2.4]

~~58.2.4~~ –

~~Vehicle and component ratings shall be the manufacturer's published ratings and shall not be modified without written authorization from the OEM.~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section is inappropriate because a) the FSAM is legally allowed to make limited modifications that would otherwise be inappropriately restricted by this section and b) federal standards already specify the restrictions that define the latitude and responsibilities of the FSAM when making such modifications.

Submitter Information Verification

Submitter Full Name: Jerry Allen
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Street Address:
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Submittal Date: Wed Nov 11 16:14:38 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-61-NFPA 1900-2021

Statement: This is being deleted as this section is inappropriate because a) the FSAM is legally allowed to make limited modifications that would otherwise be inappropriately restricted by this section and b) federal standards already specify the restrictions that define the latitude and responsibilities of the FSAM when making such modifications.

Public Input No. 108-NFPA 1900-2020 [Section No. 58.2.5]

58.2.5

Each ambulance's payload capacity (horizontal, lateral, and vertical center of gravity) shall be calculated.

58.2.5.1 – *

Horizontal and vertical payload capacity shall be determined by completing ~~a National Truck Equipment Association (NTEA) UltraMod spreadsheet (available~~ the NTEA Vehicle Center of Gravity and Axle Weight Calculator or equivalent.

A.58.2.5.1

The NETA Vehicle Center of Gravity and Axle Weight Calculator is available to NETA members at www.ntea.com~~).~~ . There are other similar tools available from other sources.

58.2.5.2

A copy of the ~~UltraMod spreadsheet and the lateral payload calculation~~ weight analysis shall be included with the ambulance documentation, along with the following calculations:

(1) Completed vehicle at curb weight

(2) 171 lb (78 kg) at the horizontal, lateral, and vertical center of each patient location and at the designated H-point of each seating position

(3) The maximum remaining cargo/equipment capacity located at the horizontal, lateral, and vertical dimension center of the patient compartment that does not result in weights that exceed the vehicle's weight rating capacities

Statement of Problem and Substantiation for Public Input

The UltraMod spreadsheet is no longer available. The proposed changes were suggested by Steve Spata at NTEA and the NFPA 1917 committee.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Sun Aug 23 16:23:24 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-76-NFPA 1900-2021
Statement: These changes are being made as the UltraMod spreadsheet is no longer available and should no longer be referenced or included as part of the requirements of this standard.

Public Input No. 997-NFPA 1900-2020 [Section No. 58.2.5 [Excluding any Sub-Sections]]

Each ambulance's payload capacity ~~(horizontal, lateral,~~ and ~~vertical~~ center of ~~gravity) shall be calculated.~~ gravity shall be determined by completing the National Truck and Equipment Association (NTEA) Vehicle and Center of Gravity and Axle Weight Calculator (available at www.ntea.com) or equivalent.

Statement of Problem and Substantiation for Public Input

The chassis task group recommends adding a reference to NTEA's Vehicle Center of Gravity and Axle Weight Calculator which supersedes the UltraMod spreadsheet.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
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Submittal Date: Wed Nov 11 19:03:28 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: This has been included in the actions the committee has taken as part of FR 76.

Public Input No. 979-NFPA 1900-2020 [Section No. 58.2.5.1]

~~58.2.5.1~~ –

~~Horizontal and vertical payload capacity shall be determined by completing a National Truck Equipment Association (NTEA) UltraMod spreadsheet (available at www.ntea.com).~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that what matters here is the calculations, not the form on which the calculations are performed. The required calculations are specified in 58.2.5. 58.2.5 is also updated to refer to NTEA's Vehicle Center of Gravity and Axle Weight Calculator which supersedes the UltraMod spreadsheet.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 16:16:46 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-76-NFPA 1900-2021
Statement: These changes are being made as the UltraMod spreadsheet is no longer available and should no longer be referenced or included as part of the requirements of this standard.

Public Input No. 1047-NFPA 1900-2020 [Section No. 58.2.5.2]

58.2.5.2

A copy of the

~~UltraMod spreadsheet and the lateral payload~~
center of gravity calculation shall be included with the ambulance documentation, along with

~~the following calculations:~~

- ~~Completed vehicle at curb weight~~
- ~~171 lb (78 kg) at the horizontal, lateral, and vertical center of each patient location and at the designated H-point of each seating position~~

~~The~~
a calculation showing the maximum remaining cargo/equipment capacity located at the horizontal, lateral, and vertical dimension center of the patient compartment that does not result in weights that exceed the vehicle's weight rating capacities . This calculation shall be completed using the measured completed vehicle curb weight and 171 lb (78 kg) at the horizontal, lateral, and vertical center of each patient location and at the Hpoint of each designated seating position.

Statement of Problem and Substantiation for Public Input

1) The opening statement dictates the sue of the Ultramod Spreadsheet with has been superseded. Additionally, NFPA allows the use of equivalent alternatives. Thus, generalizing the statement to, "center of gravity calculation" allows for both changes in the NTEA's tool title and equivalent alternatives.
2) the opening statement requires something it calls the, "lateral payload calculation". There is no such thing with regard to ambulances. Gravity only acts in one direction, down. If you have calculated the CG (required by the first item listed in the opening statement) in all three axis then you know where it is laterally with respect to the vehicles centerline but is still only acts in one direction. So, I am not sure what the objective was with this language.
3) Item 1 on the list of required calculations is not a calculation, it is a measurement.
4) Item 2 on the list of required calculations is not a calculation, is is a prescribed weight at a specific point in space.
5) Item 3 is a calculation. However, it does not specifically require the input of item #2.
I believe the original intent of this section was that the final payload be calculated using the prescribed occupant weight and the finished vehicle curb weight. The original language did not accurately communicate the objective. The suggested language is an attempt to clearly communicate the objective.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
City:
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Zip:
Submittal Date: Fri Nov 13 14:19:36 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-76-NFPA 1900-2021

Statement: These changes are being made as the UltraMod spreadsheet is no longer available and should no longer be referenced or included as part of the requirements of this standard.

Public Input No. 980-NFPA 1900-2020 [Section No. 58.2.5.2]

58.2.5.2

A copy of the ~~UltraMod spreadsheet and the lateral payload calculation~~ calculations shall be included with the ambulance documentation, along with the following calculations:

(1) Completed vehicle at curb weight

(2) 171 lb (78 kg) at the ~~horizontal, lateral, and~~ horizontal and vertical center of each patient location and at the designated H-point of each seating position

(3) The maximum remaining cargo/equipment capacity located at the ~~horizontal, lateral, and vertical dimension~~ center of the longitudinal and lateral centerlines of the patient compartment that does not result in weights that exceed the vehicle's weight rating capacities

Statement of Problem and Substantiation for Public Input

58.2.5.2: The chassis task group concluded that it is the results of the calculations that need to be included in the ambulance documentation, not a particular spreadsheet.
(2) Because lateral weight distribution is governed by 58.2.2, there is not a basis for duplicating the lateral calculations in this section.
(3) Although some chassis manufacturers specify a maximum allowed vertical center of gravity to which the FSAM must comply as a condition of FMVSS pass-thru compliance, compliance with the vehicle's gross and axle weight rating capacities is not dependent upon the vertical center of gravity.

Submitter Information Verification

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State:
Zip:
Submittal Date: Wed Nov 11 16:27:46 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-76-NFPA 1900-2021
Statement: These changes are being made as the UltraMod spreadsheet is no longer available and should no longer be referenced or included as part of the requirements of this standard.

Public Input No. 981-NFPA 1900-2020 [Section No. 58.3.2]

~~58.3.2~~ –

~~Indicators shall be provided to alert the driver to high engine temperature or low oil pressure conditions.~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section is no longer appropriate because a) the inclusion of these indicators by the chassis OEM is outside of the influence of the FSAM, and b) to the best of our knowledge, these indicators come standard on all ambulance chassis platforms.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:02:41 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-62-NFPA 1900-2021
Statement: This is being deleted as this section is no longer appropriate because a) the inclusion of these indicators by the chassis OEM is outside of the influence of the FSAM, and b) to the best of our knowledge, these indicators come standard on all ambulance chassis platforms.

Public Input No. 983-NFPA 1900-2020 [Section No. 58.3.3]

~~**58.3.3** –~~

~~An engine hour meter shall be provided.~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section is no longer appropriate because, to the best of our knowledge, hour meters come standard on all ambulance chassis platforms.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:03:36 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-63-NFPA 1900-2021
Statement: This is being deleted as this section is no longer appropriate because hour meters come standard on all ambulance chassis platforms.

Public Input No. 984-NFPA 1900-2020 [Section No. 58.5.3]

58.5.3

The vertrical centerline of the tailpipe outlet shall not terminate within 12 in. (300 mm) of the ~~vertical axis of the fuel fill opening,~~ medical gas storage ~~,~~ or patient entry doors ~~where~~ or the vertical centerline of the fuel fill opening where these features are located on the same side of the vehicle.

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that original language is ambiguous; we need to specify whether we are measuring from the edge or centerline of the pipe and the edge or center of the fuel fill opening.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:05:05 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-64-NFPA 1900-2021

Statement: These changes are being made as the original language is ambiguous and it needs to be clarified and the requirement needs to specify that what is being measured is from the edge or centerline of the pipe and the edge or center of the fuel fill opening.

Public Input No. 985-NFPA 1900-2020 [Section No. 58.6.2]

58.6.2*

Any time a secondary braking device such as transmission retarders or exhaust restriction devices are ~~used~~ provided , they shall have a switch to turn them off during adverse road conditions.

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that the requirement to have a cutout switch should be dependent not upon whether a secondary braking device is used but whether such a device is provided.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:08:13 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-65-NFPA 1900-2021
Statement: This change is being made as the requirement to have a cutout switch should be dependent not upon whether a secondary braking device is used but whether such a device is provided.

Public Input No. 172-NFPA 1900-2020 [Section No. 58.7.1]

58.7.1*

With the exception of the OEM's furnished and installed components, the ambulance shall provide not less than the following clearance~~, measured in accordance with SAE J689, *Curbstone Clearance, Approach, Departure, and Ramp Breakover Angle*~~ s :

(1) Approach angle of 10 degrees

(2) Ramp breakover of 10 degrees

(3) Departure angle of 10 degrees

Statement of Problem and Substantiation for Public Input

SAE J689 has been withdrawn with no replacement. The techniques for measuring all three are included in the definitions in chapter 3.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 03 12:17:34 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-66-NFPA 1900-2021
Statement: SAE J689 has been withdrawn with no replacement.

Public Input No. 986-NFPA 1900-2020 [Section No. 58.7.2]

58.7.2*

~~A traction control feature shall be provided~~ All ambulances shall have electronic traction control (ETC) uness it is not available from the chassis OEM .

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that traction control should be provided if it is available from the chassis OEM. It is beyond the means of the FSAM to provide traction control if it is not available from the chassis OEM.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:18:31 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-67-NFPA 1900-2021
Statement: This change is being made as the traction control should be provided if it is available from the chassis OEM. It is beyond the means of the FSAM to provide traction control if it is not available from the chassis OEM.

Public Input No. 987-NFPA 1900-2020 [Section No. 58.7.3]

~~58.7.3~~ –

~~Shock absorbers shall be furnished on the front and rear axles.~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section is no longer appropriate because, to the best of our knowledge, front and rear shock absorbers come standard on all ambulance chassis platforms. Moreover, if shock absorbers are not provided by the chassis OEM, it would not be practical for the FSAM to add them.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:22:30 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-68-NFPA 1900-2021
Statement: This change is being made as this section is no longer appropriate because front and rear shock absorbers come standard on all ambulance chassis platforms. Moreover, if shock absorbers are not provided by the chassis OEM, it would not be practical for the FSAM to add them.

Public Input No. 988-NFPA 1900-2020 [Section No. 58.8.1]

58.8.1

Hub caps or wheel covers shall be removable without loosening the lug nuts so that wheels can be observed for ~~daily~~ inspection.

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that it is inappropriate for an ambulance construction standard to specify operating parameters such as an inspection interval.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:23:41 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-69-NFPA 1900-2021
Statement: This change is being made as it is inappropriate for an ambulance construction standard to specify operating parameters such as an inspection interval.

Public Input No. 11-NFPA 1900-2020 [Section No. 58.9]

58.9* Vehicle Stability.

~~If the ambulance is~~ All ambulances shall be equipped with a stability control system~~, the~~ . The system shall have a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls.

Additional Proposed Changes

File Name	Description	Approved
1917_PI_No._5_D._Fischler.pdf	1917_PI No. 5_D. Fischler	

Statement of Problem and Substantiation for Public Input

While past editions made vehicle stability systems optional, technology has evolved that the installation of this system can now be incorporated into the vehicle. This system has become standard in most vehicles. Our own explanation in Appendix 5.9 states " This system greatly enhances the safety of the vehicle". A safer vehicle means enhanced safety for the providers, the patient and the public. Our mission is to provide a safer vehicle. Therefore, this input needs to be accepted to provide this increased safety.

Submitter Information Verification

Submitter Full Name: David Fischler
Organization: Suffolk County Fire Rescue
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 28 08:10:27 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-78-NFPA 1900-2021

Statement: This change is being made since the ESC should be provided if it is available from the chassis OEM. It is beyond the means of the FSAM to provide ESC if it is not available from the chassis OEM. It is inappropriate to specify ESC system inputs inasmuch as those are beyond the control of the FSAM. Also, this material is no longer needed in that the stability control system will no longer be optional since it has been included as part of the requirement.

Public Input No. 989-NFPA 1900-2020 [Section No. 58.9]

58.9* Vehicle Stability.

~~If the ambulance is equipped with a stability control system, the system shall have a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls~~ When available from the chassis OEM, electronic stability control (ESC) shall be furnished .

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that ESC should be provided if it is available from the chassis OEM. It is beyond the means of the FSAM to provide ESC if it is not available from the chassis OEM. It is in appropriate to specify ESC system inputs inasmuch as those are beyond the control of the FSAM.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:24:57 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-78-NFPA 1900-2021

Statement: This change is being made since the ESC should be provided if it is available from the chassis OEM. It is beyond the means of the FSAM to provide ESC if it is not available from the chassis OEM. It is inappropriate to specify ESC system inputs inasmuch as those are beyond the control of the FSAM. Also, this material is no longer needed in that the stability control system will no longer be optional since it has been included as part of the requirement.

Public Input No. 991-NFPA 1900-2020 [New Section after 58.10]

TITLE OF NEW CONTENT

58.10.1 The rear bumper shall extend to within 6 in. (152 mm) of each side of the ambulance.

Statement of Problem and Substantiation for Public Input

This section is added to include the text removed in the revision of 58.10.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 990-NFPA 1900-2020 [Section No. 58.10 [Excluding any Sub-Sections]]	The proposed new section 58.10.1 includes text removed from 58.10.
Public Input No. 990-NFPA 1900-2020 [Section No. 58.10 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:35:42 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-75-NFPA 1900-2021

Statement: These changes are being made in order to clarify the requirements are focused on the rear bumper and not the front bumper. Also, it has been concluded that the requirements of 58.10.1 through 58.10.8 should not be imposed on bumpers furnished by the chassis OEM inasmuch as the FSAM has no control over the OEM bumper design. There is needed clarification concerning which door openings require steps. The committee can think of no door openings in the ambulance that require steps in the door openings other than the side passage doors in the patient compartment.

Public Input No. 1040-NFPA 1900-2020 [Section No. 58.10]

58.10* ~~Bumpers~~ Rear Bumper .

The rear of the ambulance shall be furnished with a bumper that extends to within 6 in. (152 mm) of each side of the ambulance.

58.10.1

The rear bumper shall be secured to the vehicle's chassis frame.

58.10.2

The rear bumper of Type I and Type III vehicles shall be provided with an integrated step.

58.10.3

The step shall be designed to prevent the accumulation of mud, ice, or snow and shall be made of anti-skid open grating material.

58.10.4

The step shall not be located or exposed to the interior of the ambulance when the door(s) is closed.

58.10.5

The step shall be at least the width of the door opening for which it is provided.

58.10.6

The stepping surface shall have a minimum depth of 5 in. (127 mm) and a maximum depth of 10 in. (254 mm).

58.10.7

If the step protrudes more than 7 in. (178 mm) from the rear of the vehicle, a fold-up step shall be furnished.

58.10.8* Stepping Surface.

58.10.8.1

The rear stepping surface shall withstand a load of 500 lb (227 kg) with no more than 1.0 in. (25.4 mm) of deflection or 0.25 in. (6.4 mm) of permanent deformation.

58.10.8.2

Compliance of the rear step surface shall be validated by testing a substantially similar ambulance or bumper and step structure in accordance with Section AMD 018, *Rear Stepping Surface Load Test*.

58.10.8.3

The distance from the road surface to the top surface of the first step at the rear bumper shall not exceed 22 in. (559 mm) with the vehicle loaded to its GVWR and/or the suspension in the kneeling condition.

58.10.8.4

Steps shall be provided in the door openings.

58.10.8.5

Step wells shall be illuminated.

58.10.8.6

Step surfaces shall be constructed with anti-slip material.

58.10.8.7*

All steps shall have a minimum area of 35 in.^{2} (22,580 mm^2) and shall be of such a shape that a 5 in. (125 mm) diameter disk does not overlap any side when placed on the step.

Statement of Problem and Substantiation for Public Input

Clarify that this section applies to the rear bumper. (There is nothing in this section related to front bumpers.)

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 12:55:01 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-75-NFPA 1900-2021

Statement: These changes are being made in order to clarify the requirements are focused on the rear bumper and not the front bumper. Also, it has been concluded that the requirements of 58.10.1 through 58.10.8 should not be imposed on bumpers furnished by the chassis OEM inasmuch as the FSAM has no control over the OEM bumper design. There is needed clarification concerning which door openings require steps. The committee can think of no door openings in the ambulance that require steps in the door openings other than the side passage doors in the patient compartment.

Public Input No. 990-NFPA 1900-2020 [Section No. 58.10 [Excluding any Sub-Sections]]

~~The rear~~ When a rear bumper is not furnished by the chassis OEM, the rear of the ambulance shall be furnished with a bumper that ~~extends to within 6 in. (152 mm) of each side of the ambulance.~~ meets the requirements of 58.10.1 through 58.10.8.

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that the requirements of 58.10.1 through 58.10.8 should not be imposed on bumpers furnished by the chassis OEM inasmuch as the FSAM has no control over the OEM bumper design.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 991-NFPA 1900-2020 [New Section after 58.10]	The proposed new section 58.10.1 includes text removed from 58.10.
Public Input No. 991-NFPA 1900-2020 [New Section after 58.10]	

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:30:20 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: This has been included with FR 75.

Public Input No. 1043-NFPA 1900-2020 [New Section after 58.10.8.4]

TITLE OF NEW CONTENT

58.11 Step Surfaces

Statement of Problem and Substantiation for Public Input

Add a new section (Step Surfaces) following 58.10.8.3 to include what is currently in 58.10.8.4 through 58.10.8.7.
The items in in 58.10.8.4 through 58.10.8.7 are currently in the [Rear] Bumper section, but they apply to step surfaces other than the [rear] bumper.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 13:24:02 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-75-NFPA 1900-2021

Statement: These changes are being made in order to clarify the requirements are focused on the rear bumper and not the front bumper. Also, it has been concluded that the requirements of 58.10.1 through 58.10.8 should not be imposed on bumpers furnished by the chassis OEM inasmuch as the FSAM has no control over the OEM bumper design. There is needed clarification concerning which door openings require steps. The committee can think of no door openings in the ambulance that require steps in the door openings other than the side passage doors in the patient compartment.

Public Input No. 992-NFPA 1900-2020 [Section No. 58.10.8.4]

58.10.8.4

Steps shall be provided in the ~~door openings~~ side passage door opening(s) in the patient compartment .

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section needed clarification concerning which door openings require steps. We can think of no door openings in the ambulance that require steps in the door openings other than the side passage doors in the patient compartment.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:44:19 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-75-NFPA 1900-2021

Statement: These changes are being made in order to clarify the requirements are focused on the rear bumper and not the front bumper. Also, it has been concluded that the requirements of 58.10.1 through 58.10.8 should not be imposed on bumpers furnished by the chassis OEM inasmuch as the FSAM has no control over the OEM bumper design. There is needed clarification concerning which door openings require steps. The committee can think of no door openings in the ambulance that require steps in the door openings other than the side passage doors in the patient compartment.

Public Input No. 993-NFPA 1900-2020 [Section No. 58.11.1]

58.11.1

If the cab and the patient compartment are separate enclosures, ~~the cab shall be provided with a sealing device~~ a flexible, weather-tight, bellows-type seal fabricated from durable material that meets the operating temperature requirements and resists deterioration shall be provided between the cab and modular body .

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that clarification should be added to reduce ambiguity in the term "sealing device."

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:47:30 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-71-NFPA 1900-2021
Statement: This change is being made in order to provide clarification in order to reduce ambiguity in the term "sealing device."

Public Input No. 994-NFPA 1900-2020 [Section No. 58.12.1]

~~58.12.1~~ –

~~Front cab seating for the driver and at least one passenger shall be provided.~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section is no longer appropriate because, to the best of our knowledge, front cab seating is provided for the driver and at least one passenger on all ambulance chassis platforms. Moreover, if such seating is not provided by the chassis OEM, it would not be practical for the FSAM to add it.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:50:27 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-72-NFPA 1900-2021

Statement: This change is being made as this section is no longer appropriate because the front cab seating is provided for the driver and at least one passenger on all ambulance chassis platforms. Moreover, if such seating is not provided by the chassis OEM, it would not be practical for the FSAM to add it.

Public Input No. 999-NFPA 1900-2020 [New Section after 58.13]

TITLE OF NEW CONTENT

58.13.1 A backup camera shall be installed on or near the back of the ambulance. When the vehicle is shifted into reverse, the camera shall display a rearview image on a monitor in the cab that is within clear view of the driver.

Statement of Problem and Substantiation for Public Input

Although not discussed in the chassis task group meeting, a follow-up suggestion was made to require backup cameras on all ambulances.
FMVSS 111 requires a rearview image on vehicles under 10k GVWR. Given the generally poor visibility provided by ambulance inside rearview mirrors, it is clear that backing without either a camera or spotter can be dangerous. The question for the technical committee is whether a backup camera should be required on all ambulances regardless of the user's backing protocol.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 998-NFPA 1900-2020 [Section No. 58.13]	Change the title of 58.13 so it can include mirrors and cameras
Public Input No. 1001-NFPA 1900-2020 [Section No. A.58.13]	A.58.13 can likely be deleted if backup cameras are required in 58.13.1.
Public Input No. 998-NFPA 1900-2020 [Section No. 58.13]	
Public Input No. 1001-NFPA 1900-2020 [Section No. A.58.13]	

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 19:10:47 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-79-NFPA 1900-2021

Statement: These changes are being made in order to require backup cameras on all ambulances. FMVSS 111 requires a rearview image on vehicles under 10k GVWR. Given the generally poor visibility provided by ambulance inside rearview mirrors, it is clear that backing without either a camera or spotter can be dangerous. The concept of exterior cameras is also being included in the annex to give guidance to the AHJ or purchaser should they choose to include exterior cameras as part of the vehicle's specification.

Public Input No. 998-NFPA 1900-2020 [Section No. 58.13]

58.13* ~~Mirrors~~ Rear Visibility .

58.13.1

Dual side view mirrors having a combination flat and convex mirror system shall be furnished.

58.13.2

All primary side view mirrors used by the driver shall be adjustable from the driver's position.

58.13.3

Hardware and mirror heads shall have a corrosion-resistant exterior finish.

Statement of Problem and Substantiation for Public Input

Although not discussed in the chassis task group meeting, a follow-up suggestion was made to require backup cameras on all ambulances.
FMVSS 111 requires a rearview image on vehicles under 10k GVWR. Given the generally poor visibility provided by ambulance inside rearview mirrors, it is clear that backing without either a camera or spotter can be dangerous. The question for the technical committee is whether a backup camera should be required on all ambulances regardless of the user's backing protocol.
This input suggests changing the title of 58.13 from Mirrors to Rear Visibility to allow cameras to be included.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 999-NFPA 1900-2020 [New Section after 58.13]	The proposed title change is to allow inclusion of a backup camera.
Public Input No. 999-NFPA 1900-2020 [New Section after 58.13]	

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 19:08:35 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-79-NFPA 1900-2021
Statement: These changes are being made in order to require backup cameras on all ambulances. FMVSS 111 requires a rearview image on vehicles under 10k GVWR. Given the generally poor visibility provided by ambulance inside rearview mirrors, it is clear that

backing without either a camera or spotter can be dangerous. The concept of exterior cameras is also being included in the annex to give guidance to the AHJ or purchaser should they choose to include exterior cameras as part of the vehicle's specification.

Public Input No. 995-NFPA 1900-2020 [Section No. 58.13.1]

~~58.13.1~~ –

~~Dual side view mirrors having a combination flat and convex mirror system shall be furnished.~~

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that this section is no longer appropriate because, to the best of our knowledge, all ambulance chassis platforms include mirrors with flat and convex portions. Moreover, rear visibility requirements are already governed by FMVSS 111.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:51:30 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-79-NFPA 1900-2021

Statement: These changes are being made in order to require backup cameras on all ambulances. FMVSS 111 requires a rearview image on vehicles under 10k GVWR. Given the generally poor visibility provided by ambulance inside rearview mirrors, it is clear that backing without either a camera or spotter can be dangerous. The concept of exterior cameras is also being included in the annex to give guidance to the AHJ or purchaser should they choose to include exterior cameras as part of the vehicle's specification.

Public Input No. 12-NFPA 1900-2020 [New Section after 58.14]

Exterior Cameras.

Cameras shall be installed in several areas outside the vehicle so as to provide a 360 degree view. A display screen shall be located in the cab and visible to the vehicle operator. Visual alarms shall be available on the screen to alert the driver to imminent impact to a foreign object or person. An audible or vibrating driver's seat shall be included to alert driver to imminent impact to a foreign object or person.

Additional Proposed Changes

File Name	Description	Approved
1917_PI_No._6_D._Fischler.pdf	1917_PI No. 6_D. Fischler	

Statement of Problem and Substantiation for Public Input

In many instances, the vehicle driver must move the ambulance by himself without the assistance of other personnel to guide the movement of the vehicle. Drivers have backed into stationery objects damaging the vehicle. Crew members and other individuals have been struck by ambulances backing up. Side cameras will provide a
warning to the driver about persons and objects that may be too close to the vehicle. Without these cameras and alarms, dependence is placed on the driver to view the mirrors which we know cannot be viewed all the time or the driver becomes dependent on only one mirror. This input will increase safety to the providers, the patient and the
public as well as reduce damage to the vehicle. The technology exists as is evident in almost all new vehicles being sold today.

Submitter Information Verification

Submitter Full Name: David Fischler
Organization: Suffolk County Fire Rescue
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 28 08:16:55 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-79-NFPA 1900-2021

Statement: These changes are being made in order to require backup cameras on all ambulances. FMVSS 111 requires a rearview image on vehicles under 10k GVWR. Given the generally poor visibility provided by ambulance inside rearview mirrors, it is clear that backing without either a camera or spotter can be dangerous. The concept of exterior cameras is also being included in the annex to give guidance to the AHJ or purchaser should they choose to include exterior cameras as part of the vehicle's specification.

Public Input No. 13-NFPA 1900-2020 [New Section after 58.14]

Collision Mitigation System.

A collision mitigation system shall be installed that detects objects or persons up to 650 feet away and in adjacent lanes. The system shall provide audible and visual driver alerts for potential rear-end

collisions applying the service brake up to 50 percent in the event of a pending collision. The system shall provide audible and visual alerts to the driver when the vehicle drifts out of its operating lane.

Additional Proposed Changes

File Name	Description	Approved
1917_PI_No._7_D._Fischler.pdf	1917_PI No. 7_D. Fischler	

Statement of Problem and Substantiation for Public Input

Vehicles have rear-ended cars in front of them or have collided with vehicles that are in adjacent lanes. These accidents are can be reduced by the installation of a collision mitigation system. Less accidents will translate to enhanced safety for the providers, the patient and the public. The technology exists as demonstrated in almost all
vehicles sold today.

Submitter Information Verification

Submitter Full Name: David Fischler
Organization: Suffolk County Fire Rescue
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 28 08:19:06 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: The committee recommends resolving this input (that is, not adding text to the standard or the annex) based upon the substantiation below: • While we are eager to promote use of the best safety technology, collision mitigation systems are far from mature, particularly with respect to use on ambulance chassis platforms. • (Advanced Driver Assistance Systems) ADAS, including active collision avoidance are not currently required by NHTSA and therefore have no standardized test procedures with which to evaluate them against the proposed performance requirements. • The system response specifications are determined completely by the chassis manufacturers for their own respective models and typically will not reflect ambulance manufacturing or operation. • These systems can be incompatible with commercial vehicle applications—especially ambulances. • Forward collision mitigation system operation is likely to be incompatible with ambulance operation on account of being highly sensitive to upfits which are part of ambulance

manufacturing and therefore must be deactivated in order to allow expected emergency vehicle operation. (Example: Siren speaker installation incompatibility with RADAR, LIDAR sensors in the front bumper in the case of bumper modification.) • Similarly, lane departure system response is incompatible with vehicle maneuvers—such as intentionally driving on the shoulder—that are unique to emergency vehicle operation. • Without knowing what the future capabilities will be, and without performance standards or metrics, it is not possible to prescribe required performance characteristics.

Public Input No. 996-NFPA 1900-2020 [Section No. 58.14]

58.14 Cab Integrity.

Cabs on ambulances with a GVWR greater than 26,000 lb (11,800 kg), when applicable, shall meet the requirements of SAE J2420, *COE Frontal Strength Evaluation — Dynamic Loading Heavy Trucks*, and SAE J2422, *Cab Roof Strength Evaluation — Quasi-Static Loading Heavy Trucks*.

Statement of Problem and Substantiation for Public Input

The chassis task group concluded that an applicability clause should be added to avoid requiring tests that are not applicable to the specific chassis type and GVWR.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 17:53:17 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-74-NFPA 1900-2021
Statement: This change is being made so that an applicability clause is being added to avoid requiring tests that are not applicable to the specific chassis type and GVWR.

Public Input No. 1062-NFPA 1900-2020 [Section No. 59.3.2]

59.3.2

~~Any Type II ambulance with a gross vehicle weight rating of 10,000 lb or less shall meet the performance requirements described in FMVSS 216a,~~ ~~*Roof crush resistance*~~ ~~.~~

Statement of Problem and Substantiation for Public Input

This section is unnecessary as it is simply repeating current federal law.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 15:08:27 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-30-NFPA 1900-2021
Statement: This change is being made as the section is unnecessary as it is simply repeating current federal law.

Public Input No. 1058-NFPA 1900-2020 [Section No. 59.3.3]

59.3.3

Any Type II ambulance with a modified roof and a gross vehicle weight rating of greater than 10,000 lb shall meet the performance requirements described in AMD 001, *Static Load Test for Ambulance Body Structure*.

Statement of Problem and Substantiation for Public Input

While technically the FMVSS 216a federal requirement is only for chassis less than 10k GVWR the same roof structure is used for all vans of the same model/line. Therefore, the only time that the structural integrity of a type II ambulance roof would be in question, and thus require testing, is if the roof structure has been modified in some significant way. If no modification has occurred there is no reason to require additional testing.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 14:53:31 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-31-NFPA 1900-2021

Statement: This change is being made while technically the FMVSS 216a federal requirement is only for chassis less than 10k GVWR the same roof structure is used for all vans of the same model/line. Therefore, the only time that the structural integrity of a type II ambulance roof would be in question, and thus require testing, is if the roof structure has been modified in some significant way. If no modification has occurred there is no reason to require additional testing. New annex text has been added to clarify when no additional testing would be needed.

Also, AMD 001 is still in use it is just not being updated from the 2014 edition.

Public Input No. 109-NFPA 1900-2020 [Section No. 59.3.3]

59.3.3

Any Type II ambulance with a gross vehicle weight rating of greater than 10,000 lb shall meet the performance requirements described in ~~AMD 001, *Static Load Test for Ambulance Body Structure*~~ SAE J3057, Ambulance Modular Body Evaluation-Quasi-Static Loading for Type I and Type III Modular Ambulance Bodies .

Statement of Problem and Substantiation for Public Input

AMD 001 was withdrawn and replaced by SAE J3057 according to AMD. Note that this section deals with Type II ambulances and the Standard title specifically calls out Type I and Type III. The committee will need to verify that this new SAE standard is applicable.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 17:26:46 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-31-NFPA 1900-2021

Statement: This change is being made while technically the FMVSS 216a federal requirement is only for chassis less than 10k GVWR the same roof structure is used for all vans of the same model/line. Therefore, the only time that the structural integrity of a type II ambulance roof would be in question, and thus require testing, is if the roof structure has been modified in some significant way. If no modification has occurred there is no reason to require additional testing. New annex text has been added to clarify when no additional testing would be needed.

Also, AMD 001 is still in use it is just not being updated from the 2014 edition.

Public Input No. 789-NFPA 1900-2020 [Section No. 59.4.2.2]

59.4.2.2

The patient compartment shall include a listed CO detector in accordance with ~~ANSI/~~ UL 2034, *Standard for ~~Safety,~~ Single and Multiple Station Carbon Monoxide Alarms*.

Statement of Problem and Substantiation for Public Input

Update document title.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 03 15:57:31 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-32-NFPA 1900-2021
Statement: This change is being made in order to update the document title.

Public Input No. 666-NFPA 1900-2020 [Section No. 59.6.6]

59.6.6

If so equipped, a window in the cab or body shall be of the sliding or hinged type, aligned, and connected with the modular body window opening.

Statement of Problem and Substantiation for Public Input

This text has been added as there are widows meeting this requirement that can be of the sliding type or the hinged type and the previous editions text did not include the hinged type.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 15:49:47 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-33-NFPA 1900-2021
Statement: This text has been added as there are widows meeting this requirement that can be of the sliding type or the hinged type and the previous editions text did not include the hinged type.

Public Input No. 667-NFPA 1900-2020 [Section No. 59.8.3]

59.8.3

Entry doors and door openings shall be designed to minimize inadvertent snagging of apparel.

Care should be given in the use of bolt-on equipment in the minimization of the snagging of apparel.

Statement of Problem and Substantiation for Public Input

This text is being added in order to provide the end user with further clarification of the requirement so as to ensure that apparel isn't snagging on bolts used in bolt-on equipment.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 15:55:35 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-34-NFPA 1900-2021
Statement: This text is being added in order to provide the end user with further clarification of the requirement so as to ensure that apparel isn't snagging on bolts used in bolt-on equipment.

Public Input No. 670-NFPA 1900-2020 [Section No. 59.8.4]

59.8.4

~~Door latches, hinges, and hardware furnished by OEMs and final-stage ambulance manufacturers (FSAMs) shall meet the performance requirements of 49 CFR 571, FMVSS 206.~~

Statement of Problem and Substantiation for Public Input

This text is being deleted as it is redundant and has to be met whether it is part of the requirements of this standard or not.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:01:08 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-35-NFPA 1900-2021
Statement: This text is being deleted as it is redundant and has to be met whether it is part of the requirements of this standard or not.

Public Input No. 671-NFPA 1900-2020 [Section No. 59.9.4]

59.9.4

The egress and cot loading doors shall have a readily identifiable secondary emergency release mechanism.

Statement of Problem and Substantiation for Public Input

This text is being added to ensure the secondary emergency release mechanism is something that is easily identifiable and easily located.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:03:25 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-36-NFPA 1900-2021
Statement: This text is being added to ensure the secondary emergency release mechanism is something that is easily identifiable and easily located.

Public Input No. 1063-NFPA 1900-2020 [Sections 59.10.1, 59.10.2]

Sections 59.10.1, 59.10.2

~~**59.10.1** –~~

~~All materials used for exterior surfaces designated as stepping, standing, and walking areas and all interior steps shall have a minimum slip resistance in any orientation of 0.68 when tested wet using the English XL tester in accordance with the manufacturer's instructions or 0.52 when tested wet using the Brungraber Mark II tester in accordance with the manufacturer's instructions.~~

~~**59.10.2** –~~

~~A standard Neolite ® test sensor shall be used with both the English XL tester and the Brungraber Mark II tester.~~

Statement of Problem and Substantiation for Public Input

The test apparatus listed (English XL tester and the Brungraber Mark II) have both been proven to provide unreliable and inconsistent results. As such their use has been largely abandoned. The subject of slip resistance testing is currently under ongoing research and hopefully, in the not to distant future, a better system for testing will be developed. However, in the mean time maintaining a requirement for a test apparatus/process that has been proven to provide inconstant and unreliable results is counter productive and possibly deceptive as it communicates something that may be inaccurate and adds cost without adding any value.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 15:12:42 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-37-NFPA 1900-2021

Statement: The test apparatus listed (English XL tester and the Brungraber Mark II) have both been proven to provide unreliable and inconsistent results. As such their use has been largely abandoned. The subject of slip resistance testing is currently under ongoing research and hopefully, in the not to distant future, a better system for testing will be developed. However, in the mean time maintaining a requirement for a test apparatus/process that has been proven to provide inconstant and unreliable results is counter productive and possibly deceptive as it communicates something that may be inaccurate and adds cost without adding any value.

Public Input No. 1073-NFPA 1900-2020 [Section No. 59.11.2]

59.11.2

All hinged doors wider than ~~14 in~~ 15 in . (~~356 mm~~ 381 mm) and excluding battery compartments shall have positive hold-open devices that permit one-hand closure.

Statement of Problem and Substantiation for Public Input

Double spring door checks do not fit in compartments less than 15" wide.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 17:00:20 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-38-NFPA 1900-2021
Statement: The changes are being made in order to reduce or eliminate any confusion for the end user as well as to eliminate redundancy.

Public Input No. 673-NFPA 1900-2020 [Section No. 59.11.2]

59.11.2

All hinged ~~doors wider than 14 in. (356 mm) and~~ doors excluding battery compartments shall have positive hold-open devices that permit one-hand closure.

Statement of Problem and Substantiation for Public Input

This text is being deleted in order to keep the requirement simple and straight forward.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:06:01 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-38-NFPA 1900-2021
Statement: The changes are being made in order to reduce or eliminate any confusion for the end user as well as to eliminate redundancy.

Public Input No. 676-NFPA 1900-2020 [Section No. 59.11.4]

59.11.4

~~All primary exterior compartment doors shall have latches with locks.~~

Statement of Problem and Substantiation for Public Input

This text is being deleted as it is redundant.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:13:50 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-38-NFPA 1900-2021
Statement: The changes are being made in order to reduce or eliminate any confusion for the end user as well as to eliminate redundancy.

Public Input No. 677-NFPA 1900-2020 [Section No. 59.11.6]

59.11.6

~~All surfaces shall be nonabsorbent.~~

The finish of the entire exterior storage, including interiors of storage cabinets, shall be as follows:

(1) Impervious to soap, water, body fluids, and disinfectants

(2) Mildew resistant

(3) Able to be cleaned and disinfected

Statement of Problem and Substantiation for Public Input

This change is being made for document consistency.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:15:48 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-38-NFPA 1900-2021

Statement: The changes are being made in order to reduce or eliminate any confusion for the end user as well as to eliminate redundancy.

Public Input No. 679-NFPA 1900-2020 [Section No. 59.12.2]

59.12.2

With the exception of cot retention hardware, the floor shall be free of obstructions in the ~~door~~ doorway (s)~~ access and~~ and work area.

Statement of Problem and Substantiation for Public Input

These changes are being made in order to reduce confusion.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:19:04 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-39-NFPA 1900-2021
Statement: These changes are being made in order to reduce confusion.

Public Input No. 1068-NFPA 1900-2020 [Section No. 59.13.2]

59.13.2

The floor ~~covering shall~~ covering shall *offer a minimum non-prorated waranty for 12 years,* cover the entire length and width of the compartment's exposed floor.

Statement of Problem and Substantiation for Public Input

Flooring industry enhancements are resulting in products with greater tensile strength, improved abrasion/scratch/tear resistance, easier/faster/more effective cleaning properties plus significant reductions in flooring weight. Weight reduced anywhere from 5 to nearly 24 pounds per vehicle. Flooring with minimum 12 year non prorated warranties

Submitter Information Verification

Submitter Full Name: Ralph Metcalf
Organization: ALTRO TRANSFLOR
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 15:45:29 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: The committee has taken this action as this document doesn't address the need for warranties and is potentially manufacturer and consumer restrictive.

Public Input No. 680-NFPA 1900-2020 [Section No. 59.15.3]

59.15.3

Where furnished, top-opening squad bench lids shall be fitted with an automatic hold-open device and a quick-release slam-type latching device ~~when closed~~ .

Statement of Problem and Substantiation for Public Input

This text is being deleted as it didn't make any sense.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:21:24 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-40-NFPA 1900-2021
Statement: This text is being deleted as it didn't make any sense.

Public Input No. 681-NFPA 1900-2020 [Section No. 59.15.4]

59.15.4

Storage compartment door handles, where provided, ~~shall~~ not protrude more than 1 in. (25 mm) if located 14 in. (356 mm) or higher above the floor and shall not protrude more than 2 in. (51 mm) if located lower than 14 in. (356 mm) ~~or higher~~ _ above the floor.

Statement of Problem and Substantiation for Public Input

These changes are being made in order to comply with the NFPA MOS and to reduce confusion and possible contradiction within the requirement.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:22:56 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-41-NFPA 1900-2021
Statement: These changes are being made in order to comply with the NFPA MOS and to reduce confusion and possible contradiction within the requirement.

Public Input No. 682-NFPA 1900-2020 [Section No. 59.15.7]

59.15.7

~~The securing mechanism of those interior storage compartments, if provided, shall be capable of being accessed under the same reach condition.~~

Statement of Problem and Substantiation for Public Input

This text is being deleted as it does not make sense and could be confusing to the end users.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:30:17 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-42-NFPA 1900-2021
Statement: This text is being deleted as it does not make sense and could be confusing to the end users.

Public Input No. 683-NFPA 1900-2020 [Section No. 59.16.2]

59.16.2*

The finish of the entire patient compartment ~~and exterior storage~~ , including interiors of storage cabinets, shall be as follows:

(1) Impervious to soap, water, body fluids, and disinfectants

(2) Mildew resistant

(3) Fire resistant in compliance with 49 CFR 571, FMVSS 302

(4) Able to be cleaned and disinfected

Statement of Problem and Substantiation for Public Input

This text is being deleted as it seems redundant and already stated within this requirement.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:31:44 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-43-NFPA 1900-2021
Statement: This text is being deleted as it is redundant and already stated within the document and for document consistency.

Public Input No. 684-NFPA 1900-2020 [Section No. 59.18]

59.18* Waste and Sharps Disposal.

A receptacle for general waste and an OSHA-compliant container for sharps disposal shall be provided in the patient compartment.

~~**59.18.1** –~~

~~Containers for contaminated sharps shall~~

and be within the reach of the EMSPs while remaining seated and restrained in the designated primary patient care seat.

Statement of Problem and Substantiation for Public Input

This text is being added to ensure that both types of containers are within reach of the EMSP while seated and restrained in the designated patient care seat and not just a container for sharps. The goal is to keep the EMSP seated and restrained as much as possible.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:38:04 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-44-NFPA 1900-2021

Statement: This text is being changed to ensure that both types of containers are within reach of the EMSP while seated and restrained in the designated patient care seat and not just a container for sharps. The goal is to keep the EMSP seated and restrained as much as possible.

Public Input No. 685-NFPA 1900-2020 [Section No. 59.18.1]

~~59.18.1~~ –

~~Containers for contaminated sharps shall be within reach of EMSPs while remaining seated and restrained in the designated primary patient care seat.~~

Statement of Problem and Substantiation for Public Input

This text is being deleted since it is now included in the previous section.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:40:50 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-44-NFPA 1900-2021

Statement: This text is being changed to ensure that both types of containers are within reach of the EMSP while seated and restrained in the designated patient care seat and not just a container for sharps. The goal is to keep the EMSP seated and restrained as much as possible.

Public Input No. 686-NFPA 1900-2020 [Section No. 59.19]

59.19 Fire Extinguishers.

One 5 lb ABC fire extinguisher shall be ~~mounted in the vehicle using a SAE~~ accessible within the patient compartment and be mounted using a quick-release bracket meeting the requirements of SAE J3043, *Ambulance Equipment Mounts*, ~~compliant quick-release bracket and be accessible within the patient compartment.~~

Statement of Problem and Substantiation for Public Input

These changes are being made to make the requirement ready easier and to clarify the requirement.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:42:29 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-45-NFPA 1900-2021
Statement: These changes are being made to make the requirement ready easier and to clarify the requirement.

Public Input No. 1074-NFPA 1900-2020 [Section No. 59.20.2]

59.20.2

The device shall not protrude more than 1.0 in. (25 mm) in the ~~closed~~ stowed position.

Statement of Problem and Substantiation for Public Input

This presumably applies to ceiling-mounted IV hangers. In that case, there is really not a "closed" position; the holder is either in use or stowed (i.e. folded up to or into the ceiling).

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 17:06:49 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-47-NFPA 1900-2021
Statement: This presumably applies to ceiling-mounted IV hangers. In that case, there is really not a "closed" position; the holder is either in use or stowed (i.e. folded up to or into the ceiling).

Public Input No. 687-NFPA 1900-2020 [Section No. 59.21.2]

~~59.21.2~~ –

~~All seating in the patient compartment shall conform to all applicable 49 CFR 571, FMVSS requirements.~~

Statement of Problem and Substantiation for Public Input

This text is being deleted as it is redundant is already has to be met whether it is part of the requirements or not.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:45:54 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-46-NFPA 1900-2021
Statement: This text is being deleted as it is redundant is already has to be met whether it is part of the requirements or not.

Public Input No. 689-NFPA 1900-2020 [Sections 59.21.3.2, 59.21.3.3]

Sections 59.21.3.2, 59.21.3.3

~~**59.21.3.2** –~~

~~If the occupant crash protection is a seat belt system, the seat belt shall comply with 59.21.3.3.1 and 59.21.3.3.1.2 .~~

~~**59.21.3.3** –~~

~~Ambulances above 19,500 lb (8845 kg) GVWR shall provide seat belts in accordance with 59.21.3.3.1 and 59.21.3.3.1.2 in the cab.~~

~~**59.21.3.3.1** –~~

~~The effective seat belt web length for a Type 1 lap belt for pelvic restraint shall be a minimum of 60 in. (1525 mm) with the seat adjusted all the way back and down when measured using the following procedure:~~

(1) ~~Locate an imaginary line where the plane of the center of the seat back surface intersects the plane of the center of the seat cushion surface (line 1 in Figure 59.21.3.3.1).~~

(2) ~~Locate point A on line 1 at the outside of the seat on the retractor side of the seat.~~

(3) ~~Locate point C on line 1 at the outside of the seat on the buckle side of the seat.~~

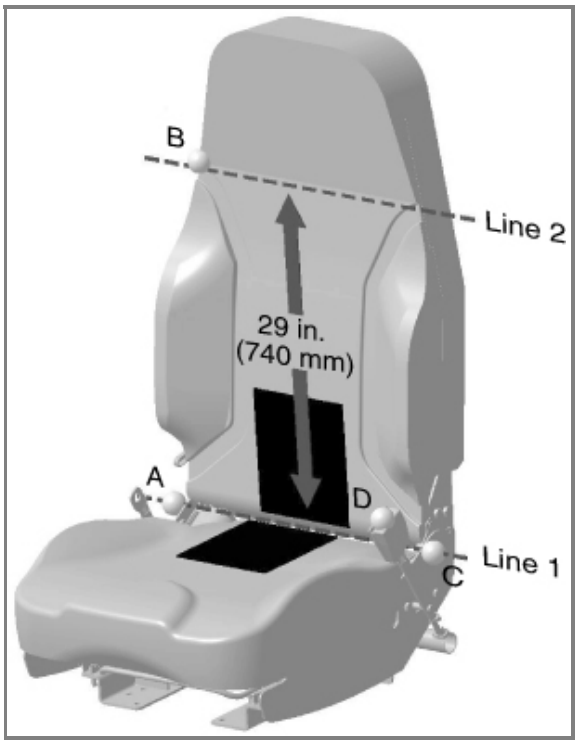
(4) ~~Locate point D at the tip of the buckle.~~

(5) ~~Pull the seat belt webbing entirely out of the retractor and measure along the webbing between point A and the seat belt latch plate (tongue). Record this length as AD.~~

(6) ~~Measure from point C to point D, and record this length as CD.~~

(7) ~~The effective seat belt web length equals AD + CD.~~

~~Figure 59.21.3.3.1 Dimension Lines for Measuring Seat Belt Effective Length.~~



59.21.3.3.1.1 –

Effective seat belt web length for a single retractor Type 2 seat belt shall be measured according to the following procedure:

(1) Locate an imaginary line where the plane of the center of the seat back surface intersects the plane of the center of the seat cushion surface (line 1 in Figure 59.21.3.3.1).

(2) Locate an imaginary line parallel with line 1 and lying on the center of the seat back surface 29 in. (740 mm) from line 1 (line 2 in Figure 59.21.3.3.1).

(3) Locate point A on line 1 at the outside of the seat on the retractor side of the seat.

(4) Locate point B on line 2 at the shoulder strap edge of the seat back.

(5) Locate point C on line 1 at the outside of the seat on the buckle side of the seat.

(6) Locate point D at the tip of the buckle.

(7) Pull the seat belt webbing entirely out of the retractor, and measure along the webbing between points A and B. Record this length as AB.

(8) Measure from point C to point D, and record this length as CD.

(9) The effective lap belt web length equals AB + 2CD.

59.21.3.3.1.2 –

Effective seat belt web length for a dual retractor Type 2 seat belt shall be measured according to the following procedure:

(1) Locate an imaginary line where the plane of the center of the seat back surface intersects the plane of the center of the seat cushion surface (*see line 1 in Figure 59.21.3.3.1*).

(2) Locate point A on line 1 at the outside of the seat on the retractor side of the seat.

(3) Locate point C on line 1 at the outside of the seat on the receiver side of the seat.

(4) Locate point D at the tip of the buckle.

(5) Pull the lap belt webbing entirely out of the lap belt retractor, and measure along the webbing between point A and the seat belt latch plate (tongue). Record this length as AD.

(6) Locate an imaginary line parallel with line 1 and lying on the center of the seat back surface 29 in. (740 mm) from line 1 (line 2 in Figure 59.21.3.3.1).

(7) Locate point B on line 2 at the shoulder strap edge of the seat back.

(8) Pull the shoulder belt webbing entirely out of the shoulder belt retractor, and measure along the webbing between point B and the seat belt latch plate (tongue). Record this length as BD.

(9) Measure from point C to point D, and record this length as CD.

(10) The effective lap belt web length equals AD + CD.

(11) The effective shoulder belt web length equals BD + CD.

59.21.3.3.2 –

A Type 2 seat belt shall have either a single retractor or dual retractors.

59.21.3.3.2.1 –

A single retractor Type 2 pelvic and upper torso restraint-style seat belt assembly shall have a minimum effective seat belt web length of 110 in. (2800 mm) with the seat adjusted all the way back and down and as measured in accordance with 59.21.3.3.1.1.

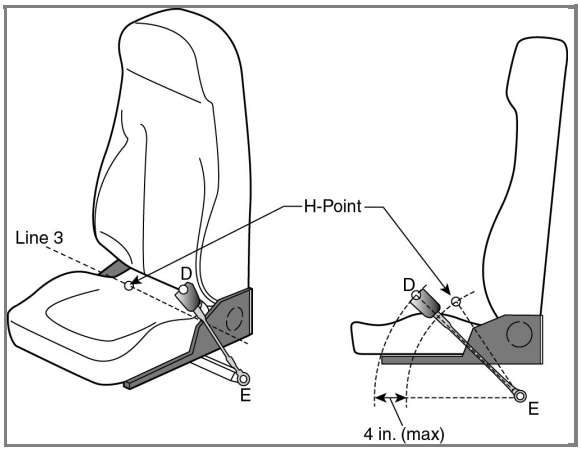
~~**59.21.3.3.2.2** –~~

~~A dual retractor Type 2 pelvic and upper torso restraint-style seat belt assembly shall have a minimum effective shoulder belt web length of 50 in. (1270 mm) and a minimum effective lap belt web length of 60 in. (1530 mm) with the seat all the way back and down and as measured in 59.21.3.3.1.2 .~~

~~**59.21.3.3.3 *** –~~

~~In the case of a Type 2 seat belt, the distance from the buckle anchorage (point E in Figure 59.21.3.3.3) to the buckle tip (point D in Figure 59.21.3.3.3) shall be no more than 4 in. (102 mm) longer than the perpendicular distance from the buckle anchorage lateral axis through the H-point of the seat (line 3 in Figure 59.21.3.3.3) when the seat is adjusted to its lowest and most rearward position.~~

~~Figure 59.21.3.3.3 Dimension Lines for Measuring Buckle Length. [1901:Figure 14.1.3.2.3]~~



Statement of Problem and Substantiation for Public Input

This text is being deleted as it is already covered by SAE J3026 and is not necessary to have as part of the requirements of this chapter. This text was borrowed from NFPA 1901 before SAE J3026 was available and the existing text is also geared towards occupants in the patient compartment that might be wearing a structural fire fighter protective garments and the need for longer seatbelt lengths. There is text being added to the annex to point end users to the specific chapter within NFPA 1900 that would applicable should a department desire longer seatbelts.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:48:19 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-48-NFPA 1900-2021

Statement: This text is being deleted as it is already covered by SAE J3026 and is not necessary to have as part of the requirements of this chapter. This text was borrowed from NFPA 1901 before SAE J3026 was available and the existing text is also geared towards occupants in the patient compartment that might be wearing a structural fire fighter protective garments and the need for longer seatbelt lengths. There is text being added to the annex to point end users to the specific chapter within NFPA 1900 that would applicable should a department desire longer seatbelts.

Public Input No. 626-NFPA 1900-2020 [Section No. 59.21.3.3.1 [Excluding any Sub-Sections]]

The effective seat belt web length for a Type 1 lap belt for pelvic restraint shall be a minimum of ~~60 in~~ 60??? in . (1525 mm) with the seat adjusted all the way back and down when measured using the following procedure:

(1) Locate an imaginary line where the plane of the center of the seat back surface intersects the plane of the center of the seat cushion surface (line 1 in Figure 59.21.3.3.1).

(2) Locate point A on line 1 at the outside of the seat on the retractor side of the seat.

(3) Locate point C on line 1 at the outside of the seat on the buckle side of the seat.

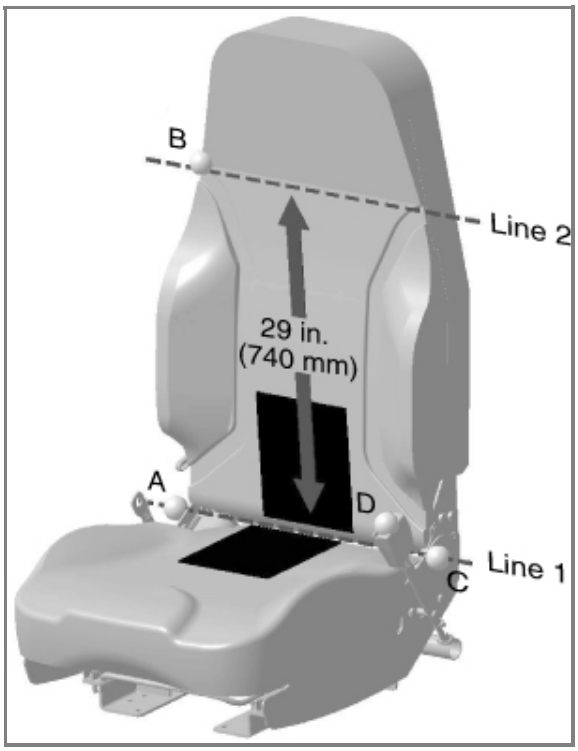
(4) Locate point D at the tip of the buckle.

(5) Pull the seat belt webbing entirely out of the retractor and measure along the webbing between point A and the seat belt latch plate (tongue). Record this length as AD.

(6) Measure from point C to point D, and record this length as CD.

(7) The effective seat belt web length equals AD + CD.

Figure 59.21.3.3.1 Dimension Lines for Measuring Seat Belt Effective Length.



Statement of Problem and Substantiation for Public Input

These seat belt dimensions were developed based on an anthropomorphic study of fire fighters wearing heavy turnout gear. Is it reasonable or necessary to require the same length seat belts in an ambulance where medical personnel might wear a winter coat but would not be wearing turnout pants, turnout coats, and pockets full of tools and equipment.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
State:
Zip:
Submittal Date: Wed Oct 14 16:49:21 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: See committee action taken on FR 48 as this section of text has been deleted from the chapter.

Public Input No. 627-NFPA 1900-2020 [Sections 59.21.3.3.2.1, 59.21.3.3.2.2]

Sections 59.21.3.3.2.1, 59.21.3.3.2.2

59.21.3.3.2.1

A single retractor Type 2 pelvic and upper torso restraint-style seat belt assembly shall have a minimum effective seat belt web length of ~~110 in~~ 110??? in . (2800 mm) with the seat adjusted all the way back and down and as measured in accordance with 59.21.3.3.1.1.

59.21.3.3.2.2

A dual retractor Type 2 pelvic and upper torso restraint-style seat belt assembly shall have a minimum effective shoulder belt web length of ~~50 in~~ 50??? in . (1270 mm) and a minimum effective lap belt web length of ~~60 in~~ 60??? in . (1530 mm) with the seat all the way back and down and as measured in 59.21.3.3.1.2.

Statement of Problem and Substantiation for Public Input

These seat belt dimensions were developed based on an anthropomorphic study of fire fighters wearing heavy turnout gear. Is it reasonable or necessary to require the same length seat belts in an ambulance where medical personnel might wear a winter coat but would not be wearing turnout pants, turnout coats, and pockets full of tools and equipment.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
State:
Zip:
Submittal Date: Wed Oct 14 16:56:51 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-48-NFPA 1900-2021

Statement: This text is being deleted as it is already covered by SAE J3026 and is not necessary to have as part of the requirements of this chapter. This text was borrowed from NFPA 1901 before SAE J3026 was available and the existing text is also geared towards occupants in the patient compartment that might be wearing a structural fire fighter protective garments and the need for longer seatbelt lengths. There is text being added to the annex to point end users to the specific chapter within NFPA 1900 that would applicable should a department desire longer seatbelts.

Public Input No. 1076-NFPA 1900-2020 [Section No. 59.21.3.4]

~~59.21.3.4~~ –

~~Signs that read "Occupants Must Be Seated and Belted When Ambulance Is in Motion" shall be visible from each seated position.~~

Statement of Problem and Substantiation for Public Input

We all agree on the merit of keeping occupants seated and belted. However, this is a requirement that should be driven by the operating entity. We do little more than add to the clutter of the patient compartment by adding signage that does nothing more than state what any and every operator already knows.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 17:19:08 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: The committee has chosen to keep this test within the document so as to work to ensure that occupants of the vehicle wear their seatbelts and are reminded visually to do so.

Public Input No. 691-NFPA 1900-2020 [Section No. 59.21.9.1]

~~59.21.9.1~~ –

~~Any seat with a built-in system for transporting a child or an infant shall be designed for operation in a forward-facing or rear-facing direction during transport.~~

Statement of Problem and Substantiation for Public Input

This text is being deleted as it appears to be outside the scope of this section as the section is addressing Child Seating Restraints and this text dealing with seat design.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:50:42 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-49-NFPA 1900-2021
Statement: This text is being modified as it is outside the scope of this section as the section is addressing Child Seating Restraints however text is being added to ensure that child car seats are used and installed in the orientation prescribed by the car seat manufacturer.

Public Input No. 693-NFPA 1900-2020 [Section No. 59.21.9.2]

59.21.9.2

If the ambulance is designed to transport infants ~~in a seat~~ , the ambulance shall include ~~an infant restraint seat or have provisions to~~ a provision to accommodate an infant car seat.in the orientation prescribed by the car seat manufacturer.

Statement of Problem and Substantiation for Public Input

This text is being modified as it appears to be outside the scope of this section as the section is addressing Child Seating Restraints however text is being added to ensure that infant car seats are used in the orientation prescribed by the car seat manufacturer, should the ambulance be designed to transport infants.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:52:29 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-49-NFPA 1900-2021
Statement: This text is being modified as it is outside the scope of this section as the section is addressing Child Seating Restraints however text is being added to ensure that child car seats are used and installed in the orientation prescribed by the car seat manufacturer.

Public Input No. 1072-NFPA 1900-2020 [Section No. 59.21.10]

~~**59.21.10** – Seatbelt Warning System.~~

~~**59.21.10.1** –~~

~~An occupant restraint warning system shall be provided for each designated seating position in the patient compartment.~~

~~**59.21.10.2** –~~

~~The warning system shall indicate if an occupant in the patient compartment is not belted or restrained.~~

~~**59.21.10.3** –~~

~~The warning system shall consist of an audible and visual warning device that can be heard and seen by the driver and seen by the occupants of the patient compartment.~~

~~**59.21.10.3.1** –~~

~~The audible portion of the warning system shall comply at a minimum with 49 CFR 571, FMVSS 208.~~

~~**59.21.10.4** –~~

~~The warning shall be activated when the parking brake is released and the transmission is not in neutral or park.~~

~~**59.21.10.5** –~~

~~The warning system shall not show an affirmative indication unless it has determined that the seat was occupied before the seat belt or restraint was buckled.~~

Statement of Problem and Substantiation for Public Input

Seatbelt warning systems are a chronic problem on patient compartment seating. Circuited buckles are impractical on attendant seats, and sensors are problematic on bench seats.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 16:57:31 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: The committee has chosen to keep this requirement in the standard as it works to ensure the safety of the occupants in the patient compartment of the vehicle is supported and monitored. While the committee recognizes there are potential challenges with this technology, it is available for use and should the AHJ choose not to include it in the

purchase specification, it is within their ability to do so through the statement of exceptions.

Public Input No. 10-NFPA 1900-2020 [Section No. 59.22.1]

59.22.1

Patient cots shall meet the performance requirements of SAE J3027, *Ambulance Litter Integrity, Retention, and Patient Restraint.*

Additional Proposed Changes

File Name	Description	Approved
1917_PI_No._3_K._Brunner.pdf	1917_PI No. 3_K. Brunner	

Statement of Problem and Substantiation for Public Input

Should we require AMD 028 and SAE J3043 for equipment over 3lbs?

Submitter Information Verification

Submitter Full Name: Kristi Brunner
Organization: Stryker
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 28 08:07:37 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-81-NFPA 1900-2021
Statement: These changes are being made as the patient cot is outside the scope of this document, however the retention system is within the scope.

Public Input No. 1075-NFPA 1900-2020 [Section No. 59.22.6]

~~59.22.6~~ –

~~Cot and infant transporters shall only be used with the required fastener assembly and occupant restraint systems as prescribed by the litter/transporter manufacturer.~~

Statement of Problem and Substantiation for Public Input

This requirement makes sense, it just doesn't belong in an ambulance construction standard. The ambulance manufacturer cannot control how such equipment will be used.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 17:15:26 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-81-NFPA 1900-2021
Statement: These changes are being made as the patient cot is outside the scope of this document, however the retention system is within the scope.

Public Input No. 9-NFPA 1900-2020 [Section No. 59.22.6]

59.22.6

Cot and infant transporters shall only be used with the required fastener assembly and occupant restraint systems as prescribed by the litter/transporter manufacturer.

Additional Proposed Changes

File Name	Description	Approved
1917_PI_No._2_K._Brunner.pdf	1917_PI No. 2_K. Brunner	

Statement of Problem and Substantiation for Public Input

CAAS changed this statement. Would we modify NFPA to align with CAAS changes?

Submitter Information Verification

Submitter Full Name: Kristi Brunner
Organization: Stryker
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 28 08:06:19 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-81-NFPA 1900-2021
Statement: These changes are being made as the patient cot is outside the scope of this document, however the retention system is within the scope.

Public Input No. 628-NFPA 1900-2020 [Section No. 59.25.2]

59.25.2

The stripe or combination of stripes shall be a minimum of ~~6 in. (152 mm~~ 4 in (101.6mm) ~~_~~ in total vertical width.

Statement of Problem and Substantiation for Public Input

The use of 4" as a minimum harmonizes the striping requirements with 1901 1nd 1906. If 6" is better then change everything in 1900 to 6"

Submitter Information Verification

Submitter Full Name: W K Menke III
Organization: Powerarc Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Oct 14 17:17:08 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: The committee has chosen to keep the requirement as it is currently written due to the fact that this is a minimum standard and should the AHJ want to deviate from the requirements applicable to ambulances and get 4" stripes, they can do so as part of the statement of exceptions. Also, many state regulators, who actually control what can be licensed as an ambulance in states, have incorporated into their regulations the use of 6" stripes as they use 4" lettering within those stripes. Lastly, since 1900 covers several different types of vehicles it is expected that there will be some differences in the requirements with those vehicles and the committee believes this is one of those places.

Public Input No. 696-NFPA 1900-2020 [Section No. 59.25.4]

59.25.4

A retroreflective graphic design shall be permitted to replace all or part of the required striping material on ~~the front and~~ the sides of the vehicle if the design or combination thereof covers at least the same surface area as required by 59.25.1.

Statement of Problem and Substantiation for Public Input

This text is being deleted as this section is dealing only with the sides of the vehicle, not the front.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:56:34 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-53-NFPA 1900-2021
Statement: This text is being deleted as this section is dealing only with the sides of the vehicle, not the front.

Public Input No. 629-NFPA 1900-2020 [Section No. 59.25.6 [Excluding any Sub-Sections]]

At least 50 percent of the rear-facing vertical surfaces other than glass and lenses, visible when facing from the rear of the ambulance, shall be equipped with retroreflective material consisting of daytime and nighttime colors . . .

Statement of Problem and Substantiation for Public Input

Use of day and night colors improves conspicuity.

Submitter Information Verification

Submitter Full Name: W K Menke III
Organization: Powerarc Inc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Oct 14 17:22:57 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: The committee has chosen to keep the requirement as currently written since there is not clear definition of what daytime and nighttime colors are and their levels of conspicuity based on their expected use. Should the AHJ decide to use different colors that might meet what the submitter is attempting to accomplish, they could do so using the statement of exceptions.

Public Input No. 697-NFPA 1900-2020 [Sections 59.28.11.1, 59.28.11.2]

Sections 59.28.11.1, 59.28.11.2

59.28.11.1

A medical gas cylinder(s) shall be mounted with a restraining device(s) that meets the requirements of SAE J3043, *Ambulance Equipment Mounts*, in the lateral and longitudinal directions.of the vehicle.

59.28.11.2

Compliance of the medical gas tank retention device, in the lateral and longitudinal directions of the vehicle , shall be validated by testing a sample retention device using a substantially similar ambulance or body structure in accordance with the testing requirements of SAE J3043, *Ambulance Equipment Mounts*.

Statement of Problem and Substantiation for Public Input

This text is being added just to provide further clarification as to ensure the tests were being performed in relation to the vehicle and not the mounted cylinder.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 16:58:22 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-54-NFPA 1900-2021
Statement: This text is being modified just to provide further clarification as to ensure the tests were being performed in relation to the vehicle and not the mounted cylinder, also to update externally referenced documents.

Public Input No. 110-NFPA 1900-2020 [Section No. 59.28.11.3]

59.28.11.3

A medical gas cylinder(s) shall be mounted with a restraining device(s) that meets the requirements of ~~AMD 003,~~ ~~*Oxygen Tank Retention System Static Test*~~ *SAE J3043, Ambulance Equipment Mounts* , in the vertical direction.

Statement of Problem and Substantiation for Public Input

AMD 003 has been withdrawn and replaced by SAE J3043 per AMD.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 17:34:12 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-54-NFPA 1900-2021
Statement: This text is being modified just to provide further clarification as to ensure the tests were being performed in relation to the vehicle and not the mounted cylinder, also to update externally referenced documents.

Public Input No. 699-NFPA 1900-2020 [Sections 59.28.11.3, 59.28.11.4]

Sections 59.28.11.3, 59.28.11.4

59.28.11.3

A medical gas cylinder(s) shall be mounted with a restraining device(s) that meets the requirements of AMD ~~003~~ 028 , ~~*Oxygen Tank*~~ *Vertical Component* *Retention* ~~*System*~~ - *Static Test*, in the vertical direction.

59.28.11.4

Compliance with the medical gas retention device in the vertical direction shall be validated by testing a sample retention device using a substantially similar ambulance or body structure in accordance with the testing requirements of AMD ~~003~~ 028 , ~~*Oxygen Tank*~~ *Vertical Component* *Retention* ~~*System*~~ - *Static Test*. .

Statement of Problem and Substantiation for Public Input

This change is being made in order to update externally referenced documents.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 17:06:40 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-54-NFPA 1900-2021
Statement: This text is being modified just to provide further clarification as to ensure the tests were being performed in relation to the vehicle and not the mounted cylinder, also to update externally referenced documents.

Public Input No. 111-NFPA 1900-2020 [Section No. 59.28.11.4]

59.28.11.4

Compliance with the medical gas retention device in the vertical direction shall be validated by testing a sample retention device using a substantially similar ambulance or body structure in accordance with the testing requirements of ~~AMD 003, *Oxygen Tank Retention System Static Test*~~ SAE J3043, *Ambulance Equipment Mounts* .

Statement of Problem and Substantiation for Public Input

AMD 003 has been withdrawn and replaced by SAE J3043 per AMD.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 17:36:31 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-54-NFPA 1900-2021
Statement: This text is being modified just to provide further clarification as to ensure the tests were being performed in relation to the vehicle and not the mounted cylinder, also to update externally referenced documents.

Public Input No. 698-NFPA 1900-2020 [Section No. 59.28.12]

59.28.12 Medical Gas System Integrity.and Flow Capacity

59.28.12.1

The medical gas system of each ambulance shall be tested prior to delivery in accordance with AMD 015, *Ambulance Main Medical Gas System Test.*

59.28.12.1.1

The medical gas system shall lose no more than 5 psi (34 kPa) of pressure in a 2-hour period.

59.28.12.1.2

Each port shall be capable of delivering at least 26.4 gpm (100 L/min) of medical gas.

59.28.12.2

A label shall be provided near the medical gas tank stating the following: The integrity of this medical gas system was tested in accordance with NFPA 1917 and meets the requirements thereof.

59.28.12.3

The label shall be signed and dated by an authorized representative of the ambulance manufacturer or test agency.

Statement of Problem and Substantiation for Public Input

This change is being made in order to address the material that is covered in the section.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 17:00:33 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-55-NFPA 1900-2021
Statement: This change is being made in order to address the material that is covered in the section. Also, since the test is not part of NFPA 1917, this change is being made in order to reference the correct externally referenced document and test.

Public Input No. 700-NFPA 1900-2020 [Section No. 59.28.12.2]

59.28.12.2

A label shall be provided near the medical gas tank stating the following: The integrity of this medical gas system was tested in accordance with ~~NFPA 1917 and~~ AMD 015 and meets the requirements thereof.

Statement of Problem and Substantiation for Public Input

Since the test is not part of NFPA 1917, this change is being made in order to reference the correct externally referenced document and test.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 17:09:58 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-55-NFPA 1900-2021
Statement: This change is being made in order to address the material that is covered in the section. Also, since the test is not part of NFPA 1917, this change is being made in order to reference the correct externally referenced document and test.

Public Input No. 112-NFPA 1900-2020 [Section No. 60.1.1]

60.1.1 Printed Circuits.

60.1.1.1

Where printed circuits are utilized, they shall conform to IPC A-~~610F~~ 610 , *Acceptability of Electronic Assemblies*.

60.1.1.2

Printed circuit assemblies installed by the FSAM shall comply with IPC A-~~610F~~ 610 , *Acceptability of Electronic Assemblies,* Classification 1.4.1.

Statement of Problem and Substantiation for Public Input

Remove version information F is no longer the current edition. See section 2.3.11.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 17:39:08 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-1-NFPA 1900-2020
Statement: Remove version information F is no longer the current edition, however version H is the current edition.

Public Input No. 1045-NFPA 1900-2020 [Section No. 60.2.1.2]

60.2.1.2

Voltage drops in all wiring from the power source to the ~~load~~ using device shall not exceed ~~5 percent of the nominal source voltage~~ 10 percent .

Statement of Problem and Substantiation for Public Input

Revise this section to harmonize with 1901 (16.2.1.1) and 1906 (41.2.1.1). There is no apparent basis for requiring a lower value for ambulances than for fire apparatus.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 13:56:10 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-2-NFPA 1900-2020
Statement: The committee is revising this section to harmonize with 1901 (16.2.1.1) and 1906 (41.2.1.1). There is no apparent basis for requiring a lower value for ambulances than for fire apparatus.

Public Input No. 1048-NFPA 1900-2020 [Section No. 60.3.4.2]

60.3.4.2

Compliance of the high-idle alternator output shall be validated by the final-stage ambulance manufacturer by testing each ambulance in accordance with the "Alternator Performance Test at High Idle" as specified in AMD 005, *Low Voltage Electrical Test*.

Statement of Problem and Substantiation for Public Input

This corrects an apparent typo. 60.3.2.2 covers low idle alternator output. The corresponding section 60.3.4.2 is intended to cover high idle alternator output but currently calls for the low idle portion of the AMD test rather than the high idle portion of that test.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 14:28:49 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-82-NFPA 1900-2021

Statement: This corrects an apparent typo. 60.3.2.2 covers low idle alternator output. The corresponding section 60.3.4.2 is intended to cover high idle alternator output but currently calls for the low idle portion of the AMD test rather than the high idle portion of that test.

Public Input No. 1051-NFPA 1900-2020 [Section No. 60.5.3.1]

60.5.3.1

An engine speed auxiliary control device (voltage sensing high idle circuit, high -idle switch, or throttle) shall be installed to allow an increase in the engine speed, not to exceed the chassis manufacturer's recommendations, when the ambulance is in park or neutral with the parking brake applied.

Statement of Problem and Substantiation for Public Input

Most ambulance chassis come with OEM voltage sensing high idle circuits that do not require activation by a switch or manual throttle control. The proposed change updates the requirements of this standard to allow the system provided by the chassis OEM to meet the objective of elevating idle speed in order to boost alternator output.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 14:40:30 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-98-NFPA 1900-2021

Statement: The stated intent of the PI was to accommodate the reality that OEM-provided, voltage-sensing high idle systems typically do not require installation of a switch for activation. The technical committee notes that, while most chassis used for ambulance platforms come with an OEM voltage-sensing high idle system, not all chassis do. Moreover, some chassis do not allow installation of a high idle system. Because what matters is the electrical system performance, and because testing required by 60.1.2 confirms the electrical system performance, it is not necessary to specify the specific components—high idle systems or otherwise—that must be used to meet the requirements.

Public Input No. 1054-NFPA 1900-2020 [Section No. 60.5.3.2]

60.5.3.2

~~An~~ If an engine speed auxiliary control device is installed by the FSAM, an interlock shall prevent the operation of the engine speed auxiliary control device unless the parking brake is engaged and the transmission is in neutral or park, or the parking brake is engaged and the engine is disengaged from the drive wheels.

Statement of Problem and Substantiation for Public Input

The requirement contained in the original text is logical, but the FSAM has no control over the interlocks incorporated into the elevated idle systems provided by the chassis OEM. The proposed change makes the FSAM responsible for elevated idle systems installed by the FSAM.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 14:47:13 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-86-NFPA 1900-2021
Statement: The requirement contained in the original text is logical, but the FSAM has no control over the interlocks incorporated into the elevated idle systems provided by the chassis OEM. The proposed change makes the FSAM responsible for elevated idle systems installed by the FSAM.

Public Input No. 1057-NFPA 1900-2020 [Section No. 60.5.3.3]

~~60.5.3.3~~ –

~~The engine shall be prevented from regulating its own engine speed during times when engine rpm control is critical for consistent ambulance functions.~~

Statement of Problem and Substantiation for Public Input

The FSAM has no control over how the engine regulates its own speed. Because that is under the exclusive control of the chassis manufacturer, it is inappropriate to include it as part of the ambulance construction standard.

Submitter Information Verification

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Submittal Date: Fri Nov 13 14:52:35 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-87-NFPA 1900-2021
Statement: The FSAM has no control over how the engine regulates its own speed. Because that is under the exclusive control of the chassis manufacturer, it is inappropriate to include it as part of the ambulance construction standard.

Public Input No. 1060-NFPA 1900-2020 [Section No. 60.6.8]

~~**60.6.8** – Starter Solenoid.~~

~~**60.6.8.1** –~~

~~Electronic control systems and similar devices shall be permitted to be otherwise connected if so specified by their manufacturer.~~

Statement of Problem and Substantiation for Public Input

Ambulance manufacturers don't touch the chassis OEM starter circuit. This section serves no apparent purpose.

Submitter Information Verification

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Submittal Date: Fri Nov 13 15:00:48 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-88-NFPA 1900-2021
Statement: Ambulance manufacturers don't touch the chassis OEM starter circuit. This section serves no apparent purpose, which is why the committee has chosen to delete this text.

Public Input No. 1061-NFPA 1900-2020 [Section No. 60.6.11.3]

~~**60.6.11.3** –~~

~~The power point circuits shall include a (low voltage drop) Schottky diode or other solid-state equivalent devices to isolate medical equipment batteries from any electrical loads that the remainder of the ambulance electrical system could impose.~~

~~**60.6.11.3.1** –~~

~~If a Schottky diode is used, it shall be heat-sink mounted, have an inverse voltage rating of at least 45 volts, and also be rated to carry the maximum short-circuit current until the circuit breaker opens.~~

~~**60.6.11.3.2** –~~

~~If a Schottky diode is used, it shall be physically located in an accessible location and be electrically connected between the circuit breaker and the power point connectors.~~

Statement of Problem and Substantiation for Public Input

The Schottky diode is an archaic requirement from the days when devices supported by DC chargers lacked internal diodes for discharge protection. The need for Schottky diodes went away years ago. The KKK and CAAS ambulance standards used to require Schottky diodes, but both have been updated to remove that requirement.

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Submittal Date: Fri Nov 13 15:07:50 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-89-NFPA 1900-2021
Statement: The Schottky diode is an archaic requirement from the days when devices supported by DC chargers lacked internal diodes for discharge protection. The need for Schottky diodes went away years ago. The KKK and CAAS ambulance documents used to require Schottky diodes, but both have been updated to remove that requirement.

Public Input No. 524-NFPA 1900-2020 [Section No. 60.9]

60.9 Optical Warning ~~Devices~~ System .

Each ambulance shall have a system of optical warning devices that meets or exceeds the requirements of ~~this~~ section 16 .8 .

60.9.1*

(REMOVE) The optical warning system shall consist of an upper and a lower warning level.

60.9.2

(REMOVE) The requirements for each level shall be met by the warning devices in that particular level without consideration of the warning devices in the other level.

60.9.3

(REMOVE) For the purposes of defining and measuring the required optical performance, the upper and lower warning levels shall be divided into four warning zones.

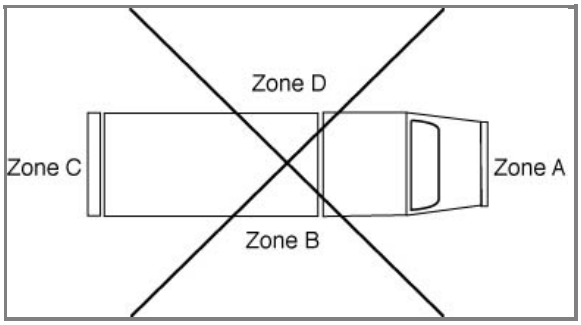
~~**60.9.3.1** –~~

~~The four zones shall be determined by lines drawn through the geometric center of the ambulance at 45 degrees to a line drawn lengthwise through the geometric center of the ambulance~~

~~**60.9.3.2** –~~

~~The four zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the ambulance, as shown in Figure 60.9.3.2 .~~

~~**Figure 60.9.3.2 Warning Zones for Optical Warning Devices.**~~



~~**60.9.4** –~~

~~Each optical warning device shall be installed on the ambulance and connected to the ambulance's electrical system in accordance with the requirements of this standard and the requirements of the manufacturer of the device.~~

~~**60.9.5** –~~

~~A master optical warning system switch that energizes all the optical warning devices shall be provided.~~

~~**60.9.6** –~~

~~The optical warning system on the ambulance shall be capable of two separate signaling modes during emergency operations.~~

60.9.6.1 –

One mode shall signal to drivers and pedestrians that the ambulance is responding to an emergency and is calling for the right-of-way.

60.9.6.2 –

One mode shall signal that the ambulance is stopped and is blocking the right-of-way.

60.9.6.3 –

The use of some or all of the same warning lights shall be permitted for both modes provided the other requirements of this chapter are met.

60.9.7 –

A switching system shall be provided that senses the position of the parking brake or the park position of an automatic transmission.

60.9.7.1 –

When the master optical warning system switch is enabled and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way shall be energized.

60.9.7.2 –

When the master optical warning system switch is enabled and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized.

60.9.7.3 * –

The system shall be permitted to have a method of modifying the two signaling modes.

60.9.8 –

The optical warning devices shall be constructed or arranged so as to avoid the projection of light, either directly or through mirrors, into any driving or crew compartment(s).

60.9.9 –

The front optical warning devices shall be placed so as to maintain the maximum practical separation from the headlights.

60.9.10 * –

Failure of a single optical device should not impede the visibility of the vehicle at 100 ft (30 m) from the geometric center of the ambulance.

60.9.11 – Flash Rate.

60.9.11.1 –

The minimum flash rate of any optical source shall be 75 flashes per minute.

60.9.11.1.1 –

Steadily burning, nonflashing optical sources shall be permitted to be used.

60.9.11.1.2 –

Only the optical energy provided by flashing optical sources shall be included in the calculations of the zone's total optical power.

60.9.11.1.3 –

The minimum number of flashes at any measurement point shall be 150 flashes per minute.

60.9.12 * – Color of Warning Lights.

60.9.12.1 –

Permissible colors or combinations of colors in each zone, within the constraints imposed by applicable laws and regulations, shall be as shown in Table 60.9.12.1 .

Table 60.9.12.1 Zone Colors

Color Calling for Right-of-Way Blocking Right-of-Way Red Any zone Any zone Blue Any zone Any zone Yellow Any zone except A Any zone White Any zone except C Not permitted

60.9.12.2 –

All colors shall be as specified in SAE J578, *Color Specification* , for red, blue, yellow, or white.

60.9.13 * – Requirements for Large Ambulances.

60.9.13.1 –

If the ambulance 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 60.9.13.2 through 60.9.13.6 shall apply.

60.9.13.2 – Upper-Level Optical Warning Devices.

60.9.13.2.1 –

The upper-level optical warning devices shall be mounted high and close to the corner points of the ambulance to define the clearance lines of the ambulance.

60.9.13.2.2 –

The upper-level optical warning devices shall not be mounted above the maximum height, specified by the device manufacturer, that 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.

60.9.13.3 – Lower-Level Optical Warning Devices.

60.9.13.3.1 –

To define the clearance lines of the ambulance, 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 axle centerline and close to the front corner points of the ambulance.

60.9.13.3.2 –

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 corners of the ambulance.

60.9.13.3.3 –

The optical center of any lower-level device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

60.9.13.4 – Midship Optical Warning Devices.

60.9.13.4.1 –

A midship optical warning device shall be mounted on both the right and the left sides of the ambulance if the distance between the front and rear lower-level optical devices exceeds 25 ft (7.6 m) at the optical center.

60.9.13.4.2 –

Additional midship optical warning devices shall be required, where necessary, to maintain a horizontal distance between the centers of adjacent lower-level optical warning devices of 25 ft (7.6 m) or less.

60.9.13.4.3 –

The optical center of any midship-mounted optical warning device shall be between 18 in. and 62 in. (460 mm and 1600 mm) above level ground.

60.9.13.5 * –

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 60.9.13.5 .

Table 60.9.13.5 Minimum Optical Power Requirements for Large Ambulances

Mode of Operation Calling for Right-of-Way Blocking Right-of-Way Zone Level *H* Total At Any *H* Point At Any Point 5 Degrees Up or 5 Degrees Down from *H* *H* Total At Any *H* Point At Any Point 5 Degrees Up or 5 Degrees Down from *H* A Upper 1,000,000 10,000 3,500 400,000 10,000 3,500 B Upper 400,000 10,000 3,500 400,000

H = Horizontal plane passing through the optical center.

Notes:

(1) All values are in candela-seconds/minute.

(2) The values in the *H* Total columns are the total of 19 data point values for each light, with data points on the boundary between zones counted in both zones.

60.9.13.6 –

No individual measurement point shall be less than that shown in Table 60.9.13.5 .

60.9.14 * – Requirements for Small Ambulances.

60.9.14.1 –

If the ambulance has a bumper-to-bumper length of less than 25 ft (7.6 m) and has the optical center of all optical warning devices at 8 ft (2.4 m) or less above level ground, the requirements of 60.9.14.2 through 60.9.14.5 shall apply.

60.9.14.2 – Upper-Level Optical Warning Devices.

60.9.14.2.1 –

The upper-level optical warning devices shall be mounted as high as practical, but not over 8 ft (2.4 m), at the optical center.

60.9.14.2.2 –

The upper-level optical warning devices shall be permitted to be combined in one or more enclosures and shall be permitted to be mounted on the cab roof or any other convenient point.

60.9.14.3 – Lower-Level Optical Warning Devices.

60.9.14.3.1 –

One or more lower-level optical warning devices shall be visible from the front and the side of the ambulance.

60.9.14.3.2 –

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 ambulance.

60.9.14.3.3 –

The optical center of the device(s) shall be between 18 in. and 48 in. (460 mm and 1220 mm) above level ground.

60.9.14.4 –

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 60.9.14.4 .

Table 60.9.14.4 Minimum Optical Power Requirements for Small Ambulances

Mode of Operation Calling for Right-of-Way Blocking Right-of-Way Zone *H* Total At Any *H* Point At Any Point 5 Degrees Up or 5 Degrees Down from *H* *H* Total At Any *H* Point At Any Point 5 Degrees Up or 5 Degrees Down from *H* A 1,000,000 10,000 3,500 400,000 10,000 3,500 B 200,000 8,000 3,500 200,000 8,000 3,500 C

Notes:

H = Horizontal plane passing through the optical center.

(1) All values are in candela-seconds/minute.

(2) The values in the *H* Total columns are the total of 19 data point values for each light, with data points on the boundary between zones counted in both zones.

60.9.14.5 –

No individual measurement point shall be less than that shown in Table 70.9.14.4.

60.9.15 – Tests of Optical Warning Devices.

60.9.15.1 – Mechanical and Environmental Test.

60.9.15.1.1 –

All optical warning devices shall be tested to the requirements of SAE J595, *Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles* ; SAE J845, *Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles* ; SAE J1318, *Gaseous Discharge Warning Lamp for Authorized Emergency, Maintenance, and Service Vehicles* ; or SAE J1889, *L.E.D. Signal and Marking Lighting Devices* .

60.9.15.1.2 –

Optical devices and components designed for mounting only in weatherproof, interior spaces shall be tested in conformance with the applicable SAE standard listed in 60.9.15.1.1 and shall comply with the vibration test and the warpage test for plastic components.

60.9.15.1.3 –

Optical devices and components designed for mounting on the exterior of the ambulance or in nonweatherproof interior spaces shall be tested in conformance with SAE J845, *Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles* , 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

60.9.15.2 – Photometric Test Procedures for Optical Devices.

60.9.15.2.1 –

Testing shall be performed by, or on behalf of, the device manufacturer to ensure compliance with the requirements of 60.9.15.2.2 through 60.9.15.2.5.2 .

60.9.15.2.1.1 –

The results of the testing shall be used to determine compliance with this standard, and all required photometric data made available, upon request, from the optical warning device manufacturer.

60.9.15.2.1.2 –

The goniometer, integrating photometer, and other equipment used to take the test measurements shall meet the requirements of SAE J1330, *Photometry Laboratory Accuracy Guidelines* .

60.9.15.2.2 –

The optical source shall be mounted in a goniometer and operated as it would be in a normal system application.

60.9.15.2.2.1 –

The minimum distance between the light-emitting surface of the source being tested and the front face of the photometer detector shall be 59 ft (18 m).

60.9.15.2.2.2 –

The goniometer shall be oriented and the integrating photometer shall be set to integrate light pulses from the source for 20 seconds.

60.9.15.2.3 –

For all tests performed with the power applied, the lighting system, or component thereof, shall be operated at 12.8 volts ± 0.1 volt for 12-volt nominal equipment, 25.6 volts ± 0.2 volt for 24-volt nominal equipment, and 38.4 volts ± 0.3 volt for 42-volt nominal equipment.

60.9.15.2.3.1 –

If the equipment is rated for operation on multiple voltages, the tests shall be performed at each of the rated voltages used by the equipment.

60.9.15.2.3.2 –

Voltage shall be measured at a point 12 in. ± 1 in. (300 mm ± 25 mm) from the entry into the component.

60.9.15.2.4 –

The technique described in 60.9.15.2.2 through 60.9.15.2.2.2 shall be performed along the horizontal plane that passes through the optical center, beginning at the optical center and repeated at 5-degree intervals to the left and to the right of the optical center throughout the active horizontal angle of light emission of the optical source.

60.9.15.2.5 –

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 the vertical plane passing through the optical center.

60.9.15.2.5.1 –

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.

60.9.15.2.5.2 –

If the optical warning device contains more than one optical source, the test shall be repeated for each optical source.

60.9.16 * – Compliance Documentation.

The ambulance manufacturer shall demonstrate compliance of the warning system by one of the following methods:

(1) Certification that the system was installed within the geometric parameters specified by the manufacturer of the system referencing the optical source test reports provided by the manufacturer of the system

(2) Certification that a mathematical calculation based on test reports for individual optical sources provided by the manufacturer of the devices and performed by a qualified person demonstrates that the combination of individual devices as installed meets the requirements of this standard

(3) Actual measurement of the lighting system after installation on the ambulance

60.9.17 – Alternate Lighting Systems.

60.9.17.1 –

An emergency lighting system shall provide the ambulance with 360 degrees of conspicuity for safety during its missions.

60.9.17.1.1 –

The system shall display highly perceptible and attention-getting signals that function in a modal system and convey the following messages:

(1) In the primary mode — "Clear the Right-of-Way"

(2) In the secondary mode — "Hazard: Vehicle Stopped on Right-of-Way"

60.9.17.1.2 –

The warning light systems shall not impair the effectiveness of the legally required exterior lighting on the ambulance.

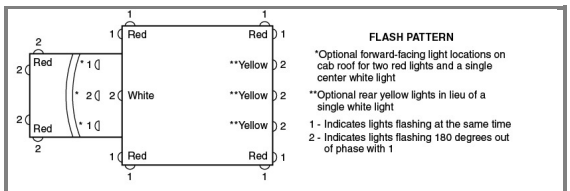
60.9.17.2 –

The ambulance standard emergency warning light system shall contain 12 fixed red lights, 1 fixed white light, and 1 or more fixed yellow lights.

60.9.17.2.1 –

These lights shall function in a dual mode system as shown in Figure 60.9.17.2.1 and meet the physical and photometric requirements.

Figure 60.9.17.2.1 Emergency Lighting.



MINIMUM FLASH ENERGY, Cd-S PER FLASH, PER FIXTURE

Color	Red		White	Yellow
Location	Grille and fenders	Upper body corners	Front center	Rear center*
Day	160 Cd-S @ HV	240 Cd-S @ HV	900 Cd-S @ HV	600 Cd-S @ HV
	80 Cd-S @ ± 5° H points	120 Cd-S @ ± 5° H points	450 Cd-S @ ± 5° H points	300 Cd-S @ ± 5° H points
	12 Cd-S @ all 5° V – 45° H points	32 Cd-S @ all 5° V – 45° H points	96 Cd-S @ all 5° V – 45° H points	72 Cd-S @ all 5° V – 45° H points
Night	10%–30% of the above			

* Single center rear or combined dual rear (optional).

MODAL EMERGENCY LIGHTING SYSTEM

Color & Location / Mode of Operation	Red	White	Yellow	Red
	Front and rear corners	Front upper center	Rear center	Grille and fenders
Primary (Clear the right-of-way)	On	On	On	On
Secondary (Hazard: vehicle stopped on right-of-way)	On	Off	On	Off

60.9.17.2.2 –

The upper body warning lights shall be mounted at the extreme upper corner areas of the ambulance body.

60.9.17.2.3 –

The single white light shall be centered between the two front-facing, red, upper corner lights or in a dedicated housing mounted forward of the body on the cab roof.

60.9.17.2.4 –

Doors or other ancillary equipment shall not obstruct the standard warning lights.

60.9.17.2.5 –

The yellow light shall be symmetrically located between the two rear-facing red lights.

60.9.17.2.6 –

The red grille lights shall be located at least 30 in. (762 mm) above the ground and below the bottom edge of the windshield and be laterally separated by at least 18 in. (457 mm), measured from centerline to centerline of each lamp.

60.9.17.2.7 –

The lateral-facing intersection lights shall be mounted as close as possible to the front upper edge of each front fender and be angled forward between 0 and 30 degrees.

60.9.17.2.8 –

All warning lights furnished shall be mounted to project their highest intensity beams on the horizontal plane.

60.9.17.3 – Photometric, Chromaticity, and Physical Requirements.

60.9.17.3.1 –

Each emergency light shall flash 75 to 125 times per minute.

60.9.17.3.2 –

The chromaticity values of the lights shall conform to SAE J578, *Color Specification* , for their respective colors, except for the red lights, which can conform to the expanded boundary limits of y = 0.34, y = 0.32, and x = 0.62.

60.9.17.3.3 –

All warning lights shall project a beam spread of at least 5 degrees up and 5 degrees down and at least 45 degrees left and right of horizontal and vertical (H-V).

60.9.17.3.4 –

Each light shall produce flash energy, measured in candelas per second (Cd-s), from the H-V to all the extreme test point coordinates and be tested at all 5-degree increments.

60.9.17.3.4.1 –

At no point shall the Cd-s values drop to less than the minimum values as shown in Figure 60.9.17.2.1 when tested at 14.2 volts.

60.9.17.3.4.2 –

Flash energy shall be determined in accordance with the SAE J845, *Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles,* method for determining the flash energy of a light.

60.9.17.3.5 –

Testing shall be conducted on the device(s) as manufactured, including use of the actual light source and all other related system components.

60.9.17.4 –

The emergency light switches shall be wired and arranged to provide the warning light signal modes and combinations as specified.

60.9.17.4.1 –

All emergency light switches shall be labeled, each primary and secondary mode switch having an indicator light to show the driver which mode is activated.

60.9.17.5 –

~~The emergency lighting system shall be comprised of components and devices that comply with the general requirements and tests of SAE J575, *Test Methods and Equipment for Lighting Devices and Components for Use on Vehicles Less Than 2032 mm in Overall Width* , SAE J576, *Plastic Material or Materials for Use in Optical Parts Such as Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices* , SAE J578, *Color Specification* , and 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)* , as applicable for the unit.~~

~~60.9.17.5.1~~ ~~–~~

~~Warning lights shall be fastened to reinforced body surfaces in accordance with the lighting manufacturer's requirements and recommendations and include aiming wedges to compensate for sloped body surfaces, grille, hood, and fender angles or mold release angles on roof caps.~~

~~60.9.17.5.2~~ ~~–~~

~~The manufacturer shall aim the lights to ensure that all lighting performance requirements herein are met.~~

~~60.9.17.5.3~~ ~~–~~

~~The lights shall be aimed either mechanically or optically on the horizontal axis with a tolerance of +0 degrees to −3 degrees.~~

~~60.9.17.5.4~~ ~~–~~

~~All switches, connectors, and wiring shall be rated to carry a minimum of 125 percent of their maximum ampere load.~~

~~60.9.17.5.5~~ ~~–~~

~~When halogen or another long-duty cycle light source is used, the duty cycle of any device shall not exceed 50 percent.~~

~~60.9.17.5.6~~ ~~–~~

~~Where strobe lights are furnished, all high voltage leads and connections shall be insulated and enclosed or weatherproof connectors with the proper voltage rating.~~

~~60.9.17.6~~ ~~– Tests of Warning Light System.~~

~~60.9.17.6.1~~ ~~–~~

~~The lighting manufacturers shall furnish and certify, or the ambulance manufacturer measure and record, the total average current load of the standard emergency warning light system on the vehicle as manufactured at the regulated voltage of 14.2 volts when operated in the mode that draws maximum current.~~

~~60.9.17.6.2~~ ~~–~~

~~The warning light system and related components and devices shall be tested and approved by an Automotive Manufacturers Equipment Compliance Agency (AMECA) accredited laboratory independent from the lighting device manufacturer's own labs and listed with the AMECA for compliance with the requirements in the *AMECA Compliance Handbook* .~~

Additional Proposed Changes

File Name	Description	Approved
NFPA_Rational_for_single_lighting_section_-_Ver1.pdf		

Statement of Problem and Substantiation for Public Input

- All emergency vehicles operating on public roads, "calling for the right-of-way" and/or "blocking the right-of-way", should comply with the same minimum required level of conspicuity protection

regardless of the vehicle classification. Vehicular and road hazards encountered are universal.

- All four NFPA standards being combined, reference or require the same minimum lighting requirements found in 1901.

- All existing emergency vehicles currently built under these four standards can be classified under one these two sizes and meet the current conspicuity requirements without added cost or modifications.

- Future revisions to warning light conspicuity standards will be easier to address and implement for all emergency vehicles.

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Submittal Date: Thu Oct 08 17:53:59 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-572-NFPA 1900-2021
Statement: These changes are being made for document consistency based on the changes that were made to 16.8 of this document.

Public Input No. 785-NFPA 1900-2020 [Section No. 60.9 [Excluding any Sub-Sections]]

Each ambulance shall have a system of optical warning devices that meets or exceeds the requirements of this section.

[THE TEXT OF THIS SECTION (60.9) IS LARGELY BASED ON THE CORRESPONDING SECTION (19.8) OF THE FIRE APPARATUS PORTION OF THIS STANDARD. THAT SECTION IS UNDERGOING A MAJOR REVISION BY THE FIRE DEPARTMENT APPARATUS COMMITTEE. THE AMBULANCES COMMITTEE MIGHT WANT TO COORDINATE WITH THE FIRE DEPARTMENT APPARATUS COMMITTEE TO SEE WHETHER ANY OF THESE CHANGES SHOULD COME OVER INTO THE AMBULANCES SECTION OF THIS STANDARD.]

Statement of Problem and Substantiation for Public Input

The text of this section (60.9) is largely based on the corresponding section (19.8) of the Fire Apparatus portion of this standard. That section is undergoing a major revision by the Fire Department Apparatus committee. The Ambulances committee might want to coordinate with the Fire Department Apparatus committee to see whether any of those changes should come over into the ambulances section of this standard.

Submitter Information Verification

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Submittal Date: Tue Nov 03 15:30:33 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-572-NFPA 1900-2021
Statement: These changes are being made for document consistency based on the changes that were made to 16.8 of this document.

Public Input No. 93-NFPA 1900-2020 [Section No. 60.9.3]

60.9.3

For the purposes of defining and measuring the required optical performance (not device physical mounting locations) , the upper and lower warning levels shall be divided into four warning zones.

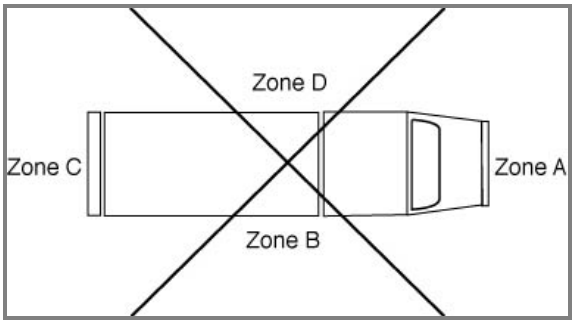
60.9.3.1

The four zones shall be determined by lines drawn from the vehicle centerline out through the ~~geometric center~~ corners of the ambulance at 45 degrees to a line drawn lengthwise through the geometric center of the ambulance

60.9.3.2

The four zones shall be designated A, B, C, and D in a clockwise direction, with zone A to the front of the ambulance, as shown in Figure 60.9.3.2.

Figure 60.9.3.2 Warning Zones for Optical Warning Devices.



[REVISE FIGURE 60.9.3.2 SIMILAR TO FIGURE 16.8.3.2]

Statement of Problem and Substantiation for Public Input

A number of comments were received for NFPA 1901 and NFPA 1906 that this diagram was confusing, with almost no lights counting towards Zone B and Zone D because of the way the lines were drawn. The suggested changes would make the description in this section consistent with the description of the same thing for fire apparatus. This figure, and the description in this section, refer to the direction of light projection, not the physical locations of device mountings.

Submitter Information Verification

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Affiliation: 1900 Admin Task Group
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Submittal Date: Sun Aug 23 14:36:32 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-572-NFPA 1900-2021

Statement: These changes are being made for document consistency based on the changes that were made to 16.8 of this document.

Public Input No. 94-NFPA 1900-2020 [Section No. 60.9.15.1.1]

60.9.15.1.1

All optical warning devices shall be tested to the requirements of SAE J595, *Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles*; SAE J845, *Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles*; ~~SAE J1318, *Gaseous Discharge Warning Lamp for Authorized Emergency, Maintenance, and Service Vehicles* ;~~ or SAE J1889, *L.E.D. Signal and Marking Lighting Devices*.

Statement of Problem and Substantiation for Public Input

SAE J1318 was withdrawn in 2009. A corresponding change was made to NFPA 1901 and NFPA 1906 in the 2016 editions. See 16.8.15.1.1 and 41.8.15.1.1.

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Committee: AMB-AAA

Committee Statement

Resolution: FR-572-NFPA 1900-2021
Statement: These changes are being made for document consistency based on the changes that were made to 16.8 of this document.

Public Input No. 164-NFPA 1900-2020 [Section No. 60.9.17.6.2]

60.9.17.6.2

The warning light system and related components and devices shall be tested and approved by an Automotive Manufacturers Equipment Compliance Agency (AMECA) accredited laboratory independent from the lighting device manufacturer's own labs and listed with the AMECA for compliance with the requirements in the *AMECA ~~Compliance~~ Handbook of Compliant Automotive Safety Devices* .

Statement of Problem and Substantiation for Public Input

Correct title of the document.

Submitter Information Verification

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Submittal Date: Mon Aug 31 14:16:44 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-572-NFPA 1900-2021
Statement: These changes are being made for document consistency based on the changes that were made to 16.8 of this document.

Public Input No. 1065-NFPA 1900-2020 [Section No. 60.12.1]

60.12.1*

A red flashing or rotating light or electronic display within the forward view of the driver shall be illuminated automatically whenever the ambulance's ignition ~~switch is in the run position~~ circuit is energized , the parking brake is not fully engaged, and either of the following conditions exists:

(1) Any passenger door, patient entry door, or equipment compartment door is not closed.

(2) Any other device permanently attached to the ambulance is open, extended, or deployed in a manner that is likely to cause damage to the ambulance if the ambulance is moved.

Statement of Problem and Substantiation for Public Input

Some chassis do not have ignition switches. The proposed language accommodates that new reality.

Submitter Information Verification

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Organization: Braun Northwest
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Submittal Date: Fri Nov 13 15:21:03 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-90-NFPA 1900-2021
Statement: The committee had made this change as some chassis do not have ignition switches. The proposed language accommodates that new reality.

Public Input No. 20-NFPA 1900-2020 [New Section after 60.15]

60.15.4
Onboard Data Management and Communications Equipment

The purchaser shall specify what the contractor needs to provide in terms of onboard data management and communications equipment for the apparatus.

60.15.1 the purchaser shall specify what equipment the contractor is to supply and install.

60.15.2 , the purchaser shall specify what purchaser supplied equipment the contractor is to install.

60.15.3* the purchaser shall specify what accommodations such as space, power, antenna bases, or other accommodations the contractor is to provide to support purchaser installed equipment.

60.15.4 the purchaser shall specify if no equipment in that category is to be supplied, installed, of have any accommodations provided.

60.15.5 The purchaser shall provide the information identified in 60.15.1 through 60.15.4 for the following:

(1) Radio communication equipment

(2) Mobile data terminals or other computer equipment

(3) Traffic Preemption equipment

(4)* Vehicle Data Recorder

(5)* V2X communications

Additional Proposed Changes

File Name	Description	Approved
KKK-A-1822F_change_notice_13_1July2020.pdf	K CN 13	

Statement of Problem and Substantiation for Public Input

The VDR was added to the 2009 edition of NFPA 1901. While it has significant value if used, many departments never access the data and thus it adds no value for the purposes it was intended. It adds cost to every vehicle, whether the department intends to use the data or not. There have been many complaints that on smaller, commercial, chassis, the data needed is not available from the chassis systems and they cannot modify those systems. This proposal makes the VDR optional, while at the same time maintaining the information about a set of minimum standards to a VDR. As technology rapidly advances, a rigid definition of any electronic product quickly becomes outdated.

In addition to the VDR, there are many other decisions to be made around onboard data management and communications equipment. Depending on a number of factors, the purchaser may want the contractor to supply and install the equipment, the purchaser may supply equipment and ask the contractor to install the equipment, equipment may be installed after the vehicle is delivered, or the purchaser may decide some equipment is not needed for their department. This section calls for the information to be provided by the purchaser to allow the contractor to meet the requirements of the purchaser. These decisions include not only who provides and/or installs the equipment but also what

requirements in terms of space, power provisions, antenna bases and cables, and other provisions should be designed into the vehicle even if the purchaser will install, or have installed, the equipment after delivery of the finished apparatus.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 18-NFPA 1900-2020 [Section No. 7.12]	same material

Submitter Information Verification

Submitter Full Name: John McDonald
Organization: US General Services Administra
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 28 16:28:00 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-91-NFPA 1900-2021

Statement: The VDR was added to the 2009 edition of NFPA 1901. While it has significant value if used, many departments never access the data and thus it adds no value for the purposes it was intended. It can add equipment to every vehicle, whether the department intends to use the data or not. There have been many complaints that on smaller, commercial, chassis, the data needed is not available from the chassis systems and they cannot modify those systems. This proposal makes the VDR optional, while at the same time maintaining the information about a set of minimum standards to a VDR. As technology rapidly advances, a rigid definition of any electronic product quickly becomes outdated. In addition to the VDR, there are many other decisions to be made around onboard data management and communications equipment. Depending on a number of factors, the purchaser may want the contractor to supply and install the equipment, the purchaser may supply equipment and ask the contractor to install the equipment, equipment may be installed after the vehicle is delivered, or the purchaser may decide some equipment is not needed for their department. This section calls for the information to be provided by the purchaser to allow the contractor to meet the requirements of the purchaser. These decisions include not only who provides and/or installs the equipment but also what requirements in terms of space, power provisions, antenna bases and cables, and other provisions should be designed into the vehicle even if the purchaser will install, or have installed, the equipment after delivery of the finished apparatus.

Public Input No. 1069-NFPA 1900-2020 [Section No. 61.2.1 [Excluding any Sub-Sections]]

All components, equipment, and installation procedures shall conform to *NFPA 70*, ~~except where superseded~~ as specified by the requirements of this chapter.

Statement of Problem and Substantiation for Public Input

NFPA 70 was not written or intended to be applied to automotive apparatus. Automotive equipment is not included in the installations listed in NFPA 70 Section 90.2 (A) Covered. In fact, automotive vehicles other than mobile homes and recreational vehicles are specifically listed as not covered in Section 90.2 (B) Not Covered.
While it is not inappropriate to cite specific ambulance features that are to be constructed in conformity with specific NFPA 70 requirements, there is no basis for incorporation of NFPA 70 in its entirety. Based upon the scope statement in NFPA 70, the current requirement in this section of NFPA 1900 creates a conflict between two NFPA standards.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
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Submittal Date: Fri Nov 13 16:05:29 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-92-NFPA 1900-2021

Statement: NFPA 70 was not written or intended to be applied to automotive apparatus. Automotive equipment is not included in the installations listed in NFPA 70 Section 90.2 (A) Covered. In fact, automotive vehicles other than mobile homes and recreational vehicles are specifically listed as not covered in Section 90.2 (B) Not Covered.

While it is not inappropriate to cite specific ambulance features that are to be constructed in conformity with specific NFPA 70 requirements, there is no basis for incorporation of NFPA 70 in its entirety. Based upon the scope statement in NFPA 70, the current requirement in this section of NFPA 1900 creates a conflict between two NFPA standards.

Public Input No. 796-NFPA 1900-2020 [Section No. 61.2.3.3]

61.2.3.3

The maximum voltage supplied to portable equipment shall not exceed 275 volts to ground. Higher voltage shall be permitted only when used to operate fixed wired, permanently mounted equipment on the ambulance.

Statement of Problem and Substantiation for Public Input

The existing text appears to be from what is now 25.2.2 which includes the added sentence. Without this other sentence, the requirement does not make any sense. While 275 might not be the correct number for ambulances, the reference to "higher voltage" does not make sense without some voltage to be higher than.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Tue Nov 03 18:03:16 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-93-NFPA 1900-2021
Statement: The existing text appears to be from what is now 25.2.2 which includes the added sentence. Without this other sentence, the requirement does not make any sense. While 275 might not be the correct number for ambulances, the reference to "higher voltage" does not make sense without some voltage to be higher than.

Public Input No. 797-NFPA 1900-2020 [Section No. 61.3.3.3.1]

61.3.3.3.1

The conductor shall have a minimum amperage rating, as defined in 310.15, "~~Ampacities for Conductors Rated 0–2000 Volts~~ "Ampacity Tables ," of *NFPA 70*, of 115 percent of the rated amperage on the power source specification label.

Statement of Problem and Substantiation for Public Input

Update section title.

Submitter Information Verification

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Submittal Date: Tue Nov 03 18:24:43 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-4-NFPA 1900-2020
Statement: This change is being made in order to update section title.

Public Input No. 1070-NFPA 1900-2020 [Section No. 61.4]

61.4* Ground-Fault Circuit Interrupters.

All line ~~voltage ac circuits and receptacles~~ voltage receptacles of the ambulance shall be protected by listed ground-fault circuit interrupters (GFCIs) in accordance with ANSI/UL 498, *Standard for Safety Attachment Plugs and Receptacles*.

Statement of Problem and Substantiation for Public Input

The purpose of ground fault protection is to interrupt leakage current that might otherwise create danger for persons using line voltage cords and devices. Where such protection is required by NFPA 70, it is permitted to be provided either at the source (by way of a GFCI breaker) or at the point of use (by way of a GFCI receptacle). The original language of this section, by requiring protection of circuits upstream of GFCI receptacles, inappropriately prohibits use of protection at the receptacle. In ambulance applications, GFCI protection at each protected receptacle is actually superior to upstream circuit protection because it allows for immediate identification of the device causing a ground fault.

Submitter Information Verification

Submitter Full Name: Jerry Allen
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Submittal Date: Fri Nov 13 16:25:39 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-5-NFPA 1900-2020

Statement: This change is being made in order to update document title. Also, the purpose of ground fault protection is to interrupt leakage current that might otherwise create danger for persons using line voltage cords and devices. Where such protection is required by NFPA 70, it is permitted to be provided either at the source (by way of a GFCI breaker) or at the point of use (by way of a GFCI receptacle). The original language of this section, by requiring protection of circuits upstream of GFCI receptacles, inappropriately prohibits use of protection at the receptacle. In ambulance applications, GFCI protection at each protected receptacle is actually superior to upstream circuit protection because it allows for immediate identification of the device causing a ground fault.

Public Input No. 790-NFPA 1900-2020 [Section No. 61.4]

61.4* Ground-Fault Circuit Interrupters.

All line voltage ac circuits and receptacles of the ambulance shall be protected by listed ground-fault circuit interrupters (GFCIs) in accordance with ~~ANSI/~~ UL 498, ~~*Standard for Safety*~~ *Attachment Plugs and Receptacles*.

Statement of Problem and Substantiation for Public Input

Update document title.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Tue Nov 03 16:08:20 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-5-NFPA 1900-2020

Statement: This change is being made in order to update document title. Also, the purpose of ground fault protection is to interrupt leakage current that might otherwise create danger for persons using line voltage cords and devices. Where such protection is required by NFPA 70, it is permitted to be provided either at the source (by way of a GFCI breaker) or at the point of use (by way of a GFCI receptacle). The original language of this section, by requiring protection of circuits upstream of GFCI receptacles, inappropriately prohibits use of protection at the receptacle. In ambulance applications, GFCI protection at each protected receptacle is actually superior to upstream circuit protection because it allows for immediate identification of the device causing a ground fault.

Public Input No. 798-NFPA 1900-2020 [Section No. 61.6.1.1]

61.6.1.1

Conductors in flexible cord shall be sized in accordance with Table 400.5(A)(1) of *NFPA 70*.

Statement of Problem and Substantiation for Public Input

There are two tables in 500.5(A). All the wire types allowed in 61.5 are covered in Table 500.5(A)(1).

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Submittal Date: Tue Nov 03 20:43:47 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-6-NFPA 1900-2020
Statement: This change is being made as there are two tables in 500.5(A). All the wire types allowed in 61.5 are covered in Table 500.5(A)(1).

Public Input No. 799-NFPA 1900-2020 [Section No. 61.6.1.2]

61.6.1.2

Conductors used in conduit shall be sized in accordance with 310.15, "~~Ampacities for Conductors Rated 0–2000 Volts~~ "Ampacity Tables ," of *NFPA 70*.

Statement of Problem and Substantiation for Public Input

Update section name in NEC.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Tue Nov 03 20:47:36 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-7-NFPA 1900-2020
Statement: This change is being made in order to update the cross referenced section name in the NEC

Public Input No. 800-NFPA 1900-2020 [Section No. 61.6.2 [Excluding any Sub-Sections]]

All boxes shall conform to and be mounted in accordance with Article 314, “Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and ~~Manholes~~ Manhole Enclosures ,” of *NFPA 70*.

Statement of Problem and Substantiation for Public Input

Update article title in NEC.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Tue Nov 03 20:49:14 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-8-NFPA 1900-2020
Statement: This change is being made in order to update article title in the NEC.

Public Input No. 801-NFPA 1900-2020 [Section No. 61.6.5.5.1]

61.6.5.5.1

All wet location receptacle outlets and inlet devices, including those on hardwired, remote power distribution boxes, shall be of the grounding type, provided with a wet location cover, and installed in accordance with 406.8 9 , “Receptacles in Damp or Wet Locations,” of *NFPA 70*.

Statement of Problem and Substantiation for Public Input

Correct section number.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Tue Nov 03 21:10:12 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-9-NFPA 1900-2020
Statement: This change is being made to correct section number.

Public Input No. 791-NFPA 1900-2020 [Section No. 61.6.5.10]

61.6.5.10

All receptacles and electrical inlet devices shall be listed to ~~ANSI/~~ UL 498, ~~*Standard for Safety*~~ *Attachment Plugs and Receptacles*, or other recognized performance standards.

Statement of Problem and Substantiation for Public Input

Update document title.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Tue Nov 03 16:11:12 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-10-NFPA 1900-2020
Statement: This change is being made in order to update document title.

Public Input No. 802-NFPA 1900-2020 [Section No. 61.7.6]

61.7.6

The wire size shall be in accordance with *NFPA 70*, Table 400.5(A)(1) , but in no case shall it be smaller than 12 AWG.

Statement of Problem and Substantiation for Public Input

All the allowed wire types are in Table 400.5(A)(1). None are in 400.5(A)(2).

Submitter Information Verification

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Submittal Date: Tue Nov 03 21:12:33 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-11-NFPA 1900-2020
Statement: This change is being made as all the allowed wire types are in Table 400.5(A)(1). None are in 400.5(A)(2).

Public Input No. 803-NFPA 1900-2020 [Section No. 61.7.9.3]

61.7.9.3

Inlets, receptacles, circuit breakers, or GFCI devices shall not be mounted ~~on the top surface of the horizontal plane~~ in a face-up position .

Statement of Problem and Substantiation for Public Input

The existing wording is not clear. The proposed wording is the wording used in the NEC for this requirement.

Submitter Information Verification

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Submittal Date: Tue Nov 03 21:39:33 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-94-NFPA 1900-2021
Statement: The existing wording is not clear. The proposed wording is the wording used in the NEC for this requirement.

Public Input No. 792-NFPA 1900-2020 [Section No. 61.9.4]

61.9.4

The manufacturer of the device shall have the scene light tested by a nationally recognized testing laboratory and listed to ~~ANSI/~~ UL 153, ~~*Standard for*~~ *Portable Electric Luminaires*, or ~~ANSI/~~ UL 1598, *Luminaires*.

Statement of Problem and Substantiation for Public Input

Update document title.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
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Submittal Date: Tue Nov 03 16:16:49 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-12-NFPA 1900-2020
Statement: This change is being made in order to update document title.

Public Input No. 810-NFPA 1900-2020 [Chapter 62]

Chapter 62 Line Voltage Power Source (NFPA 1917)

62.1 – 3.5 _ Line Voltage Power Derived from an Inverter.

62.1.1 –

If the power source derives its input energy from an inverter, the power source shall meet the requirements of 62.3.5. 1.2 - through 62.3.5. 1. 4.

62.1.2 – 3.5.1 _

The low voltage power supply system shall be installed in compliance with the requirements of Chapter 60.

62.1.3 – 3.5.2 _

The alternator and the battery system shall be adequate to provide power for continuous operation for a minimum of 1 hour at nominal listed power output.

62.1.4 – 3.5.3 _

The inverter shall be tested to the requirements of the "Inverter Test" as specified in AMD 027, *Line Voltage Electrical Systems Test*.

62.

2 –

1 General Requirements

62.2 Requirements by Generator Size

62.2.1 _ Generators Rated Below 11 hp (8 kW) General Requirements.

62.2.1 – 3.4 Mechanically Driven Power Sources

If the power source is mechanically driven and mounted on the vehicle, it shall comply with *NFPA 70*, Article 445.

62.2.2.

62.2.2 –

If the generator is less than 11 hp (8 kW), it shall meet the requirements of

1

through 62.2.2.8 .

62.2.2.1 –

.3 _

Access shall be provided to permit both routine maintenance and removal of the power source for major servicing.

62.2 1 .2.2 – _

The power source shall be located so that neither it nor its mounting brackets interfere with the routine maintenance of the ambulance.

62.2.2 1 .3 – 1 _

If the power source is rated at less than 3 kW, a “Power On” indicator shall be provided.

62.2.1. 2.4 – _

If the power source is rated at 3 kW or more but less than 8 kW, a voltmeter shall be provided.

62.~~2.2.5~~ – 1.6

The rating on the power source specification label shall not exceed the declared rating from the power source manufacturer.

62.~~2.2.6~~ – 1.1

An instruction plate(s) that provides the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the ambulance at any point where such operations can take place.

62.~~2.2.7~~ – 1.5

If there is permanent wiring on the ambulance that is designed to be connected to the power source, a power source specification label that is permanently attached to the ambulance at the operator's control station shall provide the operator with the information detailed in Figure 62.~~2~~ 1 .~~2~~ 5 . ~~7.~~

Figure 62.~~2.2.7 Power~~ 1.5 Power Source Specification Label. [1901:Figure 22.4.9]

Power Source Specifications	
Operational Category	**Continuous Duty Rating**
Rated voltage(s) and type (ac or dc)	
Phase	
Rated frequency	
Rated amperage	
Continuous rated watts	
Power source engine speed	

62.~~2.2.8~~ – 1.4

The power source, at any load, shall not produce a noise level that exceeds 90 dBA in any driving compartment or patient compartment with windows and doors closed or at any operator's station on the ambulance.

62.3 – 2.2 Power Sources of 11 hp (8 kW) or Larger.

Power sources of 11 hp (8 kW) or larger shall meet the ~~requirements~~ :

1) Requirements of NFPA 1901, 22.4.3.1.

~~62.3.1~~ –

~~Instrumentation shall meet the~~

2) Instrumentation requirements of NFPA 1901, 22.4.6.3 through 22.4.6.4.3.

~~62.3.2~~ –

~~Operation shall meet the~~

3) Operation requirements of NFPA 1901, 22.4.8.

62.~~3.3~~ Power Source–Type Specific Requirements.

62.3.~~3.~~ 1 Direct-Drive (PTO) Generators.

If the generator is driven by any type of power takeoff (PTO), it shall meet the requirements of NFPA 1901, 22.5.1.

62.3.~~3.~~ 2 Hydraulically Driven Generators.

If the generator is driven using hydraulic components, it shall meet the requirements of NFPA 1901, 22.5.2.

62.3.3.~~3~~ Fixed Auxiliary Engine–Driven Generators 11 hp (8 kW) and Larger.

If the generator is driven by a fixed auxiliary engine, it shall meet the requirements of NFPA 1901, 22.5.3.

62.4 Wiring for Portable Generator.

Installations shall meet the requirements of NFPA 1901, 22.6.3.

Additional Proposed Changes

File Name	Description	Approved
NFPA_1900_Chapter_62_Reorganized.docx	Chapter 62 with reorganization.	

Statement of Problem and Substantiation for Public Input

The requirements in chapter 62 seen disorganized and sometimes the organization or headings contradict the requirements. This proposal reorders the requirements in a more logical order. The legislative format change is a little hard to follow. The attached document reorders the requirements as renumbered to show the final organization.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
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Zip:
Submittal Date: Wed Nov 04 20:56:58 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-95-NFPA 1900-2021

Statement: These changes have been made as the requirements in chapter 62 seemed disorganized and sometimes the organization or headings contradict the requirements. The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters. It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US. Several changes were also made to update references due to document consolidation.

Public Input No. 805-NFPA 1900-2020 [Section No. 62.1]

62.1 Line Voltage Power ~~Derived~~ from an Inverter.

62.1.1

If the power source ~~derives its input energy from~~ is an inverter, the power source shall meet the requirements of 62.1.2 through 62.1.4.

62.1.2

The low voltage power supply system shall be installed in compliance with the requirements of Chapter 60.

62.1.3

The alternator and the battery system shall be adequate to provide power for continuous operation for a minimum of 1 hour at nominal listed power output.

62.1.4

The inverter shall be tested to the requirements of the "Inverter Test" as specified in AMD 027, *Line Voltage Electrical Systems Test*.

Statement of Problem and Substantiation for Public Input

The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 04 11:28:17 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-95-NFPA 1900-2021
Statement: These changes have been made as the requirements in chapter 62 seemed disorganized and sometimes the organization or headings contradict the requirements. The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the

power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters. It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US. Several changes were also made to update references due to document consolidation.

Public Input No. 807-NFPA 1900-2020 [Section No. 62.2]

62.2 Generators Rated Below ~~11 hp (~~ 8 kW ~~)~~ General Requirements.

62.2.1

If the power source is mechanically driven and mounted on the vehicle, it shall comply with *NFPA 70*, Article 445.

62.2.2

If the generator is less than ~~11 hp (~~ 8 kW~~)~~, it shall meet the requirements of 62.2.2.1 through 62.2.2.8.

62.2.2.1

Access shall be provided to permit both routine maintenance and removal of the power source for major servicing.

62.2.2.2

The power source shall be located so that neither it nor its mounting brackets interfere with the routine maintenance of the ambulance.

62.2.2.3

If the power source is rated at less than 3 kW, a “Power On” indicator shall be provided.

62.2.2.4

If the power source is rated at 3 kW or more but less than 8 kW, a voltmeter shall be provided.

62.2.2.5

The rating on the power source specification label shall not exceed the declared rating from the power source manufacturer.

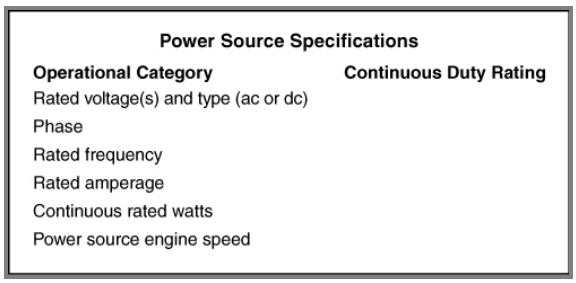
62.2.2.6

An instruction plate(s) that provides the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the ambulance at any point where such operations can take place.

62.2.2.7

If there is permanent wiring on the ambulance that is designed to be connected to the power source, a power source specification label that is permanently attached to the ambulance at the operator's control station shall provide the operator with the information detailed in Figure 62.2.2.7.

Figure 62.2.2.7 Power Source Specification Label. [1901:Figure 22.4.9]



62.2.2.8

The power source, at any load, shall not produce a noise level that exceeds 90 dBA in any driving compartment or patient compartment with windows and doors closed or at any operator's station on the ambulance.

Statement of Problem and Substantiation for Public Input

It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
State:
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Submittal Date: Wed Nov 04 15:21:29 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-95-NFPA 1900-2021

Statement: These changes have been made as the requirements in chapter 62 seemed disorganized and sometimes the organization or headings contradict the requirements. The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters. It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US. Several changes were also made to update references due to document consolidation.

Public Input No. 113-NFPA 1900-2020 [Section No. 62.3]

62.3 Power Sources of 11 hp (8 kW) or Larger.

Power sources of 11 hp (8 kW) or larger shall meet the requirements of ~~NFPA 1901, 22~~ 25 .4.3.1.

62.3.1

Instrumentation shall meet the requirements of ~~NFPA 1901, 22~~ 25 .4.6.3 through ~~22~~ 25 .4.6.4.3.

62.3.2

Operation shall meet the requirements of ~~NFPA 1901, 22~~ 25 .4.8.

62.3.3 Power Source–Type Specific Requirements.

62.3.3.1 Direct-Drive (PTO) Generators.

If the generator is driven by any type of power takeoff (PTO), it shall meet the requirements of ~~NFPA 1901, 22~~ 25 .5.1.

62.3.3.2 Hydraulically Driven Generators.

If the generator is driven using hydraulic components, it shall meet the requirements of ~~NFPA 1901, 22~~ 25 .5.2.

62.3.3.3 Fixed Auxiliary Engine–Driven Generators 11 hp (8 kW) and Larger.

If the generator is driven by a fixed auxiliary engine, it shall meet the requirements of ~~NFPA 1901, 22~~ 25 .5.3.

Statement of Problem and Substantiation for Public Input

Update references due to document consolidation.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 18:00:16 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-95-NFPA 1900-2021
Statement: These changes have been made as the requirements in chapter 62 seemed disorganized and sometimes the organization or headings contradict the requirements. The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the

power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters. It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US. Several changes were also made to update references due to document consolidation.

Public Input No. 806-NFPA 1900-2020 [Section No. 62.3]

62.3 Power Sources of ~~11 hp (~~ 8 kW ~~)~~ or Larger.

Power sources of ~~11 hp (~~ 8 kW ~~)~~ or larger shall meet the requirements of NFPA 1901, 22.4.3.1.

62.3.1

Instrumentation shall meet the requirements of NFPA 1901, 22.4.6.3 through 22.4.6.4.3.

62.3.2

Operation shall meet the requirements of NFPA 1901, 22.4.8.

62.3.3 Power Source–Type Specific Requirements.

62.3.3.1 Direct-Drive (PTO) Generators.

If the generator is driven by any type of power takeoff (PTO), it shall meet the requirements of NFPA 1901, 22.5.1.

62.3.3.2 Hydraulically Driven Generators.

If the generator is driven using hydraulic components, it shall meet the requirements of NFPA 1901, 22.5.2.

62.3.3.3 Fixed Auxiliary Engine–Driven Generators ~~11 hp (~~ 8 kW ~~)~~ and Larger.

If the generator is driven by a fixed auxiliary engine, it shall meet the requirements of NFPA 1901, 22.5.3.

Statement of Problem and Substantiation for Public Input

It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 04 12:00:11 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-95-NFPA 1900-2021

Statement: These changes have been made as the requirements in chapter 62 seemed disorganized and sometimes the organization or headings contradict the requirements. The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters. It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US. Several changes were also made to update references due to document consolidation.

Public Input No. 808-NFPA 1900-2020 [Section No. 62.3.3.3]

62.3.3.3 Fixed Auxiliary Engine–Driven Generators ~~11 hp (8 kW) and Larger~~ .

If the generator is driven by a fixed auxiliary engine, it shall meet the requirements of NFPA 1901, 22.5.3.

Statement of Problem and Substantiation for Public Input

The title did not agree with the requirement below it, or the requirements in the referenced section. Both refer to any generator driven by a fixed auxiliary engine (which would exclude portable generators but would include fixed generators less than 8 kW).

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 04 15:35:12 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-95-NFPA 1900-2021

Statement: These changes have been made as the requirements in chapter 62 seemed disorganized and sometimes the organization or headings contradict the requirements. The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters. It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US. Several changes were also made to update references due to document consolidation.

Public Input No. 114-NFPA 1900-2020 [Section No. 62.4]

62.4 Wiring for Portable Generator.

Installations shall meet the requirements of ~~NFPA 1901, 22~~ 25 .6.3.

Statement of Problem and Substantiation for Public Input

Update reference due to document consolidation.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 18:03:52 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-95-NFPA 1900-2021

Statement: These changes have been made as the requirements in chapter 62 seemed disorganized and sometimes the organization or headings contradict the requirements. The wording either needs to say "the power source is an inverter" or that "the power source derives its input energy from the ambulance low voltage electrical system." By definition (3.3.202) a Power Source is "A device that produces line voltage electricity." Thus, the inverter is the power source producing line voltage electricity, using energy provided by the low voltage electrical system. The corresponding section from fire apparatus (25.5.5) covers other systems that create line voltage electricity using power from the low voltage electrical system, but as electronics become less expensive, inverters are probably the best choice for ambulances of these systems. The rest of the section specifically references that this section just covers inverters. It appears that the existing language was an attempt to show imperial and SI units, but electrical power is measured in watts and kilowatts in the US as well as the rest of the world. While theoretically power measurements can be converted between kilowatts and horsepower (both are measures of power, energy transferred or converted per unit of time), in the US and throughout the world, electrical power is measures in kilowatts. Engine power is measured in kilowatts in the rest of the world and horsepower in the US. Several changes were also made to update references due to document consolidation.

Public Input No. 115-NFPA 1900-2020 [Section No. 63.1.1 [Excluding any Sub-Sections]]

This chapter is applicable to automotive ambulances contracted for remounting on or after ~~January~~ July 1, ~~2019~~ 2023 ; however, nothing shall prevent the voluntary application of this chapter to ambulances contracted for remounting prior to ~~January~~ July 1, ~~2019~~ 2023 if the purchaser and contractor agree to do so.

Statement of Problem and Substantiation for Public Input

Update effective date.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 18:06:14 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-27-NFPA 1900-2021
Statement: These changes are being made in order to update the effective date.

Public Input No. 116-NFPA 1900-2020 [Section No. 63.5.4]

63.5.4

Each ambulance's payload capacity and the horizontal and vertical center of gravity shall be calculated.

63.5.4.1 – *

Horizontal and vertical payload capacity shall be determined by completing ~~an NTEA UltraMod spreadsheet (available~~ the NTEA Vehicle Center of Gravity and Axle Weight Calculator or equivalent.

A.63.5.4.1 The NETA Vehicle Center of Gravity and Axle Weight Calculator is available to NETA members at www.ntea.com~~).~~ . There are similar tools available from other sources.

63.5.4.2

A copy of the ~~UltraMod spreadsheet~~ weight analysis shall be included with the ambulance documentation, along with the following calculations:

(1) Completed vehicle at curb weight

(2) Inclusion of an assumed occupant weight of 171 lb (77 kg) at the horizontal, lateral, and vertical center of each patient location and at the designated H-point of each seating position

(3) The maximum remaining cargo/equipment capacity located at the horizontal, lateral, and vertical dimension center of the patient compartment that will not exceed the vehicle's weight rating capacity.

Statement of Problem and Substantiation for Public Input

The UltraMod spreadsheet is no longer available. The proposed changes were suggested by Steve Spata at NTEA and the NFPA 1917 committee.

Submitter Information Verification

Submitter Full Name: Thomas Stalnaker
Organization: Goshen Fire Company
Affiliation: 1900 Admin Task Group
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 23 18:26:32 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-28-NFPA 1900-2021
Statement: The committee is making these changes in text based on combining the three individual public inputs that are related to this subject/section.

The NTEA UltraMod spreadsheet is no longer available. Other software packages and calculation methods are available and will still meet these needs and the committee believes we should not dictate what program is used.

“Horizontal and vertical payload” does not exist and is removed. Replaced with “Payload”.

The original intent of this section was that the final payload be calculated using the prescribed occupant weight and the finished vehicle curb weight and to ensure compliance with the requirements for OEM pass through certification. The original language did not accurately communicate the objective. The suggested language is our recommendation to clearly communicate the objective.

Public Input No. 1071-NFPA 1900-2020 [Section No. 63.5.4.1]

63.5.4.1

~~Horizontal and vertical payload~~ Payload capacity shall be determined by ~~completing an NTEA UltraMod spreadsheet~~ using the NTEA Vehicle center of gravity and axle weight calculator (available at www.ntea.com) or equivalent .

Statement of Problem and Substantiation for Public Input

There is no such thing as a horizontal and vertical payload.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 16:52:44 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-28-NFPA 1900-2021

Statement: The committee is making these changes in text based on combining the three individual public inputs that are related to this subject/section.

The NTEA UltraMod spreadsheet is no longer available. Other software packages and calculation methods are available and will still meet these needs and the committee believes we should not dictate what program is used.

“Horizontal and vertical payload” does not exist and is removed. Replaced with “Payload”.

The original intent of this section was that the final payload be calculated using the prescribed occupant weight and the finished vehicle curb weight and to ensure compliance with the requirements for OEM pass through certification. The original language did not accurately communicate the objective. The suggested language is our recommendation to clearly communicate the objective.

Public Input No. 1053-NFPA 1900-2020 [Section No. 63.5.4.2]

63.5.4.2

A copy of the ~~UltraMod spreadsheet~~ center of gravity calculation shall be included with the ambulance documentation, along with ~~the following calculations:~~

- ~~Completed vehicle at curb weight~~
- ~~Inclusion of an assumed occupant weight of 171 lb (77 kg) at the horizontal, lateral, and vertical center of each patient location and at the designated H-point of each seating position~~ ~~The~~ a calculation showing the maximum remaining cargo/equipment capacity located at the horizontal, lateral, and vertical dimension center of the patient compartment that ~~will~~ does not result in weights that exceed the vehicle's weight rating ~~capacity.~~ capacities. This calculation shall be completed using the measured completed vehicle curb weight and 171 lb (78 kg) at the horizontal, lateral, and vertical center of each patient location and at the Hpoint of each designated seating position.

Statement of Problem and Substantiation for Public Input

1) The opening statement dictates the use of the Ultramod Spreadsheet with has been superseded. Additionally, NFPA allows the use of equivalent alternatives. Thus, generalizing the statement to, "center of gravity calculation" allows for both changes in the NTEA's tool title and equivalent alternatives.
2) the opening statement requires something it calls the, "lateral payload calculation". There is no such thing with regard to ambulances. Gravity only acts in one direction, down. If you have calculated the CG (required by the first item listed in the opening statement) in all three axis then you know where it is laterally with respect to the vehicles centerline but is still only acts in one direction. So, I am not sure what the objective was with this language.
3) Item 1 on the list of required calculations is not a calculation, it is a measurement.
4) Item 2 on the list of required calculations is not a calculation, is is a prescribed weight at a specific point in space.
5) Item 3 is a calculation. However, it does not specifically require the input of item #2.
I believe the original intent of this section was that the final payload be calculated using the prescribed occupant weight and the finished vehicle curb weight. The original language did not accurately communicate the objective. The suggested language is an attempt to clearly communicate the objective.

Submitter Information Verification

Submitter Full Name: Andrew Conway
Organization: Braun Northwest Ambulances, In
Street Address:
City:
State:
Zip:
Submittal Date: Fri Nov 13 14:46:50 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-28-NFPA 1900-2021

Statement: The committee is making these changes in text based on combining the three individual public inputs that are related to this subject/section.

The NTEA UltraMod spreadsheet is no longer available. Other software packages and calculation methods are available and will still meet these needs and the committee believes we should not dictate what program is used.

“Horizontal and vertical payload” does not exist and is removed. Replaced with “Payload”.

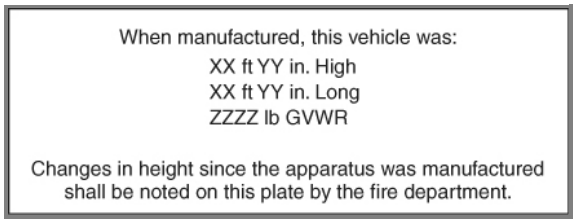
The original intent of this section was that the final payload be calculated using the prescribed occupant weight and the finished vehicle curb weight and to ensure compliance with the requirements for OEM pass through certification. The original language did not accurately communicate the objective. The suggested language is our recommendation to clearly communicate the objective.

Public Input No. 1000-NFPA 1900-2020 [Section No. A.58.1.3.2]

A.58.1.3.2

It is important for ~~ambulance drivers~~ vehicle operators to understand the height and weight of the vehicle compared to their personally owned vehicles. It is also important that this information be accurate. If anything is added above the roofline height as delivered, the plate should be changed to reflect the new height. Suggested wording for the plate is shown in Figure A.58.1.3.2.

Figure A.58.1.3.2 Vehicle Height and Weight Plate.



Statement of Problem and Substantiation for Public Input

Although not discussed in the chassis task group meeting, a follow-up suggestion was made to improve the description of those to whom the ambulance height and weight should be of concern.

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 19:30:28 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-77-NFPA 1900-2021
Statement: This change is being made to improve the description of those to whom the ambulance height and weight should be of concern. Also, the word "fire department" needs to be removed from the label.

Public Input No. 14-NFPA 1900-2020 [Section No. A.58.9]

A.58.9

Electronic stability control (ESC) uses a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls in conjunction with the antilock brake system (ABS). The system tracks the direction that the driver intends to steer and uses brake application at individual wheels to help straighten out the vehicle. This system greatly enhances the safety of the vehicle~~, and the purchaser should consider adding ESC to the ambulance if it is available as an option or consider purchasing an ambulance configuration that offers ESC~~ .

Additional Proposed Changes

File Name	Description	Approved
1917_PI_No._8_D._Fischler.pdf	1917_PI No. 8_D. Fischler	

Statement of Problem and Substantiation for Public Input

This material is no longer needed in that the stability control system will no longer be optional if the input to 5.9 is accepted.

Submitter Information Verification

Submitter Full Name: David Fischler
Organization: Suffolk County Fire Rescue
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jul 28 08:23:07 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-78-NFPA 1900-2021

Statement: This change is being made since the ESC should be provided if it is available from the chassis OEM. It is beyond the means of the FSAM to provide ESC if it is not available from the chassis OEM. It is inappropriate to specify ESC system inputs inasmuch as those are beyond the control of the FSAM. Also, this material is no longer needed in that the stability control system will no longer be optional since it has been included as part of the requirement.

Public Input No. 1001-NFPA 1900-2020 [Section No. A.58.13]

~~**A.58.13** —~~

~~Purchasers might want to consider specifying that all mirror head faces be independently adjustable from the driver's position (if this feature is available from the OEM). Medium- and heavy-duty vehicles (>14,400 lb GVW) should be equipped with a camera at the rear of the vehicle that can be seen and monitored by the driver when the vehicle is in reverse.~~

Statement of Problem and Substantiation for Public Input

The first sentence in this section appears to be superseded by current language in 58.13.2. It would be unusual to have mirrors on an ambulance other than primary side mirrors and inside rearview mirrors.
Although not discussed in the chassis task group meeting, a follow-up suggestion was made to require backup cameras on all ambulances. In that case the second sentence would no longer be necessary.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 999-NFPA 1900-2020 [New Section after 58.13]	A.58.13 can likely be deleted if backup cameras are required in 58.13.1.
Public Input No. 999-NFPA 1900-2020 [New Section after 58.13]	

Submitter Information Verification

Submitter Full Name: Jerry Allen
Organization: Braun Northwest
Street Address:
City:
State:
Zip:
Submittal Date: Wed Nov 11 19:36:50 EST 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-79-NFPA 1900-2021

Statement: These changes are being made in order to require backup cameras on all ambulances. FMVSS 111 requires a rearview image on vehicles under 10k GVWR. Given the generally poor visibility provided by ambulance inside rearview mirrors, it is clear that backing without either a camera or spotter can be dangerous. The concept of exterior cameras is also being included in the annex to give guidance to the AHJ or purchaser should they choose to include exterior cameras as part of the vehicle's specification.

Public Input No. 701-NFPA 1900-2020 [Section No. A.59.8.8]

A.59.8.8

The requirement of ~~6~~ 59 .8.8 does not apply to both rear doors, only the primary door.

Statement of Problem and Substantiation for Public Input

This change is editorial in nature.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 17:13:48 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-56-NFPA 1900-2021
Statement: This change is editorial in nature.

Public Input No. 702-NFPA 1900-2020 [Section No. A.59.15.6]

A.59.15.6

Determination of whether an item is within reach is not an exact science given the vast variability in human forms. Arm and torso length as well as flexibility will vary greatly between individuals. When making trade-offs between reach, comfort, convenience, and practicality, useful anthropometric and human factors data can be found in publications such as MIL-STD-1472, *Department of Defense Design Criteria Standard —- Human Engineering*. and the Department of Homeland Security's Ambulance Patient Compartment Human Factors Design Guidebook.

Statement of Problem and Substantiation for Public Input

This text is being added as it is another good resource that should be included in this section of text.

Submitter Information Verification

Submitter Full Name: Michael Berg
Organization: Delta Response Team
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 24 17:15:40 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-57-NFPA 1900-2021
Statement: This reference is being added as it is another good resource that should be included in this section of text.

Public Input No. 703-NFPA 1900-2020 [Section No. A.59.21.3.1]

A.59.21.3.1

The ultimate mission of any ambulance is to safeguard the health and welfare of the patient being transported. That mission fails if the ambulance does not arrive safely. It is essential that the ambulance be driven in a safe manner and that all occupants are seated and belted while the vehicle is in motion. During emergency responses, emergency medical personnel might be inclined to take more risks than usual and to skip basic vehicle safety precautions. To encourage safe practices, ambulance operation management should consider employing some method of monitoring the driving habits of the ambulance personnel. Methods of monitoring compliance with all safety precautions by personnel in the vehicle include live video monitoring, video recording, and vehicle data recording. Any monitoring method should include monitoring of the use of seat belts and an indication of how carefully the ambulance is being driven.

Purchasers may wish to consider specifying seat belt colors such as bright red or bright orange. Bright belt colors are easier to see on videos or through ambulance windows for enforcement of seat belt use compliance.

Seat belt design is critical to safety during a crash. Seat belts should conform to 49 CFR 571, FMVSS 210, S4.3.1.1, which requires that the lap portion of the belt in any designated seating position not constrain the occupant high across the belly.

If the ambulance will be used with occupants in the patient compartment wearing structural firefighting protective garments, the purchaser should consider specifying the requirements for seat belt systems found in Chapter 17 of this standard.

Statement of Problem and Substantiation for Public Input

This text is being added to assist the end user should they desire the longer seat belt based on the expected occupants of the patient compartment.

Submitter Information Verification

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Submittal Date: Sat Oct 24 17:18:43 EDT 2020
Committee: AMB-AAA

Committee Statement

Resolution: FR-58-NFPA 1900-2021
Statement: This text is being added to assist the end user should they desire the longer seat belt based on the expected occupants of the patient compartment.

Public Input No. 704-NFPA 1900-2020 [Section No. A.59.21.3.3.3]

~~**A.59.21.3.3.3** —~~

~~The H-Point is the mechanically hinged hip point of the torso and thigh on devices used in defining and measuring vehicle seating accommodation in SAE J826, *Devices for Use in Defining and Measuring Vehicle Seating Accommodation* . It is an imaginary point located in two-dimensional space above the seat cushion. The H-Point is measured using a tool that simulates human hips and torso of a specific size and weight. The H-Point will vary with the size, shape, and material of the seat back, seat frame, and seat cushion. If the H-Point measurement is not available, it can be approximated by measuring 5 in. (130 mm) ahead of the seat back and 3 in. (75 mm) up from the nondepressed seat cushion surface.~~

Statement of Problem and Substantiation for Public Input

This text is being deleted as the main body text is being deleted.

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Committee: AMB-AAA

Committee Statement

Resolution: FR-48-NFPA 1900-2021

Statement: This text is being deleted as it is already covered by SAE J3026 and is not necessary to have as part of the requirements of this chapter. This text was borrowed from NFPA 1901 before SAE J3026 was available and the existing text is also geared towards occupants in the patient compartment that might be wearing a structural fire fighter protective garments and the need for longer seatbelt lengths. There is text being added to the annex to point end users to the specific chapter within NFPA 1900 that would applicable should a department desire longer seatbelts.

Public Input No. 442-NFPA 1900-2020 [Section No. A.60.15.2]

A.60.15.2

~~The purchaser should specify the appropriate features to accommodate communication equipment, including, but not limited to, metal ground planes, grounding, coaxial cable, and antenna placement.~~

A.60.15.3 If equipment is going to be installed after delivery, such as radio or data communications equipment, it may be a good idea to consult with the future installer for what accommodations they would like to have the apparatus manufacturer provide to make their work easier.

A.60.15.5 (4)

If a Vehicle Data Recorder (VDR) is provided, it should provide at least the following minimum capabilities:

The VDR should be capable of recording the data shown in Table A.7.12.5(a) at least once per second.

Table A.7.12.5(a) VDR Data

Data	Unit of Measure
Vehicle speed	Mph
Acceleration (from speedometer)	mph/sec
Deceleration (from speedometer)	mph/sec
Engine speed	Rpm
Engine throttle position	% of full throttle
Antilock braking system event	On/off
Seat occupied status	Occupied: Yes/No by position
Seat belt status	Buckled: Yes/No by position
Master optical warning device switch	On/off
Time	24-hour clock
Date	Year/month/day

Data should be stored at the sampling rate in a 48-hour loop.

Memory should be sufficient to record 100 engine hours' worth of minute-by-minute summary showing the data in Table A.7.12.5(b).

Table A.7.12.5(b) VDR Summary Data

Data	Unit of Measure
Maximum vehicle speed	mph
Maximum acceleration (from speedometer)	mph/sec
Maximum deceleration (from speedometer)	mph/sec
Maximum engine speed	rpm
Maximum engine throttle position	% of full throttle
Antilock braking system event	On/off

Data	Unit of Measure
Seat occupied with seat belt unbuckled	Yes/no by position at 30 sec into minute
Master optical warning device switch	On/off at 30 sec into minute
Time	24-hour clock
Date	Year/month/day

When the memory capacity is reached, the system should erase the oldest data first.

All data stored in the VDR should be uploadable by the user to a computer or fire department management/engineering system via cable, Wi-Fi, data channel, cellular data, or other technology.

As a minimum, the user should have the capability to view the data as:

(1) Raw second-by-second data over a specified data/time range

(2) Daily log for the time the engine is running for a given date (minute-by-minute output of all values)

(3) Weekly summary (i.e., maximum values each hour for each day of the week)

(4) Monthly summary (i.e., maximum values each day for each day of the month)

A.60.15.5 (5)

V2X (Vehicle to Everything) communications provide information from a vehicle to other systems. This can include communications through Dedicated Short Range Communications, cellular communications, WLAN, WiFi (in station), and in the case of emergency vehicles, existing radio network data channels. Vehicles may communicate with other vehicles (V2V), Infrastructure such as traffic signals and other fixed infrastructure (V2I), Pedestrians (V2P), Networks (V2N), Devices such as smartphone apps or other portable devices (V2D), Power Grid (V2G), and other systems such as maintenance/engineering departments and other technologies. This is a rapidly growing and developing area of technology with almost unlimited possibilities to improve safety and efficiency. Purchasers need to research available equipment and capabilities, and then direct the contractor to provide the capabilities desired. There are many standards related to these communications including NFPA 950, *Standard for Data Development and Exchange for the Fire Service* and the proposed FMVSS 150, *V2V Communications*

Statement of Problem and Substantiation for Public Input

supporting text for 60.15.2

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 19-NFPA 1900-2020 [New Section after A.7.11.2]	same material

Submitter Information Verification

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Committee: AMB-AAA

Committee Statement

Resolution: FR-91-NFPA 1900-2021

Statement: The VDR was added to the 2009 edition of NFPA 1901. While it has significant value if used, many departments never access the data and thus it adds no value for the purposes it was intended. It can add equipment to every vehicle, whether the department intends to use the data or not. There have been many complaints that on smaller, commercial, chassis, the data needed is not available from the chassis systems and they cannot modify those systems. This proposal makes the VDR optional, while at the same time maintaining the information about a set of minimum standards to a VDR. As technology rapidly advances, a rigid definition of any electronic product quickly becomes outdated. In addition to the VDR, there are many other decisions to be made around onboard data management and communications equipment. Depending on a number of factors, the purchaser may want the contractor to supply and install the equipment, the purchaser may supply equipment and ask the contractor to install the equipment, equipment may be installed after the vehicle is delivered, or the purchaser may decide some equipment is not needed for their department. This section calls for the information to be provided by the purchaser to allow the contractor to meet the requirements of the purchaser. These decisions include not only who provides and/or installs the equipment but also what requirements in terms of space, power provisions, antenna bases and cables, and other provisions should be designed into the vehicle even if the purchaser will install, or have installed, the equipment after delivery of the finished apparatus.