



## National Fire Protection Association

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### MEMORANDUM

**TO:** NFPA Technical Committee on Ambulances  
**FROM:** Stacey Van Zandt  
**DATE:** November 4, 2011  
**SUBJECT:** NFPA 1917 ROC TC Letter Ballot (A2012)

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The ROC letter ballot for NFPA 1917 is attached. The ballot is for formally voting on whether or not you concur with the committee's actions on the comments. Reasons must accompany all negative and abstention ballots.

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

Please complete and return your ballot as soon as possible but no later than **November 21, 2011**. As noted on the ballot form, please return the ballot to Stacey Van Zandt either via e-mail to [svanzandt@nfpa.org](mailto:svanzandt@nfpa.org) or via fax to 617-984-7056. You may also mail your ballot to the attention of Stacey Van Zandt at NFPA, 1 Batterymarch Park, Quincy, MA 02169.

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

Attachments: Comments  
Letter Ballot

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1917-1 Log #7  
(2.3)

Final Action: Accept

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Submitter: John F. Bender, Underwriters Laboratories Inc.

Comment on Proposal No: 1917-32

Recommendation: Revise text as follows:

2.3

ANSI/UL 153, Standard for Portable Electric Luminaires, 2002, Revised 2010

ANSI/UL 498, Standard for Safety Attachment Plugs and Receptacles, 2001, Revised 2010

ANSI/UL 1598, Luminaires, 2008, Revised 2010

Substantiation: Update the referenced standards to the most recent edition.

Committee Meeting Action: Accept

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1917-2 Log #8  
(2.3.x (New) )

Final Action: Accept

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Submitter: John F. Bender, Underwriters Laboratories Inc.

Comment on Proposal No: 1917-3

Recommendation: Revise text as follows:

2.3.x UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096, www.UL.com.

ANSI/UL 969, Standard for Marking and Labeling Systems, ~~2006~~ 1995, Revised 2008.

ANSI/UL 2034, Standard for Safety, Single and Multiple Station Carbon Monoxide Alarms, 2008, Revised 2009.

Substantiation: Add ANSI approval designation to ANSI/UL 969 and update referenced standard to most recent edition.

Add ANSI/UL 2034 if the proposed recommendation stated in ROP 1917-500 Log#30 is accepted by the TC.

Committee Meeting Action: Accept

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1917-3 Log #16  
(2.3.4)

Final Action: Accept in Principle in Part

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-490

Recommendation: Delete text as follows:

~~2.3.4 ECE Publications: UN Economic Commission for Europe, Palais des Nations, CH-1211 Geneva 10, Switzerland:  
ECE R29, *Uniform Provisions Concerning the Approval of Vehicles with Regard to the Protection of the Occupants of the Cab of a Commercial Vehicle.*~~

Substantiation: This is a standard that is a) not a US standard, b) not readily available in the US, and c) not relevant to modular ambulances. No justification has been provided for including this standard.

Committee Meeting Action: Accept in Principle in Part

Revise the following text:

5.15 Cab Integrity. Cabs on ambulances with a GVWR greater than 26,000 lb (11,800 kg) shall meet the requirements of one of the following sets of standards:

(†) SAE J2420, COE Frontal Strength Evaluation — Dynamic Loading Heavy Trucks, and SAE J2422, Cab Roof Strength Evaluation — Quasi-Static Loading Heavy Trucks

(2) ~~ECE Regulation number 29, Uniform Provisions Concerning the Approval of Vehicles with Regard~~

Committee Statement: The committee accepted the comment and also revised text to delete the document being referenced deleted from the document.

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1917-4 Log #32  
(3.3.3 Ambulance)

Final Action: Accept

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Submitter: Charles D. Drake, Goshen, IN

Comment on Proposal No: 1917-44

Recommendation: Revise text to read as follows:

A vehicle used for emergency out of hospital medical care and patient transport that provides a driver's compartment; a patient compartment to accommodate an emergency medical services provider (EMSP) and one patient located on the primary cot so positioned that the primary patient can be given emergency care during transit; equipment and supplies for emergency care at the scene as well as during transport; safety, comfort and avoidance of aggravation of the patient's injury or illness; two-way radio communication; and audible and visual traffic warning devices.

Substantiation: The definition reworded as above now follows the verbiage as set forth in Section 1.1 Scope. This eliminates any confusion about emergency (911) ambulances and transport ambulances.

Committee Meeting Action: Accept

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1917-5 Log #37  
(3.3.9 Chassis and A.3.3.9)

Final Action: Accept

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Submitter: Marcelo M. Hirschler, GBH International

Comment on Proposal No: 1917-1a

Recommendation: Revise text to read as follows:

3.3.9\* Chassis. The basic operating motor vehicle including the engine, frame, and other essential structural and mechanical parts, but exclusive of the body and all appurtenances for the accommodation of driver, property, passengers, appliances, or equipment related to other than control. ~~Common usage might, but need not, include a cab (or cowl):~~

A.3.3.9 Common usage might, but need not, include a cab (or cowl).

Substantiation: The NFPA manual of style requires definitions to be in single sentences. The second sentence should become an annex note. Alternately the information can be placed in the body of the standard.

I am the chair of the NFPA Committee on the Glossary of Terminology.

Committee Meeting Action: Accept

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1917-6 Log #9  
(4.9.2)

Final Action: Accept

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Submitter: John F. Bender, Underwriters Laboratories Inc.

Comment on Proposal No: 1917-145

Recommendation: Revise text as follows:

4.9.2\* All required signs, instruction plates, and labels shall be permanent in nature and securely attached and shall meet the requirements of 4.9.4 and ANSI/UL 969, Standard for Marking and Labeling Systems.

Substantiation: Add ANSI approval designation to ANSI/UL 969.

Committee Meeting Action: Accept

1917-7 Log #5  
(4.13.3)

Final Action: Reject

Submitter: Michael P. Lewis, Berkeley County EMS

Comment on Proposal No: 1917-258

Recommendation: Revise text to read as follows:

~~(77 mph)~~ (80 mph)

Substantiation: Interstate travel top speed is 70 mph, 80 mph would be a better number to use the left lane and not cause any traffic issues.

Committee Meeting Action: Reject

Committee Statement: Committee consensus originally was that 75 mph was fast enough for ambulances and the extra 2 mph accounted for some tolerance. Some chassis OEM software may be limited to set-points at even numbers only, and others in increments of 5 mph. The 77 mph specification allows a 74, 75 or 76 mph set point to be in compliance with a little tolerance for system error.

1917-8 Log #17  
(4.17.3)

Final Action: Reject

Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-10

Recommendation: Revise text to read as follows:

4.17.3 An ambulance that is delivered subject to a Statement of Exceptions other than a certification of full compliance shall not be placed in emergency service until the ambulance has been ~~modified as necessary to accomplish full compliance with this standard~~ accepted for service by the authority having jurisdiction.

Substantiation: The intent of the NFPA ambulance standard is to establish minimum requirements for automotive ambulances. Prescribing whether an ambulance delivered subject to a Statement of Exceptions can be placed in service is the responsibility of the authority having jurisdiction (AHJ).

In eliminating the AHJ's ability to request an exception and to accept and place in service an ambulance with the requested exception, the standard as written will fail to meet customer needs sufficiently to serve as a consensus standard.

The important point here is that the standard with this proposed change does establish the minimum requirements for new automotive ambulances. Dictating to an AHJ what they can and cannot place in service, however, goes subtly but very significantly beyond the defined scope of this standard.

The standard should not restrict the AHJ from placing in service an ambulance for which they have requested exceptions.

Committee Meeting Action: Reject

Committee Statement: Proposed changes allows the purchaser to essentially ignore the standard.

1917-9 Log #35  
(5.1.2(5))

Final Action: Reject

Submitter: Joseph V. Maruca, West Barnstable Fire Department

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

(5) 171 lb (78 kg) to account for each patient.

Substantiation: The addition of the word "each" clarifies that you need to account for the weight of each patient the ambulance is designed to carry, not just one patient if the ambulance can carry two or more.

Committee Meeting Action: Reject

Committee Statement: The text the comment is referencing no longer exists, but has been replaced by Table 5.1.1.

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1917-10 Log #18  
(5.1.3.2)

Final Action: Reject

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

5.1.3.2 The label shall show the height of the completed ambulance in feet and inches (meters), and the GVWR in ~~tons (metric tons)~~ pounds.

Substantiation: US highway and bridge weight restrictions as well as gross vehicle weight ratings are most often expressed in pounds. Expressing the ambulance GVWR in the same units (pounds) will minimize confusion.

Committee Meeting Action: **Reject**

Committee Statement: Intent of this label is to give the driver a quick indication of what capacity of bridge he can cross. Bridge signs are posted in tons, so the label should indicate in tons.

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1917-11 Log #19  
(5.9.1)

Final Action: **Accept in Principle**

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-374, through 1917-378

Recommendation: Revise text to read as follows:

5.9.1 ~~Hub caps or wheel covers shall not obscure the wheel nuts so that they can be readily observed for daily inspection. Wheel nuts shall be tightened to the chassis manufacturer's recommendations prior to vehicle delivery.~~

Substantiation: We should not operate under the delusion that a visual inspection is a substitute for proper torquing procedures. Moreover, engineering science supports the conclusion that properly torqued wheel nuts will not come loose.

Committee Meeting Action: **Accept in Principle**

Replace 5.9.1 with the following:

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

Committee Statement: The committee chose to modify text to require that wheel covers be removable without removing the lug nuts. This will give the operator the ability to inspect wheels and lug nuts frequently to check for wheel integrity, nut condition, etc...

1917-12 Log #34  
(5.9.2)

**Final Action: Accept in Principle**

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**Submitter:** H. Stephen Williamson, American Ambulance Association

**Comment on Proposal No:** 1917-374, through 1917-378

**Recommendation:** Revise text as follows:

Section 5.9.2 currently provides that "Hub caps or wheel covers shall not obscure the wheel nuts so that they can be readily observed for wheel inspection".

AAA proposes a revision to provide that "Hub caps or wheel covers on vehicles with GVWR of 15,000 or greater shall not obscure the wheel nuts so that they can be readily observed for wheel inspection"

The revised language would replace the existing provision in its entirety.

**Substantiation:** The AAA represents ambulance service agencies that provide over 75% of the U.S. population with emergency and non-emergency ambulance services. Of those agencies, one operates vehicles that travel more than 100,000,000 miles annually and has not had an incident where lug nuts have come loose and a tire fallen off. EMS vehicles are routinely serviced with tire rotation, repair and replacement and are checked for tightness. In addition, Ford Motor Company, which produces more than 90% of all ambulance chassis in the U.S. has advised that vehicles sold by Ford with steel wheels are delivered with hub caps to protect the wheel studs from unnecessary corrosion. Corrosion of the steel hubs makes removal of the lug nut difficult when rotating, repairing or replacing tires. Specifically, without the hub caps the wheel studs will oxidize and make it very difficult to remove the studs. The studs are not painted and are not stainless as they need to be of a tensile strength that stainless steel cannot provide. Vehicles exceeding 15,000 GVWR are commonly delivered with aluminum wheels that include chrome deep lug nuts that completely cover the wheel studs and have a center cap that prevents oxidization.

**Committee Meeting Action:** **Accept in Principle**

See committee action on 1917-11 (Log #19).

**Committee Statement:** The committee chose to modify text to require that wheel covers be removable without removing the lug nuts. This will give the operator the ability to inspect wheels and lug nuts frequently to check for wheel integrity, nut condition, etc...

1917-13 Log #36  
(5.9.2)

Final Action: Accept in Principle

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Submitter: Jan Polka, Realwheels Corp.

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

Hub caps or wheel covers ~~shall not obscure the wheel nuts so that they can be readily observed for daily inspections.~~

Hub caps or wheel covers shall not mount under the wheel lug nuts as to disturb the torque or integrity of the wheel nuts.

Hub caps or wheel covers shall be a removable type so that wheel nuts can be inspected. Additionally if individual wheel lug nut covers are used, They shall be a type that provides a separate directional indicator that will indicate when a wheel nut may be starting to come lose, and can be alerted to during inspections.

Substantiation: Hub caps and wheel covers that mount under the lug nuts have shown to disturb the torque and integrity of wheel nuts and studs, per OEM wheel manufactures. They are put on with air guns and are not easily removed for inspections. I agree these types of hub caps/wheel covers should not be used. However, hub caps or wheel covers of the removable type are not attached, nor disturb the wheel nuts in any way. They can easily be removed for inspections. Plus they serve to protect the wheel nuts and act as a dust/debris cover for the wheel itself. Hub caps and wheel covers that are easily removed for inspections do not affect wheel nuts. If additional concerns of wheel nut inspections and or loose wheel nuts remain an issue. Then the use of a lug nut cover with a torque indicator is much better to have, than just physically seeing the wheel nuts. A lug nut cover torque indicator will instantly alert the inspector that a loose wheel nut exists, and can be corrected right away or noted for later repair.

Committee Meeting Action: **Accept in Principle**

See committee action on 1917-11 (Log #19).

Committee Statement: The committee chose to modify text to require that wheel covers be removable without removing the lug nuts. This will give the operator the ability to inspect wheels and lug nuts frequently to check for wheel integrity, nut condition, etc...

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1917-14 Log #43  
(5.9.2)

Final Action: Accept in Principle

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Submitter: David Waid, Regional Pramedical Services

Comment on Proposal No: 1917-375

Recommendation: Revise text to read as follows:

Hub caps or wheel covers shall be easily removed for inspection of wheel nuts not obscure the wheel nuts so that they can be readily observed for daily inspection. If wheel covers are used, they should implement a locking lug nut cover so as to provide a double lock lug nut. If a special tool is to be used, then tool shall be provided with ambulance. Wheel Lugs should only be inspected by qualified technicians

Substantiation: Under NFPA 1901, NFPA1906, no standard is provided addressing wheel covers or hub caps. Most injuries to firefighters on an apparatus is from a rollover, which a pressure monitoring system addresses that issue. No Federal agency has been able to provide information that having a wheel cover has directly caused a crash or rollover. National Highway Traffic Safety Administration (NHTSA), which is the government agency that maintains statistics on fatalities, has stated that in the past 10 years, no ambulance has been involved in a crash with a fatality that has occurred as a result of wheel or wheel liner failure. In fact, images are presented that show during some of the worst crashes wheel covers have in fact helped the wheel stay attached to the ambulance.

Since most ambulances are tax payer owned, the general public expects to see a clean and shiny ambulance. The stainless steel wheel liners offer the perception of clean and well maintained ambulance.

The statement of wheel nuts being readily observed for daily inspection indicates that a person can determine the proper torque of a lug nut by a visual examination which is not true. To determine proper torque requires specialized tools and specialized training. Where will the liability fall for making this statement?

The maintenance of lug nuts and wheels should be addressed similar to NFPA 1901 4.3.2 – After acceptance of the fire apparatus, the purchaser shall be responsible for ongoing training of personnel to develop and maintain proficiency regarding the proper and safe use of the apparatus and the associated equipment.

In addition, by not allowing wheel covers, many manufacturers, dealers and end-users will be forced to resume painting the wheels. Painting creates more issues- paint hides stress fractures and cracks in the wheel, they become heavier over time as wheels are repainted, and it doesn't allow heat to dissipate and increases the chances that stress fractures and cracks will occur within the wheel. Another issue with painting steel wheels it creates environmental issues with excess paint needing to be disposed.

Painting wheel covers can potentially add undue financial burden. Average lifespan of an ambulance is three to five years. Repainting wheels can add additional expense of 1500-2500 dollars over the lifespan. This does not include the expense of downtime of the ambulance to have the wheels painted and reinstalled or if they keep extra wheels, the additional expense of purchasing and storing additional wheels.

Wheel liners/covers assist in reducing the dirt and grime on wheels and lug nuts. They act as some protection against the ordinary road grime and brake dust and are easy to clean and maintain. When the ambulance is washed with soap and water, the wheel covers are cleaned the same way. No special chemicals or cleaners are required.

In reviewing actual and customary standards within ambulance fleets and municipalities, their standard daily checklist comprises of tire checks (inflated properly), fuel and fluid levels, supplies and monitoring equipment for patient are stocked and working properly, lights function properly and check for cleanliness and if any visible damage to vehicle. Not one of the check lists we found include a check or inspect lug nuts or wheels. This is reserved for the mechanics. Recommendations from different wheel and tire manufacturers recommend torque of lug nuts to specifications, which vary from make and model, at 50 to 100 miles and thereafter at 10,000 mile intervals. Accurate checking of lug nuts can only be done with a calibrated torque wrench. Specialized tooling requires specialized training. This is a higher level inspection that should be reserved for professionals not a responsibility placed upon the average EMT/Paramedic as their professional role is care and transport of the patient. Sample checklists have been provided to review.

With Phoenix USA DOT liners, all four wheel liners can be removed in about 10 minutes. For most sets, it 3 pieces per wheel to be removed, 2 Phoenix USA locking lug nut covers and 1 wheel cover. It is recommended that this be performed any time there are mechanics dismounting or remounting wheels and/or tires. We are willing to include an easy to read instructions sheet/card to be included with sets for ambulance manufacturers, to guide anyone that may be involved with removal and/or installation of a set of wheel liners on proper care and installation.

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

Hub Supplier

Committee Meeting Action: Accept in Principle

See committee action on 1917-11 (Log #19).

**Committee Statement:** The committee chose to modify text to require that wheel covers be removable without removing the lug nuts. This will give the operator the ability to inspect wheels and lug nuts frequently to check for wheel integrity, nut condition, etc...

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1917-15 Log #38  
(5.13.3 (New) )

**Final Action: Reject**

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**Submitter:** Marcelo M. Hirschler, GBH International

**Comment on Proposal No:** 1917-1a

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

5.13.3 Padding components of seats shall comply with the requirements of California Technical Bulletin 117, Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture.

*Also, add California Technical Bulletin 117, Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture, 2000, to the section on referenced standards.*

**Substantiation:** It is important that the all seats, including those in the front and in the passenger compartment comply with some minimal fire safety requirements and this standard will ensure that. The requirements of FMVSS 302 are insufficient to ensure fire safety.

**Committee Meeting Action:** Reject

**Committee Statement:** FMVSS 302 already provides a minimum standard that is appropriate for vehicles. The comment is suggesting applying a non-vehicle standard.

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1917-16 Log #13  
(5.14)

**Final Action: Accept in Principle**

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**Submitter:** Paul Hughes, Velvac Inc.

**Comment on Proposal No:** 1917-3

**Recommendation:** Add new text as follows:

Mirror span from driver's side inside glass edge to passenger side glass edge shall be two inches greater than overall width of ambulance body.

This will enable drivers to see clearly down the sides of the vehicle.

**Substantiation:** Previous collateral submitted shows over 50% of ambulance accidents are side swipes. NHTSA recommends mirror span per suggestion above to obtain maximum visibility.

**Committee Meeting Action:** Accept in Principle

Add new text to read as follows:

5.14.5 Each side view mirror reflective surface outboard edge shall extend at least one inch beyond the outside of the modular body.

**Committee Statement:** The Committee agreed with the comment but re-worded the proposed text to avoid the situation where the mirrors could be installed unsymmetrically but still meet the letter of the specification.

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1917-17 Log #20  
(6.3.1.1)

Final Action: Accept in Principle

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-490

Recommendation: Delete text to read as follows:

~~6.3.1.1 The modular body shall be tested in accordance with SAE J2422 and ECE R29.~~

Substantiation: From the document title and scope descriptions alone, it is clear that these standards were not intended to apply to modular ambulance bodies.

SAE J2422 is the standard for Cab Roof Strength Evaluation—Quasi-Static Loading Heavy Trucks. "Scope—This SAE Recommended Practice describes the test procedures for conducting quasi-static cab roof strength tests for heavy-truck applications. Its purpose is to establish recommended test procedures which will standardize the procedure for heavy trucks."

ECE R29 is Uniform Provisions Concerning The Approval of Vehicles with Regard to The Protection of The Occupants of The Cab of a Commercial Vehicle.

Commercial vehicle cabs, because of their inherently high proportion of glass relative to metal structure present unique challenges for occupant protection. Accordingly these two standards address issues and prescribe test procedures that are relevant to cab structure—not ambulance modules.

No justification has been provided for inclusion of these standards. Moreover, there is no guidance provided for how these commercial truck cab tests would be applied to ambulance modules.

There is not an industry consensus for using these cab test standards on ambulance modules. In contrast, the static load tests were formulated through AMD via an industry consensus process and are already incorporated in the NFPA ambulance standard (Sections 6.3 and 6.4).

Committee Meeting Action: Accept in Principle

See committee action on 1917-18 (Log #33).

Committee Statement: Committee recommends creating a new specific test for the ambulance modular body that will be introduced in the next revision. NIOSH is currently working on this. In the mean time the AMD test requirements are still included in this standard.

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1917-18 Log #33  
(6.3.1.1)

Final Action: Accept

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Submitter: Charles D. Drake, Goshen, IN

Comment on Proposal No: 1917-490

Recommendation: Revise text to read as follows:

The modular body shall be tested in accordance with ~~SAE J2422 and ECE R29~~ Section 9.1 Ambulance Body Structure Test.

Substantiation: Dynamic testing forces are still under evaluation for appropriate loads, changing the above section keeps it in sync with the current verbiage as defined in Section 9 of the NFPA 1917 document.

Committee Meeting Action: Accept

1917-19 Log #11  
(6.5.2)

Final Action: Accept

Submitter: John F. Bender, Underwriters Laboratories Inc.

Comment on Proposal No: 1917-500

Recommendation: Revise as follows:

6.5.2 Sealing Out Exhaust Gas.

6.5.2.1 The body shall be sealed and vented so that the interior carbon monoxide level does not exceed 13 ppm of CO.

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

Substantiation: Specify that a "listed" carbon monoxide detector is required and add reference to ANSI/UL 2034 to ensure the carbon monoxide detector meets the appropriate safety test standard for this application. Change the previous proposed value of "10 ppm of CO above ambient" to 13 ppm to account for the 3 ppm ambient background of CO that UL typically allows when testing. This provides an absolute overall value in the standard and removes any ambiguity that may be created about what value to account for "ambient conditions" in the previous proposed text.

The TC action and substantiation on proposal 1917-514 (Log #CP12) provided to delete the CO detector is too simplistic and misleading in portraying the CO detection devices as being "unreliable or too sensitive." In addition, there is also research that demonstrates CO detection is needed in ambulances.

Since October of 1998, UL 2034 (Standard for Safety, Single and Multiple Station Carbon Monoxide Alarms) has included requirements that CO alarms evaluated to this standard not produce an alarm signal when exposed to 30 ppm of CO for 30 days, and 70 ppm of CO for one hour. UL 2034 requirements have been developed to cover required alarm thresholds, as well as shall not alarm threshold, as noted in the following text from the scope of the standard:

"1.1 These requirements cover electrically operated single and multiple station carbon monoxide (CO) alarms intended for protection in ordinary indoor locations of dwelling units, including recreational vehicles, mobile homes, and recreational boats with enclosed accommodation spaces and cockpit areas.

1.2 Carbon monoxide alarms covered by these requirements are intended to respond to the presence of carbon monoxide from sources such as, but not limited to, exhaust from internal-combustion engines, abnormal operation of fuel-fired appliances, and fireplaces. Carbon monoxide alarms are intended to alarm at carbon monoxide levels below those that cause a loss of ability to react to the dangers of carbon monoxide exposure. See Table 39.1, Part A, Alarm – carbon monoxide concentration and response time.

1.3 Carbon monoxide alarms covered by this standard are not intended to alarm when exposed to long-term, low-level carbon monoxide exposures or slightly higher short-term transient carbon monoxide exposures, possibly caused by air pollution and/or properly installed/maintained fuel-fired appliances and fireplaces. See Table 39.1, Part B, False alarm resistance specifications."

As noted above, these thresholds also cover CO alarms for use in RV's, which have some similarities to ambulances. Thus, I do not believe that the alarm thresholds specified for current CO alarms in UL 2034 are unnecessarily too sensitive for use in ambulances too. It is my opinion that if the CO alarms/detectors mentioned in the substantiation ("Many public comments on the fact that CO monitors are unreliable or too sensitive.") were evaluated to these UL 2034/UL 2075 requirements, then the devices were not "too sensitive" but were delivering appropriate alarm signals that need to be acted upon. Indeed, the research noted below points toward a need for perhaps even more sensitive CO thresholds than currently exist in UL 2034.

Researchers R. Iglewicz, K. Rosenman, B. Iglewicz, K. O'Leary, and R. Hockemier published a study in the American Journal of Public Health, May 1984, Vol. 74, No. 5. In this study, Elevated Levels of Carbon Monoxide in the Patient Compartment of Ambulances, the researchers summarized the measurements of CO levels in a number of ambulances. Some of their conclusions were:

- If the absolute CO level exceeded 35 ppm at the head of the stretcher, the ambulance should not be used until repairs had been made.

- 15 (2.2%) of the tested ambulances had CO levels greater than 35 ppm at the head of the stretcher.

- CO levels of greater than 10 ppm above ambient air CO levels were significant enough to highlight a problem.

- 174 (25.3%) of the tested ambulances had CO levels greater than 10 ppm above ambient air CO levels.

Based on the above, the substantiation provided by the Technical Committee for removing the requirement for CO detection in ambulances is not sufficient, in my view. If the Technical Committee wishes to remove the CO detection requirement, further technical justification is needed.

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

Substantiation provided by John L. Parssinen, P.E., Senior Staff Engineer, Life Safety and Security, Underwriters

Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062

Committee Meeting Action: Accept

1917-20 Log #10  
(6.5.2.2)

Final Action: Accept

Submitter: John F. Bender, Underwriters Laboratories Inc.

Comment on Proposal No: 1917-500

Recommendation: Revise as follows:

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

Substantiation: Specify that a "listed" carbon monoxide detector is required and add reference to ANSI/UL 2034 to ensure the carbon monoxide detector meets the appropriate safety test standard for this application.

The previous TC action and substantiation to delete the CO detector is too simplistic and misleading in portraying the CO detection devices as being "unreliable or too sensitive." In addition, there is also research that demonstrates CO detection is needed in ambulances.

Since October of 1998, UL 2034 (Standard for Safety, Single and Multiple Station Carbon Monoxide Alarms) has included requirements that CO alarms evaluated to this standard not produce an alarm signal when exposed to 30 ppm of CO for 30 days, and 70 ppm of CO for one hour. UL 2034 requirements have been developed to cover required alarm thresholds, as well as shall not alarm threshold, as noted in the following text from the scope of the standard:

"1.1 These requirements cover electrically operated single and multiple station carbon monoxide (CO) alarms intended for protection in ordinary indoor locations of dwelling units, including recreational vehicles, mobile homes, and recreational boats with enclosed accommodation spaces and cockpit areas.

1.2 Carbon monoxide alarms covered by these requirements are intended to respond to the presence of carbon monoxide from sources such as, but not limited to, exhaust from internal-combustion engines, abnormal operation of fuel-fired appliances, and fireplaces. Carbon monoxide alarms are intended to alarm at carbon monoxide levels below those that cause a loss of ability to react to the dangers of carbon monoxide exposure. See Table 39.1, Part A, Alarm – carbon monoxide concentration and response time.

1.3 Carbon monoxide alarms covered by this standard are not intended to alarm when exposed to long-term, low-level carbon monoxide exposures or slightly higher short-term transient carbon monoxide exposures, possibly caused by air pollution and/or properly installed/maintained fuel-fired appliances and fireplaces. See Table 39.1, Part B, False alarm resistance specifications."

As noted above, these thresholds also cover CO alarms for use in RV's, which have some similarities to ambulances. Thus, I do not believe that the alarm thresholds specified for current CO alarms in UL 2034 are unnecessarily too sensitive for use in ambulances too. It is my opinion that if the CO alarms/detectors mentioned in the substantiation ("Many public comments on the fact that CO monitors are unreliable or too sensitive.") were evaluated to these UL 2034/UL 2075 requirements, then the devices were not "too sensitive" but were delivering appropriate alarm signals that need to be acted upon. Indeed, the research noted below points toward a need for perhaps even more sensitive CO thresholds than currently exist in UL 2034.

Researchers R. Iglewicz, K. Rosenman, B. Iglewicz, K. O'Leary, and R. Hockemier published a study in the American Journal of Public Health, May 1984, Vol. 74, No. 5. In this study, *Elevated Levels of Carbon Monoxide in the Patient Compartment of Ambulances*, the researchers summarized the measurements of CO levels in a number of ambulances. Some of their conclusions were:

- If the absolute CO level exceeded 35 ppm at the head of the stretcher, the ambulance should not be used until repairs had been made.
- 15 (2.2%) of the tested ambulances had CO levels greater than 35 ppm at the head of the stretcher.
- CO levels of greater than 10 ppm above ambient air CO levels were significant enough to highlight a problem.
- 174 (25.3%) of the tested ambulances had CO levels greater than 10 ppm above ambient air CO levels.

Based on the above, the substantiation provided by the Technical Committee for removing the requirement for CO detection in ambulances is not sufficient, in my view. If the Technical Committee wishes to remove the CO detection requirement, further technical justification is needed.

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

Substantiation provided by John L. Parssinen, P.E. Senior Staff Engineer, Life Safety and Security, Underwriters Laboratories Inc., 333 Pflingsten Road, Northbrook, IL 60062

Committee Meeting Action: Accept

1917-21 Log #4  
(6.14)

Final Action: Accept in Principle

Submitter: William Ott, Link Manufacturing, Ltd.

Comment on Proposal No: 1917-570

Recommendation: Revise text to read as follows:

6.14 Floor.

6.14.1 The patient compartment floor shall be flat, except when the area near the rear entrance door is sloped for a lower entering height.

~~6.14.2 The floor height at loading shall be a maximum of 34 inches.~~

6.14.2 Floor Height

6.14.2.1 For 4X2 ambulances, the floor height shall be a maximum of 34 inches

6.14.2.2 For 4X4 ambulances, the floor height shall be a maximum of 39 inches

~~6.14.2~~ 6.14.3 With the exception of cot related hardware, the floor shall be unencumbered in the door(s) access and work area.

6.14.4 Sub Floor

~~6.14.3~~ 6.14.4.1 The sub floor of the modular body patient compartment shall be designed to prevent water penetration.

~~6.14.4~~ 6.14.4.2 The sub floor of the modular body shall include a heat shield.

~~6.14.5~~ The floor shall be designed to eliminate voids or pockets, where water or moisture can become trapped.

~~6.14.6~~ 6.14.4.3 The sub floor construction shall cover the full length and width of the patient compartment.

~~6.14.7~~ 6.14.4.4 The sub floor of the patient compartment shall be not less than 0.5 in. (13 mm) thick.

~~6.14.8~~ 6.14.4.5 The sub floor material shall be non-hygroscopic.

~~6.14.9~~ 6.14.4.6 If plywood is used in the sub floor it shall be marine or exterior grade.

6.14.5 The floor shall be designed to eliminate voids or pockets, where water or moisture can become trapped.

6.14.6 Body Floor Structural Integrity.

Renumber remainder of Standard as required.

Substantiation: 1. Previous versions of KKK-A-1822 have included maximum floor height requirements

2. GSA's KKK-A-1822 floor height requirements has given suppliers to the ambulance industry standard design guidelines to aid in the design of universal patient handling equipment

3. Loading and unloading patients is a dangerous operation (3)

4. Patient size and weights are increasing (1), (2)

5. Giving designers and manufacturers design standards will enable the industry to maintain some universality of their equipment. Removing the floor height requirement may lead to large variations in floor height from vehicle or body manufacturer. This will make it more difficult, and as a result, more expensive for equipment manufacturers to anticipate and accommodate the full range of ambulance floor heights that may appear in the industry.

References

1) Increasing Obesity Requires New Ambulance Equipment, "NY Times", Zezima, Katie, April 8, 2008

2) As obesity increases, so does challenge to EMS, Pittsburg Post-Gazette, Fuoco, Michael, March 21, 2010

3) Ambulance stretcher adverse events, Wang, H.E., Qual Saf Health Care 2009;18:213-216

doi:10.1136/qshc.2007.024562

Committee Meeting Action: Accept in Principle

Add new Annex to read as follows:

A.6.14.2 The Purchaser may wish to consider the rear maximum load height based on the primary stretcher being utilized. Current accepted maximum load heights as stated by the cot manufacturers are 34" to 36". The load height is dependent on the chassis chosen. Chassis with four wheel drive are traditionally 4" – 6" higher than a comparable 4 x 2.

Committee Statement: It is the committees intention to allow design flexibility in loading height, but will add guidance on maximum load height in the annex cautioning buyers to pay close attention to their load height requirements.

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1917-22 Log #39  
(6.15)

Final Action: Reject

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Submitter: Marcelo M. Hirschler, GBH International

Comment on Proposal No: 1917-1a

Recommendation: Revise text to read as follows:

**6.15 Insulation.**

6.15.1 Where the patient compartment is insulated, it shall be insulated with a nonsettling type, verminproof, mildewproof, nontoxic, and nonhygroscopic material ~~that meets the requirements of FMVSS 302.~~

6.15.2 If fiberglass insulation is used, it shall be protected from exposure to water.

6.15.3 Insulation materials shall exhibit a flame spread index not to exceed 75 and a smoke-developed index not to exceed 450 when tested in accordance with ASTM E84 or ANSI/UL 723.

Also add ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, 2011a and ANSI/UL 723, Standard for Test for Surface Burning Characteristics of Building Materials, 2010, into section 2 on referenced standards.

**Substantiation:** FMVSS 302 has no requirements for concealed materials, including concealed insulation. The typical requirements for concealed insulation are those requiring fire testing using the Steiner tunnel, ASTM E84 or UL 723. This will ensure a minimum amount of fire safety and virtually all commercial insulation materials are typically tested to this standard. Requiring a flame spread index of 75 and a smoke developed index of 450 (for concealed insulation) corresponds to a Class B, which many insulations can meet.

FMVSS 302 applies only to exposed surfaces and is an extremely mild test, intended for cigarette protection only.

NFPA 556 was developed by the NFPA technical committee on hazard and risk of contents and furnishings. NFPA 556, Guide on Guide on Methods for Evaluating Fire Hazard to Occupants of Passenger Road Vehicles, explains why it is unsafe to rely on fire testing to FMVSS 302, even if it were applicable. NFPA 556 shows that testing to FMVSS 302 does not provide fire safety because virtually every material passes the test.

**Committee Meeting Action:** Reject

**Committee Statement:** FMVSS 302 already provides a minimum standard that is appropriate for vehicles. The commenter is suggesting applying a non-vehicle standard.

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1917-23 Log #40  
(6.17.3)

Final Action: Reject

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Submitter: Marcelo M. Hirschler, GBH International

Comment on Proposal No: 1917-1a

Recommendation: Revise text to read as follows:

6.17.3 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 FMVSS 302~~

~~(4) (3) Able to be cleaned and disinfected~~

(4) Interior finish materials shall exhibit a flame spread index not to exceed 75 and a smoke-developed index not to exceed 450 when tested in accordance with ASTM E84 or ANSI/UL 723.

Also add ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, 2011a and ANSI/UL 723, Standard for Test for Surface Burning Characteristics of Building Materials, 2010, into section 2 on referenced standards.

Substantiation: The typical requirements for interior finish materials are those requiring fire testing using the Steiner tunnel, ASTM E84 or UL 723. This will ensure a minimum amount of fire safety and many interior finish materials are tested to this standard. Requiring a flame spread index of 75 and a smoke developed index of 450 (for concealed insulation) corresponds to a Class B, which most wood materials can meet.

FMVSS 302 is an extremely mild fire test, intended for cigarette protection only.

NFPA 556 was developed by the NFPA technical committee on hazard and risk of contents and furnishings. NFPA 556, Guide on Guide on Methods for Evaluating Fire Hazard to Occupants of Passenger Road Vehicles, explains why it is unsafe to rely on fire testing to FMVSS 302. NFPA 556 shows that testing to FMVSS 302 does not provide fire safety because virtually every material passes the test.

Committee Meeting Action: Reject

Committee Statement: See committee statement on 1917-22 (Log #39).

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1917-24 Log #21  
(6.20.3)

Final Action: Accept

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-643

Recommendation: Revise text to read as follows:

6.20.3 Each patient compartment cabinet shall be permanently labeled ~~on the exterior of the cabinet~~ with its maximum load capacity.

Substantiation: The science of emergency management shows that emergency responders are best served by selective presentation of only the most-essential information. Superfluous information adds clutter and interferes with effective decision making processes.

Putting the label on the inside of the cabinet serves the intended purpose without cluttering the ambulance interior with non-emergency-related information.

Committee Meeting Action: Accept

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1917-25 Log #22  
(6.21.3.3)

Final Action: Reject

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-729

Recommendation: Delete text to read as follows:

~~6.21.3.3 Signs that read "Occupants Must Be Seated and Belted When Ambulance Is in Motion" shall be visible from each seated position.~~

Substantiation: While the requirement to be belted has unquestionable safety value, there is no more justification for this labeling requirement than for a label on the dashboard stating that drivers must drive safely.

Printed instructions in the module should be restricted to those that provide needed but otherwise unknown information to the occupants.

Committee Meeting Action: Reject

Committee Statement: The label is a reminder for those non EMS personnel that seats belts are available to them.

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1917-26 Log #23  
(6.21.7.3)

Final Action: Reject

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-685

Recommendation: Delete text as follows:

~~6.21.7.3 A back cushion that extends from the seat bottom cushion vertically at least 7 in. (460 mm) and that is a minimum of 18 in. (460 mm) wide at the base shall be provided.~~

Substantiation: The intent of this section is still unclear. If the intent is to specify the minimum width at the base of the back support, then it would be better to add that requirement to section 6.21.7.4.

In any case, requiring the back cushion to go all the way down to the seat bottom cushion is ergonomically unjustified as our spinal curvature receives greater benefit from back support located above the seat bottom cushion.

Committee Meeting Action: Reject

Committee Statement: This section is written in a manner that allows seat back cushions to accommodate a window in a squad bench. Comments from users suggest that windows are important to reduce the incidence of motion sickness.

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1917-27 Log #24  
(6.21.7.4)

Final Action: Reject

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-685

Recommendation: Revise text to read as follows:

6.21.7.4 Each seat shall provide back and head support beginning no more than 24 in. (610 mm) above the seat bottom cushion and continuing to at least 36 in. (914 mm) above the seat bottom cushion. The base of the back support shall be a minimum of 18 in. (460 mm) wide.

Substantiation: Clarify and simplify the back cushion/support requirements by consolidating 6.21.7.3 and 6.21.7.4 in one section.

Committee Meeting Action: Reject

Committee Statement: This comment is not relevant unless 1917- (Log #23) was accepted. See action on 1917-26 (Log #23).

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1917-28 Log #CC1  
(6.21.7.4)

Final Action: Accept

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Submitter: Technical Committee on Ambulances,

Comment on Proposal No: 1917-655

Recommendation: Revise text as follows:

6.21.7.4 Each seat shall provide back and head support beginning no more than 24 in. (610 mm) above the seat bottom cushion and continuing to at least ~~32 36~~ in. (813 ~~914~~ mm) above the seat bottom cushion.

Substantiation: This change was made to allow conventional seats with attached seat-backs to meet the requirements of this standard. Most seat manufacturers do not provide a seat with a seat-back that is 36 in. tall.

Committee Meeting Action: Accept

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1917-29 Log #25  
(6.21.8.4)

Final Action: Reject

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-692

Recommendation: Revise text to read as follows:

6.21.8.4 If the designated primary patient care seat is at the patient head position, the longitudinal centerline of the seat shall line up within 11 in. (280 mm) of the longitudinal centerline of the cot.

Substantiation: Add missing word.

Committee Meeting Action: Reject

Committee Statement: The word "at" is not appropriate for the meaning of the statement.

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1917-30 Log #41  
(6.21.10 (New) )

Final Action: Reject

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Submitter: Marcelo M. Hirschler, GBH International

Comment on Proposal No: 1917-1a

Recommendation: Revise text to read as follows:

6.21.10 Padding components of seats in passenger compartment shall comply with the requirements of California Technical Bulletin 117, Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture.

*Also, add California Technical Bulletin 117, Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture, 2000, to the section on referenced standards.*

Substantiation: It is important that the seats in the passenger compartment comply with some minimal fire safety requirements and this standard will ensure that. The requirements of FMVSS 302 are insufficient to ensure fire safety.

Committee Meeting Action: Reject

Committee Statement: FMVSS 302 already provides a minimum standard that is appropriate for vehicles. The comment is suggesting applying a non-vehicle standard.

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1917-31 Log #31  
(6.24.6)

Final Action: Reject

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Submitter: Charles D. Drake, Goshen, IN

Comment on Proposal No: 1917-684

Recommendation: Revise text to read as follows:

Each designated seating space shall have a minimum width of ~~24~~ 19.2 in. measured from the seat surface to 43 in. above the seating surface.

Substantiation: 19.2 inches is the shoulder width for a 95<sup>th</sup> percentile man. Using these standards provides consistency with other anthropometric measurements. As we define the arc of reach for medics standardizing with existing measurements will enhance the universal appeal of the document.

Committee Meeting Action: **Reject**

Committee Statement: FAMA anthropometric survey of fire fighters showed the width of a clothed fire fighter is 23.3 inches for the 95th percentile. 24 inches provides a little wiggle room for two large men shoulder to shoulder.

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1917-32 Log #42  
(6.24.7.2)

Final Action: Accept in Principle

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Submitter: Tim Schroeder, Ferno-Washington, Inc.

Comment on Proposal No: 1917-697

Recommendation: Revise text to read as follows:

The fore-aft position of the seat shall line up within 6 in. (152 mm) of the ~~centerline of the torso~~ patient cot backrest hinge as defined by the cot manufacturer.

Substantiation: Considering various patient sizes and the multiple positions of an ambulance cot backrest, it is impossible for a cot manufacturer to define the centerline of a patient's torso in a fore-aft attitude. The backrest hinge is a fixed reference point that is common to all cots regardless of manufacturer. Using this reference point will allow the seat to be positioned so the EMT has access to the patient, while allowing for consistent installation regardless of the cot, seat, or ambulance manufacturer.

Committee Meeting Action: **Accept in Principle**

Replace 6.21.8.2 with the following text:

6.21.8.2 If the primary patient care position is the patient torso position the fore-aft position of the seat shall be capable of lining up within 6 in. (152 mm) of the midpoint between the head end of the cot and the backrest hinge.

Committee Statement: The committee agrees with the comment that a physical feature would be a more practical method of specifying the seat location, but lining up with the hinge would not locate the seat properly in relation to the patient's torso.

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1917-33 Log #6  
(6.25.6.1)

Final Action: Reject

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Submitter: Michael P. Lewis, Berkeley County EMS

Comment on Proposal No: 1917-800

Recommendation: Revise text to read as follows:

~~Red and either yellow, fluorescent yellow, or fluorescent yellow green.~~ Red and either yellow, fluorescent yellow, or fluorescent yellow-green and also may include blue and either orange.

Substantiation: Blue and orange should be added to the colors offered, only two colors are used on interstate signs; green and blue, blue is a color that has already been proving to be an effective color.

Orange should be added to the colors offered, orange is an international color and is used in every country and all state transportation road workers and does not blend in with the traffic vest now being used by emergency workers.

Committee Meeting Action: **Reject**

Committee Statement: The colors in the current draft come from NFPA 1901, which were selected to be consistent with the colors for roadway barriers indicating blocking right-of-way. These colors provide consistency for the public and were endorsed by the International Association of Fire Chiefs at the time this initiative was considered for NFPA 1901.

1917-34 Log #12  
(6.26)

Final Action: Accept in Principle

Submitter: William J. Tansey, Ballston Lake, NY

Comment on Proposal No: 1917-729

Recommendation: Add new text as follows:

**6.26.2 Seatbelt Warning System**

6.26.10 a seat-belt/restraint warning system shall be provided for the patient compartment that will indicate if any seated person in the patient compartment is NOT seat-belted./ restrained

6.26.3 the warning system shall consist of an audible and or visual warning device that can be heard and or seen at all seating positions in the patient compartment, designed to be occupied while the vehicle is in motion and a visual display visible to the driver ~~showing the condition of each seating position.~~ If a VDR system is installed, the audible and or visual warning, will be detectable by the VDR

6.26.4 the warning shall be activated anytime ~~the parking brake is released or the automatic transmission is not in park or neutral.~~

**6.25.5 Display for Seating System**

6.26.6 The display indication shall be permitted to consist of lights, text, graphical indicators, digital displays, or other methods.

6.26.7 the warning system shall ~~not show an affirmative indication~~ not sense that a person is seat belted / restrained unless it has determined that the seat was occupied before the seat belt/restraint was buckled.

**Substantiation: REASON FOR THE CHANGE**

In 1917 -715 through 1917-751 the committee voted to “accept” or “accept in principal” most of the recommendations. Some of these were supporting a warning system but changing text (ie1917 746,747,750,751 and others). Others suggesting the deleting of a seatbelt warning system (1917-715). The result was the seatbelt warning section was eliminated from this draft.

The above recommended changes, eliminates most of the objections to the original text and keeps a seatbelt/restraint warning system for the patient compartment in 1917.

Here is a summation (1917-715-751) of the reason why people were opposed to a seatbelt warning system.

1. “The proposed standard is redundant. Most state legislate seatbelt indication. Operational policy issue not standard. The technology to meet these requirements does not exist and has not been scientifically proven to improve safety, operational efficiency or patient care. Any device of this type should be produced and installed by the OEM.” (1917-715 log88)

2. It was tied to VDR in the original draft.

3. It was tied to the OEM chassis seat belt alarm system

4. Increased cost of an integrated system

5. A distraction to the driver

6. Patient care requires having to be unbelted.

7. Being able to bypass the system (-748 log#1702)

Here are my reason why my proposal answers most of the concerns / objections:

OBJECTION #1 Many of the “comments” that the committee agreed with were inaccurate. For example above 1917-715 had over 130 signatories and the committee “agreed in principle”. This called for the elimination of the seatbelt warning section. Here is what it said.

“The proposed standard is redundant”..... This is just wrong. There is no other authority that calls for a seatbelt monitoring system in the back of an ambulance. A second seatbelt warning system in the driver compartment, for the driver, would be redundant. That is not what I am suggesting.

“Most states legislate seatbelt indications” This is just wrong. If they are referring to seatbelt unbuckled alarms in the cab, I believe that is a FMVSS (federal) requirement. This does not cover the back of the ambulance.. There are no states that legislate seatbelt indications in the back of an ambulance therefore this is just wrong.

“Operational policy not a standard” ... That is what the problem is today and it is killing EMTs. This has resulted on average more than 70 deaths and hundreds of injuries per year and the reason Fire Chiefs have asked the NFPA to develop a standard to make ambulances safer. This is the reason similar type seatbelt monitoring systems are in 1901. Secondly, a monitoring system will help agencies to implement “operational policies” resulting in safer operation.

“The technology to meet these requirements does not exist” This is wrong. I believe several companies make such

systems. Systems used for fire apparatus can be modified for the patient compartment. I know of at least one company that has a system today that can be used in ambulance patient compartment (Fire Research).

“and has not been scientifically proven to improve safety” Although this statement may be true, there isn’t any publication or expert that does not believe being restrained will save lives. (i.e. FMVSS, NTSB, Dr. Levick, etc.) I can attach several publications and reports that speak to the EMTs being injured or ejected and killed, where it says they were “unrestrained”. In 10 years of my own personal research I don’t know of or can find a report of an EMT that was restrained who was killed or even seriously injured. The anecdotal evidence is overwhelming!!!! 1901 requires this for firefighters. How in good faith can the NFPA 1901 require firefighters to be restrained and not similar protective measures in 1917 for firefighter EMTs in the patient compartment?

OBJECTIONS #2, 3, 4. my proposal does not require an interface with a VDR system or to the OEM seatbelt monitoring system making it far less expensive, and products to implement this are readily available.

OBJECTION #5 My proposal also does not require an audible alarm in the driver compartment so as to answer the concerns of some, “that it creates a distraction for the driver”

OBJECTION # 6

The one issue that was in several public comments was that “patient care” and “procedures” require you to be unbuckled in the back. In the past with historically typical ambulance layouts/ designs, this was true. I have been a NYS MET(pre 1970) AND EMT for 42 years. The reason I did not buckle up in the back was two fold:

1. From the squad bench (primary patient care position)I couldn’t reach some of the things I needed to do patient care while restrained. O2 regulators, equipment from monitors, O2 adjuncts, iv start stuff, bandaging supplies, etc. With the arrival of center mount cots, the “captains” chair or airway seat was still bolted to the floor next to the action area when we mounted the cot to the streetside wall. In that position you can’t be seat belted and do bag valve mask, intubate, suction or anything. Therefore you have to unbuckle. How stupid!!!!!!!!!! If the airway management seat is simply centered on the cot you can be seat belted and do airway management. So with simple, better interior design and layout one can be seat belted and do patient care and reach most equipment needed, a majority of the time.

2. If I was leaned forward, on the squad bench, to examine a patient and I buckled up... as soon as I finished and leaned back against the back rest, the next time I went to lean forward to check vitals, the seat belt ratcheted back so I could no longer reach my patient. So I didn’t buckle up.

Both of these are ergonomic design issues that can be eliminated, by new seats available on the market today like the EVS Mobility One seat, and like an Easy Reach Wall design, much like a “jersey” wall that restrict you from seating to far back.

IMPORTANTLY even with “traditional ambulance design and problems above, most patient care is done prior to moving the vehicle. With my proposal if the medic gets up and unbuckles there are NO alarms. When the medic gets what is needed or finish starting another IV and returns to their seat, the reminder goes off to remind them to re buckle. The more we are restrained the better chance we have to survive.

OBJECTION # 7 Is answered in 6.27.7

IN CONCLUSION:

The reminder / warning audible visual alarm can be a simple unobtrusive chime with a flashing light on the front bulkhead that will not alarm a patient but hopefully remind the EMT to buckle up.

AGAIN, there isn’t a single person, publication, or expert that doesn’t agree that being restrained will save lives. As much as we focus on EVOC and driver training, accidents will still happen. Being restrained when it happens will save your life and reduce significant injuries. If it is in 1901 it has to be in 1917.

Please don’t let this opportunity pass, which will have the most significant impact on EMT safety that this committee can do.

#### Committee Meeting Action: Accept in Principle

Add new text to read as follows:

##### 6.21.10 Seatbelt Warning System

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

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

6.21.10.3 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.

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

6.21.10.5 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.

Committee Statement: The committee agrees with the intention of the comment, but revised the wording to be

consistent with the NFPA manual of style. The committee felt that the VDR language was not required as the decision to not include it had been debated at previous meetings, and the comment was only adding it as an option. Optional suggestions belong in the annex, and it is already there.

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1917-35 Log #26  
(6.28.2)

Final Action: Accept

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-820

Recommendation: Revise text to read as follows:

6.28.2 If a compressed gas cylinder is used, a cylinder-changing wrench shall be furnished, tethered, and secured within the oxygen storage compartment.

Substantiation: The customer should be allowed to specify the preferred means of securement. Many have concluded that it is safer and easier to change the oxygen cylinder if the wrench is not tethered.

Committee Meeting Action: Accept

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1917-36 Log #1  
(6.28.9.3)

Final Action: Reject

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Submitter: Michael P. Lewis, Berkeley County EMS

Comment on Proposal No: 1917-819

Recommendation: Revise text to read as follows:

Oxygen cylinder compartment shall not be utilized for storage of any other equipment and shall be labeled "Oxygen Storage Only." Oxygen cylinder compartment shall not be utilized for storage of any oils or tools that use liquids in their operation.

Substantiation: To say that you cannot store a splint or type of equipment that in no way can cause harm to an oxygen cylinder is not in the best interest of ambulance users.

Committee Meeting Action: Reject

Committee Statement: Committee did not feel that it would be practical to create signage describing in detail those items that would be safe to store and those that would not. Items that may be safe when clean may not be safe if they become contaminated with petroleum products.

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1917-37 Log #27  
(6.28.11.1.2)

Final Action: Accept

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Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

6.28.11.1.2 ~~Oxygen flow through e~~ Each outlet shall be capable of delivering at least 100 L/min of oxygen.

Substantiation: The grammatical error in this sentence was not corrected in the previous revision. It is the *outlet* that is capable of delivering the desired flow; the *oxygen flow* is not capable of delivering the desired flow.

Committee Meeting Action: Accept

1917-38 Log #3  
(7.1.2)

Final Action: Accept

Submitter: Stephen Wilde, Certified Fleet Services, Inc.

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

7.1.2 Electrical System Performance Tests.

The low voltage electrical system performance test shall be done according to Section ~~9.1~~ 9.5.

Substantiation: Correct incorrect text, referring to wrong testing section.

Committee Meeting Action: Accept

1917-39 Log #28  
(7.2.2.7)

Final Action: Accept in Principle

Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: 1917-897

Recommendation: Revise text to read as follows:

7.2.2.7 All exterior wiring ~~connecting to exterior lights and fixtures connections~~ shall utilize sealed connectors or splices.

Substantiation: The committee apparently missed the intent of the four comments recommending change to this section (1917-897 Log #285, 1917-898 Log #1107, 1917-899 Log #1307, 1917-901 Log #1550). The interest is to protect electrical connections that are exposed to the exterior environment. The respondents all share that interest. However, they note that just because a connection serves an exterior device does not mean that the connection is an external connection. Conversely, it is possible for an internal device to be served by an external connection, in which case that connection also should be protected.

The important point here is to require that all external connections be sealed regardless of whether they serve an internal or external device.

Internal connections—those not exposed to the elements—need not be sealed. Sealing internal connections adds unnecessary expense and makes maintenance and service more difficult.

While logical reasoning supports the use of sealed connectors or splices on exterior wiring, no justification has been provided for mandating their use on internal connections.

Committee Meeting Action: Accept in Principle

Revise text to read as follows:

7.2.2.7 All ~~exterior wiring connecting to exterior lights and fixtures connections~~ shall utilize sealed connectors or ~~splices~~. Connections at exterior lights and fixtures shall utilize sealed connectors or sealed splices.

Committee Statement: The committee changed the submitter's text to make more clear that the group wanted sealed connectors at the closest connection to the exterior light or fixture.

1917-40 Log #29  
(7.11.6.3.4)

Final Action: Reject

Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

7.11.6.3.4 The patient compartment lighting shall have ~~the~~ two levels of lighting, high and low, at a ~~minimum~~ minimum.

Substantiation: Grammar and spelling correction.

Committee Meeting Action: Reject

Committee Statement: The text in the document has already been revised to reflect the submitter's proposal.

1917-41 Log #2  
(8.2.7)

Final Action: Accept

Submitter: Stephen Wilde, Certified Fleet Services, Inc.

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

8.2.7 Line Voltage Electrical System Testing.

Electrical System Testing shall be performed according to Section ~~9.2~~ 9.9.

Substantiation: Correct incorrect text, referring to wrong testing section.

Committee Meeting Action: Accept

1917-42 Log #15  
(8.6.3.x (New) )

Final Action: Accept in Principle

Submitter: James J. Juneau, Juneau, Boll, Stacy, & Ucherek, PLLC

Comment on Proposal No: N/A

Recommendation: Add new text to read as follows:

8.6.3.8 A visual and audible warning shall be provided in the ambulance cab, visible from the operator's seat, to (1) visually indicate that the generator engine is operating, and (2) visually and audibly indicate that the generator engine is in operation when the ambulance engine is off.

Substantiation: The problem addressed in this new section is the risk that an ambulance equipped with a fixed auxiliary engine-driven generator might be parked indoors (e.g. inside the station) with the generator inadvertently left running, thus exposing persons inside the building to dangerous levels of carbon monoxide. Modern generators are very quiet, and can easily be left running accidentally. The proposed language would provide an in-cab audible & visual warning to the operator at times when the ambulance engine is turned off, but the generator engine is left running.

Committee Meeting Action: Accept in Principle

Add new text to read as follows:

8.6.3.7.1 A visual and audible warning shall be provided in the ambulance cab, visible from the operator's seat, to (1) visually indicate that the generator engine is operating, and (2) visually and audibly indicate that the generator engine is in operation when the ambulance ~~engine~~ engine ignition is off.

8.6.3.7.2 The audible warning shall be permitted to be equipped with an override function that resets automatically when the ignition is cycled on.

Committee Statement: The committee agrees with the submitter that the issue he proposed, with the task groups changes, should be included in this document. Including this safety interlock would dramatically increase personnel's safety.

1917-43 Log #14  
(8.6.3.9 (New) )

Final Action: Accept in Principle

Submitter: James J. Juneau, Juneau, Boll, Stacy, & Ucherek, PLLC

Comment on Proposal No: N/A

Recommendation: Add new text to read as follows:

8.6.3.9 The generator engine shall shut-down automatically when connection to an external source of electrical power ("shore power") is established.

**Substantiation:** The problem addressed in this new section is the risk that an ambulance equipped with a fixed auxiliary engine-driven generator might be parked indoors (e.g. inside the station) with the generator inadvertently left running, thus exposing persons inside the building to dangerous levels of carbon monoxide. Modern generators are very quiet, and can easily be left running accidentally, especially after a "shore power" cable is connected. There is no reason to have the generator run after shore power is established, and there are other good reasons (e.g. out-of-phase generator current backfeeding) to justify an automatic shutdown requirement. The proposed language would provide for automatic generator engine shut-down when external shore power connection is established.

**Committee Meeting Action:** Accept in Principle

Add new text to read as follows:

8.6.3.7.3 The generator engine shall shut-down and be prevented from restarting automatically when connection to an external source of electrical power ("shore power") is established.

**Committee Statement:** The committee agrees with the submitter that the issue he proposed, with the task groups changes, should be included in this document. Including this interlock as a redundant safety feature would dramatically increase personnel's safety.

1917-44 Log #30  
(9.5.1)

Final Action: Reject

Submitter: Jerry Allen, Braun Northwest, Inc.

Comment on Proposal No: N/A

Recommendation: Revise text to read as follows:

9.5.1\* The ambulance ~~is~~ low voltage electrical system shall be tested as required by this section, ~~and~~ the test results shall be certified by the ambulance manufacturer, and the certified test results shall be delivered with the ambulance.

**Substantiation:** Suggested grammar correction.

**Committee Meeting Action:** Reject

**Committee Statement:** The text in the document has already been revised to reflect the submitter's proposal.

1917-44a Log #CC2  
(A.7.9.13(a) and A.7.9.13(b))

Final Action: Accept

Submitter: Technical Committee on Ambulances,

Comment on Proposal No: 1917-1153

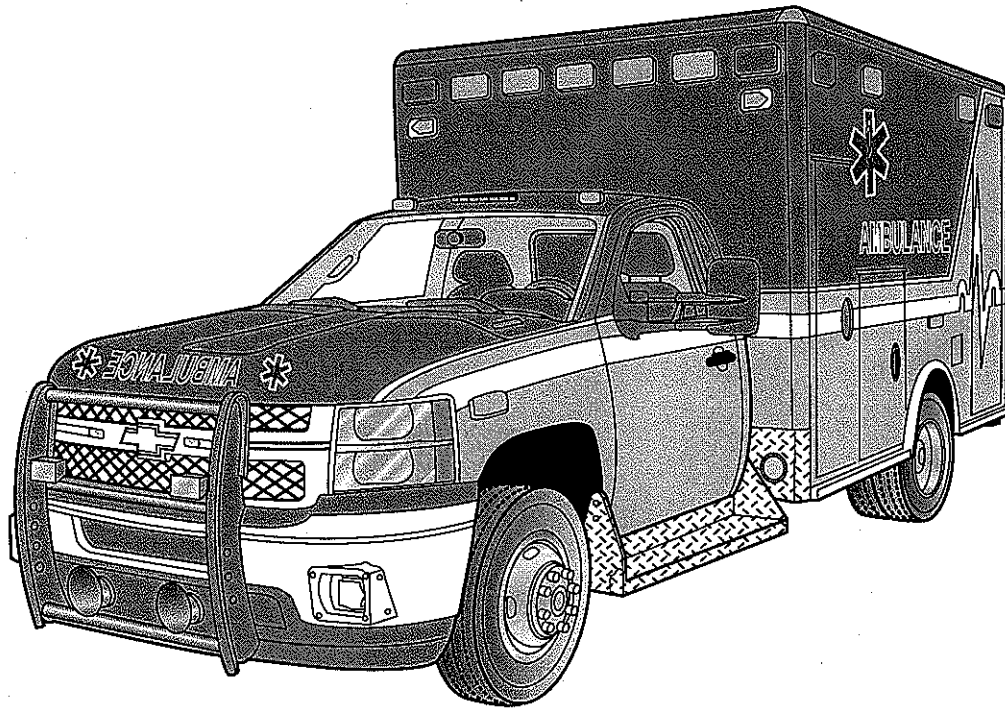
Recommendation: Replace existing figures A.7.9.13(a) and A.7.9.13(b) with the following:

\*\*\*\* insert figures A.7.9.13(a) and (b) here\*\*\*\*

**Substantiation:** During the ROP the committee accepted proposal 1917-1153 (Log #161) to delete the figure of a fire truck and replace with a figure of an ambulance. The submitter did not supply a replacement figure. The figure of this ambulance placed in this committee comment replaces the figure of the fire truck.

**Committee Meeting Action:** Accept

1917\_Amb-Front.eps 10/27/11 8:05:52 AM



1917\_Amb-Back.eps 10/27/11 8:06:46 AM

