

NHTSA-97-1742-006

Recreation Vehicle Industry Association



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February 10, 1995

ORIGINAL

Dr. Ricardo Martinez, Administrator
National Highway Traffic Safety Administration
Docket Section, Room 5109
400 Seventh Street, SW
Washington, DC 20590

7 pgs

Re: Request for Views and Comments on Changes to Roof
Crush Resistance Standard, 49 CFR 571.216, Docket No.
94-97; Notice 01.

COMMENTS SUBMITTED BY RECREATION VEHICLE INDUSTRY
ASSOCIATION (RVIA)

RVIA is a national trade association that represents the manufacturers of recreation vehicles including motorhomes, travel trailers, fifth wheel trailers and truck campers as well as custom van, pickup truck, and sport utility vehicle conversions. RVIA's members produce more than 95 percent of all motorhomes, travel trailers, folding camping trailers, fifth wheel trailers and truck campers and 80 percent of all custom van conversions produced in the United States. Most of these manufacturer members are small business entities.

RVIA applauds NHTSA's decision to grant both RVIA's and Ford's petitions for clarification of testing procedures contained in FMVSS 216, Roof Crush Resistance. We also welcome this opportunity to submit additional comments in support of the proposed changes to the roof crush testing procedures for raised-roof vehicles submitted in our letter petition to NHTSA dated April 8, 1994.

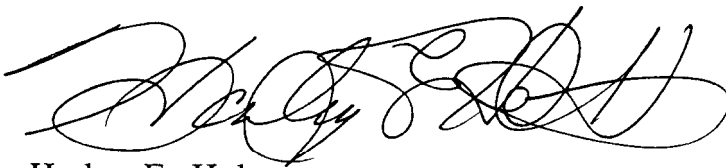
RVIA is in the process of conducting research/testing to provide additional information and test data to support our industry's 001

QA 16787

position that A-pillar strength is retained following removal of portions of a minivan roof from a vehicle that has been previously certified to be in compliance with 216 requirements. The results of these processes are not presently available for inclusion with these comments. It is anticipated that data will be available in a matter of weeks. These data will be submitted for NHTSA's consideration when tests are completed. It is noted in the Federal Register notice that NHTSA will continue to file relevant information as it becomes available in the docket after the closing date.

In further support of RVIA's petition for substitution of a 220-type test in place of a second 216 test when a raised roof is added by a van conversion manufacturer, we submit that at present many state governments require a 220-type test certification for ambulance conversions purchased and licensed in those states. This requirement is contained in Federal Specification for Ambulances, KKK-A-1822D, dated November 1, 1994. A copy of the relevant section is attached for your consideration. This specification is also approved by the General Services Administration for use by all Federal Agencies when purchasing ambulances. The specification does not limit the gross vehicle weight rating (GVWR) of the vehicles to which it applies, and therefore, it applies to minivans under 6,000 pounds that are converted for ambulance use with raised roofs. Consequently, the requirements of the ambulance specification indicate the relevance of a 220-type roof crush test as it applies the structural integrity of raised roof vehicles. A copy of the relevant section of KKK-A-1822D is included for your consideration.

Sincerely,



Harley E. Holt
Director, Automotive Standards

Attachment

002

This revised federal Specification for
Ambulances

KKK-A-1822D dated November 1, 1994

SUPERSEDES

KKK-A-1822C dated January 1, 1990

The changes in this **specification** are based on input from emergency **medical technicians, paramedics, vehicle maintenance personnel, ambulance manufacturers, and equipment/component suppliers** to the **ambulance** industry.

The **specification** has been coordinated with the **Ambulance Manufacturers Division (AMD)** of the National Truck Equipment **Association**, the American Ambulance **Association (AAA)**, and the **Federal Interagency on Emergency Medical Services (FICEMS)**. The **contract** is based on performance, function, and design requirements necessary to provide for a **safe, reliable, highly functional** ambulance while allowing flexibility for purchasers to customize **the** ambulance for individual needs.

This specification should be carefully read prior to ordering an ambulance, to help separate “**real** from perceived” needs, and to avoid requiring the ambulance manufacturer to supply equipment or **designs contrary** to good **engineering** practices, and the requirements and intent **of this specification**.

When using this **specification**, particular attention should be **given the** NOTES, NOTICES, and **WARNINGS** placed in critical areas throughout the document. This **will help avoid serious** errors that could have a **deleterious** effect on the ambulance safety, **reliability**, and the ability to “complete the mission”.

**THIS SPECIFICATION IS APPROVED BY THE COMMISSIONER,
FEDERAL SUPPLY SERVICE, GENERAL SERVICES ADMINISTRATION,
FOR THE USE BY ALL FEDERAL AGENCIES.**

J1349 - Engine Power Test Code, Spark Ignition and Diesel.
J1318 - Strobe Warning Lights.

NATIONAL TRUCK EQUIPMENT ASSOCIATION / AMD

AMD Standard 001 - Static Load For Ambulance Body Structure Test.

AMD Standard 002 - Body Door Retention Components Test.

AMD Standard 003 - Oxygen Tank Retention System Test (Main and Portable Bottles).

AMD Standard 004 - Litter Retention System Test.

AMD Standard 005 - Ambulance 12 Volt DC Electrical Systems Test,

AMD Standard 006 - Sound Level Test Code.

AMD Standard 007 - Carbon Monoxide Levels For Patient Compartment Interiors.

AMD Standard 008 - Ambulance Patient Compartment Grab Rail (Load Test).

AMD Standard 009 - Alternating Current (AC) Electrical Systems .

Application for copies should be addressed to the Ambulance Manufacturer's Division (AMD) of the National Truck Equipment Association, 37400 Hills Tech Drive, Farmington Hills, MI 48331, (810) 489-7090.

ILLUMINATION ENGINEERING SOCIETY:

Guide for Calculating The Effective Intensity of Flashing **Signal Lights**

Application for copies should be addressed to the Illumination Engineering Society, 345 East 47th Street, New York, New York 10017.

AUTOMOTIVE MANUFACTURERS EQUIPMENT COMPLIANCE AGENCY (AMECA):

Approval of **Motor Vehicle Safety Equipment (emergency lights and sirens).**

Application for copies should be addressed to the American Association of Motor Vehicle Administrators, 4200 Wilson Blvd. Suite 600, Arlington, VA 22203. Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.

2.3 ORDER OF PRECEDENCE.

In the event of a conflict between the **text** of this specification and the references cited herein, the **text** of this specification shall take precedence,

3.10.3 EMERGENCY MEDICAL TECHNICIAN (EMT) SEATING.

The EMT shall be provided with a seat equipped with a safety belt and a padded back and a padded headrest. Unless otherwise specified (see 6.2-bb), the seat shall be not less than 46 cm (18 in.) deep by 46 cm (18 in.) wide and 38 to 46 cm (15 to 18 in.) high, measured to the top of the seat cushion (see 3.11.1.1) and adjustable a minimum of 10 cm (4 in.) (front to rear) when a bucket type seat is furnished. The EMT shall be seated at the head of the primary patient, near the bulkhead or partition behind cab compartment, facing rearward (see 3.1.5.) The space under the seat may be designed as a storage compartment or utilized for other equipment. The EMT seat shall be upholstered per 3.11.4. When an ambulance manufacturer's fabricated seat is furnished, the padded backrest shall be the maximum practical width and height. When specified and available (see 6.2-BB), an EMT seat with integral infant/child safety seat shall be furnished and conform with all requirements including FMVSS.

3.10.4 PATIENT COMPARTMENT INTERIOR DIMENSIONAL PARAMETERS.

The patient compartment shall provide, but not be limited to, a minimum of 9.2 cubic meters (325 cubic feet) of space, less 1 cubic meter (35 cubic feet) for cabinets, while complying with the following:

Length: Unless otherwise specified or permitted by the purchaser (see 6.2-cc), length, measured from the partition to the inside edge of the rear loading doors at the floor, shall be at least 310 cm (122 in.). This length in the compartment shall provide at least 64 cm (25 in.) and not more than 76 cm (30 in.) of unobstructed space at the head of the primary patient, measured from the face of the backrest of the EMT seat to the forward edge of the Style 1 cot. A minimum of 25 cm (10 in.) shall be provided, from the end of the cot to the rear loading doors, to permit clearance for traction or long board splints.

Width: The width of the compartment, after installation of the cabinets, shall provide 46 cm (18 in.) +/- 16 cm (6 in.) of clear aisle walkway between cot and base of squad bench, with the cot located in the street side (non-centered) position.

Height: Unless otherwise specified by the purchaser (see 6.2-dd), the patient compartment shall provide at least 152 cm (60 in.) height, over the primary patient area, measured from floor to ceiling panels.

3.10.5 BODY, GENERAL CONSTRUCTION.

For modular construction, the body shall be all welded aluminum or, when specified or approved by the purchaser (see 6.2-ee), other lightweight, inherently corrosion resistant materials of equal, or greater, strength. The exterior of the body shall be finished smooth with symmetrically radiused corners and edges, including rub-rails when specified [see 3.15.3-19), and shall include doors and windows specified herein. Ambulance body, as a unit, shall be designed and built to provide impact and patient compartment penetration resistance and shall be of sufficient strength to support the entire weight of the fully loaded vehicle on its top or side, if overturned, without separation of joints or permanently deforming roof bow or reinforcements, body posts, doors, stringers, floor, inner linings, outer panels, rub-rails, and other reinforcements. Wood, or wood products, shall not be used for structural framing. As evidence that the ambulance body meets the above criteria, the manufacturer's body (fabricated, modified, or converted), excluding the conventional cab, shall furnish for each body model (Type) a certification that the ambulance body meets Static Load Test for Ambulance Body Structure, AMD Standard No. 001.

Additionally, the roof structure, inner, and outer skin or cap shall be designed and constructed to prevent separation and the possible ejection of patients or crew in the event of an accident and shall include welded and, if necessary, reinforced attachments to the body.

AMD STANDARD 001

STATIC LOAD TEST FOR AMBULANCE BODY STRUCTURE

- S1.** **SCOPE.** This standard establishes performance requirements for ambulance body structural integrity.
- S2.** **PURPOSE.** The purpose of this standard is to reduce the possibility of injuries and fatalities that could result from the failure of the ambulance body structure that may be encountered in roll-over crashes.
- S3.** **APPLICABILITY.** This standard applies to all ambulances.
- S4.** **DEFINITION.**
- S4.1** **“Curb Weight”**- Curb weight shall include the weight of the complete ambulance; chassis, cab, and body, including all mandatory equipment, full complement of fuel, lubricants and coolant.
- S5.** **REQUIREMENTS.** When a force equal to 1.6 times the curb weight of the vehicle is applied to the roof of the vehicle's body structure through a force applications plate, as specified in **S6.** (Test Procedures):
- The downward vertical movement at any point on the application plate shall not exceed 6.125 inches.
 - Each exterior exit door of the vehicle shall be capable of opening and closing during the full application of the force and after release of the force.
 - No structural or component damage, i.e., torn or broken material, broken welds, popped or sheared rivets, bolts, and/or fasteners, shall be evident during the application of the force and after the release of the force.
- S6.** **TEST PROCEDURES.** Each vehicle tested shall be capable of meeting the requirements of **S5.** when tested in accordance with the procedures set forth below:
- S6.1** Place the vehicle on a rigid horizontal surface so that the vehicle is entirely supported by means of the vehicle frame without any support from the suspension system. If the vehicle is constructed without a frame, place the vehicle on its body sill. Remove any components which extend upward from the vehicle roof.
- S6.2** Apply a rigid, rectangular force application plate fitted as near as possible to the contour of the ambulance roof. The application plate shall be a minimum of 5 inches longer and 5 inches wider than the vehicle roof of the patient's compartment. For the purposes of these measurements, the ambulance roof is that structure, seen in the top projected view, that coincides with the patient compartment of the ambulance.
- S6.3** Position the force application plate on the vehicle roof so that its rigid surface is perpendicular to a vertical longitudinal plane in the top projected view, so its longitudinal centerline coincides with the longitudinal centerline of the vehicle, and its rear edge measures a minimum of 2.6 inches from the rear edge of the vehicle roof at the centerline.
- S6.4** With all doors fully closed, apply an evenly distributed vertical force in the downward direction to the force application plate at a rate of not more than 0.6 inches per second, until a force of 500 pounds has been applied.
- S6.5** Record elevation readings of all 4 corners of the roof.

S6.6 Apply additional vertical force in the downward direction to the force application plate at a rate of not more than 0.6 inches per second until 50% of the force specified in S5. has been applied.

S6.7 Repeat procedure in S6.6,

S6.8 Continued to apply a vertical force to the application plate until the total load specified in S5. is recorded.

S6.9 Repeat procedure in S6.5.

S7. DOOR CAPABILITIES.

S7.1 With total load applied, test all doors for compliance with S5.b and record results.

S8. CONCLUSION,

S8.1 Remove applied load from application plate.

S8.2 Repeat procedure in S6.5 and compare with original readings to determine permanent deformation of roof.

S8.3 Record all results.