Certification Labels and the Federal Specification for the Star-of-Life Ambulance

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Why Is He Here?

• There was an article in 2013 that said “K” was gone

• I heard “K” was “Sunseted” in 2015

• I Just read an article that said, “The KKK standard has since been replaced by two new standards”
Guide to State Ambulance Regulations

- GVS
- GSA K-Specs
- state-specific
- multiple
- no regulations
- unknown

Map of the United States showing regulations for state ambulance services.

5/21/2018
Why Was “K” Developed?

- DOT requested it in 1972
- It was estimated that there were 28,000 ambulances in service
- 1,200 were Federally owned
How Long Has the “K” Std been around?

• Over 40 Years
When did the first “K” Standard go into effect?

- 2 January 1974
- Covered Types I, II & III
- 1,000 lb. Payload
- Gasoline Engines
- Requires Squad Bench
How About Revision A?

- 1 April 1980
- Dual Rear Wheels
  1,500 lb. Payload
- Diesel Engine becomes an Option
- 11 Light System
- Orange Band
- Wiring Diagram
- AMD Stds. 1-6
And Revision B ??

- 1 June 1985
- New Flash Pattern
- Interior Cabinet Figures
- 4X4s
What changed in Revision C?

• 1 January 1990
• I & III Single Rears 1,200 lb. Payload
• 1,700 lb, payload for II’s
• Duals go to 1,750 lb.
• Workmanship section expanded
• 14 Light System

• AMD Std 7-9
• ALS/BLS
• Max Load Heights
• Diesel becomes Std.
• Payload Sticker
• Notes, Notices & Warnings
And Revision D??

- 1 January 1994
- Metrification
- I & III Single Rears
  1,500 lb. Payload
- Color Printing
How about Revision E?

- 1 June 2002
- Adds “AD” units
- Portable Equipment Charging Circuits
- Revised Electrical Diagram
- AMD 10-15
- Available as PDF file
- 3 Change Notices issued
AMD Standardized Test methods

Revision A (1980)

• 001 - AMBULANCE BODY STRUCTURE STATIC LOAD TEST
• 002 - BODY DOOR RETENTION COMPONENTS TEST
• 003 - OXYGEN TANK RETENTION SYSTEM STATIC TEST
• 004 - LITTER RETENTION SYSTEM STATIC TEST
• 005 - 12-VOLT DC ELECTRICAL SYSTEM TEST
• 006 - PATIENT COMPARTMENT SOUND LEVEL TEST

Revision C (1990)

• 007 - PATIENT COMPARTMENT CARBON MONOXIDE LEVEL TEST
• 008 - PATIENT COMPARTMENT GRAB RAIL STATIC LOAD TEST
• 009 - 125-VOLT AC ELECTRICAL SYSTEMS TEST

Revision E (2002)

• 010 - WATER SPRAY TEST
• 011 - EQUIPMENT TEMPERATURE TEST
• 012 - INTERIOR CLIMATE CONTROL TEST
• 013 - WEIGHT DISTRIBUTION GUIDELINES
• 014 - ENGINE COOLING SYSTEM TEST
• 015 - AMBULANCE MAIN OXYGEN SYSTEM TEST
Revision F

- **AMD 16-26**
- **Revised Format**
  - Minimum Requirements
  - Optional Configurations
- **Increased seat overhead clearance to 43”**
- **Removed requirement for Squad Bench**
- **Initial testing and inspections required for certification shall be performed by a nationally recognized independent testing facility**
- **9 Change Notices issued**
NHTSA

• 2007 - Requires Door Hardware on Ambulances to be compliant with:
  – 49 CFR 571.206 - STANDARD NO. 206; DOOR LOCKS AND DOOR RETENTION COMPONENTS.

• 2008 - Requires Seats, Belts and Anchorages on Ambulances to be compliant with:
  – 49 CFR 571.207 - Standard No. 207; Seating systems and 49 CFR 571.210 - Standard No. 210; Seat belt assembly anchorages
CN7    29 January 2015

• Cumulative, replaces CN’s 1-6

• Contains references to NIST research

• Occupant weight goes to 175 lbs.
CN 8  1 July 2015

• Incorporates SAE J3026 Ambulance Patient Compartment Seating Integrity and Occupant Restraint

• Incorporates SAE J3027 Ambulance Litter Integrity, Retention, and Patient Restraint

• Incorporates NIST Guidebook
Testing Criteria – Frontal & Side Impact

SAE J2917- Ambulance Patient Compartment Frontal HYGE Sled Pulse, Pub. May 2010


5/21/2018
Frontal Impact – 3 Conducted
Matches Federal Standard
Side Impact – 4 Conducted Matches IIHS Side Impact Test
Rear Impact – 2 Tests Measured Vehicle Response at Impact

• Both tests utilized the IIHS moving deformable barrier
  – IIHS MDB weight was 1,500 kg or 3,300 lbs.
  – Impact velocity 50 kph or 31 mph
  – Vehicle instrumentation package described in SAE 2007-01-4267
  – E350 Type II weighed 8,840 lbs. while the E350 Type III weighed 9,975 lbs.
Occupant Excursion Concerns
Standard Gurney – 30 mph Impact

Pre-crash event: standard cot, restraint and antler floor fastener

Mid-crash event: patient excursion exceeds 30 inches or 76 cm
Demo: Frontal Impact, Forward and Rear Facing Seating

Testing provides data on ATD response under dynamic crash loading – ATD measured values must fall below fed limits
SAE J3026: Seat and Worker Restraint
Publication Date: Sept 2014

Key Elements in Recommended Practice

- Dynamic, crash testing is required
- Seat and restraint systems must protect occupants to same crash standards as automotive seating
- Utilizes H-III and ES2-re 50th male ATD as appropriate.
- ATD measured values must fall below federal limits for injury tolerance
CN 9  1 July 2016

• Incorporates SAE J3043  Ambulance Equipment Mounts

• Limited to installed Oxygen cylinder, cardiac monitor, and fire extinguisher mounting devices
Equipment Mount Test Standard: Dynamic Test Option

Equipment Mount Dynamic Test Standard

Utilizes Front and Side Impact Pulses

Orientation defined by Manufacturer

Sled test fixture replicating side and rear wall installations of oxygen cylinder and mount – successfully tested to SAE J2917
Equipment Mount Integrity
Pre- and Post-Crash

Prior to crash equipment and gurney either mounted or stowed in cabinets

Post crash (rollover) equipment and gurney positions drastically changed
Change Notice 10

- J3058  Cabinet Testing
- J3057  Modular Body Integrity
- J3102  Litter Subfloor Test
- J3059  Occupant Excursion
Side Impact
Roof Loading
J3058 Compliant Cabinets
J3058 Compliant Cabinets
Units are in millimeters. Drawings are not to scale.

Measurements are from the foremost seat plane in each direction.

*Side impact pulse data

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<table>
<thead>
<tr>
<th>Seat Attitude</th>
<th>Pulse</th>
<th>Max Excursion (mm)</th>
<th>Peak Velocity @ Peak Vel (m/s)</th>
<th>Vel @ 50mm (m/s)</th>
<th>Vel @ 100mm (m/s)</th>
<th>Vel @ 150mm (m/s)</th>
<th>Vel @ 200mm (m/s)</th>
<th>Vel @ 250mm (m/s)</th>
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</table>
Tests Required as of 1 July 17 2017

**AMD**
- AMD 001 Body Structure Test - 2014. (type II only)
- AMD 002 Reserved
- AMD 003 Oxygen Tank Retention System Static Test - 2014
- AMD 004 Litter Retention System Static Test - 2014
- AMD 005 Low Voltage Electrical System Test- 2014.
- AMD 006 Patient Compartment Sound Level Test- 2014.
- AMD 007 Patient Compartment Carbon Monoxide Level Test - 2014
- AMD 008 Patient Compartment Handrail Static Load Test- 2014.
- AMD 009 125V AC Electrical Systems Test- 2014.
- AMD 010 Water Leak Test - 2014.
- AMD 011 Equipment Temperature Test - 2014.
- AMD 012 Interior Climate Control Test- 2014.
- AMD 014 Engine Cooling System Test - 2014.
- AMD 015 Ambulance Main Medical Gas System Test- 2014.
- AMD 016 Patient Compartment Lighting Level Test- 2014.
- AMD 017 Road Test - 2014.
- AMD 018 Rear Stepping Surface Load Test- 2014.
- AMD 020 Floor Distributed Load Test - 2014
- AMD 021 Aspirator System Test- 2014.
- AMD 022 Cold Engine Start Test - 2014
- AMD 023 Siren Performance Test - 2014
- AMD 024 Perimeter Illumination Test- 2014
- AMD 025 Occupant Head Clearance Zones Test - 2014
- AMD 026 Ambulance Emergency Lighting System Configuration - 2014

**SAE**
- SAE J3057 Ambulance Modular Body Evaluation-Quasi-Static Loading For Type I and Type III Modular Ambulance Bodies
- SAE J3058 Ambulance Interior Storage Compartment Integrity
- SAE J3059 Ambulance Patient Compartment Seated Occupant Excursion Zone Evaluation
- SAE J3102 Ambulance Patient Compartment Structural Integrity Test to Support SAE J3027 Compliant Litter Systems
- SAE J3043 Ambulance Equipment Mounts
- SAE J3026 Ambulance Patient Compartment Seating Integrity and Occupant Restraint
- SAE J3027 Ambulance Litter Integrity, Retention, and Patient Restraint
Can I get an ambulance with no cot?

- Cots are not required for K Certification
- A complete litter fastener assembly is required
The “K” Sticker

CERTIFIED “STAR OF LIFE” AMBULANCE

Date of Manufacture ______________________________________________________
Mfg By:_________________________________________________________________
This Ambulance confirms to Federal Specification KKK-A-1822 In effect on the date the
ambulance was contracted for.
Exceptions taken? NO _______________ YES _______________
If exceptions are taken, they must be listed in the handbook of instruction and identified
by Section number.
Final Stage Ambulance Manufacturers ID Number _______________________________
VIN ___________________________________________________________________
OEM Chassis Model, Year of Manufacture _____________________________________
Vehicle Type ____________________________________________________________
NOTICE: THIS VEHICLE, AS MANUFACTURED, CONFORMS TO THE PAYLOAD
USERS SHALL NOT LOAD VEHICLES ABOVE THE GVWR, GAWRS OR EXCEED THE
TOTAL USABLE PAYLOAD OR CAPACITY LISTED BELOW.
“My ambulance just failed inspection. They said I need a new K sticker. I need you to send me one right away”
Where does the Federal Government say I have to have a “K” sticker?

• It doesn’t
• There is no Federal law requiring “K” stickers
• However, some States do require
What is the future of K?

• Will be updated to take advantage of new technologies
• Will be updated to take advantage of proven safety upgrades
• Will be updated to take advantage of new dynamic and static test methods
• States still mandate the use of K for State certification
Remounts

- Before the decision is made to remount, the condition and suitability of the module for remount should be determined.

- The benefits of remounting should be considered with respect to patient and care provider safety.

- To what standard will the remount be required to comply with?
Who Regulates Remounts?

- Federal Government?
- States?
THEY BOTH DO!
Federal Regulations come from NHTSA

49 U.S.C. 30115 requires a motor vehicle to be certified to the FMVSS by permanently affixing a tag or label to the vehicle by the time of its delivery to a distributor or dealer.
Is an Ambulance Body Remounter a Manufacturer?

- Yes. NHTSA’s regulations at 49 CFR 571.7(e) provide that when a new cab is used in the assembly of a truck, the truck will be considered newly manufactured for the purpose of applying the National Traffic and Motor Vehicle Safety Act of 1966 and the Federal motor vehicle safety standards unless the engine, transmission, and drive axle(s) (as a minimum) of the assembled vehicle are not new, and at least two of these components were taken from the same vehicle.
What kind of a manufacturer is an ambulance body remounter?

- An ambulance body remounter is a **Final-Stage Manufacturer**.

- NHTSA’s regulations at 49 CFR 567.3 define a “**chassis-cab**” as an incomplete vehicle with a completed occupant compartment that requires only the addition of cargo-carrying, work-performing, or load-bearing components to perform its intended function.

- The same regulations define a “**final-stage manufacturer**” as a person who performs such manufacturing operations on an incomplete vehicle that it becomes a completed vehicle.

- A “**completed vehicle**” is defined as a vehicle that requires no further manufacturing operations to perform its intended function.
Must an ambulance body remounter affix a certification label to the completed vehicle?

• Yes. As a final stage manufacturer, an ambulance body remounter must affix a certification label to each vehicle in a manner that does not obscure the labels affixed by previous stage manufacturers

• This is NOT a K label
Certification Label
Penalties

• If the manufacturer fails to demonstrate that it exercised “reasonable care” in certifying the vehicle or equipment item to the standard in question, it is subject to civil penalties
• Penalties are currently set at $21,000 per violation, up to a maximum penalty of $105,000,000 for a related series of violations
• A separate violation exists with respect to each vehicle or equipment item that does not comply
State Regulations

• Determined by each state
  – Some have none
  – Some use K
  – Some use NFPA
  – Some use CAAS
  – Some use 2 or all 3
1.1.3 “STAR OF LIFE” CERTIFICATION.

The final stage ambulance manufacturer (FSAM) shall furnish to a purchaser an authenticated certification and label stating that the ambulance and equipment comply with this specification and applicable change notices in effect on the date the ambulance is contracted for.
Who provides the “K” sticker?

• The final stage ambulance manufacturer (FSAM) shall furnish to a purchaser an authenticated certification and label stating that the ambulance and equipment comply with this specification and applicable change notices in effect on the date the ambulance is contracted for.
The label shall be mounted on the body (module) interior in a conspicuous location.

- The label shown here is suggested format.
- Deviations in dimensions are acceptable.
- All text must be included.
- Exceptions, when taken, shall be documented in the handbook of instructions
- No text shall be added to this label

- CERTIFIED “STAR OF LIFE” AMBULANCE
- Date of
- Manufacture __________________________
- Mfg By __________________________
- [ ] Address

City __________________________ State ________ Zip ______

This ambulance conforms to Federal Specification KKK-A-1822 in effect on the date the ambulance was contracted for

- Exceptions taken? No [ ] Yes [ ]
  
  If exceptions are taken, they must be listed in the handbook of instructions and identified by
  
  Section Number

- **Final Stage Ambulance Manufacturers ID**
- **Number** __________________________
- **VIN** __________________________

- **OEM Chassis Model, Year of Manufacture** __________________________
- **Vehicle Type** __________________________

**NOTICE: THIS VEHICLE, AS MANUFACTURED, CONFORMS TO THE PAYLOAD**

**REQUIREMENTS OF THE FEDERAL AMBULANCE SPECIFICATION KKK-A-1822. USERS SHALL NOT LOAD VEHICLES ABOVE THE GVWR, GAWRs OR EXCEED THE TOTAL**

**USABLE PAYLOAD OR CAPACITY LISTED BELOW.** __________________________ lbs.

- (Total remaining weight capacity of equipment and cargo evenly distributed in interior and exterior compartments the user may add)
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Other Considerations

• State Acceptance of remounts
  – States determine what standards the Module must meet

• Remounter Qualifications
  – Chassis Manufacturer approved
  – ASE/EVT technicians
  – NHTSA Registered as final stage manufacturer
Cost Analysis

• New vs Remount
• Loss of use
• Warranties
• Insurance Costs
WHEN AMBULANCES CRASH
EMS Provider & Patient Safety
DATA COLLECTED BETWEEN 1992-2011

4,500 vehicle traffic crashes involving an ambulance per year
(ESTIMATED ANNUAL AVERAGE)

34% resulted in injuries

33 people killed per year

44% of patients were ejected from the cot in serious crashes*

61% restrained with lateral belts only*

38% shoulder harnesses were available but were not used*

84% of EMS providers in the patient compartment
WERE NOT RESTRANDED

INJURY SEVERITY AND USE OF SAFETY RERAINTS IN EMS PROVIDERS*

<table>
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<tr>
<th>Injury Severity</th>
<th>% Restrained</th>
<th>% Not Restrained</th>
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<tr>
<td>No Injury</td>
<td>10</td>
<td>90</td>
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<tr>
<td>Non-impacting</td>
<td>20</td>
<td>80</td>
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<td>Impacting</td>
<td>5</td>
<td>95</td>
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<tr>
<td>Fatal</td>
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</tbody>
</table>

33% OF PATIENTS WERE SECURED WITH SHOULDER AND LAP RESTRAINTS

SIT DOWN & BUCKLE UP! Secure Your Patients. They Rely on You!

This safety message brought to you by NHTSA's Office of EMS.
Who Regulates Ambulances in Your State?

- Not GSA
- Not NFPA
- Not ASTM
- Not CAAS
- Not DOT
- Not NHTSA

Your State EMS Director
What Does My State Require?

• Different in each state

• Contact your state EMS Director **B E F O R E** you sign a contract, not after the ambulance is delivered

THANK YOU!

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