

## Differences Between NFPA 1917, KKK-F and ASTM

Subject Topic	NFPA Code	NFPA Description	KKK-F Code	KKK-F Description	ASTM Code	ASTM Description
<b>REFERENCED DOCUMENTS: Significant differences between referenced items used by NFPA - KKK - ASTM</b>						
<b>Chapter 2 – Referenced Documents</b>						
Applicable Documents and References Cited	2.3.9	Slight differences between KKK or ASTM referenced materials, Includes NFPA, ASTM, SAE, AMECA, ANSI / UL, Title 49 and Title 29 references.	2.1	KKK has been used as the basis for comparison of this item  Includes NFPA, ASTM, SAE, AMECA, ANSI / UL, Title 49 and Title 29 references.	2.5	Similar to KKK with exceptions Missing 29CFR1910.1030 Blood-borne Pathogens regulation. Missing 29CFR1910.7 Definition and requirements for a nationally recognized testing laboratory.
AMD Testing Requirements	N/A	Includes a reference to third party testing laboratories for generator 3KW or larger. NFPA (TBD) Proposes using some of the AMD Standards, but not 007, 013, 017, 019, 020, 022, or 023. Definitions are included on the last page.	2.2	Third party testing of AMD 001 through 025 required for type certification.	2.6	ASTM only references AMD 001 through 015 and allows third party or self-certification. (ASTM Current edition published March 2009).
<b>Chapter 3 - Definitions</b>						
Cot Orientation	3.3.3	One patient located on the primary cot so positioned that care can be given from a selected seating position. No orientation of patient head position specified.	3.1.5	Primary cot is to be loaded so that it positions the patient's head forward in the ambulance.	6.1.5	Configuration A - All litters shall be loaded to position the patient's head forward in the vehicle. Configuration B – Requires accommodation for (2) patients - (1) primary and (1) secondary or (1) Primary and (3) secondary patients seated on the squad bench.
Type I Definition	3.3.3.2	Same as KKK. GVWR 10,001 to 14,000.	3.1.2	Type 1 does not specify the number of OEM doors on the cab. GVWR 10,001 to 14,000.	6.1.2	Type 1 will be a (2) door enclosed cab. Note: GVWR not listed.
Type I -AD Definition	3.3.3.3	Type 1 - AD 14,001 GVWR or more.	3.1.2.1	Type 1 - AD 14,001 GVWR or more.	6.1.2.1	Type 1- AD Calls for increased GVWR.
Type II Definition	3.3.3.4	Type II- An Ambulance constructed on a van.	3.1.3	Type II- Up to 10,000 GVWR. * Shall be long wheel base.	6.1.3	Type II – No GVWR listed. Requires OEM long wheelbase model chassis.
Type III Definition	3.3.3.5	Type III – 10,001 to 14,000 GVWR.	3.1.4	Type III – 10,001 to 14,000 GVWR.	6.1.4	Type III – No GVWR listed.
Type III -AD	3.3.3.6	Type III – AD 14,001 GVWR or more.	3.1.4.1	Type III – AD 14,001 GVWR or more.	6.1.4.1	Type III – No GVWR listed.

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Vehicle Weight Ratings	3.3.66.1 3.3.66.2	GAWR / GCWR (combination articulated) To be determined by the final stage manufacturer.	3.5.5	The vehicle component rating shall be the OEM published ratings and shall not be raised above the OEM ratings. GCWR not applicable.	6.5.5	Weight ratings shall be the chassis manufacturers published ratings and shall not be raised. GCWR not applicable.
Vehicle Weight Ratings	3.3.66.3	GVWR- Gross vehicle weight rating. The final stage manufacturer's specified maximum load – carrying capacity of a single vehicle. Later contradicted by 5.2.4 and 5.2.5	3.5.5	OEM Manufacture determines GVWR. The OEM published ratings and shall not be raised above the OEM ratings.	6.5.5	OEM Same as KKK - OEM Manufacture determines GVWR. Weight ratings shall be the chassis manufacturers published ratings and shall not be raised.
Wet Location	3.3.67	WET LOCATION- Area while open, exposes the panel board to the environment		N/A		N/A
<b>Chapter 4 - General</b>						
Payload Requirements	4.2.1	Purchaser sets minimum usable payload or refer to 5.1.1 for GVWR requirements	3.5.2	Type II – 1500 lbs Type I or III – 1750 lbs Type I or III AD – 2250 lbs	6.5.2.2	Type II - 1700 lbs. Type I or III – 1750 lbs SRW Modular – 1500 lbs Note: March 2009 latest update
AD Payload Requirement	4.2.1	(See Above)	3.5.2	(See Above)	6.5.2.4	Additional duty payload to be determined by customer.
Contractor Information Responsibility	4.3.1.1	Detailed description required, payload, turning radius, angles of departure and approach, etc.	4.3.3	Weights for Star of Life Label, testing documentation, payload, tire information, drawings, and data.	6.19	Star of Life Certification, testing documentation, payload, tire information.
NFPA 1917 or Star of Life Certification	4.3.1.2	Detailed statement for each aspect of ambulance not <u>fully</u> compliant with NFPA standard.	3.15.3	Configuration worksheet. Provide list of purchaser requested exceptions.	9.2.45 1.2	Additional systems..... Cite additional parameters, provide list of exceptions to star of life and applicable amendments.
Manufacturer Self-Certification	4.7.3	Manufacturer required tests performed with appropriate equipment and a program for the calibration of all equipment.	4.3.3 4.3.5	N/A Requires third party testing by a nationally recognized independent testing facility.	7.1	Quality Assurance Program & Self certification requirements documented.
Manufacturer Self-Certification	4.7.5	Programs for employee training, proficiency testing and performance verification of vehicle testing required.	4.3.3	N/A Requires third party OSHA or ISO 17025 accredited laboratory testing.	7.1	Quality Assurance Program & Self certification requirements.
Certification Duration	4.7.8	Certification on substantially similar ambulance valid for seven (7) years.	4.3.3	Five (5) years	7.3.3	Five (5) years

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Vehicle Overall Height		N/A	3.4.10.3	Purchaser shall specify.	6.4.11.3	Unless otherwise specified, Vehicle height maximum 110 inches, excluding antennas for 2-way radios.
Vehicle Ground Clearance		N/A		N/A	6.4.11.4	Ground clearance minimum 8"
Vehicle Operating Temperatures	4.11.3	To function at -20°F to 110°, and stored without damage.	3.4.2.1	Operable from 0°F to 95°F.	6.4.2	Temperature conditions capable of being stored without damage from -30°F to 125°F.
Vehicle Speed	4.12.3	Maximum speed of ambulance to be 77 mph or less depending on tire rating.		N/A		N/A
Data Required From Manufacturer	4.16.1	Ambulance Documentation	3.19, 4.3.3, Figure 1 Figure 2	Ambulance Documentation	6.19, 6.20, 6.21, 6.22	Ambulance Documentation
Required Documents	4.16.2	Operation and Service Documentation – Extensive listing including optical warning systems certifications, certification of slip resistance, MSDS sheets for any fluid used in the ambulance module.	AMD 005 AMD 009 AMD013	Limited Documentation required compared to NFPA 1917.	AMD 005 AMD 009 AMD013	Similar to KKK.
Certification Labeling Requirement	4.17	Statement of Exceptions.  Detailed listing and sign off procedure for manufacturer and customer. 4.17.3 states: 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 modified to be in full compliance with this standard.		N/A  Allows for customer options and needs, allows exceptions.		N/A  Similar to KKK.

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<p>Certification and Payload Labeling Requirement Continued</p>	<p>4.17</p>	<p>Example from NFPA 1917 draft:</p> <p><b>4.17 Statement of Exceptions.</b> The entity responsible for final assembly of the ambulance shall deliver with The ambulance either a certification that the ambulance fully complies with all requirements of this standard or, alternatively, a Statement of Exceptions specifically describing each aspect of the completed ambulance that is not fully compliant with the requirements of this standard at the time of delivery.</p> <p><b>4.17.1</b> The Statement of Exceptions shall contain, for each noncompliant aspect of the ambulance or missing required item, the following information:                      (1) A separate listing of the section(s) of the applicable standard for which compliance is lacking                      (2) A description of the particular aspect of the ambulance that is not in compliance therewith or required equipment that is missing                      (3) A description of the further changes or modifications to the delivered ambulance that must be completed to achieve full compliance                      (4) Identification of the entity that will be responsible for making the necessary post-delivery changes or modifications or for supplying and installing any missing required equipment to the ambulance to achieve full compliance with this standard.</p> <p><b>4.17.2</b> Prior to, or at the time of, delivery of the ambulance, the Statement of Exceptions shall be signed by an authorized agent of the entity responsible for final assembly of the ambulance and by an authorized agent of the purchasing entity, indicating mutual understanding and agreement between the parties regarding the substance thereof.</p> <p><b>4.17.3</b> 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.</p>	<p>3.15.3</p>	<p>N/A</p> <p>Unless otherwise specified by the purchaser, Vehicles will be Star of Life compliant and provided with a list of purchaser requested exceptions.</p> <p>Purchaser is not required to make additional post-delivery modifications to obtain full compliance to KKK – Star of Life</p>	<p>9.2.45</p> <p>1.2</p>	<p>N/A</p> <p>Similar to KKK, provide list of exceptions to Star of Life and applicable amendments.</p> <p>Purchaser is not required to make additional post-delivery modifications to obtain full compliance to ASTM - Star of Life</p>

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Suggested Medical Equipment and Supplies		N/A	3.15.1	Additional equipment and supplies. A work sheet is supplied to assist the purchaser to determine the optional equipment.	6.15.4.1	When specified by the purchaser the following Ambulance Equipment should be carried: Table 6 – Miscellaneous Extrication Equipment, Table 8 - Medical, Surgical, Bio Medical Equipment , Table – 9 Pediatric Medical Equipment and Supplies.
<b>Chapter 5 - Chassis</b>						
GVWR Calculations	5.1	Carrying Capacity Design and weight values required for GVWR calculations (see table).	3.5.2	Remaining Payload excluded loose equipment. Per 3.5.2	6.5.2	Similar to KKK.
Occupant Calculations	5.1.1	Weight calculated at 171 lbs for each person.	3.5.2	Weight calculated at 150 lbs for each person.	6.5.2.4	Weight calculated at 175 lbs for each person.
Height Label Requirement	5.1.3.2	Label visible to driver showing completed ambulance height and GVWR.		N/A		N/A - 6.4.11.3 Limited Height to 110" unless otherwise specified.
Engine Design	5.3	N/A	3.6.3.1	Power unit shall meet specified performance requirements.	6.6.3.4	Diesel Engine, requires the highest horsepower/displacement engine available be provided.
Engine Design	5.3.1.1	Low temp start, engine must start without aid at 0°F.	3.6.3.2	Low temp start, engine must start without aid at 0°F.	6.6.3.2	Low temp start, engine must start without aid at 10°F.
Engine Design	5.3.3	Engine hour meter required		Option		Option
Engine Design	5.3.4	Idle reduction engine shutdown device shall be disabled if provided.		N/A		N/A
Exhaust Systems	5.6.3	The tailpipe outlet shall not terminate within 12" of fuel fill, O2 storage, and patient entry doors.	3.6.4.6	12" from fuel filler and a maximum 1" beyond the side of the body.	6.6.4.7	6" from fuel filler on modular units – 1" beyond the size of the body
Brake System	5.7	Brake System. Additional rules for air brakes and secondary braking devices.	3.6.5.4	OEM Heavy Duty power assists with antilock if available.	6.6.5.9	Same as KKK – HD power- Special Air Brake- Notations.
Suspension Clearance Angles	5.8.1	Angle of Approach – 10° Breakover Angle – 10° Angle of Departure – 10°	3.4.10.4	Angle of Approach – 20° Breakover Angle – 10° Angle of Departure – 10°	6.4.11.5	Angle of Approach – 20° Breakover Angle – 10° Angle of Departure – 10°
Suspension	5.8.2	Traction control shall be provided.	3.6.5.6	Traction control required unless not furnished by OEM.		Same as KKK.

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Suspension	5.8.4	Any air ride suspension shall have an air dryer and automatic moisture ejection device.	3.15.4.8	Optional equipment		Optional equipment
Tires	5.9.5	Each tire shall be equipped with a visual indicator or monitoring device.		N/A		N/A
Bumpers	5.11.1	A front bumper at least equal to the chassis manufacturer's front bumper.	3.9.6	OEM chrome front bumper required.	6.9.6	OEM chrome front bumper required.
Bumpers	5.11.2	Rear bumper to extend within 6" of each side of the ambulance.	3.9.6	Full width rear bumper required.	6.9.6	Rear bumper to support 500lbs, without flex- Detailed requirements.
Stepping Surfaces	5.11.2.8.2	NFPA step surface compliance and validation to testing.		N/A testing – commercial grip strut.		N/A testing – commercial grip strut.
Mirrors	5.14.2	All primary side view mirrors used by the driver shall be adjustable from the driver's position.	3.9.5	Mirrors to be independently adjustable.	6.9.5	Largest usable reflective area practical – Min. 125in <sup>2</sup> – flat/convex required.
Mirrors	5.14.5	Each side view mirror outboard edge shall extend at least 1" beyond the outside of the modular body. "Velvac" in many cases if the body is 96" or wider.		N/A  Mirrors to meet FMVSS 111.		N/A  Mirrors to meet FMVSS 111.
SRW Modular Chassis Selection	N/A	Chassis not permitted under NFPA.	N/A	Chassis not permitted under KKK.	6.5.2.1	Single rear wheeled modular ambulance payload 1500lbs Note: March 2009 latest update.
<b>Chapter 6 – Patient Compartment</b>						
Required Equipment	6.5.2.2	Requires a Carbon Monoxide Detector.		N/A - AMD 007 Patient compartment Carbon monoxide level testing required.		N/A - AMD 007 Patient compartment Carbon monoxide level testing required.
Bulkhead / Partition	6.7.6	A bulkhead partition shall be provided. If equipped with a window it shall be a minimum 150 sq. in.	3.10.14	Requires a walkthrough opening with a window.	6.10.15	Walkthrough opening in a bulkhead with roll bar characteristics.
Bulkhead Door	6.7.7	N/A - Sliding window, it shall be latchable from the cab, minimum 150 sq. inches	3.10.14.1	17" x 46" latchable door.	6.10.15.1	17 x 46 latchable door or customer approved alternate size.

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Finished Floor Loading Height	6.14.2	4x2 Floor Load Height, 34" and 4x4 Floor Load Height, 39" are (accept in principle) listed in the NFPA ROC ballot dated 11/4/11. NOTE: This may have been eliminated from the final version leaving no maximum load height requirement.	3.4.10.6	4x2 considered the standard – floor load 34". 4x4 is optional no height given.	6.4.11.7	Floor load height 4x2 floor height 33" 4x4 floor height 38"
Access Handrails	6.8.1	Interior or exterior grab handles required on the cab and patient compartments at each step or climbing location.	3.10.9.4	To facilitate entry and exit a grab handle shall be provided on the inside of each door or the adjacent body structure.	6.10.9	Similar to KKK.
Handrail Construction	6.8.2	Exterior access grab handles shall be constructed of or covered with a slip resistant (i.e.: cross hatched stainless steel, rubberized, etc.) non corrosive material.		N/A	6.10.9	Grab handle hardware shall be Chrome plated bright finish, S/S, anodized aluminum, or other powder coated metal.
Exterior Access Handrails	6.8.3	Specifies handle size between 1" and 1 5/8" in diameter with a minimum clearance of at least 2".	3.10.9	Require a minimum 6" long 3/4" wide handle inside of each door or body structure.	6.10.9	Similar to KKK.
Means of Escape - Required Door Openings	6.10.1 6.10.2	Any interior area to be occupied by personnel shall have a minimum of two means of escape. Means of escape openings shall be a minimum of 24" x 24". No minimum door size specified.	3.10.8	Two patient compartment door openings required. Modular bodies had minimum door sizes required. Rear 44" x 46" and Curbside 30" x 63".	6.10.8	Same size requirements as KKK located at the right forward side and rear of the body.
Step Surfaces	6.11.1	Slip resistant exterior surfaces and interior steps.	3.10.12	Step surfaces will be constructed with anti -slip material.	6.10.12	Mentions interior step surfaces using Diamond plate or anti -slip material.
Step Surface Certification	6.11.4	Testing procedures and required documentation provided with each vehicle.	3.9.6	Provides step tread size guidelines. Bumper step designed to prevent accumulations made of anti-skid open grate metal.	6.9.6 Table 7	Anti-skid, open grating for folding style step. (See Table 7)

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Plywood Sub-Floor	6.13.7.1	Subfloor if plywood requires APA floor rating of 16" or better.	3.10.10	If sub- floor is plywood it shall not be less than .5" thick, minimum 5 ply and supported by body framework utilizing an aluminum sealed splash pan.	6.10.10.1	Similar to KKK.
Floor Testing Requirements	6.13.7.2	Structural integrity allows more deflection and less ultimate load testing pressure than KKK.	AMD-020	AMD 020 floor deflection test requires less deflection at higher test loading pressures.	6.10.10.1	Distributed floor load test of 73kg/1000cm <sup>2</sup> – 150lbs / ft <sup>2</sup> .
Equipment Storage Criteria	6.18.2	Equipment weighing 3 pounds or more mounted or stored in the cab or patient compartment shall be contained in an enclosure, bracket or mount capable of withstanding a 10G force in all directions.	3.11.1.1	Minimum of 35 cubic feet of enclosed stowage for medical supplies and devices. Designed to accommodate the respective items. All medical devices stowed or fastened according to the medical device manufactures instructions.	6.11.1.1	Location dictated by relative importance and readily accessible. All medical devices and equipment shall be stowed or properly fastened in brackets or cabinets to prevent items from becoming projectiles that can cause injury while in motion or accident.
Cabinet Storage Maximum Load Capacity	6.18.3	Each patient compartment cabinet shall be permanently labeled with its maximum load capability.		N/A	6.11.1	N/A
Patient Compartment Seating	6.21.1	Seat Integrity. On adjustable seats use SAEJ2917 dynamic testing.	3.10.3	(EMSP) seating must comply with all applicable FMVSS standards.	6.10.3	Conform to FMVSS 207/210. Adjustable a minimum of 4" front to rear.
Labeling For Seat Belts	6.21.3.3	Signs that read "Occupants must be seated and belted when Ambulance is in Motion" visible from each seated position.	3.15.2	"Fasten Seatbelts" in cab and patient cmpt.	6.15.2.2	"Fasten Seatbelts" and "No Smoking" in cab and patient area.
Seating Construction	6.21.7	Minor changes to update new FMVSS 202 revisions – does not supply thickness for pads or cushions.	3.11.4	40oz minimum reinforced vinyl 2.5" foam for seat pads, 2" for backrest.	6.11.4.1	Similar to KKK. Fire retardant per FMVSS 302.
Access to Patient	6.21.8 6.21.8.1 6.21.8.2 6.21.8.3 6.21.8.4	Access to patient Special instructions for seat to cot relationship allows for multiple primary cot positions.	3.10.4	Primary seat to be located a minimum of 25" from head of the patient cot.	6.10.3 6.10.4.1	Unless otherwise specified 25" to 30" of unobstructed space from the head of the cot to the EMT seat mounted near the bulk head.



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Seat Belt Warning System	6.21.10 6.21.10.1 6.21.10.2 6.21.10.3 6.21.10.4 6.21.10.5	Seatbelt warning system (Accept in Principle) may be added as standard. Proposes a warning system with an audible & visual warning device that can be heard & seen by the driver & seen by the occupants of the patient compartment.	3.15.2	Labeling only "Fasten Seat Belts" in cab and patient area.	6.15.2.2	Labeling only "Fasten Seat Belts" in cab and patient area.
Reflective Striping	6.25	Retro reflective stripe minimum 4" width 1) 25% of the width of the front of the ambulance visible. 2) 50% of the length visible from each side.	3.16.2	6" minimum, 14" maximum Orange reflective stripe that encircles the entire body.	6.16.2	Similar to KKK but allows for reflective tape or paint.
Rear Chevron	6.25.6	50% of the rear facing vertical surfaces equipped with retro-reflective chevron pattern per.	Defined option 3.15.4.32	Optional Code K15C Reflective Chevron minimum 50% of the rear vertical surfaces.		N/A
Chevron Color	6.25.6.1	ASTM D 4956 red and yellow color suggested/required.	3.15.4.32	N/A		N/A
O2 Storage	6.28.9.3	Oxygen compartment shall not be used for storage of any other equipment – Labeled as O2 storage only.	3.11.3.9	Oxygen storage compartment shall not be utilized for storage of any other equipment.	6.11.3	Oxygen storage compartment shall not be utilized for storage of any other equipment.
O2 Label / Test Requirement	6.28.11.2	O2 testing label, signed stating NFPA tested compliant.		AMD 015 test method and labeling requirement.		AMD 015 and ASTM F1949 Specification for Medical Oxygen Delivery System for EMS Ground Vehicles.
<b>Chapter 7 – Low Voltage Electrical Systems and Warning Devices</b>						
Printed Circuits	7.1.1.2	Printed Circuit Assemblies IPC-A-610D – Class 2 "Commercial and industrial assemblies" or better.	3.7.2.2	Printed Circuit Assemblies IPC-A-610D – Class 3 "Life Support or other critical assemblies".	6.7.2.2	Printed Circuit Assemblies conform to SAE J771.
Wiring	7.2.1.3	The use of star washers for circuit grounding connections shall not be permitted "external tooth lock washers".	3.7.3.1	Minimum 3/4" ground straps secured to cleaned metal surfaces on the body and frame with lock washers.	6.7.3.2	Minimum 3/4" braided ground straps with star washers and rust proofing compound.

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O2 Compartment Electrical Restrictions	7.2.1.5	Only electrical components directly related to the delivery of on-board oxygen shall terminate in the oxygen compartment.	3.11.2	Automotive lighting in O2 compartment was required.	6.7.2	O2 solenoid, light, and switch only in the O2 compartment.
Wire Harness Construction	7.2.2.1	Low voltage wire insulation types: SXL, GXL or TXL.	3.7.2	SXL or GXL Only.	6.7.2	SXL, GXL, or better.
Wire Harness Construction	7.2.2.1.2	Conductor materials and strands other than copper shall be permitted.	3.7.2	Copper only for wiring.	6.7.2	Copper wiring to conform to SAE J1292.
Wire Harness Covering	7.2.2.2	Loom 194° F temperature rating.	3.7.2	Loom 300° F temperature rating.	6.7.2	Loom 300°F temperature rating.
Wire Connections	7.2.2.7	Connectors at all exterior lights and fixtures shall utilize sealed connectors (accept in principle)	3.7.2.1	All exterior wiring to lights or any other component shall utilize sealed connectors or splices.	6.7.2.1	All exterior wiring to lights or any other component shall utilize sealed connectors or splices.
Drawing Protocol	7.2.2.9.3	Wiring diagrams shall have an alphabetical list of identifiers and locations.		N/A		N/A
Low Idle Test	7.3.2	NFPA Low Idle Alternator output testing.		Not required in KKK AMD-005 testing.		
Trailer Towing	7.4.2	Allows for towing a trailer – requires additional 45 amps of 12v power.		N/A		N/A
Load Management	7.5.1	If the total continuous electrical load exceeds the minimum continuous electrical output of the alternator, an automatic electrical load management system shall be required.	3.7.6	As a minimum, the generating system shall be capable of supplying at its regulated voltage, at 200F, the continuous electrical load. Load Manager optional.	6.7.6.1	If minimum continuous load exceeds alternator output, then a load management system is required.
Engine Speed Control	7.5.3.2	Hi Idle interlock to prevent control unless the parking brake is engaged and the transmission is in neutral, park or disengaged from the drive wheels.	3.7.6.1	Allowed OEM high idle strategies and OEM control.	6.7.6.2	Engine high idle speed control shall be furnished.

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Warning Lights	7.9.1	Optical warning device system shall consist of an upper and lower warning level “(4) Zones Total”. Alternate Approved Pattern: KKK-A-1822	3.8.2.1	KKK-A-1822-F Emergency Lighting requirements. Alternate Approved Patterns: NFPA1901 or SAEJ2498	6.8.2.1	Standard Emergency Lighting configuration per table 2 Fig. 10.
Flash Sequence	7.9.7	Primary drop to secondary in park position.		N/A	6.8.2.3 9.2.22	User specified.
Warning Lights	7.9.13	Lighting requirements for larger ambulances of 25 feet or more.		N/A	6.4.11.1	Purchaser may specify additional length
Warning Lights	7.9.14	Lighting requirements for small ambulances less than 25 feet.	3.8.2.1	KKK Emergency Lighting system configuration or approved alternate systems are NFPA 1901 or SAE J2498.	9.2.6	Standard length shall not exceed 22ft.
Document Compliance Methods	7.9.16	Compliance Documentation Ambulance Mfg shall demonstrate compliance of the optical warning standard chosen.		Requires compliance to KKK-A-1822F.	6.8.2.5	References FMVSS 108. Uses specific pattern in figure 10 as well as flash energy and flashes required per fixture- tables 2-3.
Alternate Lighting	7.9.17	Alternate lighting system allowed with a 40amp max electrical load restriction.	3.8.2.1	Same as Emergency lighting system configuration. 40amp restriction.	6.8.2.6	Not to exceed 40amp at 14.2V or 42amp with approved second amber rear light.
Siren/Horn Locations	7.10.3	Audible warning equipment shall not be mounted on the roof of the ambulance.	3.14.4	Addresses siren only. Air horn optional and location not addressed.	6.14.5.1 6.14.6	Addresses siren and speakers. Air horns are optional and lists acceptable locations.
Ground Lighting	7.11.5.1	Ground lighting shall be provided at all areas that personnel can climb in or out of the vehicle		N/A		N/A
Lighting in Cab	7.11.6.1	The ambulance shall provide 1 fc of light at each seat in the cab.	3.9.2	OEM Dome light required.	6.9.2.13	OEM cab light and controls.
Warning Indicators	7.12	“DO NOT MOVE” ambulance light – to be illuminated by ignition switch in the run position, parking brake not engaged and warning of any of the following conditions: 1) Door open. 2) Equipment rack not stowed. 3) Permanently attached device open or deployed.	3.7.1.1	Requires Door /Equipment indicator light in the drivers compt. 1) Open patient compartment entry door. 2) Open cab entry door. 3) Open equipment compartment doors. 4) Extended devices (flood lights, etc.).	6.7.1.1	Requires red colored “Door Open” light, and separate green color Hazard indicator lights as described in this passage.

## Differences Between NFPA 1917, KKK-F and ASTM

Subject Topic	NFPA Code	NFPA Description	KKK-F Code	KKK-F Description	ASTM Code	ASTM Description
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### Chapter 8 – Line Voltage Electrical Systems

Shoreline Label	8.2.2.6	Permanent label for shoreline per NFPA Figure 8.2.2.6.  Shore power Inlet Line Voltage _____ Volts Current rating _____ Amps	3.7.8.1	Permanently labeled with the following :  THIS CONNECTION IS FOR 125-VOLT AC, 60Hz, 1-AMPERE SUPPLY.	6.7.8.1	Permanently labeled with the following :  “This connection is for 115VAC (__)amp supply”.
Shoreline Receptacle	8.2.3.2	A proper 15 amp weatherproof mating plug conforming to NEMA configuration shall be furnished without cable and tagged for future hook up.	3.7.8.1	A proper mating, weatherproof, 15 amp NEMA 5-15 connector shall be furnished without cable and tagged for future hook up.	6.7.8.1	Similar to KKK, a female 115V receptacle (NEMA 5-15R) Shipped loose without cable and tagged for future hook up.
Generator Requirements	8.5  9.9.6.2	NFPA Power Source “Generators” General Requirements. Note: See Actual NFPA standards for specifics.  The testing of any power source greater than 3kw shall be witnessed, and the results of the tests of the power source shall be certified by an independent third-party certification organization.		N/A	6.15.1 9.2.45	Considered additional & optional equipment items to be selected by the purchaser.
Generator Requirements	8.5.9	Generator control panels to be within reach of the driver’s seat or standing upright on the ground.		N/A		N/A
Label Requirements	8.5.10	New Label required for units with Generators		N/A		N/A
DC Power Supply Capacity	8.6.4.2	The alternator and/or battery system shall be adequate to provide power for continuous operation for a minimum of 2 hours at full output. Critical if inverter is installed.		Optional	6.7.8.3	Optional when specified it shall provide a minimum of 750w of sine-wave-type 115V power
Generator Operating Preferences	8.6.5.2	Interlock shall prevent generator engagement unless parking brake is engaged and transmission is in neutral.		Common operation in motion.		N/A

## Differences Between NFPA 1917, KKK-F and ASTM

Subject Topic	NFPA Code	NFPA Description	KKK-F Code	KKK-F Description	ASTM Code	ASTM Description
AC Receptacles	8.12.5.1	The patient compartment furnished with (3) duplex receptacles.	3.7.8.2	(2) duplex 125v receptacles.	6.7.8.2	(2) duplex 115V receptacles.
AC Labeling	8.12.5.10.1	New Label for 125v receptacles to include amp rating	3.7.8.2	N/A	6.7.8.2	N/A
AC Receptacles	8.12.5.6.2	All receptacles located in a wet location shall not be less than 24" from the ground.		N/A		N/A
AC Receptacles	8.12.5.7	All receptacles shall be mounted at least 12" above the interior floor height.		N/A		N/A
AC Receptacles	8.12.5.8	No receptacle shall be installed in a face-up position.		N/A		N/A
AC Labeling	8.13.8	New Labels for units with 125vac retractable cords.		N/A		N/A
<b>Chapter 9 – Test Methods</b>						
Door Testing Criteria	9.2	Body Door Test Added a time duration of 10 seconds No load force weights noted FMVSS 206 not mentioned but applies to manufacture and testing requirements.	AMD002	2500 pound force / FMVSS 206.	2	References AMD-002 / FMVSS 206.
O2 Tank Testing Criteria	9.3	Oxygen tank retention has added a time duration of 10 seconds to applied force.	AMD003	25 times the fully loaded bottle weight.	6.11.3	References AMD-003.
DC Testing Criteria	9.5	Load voltage electrical system tests – 3 steps in sequential order 1) Battery reserve test. 2) Alternator min electrical test at idle. 3) Alternator operational test at high idle. 4)	AMD005	All loads measured at high idle.	6.7.6	References AMD-005.

## Differences Between NFPA 1917, KKK-F and ASTM

Subject Topic	NFPA Code	NFPA Description	KKK-F Code	KKK-F Description	ASTM Code	ASTM Description
Line Voltage Testing	9.9 9.9.2 9.9.3 9.9.5	NFPA unique Line Voltage Electrical Systems Test criteria in lieu of AMD 009. Tests include: Check for polarity. Operational Check. Check for continuity.	AMD009	Comply with AMD-009 Tests include: Check for polarity. Operational Check. Check for continuity. 900 Volt Dielectric strength test specified for all current – carrying conductors including neutral and vehicle ground.	6.7.8	Comply with AMD-009 Tests include: Check for polarity. Operational Check. Check for continuity. 900 Volt Dielectric strength test specified for all current – carrying conductors including neutral and vehicle ground. Listing shall be by a nationally recognized testing laboratory.
Independent Testing Requirement	9.9.6.2	Requires any power source “generator” greater than 3kw be tested and witnessed by an independent third party certification organization.		N/A		N/A
Water Test	9.10.2.3	Drench vehicle evenly with water spray from nozzle or combination of nozzles no pressure or force specified.	AMD010	S5.4 25-35psi flow rate 1 gallon per minute producing a direct stream. Per diagram	7.2.3.3 7.4.5	References AMD-010. Nozzles operating at 25psi.
Water Test	9.10.2.4	Continue spraying until a minimum of 40 gallons of water have been used – no time duration.	AMD010	S5.4 Test Method “A” 15 minutes. Test Method “B” 5 minutes.	7.4.5	Minimum of 15min – AMD-010
Water Test	9.10.2.6	Start engine – continue test until another 40 gallons of water has been used – no time duration.	AMD010	S6.3 Start Engine maintain water spray for 15 minutes.	AMD010	S6.3 Start Engine maintain water spray for 15 minutes.
Interior Climate Control Test	9.12.17 9.12.27	Record Thermo Couple temperatures at 5-minute intervals up to 30-minutes.	AMD012	Interior climate control Test S6.7(d) S6.12(d) Record thermo couples at the start of test, 10-minutes, 20 –minutes and 30-minutes.	6.13.1	References AMD 012.
Oxygen Flow Test Criteria	9.15.2	Flow test does not specify minimum flow rate required. Adds an electrical continuity check between the oxygen system piping and the vehicle to verify that it is grounded.	AMD015	S6.3 note breathing air or dry nitrogen must flow at a rate of 110lpm at each outlet as an equivalent to 100lpm flow of oxygen.	6.12.1.1	Similar to KKK – Uses AMD015 Plus the addition of ASTM F1949-99 Standard Specification for Medical Oxygen Delivery Systems for EMS Ground Vehicles.

## Differences Between NFPA 1917, KKK-F and ASTM

Subject Topic	NFPA Code	NFPA Description	KKK-F Code	KKK-F Description	ASTM Code	ASTM Description
Patient Compartment Lighting Tests	9.16 (3)	Start engine for patient compartment lighting level test.	AMD016	S5.3 vehicle will be started and high idle engaged.		N/A
Patient Compartment Lighting Tests	9.16 (10)	Measure and record light intensity in the center of each 5 in <sup>2</sup> area on the test grid.	AMD016	S6.2 uses 10 in <sup>2</sup> test grids.	6.8.5.1	Detailed criteria documented Minimum of 35-ft candles of illumination measured on at least 90% of the cots surfaces.
Rear Step Load Test	9.18 (2)	Rear Stepping surface Load Test – Apply vertical load on the stepping surface using a fixture with a circular area 5” in diameter.	AMD018	S3.3 uses an application plate weighing 500 pounds measuring 36” wide x 9.75” deep.	6.9.6	Rear bumper to support 500lbs, without flex- Detailed requirements.
Occupant Head Zone Criteria	9.25.1	Occupant Head Clearance Zone Size of Zone 43” high, 24” wide x 15” deep. No Non-compliant guidelines provided see AMD025 S6.5 example “The test fixture cannot hang over the front edge of the seating position”.	AMD025	S4.3 Size of Zone 43” high x 18” wide and 15” deep S5.7 All clearances to be validated – The test fixture cannot extend over the free edge of the seat plane “Overlap the cushions”.		N/A
AMD Standards Utilized	<p>NOTE: The following AMD test standards were not selected for inclusion into this initial NFPA-1917 Draft version however; a location for each was reserved for possible future inclusion.</p> <p>Excluded AMD Test Standards :</p> <p>007 Patient Compartment Carbon Monoxide Level.</p> <p>013 Weight Distribution Guidelines.</p> <p>017 Road Test.</p> <p>019 Measuring Guidelines for cabinets and compartments.</p> <p>020 Floor Distributed Load.</p> <p>022 Cold Start Test.</p> <p>023 Siren Performance.</p>			Uses AMD-001 through AMD-025		<p>Uses AMD-001 through AMD-015</p> <p>Note: Several AMD standards have been developed since ASTM original approval.</p>