NMMA Trailer Certification Handbook

Effective beginning the 2016 Model Year

NATIONAL MARINE MANUFACTURERS ASSOCIATION

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Effective beginning the 2016 Model Year

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NMMA TRAILER CERTIFICATION PROCEDURES & ANNUAL REQUIREMENTS

The National Marine Manufacturers Association (NMMA) is a trade association representing all facets of the recreational boating industry. NMMA's members include manufacturers of boats, marine engines, outboard motors, boat trailers, components, accessories and supplies.

NMMA has developed the NMMA Trailer Certification program to assist boat trailer manufacturers in complying with established industry standards and Federal Regulations, and to help inform the public of such compliance when purchasing a boat trailer. NMMA certifies that the design meets the requirements outlined in this handbook; the manufacturer has the responsibility of assuring production units are manufactured in compliance with the certified design.

NMMA Certification is an annual process which requires the following be completed each model year:

- Execution of the annual agreement and payment of the annual agreement fee
- Submission of model applications and signing of the Master Model List
- Physical inspection conducted by the NMMA third-party Inspector (charges apply; see agreement)
- A response to the inspection in writing adressing resolution of all variances within 30 days of receipt of the formal inspection report

Official inspection reports are issued to the manufacturer after the inspection.

The technical and administrative requirements of the NMMA Trailer Certification Program are subject to change in accordance with Federal Regulations, (should the Regulation change during the model year) and NMMA policies and procedures.

The Federal Motor Vehicle Safety Standards (FMVSS) and other regulations used are based on the Code of Federal Regulations (CFR) and other government publications, which may be obtained from:

U.S Government Publishing Office
732 North Capitol Street N.W.
Washington, DC 20401-0001
202.512.1800

Industry standards used are from the Society of Automotive Engineers (SAE), and may be obtained from:

SAE World Headquarters
400 Commonwealth Drive
Warrendale, PA 15096
724.776.4841

Remaining requirements for NMMA Trailer Certification result from the actions of the Boat Trailer Manufacturer Association (BTMA), the NMMA Accessory Manufacturer Division (AMD) Board of Directors or NMMA staff.

Model applications and annual agreements are available online at nmma.org/certification.

Manufacturers wishing to participate should contact NMMA at 312.946.6200 or online at nmma.org.

TRAILER V.I.N. PLATES

The trailer manufacturer shall affix a label to a location on the forward half of the left side of the trailer, such that it is easily readable from outside the vehicle without moving any part of the vehicle. This label shall be riveted or permanently affixed in such a manner that it cannot be removed without destroying or defacing it.

The label shall contain the following information, in the English language, lettered in block capitals and numerals not less than 3/32 inches and in a color that contrasts with the background of the label, in the following order:

1. The words "Manufactured by" or "Mfd. by," followed by the name of the trailer manufacturer.

2. Month and year of manufacture. This shall be the time work was completed at the place of main assemble; it may be spelled or expressed in numerals, such as in the following example: "June 2008" or "6/08."

3. The words "Gross Vehicle Weight Rating" or "GVWR" followed by the appropriate value in kilograms (and pounds in parentheses).

4. The Words "Gross Axle Weight Rating" or "GAWR" followed by the appropriate value in kilograms (and pounds in parentheses) for each axle, identified in order from front to rear. The GAWR shall be followed by the tire size including load range, rim designation, cold inflation pressure and speed restriction, if any. The ratings for any consecutive axles having identical gross axle weight ratings when equipped with tires having the same tire size designation may, at the option of the manufacturer, be stated as a single value, with the label indicating to which axles the ratings apply.

5. The statement of compliance with federal standards: "This vehicle conforms to all applicable federal motor vehicle safety standards in effect on the date of manufacture shown above." The expression "U.S." or "U.S.A." may be inserted before the word "Federal".

6. Vehicle Identification Number (VIN) (49 CFR 565)

7. The type classification of the vehicle as defined in 49CFR571.3 (i.e. Type — BOAT TRAILER)

MANUFACTURED BY PRDNKWY TRAILER CO., ANYCITY, IL, USA **MANUFACTURED June 1998**
GVWR: 1415 KG(3120 LB) GAWR: (ALL) — 708 KG(1560 LB) WITH 4.80 — 12(B) TIRES, 12 x 4 JA RIMS, AT 410 KPa(60 PSI) COLD
GVWR: 1896 KG(4180 LB) GAWR: (ALL) — 948 KG(2090 LB) WITH 5.30 — 12(C) TIRES, 12 x 4 JA RIMS, AT 550 KPa(80 PSI) COLD
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE VIN — 1C91ABC12A3015036 TYPE — BOAT TRAILER

Note: The applicable Federal motor vehicle safety standards referenced on the VIN Plate are those standards which apply to trailer light and VIN Plate placement and verbiage.

Tire and rim information need not be on the trailer VIN plate if it is shown on a separate tire information label in the format above and affixed at the same location. See "Capacity Ratings" in this handbook.

BILINGUAL PLATES

1. The Canadian and U.S. federal motor vehicle standards for trailers are very similar. All trailers built or sold in Canada must comply with the Canada Motor Vehicle Safety Standards (CMVSS). Additional information can be found in the "Trailer Information Guide." This helpful publication is obtained from Transport Canada, telephone 613.998.1460.

2. The Canadian Compliance Label shall be formatted as per the sample below. The U.S. Certification Plate and the Canadian Compliance Label may be combined on one label. However, the U.S. format must be followed and the Canadian bilingual conformity statement must be located only after the "Classification Type" information field.

***MANUFACTURED BY/FABRIQUÉ PAR:**
TYPE OF VEHICLE/TYPE DE VÉHICULE: **DATE:**
GVWR/PNBV _____ KG. **V.I.N./N.I.V.: _____**

GAWR/PNBE KG TIRE/PNEU – DIMENSION – RIM/JANTE

THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE/CE VÉHICULE EST CONFORME À TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTU DU RÈGLEMENT SUR LA SÉCURITÉ DES VÉHICULES AUTOMOBILES DU CANADA EN VIGUEUR À LA DATE DE SA FABRICATION

*NOTE: *Manufacturers modifying fully certified completed vehicles, other than chassis-cabs, shall use the wording "THIS VEHICLE WAS ALTERED BY/CE VÉHICULE A ÉTÉ MODIFIÉ PAR" instead of the wording "MANUFACTURED BY/FABRIQUÉ PAR".*

This label cannot be used for **passenger cars**.

The tire and rim specifications may be displayed on a separate label applied to the vehicle beside the compliance label.

All lettering shall be a minimum of 2mm high and in block capitals.

VEHICLE PLACARD FOR TRAILERS WITH A GVWR OF 10,000 LBS OR LESS (49 CFR 571.110)

Each trailer shall show the following information on a permanently affixed label proximate to the certification label:

1. The cargo capacity expressed in the statement: "The weight of the cargo should never exceed XXX kilograms or XXXX pounds"

2. S4.3(c) Vehicle manufacturer's recommended cold tire inflation pressure for front, rear and spare tires.

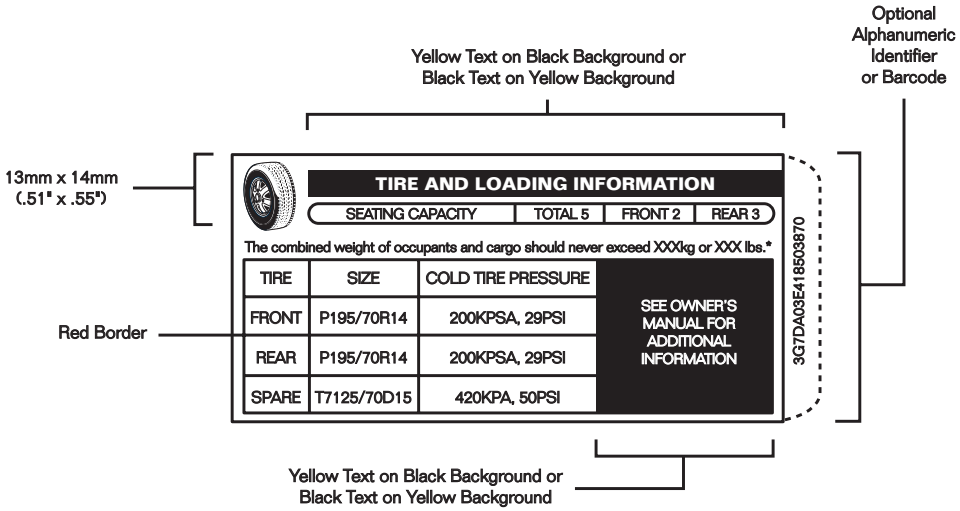
3. S4.3(d) Tire size designation, indicated by the headings "size" or "original tire size," and "spare tire" or "spare" for the tires installed at the time of the first purchase for purpose other than resale.

4. S4.3(e) The words "Tire and Loading Information" on the vehicle placard, and the words "Tire Information" on the tire inflation pressure label.

5. S4.3(f) The statement "See Owner's Manual for additional information"

6. S4.3(g) For vehicle equipped with a non-pneumatic spare tire assembly, the tire identification code with which that assembly is labeled pursuant to the requirements of S4.3(a) of 49CFR571.129.

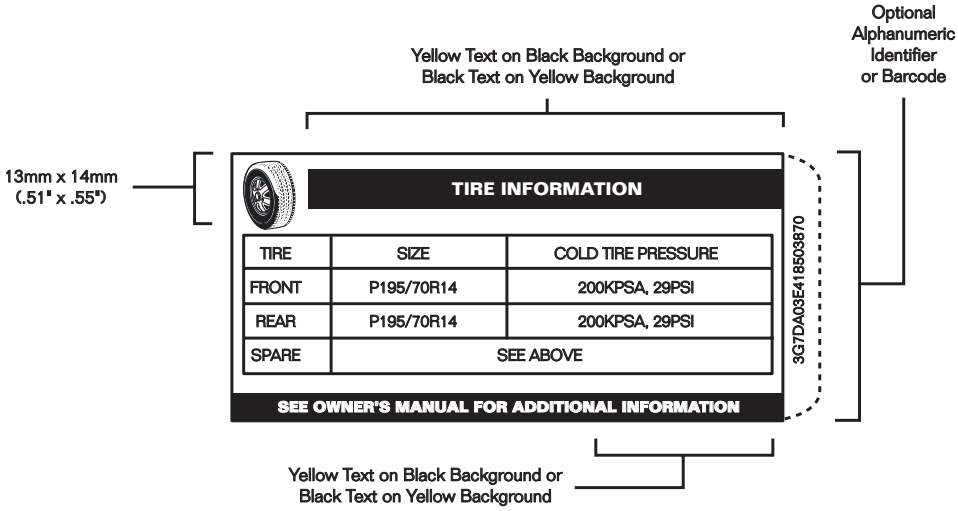
Vehicle Placard



*For trailers, this statement should read:
The weight of cargo should not exceed XXX kg or XXX lbs.

NOTE: At the manufacturers option, the information specified in S4.3 (c), (d), may be shown, alternatively, on a "tire inflation pressure label" (see 49 CFR 571.110 S4.3.5)

Tire Inflation Pressure Label



NOTE: At the manufacturers option, the information specified in S4.3 (c), (d), may be shown, alternatively, on a "tire inflation pressure label" (see 49CFR571.110 S4.3.5)

S4.2.2 TIRE LOAD LIMITS FOR MULTIPURPOSE PASSENGER VEHICLES, TRUCKS, BUSES, AND TRAILERS.

S4.2.2.1 Except as provided in S4.2.2.2, the sum of the maximum load ratings of the tires fitted to an axle shall not be less than the GAWR of the axle system as specified on the vehicle's certification label required by 49 CFR part 567. If the certification label shows more than one GAWR for the axle system, the sum shall be not less than the GAWR corresponding to the size designation of the tires fitted to the axle.

S4.2.2.2 When passenger car tires are installed on an MPV, truck, bus, or trailer, each tire's load rating is reduced by dividing it by 1.10 before determining, under S4.2.2.1, the sum of the maximum load ratings of the tires fitted to an axle.

S4.4.2. RIM MARKINGS FOR VEHICLES OTHER THAN PASSENGER CARS.

Each rim or, at the option of the manufacturer in the case of a single-piece wheel, each wheel disc shall be marked with the information listed in S4.4.2 (a) through (e), in lettering not less than 3 millimeters in height, impressed to a depth or, at the option of the manufacturer, embossed to a height of not less than 0.125 millimeters. The information listed in S4.4.2 (a) through (c) shall appear on the outward side. In the case of rims of multi-piece construction, the information listed in S4.4.2 (a) through (e) shall appear on the rim base and the information listed in S4.4.2 (b) and (d) shall also appear on each other part of the rim.

Trailer manufacturers shall secure component manufacturers certifications for the capacities of tires, rims, axles, hubs and springs.

GVWR & GAWR

Gross vehicle weight rating or *GVWR* means the value specified by the manufacturer as the loaded weight of a single vehicle.

Gross axle weight rating or *GAWR* means the value specified by the vehicle manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Accordingly, the *GVWR* is the total combined weight of the trailer and the maximum weight of cargo, and not less any portion of it that might transfer to the hitch of the tow vehicle.

Unless by intent of design for unequal distribution, the *GVWR* shall be the sum of the *GAWR*s.

TRAILER COUPLINGS

Trailer couplings shall confrom to the Society of Automotive Engineers J684 standard, Trailer Couplings, Hitches, and Safety Chains—Automotive Type.

SAE establishes classes for both trailers and couplings up to 4540kg (10,000 lbs). The designated classification of the coupling shall be based on the GVWR of the trailer rather than the weight imposed vertically down on the ball by the coupling. Trailers and couplings shall be of the same type; this does not restrict the use of a heavier-duty coupling being used in a lighter class of trailer.

5.2 All couplings are to be attached to the trailer's structural attaching member by bolting, welding, or riveting in such a manner that the loads indicated in Table I may be applied without incurring loss of attachment or distortion or failure which would affect the safe towing of trailers.

TABLE I – STRENGTH TEST LOADS FOR TRAILER COUPLING ATTACHMENTS	
MODE	**MINIMUM STATIC TEST LOAD**
Longitudinal Tension and Compression	1.5 x Max Trailer GVWR
Transverse Thrust	0.5 x Max Trailer GVWR
Vertical Tension and Compression	0.5 x Max Trailer GVWR

5.4 Trailer couplings which meet the minimum standards set forth in Table II shall be permanently marked with the following information:

1. Coupling manufacturer's name, initials, or trademark
2. Part, style, or model number
3. SAE coupling classification and maximum trailer GVWR
4. Ball diameters for which coupling is designed

5.5 There shall be a minimum strength test for couplings by class as indicated in Table II.

TABLE II – STRENGTH RATINGS FOR TRAILER COUPLINGS AND BALLS

TRAILER CLASSIFICATION AND MAXIMUM GVWR		CLASS 1 NOT OVER 2000 LBS	CLASS 2 OVER 2000–3500 LBS	CLASS 3 OVER 3500–5000 LBS	CLASS 4 OVER 5000–10000 LBS
COUPLING DESIGNATION		**CLASS 1**	**CLASS 2**	**CLASS 3**	**CLASS 4**
Ball Type	Nominal Ball Diameter	1 7/8 in. (47.6mm)	2 in. (50.8mm)	2 in. (50.8mm)	Ball and bolt shall be of such size and strength as to conform to the minimum breaking strength require-ments required for the specific gross trailer weight.
Min. breaking-point Requirements for Trailer Couplings and Balls "Static Bench Test"	Longitudinal Tension and compression	6000 lb. (26.7 kN)	10500 lb. (46.7 kN)	15000 lb. (66.7 kN)	3 x Gross Trailer Weight
	Transverse Thrust	2000 lb. (8.9 kN)	3000 lb. (13.3 kN)	4000 lb. (17.8 kN)	1 x Gross Trailer Weight
	Vertical Tension and Compression	2000 lb. (8.9 kN)	4500 lb. (20.0 kN)	7000 lb. (31.1 kN)	1.3 x Gross Trailer Weight

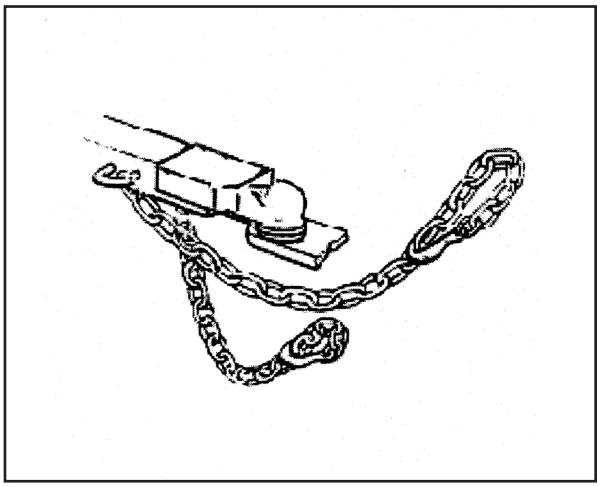
SAFETY CHAINS

Trailer manufacturers shall provide safety chains conforming to the Society of Automotive Engineers' J684 standard, Trailer Couplings, Hitches, and Safety Chains — Automotive Type.

7.2 Each individual safety chain, and all attaching means, shall meet the minimum breaking force tensile loads as indicated in Table III, and where applicable such load shall be applied in a direction parallel to the trailer's or towing vehicle's longitudinal axis. Any operation performed on the safety chain subsequent to its manufacture shall not reduce its strength below the requirements of Table III.

NOTE: Safety cables may be substituted for safety chains provided each cable and attaching hardware have a minimum breaking strength equal or greater than the trailer's Gross Vehicle Weight Rating (GVWR).

TYPICAL DOUBLE SAFETY CHAIN INSTALLATION



SAFTEY CHAIN OR TRAILER CLASSIFICATION	TABLE III – STRENGTH REQUIREMENTS FOR SAFETY CHAIN AND ATTACHING MEANS*
	BREAKING FORCE – MINIMUM
Class 1	2,000 lbs. (8.9 kN)
Class 2	3,500 lbs. (15.6 kN)
Class 3	5,000 lbs. (22.2 kN)
Class 4	The strength rating of each length of safety chain or its equivalent and its attachments shall be equal to or exceed in minimum breaking force the GVWR of the trailer.
*When conducting a tensile strength test of a length of chain or equivalent and its attaching means, when the minimum load specified in Table 4 is applied, such load shall be maintained for a minimum of 1 minute.	

7.3 When wire rope is used as safety chain, the strands of the rope shall be protected from damage by use of a wire rope thimble in the areas of its attaching means.

7.5 Two safety chains shall be permanently fastened (i.e. bolted, anchored) to the trailer tongue, one on each side. The safety chains shall be connected from the trailer tongue to the hitch assembly or to other towing vehicle members meeting the strength requirements of 7.2.

7.6 Equivalency

7.6.1 Nothing in Section 7 shall preclude the use of an alternative connecting arrangement which will effectively maintain connection between towing vehicle and trailer in the event of separation of the coupling from the ball or the ball from hitch.

7.6.2 A single chain may be used provided it is permanently fastened to each side of the trailer tongue so as to function as two separate chains, and meets all other requirements of this document.

TRAILER LIGHTING

Lighting installation, and assembly instructions as needed, shall be provided for each trailer model. All lamp housings, lenses and reflex reflectors shall bear design conformance markings as shown in Table IV, unless separate certification and test reports are provided.

Where practical, combination fixtures may incorporate 2 or more of these items together except that clearance lamps may not be combined optically with tail or identification lamps.

Lenses of combination clearance and side marker lamps shall be marked PC and must be mounted to meet the photometric requirements for both services. Other combination fixtures must bear the lens markings for all functions combined, except that license plate lamps need not be marked L when combined in tail lamp housings.

With the exception of clearance, identification and license plate lamps, all lamp centers must be at least 15 inches above the road surface, but not higher than any applicable requirement for that lamp function.

Lamps and reflectors shall be located so that their visibility shall not be obstructed by any part of the trailer throughout the photometric and visibility angles specified in the applicable SAE Standard (See Table III). Except for license plate lamps, these standards provide photometric requirements for all lights and reflectors 10° up and down from the horizontal axis of the fixture. Reflectors, stop, tail and turn signal lamps must meet these requirements 20° to the right and left of the lamps vertical axis. Clearance side marker and identification lamps must meet these requirements 45° to the right and left of the vertical axis. In addition, stop, tail and turn signal lamps must show at least 2 sq. in. of illuminated lens 45° to the right and left of the lamp's vertical axis.

The photometric requirements for side markers used on vehicles less than 30 ft. in overall length may be met for inboard test points at a distance of 15 ft. from the vehicle on a vertical plane that is perpendicular to the longitudinal axis of the vehicle and located midway between the front and rear side marker lamps.

License plate lamps shall be located so that at no point on the license plate will the incident light make an angle of less than 8 degrees to the plane of the plate.

WIRE-SIZE TYPE INSULATION

All wire and insulation shall conform to standards of the Society of Automotive Engineers (See Table V).

As a precaution against rupture by vibration, all conductors shall be of the stranded type and no single conductor smaller than No. 16 AWG shall be used. Multi-conductor cable circuits shall be no smaller than No. 18 AWG.

Wire sizes should be in accordance with those specified in Table VI. These values are calculated with the intention of providing safe wiring with not more than a 3 percent line loss.

INSTALLATION

Where lighting is not factory installed, adequate installation instructions shall be provided. All lamps and reflective devises must be securely mounted to a rigid part of the vehicle that is not designed to be removed except for repair.

Wiring and related devices shall be installed in a workman-like manner, mechanically and electrically secure. Devices, lamps and so forth, requiring periodic service shall be readily serviceable and accessible. The trailer connector ground wire shall be attached to the trailer frame.

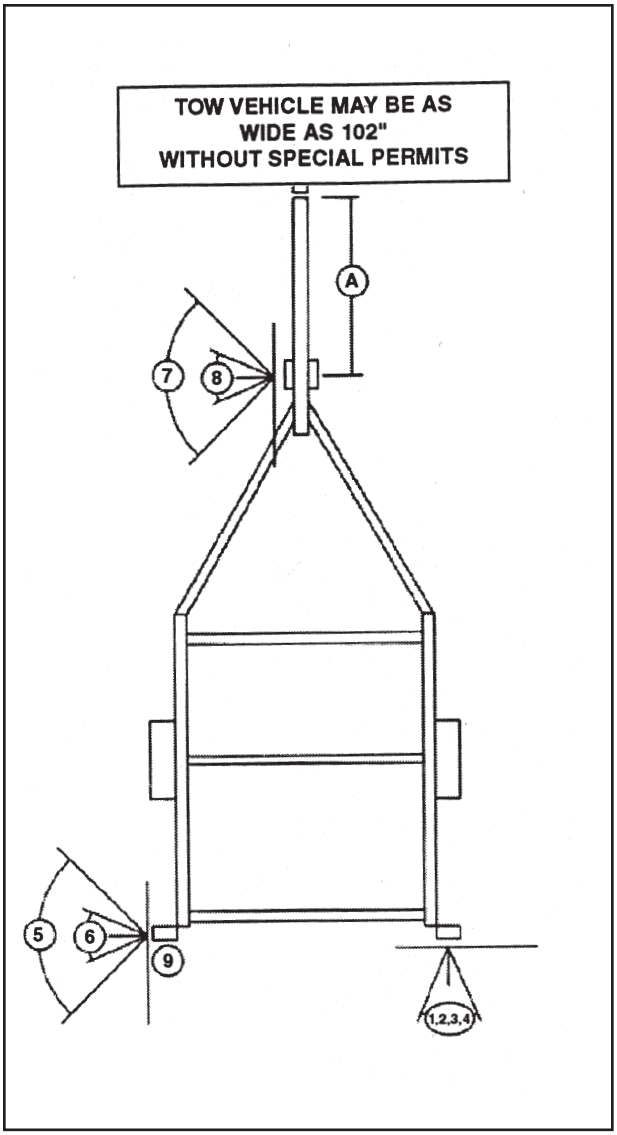
The edges of holes punched or drilled through metal members, through which cable passes, shall be deburred or bushed with suitable grommets. Shielding over cables may be substituted for grommets.

Exposed wiring shall be secured in a workman-like manner to stop sideways movement and prevent rubbing or chafing.

Clips for retaining cables and harness shall be rigidly attached to body or frame member and cable or harness.

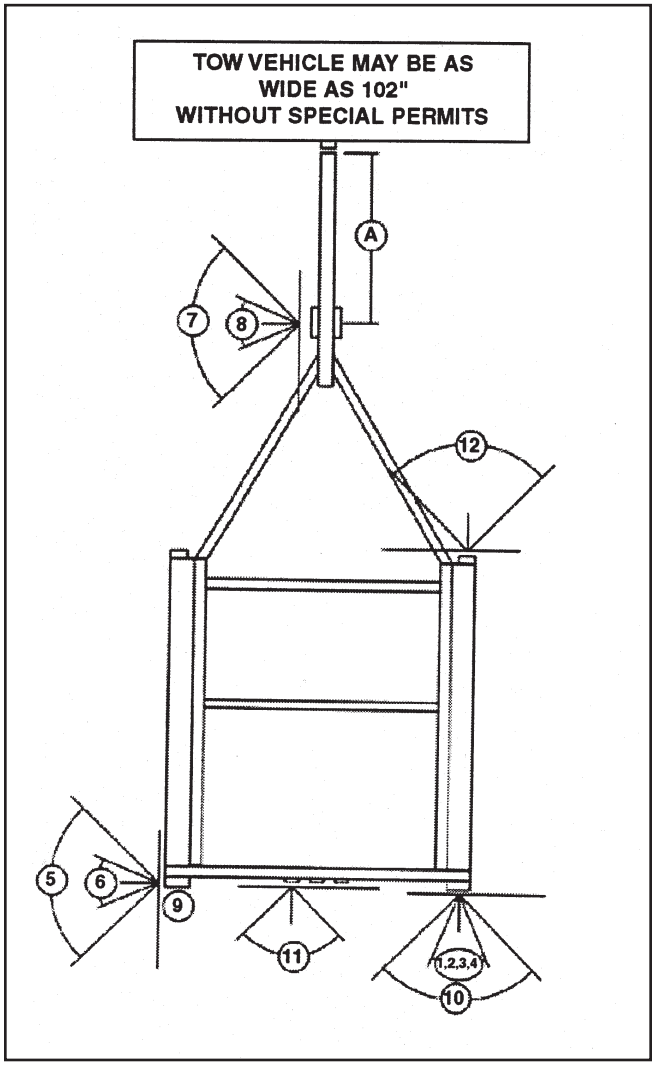
Wiring should be located to afford protection from road splash, stones, or abrasion. Wiring exposed to such conditions should be further protected by the use of—or a combination of—additional tape application, plastic sleeving, nonmetallic or other suitable shielding or covering.

TRAILER UNDER 80" WIDE



	Function	Color	Visibility Requirements
1	Tail Light	Red	45 Degrees Left and Right 15 Degrees Up and Down
2	Stop Light	Red	45 Degrees Left and Right 15 Degrees Up and Down
3	Turn Light	Red	45 Degrees Left and Right 15 Degrees Up and Down
4	Rear Reflex	Red	20 Degrees Left and Right 10 Degrees Up and Down
5	Rear Sidemarker	Red	45 Degrees Left and Right 10 Degrees Up and Down
6	Rear Side Reflector	Red	20 Degrees Left and Right 10 Degrees Up and Down
7	Front Sidemarker	Amber	45 Degrees Left and Right 10 Degrees Up and Down
8	Front Side Reflector	Amber	20 Degrees Left and Right 10 Degrees Up and Down
9	License Light	Clear	Above or Side Illumination
	Interpretations		
A	United States		The front sidemarker must be mounted so that it is visible from 45 degrees left and right without obstruction from the trailer or tow vehicle to comply with NHTSA's interpretation of "as far forward as practicable."
	Canada		The front sidemarker must be mounted from 1 meter (39") to 1.5 meters (60") from the front of the trailer and be visible from 45 degrees left and right without obstruction from the trailer and tow vehicle to comply with Transport Canada's interpretation of "as far forward as practicable."

TRAILER OVER 80" WIDE



	Function	Color	Visibility Requirements
1	Tail Light	Red	45 Degrees Left and Right 15 Degrees Up and Down
2	Stop Light	Red	45 Degrees Left and Right 15 Degrees Up and Down
3	Turn Light	Red	45 Degrees Left and Right 15 Degrees Up and Down
4	Rear Reflex	Red	20 Degrees Left and Right 10 Degrees Up and Down
5	Rear Sidemarker	Red	45 Degrees Left and Right 10 Degrees Up and Down
6	Rear Side Reflector	Red	20 Degrees Left and Right 10 Degrees Up and Down
7	Front Sidemarker	Amber	45 Degrees Left and Right 10 Degrees Up and Down
8	Front Side Reflector	Amber	20 Degrees Left and Right 10 Degrees Up and Down
9	License Light	Clear	Above or Side Illumination
10	Rear Clearance Light	Red	45 Degrees Left and Right 10 Degrees Up and Down
11	Rear Identification Lights	Red	45 Degrees Left and Right 10 Degrees Up and Down
12	Front Clearance Light	Amber	45 Degrees Left and Right 10 Degrees Up and Down
	Interpretations		
A	United States		The front sidemarker must be mounted so that it is visible from 45 degrees left and right without obstruction from the trailer or tow vehicle to comply with NHTSA's interpretation of "as far forward as practicable."
	Canada		The front sidemarker must be mounted from 1 meter (39") to 1.5 meters (60") from the front of the trailer and be visible from 45 degrees left and right without obstruction from the trailer and tow vehicle to comply with Transport Canada's interpretation of "as far forward as practicable."

FMVSS 108 TABLE I-B—REQUIRED LAMPS AND REFLECTIVE DEVICES

LIGHTING DEVICE	NUMBER & COLOR	MOUNTING LOCATION	MOUNTING HEIGHT	REQUIREMENT
ALL TRAILERS				
Turn Signal Lamps	2 Red or amber	On the rear, at the same height, symmetrically about the vertical centerline, as far apart as practicable	Not less than 15 inches, nor more than 83 inches	49 CFR 571.108 **S7.1**
Tail Lamps	2 Red or 1 red on trailers less than 30 inches wide	On the rear, at the same height, symmetrically about the vertical centerline, as far apart as practicable. When a single lamp is installed it must be mounted at or near the vertical centerline	Not less than 15 inches, nor more than 72 inches	49 CFR 571.108 **S7.2**
Stop Lamps	2 Red, or 1 red on trailers less than 30 inches wide	On the rear, at the same height, symmetrically about the vertical centerline, as far apart as practicable. When a single lamp is installed it must be mounted at or near the vertical centerline	Not less than 15 inches, nor more than 72 inches	49 CFR 571.108 **S7.3**
Side Marker Lamps	2 Amber None required on trailers less than 1829 mm [6 ft] in overall length including the trailer tongue	On each side as far to the front as practicable exclusive of the trailer tongue*	Not less than 15 inches	49 CFR 571.108 **S7.4**
	2 Red	On each side as far to the rear as practicable	Not less than 15 inches. Not more than 60 inches on trailers 2032 mm or more in overall width	
Reflex Reflectors. A trailer equipped with a conspicuity treatment in conformance with S8.2 of this standard need not be equipped with reflex reflectors if the conspicuity material is placed at the locations of the required reflex reflectors	2 Amber None required on trailers less than 1829 mm [6 ft] in overall length including the trailer tongue	On each side as far to the front as practicable exclusive of the trailer tongue*	Not less than 15 inches, nor more than 60 inches	49 CFR 571.108 **S7.8.**
	2 Red	On each side as far to the rear as practicable		
	2 Red or 1 red on trailers less than 30 inches wide	On the rear, at the same height, symmetrically about the vertical centerline, as far apart as practicable. When a single reflector is installed it must be mounted at or near the vertical centerline.		
License Plate Lamp	1 White Additional lamps permitted to meet requirements	On the rear to illuminate license plate from top or sides	No requirement	49 CFR 571.108 **S7.7**

**CMVSS108 requires application on the trailer tongue, if the tongue is over five feet. See Canadian interpretation for location of lamp on pages 11–12.*

FMVSS 108 TABLE I-B—REQUIRED LAMPS AND REFLECTIVE DEVICES

ADDITIONAL LAMPS AND REFLECTIVE DEVICES REQUIRED ON ALL TRAILERS 30 FEET OR LONGER				
Intermediate Side Marker Lamps	2 Amber	On each side located at or near the midpoint between the front and rear side marker lamps	Not less than 15 inches	49 CFR 571.108 **S7.4**
Intermediate Side Reflex Reflectors A trailer equipped with a conspicuity treatment in conformance with S8.2 of this standard need not be equipped with reflex reflectors if the conspicuity material is placed at the locations of the required reflex reflectors	2 Amber	On each side located at or near the midpoint between the front and rear side reflex reflectors	Not less than 15 inches, nor more than 60 inches	49 CFR 571.108 **S7.8**

FMVSS 108 TABLE I-B—REQUIRED LAMPS AND REFLECTIVE DEVICES

ADDITIONAL LAMPS REQUIRED ON ALL TRAILERS 2032 MM OR MORE IN OVERALL WIDTH				
Clearance Lamps	2 Amber	On the front to indicate the overall width of the vehicle, at the same height, symmetrically about the vertical centerline May be located at a location other than the front if necessary to indicate the overall width of the vehicle, or for protection from damage during normal operation of the vehicle	As near the top as practicable	49 CFR 571.108 **S7.5**
	2 Red	On the rear to indicate the overall width of the vehicle, at the same height, symmetrically about the vertical centerline May be located at a location other than the rear if necessary to indicate the overall width of the vehicle, or for protection from damage during normal operation of the vehicle	As near the top as practicable, except where the rear identification lamps are mounted at the extreme height of the vehicle. Practicability of locating lamps on the vehicle header is presumed when the header extends at least 25 mm (1 inch) above the rear doors	
	2 Amber to front and red to rear	On a boat trailer the requirement for front and rear clearance lamps may be met by installation at or near the midpoint on each side of a dual facing lamp so as to indicate the extreme width. May be located at a location other than the front and the rear if necessary to indicate the overall width of the vehicle, or for protection from damage during normal operation of the vehicle	As near the top as practicable	
Identification Lamps	3 Red	On the rear, at the same height, as close as practicable to the vertical centerline, with lamp centers spaced not less than 6 inches or more than 12 inches apart	As near the top as practicable Practicability of locating lamps on the vehicle header is presumed when the header extends at least 25 mm (1 inch) above the rear doors	49 CFR 571.108 **S7.5**

S4. Definition: the term “overall width” means the nominal design dimension of the widest part of the vehicle, exclusive of signal lamps, marker lamps, outside rearview mirrors, flexible fender extensions and mud flaps.

S6.2.1 No additional lamp, reflective device or other motor vehicle equipment shall be installed that impairs the effectiveness of lighting equipment required by this standard.

S6.1.3.2 Except as provided in succeeding paragraphs of S5.3.1, each lamp, reflective device and item of associated equipment shall be securely mounted on a rigid part of the vehicle other than glazing that is not designed to be removed except for repair.

S6.3 *Equipment combinations.* Two or more lamps, reflective devices, or items of associated equipment may be combined if the requirements for each lamp, reflective device, and item of associated equipment are met with the following exceptions:

S6.3.3 No clearance lamp is permitted to be optically combined with any taillamp.

CONDUCTORS (SAE TYPES)

TYPE	INSULATION
TWP	Thin Wall, Termoplastic Insulated
GPT	General Purpose, Thermoplastic Insulated
HDT	Heavy Duty, Thermoplastic Insulated
STS	Standard Duty, Thermoset Elastomer (Synthetic Rubber) Insulated
HTS	Heavy Duty, Thermoset Elastomer (Synthetic Rubber) Insulated
TXL	Thin Wall, Cross (X) Linked Polyolefin Insulated
GXL	General Purpose, Cross (X) Linked Polyolefin Insulated
SXL	Special Purpose, Cross (X) Linked Polyolefin, Insulated
TWE	Thin Wall, Thermoplastic Elastomer Insulated
GTE	General Purpose, Thermoplastic Elastomer Insulated
HTE	Heavy Duty, Thermoplastic Elastomer Insulated

STRANDED CONDUCTORS FOR 12 VOLT CIRCUITS, 3% VOLTAGE DROP

WIRE SIZE	20	18	16	14	12	10
STRANDING	7x28	16x30	19x29	19x27	19x25	19x23
CIRCULAR MIL AREA	1072	1537	2336	3702	5833	9343
CIRCUIT CURRENT IN AMPS	MAXIMUM LENGTH OF CONDUCTOR IN FEET FROM POWER SOURCE TO LOAD					
1.	36.4	52.3	78.0			
2.	18.2	26.1	39.0	63.0	99.0	
3.	12.2	17.4	26.0	42.0	66.0	
4.	9.1	13.1	19.5	31.5	49.5	78.8
5.	7.3	10.4	15.6	25.2	39.6	63.0
6.	6.1	8.7	13.0	21.0	33.0	52.5
7.	5.2	7.4	11.1	18.0	28.2	45.0
8.		6.5	9.8	15.8	24.8	39.4
9.		5.8	8.6	14.0	22.0	35.0
10.		5.2	7.8	12.6	19.8	31.5
15.			5.2	8.4	13.2	21.0
20.				6.3	9.9	15.8

ELECTRICAL CONNECTORS

3.4 The receptacle leads shall be attached to the vehicle wiring harness in a workmanlike manner, mechanically and electrically secure. Further, a well-insulated strain relief shall be provided between the receptacle and the towing vehicle wiring harness connections so that there will be no strain on the vehicle harness in the event of an abnormal pull on the receptacle. The receptacle shall be placed in a location where it will not be exposed to road hazards either when connected or loose. The receptacle leads must be properly routed and protected against damage from cutting and pinching where they leave the vehicle body. Extra insulation should be provided between the strain relief at the trailer hitch and wiring assembly so that an abnormal pull on the plug will not damage the wiring.

3.5 No receptacle leads designated for lighting shall be smaller than SAE wire size 1 mm^2 (SAE wire size no. 16 gauge) minimum if a single conductor, or smaller than SAE wire size 0.8 mm^2 (SAE wire size no. 18 gauge) if a multiconductor cable.

3.6 No receptacle leads for brake circuits shall be smaller than SAE wire size 2 mm^2 (SAE wire size no. 14 gauge) and no circuits shall be smaller than SAE wire 3 mm^2 for (SAE wire size no. 12 gauge) trailer battery charge circuit or battery return circuit.

3.7 The gauge of conductors for the auxiliary circuits shall be sized to provide at least the maximum amperage for the load it will service with a voltage drop not exceeding 3%. The receptacle shall be placed in a location where it will not be exposed to road hazards when disconnected from trailer.

ELECTRICAL CONNECTORS (CONTINUED)

5.1 Exposed trailer wiring shall be run in conduits or secured at intervals not greater than 457 mm (18 in) to stop lateral movement and prevent rubbing or chafing.

5.2 So far as practicable, wiring should be located to afford protection from road splash, stones, or abrasion. Wiring exposed to such conditions shall use additional tape, plastic sleeve, nonmetallic conduit, and/or other suitable shielding or covering to further protect the wiring.

SPECIAL EXPLANATION FOR INSTALLING BOAT TRAILER SIDE MARKER AND SIDE CLEARING LAMPS

The photometric requirements for clearance and side marker lamps are identical, so whether the lamp is a clearance or a side marker lamp depends only on whether it is mounted perpendicular or parallel to the trailer's longitudinal axis. (Front to Rear Centerline.)

Combination clearance/side marker lamps, with a lens marking of PC, add the angular requirements together for both functions making them provide the required light through a 180 degree arc. In order to do this the combination clearance/side marker lamp may have to be mounted on a 45 degree angle from the trailer's longitudinal axis to meet the photometric requirements. The exception has the effect of providing some flexibility in the mounting angle. For example, if the trailer tongue blocks seeing an amber clearance lamp function, (the required 45 degrees across the trailer centerline) and there is no better practical location for the lamp, that is all right, but nothing must block seeing the light from dead ahead. If the blocking tongue allows this light to be seen only 15 degrees across the front, then the mounting angle for this PC lamp may be any angle between 15 and 45 degrees from the trailer's longitudinal axis as long as the mounting requirement for other required functions of that lamp are met.

If the lens of a PC lamp incorporates a reflector, the reflector only functions as a side marker reflector if the lamp is mounted parallel to the trailer's longitudinal axis; therefore, such installed PC lamp is being used only as a side marker lamp. Whenever a combination clearance/side marker function is used, a separate reflector may be required.

NOTE: Conductors used on electrical receptacles shall be color coded as per SAE J1239 FEB 2003

S5.7 CONSPICUITY SYSTEMS

Each trailer of 80 or more inches overall width, and with a GVWR over 10,000 lbs., manufactured on or after December 1, 1993, except a trailer designed exclusively for living or office use, shall be equipped with either retroreflective sheeting that meets the requirements of S5.7.1, reflex reflectors that meet the requirements of S5.7.2, or a combination of retro-reflective sheeting and reflex reflectors that meet the requirement of S5.7.3.

S5.7.1 RETROREFLECTIVE SHEETING

Each trailer to which S5.7 applies that does not conform to S5.7.2 or S5.7.3 shall be equipped with retro-reflective sheeting that conforms to the requirements specified in S5.7.1.1 through S5.7.1.5.

S5.7.1.1 CONSTRUCTION

Retroreflective sheeting shall consist of a smooth, flat, transparent exterior film with retroreflective elements embedded or suspended beneath the film so as to form a non-exposed retroreflective optical system.

S5.7.1.2 PERFORMANCE REQUIREMENTS

Retroreflective sheeting shall meet the requirements of ASTM D 4956-90, Standard Specification for Retroreflective Sheeting for Traffic Control, for Type V Sheeting, except for the photometric requirements, and shall meet the minimum photometric performance requirements specified in 49 CFR 571.108.

S5.7.1.3 SHEETING PATTERN, DIMENSIONS, AND RELATIVE COEFFICIENTS OF RETROREFLECTION

(a) Retroreflective sheeting shall be applied in a pattern of alternating white and red color segments to the side and rear of each trailer, and in white to the upper rear corners of each trailer, in the locations specified in S5.7.1.4, and illustrated in 49 CFR 571.108.

(b) Except for a segment that is trimmed to clear obstructions, or lengthened to provide red sheeting near red lamps, each white or red segment shall have a length of 300 mm + 150 mm.

(c) Neither white nor red sheeting shall represent more than two thirds of the aggregate of any continuous strip marking the width of a trailer, or any continuous or broken strip marking its length.

(d) Retroreflective sheeting shall have a width of 50 mm (Grade DOT-C2), 75 mm (Grade DOT-C3), or 100 mm (Grade DOT-C4).

(e) The coefficients for retroreflection of each segment of red or white sheeting shall be not less than the minimum values specified in 49 CFR 571.108 of this standard for grades DOT-C2, DOT-C3, and DOT-C4.

S5.7.1.4 LOCATION

(a) Retroreflective sheeting shall be applied to each trailer on the side and rear as specified below, but need not be applied to discontinuous surfaces such as outside ribs, stake post pickets on platform trailers, and external protruding beams, or to items of equipment such as door hinges and lamp bodies.

(b) The edge of white sheeting shall not be located closer than 75 mm to the edge of the luminous lens area of any red or amber lamp that is required by this standard.

(c) The edge of red sheeting shall not be located closer than 75 mm to the edge of the luminous lens area of any amber lamp that is required by this standard.

S5.7.1.4 REAR OF TRAILERS

Retroreflective sheeting shall be applied to the rear of each trailer as follows:

(a) Element 1: A strip of sheeting, as horizontal as praticable in alternating colors across the full width of the trailer, as close to the extreme edges as practicable and as close as practicable to not less than 375 mm and not more than 1525 mm above the road surface at the stripe centerline with the trailer at curb weight.

(b) Element 2: Two pairs of white strips of sheeting, each pair consisting of strips 300 mm long of grade DOT-C2, DOT-C3, or DOT-C4, applied horizontally and vertically to the right and left upper contours of the body, as viewed from the rear as close to the top of the trailer and as far apart as practicable.

(c) Element 3: A strip of sheeting in alternating colors across the full width of the horizontal member of the rear underride protection device. Grade DOT-C2 material not less than 38 mm wide may be used.

S5.7.1.4.2 SIDE OF TRAILERS

Retroreflective sheeting shall be applied to each side of a trailer as follows:

(a) A strip of sheeting as horizontal as praticable, in alternating colors, originating and terminating as close to the front and rear ends as practicable, and as close as practicable to not less than 375 mm and not more than 1525 mm above the road surface at the stripe centerline with the trailer at curb weight, except that, at the location chosen, the strip shall not be obscured in whole or in part by other motor vehicle equipment or trailer cargo. The strip need not be continuous as long as at least half of the length of the trailer is coveredand the spaces are distributed as evenly as practicable.

(b) If necessary to clear rivet heads or other similar obstructions, grade DOT-C2 retro-reflective sheeting may be separated into two 25 mm wide strips of the same length and color, separated by a space of not more than 25 mm, and used in place of the retroreflective sheeting that would otherwise be applied.

S5.7.1.5 CERTIFICATION

The letters DOT-C2, DOT-C3, or DOT-C4, as appropriate, constituting a certification that the retro-reflective sheeting conforms to the requirements of S5.7.1.2, shall appear at least once on the exposed surface of each white or red segment of retroreflective sheeting, and at least once every 300 mm on retro-reflective sheeting that is white only. The characters shall be not less than 3 mm high, and shall be permanently stamped, etched, molded, or printed in indelible ink.

S5.7.2 REFLEX REFLECTORS

Each trailer to which S5.7 applies that does not conform to S5.7.1 or S5.7.3 shall be equipped with reflex reflectors in accordance with this section.

S5.7.3 COMBINATION OF SHEETING AND REFLECTORS

Each trailer to which S5.7 applies that does not conform to S5.7.1 or S5.7.2, shall be equipped with retroreflective materials that meet the requirements of S5.7.1 except that reflex reflectors that meet the requirements of S5.7.2.1, and that are installed in accordance with S5.7.2.2, may be used instead of any corresponding element of retroreflective sheeting located as required by S5.7.1.4.

HAND WINCHES—
BOAT TRAILER TYPE

STANDARDS BASIS
SAE J1853 JUNE 2014

BOAT TRAILER WINCHES SHALL BE PERMANENTLY MARKED AS FOLLOWS:

1. Winch manufacturer's name, initials, or trademark
2. Model number
3. Maximum first layer line pull rating of the winch
4. Year of manufacture

DRUM DIAMETER FOR WIRE ROPE

The minimum drum diameter shall be based on the following equation when wire rope is used:

$$\frac{\text{DRUM DIAMETER}}{\text{WIRE ROPE DIAMETER}} = 8 \text{ MINIMUM}$$

ATTACHMENT OF WINCHES

All winches shall be mounted by bolting or welding in such a manner the 300% of the rated straight line pull of the winch can be applied without failure of its attachment.

WINCH LINE ATTACHMENT

When using rope, wire rope, or similar line, a minimum of 3 turns shall be maintained on the drum at the beginning of the load cycle to ensure the integrity of the attachment to the drum.

When using winch straps or the like, the attachment to the drum shall be capable of withstanding 150% of the rated straight line pull of the winch.

APPLICATION REQUIREMENTS

Winch rope, wire rope, straps or equivalent: The minimum breaking strengths of these lines and their attachments shall not be less than 150% of the rated straight line pull of the winch.

The minimum breaking strength of a winch hook shall not be less than 125% of the strength of its attachment to steel cable or 150% of its attachment to other winch lines, times the number of working lines.

MINIMUM BREAKING STRENGTH (POUNDS) FOR TRAILER WINCH ROPE* AND CABLE

DIAMETER OF ROPE	POLYETHYLENE OR POLYPROPYLENE	NYLON/ DACRON POLYESTER	DIAMETER OF CABLE	7x19 AIRCRAFT CABLE	
				GALVANIZED OR TINNED PREFORMED	STAINLESS STEEL PREFORMED
1/4"	1130	1490	1/8"	2000	1760
5/16"	1710	2300	5/32"	2800	2400
3/8"	2440	3340	3/16"	4200	3700
7/16"	3160	4500	7/32"	5600	5000
1/2"	3780	5750	1/4"	7000	6400

**Rope should withstand a sustained load of 2/3 of the tabled values for at least 5 minutes. Rope that does not meet this minimum requirement is not suitable for trailer winch rope. Rope strengths are based on New Rope Tensile Strength values published by the Cordage Institute.*

BRAKES

Trailer manufacturers shall offer brakes for all wheels of trailers designed for a GVWR of 1500lbs. or over.

Brakes shall be of a type which will operate automatically when the service brakes of the towing vehicle are applied, and in the event of separation of the trailer from the towing vehicle. Installation instructions shall be provided with brake kits. Exposed brake lines shall be secured to minimize rubbing or chaffing.

BRAKE HOSES (FMVSS 106; 49 CFR 571.106)

Brake hoses used in hydraulic, air and vacuum brake systems shall conform to 49 CFR 571.106.

NMMA STATE BRAKES POLICY

Trailer manufacturers shall supply brakes on trailers based on the individual state laws in which that particular trailer is sold.

INSPECTION PROCEDURE:

NMMA Inspectors will check to ensure the trailer manufacturer has a procedure in place to ensure trailers are appropriately supplied with brakes based on the state in which that trailer is to be sold. If the state of sale is unkown when the trailer leaves the manufacturing or final assembly location, the manufacturer shall have a provision to ensure the information on each state's laws is readily available and provided to the selling dealer/distributor. It will be the responsibility of the NMMA Certified trailer manufacturer to NOT knowingly sell a trailer into a state unless the brake requirements for that state are installed on the trailer and to outline their procedures to the NMMA Inspector at the time of inspection, detailing the protocol in place. If such a protocol is not found to be adequate or is inexistent, it will be noted a variance in the NMMA Inspection Report.

TRAILER OWNER'S MANUAL POLICY

NMMA Certified boat trailer manufacturers are required to provide an Owner's Manual with new trailers as a part of the NMMA Certification program.

The purpose of this requirement is to ensure that at a minimum, a manual is provided by the manufacturer.

NOTE: Federal Regulations and Society of Automotive Engineer (SAE) standards applied in the Certification program may contain requirements for information to be provided to the end-user; please reference these for any specific requirements.

TRAILER REGISTRATION

For purpose of compliance with Federal defect notification regulations, trailer manufacturers shall provide trailer registration forms with each trailer containing the information shown in the example below. First purchaser lists shall be maintained for at least (5) years.

(please print)

SELLERS NAME AND/OR MANUFACTURER SELLER NUMBER	MFR'S NAME
ADDRESS	ADDRESS
CITY STATE ZIP	CITY STATE ZIP
IMPORTANT: FEDERAL LAW REQUIRES THE RECORDING OF THIS INFORMATION:	
CUSTOMER'S NAME	DATE OF SALE
ADDRESS	VEHICLE IDENTIFICATION NUMBER
CITY STATE ZIP	

TIRE REGISTRATION

§ 574.8 INFORMATION REQUIREMENTS—TIRE DISTRIBUTORS AND DEALERS.

(a) Independent distributors and dealers.

(1) Each independent distributor and each independent dealer selling or leasing new tires to tire purchasers or lessors (hereinafter referred to in this section as "tire purchasers") shall provide each tire purchaser at the time of sale or lease of the tire(s) with a tire registration form.

(2) The distributor or dealer may use either the registration forms provided by the tire manufacturers pursuant to §574.7(a) or registration forms obtained from another source. Forms obtained from other sources shall comply with the requirements specified in §574.7(a) for forms provided by tire manufacturers to independent distributors and dealers.

(3) Before giving the registration form to the tire purchaser, the distributor or dealer shall record in the appropriate spaces provided on that form:

(i) The entire tire identification number of the tire(s) sold or leased to the tire purchaser, and

(ii) The distributor's or dealer's name and address or other means of identification known to the tire manufacturer.

(4) Multiple tire purchases or leases by the same tire purchaser may be recorded on a single registration form.

§ 574.10 REQUIREMENTS FOR MOTOR VEHICLE MANUFACTURERS.

Each motor vehicle manufacturer, or his designee, shall maintain a record of the new tires on or in each vehicle shipped by him or a motor vehicle distributor or dealer, and shall maintain a record of the name and address of the first purchaser for purposes other than resale of each vehicle equipped with such tires. These records shall be maintained for a period of not less than 5 years from the date of sale of the vehicle to the first purchaser for purposes other than resale.

SAMPLE TIRE REGISTRATION

IMPORTANT

In case of a recall, we can reach you only if we have your name and address. You **MUST** send in this card to be on our recall list.

DO IT TODAY

Approved through 5/31/08
OMB No. 2127-0050

SHADED AREAS MUST BE FILLED IN BY SELLER

		TIRE IDENTIFICATION NUMBERS										
	QTY	1	2	3	4	5	6	7	8	9	10	11
CUSTOMER'S NAME (Please Print)												
CUSTOMER'S ADDRESS												
CITY STATE ZIP												
NAME OF DEALER WHICH SOLD TIRE												

A—Preprinted tire manufacturer's name–unless the manufacturer's name appears on the reverse side of form

RECORD RETENTION

Each manufacturer of motor vehicles shall retain all records described in 576.6 for a period of five years. Records to be retained by manufacturers under this part include all documentary materials, films, tapes, and other information-storing media that contain information concerning malfunctions that may be related to motor vehicle safety.

Such records include, but are not limited to, communications from vehicle users and memoranda of such user complaints; reports and other documents, including material generated or communicated by computer, fax or other electronic means, that are related to work performed under, or claims made under, warranties; service reports or similar documents, including electronic transmissions, from dealers or manufacturer's field personnel; and any lists, compilations, analyses, or discussions of such malfunctions contained in internal or external correspondence of the manufacturer, including communications transmitted electronically.

CONSUMER INFORMATION REGULATIONS AND REQUIREMENTS

The following statement must appear in the owner's manual or if there is no owner's manual, on a one-page document. The page on which the statement appears must be listed in the TABLE OF CONTENTS of the owner's manual under "Reporting Safety Defects."

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying (INSERT NAME OF MANUFACTURER).

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or (INSERT NAME OF MANUFACTURER).

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to http://nhtsa.safercar.gov; or write to: Administrator, NHTSA, 1200 New Jersey Avenue SE, Washington, DC 20590. You can also obtain other information about motor vehicle safety from http://www.safercar.gov

TYPE ACCEPTED INFORMATION

Components covered in the handbook are required to be NMMA Type Accepted; records shall be kept on file by the trailer manufacturer verifying that the components used meet or exceed the respective regulations and industry standards.

NMMA Inspectors will ensure compliance by requesting to inspect these records.