

## Chapter MVD 8

## REQUIREMENTS FOR TRAILER AND SEMI-TRAILER BRAKE, HITCH AND COUPLING, SAFETY CHAINS, CABLES AND LEVELING BARS

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**MVD 8.01 Emergency braking.** (1) Every truck or truck tractor equipped with air brakes, when used for towing other vehicles equipped with air brakes, shall be equipped with 2 means of activating the emergency features of the trailer brakes. One of these means shall operate automatically in the event of reduction of the towing vehicle air supply to a fixed pressure which shall not be lower than 20 pounds per square inch nor higher than 45 pounds per square inch. The other means shall be a manually controlled device readily operable by a person seated in the driving seat. Its emergency position or method of operation shall be clearly indicated. In no instance may the manual means be so arranged as to permit its use to prevent operation of the automatic means. The automatic and manual means required by this section may be, but are not required to be separate.

(2) Every truck tractor and truck when used for towing other vehicles equipped with vacuum brakes, shall have, in addition to the single control required by section MVD 8.06 to operate all brakes of the combination, a second manual control device which can be used to operate the brakes on the towed vehicles in emergencies. Such second control shall be independent of other controls, unless the braking system be so arranged that failure of the pressure on which the second control depends will cause the towed vehicle brakes to be applied automatically. The second control is not required by this rule to provide modulated or graduated braking.

(3) Air brake systems installed on towed vehicles shall be so designed, by the use of "no-bleed-back" relay emergency valves or equivalent devices, that the supply reservoir used to provide air for brakes shall be safeguarded against backflow of air to the towing vehicle upon reduction of the towing vehicle air pressure.

(4) The requirements of subsections (2) and (3) shall not be applicable to motor vehicles in driveaway-towaway operations.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.02 Brake tubing and hose, adequacy.** Brake tubing and brake hose shall be:

(1) Designed and constructed of proper material and so installed and maintained as to insure proper continued functioning;

(2) Sufficiently long and flexible as to accommodate without damage all normal motions of the parts to which they are attached;

(3) Suitably secured against chafing, kinking, or other mechanical injury; and

(4) Brake hose shall be so constructed as to insure adequate and reliable functioning and shall conform to the appropriate specification set forth in the SAE Standards for "Hydraulic Brake Hose", "Air Brake Hose", or "Vacuum Brake Hose". (See 1968 SAE Handbook, pages 260-264.)

**Note:** The above referred to standards are on file in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes, and may be obtained for personal use from Society of Automotive Engineers, Inc., 485 Lexington Avenue, New York, New York.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.03 Brake tubing and hose connections.** All connections for air, vacuum, or hydraulic braking systems shall:

(1) Be adequate in material and construction to insure proper continued functioning;

(2) Be designed, constructed, installed and maintained so as to insure, when properly connected, an attachment free of leaks, constrictions, or other defects;

(3) Have suitable provision in every detachable connection to afford reasonable assurance against accidental disconnection;

(4) Have the vacuum brake engine manifold connection at least three-eighths inch in diameter.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.04 Brake lining.** The brake lining on every trailer type vehicle shall be so constructed, installed and maintained as not to be subject to excessive fading and grabbing and shall be adequate in thickness, means of attachment, and physical characteristics to provide for safe and reliable stopping of the vehicle.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.05 Brakes to be operative.** All brakes with which trailer-type vehicles are equipped shall be operative at all times except brakes need not be operative on disabled vehicles being towed.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.06 Single valve to operate all brakes.** Every motor vehicle, the date of manufacture of which is subsequent to June 30, 1953, which is equipped with power brakes, shall have the braking system so arranged that one application valve shall when applied operate all the service brakes on the motor vehicle or combination of motor vehicles. This requirement shall not be construed to prohibit motor vehicles from being equipped with an additional valve to be used to operate the brakes of a trailer or trailers. This section shall not be applicable to driveaway-towaway operations unless the brakes on such operations are designed to be operated by a single valve.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.07 Warning devices and gauges.** (1) AIR BRAKES AS PROVIDED IN SUBSECTION (4). Every truck and truck tractor using compressed air for the operation of its own brakes or the brakes of any towed vehicle shall be equipped with a warning signal readily audible or visible to the driver, which will give continuous warning at all pres-

tures below a fixed pressure not less than one-half of the compressor governor cut-out pressure. In addition, each such vehicle shall be equipped with a pressure gauge which will indicate to the driver the pressure in pounds per square inch available for braking.

(2) **VACUUM BRAKES AS PROVIDED IN SUBSECTION (4).** Every truck and truck tractor using vacuum for the operation of its own brakes and vacuum for the brakes on any towed vehicle shall be equipped with a warning signal readily audible or visible to the driver, which will give continuous warning at any time the vacuum in the vehicle's supply reservoir is less than 8 inches of mercury. In addition, each such vehicle shall be equipped with a vacuum gauge which will indicate to the driver the vacuum in inches of mercury available for braking.

(3) **MAINTENANCE.** The warning devices and gauges required by this section shall be maintained in operative condition.

(4) **APPLICATION.** This section applies to all combinations of property-carrying vehicles utilizing trailers or semi-trailers where the gross weight of the trailer or semi-trailer is 3000 pounds or more.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.08 Electrical brake connections.** All electrical wiring shall be mechanically and electrically adequate and free of short or open circuits. Suitable provision shall be made in every such detachable connection to afford reasonable assurance against connection in an incorrect manner or accidental disconnection. Detachable connections made by twisting together wires from the towed and towing units are prohibited. Precaution shall be taken to provide sufficient slack in the connecting wire or cable to accommodate without damage all normal motions of the parts to which they are attached.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.09 Brake performance.** Every combination of vehicles, at all times and under all conditions of loading, upon application of the service brake, shall be capable of stopping from a speed of 20 miles per hour in not more than 50 feet.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.10 Trailer and mobile home classification and standard minimum strength requirements of hitch and coupling.** (1) **HITCH DEFINITION.** The hitch is that part of the connecting mechanism, including the coupling platform and its attaching members or weldments, which is attached to the towing vehicle.

(2) **COUPLING DEFINITION.** The coupling is that part of the connecting mechanism, including the coupling and its attaching members or weldments, which is attached to the trailer or mobile home and by which connection is made to the hitch.

(3) **TRAILER AND MOBILE HOME CLASSIFICATION.** Trailers and mobile homes shall be classified according to the following gross weights, which gross weight shall include the weight of the vehicle and the actual load carried.

(a) **Class A**—All vehicles whose gross weight does not exceed 2000 lbs.

(b) **Class B**—All vehicles in excess of 2000 lbs. gross weight but not exceeding 3500 lbs. gross weight.

(c) Class C—All vehicles in excess of 3500 lbs. gross weight and not exceeding 5000 lbs. gross weight.

(d) Class D—All vehicles with gross weight, in excess of 5000 lbs. but not to exceed 10,000 lbs.

(4) STRENGTH RATINGS FOR TRAILER AND MOBILE HOME COUPLINGS.

(a) The trailer or mobile home coupling shall be of such design as to conform to the minimum strength requirements set forth in subparagraph (b) of this section. Where a ball-and-socket type of coupling is used, the ball must conform to the minimum load ratings of the mating coupling.

(b) Minimum strength ratings for the coupling used in conjunction with specific classes of trailers and mobile homes:

Vehicle Classification	Minimum Breaking Point Requirements of Coupling	
Class A	Longitudinal tension.....	6,000 lbs.
	Longitudinal compression.....	6,000 lbs.
	Transverse thrust.....	2,000 lbs.
	Vertical tension.....	2,500 lbs.
	Vertical compression.....	2,500 lbs.
Class B	Longitudinal tension.....	10,500 lbs.
	Longitudinal compression.....	10,500 lbs.
	Transverse thrust.....	3,000 lbs.
	Vertical tension.....	4,500 lbs.
	Vertical compression.....	4,500 lbs.
Class C	Longitudinal tension.....	15,000 lbs.
	Longitudinal compression.....	15,000 lbs.
	Transverse thrust.....	4,000 lbs.
	Vertical tension.....	7,000 lbs.
	Vertical compression.....	7,000 lbs.
Class D	Longitudinal tension—gross load of trailer-type vehicle in pounds x 3	
	Longitudinal compression—gross load of trailer-type vehicle in pounds x 3	
	Transverse thrust—gross load of trailer-type vehicle in pounds x 1	
	Vertical tension—gross load of trailer-type vehicle in pounds x 1.3	
	Vertical compression—gross load of trailer-type vehicle in pounds x 1.3	

(c) Strength rating of hitch and coupling for trailers over 10,000 lbs.—Each coupling system, other than safety chain or cable, shall have a minimum longitudinal strength, in both tension and compression, no less than 130% of the total gross weight towed by the coupling system but not to exceed 60,000 lbs. The coupling system shall include not only coupling devices such as tow bars, pintles, tow bar eye, but all the members, means and attachments used to fasten or secure the coupling device to the motor vehicle.

(5) COUPLING, MOUNTING. Each coupling is to be mounted to the attaching member by bolting, welding or riveting in such manner that the maximum loading required for the coupling designation shown in (4) (b) is safely and adequately transferred to that member.

(6) REQUIRED MECHANISM. Each hitch and coupling, regardless of classification, must be equipped with a manually operated mechanism so adapted as to prevent disengagement of the unit while in operation.

(7) STRENGTH RATING FOR TRAILER AND MOBILE HOME HITCHES. (a) The hitch and its coupling platform shall be of such design and shall

be so attached to the towing vehicle as to safely and adequately handle the gross load of trailer or mobile home including contents thereof.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.11 Minimum strength ratings, coupling and ball, trailers and mobile homes.** Minimum strength ratings for the coupling and ball for trailers and mobile homes are as follows:

Maximum Gross Wt.	Minimum Ball Diam.	Minimum Ball Bolt Diam.
2000 lbs.....	1 7/8"	5/8"
3500 lbs.....	2"	5/8"
5000 lbs.....	2"	5/8"
over 5000 lbs.....	Ball and bolt sizes shall equal or exceed the larger of the above classification. In addition the ball and bolts shall be of sufficient size and strength to prevent collapse or shearing under the actual gross towed weight.	

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.12 Safety chains or cables for trailer and mobile homes. (1) NUMBER OF LENGTHS OF CHAIN REQUIRED.** Two separate lengths of safety chain or cable shall be required on all trailers and mobile homes.

**(2) STRENGTH RATINGS FOR SAFETY CHAINS OR CABLES.** The strength rating for each length of safety chain or cable used in conjunction with trailers and mobile homes as classified in section MVD 8.10 (3) shall be as follows:

Maximum Gross Wt.	Minimum Chain Size	Minimum Cable Size
2000 lbs.....	5/8" proof coil steel chain or equivalent	3/8" diam. 7 x 19 preformed aircraft cable or equivalent
3500 lbs.....	3/4" proof coil steel welded chain or equivalent	3/8" diam. 7 x 19 preformed aircraft cable or equivalent
5000 lbs.....	5/8" proof coil steel welded chain or equivalent	3/8" diam. 7 x 19 preformed aircraft cable or equivalent
over 5000 lbs.....	Strength rating of each length of safety chain or cable shall be equal in minimum break test load to the gross weight of the trailer or mobile home.	

**(3) ATTACHMENT OF SAFETY CHAINS.** The means of attachment of safety chains shall be located equally distant from and on opposite sides of the longitudinal centerline of the towing vehicle and the trailer. Each means of attachment shall have no towing function other than the connection of safety chains and shall not be common with or utilize fasteners common with a ball, socket, ring, pintle, clevis, pin or other equivalent portion of the primary towing arrangement. No welding operation shall be performed on safety chain subsequent to its manufacture. Safety chains shall be so connected that the slack for each length of chain between the trailer and towing vehicle is the same and is not more than necessary to permit proper turning of the vehicles. Each means of attaching chain or cable shall have a longitudinal strength at least equal to the total gross towed weight.

**(4) TILT BED TRAILERS, EQUIPMENT.** All tilt bed trailers built with a swivel pole to permit angling of pole for forward drive unloading,

shall be equipped with a chain at that point where the bend is joined to the pole. Chain shall be of sufficient strength, adequately fastened, and short enough to prohibit the trailer from angling in the event the connecting pin breaks or becomes disconnected.

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.

**MVD 8.13 Leveling bars.** The strength rating of each leveling bar, or part of such unit, shall be not less than:

- (1) Longitudinal tension—gross load of trailer-type vehicle in pounds x 3
- (2) Longitudinal compression—gross load of trailer-type vehicle in pounds x 3
- (3) Transverse thrust—gross load of trailer-type vehicle in pounds x 1
- (4) Vertical tension—gross load of trailer-type vehicle in pounds x 1.3
- (5) Vertical compression—gross load of trailer-type vehicle in pounds x 1.3

**History:** Cr. Register, July, 1968, No. 151, eff. 8-1-68.