drop the tank 10 feet onto an unyielding surface so that it lands squarely on its fill-pipe.

(ii) *Required performance.* Neither the tank nor any fitting may leak more than a total of 1 ounce by weight of water per minute.

(f) *Certification and markings.* Each liquid fuel tank shall be legibly and permanently marked by the manufacturer with the following minimum information:

(1) The month and year of manufacture,

(2) The manufacturer's name on tanks manufactured on and after July 1, 1988, and means of identifying the facility at which the tank was manufactured, and

(3) A certificate that it conforms to the rules in this section applicable to the tank. The certificate must be in the form set forth in either of the following:

(i) If a tank conforms to all rules in this section pertaining to side-mounted fuel tanks: ''Meets all FMCSA side-mounted tank requirements.''

(ii) If a tank conforms to all rules in this section pertaining to tanks which are not side-mounted fuel tanks: ''Meets all FMCSA requirements for non-side-mounted fuel tanks.''

(iii) The form of certificate specified in paragraph (f)(3) (i) or (ii) of this section may be used on a liquid fuel tank manufactured before July 11, 1973, but it is not mandatory for liquid fuel tanks manufactured before March 7, 1989. The form of certification manufactured on or before March 7, 1989, must meet the requirements in effect at the time of manufacture.

[36 FR 15445, Aug. 14, 1971, as amended at 37 FR 4341, Mar. 2, 1972; 37 FR 28753, Dec. 29, 1972; 45 FR 46424, July 10, 1980; 53 FR 49400, Dec. 7, 1988; 59 FR 8753, Feb. 23, 1994]

§ 393.69 Liquefied petroleum gas systems.

(a) A fuel system that uses liquefied petroleum gas as a fuel for the operation of a motor vehicle or for the operation of auxiliary equipment installed on, or used in connection with, a motor vehicle must conform to the ''Standards for the Storage and Handling of Liquefied Petroleum Gases'' of the National Fire Protection Association, Battery March Park, Quincy, MA 02269, as follows:

(1) A fuel system installed before December 31, 1962, must conform to the 1951 edition of the Standards.

(2) A fuel system installed on or after December 31, 1962, and before January 1, 1973, must conform to Division IV of the June 1959 edition of the Standards.

(3) A fuel system installed on or after January 1, 1973, and providing fuel for propulsion of the motor vehicle must conform to Division IV of the 1969 edition of the Standards.

(4) A fuel system installed on or after January 1, 1973, and providing fuel for the operation of auxiliary equipment must conform to Division VII of the 1969 edition of the Standards.

(b) When the rules in this section require a fuel system to conform to a specific edition of the Standards, the fuel system may conform to the applicable provisions in a later edition of the Standards specified in this section.

(c) The tank of a fuel system must be marked to indicate that the system conforms to the Standards.

[36 FR 15445, Aug. 14, 1971, as amended at 37 FR 4342, Mar. 2, 1972; 41 FR 53031, Dec. 3, 1976; 53 FR 49400, Dec. 7, 1988]

Subpart F—Coupling Devices and Towing Methods

§ 393.70 Coupling devices and towing methods, except for driveaway-towaway operations.

(a) *Tracking.* When two or more vehicles are operated in combination, the coupling devices connecting the vehicles shall be designed, constructed, and installed, and the vehicles shall be designed and constructed, so that when the combination is operated in a straight line on a level, smooth, paved surface, the path of the towed vehicle will not deviate more than 3 inches to either side of the path of the vehicle that tows it.

(b) *Fifth wheel assemblies*—(1) *Mounting*—(i) *Lower half.* The lower half of a fifth wheel mounted on a truck tractor or converter dolly must be secured to the frame of that vehicle with properly designed brackets, mounting plates or angles and properly tightened bolts of adequate size and

grade, or devices that provide equivalent security. The installation shall not cause cracking, warping, or deformation of the frame. The installation must include a device for positively preventing the lower half of the fifth wheel from shifting on the frame to which it is attached.

(ii) *Upper half.* The upper half of a fifth wheel must be fastened to the motor vehicle with at least the same security required for the installation of the lower half on a truck tractor or converter dolly.

(2) *Locking.* Every fifth wheel assembly must have a locking mechanism. The locking mechanism, and any adapter used in conjunction with it, must prevent separation of the upper and lower halves of the fifth wheel assembly unless a positive manual release is activated. The release may be located so that the driver can operate it from the cab. If a motor vehicle has a fifth wheel designed and constructed to be readily separable, the fifth wheel locking devices shall apply automatically on coupling.

(3) *Location.* The lower half of a fifth wheel shall be located so that, regardless of the condition of loading, the relationship between the kingpin and the rear axle or axles of the towing motor vehicle will properly distribute the gross weight of both the towed and towing vehicles on the axles of those vehicles, will not unduly interfere with the steering, braking, and other maneuvering of the towing vehicle, and will not otherwise contribute to unsafe operation of the vehicles comprising the combination. The upper half of a fifth wheel shall be located so that the weight of the vehicles is properly distributed on their axles and the combination of vehicles will operate safely during normal operation.

(c) *Towing of full trailers.* A full trailer must be equipped with a tow-bar and a means of attaching the tow-bar to the towing and towed vehicles. The tow-bar and the means of attaching it must—

(1) Be structurally adequate for the weight being drawn;

(2) Be properly and securely mounted;

(3) Provide for adequate articulation at the connection without excessive slack at that location; and

(4) Be provided with a locking device that prevents accidental separation of the towed and towing vehicles. The mounting of the trailer hitch (pintle hook or equivalent mechanism) on the towing vehicle must include reinforcement or bracing of the frame sufficient to produce strength and rigidity of the frame to prevent its undue distortion.

(d) *Safety devices in case of tow-bar failure or disconnection.* Every full trailer and every converter dolly used to convert a semitrailer to a full trailer must be coupled to the frame, or an extension of the frame, of the motor vehicle which tows it with one or more safety devices to prevent the towed vehicle from breaking loose in the event the tow-bar fails or becomes disconnected. The safety device must meet the following requirements:

(1) The safety device must not be attached to the pintle hook or any other device on the towing vehicle to which the tow-bar is attached. However, if the pintle hook or other device was manufactured prior to July 1, 1973, the safety device may be attached to the towing vehicle at a place on a pintle hook forging or casting if that place is independent of the pintle hook.

(2) The safety device must have no more slack than is necessary to permit the vehicles to be turned properly.

(3) The safety device, and the means of attaching it to the vehicles, must have an ultimate strength of not less than the gross weight of the vehicle or vehicles being towed.

(4) The safety device must be connected to the towed and towing vehicles and to the tow-bar in a manner which prevents the tow-bar from dropping to the ground in the event it fails or becomes disconnected.

(5) Except as provided in paragraph (d)(6) of this section, if the safety device consists of safety chains or cables, the towed vehicle must be equipped with either two safety chains or cables or with a bridle arrangement of a single chain or cable attached to its frame or axle at two points as far apart as the configuration of the frame or axle permits. The safety chains or cables shall be either two separate pieces, each

equipped with a hook or other means for attachment to the towing vehicle, or a single piece leading along each side of the tow-bar from the two points of attachment on the towed vehicle and arranged into a bridle with a single means of attachment to be connected to the towing vehicle. When a single length of cable is used, a thimble and twin-base cable clamps shall be used to form the forward bridle eye. The hook or other means of attachment to the towing vehicle shall be secured to the chains or cables in a fixed position.

(6) If the towed vehicle is a converter dolly with a solid tongue and without a hinged tow-bar or other swivel between the fifth wheel mounting and the attachment point of the tongue eye or other hitch device—

(i) Safety chains or cables, when used as the safety device for that vehicle, may consist of either two chains or cables or a single chain or cable used alone;

(ii) A single safety device, including a single chain or cable used alone as the safety device, must be in line with the centerline of the trailer tongue; and

(iii) The device may be attached to the converter dolly at any point to the rear of the attachment point of the tongue eye or other hitch device.

(7) Safety devices other than safety chains or cables must provide strength, security of attachment, and directional stability equal to, or greater than, safety chains or cables installed in accordance with paragraphs (d) (5) and (6) of this section.

(8) When two safety devices, including two safety chains or cables, are used and are attached to the towing vehicle at separate points, the points of attachment on the towing vehicle shall be located equally distant from, and on opposite sides of, the centerline of the towing vehicle. Where two chains or cables are attached to the same point on the towing vehicle, and where a bridle or a single chain or cable is used, the point of attachment must be on the longitudinal centerline of the towing vehicle. A single safety device, other than a chain or cable, must also be attached to the towing vehicle at a point on its longitudinal centerline.

[37 FR 21439, Oct. 11, 1972]

§ 393.71 Coupling devices and towing methods, driveaway-towaway operations.

(a) *Number in combination.* (1) No more than three saddle-mounts may be used in any combination.

(2) No more than one tow-bar may be used in any combination.

(3) When motor vehicles are towed by means of triple saddle-mounts, the towed vehicles shall have brakes acting on all wheels which are in contact with the roadway.

(b) *Carrying vehicles on towing vehicle.* (1) When adequately and securely attached by means equivalent in security to that provided in paragraph (j)(2) of this section, a motor vehicle or motor vehicles may be full-mounted on the structure of a towing vehicle engaged in any driveaway-towaway operation.

(2) No motor vehicle or motor vehicles may be full-mounted on a towing vehicle unless the relationship of such full-mounted vehicles to the rear axle or axles results in proper distribution of the total gross weight of the vehicles and does not unduly interfere with the steering, braking, or maneuvering of the towing vehicle, or otherwise contribute to the unsafe operation of the vehicles comprising the combination.

(c) *Carrying vehicles on towed vehicles.* (1) When adequately and securely attached by means equivalent in security to that provided in paragraph (j)(2) of this section, a motor vehicle or motor vehicles may be full-mounted on the structure of towed vehicles engaged in any driveaway-towaway operation.

(2) No motor vehicle shall be full-mounted on a motor vehicle towed by means of a tow-bar unless the towed vehicle is equipped with brakes and is provided with means for effective application of brakes acting on all wheels and is towed on its own wheels.

(3) No motor vehicle or motor vehicles shall be full-mounted on a motor vehicle towed by means of a saddle-mount unless the center line of the kingpin or equivalent means of attachment of such towed vehicle shall be so located on the towing vehicle that the relationship to the rear axle or axles results in proper distribution of the total gross weight of the vehicles and does not unduly interfere with the steering, braking, or maneuvering of