Part 393

Parts and Accessories Necessary for Safe Operation

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Every commercial motor vehicle must be equipped with certain standard equipment. Other (optional) equipment or accessories are permitted only if these items do not decrease the operational safety of the vehicle.

Lights

What lighting is covered?
Part 393 specifies the required color, position, and types of lamps and reflectors for commercial motor vehicles. All lamps and reflectors for commercial motor vehicles manufactured after March 7, 1989, must meet the requirements of Federal Motor Vehicle Safety Standard (FMVSS) No. 108 (49 CFR 571.108) in effect on the date of manufacture. Certain trailers manufactured on or after December 1, 1993, must have retro-reflective sheeting or additional reflex reflectors to make them more visible to other motorists at nighttime and under other conditions of reduced visibility. Trailers manufactured before December 1, 1993, must be retrofitted with retro-reflective sheeting or additional reflectors by June 1, 2001.

Lamps and reflectors on commercial motor vehicles manufactured on or prior to March 7, 1989, must meet either the requirements of Part 393 or of FMVSS No. 108 that were in effect on the date of manufacture.

Must be Operable

All required lamps must light on request at an inspection and must light when required during regular operation of the vehicle.

Lamp Mounting

All lamps must be permanently and securely mounted on a permanent part of the vehicle. The exceptions are temporary lamps, such as those used in a driveaway-towaway operation or mounted on projecting loads. Temporary lamps must be securely attached.

Stop Lamps

All stop lamps on a commercial motor vehicle must activate when the service brakes are applied.

Brakes

Commercial motor vehicles must be equipped with the following brake systems:

- A service brake system that meets the requirements of 49 CFR 393.52, which specifies braking and holding performance
- A parking brake system that meets the requirements of 49 CFR 393.41, which specifies parking brake activation and the method for holding the brakes in the applied position

Brakes on All Wheels

Every commercial motor vehicle must be equipped with brakes acting on all wheels, with the following exceptions:

- Trucks and truck tractors with three or more axles, manufactured before July 25, 1980, are not required to have steering axle brakes
- Vehicles being towed in a driveaway-towaway operation. (However, the towed vehicle must have brakes in operation if the brakes on the towing vehicle are not capable of stopping the combination vehicle under the conditions covered by Section 393.52)
- Any full trailer, semi-trailer, or pole trailer having a gross weight of 3,000 pounds or less provided the trailer weight does not exceed 40 percent of weight of the towing vehicle

Breakaway and Emergency Braking

Every vehicle used to tow a trailer equipped with brakes must have a means of maintaining the operation of the brakes on the towing vehicle in the event that the trailer breaks away from the towing vehicle. Among the other requirements:

- Every truck or truck tractor equipped with air brakes, when used to tow other vehicles equipped with air brakes, must be capable of activating (manually and automatically) the emergency features of the trailer brakes. The brakes must apply automatically when the towing vehicle air supply pressure is between 20 and 45 psi. The manual control must be operable by the driver from the driver's seat, with seat belt in use
- Every trailer is required to be equipped with brakes that apply automatically if the trailer breaks away from the towing vehicle.* The brakes must remain in the applied position for at least 15 minutes.

*These requirements do not apply to vehicles in driveaway-towaway operations.

Brake Tubing and Hose

Safe and reliable operation of a vehicle's brakes depends upon adequate protection of the tubing and hoses from mechanical and other damage.

- Design and construction of brake tubing and hose must ensure proper, adequate, and continued functioning
- Installation must ensure proper functioning of the hose
- Length and flexibility must be enough to accommodate all normal motions of the parts to which the hose is attached
- Protection against mechanical damage must include protection against chafing, kinking, and mechanical damage
- Protection from high temperature must include protection from or located away from exhaust pipes and other sources of high temperatures

Brake Warning Devices

Buses, trucks, and truck tractors must be equipped with a signal that provides a warning to the driver when a failure occurs in the vehicle's service brake system. This signal requirement covers hydraulic brake systems, air brake systems, vacuum brake systems, and hydraulic brakes applied or assisted by air or vacuum.

Automatic Brake Adjusters and Brake Adjustment Indicators

- Each commercial motor vehicle manufactured on or after October 20, 1993, and equipped with a hydraulic brake system, must be equipped with an automatic brake adjustment system that meets the requirements of FMVSS No. 105
- Each commercial motor vehicle manufactured on or after October 20, 1994, and equipped with an air brake system, must be equipped with an automatic brake adjustment system that meets the requirements of FMVSS No. 121
- Air-braked vehicles manufactured on or after
- October 20, 1994, and equipped with an external automatic adjustment mechanism, must be equipped with an automatic brake adjustment indicator that meets the requirements of FMVSS No. 121

Automatic Slack Adjusters

- All Commercial Vehicle's manufactured since October 1994 are required to be equipped with automatic slack adjusters.
- Automatic slack adjusters should work properly without manual adjustment, but do require regular maintenance and should be checked on regular intervals to ensure proper function.

Commercial Vehicle Safety Alliance (CVSA) Recommendations

- If the brakes are out-of-adjustment on this type of vehicle, it is a brake auto slack adjuster problem, not brakes-out-of-adjustment. Out-of-adjustment indicates the adjuster is not working properly due to being broken, improperly installed or serviced, the driver has readjusted the brakes incorrectly, etc.
- Carriers need to improve their brake knowledge and maintenance program to catch brake problems early and only allow drivers who are truly qualified and knowledgeable to work on brakes and adjusters. Maintenance records should reflect how often and how far adjustments are made on brakes to track brake issues.
- Drivers, mechanics, and carrier officials need to be educated about brakes and slack adjusters. Brakes are one of the most common violations cited and one of the top contributing factors in crashes.

Antilock Braking Systems (ABS)

Certain commercial motor vehicles are required to be equipped with antilock braking systems that meet the requirements of FMVSS No. 105 (49 CFR 571.105) concerning hydraulic brake systems, and FMVSS No. 121 (49 CFR 571.121) concerning air brake systems. The rules apply to:

- Truck-tractors manufactured on or after March 1, 1997
- Air-braked single-unit trucks, buses, and trailers (including converter dollies) manufactured on or after March 1, 1998, and
- Hydraulic-braked trucks and buses manufactured on or after March 1999

Windshield Condition

A vehicle's windshield must be free of discoloration and cracks in the area extending from the top of the steering wheel to within two inches of the top of the windshield.

Fuel Systems

Fuel systems used for the operation of commercial motor vehicles and of auxiliary equipment installed on or used in connection with commercial motor vehicles must meet the following requirements:

Each fuel system must be located so that

- No part of the system extends beyond the widest part of the vehicle
- No part of a fuel tank is forward of the front axle of a power unit
- Fuel spilled vertically from a fuel tank while it is being filled will not contact any part of the exhaust or electrical systems of the vehicle, except the fuel level indicator assembly
- Fill pipe openings are located outside the vehicle's passenger compartment and its cargo compartment
- Fuel lines do not extend between a towed vehicle and the towing unit while the combination is in motion
- No part of the fuel system of a bus manufactured on or after January 1, 1973, is located within or above the passenger compartment

Coupling Devices

Sections 393.70 and 393.71 provide requirements for the attachment and location of the fifth wheel and requirements for the towing of full trailers. In addition, requirements for saddle mount operations are provided.

Cargo Securement

Sections 393.100-393.136 provide the standards covering cargo securement. Cargo is required to be loaded and secured so that it will not shift or fall off the vehicle. The cargo securement regulations include minimum strength requirements for securement devices and requirements for protection against longitudinal and lateral movement of the cargo.

Two cargo securement requirements are Weight & Length:

- Weight – The total weight of the item is the working load limit (WLL)
  - Securement devices MUST be at least ½ of the WLL
  - All tie downs have a working load limit (WLL) including the anchor points
  - The weakest point will always be used as the maximum
  - Use WLL markings as a guide, if the WLL is not marked, use the table in 393.108
  - The truck or trailer headerboard and friction mats can be used to help secure the load
- Length – The length determines the number of tie-downs required
  - One device is required for each 10 feet of load, or fraction of 10 feet
  - Other requirements apply, such as securing round objects (pipes) from rolling, machinery arms must be down and locked

Sleeper Berths

Sleeper berths must meet minimum dimensions. A sleeper berth must not be installed on a trailer and must be located in or adjacent to the cab. An exit door at least 18" high by 36" wide must lead directly into the cab. Section 393.76 contains special provisions for sleeper berths.

Sleeper berths must be equipped with adequate sheets and blankets, and a mattress and springs or innerspring mattress. They must be adequately ventilated, and located so as to protect occupants against exhaust heat and fumes and fuel leaks. A mandatory restraint system must withstand at least 6,000 lbs. of force applied toward the front of the vehicle.

Exhaust Systems

Exhaust systems must meet the following requirements:

- The exhaust system and discharge must be located where it is not likely to burn or damage the electrical wiring, the fuel supply, nor any combustible part of the vehicle
- The discharge from the exhaust system must not be located immediately below the fuel tank or the fuel tank filler pipe

- The exhaust system may not be temporarily repaired with patch or wrap material
- The exhaust pipe and mufflers must be securely fastened to the vehicle
- The exhaust system may not leak or discharge at any point forward of or directly below the driver or sleeper compartment

For trucks and truck tractors, the exhaust system must discharge at a location to the rear of the cab, or above and near the rear of the cab.

For a bus powered by a gasoline engine, the exhaust pipe must discharge at a point no farther forward than six inches forward of the rearmost part of the bus.

For a bus powered by diesel or other fuel (not gasoline), the exhaust pipe must discharge either:

- At a point no farther forward than 15 inches forward of the rearmost part of the bus or
- To the rear of all doors or windows designed to be open (not including emergency exits)

Rear End Protection

Every commercial motor vehicle must be equipped with either bumpers or other devices that prevent the under ride of another vehicle. Tractors, pole trailers, pulpwood trailers, low chassis vehicles, special purpose vehicles, wheels back vehicles, trailers towed in driveaway-towaway operations, and driveaway-towaway vehicles may be exempt. Certain trailers manufactured on or after January 26, 1998, must have rear impact guards that meet FMVSS Nos. 223 & 224.

Seat Belts

Commercial motor vehicle must be equipped with seats, seat belt assemblies, and seat belt anchorages as specified in the Federal Motor Vehicle Safety Standards (FMVSS).

Emergency Equipment

Commercial motor vehicles must carry the following emergency equipment:

- Fire extinguisher
- Spare fuses
- Warning devices for stopped vehicles

Fire Extinguisher

Fire extinguishers must be securely mounted and readily accessible for use. Each extinguisher must have a gauge or other indicator that shows whether the extinguisher is fully charged, and a label showing its Underwriters' Laboratories (UL) rating.

The fire extinguisher(s) must meet one of the following standards:

- One extinguisher with a UL rating of 5 B:C or more or
- Two extinguishers each with a UL rating of 4 B:C or more
- One extinguisher with a UL rating of 10 B:C or more, if the vehicle is transporting placardable quantities of hazardous material

Suspension, Steering and Conspicuity Requirements

Suspension Systems

Suspension systems are required to be structurally sound and in safe working order, including the following:

- Axles must be in proper alignment, and no positioning part can be cracked, broken, loose, or missing
- Adjustable axles must have locking pins in place
- Leaf springs must not be cracked, broken, missing, or shifted out of position
- Coil springs must not be cracked or broken
- Torsion bars must not be cracked or broken
- Air suspensions must support the vehicle in a level position, and must not leak

Steering System

Steering system must be in proper working order, which includes the following:

- Steering wheel must be properly secured and no cracked or missing spokes
- Steering wheel lash must meet the requirements of Section 393.209 (b)
- Steering column must be securely fastened
- Steering system must not have worn or welded universal joints, loose steering gear box, missing bolts, or a loose pitman arm on the steering gear output shaft
- Power steering unit must not have loose or broken parts, (frayed, cracked, or slipping belts); no leaks; or insufficient fluid in reservoir

FMCSA'S Conspicuity Requirements for Commercial Motor Vehicles

The FMCSA has regulations requiring the use of conspicuity materials (i.e., retroreflective sheeting (or reflex reflectors)) on trailers and the rear of truck tractors. The rules are intended to reduce the incidence of motorists crashing into the sides or rear of trailers at nighttime and under other conditions of reduced visibility, and to reduce the incidence of motorists rear-ending truck tractors (being operated without trailers) under the same conditions.

There are three separate groups of commercial motor vehicles subject to the FMCSR requirements and the date of manufacture for the vehicle must be known to determine the applicability of the rules to the vehicle. The rules cover:

- Trailers manufactured on or after December 1, 1993;
- The retrofitting of trailers built before that date; and
- Truck tractors built on or after July 1, 1997.