must be located so that leaks in the vehicle’s exhaust system or fuel system do not permit fuel, fuel system gases, or exhaust gases to enter the sleeper berth. A sleeper berth must be located so that it will not be overheated or damaged by reason of its proximity to the vehicle’s exhaust system.

(h) Occupant restraint. A motor vehicle manufactured on or after July 1, 1971, and equipped with a sleeper berth must be equipped with a means of preventing ejection of the occupant of the sleeper berth during deceleration of the vehicle. The restraint system must be designed, installed, and maintained to withstand a minimum total force of 6,000 pounds applied toward the front of the vehicle and parallel to the longitudinal axis of the vehicle.


§ 393.77 Heaters.

On every motor vehicle, every heater shall comply with the following requirements:

(a) Prohibited types of heaters. The installation or use of the following types of heaters is prohibited:

(1) Exhaust heaters. Any type of exhaust heater in which the engine exhaust gases are conducted into or through any space occupied by persons or any heater which conducts engine compartment air into any such space.

(2) Unenclosed flame heaters. Any type of heater employing a flame which is not fully enclosed, except that such heaters are not prohibited when used for heating the cargo of tank motor vehicles.

(3) Heaters permitting fuel leakage. Any type of heater from the burner of which there could be spillage or leakage of fuel upon the tilting or overturning of the vehicle in which it is mounted.

(4) Heaters permitting air contamination. Any heater taking air, heated or to be heated, from the engine compartment or from direct contact with any portion of the exhaust system; or any heater taking air in ducts from the outside atmosphere to be conveyed through the engine compartment, unless said ducts are so constructed and installed as to prevent contamination of the air so conveyed by exhaust or engine compartment gases.

(5) Solid fuel heaters except wood charcoal. Any stove or other heater employing solid fuel except wood charcoal.

(6) Portable heaters. Portable heaters shall not be used in any space occupied by persons except the cargo space of motor vehicles which are being loaded or unloaded.

(b) Heater specifications. All heaters shall comply with the following specifications:

(1) Heating elements, protection. Every heater shall be so located or protected as to prevent contact therewith by occupants, unless the surface temperature of the protecting grilles or of any exposed portions of the heaters, inclusive of exhaust stacks, pipes, or conduits shall be lower than would cause contact burns. Adequate protection shall be afforded against igniting parts of the vehicle or burning occupants by direct radiation. Wood charcoal heaters shall be enclosed within a metal barrel, drum, or similar protective enclosure which enclosure shall be provided with a securely fastened cover.

(2) Moving parts, guards. Effective guards shall be provided for the protection of passengers or occupants against injury by fans, belts, or any other moving parts.

(3) Heaters, secured. Every heater and every heater enclosure shall be securely fastened to the vehicle in a substantial manner so as to provide against relative motion within the vehicle during normal usage or in the event the vehicle overturns. Every heater shall be so designed, constructed, and mounted as to minimize the likelihood of disassembly of any of its parts, including exhaust stacks, pipes, or conduits, upon overturn of the vehicle in or on which it is mounted. Wood charcoal heaters shall be secured against relative motion within the enclosure required by paragraph (c)(1) of this section, and the enclosure shall be securely fastened to the motor vehicle.

(4) Relative motion between fuel tank and heater. When either in normal operation or in the event of overturn, there is or is likely to be relative motion between the fuel tank for a heater and the heater, or between either of such units and the fuel lines between them.
a suitable means shall be provided at
the point of greatest relative motion so as to allow this motion without caus-
ing failure of the fuel lines.

(5) Operating controls to be protected. On every bus designed to transport more than 15 passengers, including the driver, means shall be provided to pre-
vent unauthorized persons from tamper-
ing with the operating controls. Such means may include remote con-

(6) Heater hoses. Hoses for all hot water and steam heater systems shall be specifically designed and con-
structed for that purpose.

(7) Electrical apparatus. Every heater employing any electrical apparatus shall be equipped with electrical con-
ductors, switches, connectors, and other electrical parts of ample current-
carrying capacity to provide against overheating; any electric motor em-
ploved in any heater shall be of ade-
quate size and so located that it will not be overheated; electrical circuits shall be provided with fuses and/or cir-
cuit breakers to provide against electric-

(8) Storage battery caps. If a separate storage battery is located within the personnel or cargo space, such battery shall be securely mounted and equipped with nonspill filler caps.

(9) Combustion heater exhaust construc-
tion. Every heater employing the com-
bustion of oil, gas, liquefied petroleum gas, or any other combustible material shall be provided with substantial means of conducting the products of combustion to the outside of the vehi-
cle: Provided, however, That this re-

(10) Combustion chamber construction. The design and construction of any combustion-type heater except cargo space heaters permitted by the provo-
of paragraph (c)(9) of this section and unenclosed flame heaters used for heat-
ing cargo of tank motor vehicles shall be such as to provide against leakage of products of combustion into the atmosphere and the means of discharge of such products shall be such as to minimize the likeli-

(11) Heater fuel tank location. Every bus designed to transport more than 15 passengers, including the driver, with heaters of the combustion type shall have fuel tanks therefor located out-
side of and lower than the passenger space. When necessary, suitable protec-
tion shall be afforded by shielding or other means against the puncturing of any such tank or its connections by flying stones or other objects.

(12) Heater, automatic fuel control. Gravity or siphon feed shall not be per-
mitted for heaters using liquid fuels.
Heaters using liquid fuels shall be equipped with automatic means for shutting off the fuel or for reducing such flow of fuel to the smallest practicable magnitude, in the event of overturn of the vehicle. Heaters using liquefied petroleum gas as fuel shall have the fuel line equipped with automatic means at the source of supply for shutting off the fuel in the event of separation, breakage, or disconnection of any of the fuel lines between the supply source and the heater.

(13) "Tell-tale" indicators. Heaters subject to paragraph (b)(14) of this section and not provided with automatic controls shall be provided with "tell-tale" means to indicate to the driver that the heater is properly functioning. This requirement shall not apply to heaters used solely for the cargo space in semitrailers or full trailers.

(14) Shut-off control. Automatic means, or manual means if the control is readily accessible to the driver without moving from the driver’s seat, shall be provided to shut off the fuel and electrical supply in case of failure of the heater to function for any reason, or in case the heater should function improperly or overheat. This requirement shall not apply to wood charcoal heaters or to heaters used solely to heat the contents of cargo tank motor vehicles, but wood charcoal heaters must be provided with a controlled method of regulating the flow of combustion air.

(15) Certification required. Every combustion-type heater, except wood charcoal heaters, the date of manufacture of which is subsequent to September 1, 1953, shall be marked plainly to indicate the type of service for which such heater is designed and with a certification by the manufacturer that the heater meets the applicable requirements for such use. For example, "Meets I.C.C. Bus Heater Requirements," "Meets I.C.C. Flue-Vented Cargo Space Heater Requirements," and after December 31, 1967, such certification shall read "Meets FMCSA Bus Heater Requirements," "Meets FMCSA Flue-Vented Cargo Space Heater Requirements," etc.

(i) Exception. The certification for a catalytic heater which is used in transporting flammable liquid or gas shall be as prescribed under §177.834(1) of this title.

§ 393.78 Windshield wiping and washing systems.

(a) Vehicles manufactured on or after December 25, 1968. Each bus, truck, and truck-tractor manufactured on or after December 25, 1968, must have a windshield wiping system that meets the requirements of FMVSS No. 104 (S4.1) in effect on the date of manufacture. Each of these vehicles must have a windshield washing system that meets the requirements of FMVSS No. 104 (S4.2.2) in effect on the date of manufacture.

(b) Vehicles manufactured between June 30, 1953, and December 24, 1968. Each truck, truck-tractor, and bus manufactured between June 30, 1953, and December 24, 1968, shall be equipped with a power-driven windshield wiping system with at least two wiper blades, one on each side of the centerline of the windshield. Motor vehicles which depend upon vacuum to operate the windshield wipers, shall have the wiper system constructed and maintained such that the performance of the wipers will not be adversely affected by a change in the intake manifold pressure.

(c) Driveaway-towaway operations. Windshield wiping and washing systems need not be in working condition while a commercial motor vehicle is being towed in a driveaway-towaway operation.

§ 393.79 Windshield defrosting and defogging systems.

(a) Vehicles manufactured on or after December 25, 1968. Each bus, truck, and truck-tractor manufactured on or after December 25, 1968, must have a windshield defrosting and defogging system that meets the requirements of FMVSS No. 103 in effect on the date of manufacture.

(b) Vehicles manufactured before December 25, 1968. Each bus, truck, and truck-tractor shall be equipped with a means for preventing the accumulation of water in the windshield and defrosting and defogging the windshield during a period of 10 minutes after starting the motor.