Chapter MVD 17

"EXHIBIT A"

TRANSPORTATION OF SCHOOL CHILDREN

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MVD 17.01 Definition. (1) (Statutory) "School bus" means a motor vehicle which transports children to or from a public or private school or which transports school groups engaged in extracurricular activities to or from points designated by such schools, but does not include:

(a) A motor vehicle owned or operated by a parent or guardian transporting only his own children, regardless of whether the school has made a contract with or paid compensation to such parent or guardian for such transportation; or

(b) A vehicle having a seating capacity of fewer than 10 persons, including the operator, and used in casual, occasional or reciprocal transprotation of school children and not under contract.

(c) Buses operated by a common motor carrier of passengers used in urban transportation of school children, or when used in extra-curricular activities to and from points designated by a school.

Note: (This is a direct quote of section 340.01 (56) Wis. Stats. as amended by 1959 Legislature.)

(2) These minimum standards are intended to apply to all types of school buses:

(a) Type 1 school buses: means any school bus transporting 17 or more pupils or other authorized persons exclusive of driver.

(b) Type 2 school buses: means any school bus transporting 16 or less pupils or other authorized persons exclusive of driver:

(c) School vans: means any school bus having a seating capacity of 13 or less pupils or other authorized persons exclusive of driver.

Note: The method of determining whether a small passenger vehicle is in the school van or type 2 class is provided in sec. 340.01(31), Wisconsin Statutes which states as follows: (31) "Motor bus" means a motor vehicle designed primarily for the transportation of persons rather than property and having a passenger-carrying capacity of 10 or more persons including the operator. Passenger-carrying capacity shall be determined by dividing by 20 the total seating space measured in inches.

The total seat measurement is determined by measuring all the seats, including the driver's seat, from side to side across the widest part of the area upon which the passengers sit and adding these measurements. This total is then divided by 20, and if the result is less than 10, the vehicle is in the school van class. If it is 10 or over, the vehicle is a type 2 bus.

However, since the minimum rump space for pupils is established at 13" it is obvious that for purposes of pupil transportation more than 9 pupils can be seated in a school bus van.

To determine the number of pupils which can be transported we must subtract 20" from the total seat measurement to take care of the driver's seat and then divide the remainder by 13".

Example #1: School van

A vehicle is converted to school bus use and has 6 seats each 26" wide exclusive of the driver's seat. The total measurement of

the 6 seats would be 156". Dividing this figure by 13" would result in 12 which would be the maximum number of pupils which could be transported.

If these seats were each 4" wider the total measurement would be 180" . However, the vehicle could still haul only 12 children because at least 13" of the extra 20" would have to be in one seat to accomodate one more passenger.

Example #2: Type 2 bus.

If the vehicle in example 1 had been converted with 8 seats each 26" wide the total seat measurement, exclusive of the driver's seat, would be 208". Dividing this figure by 13" would result in 16 pupils which would be the maximum for this vehicle.

Subchapter I

DRIVER REQUIREMENTS

MVD 17.10 Driver requirements. (1) SCHOOL BUS OPERATOR'S LICENSE. No person shall driver a school bus transporting pupils or other authorized passengers without first having applied for and received a school bus driver's license or a license endorsed to authorize school bus operation or a driver license examiner's receipt.

(The law prohibits issuance of a school bus driver's license to any person who is less than 18 or more than 70 years of age.)

(2) PHYSICAL QUALIFICATIONS. School bus driver must be in good physical condition, possessing at least 20/40 vision either normally or corrected, in each eye, and having a minimum horizontal form field of 70 degrees; having normal ability to hear the spoken voice without a hearing aid, and possessing sufficient use of both his hands to operate

necessary hand controls, and the foot normally employed to operate the foot brake and foot accelerator which may be substantiated by competent medical proof submitted by the applicant.

(3) SMOKING. The driver shall not smoke or permit smoking when any children ane aboard the bus.

(4) MAINTAINING ORDER. Driver shall be responsible for the maintenance of order among children being transported. Misconduct shall be promptly reported to proper authority.

(5) CHECKING VEHICLE. Driver shall check daily the condition of the vehicle, giving particular attention to brakes, tires, lights, emergency equipment and interior cleanliness of the vehicle. Defects shall be corrected and, if necesssary, the interior of the bus cleaned before the next shcool bus operation.

(6) CONDUCT IN EVENT OF ACCIDENT. In case of an accident or a breakdown, the driver shall remain with the vehicle and send 2 responsible children to the nearest place for help, when practicable.

(7) LOADING AND UNLOADING PROCEDURE. Loading stations or points must be selected with due regard for traffic and pedestrian safety, and shall be apporved by school authorities. When flashing red warning lights are used as required by sec. 346.48 Wisconsin Statutes, they shall be actuated continuously at least 100 feet before stopping.

Except where there are special loading zones where the bus is entirely off the traveled portion of the highway, the bus shall be stopped on the traveled portion of the highway as near as practicable to the right hand edge of that portion of the lane

farthest to the right which is improved, designed or ordinarily used for vehicular travel, excluding the berm or shoulders.

The flashing red warning lights shall not be extinguished until loading or unloading is completed and persons who must cross the highway are safely across.

(8) STARTING AND STOPPING. Doors must be closed securely before starting and must remain closed while vehicle is in motion, except as provided in subsection (15). Abrupt starts and stops or sudden maneuvers are prohibited, except in emergency.

(9) UNATTENDED VEHICLE. Driver shall not leave vehicle unattended with engine running when pupils are in the bus.

(10) AUTHORIZED PASSENGERS. No persons except pupils, school employees, chaperones and other persons approved by the school authorities shall be permitted to ride in a vehicle subject to these regulations; provided that school board members or an authorized official making an inspection, or conducting an examination of the driver's ability shall be given such privilege. Transportation of passengers in excess of the number posted as required in Wisconsin Administrative Code section MVD 17.20(22)(b) is prohibited.

(11) TRANSPORTATION OF ARTICLES. No articles may be transported within bus body if there is or may be interference with pupils or driver or if aisle, well, or steps are obstructed. Articles other than those associated with school activity may not be transported.

(12) CHILDREN CROSSING ROAD. When discharging passengers, driver shall make sure that there is no traffic danger before

allowing children to cross. Children obliged to cross the road shall be required to cross from a point at least 10 feet in front of the standing vehicle after receiving a signal from the driver, and the driver shall not proceed until children are safely across the street or highway. This section applies only where flashing red signals are used.

(13) COOPERATION WITH OFFICERS. Drivers, school boards and vehicle owners shall cooperate at all times with authorized division of motor vehicles personnel in carrying out inspection of equipment, or examination of driver pursuant to law or to divisional regulations.

(14) STANDING IN VEHICLE PROHIBITED. Driver shall not require or allow any passenger to stand while the vehicle is in motion except while passenger is going to door or seat just prior to stopping or immediately after loading. This does not apply to chaperones or monitors in the performance of their duties.

Driver shall not permit any passenger to sit anywhere except in seats provided.

(15) STOPPING AT RAILROAD CROSSINGS. When a bus is carrying school children driver shall come to a full stop at a distance of not less than 15 feet nor more than 50 feet from the nearest rail of the main line tracks of such railroad. While the vehicle is so stopped, the driver shall open the service door and listen and look in both directions along such track for any approaching train and for signals indicating the approach of a train. After stopping and upon proceeding when it is safe to do so,, the driver of such vehicle shall cross only in such gear of the vehicle as will make it unnecessary to manually shift gears while traversing the crossing and he shall not shift gears while traversing the crossing. The door shall remain open until the driver can satisfactorily determine that he can cross

in safety. By the time the bus has cleared the tracks, the door shall be closed. If the bus is a school van not equipped with a service door controlled from the driver's seat, opening of the service door is not required provided the driver lowers the window to his left and provided that the service door glass is kept free of frost and fog. This section does not apply at crossings with interurban railroad tracks whch are laid on or along streets within the corporate limits of a city or village, nor to vehicles having a seating capacity of fewer than 10 persons (less than 200" seating capacity) and which are not painted school bus yellow.

(16) SPEED LIMITATIONS. No vehicle subject to the provisions of Wis. Adm. Code Chapter MVD 17 shall be driven at a speed in excess of 45 miles per hour while transporting school children except that:

(a) When engaged in transporting children to and from extra-curricular activities, the speed of the vehicle shall not exceed 50 miles per hour, except that when operating on the national system of interstate and defense highway the speed limit may not exceed the posted truck speed limit at any time.

(b) Vehicles having a seating capacity of less than 200 inches counting the driver's seat, may not be driven in excess of 55 miles per hour while transporting children to and from school and extra-curricular actiivties.

(17) DRIVER SEAT BELT. A school bus which has a seat belt assembly installed at the driver's seat shall not be operated unless the driver is properly restrained by the seat belt assembly.

(18) COMPLIANCE WITH DRIVER' INSTRUCTIONS. School bus passengers shall comply with all orders given by school bus drivers in carrying out said driver's responsibilities under Wis. Adm. Code Section MVD 17.10(3),(4),(11),(12) and (14).

Subchapter II

TYPE I BUSES

CHASSIS

MVD 17.20 Chassis, Type I Buses. (1) AIR CLEANER. Bus shall be equipped with adequate oilbath, dry element or equivalent type air cleaner mounted outside the passenger compartment.

(2) AXLES. (a) Front axle or other type of suspension assembly shall be of sufficient capacity at ground to support such load on front axle as would be imposed by actual average gross vehicle weight. See subsection (22).

(b) Rear axle shall be full-floating type. Rear axle or other type of suspension assembly shall have gross weight rating at ground equal to or exceeding that portion of total load which is supported by rear suspension assembly.

(c) Exception--transit and metropolitan vehicles. 1. Front axle shall be wide-track, heavy-duty bus type and shall have gross weight rating at ground equal to or exceeding that portion of total load which is supported by front axle.

2. Rear axle shall be full-floating, heavy-duty bus type and shall have gross weight rating at ground equal to or exceeding that portion of total load which is supported by rear axle.

3. BATTERY (a) When the battery is mounted outside of the engine compartment by the chassis manufacturer, the body manufacturer shall securely attach battery on slide out tray in a closed, weather-tight and vented compartment in the body skirt, whereby the battery may be exposed to the outside for convenient servicing. The battery compartment door or cover shall be secured by an adequate and conveniently operated latch or other type fastener.

(b) The storage battery shall be of sufficient capacity to supply all electrical requirements, and shall be of rating not less than 70 ampere hours, at 12 volts, measured at a 20-hour rate.

(c) When battery is to be mounted outside of engine compartment, it may be temporarily mounted to chassis by chassis manufacturer. Body company will permanently mount battery on a sliding tray located so that center line of battery is 52 inches back of cowl. One-piece battery cables shall be provided by chassis manufacturer, such cables to be at least 36 inches longer than normally required, to accomodate battery when located 52 inches to rear of cowl.

(d) Exception--transit and metropolitan vehicles: subsection (c) does not apply.

(4) BRAKES. Bus chassis manufactured prior to January 1, 1968 shall be governed by the applicable provisions of Wis. Adm. Code Ch. MVD 5 in effect when the vehicle was manufactured. The following provisions for brakes shall become effective January 1, 1968 on bus chassis manufactured after that date.

(a) Service Brake

1. Stopping ability of service brake system. Service brake system shall be designed and constructed so that by application of single control unit vehicle can be stopped within distances specified in a and b of this subsection. Stopping distance requirement tests shall be conducted in accordance with SAE J658 1966 and with vehicle loaded (MGVW - manufacturer's gross vehicle weight).

Note: SAE J658 - Service Brake Performance, recommended practice of Society of Automotive Engineers. This reference is available in the office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

a. Brakes shall be designed to have capability of developing deceleration of 14 fpsps (feet per second per second) from speed of 20 mph at pedal effort of not more than 75 pounds.

b. Stopping distance test with brakes cold shall be conducted after proper conditioning according to SAE J880 and vehicle shall stop, from speed of 20 mph, within following distances at pedal effort of not more than 200 pounds:

10,000 pounds GVW and under---25 feet

Over 10,000 pounds GVW--------35 feet

c. Brake balance shall be such that, when tested at speed of 20 mph under any normal conditions of loading within MGVW (manufacturer's gross vehicle weight), deceleration of 12 fpsps (feet per second per second) can be achieved without locking wheels on any axle.

2. Energy absorption - horsepower rating. Energy absorption capability of brakes, when tested in accordance with procedure established by SAE J880 or equivalent, shall be not less than 12 + 1.4 GVW.

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Note: SAE J880 (1966) Brake Rating System Test Code--Commercial Vehicles, recommended practice of Society of Automotive Engineers. This reference is available in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

3. Travel reserve of air brake actuator or hydraulic brake pedal. Brake actuator travel, when measured statically at actuating force required for compliance with Item (a) 1 b. above, shall be not more than 60 percent of available travel.

4. Reservoirs required. Every brake system which employs air or vacuum shall include following reservoir capacity:

a. Air brake system shall have reservoir capacity which is equal to or greater than 12 times total volume of all brake actuators at full travel. Engine shall be protected by proper filters.

b. Vacuum brake system shall have reservoir used exclusively for brakes, with capacity of not less than 1,000 cubic inches, and shall be adequate to insure loss in pressure at full stroke application of not more than 30 percent.

5. Safeguarding of air or vacuum system reservoir. Brake system reservoir shall be so safeguarded by a check valve or equivalent device that in the event of failure or leakage in its connection to the source of compressed air or vacuum, the stored air or vacuum shall not be depleted by the leak or failure. Means shall be provided to establish air check valve to be in working order.

6. Gauges. A vehicle using air or vacuum in operation of brake

system shall be equipped with an illuminated gauge, accurate to within 10 percent of actual reservoir pressure, which will indicate to driver the air pressure in psi (pounds per square inch) which is available for the operation of air brakes; or the vacuum in inches of mercury which is available for the operation of vacuum brakes.

7. Warning devices. In addition to the gauges required in 6 above, vehicle shall be equipped with audible or visible warning signal which will give continuous warning to driver when air pressure in braking system is 60 psi (pounds per square inch) or less; or when vacuum in braking system is 8 inches of mercury or less.

(b) Emergency braking system: General. Brake system(s) shall perform emergency stopping function and be so designed and constructed that single failure anywhere in brake system which performs service brake funtion, excepting mechanical parts of wheel brake assemblies and brake pedal and brake pedal attachment to brake valve(s) or master cylinder(s), will not leave vehicle without operative brakes capable of stopping vehicle when loaded up to and including manufacturer's rated GVW (gross vehicle weight) at any legal speed and in accordance with requirements of 1 and 2 below.

1. Emergency stopping performance requirements. Following performance shall be obtained under road and test conditions outlined in (a) 1. above:

a. Vehicle, when loaded to manufacturer's GVW (gross vehicle weight) capacity, shall be brought to stop from speed of 20 mph in measured distance of 85 feet.

b. Deceleration of not less than 6 fpsps (feet per second per second) shall be maintained throughout stop from 20 mph.

2. Control requirements of emergency stopping system. Control of emergency stopping system shall be designed and constructed:

a. to permit modulated control by driver of brake application and release; and

b. to prevent release of brakes by driver unless energy is available for re-application.

(c) Parking brakes. Parking brake system shall be designed and constructed to meet following requirements:

1. Parking brake shall hold vehicle stationary, or to limit of traction of braked wheels, on 20-percent grade under any condition of legal loading and on surface free from snow, ice, and loose material.

2. When applied, parking brake shall remain in applied position with capability set forth in (c) 1 above, despite exhaustion of source of energy used for application or despite leakage of any kind.

(5) BUMPER, FRONT. The front bumper shall be of heavy duty channel steel of at least 3/16 inch thickness and not less than an 8 inch face, and shall extend to protect the outer edges of the fenders. It shall be of sufficient strength to permit pushing another vehicle of equal gross weight without distortion.

(6) BUMPER, REAR. See Wis. Adm. Code section MVD 17.30(4).

(7) CLUTCH. All chassis of 48 through 60 pupil capacity having mechanical type transmission shall be equipped with clutch of 12 inch minimum diameter. Chassis of 66 and greater pupil capacity having mechanical type transmission shall be equipped with clutch

of 13 inch minimum diameter or clutch of equivalent performance.

(8) COLOR. See Wis. Adm. Code section MVD 17.30 (8).

(9) DRIVE SHAFT. Each segment of the drive shaft shall be equipped with a suitable guard to prevent accident or injury in the event of its fracture or disconnection.

(10) ELECTRICAL SYSTEM. (a) Battery. See subsection (3) above.

(b) Generator or alternator. See Wis. Admin. Code section MVD MVD 17.20 (15

(c) Lamps and signals. See Wis. Adm. Code section MVD 17.30 (24).

(d) Wiring. See Wis. Adm. Code section MVD 17.30 (46).

(11) EXHAUST SYSTEM. (a) The exhaust system shall include the exhaust manifold and gaskets, piping leading from the flange of the exhaust manifold to the muffler(s), and from the muffler to the rear.

(b) The tail pipe(s) shall be of non-flexible 16 gauge steel or equivalent and shall extend beyond the rear of the chassis frame but not beyond the rear limit of the bumper. Tail pipe may exit on the left side of the bus but not ahead of the forward edge of the wrap-around bumper.

(c) The system shall not extend into the passenger compartment and shall be attached to the chassis. A slip joint is permitted for expansion purposes provided there is no leakage at operating temperature.

(d) Exhaust system shall be properly insulated from electrical wiring and from fuel tank and tank connections by a securely attached metal shield at any point where it is less than 12 inches from such wiring, tank or tank connections. No part of the exhaust system shall pass within 12 inches of any flexible brake line or hose

unless protected by a suitable heat baffle.

(e) The size of the tailpipe shall not be reduced after it leaves the muffler except for the thickness of the metal at the connection to the muffler.

(f) The exhaust system noise level shall not exceed 125 sones as measured by the Beranek Armour=ATA Equivalent Tone Method (1954). This reference is available in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(12) FENDERS, FRONT. (a) Total spread of outer edges of front fenders, measured at fender line, shall exceed total spread of front tires when front wheels are in straight-ahead position.

(b) Front fender shall be properly braced and free from any body attachment.

(c) Chassis sheet metal shall not extend beyond rear face of cowl.

(d) Exception--transit and metropolitan vehicles: Standard does not apply.

(13) FRAME. (a) Frame or equivalent shall be of such design as to correspond at least to standard practice for turcks of same general load characteristics which are used for severe service.

(b) When frame side members are used they shall be of one-piece construction. If frame side members are extended, such extension shall be designed and furnished by chassis manufacturer with his guarantee, and installation shall be made by either chassis or body manufacturer and guaranteed by company making installation. Extensions of frame lengths are permissible only when such alterations are behind rear hanger of rear spring and shall not be for purpose of extending wheel base.

(c) Holes in top or bottom flanges of frame side rails shall not be permitted except as provided in original chassis frame. There shall be no welding to frame side rails except by chassis or body manufacturer.

(14) FUEL SYSTEM AND TANK. (a) Capacity. The fuel tank shall have the minimum capacity of 30 gallons and shall be mounted directly on the right side of the chassis frame, and shall be filled and vented entirely outside the body.

(b) Liquid fuel tank construction - 1. Material. Material used in the construction of the tank and its fittings shall be suitable for the purpose intended.

2. Joints. Joints of the tank body shall be closed only by arc, gas, seam, or spot welding, brazing, or silver soldering.

3. Fittings. The tank shall be provided with suitable flanges or spuds for the assembly of all fittings.

4. Threads. Threads on all fittings shall be American (National) Standard Taper Pipe Thread or SAE Standard Short Dryseal Taper Pipe Thread except that straight (nontapered) threads may be used on fittings having integral flanges and using gaskets for sealings. There shall not be less than four full threads in engagement in any fitting.

5. Drains and bottom fittings. Drains and other bottom fittings shall not extend more than three-quarter inch below the lowest part of the tank and shall be designed or guarded to minimize

their being torn loose. All drain fittings shall be so designed and located as to permit complete drainage. The drain shall be located in a suitable flange or spud.

6. Fuel discharge line. The fitting through which the fuel is drawn from the tank shall be located above the normal full line of the tank.

7. Excess flow valve. When pressure devices are used to force fuel from the tank, means shall be provided to prevent the continued flow of fuel in the event the fuel feed line is broken.

8. Fill-pipe design. The fill-pipe shall be designed and located so as to minimize the probability of its being torn loose in the event of an accident. The fill-pipe and vents on any fuel tank having a fuel capacity in excess of 25 gallons shall be so designed and constructed as to permit filling at a rate of at least 20 gallons per minute without spillage.

9. Air Vent. Every fuel tank shall be equipped with an air vent of a nonspill type (ball check or equivalent). The air vent may be mounted separately or combined with the filler cap or safety vent.

10. Safety Vents. (a) Side-mounted fuel tanks having a fuel capacity in excess of 25 gallons shall be provided with a fusible safety vent or vents which shall be so designed as to limit the pressure rise in the tank under any fire condition to a maximum of 50 pounds per square inch gauge. The vent area shall be sufficient to prevent a rise in pressure in the tank of more than 10 percent of the release pressure of the safety vent or vents when the

tank is subjected to a fire of any magnitude. If but one fusible safety vent is provided, it shall be located in the top of the tank; if more than one fusible safety vent is provided at least one shall be in the top of the tank.

(b) All fuel tanks having a fuel capacity in excess of 25 gallons shall be provided with means of relieving pressure in the tank due to fire before such pressure would result in the failure of the body, seams, or any bottom opening in the tank.

(c) Liquid fuel tank capacity markings. The tank shall be marked with its liquid capacity and shall be provided with means to indicate that it shall not be filled to more than 95 percent of its total capacity.

(d) Liquid fuel tank tests -- 1. Drop test on corner of tank. The tank when filled with water equal in weight to that of its fuel capacity shall withstand without leakage a drop of 30 feet falling so as to strike squarely on one corner on concrete or equivalent surface which shall not rupture under the impact. The fill-pipe and cap, fuel gauge sending device, and the air intake and safety vents shall not leak more than 1 ounce of water per minute as a result of this test.

2. Safety vent test. The safety vent, or vents, shall limit the rise in internal pressure in the tank to a maximum of 50 pounds per square inch gauge when the tank is filled to three-fourths of rated capacity with standard fuel and placed in inverted position with the fuel feed outlet connection plugged when an enveloping flame is applied to the tank with sufficient intensity to produce an internal fuel temperature rise of 6^0 to 8^o F per minute strating from a fuel temperature of 50^o to 80^o F.

Neither the tank, fill-pipe, fuel gauge, air intake vent, nor any other opening except blown fusible plugs shall leak more than 1 ounce of fuel per minute after having been subjected to these conditions. Other types of tests or calculations may be employed to determine compliance with this requirement if a comparable result is obtained.

3 Rupture test. The tank and all appurtenances including the fill-pipe, cap, fuel gauge, and air intake vent shall withstand without rupture an internal hydrostatic pressure of 150 percent of the maximum at which the safety vent is required to release.

4 Spillage test: At ordinary room temperature the tank when filled to capacity with its normal fuel and turned through an angle of 150° from its normal position, with outlet pipe plugged, shall not spill or leak fuel at a rate greater than 1 ounce per minute. The fill-pipe , cap, fuel gauge outlet, air intake vent, safety vent, and any other openings shall withstand this test.

(e) Liquid fuel tank certification. Every side-mounted gasoline fuel tank designed and constructed to comply with these requirements shall be plainly and permanently marked with the date of manufacture and a certification of the manufacturer that it complies with such requirements. The certification shall contain the words "Meets FHWA requirements--side-mounted--gasoline", or words of similar meaning.

(f) Fuel filter with replaceable element shall be installed between fuel tank and carburetor.

(g) Fuel tank, fittings or lines, shall not extend above

top of chassis frame rail. Fuel lines shall be mounted to obtain maximum possible protection from chassis frame.

(h) Tank size. If tank sizes other than 30 gallons are supplied, location of tank and filler spout must remain as specified.

(15) GENERATOR OR ALTERNATOR. Generator or alternator with rectifier shall have maximum output of at least 62 amperes with a minimum charging of 20 amperes at manufacturer's recommended engine idle speed (12 volt system), and shall be ventilated and voltage-controlled and, if necessary, current controlled and shall be capable of supplying all electrical requirements. Dual belt drive shall be used with generator or alternator.

Suggested Method for Estimating
Generator or Alternator Capacity

Constant Load

Equipment	Number of Units	Current Draw (Amperes)
Ignition		2.50 (average)
Head Lamps (Type 2 dual lower beam)	2	8.40
Tail lights	2	1.18
Clearance lights	4	2.36
Cluster lights	6	3.54
Body instrument panel		0.80
Primary front heater motors	2	24.00
Primary defroster motor	1	12.00
Supplementary front heater motor	1	12.00
Supplementary defroster motor	1	12.00
Underseat heater motors	2	10.50
Underseat heater motor	1	8.50
Defroster fan motor	1	3.50
Windshield wipers		14.00
Fuel pump		3.00
Emergency door buzzer		1.00

Intermittent Load

Flasher motor		2.90
Alternately flashing signal lamps	2	11.60
Step-well and 6 interior dome lights		5.64
Individual additional dome lights		0.94
Stop (brake) lights	4	6.60
Turn signals	2	2.36

To determine the electrical load (in amperes) for a typical school bus, the following formula is recommended:

Constant load + 35% of intermittent load = total load.

(16) GOVERNOR (a) Governor is permissible and where used shall be approved by chassis manufacturer.

(b) Exception--transit and metropolitan vehicles: When engine is remotely located from driver, governor shall be installed to limit engine speed to maximum revolutions per minute recommended by engine manufacturer, or tachometer shall be installed so engine speed may be known to driver.

(17) HORNS. Bus shall be equipped with standard make dual horns in good working order and capable of emitting sound audible under normal traffic conditions from a distance of not less than 300 feet.

(18) INSTRUMENTS AND INSTRUMENT PANEL. (a) Chassis shall be equipped with following instruments and gauges:

1. Speedometer which will show speed.

2. Odometer which will give accrued mileage.

3. Ammeter with charge and discharge, both ammeter and its wiring to be compatible with generating capacities and capable of handling continuous current draw of 100 amperes.

4. Oil-pressure gauge.

5. Water-temperature gauge.

6. Fuel gauge.

7. Upper-beam headlamp indicator.

8. Air pressure or vacuum gauge, where air or vacuum brakes are used, and audible or visible low pressure indicators to warn driver. See subsection MVD 17.20 (4) (a) 5 and 6.

9. Directional signal indicators.

(b) All instruments shall be accessible for maintenance and repair. All instruments shall be maintained in good working order.

(c) Above instruments and gauges shall be mounted on instrument panel in such manner that each is clearly visible to driver in normal seated position. Indicators described in subsection MVD 17.20(4) (a) 5 and 6 may be mounted in front of driver above windshield. Lights in lieu of gauges are not acceptable after January 1,1963.

(d) Instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges.

(19) Oil filter. Oil filter of replaceable element or cartridge type shall be provided and shall be connected by flexible oil lines if it is not of built-in or engine-mounted design. Oil filter shall have oil capacity of at least 1 quart.

(20) Openings. All openings in floorboard of firewell between chassis and passenger-carrying compartment, such as for gearshift lever and auxiliary brake lever, shall be sealed. See Wis. Adm. Code section MVD 17.30(9) (b).

(21) Over-all length. Over-all length of bus shall not exceed 40 feet.

(22) Passenger load. (a) Gross vehicle weight (i.e., chassis weight with oil, water, and full tank of fuel plus body weight, plus driver's weight of 150 pounds, plus weight of maximum seated pupil load based on not less than 120 pounds per pupil) shall not exceed maximum gross vehicle-weight rating as established by manufacturer.

(b) There shall be displayed on the inside of the bus body directly over the windshield on the right side of the driver a sign indicating the maximum pupil seating capacity of the bus. The size of the letters and numerals shall be large enough to permit them to be read by passengers. Transportation of passengers in excess of the number designated on such sign is prohibited.

(23) Power or grade ability. (a) Chassis must be so geared and powered as to be capable of surmounting 3.7% grade at speed of at least 20 miles per hour with full load (see subsection (22) (a)) on continuous pull in direct drive.

Grade Ability Formula:

$$G = \frac{33750 \times H.P.}{G.V.W. \times M.P.H.} - \begin{cases} 1.5 \text{ (for buses having seating capacity up to and including 67 pupils)} \\ \text{or} \\ 1.2 \text{ (for buses having seating capacity of 68 or more pupils)} \end{cases}$$

Where G = Grade in per cent
H.P. = Certified net horsepower delivered at road speed (M.P.H.)
G.V.W. = Gross vehicle weight (see table below)
M.P.H. = Miles per hour vehicle is driven
Rolling Resistance = 1.5 or 1.2 (depending on seating capacity on bus)

(b) Following figures are based on achieving 3.7 percent grade at 20mph in direct drive using 1.5 rolling resistance (1.2 for buses having seating capacity of 68 or more pupils), 150-pound driver, 120-pound pupil, and 7.17:1 to 7.2:1 rear axle ratio. For 36-pupil capacity, rear axle ratio is 6.16:1 or higher.

Chassis size/capacity	36	42	48	54	60	66	73
1. Recommended manufacturer's rated GVW	15,000	17,000	17,000	19,000	21,000	22,000	27,000**
a) Calculated avg. GVW (120 lbs. per pupil)	13,800	15,800	16,700	18,000	20,100	21,600	26,500**
b) Min. net HP required	42.6	48.6	51.5	55.4	61.9	66.5	76.9
@20 mph at eng. RPM	1368	1368	1325	1325	1267	1267	1206
2. a) Est. part of GVW front axle*	3,698	5,056	4,625	4,860	5,680	5,724	8,650
b) % Est. wt., front axle	26.8	32	27.7	27	26.3	26.5	32.6
c) Est. part of GVW rear axle*	10,102	10,744	12,074	13,140	14,420	15,836	17,850
d) % Est. wt., rear axle	73.2	68	72.3	73	73.7	73.7	67.4
3. Recommended tire size (w/tube)	7.50-20	7.50-20	8.25-20	8.25-20	9.00-20	9.00-20	10.00-20**
Ply rating	8 or 10	8 or 10	10	10	10	10	12
a) Rim size (w/tube)							
Preferred	6.0	6.0	6.5	6.5	7.0	7.0	7.5
Alternate			6.0	6.0	6.5	6.5	7.0
4. Motor speed (RPM) necessary to attain road speed of 55 mph with gear ratio shown	7.2-1 3738	7.2-1 3738	7.2-1 3564	7.2-1 3564	7.2-1 3412	7.2-1 3412	7.2-1 3294
	6.8-1 3522	6.8-1 3522	6.8-1 3516	6.8-1 3516	6.8-1 3223	6.8-1 3223	6.8-1 3110

School bus operators should follow current recommended tire inflation tables of Tire & Rim Association.

*Approximate weights on axles are calculated by formula which does not provide for reserve capacity.

**The calculations in this column are for the 73 pupil capacity pusher school bus, but are not intended to limit the use of a forward control transit school bus.

(24) Shock absorbers. Bus shall be equipped with front and rear double-acting shock absorbers compatible with manufacturers rated axle capacity.

(25) Springs. (a) Springs or suspension assemblies shall be of ample resiliency under all load conditions and of adequate strength to sustain loaded bus without evidence of overload.

(b) Springs or suspension assemblies shall be designed to carry their proportional share of gross vehicle weight in accordance with requirement for weight distribution as shown in subsection (29).

(c) If rear springs are used, they shall be of progressive type.

(d) If leaf-type front springs are used, stationary eyes shall be protected by full wrapper leaf in addition to main leaf.

(26) Steering gear. (a) Steering gear shall be approved by chassis manufacturer and designed to assure safe and accurate performance when vehicle is operated with maximum load and at maximum speed.

(b) Steering mechanism shall provide for easy adjustment for lost motion.

(c) No changes shall be made in steering apparatus which are not approved by chassis manufacturer.

(d) There shall be clearance of at least 2 inches between steering wheel and cowl instrument panel, windshield, or any other surface.

(e) Power steering is permissible if approved by chassis manufacturer.

(27) TIRES AND RIM. (a) Minimum tire sizes shall be as shown in chart under power and grade ability (sec. MVD 17.20 (23) (b)).

(b) Rim sizes shall be based on current sizes of Tire and Rim Association, 3200 Market Street, Akron, Ohio 44313.

Note: This reference is available in the office of Division of Motor Vehicles, The Secretary of State and the Revisor of Statutes.

(c) Total weight imposed on any tire shall not be greater than permitted by the standards of Tire and Rim Association.

(d) Dual rear tires or wide single equivalents shall be provided on all vehicles.

(e) Front tires shall have tread depth of at least 4/32 inch and rear tires shall have tread depth of at least 2/32 inch around the entire periphery measured at 2 points no less than 15 inches apart in any major tread groove.

(f) No school bus shall be operated with regrooved, recapped or retreaded tires on the front wheels.

(g) Unless adequate arrangements for service facilities have been made, spare tire is required and shall be suitably mounted in accessible location outside passenger compartment.

(h) Tires of different size or ply rating may be used on a bus, except that all tires on an axle must be the same size and ply rating.

(28) Transmission. (a) Mechanical type transmission shall be synchromesh except first and reverse gears. Its design shall provide not less than four forward and one reverse speeds.

(b) Automatic transmissions are permissible.

(29) Weight distribution. (a) Weight distribution of fully loaded bus on level surface shall be such that not more than 75% of gross vehicle weight is on rear tires and not more than 35% is on front tires.

(b) Exception--transit and metropolitan vehicles with engine inside front of body: If entrance door is ahead of front wheels, not more than 75% of gross vehicle weight shall be on rear tires nor more than 50% on front tires. If entrance door is behind front wheels, not more than 75% of gross vehicle weight shall be on rear tires nor more than 40% on front tires. With engine in rear: Not more than 75% of gross vehicle weight shall be on rear tires nor more than 40% on front tires.

TYPE I BUSES

BODY

MVD 17.30 BODY, Type I buses. (1) AISLE. (a) Minimum clearance of all aisles, including aisle (or passageway between seats) leading to emergency door, shall be 12 inches. See Wis. Adm. Code section MVD 17.30 (11) (b) 1a and c.

(b) Aisle supports of seat backs shall be slanted away from aisle sufficiently to give aisle clearance of 15 inches at tops of seat backs.

(c) Exception--transit and metropolitan vehicles with engine inside front of body: Minimum distance between stanchion at rear of entrance stepwell and engine cover shall be 14 inches measured at floor level.

(2) BODY SIZES. (a) Sizes are based on 27 inch center to center spacing between rows of forward facing seats, overall width of 96 inches, center aisle width of 12 inches, and average rump width of 13 inches for 3-3 seating plan or 15 inches for 3-2 seating plan.

(b) In no case shall less than 13 inches rump space per pupil be permitted in computing passenger capacity.

(c) Buses having seating capacity of more than 72 pupils must be transit or metropolitan type.

(3) BOOK RACKS. (a) Book racks, if installed, shall be provided above side windows within range from front cross-seat to rear transverse seat except across or above emergency door.

(b) Book racks made of expanded, punched, or woven metal are not permitted.

(c) Racks shall be free of projections or sharp edges likely to cause injury.

(4) BUMPER, REAR. (a) Rear bumper shall be of pressed steel channel at least 3/16" thick and 8 inches wide (high).

(b) It shall be wrapped around back corners of bus, and the ends shall extend forward at least 12 inches, measured from rear-most point of body at floor line.

(c) Bumper shall be attached to chassis frame in such a manner that it may be easily removed, shall be so braced as to develop full strength of bumper section from

rear or side impact, and shall be so attached as to prevent hitching of rides.

(d) Rear bumper shall extend beyond rear-most part of body surface at least 1 inch measured at floor line.

(e) Rear bumper shall be of sufficient strength to permit the bus being pushed by another vehicle without permanent distortion and shall extend rearward sufficiently to protect all lamps.

(5) BUMPER, FRONT. See Wis. Adm. Code section MVD 17.20(5).

(6) CEILING. See Wis. Adm. Code section MVD 17.30(21) and Wis. Adm. Code section MVD 17.30 (22).

(7) CHAINS. See Wis. Adm. Code section MVD 17.30 (41).

(8) COLOR. (a) With the exception of trim, bumpers and wheels, body including hood, cowl, fenders, roof and grill shall be painted a uniform color known as National School Bus Glossy Yellow according to General Services Administration specification color No. 13432, Glossy Yellow, of Federal Standard No. 595.

(b) Wheels and trim, except where supplied by the manufacturer chrome plated or of a similar color (aluminum, silver, zinc, etc.), and bumpers, shall be in color No. 17038 black, of Federal standard No.595.

Note: This reference is available in the office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

1. Trim is designated to be:

a. Door handles.

b. Grab handles.

c. Window sash, seals, gaskets and bands on exposed edges.

d. Door seals and gaskets.

e. Mirror frame and mounting bracket.

f. Lamp flanges and housings.

g. Reflector frames and flanges.

h. Stop arm mounting brackets.

i. Windshield wiper arms.

j. Rub rails.

k. Snow rails.

l. License frame and mounting brackets.

(9) CONSTRUCTION. (a) Construction shall be of prime commercial quality steel or other metal or other material with strength at least equivalent of all-steel as certified by bus body manufacturer. All such construction materials shall be fire-resistant.

(b) Construction shall provide a reasonably dustproof, weather-tight and fume proof unit. Openings between the chassis and passenger compartment shall be sealed to prevent fumes or exhaust gas from entering the bus body.

(c) The bus body, including all of its components and reinforcements, shall be of sufficient strength to support the entire weight of the fully loaded vehicle on its top or side if overturned. The body shall be designed and built to provide impact and penetration resistance into the passenger compartment. The deflection of the body after testing in accordance with the code must not exceed the following measurements:

1. Deflection at center of roof bow	3.00 inches
2. Deflection of each pillar at window sill level	1.00 inch
3. Deflection at center of floor	.40 inch

(d) Floor shall be of prime commercial quality steel of at least 14-gauge or other metal or other material at least equal in strength to 14-gauge steel. If plywood is used, it shall be 5-ply.,at least 5/8 inch thick and it shall equal or exceed properties of exterior-types Douglas fir plywood, B-B Grade, as specified in standard issued by U.S. Department of Commerce. Floor shall be level from front to back and from side to side except in wheel housing, toe-board, and driver's seat platform areas.

Note: Commercial standard CS45-60 Douglas Fir Plywood: A Recorded Voluntary Standard of the Trade (as amended). Obtainable from Superintendent of Documents. Washington D. C. 20401.

This reference is available in the office of the Division of

(e) At all points of contact between longitudinal members and other structure material, attachment shall be by welding, riveting, or bolting. After load as called for in the Static Load Test Code has been removed none of the following defects shall be evident:

1. Failure or separation at joints where longitudinal members are fastened to the roof bows.
2. Appreciable difference in deflection between adjacent longitudinal members and roof bows.
3. Twisting, buckling, or deformation of longitudinal member cross section.

(f) 1. Strength of structural joints of school bus bodies. It is the intent of this section to insure that all joints within bus bodies which employ discrete fasteners, specifically those which join panels to panels achieve a significant portion of the strength of the parent metal, so that all available panel materials are capable of serving as part of the structure. For any method of joining such members, it shall be demonstrated by calculation that the strength of such joints is at least 60% of the tensile strength of the thinnest joined member. For purposes of this subsection, no metal with a thickness of less than 20 gauge shall be used in any of the aforementioned external structural joints, nor less than 22 gauge or equivalent in the aforementioned internal structural joints.

2. All school buses manufactured for sale in Wisconsin after March 1,1974 shall comply with Standard No. SBMI-007, School Bus Manufacturers Institute Test Code for School Bus Bodies, as published January 17,1972.

(g) School bus manufacturers shall certify to the administrator of the Division of Motor Vehicles that all school buses manufactured for sale in Wisconsin after March 1,1974 comply with (f) 1. and 2. above.

(h) All metal used in construction of bus body shall be zinc or aluminum coated or treated by equivalent process before bus is constructed. (Included are such items as structural members, inside and outside panels, floor panels and floor sills; excluded are door handles, grab handles, stanchions, interior decorative parts, and other interior plated parts.)

Note: This reference is available in the office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(10) DEFROSTERS. Defrosting equipment shall keep the windshield, the window to the left of the operator and the glass in the service door clear of fog, frost and snow, using heat from an approved heater or heaters and circulation from fans. Portable heaters may not be used. Defroster ducts shall be designed to prevent the placing of objects which might obstruct the flow of air.

(11) DOORS. (a) Service 1. Service door shall be power or manually operated, under control of driver, and so designed as to afford easy release and prevent accidental opening. When hand lever is used, no parts shall come together so as to shear or crush fingers.

2. Service door shall be located on right side of bus opposite driver and within his direct view.

3. Service door shall have minimum horizontal opening of 24 inches and minimum vertical opening of 68 inches.

4. Service door shall be of split type, sedan type, or jackknife type. (Split type door includes any sectioned door which divides and opens inward or outward.) If one section of split type door opens inward and other opens outward, front section shall open outward.

5. Lower as well as upper panels shall be of safety glass. Bottom of lower glass panel shall not be more than 35 inches from ground when bus is unloaded. Top of upper glass panel shall not be more than 6 inches from top of door.

6. Vertical closing edges shall be equipped with flexible material to protect children's fingers.

7. There shall be no door to left of driver. (This shall not be interpreted to conflict with subsection (b) 1.)

(b) Emergency door and emergency windows:

1. An emergency door shall be located in the rear and near the center or in the left side of the rear half and it shall meet the following specifications:

a. It shall have a horizontal opening of at least 24 inches and a vertical opening of at least 48 inches measured from the floor level. When the door is on the left side this minimum clearance must be maintained to the center aisle.

b. It shall be devised so as to be opened from the inside and outside.

c. The passage to the emergency door shall be kept clear of obstructions.

d. No steps shall lead to the emergency door.

e. The upper and lower portion of the central rear emergency door shall be equipped with approved safety glass, the exposed area of which shall be not less than (400) square inches in the upper portion and not less than (280) square inches in the lower portion. The left side emergency door shall be equipped with safety glass in the upper portion and the lower portion shall be of at least the same gauge metal as the body. The emergency door shall be hinged on the right side if it is in the rear end of the bus and on the front side if it is in the left side and shall open only outward. Control from the drivers seat shall not be permitted.

f. The emergency door shall be equipped with a slide-bar, camoperated latch which shall have a minimum stroke of one inch. The latch shall be equipped with a suitable electric plunger-type switch connected with a distinctive audible signal automatically operated and located in the driver's compartment which shall clearly indicate the unlatching of this door and no cutoff switch shall be installed in the circuit. The switch shall be enclosed in a metal case, and wires leading from the switch shall be concealed in the body. The switch shall be so installed that the plunger contacts the farthest edge of the slide bar in such a manner that any movement of the slide bar will immediately close the circuit and activate the signal. The door latch shall be equipped with an interior handle which shall be capable

of quick release but shall be protected against accidental release. It shall lift up to release the latch. The outside handle shall be such as to minimize hitching and shall be a non-detachable device.

g. If locks are installed on the emergency or service doors they shall include a device to prevent the activating of the starter mechanism of the vehicle engine while any door is locked. An audio-visual alarm shall indicate to the driver when any door is in the locked position while the ignition switch is in the "on" position.

h. A rear emergency window at least 16 inches in height and as wide as practicable shall be provided in any bus where the emergency door is not in the rear. The rear window shall be designed so as to be opened from either the inside or the outside. It shall be hinged at the top and assure against accidental closing in an emergency. A positive latch on the inside shall provide for quick release but offer protection against accidental release. The outside handle shall be non-detachable and designed to minimize hitching.

i. [illegible] The inside of each emergency window or door shall have the designation "Emergency Exit" followed by concise operating instructions located within 6 inches of the release mechanism. When a release mechanism is not located within an occupant space of an adjacent seat, a label meeting the requirements of Federal Motor Vehicle Standard #217 /that indicates the location of the nearest mechanism shall be placed within that occupant space. If the exit has no adjacent seat the marking must meet the legibility requirements of FMVSS #217 for occupants standing in the aisle location nearest the emergency exit.

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Note: This reference is available in the office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

The outside of the emergency door shall be clearly marked "Emergency Door" in letters 2 inches high at the top of the door or on the door below the top pane of glass and an arrow at least 6 inches long and 3/4 inch in width indicating the direction the release mechanism should be turned to open the door

shall be painted in black on the yellow background.

The outside of the emergency window shall be labeled "Emergency Exit" in letters at least 2 inches high directly below the window.

j. A distinctive audible signal automatically operated shall clearly indicate to the driver the unlatching of the rear emergency window and no cutoff switch shall be installed in the circuit.

k. Paneling shall cover the space between the top of the rear divan seat and the inside lower edge of the rear emergency window.

(12) Electrical system. (a) BATTERY. See Wis. Adm. Code section MVD 17.20(3).

(b) GENERATOR OR ALTERNATOR. See Wis. Adm. Code section MVD 17.20(15).

(c) LAMPS AND SIGNALS. See Wis. Adm. Code section MVD 17.30(24).

(d) WIRING. See Wis. Adm. Code section MVD 17.30(46).

(13) Emergency equipment. (a) Each school bus shall be provided with the following emergency equipment:

1. One firemans axe or a ripping bar or ripping chisel. The bar or chisel shall be a minimum 18" long and 3/4" thick.

2. A suitable jack, spare tire and necessary tools for tire or wheel changing, and tools for minor repairs. This standard shall not apply if adequate arrangements have been made for service facilities.

3. Oil burning pot flares may be kept under seat at extreme rear of bus. All other emergency equipment shall be kept in suitable fasteners or containers in a readily accessible place in the driver's compartment.

(b) Warning for stopped school buses:

1. Buses placed in operation prior to March 1,1974. The following warning devices may be used until replacements are necessary:

a. At least 3 red flags not less than 12 inches square and means for mounting.

b. At least 3 red electric lanters, or 3 oil burning pot flares and 3 red burning fusees; or 3 red emergency reflectors.

c. When replacements of the above are made, they shall be replaced with 3 bidirectional emergency triangles that conform to the requirements of Bureau of Motor Carrier Safety Regulations Sec.393.95 (August 25, 1972).

(c) Emergency Equipment may be locked or kept in a locked compartment provided it is not locked when passengers are being transported.

2. Buses first placed in operation after March 1,1974 shall be equipped with 3 bidirectional emergency triangles that conform to the requirements of Bureau of Motor Carrier Safety Regulations Sec.393.95 (August 25, 1972). The requirements of the bidirectional emergency triangles does not preclude the use of items in b and c above to supplement these emergency reflective triangles.

Note: This reference is available in the office of the Division of Motor Vehicles, Secretary of State and Revisor of Statutes.

(14) Fire extinguisher. (a) Each bus shall be equipped with a fire extinguisher of a type approved by and bearing the label of the laboratories of the National Board of Fire Underwriters, 207 E. Ohio Street, Chicago, Illinois 60611, having not less than the following classifications: 4BC dry power type, or 6BC C02 type. Extinguisher shall be mounted in full view in the driver's compartment or it may be mounted inside a compartment in the driver's area if the compartment is in plain view and is labeled "Fire Extinguisher" in red letters to indicate location of the extinguisher.

(b) Fire extinguishers may be locked or kept in a locked compartment provided it is not locked when passengers are being transported.

(15) First-aid kit. (a) Bus shall carry Grade A metal first-aid kit and Type II contents conforming to specifications as set forth in Federal Specifications, GG-K391a of March 3,1959. Kit shall be mounted in full view in the driver's compartment, or it may be placed inside a compartment in the

driver's area if the compartment is labeled "FIRST AID KIT" or marked with a red cross emblem in plain view to indicate location of the kit. It shall be removable without necessitating the use of any tools. Kit must contain at least 16 units as listed in the following table.

Bandage compress; (sterile gauze pads) 4-inch.....	2 packets
Bandage compress, (sterile gauze pads) 2-inch.....	1 packet
Adhesive absorbent bandage, (bandaid type) 1-inch.....	2 packets
Triangular bandage, 40-inch.....	1 packet
Gauze bandage, 4-inch	1 packet
Absorbent-gauze compress.....	1 packet
Burn compound, 1/8 ounce.....	2 packets
Antiseptic applicators (swab type) (iodine or nitromersol tincture N.F. or thimersol N.F.).....	2 packets
Wire splints.....	1 packet
Ammonia inhalants.....	1 packet
Tourniquet and forceps.....	2 packets

Note: Federal specifications, GG-K391a obtainable from:
General Services Administration
Business Service Center
Region 3, Seventh & D Streets
Washington 25, D.C.

This reference is available in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(b) First aid kit may be locked or kept in a locked compartment provided it is not locked when passengers are being transported.

(16) Floor. See subsection MVD 17.30 (9) (d).

(17) Floor covering. (a) Floor in underseat area, including tops of wheel housings, driver's compartment, and toeboard, shall be covered with fire-resistant floor-covering material of type commonly used in passenger transportation equipment. Floor covering shall be of rubber or linoleum and shall have minimum over-all thickness of 0.125 inch. (Linoleum floor covering shall be made with oxidized linseed-oil binder having cork filler and placed on burlap or felt backing.)

(b) Floor covering in aisle shall be aisle-type fire-resistant rubber or equivalent, non-skid, wear resistant and ribbed. Minimum over-all thickness shall be .1875 inch measured from tops of ribs. Rubber floor covering shall meet Federal Specifications ZZ-M-71b, September 24,1962.

Note: Specification obtainable from Superintendent of Documents, Washington, D.C. 20401.

This reference is available in the office of the Division of Motor Vehicles, Secretary of State and the Revisor of Statutes.

(c) Floor covering must be permanently bonded to floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be of type recommended by manufacturer of floor-covering material. All seams must be sealed with waterproof sealer.

(18) Heater(s). (a) Heater(s) are required, and shall be of hot-water or combustion type.

(b) If only one heater is used, it shall be of fresh-air or combination fresh-air and recirculating type.

(c) If more than one heater is used, additional heaters may be of circulating type.

(d) Where hot-water heaters are used, they shall bear name plate rating of 1953 School Bus Body Manufacturers' Association Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment, plate to be affixed by heater manufacturer.

Note: School Bus Body Manufacturers' Association

401-402 Washington Board of Trade Building
1616 K Street, N. W.
Washington 6, D. C.

This reference is available in the office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(e) All combustion-type heaters shall be approved by Underwriters' Laboratories, Inc.

(f) If combustion-type heaters are used, they shall be installed on new buses by body manufacturers and on buses now in operation by authorized dealers or by authorized garages.

(g) Heater(s) shall be capable of maintaining inside temperatures of 50 degrees Fahrenheit at average minimum January temperatures as established by U.S. Department of Commerce, Weather Bureau, for area in which heater is required.

(h) Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or sharp edges and shall not interfere with or restrict the operation of any engine function, such as the spark advance of an automatic distributor. Heater lines inside passenger compartment shall be guarded to prevent accidental contact by driver or passengers.

(19) Identification: (a) Only signs and lettering approved by state law or regulation shall appear on bus. Except as provided in subsection (c) 2 and 7, the painting of school nicknames, slogans, insignia or decals on bus is prohibited.

(b) Body shall bear words "SCHOOL BUS" in black letters at least 8 inches high and one inch stroke on both front and rear of body or on yellow signs attached thereto. Such lettering shall be placed above rear window and windshield as high as possible without impairment to visibility.

Note: Full scale layout (40" overall length) of words "SCHOOL BUS" with suggestions for application available from National Commission on Safety Education, 1201 Sixteenth Street, N.W., Washington 6, D.C.

This reference is available in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(c) 1. Bus may not have to exceed three fleet numbers painted in locations of owner's choice. Fleet number shall not be more than 6 inches high.

2. Name and address (and telephone number if desire) of owner or operator shall be displayed in lower yellow panel to the rear of, and as close as possible to, the service door in letters not less than 2 inches high nor more than 3 inches high by one-fourth inch stroke. If desired, this marking may also be

painted on the left side of the bus below the driver's window. Owners' decals may be used to comply with this subsection provided they do not violate the provisions of this subsection and provided approval for such use is obtained from the administrator of the Division of Motor Vehicles.

3. Name of school or school-bus firm may appear on sides of bus between the seat line rub-rail and the bottom window line in contrasting yellow or black letters not more than 10 inches high.

4. Identification of emergency doors and windows. See Wis. Adm. Code section MVD 17.30(11) (b)1 and Wis. Adm. Code section MVD 17.30 (11) (b)7

5. See Wis. Adm. Code section MVD 17.20(22)(b) regarding sign indicating passenger capacity.

6. When bus is being used for other than school transportation purposes, flashing red signals shall not be used and the words SCHOOL BUS shall be removed or concealed.

7. A placard, decal or other device, not to exceed 90 square inches in size, to identify bus to small children, may be attached to bus.

(d) The registration card shall be displayed in the driver's compartment as required by section 341.11(4), Wis. Stats.

(20) Inside height. Inside body height shall be a nominal 72 inches or more, measured metal to metal, at any point on longitudinal center line from front vertical bow to rear vertical bow.

(21) Insulation. Ceilings and walls shall be insulated with thermal insulation materials to deaden sounds and to reduce vibrations and heat transfer. Said insulation shall be fire-resistant material of type approved by Underwriters' Laboratories, Inc. 207 E. Ohio Street, Chicago, Illinois 60611

(22) Interior. (a) Interior of bus shall be free of all unnecessary projections likely to cause injury. This standard requires inner lining on ceilings and walls.

(b) The interior of the bus, including the ceiling, shall be free of all unnecessary projections likely to cause injury. Rearward components shall be lapped over forward components to reduce likelihood of injury in the event of separation. Exposed edges shall be beaded, hemmed or flanged.

(23) LADDERS. No school bus shall have a ladder attached to its interior or exterior while in motion. Folding or protruding steps are not permitted except as provided in Wis. Adm. Code Section MVD 17.30(36)(g).

(24) LAMPS AND SIGNALS

(a) Headlamps. At least two headlamps of the sealed-beam type with at least one headlamp on each side of the front of the bus shall be provided. The bus shall be equipped with a beam indicator, which shall be lighted when the uppermost distribution of light from the headlamps is in use and shall not otherwise be lighted. Said indicator shall be so designed and located that when lighted it will be readily visible without glare to the operator. The headlamps shall be located at a height of not more than (54) inches nor less than (24) inches when measured from the center of the lamp to the level ground upon which the unloaded bus stands.

(b) Tail lamps. Two red tail lamps mounted on the rear with centers not less than forty inches nor more than fifty inches above the surface on which the unloaded bus rests and as far apart laterally as practical shall be provided. The light produced shall be plainly visible at night from a distance of 500 feet and they shall be wired for illumination with the headlamps.

(c) Stop Lamps. Two red, seven inch stop lamps mounted on the rear as high as practical but below the window line with centers as far apart laterally as practical but not less than three feet shall be installed. Their light shall be of an intensity at least equal to that of Class A turn signal lamps as established

(August 1, 1970)
by SAE Standard J586C, and shall be plainly visible from a distance of 500 feet. They shall be actuated upon the initial application of the service brake pedal.

Note: This reference is available in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(d) School Bus Alternating Red Flashing Lamps.

(Definition) School bus alternately flashing red signal lamps are lamps mounted at same horizontal level, intended to identify vehicle as school bus and to inform other users of highway that such vehicle is stopped or about to stop on highway to take on or discharge school children.

1. Bus shall be equipped with 2 red warning lamps at rear of vehicle and 2 red warning lamps at front of vehicle, which shall be controlled by manually actuated switch and shall flash alternately at rate of 60 to 120 cycles per minute. No brake or door operated switch shall be permitted. "On" period shall be long enough to permit bulb filament to come up to full brightness.

2. Red warning lamps shall be seal beam type, or other improved type meeting the requirements of 4. of the section, not less than 5 inches in diameter and visible from a distance of at least 500 feet along the axis of the vehicle in bright sunlight.

3. There shall be visible or audible means of giving clear and unmistakable indication to driver when signaling system is turned on.

4. Installation, a. Each red warning signal lamp shall be mounted with its axis substantially parrallel to longitudinal axis of vehicle.

b. Front and rear red warning signal lamps shall be spaced as far apart laterally as practicable, but in no case shall spacing between lamp centers be less than 3 feet.

c. Location of front red warning signal lamps shall be such that they can be clearly distinguished when headlamps are lighted on lower beam.

d. Red warning signal lamps shall be mounted at front above windshield and at rear so that lower edge of lens is not lower than top line of side window openings.

e. Vision of front signal lamps to front and rear signal lamps to rear shall be unobstructed by any part of vehicle from 5 degrees above to 10 degrees below horizontal and from 30 degrees to right and 30 degrees to left of center line of vehicle.

f. The area around the lens of each alternately flashing red signal lamp and extending outward approximately 3 inches shall be painted black on all school buses. In installations where there is no flat vertical portion of body immediately surrounding entire lens of lamp, circular or square band of black approximately 3 inches wide, immediately below and to both sides of lens, shall be painted on body or roof area against which red warning signal lamp is seen. This standard shall not apply to vehicles not specifically manufactured as school buses and which have red warning signal lamps mounted above the roof top. Red warning signal lamps on such vehicles shall be equipped with black hoods at least 3 inches long.

g. Hoods. Except as provided in f above, red warning signal lamps may be equipped with hoods to shield from rays of sun for improved visibility.

(e) Clearance lamps and reflectors. 1. Shall be located as follows:

a. On the rear, 2 red reflectors, equally spaced as far from the center as practicable.

b. On each side, 2 reflectors, one amber, at or near the front and one red at or near the rear.

c. On each side of buses 30 or more feet in length as near the center as practicable one amber reflector.

2. Each reflector shall be mounted at a height not less than 15 inches and not higher than 60 inches above the surface on which the unloaded bus stands.

3. Two red clearance lamps on the rear and two amber clearance lamps on the front shall be mounted as high as practical on the permanent structure of the bus to indicate its extreme width. Two side marker lamps, amber at the front and red at the rear shall be mounted on each side of the bus. Three red identification lamps shall be mounted on the same level not more than eight inches apart in the center rear of the body as high as practical, and three amber identification lamps shall be likewise mounted in the center front of the body.

(f) Rear license plate lamp. The rear registration number shall be illuminated by a white light so as to be plainly legible at 50 feet during periods of darkness. The registration plate lamp shall be so wired as to be lighted whenever the headlamps are lighted.

(g) Interior lamps. Interior lamps shall adequately illuminate the entire aisle, emergency passageway and step well.

(h) Turn signal lamps. Class A turn signal lamps shall be provided, and shall meet SAE Standard J588e (September. 1970). These signals shall be independent units and be equipped with a four-way hazard warning signal switch to cause simultaneous flashing of the turn signal lamps when needed as a vehicular traffic hazard warning. Flush mounted "armored" type amber clearance lamps with a minimum of 4 candlepower each shall be mounted on the sides of the body at approximately seat level rub rail height just to the rear of the service door on the right side, and approximately opposite the driver's seat on the left side. They are to be connected to function with the regular turn signal lamps. If bus is not equipped with body mounted front turn signals, double-faced fender mounts shall be installed which shall not extend beyond the outer edge of the fender, and in any case shall be mounted higher than the headlights but not higher than the bottom of the windshield.

(i) Back up lamps. Two back up lamps shall be provided and shall conform to SAE Standard J593d (January, 1971).

Note: References to above SAE specifications are available in the office of the Division of Motor Vehicles, Secretary of State and Revisor of Statutes.

(25) Lettering. See identification subsection (19).

(26) Mounting. (a) Chassis frame shall extend to rear edge of rear body cross member. Bus body shall be attached to chassis frame in such manner as to prevent shifting or separation of body from chassis under severe operating conditions.

(b) Body front shall be attached and sealed to chassis cowl in such manner as to prevent entry of water, dust, and fumes through joint between chassis cowl and body.

(c) Insulating material shall be placed at all contact points between body and chassis frame. Insulating material shall be approximately 1/4 inch thick, shall have quality of sidewall of automobile tire, and shall be so attached to chassis frame or body member that it will not move under severe operating conditions.

(27) Over-all width. Over-all width of bus body shall not exceed 96 inches.

(28) Posts. See subsection (9) (c) and subsection (43) (c).

(29) Rear vision. (a) Interior clear-view mirror shall be at least 6 by 30 inches over-all, to afford good view of pupils and roadway to rear. If not metal-backed and framed, mirror shall be of laminated plate safety glass. It shall have rounded corners and protected edges.

(b) Two exterior clear-view rearview mirrors shall be provided, one to left and one to right of driver. Area of each mirror shall be not less than 50 square inches over-all. Each mirror shall be firmly supported and adjustable to give driver clear views past left rear and right rear of bus.

Outside mirror mounts may include a side angle adjustable convex mirror to provide an additional close-in field of vision located so as not to reduce the visual field of the flat surfaced mirror below 50 square inches.

(c) Mirrors which are cracked, broken or clouded so as to create a hazard or interfere with required sight shall be replaced.

(d) At least one clear view mirror not less than 7 inches in diameter shall be mounted in such a manner that the driver may observe a reflection of the road from the front bumper forward to a point where direct observation is possible.

Note: Installation dates for this mirror shall be the same dates as given for installation of stop signal arms. See MVD17.30 (37) (a).

(30) RUB RAILS. (a) There shall be one rub rail located approximately at seat level which shall extend from the rear side of the service door completely around the bus body, except at the emergency door or rear compartment, to a point of curvature near the front of the body on the left side.

(b) There shall be one rub rail located between the floor line and 9 inches above the floor line. It shall extend over the same longitudinal distance as the upper rub rail, except where it meets the wheel housing, and which shall terminate at the radii of the right and left rear corners.

(c) Rub rails shall be constructed of 16 gauge longitudinally corrugated or ribbed steel of (4) inch minimum width, flange to flange. Each rub rail flange shall be attached with descrete fasteners to the bus body at each body post and at least (3) intermediate points between body posts.

(d) Rub rails shall be applied outside body or outside body posts. Pressed-in or snap-on rails are not permitted.

(e) Rub rails applied to transit type buses with engine in the rear may terminate at forward edge of engine compartment.

31. SANDERS. The use of sanders is optional, however if used, must comply with the following requirements:

(a) Be of hopper cartridge-valve type.

(b) Have metal hopper with all interior surfaces treated to prevent condensation of moisture.

(c) Be of at least 100-pound (grit) capacity.

(d) Have cover on filler opening of hopper, which screws into place, sealing unit airtight.

(e) Have discharge tubes extending to front of each rear wheel under fender.

(f) Have no-clogging discharge tubes with slush-proof, non-freezing rubber nozzles.

(g) Be operated by electric switch with telltale light mounted on instrument panel.

(h) Be exclusively driver-controlled.

(i) Have gauge to indicate hoppers need refilling when they are down to one-quarter full.

(32) SEAT BELT FOR DRIVERS. Seat belt for driver shall be provided, belt to comply with Standard J787B and J800B (Handbook, 1966) of Society of Automotive Engineers.

Note: Seat belt specifications are available from Society of Automotive Engineers, 485 Lexington Avenue, New York, N.Y. 10017.

This reference is available in the office of Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(33) SEATS (a) All seats shall have a minimum fore and aft depth of 14 inches and shall have back rests.

(b) In determining seating capacity of a bus, individual seating width shall be 13 inches where 3-3 seating plan is used and 15 inches where 3-2 seating plan is used.

(c) All seats shall be forward facing and securely fastened to that part or parts of the body which support them. Passenger seat cushion retention System shall be employed to prevent passenger seat cushions from disengaging from seat frames in event of accident. Each seat cushion retention system shall be capable of withstanding vertical static load equal to minimum of 5 times weight of cushion. System shall also be capable of withstanding forward or rearward static load equal to 20 times weight of cushion.

(d) The forward most seat on the right side of the bus shall be located so as not to interfere with the driver's vision and be not farther forward than the rear of the operator's seat when adjusted to its rearmost position.

(e) The minimum center to center seat spacing shall be 27 inches measured at cushion height. The distance between the rearmost position of the driver's seat and the front face of the seat back of the forwardmost seat on the left side shall not be less than 24 inches measured at cushion height.

(f) The minimum distance between the steering wheel and the back rest of the driver's seat shall be 11 inches. The operator's seat shall be rigidly positioned, shall have vertical adjustment and fore and aft adjustment of not less than 4 inches, without the use of tools or other devices.

(g) A minimum of 36 inches of headroom for the sitting position above the top of the undepressed cushion line of all seats shall be provided. Measurement shall be made vertically not more than 7 inches from the side wall at cushion height and at the fore and aft center of cushion.

(h) The backs of seats of similar size shall be of the same width at the top and of the same height from the floor and shall slant at the same angle with the floor. The top corners, and at least ten inches of the top of the back, surface of the seat backs shall be padded sufficiently to reduce the likelihood of injury upon impact. The rearmost seats may be exempt from these requirements.

(i) Where grab handles are used, they shall be enclosed.

(j) Seat cushion shall be constructed with springs, foam rubber, polyurethane foam, or other equivalent material. If springs are used, there shall be at least 21 springs per cushion. Padding used to cover springs may be cotton, rubberized hair, foam rubber, or other equivalent material. If cotton or similar material is used, padding for cushions shall be at least 2 inches thick, except for reasonable distance from edge of cushion to allow for curve of edges. If sponge rubber, rubberized hair, or similar materials are used, its thickness shall be at least 1 inch, except for edges of cushion. If foam rubber or polyurethane foam is used without springs, its thickness in cushion shall be approximately 5 inches and it shall be depressed not more than 80% when distributed weight of 345 pounds is applied to it. If cotton or similar material, rubberized hair, foam rubber, or polyurethane foam is used in seat back rests, it shall be approximately 2 inches thick and shall not be depressed more than 80% when distributed weight of 300 pounds is applied to it. Seat covering shall be artificial leather equal to coated fabrics, 42 ounce finished weight, 54 inches wide, reinforced backing of 1.06 broken twill. Other covering of equal quality may be used subject to approval by the Administrator, Division of Motor Vehicles. Padding and covering of surfaces on all seats shall be of material that will not flash or explode upon contact with spark or open fire. Seams of seat cushions shall be made of good quality welt.

(k) Fiber glass and plastic type seats made of acrylonitrile-butadiene-styrene (known as ABS seats) may be used provided they meet the following standards:

1. Seats must meet all foregoing provisions for seats except those concerning construction of seat cushions and seat backs or those concerning seat backs only. Padding as specified in (h) above is required.

2. Seats shall combine rigid construction of welded tubular steel with contoured matched die formed or hand sprayed molded plastic shell for fiberglass seats; or thermo-formed or injection-molded plastic shell for ABS seats. Exposed steel shall be stainless or shall be finished with baked enamel.

(34) STANCHIONS AND GUARD RAILS. (a) Vertical stanchion shall be installed at right rear corner of driver's seat in such position as neither to interfere with adjustment of driver's seat nor to obstruct 12 inch aisle. Guard rail, approximately 30 inches above floor, and so placed as not to interfere with fore-and-aft adjustment of driver's seat, shall extend from vertical stanchion to left-hand wall behind driver's seat. Guard rail shall not be higher than the driver's seat back adjusted to its lowest position.

(b) Vertical stanchion shall be installed at rear of entrance step-well from roof to floor. Placement shall not restrict passageway at any level to less than 24 inches nor aisle to less than 12 inches.

(c) Guard rail and step-well guard panel shall be installed from step-well stanchion to right-hand wall to prevent children in front seat from being thrown into step-well in case of sudden stop. Guard rail shall be approximately 30 inches above floor and its guard panel shall not restrict entrance passageway to less than 24 inches at any level. Panel shall extend from guard rail to within 2 inches of floor. If panel extends over or into step-well opening, it must be flanged at floor line so as to close any opening between panel and floor.

(d) Clearance between step-well guard panel and first pupil seat shall be at least 24 inches measured from panel to front face of seat back at cushion height.

(e) All stanchions and guard rails shall be minimum of 1-inch outside diameter steel or equivalent strength tubing. Stanchions and guard rails shall be padded with an energy absorbing material designed to minimize injury-producing impact forces. Padding on stanchions shall extend to within 3 inches of the ceiling and floor. Padding on guard rail shall extend from wall to farthest support.

(35) STEERING WHEEL. See Wis. Adm. Code section MVD 17.20 (26) (d).

(36) STEPS. (a) First step at service door shall be not less than 12 inches and not more than 16 inches from ground, based on standard chassis specifications.

(b) Riser of upper step at service door shall be not more than 15 inches. When more than 2 steps are used, risers must be within 1/2 inch of equal height except that, where plywood floor is used on steel, differential may be increased by thickness of plywood used.

(c) Steps shall be enclosed to prevent accumulation of ice and snow.

(d) Steps shall not protrude beyond side body line.

(e) Grab handle not less than 10 inches in length shall be provided in unobstructed location inside doorway.

(f) Surface of steps shall be of non-skid material or construction.

(g) There shall be one stirrup step or one bumper step and suitably located handle on each side of front of body to provide easy accessibility for cleaning windshield and lamps.

(37) STOP SIGNAL ARM (a) Installation of stop signal arms shall be required on school buses according to the following schedule:

1. Except as provided in (e) below all new buses put into service as school buses after March 1,1974 must be equipped with stop arms.

2. Except as provided in (e) below all other buses operated as school buses shall be equipped with stop signal arms by September 1,1975.

(b) The stop signal arm control shall be optional.

(c) The following specifications shall govern installation and operation of the stop signal arms:

1. It shall be a metal octagon shaped sign at least 18 inches wide and 18 inches long exclusive of mounting bracket. All sheet metal parts shall be 16 gauge or heavier.

2. It shall have the word "STOP" on both sides in white letters at least 6 inches high and 7/8 inch wide on a bright red background. The outer edge shall have a white border at least 1/2 inch wide. All other parts of the assembly shall be painted black.

3. It shall be equipped with 2 four-inch or larger double faced alternating flashing red lamps to be mounted near the perimeter of the sign with a minimum of 12 inches spacing between lamp centers. These lamps shall be wired to the circuit of the flashing red warning lamps mounted on the front and rear of the bus and shall have 32 candle power bulbs. The wire leading to them shall be 16 gauge copper stranded protected by a plastic shield.

Reflectorizing of the sign shall be optional, but if used the entire sign shall be reflectorized with "Scotchlite" or equivalent which will not lose over 20% of reflectivity when wet.

4. Vacuum operated stop arm. If stop signal arm is vacuum operated the power source shall not be taken from the primary tank supplying power to the braking system. If bus is equipped with a separate tank for vacuum operated stop arm, the tank shall have a minimum capacity of 1000 cubic inches, shall be chassis mounted and connected to the fitting provided by the chassis manufacturer. There shall be a check valve between this connection and the tank. It shall be connected in such a manner that it could not receive vacuum from the brake vacuum tank. It shall not be connected to the vacuum gauge.

5. Air operated Stop Arms. a. Air for the operation of stop signal arms shall come from a connection to the air line serving the air brake system. A check valve and pressure reduction valve shall be provided to safeguard the air supply for brake application.

b. Connections for the operation of the stop signal arms shall not be made to the emergency air tank line.

6. Stop signal arm shall be mounted on the left side of bus as close to the driver's window as practicable.

(d) Stop signal arm shall be used only when the flashing red warning lights are in operation. It shall be activated after the bus comes to a complete stop and before or as the door is opened, and shall be retracted before the bus resumes motion.

(e) The foregoing requirements for installation and operation of stop signal arms shall not apply to school buses which are operated only on highways, streets or in areas where use of the flashing red warning lights is not permitted.

(38) SUN SHIELD. Interior adjustable sun visor not less than 6 by 16 inches in size shall be installed above windshield.

(39) UNDERCOATING. The entire underside of the body, including the floor members and side panels below the floor level shall be coated with a fire-resistant undercoating material, applied by the spray method, in order to seal, insulate, and to reduce oxidation and the noise level. Fenders or other metal surfaces around front wheels shall be undercoated.

(40) VENTILATION. The body shall be equipped with a suitable, controlled ventilating system of sufficient capacity to maintain a proper quantity of air under operating conditions without the opening of windows except in extremely warm weather. If static type exhaust roof ventilators are used, they shall be non-closable and be installed in the low pressure area of the roof.

(41) WHEEL HOUSINGS. (a) Wheel housing openings shall allow for easy tire removal and service.

(b) Wheel housing shall be designed to support seat and passenger loads and shall be attached to floor sheets in such manner as to prevent any dust or water from entering body.

(c) Inside height of wheel housings above floor line shall not exceed 10 inches.

(d) Wheel housings shall provide clearance for loaded bus and the use of anti-skid chains.

(42) WIDTH. See subsection (27).

(43) WINDSHIELD AND WINDOWS. (a) All glass in windshield, windows and doors shall be of approved safety glass installed so that the identification mark is legible and shall conform to the standard of the American National Standards Institute. Code Z26.1(1966).

Note: Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways (Z26.1) obtainable from United States of America Standards Institute, 10 East Fortieth St., New York, N.Y. 10016
This reference is available in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(b) Windshield shall be of laminated AS-1 safety glass of a quality that will prevent distortion of view in any direction. It shall be heat absorbent.

(c) The windshield shall be large enough to permit the driver to see the highway clearly, shall be slanted to reduce glare, and shall be installed between front corner posts that are so designed and located as to afford a minimum of obstruction to the driver's view of the highway.

(d) The windshield may have a horizontal gradient band starting slightly above the line of the driver's vision and gradually decreasing in light transmission to 20 percent or less at the top of the windshield.

(e) All side windows shall operate freely. These, except the driver's shall open from 9 to 10 and 1/2 inches and shall open from the top only, and provide an emergency exit at least 9 X 22 inches. All exposed edges of glass shall be banded. Windows shall be free of window guard or bars either on the inside or outside.

(44) WINDSHIELD WASHERS. A windshield washer which will effectively clean the entire area covered by both windshield wipers shall be provided. Fluid container shall be located in engine compartment.

(45) WINDSHIELD WIPERS. Bus shall be equipped with two automatic, individually powered, variable speed windshield wipers with non-glare arms and blades which shall clean the maximum possible area of the windshield.

(46) WIRING (a) All wiring shall conform to the standards of the Society of Automotive Engineers, SAEJ555a. This reference is available in the office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(b) Wiring shall be arranged in at least nine regular circuits as follows:

1. Head, tail, stop (brake) and instrument panel lamp.

2. Clearance lamps and step well lamps.

3. Dome lamps.

4. Starter motor.

5. Ignition and emergency door signal.

6. Turn signal lamps.

7. Although Sec. MVD 17.30(24) (d) requires only red flashing warning lights buses shall be wired with 8 light warning system harness.

8. Horn.

9. Heater and defroster.

Any of the above combination circuits may be subdivided into independent circuits. When possible, all other electrical functions (sanders, electric-type windshield wipers) shall be provided with independent and properly protected circuits. Each body circuit shall be coded by number or letter at 4 inch intervals or by color. The code shall appear on a diagram of the circuits in a readily accessible location.

(c) A separate fuse or circuit breaker shall be provided for each circuit required under MVD 17.30(46) except the starter motor and ignition circuits.

(d) All wires within the body shall be insulated and protected by covering of fibrous loom (or equivalent) which will protect them from external damage and minimize dangers from short circuits. Whenever wires pass through body or chassis members,

additional protection in the form of a grommet or other appropriate type of insert shall be provided.

(e) Wires not enclosed within the body shall be fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equally effective connectors.

(f) One extra fuse for each size of fuse used on the bus shall be conveniently mounted in the bus body.

(g) The chassis manufacturer shall install a readily accessible electrical terminal so that the body and chassis electrical load can be indicated through a chassis ammeter without dismantling or disassembling the chassis component. The chassis wiring system to terminal shall have a minimum 100 ampere capacity. The chassis ammeter and wiring shall be compatible with generating capacity, and the ammeter shall be capable of indicating a continuous draw of 100 amperes.

MVD 17.35 Applicability. Sections MVD 17.20 and MVD 17.30 apply only to Type I Buses as defined in section MVD 17.01 (2) (a).

Subchapter III

Type II Buses

Note: The term "not originally manufactured as school buses" means a vehicle not intended to be used as a school bus at the time of original manufacture.

The term "manufacturer's standard" means that the installation made by the original manufacturer or its equal will be acceptable.

Chassis

MVD 17.40(1) Air Cleaner. Bus shall be equipped with adequate oil-bath or dry element type air cleaner mounted outside passenger compartment.

(2) Axles. (a) Front axle or other type of suspension assembly shall be of sufficient capacity at ground to support such load on front axle as would be imposed by actual average gross vehicle weight.

(b) Rear axle shall be full-floating type. Rear axle or other type of suspension assembly shall have gross weight at ground equal to or exceeding that portion of total load which is supported by rear suspension assembly.

(c) Requirement in above section for full-floating rear axle does not apply to small vehicles not originally manufactured as a school bus.

(3) Battery. (a) Storage battery, as established by manufacturer's rating, shall be of sufficient capacity to care for starting, lighting, signal devices, heating and other electrical equipment.

(b) No bus shall be equipped with battery of less than 50 ampere hours at 12 volts, measured at 20 hour rate.

(c) Battery shall be mounted outside passenger compartment in adequate carrier and be readily accessible for servicing and removal, preferably from outside passenger compartment.

(4) Brakes.

For buses not originally manufactured as school buses the following requirements shall apply:

(a) Four-wheel, increased or over-size brakes, with highest possible braking area, adequate at all times to control bus when fully loaded, shall be provided.

(b) Foot or service brakes shall, at all times, be capable of stopping complete unit, when fully loaded, from speed of 20 miles per hour in not more than 30 feet, such distance to be measured from point at which movement of service brake pedal or control begins. Tests for stopping distance shall be made on substantially level (not to exceed plus or minus 1% grade), dry, smooth, hard surface that is free from loose material.

(c) Chassis shall be equipped with auxiliary brake capable of locking 2 wheels and capable of holding vehicle on any grade on which it is operated under any conditions of loading on a surface free from snow or ice. Operating controls of such auxiliary brake shall be independent of operating controls of service brakes.

(d) Buses having full compressed-air systems shall be equipped with:

1. At least 2 reservoirs (or one vessel divided into 2 compartments) connected in series.

2. Safety valve mounted on first reservoir to protect air brake system against excessive air pressure and check valve mounted in optional location.

3. Air gauge mounted on instrument panel to register air pressure in air brake system. See Wis. Adm. Code Section MVD 17.20(18).

4. Audible low-pressure indicator to warn driver if air pressure in air brake system falls below 60 pounds per square inch.

(e) Buses having vacuum-actuated or compressed air over hydraulic systems shall be equipped with check valve located between source of supply and reservoir and must have air or vacuum gauge on instrument panel.

Note: For buses originally manufactured as school buses the above requirements apply until January 1, 1968. After that date the following requirements shall apply:

(f) Service Brakes:

1. Stopping ability of service brake system. Service brake system shall be designed and constructed so that by application of single control unit vehicle can be stopped within distances specified in (a) and (b) of this subsection. Stopping distance requirement tests shall be conducted in accordance with SAE J658 and with vehicle loaded (MGVW - manufacturer's gross vehicle weight).

Note: SAE J658 - Service Brake Performance, recommended practice of Society of Automotive Engineers. This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

a. Brakes shall be designed to have capability of developing deceleration of 14 fpsps (feet per second per second) from speed of 20 mph at pedal effort of not more than 75 pounds.

b. Stopping distance test with brakes cold shall be conducted after proper conditioning according to SAE J880 and vehicle shall stop, from speed of 20 mph, within following distances at pedal effort of not more than 200 pounds:

10,000 pounds GVW and under - - - 25 feet

Over 10,000 pounds GVW- - - - - - 35 feet

c. Brake balance shall be such that, when tested at speed of 20 mph under any normal condition of loading within MGVW (manufacturer's gross vehicle weight), deceleration of 12 fpsps (feet per second per second) can be achieved without locking wheels on any axle.

d. Energy Absorption - Horsepower Rating. Energy absorption capability of brakes, when tested in accordance with procedure established by SAE J880 or equivalent, shall be not less than $12 + \frac{1.4\ GVW}{1000}$.

Note: SAE J880 - Brake Rating System Test Code--Commercial Vehicles, recommended practice of Society of Automotive Engineers. This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

2. Travel reserve of air brake actuator or hydraulic brake pedal. Brake actuator travel, when measured statically at actuating force required for compliance with Item (f)1 b above, shall be not more than 60 percent of available travel.

3. Reservoirs Required. Every brake system which employs air or vacuum shall include following reservoir capacity:

a. Air brake system shall have reservoir capacity which is equal to or greater than 12 times total volume of all brake actuators at full travel.

b. Vacuum brake system shall have reservoir used exclusively for brakes, with capacity of not less than 1,000 cubic inches, and shall be adequate to insure loss in pressure at full stroke application of not more than 30 percent.

c. Brake system shall include suitable and convenient connection for installation of separate vacuum reservoir with capacity of not less than 1,000 cubic inches, furnished and installed by body manufacturer and protected by check valve, for actuation of other vacuum-powered accessories. Engine shall be protected by proper filters.

4. Safeguarding of air or vacuum system reservoir. Brake system reservoir shall be so safeguarded by a check valve or equivalent device that in the event of failure or leakage in its connection to the source of compressed air or vacuum, the stored air or vacuum shall not be depleted by the leak or failure. Means shall be provided to establish air check valve to be in working order.

5. Gauges. A vehicle using air or vacuum in operation of brake system shall be equipped with an illuminated gauge, accurate to within 10 percent of actual reservoir pressure, which will indicate to driver the air pressure in psi (pounds per square inch) which is available for the operation of air brakes; or the vacuum in inches of mercury which is available for the operation of vacuum brakes.

6. Warning Devices. In addition to the gauges required in 5. above, vehicle shall be equipped with audible or visible warning signal which will give continuous warning to driver when air pressure in braking system is 60 psi (pounds per square inch) or less; or when vacuum in braking system is 8 inches of mercury or less.

(g) Emergency Braking System: General. Brake system(s) shall perform emergency stopping function and be so designed and constructed that single failure anywhere in brake system which performs service brake function, excepting mechanical parts of wheel brake assemblies and brake pedal and brake pedal attachment to brake valve(s) or master cylinder(s), will not leave vehicle without operative brakes capable of stopping vehicle when loaded up to and including manufacturer's rated GVW (gross vehicle weight) at any legal speed and in accordance with requirements of 1 and 2, below.

1. Emergency stopping performance requirements. Following performance shall be obtained under road and test conditions outlined in (f)1 above:

a. Vehicle, when loaded to manufacturer's GVW (gross vehicle weight) capacity, shall be brought to stop from speed of 20 mph in measured distance of 85 feet.

b. Deceleration of not less than 6 fpsps (feet per second per second) shall be maintained throughout stop from 20 mph.

2. Control requirements of emergency stopping system. Control of emergency stopping system shall be designed and constructed:

a. to permit modulated control by driver of brake application and release; and

b. to prevent release of brakes by driver unless energy is available for re-application.

(h) Parking Brakes:

Parking brake system shall be designed and constructed to meet following requirements:

1. Parking brake shall hold vehicle stationary, or to limit of traction of braked wheels, on 20-percent grade under any condition of legal loading and on surface free from snow, ice, and loose material.

2. When applied, parking brakes shall remain in applied position with capability set forth in (h)1 above, despite exhaustion of source of energy used for application or despite leakage of any kind.

(5) Bumper, Front. (a) Bumper shall be furnished by chassis manufacturer as part of chassis.

(b) Front bumper must extend to outer edges of fenders at bumper top line (to assure maximum fender protection) and be of sufficient strength to permit pushing vehicle of equal gross weight without permanent distortion to bumper, chassis or body.

(6) Bumper, Rear. (a) Rear bumper shall be furnished by chassis manufacturer as part of the chassis.

(b) Rear bumper shall be of sufficient strength to permit vehicle being pushed without permanent distortion to bumper, chassis or body.

(c) Manufacturer's standard will be acceptable on buses not originally manufactured as school buses.

(7) Clutch. Clutch torque capacity shall be not less than 10% in excess of maximum net torque output of engine.

(8) Color. See Wis. Adm. Code Section 17.50(5).

(9) Drive Shaft. Drive shaft shall be protected by metal guard or guards to prevent it from whipping through floor or dropping to ground. This does not apply to vehicles with torque-tube drive shaft.

(10) Exhaust System. (a) Exhaust pipe, muffler, and tailpipe shall be outside bus body and attached to chassis. All units and connections shall be firm and leakproof.

(b) Tailpipe shall be constructed of seamless or electrically welded tubing of 16-gauge steel or equivalent. Flexible tubing is not acceptable.

(c) Size of tailpipe shall not be reduced after it leaves muffler except for the thickness of the metal of the tailpipe at the connection to the muffler. Tailpipe shall extend beyond the external rear of the bus body at the point of projection, but not beyond the bumper.

(d) Exhaust system shall be properly insulated from fuel tank and tank connections by securely attached metal shield at any point where it is less than 12 inches from tank or tank connections.

(e) Noise level shall not exceed 125 sones as measured by Beranek-Armour-ATA tone equivalent method as established by the Automobile Manufacturers Association in 1954.

Note: Obtainable from Automobile Manufacturers Association, 320 New Center Building, Detroit 2, Michigan.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(11) Fenders, Front. Total spread of outer edges of front fenders, measured at fender line, shall exceed total spread of front tires when front wheels are in straight ahead position.

(12) Frame. (a) Frame or equivalent shall be of such design as to correspond at least to standard practice for trucks of same general load characteristics which are used for severe service.

(b) When frame side members are used they shall be of one-piece construction. If frame side members are extended, such extension shall be designed and furnished by chassis manufacturer with his guarantee, and installation shall be made by either chassis or body manufacturer and guaranteed by company making installation. Extensions of frame lengths are permissible only when such alterations are behind rear hanger of rear spring and shall not be for purpose of extending wheel base.

(c) Holes in top or bottom flanges of frame side rails shall not be permitted except as provided in original chassis frame. There shall be no welding to frame side rails except by chassis or body manufacturer.

(13) Fuel Tank. (a) Fuel tank shall be mounted, filled, and vented outside of body. Mounting shall be on right side of bus unless wheelbase is too short, in which case mounting shall be on left side.

(b) Capacity of fuel tank shall be manufacturer's specification.

(14) Generator or Alternator. Generator or alternator with rectifier shall have minimum output of at least 35 amperes with 12 volt system or 40 amperes if 6 volt system and shall be ventilated, voltage controlled and current-controlled.

(15) Governor. Governor is permissible and where used shall be approved by chassis manufacturer.

(16) Horns. Shall be equipped with standard make dual horns in good working order and capable of emitting sound audible under normal traffic conditions from a distance of not less than 300 feet.

(17) Instruments and Instrument Panel. (a) Chassis shall be equipped with following instruments and gauges.

1. Speedometer which will show speed.
2. Odometer which will give accrued mileage.
3. Ammeter with charge and discharge.
4. Oil pressure gauge.
5. Water temperature gauge.
6. Fuel gauge.
7. Upper-beam headlamp indicator.
8. Air pressure or vacuum gauge, where air or vacuum brakes are used.

(b) All instruments shall be accessible for maintenance and repair. All instruments shall be kept in good working order.

(c) Above instruments and gauges shall be mounted on instrument panel in such manner that each is clearly visible to driver in normal seated position. Lights in lieu of gauges are not acceptable.

(d) Instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges.

(e) Manufacturer's standard acceptable on buses not originally manufactured as school buses.

(18) Length. Over-all length shall not exceed 40 feet.

(19) Oil Filter. Oil filter of replaceable element or cartridge type shall be provided and shall be connected by flexible oil lines if it is not of built-in or engine-mounted design. Oil filter shall have oil capacity of at least 1 quart.

(20) Openings. All openings in floor board or firewall between chassis and passenger-carrying compartment, such as for gearshift lever and auxiliary brake lever, shall be sealed. See Wis. Adm. Code Section MVD 17.50(6)(d)2.

(21) Passenger Load. (a) Gross vehicle weight (i.e. chassis weight with oil, water, and full fuel tank, plus body weight, plus driver's weight of 150 pounds, plus weight of maximum seated pupil load based on not less than 120 pounds per pupil) shall not exceed maximum gross vehicle weight rating as established by manufacturer.

(b) There shall be displayed on the inside of the bus body directly over the windshield on the right of the driver a sign indicating the maximum pupil seating capacity of the bus. The size of the letters and numerals shall be large enough to permit them to be read by passengers. Transportation of passengers in excess of the number designated on such sign is prohibited.

(22) Power and Gradeability. Chassis must be so geared and powered as to be capable of surmounting 3.7% grade at speed of at least 20 mph with full load (see subsection (21)(a)) on continuous pull in direct drive. For formula refer to Wis. Adm. Code Section MVD 17.20(23).

(23) Shock Absorbers. Shall be equipped with front and rear double acting shock absorbers compatible with manufacturer's rated axle capacity.

(24) Springs. (a) Springs or suspension assemblies shall be of ample resiliency under all load conditions and of adequate strength to sustain loaded bus without evidence of overload.

(b) Springs or suspension assemblies shall be designed to carry their proportional share of gross vehicle weight in accordance with requirement for weight distribution as shown in Wis. Adm. Code Section MVD 17.40(28).

(c) If rear springs are used, they shall be of progressive type.

(d) If leaf-type front springs are used, stationary eyes shall be protected by full wrapper leaf in addition to main leaf.

(e) Springs on small buses not originally manufactured as school buses shall be manufacturer's standard.

(25) Steering Gear. (a) Steering gear shall be approved by chassis manufacturer and designed to assure safe and accurate performance when vehicle is operated with maximum speed.

(b) Steering mechanism shall provide for easy adjustment for lost motion.

(c) No changes shall be made in steering apparatus which are not approved by chassis manufacturer.

(d) There shall be a clearance of at least 2 inches between steering wheel and cowl, instrument panel, windshield, or any other surface.

(e) Power steering is permissible if approved by chassis manufacturer.

(26) Tires and Rims. (a) Tire and rim sizes, based upon standards contained in the 1973 Yearbook of Tire and Rim Association, 3200 West Market Street, Akron, Ohio, 44313, shall be required.

Note: This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(b) In order to allow for reasonable tolerance, total weight imposed on any tire shall not be greater than 10% above said standard of Tire and Rim Association.

(c) All tires shall be of same size and ply rating, except where wide single equivalents are used.

(d) Spare tire, if required, shall be suitably mounted in accessible location outside passenger compartment. Spare tire is required unless adequate arrangements for service facilities have been made.

(e) Vehicles not manufactured originally as school buses must comply with subsections (a)(b)(c) above. Spare tire mounting may be manufacturer's standards.

(f) All tires must have visible tread around entire periphery.

(g) No recap tires are permitted on steering wheels.

(27) Transmission. Three speed and automatic transmissions are acceptable.

(28) Weight Distribution. Weight distribution of fully loaded vehicle on level surface shall be such that not more than 75% of gross vehicle weight is on rear tires and not more than 35% is on front tires.

Body

Type II Buses

MVD 17.50(1) Aisle. (a) Minimum clearance of all aisles, including aisle (or passageway between seats) leading to emergency door, shall be 12 inches. See Wis. Adm. Code Section MVD 17.50(8)(b)4.

(b) Aisle supports of seat backs shall be slanted away from aisle sufficiently to give aisle clearance of 15 inches at tops of seat backs.

(2) Body Size. (a) Type II bus has a carrying capacity of 16 or less pupils, may be narrower than Type I bus, and body may have been converted from one originally manufactured for other purposes.

(b) In no case shall less than 13 inch rump space per pupil be permitted in computing passenger capacity.

(3) Book Racks. (a) Book racks, if installed, shall be provided above side windows within range from front cross-seat to rear transverse seat except across or above emergency door.

(b) Book racks made of material which is expanded, woven or punched are prohibited. Any other type having openings large enough to permit insertion of fingers are prohibited.

(c) Racks shall be free of projections or sharp edges likely to cause injury.

(4) Bumper, Rear. See Wis. Adm. Code Section MVD 17.40(6).

(5) Color. Painting is optional but if a Type II bus is painted school bus glossy yellow, the color scheme shall be the same as Type I bus, (Section 17.30(8)). Buses presently using a yellow with black trim color scheme prior to January 1, 1975 are not required to paint to the Type I standard.

Note: Color chips of federal standard No. 595 glossy yellow enamel No. 13432 and black enamel No. 17038 available from General Services Administration, Business Center, Region 3, Seventh and D Streets, S.W., Washington 25, D.C.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(6) Construction. (a) Construction shall be all-steel or other metal with strength at least equivalent to all steel as certified by body manufacturer.

(b) Construction shall provide reasonably dustproof and watertight unit.

(c) Bus body (including roof bows, body posts, and floor) shall be of sufficient strength to support entire weight of fully loaded vehicle on its top or side if overturned. It shall have sufficient frame members (strainers, stringers, etc.) in roof structure and corners to provide adequate safety and to resist damage on impact.

(d) 1. Floor shall be of prime commercial quality steel of at least 14-gauge or other metal or other material at least equal in strength to 14-gauge steel. If plywood is used, it shall be 5-ply, at least 5/8-inch thick and it shall equal or exceed properties of exterior-type Douglas fir plywood, B-B Grade, as specified in standard issued by U.S. Department of Commerce. Floor shall be level from front to back and from side to side except in wheel housing, toeboard, and driver's seat platform areas. For buses not originally manufactured as school buses, manufacturer's standards will be acceptable.

Note: Commercial standard CS45-60 Douglas Fir Plywood: A Recorded Voluntary Standard of the Trade (as amended). Obtainable from Superintendent of Documents, Washington, D.C. 20401.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

2. All openings between chassis and passenger carrying compartment made due to alterations by body manufacturer must be sealed. See Wis. Adm. Code Section MVD 17.40(20).

(e) In the above section, subsection (c) does not apply to small vehicles not manufactured originally as school buses. Subsection (d) 1-floor on small-vehicles not manufactured originally as school buses shall be manufacturer's standard.

(7) Defrosters. Defrosters are required, and shall be of sufficient capacity to keep windshield and driver's window clear of fog, ice and snow. This may be done by using fans or by taking heat directly from approved heater.

(8) Doors. (a) SERVICE DOOR. Service door shall be located to right of driver and shall be manually controlled from driver's seat by over-center control for bus-type conveyance. This standard shall not apply to vehicles not originally manufactured as school buses.

(b) EMERGENCY DOOR. 1. Emergency door shall be located in center of rear end of bus and shall be equipped with fastening device for opening from inside and outside body, which may be quickly released but is designed to offer protection against accidental release. Metal guard shall be placed over door control on inside. Control from driver's seat shall not be permitted. Provisions for opening from outside shall consist of device designed to prevent hitching-to but to permit opening when necessary. This standard shall not apply to vehicles not originally manufactured as school buses.

2. Door shall open either vertically or horizontally. When vertical type door is used, there shall be unobstructed aisle at least 12 inches wide. This standard shall not apply to vehicles not originally manufactured as school buses.

3. There shall be no steps leading to emergency door.

4. No seat or other object shall be placed in bus which restricts passageway to emergency door to less than 12 inches.

(9) Electrical System. (a) BATTERY. See Wis. Adm. Code Section MVD 17.40(3).

(b) GENERATOR OR ALTERNATOR. See Wis. Adm. Code Section MVD 17.40(14).

(c) LAMPS AND SIGNALS. See Wis. Adm. Code Section MVD 17.50(21).

(d) WIRING. See Wis. Adm. Code Section MVD 17.50(40).

(10) Emergency Equipment. (a) Each school bus shall be provided with the following emergency equipment.

1. One axe or steel wrecking bar.

2. A suitable jack, spare tire and necessary tools for tire or wheel changing, and tools for minor repairs. This standard will not apply if adequate arrangements have been made for service facilities.

3. All emergency equipment shall be kept in a readily accessible place in vehicle, in suitable fasteners or containers.

(b) 1. Each school bus shall carry at all times at least 3 red flags not less than 12 inches square and means for mounting.

2. Each school bus shall carry at all times at least 3 red electric lanterns, or 3 oil burning pot-type flares and 3 red burning fusees or 3 red emergency reflectors.

(c) Flags, fusees, red emergency reflectors and axe or wrecking bar shall be kept in the driver's compartment. Flares shall be kept full and in metal containers to right or left of emergency door. All other emergency equipment shall be kept in a readily accessible place in proper containers or fasteners.

(11) Fire Extinguishers. Each bus shall be equipped with a fire extinguisher of a type approved by and carrying the seal of the laboratories of the National Board of Fire Underwriters, 207 E. Ohio Street, Chicago, Illinois, having not less than the following classifications: 4BC dry powder type, or 6BC C02 type. Extinguisher shall be mounted in an accessible place in full view, and kept filled and in satisfactory operating condition at all times.

(12) First Aid Kit. (a) Bus shall carry Grade A metal first aid kit and Type II contents conforming to specifications as set forth in Federal Specifications GG-K-391a of March 3, 1959, mounted in full view in the driver's compartment, and shall be removable without necessitating the use of any tools. Kit must contain at least 16 units as listed in the following table:

Bandage Compress (sterile gauze pads) 4-inch	2 Packets
Bandage Compress (sterile gauze pads) 2-inch	1 Packet
Adhesive Absorbent Bandage (bandaid type) 1-inch	2 Packets
Triangular Bandage, 40-inch	1 Packet
Gauze Bandage, 4-inch	1 Packet
Absorbent-Gauze Compress	1 Packet
Burn Compound, 1/8 Ounce	2 Packets
Antiseptic Applicators (swab type) (iodine or nitromersol tincture N.F. or thimersal N.F.)	2 Packets
Wire Splints	1 Packet
Ammonia Inhalants	1 Packet
Tourniquet and Forceps	2 Packets

Note: Federal Specifications, GG-K-391a Obtainable From:
General Services Administration
Business Service Center
Region 3, Seventh & D Streets
Washington 25, D. C.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(b) First aid kit may be put inside a compartment in the driver's area if the compartment is marked "FIRST AID KIT" or has a red cross emblem in plain view to indicate location of the kit.

(13) Floor. See Wis. Adm. Code Section 17.50(6)(d)1.

(14) Floor Covering. (a) Floor in underseat area, including tops of wheel housings, driver's compartment, and toeboard, shall be covered with fire-resistant floor covering material of type commonly used in passenger transportation equipment. Floor covering shall be of rubber or linoleum and shall have minimum over-all thickness of 0.125 inch. (Linoleum floor covering shall be made with oxidized lineseed-oil binder having cork filler and placed on burlap or felt backing.)

(b) Floor covering in aisle shall be of aisle-type rubber or linoleum, non-skid, and wear resistant. If of linoleum, or rubber without ribs, it shall have minimum over-all thickness of 0.125 inch. If of ribbed material, minimum over-all thickness shall be 0.140 inch measured from tops of ribs. (Linoleum floor covering in aisle shall be as described in subsection (a)).

(c) Floor covering must be permanently bonded to floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be of type recommended by manufacturer of floor covering material. All seams must be sealed with waterproof sealer.

(d) Exception - Floor covering on small vehicles not manufactured originally as school buses shall be of manufacturer's standard. Where no floor covering is supplied by manufacturer, installation shall be made according to above requirements.

(15) Heater(s). (a) Heater(s) are required and shall be of hot water or combustion type.

(b) If only one heater is used, it shall be of fresh air or combination fresh air and recirculating type.

(c) If more than one heater is used, additional heaters may be of circulating type.

(d) Where hot-water heaters are used, they shall bear name plate rating of School Bus Body Manufacturer's Association Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment. This subsection shall not apply to small vehicles not originally manufactured as school buses.

Note: School Bus Body Manufacturer's Association
401-402 Washington Board of Trade Building
1616 K Street, N.W.
Washington 6, D. C.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(e) All combustion-type heaters shall be approved by Underwriter's Laboratories, Inc.

(f) If combustion-type heaters are used, they shall be installed on new buses by body manufacturer and on buses now in operation by authorized dealers or by authorized garages.

(g) Heater(s) shall be capable of maintaining inside temperature of 50 degrees fahrenheit at average minimum January temperatures as established by U. S. Department of Commerce, Weather Bureau, for area in which heater is required.

(16) Identification. (a) Only signs and lettering approved by state law or regulation shall appear on bus. Except as provided in subsection (c)2 and 8, the painting of school nicknames, slogans, insignia, or decals on bus is prohibited.

(b) Body shall bear words "SCHOOL BUS" in black letters at least 8 inches high and one inch stroke on both front and rear of body or on yellow signs attached thereto. Such lettering shall be placed above rear window and windshield as high as possible without impairment to visibility.

(c) 1. Carrier may show not more than three fleet numbers, not more than 6 inches high, location to be left to owner's discretion.

2. Name and address (and telephone number if desired) of owner or operator shall be displayed in lower yellow panel to the rear of, and as close as possible to, the service door in letters not more than 2 inches high by one-fourth inch stroke. If desired, this marking may also be painted on the left side of the bus below the driver's window. Owner's decals may be used to comply with this subsection provided they do not violate the provisions of this subsection and provided approval for such use is obtained from the Administrator of the Division of Motor Vehicles.

3. Name of school or school-bus firm may appear on sides of bus below window line and above the seat line rub rail, in contrasting yellow or black letters not more than 10 inches high.

4. Words "Emergency Door" shall be painted on the inside of the bus above the emergency door, in letters not less than 2 inches high by one-fourth inch stroke.

5. Words "Emergency Exit" in letters at least 2 inches high by one-fourth inch stroke shall be painted directly above the emergency window referred to in Wis. Adm. Code Section MVD 17.30 (11)(b)1i on the inside of the bus, and directly below it on the outside.

6. See Wis. Adm. Code Section MVD 17.40(21)(b) regarding sign indicating passenger capacity.

7. When bus is being used for other than school transportation purposes, flashing red signals shall not be used and the words "SCHOOL BUS" shall be removed or concealed.

8. A placard, decal or other device, not to exceed 90 square inches in size, to identify bus to small children, may be attached to bus; location to be left to owner's discretion.

(d) The registration card shall be displayed in the driver's compartment as required by Section 341.11(4), Wis. Stats.

(17) Inside Height. (a) Except as provided in (b) inside height shall be nominal 72 inches or more, measured metal to metal at any point on longitudinal center line from front vertical bow to rear vertical bow.

(b) Manufacturer's standard shall apply to vehicles not originally manufactured as school buses.

(18) Insulation. (a) Except as provided in (b) ceilings and walls shall be insulated with thermal insulation materials to deaden sounds and to reduce vibrations and heat transfer. Said insulation shall be fire-resistant material of type approved by Underwriters' Laboratories, Inc., 207 E. Ohio Street, Chicago, Illinois.

(b) Manufacturer's standards shall apply to vehicles not originally manufactured as school buses.

(19) Interior. (a) Interior of bus shall be free of all unnecessary projections likely to cause injury. This standard requires inner lining on ceilings and walls except on vehicles not originally manufactured as school buses.

(b) Ceilings over aisles shall be free of all projections.

(20) Ladders. No school bus shall have a ladder attached to its exterior or interior while in motion. Steps of folding or protruding types are not permitted except as provided in Wis. Adm. Code Section MVD 17.50(31)(g).

(21) Lamps and Signals. (a) GENERAL. All lamps and their installation shall conform to standards and recommendations as set forth in handbook supplement 34 of 1966 of Society of Automotive Engineers, 485 Lexington Avenue, New York, N.Y.

Note: This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(b) HEAD LAMPS. Bus shall be equipped with head lamps and fuses or circuit breakers.

(c) CLEARANCE LAMPS AND REFLECTORS. Vehicles having a width at any part in excess of 80 inches shall be equipped with 2 amber clearance lamps mounted in such manner as to indicate the extreme width of the vehicle and as near the top thereof as practicable, and visible from a distance of 500 feet. Vehicles having a width in excess of 80 inches shall also be equipped with 2 amber reflectors mounted on the front and 2 red reflectors mounted on the rear, in such a manner as to indicate as nearly as possible the extreme width of the vehicle. Reflectors shall be mounted not less than 16 nor more than 60 inches from the ground. A lawful red reflector may be incorporated as part of the tail lamp.

(d) TAIL AND STOP (BRAKE) LAMPS. 1. Bus shall be equipped with 2 tail lamps and 2 stop lamps capable of emitting red light plainly visible for a distance of 500 feet to the rear. If tail and stop lamps are in combination there shall be 2 additional separate and distinct stop lamps meeting the requirements of this section. Stop lamps shall have light intensity at least equal to Class A, Type I turn signal lamps as set forth in handbook supplement 34 of 1966 of Society of Automotive Engineers, 485 Lexington Avenue, New York 17, N.Y.

2. Tail lamps shall be mounted not less than 40 inches from surface on which vehicle stands. Stop (brake) lamps shall be as high as practicable but below window line and spaced as far apart laterally as practicable but not less than 3 feet. Measurements shall be taken from lamp centers.

(e) LICENSE-PLATE LAMP. Bus shall be equipped with rear license plate illuminator. This lamp may be combined with one of the tail lamps.

(f) INTERIOR LAMPS. Interior lamps shall be provided which adequately illuminate aisle and step-well. Manufacturers standards apply to buses not originally manufactured as school buses.

(g) TURN SIGNAL LAMPS. Bus shall be equipped with Class A turn signal lamps, the component parts of which meet the specifications set forth in handbook supplement 34 of 1966 of Society of Automotive Engineers. These signals must be independent units and may be equipped with four-way hazard warning switch to cause simultaneous flashing of turn signals when needed as vehicular traffic hazard warning. Manufacturers standards apply to buses not originally manufactured as school buses.

(h) SCHOOL BUS ALTERNATELY FLASHING RED WARNING SIGNAL LAMPS. (Definition) School bus alternately flashing red signal lamps are lamps mounted at same horizontal level, intended to identify vehicle as school bus and to inform other users of highway that such vehicle is stopped or about to stop on highway to take on or discharge school children.

1. Bus shall be equipped with 2 red warning lamps at rear of vehicle and 2 red warning lamps at front of vehicle, which shall be controlled by manually actuated switch and shall flash alternately at rate of 60 to 120 cycles per minute. No brake or door operated switch shall be permitted. "On" period shall be long enough to permit bulb filament to come up to full brightness.

2. Red warning lamps shall be sealed beam type, or other improved type meeting the requirement of subsection 4. below. Both types shall be visible from a distance of at least 500 feet along the axis of the vehicle in bright sunlight.

3. There shall be visible or audible means of giving clear and unmistakable indication to driver when signaling system is turned on.

4. INSTALLATION. a. Each red warning signal lamp shall be mounted with its axis substantially parallel to longitudinal axis of vehicle.

b. Front and rear red warning signal lamps shall be spaced as far apart laterally as practicable, but in no case shall spacing between lamp centers be less than 3 feet.

c. Location of front red warning signal lamps shall be such that they can be clearly distinguished when head lamps are lighted on lower beam.

d. Red warning signal lamps shall be mounted at front above windshield and at rear so that lower edge of lens is not lower than top line of side window openings.

e. Vision of front signal lamps to front, and rear signal lamps to rear shall be unobstructed by any part of vehicle from 5 degrees above to 10 degrees below horizontal and from 30 degrees to left and 30 degrees to right of center line of vehicle.

f. The area around the lens of each alternately flashing red signal lamp and extending outward approximately 3 inches shall be painted black on all school buses. In installations where there is no flat vertical portion of body immediately surrounding entire lens of lamps, circular or square band of black approximately 3 inches wide, immediately below and to both sides of lens, shall be painted on body or roof area against which red warning signal lamp is seen.

This standard shall not apply to vehicles not originally manufactured as school buses and which have red warning signal lamps mounted above the roof top. Red warning signal lamps on such vehicles shall be equipped with black hoods at least 3 inches long.

g. Hoods. Except as provided in f. above, red warning signal lamps may be equipped with hoods to shield from rays of sun for improved visibility.

(22) Lettering. See Identification Wis. Adm. Code Section MVD 17.50(16).

(23) Mounting. Chassis frame shall extend to rear of rear body cross member.

(24) Posts. See Wis. Adm. Code Section MVD 17.50(6)(c) and Wis. Adm. Code Section MVD 17.50(37)(b).

(25) Rear Vision. (a) For buses originally manufactured as school buses the following shall apply:

1. Interior clear-view mirror shall be at least 6 by 30 inches over-all, to afford good view of pupils and roadway to rear. If not metal-backed and framed, mirror shall be of laminated plate safety glass. It shall have rounded corners and protected edges.

2. Two exterior clear-view, rearview mirrors shall be provided, one to left and one to right of driver. Area of each mirror shall be not less than 50 square inches over-all. Each mirror shall be firmly supported and adjustable to give driver clear views past left rear and right rear of bus.

(b) Buses not originally manufactured as school buses shall have two exterior clear-view mirrors mounted on left and right sides. Manufacturers standards are acceptable.

(c) At least one clear-view mirror not less than 7 inches in diameter shall be fender mounted in such a manner that the driver may observe a reflection of the road from the entire front bumper forward to a point where direct observation is possible.

Note: Installation dates for this mirror shall be the same dates as given for installation of stop arms. See MVD.17.30(37)(a).

(26) Rub Rails. (a) There shall be one rub rail located on each side of bus approximately at seat level which shall extend from rear side of entrance door completely around bus body (except for emergency door) to point of curvature near outside cowl on left side.

(b) There shall be one rub rail located approximately at floor line which shall cover same longitudinal area as upper rub rail, except at wheel housings, and shall extend only to radii of right and left rear corners.

(c) Both rub rails shall be attached at each body post and all other upright structural members.

(d) Both rub rails shall be 4 inches or more in width, shall be of 16-gauge steel, and shall be constructed in corrugated or ribbed fashion.

(e) Both rub rails shall be applied outside body or outside body posts. Pressed-in or snap-on rub rails do not satisfy this requirement.

(f) The above sections do not apply to small vehicles not manufactured originally as school buses.

(27) Sanders. The use of sanders is optional; however, if used, must comply with the following requirements.

(a) Be of hopper cartridge-valve type.

(b) Have metal hopper with all interior surfaces treated to prevent condensation of moisture.

(c) Be of at least 100-pound (grit) capacity.

(d) Have cover on filler opening of hopper, which screws into place, sealing unit airtight.

(e) Have discharge tubes extending to front of each rear wheel under fender.

(f) Have no-clogging discharge tubes with slush-proof, non-freezing rubber nozzles.

(g) Be operated by electric switch with telltale light mounted on instrument panel.

(h) Be exclusively driver-controlled.

(i) Have gauge to indicate hoppers need refilling when they are down to one-quarter full.

(28) Seat Belt for Driver. Seat belt for driver shall be provided, belt to comply with current specifications and recommended practices of Society of Automotive Engineers.

Note: Seat belt specifications are available from Society of Automotive Engineers, 485 Lexington Avenue, New York, N.Y. 10017. This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(29) Seats. Vehicles originally manufactured as school buses shall comply with the following:

(a) All seats shall have minimum depth of 14 inches.

(b) In determining seating capacity of bus, allowable average rump width shall be:

1. 13 inches where 3-3 seating plan is used.

2. 15 inches where 3-2 seating plan is used.

(c) All seats shall be forward-facing and shall be securely fastened with bolts and nuts, or with self tapping lag bolts, but not with sheet metal screws.

(d) No bus shall be equipped with jump seats or portable seats.

(e) Forward-most pupil seat on right side of bus shall be located so as not to interfere with driver's vision, not farther forward than guard rail behind driver or rear of driver's seat when adjusted to its rear-most position.

(f) Minimum center to center seat spacing shall be 27 inches for cushioned seats, or 25.1 inches if fiber glass seats are used. Distance between driver's seat when adjusted to its rear-most position and front face of seat-back of forward-most pupil seat on left side of bus shall not be less than 24 inches measured at cushion height.

(g) Seat cushion shall be constructed with springs, foam rubber, polyurethane foam, or other equivalent material. If springs are used, there shall be at least 21 springs per cushion. Padding used to cover springs may be cotton, rubberized hair, foam rubber, or other equivalent material. If cotton or similar material is used, padding for cushion shall be at least 2 inches thick, except for reasonable distance from edge of cushion to allow for curve of edges. If foam rubber or polyurethane foam is used without springs, its thickness in cushion shall be approximately 5 inches and it shall be depressed not more than 80% when distributed weight of 345 pounds is applied to it. If cotton or similar material, rubberized hair, foam rubber, or polyurethane foam is used in seat-back rests, it shall be approximately 2 inches thick and shall not be depressed more than 80% when distributed weight of 300 pounds is applied to it. Seat covering shall be artificial leather equal to coated fabrics, 42 ounce finished weight, 54 inches wide, reinforced backing of 1.06 broken twill. Padding and covering or surfaces on all seats shall be of material that will not flash or explode upon contact with spark or open fire. Seams of seat cushions shall be made of good quality welt.

(h) Minimum distance between steering wheel and back rest of driver's seat shall be 11 inches. Driver's seat shall be strongly attached, shall have vertical adjustment, and shall have fore and aft adjustment of not less than 4 inches.

(i) Backs of all seats of similar size shall be of same width at top and of same height from floor and shall slant at same angle with floor.

(j) Where grab handles on seats are used, they shall be enclosed.

(k) Allowable rump width in determining seating capacity of small buses shall be 13 inches.

(l) Fiber-glass seats may be used provided they meet the following standards.

1. Fiber-glass seats must meet all foregoing provisions for seats except those concerning construction of seat cushions and seat backs.

2. Fiber-glass seats shall combine rigid construction of welded tubular steel with contoured matched die formed or hand-sprayed molded plastic shell. Exposed steel shall be stainless steel or shall be finished with baked enamel.

3. Plastic shells shall consist of good commercial grade, fire-resistant, color pigmented resin reinforced with glass fibers in such manner as to avoid resin rich sections. Shells shall be shaped to provide maximum comfort.

4. Both metal frames and plastic shells shall have rounded corners and be free from sharp edges. Except for rearmost row, fiber-glass seats shall be provided with top-rail crash pads.

(m) Vehicles not originally manufactured as school buses shall comply with these seat requirements.

1. All seats shall be forward facing and securely fastened with bolts and nuts, or where this is not possible, with self-tapping lag bolts. Sheet metal screws shall not be used.

2. Seats shall be covered with fire-resistant padding material and comfortably upholstered with adequate padding. (Not applicable to fiber-glass seats).

3. Jump seats or portable seats shall not be used.

4. Seat beside driver, if regular equipment or installed by vehicle manufacturer, may be used for pupil seating. It shall be securely fastened to body and shall be so constructed as not to interfere with pupils entering or leaving vehicle.

5. Allowable average rump width in determining seating capacity of bus shall be 13 inches.

6. All seats shall be at least 14 inches in over-all depth.

7. Seats shall be so placed that distance from center to center measured at top center of backs shall be not less than 27 inches, or 25.1 inches if fiber glass seats are used.

(30) Stanchions and Guard Rails. (a) Vertical stanchion shall be installed at right rear corner of driver's seat in such a position as neither to interfere with adjustment of driver's seat nor to obstruct 12 inch aisle. Guard rail, approximately 30 inches above floor, and so placed as to not interfere with fore-and-aft adjustment of driver's seat, shall extend from vertical stanchion to left-hand wall behind driver's seat.

(b) Vertical stanchion shall be installed at rear of entrance step-well from roof to floor. Placement shall not restrict passageway at any level to less than 24 inches nor aisle to less than 12 inches.

(c) Guard rail and step-well guard panel shall be installed from step-well stanchion to right-hand wall to prevent children in front seat from being thrown into step-well in case of sudden stop. Guard rail shall be approximately 30 inches above floor and its guard panel shall not restrict entrance passageway to less than 24 inches at any level. Panel shall extend from guard rail to within 2 inches of floor. If panel extends over or into step-well opening, it must be flanged at floor line so as to close any opening between panel and floor.

(d) Clearance between step-well guard panel and first pupil seat shall be at least 24 inches measured from panel to front face of seat back at cushion height.

(e) All stanchions and guard rails shall be minimum of 1-inch outside diameter and stainless steel clad or equal.

(f) The above sections do not apply to vehicles not originally manufactured as school buses.

(31) Steps. (a) First step at service door shall be not less than 12 inches and not more than 16 inches from ground, based on standard chassis specifications.

(b) Riser of upper step at service door shall be not more than 15 inches. When more than 2 steps are used, risers must be within 1/2 inch of equal height except that, where plywood floor is used on steel, differential may be increased by thickness of plywood used.

(c) Steps shall be enclosed to prevent accumulation of ice and snow.

(d) Steps shall not protrude beyond side body line.

(e) Grab handle not less than 10 inches in length shall be provided in unobstructed location inside doorway.

(f) Surface of steps shall be of non-skid material.

(g) There shall be one stirrup step and suitably located handle on each side of front of body for easy accessibility for cleaning windshield and lamps.

(h) Above standards do not apply to vehicles not originally manufactured as school buses.

(32) Stop Signal Arm. All Type II school buses shall be equipped with stop signal arms except those which are operated only on highway, streets or in areas where use of flashing red warning lights are prohibited.

For specifications and installation requirements see/Section Wis. Adm. Code MVD 17.30(37).

(33) Sun Shield. Interior adjustable sun visor not less than 6 inches by 16 inches in size shall be installed above windshield.

(34) Undercoating. Entire underside of body, including floor members and side panels below floor level, shall be coated with fire-resistant, asphalt base or rubber base undercoating material applied by spray method, at least 1/8 inch thick, in order to seal, to deaden sound, to insulate, and to prevent oxidation.

(35) Ventilation. (a) Body shall be equipped with suitable, controlled ventilating system of sufficient capacity to maintain proper quantity of air under operation conditions without opening of windows except in extremely warm weather.

(b) If static-type exhaust roof ventilators are desired, they shall be installed forward of the center of roof.

(c) Above sections do not apply to small vehicles not originally manufactured as school buses.

(36) Wheel Housings. (a) Wheel housing openings shall allow for easy tire removal and service.

(b) Wheel housing shall be designed to support seat and passenger loads and shall be attached to floor sheets in such manner as to prevent any dust or water from entering body.

(c) Inside height of wheel housings above floor line shall not exceed 10 inches.

(d) Wheel housings shall provide clearance for loaded bus and the use of anti-skid chains.

(e) Above sections do not apply to small vehicles not originally manufactured as school buses.

(37) Width. Overall width of bus shall not exceed 96 inches.

(38) Windshield and Windows. (a) All glass in windshield, windows, and doors shall be of safety glass, so mounted that permanent mark is visible, and of sufficient quality to prevent distortion of view in any direction.

(b) Windshield shall be large enough to permit driver to see roadway clearly, shall be slanted to reduce glare, and shall be installed between front corner posts that are so designed and placed as to afford minimum obstruction to driver's view of roadway.

(c) All regular side windows shall provide an opening from the top of not more than 10 inches obtained by lowering window. Windows which are hinged at top and push out from the bottom must be fastened so that they cannot be pushed out from the bottom when being used in school transportation. Windows may be reversed to push out from the top. Such installation shall have the window hinged at the bottom and the top shall be restrained so it does not push out further than it would if hinged at the top.

(d) All exposed edges of glass shall be banded.

(e) Glass in all side and rear windows shall be of AS-2 or better grade, as specified in American National Standards Institute Code Z26.1.

(f) Knockout-type, split sash windows may be used.

Note: Current Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways (Z26.1) obtainable from American National Standards Institute, 10 East Fortieth Street, New York, N.Y. 10016.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State and the Revisor of Statutes.

(39) Windshield Washers. Windshield washers shall be optional, but where installed they shall conform to manufacturers specifications as to type and size of bus on which they are to be used.

(40) Windshield Wipers. Bus shall be equipped with 2 positive-action variable-speed windshield wipers of vacuum, air, or electric type.

(41) Wiring. (a) All wiring shall conform to standard of Society of Automotive Engineers, SAEJ555(a) of 1962 revision.

Note: This standard obtainable from Society of Automotive Engineers, 485 Lexington Avenue, New York, N.Y. 10017.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(b) Circuits:

1. Wiring shall be arranged in at least eight regular circuits as follows:

a. Head, tail, stop (brake), and instrument panel lamps.

b. Clearance lamps.

c. Dome.

d. Starter motor.

e. Ignition and emergency door signal.

f. Turn signal lamps.

g. Alternately flashing red signal lamps.

h. Horn.

i. Step-well lamps, with door-actuated switch, shall be on the clearance light circuit or separate circuit.

2. Any of the above combination circuits may be subdivided into additional independent circuits.

3. Whenever heaters and defrosters are used, at least one additional circuit shall be installed.

4. Whenever possible, all other electrical functions (such as sanders and electric-type windshield wipers) shall be provided with independent and properly protected circuits.

5. Each body circuit shall be color coded and a diagram of the circuits shall be attached to the body in a readily accessible location.

(c) A separate fuse or circuit breaker shall be provided for each circuit except starter motor and ignition circuits.

(d) All wires within body shall be insulated and protected by covering of fibrous loom (or equivalent) which will protect them from external damage and minimize dangers from short circuits. Whenever wires pass through body member, additional protection in form of appropriate type of insert shall be provided.

(e) Wires not enclosed within body shell shall be fastened securely at intervals of not more than 24 inches. All joints shall be soldered or joined by equally effective connectors.

(f) Above sections do not apply to type II bus not originally manufactured as school buses.

Wis. Adm. Code

MVD 17.55 Applicability/Sections 17.40 and 17.50 apply only to type II bus as defined in s. 17.01(2)(b).

Subchapter IV

School Vans

Note: For purposes of this order, an automobile is considered as a school bus when it is used for the transportation of pupils and has a seating measurement of less than 200 inches based on seat measurements of 20 inches per person, including the driver's seat.

Note: See explanation in Section 17.01(1).

Chassis

MVD 17.60(1) Air Cleaner. Vehicle shall be equipped with adequate oil-bath or dry-element type air cleaner mounted outside passenger compartment.

(2) Battery. (a) Storage battery, as established by manufacturers rating, shall be of sufficient capacity to care for starting, lighting, signal devices, heating and other electrical equipment.

(b) Battery shall be mounted outside passenger compartment in adequate carrier and be readily accessible for servicing and removal, preferably from outside passenger compartment.

(3) Brakes. (a) Foot or service brakes shall, at all times be capable of stopping complete unit from speed of 20 mph in not more than 30 feet, such distance to be measured from point at which movement of service brake pedal or control begins. Tests for stopping distance shall be made on substantially level (not to exceed plus or minus 1% grade) dry, smooth, hard surface that is free from loose material.

(b) Chassis shall be equipped with auxiliary brake capable of locking 2 wheels and capable of holding vehicle on any grade on which it is operated under any conditions of loading on a surface free from snow or ice. Operating controls of such auxiliary brake shall be independent of operating controls of service brakes.

(4) Bumper, Front. (a) Front bumper shall be furnished by chassis manufacturer as part of chassis.

(b) Front bumper must extend to outer edges of fenders at bumper top line (to assure maximum fender protection) and be of sufficient strength to permit pushing vehicle of equal gross weight without permanent distortion to bumper, chassis or body.

(5) Exhaust System. (a) Exhaust pipe, muffler, and tailpipe shall be outside body and attached to chassis. All units and connections shall be firm and leakproof.

(b) Tailpipe shall be constructed of seamless or electrically welded tubing of 16-gauge steel or equivalent. Flexible tubing shall not be used as part of the exhaust system.

(c) Size of tailpipe shall not be reduced after it leaves muffler. Tailpipe shall extend beyond the external rear of the body at the point of projection, but not beyond the bumper.

(d) Noise level shall not exceed 125 sones as measured by Beranek-Armour ATA Tone Equivalent Method.

Note: Automobile Manufacturers Association, 320 New Center Building, Detroit 2, Michigan.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(6) Fenders. Protection for wheels shall be provided by fenders or suitable body construction. Total spread of outer edges of such protection, measured at fender line, shall exceed total spread of tires when wheels are in a straight ahead position.

(7) Horns. Vehicle shall be equipped with standard make dual horns in good working order and capable of emitting sound audible under normal traffic conditions from a distance of not less than 300 feet.

(8) Instruments and Instrument Panel. (a) Chassis shall be equipped with the following instruments and gauges.

1. Speedometer which will show speed.
2. Odometer which will give accrued mileage.
3. Fuel gauge.
4. Upper-beam headlight indicator.
5. Ammeter.
6. Oil pressure indicator.
7. Temperature indicator.

(b) All instruments shall be accessible for maintenance and repair. All instruments shall be maintained in good working order.

(c) Above instruments and gauges shall be mounted on instrument panel in such manner that each is clearly visible to driver in normal seated position. Indicator lights may be used in place of ammeter, oil pressure indicator, and temperature indicator.

(d) Instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges.

(9) Openings. All openings in floor board or firewall between chassis and passenger-carrying compartment, such as for gearshift lever and auxiliary brake lever, shall be sealed. See Wis. Adm. Code Section MVD 17.70(2)(c).

(10) Power and Gradeability. Chassis must be so geared and powered as to be capable of surmounting 3.7% grade at speed of at least 20 miles per hour with full load on continuous pull in direct drive.

(11) Shock Absorbers. Vehicle shall be equipped with double acting shock absorbers of adequate size and in good working order.

(12) Springs. Springs or suspension assemblies shall be of ample resiliency under all load conditions and of adequate strength to sustain loaded vehicle without evidence of overload.

(13) Tires and Rims. (a) All tires shall be of same size.

(b) All tires shall have visible tread.

(c) Spare tire mounting may be manufacturer's specification.

(14) Bumper, Rear. (a) Rear bumper shall be furnished by chassis manufacturer as part of chassis.

(b) Rear bumper shall be of sufficient strength to permit vehicle being pushed without permanent distortion to bumper, chassis or body.

Body

MVD 17.70(1) Color. Painting is optional but, if vehicle is painted school bus glossy yellow, the color scheme shall be the same as the Type I bus (section 17.30(8)). Buses presently using a yellow with black trim color scheme prior to January 1,1975 are not required to paint to the Type I standard.

Note: Color chips of federal standard No. 595 chrome yellow enamel No.13432 and black enamel No.17038 available from General Services Administration, Business Center, Region 3, Seventh and D Streets, S.W., Washington 25, D.C.

This reference is available in the office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(2) Construction. (a) Construction shall be all-steel or other metal with strength at least equivalent to all-steel as certified by manufacturer.

(b) Construction shall be reasonably dustproof and watertight.

(c) All openings between chassis and passenger-carrying compartment made due to alterations by body manufacturer must be sealed. See also Wis.Adm. Code Section 17.60(9).

(d) Floors shall be manufacturer's standards and shall be covered with non-skid material.

(3) Defrosters. Defrosters are required, and shall be of sufficient capacity to keep windshield and driver's window clear of fog, ice, and snow. This may be done by using fans or by taking heat directly from approved heater.

(4) Doors. Manufacturers specifications. All inside door handles on camper type vehicles shall be protected against accidental release.

(5) Emergency Equipment. (a) Except for those vehicles used as family cars, vehicles coming within the purview of this subchapter shall be equipped with the following emergency equipment:

1. One axe or steel wrecking bar.

2. At least three red flags not less than 12 inches square with suitable means for mounting.

3. At least three red electric lanterns, or three oil burning pot type flares and three red burning fusees, or three red reflective type flares.

(6) First Aid Kit. Grade A metal first aid kit and Type II contents conforming to specifications as set forth in Federal Specifications GG-K-391a of March 3, 1959 and containing at least 10 units as follows:

Bandage Compress, (sterile gauze pads) 4-inch	1 Packet
Bandage Compress, (sterile gauze pads) 2-inch	1 Packet
Adhesive Absorbent Bandage (bandaid type) 1-inch	2 Packets
Triangular Bandage, 40-inch	1 Packet
Burn Compound, 1/8 Ounce	1 Packet
Antiseptic Applicators (swab type) (iodine, or nitromersol tincture N.F. or thimerosal N.F.)	1 Packet
Ammonia Inhalants	1 Packet
Tourniquet and Forceps	2 Packets

Note: Federal Specifications, GG-K-391a Obtainable From:
General Services Administration
Business Service Center
Region 3, Seventh & D Streets
Washington 25, D. C.

This reference is available in the Office of the Division of Motor Vehicles, the Secretary of State, and the Revisor of Statutes.

(7) Heater(s). (a) Heater(s) are required, and shall be of hot-water or combustion type, manufacturer's standards.

(b) If only one heater is used, it shall be of fresh-air or combination fresh air and recirculating type.

(c) If more than one heater is used, additional heaters may be of circulating type.

(d) All combustion-type heaters shall be approved by Underwriters' Laboratories, Inc.

(e) Heater(s) shall be capable of maintaining inside temperatures of 50 degrees fahrenheit at average minimum January temperatures as established by U. S. Department of Commerce, Weather Bureau, for area in which heater is required.

(8) Identification. (a) If vehicle is painted in compliance with Wis. Adm. Code Section MVD 17.70(1) the following requirements shall be complied with:

1. Body shall bear words "SCHOOL BUS" in black letters at least 6" high and 3/4" brush stroke on yellow signs attached to front and rear. Such signs shall be placed above windshield and rear window as high as possible without impairment to visibility.

2. Name and address (and telephone number if desired) shall be displayed on right hand door of driver's compartment. If desired, this marking may also be painted on the left side below the driver's window.

3. When bus is being used for other than school transportation purposes, flashing red signals shall not be used and the words "SCHOOL BUS" shall be removed or concealed.

4. (a) The registration card shall be carried or displayed in the driver's compartment as required by Section 341.11(4) Wis. Stats.

(b) If vehicle is not painted, use of school bus sign is optional but, if used, must comply with subsection 1. above.

(9) Lamps and Signals. (a) Manufacturer's standards shall apply for headlamps, tail lamps, stop lamps, direction lamps and license plate lamps.

(b) Flashing red signal lamps as follows are required if automobile is painted according to Wis. Adm. Code Section MVD 17.70(1).

(Definition) School bus alternately flashing red signal lamps are lamps mounted at same horizontal level, intended to identify vehicle as school bus and to inform other users of highway that such vehicle is stopped or about to stop on highway to take on or discharge school children.

1. Bus shall be equipped with 2 red warning lamps at rear of vehicle and 2 red warning lamps at front of vehicle, which shall be controlled by manually actuated switch and shall flash alternately at rate of 60 to 120 cycles per minute. No brake or door operated switch shall be permitted. "On" period shall be long enough to permit bulb filament to come up to full brightness.

2. Red warning lamps shall be seal beam type, or other improved type meeting the requirements of subsection 4. following, not less than 5 inches in diameter and visible from a distance of at least 500 feet along the axis of the vehicle in bright sunlight.

3. There shall be visible or audible means of giving clear and unmistakable indication to driver when signaling system is turned on.

4. INSTALLATION. a. Each red warning signal lamp shall be mounted with its axis substantially parallel to longitudinal axis of vehicle.

b. Front and rear red warning signal lamp shall be spaced as far apart laterally as practicable, but in no case shall spacing between lamp centers be less than 3 feet.

c. Location of front red warning signal lamps shall be such that they can be clearly distinguished when headlamps are lighted on lower beam.

d. Red warning signal lamps shall be mounted at front above windshield and at rear so that lower edge of lens is not lower than top line of side window openings.

e. Vision of front signal lamps to front, and rear signal lamps to rear shall be unobstructed by any part of vehicle from 5 degrees above to 10 degrees below horizontal and from 30 degrees to right and 30 degrees to left of center line of vehicle.

f. Red warning signal lamps on such vehicles shall be equipped with black hoods at least 3 inches long.

(10) Rear Vision. Manufacturer's standard is acceptable. In addition, one outside mirror mounted on left side shall be required.

(11) Seats. (a) All seats shall be forward-facing and shall be securely fastened to that part of parts of automobile which support them.

(b) No jump seats, portable seats or side seats shall be used.

(c) If fiber-glass seats are used, the following requirements must be complied with:

1. Fiber-glass seats must meet all foregoing provisions for seats except those concerning construction of seat cushions and seat backs.

2. Fiber-glass seats shall combine rigid construction of welded tubular steel with contoured matched die formed or hand-sprayed molded plastic shell. Exposed steel shall be stainless steel or shall be finished with baked enamel.

3. Plastic shells shall consist of good commercial grade, fire-resistant, color pigmented resin reinforced with glass fibers in such manner as to avoid resin rich sections. Shells shall be shaped to provide maximum comfort.

4. Both metal frames and plastic shells shall have rounded corners and be free from sharp edges. Except for rear-most row, fiber-glass seats shall be provided with toprail crash pads.

(d) Allowable rump width in determining seating capacity of automobiles or actually seating pupils shall be 13 inches.

(12) Seat Belts. Seat belt complying with ss. 347.48 Wis. Stats. shall be provided for driver.

(13) Stop Signal Arm. All school vans shall be equipped with stop signal arms except the following:

(a) vans which are not painted yellow or equipped with red flashing warning lights,

(b) vans which are operated only in areas, streets or highways where use of flashing red warning lights is prohibited.

For specifications and installation requirements see Sec. 17.30(37).

(14) Sun Shield. Shall be manufacturer's standards.

(15) Windshield and Windows. All glass in windshield, windows, and doors shall be of safety glass, so mounted that permanent mark is visible, and of sufficient quality to prevent distortion of view in any direction.

(16) Windshield Wipers. Vehicle shall be equipped with two positive-action windshield wipers of vacuum, air, or electric type.

(17) Wiring. All wiring shall be manufacturer's standards or equal.

MVD 17.75 Applicability Sections 17.60 and 17.70 apply only to school vans as defined in s. 17.01(2)(c).

Subchapter V

General Requirements

MVD 17.80(1) Orthopedic Buses. Buses used for the transportation of handicapped children shall comply with standards set forth elsewhere in this chapter for buses of the same capacity, but, because of the special equipment required, certain modification may be made as follows:

(a) General driver requirements set forth in Subchapter 1 are applicable except that special loading and unloading procedures may be followed.

(b) Special seating devices are permissible. Where wheel chairs are used, they must be securely anchored to the floor or walls or both before vehicle is put in motion.

(c) If ramp or power lift is used, it shall be of sufficient strength and rigidity to support the wheel chair, occupant and attendant. It shall be covered with non-skid material.

(d) Because of the special construction and function of orthopedic buses, they will be inspected by the Division of Motor Vehicles on an individual basis.

(2) Panel trucks and station wagons. No panel truck or delivery car shall be put in service as a school bus unless it meets the requirements of this section. No station wagon having a body of wood construction shall be put into service as a school bus.

(3) Enforcement Policy. (a) The enforcement policy of the Division of Motor Vehicles shall take into consideration the age, condition, and equipment of vehicles before granting approval for their continued use. Division of Motor Vehicles shall prohibit the use of any vehicle for school transportation purposes which is deemed to be unsafe or unfit for such service.

(b) In construing and enforcing the provisions of this chapter, the act, omission or failure of any officer, agent, servant or other person acting for or employed by the registered owner or the lessee of the bus, whoever has control, done within the scope of his employment is deemed to be the act, omission or failure of such registered owner or lessee. This shall not apply to violations of Chapter 346, Wis. Stats.

(4) Inspection. Upon notification by the Administrator of the Division of Motor Vehicles or his representative, or the Department of Public Instruction, or any public school official, the owner or operator shall present all school buses for inspection at the time and place designated. No bus shall be operated in pupil transportation until it has been approved for such operation by the Division of Motor Vehicles.

(5) Penalties. Violations of any provision of Chapter MVD 17 shall be prosecuted under the governing statute. Where no penalty is provided the violation shall be prosecuted as set forth in Section 341.04(3) Wis. Stats.

(6) Applicability. (a) The provisions of Chapter MVD 17 (revised 1973) shall take effect on all buses first placed in operation as school buses in Wisconsin after March 1, 1974.

(b) Except as provided in (c) buses placed in service as school buses in Wisconsin prior to March 1, 1974 shall comply with the administrative code in effect at the time they were first put in such service.

(c) Subchapter 1, Driver Requirements as set forth in this 1973 revision shall apply to the operation of all school buses regardless of age.