Chapter 4501-5
School Bus Minimum Standards

4501-5-01 General provisions.

(A) Except as otherwise provided in paragraphs (O)(2)(a) to (O)(2)(d) of this rule, all school buses for which bids are issued, bid on or after the effective date of this rule, shall conform to the rules in this chapter. These rules also cancel all existing "Approved Equal" certification and all construction approvals or waivers.

(B) School buses shall be manufactured and maintained as specified in rules 4501-5-02 to 4501-5-08 of the Administrative Code as applicable for the type of school bus. Any manufacturer, dealer or owner wishing to install any equipment or product other than those specified in rules 4501-5-02 to 4501-5-08 of the Administrative Code, including equipment or products the manufacturer, dealer or owner believes are equivalent or superior to equipment or products specified in those rules shall have prior approval, in writing, from the director. Requests for permission to install shall comply with rule 4501-5-09 of the Administrative Code.

(C) A manufacturer's and/or dealer's failure to comply with any of the rules in this chapter and all national highway traffic safety administration recalls may result in the suspension of authorization for sale and/or use of the chassis and/or body in the state of Ohio until such discrepancy is corrected by the manufacturer or responsible representative and written approval is issued by the department.

(D) Each manufacturer shall file a statement of compliance within thirty days after the effective date of this rule. The statement shall certify that all products and components manufactured for use in school buses sold for use in Ohio, as defined in division (F) of section 4511.01 of the Revised Code, will meet all rules in this chapter.

(E) Specifications shall be filed with the director in duplicate by the school bus chassis and/or body manufacturer that will meet the standards in this chapter. Specifications being submitted by the manufacturers shall also include any sales brochures and pertinent literature. When new models are introduced, specifications shall be filed with the director.

(F) Pre-delivery inspection shall be conducted by both body and chassis manufacturers to assure the bus being delivered is in satisfactory operating order (all components) and meets all applicable federal and Ohio standards. This predelivery inspection shall be according to the specific instructions of the purchaser and to the purchaser's satisfaction.

(G) The bus shall be delivered clean inside and out.



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(H) Body and chassis manufacturers shall provide a written document specifying warranty provisions and enumerating major parts and equipment covered under warranty. Bus body and chassis dealers shall be responsible for providing full warranty service.

(I) The chassis manufacturer shall provide for service at the body plant location after the body is mounted and prior to delivery to the purchaser. At the time of delivery, the chassis dealer shall provide to the purchaser the following documents:

(1) Line set tickets.

(2) Predelivery service check list.

(3) Predelivery check-out form by the chassis manufacturer or designated agent.

(4) Warranty book and statement of warranty.

(J) Any changes in design or equipment by school bus owners after receipt of the school bus must have prior approval in writing from the director of the department.

(K) School buses equipped with equipment or products that have been approved by the director pursuant to rule 4501-5-09 of the Administrative Code shall comply with the installation and operation requirements as approved. If equipment or products that have been approved by the director pursuant to rule 4501-5-09 of the Administrative Code are to be installed by other than the manufacturer or dealer at the original time of sale, permission shall be obtained in accordance with rule 4501-5-09 of the Administrative Code.

(L) School bus definitions

(1) A "Type A School Bus" is a conversion or body constructed upon a van-type compact or cutaway front-section vehicle with a left side driver's door, designed for carrying more than ten persons. This definition shall include two classifications:

(a) Type A-1, with a gross vehicle weight rating (GVWR) of ten thousand pounds or less,

(b) Type A-II, with a gross vehicle weight rating (GVWR) of ten thousand one pounds or more.

(2) A "Type B School Bus" is a conversion or body constructed and installed upon a van or front-section vehicle chassis, or stripped chassis, with a gross vehicle weight rating of more than ten thousand pounds, designed for carrying more than ten persons. Part of the engine is beneath and/or behind the windshield and beside the driver's seat. The entrance door is behind the front wheels.

(3) A "Type C School Bus" is a body installed upon a flat back cowl chassis with a gross vehicle weight rating of more than ten thousand pounds, designed for carrying more than ten persons, including the driver. All of the engine is in front of the windshield and the entrance door is behind the front wheels.

(4) A "Type D School Bus" is a body installed upon a chassis, with the engine mounted in the front, midship, or rear, with a gross vehicle weight rating of more than ten thousand pounds and designed for carrying more than ten persons, including the driver. The engine may be behind the windshield and beside the driver's seat, at the rear of the bus behind the rear wheels, or midship between the front and rear axles. The entrance door is ahead of the front wheels.

(M) All body and chassis manufacturers shall provide a current up-to-date parts and service repair manual(s) for each body and chassis. This is not to be interpreted as an owner's manual. If the school bus owner is ordering more than one of the same body and chassis then only one parts and service manual would be required.

(N) All chassis and body replacement parts shall be readily available for a minimum of fifteen years.

(O) (1) The responsibility for compliance with these rules and/or national highway traffic safety administration recalls lies with the school bus owner. A manufacturer's and/or dealer's failure to comply with any of the rules in this chapter and all national highway traffic safety administration recalls may result in the suspension of authorization for sale and/or use of the chassis and/or body in the state of Ohio until such discrepancy is corrected by the manufacturer or the responsible representative and written approval is issued by the department.

(2) School bus owners shall maintain all school buses in such condition that they continue to meet Ohio school bus minimum construction standards as follows and federal motor vehicle safety standards (FMVSS) in effect on the bid date, or if the bid date is unknown, on the manufacture date until such standards or specifications are subsequently repealed or reduced:

(a) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after September 1, 1998, but before the effective of this chapter, the Ohio Department of Public Safety Ohio School Bus Construction Standards, Effective September 1, 1998

(b) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after January 1, 1990 but before September 1, 1998, the Ohio Department of Education School Bus Minimum Construction Standards, Effective January 1, 1990

(c) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after July 1, 1988 but before January 1, 1990, the Ohio Department of Education School Bus Minimum Construction Standards, Effective July 1, 1988

(d) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after April 1, 1978 but before July 1, 1988, the Ohio Department of Education School Bus Minimum Construction Standards, Effective April 1, 1978.

(3) A complete and accurate copy of the Ohio school bus construction standards as indicated above will be deposited in each of five depository libraries designated by the state library board or may be obtained by contacting: The Ohio State Highway Patrol Office of Licensing and Commercial Standards, Ohio Department of Public Safety, 1970 West Broad Street, Columbus, Ohio 43223.

(P) All school bus body and chassis manufacturers shall immediately notify the director and the superintendent of public instruction of any safety-related product recalls.

(Q) Any composite materials used in school bus construction shall meet or exceed all applicable FMVSS in strength and durability.

(R) Material approved for incorporation by reference

The following are contact sites for the material incorporated by reference in Chapter 4501-5 of the Administrative Code: Except as otherwise provided in paragraphs (O)(2)(a) to (O)(2)(d) of this rule, the versions of all federal regulations and other texts incorporated by reference throughout Chapter 4501-5 of the Administrative Code are those in effect on the effective date of this rule.

(1) Federal Motor Vehicle Safety Standards (FMVSS), Department of Transportation-National Highway Traffic Safety Administration (DOT-NHTSA), 400 7th Street SW, Washington DC 20590

Obtained via Government Printing Web Site: www.access.gpo.gov/nara

(2) Society of Automotive Engineers (SAE)

Obtained via: 400 Commonwealth Drive, Warrendale, PA 15096

Telephone: (724) 776-4841, Web Site: www.sae.org

(3) American Society for Testing and Materials (ASTM)

Obtained via: ASTM International, 100 Barr Harbor Drive PO Box C700, West Conshohocken, PA 19428-2959

Telephone: (610) 832-9585, Web Site: www.astm.org

(4) Federal Motor Carrier Safety Regulations (FMCSR)

Obtained via: Government Printing Office, 400 7th Street SW, Washington DC 20590

Telephone: (202) 366-2519, Web Site: www.fmcsa.dot.gov

(5) National School Transportation Specification and Procedures, Missouri Safety Center, Central Missouri State University, Warrensburg, Missouri 64093

Telephone: (660) 543-4830

(S) Definitions:

As used in this chapter of the Administrative Code:

(1) "Department" means the department of public safety.

(2) "Director" means the director of the department of public safety.

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Research Aids

School bus marking and equipment

O-Jur3d: Auto & Veh § 251

4501-5-02 Standards and specifications for type B, C, and D school bus chassis.

(A) The front and rear axles, including suspension assemblies, and all frame-to-ground components, shall have a gross axle weight rating at ground at least equal to that portion of the load as would be imposed by the chassis manufacturer's maximum gross vehicle weight rating.

(1) Heavy-duty double-acting shock absorbers compatible with the manufacturer's rated axle capacity shall be installed on the front and rear of the school bus chassis.

(2) Suspension assemblies as specified shall maintain/control stability of school bus under all loading conditions.

(B) Battery.

(1) An eight hundred cold cranking amperes or larger battery shall be used with a gasoline engine. A one thousand two hundred fifty cold cranking amperes or larger battery, depending on additional amperes draw, shall be used with diesel engines.

(2) One-piece non-spliced battery cables shall be provided by the chassis manufacturer. All cables shall conform to society of automotive engineers standard J541 with respect to electrical resistance.

(3) Batteries for types B, C, and D school buses shall be mounted in the body skirt by the body manufacturer. In this case the chassis manufacturer shall temporarily mount the battery on the chassis frame, with proper cables of appropriate length for mounting Exception: Type D rear engine bus may have batteries mounted in engine compartment.

(C) All braking systems and components shall meet or exceed the minimum requirements specified in applicable FMVSS 571.105, 571.121 and the following.

(1) Air or hydraulic brake systems are acceptable. If brakes are air actuated, they shall be of the cam drum type on front and rear wheels, if brakes are hydraulically actuated, they shall be disc front and drum rear or four wheel disc. Only split type systems are acceptable.

(2) All air brake systems shall have both visual and audible warning systems that activate when the air pressure drops below sixty pounds per square inch in any service reservoir. Hydraulic brake systems that utilize hydraulic power assist shall have both systems to indicate loss of fluid flow to the power assist unit.

(3) All buses equipped with air brakes shall have oil deflectors installed between the rear hub and drum to divert excessive oil or grease from contaminating the brake lining due to a rear axle seal leak.

(4) Air compressors that supply air to brakes must have a rated capacity of at least thirteen cubic feet per minute and must be pressure oil fed. Clean air to all compressors shall be supplied and filtered through engine air cleaner. Separate compressors that supply air to accessories only and not braking systems, shall be a minimum of nine and one half cubic feet per minute. Air compressor may be gear or belt driven.

(5) All air supplied from the wet, primary, secondary, and accessory air tanks shall be taken at or above the center line of the air tank to avoid water entering the braking system or air operated accessories.

(6) The wet, primary, secondary, and accessory air tanks shall all be equipped with manual air tank drains.

(7) All school buses equipped with air brakes shall require a desiccant type air dryer with a renewable or replaceable desiccant cartridge (filter). Dryer shall incorporate an automatic purge and drain cycle with heating element.

(8) All parking brakes shall be mechanically applied and held. A red indicator light, located in the dashboard with the words "parking brake", shall light whenever the parking brake has been applied.

(D) Front bumper

(1) Front bumper on all conventional-type buses shall be furnished by the chassis manufacturer.

(2) Front bumper on all transit buses shall be furnished by the body manufacturer.

(3) Front bumper shall be at least three-sixteenths of an inch thick pressed steel channel, one-piece construction, with a minimum width of eight inches after forming.

(4) Front bumper shall be contoured to offer maximum protection of fender lines without permitting snagging or hooking.

(5) Front bumper shall be attached to the frame and extended forward of grille, head lamps, fender, or hood sections and extend the entire width of the bus to provide maximum protection.

(6) Front bumper unless an energy-absorbing bumper, shall be of sufficient strength to permit lifting the bus with a bumper type lift for servicing and pushing a vehicle of equal weight without permanent distortion to bumper, chassis, or body.

(7) An optional energy-absorbing front bumper may be used, providing its design shall incorporate a self-restoring energy absorbing system of sufficient strength to:

(a) Push another vehicle of similar gross vehicle weight without permanent distortion to the bumper, chassis, or body; and

(b) Withstand repeated impacts without damage to the bumper, chassis, or body according to the following performance standards:

(i) Seven and one half miles per hour fixed-barrier impact (FMVSS cart and barrier test)

(ii) Four miles per hour corner impact at thirty degrees (49 CFR, Chapter 5, Part 581)

(iii) Twenty miles per hour into parked passenger car (class B, C, and D buses of eighteen thousand pounds gross vehicle weight rating or more)

(E) The manufacturer of the energy-absorbing system shall provide evidence from an approved test facility capable of performing the above standards tests that their product conforms to the above.

(F) Clutch – chassis using manual transmission shall be equipped with a clutch which shall have a rated capacity in a range from equal to the maximum net engine torque up to ten percent greater than the maximum net engine torque.

(G) Color of chassis.

(1) Bumper shall be painted black.

(2) Cowl and fender shall be painted national school bus yellow.

(3) Hood shall be painted non-reflective national school bus yellow or flat black.

(4) Frame shall be painted black.

(5) Grille may be painted national school bus yellow or may also be chrome or anodized aluminum finish.

(6) Wheels, spokes and rims shall be black, and/or gray.

(7) Paint finish coats to bus body, hood, cowl, and all attaching sheet metal and fiberglass parts shall be warranted for sixty months with no mileage limit, one hundred percent parts and labor, for adhesion and color retention.

(8) Paint shall be applied for a total dry thickness at a minimum of one and eight tenths mils over all painted surfaces.

(H) Cooling system.

(1) The cooling system radiator shall be of sufficient capacity to cool the engine at all speeds in all gears. Thermostatic controls shall keep the engine at the manufacturer's recommended operating temperature.

(2) Permanent ethylene-glycol or propylene-glycol base antifreeze shall be provided by chassis manufacturer. Anti-freeze shall be compatible with the cooling system and engine.

(3) The cooling system shall be equipped with a coolant recovery or a deaeration system. The system shall be of sufficient size to allow for the added expansion from the added coolant needed for the body heating system. The cooling system shall have a means of checking the coolant without having to remove the radiator cap.

(4) A chassis equipped with an automatic transmission shall have a heavy duty cooling system to provide additional cooling required by the automatic transmission.

(5) The fan shall be a viscous, air operated, or electromagnetic drive type. The fan, alternator, and water pump may be driven by matched dual belts or a single multiple groove serpentine belt of equivalent capacity.

(I) Drive shaft and differential

(1) Drive shafts and universal joints are to be original equipment manufacturer standard.

(2) Metal drive shaft guards are required for each drive shaft section to prevent projecting through the floor or dropping to the ground if broken.

(3) The rear axle ratio shall be compatible with engine, transmission, and tire size.

(J) Electrical system

(1) Alternator

(a) School buses with designed maximum capacity of thirty-five passengers or larger shall be provided with a minimum of one hundred forty-five ampere alternator with a matched regulator. Transit buses with a designed maximum capacity of more than seventy passengers shall be equipped with a one hundred forty-five ampere alternator minimum. Output must be approximately sixty amperes at engine manufactures recommended idle speed.

(b) All school buses of twenty-four through thirty-four designed capacity shall be provided with a minimum of one hundred five ampere alternator. School buses with twenty-four through thirty-four capacity equipped with a lift shall be provided with a one hundred forty-five ampere alternator.

(c) Alternator shall be driven by dual belts with matched pulleys and matched belts. A single multiple-grooved serpentine belt of equivalent or greater horsepower capacity may be used.

(2) Chassis manufacturer shall provide an adequate electric power source terminal for bus body power connection. This terminal shall be connected by number eight wire or larger wire of adequate gauge running from the power supply.

(3) All wiring shall conform to current society of automotive engineers standards.

(K) Exhaust system

(1) Exhaust pipe, muffler, and tailpipe shall be outside bus body and attached to chassis.

(2) Muffler shall be heavy-duty truck type of aluminized or stainless steel or ceramic coated to offer maximum resistance to corrosion or oxidation.

(3) All exhaust pipes and tailpipes shall be constructed of sixteen gauge aluminized steel tubing or better. Short sections of flexible pipe for gas and diesel engines are permitted.

(4) Diameter of tailpipe shall not be reduced after it leaves the muffler.

(5) The tailpipe shall extend to but not beyond the rear bumper. The rear end of tailpipe must be located at least twenty inches to the right or left of the center line of the chassis. A left side exit is permitted for gas and diesel-powered buses. The tailpipe, if a left side exit, shall be located at least three inches and not more than eighteen inches in front of the rear wheel and bent downward at a forty-five degree angle six inches from the end of the pipe. Right side exhaust systems are not permitted.

(6) The exhaust system on a gas-powered chassis shall be insulated from the rear fuel tank and fuel tank connections by a securely attached metal shield at any point where it is twelve inches or less from the fuel tank. Metal shield is not required on diesel-powered buses.

(L) Fenders

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

(2) Front fenders shall be braced and free from any body attachment. Trailing edge of front fender shall extend to bottom of front body section. Fender extensions are acceptable.

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

(M) Frame

(1) Frame shall be designed to correspond with or exceed standard practice performance criteria for trucks of same general load specifications used for highway service.

(2) Frame side members shall be one-piece construction with the following exceptions:

(a) Extension of these members shall be designed, furnished, and guaranteed by chassis or body manufacturer. Installation shall be guaranteed by the company installing extension. Extension of frame lengths shall not be for the purpose of extending wheel base.

(b) No holes shall be permitted in the chassis rails except those drilled at the chassis plant or authorized by the chassis manufacturer.

(c) Welding to chassis rails is permitted only when guaranteed by the company making the modifications.

(N) All fuel tank specifications shall conform with FMVSS 571.301.

(1) Fuel tank shall have a minimum capacity of thirty-three gallons with a thirty gallon actual draw, for school buses up to and including fifty-nine passengers. School buses of sixty passengers and above shall have a minimum capacity of sixty gallons with a fifty-five gallon actual draw. It shall be filled and vented outside of the body. Construction will prevent the spillage or drainage of fuel on any part of the exhaust system. Type B buses' fuel tank shall have a minimum capacity of thirty gallons with a twenty-five gallon actual draw.

(2) Fuel filter with replaceable element shall be installed between the fuel tank and injector pump. A flexible connection which is gasoline and oil-proof shall be provided at the engine end of the fuel line.

(3) A water separator shall be installed between fuel tank and all diesel engine fuel and/or fuel injector pumps. The fuel/water separator shall not serve as the only fuel filter.

(4) Drain plug of at least one-fourth inch pipe thread shall be located in center of bottom of tank.

(O) Engine speed governor shall be installed on all school buses. Setting shall comply with manufacturer's maximum recommended governed speed and be set by the chassis manufacturers.

(P) Horns

School bus shall be equipped with dual horns of standard make, each horn capable of producing complex sound in band of audio frequencies from two hundred fifty to two thousand hertz and having total sound level of one hundred to one hundred twenty decibels within these frequency limits when measured at fifty feet from the vehicle.

(Q) Instruments and instrument panel.

(1) Chassis shall be equipped with the following instruments and gauges. Lights in lieu of gauges are not acceptable.

(a) Speedometer

(b) Odometer which will give accrued mileage up to nine hundred ninety nine thousand and nine hundred ninety nine.

(c) A voltmeter with a graduated scale of sixteen volts. Voltmeter shall show the battery voltage. It shall be off when the key is in the off position.

(d) Electrical or mechanical oil pressure gauge.

(e) Electrical water temperature gauge.

(f) Fuel gauge.

(g) Rear engine transit type d chassis shall be equipped with an electrical tachometer.

(2) All buses shall have a warning system consisting of a light and optional buzzer to notify driver of low engine oil pressure, low engine coolant level, and coolant overheating. System shall not automatically shut off engine.

(3) All instruments shall be easily accessible for maintenance and repair.

(4) The above instruments and gauges shall be mounted on instrument panel in such a manner that each is clearly visible to driver in a seated position. The visibility of the instruments must comply with FMVSS 571.101.

(5) All instrument faces shall be illuminated.

(6) The chassis manufacturer shall provide and cover instrument panel with plastic covering or equivalent in order to provide protection from precipitation from the time of manufacture until the body is mounted.

(R) Chassis lamps and signals

(1) All lamps and their installation shall conform to current FMVSS 571.108.

(2) High beams are to be controlled by a column mounted dimmer switch.
(3) A self-canceling turn signal shall be installed by the manufacturer as an integral part of the steering column assembly.

(S) Oil filter of replaceable element or cartridge type shall be provided and shall be connected by flexible high-pressure type hose with wire braid reinforcement that will withstand pressure and heat if it is not of built-in or engine-mounted design. Hose must meet SAE J1019 and SAE J1402.

(T) All openings made by the chassis manufacturer in the floorboard and fire-wall shall be sealed by the chassis manufacturer to prevent gases from entering driver's compartment. Boots for the accelerator pedal, gearshift, and emergency brake, when required, shall be supplied by the chassis manufacturer.

(U) Power train

(1) Diesel engines

| Passengers | Minimum Horse Power | Minimum Torque | Maximum Revolutions Per Minute |
|---|---|---|---|
| 24 – 48 | 160 | 350 foot/pounds | 3000 |
| 49 – 54 | 165 | 350 foot/pounds | 3000 |
| 55 – 59 | 175 | 400 foot/pounds | 3000 |
| 60 – 84 | 185 | 400 foot/pounds | 3000 |

(2) Gasoline engine

| Passengers | Minimum Horse Power | Minimum Torque | Maximum Revolutions Per Minute |
|---|---|---|---|
| 24 – 48 | 160 | 275 foot/pounds | 3800 |
| 49 – 54 | 180 | 290 foot/pounds | 3800 |
| 55 – 59 | 180 | 290 foot/pounds | 3800 |
| 60 – 84 | 190 | 310 foot/pounds | 3800 |

(3) All diesel engines shall be equipped with a turbocharger and air to air intercooler.

(4) All diesel engines shall be equipped with a block heater. Heater shall be a minimum of seven hundred fifty watts.

(5) Dry type air cleaner with an air filter restriction indicator is required.

(6) Engine shall be equipped with a fast idle (air, electronic, or manual) throttle.

(V) Steering system.

(1) All school buses shall be equipped with heavy-duty, truck-type integral power steering.

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

(3) No changes shall be made in the steering mechanism unless approved by chassis manufacturer.

(4) There shall be a clearance of at least two inches between steering wheel and any other surface or control.

(5) Chassis manufacturer shall provide and cover steering wheel and column with a temporary plastic covering or equivalent in order to provide protection from precipitation from the time of manufacture until body is mounted.

(W) Tires, rims, and wheels

(1) Chassis manufacturer or authorized dealer shall balance all wheels and make necessary alignments prior to delivery.

(2) Dual rear tires and wheels shall be provided on all type B, C and D school buses.

(3) All tires on a given vehicle shall be of same size, construction, and capacity.

(4) All school buses shall be equipped with tubeless radial tires of proper size and load range for chassis gross vehicle weight ratings and body combinations as required by FMVSS 571.120. Disc or spoke wheels may be used.

(X) Transmission.

(1) Chassis manufacturer shall furnish an automatic transmission unless the school bus owner specifies a manual transmission.

(2) The torque rating of the automatic transmission shall meet or exceed the maximum torque output of the engine.

(3) Manual transmissions shall be full synchromesh in all forward gears except first and reverse. Manual transmissions shall conform to the following designed maximum chassis capacities.

(a) Ten through forty-nine passenger requires a minimum of four forward speeds and one reverse.

(b) Fifty and above passenger requires a minimum of five forward speeds and one reverse.

(Y) All school bus chassis serial number identification plates shall be attached to the bus and be clearly identifiable and legible for the entire life of the bus.

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Rule amplifies: RC 4511.76
R.C. 119.032 review dates: 03/07/2003 and 03/07/2008

4501-5-03 School bus body standards for type B, C, and D.

(A) Aisle.

(1) Minimum clearance between seats shall be twelve inches at seat level and fourteen inches at top of seat back.

(2) On type D transit forward control front engine buses the aisle shall not be less than twelve inches between engine cover and any other object (measured at floor level). Hold-down fastening devices used on engine cover shall be designed to prevent hooking or catching on shoes or clothing.

(B) Batteries.

Body manufacturer shall provide a drawer-type pull-out tray on all type B, C, and D buses. The batteries shall be enclosed by a compartment constructed of mill-applied zinc steel provided with drain ports, hold-down carrier mounted so as to avoid blocking filler ports, and latching device to prevent accidental opening, Drawer assembly shall be covered with acid-resistant paint. Rustproofing shall be provided and applied to battery box. Battery tray shall be equipped with a positive locking device to keep tray from sliding completely out to prevent battery from being dropped. Exception: Type D rear engine buses – battery may be located in engine compartment.

(C) Rear bumper

(1) Rear bumper shall be of sufficient strength to permit lifting the bus with a bumper type lift for servicing and shall be one piece, heavy-duty type of pressed steel channel, at least three-sixteenths inch of thickness and a minimum of eight inches in height after forming.

(2) Rear bumper shall be wrapped around back corners of bus and extend forward at least twelve inches, measured from rear-most point of body at floor line. Rear bumper shall also protect rear corners of body by extending beyond the body exterior side panels. The bend of the rear bumper at the rear body corners shall be sufficient to allow the entire contour of the forward end of the rear bumper to extend no more than one inch beyond the body line of the exterior side panels.

(3) Bumper shall be fastened to chassis frame side rails in such a manner as to develop full strength of bumper section from rear or side impact. Bracing materials shall have an impact ratio comparable to that of bumper material and shall be fastened at the ends and radii of the bumper, attached to the side of the frame only and not to the body at any point.

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

(5) No spaces, projections, or cutouts that will permit a handhold are permitted.

(6) Two rear tow hooks shall be installed, with the hooks and their mounting of sufficient strength to tow the vehicle at the vehicle's curb weight.

(7) Front ends of the bumper shall be enclosed by endcaps or other protective metal or shall have the ends rounded or tucked in and shall be free from sharp edges or projections likely to cause injury or snagging.

(8) A rubber or metal strip shall be installed to close any opening exceeding one-fourth inch between rear bumper and body metal.

(9) The rear bumper vertical distance between the bottom of the bumper and the ground shall not exceed thirty inches when the vehicle is empty.

(D) Color of body exterior and interior.

(1) Body exterior.

(a) All exterior body and chassis sheet metal including fiberglass shall be painted with polyurethane paint or equivalent.

(b) Components to be black:

(i) Lettering and numbering.
(ii) Bumpers.
(iii) Floor level rub rail.
(iv) Seat level rub rail.
(v) Background area and hoods for warning light system.

(2) All interior panels, walls, and roof surfaces shall be painted by the body manufacturer.

(3) Paint finish coats to bus body, hood, cowl, and all attaching sheet metal and fiberglass parts shall be warranted for sixty months with no mileage limit, one hundred percent parts and labor, for adhesion and color retention.

(4) Paint shall be applied for a total dry thickness at a minimum of one and eight tenths mils over all painted surfaces.

(E) Body construction.

(1) All school bus body construction components except, door handles, grab handles, interior decorative parts, other interior plated parts, and components heavier than twelve-gauge, shall be of prime commercial quality mill-applied zinc coated steel or composite materials. Components must meet or exceed current strength and durability and all applicable FMVSS. The zinc plating shall be one hundred twenty grams per meter square

minimum coating weight (grade sixty) or equivalent applied by either hot dipping or electroplating. All such construction materials shall be fire resistant.

(2) All metal surfaces that will be painted shall be chemically cleaned, etched, zinc-phosphate coated, and zinc-chromate or epoxy-primed, or conditioned by equivalent process.

(3) In providing for the requirements in paragraphs (F)(1) and (F)(2) of this rule, particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges, punched or drilled holed areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subject to abrasion during vehicle operation.

(4) Upon final assembly of the school bus body and after mounting body upon chassis, the total unit strength of the school bus shall meet or exceed all strength criteria as established by FMVSS 571.220 and 571.221.

(5) Body construction shall provide a dustproof and watertight unit.

(6) Floor.

(a) The floor shall be not less than fourteen-gauge mill applied zinc-coated steel. The zinc plating shall be one hundred twenty grams per meter square minimum coating weight (grade sixty) or equivalent applied by either hot dipping or electroplating.

(b) There shall be a main floor cross member of at least ten-gauge steel or equivalent placed at each side post extending the full width of the floor plate and permanently attached.

(c) There shall be a minimum of two intermediate floor cross members of at least sixteen-gauge steel placed equally between the main floor cross members and permanently attached.

(7) All three longitudinal side strainers and members shall be a minimum of sixteen-gauge steel and three inches wide.

(a) There shall be one longitudinal side strainer or impact rail mounted at belt line, windowsill level, and extending at least from the front main vertical post, excluding the front door entrance, to the last main vertical post on each side of body. This member shall be attached at each vertical post.

(b) There shall be one longitudinal side strainer mounted at the side window header level and extended completely around the school bus body. This member shall be attached at each vertical post.

(c) An additional longitudinal side strainer is permitted and shall form an integral part of the school bus body construction and meet all fastening requirements.

(d) Side strainers used in basic construction at floor level and extending above floor line may be utilized as mounting base at wall line for rail-mounted seats.

(8) Rub rails.

(a) Body manufacturers shall install one rub rail at approximately seat level, except for opening for engine compartment side door in a type D bus. This rail shall extend from the main vertical post behind the entrance door to the forward-most vertical post on the left side of the body, including left side emergency door.

(b) A second rub rail shall be installed at approximately the floor line and cover the same longitudinal area as the seat level rail, except at wheel housings, and shall extend to the radii of right and left rear corners.

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

(d) All rub rails shall be four inches or more in width after formed and shall be a minimum of sixteen-gauge steel, corrugated, or ribbed pattern.

(e) All rub rails shall be mounted outside body panels.

(f) External longitudinal members are permissible in addition to all previously specified members if they form an integral part of the body construction and meet the fastening requirements.

(9) Two or more roof strainers or longitudinal members shall be provided to connect, to reinforce flattest portion of roof skin, and to space roof bows. These strainers may be installed between roof bows or applied externally. They shall extend from the windshield header and are to function as continuous longitudinal roof members. At all points of contact between strainers or longitudinal members and other structural material, attachment shall be made by means of welding, riveting, or bolting.

(10) Rear corner construction of the bus body between the floor and windowsill and between the emergency door posts and last vertical side posts shall consist of at least three structural members which will provide impact and penetration resistance equal to or greater than that provided by frame members in the sides of the body. Such structural members shall be securely attached at each end.

(11) If the ceiling is so constructed to contain lap joints, the forward panel shall be lapped by the rear panel and the exposed edges shall be beaded, hemmed, flanged or otherwise treated to minimize sharp edges.

(12) All body components shall be designed and constructed so as to avoid the entrapment of moisture.

(F) Defroster.

(1) Defroster system shall exceed society of automotive engineers standard J381 performance requirements without use of auxiliary fan and with three gallons per minute one hundred seventy degree water applied.

(2) Supplemental coolant additive level shall meet engine original equipment manufacturer specifications. Levels shall be recorded at pre-delivery.

(3) A defroster system of sufficient capacity to keep windshield area, left front side window to rear of the driver's vision, and service door glass area free of condensation or ice under all possible combinations of pupil load and climatic conditions shall be installed.

(4) Defroster system shall be capable of providing at least sixty percent fresh air.

(5) Two adjustable six-inch auxiliary defroster fans shielded with small mesh metal or polypropylene guards shall be installed.

(a) Fans shall be mounted to complement the defroster system used by the manufacturer.

(b) Auxiliary defroster fans shall be controlled individually by multi-speed switches located in the electrical control panel.

(G) Doors and emergency exits.

(1) Service doors.

(a) Service door shall be outward opening split type on all type B, C, and D buses. Service door shall be air, electric, or manually operated. Door shall be under the control of the driver and designed to afford easy release and prevent accidental opening. When a manual lever is used, no parts shall come together so as to shear or crush fingers. Lever shall be equipped with an approved safety latch to prevent accidental opening which will lock in the over-center position when door is fully opened. Manually operated doors shall require no more than twenty-five pounds of pull to close and may be hydraulically assisted.

(b) Manual door control mechanism shall be heavy-duty bearing type, adjustable for wear, non-corrosive, anodized steel, or equivalent.

(c) Service door shall be located on right side of bus opposite the driver and within the driver's direct view.

(d) Service door shall have minimum horizontal opening of twenty-four inches and minimum vertical opening of sixty-eight inches.

(e) Glass in service door shall provide maximum area of visibility for operation of bus.

(f) All edges of service door shall be sealed by flexible rubber or equivalent material to prevent air from entering door entrance when closed.

(g) There shall be no safety rail or handholds mounted on the service door.

(h) There shall be a head bumper pad installed on the inside at the top of the entrance door. This pad shall be approximately four inches in width and extend across the entire top of the entrance door opening and shall meet FMVSS 571.302, flammability of interior materials.

(i) Service door shall have suitable access for easy lubrication.

(j) All electrically or air-operated service doors shall be equipped with a switch or lever located in either hinged panel above the entrance door or above the passenger side windshield that have emergency and normal positions. The switch or lever shall be identified by a decal with the heading "entrance door operation" or "emergency release". The words "emergency" and "normal" will be placed where switch lever is located when in these positions.

(i) When the switch or lever is in the emergency position, it will override door control in driver's area making it non-operational in any of the door control positions.

(ii) Whenever the switch or lever is placed in the emergency position, it will allow the service door to be opened or closed freely in the event of an emergency.

(iii) Air door switches and distribution block that control eight light warning systems shall be securely fastened near the door control valve in the switch panel and shall be easily accessible for service or repair.

(2) Emergency doors.

(a) Emergency doors shall meet FMVSS 571.217 and be designed to be opened from inside and outside of bus and shall be equipped with a fastening device which may be quickly released, but is designed to offer protection against accidental release. An interior handle shall be provided to pull the door shut from the inside which may be used as a protection against accidental release.

(b) Emergency door latch shall be equipped with suitable electric plunger type switch connected to two buzzers, with one located at emergency door and the other in driver's compartment. Switch shall be enclosed in metal or equivalent composite material case, and wires leading from switch shall be concealed in the school bus body. Switch shall be so installed that plunger contacts farthest edge of slide bar in such a manner that any

movement of slide bar will immediately close circuit on switch and activate both buzzers and all dome lights, driver dome light excluded.

Buzzers and dome lights will be operational with the key in the on-off or accessory positions. Power for the emergency lighting and buzzers shall be supplied by a twelve volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(c) Exterior door handle shall be of permanent hitch-proof design and mounted with enough clearance to permit opening without touching door surface.

(d) All emergency door openings shall be completely weather-stripped.

(e) Operation instructions for opening the door shall be lettered or declared on the inside of the emergency door.

(f) There shall be no step-type mechanism in the use of the emergency door.

(g) No seat, chassis or body component shall be installed in the aisleway leading to the emergency door, in violation of FMVSS 571.217, bus emergency exits.

(h) Emergency door shall display the words "Emergency Door" both inside and outside in letters at least two inches high. Words shall be placed directly above the emergency door or on the upper portion of the door.

(i) Rear emergency door.

(i) On all buses, except rear-engine transits, an emergency door shall be located in the rear of the school bus body and centered with respect to the body.

(ii) Emergency door shall have a minimum horizontal opening of twenty-four inches and a minimum vertical opening of forty-eight inches measured from floor level.

(iii) Rear emergency door shall be hinged on right side and shall open outward.

(iv) The rear emergency door shall contain upper and lower glass panels Glass in emergency door shall provide maximum area of visibility for safe operation of school bus.

(v) There shall be a head bumper pad installed over the emergency door on the inside of the school bus body. This pad shall be at least the width of the door opening. Padding shall be of the same material as the padding used over the service door exit.

(j) Left side emergency door.

(i) On all rear-engine transit school buses, a side emergency door shall be located in the rear half of the left side of the bus body. The door shall be hinged on the front side. A theater type flip up seat bottom is permitted to achieve a minimum twelve inch aisle.

(ii) If a door sill or heater line extends above the floor line, a ramp shall be provided covering the area over which a foot must pass as an individual exits through the door.

(3) Emergency side window exits.

(a) All type B, C, and D school buses shall be equipped with side window emergency exits.

(b) School buses with designed maximum seating capacity of less than fifty shall have two emergency swing out windows, one on each side located midway between the front and rear side windows.

(c) School buses with a designed maximum seating capacity of fifty or larger shall have four emergency swing out windows. The emergency windows shall be evenly distributed on both sides of the bus and appropriately spaced. No side emergency exit window will be located above a stop arm.

(d) Emergency window shall display the words "emergency exit" in letters at least two inches high, both inside and outside the window. Words shall be placed no more than three inches directly above window.

(e) Emergency windows shall activate an emergency door buzzer in driver's compartment and all dome lights when not fully latched, driver dome lights excluded. Buzzer and dome lights shall be operational with key in the on-off and accessory positions. Power for the emergency lighting and buzzers shall be supplied by a twelve-volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(f) Operating instructions for opening windows shall be lettered or decaled on the inside below the window or on the window. If lettered on the window, lettering shall be located at the bottom of the window and shall not be a view obstruction.

(4) Emergency windows, type D rear-engine buses.

(a) An emergency window shall be installed above the engine compartment and shall be no smaller than sixteen inches in height and fifty-four inches in width.

(b) Windows shall be hinged from top and provided with a device to ensure against accidental closing during an emergency.

(c) Emergency window in rear shall be equipped with a latch on the inside, and also be equipped with a handle of hitch-proof design which will permit opening from the outside.

(d) Emergency window shall display the words "emergency exit" in letters at least two inches high, both inside and outside the window. Words shall be placed no more than three inches directly above window.

(e) Emergency windows shall activate an emergency door buzzer in the driver's compartment and all dome lights when not fully latched, driver dome lights excluded. Buzzer and dome lights will be operational with key in the on-off or accessory positions. Power for the emergency lighting and buzzers shall be supplied by a twelve -volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(f) If the type D bus is equipped with a left side emergency door, then only one emergency swing out side window is required on the left side of the body midway between the driver window and the left side emergency door.

(5) Emergency roof hatch-type B, C, and D buses.

(a) Buses that have fifty or larger designed maximum capacity shall have a minimum of two emergency hatches located in the front third and rear third of the bus.

(b) Buses that are less than fifty capacity shall have a minimum of one emergency hatch located in the middle of the bus.

(c) A buzzer shall sound and all interior dome lights (driver's dome light excluded) and emergency door buzzer located in driver's compartment shall be activated when the hatch is opened in the escape position. Buzzer and dome lights shall be operational with key in "ON-OFF" or accessory positions. Power for emergency lighting and buzzer shall be supplied by twelve volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(d) If a bus is not manufactured with a static vent, the hatch shall be a static-type with exhaust vent.

(e) Emergency roof hatches shall meet all requirements of FMVSS 571.217.

(H) Emergency equipment shall be mounted in the driver's compartment area in an easily accessible location.

(1) Bus shall be equipped with at least one dry-chemical-type fire extinguisher of at least five-pound capacity, 3A – 40 B.C. rating, mounted in a quick release-type bracket and easily accessible from the driver compartment. The extinguisher shall be equipped with a dial-type graduated gauge which indicates loss of pressure. Fire extinguisher shall be of the type that permits the dry-chemical case to be refilled by ordinary procedures. Fire extinguisher shall be equipped with metal head.

(2) First aid kits shall be dustproof, plainly labeled, mounted in a location easily accessible to the driver, and securely mounted in a metal or plastic container minimum units for the school bus shall be as follows: A sixteen-unit kit shall be used on buses less than fifty designed maximum capacity. A twenty-four unit kit is required for buses of fifty or more designed maximum capacity.

(3) Contents of sixteen-unit first aid kit:

3 Units – 1 inch adhesive compress
2 Units – 2 inch bandage compress
1 Unit – 3 inch bandage compress
1 Unit – 4 inch bandage compress
1 Unit – 3 inchx3 inch plain gauze pads
1 Unit – 4 inch gauze roller bandage
2 Units – plain absorbent gauze – 1/2 square yard
2 Units – plain absorbent gauze – 24 inchx72 inch
3 Units – Triangular bandages

(4) Contents of twenty-four-unit first aid kit:

4 Units – 1 inch adhesive compress
3 Units – 2 inch bandage compress
2 Units – 3 inch bandage compress
1 Units – 4 inch bandage compress
1 Unit – 3 inchx3 inch plain gauze pads
2 Units – 4 inch gauze roller bandage
4 Units – plain absorbent gauze-1/2 square yard
3 Units – plain absorbent gauze-24 inchx72 inch
4 Units – triangular bandages

(5) Three triangle reflectors with weighted stands shall be properly encased for easy storage. Six thirty-minute fusees shall be encased with the triangle reflectors. The triangle reflectors shall meet FMVSS 571.125. The reflectors and fusees shall be encased together in a heavy-duty container. A latchable metal bracket shall be provided to hold these items and shall be mounted within easy access of the driver.

(6) One body fluid kit shall be required. The kit shall contain the following items:

(a) Effective chlorine absorbent deodorant.

(b) Effective germicidal detergent. If detergent contains alcohol, no more than one fluid ounce is permitted in a single-use disposable container.

(c) Single-use, disposable bag.

(d) Single-use, disposable scraper.

(e) Minimum of one pair of disposable, single-use, effective protective gloves.

(f) Effective hand rinse. If hand rinse contains alcohol, no more than one-half fluid ounce is permitted in a single-use disposable container.

(g) The body fluid clean-up kit shall be easily accessible to the driver in the area of the first aid kit and shall be securely mounted in a metal or plastic container.

(h) If alcohol is included, the body fluid clean-up kit shall not contain more than one and one-half fluid ounces of alcohol.

(I) Floor covering.

(1) All floor covering shall be fire resistant and permanently bonded to the floor and must not crack or lose its adhesive power when vehicle is subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and recommended by the manufacturer of the floor covering material.

(2) Underseat areas shall have a smooth fire-resistant floor covering, having a minimum overall thickness of one-eighth inch. The entire joint between the floor covering and the wall of the school bus body shall be covered with a curved, fitted, rust-free metal or composite molding or reformed interior panel.

(3) Driver's compartment floor area shall provide sure footing when wet and be of the same quality material as the underseat floor covering. The driver's compartment floor covering shall be permanently bonded to the floor. A floor mat is not acceptable.

(4) Center aisle covering shall be fire-resistant, non-skid, wear-resistant and ribbed. Minimum thickness shall be one hundred eighty-seven thousandths inch measured from the top of the ribs.

(5) A manual transmission inspection plate shall be installed for easy servicing of the clutch and transmission. The plate shall be installed above the regular floor covering when possible and shall not be undercoated.

(6) Brake, gear shift, and accelerator boots supplied by the chassis manufacturer shall be installed by the school bus body manufacturer.

(7) Metal composite molding, bonding or non-metal welding is acceptable.

(a) Metal, composite molding, bonding or non-metal welding shall cover all floor-covering joints between the ribbed center aisle and smooth underseat floor covering.

(b) Molding around the wheel-well and floor covering shall be provided to seal floor covering with the wheel well.

(8) A fuel access plate shall be installed for easy access to fuel gauge mechanism and shall be installed above the regular floor covering when possible. The access plate shall not be undercoated. Panel shall be sealed to prevent any leakage or moisture. Interior shall not be undercoated. Diamond plate may be used as an access panel.

(9) Floor covering on top step landing shall be one piece.

(J) The fuel fill opening in the body skirt shall be equipped with a hinged cover held closed by a spring or other conveniently operated device. The mechanism that holds this cover closed shall be sufficient to keep it closed under severe operating conditions. The fuel fill opening shall be large enough to permit the entire pump nozzle to pass through the opening and reach the fill neck of the fuel tank.

(K) Glass

(1) All glass shall be manufactured and maintained as follows:

| Location | Glass Type | Rating |
|---|---|---|
| Service Door | Laminated | AS 1 |
| Emergency Door | Tempered | AS 2 or 3 |
| Emergency Window | Tempered | AS 2 or 3 |
| Windshield | Laminated | AS 1 |
| Driver's Side Glass | | |
| And Glass To The Right | | |
| Of The Driver | Laminated | AS 1 |
| All Other Glass | | |
| Behind The Driver | Tempered | AS 2 or 3 |

(L) Heaters.

(1) School bus heating systems shall provide evenly distributed heat throughout the bus body and provide defrosting for windshield and entrance door.

(2) All school buses shall be equipped with three or more hot water heaters capable of maintaining inside temperature of fifty degrees fahrenheit using an ambient temperature of zero degrees to ten degrees fahrenheit.

(3) Type D transit-buses shall be equipped with front heaters. Conventional-type buses shall be equipped with right and left front heaters. A third heater is required on all type B, C, and D school buses and is to be mounted to the rear of the rear wheel well.

(4) Hot water heaters shall display the name plate rating in accordance with the standard code for testing and rating automotive bus hot water heater and ventilating equipment.

(5) multi-speed switches shall operate all heater fans independently.

(6) All hot water lines shall be enclosed.

(7) Heater cores and fans shall be completely encased, but designed to permit servicing heating assembly by removing all or part of the case.

(8) Heater hose installation in the engine compartment shall include two brass shut-off valves able to shut off coolant completely when necessary.

(a) One shut-off valve shall be mounted between the water pump inlet and heater hose connection.

(b) One shut-off valve shall be mounted between the motor block and the heater hose connection.

(9) The body manufacturer shall add the required amount of appropriate antifreeze to protect the cooling system to minus twenty degrees fahrenheit tested at normal engine temperature.

(10) There shall be a heater water-flow regulating valve installed for convenient operation when the driver is in a normal seated position.

(M) The hood engine cover on type D buses must be secured when open to prevent accidental closing while engine is being checked.

(N) Body shall display the following identification:

(1) "School Bus" in black letters at least eight inches high on both front and rear of body. Lettering shall be placed as high as possible without impairment of visibility.

(2) "Stop" on the rear of the school bus in letters approximately ten inches high on the door or the center of the school bus.

(3) Name of the school district shall appear on both sides of the vehicle at the belt line and be at least five inches high.

(4) County of the school district shall appear on both sides of the vehicle in a minimum of three-inch letters with the name, unless the name of the city or exempted village appears as a part of the school district name.

(5) Ownership of the vehicle shall appear on the entrance door side in two-inch high letters to the rear of the entrance door.

(6) Local school bus numbers shall be five inches high and shall be located as follows:

(a) On body near the entrance door;

(b) Centered below the right lower tail light.

(c) On the left side in the area of the driver's window;

(d) On the front in the area designated by the buyer.

(7) Buses shall be marked with reflectorized material as follows

(a) All reflectorized material shall be prismatic retro-reflective super-high intensity grade five or equivalent. The reflectorized material shall meet or exceed the initial reflective value as outlined in ASTM D4956-01.

(b) All reflective material shall be able to retain at least fifty percent of the reflective values for a minimum of seven years.

(c) All reflective material shall be warranted against peeling, cracking, separation and lifting due to weather conditions, pressure, and mechanical washing for a minimum of seven years.

(d) Reflective yellow material two inches in width (plus/minus one quarter inch) shall be applied to both corners of the rear of the bus and extend from the bumper vertically up to the top of the rear windows.

(e) Three seven by fourteen-inch wide pieces of white-silver reflective material shall be applied to the front and rear of the bus to accommodate the state identification and local bus numbers as follows:

(i) One seven by fourteen inch piece of white-silver reflective material shall be applied and centered on the front bumper. If the bumper is manufactured with the holes in the center for two hooks, the seven by fourteen piece of material may be located on the driver's side of the bumper. If the bumper is less than six inches in height, a seven by fourteen inch plate will be permanently attached to the bumper to accommodate the seven by fourteen inch reflective material.

(ii) In the rear, two seven by fourteen inch pieces of white-silver reflective material shall be applied and centered on the flat surface under the left and right lower tail lights.

(f) All emergency doors, windows, and roof hatches shall be outlined around the outside perimeter with one inch yellow reflective material. Roof hatches may be white reflective material.

(g) Reflective material used on stop signs shall be red grade five or equivalent.

(O) Inside body height shall be seventy-two inches or more measured metal-to-metal at any point on longitudinal center line from front vertical bow to rear vertical bow.

(P) Insulation.

(1) Bus body shall be fully insulated in the roof and all body panels to deaden sound, reduce vibrations and heat transfer. Insulation, one-inch minimum thickness, in addition to the usual sprayed on material, shall be a fiberglass or equal and fire-resistant material.

(2) A plywood floor shall be applied on top of the steel floor. Floor covering shall be applied on top of the plywood. Plywood shall be five-eighths inch five-ply type CD exterior grade. Plywood shall extend to fire-wall and under the driver's seat. Plywood shall be sanded and vacuumed before covering is applied. waterproof sealing material shall be applied to seams in the section of plywood floor. Plywood shall be four feet by eight feet sections, pieced only as necessary. Waterproof sealing applied on top of the plywood to hold the floor covering is considered as one method of sealing the seams in the plywood floor.

(Q) Interior.

(1) Interior of the school bus shall be free of all projections.

(2) All school buses shall require inner lining on ceiling and walls and shall include sound abatement package in the driver area. The interior sound level at the driver's seating position shall not exceed ninety decibels when measured in accordance with test procedures found in 49 CFR 393.94C.

(R) Lamps and signals.

All lamps herein listed and their installation shall conform to current standards and recommendations of the society of automotive engineers and meet FMVSS 571.108.

(1) Construction of components.

(a) Directional signal, stop light, taillight, marker light, clearance light, identification light, back up light and reflector lenses shall be of acrylic plastic or meet SAE J576/SAE J579. Alternately flashing red and amber signal lamps shall be sealed beam of acrylic plastic lens construction. Body-mounted stop lamps, directional signals and red signal lamps shall be visible throughout one hundred eighty degrees.

(b) All exterior lamp sockets shall be zinc-plated or chromated steel, or other suitable non-corrosive materials such as plastic or stainless steel.

(c) Alternately flashing red signal lamps, body-mounted directional signals and stop lamps shall be grounded by attaching a ground wire or strap from the lamp socket or negative side of the bulb or ground wire included in the wiring.

(d) Wiring shall conform to current society of automotive engineers standards. A one hundred amp continuous body disconnect solenoid of one hundred amperes continuous-duty shall be supplied and installed so that when the ignition switch is in the off position, all body electrical circuits will be inoperative, except the hazard warning, stop light, marker lights, headlamps, passenger emergency dome lights and buzzers and emergency override switch for warning lights.

(e) The service door step-well light shall be wired with the marker light circuit and activated by a switch controlled by the service door. The light shall be a minimum of six candlepower.

(2) Passenger dome lights and emergency lighting.

(a) Passenger dome lights when activated shall adequately and uniformly illuminate aisleway to three to four foot candles.

(b) All dome light bulbs shall have a minimum candle power of fifteen.

(c) All dome lights shall be equipped with shatter-proof, clear plastic or polycarbonate lenses.

(3) Passenger dome lights shall be controlled by a single switch in the driver's console. Power shall be provided by the switched side of the continuous duty solenoid when key is on the "On" or "Accessory" position and shall be protected by a circuit breaker.

(4) A single driver dome light shall be provided and controlled by a single switch in the driver's console.

(5) Directional signals.

(a) Side and rear directional signals shall be wired to operate properly with the front directional signals supplied by the chassis manufacturer on all conventional-type school buses. Transit-type school buses shall have front, side, and rear directional signals installed by the manufacturer.

(b) School bus body manufacturer shall install required signal lamps to the directional signal control switch so all directional signal lamps shall be operative. The

directional signal system shall be installed on an integral part of the hazard warning signal switch activated by an independent switch furnished by the chassis manufacturer.

(c) Color of lenses shall be amber. All rear directional signals installed by the body manufacturer shall be double-optic and at least seven inches in diameter. Side directional signals shall be armor protected.

(d) Two seven-inch back up lights are required and shall be mounted on or below the belt line on the school bus body. Back up lights shall conform with FMVSS 571.108.

(e) All school buses shall be equipped with an audible electrical warning device, automatically actuated when the bus is in reverse gear. Device shall be one hundred seven decibels or more, meeting society of automotive engineers J994. Device shall be mounted behind rear axle, between frame rails, and shall emit intermittent sound. Device to be provided and installed by body manufacturer.

(6) School bus alternately flashing warning signal lamp.

(a) Each school bus body shall be equipped with a system of four red signal lamps and four amber signal lamps. Both red and amber lamps shall be installed in accordance with society of automotive engineers J887.

(i) Each amber signal lamp shall be located near each red signal lamp, at the same level, but closer to the vertical center line of the bus.

(ii) The system shall be wired so that the amber signal lamps are activated only by a manual momentary switch, and if activated, are automatically deactivated when the bus entrance door is open.

(b) These lamps shall flash at a designated rate from sixty to one hundred twenty cycles per minute.

(c) Operation of warning lights and stop arm system:

(i) Power for the eight light warning system shall be provided by the body continuous duty solenoid when the key is in the "on" position.

(ii) With the key in the "On" position and master switch on, green pilot light shall illuminate to indicate system is ready for operation.

(iii) With entrance door closed and the manual momentary (amber) start switch activated and released, the amber pilot light and amber warning lights shall flash.

(iv) When the entrance door is moved toward the open position, the amber pilot and the amber warning lights shall turn off and the red pilot and the red warning lights shall flash and stop arm shall automatically extend and lights on the stop arm shall flash.

(v) When entrance door is closed, all lights shall go out and the stop arm shall retract automatically. The entrance door switch that activated the red lights in the light system shall be located in a position by a cover or guard that will prevent the switch from being activated or deactivated by pupils boarding or leaving the bus.

(vi) With entrance door open and the manual momentary (amber) start switch activated and released, the red pilot and red warning lights shall flash and the stop arm shall automatically extend, and the lights on stop arm shall flash.

(vii) An emergency system for extending the stop arm and flashing the red warning lights on the bus body and the stop arm shall be installed on each bus body.

(viii) A red emergency override on/off switch shall be installed in the bus body electrical accessory panel. This switch shall be installed with a standard switch identification decal with the words "Emergency Warning Lights."

(ix) The emergency override system shall operate the red pilot light, the red warning lights and automatically extend the stop arm with lights flashing in any door position. System shall operate with key in the on/off or accessory position.

(x) Power for the emergency override system shall be taken off the twelve volt supply line going to the body continuous duty solenoid and shall be protected by a circuit breaker.

(xi) The master and momentary activating switches and pilot lights shall be in a position that is clearly accessible and visible to the driver. The amber and red pilot light lenses shall be approximately one-half inch in diameter.

(xii) If the bus is equipped with a crossing gate, it shall extend and retract in the same manner as outlined for the stop sign.

(d) Installation requirements.

(i) Each flashing signal lamp shall be mounted with its axis substantially parallel to longitudinal axis of vehicle.

(ii) Front and rear alternately flashing signal lamps shall be spaced as far apart laterally as practicable.

(iii) Alternately flashing signal lamps shall be mounted at the front above the windshield and at the rear so that the lower edge of the lens is not lower than the top line of the side window.

(iv) Vertical and lateral vision of the front and rear alternately flashing warning lights shall not be obstructed by any part of the body of the lamp-house insofar as standard bus body construction will permit.

(v) A square or rectangular area around the lens of each alternately flashing signal light and extending outward approximately three inches shall be painted black. In installations where there is no flat vertical portion of the body immediately surrounding the entire lens of the lamp, a square or rectangular band of black, approximately three inches wide, immediately below and to both sides of the lens, shall be painted on the body or roof area against which signal light is visible from a distance of five hundred feet along the axis of the vehicle.

(7) Each bus shall be equipped with two double-optic combination stop and double-optic taillamps with a diameter of not less than seven inches with plain red lens, emitting red light plainly visible from a distance of five hundred feet to the rear. These lamps shall be as high as practical but below the window line and spaced as far apart laterally as practicable, but not less than three feet. Measurements shall be taken from lamp centers. The stop lights are to be activated by the brake switch.

(8) All school bus body lamps and reflectors shall comply with FMVSS 571.108

(a) All marker, clearance and identity lamps shall be armored and conform to society of automotive engineers code PC.

(b) These clearance lamps shall be connected to the chassis headlight circuit and shall be activated by the chassis headlight switch.

(S) All school buses shall be equipped with mirrors meeting the requirements of FMVSS 571.111

(1) Interior rear view mirror shall be a minimum of six by thirty inches.

(2) All exterior mirrors shall be heated and fully adjustable.

(3) Mirror assemblies may include stainless steel materials as necessary (including mounting bracketry), and be warranted one hundred percent replacement coverage for thirty-six months against rust and corrosion, and against any reduction in clarity of view due to discoloration or other deterioration of the lens.

(T) Mounting of body on chassis.

(1) Insulating material shall be placed between all main cross-sill and intermediate members. Insulating material shall be at least one-fourth inch thick and shall be attached to chassis frame or body members so that the body will not move under severe operating conditions.

(2) Chassis frame shall extend to rear edge of rear body cross member.

(3) Bus body shall be attached to chassis frame in such a manner as to prevent shifting or separation of the body from the chassis under severe operating conditions.

(4) Body front shall be attached and sealed to the chassis cowl in such a manner as to prevent entry of moisture.

(U) All buses shall be equipped with two front fender mud flaps and two rear mud flaps.

(V) All openings created in mounting of bus body to chassis shall be sealed by body manufacturer to prevent entrance of gases, dust or moisture into passenger and driver's compartments.

(W) Overall length of a school bus shall not exceed forty feet.

(X) Overall width of a school bus shall not exceed one hundred and two inches, excluding mirrors.

(Y) Seat belt and upper torso restraint system for driver.

(1) A locking retractor-type seat belt for driver shall be provided. Belts shall be equipped with protective boots of sufficient quality and strength to keep it retracted and off the floor and within easy reach of the driver. Belt shall be adjustable on one side only and keep the driver from sliding sideways under the belt.

(2) Belt and emergency locking retractor upper torso restraint shall be installed in compliance with current federal and society of automotive engineers standards.

(3) An emergency locking retractor upper torso restraint shall be provided and shall work in unison with the seat belts.

(Z) Driver's seat.

(1) Minimum distance between steering wheel and back rest of driver's seat shall be eleven inches. Driver's seat shall have vertical adjustment of not less than four inches and horizontal adjustment of not less than four inches.

(2) Seams in cushions and seat backs shall be forty-two ounces or equivalent material strength as upholstery.

(3) The driver's seat and driver's area shall have a barrier meeting FMVSS 571.222 positioned immediately behind the driver's area.

(AA) Passenger seats.

(1) All seating and restraining barrier design and construction must meet the provisions of FMVSS 571.222 all seat back barriers must be a minimum of twenty-eight inches in height, as measured from the intersection of the forward surface of the seat back and the underpressed surface of the seat cushion. The top surface of the barriers shall be the same height as the top surfaces of the seat backs.

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

(3) All seats shall be forward-facing.

(4) School buses with left side emergency door(s) may be equipped with one jump seat. Such seat will be located only immediately adjacent to side emergency exit(s) and shall conform to all applicable federal standards.

(5) Seats shall be mounted so as to provide a minimum of thirty-six inches headroom for sitting position above the top of undepressed cushion line of all seats. Measurement shall be made vertically not more than seven inches from side wall at cushion height and at fore and aft center of cushion.

(6) Seat construction.

(a) Backs of all seats shall be same width at the top and same height from floor, also slanting at the same angle with the floor.

(b) Seat, seat back cushion, seat bottom and crash barrier shall be covered with flame-barrier fire-retardant seating material. Such material must pass the "Fire Block" test.

(i) The flame will not spread to seat back in front of the fire.

(ii) The flames on the rear seat will self-extinguish.

(iii) The flame-barrier, fire retardant seating material will successfully prevent the underlying padding material from being exposed to the flames.

(c) All seat backs and rails shall be covered with energy-absorbing padding material as required by FMVSS 571.222.

(d) A passenger seat cushion retention system shall be employed to prevent the passenger seat cushion from disengaging from the seat frame in the event of an accident. Each seat cushion retention system shall be capable of withstanding a vertical static load equal to a minimum of five times the weight of the cushion. The system shall also be capable of withstanding a forward or rearward static load equal to twenty times the weight of the cushion.

(e) A barrier/padded guard panel in compliance with FMVSS 571.222 shall be placed forward of all seats not having another passenger seat in front

(BB) Service door steps.

(1) The first step of the service door shall be not less than six inches and not more than sixteen inches from the ground.

(2) Service door entrance shall be equipped with three steps. Risers in each case shall be approximately equal.

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

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

(5) Grab handles of maximum length, but not less than ten inches long, shall be installed on both sides of the interior step-well area. These handles shall be stainless steel clad. Both grab handles shall be securely fastened and designed so as to prevent clothing or any other item from being caught.

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

(a) Steps shall be covered with first-quality step covering material which shall have non-skid characteristics and be of ribbed or pebble design. Step covering shall have a turned-down nosing of a contrasting color of either white, yellow, or bright orange.

(b) Step covering shall be securely fastened to the steps in a manner that will minimize tripping. This requires that the heads of mounting screws or bolts be below the top surface of the step tread.

(7) The service door steps shall have a barrier that is in compliance with FMVSS 571.222 positioned between the stairwell and the passenger compartment.

(CC) Access steps

(1) Steps shall be installed on each side of the school bus to allow access to windshield for cleaning.

(2) Grab handles shall be securely mounted in a suitable position.

(DD) Sun visor.

The school bus shall be equipped with at least one interior adjustable transparent sun visor, folding type, which is a minimum of six by thirty inches in size.

(EE) Wheel-housings.

(1) Wheel-house shall be attached to floor components in such a manner to prevent water, dust or fumes from entering the bus body.

(2) Wheel-house openings shall allow for easy tire removal and service.

(3) Inside height of wheel-housing above floor line shall not exceed ten inches.

(4) Wheel-housing shall provide clearance for dual wheels to permit the installation of tire chains.

(FF) Windows.

(1) Driver's side window shall be capable of opening and be equipped with a lock-type closure.

(1) Each side window shall be double sash and provide unobstructed emergency opening at least nine inches high and twenty-two inches wide, obtained by lowering the upper sash. All exposed edges of glass shall be banded.

(2) Individual windows shall not have a vertical opening greater than twelve inches. Stops shall be installed where needed to obtain this dimension.

(GG) Windshield wipers.

(1) Bus body to be equipped with two heavy-duty windshield wipers.

(2) Windshield wipers to be operated by one or more electric motors.

(3) Windshield wipers shall be controlled with one switch. Switch shall provide multi-speed operation and shall incorporate an intermittent position.

(4) Wipers shall be wet arm type.

(5) The windshield wiper motor or motors shall have sufficient power and the wiper arms and blades shall be of sufficient length to provide the largest cleaning area possible.

(6) Wiper blades shall be a minimum of sixteen inches in length. The blade holders shall be the type that permit replacement of only the rubber blade.

(7) The left side windshield wiper shall be so positioned that the approximate center of the wiped area will be directly in front of the driver in a normal seated position. The right side windshield wiper shall be so positioned that the wiped area will provide the driver with maximum vision to the right in a normal seated position.

(HH) Windshield washers.

(1) The windshield washer fluid reservoir shall have a minimum capacity of two quarts in a rigid plastic container. It shall be mounted outside the passenger compartment in a position readily accessible for refilling,

(2) Windshield washer shall incorporate a check valve in supply line. Check valve will not allow washer fluid to drain back into washer tank when not in use.

(II) Wiring

(1) All wiring shall conform to current society of automotive engineers standards. All wires shall be coded and numbered as required by the "2000 National School Transportation Specifications and Procedures". Wiring diagrams must be made available to school bus owners.

(2) There shall be no less than nine regular circuits, as follows:

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

(b) Clearance and step-well lamps.

(c) Dome.

(d) Starter motor.

(e) Ignition and emergency door signal.

(f) Turn signal lamps.

(g) Alternately flashing red and amber signal lamps.

(h) Horn.

(i) Heaters and defrosters.

(3) Any of the above combination circuits may be subdivided into additional independent circuits.

(4) All other electrical functions, 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.

(6) A circuit breaker or equivalent protection device shall be provided for each major circuit except starter motor and ignition circuits.

(7) All wires within body shall be insulated and protected by a covering which will protect them from external damage and minimize dangers from short circuits. Whenever wires pass through body members, additional protection in the form of an appropriate type of insert shall be provided.

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

(JJ) Stop arm sign specifications.

(1) All school buses shall be equipped with an octagonal "Stop" sign. The background shall be a minimum of eighteen inches in height and eighteen inches in width and shall be reflective material, red in color with white lettering. The sign shall be so mounted as to not interfere with the driver's vision to the rear when the sign is extended. The standard octagonal sign shall contain two flashing red lamps which are visible from both sides of the extended sign.

(2) The word "Stop" shall be in reflective white letters on both sides of the sign. The sign shall be vacuum, electric or air-power controlled and so constructed as to lock in extended and closed position.

HISTORY: Eff 7-15-78; 2-11-93; 2-18-93; 9-1-98; 9-1-03
Rule promulgated under: RC 119.03
Rule authorized by: RC 4511.76
Rule amplifies: RC 4511.76
Replaces: part of 4501-5-02
R.C. 119.032 review dates: 03/07/2003 and 03/07/2008

4501-5-04 Type B school bus body and chassis.

(A) Type B school buses shall meet all requirements of rules 4501-5-01 to 4501-5-03 of the Administrative Code with the following modifications:

(1) Manufacturer's standards shall be followed for front bumpers, exhaust systems, fender paint, front heater and defroster, driver seat, and fuel tanks;

(2) Manual transmission shall be a minimum of three speeds forward, one reverse. Automatic transmission shall be a minimum of three speeds forward, one reverse.

(3) Fuel-injected gasoline engine shall be not less than three hundred fifty cubic inches. Diesel engine shall be not less than one hundred sixty horsepower.

HISTORY: Eff 7-15-78; 2-11-93; 2-18-93; 9-1-98; 9-1-03
Rule promulgated under: RC 119.03

Rule authorized by: RC 4511.76
Rule amplifies: RC 4511.76
R.C. 119.032 review dates: 03/07/2003 and 03/07/2008

4501-5-05 Types A-I and A-II school bus chassis.

(A) Axles and suspensions

(1) Front and rear axles, including suspension assemblies and all frame-to-ground components shall have a gross axle rating at ground at least equal to that portion of the load as would be imposed by the chassis manufacturer's maximum gross vehicle weight rating.

(2) Heavy-duty double-acting shock absorbers compatible with the manufacturer's rated axle capacity shall be installed on the front and rear of the school bus chassis.

(3) Suspension assemblies as specified shall maintain control stability of school bus under all load conditions.

(B) Battery

(1) Gasoline powered engine shall be equipped with one six hundred cold cranking amperes battery or larger.

(2) Diesel powered engine shall be equipped with two five-hundred cold cranking amperes battery or larger.

(3) One-piece non-spliced battery cables shall be provided by the chassis manufacturer.

All cables shall conform to society of automotive engineers standard J541 with respect to electrical resistance.

(4) Buses equipped with a lift shall have dual batteries of six hundred cold cranking amperes or larger.

(C) All braking systems shall comply with FMVSS 105 and shall be manufacturer's standard.

(D) Front bumper shall be manufacturer's standard.

(E) Clutch shall be manufacturer's standard.

(F) Chassis color

(1) Bus shall be painted national school bus yellow. Hood shall be non-glare national school bus yellow or non-glare black.

(2) Wheels shall be black and/or gray.

(G) Cooling system

(1) The cooling system radiator shall be of sufficient capacity to cool the motor at all speeds in all gears.

(2) On all chassis requiring hoses or extensions to fill radiators, the hose or extension shall be so designed to permit adding coolant without trapping air.

(3) Permanent ethylene-glycol base or propylene-glycol base antifreeze shall be provided by chassis manufacturer. Anti-freeze shall be compatible with the cooling system.

(4) When a chassis is equipped with an automatic transmission, the chassis shall have a heavy-duty cooling system with increased capacity in the radiator, fan, and other necessary components to provide for the additional cooling required by the automatic transmission.

(5) Chassis shall be equipped with a coolant recovery system or a deaeration system.

(H) Manufacturer's standard drive shaft guard shall be required to prevent drive shaft from dropping to ground.

(I) Driver's seat shall be chassis manufacturer's standard.

(J) Electrical system

(1) Alternator shall be a minimum one hundred ampere.

(2) All buses shall be equipped with a voltmeter. Manufacturer's standard acceptable.

(3) All wiring shall meet applicable society of automotive engineers requirements.

(K) Exhaust system

(1) Exhaust pipe, muffler, and tailpipe shall be outside bus body and attached to chassis.

(2) Muffler shall be heavy-duty truck type of aluminized or stainless steel, or ceramic coated to offer maximum resistance to corrosion or oxidation.

(L) Front fenders' total spread of outer edges, measured at the fender line, shall exceed the total spread of front tires when front tires are in straight-ahead position.

(M) Frame

(1) Frame shall be designed to correspond with or exceed standard practice performance criteria for trucks of same general load specifications used for highway service.

(2) Extension of these frame members shall be designed, furnished, and guaranteed by chassis or body manufacturer. Installation shall be guaranteed by the company installing the extension. Extension of frame length shall not be for the purpose of extending wheel-base.

(3) No holes shall be permitted in the chassis frame rails except those drilled at the chassis plant or authorized by the chassis manufacturer.

(4) Any welding to chassis frame rails must be guaranteed by the company performing the welding procedure.

(N) Manufacturer's standard fuel tank construction shall prevent spillage or drainage of fuel on any part of the exhaust system.

(O) Horn(s) shall be capable of producing complex sound in band of audio frequencies from two hundred fifty to two thousand hertz and having a total sound band of eighty-two to one hundred two decibels within these frequency limits when measured at fifty feet from the vehicle.

(P) Instruments and instrument panel shall be manufacturer's standard.

(Q) Chassis lamps and signals

(1) All lamps and their installation shall conform to current FMVSS 571.108.

(2) Bus shall be equipped with a column mounted dimmer switch.

(3) A self-canceling turn signal shall be installed by the chassis manufacturer as an integral part of the steering column assembly,

(R) Oil filter shall be manufacturer's standard.

(S) All openings made by the chassis manufacturer in the floorboard and fire-wall shall be sealed by the chassis manufacturer to prevent gases from entering the driver's compartment. Boots for the accelerator pedal, clutch, service brake, gearshift, and emergency brake, when required, shall be supplied by the chassis manufacturer.

(T) Power train

(1) Chassis equipped with gasoline engine shall have a minimum three-hundred fifty cubic-inch displacement and shall be fuel-injected.

(2) Chassis equipped with diesel engine shall have a minimum of one hundred-sixty horsepower.

(U) Steering system shall be equipped with heavy-duty integral power steering compatible with the gross vehicle weight for each capacity.

(V) Tires

(1) All tires shall be tubeless radial and meet all applicable tire and rim association standards. Tires shall be of adequate size and load rating for applicable gross vehicle weight.

(2) All tires on a given vehicle shall be of the same size, construction and capacity.

(W) Transmission

(1) Automatic transmission shall have at least three forward gears, neutral, and reverse.

(2) Manual transmission shall be synchromesh in all gears except first and reverse gears. Gearshift shall not interfere with operation of service/entrance door.

HISTORY: Eff 7-15-78; 2-11-93; 2-18-93; 9-1-98; 9-1-03
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4501-5-06 School bus body standards - types A-I and A-II school bus with body supplied by body manufacturer.

(A) Minimum aisle clearance between seats shall be twelve inches at floor level and fourteen inches at top of seat back.

(B) Battery shall be provided by the chassis manufacturer.

(C) Rear bumper shall be one piece, heavy-duty type, pressed steel channel or equivalent material, at least three sixteenths inch thick and shall be a minimum of eight inches wide (high) on type A-I and a minimum of nine and one-half inches (high) on type A-II and of sufficient strength to permit being pushed by another vehicle without

permanent distortion. The rear bumper vertical distance between the bottom of the bumper and the ground shall not exceed thirty inches when the vehicle is empty.

(D) Color of body exterior

(1) All exterior body components shall be painted national school bus yellow except exterior body components listed in paragraph (D)(2) of this rule.

(2) The following shall be painted black:

(a) Lettering and numbering.

(b) Bumpers.
(c) Floor level rub rail.

(d) Seat level rub rail.

(e) Background area and hoods for warning light system.

(E) Body construction

(1) All school bus body construction components (except door handles, interior decorative parts and components heavier than twelve gauge) shall be of prime commercial quality mill-applied zinc-coated steel or composite materials. Components must meet or exceed current strength and durability and all applicable FMVSS. The zinc plating shall be one hundred twenty grams per square meter minimum coating weight (grade sixty) or equivalent applied by either hot-dipping or electroplating. All such construction materials shall be fire resistant.

(2) All painted metal surfaces shall be chemically cleaned, etched, zinc-phosphate-coated, and zinc-chromate, epoxy primed, or conditioned by equivalent process in addition to the above requirements.

(3) In providing for the requirements in paragraphs (F)(1) and (F)(2) of this rule, particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges, punched or drilled hold areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subject to abrasion during vehicle operation.

(4) Upon final assembly of the school bus body and after mounting body upon chassis, the total unit strength of the school bus shall meet or exceed all strength criteria as established by FMVSS 571.220. and FMVSS 571.221.

(5) Body construction shall provide a dust-proof and watertight unit.

(6) The floor shall be not less than fourteen gauge mill-applied zinc-coated steel sheet or composite materials. Components must meet or exceed strength and durability

and meet all applicable FMVSS. The zinc plating shall be one hundred twenty grams per square meter minimum coating weight of grade sixty or equivalent applied by either hot-dipping or electroplating. If the floor and frame are of a unitized type construction, the manufacturer's standard floor is acceptable.

(7) All longitudinal side strainers and members shall be a minimum of sixteen-gauge steel or composite materials. Materials must meet or exceed in strength and durability and all applicable FMVSS.

(a) There shall be one longitudinal side strainer or impact rail mounted at belt line or window sill level and extending at least from the front main vertical post, excluding the front door entrance, to the last main vertical post on each side of the body. This member shall be attached at each vertical post.

(b) There shall be one longitudinal side strainer mounted at the side window header level and extended around the school bus body. This member shall be attached at each vertical post.

(c) Additional longitudinal side strainers are permissible if they form an integral part of the school bus body construction and meet all fastening requirements.

(d) Side strainers used in basic construction at floor level and extending above floor line may be utilized as base at wall line for rail mounted seats.

(8) Rub rails

(a) Body manufacturers shall install one rub rail at approximately seat level, except for opening for emergency door. This rail shall extend from the main vertical post behind the entrance door to the most forward vertical post on the left side of the body.

(b) A second rub rail shall be installed at approximately the floor line and cover the same longitudinal area as the seat level rail, except at wheel housing, and shall extend to the radii of right and left rear corners.

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

(d) All rub rails shall be four inches or more in width after forming and shall be a minimum of sixteen-gauge steel, corrugated or ribbed pattern.

(e) All rub rails shall be mounted outside body panels.

(f) External longitudinal members are permissible in addition to all previously specified members if they form an integral part of the body construction and meet fastening requirements.

(9) Two or more roof strainers or longitudinal members shall be provided to connect, to reinforce flattest portion of roof skin, and to space roof bows. Strainers may be installed between roof bows or applied externally. They shall extend from the windshield header and are to function as continuous longitudinal roof members at all points of contact between strainers or longitudinal members and other structural material, attachment shall be made by means of welding, riveting, or bolting.

(10) Rear corner construction of the bus body between the floor and window sill and between the emergency door posts and last vertical side post shall consist of at least three structural members and shall provide impact and penetration resistance equal to or greater than that provided by frame members in the sides of the body. Such structural members shall be securely attached at each end.

(11) If the ceiling is so constructed to contain lap joints, the forward panel shall be lapped by the rear panel and the exposed edges shall be beaded, hemmed, or flanged or otherwise treated to minimize sharp edges.

(12) All body components shall be designed and constructed so as to avoid the entrapment of moisture.

(F) Defroster fan

One adjustable six-inch auxiliary defroster fan shielded with small mesh metal or polypropylene guard shall be installed.

(1) Fan shall be mounted to complement the defroster system used by the manufacturer.

(2) Auxiliary defroster fan shall be controlled individually by multi-speed switch located in the electrical control panel.

(G) Doors and emergency exits

(1) Service doors

(a) Service door shall be outward opening split type. Service door shall be air, electric, or manually operated. Door shall be under the control of the driver and designed to afford easy release and prevent accidental opening. When a manual lever is used, no parts shall come together so as to shear or crush fingers. Lever shall be equipped with an approved safety latch to prevent accidental opening which will lock in the over-center position when door is fully opened. Manually operated doors shall require no more than twenty-five pounds of pull to close and may be hydraulically assisted.

(b) Manual door control mechanism shall be heavy-duty bearing type, adjustable for wear, non-corrosive, anodized steel or equivalent.

(c) Service door shall be located on right side of bus opposite the driver and within the driver's direct view.

(d) Service door shall have minimum horizontal opening of twenty-four inches and minimum vertical opening of sixty-eight inches.

(e) Glass in service door shall provide maximum area of visibility for operation of bus

(f) All edges of service door shall be sealed by flexible rubber or equivalent material to prevent air from entering door entrance when closed.

(g) There shall be no safety rail or hand-holds mounted on the service door

(h) There shall be a head bumper pad installed on the inside of the bus body at the top of the entrance door. This pad shall be approximately four inches in width and extend across the entire top of the entrance door opening.

(i) Service door shall have access for easy lubrication.

(j) All electrically or air-operated service doors shall be equipped with a switch or lever located in either hinged panel above the entrance door or above the passenger side windshield that have emergency and normal positions. The switch or lever shall be identified by a decal with the heading "Entrance Door Operation" or "Emergency Release." The words "Emergency" and "Normal" will be placed where switch lever is located when in these positions.

(i) When the switch or lever is in the emergency position, it will override door control in driver's area making it non-operational in any of the door control positions.

(ii) Whenever the switch or lever is placed in the emergency position, it will allow the service door to be opened or closed freely in the event of an emergency.

(iii) Air door switches and distribution block that control eight light warning systems shall be securely fastened near the door control valve in the switch panel and shall be easily accessible for service or repair.

(2) Emergency doors

(a) Emergency door shall meet FMVSS 571.217 and be designed to be opened from the inside and outside of the bus and shall be equipped with a fastening device which may be quickly released, but is designed to offer protection against accidental release. An interior handle shall be provided to pull the door shut from the inside which may be used as a protection against accidental release.

(b) Emergency door latch shall be equipped with suitable electric plunger type switch connected to two buzzers, with one located at emergency door and the other in driver's

compartment. Switch shall be enclosed in metal case, and wires leading from switch shall be concealed in school bus body. Switch shall be so installed that plunger contacts farthest edge of slide bar in such a manner that any movement of slide bar will immediately close circuit on switch and activate both buzzers and all dome lights, driver dome light excluded. Buzzers and dome lights shall be operational with key in "on-off", or accessory position. Power for the emergency lighting and buzzers shall be supplied by a twelve-volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(c) Exterior door handle shall be of permanent hitch-proof design and mounted with enough clearance to permit opening without touching door surface.

(d) All emergency door openings shall be completely weather-stripped.

(e) Operation instructions for opening the door shall be lettered or decaled on the inside of the emergency door.

(f) There shall be no step-type mechanism in the use of the emergency door.

(g) No seat, chassis or body component shall be installed in the aisle leading to the emergency door.

(h) Emergency door shall display the words, "Emergency Door" both inside and outside in letters at least two inches high. Words shall be placed directly above emergency door or on the upper portion of the door.

(i) Rear emergency door

(i) Emergency door shall be located in the rear of the school bus body and centered with respect to the body.

(ii) Emergency door shall have a minimum horizontal opening of twenty-four inches, and a minimum vertical opening of forty-eight inches measured from the floor level.

(iii) Emergency door shall be hinged on the right side and shall open to the outside.

(iv) Emergency door shall contain upper and lower glass panels that provide maximum area of visibility for safe operation of school bus.

(v) There shall be a head bumper pad installed over the emergency door on the inside of the school bus body. This pad shall be at least four inches in width and cover the entire width of the door opening. Padding shall be same material as padding used over the service door.

(3) Emergency side window exits

(a) School buses with a designed maximum capacity of less than fifty shall have one emergency swing out window on each side of the bus body and shall not be located over required stop arm.

(b) Emergency window shall display the words "emergency exit" in letters at least two inches high both inside and outside the window. Words shall be placed no more than three inches directly above window.

(c) Emergency windows shall activate emergency door buzzer in the driver's compartment and all dome lights when not fully latched, driver dome light excluded. Buzzer and dome lights shall be operational with key in "on", "off" or "accessory" position. Power for the emergency lighting and buzzers shall be supplied by a twelve-volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(d) Operating instructions for opening windows shall be lettered or decaled on the inside below the window or on the window. If lettered on the window, lettering shall be located at the bottom of the window and shall not be a view obstruction.

Emergency Roof Hatch

(a) Buses rated less than fifty designed maximum capacity shall have a minimum of one hatch located in the middle of the bus.

(b) A buzzer shall sound and all interior dome lights (driver's dome light excluded) and emergency door buzzer located in driver's compartment shall be activated when the hatch is opened in the escape position. Buzzer and dome lights shall be operational with key in "on-off" or accessory positions. Power for emergency lighting and buzzer shall be supplied by twelve volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(c) Each bus shall be equipped with at least one roof hatch type emergency exit/vent, specified as follows:

(i) Emergency roof exits shall meet all requirements of FMVSS 571.217.

(ii) Hinges shall be located on forward side of hatch.

(iii) Emergency roof exits shall be equipped with release inside and outside and shall be labled with instructions for release inside.

(iv) If a bus is not manufactured with a static vent, the hatch will be a static-type with exhaust vent.

(H) Emergency equipment shall be mounted in the driver's compartment area in an easily accessible location.

(1) Bus shall be equipped with at least one dry-chemical type fire extinguisher of at least five-pound capacity, 3A 40 BC rating, mounted in a quick release bracket easily accessible to the driver's compartment. The extinguisher is to be equipped with a dial-type, graduated gauge which indicates loss of pressure. Fire extinguisher shall be of the type that permits the dry chemical case to be refilled by ordinary procedures. Fire extinguisher shall be equipped with a metal head.

(2) First-aid kits shall be dust proof, plainly labeled and mounted in a location easily accessible to the driver. Minimum units for the first-aid kit shall be as follows:

Sixteen unit kit:

3 units – 1 inch adhesive compress

2 units – 2 inch bandage compress

1 unit – 3 inch bandage compress

1 unit – 4 inch bandage compress

1 unit – 3 inchx3 inch plain gauze pads

1 unit – 4 inch gauze roller bandage

2 units – plain absorbent gauze – 1/2 square yard

2 units – plain absorbent gauze – 24 inchx72 inch

3 units – triangular bandage

(3) Three triangle reflectors meeting FMVSS 571.125 with weighted stands encased for easy storage shall be provided. Six fusees, thirty-minute type shall be encased with the triangle reflectors. Reflectors and fuses shall be encased in a heavy-duty container and be secured in a lockable metal bracket. The bracket shall be mounted within easy access of the driver.

(4) One body fluid kit shall be required. Body fluid kits shall meet all applicable state and federal regulations. The kit shall contain the following items:

(a) Effective chlorine absorbent deodorant.

(b) Effective germicidal detergent (if detergent contains alcohol, no more than one fluid ounce of alcohol in a single use disposable container).

(c) Single use disposal bag.

(d) Single use disposable scraper.

(e) Minimum of one pair of disposable, single use effective protective gloves.

(f) Effective hand rinse. If hand rinse contains alcohol, no more than one-half fluid ounce is permitted in a single use disposable container.

(g) The body fluid clean-up kit shall be easily accessible to the driver in the area of the first aid kit, and shall be securely mounted in a metal or plastic container.

(h) If alcohol is included, the body fluid clean-up kit shall not contain more than one and one-half fluid ounces of alcohol.

(I) Floor covering

(1) All floor covering shall be permanently bonded to the floor and must not crack or lose its adhesive power when vehicle is subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and recommended by the manufacturer of the floor covering material.

(2) Underneath areas shall have a smooth fire-resistant floor covering having minimum overall thickness of one-eighth inch. The entire joint between the floor covering and the wall of the school bus body shall be covered with a curved, fitted, rust-free metal molding or pre-formed interior panel.

(3) Driver's compartment floor area shall be the chassis manufacturer's standard. It shall be permanently bonded to the floor. A floor mat is not acceptable.

(4) Center aisle covering shall be fire-resistant material, non-skid, wear-resistant and ribbed. Minimum thickness shall be one hundred eighty-seven thousandths inch measured from the top of the ribs.

(5) Metal composite molding, bonding or non-metal welding is acceptable.

(a) Metal, composite molding, bonding or non-metal welding shall cover all floor covering joints between the ribbed center aisle and smooth underneath floor covering.

(b) Molding around the wheel-well and floor covering shall be provided to seal floor covering with the wheel-well.

(J) Glass

(1) All glass shall be manufactured and maintained as follows:

| Location | Glass Type | Rating |
|---|---|---|

| | | |
|---|---|---|
| Service Door | Laminated | AS 1 |
| Emergency Door | Tempered | AS 2 or 3 |
| Emergency Window | Tempered | AS 2 or 3 |
| Windshield | Laminated | AS 1 |
| Glass to the right of the driver | Laminated | AS 1 |
| All other glass behind the driver | Tempered | AS 2 or 3 |

Driver's side glass shall be manufacturer standard.

(K) Heaters, rear

(1) All school buses shall be equipped with at least one rear hot water heater capable of maintaining inside temperature of fifty degrees fahrenheit using an ambient temperature of zero degrees to ten degrees fahrenheit.

(1) Hot water heaters shall display the name plate rating in accordance with the standard code for testing and rating automotive bus hot water heater and ventilating equipment.

(2) Multi-speed switches shall operate all heater fans independently.

(3) All hot water lines shall be enclosed.

(4) Heater cores and fans shall be completely encased, but designed to permit servicing heating assembly by removing all or part of the case.

(5) Heater hose installation in the engine compartment shall include two brass shut-off valves able to shut off coolant completely when necessary. Valves shall be installed in an accessible location.

(6) The body manufacturer shall add the required amount of appropriate anti-freeze to protect the cooling system to minus twenty degrees fahrenheit tested at normal engine temperature.

(L) Body shall display the following identification:

(1) "School Bus" in black letters at least eight inches high on both front and rear of body. Lettering shall be placed as high as possible without impairment of visibility.

(2) "STOP" on the rear of the school bus in letters approximately ten inches high on the door or the center of the school bus.

(3) Name of the school district shall appear on both sides of the vehicle at the belt line and be at least five inches high.

(4) County of the school district shall appear on both sides of the vehicle in three-inch letters unless the name of the city or exempted village appears as a part of the district name.

(5) Ownership of the vehicles shall appear on the entrance door side in two-inch high letters.

(6) Local school bus numbers shall be five inches high and shall be located as follows:

(a) On body near the entrance door;

(b) Centered below the right lower tail light;

(c) On the left side in the area of the driver's window;

(d) On the front in the area designated by the buyer.

(7) Buses shall be marked with reflectorized material as follows:

(a) All reflectorized material shall be prismatic retro-reflective super-high intensity grade five or equivalent. The reflectorized material shall meet or exceed the initial reflective values as outlined in ASTM D4956-01.

(b) All reflective material shall be able to retain at least fifty per cent of the reflective values for a minimum of seven years.

(c) All reflective material shall be warranted against peeling, cracking, separation and lifting due to weather conditions, pressure, and mechanical washing for a minimum of seven years.

(d) Reflective yellow material two inches (plus/minus one quarter inch) in width shall be applied to both corners of the rear of the bus and extend from the bumper vertically up to the top of the rear windows.

(e) Three seven by fourteen inch wide white-silver reflective material shall be applied to the front and rear of the bus to accommodate the state identification and local bus numbers, as follows:

(i) One seven by fourteen inch piece of white-silver reflective material shall be applied and centered on the front bumper. If the bumper is manufactured with holes in the center for two hooks, the seven by fourteen piece of material may be located on the driver's side of the bumper. If the bumper is less than six inches in height, a seven by fourteen inch plate will be permanently attached to the bumper to accommodate the seven by fourteen inch reflective material.

(ii) In the rear, two seven by fourteen inch pieces of white-silver reflective material shall be applied and centered on the flat surface under the left and right lower tail lights.

(f) All emergency doors, windows, and roof escape hatches shall be outlined around the outside perimeter with one inch yellow reflective material. The color of the one inch reflective material around escape hatch may be manufacturer's discretion.

(g) Reflective material used on stop signs shall be red grade five or equivalent.

(M) Inside body height shall be sixty-eight inches or more measured metal-to-metal at any point on longitudinal center line from front vertical bow to rear vertical bow.

(N) Insulation

(1) Bus body shall be fully insulated in the roof and all body panels to deaden sound, reduce vibrations and heat transfer insulation one-inch minimum thickness in addition to the usual sprayed-on material shall be a fiberglass or equal and fire-resistant material.

(2) A plywood floor shall be applied on top of the steel floor. Floor covering shall be applied on top of the plywood. Plywood shall be five/eighths inch five ply, CD exterior plywood. Plywood shall be sanded and vacuumed before covering is applied. Waterproof sealing material shall be applied to seam in the sections of plywood floors. Plywood shall be four feet by eight feet sections, pieced only as necessary. Waterproof sealing applied on top of the plywood to hold the floor covering is considered as one method of sealing the seams in the plywood floor.

(O) Interior

(1) Interior of the school bus shall be free of all projections.

(2) All school buses shall require inner linings on ceiling and walls and shall include abatement package in the driver area. The interior sound level at the driver's seating position shall not exceed ninety decibels when measured in accordance with test procedures found in 49 CFR 393.94(C).

(P) All lamps and signals herein listed and their installation shall conform to current standards and recommendations of the society of automotive engineers and meet FMVSS 571.108.

(1) Construction of components

(a) Directional signal, stop light, taillight, marker light, clearance light, identification light, backup light and reflector lenses shall be of acrylic plastic. Alternately flashing red and amber signal lamps shall be sealed beam of polycarbonite or acrylic plastic lens construction. Body-mounted stop lamps, directional signals and red signal lamps shall be visible throughout one hundred eighty degrees.

(b) All exterior lamp sockets shall be zinc-plated or chromated steel, or other suitable non-corrosive materials such as plastic or stainless steel.

(c) Alternately flashing red signal lamps, body-mounted directional signals and stop lamps shall be grounded by attaching a ground wire or strap from the lamp socket or negative side or the bulb to the school bus body or ground wire included in the wiring.

(d) Wiring shall conform to current society of automotive engineers standards. A one hundred Amp continuous body disconnect solenoid of one hundred ampere continuous duty shall be supplied and installed so that when the ignition switch is in the off position all body electrical circuits will be inoperative except the hazard warning, stop light, marker-lights, headlamps, passenger emergency dome lights and buzzers and emergency override switch for warning lights.,

(2) The service door step-well light shall be wired with the marker light circuit and activated by a switch controlled by the service door. On type A bus, the light shall be a minimum of six candle power.

(3) Passenger dome lights and emergency lighting.

(a) Passenger dome lights when activated shall adequately and uniformly illuminate aisleway to three to four foot candles.

(b) All dome light bulbs shall have a minimum candle power of fifteen.

(c) All dome lights shall be equipped with shatterproof, clear plastic or polycarbonated lenses.

(d) Passenger dome lights shall be controlled by a single switch in the driver's console.

(e) A single driver dome light shall be provided and controlled by a single switch in the driver's console. Power to the switch shall be provided by the switched side of the

continuous duty soleno id when the ignition key is in the "ON" or "AUXILIARY" position and shall be protected by a circuit breaker.

(4) Brake and tail lights

Each bus shall be equipped with two double-optic combination stop and double optic taillamps with a diameter of not less than seven inches with plain red lens, emitting red light plainly visible from a distance of five hundred feet to the rear. These lamps shall be as high as practical but below the window line and spaced as far apart laterally as practicable, but not less than three feet. Measurements shall be taken from lamp centers. The stop lights are to be activated by the brake switch.

(a) These lamps are to use double-contact bulbs.

(b) These lamps are to have lenses approximately seven inches in diameter.

(c) Grounding instructions: The socket of these stop lamps shall be grounded separately, either by use of a wire with one end permanently affixed to the socket and the other end affixed to the lamp base or bus body metal or by the use of a lamp socket flane grounded to the bus body metal by a screw or bolt.

(5) Directional signals

(a) Side and rear directional signals shall be wired to operate properly with the front directional signals supplied by the chassis manufacturer.

(b) School bus body manufacturer shall install required signal lamps to the directional signal control switch so all directional signal lamps shall be operative. The directional signal system shall be installed on an integral part of the hazard warning signal switch activated by an independent switch furnished by the chassis manufacturer.

(c) Color of lenses shall be amber. All rear directional signals installed by the body manufacturer shall be double-optic and at least seven inches in diameter. If installed, side directional signal shall be armor protected.

(d) Two seven-inch backup lights are required and shall be mounted on or below the belt line on the school bus body. Backup lights shall conform with FMVSS 571.108.

(e) All school buses shall be equipped with an audible electrical warning device, automatically actuated when the bus is in reverse gear. Device shall be one hundred seven decibels or more, meeting society of automotive engineers J994. Device shall be mounted behind rear axle, between frame rails, and shall emit intermittent sound.

Device to be provided and installed by body manufacturer.

(6) School bus alternately flashing warning signal lamp

(a) Each school bus body shall be equipped with a system of four red signal lamps and four amber signal lamps. Both red and amber lamps shall be installed in accordance with society of automotive engineers J887.

(i) Each amber signal lamp shall be located near each red signal lamp, at the same level but closer to the vertical center line of the bus.

(ii) The system shall be wired so that the amber signal lamps are activated only by a manual switch, and if activated, are automatically deactivated when the bus entrance door is opened.

(b) These lamps shall flash at a designated rate from sixty to one hundred twenty cycles per minute.

(c) Operation of eight light warning system and stop arm.

(i) Power for eight light warning system shall be provided by the body continuous duty solenoid when key is in the "on" position.

(ii) With the key in the "on" position and master switch on, green pilot light shall illuminate to indicate system is ready for operation.

(iii) With entrance door closed and the manual momentary (amber) start switch activated and released, the amber pilot light and amber warning lights shall flash.

(iv) When the entrance door is moved toward the open position, the amber pilot and amber warning lights shall go off and the red pilot and red warning lights shall flash and stop arm shall automatically extend and lights on the stop arm shall flash.

(v) When entrance door is closed, all lights shall go out and the stop arm shall retract automatically. The entrance door switch that activated the red lights in the light system shall be located in a position by a cover or guard that will prevent the switch from being activated or deactivated by pupils boarding or leaving the bus.

(vi) With entrance door open and the manual momentary (amber) start switch activated and released, the red pilot and red warning lights shall flash and the stop arm shall automatically extend, and the lights on stop arm shall flash.

(vii) An emergency system for extending the stop arm and flashing the red warning lights on the bus body and the stop arm shall be installed on each bus body.

(viii) A red emergency override on/off switch shall be installed in the bus body electrical accessory panel This switch shall be installed with a standard switch identification decal with the words emergency warning lights.

(ix) The emergency override system shall operate the red pilot light, the red warning lights and automatically extend the stop arm with lights flashing in any door position. System shall operate with key in the on/off or accessory position.

(x) Power for the emergency override system shall be taken off the twelve volt supply line going to the body continuous duty solenoid and shall be protected by a circuit breaker.

(xi) The master and momentary activating switches and pilot lights shall be in a position that is clearly accessible and visible to the driver. The amber and red pilot light lenses shall be approximately one-half inch in diameter.

(xii) If the bus is equipped with a crossing gate, it shall extend and retract in the same manner as outlined for the stop sign.

(d) Installation Requirements

(i) Each flashing signal lamp shall be mounted with its axis substantially parallel to longitudinal axis of vehicle.

(ii) Front and rear alternately flashing signal lamps shall be spaced as far apart laterally as practicable.

(iii) Alternately flashing signal lamps shall be mounted at the front above the windshield and at the rear so that the lower edge of the lens is not lower than the top line of the side window.

(iv) Vertical and lateral vision of the front and rear alternately flashing warning lights shall not be obstructed by any part of the body or the lamp house insofar as standard bus body construction will permit.

(v) A square or rectangular area around the lens of each alternately flashing signal light and extending outward approximately three inches shall be painted black. In installations where there is no flat vertical portion of the body immediately surrounding the entire lens of the lamp, a square or rectangular band of black, approximately three inches wide, immediately below and to both sides of the lens, shall be painted on the body or roof area against which signal light is visible from a distance of five hundred feet along the axis of the vehicle.

(7) All school bus body lamps and reflectors shall comply with FMVSS 571.108.

(a) All marker, clearance and identity lamps shall be armored and conform to society of automotive engineers code pc.

(b) These clearance lamps shall be connected to the chassis headlight circuit and shall be activated by the chassis headlight switch.

(Q) All school buses shall be equipped with mirrors meeting the requirements of FMVSS 571.111.

(1) Interior rear view mirror shall be a minimum of six by sixteen inches.

(2) All exterior mirrors shall be heated and fully adjustable.

(3) Mirror assemblies may include stainless steel materials as necessary (including mounting bracketry) and be warranted one hundred per cent replacement coverage for thirty-six months against rust and corrosion and against any reduction in clarity or view due to discoloration or other deterioration of the lens.

(R) Mounting of body on chassis.

(1) Insulating material shall be placed between all main cross-sill and intermediate members. Insulating material shall be at least one-fourth inch thick and shall be attached to chassis frame or body members so that the body will not move under severe operating conditions.

(2) Chassis frame shall extend to rear edge of rear body cross member.

(3) Bus body shall be attached to chassis frame in such a manner as to prevent shifting or separation of the body from the chassis under severe operating conditions.

(4) Body front shall be attached and sealed to the chassis cowl in such a manner as to prevent entry of moisture.

(S) All buses shall be equipped with two front fender mud flaps and two rear mud flaps.

(T) All openings created in mounting of bus body to chassis shall be sealed by body manufacturer to prevent entrance of gases, dust or moisture into passenger and driver's compartments.

(U) Overall length of the school bus shall not exceed forty feet.

(V) Overall width of the school bus shall not exceed one hundred two inches, excluding mirrors.

(W) Driver's seat, seat belt and upper torso restraint shall meet the chassis manufacturer's standard.

(X) The driver's seat and driver's area shall be equipped with a barrier that complies with FMVSS 571.222 that is positioned immediately behind the driver's area.

(Y) Passenger seats.

(1) All seating and restraining barrier design and construction must meet the provisions of FMVSS 571.222 (school bus seating and crash protection). All seat back barriers must be a minimum of twenty-eight inches in height, as measured from the intersection of the forward surface of the seat back and the undepressed surface of the seat cushion. The top surface of the barriers shall be the same height as the top surfaces of the seat backs.

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

(3) All seats shall be forward-facing.

(4) Seats shall be mounted so as to provide a minimum of thirty-six inch head room for sitting position above the top of undepressed cushion line of all seats. Measurement shall be made vertically not more than seven inches from side wall at cushion height and at fore-and-aft center of cushion.

(5) Seat construction.

(a) Backs of all seats shall be the same width at the top and same height from floor, also slanting at the same angle with the floor.

(b) Seat, seat back cushion, seat bottom and crash barrier shall be covered with flame-barrier fire-retardant seating material. Such material must pass the "fire block" test. Flame-barrier fire-retardant seating material shall meet the following criteria.

(i) The flames shall not spread to seat back in front of the fire.

(ii) The flames on the rear seat shall self-extinguish.

(iii) The flame barrier seating and seat bottom material will successfully prevent the underlying padding material from being exposed to the flames.

(c) All seat backs and rails shall be padded with energy-absorbing material as required by FMVSS 571.222.

(d) A passenger seat cushion retention system shall be employed to prevent the passenger seat cushion from disengaging from the seat frame in the event of an accident. Each seat cushion retention system shall be capable of withstanding a vertical static load equal to a minimum of five times the weight of the cushion. The system shall also be capable of withstanding a forward or rearward static load equal to twenty times the weight of the cushion.

(e) A padded barrier shall be placed forward of all seats not having another passenger seat in front of it.

(Z) Service door steps.

(1) The first step of the service door shall be not less than six inches and not more than sixteen inches from the ground.

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

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

(4) Grab handles of maximum length, but not less than ten inches long shall be installed on both sides of the interior step well area. These handles shall be stainless steel clad. Both grab handles shall be securely fastened and designed so as to prevent clothing or any other item from being caught.

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

(a) Steps shall be covered with first-quality step-covering material which shall have non-skid characteristics and be of ribbed or pebble design. Step covering shall have a turned-down nosing of a contrasting color either white, yellow, or bright orange.

(b) Step covering shall be securely fastened to the steps in a manner that will minimize tripping. This requires that the head of mounting screws or bolts be below the top surface of the step tread.

(6) A barrier that complies with FMVSS 571.222 shall be positioned between the stairwell of the service door and the passenger compartment.

(AA) Sun visor shall be manufacturer's standard.

(BB) Wheel-housing

(1) Wheel-house shall be attached to floor components in such a manner to prevent water, dust or fumes from entering the bus body.

(2) Wheel-house opening shall allow for easy tire removal and service.

(3) Inside height of wheel-housing above floor line shall not exceed ten inches.

(4) Wheel-housing shall provide clearance for dual wheels as established by SAE J683.

(CC) Windows.

(1) Each side window shall be double sash and provide unobstructed emergency opening at least nine inches high and twenty-two inches wide obtained by lowering the upper sash. All exposed edges of glass shall be banded.

(2) Individual windows shall not have a vertical opening greater than twelve inches. Stops shall be installed where needed to obtain this dimension.

(DD) Windshield wipers

(1) Windshield wipers shall be controlled with one switch. The switch shall provide multi-speed and intermittent operation.

(2) The windshield wiper motor or motors shall have sufficient power and the wiper arms and blades shall be of sufficient length to provide the largest cleaning area possible.

(EE) Windshield washers shall be chassis manufacturer standard

(FF) Wiring

(1) All wiring shall conform to current society of automotive engineers standards. All wires shall be coded and numbered as required by the national school transportation specification and procedures. Wiring diagrams must be made available to school bus owners.

(2) There shall be no less than nine regular circuits, as follows:

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

(b) Clearance and step well lamps

(c) Dome

(d) Starter motor

(e) Ignition and emergency door signal

(f) Turn signal lamps

(g) Alternately flashing red and amber signal lamps

(h) Horn

(i) Heaters and defrosters

(3) Any of the above combination circuits may be subdivided into additional independent circuits.

(4) All other electrical functions, shall be provided with independent and properly protected circuits.

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

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

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

(GG) Stop arm sign – specifications

(1) All school buses shall be equipped with an octagonal "stop" sign. The background shall be a minimum of eighteen inches in height and eighteen inches in width and shall be reflective material red in color with white lettering. The sign shall be so mounted as to not interfere with the driver's vision to the rear when the sign is extended. The standard octagonal sign shall contain two flashing red lamps which are visible from both sides of the extended sign.

(2) The word "stop" shall be in reflective white letters on both sides of the sign. The sign shall be vacuum, electric or air controlled and so constructed as to lock in an extended and closed position.

HISTORY: Eff 7-15-78; 2-11-93; 2-18-93; 9-1-98; 9-1-03
Rule promulgated under: RC 119.03
Rule authorized by: RC 4511.76
Rule amplifies: RC 4511.76
R.C. 119.032 review dates: 03/07/2003 and 03/07/2008

4501-5-07 Type A van conversion school bus body.

Type A van conversion school bus body using chassis manufacturer's existing body components shall meet all the requirements of rule 4501-5-06 of Administrative Code type A with the following exceptions.

(A) Rear bumper shall be chassis manufacturer's standard.

(B) Service door

(1) The service door shall be outward opening split type. Service door shall be air, electric, or manually operated.

(2) Door shall be under control of the driver and designed to afford easy release and prevent accidental opening.

(3) Service door shall be located on the side of the bus opposite the driver and within the driver's direct view.

(4) Manual door control shall be heavy-duty bearing type, adjustable for wear, non-corrosive anodized steel or equivalent. No parts shall come together so as to shear or crush fingers. Lever shall be equipped with an approved safety latch to prevent accidental opening which will lock in the over-center position when the door is fully opened. Manually operated doors shall require no more than twenty-five pounds of pull to close and may be hydraulically assisted.

(5) There shall be a head bumper pad installed on the inside of the bus body at the top of the entrance door. This pad shall be approximately four inches in width and extend across the entire top of the entrance door opening.

(6) Sedan-type door is acceptable. Glass in sedan-type door shall be in compliance with manufacturer chassis standards. If a sedan-type door is used, the door must be in compliance with paragraphs (B)(2), (3), (4) and (5) of this rule.

(C) Rear emergency doors shall meet FMVSS 571.217 and shall be designed to be opened from the inside and outside of the bus and be equipped with a three-point fastening device which may be quickly released, and designed to offer protection against accidental release. If double doors are used, they shall be hinged on the outside edge.

Emergency door shall display the words "Emergency Door" both inside and outside in letters at least two inches high. Words shall be placed directly above emergency door or on upper portion of the door.

There shall be a head bumper pad installed over the emergency door on the inside of the school bus body. This pad shall be approximately four inches in width and cover the entire width of the door(s) opening. Padding shall be same material as padding used over service door.

(D) Tail lights and back-up lights shall be manufacturer's standard.

(E) Mud flaps are not required.

(F) Passenger restraint systems shall be installed as required by FMVSS 571.208, 571.209, and 571.210 for all seating positions.

(G) Running board type step with non-slip surface is acceptable in lieu of service door step.

(H) Wheel-housings

(1) Wheel-house shall be attached to floor components in such a manner as to prevent water, dust or fumes from entering the bus body.

(2) Wheel-house opening shall allow for easy tire removal and service.

(3) Inside height of wheel-housing above floor line shall not exceed ten inches.

(I) Windshield wipers shall be manufacturer's standard with multi-speed and intermittent operation.

(J) Windshield washers shall be manufacturer's standard.

HISTORY: Eff 7-15-78; 2-11-93; 2-18-93; 9-1-98; 9-1-03
Rule promulgated under: RC 119.03
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4501-5-08 School buses used to transport pupils with disabilities.

(A) General requirements.

(1) All school buses designed or used for transporting pupils with special transportation needs shall comply with rules 4501-5-01 to 4501-5-09 of the Administrative Code, when applicable.

(2) All school buses designed or used for transporting pupils having special transportation needs shall comply with school bus FMVSS as applicable to their gross vehicle weight rating category.

(3) school buses used for the transportation of pupils with disabilities that require the use of a wheelchair and/or other mobile seating devices which prohibit use of the regular service entrance shall be equipped with a power lift.

(4) The lift shall be located on the right side of the body, in no way attached to the exterior sides of the bus. When not extended, the lift shall be confined within the perimeter of the school bus body. Buses equipped with a lift shall not have passenger seats installed directly across the aisleway from the lift.

(5) All school buses transporting pupils with disabilities shall be equipped with an electronic communication system. The electronic communication system shall be capable of constant contact with the school or dispatch point. This equipment may be excluded from the bus manufacturer's bid and purchased separately.

(B) All aisles leading from the wheelchair area to the rear emergency door shall be a minimum of thirty inches in width to permit passage of a wheelchair/mobile seating device or mobility aid. Aisle leading to the left side emergency door shall be a minimum of thirty inches in width.

(C) School buses designed for the transportation of pupils with disabilities in the state of Ohio, shall have wheelchair securement and occupant restraint systems that comply with SAE J2249 and that were dynamically tested in a frontal impact at thirty miles per hour 20-G, and were installed by the body manufacturer as specified in FMVSS 571.222, Sections 5.4.1 through 5.4.4 at each wheelchair location.

(D) Securement system for mobile seating device and occupant.

(1) The designated area for the wheelchair/mobile seating devices shall be a minimum of fifty inches longitudinally by thirty inches laterally. The designated area shall be free of all obstructions from the floor to the ceiling pursuant to FMVSS.

(2) Securement system hardware and attachment points for the forward-facing system shall be provided.

(3) Wheelchair and mobile seating device securement systems shall utilize four-point tie-downs, with a minimum of two body floor attachment points located at the rear of the space designated for the wheelchair or mobile seating device and a minimum of two body floor attachment points at the front of designated space.

(4) A type two occupant securement system shall provide for securement of the occupants pelvic lap area and upper torso area.

(5) All buses equipped with attachment points securement devices and/or wheelchair securement systems shall also be equipped with a durable webbing cutter having a full width hand-grip and protected blade. The cutter must be appropriately stored in the driver's compartment to the left of the driver.

(6) Wheelchair/mobile seating device securement systems and occupant restraint systems, including attaching hardware and anchor points, shall be certified to meet the requirements of FMVSS 571.222, 571.209, and 571.210.

(7) The occupant securement system must be designed to be attached to the bus body either directly or in combination with the mobile seating device securement system by a method which prohibits the transfer of weight or force from the mobile seating device to the occupant in the event of an impact.

(8) All securement system attachments or coupling hardware not permanently attached shall be a "Positive Latch" type to prohibit accidental disconnecting.

(9) All attachment or coupling systems designed to be connected or disconnected frequently shall be accessible and operable without the use of tools or other mechanical assistance.

(10) No mobile seating device securement system hardware shall be placed so that a mobile seating device can be placed blocking access to lift door or emergency door(s).

(11) Detailed instructions, including a parts list, regarding installation and use of the system shall be provided with each vehicle equipped with an occupant securement system.

(12) Detailed instruction, including a diagram regarding the proper placement and position of the system including correct belt angles, shall be provided with each vehicle equipped with an occupant securement system.

(E) Flexibility in seat spacing and floor plan layout to accommodate special devices shall be permitted. Altered vehicles are required to meet all federal and state standards applicable to the gross vehicle weight category and designed maximum capacity.

(F) Special service entrance.

(1) The special service entrance door(s) shall be at any convenient point on the right curb side of the bus. When the special service entrance is located forward of the rear wheels, the special service entrance door(s), in the open position, shall not obstruct the regular service entrance.

(2) The opening may extend below the floor through the bottom of the body skirt. If such an opening is used, reinforcements shall be installed at the front and rear of the floor opening to support the floor and give the same strength as other floor openings.

(3) The opening, with doors open, shall be of sufficient width and depth to allow the passage of wheelchairs/mobile seating devices and mobility aids. The minimum clear opening shall be fifty-six inches in height. The width of the finished door opening shall not exceed forty-five inches for a single door installation.

(4) A drip molding shall be installed above the opening to effectively divert water from the opening. Door posts and headers for the special service entrance shall be reinforced sufficiently to provide support and strength equivalent to the areas of the side of the bus not used for service doors. A head bumper pad shall be installed above the special service entrance and/or on the lift frame.

(G) Special service entrance doors.

(1) A single door may be used if the finished clear opening does not exceed forty-five inches. Dual doors shall be used when the finished clear opening exceeds forty-five inches in width.

(2) All doors shall open outwardly. The special service entrance doors shall have a cable and snap hook to hold doors in the open position and door bumpers to prevent door-to-body contact.

(3) All doors shall be weather-sealed. Buses with double doors shall be so constructed that a flange on the forward door overlaps the edge of the rear door when closed. If optional power doors are installed, the design shall permit release of the doors for opening and closing by the attendant from inside the bus.

(4) When manually operated dual doors are provided, the rear door shall have at least a one-point fastening device to the header. The forward mounted door shall have at least three-point fastening devices. One shall be to the header, one to the floor line of the body, and the other shall be into the rear door. These locking devices shall afford maximum safety when the doors are in the closed position.

(5) The door and hinge mechanism shall be of a strength that is greater than, or equivalent to, the emergency door exit. Door materials, panels, and structural strength shall be equivalent to the conventional service and emergency doors. Color, rub rail extensions, lettering, and other exterior features shall match adjacent sections of the body.

(6) Each door shall have a window set in rubber, compatible within one inch of the lower line of adjacent sash.

(7) The special service entrance shall be equipped with a device that will actuate a green flashing visible signal located in the driver's compartment when the door or doors are not securely closed and the ignition is in "On" position.

(H) Adequate lighting shall be provided to illuminate the interior and exterior of the lift area. There shall be a light installed above the lift that will provide a minimum of two foot-candles of illumination at floor level in the area of the lift when the lift door is opened. The lights shall remain illuminated until the lift door is securely closed. There shall be a light(s) that will provide a minimum of two foot-candles of illumination on the lift platform when the lift is being operated. There shall be a light(s) that will provide a minimum of two foot-candles of illumination for a distance of three feet perpendicular from any point of the outer edge of the lift opening.

(I) The light(s) used to illuminate the interior and exterior of the lift area shall be activated when the lift door is open.

(J) Power lift.

(1) Design

(a) The design load of the lift shall be at least six hundred pounds. Working parts, such as cable, pulleys, and shafts, which can be expected to wear and upon which the lift depends for support of the load, shall have a safety factor of at least six based on the ultimate strength of the material. Non-working parts, such as platform, frame, and attachment hardware, which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(b) The lifting mechanism and platform shall be able to lift a minimum payload of eight hundred pounds.

(c) Lifts installed in all school buses shall be fully automatic, including folding and unfolding of the platform.

(2) Controls shall be provided that enable the operator to activate the lift mechanism from either inside or outside of the bus.

(3) The lift shall incorporate an emergency method of deploying and lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator, when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied. No manual emergency operation shall require more than two minutes to lower an occupied wheelchair to ground level.

(4) Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling or folding any faster than twelve inches per second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) Electrically powered lifts shall have a circuit breaker installed within twenty-four inches of the power source. The ampere rating shall be specified by the lift manufacturer.

(6) The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the platform during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the platform is in its fully raised position. Each side of the lift platform which extends beyond the vehicle in its raised position, shall have a barrier of a minimum of one and one-half inches high. Such barriers shall not interfere with maneuvering into or out of the aisle. The loading-edge barrier, outer barrier, which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system be provided to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically raise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the platform is more than three inches above the roadway or sidewalk and the platform is occupied. Alternatively, a barrier or

system may be raised, lowered, opened, closed, engaged, or disengaged by the lift operator, provided an interlock or inherent design feature prevents the lift from rising, unless the barrier is raised or closed or the supplementary system is engaged.

(7) The lift mechanism shall be equipped with adjustable limit switches and/or by-pass valves to prevent excessive pressure from building in the hydraulic system when the platform reaches the full up position or full down position.

(8) The platform surface shall be free of any protrusions over one-fourth inch high and shall be slip resistant. The platform shall have a minimum clear width of twenty-eight and one-half inches at the platform, a minimum clear width of thirty inches measured from two inches above the platform surface to thirty inches above the platform, and a minimum clear length of forty-eight inches measured from two inches above the surface of the platform.

(9) Any openings between the platform surface and the raised barriers shall not exceed five-eights inch in width. When the platform is at vehicle floor height with the inner barrier, if applicable, down or detracted, gaps between the forward lift platform edge and the vehicle floor shall not exceed one-half inch horizontally and five-eighths inch vertically. Platforms on semiautomatic lifts may have a hand hold not exceeding one and one-half inches by four and one-half inches located between the edge barriers.

(10) The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of one to eight, measured on level ground, for a maximum rise of three inches and the transition from roadway to sidewalk to ramp may be vertical without edge treatment up to one-fourth inch. Thresholds between one-fourth inch and one-half inch high shall be beveled with a slope no greater than one to two.

(11) The lift platform, not including the entrance ramp, shall not deflect more than three degrees, exclusive of vehicle roll or pitch in any direction between its unloaded position and its position when loaded with six hundred pounds applied through a twenty-six inch by twenty-six inch test pallet at the centroid of the platform.

(12) No part of the platform shall move at a rate exceeding six inches per second during lowering and lifting an occupant, and shall not exceed twelve inches per second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3G.

(13) The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users. Lifts shall accommodate persons using walkers, crutches, canes, or braces, or who otherwise have difficulty using steps. The platform may be marked to indicate a preferred standing position.

(14) Platforms on lifts shall be equipped with handrails on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees

through the entire lift operation. Handrails shall have a usable component at least eight inches long, with the lowest portion a minimum thirty inches above the platform and the highest portion a maximum thirty-eight inches above the platform. The handrails shall be capable of withstanding a force of one hundred pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between one and one-fourth inches and one and one-half inches or shall provide an equivalent grasping surface and have eased edges with corner radii of not less than one-eighth inch. Handrails shall be placed to provide a minimum one and one-half inch knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

(15) A switch activated by the lift door(s) shall be installed in the circuit to prevent the lift mechanism from operating when the door(s) are closed.

(16) School buses for the transportation of children with disabilities delivered to the state of Ohio after the effective date of this rule shall have the lift installed by the body manufacturer or authorized dealer. The installation shall be certified and the documentation shall be provided by the installer. It shall be the responsibility of the installer to ensure the levelness of the vehicle after installation. The location of the lift shall not adversely affect the legal axle loading, the maneuverability, structural, or the safe operation of the vehicle in which it is installed.

(17) When the special service entrance is installed adjacent to the stepwell or has a seat or wheelchair position directly in front of or behind the special service entrance, a barrier panel shall be installed. The barrier panel shall prevent the possibility of a body limb from becoming entangled in the lift mechanism. The barrier panel may be flush to the outside wall of the bus or at a dimension that will prohibit a passenger from coming in contact with the lift mechanism. The panel may be constructed of aluminum or polycarbonate. The end of the barrier panel exposed to the passenger compartment shall be secured to a padded stanchion extending from the floor to the ceiling. The stanchion shall be attached to the roof bow or a reinforced panel in the ceiling. If the barrier panel is used in conjunction with a padded stanchion and modesty panel, it shall extend approximately six inches above the lift platform and extend beyond the stationary frame or the most inner part of the lift exposed to the passenger compartment. If the barrier panel is a separate installation, it shall be constructed of the same materials and extend from the floor to approximately six inches above the lift platform and extend beyond the stationary frame or the most inner part of the lift exposed to the passenger compartment. The barrier panel shall be in compliance with FMVSS 571.302 and 571.222.

HISTORY: Eff 7-15-78; 2-11-93; 2-18-93; 9-1-98; 9-1-03
Rule promulgated under: RC 119.03
Rule authorized by: RC 4511.76
Rule amplifies: RC 4511.76
R.C. 119.032 review dates: 03/07/2003 and 03/07/2008

4501-5-09 Evaluation of new equipment or changes to existing equipment on school buses.

(A) Application – This rule shall apply to any manufacturer, dealer or owner of a school bus who wishes to incorporate or install any equipment or product other than those specified in rules 4501-5-01 to 4501-5-08 of the Administrative Code, including equipment or products the manufacturer, dealer or owner believes are equivalent or superior to equipment or products specified in those rules.

(B) Permission – Prior to the installation of new or additional equipment or products, or changes to any existing equipment on a school bus, the school bus manufacturer, dealer or owner shall request permission, in writting, from the director This request shall include, but is not limited to,

(1) A complete description of the item, including:

(a) Photographs or illustrations

(b) Diagrams and/or informational pamphlets

(c) Schematics, technical data, specifications, dimensions

(d) Results of testing by an independent testing facility or laboratory specific to the product being tested.

(e) If the manufacturer, dealer or owner believes the equipment or product is equivalent or superior to those included in the specifications set forth in rules 4501-5-01 to 4501-5-08 of the Administrative Code, a statement explaining how this determination was made.

(2) If practical, actual models or samples of the equipment or product should be submitted.

(3) Complete cost estimates for the new or additional product, or equipment, including initial, cost and cost of installation, labor, maintenance, and continued use.

(4) An explanation of the expected benefits.

(5) A statement of the effect, whether positive or negative, the new or additional product, or equipment, will have on other construction standards contained in rules 4501-5-01 to 4501-5-08 of the Administrative Code, as well as on any other rules governing pupil transportation adopted by the department of public safety or the department of education.

(C) Upon receipt of a request for permission submitted pursuant to paragraph (B) of this rule, the department may take any of the following actions:

(1) Immediately approve or deny the request

(2) Ask for additional information

(3) Order field testing to be conducted in accordance with paragraph (D) of this rule

(4) Seek guidance from the Ohio School Bus Construction Standards Advisory Committee at the Committee's next quarterly meeting. The Committee shall make recommendations to the department regarding the action to be taken in response to the request.

(D) The department may order field testing of any new or additional equipment or products as part of the process of evaluating a request for permission submitted pursuant to paragraph (B) of this rule. The length and extent of the field test shall be determined by the department based on the nature of the product being tested, but shall be conducted on no fewer that three school buses. If a field test is being conducted pursuant to a request submitted by a school bus manufacturer, the manufacturer will be expected to maintain, adjust, and modify the equipment or product at no cost to the school bus owner. At the conclusion of the field test, an evaluation of the equipment or product shall be submitted on a form provided by the department by at least three school bus drivers, one school bus mechanic, and one school transportation director.

(E) The department shall either approve or deny the request for permission submitted pursuant to paragraph (B) of this rule after considering the materials submitted in support of the request, any recommendations made by the Ohio School Bus Construction Standards Committee, the results of any field tests conducted, and any other information available to the department. The manufacturer or the school owner will be notified in writing of the director's decision. If the request for permission is denied, the school bus manufacturer, dealer or owner may appeal the denial in writing to the director. The director's decision on such appeal shall be final.

(F) Based upon any information which may become available to the department regarding any equipment or products that have been approved pursuant to this rule for use on school buses, the director may remove such equipment or products from service. The manufacturer, dealer or the school owner will be notified in writing of the director's decision.

(1) Any item deleted from service shall be removed from the bus, unless written permission to retain it is given by the director.

(2) Any item which, at any time is determined to present a potential hazard to occupants of the school bus or other persons or property, shall be immediately removed from the school bus and any ongoing field test terminated.

(G) The department shall maintain a list of all equipment or products that have been approved pursuant to this rule for use in school buses. This list shall be made available upon request in writing to: the Ohio State Highway Patrol Office of Licensing and Commercial Standards, Ohio Department of Public Safety, 1970 West Broad Street, Columbus, Ohio 43223.

HISTORY: Eff 11-1-71; 4-1-78; 7-1-88; 1-1-90; 9-1-98; 9-1-03
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