4501-5-01 **General provisions.**

[Comment: For dates and availability of material incorporated by reference in Chapter 4501-5 of the Administrative Code, see paragraph (R) of this rule.]

(A) Except as otherwise provided in paragraphs (Q)(2)(a) to (Q)(2)(i) 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 and 4501-5-03 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 and 4501-5-03 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 4501-5-04 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~~certifying 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) When new models are introduced, an updated statement of compliance 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.

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

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(I) For "Type A" school bus only: the chassis manufacturer shall provide for service at the body plant location after the body is mounted and prior to delivery to the purchaser.

(J) At the time of delivery, the manufacturer shall provide to the purchaser the following documents (either printed or electronic):

(1) Line set tickets.

(2) Warranty book and statement of warranty.

(K) 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.

(L) School buses equipped with equipment or products that have been approved by the director pursuant to rule 4501-5-04 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 4501-5-04 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 4501-5-04 of the Administrative Code.~~

(M) All materials used in school bus construction shall meet or exceed all applicable federal motor vehicle safety standards (FMVSS) and society of automotive engineers (SAE) standards.

(N) School bus definitions

(1) A "Type A School Bus" is a conversion bus constructed utilizing a cutaway front section vehicle with a left side driver's door. This definition shall include two classifications:

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

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

(2) A "Type B School Bus" is constructed utilizing a 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.

(O) All body and chassis manufacturers shall provide a current up-to-date parts and service repair manual(s) (either printed or electronic) 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.

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

(Q) Compliance, maintenance

(1) The responsibility for compliance with these rules and/or national highway traffic safety administration (NHTSA) 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 NHTSA 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 construction standards federal motor vehicle safety standards 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 manufacture date on or after July 1, 2025, the Ohio department of public safety school bus construction standards effective July 1, 2025.

~~(a)~~(b) For school buses with a manufacture date on or after January 1, 2018, but before the effective date of this rule, the Ohio department of public safety school bus construction standards, effective July 1, 2019.

~~(b)~~(c) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after May 15, 2014, but before the effective date of this rule, the Ohio department of public safety school bus construction standards, effective May 15, 2014.

~~(c)~~(d) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after December 1, 2008, but before the effective date of this rule, the Ohio department of public safety school bus construction standards, effective December 1, 2008.

~~(d)~~(e) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after August 16, 2007, but before the effective date of this rule, the Ohio department of public safety Ohio school bus construction standards, effective August 16, 2007.

~~(e)~~(f) For school buses with a bid date, or if bid date is unknown, with a manufacture date on or after September 1, 2003, but before August 16, 2007, the Ohio department of public safety Ohio school bus construction standards, effective September 1, 2003.

~~(f)~~(g) 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 September 1, 2003, the Ohio department of public safety Ohio school bus construction standards, effective September 1, 1998.

~~(g)~~(h) 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 and workforce school bus minimum construction standards, effective January 1, 1990.

~~(h)~~(i) 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 and workforce school bus minimum construction standards, effective July 1, 1988.

~~(i)~~(j) 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 and workforce school bus minimum construction standards, effective April 1, 1978.

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

(S) Incorporated by reference. This chapter includes material that has been incorporated by reference. If the material is subject to change, only the specific version listed in this rule is incorporated. Any revision to the referenced material is not incorporated unless and until this rule has been amended to specify the new date.

Except as otherwise provided in paragraphs (Q)(2)(a) to (Q)(2)(i) and paragraphs (S)(1) to (S)(6) 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) Code of Federal Regulations (CFR) may be obtained by writing to "U.S. Government Printing Office, 400 7th Street SW, Washington DC 20590" or via its website at http://www.gpoaccess.gov.

Chapter 4501-5 of the Administrative Code incorporates 49 CFR 393.94 (October 1, 2012).

(2) Federal motor carrier safety regulations (FMCSR) may be obtained by writing to "U.S. Department of Transportation, National Highway Traffic Safety Administration (DOT-NHTSA), 400 7th Street SW, Washington D.C. 20590" or via its website at http://www.fmcsa.dot.gov/ or at http://www.gpoaccess.gov.

Chapter 4501-5 of the Administrative Code incorporates FMCSR 390.21 (October 1, 2012).

(3) Federal motor vehicle safety standards (FMVSS) may be obtained by writing to "U.S. Department of Transportation, National Highway Traffic Safety Administration (DOT-NHTSA), 400 7th Street SW, Washington D.C. 20590" or via its website at http://www.fmcsa.dot.gov/ or at http://www.gpoaccess.gov. For the purpose of this chapter, references to federal motor vehicle safety standards are to those set forth in the Code of Federal Regulations printed as of October 1, 2012. Chapter 4501-5 of the Administrative Code incorporates the following federal motor vehicle safety standards:

(a) FMVSS 571.101;

(b) FMVSS 571.105;

(c) FMVSS 571.108;

(d) FMVSS 571.111;

(e) FMVSS 571.120

(f) FMVSS 571.121;

(g) FMVSS 571.125;

(h) FMVSS 571.131;

(i) FMVSS 571.205;

(j) FMVSS 571.209;

(k) FMVSS 571.210;

(l) FMVSS 571.217;

(m) FMVSS 571.220;

(n) FMVSS 571.221;

(o) FMVSS 571.222;

(p) FMVSS 571.301;

(q) FMVSS 571.302;

(r) FMVSS 571.403;

(s) FMVSS 571.404.

(4) National highway traffic safety administration (NHTSA) recalls may be accessed at the "National Highway Traffic Safety Administration's" website at http://www.nhtsa.gov.

(5) National school transportation specifications and procedures (May 2015), may be obtained by writing to the "NASDPTS, 3980 River Road, Wisconsin Dells, WI 53562" or via the national congress on school transportation's website at http://www.ncstonline.org.

(6) Ohio department of public safety Ohio school bus minimum construction standards and Ohio department of education and workforce school bus minimum construction standards may be obtained by writing to "Ohio Department of Public Safety, Licensing and Commercial Standards, 1970 West Broad Street, Columbus, Ohio, 43223" or via its website at http://www.statepatrol.ohio.gov. A complete and accurate copy of each publication

has also been deposited in each of five depository libraries designated by the state library board.

(7) Society of automotive engineers international (SAE) standards are to be those set forth in the "2008 Society of Automotive Engineers Handbook" as published by the "Society of Automotive Engineers, Inc." SAE standards may be obtained by writing to "SAE World Headquarters, 400 Commonwealth Drive, Warrendale, PA 15096" or via its website at http://www.sae.org. Chapter 4501-5 of the Administrative Code incorporates the following SAE standards:

(a) SAE standard J381;

(b) SAE standard J541;

(c) SAE standard J683;

(d) SAE standard J800;

(e) SAE standard J887;

(f) SAE standard J994;

(g) SAE standard J1019;

(h) SAE standard J2233

(i) SAE standard J2249.

(T) 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 or the director's designee.

(3) "Manufacturer's rated seating capacity," also known as "shell capacity," means the theoretical passenger capacity that a vehicle would have if it were constructed with the maximum number of seating positions.

(U) The director shall appoint an "Ohio School Bus Construction Standards Advisory Group" to assist with the adoption of standards.

The advisory group ~~shall be~~is administered by the Ohio state highway patrol and ~~consist~~consists of a representative from each of the following if possible:

(1) The Ohio department of education and workforce;

(2) The national highway traffic safety administration;

(3) An individual or organization representing pupil transportation;

(4) An individual or organization representing school bus mechanics;

(5) An individual or organization representing school administrators; and

(6) An individual or organization representing school bus manufacturers.

Effective: 7/1/2025

Five Year Review (FYR) Dates: 3/31/2025 and 06/01/2030

CERTIFIED ELECTRONICALLY

Certification

06/05/2025

Date

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4501-5-02 **School bus construction standards.**

[Comment: For dates and availability of material incorporated by reference in this rule, see paragraph (S) of rule 4501-5-01 of the Administrative Code.]

These standards apply to any school bus used to transport school children to and from school and/or school related activities and events.

(A) Access steps shall be installed~~.~~ (except "Type A" buses). Access steps include:

(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 to assist in using the steps.

(3) In lieu of steps installed on each side, the steps are permitted in or on the front bumper if the windshield can be accessible for cleaning from that position.

(B) Air compressor for accessories.

An accessory compressor that supplies air to accessories only shall be sized appropriately~~. Accessory compressors shall~~ and are not to be connected to the braking system in any way.

(C) ~~Aisle~~Aisles shall meet minimum measurements. Minimum aisle measurements include:~~.~~

(1) ~~Minimum width of aisle shall be twelve~~Twelve inches at floor level.

(2) ~~Minimum width of aisle~~Twelve inches between seats ~~shall be twelve inches~~ at seat level.

(3) The aisle ~~shall~~ is not to be less than twelve inches wide between any two objects from the service doors to the aisle in the passenger area from floor to ceiling.

(4) Hold-down fastening devices used on inside engine cover ~~shall be~~are to designed to prevent hooking or catching on shoes or clothing.

(D) Axles and suspensions~~.~~ shall meet minimum standards. Minimum axle and suspension standards include:

(1) The front and rear axles, including suspension assemblies, and all frame-to-ground components, ~~shall~~are to have a gross axle weight rating when measured at the

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~~are to be installed on the front and rear of the school bus chassis.

(3) Suspension assemblies as specified ~~shall~~are to maintain/control stability of school bus under all conditions.

(E) Battery.

(1) "Type B, C and D" buses:

(a) A battery or batteries of at least eight hundred cold cranking amperes for a gasoline powered engine.

(b) A battery or batteries of at least one thousand two hundred fifty cold cranking amperes for a diesel powered engine.

(2) "Type A I and A II" buses:

(a) A battery or batteries of at least six hundred cold cranking amperes for a gasoline powered engine.

(b) A battery or batteries of at least one thousand cold cranking amperes for a diesel powered engine.

(3) A battery or batteries of at least one thousand two hundred cold cranking amperes if equipped with a lift.

(4) One-piece,~~,~~ non-spliced battery cables that conform to SAE standard J541 with respect to electrical resistance shall be provided by the chassis manufacturer. ~~All cables shall conform to SAE standard J541 with respect to electrical resistance.~~

(5) "Type A I and A II" buses may have the battery/batteries located at the manufacturer's standard. Batteries for "Types B, C, and D" buses shall be mounted in the body skirt by the body manufacturer. Rear engine buses may have batteries mounted in engine compartment.

(6) A drawer-type pull-out tray shall be installed whenever the battery/batteries are accessed through the body fender skirt. The batteries shall be enclosed by a compartment constructed of mill-applied zinc coated steel, or other acid

resistant material, 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 or material. Battery tray shall be equipped with a positive locking device to keep tray from sliding completely out to prevent battery from being dropped.

(F) Body construction~~:~~ shall meet minimum standards. Minimum body construction standards include:

(1) All construction components (except door handles, grab handles, interior decorative parts, other interior plated parts, and components heavier than twelve-gauge), ~~shall~~are to be of prime commercial quality mill-applied zinc coated steel, other anti-corrosive coating or composite materials. Components ~~must~~are to meet or exceed current strength and durability and all applicable "Federal Motor Vehicle Safety Standards." The zinc plating ~~shall~~are to be one hundred twenty grams per meter square minimum coating weight (G60) or equivalent applied by either hot dipping or electroplating. All such construction materials ~~shall~~are to be fire resistant.

(2) All metal surfaces that will be painted ~~shall~~are to 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~~are to 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 bus body and after mounting body upon chassis, the total unit strength of the school bus ~~shall~~are to meet or exceed all strength criteria as established by FMVSS 571.220 and FMVSS 571.221.

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

(6) Exterior body panels ~~shall~~are to meet or exceed FMVSS 571.221.

(7) Floor.

(a) The floor ~~shall~~is not to be ~~not~~ less than fourteen-gauge mill, corrosive resistant coated steel or composite materials. If zinc plated, the plating ~~shall~~is to be one hundred twenty grams per meter square minimum coating weight (grade sixty) or equivalent applied by either hot dipping or electroplating.

(b) The floor may be flat.

(c) "Type A" buses have an additional step from the step well.

(d) A fuel access plate ~~shall~~is to be installed for easy access to fuel gauge mechanism. ("Type A" buses excluded)

(8) Rub rails.

(a) Manufacturers ~~shall~~are to install one rub rail at approximately seat level, except for the opening for engine compartment side door in a rear engine bus. This rail ~~shall~~is to extend from the main vertical post behind the service door to the forward-most vertical post on the left side of the body, including left side emergency door. (Rear emergency door exempted)

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

(c) A third rub rail may be installed on the lower edge of the body skirt.

(d) All rub rails ~~shall~~are to be attached at each body post and all other upright structural members.

(e) Each rub rail ~~shall~~is to be four inches or more in width in its finished form and ~~shall~~ be constructed of sixteen gauge metal or other material of equivalent strength suitable to help protect body side panels from damage.

(f) All rub rails ~~shall~~are to be mounted outside of body panels.

(g) Additional external rub rails are permissible if they form an integral part of the body construction and meet the fastening requirements.

(9) Fold out steps may be installed at the regular service entrance.

(a) The fold out step will provide a step level that is six inches or less to ground level.

(b) The fold out step may be power activated or manually operated.

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

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

(G) Brakes.

All braking systems and components shall meet or exceed the minimum requirements specified in applicable Federal Motor Vehicle Safety Standards 571.105 or 571.121 and the following:

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

(2) All air brake systems ~~shall~~are to have both visual and audible warning systems that activate as required by FMVSS 571.121. Hydraulic brake systems that utilize hydraulic power assist ~~shall~~are to have both visual and audible warning systems that activate as required by FMVSS 571.105.

(3) For air brake systems, an air pressure gauge ~~shall~~are to be provided in the instrument panel capable of complying with CDL pre-trip inspection requirements.

(4) Air compressors that supply air to brakes must have sufficient rated capacity that meets or exceeds FMVSS 571.121 (minimum of thirteen cubic feet per minute) and ~~shall~~are to be pressure oil fed. Clean air to all compressors ~~shall~~is to be supplied and filtered through engine air cleaner.

(5) All air supplied from the air tanks ~~shall~~is to be taken at or above the center line of the air tank to avoid contaminates entering the braking system or air operated accessories.

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

(H) Bumpers~~:~~ shall meet minimum standards. Bumper minimum standards include:

(1) Front bumper for all buses having a GVWR of twenty-one thousand five hundred pounds or less ~~shall~~is to be manufacturers standard. ("Type A" buses)

(2) Front bumper for all buses having a GVWR greater than twenty-one thousand five hundred pounds rating:

(a) Bumper ~~shall~~is to be at least three-sixteenths of an inch thick pressed steel channel, one-piece construction, with a minimum width of eight inches after forming. Materials other than pressed steel may be used if equivalent in strength and durability of pressed steel.

(b) Bumper ~~shall~~is to be contoured to offer maximum protection of fender lines without permitting snagging or hooking.

(c) Bumper ~~shall~~is to 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.

(d) The bumper ~~shall~~is to be of sufficient strength to permit lifting the bus with a bumper type lift for servicing

(3) Rear bumper.

(a) Bumper ~~shall~~is to be of sufficient strength to permit lifting the bus with a bumper type lift for servicing and ~~shall~~is to be one piece, heavy-duty type of pressed steel channel, at least three-sixteenths inch of thickness. Materials other than pressed steel may be used if equivalent in strength and durability of pressed steel.

(b) Bumper ~~shall~~is to be a minimum of eight inches in height after forming.

(c) Bumper ~~shall~~is to 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~~is to 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~~is to 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.

(d) Bumper ~~shall~~is to 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~~is to 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.

(e) Bumper ~~shall~~is to extend beyond rear-most part of body surface at least one inch, measured at floor line.

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

(g) Front ends of the bumper ~~shall~~is to 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.

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

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

(I) ~~Color.~~Bus must meet color standards. Bus color standards include:

(1) Bumpers ~~shall~~are to be black.

(2) Fender and body ~~shall~~are to be painted national school bus yellow.

(3) Hood may be painted non-reflective national school bus yellow or flat black (except "Type A").

(4) Frame ~~shall~~is to be painted black.

(5) Grille may be painted national school bus yellow, black or chrome or anodized aluminum in finish. Rear engine bus grille area(s) ~~shall~~are to be national school bus yellow.

(6) Steel wheels ~~shall~~are to be black and/or gray. Aluminum wheels are permitted.

(7) All lettering and numbering on exterior ~~shall~~is to be black.

(8) Background area and optional hoods for warning lights ~~shall~~are to be black.

(9) Rub rails ~~shall~~are to be black.

(10) Service door may be black. Note:

(a) Special service doors ~~shall~~are not to be black.

(b) Left side driver's door on "Type A and A II" buses ~~shall~~are not to be black.

(J) Cooling system~~:~~ shall meet minimum standards. Cooling system minimum standards include:

(1) Cooling system ~~shall~~is to be manufacturer's standard.

(2) Cooling fan(s) may be variable speed.

(3) The cooling system ~~shall~~is to have a means of checking the coolant without having to remove the radiator cap.

(K) Defroster~~.~~ system shall meet minimum standards. Defroster minimum standards include:

(1) Defroster system ~~shall~~is to meet or exceed SAE standard J381 performance requirements without use of auxiliary fan.

(2) The defroster system ~~shall~~is to be of sufficient capacity to keep windshield area, left front side driver's window, and service door glass area free of condensation or ice under all possible combinations of pupil load and climatic conditions.

(3) Defroster system ~~shall~~is to be capable of providing at least sixty per cent fresh air.

(4) Two adjustable six-inch auxiliary fans shielded with small mesh metal or polypropylene guards ~~shall~~are to be installed. Only one adjustable six-inch auxiliary fan is required for "Type A" buses.

(a) Each auxiliary fan(s) ~~shall~~is/are to be controlled individually by a multi-speed switch.

(b) The switch ~~shall~~is to be located within easy reach of the driver while seated.

(L) Drive shaft and differential shall meet minimum standards. Drive shaft and differential minimum standards include:~~.~~

(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 extending lengthwise under the floor of the passenger compartment to prevent projecting through the floor or dropping to the ground if broken. The drive shaft guard ~~shall~~is to be at the end of the shaft which is provided with a sliding connection (spline or other such device) to prevent whipping of the shaft in event of failure thereof or any of its component parts.

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

(M) Driver's seat~~.~~ shall meet minimum standards. Minimum driver's seat standards include:

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

(2) The driver's seat and driver's area ~~shall~~are to have a restraining barrier meeting FMVSS 571.222 positioned immediately behind the driver's area.

(3) The ~~driver's~~driver's seat upholstery ~~shall~~is to meet FMVSS 571.302 (Flammability of interior materials).

(4) A "Type II" seat belt is required for the driver. Belts ~~shall~~are to 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~~is to be adjustable on one side only and keep the driver from sliding sideways under the belt.

(5) Seating options allowed:

(a) Adjustable air driver's seat;

(b) Internal heating provided by manufacturer; and

(c) Driver alert technology.

(N) Electrical system.

(1) Alternator.

(a) Minimum of a one hundred forty five ampere alternator on all "Type A" buses.

(b) Minimum of a two hundred ampere alternator on all other buses.

(2) All wiring ~~shall~~is to conform to current society of automotive engineers standards.

(O) Emergency equipment shall be on the bus and mounted in an easily accessible location. Minimum emergency equipment includes:~~.~~

~~(1) All shall be mounted in an easily accessible location.~~

~~(2)~~(1) Bus ~~shall~~is to be equipped with at least one dry-chemical-type fire extinguisher of at least five-pound capacity, 3A - 40 B.C. rating, located outside of the passenger area, mounted in a quick release-type bracket and easily accessible by the driver. The extinguisher ~~shall~~is to be equipped with a dial-type graduated gauge which indicates loss of pressure. Fire extinguisher ~~shall~~is to be of the type that permits the dry-chemical base to be refilled by ordinary procedures.

~~(3)~~(2) First aid kits ~~shall~~are to be dustproof, plainly labeled, mounted in a location easily accessible to the driver, located outside of the passenger area, and securely mounted in a metal or plastic container.

~~(4)~~(3) A twenty-four unit kit is required for all buses. Note: The first aid kit may be installed at time of manufacture by the manufacturer, installed by dealer, or installed by the owner/operator of the school bus.

~~(5)~~(4) Three triangle reflectors with weighted stands ~~shall~~are to be properly encased for easy storage. The triangle reflectors ~~shall~~are to meet FMVSS 571.125. The storage container ~~shall~~is to be mounted to prevent movement and ~~shall~~ be mounted within easy access of the driver.

~~(6) Six thirty-minute fusees are permitted and shall be encased for easy storage. The storage container shall be mounted to prevent movement and shall be mounted within easy access of the driver. The fusees shall not be stored in the passenger area. No spiked fusees are permitted.~~

~~(7)~~(5) One body fluid kit ~~shall be~~is required. The kit ~~shall~~is to 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~~is to 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~~is not to contain more than one and one-half fluid ounces of alcohol.

Note: The body fluid kit may be installed at time of manufacture, installed by dealer or the owner/operator of the school bus.

(P) Emergency exits~~:~~ shall meet minimum standards. Emergency exit minimum standards include:

Any installed emergency exit ~~shall~~is to comply with the design and performance requirements of FMVSS 571.217 applicable to that type of exit, regardless of whether or not that exit is required by FMVSS 571.217. Additional exits are allowed in addition to the minimum required by this rule.

(1) Emergency doors.

(a) Emergency doors ~~shall~~are to meet FMVSS 571.217. An interior handle ~~shall~~is to be provided to pull the door shut from the inside which may be used as a protection against accidental release.

(b) When the interior handle is not in the position that causes the emergency door to be closed, a continuous warning sound ~~shall~~is to be audible at the driver's seating position and in the vicinity of the emergency door and the dome lights (driver's dome light excluded) ~~shall~~are to illuminate with the ignition switch in any position.

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

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

(e) There ~~shall~~is to be no step-type mechanism in the use of the emergency door.

(f) There ~~shall~~is to be a head bumper pad installed on the inside at the top of the emergency exit frame. This pad ~~shall~~is to be approximately four inches in width and extend across the entire top of the emergency exit opening and ~~shall~~ meet FMVSS 571.302 for flammability standards of interior materials.

(2) Rear emergency door.

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

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

(c) Rear emergency door ~~shall~~is to be hinged on right side and ~~shall~~ open outward.

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

(e) The rear emergency door ~~shall~~is to have a prop rod/lock out bar.

(3) Left side emergency door.

(a) On all rear-engine school buses, a left side emergency door ~~shall~~is to be installed.

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

(c) The left side emergency door ~~shall~~is to have a prop rod/lock out bar.

(4) Emergency side window exits.

(a) Emergency window ~~shall~~is to display the words "emergency exit" at the top of or directly above, or at the bottom of the emergency window exit on both the inside and outside of the bus, in a color contrasting the background.

(b) Emergency windows, when not fully latched, ~~shall~~is to activate a continuous warning sound that ~~shall~~is to be audible in driver's compartment and activate all dome lights (driver’s dome lights excluded). Warning sound and dome lights ~~shall~~is to be operational with the ignition switch in any position.

(5) Emergency window, rear-engine buses.

(a) An emergency window ~~shall~~is to be installed above the engine compartment.

(b) Window ~~shall~~is to be hinged from top and provided with a device to ensure against accidental closing when open.

(c) Emergency window in rear ~~shall~~is to 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~~is to display the words "emergency exit" at the top of or directly above, or at the bottom of the emergency window

exit on both the inside and outside of the bus, in a color contrasting the background.

(e) Emergency window, when not fully latched, ~~shall~~is to activate a continuous warning sound that ~~shall~~is to be audible in the driver's compartment and all dome lights ~~shall~~are to activate (driver dome lights excluded). Warning sound and dome lights will be operational with the ignition switch in any position.

(6) Emergency roof exits.

(a) A continuous warning sound that ~~shall~~is to be audible in the driver's compartment and all dome lights ~~shall~~are to activate when the hatch is opened in the escape position (driver dome lights excluded). Warning sound and dome lights ~~shall~~are to be operational with ignition switch in any position.

(b) If a bus is not manufactured with a static vent, the emergency roof exit ~~shall~~is to be a static-type with exhaust vent.

(7) Number of emergency roof exits required.

(a) One roof hatch is required for a bus with a manufacturer's rated shell capacity of one to forty-five.

(b) Two roof hatches are required for a bus with a manufacturer's rated shell capacity of forty-six and above.

(Q) Engine speed governor shall be installed on all buses. Setting shall comply with manufacturer's maximum recommended governed speed. A revolution per minute limiter in lieu of the engine speed governor is acceptable. Note: Recommended governed speed will reference maximum speed limits established in section 4511.21 of the Revised Code.

(R) Exhaust system shall meet minimum standards. Exhaust system minimum standards include:~~-~~

(1) Exhaust pipe, muffler or a diesel particulate filter in lieu of the muffler, and tailpipe ~~shall~~are to be outside bus body and attached to chassis.

(2) The tailpipe and after-treatment system ~~shall~~are to be constructed of a corrosion-resistant tubing material at least equal in strength and durability to sixteen-gauge steel tubing of equal diameter.

(3) The tailpipe may be flush with, or ~~shall~~is not to extend more than two inches beyond, the perimeter of the body for side-exit pipe or the bumper for rear-exit pipe. The exhaust ~~shall~~is to be designed such that exhaust gas will not be trapped under the body of the bus.

(4) The tailpipe ~~shall~~is to exit to the left or right of the emergency exit door in the rear of the vehicle to the left side of the bus, in front of or behind the rear drive axle, or the tailpipe may extend through the bumper. The tailpipe ~~shall~~is not to exit beneath any fuel filler location, emergency door, or lift door.

(5) The exhaust system ~~shall~~is to be insulated in a manner to prevent any damage to any fuel system component.

(6) The design of the after-treatment systems ~~shall~~is not to allow active (non-manual) regeneration of the particulate filter during the loading and unloading of passengers. Manual regeneration systems will be designed such that unintentional operation will not occur.

(7) Right side discharge exhaust systems are not permitted.

(S) For after treatment systems that require diesel exhaust fluid (DEF) An optional left side discharge exhaust system is permitted. If a left side discharge, the tailpipe shall be located at least three inches and not more than eighteen inches in front of the rear wheel opening and angled down at a forty-five degree angle six inches from the end of the pipe. The discharge shall extend to the edge of the body.

(1) The composition of the DEF must comply with ISO 22241-1.

(2) The DEF supply tank shall be sized to meet a minimum ratio of three diesel fills to one DEF fill.

(T) Fenders shall meet minimum standards. Minimum fender standards include:~~.~~

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

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

(3) Fiberglass replacement fenders and cowl pieces are permitted.

(U) Floor covering shall meet minimum standards. Minimum floor cover requirements include:~~-~~

(1) All floor covering ~~shall~~is to have a calculated burn rate of .1 mm per minute or less using the test methods, procedures and formulas listed in FMVSS 571.302 and 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~~is to be waterproof and recommended by the manufacturer of the floor covering material.

(2) Underseat areas ~~shall~~are to have a 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~~is to be covered with a fitted, rust-free metal or composite molding or reformed interior panel.

(3) Driver's compartment floor area ~~shall~~is to be of the same quality material as the underseat floor covering. The driver's compartment floor covering ~~shall~~is to be attached to the floor.

Exception - On "Type A" buses, the driver's compartment floor area ~~shall~~is to be manufacturer's standard~~. It shall~~ and be attached to the floor.

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

(5) Metal, composite molding, bonding or non-metal welding ~~shall~~is to cover all floor-covering joints.

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

(7) A fuel access plate ~~shall~~is to be installed for easy access to fuel gauge mechanism and ~~shall~~is to be installed above the regular floor covering when possible. The access plate ~~shall~~is to not be undercoated. Panel ~~shall~~is to be sealed to prevent any leakage or moisture. Diamond plate may be used as an access panel. ("Type A" buses and alternative fuel systems excluded)

(8) Floor covering on top step landing ~~shall~~is to be one piece.

(9) A plywood floor ~~shall~~is to be applied on top of the steel floor. Floor covering ~~shall~~is to be applied on top of the plywood. Plywood ~~shall~~is to be five-eighths inch five-ply type CD exterior grade. Plywood ~~shall~~is to extend to fire-wall and under the driver's seat. Plywood ~~shall~~is to be sanded and vacuumed before

covering is applied. Waterproof sealing material ~~shall~~is to be applied to seams in the sections of plywood floor. Plywood ~~shall~~is to 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.

(10) Equivalent material applied to top of steel floor may be used in lieu of plywood, provided it has equal or greater insulation r-value, sound abatement, deterioration-resistant and moisture-resistant properties.

(11) If alternate materials are used in lieu of plywood, manufacturer must certify that FMVSS 571.222 and 571.302 are met.

(V) Frame shall meet minimum standards. Minimum frame standards include:~~:~~

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

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

(3) Frame side members ~~shall~~are to be one-piece construction with the following exceptions:

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

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

(4) Welding to chassis rails is permitted only when guaranteed by the company making the modifications and authorized by the frame manufacturer. The Ohio state highway patrol ~~shall~~is to be notified after the repair and authorized inspection have been completed and prior to the school bus being operated with students on board.

(W) Fuel fill opening- shall be in the body and ~~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. "Type B, C, and D" buses may be provided without a door only if a fuel bucket/spill containment is provided. Exception: On "Type A" buses, the fuel fill opening shall be manufacturer's standard.

(X) Fuel system-all fuel storage specifications shall meet minimum standards and conform to FMVSS 571.301 (fuel system integrity). ~~In addition~~Fuel system minimum standards include:

(1) Fuel tank ~~shall~~is to have a minimum capacity of twenty-five gallons, for buses up to and including a shell capacity of fifty-nine passengers. School buses of sixty passengers and above ~~shall~~are to have a minimum capacity of sixty gallons. It ~~shall~~is to be filled and vented outside of the body. Construction will prevent the spillage or drainage of fuel on any part of the exhaust system.

(2) Fuel filter with replaceable element ~~shall be~~ installed.

(3) In addition to the fuel filter, all diesel fueled engines ~~shall~~are to have a water separator installed between fuel tank and the injector pumps. The fuel/water separator may be incorporated with the fuel filter but the fuel/water separator ~~shall~~is not to serve as the fuel filter.

(4) Drain plug of at least one-fourth inch pipe thread ~~shall be~~ located in center of the bottom of gas and diesel fuel tanks.

(Y) Glass.

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

Glass table

Location	Glass type	Rating
Service door	Laminated	AS 1 or AS 2
Emergency door	Tempered or laminated	AS 2 or AS 3
Emergency window	Tempered or laminated	AS 2 or AS 3
Windshield	Laminated	AS 1
Driver's side glass	Laminated	AS 1 or AS 2
All other glass in passenger's area	Tempered or laminated	AS 2 or AS 3

Exception- On "Type A" buses the driver's door glass shall be manufacturer's standard.

(2) All other glass not noted in table shall meet FMVSS 571.205 glazing materials.

(Z) Heaters shall meet minimum standards. Minimum heater standards include:~~.~~

(1) Heating systems ~~shall~~are to provide evenly distributed heat throughout the bus body and provide defrosting for windshield, driver's left side window and service door.

(2) Buses ~~shall~~are to be equipped with heaters capable of maintaining inside temperature of fifty degrees Fahrenheit using an ambient temperature of zero degrees Fahrenheit as measured per SAE standard J2233.

(3) Buses ~~shall~~are to be equipped with a front heater.

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

(5) All heaters ~~shall~~are to be independently controlled by multi-speed switches.

(6) All hot water lines inside the ~~driver's/passenger's~~driver's/passenger's area ~~shall~~are to be enclosed.

(7) Heater cores and fans ~~shall~~are to 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~~is to include two shut-off valves able to shut off coolant completely when necessary.

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

(b) One shut-off valve ~~shall~~is to be mounted between the engine block and the heater hose connection.

(9) There ~~shall~~is to be a heater flow regulating valve installed for convenient operation when the driver is in a normal seated position.

(AA) "Type D" buses with an interior engine cover shall have a device or design to secure the engine cover when in the open position, or shall be fully removable.

"Type C" buses shall have a design for the hood that minimizes the risk of accidental closing.

(BB) Horns.

Buses shall be equipped with a horn(s) of standard make 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. Air horns are permitted.

(CC) Electronic stability control shall be equipped on:

(1) Air brake equipped school buses with a build date of August 1, 2019 or later.

(2) All school buses with a build date of August 1, 2020 or later.

(DD) Instruments and instrument panel shall meet minimum standards. Instruments and instrument panel minimum standards include:~~:~~

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

(a) Speedometer.

(b) Odometer which will show accrued mileage up to nine hundred ninety-nine thousand nine hundred ninety-nine.

(c) A voltmeter showing the battery voltage. The voltmeter ~~shall~~is to be off when the ignition switch is in the off position.

(d) Oil pressure gauge.

(e) Engine temperature gauge.

(f) Fuel gauge.

(g) Air brake systems ~~shall~~is to have independent gauges indicating air pressure in the primary and secondary air tanks.

(h) Buses may be equipped with a tachometer.

(i) A diesel exhaust fluid (DEF) gauge is required for diesel engines.

(2) All buses ~~shall~~are to have a warning system consisting of a light and optional audible warning to notify driver of low engine oil pressure, low engine coolant level, and coolant overheating. System ~~shall~~is not to automatically shut off engine, unless warning signals have been displayed to the driver and the engine has derated for a period of time.

(3) The visibility and illumination of the instruments ~~must~~is to comply with FMVSS 571.101.

(EE) Insulation shall meet minimum standards. Minimum insulation standards include:~~:~~

(1) Bus body ~~shall~~is to be fully insulated in the roof and all body panels to deaden sound, reduce vibrations and heat transfer.

(2) Fire resistant fiberglass insulation or equivalent material of at least one-inch thickness ~~shall~~is to be added in the roof, in addition to the usual sprayed on material.

(FF) Interior.

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

(2) All school buses ~~shall require~~are to have inner lining on ceiling and walls and ~~shall~~ are toinclude acoustical (perforated) headlining in the driver area.

(3) The interior sound level at the driver's seating position ~~shall~~ is not to exceed ninety decibels when measured in accordance with test procedures found in 49 CFR 393.94(C).

(4) Cameras and other monitoring devices may be installed inside the bus as long as they do not intrude into the head impact zone. For "Type C and D" buses, cameras may be installed in the ceiling as long as they are above the window ling. Cameras mounted on the sidewall cannot protrude more than three inches. All camera mounting ~~shall~~is to meet FMVSS 571.222.

(5) Padded/foam covered panels may be installed on the interior walls to prevent head injuries by self-abusive pupils.

(a) The padded panels ~~shall~~are to be constructed of the same materials used in the construction of the bus seats.

(b) The padded panel may cover the window.

(c) The padded panel ~~shall~~is to be attached to the sidewall of the bus.

(d) The padded panels ~~shall~~ are not to obstruct any portion of an emergency window or exit.

(e) Materials used in the padded panel ~~shall~~are to comply with FMVSS 571.302.

(GG) Inside body height shall be a minimum of seventy-two inches measured from floor to ceiling at any point on longitudinal center line from the beginning of the aisle of the passenger compartment to the end of the aisle.

For "Type A" buses, the inside body height shall be a minimum of sixty-eight inches measured from floor to ceiling at any point on longitudinal center line from the beginning of the aisle of the passenger compartment to the end of the aisle.

Inside height measurement does not apply to air conditioning equipment.

(HH) Lamps, signals and backing warning device shall meet minimum standards. Minimum lamp, signal and backing warning device standards include:~~.~~

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

(2) Construction of components:

(a) Directional signal, stop light, taillight, marker light, clearance light, identification light, back up light and reflector lenses ~~shall~~are to meet applicable society of automotive engineers standards.

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

(c) Alternately flashing warning signal lamps, body-mounted directional signals and stop lamps ~~shall~~are to be grounded.

(3) When the ignition switch is in the off position, the hazard warning, stop light, marker lights, headlamps, passenger dome lights and emergency exit audible warnings ~~shall~~are to be operational.

(4) The service door step-well light ~~shall~~is to automatically operate when the headlights are in operation and be activated by a switch controlled by the service door.

(5) High beams are to be controlled by a column mounted dimmer switch.

(6) A maximum of two fog lamps may be installed. Fog lamps ~~shall~~are to be amber in color.

(7) Daytime running lamps are required.

(8) One white strobe light ~~shall~~is to be installed on the roof of the bus. The strobe light ~~shall~~is to cycle sixty to two-hundred forty flashes per minute. The roof strobe light ~~shall~~is to be installed on the top of the bus toward the rear as close to the center of the bus as is practical.

(9) Interior dome lights.

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

(b) All dome lights ~~shall~~are to be equipped with clear/white shatter-proof lenses.

(c) Passenger dome lights ~~shall~~are to be controlled by switches in the driver's console. Passenger zones may be switched separately. Power ~~shall~~is to be provided when the ignition switch is in the "On" or "Accessory" position and ~~shall~~ be on a protected circuit.

(d) A separate driver dome light ~~shall~~is to be provided and controlled by a single switch in the driver's console.

(10) Directional signals.

(a) Side and rear directional signals ~~shall~~are to be wired to operate properly with the front directional signals.

(b) Manufacturer ~~shall~~is to install required signal lamps to the directional signal control switch so all directional signal lamps ~~shall be~~are operative. The directional signal system ~~shall~~is to be installed on an integral part of the hazard warning signal switch activated by an independent switch furnished.

(c) Direction signals, when illuminated, ~~shall~~are to be amber in color and ~~shall~~ meet society of automotive engineers specifications.

(d) Rear directional signals ~~shall~~are to have a minimum of thirty-eight square inches of illuminated surface each. The rear directional signals ~~shall~~are to be identical in type, shape, size, and location.

(11) Backing warning devices.

(a) Two back up lights are required and ~~shall~~are to be mounted on or below the belt line on the school bus body. Back up lights ~~shall~~are to conform to FMVSS 571.108.

(b) All school buses ~~shall~~are to be equipped with an audible electrical warning device, automatically actuated when the bus is in reverse gear. Device ~~shall~~is to be one hundred seven decibels or more, meeting SAE standard J994. Device ~~shall~~is to be installed in an area on or behind the rear axle. A variable volume sounding device ranging from eighty-seven to one hundred twelve decibels may be used, maintaining a minimum of five decibels above the ambient noise level. ~~Audible electric warning devices shall meet FMVSS 571.112.~~

(12) Stop/tail lights.

(a) Each bus ~~shall~~is to have two combination stop/tail lamps as required in FMVSS 571.108. These two lamps ~~shall~~are to be identical in type, shape, and size.

(b) In addition to the two stop/tail lamps required by FMVSS 571.108, each bus ~~shall~~is to be equipped with two combination stop/tail lamps with a minimum illuminated surface area of thirty-eight square inches, emitting red light plainly visible from a distance of five hundred feet to the rear. These lamps ~~shall~~are to 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~~are to be taken from lamp centers. These additional two lamps ~~shall~~are to be identical in type, shape, and size.

(13) A white light ~~shall~~is to be installed to illuminate the area on the body near the left lower brake/tail lamp to illuminate the state identification number. This light may be incorporated into the lower left brake/tail lamp.

This light may be incorporated into the lower left brake/tail lamp.

(14) All school bus body lamps and reflectors ~~shall~~are to comply with FMVSS 571.108.

Reflectors ~~shall~~ are not to be combined with any other lamp or items of associated equipment. Exception-front amber reflectors may be incorporated into a front lamp.

(15) All marker, clearance and identity lamps ~~shall~~are to conform to society of automotive engineers standards for the type of lamp. These lamps ~~shall~~are to be activated by the chassis headlight switch.

(II) Alternately flashing warning signal lamps shall meet minimum standards. Minimum alternately flashing warning signal map standards include: ~~-~~

(1) Each school bus ~~shall~~is to be equipped with a system of four red signal lamps and four amber signal lamps. Both red and amber lamps ~~shall~~are to be installed in accordance with FMVSS 571.108 and the SAE standard J887. The four red signal lamps ~~shall~~are to be identical in type, shape, and size.

(a) There ~~shall~~is to be a system in place to allow the deactivation of the amber signal lamps without the need to open the service door or placing the ignition switch in the off position.

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

(2) Operation of alternately flashing warning signal lamps, stop signal arm and optional crossing control arm.

(a) Power for these devices ~~shall~~are to be provided when the ignition switch is in the on position. An optional master switch may be installed for these devices. If installed, a green pilot light ~~shall~~is to illuminate to indicate the system is ready for operation.

(b) With the service door closed and the manual momentary (amber) start switch activated and released, the amber pilot light and amber warning lamps ~~shall~~are to flash.

(c) When the service door is moved toward the open position, the amber pilot light and the amber warning lamps ~~shall~~are to turn off and the red pilot light and red warning lamps ~~shall~~are to flash.

(d) The stop signal arm and, if installed, the crossing control arm ~~shall~~are to automatically extend when the red warning lamps flash. The stop arm signal lamps ~~shall~~are to flash when extended.

(e) When the service door is closed, the red warning lights ~~shall~~are to deactivate, the stop signal arm and, if installed, crossing control arm ~~shall~~are to retract.

(f) With the service door open and the manual momentary (amber) start switch activated and released, the red pilot light and the red warning lamps ~~shall~~are to flash and the stop signal arm and, if equipped, the crossing control arm ~~shall~~are to extend. The stop signal arm lamps ~~shall~~are to flash when extended.

(g) The service door switch that activates the red warning lamps ~~shall~~are to be located in a position by a cover or guard that will prevent the switch from being activated or deactivated by persons boarding or leaving the bus.

(h) An emergency override system for activating the red warning lamps and extending the stop signal arm ~~shall~~is to be installed. This emergency override system ~~shall~~is to be operational with the ignition switch in any position.

(i) A red colored or red outlined emergency override switch ~~shall~~is to be installed. This switch ~~shall~~is to be marked with the words "Emergency warning lights" (abbreviation is acceptable). This ~~shall~~is to be the only red colored or red outlined switch on the switch panel.

(ii) When the emergency override system is activated, the red pilot light and the red warning lamps ~~shall~~are to flash and the stop signal arm ~~shall~~are to extend with the door in any position.

The stop signal arm lamps ~~shall~~are to flash when extended.

(iii) Power for the system ~~shall~~is to be on a protected circuit.

(3) Hoods may be installed above the lamps. If installed, all the lamps ~~shall~~are to have hoods.

(4) Eight lamp warning system.

(a) LED "strobelike" effects may be used in the eight lamp warning system. All lamps ~~shall~~are to conform to FMVSS 571.108.

(b) All eight amber and red lamps ~~must~~are to alternate between left and right at a rate of sixty to one-hundred twenty cycles per minutes.

(c) The "strobe" effect ~~must~~are to appear as a flash of varying intensity and not as separate flashes.

(d) All the warning lamps, amber and red, ~~must~~are to "strobe" in the same pattern. The same pattern is defined as the same number of flashes per lamp before the system alternates to the other side.

(e) All eight lamp warning systems on buses manufactured after January 1, 2027, are to be of LED type.

(JJ) Length of a school bus shall not exceed forty-five feet, excluding safety devices/ bumpers.

(KK) Markings - body shall display ~~the following~~ identification (in black lettering if not indicated otherwise). The following are to be displayed:~~):~~

(1) "School Bus" at least eight inches high on both the front and rear of the body. Lettering ~~shall~~is to be placed as high as possible without impairment of visibility. The ~~"~~"School Bus"~~"~~ marking ~~shall~~is to be on a background of retro reflective national school bus yellow material. The material ~~shall~~is to be the same quality and type as Federal Motor Vehicle Safety Standards requires for the marking of emergency exits.

(2) "Stop" on buses manufactured after January 1, 2027, are to be high-visibility (reflective) marking~~the rear of the bus in letters not less than ten inches centered on the metal panel of the rear emergency door or for rear engine buses, centered on the rear of the bus~~.

"Stop" on the rear of the bus in black letters not less than ten inches in height with red reflective material, meeting FMVSS 517.217 in between the black letters. Black letters are to have a brush stroke of one-half inches and placed on the metal panel of the rear emergency door, or for rear engine buses centered on the rear of the bus.

(3) Name of the private school, school district, school bus owner or operator ~~shall~~is to appear on both sides of the vehicle at the belt line and be at least five inches high.

(4) The county in which the private school or the school district resides ~~shall~~is to appear on both sides of the vehicle in a minimum of three-inch letters, unless the name of the city or exempted village appears as a part of the school district or private school name.

(5) When required by FMCSR 390.21, the ownership of the school bus (company name, city, state and USDOT number as required by FMCSR 390.21) ~~shall~~is to appear on both sides of the bus. The right side markings ~~shall~~are to be to the rear of the service door below the floor rub rail. The left side markings ~~shall~~are to be in the area of the stop signal arm below the floor rub rail. The markings ~~shall~~are to be in two inch high letters. Only the information required by FMCSR 390.21 ~~shall~~is to be displayed.

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

(a) On body near the service door.

(b) On the body, near the right lower tail light.

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

(d) Visible to the front, in an area designated by the operator.

(7) Buses ~~shall~~are to be marked with reflectorized material as follows: All reflectorized material ~~shall~~is to be a retro reflective material which meets FMVSS 517.217 for marking of emergency exits. In addition:

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

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

(c) Reflective yellow material two inches in width (plus/minus one forth inch) ~~shall~~is to 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.

(d) All emergency doors and windows ~~shall~~are to be outlined in yellow only. Emergency roof exits ~~shall~~are to be outlined in either red, yellow or white around the outside perimeter with reflective material as required by FMVSS 571.217.

(e) Both sides of the bus body ~~shall~~are to be marked with retro reflective national school bus yellow material, extending the length of the body (passenger area) and located at approximately the floor line. This marking ~~shall~~is to be two inches in width and run parallel with the rub rails.

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

(i) State identification number on the front of the vehicle ~~shall~~is to be placed on a seven by fourteen-inch piece of reflective material which ~~shall~~is to 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-inch 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, the state identification number and the local number ~~shall~~is to be placed on individual seven by fourteen-inch pieces of reflective material which ~~shall~~is to be applied and centered on the flat surface near the left and right lower taillights as the bus body design will allow.

(8) Additional markings are permitted as follows and are optional:

(a) Vinyl stick-on lettering in lieu of painted-on letters, either on original equipment or as replacement letters.

(b) Maximum of two American flags, overall size of each decal ~~shall~~ is not to exceed six inches by eleven inches, ~~shall~~is not to interfere with required markings and ~~shall~~is not to obstruct the view of the driver.

(c) Buses used for transporting special needs may display two universal handicap emblems. The emblems ~~shall~~are to be reflectorized white on blue located on the front and rear bumpers.

(d) Route number or marker bracket beside entrance door.

(e) Optional roof ID numbers, if used, ~~shall~~are to be black in color and ~~must~~ measure eighteen inches tall by ten inches wide with a brush stroke of three inches.

(LL) Mirrors must meet minimum standards. Minim mirror standards include:~~:~~

(1) The buses ~~shall~~are to be equipped with mirrors meeting the requirements of FMVSS 571.111 for school buses.

(2) Interior rear view mirror ~~shall~~is to be a minimum of six by thirty inches. Exception: "Type A" - Six by sixteen inches.

(3) All exterior mirrors ~~shall~~are to be heated and fully adjustable.

(4) Mirror assemblies ~~shall~~are to be warranted one hundred per cent 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.

(MM) Mounting of body on chassis.

(1) Isolators shall be placed between the frame and body main cross-sill and intermediate members. The isolators shall be at least one-fourth inch thick and shall be attached to chassis frame or body members in a fashion to prevent the isolators from shifting, separating or displacement of the isolators under severe operating conditions.

(2) 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.

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

(NN) Mud flaps - All buses shall be equipped with mud flaps at all wheel positions. The mud flaps shall be installed as close as practical to the wheel. May use a system for suppressing flying spray on a wet surface. Such system may consist of filament type, which is installed around the fender wheels. A full width mud flap or a full-width filament type plastic skirt may be placed at the rear wheels. May utilize rubber fender extensions. Length shall be in accordance with section 5577.11 of the Revised Code.

(OO) Noise suppression switch shall meet minimum standards. Minimum noise suppression switch standards include:~~-~~

(1) ~~Shall be installed~~Installed within easy reach of the driver in a seated position.

(2) Switch ~~shall~~to be be an on/off type.

(3) ~~Shall deactivate~~Deactivation of factory installed devices that produce noise. (Exception - devices installed in "Type A" buses during the manufacture of the chassis/cowl).

(a) AM/FM radios

(b) Heaters

(c) Air conditioner fans

(d) Fans

(e) Defrosters

(4) This switch ~~shall~~is not to deactivate safety systems, such as windshield wipers, lighting systems or two-way communication systems.

(PP) Openings created in mounting of bus body to chassis shall be sealed by manufacturer to prevent entrance of gases, dust or moisture into passenger and driver's compartments. All openings made by the manufacturer in the floorboard and fire-wall shall be sealed by the manufacturer to prevent gases from entering the driver's compartment.

(QQ) Paint ~~standard~~shall meet minimum standards. Minimum paint standards include:~~.~~

(1) Paint finish coats to bus body, hood, cowl and all attaching sheet metal and fiberglass parts ~~shall~~are to be warranted for sixty months or one-hundred thousand miles whichever comes first, one hundred per cent parts and labor, for adhesion and color retention.

(2) Paint finish to bus body, hood, cowl and all attaching sheet metal and fiberglass parts ~~shall~~are to be applied for a total dry thickness at a minimum of one and eight tenths mils over all painted surfaces.

(3) Body exterior.

All exterior body and chassis sheet metal including fiberglass ~~shall~~are to be painted with polyurethane paint or equivalent.

(4) All interior panels, walls, and roof surfaces ~~shall~~are to be painted. Finished metal/ plastic may be unpainted.

(RR) Passenger seats shall meet minimum standards. Minimum passenger seat standards include:~~.~~

(1) All seating and restraining barrier design and construction ~~must~~is to meet the provisions of FMVSS 571.222. The top surface of the restraining barriers ~~shall~~are to be the same height as the top surfaces of the seat backs

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

(3) Equipment installed above the seating area ~~must~~is to comply with head impact zone requirements found in FMVSS 571.222.

(4) All school buses equipped with attachment points, securement devices (seatbelts), and/or wheelchair securement systems ~~shall~~are to also be equipped with a durable webbing cutter having a full width hand-grip and protected blade. The cutter ~~must~~is to be appropriately stored in the driver's compartment to the left of the driver. This equipment may be excluded from the manufacturer's bid and purchased separately.

(5) Seat construction.

(a) Seat, seat back cushion, seat bottom and restraining barrier ~~shall~~are to be covered with flame-barrier fire-retardant seating material. Such material must pass the "National School Transportation Specifications and Procedures" school bus seat upholstery "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.

(b) All seat backs and restraining barriers ~~shall~~are to be covered with energy-absorbing padding material as required by FMVSS 571.222.

(SS) Engine power shall meet minimum standards. Minimum engine power standards include:~~.~~

(1) Diesel engines ~~shall~~are to have a minimum of two-hundred horsepower and five-hundred twenty foot pounds of torque.

(2) Gasoline engines ~~shall~~are to have a minimum of two-hundred sixty-five horsepower and four-hundred sixty foot pounds of torque.

(3) All diesel engines ~~shall~~are to be equipped with a block heater. Heater ~~shall~~is to be a minimum of seven hundred fifty watts.

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

(5) Engine ~~shall~~is to be equipped with a fast idle (air, electronic, or manual) throttle.

(6) An electric powered school bus is to meet all federal motor vehicle safety standards and all society of automotive engineers standards that are applicable at time of manufacture. The school bus is to meet Ohio school bus construction standards at the time of manufacture or bid date.

(7) A factory build hybrid electric school bus is to meet all federal motor vehicle safety standards and all society of automotive engineers standards that are applicable at time of manufacture. The school bus is to meet Ohio school bus construction standards at the time of manufacture or bid date.

(TT) School safety zone decal

(1) The decal shall be approximately seven inches by seven inches. At the top of the decal shall be the word "NOTICE", underlined, and immediately below the word ~~"NOTICE"~~"NOTICE" the symbol for no handgun allowed. Below the no handgun symbol, the decal shall state in black lettering on a white background ~~"Unless~~"Unless Otherwise Authorized By Law, Pursuant to Ohio Revised Code Section 2923.122, No Person Shall Knowingly Possess, Have Under The ~~Person's~~Person's Control, Convey Or Attempt To Convey A Deadly Weapon Or Dangerous Ordnance Onto A School Bus (School Safety Zone)."~~"~~

(2) No other markings, symbols or lettering are allowed on the decal.

(3) The location of the decal shall be on the flat metal surface just above the seat rub rail to the immediate left of the service door. The right edge of the decal shall be within two inches of the end of the rub rail.

(UU) Service door shall meet minimum standards. Minimum service door standards include:~~.~~

(1) Service door ~~shall~~is to be outward-opening, split-type on all buses. Service door ~~shall~~is to be air, electric, or manually-operated. Door ~~shall~~is to be under the control of the driver and designed to afford easy release and prevent accidental opening.

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

(3) Service door entrance ~~shall~~is to have minimum horizontal opening of twenty-four inches and minimum vertical opening of sixty-eight inches.

(4) Glass in service door ~~shall~~is to provide maximum area of visibility for operation of the bus.

(5) All edges of service door ~~shall~~are to be sealed by a flexible material to prevent air from entering the door entrance when closed.

(6) There ~~shall~~are to be no safety rail or handholds mounted on the inside of the service door.

(7) Only one handle or handhold may be placed on the outside of the service door.

(8) There ~~shall~~is to be a head bumper pad installed on the inside at the top of the service door frame. This pad ~~shall~~is to be approximately four inches in width and extend across the entire top of the service door opening and ~~shall~~ meet FMVSS 571.302 for flammability standards of interior materials.

(9) Service door ~~shall~~is to have suitable access for easy lubrication.

(10) Manual service door.

(a) When a manual lever is used, no parts ~~shall~~are to come together so as to shear or crush fingers. Lever ~~shall~~is to 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~~are to require no more than twenty-five pounds of pull to close and may be hydraulically assisted.

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

(11) On power-operated service doors, the emergency release valve, switch or device to release the service door ~~must~~is to be placed above the required head bumper or at the same height to the immediate left or right of the service door and ~~must~~ be clearly labeled.

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

(b) Whenever the switch or lever is placed in the released position, it will allow the service door to be opened or closed freely.

(c) This switch and distribution block that control eight light warning system ~~shall~~ is tobe securely fastened near the door control valve and ~~shall~~ be easily accessible for service and repair.

(VV) Service door steps shall meet minimum standards. Minimum service door steps standards include:~~.~~

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

(2) Service door entrance ~~shall~~is to be equipped with step risers that do not exceed ten inches. Risers in each case ~~shall~~are to be approximately equal.

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

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

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

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

(a) Steps ~~shall~~are to be covered with a covering material which ~~shall~~ have non-skid characteristics. Step covering ~~shall~~is to have a turned-down nosing of a contrasting color of either white, silver, yellow, or bright orange.

(b) Step covering ~~shall~~is to 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~~are to have a restraining barrier that is in compliance with FMVSS 571.222 positioned between the stairwell and the passenger compartment. This barrier ~~shall~~is to be equipped with a modesty panel.

(WW) Steering system shall meet minimum standards. Steering system minimum standards include:~~.~~

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

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

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

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

(XX) Stop signal arm.

The stop signal arm(s) shall comply with the requirements of FMVSS 571.131 (School bus pedestrian devices).

(YY) 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. If only one

sun visor is installed, it shall be positioned for use by the driver. Exception - "Type A" shall be manufacturer's standard.

(ZZ) Tires, rims and wheels shall meet minimum standards. Minimum standards fro tires, rims, and wheels include:~~-~~

(1) Manufacturer or authorized dealer ~~shall~~is to balance all wheels and make necessary alignments prior to delivery.

(2) Dual rear tires and wheels ~~shall~~are to be provided (except "Type A".)

(3) All tires on a given axle ~~shall~~are to be of same size, tread design, construction and capacity.

(4) All ~~shall~~are to be equipped with tubeless radial tires of proper size and load range that meets or exceeds chassis gross vehicle weight ratings and body combinations as required by FMVSS 571.120.

(5) Disc wheels ~~shall~~are to be used.

(6) Wheel composition - wheels ~~shall~~are to be made of steel or aluminum.

(AAA) Tow hooks.

(1) 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.

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

(BBB) Transmission shall meet minimum standards. Minimum transmission standards include:~~-~~

(1) Manufacturer ~~shall~~is to furnish an automatic transmission or automated manual transmission.

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

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

(DDD) Wheel-housings shall meet minimum standards. Minimum wheel-housing standards include:~~-~~

(1) Wheel-house ~~shall~~is to 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~~are to allow for easy tire removal and service.

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

(4) Wheel-housing ~~shall~~is to provide clearance to permit the installation of tire chains per SAE standard J683.

(EEE) Width - Overall width of a bus shall not exceed one hundred and two inches, excluding mirrors.

(FFF) Windows shall met minimum standards. Minimum window standards include:~~:~~

(1) Driver's side window ~~shall~~is to be capable of opening and be equipped with a lock-type closure. Exception - "Type A" buses ~~shall~~are to be manufacturer's standard.

(2) Each side window in the passenger area ~~shall~~is to be split sash and provide unobstructed opening at least nine inches high and twenty-two inches wide, obtained by lowering the upper sash. If the bus body design does not allow for all windows to meet the width dimension requirement, up to two side windows per side in the passenger area may be less than the twenty-two inches. They may or may not open.

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

(4) Windows may be tinted pursuant to section 4513.241 of the Revised Code. Any window tinting ~~must~~is also meet FMVSS 571.205.

(GGG) Windshield washers shall meet minimum standards. Minimum windshield washers standards include:~~:~~

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

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

(3) Heated windshield wipers and heated washer fluid units are permitted.

(HHH) Windshield wipers shall meet minimum standards. Minimum windshield wiper standards include:~~.~~

(1) Two heavy-duty windshield wipers~~ are required~~.

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

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

(4) Wipers ~~shall~~are to be wet arm type.

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

(III) Wiring shall meet minimum standards. Minimum wiring standards include:~~.~~

(1) All wiring ~~shall~~is to conform to current society of automotive engineers standards. Wiring diagrams ~~must~~ are tobe made available to school bus owners.

(2) Short circuit protective devices ~~shall~~are to be provided for each major circuit and all other electrical functions, except starter motor and ignition circuits.

(3) All wires within body ~~shall~~are to 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~~is to be provided.

(4) Wires not enclosed within body shell ~~shall~~are to be fastened securely at intervals of not more than twenty-four inches.

(5) All joints ~~shall~~are to be soldered or joined by equally effective connectors.

~~(JJJ) Lift equipped buses. Buses equipped with wheel chair lifts shall also meet all applicable paragraph of rule 4501-5-03 of the Administrative Code.~~

Effective: 7/1/2025

Five Year Review (FYR) Dates: 3/31/2025 and 06/01/2030

CERTIFIED ELECTRONICALLY

Certification

06/05/2025

Date

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4501-5-03 **School buses used to transport pupils with special needs.**

[Comment: For dates and availability of material incorporated by reference in this rule, see paragraph (S) of rule 4501-5-01 of the Administrative Code.]

(A) General requirements.

(1) All school buses equipped with wheelchair lifts shall comply with rules 4501-5-01 to ~~4501-5-3~~4501-5-03 of the Administrative Code, when applicable.

(2) School buses used for the transportation of pupils with special needs 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.

(3) 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 aisle way from the lift unless they are seats that have been designed to be removed for the purposes of alternative passenger securement.

(4) All school buses equipped with wheelchair lifts 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) Aisle width.

All school buses equipped with a power lift shall provide a minimum thirty inch pathway leading from any wheelchair position to an emergency door that is at least thirty inches wide.

(C) All school 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. This equipment may be excluded from the bus manufacturer's bid and purchased separately.

(D) Wheelchair securement.

School buses designed for the transportation of pupils using wheelchairs or special mobility devices shall have wheelchair securement and occupant restraint systems that comply with SAE standard J2249 installed as specified in FMVSS 571.222, sections 5.4.1 to 5.4.4 at each wheelchair location.

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(E) Wheelchair tie down systems shall meet minimum requirements. Minimum wheelchair tie down systems include:~~.~~

Securement system for mobile seating device and occupant.

(1) The designated area for the wheelchair/mobile seating devices ~~shall~~are to be a minimum of fifty inches longitudinally by thirty inches laterally. The designated area ~~shall~~is to be free of all obstructions pursuant to FMVSS 571.222.

(2) All securement system attachments or coupling hardware not permanently attached ~~shall~~are to be designed to prohibit accidental disconnecting.

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

(4) No mobile seating device securement system hardware ~~shall~~is to be placed so that a mobile seating device can be placed blocking access to lift door or emergency door(s) with the exception of track hardware.

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

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

(F) Seat spacing.

Flexibility in seat spacing and floor plan layout to accommodate special devices ~~shall be~~is permitted.

(G) Special service entrance shall meet minimum requirements. Minimum special service entrance requirements include:~~.~~

(1) The special service entrance door(s) ~~shall~~is to 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~~cannot 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~~are to 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~~is to be of sufficient width and depth to allow the passage of wheelchairs/mobile seating devices and mobility aids. The minimum clear opening ~~shall~~is to be fifty-six inches in height

(4) A drip molding ~~shall~~is to be installed above the opening to effectively divert water from the opening. Door posts and headers for the special service entrance ~~shall~~are to 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~~is to be installed above the special service entrance and/or on the lift frame.

(H) Special service entrance doors shall meet minimum requirements. Minimum special service entrance door requirements include:~~:~~

(1) A single door or double door may be used.

(2) All doors ~~shall~~are to open outwardly. The special service entrance doors ~~shall~~are to have a positive fastening device/s to hold doors in the open position and door bumpers to prevent door-to-body contact.

(3) All doors ~~shall~~are to be weather-sealed. Buses with double doors ~~shall~~are to be so constructed that a flange on the forward door overlaps the edge of the rear door when closed.

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

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

(6) Each door ~~shall~~is to have a window compatible within one inch of the lower line of adjacent sash. The window ~~shall~~is to be installed to provide a dustproof/ watertight fit.

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

(I) Lift area lighting.

Adequate lighting of the lift area (both inside and outside) shall be provided. The light(s) used to illuminate the interior and exterior of the lift area shall be activated when the lift door is open.

(J) Weight distribution.

On buses equipped with a power lift, the battery box and fuel tank may be located by the manufacturer to provide equal weight distribution to compensate for the weight of the power lift mechanism.

(K) Alternator and power supply.

A circuit breaker shall be installed between the power source and the lift motor. It shall be located as close to the power source as possible but not within the passenger/ driver compartment.

(L) Alternator shall have a minimum power output of two-hundred forty amps. "Type A" buses must be the largest alternator output available from the original equipment manufacturer.

(M) Power lift shall meet minimum requirements. Minimum power lift requirements include:~~.~~

The lift and installation ~~shall~~are to comply with the requirements set forth in FVMSS 571.403 (platform lift systems for motor vehicles) and FMVSS 571.404 (platform lift installations in motor vehicles).

(1) Design

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

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

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

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

(4) 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~~is to be installed. The barrier panel ~~shall~~is to 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~~is to be secured to a padded stanchion extending from the floor to the ceiling. The stanchion ~~shall~~is to 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~~the barrier is to 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~~the barrier is to 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~~is to be in compliance with FMVSS 571.302 and FMVSS 571.222.

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Five Year Review (FYR) Dates: 3/31/2025 and 06/01/2030

CERTIFIED ELECTRONICALLY

Certification

06/05/2025

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4501-5-04 **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 4501-5-03 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 writing, from the director. This request ~~shall include~~includes, 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 4501-5-03 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 4501-5-03 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 and workforce.

(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 group at the group's next meeting. The advisory group 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 than 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 advisory group, 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."

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