Office of the Registrar of Regulations,
Legislative Council,
State of Delaware

DEPARTMENT OF EDUCATION

OFFICE OF THE SECRETARY

Statutory Authority: 14 Delaware Code, Section 122(b) (14 **Del.C.** §122(b))

PROPOSED

PUBLIC NOTICE

Education Impact Analysis Pursuant To 14 Del.C. Section 122(d)

1105 Standards for School Buses Placed in Production on or after January 1, 2017

A. TYPE OF REGULATORY ACTION REQUIRED

New Regulation

B. SYNOPSIS OF SUBJECT MATTER OF THE REGULATION

The Secretary of Education intends to create 14 **DE Admin. Code** 1105 Standard for School Buses Placed in Production on or after January 1, 2017. This regulation is being created to establish new standards for buses built after January 2017, specifically as it relates to current equipment, production and safety features.

Persons wishing to present their views regarding this matter may do so in writing by the close of business on or before October 5, 2016 to Tina Shockley, Education Associate, Department of Education, Regulatory Review, at 401 Federal Street, Suite 2, Dover, Delaware 19901. A copy of this regulation may be viewed online at the Register of Regulation's website, http://regulations.delaware.gov/services/current_issue.shtml, or obtained at the Department of Education, Finance Office located at the address listed above.

C. IMPACT CRITERIA

1. Will the new regulation help improve student achievement as measured against state achievement standards? The new regulation is not related to improving student achievement as measured against state achievement standards.
2. Will the new regulation help ensure that all students receive an equitable education? The new regulation is not related to ensuring all students receive an equitable education.
3. Will the new regulation help to ensure that all students' health and safety are adequately protected? The new regulation does address students' health and safety by providing standards for safe school buses.
4. Will the new regulation help to ensure that all students' legal rights are respected? The new regulation continues to ensure that all students' legal rights are respected.
5. Will the new regulation preserve the necessary authority and flexibility of decision making at the local board and school level? The new regulation does not change the decision making at the local board and school level.
6. Will the new regulation place unnecessary reporting or administrative requirements or mandates upon decision makers at the local board and school levels? The new regulation does not place any unnecessary reporting or administrative requirements on decision makers.
7. Will the decision making authority and accountability for addressing the subject to be regulated be placed in the same entity? The decision making authority and accountability for addressing the subject to be regulated does not change because of the new regulation.
8. Will the new regulation be consistent with and not an impediment to the implementation of other state educational policies, in particular to state educational policies addressing achievement in the core academic subjects of mathematics, science, language arts and social studies? The new regulation is consistent with and not an impediment to the implementation of other state educational policies.
9. Is there a less burdensome method for addressing the purpose of the regulation? There is not a less burdensome method for addressing the purpose of the regulation.
10. What is the cost to the State and to the local school boards of compliance with the regulation? There is no expected cost to implementing this new regulation.

1105 Standards for School Buses Placed in Production on or after January 1, 2017

1.0 Purpose

The purpose of this regulation is to provide the standards for school buses placed in production on or after January 1, 2017. It specifies current equipment, production and safety features based on revisions to the National School Transportation Specifications and Procedures (NSTSP) in 2015.

Also, Multifunction School Activity Buses (MFSAB) shall meet all of the school bus chassis and body standards specified in this regulation.

2.0 Definitions

"**Multifunction School Activity Bus**" means a school bus whose purposes do not include transporting students to and from home or school bus stops. This type of vehicle shall not make any stops to load or unload students on roadways. A MFSAB shall have all required federal and state equipment, color and identification standards specified for school buses.

3.0 Bus Body and Chassis Standards

3.1 Air Cleaner

3.1.1 A dry element air cleaner shall be provided.

3.1.2 All diesel engine air filters shall include a latch type restriction indicator that retains the maximum restriction developed during operation of the engine. The indicator shall include a reset control so the indicator can be returned to zero when desired.

3.2 Aisle

3.2.1 All emergency exit doors shall be accessible by a 12 inch minimum aisle. The aisle shall be unobstructed at all times by any type of barrier, seat, wheelchair or tiedown. The track of a track seating system is exempt from this requirement.

3.2.2 The seat backs shall be slanted sufficiently to give aisle clearance of 12 inches at tops of seat backs.

3.3 Auxiliary fans (2):

3.3.1 Fans shall be placed in a location where they can be adjusted for maximum effectiveness and where they do not obstruct the driver's vision to the mirrors or interfere with the safe operation of the vehicle.

3.3.2 Fans shall have 6 inch (nominal) diameter; and

3.3.3 Fan blades shall be enclosed in a protective cage. Each fan shall be controlled by a separate switch.

3.4 Axles

3.4.1 The front and rear axle and suspension systems shall have a Gross Axle Weight Rating (GAWR) at ground commensurate with the respective front and rear weight loads of the bus loaded to the rated passenger capacity.

3.4.2 All buses with a capacity of 54 passengers or greater shall have a 10,000 pound front axle minimum.

3.5 Back Up Warning Alarm

3.5.1 An automatic audible alarm shall be installed behind the rear axle and shall comply with the published Backup Alarm Standards (Society of Automotive Engineers (SAE) J994b), providing a minimum of 112 dBA, or shall have a variable volume feature that allows the alarm to vary from 87 dBA to 112 dBA sound level, staying at least 5 dBA above the ambient noise level.

3.6 Brakes, General

3.6.1 The chassis brake system shall conform to the provisions of Federal Motor Vehicle Safety Standard (FMVSS) Nos. 105, Hydraulic and Electric Brake Systems,106, Brake Hoses, and 121, Air Brake Systems, as applicable. All buses shall have either a parking pawl in the transmission or a park brake interlock that requires the service brake to be applied to allow release of the parking brake.

3.6.2 The antilock brake system (ABS), provided in accordance with FMVSS No. 105, Hydraulic and Electric Brake Systems, or No. 121, Air Brake Systems, shall provide wheel speed sensors for each front wheel and for each wheel on at least one rear axle. The system shall provide antilock braking performance for each wheel equipped with sensors (Four Channel System).

3.6.3 All brake systems shall be designed to permit visual inspection of brake lining wear without removal of any chassis component(s).

3.6.4 The brake lines, booster assist lines, and control cables shall be protected from excessive heat, vibration and corrosion and installed in a manner that prevents chafing.

3.6.5 The parking brake system for either air or hydraulic service brake systems may be of a power assisted design. The power parking brake actuator should be a device located on the instrument panel within reach of a seated 5th percentile female driver. As an option, the parking brake may be set by placing the automatic transmission shift control mechanism in the "park" position.

3.6.6 The power operated parking brake system may be interlocked to the engine key switch. Once the parking brake has been set and the ignition switch turned to the "off" position, the parking brake cannot be released until the key switch is turned back to the "on" position.

3.7 Brakes, Hydraulic

3.7.1 Buses using hydraulic assist brakes shall meet requirements of FMVSS No. 105, Hydraulic and Electric Brake Systems.

3.8 Brakes, Air

3.8.1 The air pressure supply system shall include a desiccant type air dryer installed according to the manufacturer's recommendations. The air pressure storage tank system may incorporate an automatic drain valve.

3.8.2 The chassis manufacturer shall provide an accessory outlet for air operated systems installed by the body manufacturer. This outlet shall include a pressure protection valve to prevent loss of air pressure in the service brake reservoir.

3.8.3 For air brake systems, an air pressure gauge shall be provided in the instrument panel capable of complying with Commercial Driver's License (CDL) pre trip inspection requirements.

3.8.4 Air brake systems shall include a system for anti compounding of the service brakes and parking brakes.

3.8.5 Air brakes shall have both a visible and audible warning device whenever the air pressure falls below the level where warnings are required under FMVSS No. 121, Air Brake Systems.

3.9 Bumper, Front

3.9.1 School buses shall be equipped with a heavy duty front bumper.

3.9.2 The front bumper on buses of Type A-2 (with a Gross Volume Weight Rating (GVWR) greater than 14,500 pounds), Type B, Type C, and Type D shall be equivalent in strength and durability to pressed steel channel at least 3/16 inches thick and not less than 8 inches wide (high). It shall extend beyond the forward most part of the body, grille, hood, and fenders and shall extend to outer edges of the fenders at the bumper's top line.

3.9.3 Type A buses having a GVWR of 14,500 pounds or less may be equipped with an OEM supplied front bumper. The front bumper shall be of sufficient strength to permit being pushed by another vehicle on a smooth surface with a 5 degree, (8.7 percent) grade, without permanent distortion. The contact point on the front bumper is intended to be between the frame rails, with as wide a contact area as possible. If the front bumper is used for lifting, the contact points shall be under the bumper attachments to the frame rail brackets unless the manufacturer specifies different lifting points in the owner's manual. Contact and lifting pressures should be applied simultaneously at both lifting points.

3.9.4 The front bumper, except breakaway bumper ends, shall be of sufficient strength to permit pushing a vehicle of equal gross vehicle weight, per subsections 3.9.2 and 3.9.3, without permanent distortion to the bumper, chassis or body.

3.9.5 The bumper shall be designed or reinforced so that it will not deform when the bus is lifted by a chain that is passed under the bumper (or through the bumper if holes are provided for this purpose) and attached to both tow hooks/eyes. For the purpose of meeting this standard, the bus shall be empty and positioned on a level, hard surface and both tow hooks/eyes shall share the load equally.

3.10 Bumper, Rear

3.10.1 The bumper on Type A-1 buses shall be a minimum of 8 inches wide (high). Bumpers on Types A-2, B, C and D buses shall be a minimum of 9 ½ inches wide (high). The bumper shall be of sufficient strength to permit being pushed by another vehicle of similar size and being lifted by the bumper without permanent distortion.

3.10.2 The bumper shall wrap around the back corners of the bus. It shall extend forward at least 12 inches, measured from the rear most point of the body at the floor line, and shall be mounted flush with the sides of the body or protected with an end panel.

3.10.3 The bumper shall be attached to the chassis frame in such a manner that it may be removed. It shall be braced to resist deformation of the bumper resulting from impact from the rear or the side. It shall be designed to discourage hitching of rides by an individual.

3.10.4 The bumper shall extend at least 1 inch beyond the rear most part of the body surface measured at the floor line.

3.10.5 The bottom of the rear bumper shall not be more than 30 inches above ground level.

3.11 Certification

3.11.1 Upon request of the Delaware Department of Education, the chassis and body manufacturer shall certify that its product meets the State's minimum standards on items not covered by the FMVSS certification requirements of 49 CFR 567.

3.12 Color

3.12.1 The chassis, including wheels and front bumper, shall be black. The school bus body, body cowl, hood and fenders shall be in National School Bus Yellow (NSBY). The flat top surface of the hood may be painted with non reflective NSBY. (See Appendix B, current NSTSP).

3.12.2 Wheels shall be black or aluminum.

3.12.3 Wheel covers shall not be permitted and hubs and lug nuts shall be exposed.

3.12.4 Buses shall be equipped with mud flaps. They shall be black except they may have manufacturer's logo or name in white or yellow.

3.12.5 The body exterior paint trim, bumper, lamp hoods, rub rails, outside mirror supports, emergency door arrow, and lettering shall be black. (See current NSTSP, Appendix B)

3.12.6 Except for the front and rear roof caps, which shall be NSBY the roof of the bus may be painted white. The white roof shall terminate no lower than 6 inches above the dip rail.

3.13 Communications Systems

3.13.1 Buses shall be equipped with a radio (non CB) or telephonic communication device. It will be added by the school district, school, or contractor.

3.14 Construction

3.14.1 Side Intrusion Test:

3.14.1.1 The bus body shall be constructed to withstand an intrusion force equal to the curb weight of the vehicle or 20,000 pounds, whichever is less. Each vehicle shall be capable of meeting this requirement when tested in accordance with the procedures set forth below.

3.14.1.2 The complete body structure, or a representative seven body section mock up with seats installed, shall be load tested at a location 24 + or - 2 inches above the floor line, with a maximum 10 inch diameter cylinder, 48 inches long, mounted in a horizontal plane.

3.14.1.3 The cylinder shall be placed as close as practical to the midpoint of the tested structure, spanning two internal vertical structural members. The cylinder shall be statically loaded to the required force of curb weight or 20,000 pounds, whichever is less, in a horizontal plane with a load applied from the exterior toward the interior of the test structure. When the minimum load has been applied, the penetration of the loading cylinder into the passenger compartment shall not exceed ten inches from its original point of contact. There can be no separation of lapped panels or construction joints. Punctures, tears or breaks in the external panels are acceptable but are not permitted on any adjacent interior panel.

3.14.1.4 Body companies shall certify compliance with this intrusion requirement and include test results, as requested.

3.14.2 Construction shall be reasonably dust proof and watertight.

3.15 Crossing Control Arm

3.15.1 Buses shall be equipped with a crossing control arm mounted on the right side of the front bumper. When opened, the arm shall extend in a line parallel to the body side and aligned with the right front wheel.

3.15.2 All components of the crossing control arm and all connections shall be weatherproofed.

3.15.3 The crossing control arm shall incorporate system connectors (electrical, vacuum, or air) at the gate and shall be easily removable to allow for towing of the bus.

3.15.4 The crossing control arm shall be constructed of non corrodible or nonferrous material, or shall be treated in accordance with the body sheet metal standard (see "Metal Treatment", this section).

3.15.5 There shall be no sharp edges or projections that could cause injury or be a hazard to students. The end of the arm shall be rounded.

3.15.6 The crossing control arm shall extend minimum of 70 inches (measured from the bumper at the arm assembly attachment point) when in the extended position. The crossing control arm shall not extend past the end of the bumper when in the stowed position.

3.15.7 The crossing control arm shall extend simultaneously with the stop signal arm activated by stop signal arm controls.

3.15.8 An automatic recycling interrupt switch shall not be installed for temporarily disabling the crossing control arm.

3.15.9 The assembly shall include a device attached to the bumper near the end of the arm to automatically retain the arm while in the stowed position. That device shall not interfere with normal operations of the crossing control arm.

3.16 Defrosters

3.16.1 Defrosting and defogging equipment shall direct a sufficient flow of heated air onto the windshield, the window to the left of the driver and the glass in the viewing area directly to the right of the driver to eliminate frost, fog and snow. (Exception: The requirements of this standard do not apply to the exterior surfaces of double pane storm windows.)

3.16.2 The defrosting system shall conform to SAE J381, Windshield Defrosting Systems Test Procedure and Performance Requirements for Trucks, Buses, and Multipurpose Vehicles.

3.16.3 The defroster and defogging system shall be capable of furnishing heated, outside ambient air, except that the part of the system furnishing additional air to the windshield, entrance door and stepwell may be the recirculating air type.

3.16.4 Portable heaters shall not be used.

3.17 Doors

3.17.1 The entrance door shall be under the driver's control, designed to afford easy release and to provide a positive latching device on manual operating doors to prevent accidental opening. When a hand lever is used, no part shall come together that will shear or crush fingers. Manual door controls shall not require more than 25 pounds of force to operate at any point throughout the range of operation, as tested on a 10 percent grade, both uphill and downhill.

3.17.2 The entrance door shall be located on the right side of the bus, opposite and within direct view of driver.

3.17.3 The entrance door shall have a minimum horizontal opening of 24 inches and a minimum vertical opening of 68 inches.

3.17.4 The entrance door shall be a split type door and shall open outward.

3.17.5 All entrance door glass shall be approved safety glass. The bottom of each lower glass panel shall be not more than 10 inches from the top surface of the bottom step. The top of each upper glass panel when viewed from the interior shall be not more than 3 inches below the interior door control cover or header pad.

3.17.6 Vertical closing edges on entrance doors shall be equipped with flexible material.

3.17.7 All door openings shall be equipped with padding at the top edge of the opening. Padding shall be at least 3 inches wide and 1inch thick and extend the full width of the door opening.

3.17.8 On power operated entrance doors, the actuation switch shall be on or to the right of the steering wheel within reach of a seated 5th percentile adult female driver or integrated into the steering wheel.

3.17.9 On power operated entrance doors, the emergency release valve, switch or device to release the entrance door must be placed above or to the immediate left or immediate right of the entrance door and must be clearly labeled. The emergency release valve, switch or device shall work in the absence of power.

3.18 Drive Shaft

3.18.1 The drive shaft shall be protected by a metal guard or guards around the circumference of the drive shaft to reduce the possibility of its whipping through the floor or dropping to the ground, if broken.

3.19 Electrical System

3.19.1 Battery

3.19.1.1 The storage batteries shall have minimum cold cranking capacity rating (cold cranking amps) equal to the cranking current required for 30 seconds at 0 degrees Fahrenheit and a minimum reserve capacity rating of 120 minutes at 25 amps. Higher capacities may be required, depending upon optional equipment and local environmental conditions.

3.19.1.2 The manufacturer shall securely attach the batteries on a slide out or swing out tray in a closed, vented compartment in the body skirt or chassis frame, so that the batteries are accessible for convenient servicing from the outside. When in the stored position, the tray shall be retained by a securing mechanism capable of holding the tray (with batteries) in position when subjected to a 5g load from any direction. The battery compartment door or cover, if separate from the tray, shall be hinged at the front or top. It shall be secured by a positive operated latching system or other type fastener. The door may be an integral part of the battery slide tray. The door or cover must fit tightly to the body, and not present sharp edges or snagging points. Battery cables shall meet SAE requirements. Battery cables shall be of sufficient length to allow the battery tray to fully extend. Any chassis frame-mounted batteries shall be relocated to a battery compartment on Type A buses.

3.19.1.3 All batteries are to be secured in a sliding tray except that on van conversion or cutaway front-section chassis, batteries may be secured in accordance with the manufacturer’s standard configuration. In these cases, the final location of the battery and the appropriate cable lengths shall be agreed upon mutually by the chassis and body manufacturers. However, in all cases the

battery cable provided with the chassis shall have sufficient length to allow some slack, and shall be of sufficient gauge to carry the required amperage.

3.19.1.4 Buses may be equipped with a battery shut off switch. The switch is to be placed in a location not readily accessible to the driver or passengers.

3.19.2 Alternator

3.19.2.1 All Type A-2 and Type B buses with a GVWR of 15,000 pounds or less shall have a minimum 130-amp alternator. Buses equipped with an electrically powered wheelchair lift and/or air conditioning shall be equipped with the highest rated capacity available from the chassis OEM.

3.19.2.2 All buses over 15,000 pounds GVWR shall be equipped with a heavy-duty truck-or bus-type alternator having a minimum output rating of 200 amps or higher, and should produce a minimum current output of 50 percent of the rating at engine idle speed.

3.19.2.3 All other buses than those described in subsection 3.19.2.1 equipped with an electrically powered wheelchair lift and/or air conditioning shall have a minimum alternator output of 240 amps and may be equipped with a device that advances the engine idle speed when the voltage drops to, or below, a pre-set level.

3.19.2.4 A belt-driven alternator shall be capable of handling the rated capacity of the alternator with no detrimental effect on any other driven components. (For estimating required alternator capacity, see School Bus Manufacturers Technical Council's (SBMTC) publication, "School Bus Technical Reference," available at http://www.nasdpts.org)

3.19.2.5 A direct/gear drive alternator is permissible in lieu of a belt driven alternator.

3.19.3 Electrical Components: Materials in all electrical components shall contain no mercury.

3.19.4 Wiring, Chassis

3.19.4.1 All wiring shall conform to current applicable recommended practices of the Society of Automotive Engineers (SAE).

3.19.4.1.1 All wiring shall use color and at least one other method for identification. The other method shall be either a number code or name code, and each chassis shall be delivered with a wiring diagram that illustrates the wiring of the chassis.

3.19.4.2 The chassis manufacturer of an incomplete vehicle shall install a readily accessible terminal strip or connector on the body side of the cowl or in an accessible location in the engine compartment of vehicles designed without a cowl. The strip or connector shall contain the following terminals for the body connections:

3.19.4.2.1 Main 100 amp body circuit;

3.19.4.2.2 Tail lamps;

3.19.4.2.3 Right turn signal;

3.19.4.2.4 Left turn signal;

3.19.4.2.5 Stop lamps;

3.19.4.2.6 Backup lamps; and

3.19.4.2.7 Instrument panel lights (rheostat controlled by headlamp switch)

3.19.4.3 An appropriate identifying diagram (color plus a name or number code) for all chassis electrical circuits shall be provided to the body manufacturer for distribution to the end user.

3.19.4.4 Wiring for the headlamp system must be separate from the electronic controlled body solenoid module.

3.19.5 Wiring, Body

3.19.5.1 All wiring shall conform to current applicable SAE recommended practices.

3.19.5.2 All wiring shall have an amperage capacity exceeding the design load by at least 25%. All wiring splices are to be accessible and noted as splices on the wiring diagram.

3.19.5.3 A body wiring diagram, sized to be easily read, shall be furnished with each bus body or affixed to an area convenient to the electrical accessory control panel.

3.19.5.4 The body power wire shall be attached to a special terminal on the chassis.

3.19.5.5 Each wire passing through metal openings shall be protected by a grommet.

3.19.5.6 Wires not enclosed within the body shall be fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equally effective connectors, which shall be water resistant and corrosion resistant.

3.19.5.7 Wiring shall be arranged in circuits, as required, with each circuit protected by a fuse, breaker or electronic protection device. A system of color and number coding shall be used and an

appropriate identifying diagram shall be provided to the end user, along with the wiring diagram provided by the chassis manufacturer. The wiring diagrams shall be specific to the bus model supplied and shall include any changes to wiring made by the body manufacturer. Chassis wiring diagrams shall be supplied to the end user. The following body interconnecting circuits shall be color coded as noted:

FUNCTION	COLOR
Left Rear Directional Lamp	Yellow
Right Rear Directional Lamp	Dark Green
Stop Lamps	Red
Back up Lamps	Blue
Tail Lamps	Brown
Ground	White
Ignition Feed, Primary Feed	Black

Note: The color of the cables shall correspond to SAE J 1128, Low Tension Primary Cable.

3.19.5.8 Wiring shall be arranged in at least six regular circuits, as follows:

3.19.5.8.1 Head, tail, stop (brake), clearance and instrument panel lamps;

3.19.5.8.2 Stepwell lamps that shall be actuated when entrance door is open;

3.19.5.8.3 Dome lamps;

3.19.5.8.4 Ignition and emergency door signal;

3.19.5.8.5 Turn signal lamps; and

3.19.5.8.6 Alternately flashing signal lamps.

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

3.19.5.10 Heaters and defrosters shall be wired on an independent circuit.

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

3.19.5.12 Each body circuit shall be coded by number or letter on a diagram of circuits and shall be attached to the body in a readily accessible location.

3.19.6 Buses shall be equipped with a 12 volt power port in the driver compartment.

3.19.7 There shall be a manual noise suppression switch installed in the control panel. The switch shall be labeled and alternately colored. This switch shall be an on/off type that deactivates body equipment that produces noise, including, at least, the AM/FM radio, heaters, air conditioners, fans and defrosters. This switch shall not deactivate safety systems, such as windshield wipers or lighting systems.

3.19.8 The entire electrical system of the body shall be designed for the same voltage as the chassis on which the body is mounted.

3.20 Emergency Equipment

3.20.1 Fire Extinguisher

3.20.1.1 The bus shall be equipped with at least one UL approved pressurized, dry chemical fire extinguisher. The extinguisher shall be secured in a mounted bracket, located in the driver's compartment and readily accessible to the driver and passengers. A pressure gauge shall be mounted on the extinguisher and shall be easily read without moving the extinguisher from its mounted position.

3.20.1.2 The fire extinguisher shall have a rating of 2-A:10-BC or greater. The operating mechanism shall be sealed with a type of seal that will not interfere with the use of the fire extinguisher.

3.20.2 First aid kit

3.20.2.1 The bus shall have a removable, moisture proof and dust proof first aid kit in an accessible place in the driver's compartment. It shall be mounted and identified as a first aid kit. The location for the first aid kit shall be marked.

3.20.2.2 Minimum contents to include the following:

Units / Quantity per unit

2 sets of 12- 1" x 3" adhesive bandages

3 sets of 2 - 2" bandage compress

3 sets of 1 - 4" bandage compress

2 sets of 1 – non sterile triangular bandages approx. 40" x 36" x 54" with 2 safety pins

3.20.3 Body fluid clean up kit: Each bus shall have a removable and moisture proof body fluid clean up kit accessible to the driver. It shall be mounted and identified as a body fluid clean up kit in the driver's compartment. Minimum contents of the body fluid clean up kit shall include the following:

3.20.3.1 One 16 oz. bottle of 70% rubbing alcohol or 10% solution of bleach

3.20.3.2 One plastic trash bag with tie, minimum of 12" x 12"

3.20.3.3 Two pairs of medical examination gloves (non latex)

3.20.3.4 Ten paper towels, approximately 10 1/ 2" x 12 1/2"

3.20.4 Warning devices: Each school bus shall contain at least three retroreflective triangle road warning devices that meet the requirements of FMVSS No. 125, Warning Devices. They shall be mounted in an accessible place.

3.20.5 Any piece of emergency equipment may be mounted in an enclosed compartment, provided the compartment is labeled in not less than one-inch letters, identifying each piece of equipment contained therein.

3.21 Emergency Exits

3.21.1 Any installed emergency exit shall comply with the design and performance requirements of FMVSS No. 217, Bus Emergency Exits and Window Retention and Release, applicable to that type of exit, regardless of whether or not that exit is required by FMVSS No. 217.

3.21.2 Emergency window requirements

3.21.2.1 The rear emergency window shall have a lifting assistance device that will aid in lifting and holding the rear emergency window open.

3.21.2.2 Side emergency exit windows shall be vertically hinged on the forward side of the window. No side emergency exit window will be located above a stop arm.

3.21.3 Emergency door requirements

3.21.3.1 The upper portion of the emergency door shall be equipped with approved safety glazing, the exposed area of which shall be at least 400 square inches. The lower portion of the rear emergency doors on Types A-2, B, C, and D vehicles shall be equipped with a minimum of 350 square inches of approved safety glazing.

3.21.3.2 There shall be no steps leading to an emergency door.

3.21.3.3 Padding shall be affixed to the top edge of each door opening. Padding shall be at least 3 inches wide and 1 inch thick and shall extend the full width of the door opening.

3.21.3.4 The side emergency door, if installed, shall have a clear aisle leading to it i.e., flip seats shall not be used.

3.21.3.5 There shall be no obstruction higher than 1/4 inch across the bottom of any emergency door opening. Fasteners used within the emergency exit opening shall be free of sharp edges or burrs.

3.21.4 Emergency exit requirements: Types A, B, C, and D vehicles shall be equipped with a total number of emergency exits as follows for the equipped seating capacities of vehicles. Exits required by FMVSS 217 may be included to comprise the total number of exits specified.

1 to 42 Passengers = 1 emergency exit per side and 1 roof hatch.

43 to 78 Passengers = 2 emergency exits per side and 2 roof hatches.

79 to 90 Passengers = 3 emergency exits per side and 2 roof hatches.

3.21.5 In addition to the audible warning required on emergency doors by FMVSS 217, additional emergency exits shall also be equipped with an audible warning device.

3.22 Engine

3.22.1 For school buses with less than 36 passenger capacity, the minimum power plant shall be 160 hp engine or equal.

3.22.2 For school buses with a capacity of 36 passengers or greater, the engine will produce at least 190 hp measured at an RPM not to exceed 2,600 and generate at least 420 foot pounds of torque.

3.22.3 All diesel engines shall have an engine block heater.

3.23 Exhaust System

3.23.1 The exhaust pipe, after treatment system and tailpipe shall be outside the bus body compartment and shall be attached to the chassis so any other chassis component is not damaged.

3.23.2 The tailpipe and after treatment system shall be constructed of a corrosion resistant tubing material at least equal in strength and durability to 16 gauge steel tubing of equal diameter.

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

3.23.4 The tailpipe shall 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 exit location on all Types A-1 or B-1 buses may be in accordance to the manufacturer's standards. The tailpipe shall not exit beneath any fuel filler location, emergency door or lift door.

3.23.5 The exhaust system shall be insulated in a manner to prevent any damage to any fuel system component.

3.23.6 The design of the after treatment systems shall not 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.

3.23.7 For after treatment systems that require Diesel Exhaust Fluid (DEF) to meet federally mandated emissions:

3.23.7.1 The composition of Diesel Exhaust Fluid (DEF) must comply with International Standard ISO 22241-1. Refer to engine manufacturer for any additional DEF requirements.

3.23.7.2 The DEF supply tank shall have a minimum capacity of 11.5 gallons.

3.24 Fenders, Front

3.24.1 When measured at the fender line, the total spread of the outer edges of front fenders shall exceed the total spread of front tires when front wheels are in a straight ahead position.

3.24.2 Front fenders shall be properly braced and shall not require attachment to any part of the body.

3.25 Fire Suppression Systems

3.25.1 The chassis manufacturer may provide an automatic fire extinguisher system in the engine compartment.

3.25.2 Fire suppression system nozzles shall be located in the engine compartment, under the bus, in the electrical panel or under the dash, but they shall not be located in the passenger compartment. The system must include a lamp or buzzer to alert the driver that the system has been activated.

3.26 Floors

3.26.1 The floor in the under seat area, including tops of wheel housings, driver's compartment and toeboard, shall be covered with an elastomer floor covering, having a minimum overall thickness of 0.125 inches and a calculated burn rate of 0.1 mm per minute or less, using the test methods, procedures and formulas listed in FMVSS No. 302, Flammability of Interior Materials. The driver's area and toeboard area in all Type A buses may be manufacturer's standard flooring and floor covering.

3.26.2 The floor covering in the aisles shall be ribbed or other raised pattern elastomer and have a calculated burn rate of 0.1 mm per minute or less using the test methods, procedures and formulas listed in FMVSS No. 302. Minimum overall thickness shall be 0.0187 inch measured from tops of ribs.

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

3.26.4 On Types B, C and D buses, a flush mounted, screw down plate that is secured and sealed shall be provided to access the diesel or gasoline fuel tank sending unit and/or fuel pump. This plate shall not be installed under flooring material.

3.27 Frame

3.27.1 Frame lengths shall be established in accordance with the design criteria for the complete vehicle.

3.27.2 Making holes in top or bottom flanges or side units of the frame and welding to the frame shall not be permitted except as provided or accepted by the chassis manufacturer.

3.27.3 Frames shall not be modified for the purpose of extending the wheel base.

3.27.4 Any secondary manufacturer that modifies the original chassis frame shall provide a warranty at least equal to the warranty offered by the original equipment manufacturer (OEM), and shall certify that the modification and other parts or equipment affected by the modification shall be free from defects in material and workmanship under normal use and service intended by the OEM.

3.28 Fuel System

3.28.1 Fuel tank(s) for school buses with capacity of 36 passengers and above having a minimum 60 gallon capacity shall be provided by the chassis manufacturer. School buses less than a capacity of 36 shall have a manufacturer's standard fuel tank. Each tank shall be filled from and vented to the outside of the passenger compartment and each fuel filler shall be placed in a location where accidental fuel spillage will not drip or drain on any part of the exhaust system.

3.28.2 The fuel system shall comply with FMVSS No. 301, Fuel System Integrity.

3.28.3 Fuel tank(s) may be mounted between the chassis frame rails or outboard of the frame rails on either the left or right side of the vehicle.

3.28.4 The actual draw capacity of each fuel tank shall be a minimum of 83% of the tank capacity.

3.28.5 Installation of alternative fuel systems, including fuel tanks and piping from tank to the engine, shall comply with all applicable fire codes in effect on the date of manufacture of the bus.

3.28.6 Fuel gauges must be calibrated for size of tank used. If more than one tank is used, there must be a gauge for each tank.

3.28.7 Installation of Liquified Petroleum Gas (LPG) tanks shall comply with National Fire Protection Association (NFPA) 58, Liquified Petroleum Gas Code.

3.28.8 Installation of Compressed Natural Gas (CNG) containers shall comply with FMVSS No. 304, Compressed Natural Gas Fuel Container Integrity.

3.28.9 The CNG Fuel System shall comply with FMVSS No. 303, Fuel System Integrity of Compressed Natural Gas Vehicles.

3.29 Governor

3.29.1 An electronic engine speed limiter shall be provided and set to limit engine speed, not to exceed the maximum revolutions per minute, as recommended by the engine manufacturer.

3.30 Handrails

3.30.1 At least one handrail shall be installed. The handrail shall be a minimum of 1” diameter and be constructed from corrosion resistant material(s). The handrail(s) shall assist passengers during entry or exit, and shall be designed to prevent entanglement, as evidenced by the passage of the National Highway Transportation Safety Administration (NHTSA) string and nut test.

3.31 Heating System, Provision For

3.31.1 The engine shall be capable of supplying coolant at a temperature of at least 170 degrees Fahrenheit at the engine cooling thermostat opening. The coolant flow rate shall be 50 pounds per minute at the return end of 30 feet of one inch inside diameter automotive hot water heater hose. (See SBMTC-001, Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment.)

3.32 Heating and Air Conditioning Systems

3.32.1 Heating System

3.32.1.1 The heater shall be a hot water type.

3.32.1.2 Buses with a capacity of 36 or more shall have at least one heater at the front and 1 heater in the rear portion of the bus. Buses with 2 heaters at the front shall have 1 to the left of the driver, and 1 to the right of the driver near the entrance door.

3.32.1.3 If only one heater is used, it shall be fresh air or combination fresh air and recirculation type.

3.32.1.4 If more than one heater is used, additional heaters may be recirculating air type.

3.32.1.5 The heating system shall be capable of maintaining bus interior temperatures, as specified in test procedure SAE J2233.

3.32.1.6 Auxiliary fuel fired heating systems are permitted, provided they comply with the following:

3.32.1.6.1 The auxiliary heating system shall utilize the same type fuel as specified for the vehicle engine;

3.32.1.6.2 An auxiliary heating system when connected to the engine coolant system may be used to preheat the engine coolant or preheat and add supplementary heat to the heating system;

3.32.1.6.3 Auxiliary heating systems must be installed pursuant to the manufacturer's recommendations and shall not direct exhaust in such a manner that will endanger bus passengers;

3.32.1.6.4 All combustion heaters shall be in compliance with current Federal Motor Carrier Safety Regulations;

3.32.1.6.5 The auxiliary heating system shall require low voltage; and

3.32.1.6.6 Auxiliary heating systems shall comply with FMVSS No. 301, Fuel System Integrity, and all other applicable FMVSSs, as well as with SAE test procedures.

3.32.1.7 All forced air heaters installed by body manufacturers shall bear a name plate that indicates the heater rating in accordance with SBMTC-001, Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment. The plate shall be affixed by the heater manufacturer and shall constitute certification that the heater performance is as shown on the plate.

3.32.1.8 Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or any sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hoses shall conform to SAE J20c, Coolant System Hoses. Heater lines, cores on the interior of the bus shall be shielded to prevent scalding or burning of the driver or passengers.

3.32.1.9 Each hot water system installed by a body manufacturer shall include one shut off valve in the pressure line and one shut off valve in the return line, with both valves at the engine in an accessible location, except that on Types A and B buses, the valves may be installed in another accessible location.

3.32.1.10 All heaters in the passenger compartment shall be equipped with a device installed in the hot water pressure line, which regulates the water flow to all passenger heaters. The device shall be conveniently operated by the driver while seated. The driver and passenger heaters may operate independently of each other for maximum comfort.

3.32.1.11 Accessible bleeder valves for removing air from the heater shall be installed in an appropriate place in the return lines of the body company installed heater.

3.32.1.12 Access panels shall be provided to make heater motors, cores and fans readily accessible for service. An exterior access panel to the driver's heater may be provided.

3.32.2 Passenger Compartment Air Conditioning (Optional)

3.32.2.1 Performance Specifications

3.32.2.1.1 The installed air conditioning system shall cool the interior of the bus from 100 degrees to 80 degrees Fahrenheit, measured at three points (minimum), located four feet above the floor on the longitudinal centerline of the bus. The three required points shall be: (1) three feet above the center point of the horizontal driver seat surface, (2) at the longitudinal midpoint of the body, and (3) three feet forward of the rear emergency door or, for Type D rear-engine buses, three feet forward of the end of the aisle. Note for the Type A vehicles placement of the rear thermocouple should be centered in the bus over the rear axle. The independent temperature reading of each temperature probe inside the bus shall be within a range of ± 3 degrees Fahrenheit of the average temperature at the conclusion of the test.

3.32.2.1.2 The test conditions under which the above performance must be achieved shall consist of: (1) placing the bus in a room (such as a paint booth) where ambient temperature can be maintained at 100 degrees Fahrenheit; (2) heat-soaking the bus at 100 degrees Fahrenheit at a point measured two feet horizontally from the top of the windows on both sides of the bus, with windows open for two hours; and (3) closing windows, turning on the air conditioner with the engine running at 1250 ± 50 RPM, and cooling the interior of the bus to 80 degrees Fahrenheit, (standard performance) or 70 degrees Fahrenheit (high performance), within 30 minutes while maintaining 100 degrees Fahrenheit outside temperature.

3.32.2.2 Other Requirements

3.32.2.2.1 Evaporator cases, lines and ducting (as equipped) shall be designed in such a manner that all condensation is effectively drained to the exterior of the bus below the floor level under all conditions of vehicle movement and without leakage on any interior portion of bus.

3.32.2.2.2 Evaporators or ducting systems shall be designed and installed to be free of projections or sharp edges. Ductwork shall be installed so that exposed edges face the front of the bus and do not present sharp edges.

3.32.2.2.3 Evaporator cases and ducting systems shall be equipped with diffusers that are adjustable.

3.32.2.2.4 The condensers shall be equipped with a sight glass (or at least one for each part of a split system) that is accessible and directly visible for checking the level of the refrigerant.

3.32.2.2.5 The compressor system shall be equipped with both a high pressure and a low pressure switch to prevent compressor operation when system temperatures are above or below recommended safe levels. Lubrication of moving compressor parts shall be accomplished automatically. An automatic (electric) clutch shall be provided on each compressor.

3.32.2.2.6 All system operating controls, including on/off switch(es), blower switch(es) and thermostat controls shall be within reach of a seated 5th percentile adult female driver.

3.32.2.2.7 Blowers shall be a minimum of two speeds.

3.32.2.2.8 Wiring shall be copper with color coded insulation. The air conditioning system shall be equipped with at least one manually resetable circuit breaker per side to provide overload protection for the main power circuit feeding the evaporator blowers and condenser fans. System control circuits shall also have overload protection, but may be fused.

3.32.2.2.9 Refrigerant shall be R 134A.

3.32.2.2.10 All wiring, hoses, and lines shall be grommeted, routed, and supported so as to reduce wear. All flexible refrigerant hoses shall be double braided.

3.32.2.2.11 On school buses equipped with Type 2 seatbelts having anchorages above the windows, the evaporator and ducting (if used) shall be placed at a height sufficient to not obstruct occupant securement anchorages. This clearance shall be provided along the entire length of the passenger area on both sides of the bus interior;

3.32.2.2.12 The body shall be equipped with insulation, including sidewalls, roof, firewall, rear, inside body bows and plywood or composite floor insulation to reduce thermal transfer.

3.32.2.2.13 All glass shall be tinted (see “Windows”, this section and “Special Service Entrance Door”, section 2).

3.32.2.2.14 Roofs shall be painted white to aid in heat dissipation (see “Color”, this section).

3.32.2.2.15 Air intake for any evaporator assembly(ies), except for front evaporator of Type A-I, shall be equipped with replaceable air filter(s) accessible without disassembly of evaporator case.

3.32.2.2.16 For all buses (except Type D rear engine transit) equipped with a rear evaporator assembly, evaporator shall not encroach upon head impact zone, but may occupy an area of less than 26.5 inches from the rear wall and 14 inches from the ceiling.

3.32.2.2.17 For Type D rear engine transit buses equipped with a rear evaporator over the davenport, the evaporator assembly may not interfere with rear exit window and may not extend above the rear seating row.

3.32.2.2.18 Electrical generating capacity shall be provided to accommodate the additional electrical demands imposed by the air conditioning system.

3.33 Hinges

3.33.1 All exterior metal door hinges shall be designed to allow lubrication to be channeled to the center 75% of each hinge loop without disassembly, unless they are constructed of stainless steel, brass or non metallic hinge pins or other designs that prevent corrosion.

3.34 Horn

3.34.1 The bus shall be equipped with a horn(s) of standard make with the horn(s) capable of producing a complex sound in bands of audio frequencies between 250 and 2,000 cycles per second and tested in accordance with SAE J377, Horn, Forward Warning, Electric, Performance, Test, and Application.

3.35 Identification

3.35.1 The body shall bear words "SCHOOL BUS" in black letters at least 8 inches high on both front and rear of the body or on signs attached thereto. Lettering shall be placed as high as possible without impairment of its visibility. Letters shall conform to "Series B" of Standard Alphabets for Highway Signs. "SCHOOL BUS" lettering shall have a reflective background. It may not be illuminated by backlighting.

3.35.2 All lettering on NSBY surfaces shall be black, and lettering on black surfaces shall be NSBY or white.

3.35.3 Bus identification number shall be displayed on both sides, on the rear, and on the front with 6 inch numbers/letters.

3.35.4 District, company name or owner of the bus shall be displayed (letters 3 inch minimum to 6 inches maximum;

3.35.5 Each school bus shall be equipped with a sign on the left side of the rear bumper that says “WE STOP AT RAILROAD CROSSINGS”. The words “WE STOP AT” shall be four-inch capital letters conforming to “Series B” of Standard Alphabets for Highway Signs. The “RAILROAD CROSSING” portion of this signage shall be the universal round railroad crossing sign (minimum 6 inch diameter). The symbol and all lettering shall be black. The remainder of the signage shall be retroreflective NSBY material.

3.35.6 Other lettering, numbering, or symbols which may be displayed on the exterior of the bus, shall be limited to:

3.35.6.1 The location of the battery(ies) identified by the word "BATTERY" or "BATTERIES" on the battery compartment door in 2 inch lettering;

3.35.6.2 Symbols or letters not to exceed 64 square inches of total display near the entrance door, displaying information for identification by the students of the bus or route served;

3.35.6.3 Manufacturer, company name, dealer, school logo, or U.S. Flag (with no other wording or artwork) decal or plate not to exceed 6 inches by 12 inches may be displayed in the right side plate location on the rear of the bus;

3.35.6.4 Symbols identifying the bus as equipped for or transporting students with special needs (see the Specially Equipped School Bus Specifications section in NSTSP);

3.35.6.5 Identification of fuel type in 1 inch lettering adjacent to the fuel filler opening.

3.36 Inside Height: Inside body height shall be 72 inches or more, measured metal to metal, at any point on longitudinal center line from the front vertical bow to the rear vertical bow. Inside body height of Type A-1 buses shall be 62 inches or more. Inside height does not apply to air conditioning equipment

3.37 Instruments and Instrument Panel

3.37.1 The chassis shall be equipped with the instruments and gauges listed below. (Telltale warning lamps in lieu of gauges are not acceptable, except as noted):

3.37.1.1 Speedometer;

3.37.1.2 Odometer that can be read without using a key and that will give accrued mileage (to seven digits), including tenths of miles, unless tenths of miles are registered on a trip odometer;

3.37.1.3 Tachometer (Note: For Types B, C, and D buses, a tachometer shall be installed so as to be visible to the driver while seated in a normal driving position.);

3.37.1.4 Voltmeter (Note: An ammeter with graduated charge and discharge indications is permitted in lieu of a voltmeter; however, when used, the ammeter wiring must be compatible with the current flow of the system);

3.37.1.5 Oil pressure gauge;

3.37.1.6 Water temperature gauge;

3.37.1.7 Fuel gauge;

3.37.1.8 High beam headlamp indicator;

3.37.1.9 Brake air pressure gauge and low pressure lamp (air brakes), or brake indicator lamp (hydraulic brakes);

3.37.1.10 Turn signal indicator; and

3.37.1.11 Glow plug indicator light, where appropriate

3.37.2 All instruments shall be easily accessible for maintenance and repair.

3.37.3 The instruments and gauges shall be mounted on the instrument panel so that each is clearly visible to the driver while seated in a normal driving position.

3.37.4 Instruments and controls must be illuminated as required by FMVSS No. 101, Controls and Displays.

3.37.5 Multi-function gauge (MFG)

3.37.5.1 The driver must be able to manually select any displayable function of the gauge on a MFG, whenever desired.

3.37.5.2 Whenever an out of limits condition that would be displayed on one or more functions of a MFG occurs, the MFG controller should automatically display this condition on the instrument cluster. This should be in the form of an illuminated telltale warning lamp, as well as having the MFG automatically display the out of limits indications. If two or more functions displayed on the MFG go out of limits simultaneously, then the MFG should sequence automatically between those functions continuously until the condition(s) are corrected.

3.37.5.3 The use of a MFG does not relieve the need for audible warning devices, where required.

3.38 Insulation

3.38.1 If thermal insulation is specified, it shall be fire resistant, UL approved, with minimum R value of 5.5. Insulation shall be installed so as to prevent sagging.

3.38.2 If floor insulation is required, it shall be five ply softwood plywood, nominal 5/8 inch thickness and shall be equal to or exceed properties of the exterior type, C-D Grade, as specified in the standard issued by U.S. Department of Commerce. When plywood is used, all exposed edges shall be sealed. Type A-1 buses may be equipped with nominal 1/2 inch thick plywood or equivalent material meeting the above requirements. Equivalent material may be used to replace plywood, provided it has an equal or greater insulation R value, sound abatement, deterioration resistant and moisture resistant properties.

3.39 Interior

3.39.1 The interior of bus shall be free of all unnecessary projections, which include luggage racks and attendant handrails, to minimize the potential for injury. This standard requires inner lining on ceilings and walls. If the ceiling is constructed with lap joints, the forward panel shall be lapped by rear panel and exposed edges shall be beaded, hemmed, flanged, or otherwise treated to minimize sharp edges. Buses may be equipped with a storage compartment for tools, tire chains, and/or tow chains. (See “Storage Compartment”, this section)

3.39.2 Interior overhead storage compartments may be provided if they meet the following criteria:

3.39.2.1 Head protection requirements of FMVSS No. 222, School Bus Passenger Seating and Crash Protection, where applicable;

3.39.2.2 Have a maximum rated capacity displayed for each compartment;

3.39.2.3 Be completely enclosed and equipped with latching door (both door and latch sufficient to withstand a pushing force of 50 pounds applied at the inside center of the door);

3.39.2.4 Have all corners and edges rounded with a minimum radius of 1 inch or be padded equivalent to door header padding;

3.39.2.5 Be attached to the bus sufficiently to withstand a force equal to 20 times the maximum rated capacity of the compartment; and

3.39.2.6 Have no protrusions greater than ¼ inch.

3.39.3 The driver's area forward of the foremost padded barriers will permit the mounting of required safety equipment and vehicle operation equipment.

3.39.4 Every school bus shall be constructed so that the noise level at the ear of the occupant nearest to the primary vehicle noise source shall not exceed 85 dBA when tested according to the procedure found in the NSTSP, Appendix B.

3.39.5 School buses with a capacity of 36 passengers or greater shall be equipped with a sound dampening body package that includes firewall and engine cover. The headliner over the driver's compartment to the front barriers shall be perforated to absorb sound.

3.39.6 Buses shall have mar proof sidewalls.

3.40 Lamps and Signals: may be incandescent, sealed beam, halogen or light emitting diode (LED).

3.40.1 Interior lamps which illuminate the aisle and stepwell shall be provided. The stepwell lamp shall be illuminated by an entrance door operated switch, to illuminate only when headlamps and clearance lights are on and the entrance door is open.

3.40.1.1 Buses shall have a red United States Department of Transportation (USDOT) light above the emergency door.

3.40.1.2 Buses shall have dome lights in the driver and passenger compartments and shall have a separate switch to operate the rear row of lights.

3.40.2 Body instrument panel lamps shall be controlled by an independent dimmer switch.

3.40.3 School bus alternately flashing signal lamps shall be provided:

3.40.3.1 The bus shall be equipped with two red lamps at the rear of vehicle and two red lamps at the front of the vehicle.

3.40.3.1.1 Visors or hoods, black in color, shall be required and shall have a minimum depth of 4 inches.

3.40.3.2 In addition to the four red lamps described above, four amber lamps shall be installed so that one amber lamp is located near each red signal lamp, at same level, but closer to the vertical centerline of bus. The system of red and amber signal lamps shall be wired so that amber lamps are energized manually. The amber signal lamps shall be controlled by a manual button located on the steering wheel or to the right of the driver. The red lamps are automatically energized and amber lamps are automatically de-energized when stop signal arms are extended or when bus entrance door is opened. An amber pilot lamp and a red pilot lamp shall be installed adjacent to the driver controls for the flashing signal lamp to indicate to the driver which lamp system is activated.

3.40.3.2.1 The lamps shall be a non-sequential operation.

3.40.3.3 The area around lens of alternately flashing signal lamps extending outward from the edge of the lamps 1-3 inches to the sides and top and 1" to the bottom, shall be black in color on the body or roof area against which the signal lamp is seen.

3.40.3.4 Red lamps shall flash at any time the arm is extended.

3.40.3.5 All flashers for alternately flashing red and amber signal lamps shall be enclosed in the body in a readily accessible location.

3.40.4 Turn signal and stop tail lamps

3.40.4.1 The bus body shall be equipped with amber rear turn signal lamps that are at least 7 inches in diameter or if the shape is other than round, a minimum 38 square inches of illuminated area and shall meet FMVSS No. 108, Lamps, Reflective Devices, and Associated Equipment. These signal lamps must be connected to the chassis hazard warning switch to cause simultaneous flashing of turn signal lamps when needed as vehicular traffic hazard warning. Turn signal lamps are to be placed as wide apart as practical and their horizontal centerline shall be a maximum of 12 inches below the rear window.

3.40.4.2 Buses shall be equipped with amber side mounted turn signal lamps. The turn signal lamp on the left side shall be mounted rearward of the stop signal arm and the turn signal lamp on the right side shall be mounted rearward of the entrance door. An additional side turn signal lamp shall be mounted between the rear wheel opening and the rear of the bus on both sides.

3.40.4.3 In addition to manufacturer's standard turn signals, Type C school buses shall be equipped with front, Class A fender or hood mounted turn signals.

3.40.4.4 Buses shall be equipped with four combination red stop/tail lamps:

3.40.4.4.1 Two combination lamps with a minimum diameter of 7 inches, or if a shape other than round, a minimum 38 square inches of illuminated area shall be mounted on the rear of the bus just inside the turn signal lamps.

3.40.4.4.2 Two combination lamps with a minimum diameter of 4 inches, or if a shape other than round, a minimum 12 square inches of illuminated area, shall be placed on the rear of the body between the beltline and the floor line. The rear license plate lamp may be combined with one lower tail lamp. Stop lamps shall be activated by the service brakes and shall emit a steady light when illuminated.

3.40.5 All buses shall be equipped with a 16 light monitor. The monitor shall be mounted in full view of the driver. If the full circuit current passes through the monitor, each circuit shall be protected against any short circuit or intermittent shorts by a fuse, circuit breaker or electronic protection device.

3.40.6 Body markers shall be the armored type.

3.40.7 Strobe lamp

3.40.7.1 A white flashing strobe lamp meeting the requirements of SAE J845, June 2013 Edition, shall be installed directly on the roof of the bus.

3.40.7.2 It shall be located from 4 to 6 feet from the rear of the roof edge (except air conditioned buses with rooftop evaporators), within 1 foot of centerline, behind all other roof equipment.

3.40.7.3 The light shall be wired to activate when the amber alternately flashing signal lamps are activated, continuing through the full loading or unloading cycle, with an override switch to allow activation of the strobe lamp anytime for use in inclement weather.

3.40.7.4 A separate pilot lamp on the light switch panel or a pilot lamp in the strobe light switch shall be installed to indicate when the light is in operation.

3.40.8 Backup lamps

3.40.8.1 The bus body shall be equipped with two white rear backup lamps that are at least 4 inches in diameter or, if a shape other than round, a minimum of 12 square inches of illuminated area and shall meet FMVSS No. 108. If backup lamps are placed on the same horizontal line as the brake lamps and turn signal lamps, they shall be to the inside.

3.40.9 Daytime Running Lamps

3.40.9.1 Head lamps shall be provided with a switch to automatically operate the lamps when the vehicle is placed in gear or the parking brake is released. If this switch is designed to provide reduced illumination under normal operating conditions, a means whereby the head lamps can be engaged at full power shall be provided.

3.40.10 School buses may be equipped with fog lamps.

3.41 Metal Treatment

3.41.1 All metal except high grade stainless steel or aluminum used in construction of the bus body shall be zinc coated or aluminum coated or treated to prevent corrosion. This includes but is not limited to such items as structural members, inside and outside panels, door panels and floor sills. Excluded are such items as door handles, grab handles, interior decorative parts and other interior plated parts.

3.41.2 All metal parts that will be painted, in addition to the above requirements, shall be chemically cleaned, etched, zinc phosphate coated and zinc chromate or epoxy primed to improve paint adhesion. This includes but is not limited to such items as crossing control arm and stop arm.

3.41.3 In providing for these requirements, particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges on punched or drilled hole areas in sheet metal, closed or box sections, unvented or undrained areas and surfaces subjected to abrasion during vehicle operation.

3.41.4 As evidence that above requirements have been met, samples of materials and sections used in the construction of the bus body shall be subjected to a cyclic corrosion testing as outlined in SAE J1563.

3.42 Mirrors

3.42.1 The interior glass mirror shall be either laminated or tempered and shall have rounded corners and protected edges. Mirrors shall be 6 inches x 16 inches minimum for Types A buses and be 6 inches x 30 inches for Types C and D buses.

3.42.2 Each school bus shall be equipped with exterior mirrors meeting the requirements of FMVSS No. 111, Rearview Mirrors. The right side rear view mirror shall not be obscured by the unwiped portion of the windshield. Mirrors shall be easily adjustable, but shall be rigidly braced, so as to reduce vibration.

3.42.3 All buses shall be equipped with heated and remote controlled exterior rear view mirrors and heated cross over mirrors.

3.43 Mounting

3.43.1 The rear body cross member shall be supported by the chassis frame. Except where chassis components interfere, the bus body shall be attached to the chassis frame at each main floor sill in such a manner as to prevent shifting or separation of the body from the chassis under severe operating conditions.

3.43.2 Insulators shall be installed at all contact points between the body and the chassis frame on Types A-2, B, C, and D buses, and shall be secured by a positive means to the chassis frame or body to prevent shifting, separation, or displacement of the isolators under severe operating conditions.

3.44 Oil Filter

3.44.1 An oil filter with a replaceable element shall be provided and connected by flexible oil lines if it is not a built in or an engine mounted design. The oil filter shall have a capacity in accordance with the engine manufacturer's recommendation.

3.45 Openings

3.45.1 All openings in the floorboard or firewall between chassis and the passenger compartment (e.g. for gearshift selector and parking brake lever) shall be sealed.

3.46 Overall Length

3.46.1 Overall length of bus shall not exceed 45 feet, excluding accessories.

3.47 Overall Width

3.47.1 Overall width of bus shall not exceed 96 inches, excluding accessories.

3.48 Passenger Load

3.48.1 The actual gross vehicle weight (GVW) is the sum of the chassis weight plus the body weight, plus the driver's weight, plus total seated student weight. For purposes of calculation, the driver's weight is 150 pounds, and the student weight is 120 pounds per student.

3.48.2 Actual GVW shall not exceed the chassis manufacturer's GVWR for the chassis, nor shall the actual weight carried on any axle exceed the chassis manufacturer's Gross Axle Weight Rating (GAWR).

3.49 Public Address System

3.49.1 There shall be installed a public address amplifier specifically designed for vehicular applications. Such system shall consist of an on off switch, volume control, and an inside outside speaker selector switch. Additionally, it shall have an outside speaker completely weather proofed a minimum 7 watt power capability and two interior dynamic speakers with a minimum diameter of 4 inches. These speakers shall be located above the window line, to the rear of the driver, and shall not project more than 1/2 inch from the interlining of the bus. There shall be no sharp edges or corners that could cause injury to a passenger. The outside speaker on Type A and B buses shall be located on the left front side of the bus forward of the front wheels. On Type C buses the speaker shall be located in the engine compartment forward of the radiator or on the inside of the front bumper on the left side. On Type D buses the speaker shall be located under the floor on the left side of the bus between the front bumper and the left, front wheel.

3.49.2 Buses may be equipped with an AM/FM audio system.

3.49.3 No internal speakers, other than the driver's communication systems, may be installed within 4' of the driver's seat back in its rearmost upright position.

3.50 Retarder System: A retarder system, if used, shall limit the speed of a fully loaded school bus to 19.0 mph on a 7% grade for 3.6 miles.

3.51 Retroreflective Material, Reflexite or Diamond grade or equivalent (see NSTSP, Appendices A and B, Retroreflective Sheeting)

3.51.1 The front and rear bumper may be marked diagonally 45 degrees down to centerline of pavement with 2 inches + or - ¼ inch wide strips of non contrasting reflective material.

3.51.2 The rear of the bus body shall be marked with strips of retroreflective NSBY material to outline the perimeter of the back of the bus using material which conforms to the requirements of FMVSS No. 131, School Bus Pedestrian Safety Devices, Table 1. The perimeter marking of rear emergency exits per FMVSS No. 217, Bus Emergency Exits and Window Retention and Release, and/or the use of

retroreflective "SCHOOL BUS" signs partially accomplishes the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of retroreflective NSBY material a minimum of one inch and a maximum of two inches in width shall be applied horizontally above the rear windows and above the rear bumper, extending from the rear emergency exit perimeter, marking outward to the left and right rear corners of the bus. Vertical strips shall be applied at the corners connecting these horizontal strips.

3.51.3 "SCHOOL BUS" signs shall be marked with retroreflective NSBY material comprising background for lettering of the front and/or rear "School BUS" signs.

3.51.4 Sides of bus body shall be marked with at least 1 ¾ inch retro reflective NSBY material, extending the length of the bus body and located (vertically) between the floor line and the beltline.

3.52 Road Speed Control: The bus shall be equipped with a vehicle speed limiter to accurately control vehicle maximum speed to 65 miles per hour.

3.53 Rub Rails

3.53.1 There shall be three rub rails on each side of the bus. One shall be located at or no more than 8 inches above the seat cushion level. The second shall be just below the window line. The third shall be located 10 inches or less above the floor line. This rub rail shall cover the same longitudinal span as the upper rub rails except at the wheelhousing. All rub rails shall extend the length of the left side and on the right side from the rear side of the entrance door to the rear of the bus.

3.53.2 Two of the three rub rails shall wrap around the bus body (except at the emergency door or any maintenance access door).

3.53.3 There shall be a snow (rub) rail at the bottom edge of the body side skirts.

3.53.4 Rub rails above the floor line shall be attached at each body post and at all other upright structural members.

3.53.5 Each rub rail shall be 4 inches or more in width in its finished form and shall be constructed of 16 gauge steel or other material of equivalent strength suitable to help protect body side panels from damage. Rub rails shall be constructed in corrugated or ribbed fashion.

3.53.6 Rub rails shall be applied outside the body or outside the body posts. (Pressed in or snap on rub rails do not satisfy this requirement.) For Type A-1 vehicles using the body provided by the chassis manufacturer, or for Types A-2, B, C and D buses containing the rear luggage or the rear engine compartment, rub rails need not extend around the rear corners.

3.54 Seats and Restraining Barriers

3.54.1 Passenger Seating

3.54.1.1 School bus design capacities shall be in accordance with 49 CFR 571.3 and FMVSS No. 222, School Bus Passenger Seating and Crash Protection.

3.54.1.2 All seats shall have a minimum cushion depth of 15 inches, a seat back height of 24 inches above the seating reference point, and must comply with all other requirements of FMVSS No. 222.

3.54.1.3 All restraining barriers and passenger seats shall be constructed with materials that enable them to meet the criteria of the School Bus Seats Upholstery Fire Block Test.

3.54.1.4 School buses equipped with front barriers shall have modesty panels to the floor between the barrier leg and the side of the bus.

3.54.1.5 Each seat leg shall be secured to the floor by bolts, washers, and nuts in order to meet the performance requirements of FMVSS No. 222. Flange head nuts may be used in lieu of nuts and washers. All seat frames attached to the seat rail shall be fastened two or more bolts, washers and nuts, or with flange-head nuts. Seats may be track mounted in conformance with FMVSS No. 222.

3.54.1.6 If track seating is installed, the manufacturer shall supply minimum and maximum seat spacing dimensions (applicable to the bus) which comply with FMVSS No. 222. This information shall be on a label permanently affixed to the bus.

3.54.1.7 All school buses (including Type A) shall be equipped with restraining barriers which conform to FMVSS No. 222.

3.54.1.8 There shall be a minimum of 8" clearance between the top of the last seat and the rear interior of the bus.

3.54.1 9 Flip seats shall not be used.

3.54.1.10 Lap shoulder belts shall not be installed on passenger seats in large school buses (over 10,000 pounds GVWR) except in conjunction with child safety restraint systems that comply with the requirements of FMVSS No. 213, Child Restraint Systems.

3.54.1.11 An electrical child reminder system shall be installed to assist the driver in checking for students left on board the bus. There shall be an instructional placard explaining system deactivation in the driver compartment.

3.54.2 Preschool Age Seating: Passenger seats designed to accommodate a child or infant carrier seat shall comply with FMVSS No. 225, Child Restraint Anchorage Systems. These seats shall be in compliance with NHTSA's "Guideline for the Safe Transportation of Preschool Age Children in School Buses." (Note: See 3.54.1.10 above.) There shall be at least 27 inches, measured at seat cushion level between the back of the seat back or barrier and the front of the seat back of the next seat to the rear.

3.54.3 Driver Seat

3.54.3.1 The driver's seat supplied by the body manufacturer shall be a high back seat, have right side armrests and have a cloth seating surface. It may have air suspension. The seat back shall be adjustable to 15 degrees minimum, without requiring the use of tools. The seat shall be equipped with a head restraint to accommodate a 5th percentile adult female to a 95th percentile adult male, as defined in FMVSS No. 208, Occupant Crash Protection.

3.54.3.2 Type A buses may utilize the standard driver's seat provided by the chassis manufacturer.

3.54.4 Driver Restraint System

3.54.4.1 An integrated Type 2 lap shoulder belt may be provided for the driver. If not available, the shoulder belt shall have a height adjuster.

3.54.4.2 The assembly shall be equipped with an emergency locking retractor for the continuous belt system. On all buses except Type A that are equipped with a standard chassis manufacturer's driver's seat, the lap portion of the belt system shall be guided or anchored to prevent the driver from sliding sideways under the belt system. The lap/shoulder belt shall be designed to allow for easy adjustment in order to fit properly and to effectively protect drivers varying in size from a 5th percentile adult female to 95th percentile adult male.

3.54.4.3 Driver seat belt shall be of a high visibility color.

3.54.5 Each bus shall be equipped with a durable webbing cutter having a full width handgrip and a protected, replaceable or non-corrodible blade. The required webbing cutter shall be mounted in a location accessible to the seated driver in an easily detachable manner.

3.55 Shock Absorbers

3.55.1 The bus shall be equipped with double action shock absorbers compatible with the manufacturer's rated axle capacity at each wheel location.

3.56 Side Skirts

3.56.1 Side body panels and skirt shall be a maximum of 46 to 47 inches measured from the bottom of the window line to the bottom of the snow rail, unless the standard side skirt is at the center of the axles. This does not apply to buses with side body storage compartments.

3.57 Steering Gear

3.57.1 The steering gear shall be approved by the chassis manufacturer and designed to ensure safe and accurate performance when the vehicle is operated with maximum load and at maximum speed.

3.57.2 If external adjustments are required, the steering mechanism shall be accessible to make adjustments.

3.57.3 Changes shall not be made to the steering apparatus which are not approved by the chassis manufacturer.

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

3.57.5 Power steering is required and shall be of the integral type with integral valves.

3.57.6 The steering system shall be designed to provide a means for lubrication of all wear points that are not permanently lubricated.

3.57.7 On Type C and D buses, the steering column wheel shall have tilt capability and may have telescopic capability.

3.58 Steps

3.58.1 All school buses with a capacity of 36 passengers and above shall have a three step stepwell.

3.58.2 The first step at the entrance door shall be not less than 10 inches and not more than 14 inches from the ground when measured from the top surface of the step to the ground, based on standard chassis specifications, except that on Type D vehicles, the first step at the service door shall be 12 inches to 16 inches from the ground.

3.58.3 Step risers shall not exceed a height of 10 inches. Exception: When plywood is used on a steel floor or step, the riser height may be increased by the thickness of the plywood.

3.58.4 Steps shall be enclosed to prevent accumulation of ice and snow.

3.58.5 Steps shall not protrude beyond the side body line.

3.59 Step Treads

3.59.1 All steps, including floor line platform area, shall be covered with an elastomer floor covering having a minimum overall thickness of 0.187 inch.

3.59.2 The step covering shall be permanently bonded to a durable backing material that is resistant to corrosion.

3.59.3 Steps, including the floor line platform area, shall have a 1 ½ inch white nosing.

3.59.4 Step treads shall have the following characteristics:

3.59.4.1 Abrasion resistance

3.59.4.1.1 Step tread material weight loss shall not exceed 0.40 percent, as tested under ASTM D-4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser, (CS-17 Wheel, 1000 gram, 1000 cycle);

3.59.4.2 Weathering resistance

3.59.4.2.1 Step treads shall not break, crack, or check after ozone exposure (7 days at 50 phm at 40 degrees C) and Weatherometer exposure (ASTM D-750, Standard Test Method for Rubber Deterioration in Carbon Arc Weathering Apparatus, 7 days); and

3.59.4.3 Flame Resistance

3.59.4.3.1 Step treads shall have a calculated burn rate of 0.01 mm per minute or less using the test methods, procedures and formulas listed in FMVSS No. 302, Flammability of Interior Materials.

3.59.4.4 A spray on application type material may be used in lieu of the item specified in subsection 3.59.1 of this regulation that meets the requirements of subsections 3.59.2 through 3.59.4. The material shall be applied not only to the interior surfaces of the service door step treads but also to the exterior, if not covered by undercoating.

3.60 Stirrup Steps

3.60.1 If the windshield and lamps are not easily accessible from the ground, there shall be at least one folding stirrup step or recessed foothold installed on each side of the front of the body for easy accessibility for cleaning. There also may be a grab handle installed in conjunction with the step. Steps are permitted in or on the front bumper in lieu of the stirrup steps if the windshield and lamps are easily accessible for cleaning from that position.

3.61 Stop Signal Arm

3.61.1 The stop signal arm shall comply with the requirements of FMVSS No. 131, School Bus Pedestrian Safety Devices. They shall have LED lights with a strobe function.

3.62 Storage Compartments:

3.62.1 A storage container for tools, and/or other equipment may be located either inside or outside the passenger compartment. If it is inside, it shall be fastened to the floor and have a cover with a positive fastening device.

3.62.2 A storage compartment with a closeable door and minimum capacity of 500 cu. in. located in the driver compartment area shall be provided.

3.63 Sun Shield

3.63.1 On Types B, C, and D buses, an interior adjustable transparent sun shield with a finished edge and dimensions not less than 6 inches X 30 inches, shall be installed in a position convenient for use by driver.

3.63.2 On all Type A buses, the sun shield (visor) shall be installed by the chassis manufacturer.

3.64 Suspension Systems

3.64.1 The capacity of springs or suspension assemblies shall be commensurate with the chassis manufacturer's GVWR.

3.64.2 Rear leaf springs shall be of a progressive rate or multi stage design. Front leaf springs shall have a stationary eye at one end and shall be protected by a wrapped leaf, in addition to the main leaf.

3.65 Throttle

3.65.1 The force required to operate the throttle shall not exceed 16 pounds throughout the full range of accelerator pedal travel.

3.66 Tires and Rims

3.66.1 Rims and tires of the proper size and load rating commensurate with chassis manufacturer's GVWR shall be provided. All wheel rims shall be the same size to allow for interchangeability. The use of multi piece rims shall not be permitted.

3.66.2 Dual rear tires shall be provided on Type A-2, Type B, Type C, and Type D school buses.

3.66.3 All tires on a vehicle shall be tubeless radials and be of the same size, and the load range of the tires shall meet or exceed the GVWR, as required by FMVSS No. 120, Tire Selection and Rims for Vehicles other than Passenger Car.

3.66.4 If the vehicle is equipped with a spare tire and rim assembly, it shall be the same size as those mounted on the vehicle.

3.66.5 If a tire carrier is required, it shall be suitably mounted in an accessible location outside of the passenger compartment.

3.67 Towing Attachment Points: Front and rear towing devices (i.e., tow hooks, tow eyes, or other towing attachment points) shall be furnished to assist in the retrieval of buses that are stuck and/or for towing buses when a wrecker with a “wheel lift” or an “axle lift” is not available or cannot be applied to the towed vehicle.

3.67.1 Towing devices shall be attached to the chassis frame either by the chassis manufacturer or in accordance with the chassis manufacturer’s specifications.

3.67.2 Each towing device shall have a strength rating of 13,500 pounds each, for a combined rating of 27,000 pounds with the force applied in the rearward direction, parallel to the ground, and parallel to the longitudinal axis of the chassis frame rail. For pulling, angularity applied to the tow hooks will decrease the capacities of the tow hooks.

3.67.3 The towing devices shall be mounted such that they do not project forward of the front bumper or rearward of the rear bumper.

3.67.4 Type A buses are exempt from the requirement for front tow hooks or eyes due to built-in crush zones.

3.68 Traction Assisting Devices

3.68.1 Where required or used, sanders shall:

3.68.1.1 Be of hopper cartridge valve type;

3.68.1.2 Have a metal hopper with all interior surfaces treated to prevent condensation of moisture;

3.68.1.3 Have at least 100 pound (grit) capacity;

3.68.1.4 Have a cover that screws in place on the filler opening of the hopper, thereby sealing the unit airtight;

3.68.1.5 Have discharge tubes extending under the fender wheelhousing to the front of each rear wheel;

3.68.1.6 Have non clogging discharge tubes with slush proof, non freezing rubber nozzles;

3.68.1.7 Be operated by an electric switch with a pilot lamp mounted on the instrument panel located so as to be exclusively controlled by the driver;

3.68.1.8 Be equipped with a gauge to indicate that the hopper has reached the one quarter level (and needs to be refilled); and

3.68.1.9 Be designed to prevent freezing of all activation components and moving parts.

3.69 Transmission

3.69.1 Automatic transmissions shall have no fewer than three forward speeds and one reverse speed. Mechanical shift selectors shall provide a detent between each gear position when the gear selector quadrant and shift selector are not steering column mounted.

3.69.2 Automatic transmissions shall have a transmission shift interlock controlled by the application of the service brake to prohibit accidental engagement of the transmission.

3.70 Trash Container and Holding Device

3.70.1 A trash container may be provided and secured by a holding device that is designed to prevent movement and to allow easy removal and replacement. It shall be installed in an accessible location in the driver’s compartment, not obstructing passenger access to the entrance door.

3.71 Turning Radius

3.71.1 A chassis with a wheelbase of 264 inches or less shall have a right and left turning radius of not more than 42 1/2 feet, curb to curb measurement.

3.71.2 A chassis with a wheelbase of 265 inches or more shall have a right and left turning radius of not more than 44 1/2 feet, curb to curb measurement.

3.72 Undercoating

3.72.1 The entire underside of bus body, including floor sections, cross member and below floor line side panels, shall be coated with rust proofing material for which the material manufacturer has issued to the bus body manufacturer a notarized certification that materials meet or exceed all performance of SAE J 1959, Sept. 2003 Edition of the Standard.

3.72.2 The undercoating material shall be applied with suitable airless or conventional spray equipment to the undercoating material manufacturer recommended film thickness and shall show no evidence of voids in cured film.

3.72.3 The undercoating material shall not cover any exhaust components of the chassis.

3.73 Ventilation (See also subsection 3.3 of this regulation.)

3.73.1 The bus body shall be equipped with a suitably controlled ventilating system with capacity sufficient to maintain the proper quantity of air flow under operating conditions without having to open a window except in extremely warm weather.

3.73.2 Static type, non closeable exhaust ventilation shall be installed in a low pressure area of the roof.

3.73.3 Roof hatches designed to provide ventilation in all types of exterior weather conditions may be provided.

3.74 Wheelhousing

3.74.1 The wheelhousing opening shall allow for easy tire removal and service.

3.74.2 Wheelhousings shall be attached to the floor sheets in a manner to prevent any dust, water or fumes from entering the body. Wheelhousings shall be constructed of 16 gauge steel (or thicker) steel.

3.74.3 The inside height of the wheelhousings above the floor line shall not exceed 12 inches.

3.74.4 The wheelhousings shall provide clearance for installation and use of tire chains on single and dual (if so equipped) power driving wheels.

3.74.5 No part of a raised wheelhousing shall extend into the emergency door opening.

3.75 Windows

3.75.1 Other than emergency exits designated to comply with FMVSS No. 217, Bus Emergency Exits and Window Retention and Release, each side window shall provide an unobstructed opening of at least 9 inches high (but not more than 13 inches high) and at least 22 inches wide, obtained by lowering the window. One side window on each side of the bus may be less than 22 inches wide.

3.75.2 All glass may be equipped with maximum integral tinting allowed by federal or ANSI standards for the respective locations. However, the tinting in the rear windows and door shall not exceed the tinting allowed for the windshield and windows rear of the driver's compartment, if tinted, shall have approximately 28 percent light transmission.

3.76 Windshield Washers: A windshield washer system shall be provided.

3.77 Windshield Wipers

3.77.1 A variable speed windshield wiping system with an intermittent feature, shall be provided and shall be operated by a single switch.

3.77.2 The wipers shall meet the requirements of FMVSS No. 104, Windshield Wiping and Washing Systems.

4.0 Standards for Specially Equipped School Buses

4.1 General Requirements

4.1.1 Specially equipped school buses shall comply with these standards and with FMVSSs applicable to their GVWR category.

4.1.2 Any school bus to be used for the transportation of children who utilize a wheelchair or other mobile positioning device, or who require life support equipment that prohibits use of the regular service entrance, shall be equipped with a power lift.

4.1.3 Lift buses (48-60 passengers only) shall have flat floors.

4.1.4 Padded barriers shall be installed to protect wheelchair positions where seating does not interface as barrier.

4.1.5 Seats shall have the minimum spacing specified under FMVSS No. 222 School Bus Passenger Seating and Crash Protection per National Highway Traffic Safety Administration (NHTSA) February 1999 Guideline for the Safe Transportation of Pre-school Age Children in School Buses. There shall be at least 27 inches, measured at seat cushion level between the back of the seat back or barrier and the front of the seat back of the next seat to the rear.

4.1.6 All seats shall have lap shoulder seat belts installed with LATCH (Lower Anchors and Tethers for Children). The 45 inch seats shall have 3 lap shoulder seat belts and 2 sets of LATCH; 39 inch seats shall have 2 lap shoulder seat belts and 2 sets of LATCH; and 30 and 36 inch seats shall have 2 lap shoulder seat belts and 1 set of LATCH.

4.1.7 Buses shall not be equipped with vehicle ramps.

4.2 Aisles

4.2.1 All school buses equipped with a power lift shall provide a minimum 30 inch aisle leading from any wheelchair position to at least one 30 inches wide emergency exit door. A wheelchair securement position shall never be located directly in front of (blocking) a power lift door location.

4.3 Glazing

4.3.1 Tinted glazing may be installed in all doors, windows and windshields (see “Windows”, section 1 and “Special Service Entrance Door”, this section).

4.4 Handrails

4.4.1 Two handrails (at the front and rear of the stepwell) shall be provided to assist passengers during entry or exit, and shall be designed to prevent entanglement, as evidenced by the passage of the NHTSA string and nut test.

4.5 Identification

4.5.1 Specially equipped school buses shall display the International Symbol of Accessibility below the window line. Such emblems shall be white on blue or black background, shall not exceed 12 inches square in size and shall be of a high intensity retroreflective material meeting the requirements of Federal Highway Administration (FHWA) FP-85, Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

4.6 Passenger Capacity Rating

4.6.1 In determining the passenger capacity of a school bus for purposes other than actual passenger load (e.g., vehicle classification or various billing/reimbursement models), any location in a school bus intended for securement of a wheelchair during vehicle operations shall be regarded as four designated seating positions, and each lift area shall count as four designated seating positions.

4.7 Power Lifts

4.7.1 The power lift shall be located on the right side of the bus body.

4.7.2 Vehicle lift and installation

4.7.2.1 In general vehicle lifts and installations shall comply with the requirements set forth in FMVSS No. 403, Platform Lift Systems for Motor Vehicles, and FMVSS No. 404, Platform Lift Installations in Motor Vehicles. For lifts located at the rear of the bus, the power unit for the lift shall be located forward of the lift with controls secured to the interior of the lift door. For lifts located at the forward of the bus, the power unit for the lift shall be located rearward of the lift with controls secured to the interior of the lift door.

4.7.2.2 The design load of the lift shall be at least 800 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Non working parts, such as platform, frame, and attachment hardware that would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

4.7.2.3 Lift capacity

4.7.2.3.1 The lifting mechanism and platform shall be capable of operating effectively with a wheelchair and occupant mass of at least 800 pounds.

4.7.2.4 Controls: (See 49 CFR 571.403, S6.7, Control systems.)

4.7.2.5 Emergency operations: (See 49 CFR 571.403, S6.9, Backup operation.)

4.7.2.6 Power or equipment failures: (See 49 CFR 571.403, S6.2.2, Maximum platform velocity.)

4.7.2.7 Platform barriers: (See 49 CFR 571.403, S6.4.7, Wheelchair retention.)

4.7.2.8 Platform surface: (See 49 CFR 571.403, S6.4.2, S6.4.3, Platform requirements) (See also “Wheelchair or Mobility Aid Envelope” figure in the current NSTSP, Specially Equipped School Bus Specifications.)

4.7.2.8.1 The platform shall have a minimum clear width of 32 inches measured from two inches above the platform surface to 30 inches above the surface of the platform, and a minimum clear length of 48 inches measured from two inches above the surface of the platform to 30 inches above the surface of the platform.

4.7.2.9 Platform gaps and entrance ramps: (See 49 CFR 571.403, S6.4.4, Gaps, transitions and openings.)

4.7.2.10 Platform deflection: (See 49 CFR 571.403, S6.4.5, Platform deflection.)

4.7.2.11 Platform movement: (See 49 CFR 571.403, S6.2.3, Maximum platform acceleration.)

4.7.2.12 Boarding direction

4.7.2.12.1 The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users.

4.7.2.13 Handrails: (See 49 CFR 571.403, S6.4.9, Handrails)

4.7.2.14 Circuit breaker

4.7.2.14.1 A resettable circuit breaker shall be installed between the power source and lift motor if electrical power is used. It shall be located as close to the power source as possible, but not within the passenger/driver compartment.

4.7.2.15 Excessive pressure: (See 49 CFR 571.403.S6.8, Jacking prevention.)

4.7.2.16 The following information shall be provided with each vehicle equipped with a lift:

4.7.2.16.1 A phone number where information can be obtained about installation, repair, and parts. (Detailed written instructions and a parts list shall be available upon request from the vendor.)

4.7.2.16.2 Detailed instructions regarding use of the lift and readily visible when the lift door is open, including a diagram showing the proper placement and positioning of wheelchair mobility aids on the lift.

4.7.2.17 Training materials

4.7.2.17.1 The lift manufacturer shall make training materials available to ensure the proper use and maintenance of the lift. These may include instructional videos, classroom curriculum, system test results or other related materials.

4.7.2.18 Identification and certification

4.7.2.18.1 Each lift shall be permanently and legibly marked or shall incorporate a non removable label or tag that states it conforms to all applicable requirements of the current NSTSP. In addition and upon request of the original titled purchaser, the lift manufacturer or an authorized representative shall provide a notarized Certificate of Conformance, either original or photocopied, which states that the lift system meets all the applicable requirements of the current NSTSP.

4.8 Regular Service Entrance

4.8.1 On power lift equipped vehicles, steps shall be the full width of the step well, excluding the thickness of doors in the open position.

4.9 Restraining Devices

4.9.1 On power lift equipped vehicles with a GVWR of 10,000 pounds or more, seat frames may be equipped with attachment points to which belt assemblies can be attached for use with Child Safety Restraint Systems (CSRSs) that comply with FMVSS No. 213, Child Restraint Systems. Any belt assembly anchorage shall comply with FMVSS No. 210, Seat Belt Assembly Anchorages.

4.9.2 Alternatively, a child restraint anchorage system that complies with FMVSS No. 225, Child Restraint Anchorage Systems, may be installed.

4.9.3 Seat belt assemblies, if installed, shall conform to FMVSS No. 209, Seat Belt Assemblies.

4.9.4 Child safety restraint systems, which are used to facilitate the transportation of children who in other modes of transportation would be required to use a child, infant, or booster seat, shall conform to FMVSS No. 213.

4.10 Seating Arrangements

4.10.1 Flexibility in seat spacing to accommodate special devices shall be permitted to meet passenger requirements. All seating (forward facing) shall meet the requirements of FMVSS No. 222, School Bus Passenger Seating and Crash Protection.

4.11 Securement and Restraint System for Wheelchair or Mobility Aid and Occupants

4.11.1 For purposes of understanding the various aspects and components of this section, the term securement and tie down and the phrases securement system or tie down system are used exclusively in reference to the devices that anchor the wheelchair to the vehicle. The term restraint and the phrase restraint system are used exclusively in reference to the equipment that is intended to limit the movement of the wheelchair occupant in a crash or sudden maneuver. The term wheelchair tiedown and occupant restraint system (WTORS) is used to refer to the total system that secures the wheelchair and restrains the wheelchair occupant.

4.11.2 WTORS general requirements

4.11.2.1 A wheelchair tie down and occupant restraint system installed in a specially equipped school bus shall be designed, installed and operated for use with forward facing wheel chair seated passengers and shall comply with all applicable requirements of FMVSS No. 222, School Bus Passenger Seating and Crash Protection, and SAE J2249, Wheelchair Tie down and Occupant Restraint Systems for Use in Motor Vehicles.

4.11.2.2 WTORS, including the anchorage track, floor plates, pockets or other anchorages, shall be provided by the same manufacturer, or shall be certified to be compatible by manufacturers of all equipment systems used.

4.11.2.3 Wheelchair securement positions shall be located such that wheelchairs and their occupants do not block access to the lift door.

4.11.2.4 A device for storage of the WTORS shall be provided. When the system is not in use, the storage device shall allow for clean storage of the system, shall keep the system securely contained within the passenger compartment, shall provide reasonable protection from vandalism and shall enable the system to be readily accessed for use.

4.11.2.5 The WTORS, including the storage device, shall meet the flammability standards established in FMVSS No. 302, Flammability of Interior Materials.

4.11.2.6 The following information shall be provided with each vehicle equipped with a securement and restraint system:

4.11.2.6.1 A phone number where information can be obtained about installation, repair and parts. (Detailed written instructions and a parts list shall be available upon request from the vendor.)

4.11.2.6.2 Detailed instructions regarding use, including a diagram showing the proper placement of the wheelchair mobility aids and positioning of securement devices and occupant restraints, including correct belt angles.

4.11.2.7 The WTORS manufacturer shall make training materials available to ensure the proper use and maintenance of the WTORS. These may include instructional videos, classroom curriculum, system test results or other related materials.

4.11.3 Wheelchair Securement Tiedown: (See 49 CFR 571.403.S5.4.1 - S5.4.2.)

4.11.3.1 Each wheelchair position in a specially equipped school bus shall have a minimum clear floor area of 30 inches laterally by 52 inches longitudinally. Additional floor area may be required for some wheelchairs. Consultation between the user and the manufacturer is recommended to ensure that adequate area is provided.

4.11.4 Occupant Restraint System (See 49 CFR 571.403.S5.4.3 - S5.4.4.) If the upper torso belt anchorage is higher than 44 inches measured from the vehicle floor, an adjustment device, as part of the occupant restraint system, shall be supplied.

4.12 Special Light: Doorways in which lifts are installed shall be equipped with a special light that provides a minimum of 2 foot candles of illumination measured on the floor of the bus immediately adjacent to the lift and on the lift during lift operation.

4.13 Special Service Entrance

4.13.1 Power lift equipped bodies shall have a special service entrance to accommodate the power lift. Exception: A special service entrance shall not be required if the lift is designed to operate within the regular service entrance, is capable of stowing such that the regular service entrance is not blocked in any way and a person entering or exiting the bus is not impeded in any way.

4.13.2 The special service entrance and door shall be located on the right side of the bus and shall be designed so as not to obstruct the regular service entrance.

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

4.13.4 A drip molding shall be installed above the special service entrance to effectively divert water from the entrance.

4.13.5 Door posts and headers at the special service entrance shall be reinforced sufficiently to provide support and strength equivalent to the areas of the side of the bus not used for special service entrance.

4.14 Special Service Entrance Door

4.14.1 A single door shall be used for the special service entrance. They shall have rub rails.

4.14.2 There shall be a 57" door height opening.

4.14.3 The door shall be hinged to the forward side of the entrance unless this would obstruct the regular service entrance. If the door is hinged to the rearward side of the doorway, the door shall utilize a safety mechanism which will prevent the door from swinging open should the primary door latch fail.

4.14.4 The door shall have positive fastening devices to hold the doors in the “open” position when the special service entrance is in use.

4.14.5 The door shall be weather sealed.

4.14.6 Door materials, panels and structural components shall have strength equivalent to the conventional service and emergency doors. Color, rub rail extensions, lettering and other exterior features shall match adjacent sections of the body.

4.14.7 The door shall have windows set in a waterproof manner that are visually similar in size and location to adjacent non door windows. Glazing shall be of same type and tinting as standard fixed glass in the side windows.

4.14.8 The door shall be equipped with a device that will actuate an audible or visible signal located in the driver's compartment when the door is not securely closed and the ignition is in "on" position.

4.14.9 A switch shall be installed so that the lift mechanism will not operate when the lift platform door is closed.

4.14.10 The special service entrance door shall be equipped with padding at the top edge of the door opening. The padding shall be at least 3 inches wide and 1 inch thick and shall extend the full width of the door opening.