COLORADO DEPARTMENT OF EDUCATION

Colorado State Board of Education

COLORADO MINIMUM STANDARDS GOVERNING SCHOOL TRANSPORTATION VEHICLES1 CCR 301-25

1.0 Statement of Basis and Purpose

1.1 Colorado law provides for the State Board of Education to adopt and enforce regulations governing the safe operation of School Buses and School Transportation Vehicles used for the transportation of students pursuant to sections 22-51-108 and 42-4-1904, C.R.S.

1.2 The purpose of these rules is to adopt and enforce regulations governing the reasonable and adequate standards of safety for School Buses and School Transportation Vehicles that promote the welfare of the students and afford reasonable protection to the public. The purpose of the amendments is to update the minimum standards to align with recent federal standards and reflect current industry practices.

1.2.1 This does not include informal or intermittent arrangements, such as sharing of actual gasoline expenses or participation in a carpool, and the use of vehicles rented and/or leased that are operated in other states.

1.2.2 Exemption: Vehicles that carry students as part of their operation as a common carrier under the jurisdiction of the United States Department of Transportation or Colorado Public Utilities Commission (PUC) are not included within the definition of a School Transportation Vehicle, including transportation network companies; except that common carriers (other than public transit) that are contracted to provide Route transportation carrying 12 or more students per Route shall comply with sections 6 through 10, and sections 11 through 14 as applicable of these rules without regard to the operator's status as a common carrier.

1.3 Exemptions by Commissioner

1.3.1 The Commissioner, or designee, may provide an exemption to the Rules for the Operation, Maintenance, and Inspection of School Transportation Vehicles to the extent the Commissioner finds an exemption to be appropriate.

2.0 Definitions

2.0.1 Defined Terms. Terms defined in Section 2.0 shall be capitalized throughout these rules.

2.1 "Advanced Driver Assistance System" or ADAS means electronic vehicle technology designed to assist the driver in monitoring vehicle operation or roadway conditions.

2.2 “Annual” means a recurring date-to-date compliance period that expires at the end of the day exactly one calendar year after the date listed on the document.

2.2.1 Exception: “Annual,” when used in reference to Annual Inspections, means valid through the last calendar day of the month that is 12 months from the date of the previous inspection.

2.3 “Autonomous Driving System” or ADS means a combination of hardware (sensors, cameras, lidar, radar, computers) and software (AI, machine learning) that enables a vehicle to operate, perceive its environment, and navigate without human intervention or supervision. It manages all dynamic driving tasks - steering, braking, and accelerating - by creating a 360-degree, real-time map of its surroundings.

2.4 “Board of Cooperative Educational Services” or “BOCES“ means a regional educational service unit designed to provide supporting, instructional, administrative, facility, community, or any other services contracted by participating members pursuant to section 22-5-103(2), C.R.S.

2.5 “Camera Monitoring System” or CMS means a system that uses exterior high-definition cameras and interior displays mounted on the A-pillar to be used in conjunction with traditional side mirrors to enhance visibility and safety.

2.6 “Charter Bus” pursuant to section 40-10.1-301, C.R.S., means a motor vehicle with a minimum seating capacity of 33, excluding the driver, that is hired to transport a person or group of persons traveling from one location to another for a common purpose. A Charter Bus shall not provide regular Route service between locations. This vehicle may only be used for traveling to School-Related Events.

2.7 “Charter School” means a public school that operates pursuant to a charter contract entered into pursuant to the provisions of Article 30.5 of Title 22, C.R.S. As used in this title, unless the context otherwise requires, “Charter School” includes any type of Charter School created pursuant to the provisions of Article 30.5 of Title 22, 22-1-101(2), C.R.S.

2.8 “Charter Service” or “Charter” means the prearranged transportation pursuant to 4 CCR 723-6 of an affiliated group of persons (such as a school, organization, or athletic team) traveling together for a common purpose, where the district obtains a motor coach bus and driver for a specific period of time and directs the pick-up and drop-off locations and times.

2.9 “Colorado Rack and Load Test” means a test designed to verify the structural integrity and crashworthiness of the School Bus design as outlined in Rule 9.3 of these rules. The test simulates a rollover crash by applying a constant load along the full length of the bus body. This ensures that all push-out windows and emergency exits will remain fully functional after an accident.

2.10 “Educational Entity” means a School District, Charter School, Service Provider,

Specialized Day School, or Board of Cooperative Educational Services (BOCES) subject to these rules.

2.11 “Gross Vehicle Weight Rating” or “GVWR“ means the maximum total safe operating weight of a vehicle, assigned by the manufacturer.

2.12 “Kentucky Pole Test” means a test designed to verify that the interior panels above the window will not separate and expose sharp edges in the event of a crash, as outlined in Rule 9.2 of these rules. The test involves a rollover simulation in which the bus strikes a pole-like object, causing the roof to deform into the passenger compartment. Standards require that body panels shall not separate when the roof bends between 8 and 10 inches.

2.13 “15-Passenger Van” means a passenger van, not a Type A-1 or A-2 School Bus or Multifunction School Activity Bus, that has the capacity of transporting more than 12 passengers, excluding the driver, as assigned by the manufacturer.

2.14 “Lease” means temporarily obtaining possession of a motor vehicle by contract from a commercial source for a period exceeding seven consecutive calendar days.

2.15 “Local Board of Education” or LEA means the Board of Education of a School District or the governing board of a BOCES.

2.16 “Motorcoach” means a Coach Bus with an elevated passenger floor and underfloor luggage compartments designed for long-distance passenger transportation. It also may include premium features such as restrooms, reclining seats, power outlets, and televisions.

2.17 “Multifunction School Activity Bus” or “MFSAB“ means a type of School Bus that is required to meet all FMVSS regulations applicable to School Buses, except those requiring the installation of Traffic Control Devices and those pertaining to vehicle color. Pursuant to Rule 7.2 of these rules, Type A-2, B, C, and D Multifunction School Activity Buses shall not be used for transporting students to and from home to school for Route purposes as defined in these rules.

2.17.1 Exception: Per 1 CCR 301-26, 14.1.1, Type A-1 Multifunction School Activity Buses may be used to transport students to and from school, school to school for Route purposes, and School-Related Events.

2.18 “Public School District” or School District means a School District that derives its support, in whole or in part, from moneys raised by a general state, county, or district tax pursuant to section 22-1-101, C.R.S.

2.19 “Regenerative Braking System” means a mechanism found on most hybrid and full electric vehicles. It captures the kinetic energy from braking and converts it into the

electrical power that charges the vehicle's high-voltage battery. Regenerative braking also slows the vehicle, thereby reducing the load on the traditional service brakes.

2.20 “Rent” means temporarily obtaining possession of a motor vehicle by contract from a commercial source for a period not exceeding seven consecutive calendar days.

2.21 “Route” means a documented and authorized itinerary approved by an Educational Entity for the transportation of students. A Route consists of travel between identified locations including student stops, school campuses, or other approved facilities. All Routes must be operated by a driver and vehicle meeting all applicable state and federal safety standards. This definition includes regular daily schedules, shuttle services, and specialized transport, regardless of whether the itinerary follows a fixed timetable.

2.22 “Society of Automotive Engineers, Inc.” (SAE) refers to a global professional association and standards-setting organization for engineering professionals in the automotive, aerospace, and commercial vehicle industries.

2.23 “School Bus” means a passenger vehicle that is designed and used to carry more than 10 passengers in addition to the driver, and which the Secretary of Transportation determines is likely to be significantly used for the purpose of transporting pre-primary, primary, or secondary school students to or from school or an event related to school. School buses are specifically designed for maximum safety.

2.24 “School Bus Eight-Way Alternating Flashing Warning Signal Lamps” means the amber and red lamps mounted at the same horizontal level, intended to identify the vehicle as a School Bus and to inform other users of the highway that such a vehicle is stopped or about to stop on the roadway to take on or discharge school children.

2.25 “School Transportation Vehicle” means every motor vehicle that is owned, leased, or authorized by an Educational Entity, and is operated for the transportation of students for Route or School-Related Event purposes within the State of Colorado. This definition excludes vehicles operated as common carriers or informal carpooling.

2.26 “Secondary Braking System” means a backup mechanism designed to slow or stop the vehicle if the primary service brakes fail. This includes retarders, engine brakes, turbo brakes, driveline brakes, etc.

2.27 “Service Provider” means a company or individual that exclusively transports students from home to school, school to school, and School-Related Events, that is hired by a school district or charter school.

2.28 “Small-Capacity Vehicle” means a motor vehicle, which does not meet the requirements of Type A, B, C, or D School Buses or Multifunction School Activity Buses, designed for general purpose use. These vehicles with a manufacturer-assigned capacity of 11 or fewer passengers (excluding the driver) may be used to carry students to and from

school, from school to school, or to school-related events, and shall meet or exceed all applicable rules and regulations.

2.29 “Specially Equipped Bus” means any bus that is designed, equipped, and/or modified to accommodate students with special transportation needs.

2.30 “Traffic Control Device” means any sign, signal, marking, or device placed on or adjacent to a roadway for the purpose of regulating, warning, or guiding traffic.

2.31 “Transportation Network Company” or TNC means a transportation provided by a company or individual as part of their operation as a common carrier, or a Transportation Network Company operating pursuant to section 40-10.1-602(3), C.R.S., under the jurisdiction of the US Department of Transportation or the Public Utilities Commission.

2.32 “Type A School Bus” means a conversion or body constructed utilizing a cutaway front-section vehicle with a left-side driver's door and a Gross Vehicle Weight Rating(GVWR) of 21,500 pounds or less. This definition includes two classifications:

2.32.1 Type A-1 Buses have a Gross Vehicle Weight Rating (GVWR) of 14,500 pounds or less;

2.32.2 Type A-2 Buses have a Gross Vehicle Weight Rating (GVWR) greater than 14,500 pounds and less than or equal to 21,500 pounds.

(A) Type A-2 Buses require a CDL to operate if the assigned manufacturer capacity is greater than 15, excluding the driver.

2.33 “Type B School Bus” means a body constructed and installed upon a stripped chassis. Part of the engine is beneath and/or behind the windshield and beside the driver's seat. The service door is behind the front wheels. This vehicle has a GVWR between 10,000 and 20,000 pounds.

2.34 “Type C School Bus” means a body constructed utilizing a chassis with a hood and fender assembly. This includes the cutaway truck chassis, including the cab, with or without a left-side driver door, and with a GVWR greater than 21,500 pounds. The service door is behind the front wheels.

2.35 “Type D School Bus” means a body constructed utilizing a stripped chassis; the engine may be behind the windshield and beside the driver's seat, or it may be at the rear of the bus, behind the rear wheels. The service door is located ahead of the front wheels and may have a higher Vehicle Seating Capacity Rating.

2.36 “Vehicle Seating Capacity Rating” means the number of passengers (excluding the driver) as assigned by the original vehicle manufacturer and as indicated on the certificate plate or decal, and cannot be changed by the purchaser.

2.37 “Wheelchair Tie-Down Occupant Restraint System” or WTORS means a system or device for securing wheelchairs and a system of belts for restraining occupants seated in the secured wheelchairs. This can include both strap-type and docking-type securement systems.

3.0 Vehicle Standards and Age Limitations

3.1 Except as indicated in these rules, School Transportation Vehicles manufactured for the purpose of transporting Colorado students shall meet or exceed the Minimum Standards for the year listed on the certification plate or decal.

3.2 Educational Entities are discouraged from operating School Buses and Multifunction School Activity Buses, as defined in these rules, that were manufactured, per the date listed on the certification plate or decal, which are over 25 years of age.

3.2.1 Educational Entities shall not sell or lease any School Bus or Multifunction School Activity Bus over 20 years of age, per the date listed on the certification plate or decal, to any other Educational Entity for the use of transporting Colorado students for any purpose. Likewise, an Educational Entity shall not purchase any School Bus or Multifunction School Activity Bus that is more than 20 years old.

3.3 Educational Entities are discouraged from operating school transportation Small-Capacity Vehicles, as defined in these rules, that were manufactured, per the date listed on the certification plate or decal, which are over 15 years of age.

3.3.1 Educational Entities shall not sell or lease any Small-Capacity Vehicle over 15 years of age, per the date listed on the certification plate or decal, to any other Educational Entity for the use of transporting Colorado students for any purpose. Likewise, an Educational Entity shall not purchase any Small-Capacity Vehicle that is more than 15 years old.

4.0 Certification

4.1 School Bus manufacturers shall provide Annual certification to the Colorado Department of Education that their products meet or exceed the regulations in Colorado Minimum Standards and all applicable Federal Motor Vehicle Safety Standards (FMVSS) in effect at the time of manufacture.

4.2 All School Bus bodies that meet applicable FMVSS regulations and comply with these Minimum Standards shall be certified by the School Bus manufacturer by attaching a certification plate or decal.

4.3 New and used School Bus dealers and Service Providers shall register with the Colorado Department of Education, School Transportation Unit, certifying that only School Buses and School Transportation Vehicles meeting or exceeding Colorado

Minimum Standards will be sold, leased, rented, or used in contracted services for Route purposes and for School-Related Event Transportation to Educational Entities in Colorado. There shall be no fee to register.

(A) Service providers shall renew their registration every three years.

5.0 Responsibilities of Stakeholders

5.0.1 Dealers, distributors, and manufacturers of School Buses and School Transportation Vehicles each have a responsibility to comply with these Minimum Standards on or after the effective date of these rules.

5.1 Dealers

5.1.1 Dealers that supply School Buses and School Transportation Vehicles for use in the State of Colorado that do not meet the specifications of the rules shall be notified of non-compliance in writing, and a written notice will be sent to all Educational Entities within the State of Colorado advising that the equipment supplied by such dealer was not in compliance with the Minimum Standards.

(A) If a dealer has been notified of non-compliance in accordance with Rule 5.1.1 of these rules and replaces or modifies the equipment to meet the Minimum Standards in effect for that vehicle, a written notification of compliance will be issued from the Colorado Department of Education (CDE) within 30 days after evidence of compliance has been received.

5.2 Manufacturers

5.2.1 Manufacturers that supply School Buses and School Transportation Vehicles for use in the State of Colorado that do not meet the specifications of the rules shall be notified of non-compliance in writing, and a written notice will be sent to all Educational Entities within the State of Colorado advising that the equipment supplied by such manufacturer was not in compliance with the Minimum Standards.

(A) If a manufacturer has been notified of non-compliance in accordance with Rule 5.2.1 of these rules and replaces or modifies the equipment to meet the Minimum Standards in effect for that vehicle, a written notification of compliance will be issued from the Colorado Department of Education (CDE) within 30 days after evidence of compliance has been received.

5.3 Educational Entities

5.3.1 49 U.S.C. 30112(a)(2) prohibits the purchase or lease of a new 15-Passenger Van if it will be significantly used by, or on behalf of, the school or school system to transport preprimary, primary, or secondary school students to or from school or an event related to school, unless the 15-Passenger Van complies with the

Federal Motor Vehicle Safety Standards (FMVSS) prescribed for School Buses and Multifunction School Activity Buses. Each state sets its own regulations governing the use of any vehicle transporting students.

(A) Under 49 U.S.C. 30125(a)(1)(D), et seq., a passenger motor vehicle designed to carry a driver and more than 10 passengers shall be classified as a School Bus if, at the time of sale, it is intended for use as a School Bus, or if the Secretary of Transportation determines that such vehicle is likely to be significantly used for transporting preprimary, primary, or secondary students to or from school or school-related events.

5.3.2 It shall be the responsibility of the Educational Entity to ensure that all School Buses purchased, leased, or under contract with them comply with the specifications outlined in the Minimum Standards in effect for such vehicles, as indicated by the year listed on the certification plate or decal. This verification shall be obtained at the time of delivery, in addition to the Statement of Compliance included in the purchase bid, contract, or Lease agreement.

5.3.3 Upon the sale of a School Transportation Vehicle, the registered owner (Educational Entity) shall ensure the complete removal of all organizational names and identifying insignia. No vehicle shall be delivered to a purchaser with the previous owner's name visible.

5.3.4 Each School Transportation Vehicle shall be maintained in a condition that ensures continuous compliance with all Federal Motor Vehicle Safety Standards (FMVSS) applicable to the vehicle at its time of manufacture. The date of manufacture, as indicated on the vehicle’s permanent certification plate or label, shall serve as the basis for determining the specific standards to be met.

6.0 Bus Delivery Requirements

6.1 The bus manufacturer shall provide the following materials and information for direct delivery to the customer upon request:

6.1.1 Line set tickets for each individual unit, including chassis and body,

6.1.2 Copy of the pre-delivery service performed and verified by a checkout form for each individual unit,

6.1.3 Warranty book and Statement of Warranty for each individual unit,

6.1.4 Service manual (hard copy or electronic copy) for each individual unit or identical units for all major components of the bus (e.g., body, chassis, transmission, etc.), and

6.1.5 Parts manual (hard copy or electronic copy) for each individual unit or identical units for all major components of the bus (e.g., body, chassis, transmission, etc.).

7.0 Prohibited Use

7.1 A board resolution is not required for transporting students on common carriers (public transportation carriers).

7.2 Type A-2, B, C, and D Multifunction School Activity Buses, Charter Buses, and Motorcoaches shall not be used for transporting students to and from school for Route purposes as defined in these rules.

7.3 Effective January 1, 2025, Educational Entities are prohibited from transporting students for any reason in vehicles with a manufacturer-assigned seating capacity of more than 11 passengers, excluding the driver, unless the vehicle meets one of the following criteria:

7.3.1 It meets the definition of a Type A School Bus;

7.3.2 It meets the definition of a Type A Multifunction School Activity Bus (MFSAB);

7.3.3 It complies with the Colorado Rack and Load Test, Kentucky Pole Test, and FMVSS School Bus Safety Standards.

7.4 Charter Buses, as defined herein, are exempt from the requirements of Rule 7.3 provided that:

7.4.1 The Charter Bus is Chartered specifically for an authorized School-Related Event;

7.4.2 The School District or Charter School has formally authorized the use of a Charter Bus, and the governing board has adopted a supporting resolution for such use.

(A) This resolution shall state that the School District or Charter School considered safety standards to protect student welfare, incorporating recommendations from the National Highway Traffic Safety Administration (NHTSA).

7.4.3 All buses Chartered by the School District or Charter School shall be configured exclusively with forward-facing passenger seating, pursuant to FMVSS 208 - Occupant Crash Protection. The Charter Bus shall be free of any rigid interior obstructions and non-standard fixtures that could compromise passenger safety or clearance.

7.5 Legacy Coach Bus Provisions:

7.5.1 A Coach Bus acquired by an Educational Entity before January 1, 2025, may remain in service for School-Related Events provided the vehicle complies with the age limitations in Rule 3.2 and passes all required Annual Inspections.

7.6 Per the effective date of these rules, School Transportation Vehicles, as defined in these rules, owned or leased by the Educational Entities that are used for student transportation shall not have the windows obstructed in any way by advertising, decorations, or vehicle wraps.

7.6.1 Exception: Tint applied by the vehicle manufacturer to industry standards.

7.6.2 Exception: Route identification is permitted per Rule 10.24.5 of these rules.

7.7 Any type of passenger vehicle with a fiberglass roof shall not be permitted to transport students unless it meets Colorado Rack and Load testing requirements per Rule 9.3.

7.8 No student transportation vehicle may have after-market equipment on any portion of the exterior of the vehicle that could create a potential hazard for a student.

7.8.1 Exception: Roof-mounted luggage racks are permitted on Small-Capacity Vehicles when installed by a qualified mechanic.

7.9 Other than factory-installed equipment, no School Transportation Vehicle shall possess any feature - including spaces, projections, or cutouts - that permit a hand-hold or foot-hold. The vehicle body shall be maintained to diminish the risk of students being injured, dragged, or falling from a moving vehicle.

7.10 Any automated driving technology used on a School Transportation Vehicle shall not exceed Level 2 automation as defined in SAE J3016.

8.0 Construction

8.1 Floor Construction

8.1.1 Shall be at least 14-gauge, mill-applied zinc-coated steel sheet, and shall be on one plane. There shall be a main-floor cross-member of at least 10-gauge steel or equivalent, extending the full width of the floor plate and permanently attached. There shall be a minimum of two intermediate floor cross members of at least 16-gauge steel, equally spaced between the main floor cross members and permanently attached.

8.1.2 The subfloor shall be either 5-ply nominal 5/8 inches thick plywood or a material of equal or greater strength and insulation R-value, and it will equal or exceed properties of exterior-type softwood plywood C-D grade, as specified in National Bureau of Standards (NBS) Product Standard 1-83.

8.1.3 Type A-1 buses may use other metal or material with strength and corrosion resistance at least equivalent to all-steel construction as certified by the bus body manufacturer.

(A) The driver's area and toe board area in all Type A buses may be the manufacturer's standard flooring and floor covering.

(B) Shall have nominal 1/2-inch-thick plywood or equivalent material equal to or exceeding the properties listed above.

8.2 Ceiling Panels

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

8.3 All metal surfaces that will be painted shall be chemically cleaned, etched, zinc phosphate coated, and zinc-chromate or epoxy primed or conditioned by an equivalent process. Particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges, punched or drilled hole areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subject to abrasion during vehicle operation.

8.4 All body components shall be designed and constructed to avoid the entrapment of moisture and dust.

8.5 All openings between the chassis and passenger-carrying compartment made for any reason shall be sealed.

9.0 Testing

9.1 Responsibility

9.1.1 It shall be the responsibility of the School Bus manufacturer to maintain accurate records of all tests mandated by Section 9, Testing. These results shall specify which testing methods were used and be reported to the Colorado Department of Education (CDE) to verify compliance with state construction standards.

9.2 Kentucky Pole Test

9.2.1 On Type B, C, and D buses, the bus body shall meet the test standards of the Kentucky Pole Test as outlined in Rule 9.2.3 of these rules.

9.2.2 The Kentucky Pole Test shall be physically performed on a complete bus body or on a representative section composed of at least two complete frames (body posts plus roof bows) and floor.

9.2.3 In addition to complying with FMVSS 220 - School Bus Rollover Protection test procedures, the body manufacturer shall record and report the downward vertical movement of the force at 0, 25, 50, 75, and 100% of the maximum force (both loading and unloading). The expected force-deflection curve is illustrated schematically in Figure 1a. Low-load nonlinearities may indicate joint confirmation; high-load nonlinearities may indicate yielding structural members.

(A) A second load cycle shall be performed following the procedure given in the first paragraph. The expected force-deflection curve is illustrated schematically in Figure 1b. Any hysteresis following the initial shakedown will be revealed by this second cycle.

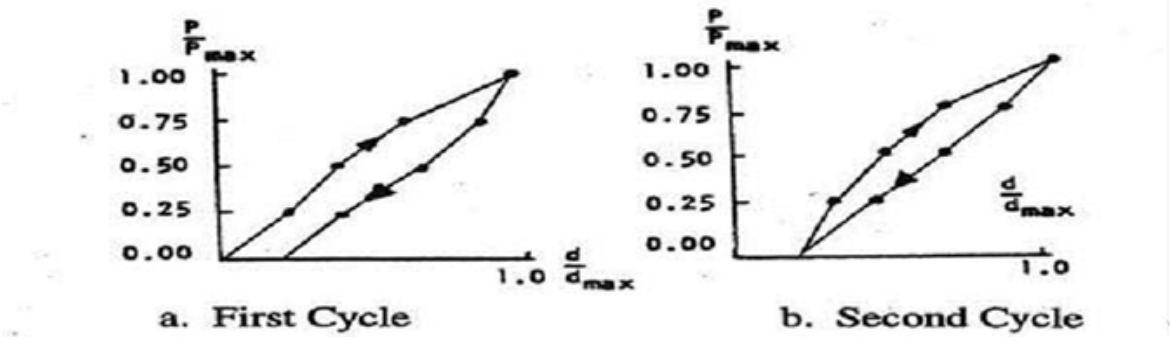


Figure 1 - Static Load Test Load-Deflection Curves

9.3 Colorado Rack and Load Test

9.3.1 A diagonal (racking) load test shall be performed on Type A-1, A-2, B, C, and D School Buses to ensure adequate shear stiffness and strength of the bus body. Details of the tests are provided below. A two-cycle loading sequence shall be conducted following the procedure described in Rule 9.2.3(A) of these rules.

9.3.2 Requirements:

(A) When a force equal to 1 1/2 times the GVW is applied to the edge of the roof of the vehicle's body structure through a force application plate as specified in (b), Test Procedures:

(1) The diagonal movement of the force at any point on the application plate shall not exceed 5 1/8 inches.

(2) Each emergency exit of the vehicle provided in accordance with FMVSS 217 - Bus Emergency Exits and Window Retention and Release, shall be capable of operation as specified in that standard during the full application of the force and after the release of the force.

9.3.3 Test Procedures:

(A) Each vehicle shall be capable of meeting the requirements of (1) and (2) when tested in accordance with the procedures set forth below.

(1) The Colorado Rack and Load Test shall be physically performed on a complete bus body or on a representative section composed of at least two complete frames (body posts plus roof bows) and floor.

(2) The vehicle shall be supported on a rigid surface along the lower edge of the frame or along the body sills in the absence of a frame.

(3) The load shall be applied through a force application plate that is flat and rigid. The plate dimensions shall be selected to ensure the plate edges do not contact the vehicle skin during testing. The specified width is 18 inches. The total length shall be calculated as the length of the vehicle's roof, measured along the longitudinal centerline, minus 20 inches.

(4) Place the force application plate in contact with the edge of the vehicle roof. Orient the plate so that its flat, rigid surface is perpendicular to a diagonal line connecting the most distant points on an interior cross-section of the vehicle. The rear edge of the plate shall be positioned approximately 20 inches from the rear edge of the vehicle roof. A temporary stand may be used to support the plate until a force is applied.

(5) Apply an evenly distributed force in a diagonally downward direction through the force application plate at a rate not more than 0.5 inches per second, until a force of 500 pounds has been applied.

(6) Apply additional force in a diagonally downward direction through the force application plate at a rate of not more than 0.5 inches per second until the force specified in Figure 2(a) has been applied and maintains this application of force.

(7) Measure the diagonal movement of any point on the force application plate that occurred during the application of force in accordance with Rule 9.3.3(A)(5) and upon the emergency exits as specified in Rule 9.3.2(A)(2) of these rules.

(8) Release all diagonal force applied through the force application plate and operate the emergency exits as specified in Rule 9.3.2(A)(2) of these rules.

9.3.4 Test Conditions:

(A) The following conditions apply to the requirements specified in Rule 9.3.3.

(1) Temperature: the ambient temperature is any level between 32° Fahrenheit and 90°Fahrenheit.

(2) Windows and Doors: Vehicle windows, doors, and emergency exits are in the fully closed position and latched but not locked.

9.3.5 An alternative method of physical testing for the racking load test shall be as follows:

(A) The racking load shall be applied along a line connecting the most distant points on a transverse cross-section of the bus interior. It produces a shear distortion of the cross-section as shown in Figure 2.

(B) When a complete bus body is rack-loaded, the total load DVW shall be distributed uniformly along the bus body. One method is to mount a series of hydraulic jacks along the length of the bus interior. Seats may be removed to facilitate jack mounting. The rack load will be considered uniformly distributed when the variation in the hydraulic jack readings is less than 10%. A maximum load for DVW shall be the sum of all jack readings.

9.3.6 A representative method of loading, which employs a hydraulic jack to load a two-frame test assembly, is illustrated in Figure 2.

(A) The test shall be performed on a complete bus body or on a representative section composed of at least two complete frames (body posts plus roof bows) and floor. Standard seats may be installed in the test section in a manner identical to that of the full bus body. Fabrication procedures for the test assembly shall be identical to normal bus body production.

(B) A two-cycle loading sequence shall be conducted, with intermediate and final load and deflection readings recorded according to the procedure described.

(C) The maximum deflection in line with the jack (A, maximum) shall not exceed 4 inches.

(D) The maximum jack load for the two-frame assembly is determined by the following formulas:

(1) Primary Equations

(a) Dynamic Vehicle Weight

$$DVW = DF\ X\ GVW$$

(b) Load Per Frame

$$P = \frac{DVW}{N}$$

(c) Maximum Jack Load (for a two-frame assembly)

$$J = 2P$$

(2) Variable Definitions

(a) *GVW* = Gross Vehicle Weight (lbf)

(b) *DF* = Dynamic Factor (must be at least 1.5)

(c) *DVW* = Dynamic Vehicle Weight (lbf)

(d) *N* = Total number of bus body frames

(e) *P* = Load per individual frame (lbf)

(f) *J* = Maximum jack load for a two-frame test assembly (lbf)

(3) Example Calculation

(a) Thus, for a DF = 1.5, a GVW = 22,000 pounds-force (lbf), and N = 11, the dynamic vehicle weight is DVW = 33,000 lbf, the load/frame is P=3000 lbf, and the maximum jack load is j = 6000 lbf.

(b) Calculate Dynamic Vehicle Weight (*DVW*):

$$DVW = 1.5\ x\ 22,000 = 33{,}000\ lbf$$

(c) Calculate Load Per Frame (*P*):

$$P = \frac{33{,}000}{11} = 3{,}000\,\frac{lbf}{frame}$$

(d) Calculate Maximum Jack Load (*J*):

$$J = 2\ x\ 3{,}000 = 6{,}000\ lbf$$

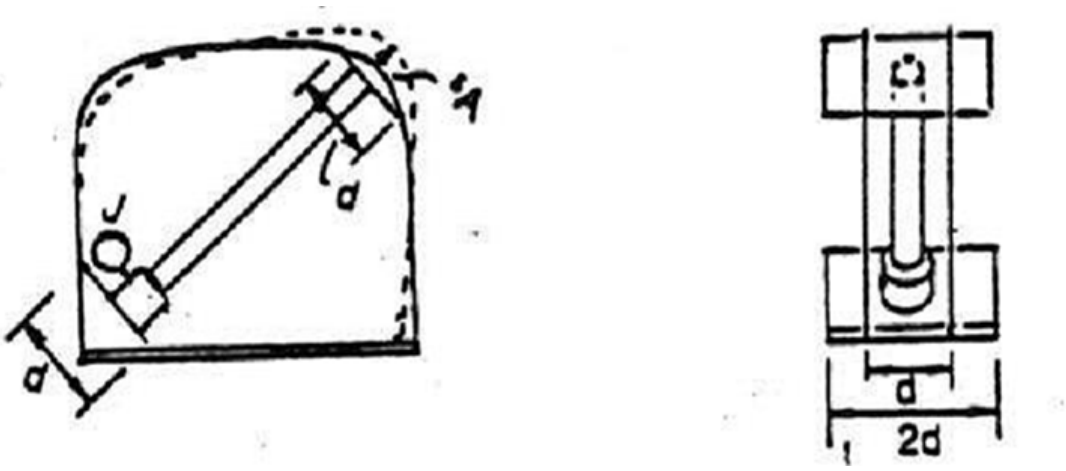


Figure 2 - Transverse Cross-Section Side View
Arrangement of the Hydraulic Jack for Rack-Loading of Two-Frame Assembly

10.0 Bus Body and Chassis

10.1 Aisle

10.1.1 The minimum aisle clearance between seats and for all emergency doors shall be 12 inches at seat level.

10.1.2 The aisle shall be unobstructed at all times by any barrier, seat, wheelchair, or tie-down, except when a flip seat is installed and occupied. The track of a track seating system is exempt from this requirement. A flip seat in the unoccupied (up) position shall not obstruct the 12-inch minimum aisle to any side emergency exit door.

10.1.3 In forward (front engine) Type D buses, the aisle passage area shall not be less than 12 inches in width, measured from floor level up, between the engine cover and any other object. Cool-down fastening devices used on the engine cover shall be designed to prevent snagging or catching on clothes or bags.

10.2 Axles

10.2.1 The rear axle shall be single-speed.

10.2.2 The front and rear axles 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.

10.3 Back-Up Camera (optional)

10.3.1 A back-up camera may be installed to view the area of restricted visibility to the rear of the bus. If installed:

(A) Cannot interfere with reflective tape or identification of the bus.

(B) The back-up camera shall only activate when the bus is in reverse.

(C) The monitor to view the back-up camera video:

(1) May be integrated into the interior rearview mirror, or

(2) May be integrated as part of the dashboard.

10.4 Back-up Warning Alarm

10.4.1 An automatic audible alarm may be installed behind the rear axle. If installed:

(A) The alarm shall comply with the published SAE J994, providing a set volume of a minimum of 112 dBA, or

(B) The alarm 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.

10.5 Brakes

10.5.1 Type C and D buses shall be equipped with full compressed air brake systems. Both air drum brake and air disc brake applications are acceptable.

10.5.2 The anti-lock brake system (ABS), provided in accordance with FMVSS 105 - Hydraulic and Electric Brake Systems or FMVSS 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 anti-lock braking performance for each wheel equipped with sensors (Four Channel System).

10.5.3 The chassis brake system shall conform to the provisions of FMVSS 105 - Hydraulic and Electric Brake Systems, FMVSS 106 - Brake Hoses, and FMVSS 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.

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

10.5.5 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.

10.5.6 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 mounted on the instrument panel and within reach of a seated 5th-percentile female driver. Alternatively, the parking brake may be engaged by placing the automatic transmission shift control mechanism in the “park” position.

10.5.7 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.

10.5.8 Air Brakes:

(A) Compressors: On buses using full compressed air brakes for service, emergency, and parking brakes, the compressor shall be a standard production model, but with a minimum 12 cubic feet per minute displacement.

(B) Moisture ejection valve: An automatic, heated, moisture ejection valve or air-drying system shall be properly installed. This is designed to automatically eject moisture, sludge, and/or foreign matter while maintaining clean, dry air lines.

(C) For air brake systems, an air pressure gauge shall be provided on the instrument panel and shall comply with CDL pre-trip inspection requirements.

(D) 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 121 - Air Brake Systems.

10.5.9 Hydraulic Brakes:

(A) Type A buses using hydraulic-assist brakes shall meet the requirements of FMVSS 105 - Hydraulic and Electric Brake Systems.

10.6 Bumpers

10.6.1 Front bumper shall:

(A) The front bumper on buses of Type A-2, 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 8Deleted" inches in height. It shall extend beyond the forward-most part of the body, grille, hood, and fenders, and shall extend to the outer edges of the fenders at the bumper's top line. The front bumper shall be of sufficient strength to permit being pushed by another vehicle on a smooth surface with a five-degree (8.7%) grade, without permanent distortion. The contact point on the front bumper is intended to be between the frame rails, with the widest possible contact area. If the front bumper is used for lifting, the contact points shall be located under the bumper's 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.

(1) Type A-1 Buses may be equipped with an OEM-supplied front bumper.

(B) The front bumper, except breakaway bumper ends, shall be of sufficient strength to permit pushing a vehicle of equal gross vehicle weight, without permanent distortion to the bumper, chassis, or body.

(C) 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.

10.6.2 Rear bumper shall:

(A) Shall be a minimum of 9 1/2 inches in height on Types A-2, B, C, and D buses.

(1) The bumper on Type A-1 Buses shall be a minimum of 8 inches in height.

(2) 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.

(B) The bumper shall wrap around the back corners of the bus. It shall extend forward at least 12 inches, measured from the rearmost 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.

(C) 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. The bumper shall be maintained to reduce the risk of students being injured, dragged, or falling from a moving vehicle.

(D) The bumper shall extend at least one inch beyond the rearmost part of the body surface, measured at the floor line.

(E) Shall not allow spaces, projections, or cutouts that will permit a hand-hold or foot-hold.

(F) Have the front ends enclosed by end caps or other protective metal or have the ends rounded or tucked in, and shall be free from sharp edges or projections likely to cause injury or snagging.

(G) Have a gasket, rubber, or equivalent installed to seal the gap between the top of the rear bumper and the body metal.

(H) Be of sufficient strength to permit being pushed by another vehicle of similar size.

(I) Be of sufficient strength to ensure that the rear of the bus may be lifted by means of a bumper-type jack without permanent deformation of the bumper.

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

10.6.3 Bumper stickers and/or signage are considered advertising. Consistent with Rules 7.6 and 10.24.9, advertising shall have prior written CDE approval.

(A) One bumper sticker, no larger than 3.75 inches by 15 inches, may be placed on the rear bumper of School Transportation Vehicles.

(B) An American flag sticker, no larger than 7 inches by 11 inches, may be placed on School Transportation Vehicles, consistent with the limitations outlined in Rule 10.6.3.

(C) Bumper stickers and/or signage shall not be located in the rear windows of the School Transportation Vehicle.

(D) Bumper stickers and/or signage that do not comply with the above exemptions shall be removed from the vehicle.

10.7 Color

10.7.1 All exterior metal shall be painted National School Bus Glossy Yellow (NSBY) except for:

(A) Lettering and numbering shall be black, white, or yellow for the bumper area.

(B) Bumpers and frames shall be black.

(1) Exception: Bumpers may be colored blue or green to reflect the type of fuel being used in the vehicle.

(C) Rub rails shall be black or yellow.

(1) Exception: Rub rails may be colored blue or green on an electric vehicle (EV) or to reflect the type of fuel being used in the vehicle.

(D) The background area for alternating flashing warning lights shall be black.

(E) The roof of the bus may be painted white, not to extend below the drip rails on the sides of the body.

(F) Student window frames, posts, and service door frames may be black.

(G) The hood of the bus may be painted matte black.

(H) Wheels may be silver/chrome, gray, white, yellow, or black.

10.7.2 Multifunction School Activity Buses (MFSABs) shall be exempt from these requirements, per Rule 12.1 of these rules.

10.8 Cooling System

10.8.1 A permanent ethylene-glycol base or environmentally safe equivalent antifreeze shall be provided to protect the cooling system to -30° Fahrenheit when tested at normal engine temperature.

10.8.2 The cooling system shall be equipped with a visual fluid level indicator.

10.9 Crossing Control Arm (optional)

10.9.1 School buses may be equipped with a crossing control arm mounted on the right side of the front bumper. If equipped:

(A) When opened, this arm shall extend in a line parallel to the body side and align with the right front wheel.

(B) There shall be no sharp edges or projections that could cause injury or be a hazard to the students.

(C) The end of the arm shall be rounded.

(D) The crossing control arm shall extend simultaneously with the stop signal arm(s), activated by the School Bus Eight-Way Alternating Flashing Warning System.

10.10 Defrosters

10.10.1 A defroster system shall be installed of sufficient capacity to keep the windshield area, the left front side window to the rear of the driver's vision, and the service door glass area free of condensation or ice.

10.10.2 The defrosting system shall conform to the requirements of SAE J381.

10.10.3 A minimum of one and a maximum of three adjustable 6-inch auxiliary fans shall be installed to complement the manufacturer's defroster system. Such fans shall be controlled individually by two-speed switches located on the control panel. The fan blade shall be covered with the protective cage.

(A) The fans shall be located so as not to interfere with the driver's horizontal line of sight.

10.11 Doors

10.11.1 The service door shall be power or manually-operated, under the control of the driver, and so designed to afford easy release and prevent accidental opening. When the manual lever is used, no parts shall come together to shear or crush fingers.

(A) The system shall be designed to prevent the door(s) from being blown open by the aerodynamic forces created by the forward motion of the bus and/or shall incorporate a safety mechanism to provide secondary protection should the primary latching mechanism fail.

10.11.2 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% grade both uphill and downhill. Power door controls shall be located within easy access of the driver.

10.11.3 The service door shall be located on the right side of the bus opposite the driver and within the driver's direct view.

10.11.4 Power-operated doors shall be equipped with a separate manual emergency release, readily accessible in the door area, either above the service door, to the side of the service door, or on the dash, so that the door may be opened in the event of an emergency. The release shall be plainly labeled with instructions for use.

10.11.5 There shall be a head bumper pad installed on the inside at the top of the entrance door. The pad shall be approximately 3 inches in height, at least 1 inch thick, and extend across the entire top of the service door opening.

10.11.6 All entrance door glass shall be approved safety glass. The bottom of each lower glass panel shall not be more than 10 inches from the top surface of the bottom step. The top of each upper glass panel shall be no more than 3 inches below the interior door control cover or header pad when viewed from the interior of the bus.

(A) All glass in any entrance door shall meet FMVSS 205 - Glazing Materials and shall be completely weather-sealed per manufacturer's specifications.

10.11.7 Vertical closing edges on any service door shall be equipped with flexible material.

10.12 Drive Shaft

10.12.1 Each drive shaft or section thereof shall be equipped with adequate metal guard(s) to prevent whipping through the floor or dropping to the ground if broken.

10.13 Electrical System

10.13.1 Battery (Low Voltage):

(A) On Type B, C, and D buses, a drawer-type pull-out tray shall be provided to facilitate the servicing or removal of batteries not used for the motive propulsion of the vehicle. The battery compartment and tray assembly shall meet the following requirements:

(1) Batteries shall be enclosed in a vented compartment equipped with drain ports.

(2) A hold-down carrier shall be mounted in a manner that ensures filler ports remain unobstructed.

(3) A latching device shall be installed to prevent accidental opening of the compartment.

(4) The battery tray shall be equipped with a safety stop or device to prevent the tray from sliding completely out of the housing during service.

(5) Undercoating shall be applied to the exterior of the battery box to prevent corrosion.

(B) The low-voltage storage batteries shall meet the following minimum performance standards:

(1) Batteries shall have a cold cranking ampere (CCA) rating equal to the cranking current required for 30 seconds at 0° Fahrenheit.

(2) Batteries shall have a minimum reserve Capacity Rating of 120 minutes at 25 amps.

(3) Higher capacities may be required based on optional equipment installed or specific local environmental conditions.

10.13.2 EV Drive System Batteries (High Voltage):

(A) EV High Voltage Batteries shall be located entirely outside of, and remain inaccessible from, the interior passenger compartment of the School Bus.

(B) Energy storage systems for the EV High Voltage Drive System shall be protected from crash impacts and encased in a non-conductive, acid-resistant compartment.

(1) The compartment shall be well-ventilated to preclude the accumulation of hydrogen gas.

(2) Energy storage units shall be positioned and configured to ensure ease of maintenance and service access.

(C) EV High Voltage Batteries shall be equipped with a system for automatic electrical isolation in the event of a vehicle crash.

(D) Buses utilizing a high voltage propulsion system (exceeding 48 nominal volts) shall comply with FMVSS 305 - Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection, with the following specific provisions:

(1) The propulsion power source (e.g., batteries, fuel cells) shall be located outside the passenger compartment.

(2) The propulsion power source enclosure shall be constructed in accordance with the manufacturer’s specifications and safety recommendations.

(3) For buses with a Gross Vehicle Weight Rating (GVWR) exceeding 10,000 lbs., the following modifications to FMVSS 305 - Electric Powered Vehicles apply:

(a) Vehicles are permitted to exceed the 5.0-liter electrolyte spillage limit due to the increased volume of the propulsion power source.

(b) Requirements for the static rotation of the vehicle on its longitudinal axis during post-test evaluations are waived.

10.13.3 Alternator (For Internal Combustion Engines):

(A) Buses equipped with an electrically powered wheelchair lift and/or air conditioning shall be equipped with the highest rated alternator with sufficient capacity available from the chassis OEM.

(B) Requirements for the static rotation of the vehicle on its longitudinal axis during post-test evaluations are waived.

(C) A direct/gear-drive alternator is permissible in lieu of a belt-driven alternator.

10.13.4 Wiring:

(A) 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.

(B) 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, including windshield wipers and lighting systems.

10.14 Emergency Equipment

10.14.1 All School Transportation Vehicles, except for Small-Capacity Vehicles, shall be equipped with at least one pressurized, 5-pound, dry-chemical fire extinguisher, with a total rating of not less than 2A10BC. The operating mechanism shall be sealed with a type of seal that will not interfere with the use of the fire extinguisher.

(A) The fire extinguisher shall be securely mounted in an extinguisher bracket (automatic type) and located in full view of and readily accessible to the

driver within the cab, or in a location plainly indicated by appropriate signage. A pressure gauge shall be mounted on the extinguisher to be easily read without removing the extinguisher from its mounted position.

(B) Fire extinguishers shall be inspected annually for charging and certification to standards by a certified fire extinguisher technician.

10.14.2 First Aid Kit:

(A) All School Transportation Vehicles shall carry one 24-Unit First Aid Kit, which shall be securely mounted in full view of the driver or with the location plainly indicated by appropriate signage. Additional kits may be installed. All first aid kits shall be mounted for easy removal.

(1) The kit shall be sealed, moisture- and dustproof, and be of sufficient capacity to store the required items.

(2) The seal verifies the integrity of the contents without opening the kit. The seal shall be designed to allow easy access to the kit's contents. If zip ties are used to seal the kit, they shall be breakaway.

(3) All first aid kit components shall be inspected annually by the Educational Entity. Any items found to be expired, damaged, or previously opened shall be replaced immediately to ensure kit integrity.

(B) The required contents of the 24-Unit First Aid Kit are listed in Table 1.

Contents of the 24-Unit First Aid Kit:	
Item	**Unit(s)**
Adhesive tape	1
1-inch bandage compress	2
2-inch bandage compress	1
3-inch bandage compress	1
4-inch bandage compress	1
4-inch x 3-inch plain gauze pads	1
Gauze roller bandage 2-inch wide	2
Plain absorbent gauze – 1/2 square yard	4
Plain absorbent gauze - 24-inch by 72 inches	3
Triangular bandages	3
Scissors	1
Tweezers	1
Space rescue blanket	1
Non-latex disposable pair of gloves	1
CPR mask or mouth-to-mouth airway	1

Table 1. 24-Unit First Aid Kit

10.14.3 Body Fluid Cleanup Kit:

(A) All School Transportation Vehicles shall have a body fluid cleanup kit, securely mounted in full view of the driver or with the location plainly indicated by appropriate signage. Additional kits may be installed. All bodily fluid cleanup kits shall be mounted for easy removal.

(1) The kit shall be sealed, moisture- and dustproof, and be of sufficient capacity to store the required items.

(2) The seal verifies the integrity of the contents without opening the kit. The seal shall be designed to allow easy access to the kit's contents. If zip ties are used to seal the kit, they shall be breakaway.

(B) All bodily fluid kit components shall be inspected annually by the Educational Entity. Any items found to be expired, damaged, or previously opened shall be replaced as soon as possible to ensure kit integrity.

(C) The required contents of the bodily fluid kit are listed in Table 2.

Contents of the Bodily Fluid Kit:	
Item	**Unit(s)**
Antiseptic BKZ Towelette	1
Disinfectant towelette	1
Absorbing powder (capable of 1/2 gallon absorption)	1
Non-latex disposable gloves, pair	1
Disposable towels (paper, microfiber, etc.)	2
Disposable biohazard scoop bag with a closure mechanism and scraper	1

Table 2. Bodily Fluid Kit

10.14.4 Emergency Reflectors:

(A) All School Transportation Vehicles shall carry three bidirectional emergency triangle reflectors in compliance with section 42-4-230, C.R.S., and with FMVSS 125 - Warning Devices, contained in a securely mounted case which shall be in full view of the driver, or within a location plainly indicated by appropriate markings.

10.14.5 Seat Belt Cutter:

(A) All School Transportation Vehicles shall be equipped with one durable seat belt cutter having a full-width handgrip and a protected blade. The cutter shall be mounted in a location accessible to and within immediate view of the seated driver.

(B) Seat belt cutters shall be replaced per the manufacturer's recommendation, or if there is any sign of rust or corrosion on the blade.

10.15 Emergency Exits

10.15.1 All emergency exits shall conform to FMVSS 217 - Bus Emergency Exits and Window Retention and Release.

10.15.2 The Educational Entity may choose to have more emergency exits installed.

10.15.3 Emergency Doors:

(A) Emergency door(s) shall be equipped with a three-point latch mechanism. The inside door handle shall be designed with a guard for protection against accidental release.

(B) The exterior door handle shall be of a permanent hitch-proof design and mounted with enough clearance to permit opening without touching the door surface.

(C) All emergency door openings shall be completely weather-sealed. No obstruction shall be higher than 1/4 inch across the bottom of any emergency door opening.

(D) A head bumper pad shall be installed over the emergency door on the inside of the bus body. The pad shall be approximately 3 inches in height, at least 1 inch thick, and extend across the entire top of the emergency door opening. The padding shall be of the same materials as the padding used over the service door.

(E) The rear emergency door shall contain upper and lower glass panels that comply with FMVSS 205 - Glazing Materials. Glass in the emergency door shall provide the maximum area of visibility for the safe operation of the bus.

(F) The emergency window glass shall meet FMVSS 205 - Glazing Materials. Glass shall be tempered unless specified as laminated by the purchaser.

(G) May be installed in place of emergency windows.

10.15.4 Emergency Windows:

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

(B) Side emergency exit windows, when installed, may be vertically hinged on the forward side of the window. No side emergency exit window shall be located above a stop arm.

10.15.5 Emergency Exit Requirements:

(A) Emergency Exit Requirements: The use of the following tables is to determine the required number and types of emergency exits to comply with this specification, based on the bus manufacturer’s equipped seating capacity.

(1) Use Table 3 if the bus contains a rear emergency door, or

(2) Use Table 4 if the bus contains a rear pushout emergency window AND a left side emergency door, as required by FMVSS No. 217 - Bus Emergency Exits and Window Retention and Release for School Buses without a rear emergency door.

(B) A School Bus will meet the requirements of this specification and the requirements of FMVSS 217 - Bus Emergency Exits and Window

Retention and Release if it contains the types and quantities of emergency exits listed on the row selected.

Seating Capacity	Additional Exits Required
1 – 45	None
46 – 62	1 left side exit door or 2 exit windows.
63 – 70	1 left side exit door or 2 exit windows, and 1 roof exit.
71 and above	1 left side exit door or 2 exit windows, and 1 roof exit, and any combination of door, roof, or windows, such that the total capacity credit specified for these exits, plus 70, is greater than the seating capacity of the bus.

Table 3. Emergency Exits Required per Seating Capacity Rating for Buses with a Front Engine

Seating Capacity	Additional Exits Required
1 – 57	None
58 – 74	1 right side exit door or 2 exit windows.
75 – 82	1 right side exit door or 2 exit windows, and 1 roof exit.
83 and above	1 right side exit door or 2 exit windows, and 1 roof exit, and any combination of door, roof, or windows, such that the total capacity credit specified for these exits, plus 82, is greater than the seating capacity of the bus.

Table 4. Emergency Exits Required per Seating Capacity Rating for Buses with a Rear Engine

10.15.6 Roof Hatches:

(A) Using the following standard and conforming to FMVSS 217 - Bus Emergency Exits and Window Retention and Release, a head form moving at a velocity of 2 in/sec, a perpendicular force applied directly to the center of the hatch lid shall exceed 3100 N (700 lb.) before ANY one of the following conditions can occur:

(1) The roof hatch opens (release mechanism fails).

(2) The hatch deforms such that an opening large enough to admit the passage of a 4-inch sphere is created.

(3) The inner surface of the hatch at the center has moved perpendicularly to the undisturbed surface of the hatch, a distance equal to the length of the smallest chord along the surface of the hatch passing through the center, divided by four.

10.15.7 Emergency Exit Interlock Device (excluding roof hatches):

(A) If an emergency exit is equipped with a locking device, the vehicle shall be incapable of starting when the exit is locked from either the inside or outside of the bus.

(B) If an exit locking device is engaged, and the vehicle's ignition is in the “on” position, a continuous warning sound shall be audible at the driver's seating position and in the vicinity of the emergency exit.

10.16 Exhaust System

10.16.1 The tailpipe shall not exit the right side of the bus body.

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

10.16.3 There shall be a switch to manually start the diesel particulate filter regeneration process.

10.16.4 The tailpipe shall be flush with but not extend more than one inch beyond the perimeter of the body for side exit or the bumper for rear exit.

10.16.5 Tailpipe shall not exit beneath any fuel filler location or beneath any emergency door or lift door.

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

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

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

10.17 Fire Suppression Systems (optional)

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

(A) Fire suppression system shall include audio and visual alerts to notify the driver that the system has been activated.

10.18 Floor Coverings

10.18.1 The floor in the under-seat area, including tops of wheel housings, driver's compartment, aisle, and the kick board, shall be covered with fire-resistant elastomer floor covering or equivalent that is non-skid and wear-resistant, having a minimum overall thickness of .125 inch and a calculated burn rate of 0.1 mm per second or less, using the test methods, procedures and formulas listed in FMVSS 302 - Flammability of Interior Materials.

(A) The driver's area and toe board area in all Type-A buses may be the manufacturer's standard flooring and floor covering.

10.18.2 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 second or less using the test methods, procedures, and formulas listed in FMVSS 302 - Flammability of Interior Materials. Minimum overall thickness shall be .187 inch measured from the tops of ribs.

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

10.18.4 Cove molding, or a manufacturer-approved edge-seal coating, shall be used along the side walls and rear corners. All floor seam separations shall be properly bonded or secured.

10.18.5 The entrance step treads, including the edge at floor level, shall be of the same quality as the aisle material. Step treads shall have an integral white or yellow nosing of 1 1/2 inches or more, or use diagonal stripes. Treads shall be

permanently bonded to the metal steps and sealed to prevent water from entering beneath the tread.

(A) New and emerging coatings may be used in lieu of step treads but shall incorporate white or yellow nosing. A sealed and insulated plate shall be provided when required to access the fuel tank sending unit. The plate shall not be installed under flooring material.

(B) Type A-1 buses are exempt.

10.19 Frame

10.19.1 No holes shall be permitted in the chassis rails except when drilled at the manufacturing plant or authorized by the manufacturer.

10.19.2 Any welding to the frame side rails that is necessary by design to strengthen, modify, or alter the basic vehicle configuration shall be authorized and documented by the manufacturer.

10.19.3 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.

10.20 Fuel System

10.20.1 All fuel tank specifications shall conform to FMVSS 301 - Fuel System Integrity, FMVSS 303 - Fuel System Integrity of Compressed Natural Gas Vehicles, FMVSS 304 - Compressed Natural Gas Fuel Container Integrity, National Fire Protection Association Code 52, and/or National Fire Protection Association Code 58, as applicable.

10.20.2 The engine supply line shall not be mounted below the fuel tank. Wiring shall be hidden whenever possible.

10.20.3 The fuel fill cap opening in the body skirt shall be equipped with a hinged cover held closed by a spring or other conveniently operated mechanism.

(A) Type A-1 buses and Small-Capacity Vehicles are exempt.

10.20.4 Fuel tank(s) having a minimum 25-gallon capacity shall be provided by the chassis manufacturer. Each tank shall be filled from and vented to the outside of the passenger compartment, and each fuel filler shall be located so that

accidental fuel spillage will not drip or drain onto any part of the exhaust system.

10.21 Handrail

10.21.1 For Type B, C, and D buses, a handrail shall be installed on the left and right sides of the stepwell and provided in an unobstructed location inside the service door.

(A) The handrail shall be a minimum of 1 inch in diameter and be constructed from corrosion-resistant material(s).

(B) The handrail may be offered in a color provided by and applied by the manufacturer.

10.21.2 For Type A buses, at least one handrail shall be installed inside the service door.

10.21.3 The handrail(s) shall assist passengers during entry or exit and shall be designed to prevent entanglement, as evidenced by the passing of the National Highway Traffic Safety Administration (NHTSA) String and Nut Test.

10.22 Heating and Air Conditioning Systems

10.22.1 Heating System Performance and Configuration:

(A) All School Buses shall be equipped with a heating system (hot water, combustion, electric, or heat pump) capable of maintaining an interior temperature of 50° Fahrenheit when measured at an ambient temperature between 0° Fahrenheit and +10° Fahrenheit.

(1) Shall deliver coolant at a rate of 6 gallons per minute.

(2) The engine shall supply coolant at a minimum of 170° Fahrenheit at the thermostat opening, with a flow rate of 50 pounds per minute at the return end of a 30-foot, 1-inch ID hose (per SBMTC-001).

(B) Heater Placement:

(1) Buses shall have at least two heaters. One heater shall be located in the rear half of the bus, positioned on or behind the rear wheel axle line.

(2) Lift-Equipped Buses: Rear heaters may be floor-mounted under the last row of seats or wall-mounted.

(3) A front heater and integrated defroster shall be provided to heat the driver's compartment and maintain the windshield, service door glass, and driver's left glass clear of moisture, ice, and snow.

(4) A step well heater shall be provided to keep the step well clear of moisture, ice, and snow.

(C) If a single heater is utilized, it shall be a fresh air or combination type. If multiple heaters are used, secondary units may be recirculating-air type.

10.22.2 Auxiliary fuel-fired systems are permitted if they meet the following:

(A) Shall utilize the same fuel type as the vehicle engine (excluding electric-power buses).

(B) Shall comply with FMVSS 301 - Fuel System Integrity and all FMCSA combustion heater regulations.

(C) Exhaust shall be directed away from the vehicle to prevent passenger endangerment.

(D) Auxiliary systems may be direct hot-air or integrated into the engine coolant system to provide supplementary heat or engine preheating. All auxiliary systems shall operate on low voltage.

10.22.3 Component Construction and Maintenance:

(A) Enclosures: Heater cores and fans shall be completely encased. Cases shall be designed to allow for partial or full removal for service access.

(B) Shut-off Valves: For hot water systems, two shut-off valves are required in the engine compartment to isolate coolant.

(C) Hoses and Regulation: Heater hoses shall be supported to prevent wear from vibration or contact with sharp edges. A flow-regulating valve shall be installed within convenient reach of the driver.

(D) Antifreeze: Systems shall be protected to -30° Fahrenheit using permanent ethylene glycol or an environmentally safe equivalent, tested at normal engine operating temperature.

10.22.4 Passenger Compartment Air Conditioning (optional):

(A) Systems should be capable of cooling the bus interior from 100° Fahrenheit to 80° Fahrenheit. Compliance is measured at three points along the longitudinal centerline, four feet above the floor.

Manufacturers shall provide test results that verify compliance with these standards.

(B) Installation and Safety:

(1) Condensate Drainage: Evaporator cases and lines shall drain all condensate to the exterior below floor level; leakage into the interior is prohibited.

(2) Interior Projections: Evaporators and ducting shall be free of sharp edges. Ductwork edges shall face the front of the bus.

(3) Clearance: Ducting shall not obstruct Type-2 seatbelt anchorages.

(4) Head Impact Zone: Rear evaporators shall not encroach upon the head impact zone. In non-Type D buses, they shall be located within an area less than 26.5 inches from the rear wall and 14 inches from the ceiling.

(5) Filters: Air intakes for all evaporators (except Type A-1 front units) shall have replaceable filters accessible without case disassembly.

(C) Thermal Protection: The body may include supplemental insulation (sidewalls, roof, firewall, and floors) to minimize thermal transfer and improve system efficiency.

10.23 Horn

10.23.1 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.

10.24 Identification

10.24.1 School Buses shall bear the words “SCHOOL BUS” in black letters at least 8 inches in height on both the front and rear of the body. Lettering shall be placed without impairment of its visibility. All lettering shall conform to Standard Alphabets for Highway Signs, Series B 2000. Lettering shall have a retro-reflective NSBY material background pursuant to Rule 10.34.3 of these rules.

(A) Front and rear “SCHOOL BUS” signs may be illuminated.

(1) If equipped:

(a) The illuminated sign shall be National School Bus Yellow

(NSBY) and have a retro-reflective material background. They shall meet the FMVSS 131 - School Bus Pedestrian Safety Devices and FMVSS 108 - Lamps, Reflective Devices, and Associated Equipment brightness standards.

(b) Lettering shall be black and at least 8 inches in height on both the front and rear of the body.

(c) Shall meet durability standards for vibration, moisture, and dust, using sealed housing.

(d) Shall activate when the engine is turned on.

10.24.2 School Buses shall bear the name of the Educational Entity on each side of the bus. The lettering shall be black, standard, unshaded letters, and at least 5 inches in height. If there is insufficient space due to the length of the name of the Educational Entity, terms such as community, consolidated, and district may be abbreviated.

(A) On School Buses, the Educational Entity name shall be displayed at the beltline.

(1) Multifunction School Activity Buses (MFSABs) are exempt from this requirement.

10.24.3 The manufacturer's original rated capacity of the vehicle shall be printed to the left of the service door on the lower skirt in 2-inch characters. The word “capacity” may be abbreviated. (Example: Cap. 48)

10.24.4 The numbering of individual buses for identification purposes is permissible.

10.24.5 Route identification signage is permissible provided it complies with the following placement restrictions:

(A) Signage shall be displayed exclusively on the third window from the front of the vehicle.

(B) Signage is strictly prohibited on the first two windows behind the driver, the first two windows behind the service door, any designated emergency exit, or the rear of the vehicle.

10.24.6 Lettering and numerals shall be painted or may be pressure-sensitive markings of similar performance quality.

10.24.7 “STOP” shall be printed on the rear of the bus in letters at least 8 inches in

height. “ON FLASHING RED” shall be printed below “STOP” in letters at least 4 1/2 inches high. An LED message panel displaying safety messages to alert motorists may be used in lieu of the above lettering. These letters shall be placed in the area(s) visible to the approaching motorist.

10.24.8 The Educational Entities logo may be placed above the side window drip line or along the side of the bus, but shall not interfere with any required lettering.

10.24.9 Only signs and lettering specifically permitted by state law or regulation, and any marking necessary for safety and identification, shall appear on the outside of the bus.

(A) Advertising, approved by the Local Board of Education, Charter School’s or Service Provider’s governing board, may appear only on the side(s) of the bus in the following areas:

(1) The location and securement of the advertising shall have prior written CDE approval.

(2) The signs shall not extend from the body to allow a handhold or present a danger to pedestrians.

(3) The signs shall not interfere with the operation of any door, window, required lettering, lamps, reflectors, or other devices.

(4) The signs shall not be placed on the side emergency door(s).

(5) Advertising signs shall not interfere with retro-reflective tape on the side of the bus.

(6) Bumper stickers and/or signage are considered advertising. Consistent with Rule 10.6.3 of these rules, advertising shall have prior written CDE approval.

10.24.10 The exterior of the battery compartment shall be labeled with the word “Battery”.

10.24.11 Identification of fuel type shall be located outside and adjacent to the fuel filler opening.

10.24.12 Identification of the charging port shall be placed on a Battery-Electric Bus in 1-inch lettering adjacent to the port location.

10.25 Instruments and Instrument Panel

10.25.1 The chassis shall be equipped with the instruments and gauges listed below:

(A) Speedometer;

(B) 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;

(C) Tachometer (internal combustion engines only);

(D) Voltmeter/Ammeter;

(E) Oil pressure gauge (internal combustion engines only);

(F) Water temperature gauge;

(G) Fuel gauge (internal combustion engines only);

(H) High beam headlamp indicator;

(I) Brake air pressure gauge (air brakes), brake indicator lamp (vacuum/hydraulic brakes), or brake indicator lamp (hydraulic);

(J) Turn signal indicator;

(K) Glow-plug indicator lamp (if applicable);

(L) High-voltage battery state of charge (electric bus only);

(M) Motor temperature (electric bus only);

(N) Battery range available in miles (electric bus only);

(O) Battery discharge and regeneration rate (electric bus only); and

(P) Battery temperature (electric bus only).

10.25.2 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.

10.25.3 Instruments and controls shall be illuminated as required by FMVSS 101 - Controls and Displays.

10.25.4 Multi-function Gauge (MFG):

(A) The driver shall be able to manually select any displayable function of the gauge on an MFG whenever desired.

(B) Whenever an out-of-limits condition that would be displayed on one or more functions of an 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, and the MFG should automatically display 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 conditions are corrected.

(C) The use of an MFG does not relieve the need for audible warning devices, where required.

10.26 Insulation

10.26.1 Thermal insulation is required between roof panels and side panels of the bus body and shall meet the flammability requirements of FMVSS 302 - Flammability of Interior Materials with a minimum R-value of 5.5. Insulation shall be installed so as to prevent sagging.

10.27 Interior

10.27.1 Body Height:

(A) Inside body height shall be 77 inches or more, measured metal-to-metal at any point on the longitudinal center line from front vertical bow to rear vertical bow.

(B) Type A-1 School Buses shall have an inside height of 68 inches or more, measured metal-to-metal.

(C) Neither measurement shall include air conditioning units.

10.27.2 Projections:

(A) The interior of a School Transportation Vehicle shall be free of all projections likely to cause injury.

(B) Interior camera systems may be installed in the vehicle.

(1) If installed: low-profile cameras, as defined by the camera manufacturer, shall be used.

(C) Interior overhead storage compartments may be provided if they meet the following criteria:

(1) Head protection requirements of FMVSS 222 - School Bus Passenger Seating and Crash Protection, where applicable, are met;

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

(3) Have all corners and edges rounded with a minimum radius of one inch or be padded equivalent to door header padding;

(4) Attached to the bus sufficiently to withstand a force equal to 20 times the maximum rated capacity of the compartment;

(5) Have no protrusions greater than 1/4 inch.

10.27.3 Mobile Data Device (MDD), including Global Positioning Systems (GPS) (optional):

(A) If equipped, the Mobile Data Device (MDD) shall be mounted in an area that shall not block the driver's field of view through the windshield. The MDD shall not block the view of/or access to any gauges, mirrors, indicator lights, or safety controls.

(B) The MDD shall be securely mounted so as not to be a snagging hazard in the student-loading area of the service door.

(C) Audio and/or visual turn-by-turn instructions from the MDD system may be functional while the bus is being operated. Audible directions shall not use the speakers within the passenger compartment.

10.28 Lamps and Signals

10.28.1 All lamps, signals, reflectors, and their installation shall conform to the requirements of SAE J2442. No lettering, symbols, or arrows, except manufacturer's markings, shall be on any lens.

10.28.2 Tail and stop (brake) lamps:

(A) Each vehicle shall be equipped with a minimum of four combination red stop/tail lamps, conforming to the following specifications:

(1) Primary Lamps: Two combination stop lamps shall feature a lens diameter of no less than 7 inches, or a minimum effective luminous area of 38.48 sq. in.

(2) Secondary Lamps: Two combination tail lamps shall feature a lens diameter of no less than 4 inches, or a minimum effective luminous area of 12.5 sq. in.

(B) If the bus is equipped with a retarder, Secondary Braking System/or another system that supplements the service brake system, the four brake lamps shall be illuminated when the braking system or other supplemental system is activated.

10.28.3 Interior lamps:

(A) Interior lamps shall be provided that adequately illuminate the aisle. A separate lamp shall be provided in the step well.

10.28.4 Back-up lamps:

(A) Back-up lamps shall feature a lens diameter of no less than 7 inches, or a minimum effective luminous area of 38.48 sq. in.

10.28.5 Turn signal lamps:

(A) The bus shall be equipped with two amber turn signals in front and two amber turn signals in the rear. The rear turn signal lamps shall feature a lens diameter of no less than 7 inches, or a minimum effective luminous area of 38.48 sq. in.

(B) On buses over 30 feet in length bumper-to-bumper, a minimum of one additional turn signal shall be mounted on each side below the window and behind the service door axis plane.

10.28.6 All School Buses shall be equipped with an alternating flashing eight-way warning signal lamp system.

(A) The flashing warning signal lamp system shall have two pilot or indicator lights; one shall show an amber light when the amber signal lamps are flashing, and the other shall show a red light when the red signal lamps are flashing.

(B) The amber flashing warning signal lamps shall be energized manually by a switch. The flashing red warning signal lamp system shall be a sequential mode type.

(C) The areas around the lens of each alternating flashing signal lamp shall be black.

(D) Visors shall be provided and securely mounted to adequately shade and protect the dual-lamp assemblies from sunlight above but not to obstruct the rear and side effectiveness of the warning lamps.

(1) LED warning signal lamps do not require visors.

10.28.7 Type D rear-engine buses shall have two hazard lamps, each visible to the rear when the engine door is open. The lamps shall be wired to be illuminated when the main hazard lamp circuit is energized.

10.28.8 A white flashing strobe lamp may be installed on the roof of a School Bus. The light shall have a single clear lens that emits light 360 degrees around its vertical axis and may not extend above the roof by more than 8 inches. A manual switch and a pilot light shall be included to indicate when the light is in operation. The lamp shall not be capable of activating emergency traffic control light switches.

(A) Exception: An amber lens may be used upon approval of a local traffic regulatory authority.

10.28.9 Exterior Lighting for Loading Zone (optional), if equipped:

(A) An exterior light or lights to illuminate an area on the right side of the bus shall project white light.

(B) Shall direct its light in a manner that prevents the light from shining directly into any mirrors.

(C) Shall be no larger than 3.5 inches, flush-mounted to the side of the bus within 5 inches of the door frame, and placed no more than 10 inches off the bottom of the skirt.

(D) Turns off approximately 5 seconds after the door has closed.

10.29 Mirrors

10.29.1 Interior Mirror Systems:

(A) All interior mirrors shall be installed and maintained in full compliance with FMVSS 111 - Rear Visibility. In addition to federal standards, the following dimensional requirements shall apply:

(1) Type A buses' interior mirrors shall provide a minimum reflective surface area of 6 inches by 16 inches.

(2) Types B, C, and D buses' interior mirrors shall provide a minimum reflective surface area of 6 inches by 30 inches.

(B) Glass shall be either laminated or tempered and shall have rounded corners and protected edges.

10.29.2 External Mirror Systems:

(A) All external mirrors shall be installed and maintained in full compliance with FMVSS 111 - Rear Visibility.

(1) The right-side rear-view mirror shall not be obscured by the unwiped portion of the windshield.

(2) Mirrors shall be easily adjustable, but shall be rigidly braced, so as to reduce vibration.

(B) Heated external mirrors should be used.

(C) Remote-controlled external rear-view mirrors should be used.

(D) External electric side-view mirrors, or Camera Monitoring Systems (CMS), may be used in addition to traditional external side-view mirrors, per 49 C.F.R. 393.80.

(1) If equipped, the CMS shall be installed on the A-pillar and shall not obstruct or interfere with the driver's vision.

10.30 Mounting, Body, and Chassis

10.30.1 Insulation material shall be placed at all attachment points between the body and chassis frame on all buses and shall be attached to the chassis frame or body to prevent movement under severe operating conditions.

10.30.2 The body front shall be attached and sealed to the chassis cowl to prevent the entry of moisture and gases.

10.31 Overall Size

10.31.1 The overall length of School Buses shall not exceed 40 feet bumper-to-bumper pursuant to section 42-4-504, C.R.S.

10.31.2 The overall width of the School Bus shall not exceed 102 inches (8 1/2 feet), including external mirrors, pursuant to section 42-4-502, C.R.S.

10.32 Public Address System (optional)

10.32.1 Buses may be equipped with an AM/FM/audio and/or public address system having interior and exterior speakers.

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

10.33 Retarder System (optional)

10.33.1 Performance Requirements:

(A) 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.

10.33.2 Mountainous Terrain Requirements:

(A) Pursuant to section 42-4-1901(2)(b), C.R.S., Educational Entities that operate School Buses and Multifunction School Activity Buses (MFSAB) on mountainous terrain are encouraged to equip the School Bus or MFSAB with a retarder system of appropriate capacity to supplement the service brake systems.

10.33.3 Statutory Definition:

(A) Pursuant to section 42-4-1901(3)(a), C.R.S., "Mountainous terrain" is defined as conditions where:

(1) Longitudinal and transverse changes in ground elevation are abrupt in relation to the road or street, and

(2) Benching and sidehill excavation are frequently required to achieve acceptable horizontal and vertical alignment.

10.34 Retro-Reflective Material

10.34.1 Retro-reflective material shall be installed on the bus conforming to the requirements of FMVSS 131 - School Bus Pedestrian Safety Devices and FMVSS 217 - Bus Emergency Exits and Window Retention and Release.

10.34.2 Rear of the School Bus body:

(A) Strips of between 1-inch and 2-inch retro-reflective National School Bus Yellow (NSBY) material 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, with vertical strips applied at the corners connecting the horizontal strips.

10.34.3 "School Bus" signs:

(A) Shall be marked with retro-reflective NSBY material comprising background for the lettering of the front and/or rear “School Bus” signs consistent with Standard Alphabets for Highway Signs, Series B 2000.

(B) All lettering shall be placed without impairment of its visibility.

(C) All lettering shall be at least 8 inches in height.

10.34.4 Sides of the School Bus body:

(A) Shall be marked with retro-reflective NSBY material at least 1 3/4 inches in width, extending the length of the bus body, and located (vertically) as close as practical to the floor line.

10.35 Rub Rails

10.35.1 There shall be one rub rail on each side of the bus located at no more than 8 inches above the seat cushion level. They shall extend from the rear side of the service door completely around the bus body (excluding emergency and/or access doors) to the point of curvature near the outside cowl on the left side.

10.35.2 There shall be one additional rub rail on each side located 10 inches or less above the floor line. The rub rail shall cover the same longitudinal span as the upper rub rail, except at the wheel housing, and it shall extend only to the longitudinal tangent of the right and left rear corners.

10.35.3 The bottom edge of the body side skirts shall be stiffened by application of a rub rail, or the edge may be stiffened by providing a flange or other stiffeners. There shall be one rub rail located on each side of the bus at the bottom of the side skirts, or a side skirt stiffener of equivalent strength.

10.35.4 Rub rails shall be attached at each body post and all other upright structural members.

10.35.5 Rub rails shall be 4 inches or more in width, 16-gauge steel, or equivalent strength, constructed in corrugated or ribbed fashion, and shall be self-draining.

10.35.6 Rub rails shall be applied to the outside of the body panels. Pressed-in or snap-on rub rails do not satisfy this requirement.

10.36 Seats/Restraining Barriers

10.36.1 All School Buses and Multifunction School Activity Buses shall be equipped with restraining barriers conforming to FMVSS 222 - School Bus Passenger Seating and Crash Protection, including a modesty panel on both front barriers.

10.36.2 No bus shall be equipped with any type of seats that are not secured to the floor per the manufacturer's specifications.

10.36.3 The forward-most pupil seat on the right side of the bus shall be located so as not to interfere with the driver's vision. The seat shall not be farther forward than the barrier behind the driver or the rear of the driver's seat when adjusted to its rear-most position.

10.36.4 Use of a flip seat at any side emergency door location and conformance with FMVSS 222 - School Bus Passenger Seating and Crash Protection, including required aisle width to the side door, is acceptable.

(A) Any flip seat shall be free of sharp projections on the underside of the seat bottom. The underside of the flip-up seat bottoms shall be padded or contoured to reduce the possibility of snagged clothing or injury during use.

(B) Flip seats shall be constructed to prevent passenger limbs from becoming entrapped between the seat back and the seat cushion when in the upright position.

(C) The seat cushion shall be designed to automatically rise to a vertical position when unoccupied.

10.36.5 School Bus student seats and seat spacing shall meet FMVSS 222 - School Bus Passenger Seating and Crash Protection.

(A) No part of the School Bus seat shall infringe on the emergency exit window frame.

10.36.6 School Bus seat materials shall meet FMVSS 302 - Flammability of Interior Materials.

10.36.7 Integrated child seats shall not be installed at an emergency exit.

10.36.8 Each individual wheelchair securement system shall consist of materials from one brand only.

10.37 Seat Belts

10.37.1 All seat belts shall conform to FMVSS 208 - Occupant Crash Protection, FMVSS 209 - Seat Belt Assemblies, and FMVSS 210 - Seat Belt Assembly Anchorages.

(A) Educational entities are discouraged from installing or utilizing any aftermarket device or modification on a school transportation vehicle that

alters the intended function, geometry, or emergency release mechanism of seat belt assemblies certified under FMVSS 208 - Occupant Crash Protection, 209 - Seat Belt Assemblies, or 210 - Seat Belt Assembly Anchorages, or on Child Restraint Systems certified under FMVSS 213.

10.37.2 School Transportation Vehicles shall not use aftermarket seat belt extenders for School Transportation Vehicle operators or passengers.

(A) If a longer seat belt is required to ensure proper adjustment and fit on the wearer, a new, certified seat belt assembly shall be provided by the original vehicle manufacturer in compliance with FMVSS 209 - Seat Belt Assemblies and FMVSS 210 - Seat Belt Assembly Anchorages.

10.37.3 Lap belts shall not be installed on passenger seats in large School Buses (over 10,000 GVWR). All seat belts shall be at least a 3-point or lap/shoulder combination.

10.38 Steering Gear Assembly

10.38.1 All School Bus chassis and all passenger capacities shall be equipped with heavy-duty, truck-type integral power steering. Power steering components shall be compatible with the GVWR.

10.38.2 No changes shall be made to the steering apparatus that are not authorized in writing by the manufacturer.

10.38.3 There shall be a clearance of at least 2 inches between the steering wheel and any other surface or control.

10.38.4 Pursuant to 49 C.F.R. 393.209(e), all power steering systems shall be in proper operating condition.

10.39 Steps

10.39.1 The first service doorstep shall be not less than ten inches from the ground while the vehicle is in motion and not more than 16 inches from the ground when measured from the top surface of the step to the ground. An auxiliary step may be added to compensate for the increase in ground-to-first-step clearance. The auxiliary step is not required to be enclosed.

10.39.2 Step risers shall not exceed a height of 10 inches. When plywood is used on the top step, the riser height may be increased by the thickness of the plywood.

10.39.3 The surface of the steps shall be of non-skid material.

10.40 Stop Signal Arm

10.40.1 The stop signal arm shall meet FMVSS 131 - School Bus Pedestrian Safety Devices. The stop signal arm may extend up to, but shall not exceed 6 1/2 feet from the side of the bus.

10.40.2 Rubber spacers shall be installed on either the side of the bus or the stop arm to prevent the sign from making abrasive contact with the side of the bus.

10.40.3 The wind guard shall be provided to keep the sign in the retracted position.

10.40.4 The stop signal arm may be illuminated.

(A) If equipped:

(1) The stop signal arm shall be red on both sides with a white border and white "STOP" lettering, featuring at least two alternating red flashing lamps per side, 60–120 times per minute. They shall meet FMVSS 131 - School Bus Pedestrian Safety Devices and FMVSS 108 - Lamps, Reflective Devices, and Associated Equipment brightness standards.

(2) Shall meet durability standards for vibration, moisture, and dust, using sealed housing.

(3) Shall activate and deactivate with the student eight-way flashing warning system.

10.41 Storage Compartment

10.41.1 A metal container of adequate strength and capacity for the storage of tire chains, tow chains, and such tools as may be necessary for minor emergency repairs while the bus is en route may be provided.

(A) The storage container may be located either inside or outside the passenger compartment.

(1) If inside, the storage compartment shall be securely fastened to prevent the contents from spilling and shall have a latched or secured cover other than a seat cushion.

10.41.2 If equipped with underbody storage compartments, the doors shall be secured and function properly during vehicle operation.

10.42 Sun Visor

10.42.1 An interior, adjustable, tinted, and transparent sun visor measuring at least 6 inches by 30 inches shall be installed on Type A-2, B, C, and D buses, for frontal viewing, in accordance with the manufacturer’s specifications.

(A) Type A-1 School Buses shall have a sun visor according to the manufacturer's standard size.

(B) The sun visor shall be maintained free of any attachments, decals, or materials that obstruct the operator’s field of vision.

(C) Left-side window sun visor shall meet the manufacturer’s available size requirements and be clear or tinted in accordance with the manufacturer's specifications.

10.43 Tires and Rims

10.43.1 Wheel and Rim Specifications:

(A) Wheel Type: All wheels shall be one-piece disc type.

(B) Material: Wheels may be constructed of steel or an aluminum alloy.

(C) Sizing: Minimum tire and rim sizes for vehicles with a 10,000 GVWR or greater shall be in accordance with FMVSS 120 - Tire Selection and Rims for Motor Vehicles with a GVWR of more than 10,000.

10.43.2 Tire Selection and Configuration:

(A) Dual Rear Tires: Type A-2, B, C, and D School Buses shall be equipped with dual rear tires.

(B) Uniformity: All tires on a vehicle shall be of the same size and load range.

(C) Mixing Restrictions: Bias-ply and radial tires shall not be used on the same axles.

10.43.3 Axle-Specific Restrictions:

(A) Steer Axle Construction: Type A-2, B, C, and D School Buses shall not utilize bias-ply tires on the steer axles.

(B) Retread Restrictions: Pursuant to 49 C.F.R. 393.75(d), no School Bus shall be operated with regrooved, recapped, or retreaded tires on the front wheels.

10.44 Tow Hooks

10.44.1 Two heavy-duty tow hooks/eyes shall be factory-installed on the front of Types B, C, and D School Buses and Multifunction School Activity Buses.

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

10.44.2 Two heavy-duty tow hooks/eyes shall be factory-installed on the rear of Type A, B, C, and D School Buses and Multifunction School Activity Buses.

10.44.3 Hooks/eyes shall not extend beyond the front or rear bumper of any School Bus or Multifunction School Activity Bus.

10.45 Traction Assisting Devices (optional)

10.45.1 Automatic traction chains (drop-down) may be installed on the rear of the vehicle.

10.45.2 Electronic stability control (ESC) may be installed on the vehicle.

10.46 Trash Container and Holding Device (optional)

10.46.1 When requested or used, the trash container shall be 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.

10.47 Undercoating

10.47.1 The entire underside of the bus body, including floor sections, cross members, 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 requirements of SAE J1959.

10.47.2 The undercoating material shall be applied with a suitable airless or conventional spray equipment as per manufacturer-recommended film thickness and shall show no evidence of voids in the cured film.

10.47.3 The undercoating materials shall not cover any exhaust components of the chassis.

10.47.4 The undercoating material shall not cover any high-voltage components or cables of a battery-electric or hybrid-electric chassis.

10.48 Ventilation

10.48.1 School Transportation Vehicles more than 20 feet bumper-to-bumper in length shall be equipped with a multi-speed powered exhaust roof ventilator or powered vent fan in the roof hatch, mounted in the rear half of the bus.

10.48.2 The air conditioning systems, if equipped, shall be installed per the manufacturer's specification.

(A) The installation of a passenger air conditioning unit shall not serve as a substitute for, nor preclude the requirement of, a multi-speed powered exhaust roof ventilator or powered roof hatch vent fan situated in the rear half of the vehicle.

10.49 Windows

10.49.1 Pursuant to section 42-4-227, C.R.S., no window except the windshield can be composed of, covered by, or treated with any material or component that presents an opaque, nontransparent, or metallic or mirrored appearance in such a way that it allows less than 27% light transmittance.

(A) The windshield shall allow 70% light transmittance.

10.49.2 All windows shall meet the requirements of FMVSS 205 - Glazing Materials.

10.50 Windshield

10.50.1 The out-of-service criteria for windshields are pursuant to 49 C.F.R. 393.60(c).

10.50.2 Nothing shall be located in the driver’s area of the vehicle that would interfere with the driver's horizontal line of sight.

10.51 Wipers and Washers

10.51.1 The wipers shall be operated by one or more air or electric motors. If a single motor is used, the wipers shall operate in tandem to provide a full sweep of the windshield.

10.51.2 All wiper controls shall be located within easy reach of the driver and designated to move blades from the driver's direct view when in the stop position.

10.51.3 The system reservoir capacity shall be a minimum of 1 gallon.

10.52 Wiring

10.53.1 All wiring shall conform to the requirements of SAE J2202.

(A) 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.

(B) 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.

(C) Each wire passing through a metal opening shall be protected by a grommet.

11.0 Electric Drive High Voltage Specs (EV)

11.1 Additional Safety Standards

11.1.1 An electric-powered School Transportation Vehicle shall meet all Federal Motor Vehicle Safety Standards and all SAE standards that are applicable at the time of manufacture.

11.2 Anti-Roll System

11.2.1 Electric School Buses and Multifunction School Activity Buses shall be equipped with a system that will hold the vehicle temporarily in place on an incline with no pedal activation/input.

11.3 EV-Specific Labeling and Identification

11.3.1 Each door, cover, or other panels that afford immediate access to any high voltage area shall be plainly marked with a hazard warning label which shall read WARNING - HIGH VOLTAGE or DANGER - HIGH VOLTAGE. This label shall be in a highly conspicuous place. All high-voltage access areas shall be equipped with a lock or other security measures to prevent unauthorized access.

11.3.2 An EV identifying label shall be affixed to the right rear corner of the bus body. An additional label shall be applied to the right side of the bus at the rearward of the entrance door and to the left side of the bus in front of the driver's window.

(A) Each label shall feature the 'EV' designation in 1-inch-high lettering, centered within a blue diamond field. The design shall include a perimeter border and a centered icon depicting either a lightning bolt or a power plug.

11.4 High Voltage Wiring Standards and Protection

11.4.1 Wire, cable, and conductor insulation in the High Voltage System shall provide adequate insulation for the voltage used and for ambient temperatures ranging from -15° Fahrenheit to 120° Fahrenheit. All high voltage circuits shall be bright orange in color or otherwise labeled as HIGH VOLTAGE. All high-voltage circuits shall provide adequate and automatic protection against electrical

overload caused by short circuits or other excessive current conditions through the use of fuses, circuit breakers, and ground fault interruption.

11.4.2 The EV Drive System shall have a system for protecting system components from thermal damage due to electrical overload. This system shall include temperature sensors at critical points and be capable of reducing EV Drive System electrical power when necessary.

11.4.3 The EV High Voltage System shall be designed so that when the ignition switch is off or in accessory mode, the propulsion motor is positively disconnected. All other accessories powered by the main propulsion battery circuit remain operable when the ignition switch is in accessory mode.

11.4.4 All buses shall be equipped with an additional manual and automatic switch or device independent of the propulsion motor disconnect controls that permit the positive disconnection of all circuits from the Drive System Batteries.

(A) This switch shall be operable from outside the vehicle. Each door or panel providing access to this switch shall be plainly marked to indicate that it is a main-power-disconnect switch or device.

11.4.5 The ignition switch circuit shall be linked to the Battery Management System and shall prevent driving the vehicle while it is connected to an external battery charging source.

11.4.6 The charging connection point shall be outside the passenger compartment.

(A) The receptacle shall accommodate the minimum requirements for Level II AC charging and DC fast charging.

11.4.7 The High Voltage System shall be designed to prevent the passenger compartment from becoming energized.

11.4.8 Battery packs shall be cooled and heated as necessary to maintain proper operating temperatures.

11.5 Instrumentation

11.5.1 In addition to the required gauges, the instrument display panel shall also contain an indication showing the state of charge (power and/or range).

11.5.2 The instrument display panel shall have a warning light that indicates when an EV drive system component exceeds a safe temperature. The warning light should illuminate prior to the critical temperature to allow sufficient time to safely stop the bus.

11.6 Passenger Heating System

11.6.1 On electric School Buses, the heating system shall be capable of meeting performance and design standards without a fuel-fired heater. See Rule 10.22 of these rules.

11.6.2 Heating systems that are independent of other cooling system functions may forgo the use of manual shutoff valves to the passenger compartment as long as the flow of coolant can be stopped by means of a heating system shut-down or an electric heater control valve.

11.7 Propulsion System

11.7.1 The propulsion system on all-electric School Buses shall be of sufficient power to propel the vehicle fully loaded up to 65 mph.

11.7.2 The propulsion system may be mounted utilizing a normal drivetrain or positioned in a way to provide direct power to the wheels. All propulsion systems shall be contained below the floor line and cannot come into contact with the road surface.

11.7.3 On electric School Buses, the propulsion system shall produce regenerated power.

11.8 Range

11.8.1 Each electric School Bus shall be equipped with an Original Equipment Manufacturer (OEM) energy storage system featuring a rated capacity to maintain a minimum operational range of 100 miles on a single full charge.

11.8.2 All electric School Buses shall comply with FMVSS 141 - Minimum Sound Requirements for Hybrid and Electric Vehicles, producing sound while in motion below 20 mph.

12.0 Multifunction School Activity Bus

12.1 Identification

12.1.1 A Multifunction School Activity Bus, as defined in these rules, shall meet the standard contained in these Minimum Standards. The Multifunction School Activity Bus shall comply with the following:

(A) The vehicle body color shall exclude National School Bus Glossy Yellow (NSBY).

(B) Shall not have the identification of “SCHOOL BUS,” as required by Rule 10.24.1 of these rules.

(C) The identification of “ACTIVITY BUS” shall be displayed on the front and rear of the vehicle. Lettering shall be:

(1) Be black on a retro-reflective National School Bus White (NSBW) background;

(2) At least 8 inches in height;

(3) Consistent with Standard Alphabets for Highway Signs, Series B 2000; and

(4) Positioned above the windshield and rear of the bus above the emergency exit for unobstructed visibility.

(D) Shall not have the identification of “STOP ON FLASHING RED,” as required by Rule 10.24.7 of these rules.

(E) Shall not have School Bus Eight-Way Alternating Flashing Warning Signal Lamps, as required by Rule 10.28.6 of these rules.

(F) Shall not have a stop signal arm, as required by Rule 10.40 of these rules.

(G) Shall not be required to have the retro-reflective material color, as required by Rule 10.34 of these rules.

(H) Rub rails are not restricted to specific color schemes, including black, yellow, or fuel-type identifiers, as required by 10.7.1(C) of these rules, and may be of any color at the discretion of the manufacturer or specified by the Educational Entity.

12.2 Retro-Reflective Material:

12.2.1 Rear of Multifunction School Activity Bus body:

(A) Strips of between 1-inch and 2-inch retro-reflective National School Bus White (NSBW) material 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, with vertical strips applied at the corners connecting the horizontal strips.

12.2.2 Sides of the Multifunction School Activity Bus body:

(A) Shall be marked retro-reflective National School Bus White (NSBW) material at least 1 3/4 inches in width, extending the length of the bus body, and located (vertically) as close as practicable to the floor line.

13.0 Specially Equipped Buses

13.1 Aisles

13.1.1 All School Buses equipped with a power lift shall provide a minimum 30-inch pathway leading from any wheelchair position to at least one 30-inch-wide emergency exit door.

13.1.2 A wheelchair securement position shall never be located directly in front of (blocking) a power-lift door location.

13.2 Identification

13.2.1 Specially Equipped Buses shall display the International Symbol of Accessibility on all four sides of the bus.

(A) Such emblems shall be white on a blue or black background and shall be a minimum of 12 inches square in size.

(B) Such emblems shall be of high-intensity retroreflective material meeting the requirements of the Federal Highway Administration's Standard Specifications for the Construction of Roads and Bridges on Federal Highway Projects, FP- 24.

(C) Such emblems (four) shall be located as follows: one on the right front, one on the right rear of the bus body or right rear bumper, one beneath the driver's window on the left side of the bus, and one on the special service entry door.

13.3 Lighting

13.3.1 Doorways in which lifts are installed shall be equipped with a special interior light that is located above the lift, and that provides a minimum of two-foot candles of illumination measured on the floor of the bus immediately adjacent to the lift during lift operations.

13.4 Power Lifts and Ramps

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

13.4.2 Vehicle Lift and Installation:

(A) Vehicle lifts and installations shall comply with the requirements set forth in FMVSS 403 - Platform Lift Systems for Motor Vehicles and FMVSS 404 - Platform Lift Installations in Motor Vehicles.

(B) The lifting mechanism(s) and platform shall be capable of operating effectively with a wheelchair and occupant mass of at least 800 pounds per FMVSS 38 - Americans with Disabilities Act (ADA) Accessibility Specification for Transportation Vehicles.

(C) Per FMVSS 403 - Platform Lift Systems for Motor Vehicles, School Bus wheelchair lifts shall have an effective safety restraint system. This system shall be an occupant-retaining barrier with an inner roll-stop mechanism, or a supplementary system, that is equipped with a handrail safety belt with interlock.

13.4.3 A ramp device may be used in lieu of a mechanical lift if the ramp meets all of the requirements of the Americans with Disabilities Act (ADA) as found in 36 C.F.R., 1192.83.

(A) The floor of the ramp shall be covered with non-skid material.

(B) The ramp shall be of a weight and equipped with a handle or handles to permit one person to put the ramp in place and return it to the storage location.

(C) The ramp shall be equipped with a protective flange on each longitudinal side to keep the wheelchair on the ramp.

13.5 Seating Arrangements

13.5.1 Flexibility in seat spacing to accommodate special devices shall be permitted to meet passenger requirements. All seating shall comply with FMVSS 222 - School Bus Passenger Seating and Crash Protection.

13.6 Special Service Entrance

13.6.1 Power lift-equipped bodies shall have a special service entrance to accommodate the power lift.

(A) 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.

13.6.2 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.

13.6.3 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.

13.6.4 Drip molding shall be installed above the special service entrance to effectively divert water from the entrance.

13.6.5 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 the special service entrance.

13.7 Special Service Entrance Doors

13.7.1 A single door or double door may be used for the special service entrance.

13.7.2 A single 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 use a safety mechanism that prevents it from swinging open if the primary door latch fails. If double doors are used, the system shall be designed to prevent the door(s) from being blown open by the aerodynamic forces created by the forward motion of the bus, and/or shall incorporate a safety mechanism to provide secondary protection should the primary latching mechanism(s) fail.

13.7.3 All doors shall have a positive fastening mechanism to hold the door(s) in the “open” position when the special service entrance is in use.

13.7.4 All doors shall be weather-sealed, per 10.11.7 of these rules.

13.7.5 When manually operated dual doors are provided, the rear door shall have at least a one-point fastening mechanism to the header, and the forward-mounted door shall have at least three one-point fastening mechanisms.

(A) One fastening mechanism shall be to the header, one to the floor line of the body, and the other shall be to the rear door.

13.7.6 The door and hinge mechanism shall have strength that is greater than, or equivalent to, the strength of the emergency exit door.

13.7.7 Door materials, panels, and structural components shall have strength equivalent to conventional service and emergency exit doors.

(A) Color, rub rail extensions, lettering, and other exterior features shall match adjacent sections of the body.

13.7.8 Each door shall have windows set in a waterproof manner that are visually similar in size and location to adjacent non-door windows.

(A) Glazing shall be of the same type and tinting (if applicable) as standard fixed glass in other body locations.

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

13.7.10 A switch shall be installed so that the lift mechanism will not operate when the lift platform door(s) are closed.

13.7.11 Special service doors shall be equipped with padding that shall be approximately 3 inches in height, at least 1 inch thick, and extend across the entire top of the service door opening.

13.8 Support Equipment and Accessories

13.8.1 If transporting oxygen that is not in use, the oxygen shall be secured. Consideration should be given to the use of a securement device that meets SAE J3043.

13.8.2 Each specially equipped School Bus that is set up to accommodate wheelchairs or other assistive or restraint devices with webbing attached may contain an additional seat belt cutter.

(A) The additional seat belt cutter shall be secured in a location determined by the purchaser that is clearly visible to the driver and passengers.

13.8.3 Each specially equipped School Bus that is set up to accommodate wheelchairs or other assistive restraint devices may be equipped with an emergency evacuation device that is certified and tested to withstand at least a 300-pound load when used as an emergency stretcher or drag.

(A) This evacuation device shall be properly secured to the bus in a location determined by the purchaser.

13.9 Wheelchair Securements

13.9.1 Each individual wheelchair securement system shall consist of materials from one brand or manufacturer only.

(A) A wheelchair securement system replacement plan shall be in place that follows the manufacturer's specifications.

13.9.2 Wheelchair securement positions shall be located so that wheelchairs and their occupants do not block access to the lift door or exits.

13.9.3 Each wheelchair position in a specially equipped School Bus shall have a minimum clear floor area of 30 inches laterally by 48 inches longitudinally. Additional floor area may be required for some wheelchairs. 49 C.F.R., 38.159(d)(2).

13.9.4 Floor securement track system, or similar floor anchors, shall be installed per FMVSS 210 - Seat Belt Assembly Anchorages, and FMVSS 222 - School Bus Passenger Seat and Crash Protection standards.

(A) Floor securement track system, or similar floor anchors, shall be factory-installed by the bus body manufacturer.

(B) Track system shall be pre-drilled every 4 inches to accommodate 5/16-inch bolts.

(C) Floor securement track system shall withstand at least 5000lbf per chair.

(D) Tracking shall be compatible with the specific wheelchair securement system used.

13.10 Wheelchair Tie-Down and Occupant Restraint System (WTORS)

13.10.1 Each WTORS system shall consist of materials that match the wheelchair securement system and be from one brand or manufacturer only.

(A) A WTORS replacement plan shall be in place that follows the manufacturer's specifications.

13.10.2 Each wheelchair tie-down and occupant restraint system shall be designed, installed, and operated with forward-facing, wheelchair-seated passengers.

(A) All wheelchair tie-down and occupant restraint systems shall comply with all applicable requirements of FMVSS 222 - School Bus Passenger Seating and Crash Protection, FMVSS 302 - Flammability of Interior Materials, and SAE J2249.

(B) An ANSI/RESNA WC18-compliant WTORS may be specified when transporting a wheelchair that is fully compliant with WC19, which includes a crash-tested wheelchair-anchored pelvic belt.

13.10.3 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, keep the system securely contained within the passenger compartment, provide reasonable protection against vandalism, and enable the system to be readily accessed for use.

13.10.4 If the upper torso belt for a WTORS anchorage is higher than 44 inches measured from the vehicle floor, an adjustment device shall be supplied as part of the occupant restraint system.

14.0 Small-Capacity Vehicles

14.1 Emergency Equipment

14.1.1 Fire Extinguisher:

(A) Small-Capacity Vehicles shall be equipped with one securely mounted, 2 1/2 pound, dry chemical fire extinguisher with a minimum rating of 1A10BC.

(1) The fire extinguisher shall be securely mounted in an extinguisher bracket (automatic type) and located in full view of and readily accessible to the driver within the cab, or in a location plainly indicated by appropriate signage. A pressure gauge shall be mounted on the extinguisher to be easily read without removing the extinguisher from its mounted position.

(2) Fire extinguishers shall be inspected annually for charging and certification to standards by a certified fire extinguisher technician.

14.2 Identification

14.2.1 Small-Capacity Vehicles shall bear the name of the Educational Entity plainly visible on each side of the vehicle.

(A) Exception: Roof-mounted signage may be used in lieu of placing the Educational Entity name on the sides of the vehicle.

(1) The name of the Educational Entity shall be plainly visible from both sides of the vehicle.

(B) Signage shall not be present on any window surface.

15.0 Incorporation by reference

15.1 The foregoing rules incorporate by reference the Federal Motor Vehicle Safety Standards (FMVSS), 49 C.F.R., Part 571 (as codified as of August 31, 2026, unless an earlier version is applicable). They also incorporate by reference ADA regulations in 48 C.F.R., Part 38 and in 36 C.F.R., § 1192.83, as codified on the effective date of these rules. The foregoing rules do not incorporate by reference any later amendments or editions to the Federal Motor Vehicle Safety Standards or to the cited ADA regulations. The Federal Motor Vehicle Safety Standards and the cited ADA regulations are available

at https://www.ecfr.gov/. They are also available for public inspection during regular business hours from the Colorado Department of Education, 201 Colfax Ave., Denver, Colorado 80203.

15.2 The foregoing rules also incorporate by reference (1) certain standards promulgated by the Society of Automotive Engineers, Inc. ("SAE"), as published at https://www.sae.org/standards; (2) codes promulgated by the National Fire Protection Association and available at https://www.nfpa.org/for-professionals/codes-and-standards/list-of-codes-and-standards; and (3) the Standard Specifications for the Construction of Roads and Bridges on Federal Highway Projects, available at https://highways.dot.gov/federal-lands/specs; and (4) the Standard Alphabets for Highway Signs from the Federal Highway Administration's Manual on Uniform Traffic Control Devices, available at https://mutcd.fhwa.dot.gov/knowledge/hwy_sign_calculator/index.cfm. These standards are incorporated as they stood on August 31, 2026. The foregoing rules do not incorporate by reference any later amendments or editions to these standards. The incorporated standards are available at the foregoing websites and are available for public inspection during regular business hours from the Colorado Department of Education, 201 E. Colfax Ave., Denver, Colorado 80203.