**WEST VIRGINIA MINIMUM REQUIREMENTS**
**FOR THE DESIGN AND EQUIPMENT OF SCHOOL TRANSPORTATION MANUAL**

**2025 EDITION**

West Virginia schools shall adhere to the School Bus Body and Chassis Specification of the current National School Transportation Specifications and Procedures Manual approved by the National Congress on School Transportation (NCST). Specifications found in this manual are in addition to the NCST specifications and are required for school buses purchased after the effective date of the policy. The National School Transportation Specifications and Procedures Manual is available at https://www.nasdpts.org/NSTSP-Documents.

Note: **Equivalency**. Permission to use a device or material as an "equivalent" to that called for in the "requirements" must be requested in writing by the manufacturer or owner. Any item supplied as an "equivalent" must have prior approval, in writing, from the State Director of School Transportation.

**New Products.** During the first year of production, new products will be subjected to the experimental and field test evaluation procedures with written evaluation provided to the State Director of School Transportation.

**Changes**. Any changes in design or equipment by counties after receipt of the school bus must have prior approval in writing from the State Director of School Transportation.

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**Section 1: School Bus Chassis.**

**Air Cleaner**

A. The engine intake air cleaner shall be dry element type and properly installed by the chassis manufacturer to meet engine specifications. Diesel chassis manufacturer shall provide air restriction indicator device. EXCEPTION: Type D vehicles with engine in rear are required to have an air restriction indicator mounted in the engine compartment, clearly visible from the rear of the bus. Exception: electrical vehicles

**Axles**

A. The front axle shall be heavy-duty bus type and equipped with oil bath (synthetic lubricant) wheel bearings. Exception: Type A buses.

**Back Up Alarms**

A. All buses shall be equipped with an audible electrical warning device, automatically actuated when the bus is in reverse gear.

B. The device shall be of 112 decibels (DB), meeting Society of Automotive Engineers (SAE) J994B. The device shall be mounted behind the rear axle. And shall emit an intermittent sound.

C. Variable sound is not permitted.

**Brakes**

A. Buses using an air-operated braking system shall be equipped with a warning device readily audible and visible to the operator in a normal seated position. The device will give a continuous warning when the air pressure available in the system for braking is approximately 60 pounds per square inch (psi) and must remain activated until the system is at or above 60 psi. An illuminated gauge that will indicate to the operator the air pressure in pounds per square inch or the inches of mercury vacuum available for the operation of the brakes shall be provided. An anti-lock braking system (ABS) shall be standard on units with air brakes.

1. Air brakes shall be installed on all chassis. Exception: Electric Powered Vehicle, Type A and less than 35 passenger vehicles.

2. All air-operated brake systems shall:

    a. Have S-Cam type on all wheels incorporating long stroke brake chamber. Exception: Air Disc.

    b. Use the same brand of automatic slack adjusters on all four wheels. Exception: Air Disc

    c. be protected by an Air Dryer Internal Purge (ADIP) or equivalent spin-on replaceable filter.

    d. be equipped with an engine or an exhaust brake. A clearly identified manual control shall be within easy reach of the operator, in addition to a modulated control through

the brake treadle valve. Exception: Propane, gasoline, and electric school buses. Propane and gasoline buses may be equipped with driveline retarder systems.

e. have a Schrader valve to charge the school bus air system in the event of a compressor failure.

f. Be equipped with MGM or equivalent long stroke welded clevis air chambers. Exception: Air Disc

3. Any brake system dry reservoir shall be safeguarded by a check valve of equivalent device that in the event of failure or leakage in its connection to the source of compressed air of vacuum, the stored dry air of vacuum shall not be depleted by the leakage or failure.

B. Buses using a hydraulic assist-booster in the operation of the brake system shall:

1. be equipped with warning signals, readily audible and visible to the operator, that will provide continuous warning in the event of a loss of fluid flow from the primary source, or loss of electric source powering the back-up system.

2. be equipped with source of hydraulic pressure, automatically initiated upon loss of power from primary source, and operating independently of the primary power source.

C. All brake lines, power and booster-assist lines shall be protected from excessive heat and vibration, and be installed to prevent chafing.

D. All brake systems shall be designed to permit visual inspection of brake lining wear without removal of any chassis components.

E. Air disc type brakes installed by chassis manufacturers are permissible.

F. Exhaust and engine brakes, and retarders are an approved option for Type C and D school buses. Installation must be made by, or under the supervision of the vehicle manufacturer.

**Brake (Parking)**

A. All air brake equipped buses shall incorporate a park brake interlock that requires the service brake be applied to allow release of the parking brake with the key in the run position. Type A buses with hydraulic brakes and a park pawl transmission must have the key in the on or run position to move the vehicle out of the park position.

B. Parking brake, when applied, shall remain in applied position despite exhaustion of source of energy used for application or leakage of any kind.

C. The parking brake knob shall be an easy-grip design. Exception: Intellipark.

**Certification**

A. The first production unit of each type shall be used as a "pilot model" as defined by the bid proposal and shall be inspected at the manufacturing facility or a location to be determined by the State Director in consultation with the dealer prior to any remaining units being produced.

B. Chassis manufacturer shall certify to the State Director of School Transportation that product meets all applicable federal requirements. Chassis seller shall certify that the State Director that product meets all state requirements.

C. The bus shall have a data tag installed on the bus that states the maximum seating capacity which includes the driver. A decal shall be installed that states build year per the bid quotation.

**Differential**

A. The differential ratio shall be determined by the dealer to provide the best possible fuel economy/performance balance.

B. In no case shall the ratio be used to limit the 65-mph road speed.

**Drive Shaft**

A. Torque capacity of the drive shaft assembly shall exceed maximum engine torque as developed through lowest transmission gear reduction.

B. Each drive shaft section shall be protected by a metal guard or guards around circumference of drive shaft to prevent whipping through the floor or dropping to the ground if broken.

**Electrical System**

A. Low Voltage Battery.

1. Diesel Power: Three Group 31 batteries with a minimum of 1950 cold cranking amps (CCA) total are required. Gasoline/propane-powered buses shall have a minimum of two batteries with a minimum of 1300 CCA. Electric-powered buses shall be the manufacturer's standard.

2. All buses shall be equipped with a battery disconnect switch to allow the electrical source on the bus to be turned off in case of an electrical short and when the bus is not in use.

3. The switch is to be placed in a location not readily accessible to the driver or passengers.

4. location shall be labeled, and the labeling shall be visible from the exterior of the bus.

5. There shall be a manual noise suppression switch installed in the control panel. The switch shall be labeled and shall be yellow in color. This switch shall be an on/off type, not a momentary type, that deactivates body and chassis equipment that produces noise, including, at least, the AM/FM radio, heaters, air conditioners, fans and defrosters. This switch shall not de-activate safety systems, such as windshield wipers or lighting systems. Exception: Electric Vehicle (EV) roof mounted A/C with integrated condenser can be left running and the fan shall be set on low.

**Exhaust System**

A. After treatment device and tailpipe shall be outside the bus body and attached to the chassis, with hangers designed to accommodate expansion and contraction of the system without damage to the system or hanger(s). Exception: Electric Powered Vehicle.

B. Tailpipe shall be constricted of a corrosion-resistant tubing material at least equal in strength and durability to 16 gauge steel tubing.

C. Tailpipe shall be flush with but not extend more than 1" beyond the perimeter of the body.

D. Left side exit is permissible.

E. Size of tailpipe shall not be reduced after it leaves the muffler/after treatment device.

**Fenders, Front**

A. The fender/bumper design must prevent direct road spray between fender and front bumper, or a flap must be installed to prevent such spray.

1. Type C vehicles.

a. A fiberglass tilt hood shall be provided with wiring quick-disconnect in the engine compartment, located at or near the radiator cradle. All electrical wiring between the fiberglass hood and the engine compartment shall pass through waterproof disconnect device(s) to facilitate removal and/or replacement of the hood.

b. rubber fender extenders shall be provided unless fender design prevents spray from tires to the windshield and mirrors and deletion is approved by the State Director.

c. front fenders shall be properly braced and free from any body attachment. Adwquate clearance shall be maintained between tires and fenders so that contact will not occur under any circumstances.

d. mud flaps shall be furnished by body manufacturer.

**Frame**

A. Frame rails less than 50,000 psi must be reinforced to prevent cracking. Exception: integrated truss chassis.

**Fuel Tank**

A. The fuel tank on all gas and diesel buses, 47 passengers and above, shall have a minimum capacity of 60 gallons with a 55-gallon actual draw. It shall be filled and vented outside of the body. Construction will prevent the spillage or drainage of fuel on any part of the exhaust system. The fuel tank shall be the manufacturer's standard. All fuel tanks shall be constructed per the manufacturer's standards and with corrosion-resistant material. Fuel tank shall be ordered with polyurea coating.

1. Exception: Type A vehicles will come with the manufactures standard.

2. A drain plug of at least ¼ inch pipe thread shall be located in the center of the bottom of tank.

**Governor**

A. The speed shall be controlled electronically, set at a max speed of 65 MPH.

**Horn(s)**

A. A bus shall be equipped with dual horns of standard make, capable of producing complex sound in bands of audio frequencies between 250 and 2000 cycles per second with a sound level of 110 dB at three

feet, per SAE Standard J377. The measurement shall be made with the meter set at flat response - C weighting.

**Power and Gradeability**

A. Gasoline and propane power are permissible.

B. The following chart presents the minimum horsepower (HP) and/or torque requirements for engines to be used in chassis-accommodating bus bodies of the respective capacities.

| **DIESEL POWER** | |
|---|---|
| Passenger Capacity | Minimum Gross Horsepower/Torque |
| Under 35 | 130HP/420 |
| 35 - 46 | 200HP/520 |
| 47 - 64 | 220HP/520 |
| 65 - 78 | 230HP/560 |
| 79 - 83 | 240HP/620 |
| 84 - 91 | 245HP/660 |

C. Type C and D diesel vehicles shall be equipped with a fast idle control device.

D. A recessed and covered receptacle for the block heater shall be mounted in the front bumper. Exception: Types A and D vehicles under 35 passengers, manufacturer's standard. Type D vehicles, rear engine - receptacle shall be located in the rear; and Type D vehicles, front engine - receptacle may be mounted to the bus body in front of the service door. Propane and gasoline powered vehicles are not required to meet this standard.

E. The warranty for the engine shall be a minimum of five years/100,000 miles. All available warranty information must be provided to the purchaser.

F. Firewall insulation is required. Exception: Rear engine vehicles.

G. A maximum idle time shall be set at ten minutes. Exception: Lift-equipped equipped and Type A buses.

**Springs / Suspension**

A. Air suspension systems are standard on rear axle only. Exception: Type A

**Stability Control**

A. Electronic Stability Control shall be provided.

**Steering Gear**

A. chassis shall be equipped with a tilt and telescopic steering wheel.

**Tires and Rims**

A. The bus must have the original installed tire size on the data plate.

**Transmission. Exception: Electric School Buses**

A. Automatic transmissions shall be equivalent to either the Allison 2500 Pupil Transport Series (PTS) five or six-speed transmission for buses of 35 to 76 passenger capacity inclusive or the 3000 PTS five or six-speed for buses of 77 to 90 passenger capacity.

B. The minimum fluid requirement for the automatic transmission is to be manufacturers approved synthetic fluid.

C. The warranty for the transmission shall be a minimum of five years/unlimited mileage. Exception: Type A propane and gasoline can be manufacturers' standard.

**Section 2: School Bus Body.**

**Body Fluid Clean-Up Kit**

A. Each bus shall carry a Grade A metal or rigid plastic, moisture resistant kit, mounted in an accessible place and identified as a body fluid clean-up kit with a directions-for-use sheet attached to the inside cover.

1. an optional STOP THE BLEED KIT is permissible.

**Ceiling (See Insulation and Interior).**

**Child Reminder System**

A. An electronic device shall be installed that requires the bus operator to walk to the rear of the bus after each run to deactivate and to check for children left on the bus.

B. The device shall only be armed after the activation of the student loading light system.

C. There shall be an audible and/or visual warning to indicate to the bus operator the system has been armed.

D. A horn shall begin sounding either by opening the entrance door or within a 30 to 60-second delay after the system has been armed and the ignition is in the off position. Type A shall activate when the left side driver's door is opened also.

**Color**

A. The hood, cowl, and fenders shall be National School Bus Glossy Yellow. Exception: Hood may be painted low luster yellow.

B. The grille may be the manufacturer's standard.

C. The rear of the bus shall have in reflective material, the lettering STOP WHEN RED LIGHTS FLASH.

**Construction**

A. The construction shall be of prime commercial quality steel or other material with strength at least equivalent to all steel as certified by the body manufacturer. Fiberglass or other composite materials are acceptable provided the construction meets all federal standards and the manufacturer certifies the materials to be of durable construction.

B. The bus body shall meet the Colorado Rack Test and Kentucky Pole Test.

**Doors**

A. Service Door.

1. A service door shall be under the control of the operator, designed to afford easy release and prevent accidental opening, and controlled by a three-position switch that is installed to the left of the operator. Exception: Type A may be to the right and does not have to have a three-position switch. A power-operated service door is required on Type A, C, and D buses. The service door emergency release shall be located below the windshield, accessible and identified to all passengers. The positions of the three-position switch are: 1st position door closed, 2nd position door closed but red lights, stop arm and crossing gate activated/deployed, 3rd position door open red lights, stop arm and crossing gate activated/deployed. As the switch is being operated in the opposite direction, the 2nd position will close the door, but the red lights, stop arm and crossing gate stay activated/deployed, 1st position will cancel the red lights and deactivate the stop arm and crossing gate.

2. The service door shall be located on the right side of the bus opposite the operator and within direct view of the operator. A decal shall be installed on the inside of the door with proper opening instructions when the front or rear side requires it to be released first.

3. The service door shall be an outward opening door equipped with a handle on the outside of the door.

4. There shall be no door to the left of the operator on Type C and D vehicles. Type A vehicles under 35 passengers may be equipped with the chassis manufacturer's standard door.

5. The service door shall be equipped with a vandal lock. Exception: Type A, exterior lock not permissible.

B. Emergency Door.

1. A vandal lock shall be installed on all emergency doors. It shall be wired into the ignition and/or starting circuit to prevent the starting of the bus with the door locked.

2. The vandal lock shall be equipped with an audible alarm to alert the driver that the vandal lock is engaged. This alarm shall sound in the vicinity of the rear door to help the driver identify that the vandal lock is engaged.

**Emergency Exits**

A. The body of the bus shall be equipped with roof safety hatches that combine the following functions in each unit:

1. multi-position, fresh air ventilation without static vents.

2. a full handgrip release handle(s) permitting operation as emergency exit(s), accessible inside and outside the vehicle.

B. Each emergency exit shall comply with the currently adopted version of the NSTSP.

**Fire Extinguisher**

A. Each bus shall be equipped with at least one pressurized, dry chemical-type fire extinguisher of total metal construction, refillable, and securely mounted with a bracket. A pressure gauge shall be mounted on the extinguisher to be easily read without removing the extinguisher from its mounted position.

B. The fire extinguisher shall be of a type approved by the Underwriters Laboratories, Inc., with a total rating of not less than 2A-10-BC. The operating mechanism shall be sealed with the type of seal which will not interfere with use of the fire extinguisher.

**First Aid Kit**

A. Each bus shall have a removable moisture and dustproof first aid kit mounted in an accessible location within the operator's compartment. This place shall be properly identified, if not within full view.

B. The minimum requirement is the current NSTSP specification.

**Floor**

A. The floor of the bus shall be of prime commercial quality steel of at least 14-gauge or other material equivalent in strength to 14-gauge steel. The floor shall be covered with approximately 5/8" thickness plywood, at least five-ply, and shall be marine grade plywood, C-D Grade, as specified in the standard issued by the U. S. Department of Commerce and shall be attached to the metal floor with stainless steel fasteners. The floor shall be level from front-to-back and from side-to-side, except in wheel housing, toe board, and operator's seat platform areas.

**Floor Covering**

A. The cove molding shall be used along the side walls and rear corners. Metal or equivalent aisle joint strips shall be used to protect joints of flooring. Aisle strips shall be so shaped that the edges of same shall be drawn and held firmly to the flooring material. Welded seam one-piece construction is permissible.

B. The floor covering shall not be black in color. Exception: Molded wheel housing covers.

**Fuel Port Door. Exception: Electric school buses**

A. The body manufacturer shall furnish a fuel port door on all vehicles. Exception: Type A

B. All vehicles shall have a fuel door labeled with proper fuel type and the label shall be within six inches of the door.

C. The fuel port door shall have a securement device.

D. A Diesel Exhaust Fluid (DEF) door is required if applicable and must be labeled.

**Heaters and Air Conditioning**

A. Heating System.

1. Each heater is to be independently controlled by a switch.

2. An installed closed combustion fuel fired heater is not permissible.

3. For 35 to 64 passenger buses, there shall be one step-well heater, and one rear minimum 50K British Thermal Unit (BTU) heater provided. For 65 to 90 passenger buses, there shall be one step-well heater, one mid-ship minimum 50K BTU heater and one rear minimum 50K BTU heater provided. Exception: Type A, no step-well heater required. Type A shall utilize a 40K minimum rear heater. Type D, no step-well heater required. All lift equipped buses shall have rear heaters mounted on rear wall.

4. At least two auxiliary fans, six inches in diameter, shall be installed, suspended from above on each side of the windshield, and can be adjusted for maximum effectiveness. The fan blade shall be covered with a protective cage. Each fan shall be controlled by a separate switch. Auxiliary fans are not to be considered as part of the primary defrosting and defogging system. Exception: Type A school buses.

**Identification**

A. Illuminated and reflective school bus signs are required on the front and rear of the bus. Must be illuminated anytime the engine is running.

B. Every bus shall be lettered "..... COUNTY SCHOOLS" on both sides of the bus and numbered on both sides and rear.

1. Bus numbers on both sides shall be near the front, in line with the lettering.

2. Lettering and numbering on sides of the bus shall be at least six inches high.

C. The number of the bus shall be a minimum of five inches in height, in white or yellow, displayed on either the front bumper or the front of the bus.

**Insulation**

A. The ceiling, walls, and bulkhead or bow cavities shall be fully insulated with proper material.

B. The ceiling and walls shall be fully insulated with a thermal insulation that is fire resistant, with a minimum R-value of 5.5. Insulation shall be installed so as to prevent sagging.

**Interior**

A. The flammability of interior materials shall meet current Federal Motor Vehicle Safety Standard (FMVSS) 302.

B. Full length acoustical ceiling shall be provided.

**Lamps and Signals**

A. All lamps, including installation, shall conform to current standards and recommendations of SAE, West Virginia Motor Vehicle Law and current FMVSS 108. All exterior and interior lamps including the headlights shall be light emitting diode (LED).

B. Clearance, Back-up and Side-Marker Lamps.

1. Clearance, side-marker, and identification lamps shall be protected or flush mounted.

2. Two seven-inch back-up lamps, or equivalent, are required.

3. Additional lighting is required to illuminate the area around the rear tires automatically when the back-up lights have been activated. The system shall be a white, light-emitting diode (LED), light-wired to the back-up light circuit.

4. The system shall illuminate a rectangular area on both sides of the vehicle beginning 29 inches aft of the center point of the rear axle and extending outward from the vehicle sides 24 inches and rearward 30 inches.

5. There shall be no point within this illuminated area having illumination of less than three-foot candles as tested on a bare concrete surface.

6. Back-up lights shall illuminate the ground at the rear of the bus when the rear exit door is open.

C. Interior Lamps.

1. Interior lamps shall include two rows of dome lamps installed on two circuits so that lamps in the front half and lamps in the rear half of the bus are on separate circuits.

2. A stepwell light which adequately illuminates the stepwell shall be provided. It shall be connected in the clearance lamp circuit and activated when the service door is opened. A separate light shall illuminate the outside area at the stepwell.

D. School Bus Alternately Flashing Signal Lamps.

1. The bus shall be equipped with two red lamps at the rear of the vehicle and two red lamps at the front of the vehicle. In addition to the four red lamps, four amber lamps shall be installed so that one amber lamp is located near each red signal lamp at the same level but closer to the vertical centerline of the bus. The system of red and amber signal lamps shall be wired so that amber lamps are energized manually. The red lamps are automatically energized, and the amber lamps are automatically de-energized when the stop sign, and front bumper crossing control arm are extended or when the bus entrance door is opened. An amber pilot lamp and a red pilot lamp shall be installed adjacent to the driver controls for the flashing signal lamp to indicate to the driver which lamp system is activated.

2. Each school bus shall be equipped with a system consisting of four red signal lamps designed to conform to current SAE Standard J887 (School Bus Warning Lamp) and four amber signal lamps designed to that standard except for color. This system, stop arm, and crossing control arm shall be wired through a master switch but not through the vehicle ignition switch.

a. Shields over lamps, painted black, are required.

b. The system shall be wired so that the amber signal lamps are activated only by hand operation, and, if activated, are automatically deactivated, and red signal lamps are automatically activated when the bus entrance door is opened.

c. There shall be an indicator lamp which shall illuminate when the respective amber or red systems are actuated. The pilot lamp shall either go out or flash at an altered rate in the event the system is not functioning normally.

d. The signal lamp system shall operate as follows:

I. With the master switch on and the entrance door closed, the operator shall depress the hand switch. The ~~a~~mber pilot lamp and amber signals shall illuminate.

II. The operator shall open the entrance door. The amber pilot lamp and amber signal lamps shall turn off, and the red pilot lamp and red signal lamps shall illuminate. The stop sign and crossing control arm, if air or electrically powered, shall automatically extend.

III. the operator shall close the entrance door. The red pilot lamp and signal lamps shall turn off, and the stop sign and crossing arm, if air or electrically powered, shall retract immediately.

IV. The operator shall open the entrance door without depressing the hand switch. The red pilot lamp and red signal lamps shall illuminate. The stop sign, if air or electrically powered, shall automatically extend.

V. With the master switch off, the depressing hand switch shall not actuate the amber signal system, nor shall opening the entrance door actuate the red signal system, the stop sign or crossing control arm.

VI. The vehicle's red loading lights shall have the ability to be activated with the key in the on or off position. If the system utilizes a single switch to activate the red lights, it shall be protected against possible accidental activation while the bus is in motion.

VII. All loading light controls shall be to the left of the operator. Exception: Type A.

3. Installation Requirements.

a. Each flashing signal lamp shall be mounted with its axis substantially parallel to the longitudinal axis of vehicle.

b. The front and rear alternately flashing signal lamps shall be spaced as far apart laterally as practicable.

c. The alternate flashing signal lamps shall be mounted at the front above the windshield and at the rear so that the lower edge of the lens is not lower than the top line of the side window.

d. The vertical and lateral vision of the front and rear alternately flashing warning lamps shall not be obstructed by any part of the body or lamp house insofar as standard bus body construction shall permit.

e. The area around each lamp shall have a readily visible black border for contrast purposes.

f. A separate fuse, circuit breaker, or Field Effect Transistor (FET) adequate to prevent damage to the system in the event of a dead short shall be provided between the power source and the master switch.

E. Roof Mounted Strobe Lamp

1. An LED strobe lamp, white in color, shall be mounted on the roof of the school bus.

2. The strobe lamp shall be a double flashing Class 2.

3. The lamp shall be a maximum of five inches in height, located on the center line of the roof and behind the rear roof hatch.

**Mirrors**

A. Exterior Mirrors.

1. All exterior mirrors are to be heated, mounted with stainless steel brackets and must conform to current FMVSS 111.

2. Remote controlled external rear view mirrors are required.

**Mud Flaps**

A. Mud flaps or guards are required and shall be provided by the body manufacturer for both front and rear wheels. They shall be constructed of heavy-duty multi-ply mud flap material.

B. Front mud flaps or guards shall be of adequate size to protect body areas vulnerable to road debris from wheels and mounted to be free of wheel movement at all times.

C. Rear mud flaps or guards shall be comparable in size to width of the rear wheel housing and shall reach within approximately nine inches of the ground when the bus is empty. They shall be mounted at a distance from the wheels to permit free access to spring hangers for lubrication and maintenance and to prevent being pulled off while the vehicle is in reverse motion and damage by tire chains.

**Rub Rails**

A. Rub rails shall be black.

B. Rub rails shall extend from the rear of the entrance door completely around the bus to the point of curvature near the outside cowl on the left side. At least one rub rail will extend around the rear of the bus. Exception: Type D vehicles with rear engine, and electric Type A and Type D.

C. Rub rails shall be one piece except where broken by the emergency door, wheel housings, battery box, access panels, the corner of bus, etc. All ends shall be capped.

D. Rub rails shall be securely attached at least twice to each body post and upright structural member within their length.

**Seat Belt for Operator**

A. A Type 2 lap belt/shoulder belt shall be provided for the operator.

B. On buses where the driver's seat and upper anchorage for the shoulder belt are both attached to the body structure, a driver's seat with an integrated Type 2 lap/shoulder belt may be substituted. Lower anchors (tethers) shall be adjustable.

C. On buses where the driver's seat and upper anchorage for the shoulder belt are both separately attached to both body and chassis structures (i.e., one attached to the chassis and the other attached to the body), a driver's seat with an integrated Type 2 lap/shoulder belt should be used.

D. The assembly shall be equipped with an emergency locking retractor for the continuous belt system.

E. On all buses except Type A that are equipped with a standard chassis manufacturer's driver seat, the lap portion of the belt system shall be guided of anchored to prevent the driver from sliding sideways under the belt system.

F. The lap/shoulder belt shall be designed to allow for easy adjustment to fit properly and to effectively protect drivers varying in size from 5th percentile adult female to 95th percentile adult male.

G. Lap belt/shoulder belt shall be orange in color.

**Seats**

A. The operator's seat shall be of the air ride high-back type with a minimum seat back adjustment of 15 degrees, and with a head restraint to accommodate a 95 percentile adult male (95 percentile adult male as defined in FMVSS 208). The lower seat cushion and back shall have fabric covering. The seat shall have lumbar support.

B. Any two seats of the first two rows of seats on all buses shall be simultaneous seat-belt ready seats, equipped with Lower Anchors and Tethers for Children (LATCH) systems for Child Safety Restraint Systems (CSRS).

C. For securing child infant seats, the seats must meet current FMVSS 210, FMVSS 222, and FMVSS 225 requirements.

D. Integrated child safety seats (with or without ISO Latch) are permissible except adjacent to an emergency exit window.

E. All 39 inch and larger passenger seats must be equipped with two sets of anchorage points per bench seat.

F. All such passenger seats with a seat width of fewer than 36 inches must be equipped with one set of anchorage points per bench seat.

G. No bus shall be equipped with jump seats or portable seats.

F. A modesty panel will be provided under the right and left front crash barrier.

G. All restraining barriers and passenger seats shall meet the criteria contained in current FMVSS 302.

H. The last seat on the left side of all buses with a rear emergency door shall not exceed 30" in width.

**Steps**

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

**Stop Sign and Crossing Control Arm**

A. There shall be a stop sign installed on the left front of the body which shall be equipped with a wind guard.

1. Two alternately flashing, high intensity, red strobe lamps visible from both sides of the sign shall be provided.

2. The stop sign shall be air operated. Exception: Type A and Electric bus.

B. A solid piece crossing control arm mounted to the right front bumper of the bus is required.

1. The device shall be air powered. Exception: Type A and Electric bus

2. The crossing control arm shall be wired in conjunction with the stop sign and the alternately flashing signal lamp.

3. The crossing arm shall be equipped with a device to hold the arm to the bumper when the arm is not activated.

**Storage Compartment**

A. Two compartments of adequate strength and capacity for storage of tire chains and other equipment shall be provided on either side or both on the same side.

1. Such storage compartments shall be located outside the passenger compartment.

2. The dimensions of these compartments shall be a minimum of 25 inches long, 16 inches wide, and 12 inches high. Exception: Type A vehicles may be manufacturer's standard size.

3. Vehicles with less than 55 passenger capacity and has air conditioning shall have at least one compartment.

4. Buses with larger luggage compartments are not required to meet this standard.

B. A door with locks keyed alike as well as a proper latch shall be provided.

1. Such compartments shall be constructed with a provision for the drainage of water resulting from snow and ice on tire chains.

**Sun Shield**

A. An interior adjustable, transparent, and tinted sun shield at a minimum of six inches x 30 inches shall be provided.

B. The sun shield must be capable of being turned to an angle of 180 degrees when not in use. Exception: Type A vehicles under 35 passengers, manufacturer's standard.

**Video Equipment**

A. Video equipment shall be installed.

B. Installation shall be either by the dealer/manufacturer or the county and both equipment and installation shall be subject to the following guidelines:

1. The equipment must be installed in an area at the front of the bus.

2. The equipment is outside the federal head impact zone, current FMVSS 222 School Bus Passenger Seating and Crash Protection.

3. The equipment is located in an area not likely to cause student injury.

4. The equipment shall be a minimum of a six-channel system. Camera head locations, if installed by the manufacturer, shall be chosen by the county. The equipment brand shall be chosen by the county. Exception: Type A shall be a minimum four-channel system and Type D shall be a minimum eight-channel system.

5. A video monitoring system for passing stopped school buses must include the minimum system requirements established by W. Va. Code §17C-12-8. A forward-facing camera shall be installed.

a. Must produce digital recorded video of vehicles being operated in violation of the W. Va. Code.

b. Must produce a recorded image of the license plate.

c. Must record the activation status of at least one warning device (the red traffic warning lights and the side stop sign) mounted on the school bus and the time, date, and location of the vehicle when the image is recorded.

C. Additional guidelines for video equipment must be met.

1. The lettering on the side of the bus must not be obscured.

2. The equipment must not impede or block any emergency exits.

3. All wiring must be mounted inside the side of the bus and cannot be mounted inside the driver/passenger area.

4. All roof and side mounting locations must be sealed to ensure there are no leaks.

5. The system wiring must be separate from any emergency lights, alarms, etc.

6. The system must operate automatically and not require the driver to activate it.

7. Vendor/manufacturer must provide documentation to the county that the system is properly mounted, and camera(s) are capturing clear video identifying a moving vehicle.

8. Installation by vendor/manufacturer must include warranty on the complete system for a minimum of 12 months after delivery of the bus.

9. Exterior cameras must be designed to eliminate movement due to vandalism or rough roads.

**Wheel Housings**

A. Non-metallic fender extensions that adequately protect the sides of the body from tire spray shall be provided.

**Windshield and Windows**

**A.** Emergency windows shall be vertically hinged.

**Windshield Washers**

A. A windshield washer reservoir shall be furnished and shall be at least a three-quart capacity unless space restrictions limit size of the container.

B. The windshield washer fluid shall be directed onto the windshield through jets on the wiper arm.

**Section 3. Training Requirements. Exception: Electric Vehicles (EVs), see section 9.**

A. The successful bidder will be required to provide training for county school bus mechanics, supervisors, and/or operators when requested by the State Director.

B. Such training, if required, will be specified in invitations to bid and will indicate the type, extent, and location of classes to be conducted.

**Section 4: Special Transportation Vehicle - Specially Equipped School Bus or Multipurpose Passenger Vehicle (MPV).**

A. Equipping buses to accommodate students with disabilities is dependent upon the needs of the passengers. While one bus may be fitted with a lift, another may have belts installed to secure child seats. Buses so equipped are not to be considered a separate class of school bus, but simply a regular school bus that is equipped for special accommodations.

**General Requirements**

A. Each securement system location shall have a minimum clear floor area of 30 inches x 54 inches. The front and rear securement points measured from center to center must be located no less than 54 inches apart. Additional floor area may be required for some applications. Consultation between the user and the manufacturer is recommended to ensure adequate area is provided in the event more securement locations are needed.

**Fastening Devices**

**Wheelchair Restraints**

A. All mobile seating must be in a forward-facing direction secured with at least a four-point tie-down system with at least two tie-downs at the rear and two tie-downs at the front of the device. The tie-down system should be adjustable so it can be adjusted and secured correctly depending on the size of the wheelchair.

B. The wheelchair securement system including all hardware (attachment bolts, track, etc.) must meet minimum impact forces of a 20 G, 30 MPH deceleration to simulate a frontal impact on the transport vehicle per WC18, Wheelchair Tie-downs and Occupant Restraint Systems for Use in Motor Vehicles (WC18).

C. All attachments or coupling systems which are designed to be connected and disconnected frequently must be operable by an adult person without the use of tools or other mechanical assistance.

D. All hardware and components of the securement system must be free of sharp or jagged areas and be made of corrosion resistant material or treated to resist corrosion.

E. All tie-downs used in the securement system for a mobile seating device must meet manufacturers' specifications and be of the automatic retractable type.

F. All tie-downs used in the securement system for a mobile seating device must be capable of adjustment in useful length of from four inches minimum to 34 inches maximum to provide sufficient flexibility to fit most possible applications.

G. All tie-downs used in mobile seating devices must be manufactured using synthetic fiber woven webbing capable of being cut to release the mobile seating device in case of an emergency condition which would preclude using the normal release function of the tie-downs.

H. All securement straps for mobile seating devices must be marked indicating that they meet the requirements of WC18.

I. A floor anchorage system shall be installed that maintains the seating versatility of the school bus with a minimum of two wheelchair position.

**Occupant Restraints**

A. An occupant restraint must be included as part of each securement system. The occupant securement must consist of a retractable pelvic restraint and upper torso restraint.

B. The occupant restraint system including all hardware (attachment bolts, track, etc.) shall have been successfully tested in combination with a mobile seating device securement system to meet minimum impact forces of 20 G, 30 MPH deceleration to simulate a frontal impact on the transport vehicle per WC18.

C. All attachment or coupling systems designed to be connected and disconnected frequently must be operable by an adult without the use of tools or other mechanical assistance.

D. The mobile seating device restraint should be retractable and independent of the occupant restraint and designed so that the weight of the wheelchair is not absorbed by the occupant.

E. Adjustment devices, quick-release buckles, and webbing used in the construction of the occupant restraint system must meet requirements of current FMVSS 209 and 222.

F. The pelvic restraint must be easily adjusted to fit a range of occupant sizes and contain a quick-release buckle. The upper torso restraint must be adjustable to fit a range of occupant sizes and be easily attached and disengaged from the pelvic restraint.

G. The manufacturer of the restraint systems must supply detailed instructions regarding the installation and use of the system, including mounting of attachment hardware or track, suggested angles for attaching tie-downs, and proper placement and positioning of the occupant restraint.

H. Padding or elimination of projections of structure or other similar elements must be considered in areas adjacent to the securement area of the mobile seating device.

**Restraining Devices**

A. Seat frames shall be equipped with attachments or devices to which belts, Child Safety Restraint System, or other devices may be attached.

B. Attachment framework or anchorage devices, if installed, shall conform to current FMVSS 210.

**Fire Blanket and Evacuation Aid**

A. The fire blanket shall be provided with a storage pouch, mounted to the wall conveniently located and identified as a fire blanket.

1. The fire blanket shall meet CRR 16-part 1610 standard for flammability of clothing.

2. The blanket shall be approximately 62 inches X 80 inches.

B. An evacuation aid shall be provided with a storage pouch, mounted to the wall conveniently located and identified as an evacuation aid and constructed with fire-resistant material.

**Passenger Capacity Rating. (See Certification in School Bus Chassis section1.)**

**Power Lift**

A. The power lift shall be located on the right side of the bus body.
Vehicle lift and Installation.

1. Vehicle lifts and installations shall comply with the requirements set forth in current FMVSS 403, Platform Lift Systems for Motor Vehicles, and current FMVSS 404, Platform Lift Installations in Motor Vehicles.

a. The lift system must be made to prevent accidental brake application while the bus is in motion.

b. The lift activation switch shall be green in color or outlined in green.

B. Lift Capacity.

1. The lifting mechanism and platform shall be capable of operating effectively with a wheelchair and occupant mass of at least 1000 pounds.

**Restraining Devices, Passenger Seats**

A. Seat frames shall be equipped with attachments or devices to which belts, restraining harnesses, or other devices may be attached.

B. The attachment framework or anchorage devices, if installed, shall conform with current FMVSS 210.

**Section 5: Specifications for Multi-Functional School Activity Bus (MFSAB).**

A. The vehicle must comply with the Definition of a Multifunction School Activity Bus (MFSAB) in the FMVSS as listed in 49 CFR Part 571, which is the National Highway Traffic Safety Administration's Final Rule on this vehicle. The primary purpose of this vehicle is to transport children, and as such, it must

comply with all applicable FMVSS, Americans with Disabilities Act of 1990 (ADA), and other standards for this type of vehicle including the West Virginia Minimum School Bus Specifications. It must be purchased or leased as a new bus and may only be used for extracurricular activities. These buses may not be used to transport students to and from schools or between schools for the purpose of attendance. In addition, the vehicle must have been inspected and received a satisfactory evaluation from the WVDE. Vehicles shall be of the latest model year in standard production and have parts that are stocked and warranty service that is available at one or more points in West Virginia or border states.

B. The Multi-Functional School Activity Bus is designed to provide all the crash safety standards that can be found on a traditional school bus, but without the "flashers and signs" that traditional school buses need for frequent pick-up and drop-off at school bus stops. The vehicle will not have specialized warning devices such as stop signs and warning lights, and it will not be school bus yellow.

1. The following exception to the West Virginia Minimum Specifications for School Buses shall be allowed for these vehicles:

2. COLOR: The local school with school system approval may determine the color of the activity bus. The color scheme may utilize any combination of up to three colors. This combination may be in addition to an optional white roof. The color National School Bus Yellow (SBMTC-008 Publication) shall not be used as a part of the color scheme. School systems and/or vendors shall submit preliminary color schemes to the WVDE, Office of School Transportation for approval prior to the purchase or manufacture of an MFSAB.

**Identification**

A. The bus body shall bear the words "ACTIVITY BUS" in a contrasting color at least eight inches in heigh in the area where "school bus" is normally positioned. Lettering and numbering shall conform to FMVSS and West Virginia Minimum Specifications and shall meet reflectivity standards. The bus numbering on this bus may be of a contrasting color.

B. The name of the school system shall be displayed in at least six-inch letters on both sides of the bus in the beltline area. No signs or logos shall be applied to any area of the bus, including the bumpers. The name of the school may be displayed in the beltline area. No signs, logos, or other items shall be displayed on the windows of the bus.

**Lighting and Warning Devices**

A. All activity buses shall meet state and federal standards for normal school bus lighting and warning device requirements with the following exceptions.

1. MFSABs may not be equipped with alternately flashing amber or red signal lamps used for loading and unloading students.

2. MFSABs may not be equipped with stop arm signals or crossing control arms.

**Seat Belts**

A. Three-point lap-shoulder belts will be supplied for any MFSAB with a GVWR of 10,000 pounds and under.

The shoulder belts supplied must be fully retractable and the anchorage must meet current FMVSS-210.B.

**Seating**

A. All MFSAB buses shall have seats that comply with current FMVSS-222.

B. If the Gross Vehicle Weight Rating (GVWR) is 10,000 pounds and under, then it must also be equipped with three-point lap-shoulder belts certified to meet appropriate FMVSS standards.

C. School systems and/or vendors shall submit preliminary seating schemes to the WVDE, Office of School Transportation for approval prior to the purchase or manufacture of a MFSAB.

1. The successful vendor shall coordinate with the agency issuing the purchase order in the selection of material and color and type of seats.

**Section 6: School Bus Type Definitions.**

**TYPE A.** A conversion or bus constructed utilizing a cutaway front-section vehicle with a left side driver's door. This shall include two classifications: Type A-I, with a Gross Vehicle Weight Rating (GVWR) 14,500 pounds or less; and Type A-II, with a GVWR of greater than 14,500 and less than or equal to 21,500 pounds.

**TYPE C.** Constructed utilizing a chassis with a hood and front fender assembly. The entrance door is behind the front wheels; it is also known as a conventional school bus. This type also includes a cutaway truck chassis or truck chassis/cab with or without a left side-door and a GVWR greater than 21,500 pounds.

**TYPE D.** Constructed utilizing a stripped chassis. The entrance door is ahead of the front wheels; it is also known as transit-style school bus or forward control bus.

**SPECIALLY EQUIPPED**. Designed, equipped, or modified to accommodate students with special needs.

**Section 7: Specifications for Compressed National Gas (CNG) Buses; CNG – Fuel Conversion.**

**Conversion and Maintenance**

A. Conversion and maintenance is to be performed only under the supervision of an individual who has satisfactorily completed a training program provided by a CNG original equipment manufacturer.

B. A training program shall involve the mechanics of installation, maintenance, repair, trouble shooting, and safety procedures.

**CNG Vessels on School Bus**

A. Each CNG fuel supply vessel shall be constructed and inspected in accordance with the latest version of the National Fire Protection Association (NFPA) 52 standards.

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

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

**Mounting Vessels to School Bus**

A. All safety devices that may discharge shall be vented to the outside of the vehicle.

**Fuel Lines**

A. Fuel lines shall be permanently secured at intervals of not more than two feet with aviation type clamps and shall be placed in such a manner as to minimize the possibility of damage due to vibrations, strains, or wear.

B. Any fuel line passing through, under, or over a structural member shall be protected by rubber grommets or tubing. Loops in the fuel lines shall be provided at appropriate stress points.

C. An automatic natural gas shut-off valve or solenoid shall be provided as an integral part of the regulator package assembly.

D. A manual shut-off valve shall be installed between the vessels and the regulator.

1. This shut-off valve shall be readily accessible to the operator, be protected from rocks and other forms of debris, and be on the curb-side of the bus where possible.

2. Such shut-off valve shall be clearly marked with reflective material.

3. If access is gained by cutting a hole in the side of the bus, suitable protective material shall be placed around the edge of the hole.

4. Wherever possible, the manual shut-off valve should be located as close as possible to the CNG vessels.

**Vehicle Refueling Connection**

A. The fueling systems shall be equipped with a backflow check-valve that will prevent the return flow of gas from vessel(s) to the filling connection.

B. All school buses shall be fitted with a refueling interlock system to prevent the bus from being moved on its own power during a refueling operation.

C. The fueling connection shall meet the standards of National Fire Protection Association (NFPA) 52.

D. The filler hose vent valve on the refueling probe shall be directed away from the operator.

**Labeling Required**

A. CNG vessel area labels showing CNG vessel I.D., hydrostatic test data, and CNG vessel master manual shut-off valve location are required.

B. Engine compartment labels to include CNG warning and instructions to mechanics including the following:

1. CNG fueled vehicle.

2. system service pressure.

   a. installer's name or company.

   b. vessel retest date(s) or expiration.

   c. total vessel water volume in gallons (liters).

**CNG Equipment**

A. Manufacturers wishing to deal in CNG equipment in West Virginia must meet all applicable federal and state requirements.

**Limit of Flammability**

A. Natural gas introduced into any system covered by this standard shall have a distinctive odor potent enough for its presence to be detected down to a concentration in air of not over 1/5 of the lower limit of flammability.

**Section 8: Specifications for Liquefied Petroleum Gas (LPG) Buses.**

**LPG Vessels on School Buses**

A. The fuel system shall comply with the latest version of NFPA 58 Liquefied Petroleum Gas Code. The fuel system integrity shall meet the specified leakage performance standards when impacted by a moving contoured barrier in accordance with test conditions specified in current FMVSS 301 and current *Commercial Motor Vehicle Safety Standards (CMVSS)* 301.1 Fuel System Integrity for LPG.

B. Propane valves shall be protected by guards or expanded steel grating.

C. Steel vessels must have protective paint coating.

D. A manual shut-off valve for maintenance shall be installed.

1. This valve shall be accessible to the operator, be protected from rocks and other forms of debris and be located on the curb-side of the bus where possible.

2. The valve location shall be clearly marked on the side of the bus.

3. Wherever possible, the valve should be located as close as possible to the LPG vessels.

**Fuel Lines**

A. Fuel lines shall be permanently secured at intervals of not more than two feet.

B. Fuel lines shall be placed in such a manner as to minimize the possibility of damage due to vibrations, strains, or wear.

C. A fuel line passing through, under, or over a structural member shall be protected by grommets or tubing.

**Fuel System Filtration**

A. Fuel filter shall be a high-capacity, high-flow LPG specific filter which is rated at five microns.

**Venting**

A. All safety devices that discharge to the atmosphere shall be vented to the outside of the vehicle.

B. The discharge line from the safety relief valve on all school buses shall be located at the rear of the vehicle on the driver's side with the relief nozzle pointing to the ground.

C. Discharge lines shall not pass through the passenger compartment.

**Vehicle Refueling Connection**

A. The vehicle shall be equipped with a receptacle with Aerospace Civil and Mechanical Engineering (ACME) thread and dust cap.

B. The fueling systems shall be equipped with a backflow check-valve that will prevent the return flow of propane fuel.

C. The fueling connection shall meet the standards of the latest version of NFPA 58.

**Labeling Required**

A. Propane vessel shall be labeled per American Society of Mechanical Engineers (ASME) requirements.

B. Engine compartment labels are to include LPG warning and instructions to mechanics including the following:

1. system service pressure.
2. installer's name or company.

**LPG Equipment**

A. Manufacturers wishing to deal in LPG equipment in West Virginia must meet all applicable federal and state requirements.

**Engine**

A. Engine retarder is not required.

B. An idle limiter is not required.

C. Warranty for the engine shall be a minimum of five years/100,000 miles.

**Transmission**

A. Allison 2300 series is acceptable.

B. Ford 6R140 is acceptable.

C. Retarder is not required.

D. Synthetic fluid is not required.

E. Warranty shall be a minimum of five years/100,000 miles.

**Differential**

A. A limited slip differential is acceptable.

**Air Compressor**

A. The air compressor shall be rated at a minimum of 13.2 Cubic Feet per Minute (CFM).

**Block Heater**

A. A block heater is not required.

**Exhaust System**

A. The exhaust system shall meet the manufacturer's specification but shall be flush with the body and not exceed one inch outside the bus body.

**Section 9: Specifications for Electric Buses**

**This specification is for new electric school buses only and does not allow for the modification of any existing school bus.**

**Training for Local School Personnel**

A. The successful bidder shall be required to provide training for first responders, state personnel, supervisors, county school bus mechanics and bus operators in the safe and efficient operation, inspection, repair and maintenance of the bus. This training may be provided at multiple locations around the state in response to local demand. Class content, location and frequency shall be approved by the WVDE.

B. All facilities shall acquire all PPE required to work on the electric bus. This includes a shepherd hook.

**Compliance With FMVSS**

A. All electric systems shall be in full compliance with all applicable Federal Motor Vehicle Safety Standards (FMVSS) and all Society of Automotive Engineers (SAE) standards that are applicable at time of manufacture.

**Charging**

A. Charging connection point shall be outside the passenger compartment.

B. While charging, the transmission/propulsion system shall be rendered inoperative.

C. Shall have AC and/or DC charging capabilities.

D. May be V2G (Vehicle to Grid) capable.

E. Wireless charging is permissible.

**Electric Power Source (battery)**

A. Shall not be located in or accessible from the interior of the school bus.

B. Shall be designed to prevent the passenger compartment from becoming energized.

C. All batteries shall be designed to prevent any dangerous fluids or fumes from entering the passenger area.

D. Battery packs shall be appropriately heated and cooled.

E. High voltage Battery warranty shall be a minimum of 8 years/100,000 miles. Excludes vehicles using Vehicle-to-Grid (V2G) or used to export power.

**Heating**

A. Heaters shall be capable of heating the passenger and driver's compartments.

**Instrument Display**

A. The instrument display panel must contain:

B. an indication showing the state of charge (power and /or range).

**Markings**

A. The outer layer of insulation or wiring conduit for drive system high-voltage wiring shall be industry standard orange color.

B. All high-voltage components shall be labeled with a High Voltage marking/warning.

C. An electric vehicle identifying label shall be affixed on the right rear corner of the bus body.

D. An additional label shall be applied to the right side of the bus rearward of the entrance door and to the left side of the bus in front of the driver's window.

**Operating Range**

A. Shall be OEM design which is capable of operating with a range of 100 miles or more.

**Power Disconnect**

A. A power disconnect device or a switch to disable high voltage shall be provided.

B. This disconnect device, or switch shall be clearly marked.

C. If located inside a compartment, the compartment shall be clearly marked.

D. This device or switch shall not be in or accessible from the passenger area.

**Power Regeneration**

A. Regenerative braking shall be required.

**Propulsion System / Drivetrain**

A. Shall be of sufficient power and torque to propel the vehicle fully loaded up to 65 mph.

B. Propulsion system warranties shall be a minimum of 5 years/100,000 miles.

**Seating**

A. All seats shall be mounted to eliminate contact with batteries and underside of the bus if seat replacement or reconfiguration is necessary.

**Sound Generation**

A. All electric school buses shall produce a sound for pedestrian alert while in motion under 15 mph as required by current FMVSS 141.