

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

2014 REVISED EDITION

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 Executive 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 Executive 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 Executive Director of School Transportation.

SCHOOL BUS CHASSIS

AIR CLEANER

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.

AXLES

- A. The front and rear axles including suspension assemblies, and all frame to ground components, shall have a gross axle weight rating at ground at least equal to that portion of the load as would be imposed by the chassis manufacturer's maximum gross vehicle weight rating.
- B. All vehicles shall be equipped with appropriate GAWR axles or suspension systems and tires by chassis manufacturer.
- C. Front axle shall be heavy duty bus type and equipped with oil bath (synthetic lubricant) wheel bearings. EXCEPTION: Type A buses.

BACK UP ALARMS

All buses shall be equipped with audible electrical warning device, automatically actuated when bus is in reverse gear. Device shall be of 112db, meeting SAE-J99. Device shall be mounted behind rear axle, between frame rails, and shall emit intermittent sound. Variable sound is not permitted.

BRAKES

- A. A braking system including service brake and parking brake shall be provided.
- B. Buses using an air-operated braking system shall be equipped with a Wig Wag warning device, and/or devices readily audible which have a minimum rating of 80 decibels measured at the operator's ear and visible to the operator that will give a continuous warning when the

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available air pressure available in the system for braking is 60 psi (pounds per square inch) or less and must remain activated until the system is at or above 60 PSI (pounds per square inch). 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. ABS automatic traction control system 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 adjuster on all four wheels. EXCEPTION: Air Disc
 - c. Have at least 13.2 CFM air compressor.
 - d. Be protected by a desiccant type air dryer, with an ADIP or equivalent spin-on replaceable filter.
 - e. Be equipped with an engine or an exhaust brake. A manual control, clearly identified, shall be within easy reach of the operator, in addition to a modulated control through the brake treadle valve.
 - f. All brakes must meet or exceed applicable FMVSS standards for braking
 - g. Have a Schrader valve to charge the school bus air system in the event of a compressor Failure
 - h. Be equipped with MGM or equivalent long stroke welded clevis air chambers
Exception: Air Disc
 - i. Be equipped with Arvin Meritor slack adjusters or equivalent
Exception: Air Disc
 3. Any brake system dry reservoir shall be safeguarded by a check valve or equivalent device that in the event of failure or leakage in its connection to the source of compressed air or vacuum, the stored dry air or vacuum shall not be depleted by the leakage or failure.
- C. 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.

- D. All brake lines, power and booster-assist lines shall be protected from excessive heat and vibration, and be installed to prevent chafing.
- E. All brake systems shall be designed to permit visual inspection of brake lining wear without removal of any chassis components.
- F. Air disc type brakes installed by chassis manufacturers are permissible.
- G. 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

Parking brake, when applied, shall remain in applied position despite exhaustion of source of energy used for application or leakage of any kind. All non-park pawl transmissions shall incorporate a park brake interlock that requires the service brake to be applied to allow release of the parking brake.

BUMPERS

All bumpers are to comply with **NSTSP**

CERTIFICATION

1. Chassis manufacturer shall certify to the State Executive Director of School Transportation that product meets all applicable federal requirements. Chassis seller shall certify to the State Executive Director of School Transportation that product meets all state requirements.
2. The bus shall have a data tag installed on the bus that states the maximum seating capacity which includes the driver.

COLOR

- A. Chassis, including front bumper, shall be black. (Grille may be manufacturer's standard.)
- B. Hood, cowl, and fenders shall be National School Bus Glossy Yellow. (SBMI-008)
EXCEPTION: Hood may be painted low-luster yellow.

DIFFERENTIAL

Differential ratio shall be determined by the dealer to provide the best possible fuel economy/performance balance. In no case shall the ratio be used to limit 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. Battery

1. Diesel Power: Three Group 31 batteries with minimum of 1950 CCA total.
2. Battery cables of sufficient length without splices shall be provided by the chassis manufacturer.
 - a. All cables shall conform to SAE Standard J541 with respect to electrical resistance.
 - b. All cable assemblies shall conform to American Trucking Association-Truck Maintenance council (ATA-TMC) RP105.
 - c. Manufacturer shall assure continuous ground integrity.
3. Batteries for Type C and D vehicles shall be mounted in the body skirt by the body manufacturer. In this case the chassis manufacturer shall temporarily mount the battery on the chassis frame, with proper cables of appropriate length for mounting in final location by body manufacturer. All cables, mounting, etc., shall conform to the SBMI Design Objectives Booklet, May 1990 edition. Body manufacturer will be responsible for final cable and connections between batteries. All buses shall be equipped with a body battery disconnect switch to allow the electrical source on the bus body to be turned off in case of an electrical short and when bus is not in use. The switch is to be placed in a location not readily accessible to the driver or passengers. The location shall be labeled and the labeling shall be visible from the exterior of the bus. EXCEPTION: Type D vehicles, rear engine, may have batteries mounted in engine compartment.
4. All batteries will be utilized during engine starting.
5. Battery/batteries shall be furnished by chassis manufacturer.

B. Alternator

1. All Type C and D vehicles shall have an alternator with a minimum charging rate of at least 200 amperes. A/C equipped buses shall have a minimum of a 270 amperes.
Exception: Type A must use manufacturer's highest possible capacity alternator.
2. Belt drive shall be capable of handling the rated capacity of the alternator with no detrimental effect on other driven components.

C. Lamps and Signals -

1. USA daytime running lamps are required and will be activated at all times that the engine is running.

D. Wiring

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1. All wiring shall conform to current applicable recommended practices of the Society of Automotive Engineers, with the capability of carrying a 10% overload without damage to wiring circuits. All wiring shall use a standard color coding and each chassis shall be delivered with a wiring diagram that coincides with the wiring of the chassis.
2. Chassis manufacturer shall install a readily accessible terminal so that body and chassis electrical load can be recorded through the chassis ampmeter without dismantling or disassembling chassis component(s).
3. Chassis voltmeter and wiring shall be compatible with generating capacity. Type AI, D and B vehicles under 35 passengers may have ammeter in lieu of voltmeter.
4. In addition to the main 100 amperes body circuit terminal, chassis manufacturer shall provide the following terminals for body connections:
 - a. Tail lamps.
 - b. Right turn signal.
 - c. Left turn signal.
 - d. Stop lamps.
 - e. Back-up lamps.
 - f. Instrument panel lamps. (Rheostat controlled)
 - g. Ignition circuit.

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).
- B. Tailpipe shall be constructed 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. Type C vehicles.

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1. 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 Executive Director of School Transportation.
2. Front fenders shall be properly braced and free from any body attachment. Adequate clearance shall be maintained between tires and fenders so that contact will not occur under any condition.
3. A fiberglass tilt hood shall be provided with wiring quick-disconnect in 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.
4. Mud flaps shall be furnished by body manufacturer.
5. Fender/bumper design must prevent direct road spray between fender and front bumper, or a flap must be installed to prevent such spray.

FRAME

- A. Frame or equivalent shall have design and strength characteristics to correspond at least to standard practice for trucks of same general load characteristics which are used for highway service.
- B. Any secondary manufacturer that modifies the original chassis frame shall guarantee the performance of workmanship and materials resulting from such modification.
- C. Any frame modification shall not be for the purpose of extending the wheelbase.
- D. Holes in top or bottom flanges of frame side rail shall not be permitted except as provided in original chassis frame. There shall be no welding to frame side rails except by chassis or body manufacturers.
- E. Frame lengths shall be provided in accordance with SBMI Design Objectives, May 1990 edition.
- F. Frame rails less than 50,000 PSI must be reinforced to prevent cracking.

FUEL TANK

- A. Fuel tank shall have a minimum capacity of 60 gallons with a 55 gallon actual draw, on all buses 47 passengers and above. 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. EXCEPTION: Type A vehicles - Fuel tank shall be manufacturer's standard. All fuel tanks shall be constructed per the manufacturer's standards and with corrosion resistant material.
- B. No portion of the fuel system located to the rear of the engine compartment, except the filler tube, shall extend above the top of the chassis frame rail.
- C. Fuel lines shall be mounted to obtain maximum protection from the chassis frame. Engine supply

line shall be taken from top of tank.

- D. Fuel filter with replaceable element shall be installed between fuel tank and injector pump. Flexible gasoline-and-oil-proof connection shall be provided at engine end of fuel line.
- E. Drain plug of at least 1/4" pipe thread shall be located in center of bottom of tank.
- F. Fill-pipe cap shall be designed to minimize spillage of fuel when bus turns corner in either direction. If venting of fuel tank is done other than through fill-pipe cap, cap shall be of non-vented type. (See provision for fuel systems in current Motor Carrier Safety Regulations.)
- G. A port shall be provided in the fuel tank for auxiliary equipment.

FUEL, ALTERNATE

- A. Alternate fuels are permissible provided they have been adequately tested for installation and use, both in the vehicle and in storage facilities, and meet all federal, state and industry safety requirements, regulations and standards.
- B. Compressed Natural Gas (CNG) or propane (LPG) - See Appendix C & D
- C. Fuel -Bio Diesel (B5) meeting ASTM D6751 specifications.

GOVERNOR

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

HEATING SYSTEM, PROVISION FOR

- A. The chassis engine shall have plugged openings for the purpose of supplying hot water for the bus heater system. The opening shall be suitable for attaching 3/4" pipe thread/hose connector. The engine shall be capable of supplying water having a temperature of at least 170 degrees F, at a flow rate of 50 pounds per minute at the return end of 30 feet of one inch diameter automotive hot water heater hose. (SBMI Standard #001 - Standard Code for Testing and Rating Automotive Bus Hot Water Heating Ventilating Equipment.)
- B. SAE 20R3 - Class D2 hose shall be used throughout the bus heating systems. Engine cooling system hose shall meet applicable SAE Standard.
- C. Chassis manufacturers shall supply "heater bibb" connection for bus body supply and return lines. Connection will accept one inch inside diameter hose.
- D. Chassis manufacturers shall supply clear firewall bulkhead area to insure body manufacturer's ability to comply with this section.

HORN(S)

- 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

dbat three feet, per SAE Standard J-377. (Measurement shall be made with meter set at flat response - C weighting.)

- B. Air horns are not permissible.
- C. Covers shall be utilized to keep moisture out of horns.

INSTRUMENTS AND INSTRUMENT PANEL

- A. Lamps in lieu of gauges are not permissible. Chassis shall be equipped with the following instruments and gauges:
 - 1. Speedometer.
 - 2. Odometer or trip meter which will give accrued mileage including tenths of miles.
 - 3. Voltmeter with graduated scale to 16 volts.
 - 4. Oil pressure gauge with red warning lamp to warn of low pressure. If equipped with low oil pressure warning buzzer, the buzzer shall only be activated when ignition switch is in "ON" position.
 - 5. Water temperature gauge, with red warning lamp to indicate overheating.
 - 6. Fuel gauge.
 - 7. Upper beam head lamp indicator.
 - 8. Brake indicator gauge (air). Lamp indicator in lieu of gauge is permissible on vehicles equipped with hydraulic-assist power brake.
 - 9. Turn signal indicator.
 - 10. Automatic transmission temperature gauge. Exception: Type A
 - 11. Tachometer. Exception: Type A
 - 12. Glow plug indicator lamp where appropriate.
- B. All instruments shall be easily accessible for maintenance and repair.
- C. Instruments and gauges shall be mounted on instrument panel clearly visible to operator while in normal seated position.
- D. Instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges, and shift selector indicator for automatic transmission.
- E. Radiator shall be so equipped as to provide a visual fluid level inspection without removal of the radiator cap. The fluid level indicator must be positioned as to afford easy visibility from ground

level.

OIL FILTER

Oil filter or replaceable element or cartridge type shall be provided, and shall be connected by flexible oil lines if it is not of built-in or engine-mounted design. Oil filter shall have a capacity of approximately one quart.

OPENINGS

All openings in floorboard or fire wall between chassis and passenger carrying compartment, such as gear shift lever and parking brake lever, shall be sealed.

PASSENGER LOAD

- A. GVW is the sum of the chassis weight, plus the body weight, plus the operator's weight, plus total seated pupil weight.
 - 1. For purposes of calculation, the operator's weight is 150 pounds.
 - 2. For purposes of calculation, the pupil's weight is 120 pounds.
- B. Actual GVW shall not exceed the chassis manufacturer's gross vehicle weight rating (GVWR) for the chassis.

POWER AND GRADEABILITY

- A. Gross vehicle weight (GVW) shall not exceed 185 pounds per certified net published horsepower of the engine at the manufacturer's recommended maximum number of revolutions per minute.

The following chart presents the minimum horsepower 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	130 HP/420
35 - 46	200HP/520
47 - 64	220HP/520
65 - 78	230HP/560
79 - 83	240HP/620
84 - 91	245HP/660

- 1. Type C and D vehicles shall be equipped with positive locking hand throttle, or a fast idle control

device.

2. All engines shall be equipped with an automatic engine cooling fan.
3. An engine block heater of 750 watts minimum shall be provided. A recessed and covered receptacle for the block heater shall be mounted in the front bumper. EXCEPTION: Type AI, D and B vehicles under 35 passengers, manufacturer's standard. Type D vehicles, rear engine - receptacle shall be located in the rear. Type D vehicles, front engine - receptacle may be mounted to the bus body in front of the service door.
4. Electrical key shut down shall be required.
5. An installed closed combustion fuel fired heater is not permissible.
6. Warranty for the engine shall be 5 years/100,000 miles. All available warranty information must be provided to the purchaser.
7. Noise acoustical abatement package is required. EXCEPTION: Rear engine vehicles.
8. A maximum idle time shall be set at 10 minutes. Exception: Lift equipped buses

SHOCK ABSORBERS

Buses shall be equipped with front and rear double-action shock absorbers compatible with manufacturer's rated axle capacity, at each wheel location.

SPRINGS/SUSPENSION

- A. Air suspension systems are standard on rear axle only. EXCEPTION: Type A.
- B. Capacity of springs or suspension assemblies shall be equal to or exceed axle rating, except when otherwise specified in bid invitation.
- C. Clearance between springs and tire, and between tires, shall provide ample space for use of triple side dual chains.

STEERING GEAR

- A. All chassis shall be equipped with heavy duty power steering of integral type with integral valves. Design shall provide a means of lubrication for all wear points, if wear points are not permanently lubricated.
- B. Steering mechanism shall provide for easy adjustment for lost motion.
- C. No changes shall be made in steering apparatus which are not approved by chassis manufacturer.
- D. There shall be clearance of at least 2" between steering wheel and cowl instrument panel, windshield, or any other surface.

- E. All chassis shall be equipped with a tilt steering wheel having a minimum diameter of eighteen (18) inches.

TIRES AND RIMS

- A. Standard profile tubeless tires and rims of proper size with load ratings that equal or exceed axle ratings in these requirements shall be provided.
- B. Dual rear tires shall be provided.
- C. First line steel belted radial tires are required.
- D. Hub piloted wheels are standard. Stud piloted disk wheels are optional.
- E. Bus must have original installed tire size on data plate

TOW HOOKS

Front and rear tow hooks shall be installed by chassis manufacturer and shall be at least 200 degrees spiral, have a minimum inside diameter of 2.4 inches and mounted parallel to bus frame rail. Hooks shall be mounted in such a manner that the danger of the hooks becoming accidentally caught on objects on the ground is reduced.(horizontally mounted preferred).

TRANSMISSION

- A. Automatic transmissions shall be equivalent to either the Allison2500 PTS—5 or 6 speed for buses of 35 to 76 passenger capacity inclusive or the 3000 PTS -5 or 6 speed for buses of 77 to 90 passenger capacity. Minimum fluid requirements for the automatic transmission is to be Transynd or TES 295 approved fluids synthetic fluids. Warranty for the transmission shall be 5 yrs. / unlimited mileage
- B. Auto transmissions shall be programmed at the factory in the performance mode as the default setting.

TURNING RADIUS

- A. Chassis with a wheelbase of 264" or less shall have a right and left turning radius of not more than 422 feet, curb to curb measurement.
- B. Chassis with a wheelbase of 265" or more shall have a right and left turning radius of not more than 442 feet, curb to curb measurement.

SCHOOL BUS BODY

AISLE

All emergency exit doors shall be accessible by a 12-inch minimum aisle. The aisle shall be unobstructed at all times by any type of barrier, seat, wheelchair or tie-down, unless 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.

CEILING

See Insulation and Interior,

CHAINS

B. See Wheel Housings

CHILD REMINDER SYSTEM

Alarm device that activates when the red warning lights are activated, and requires the operator to walk to the rear of the bus and operate a deactivation device within 30 to 60 seconds after the ignition is in the off position or a bus horn will begin blowing. A pre-warning device shall be included

COLOR

A. The school bus body shall be painted uniform "National School Bus Glossy Yellow" in compliance with NSTSP

B. Primer shall be 3/4 - 1 mil and 1 2 - 2 mils of yellow paint.

C. Reflective material shall be installed on the bus. Material shall be automotive engineering grade or better, meeting initial reflectance values in FHA FP-85 and retaining at least 50% of those values for a minimum of six years. Reflective materials and markings shall include any or all of the following:

1. "SCHOOL BUS" Signs: shall be marked with reflective National School Bus Glossy Yellow material comprising background for lettering of the front and rear "SCHOOL BUS" signs.
2. Sides of bus body - shall be marked with reflective National School Bus Glossy Yellow material at least 1 3/4" but not more than 2" in width, extending the length of the bus body and located (vertically) as close as practicable to the floor line. Emergency window exits shall be marked with no greater than 1 3/4" in width strip of reflective National School Bus Glossy Yellow material. Top, bottom and each side shall be outlined.
3. Rear of bus body shall be marked with reflective material per NSTSP.

CONSTRUCTION

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

B. Construction shall meet the NSTSP for the Side Intrusion Test.

C. Bus body shall meet the Colorado Rack Test

D. Bus bodies shall be minimum 77" headroom. EXCEPTION : Type A

DOORS

A. Service Door

1. Service door shall be under control of the operator, and designed to afford easy release and prevent accidental opening and controlled by a three position switch that is installed to left of the operator. When the hand lever is used, no part shall come together to shear or crush fingers. A power operated service door is required on Type C and D buses.
2. Service door shall be located on right side of bus opposite operator and within direct view of operator and 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. Service door shall have minimum horizontal opening of 24" and minimum vertical opening of 68".
4. Service door shall be an outward opening door equipped with a grab handle on the outside of the door.
5. There shall be no door to left of the operator on Type C and D vehicles. Type AI and II and B vehicles under 35 passengers may be equipped with chassis manufacturer's standard door.
6. All doors shall be equipped with padding at the top edge of each door opening. Pad shall be at least 3" wide and 1" thick and extend the full width of the door opening.
7. Service door shall be equipped with a vandal lock. EXCEPTION: Type AI and II van cutaway with lockable operator side door.
8. Stainless steel hand rail, sufficiently anchored, not less than 20" in length, designed with smooth contour to prevent catching of belts or articles of clothing shall be provided on the rearward side of the service door entrance. Additional forward side grab handle is 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 starting of the engine with the door locked and shall be equipped with and audible alarm to alert the driver that the vandal lock is engaged.

EMERGENCY EXITS

A. Body 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 hand grip release handle(s) permitting operation as emergency exit(s), accessible inside and outside the vehicle.

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

FASTENING DEVICES

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

FIRE EXTINGUISHER

- A. Each bus shall be equipped with at least one pressurized, dry chemical-type fire extinguisher of total metal construction, refillable, securely mounted with spring steel friction fit 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 a type of seal which will not interfere with use of the fire extinguisher.

FIRST AID KIT

- A. Bus shall have removable, moisture and dust proof first aid kit mounted in full view in an accessible place within the operator's compartment. This place shall be properly identified.
- B. The minimum requirement is a 35 unit kit with contents as follows:

Bandage Compress, (sterile gauze pads) 4"	5 units
Bandage Compress, (sterile gauze pads) 2"	6 units
Adhesive Absorbent Bandage (adhesive tape) 1"	5 units
Triangular Bandage, 40"	4 units
Gauze Bandage, 4"	5 units
Absorbent-Gauze Compress	6 units
Wire Splints	1 unit
Non Latex Gloves	1 unit
Kindergarten Scissors	1 unit
Mouth-to-Mouth Airway (plastic breathing shield)	1 unit

- C. Mounting bracket shall be able to sustain a 20 G force load in any direction except upward.

D. Body fluid clean-up kit.

1. Each bus shall carry a Grade A metal or rigid plastic 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.
2. The kit shall be moisture resistant.
3. Contents shall include but not be limited to the following items:
 - a. One pair non latex gloves.

B. One pick-up spatula or scoop.

- c. One face mask.
- d. Infectious liquid spill control powder.
- e. Anti-microbial hand wipes - individually wrapped.
- f. Germicidal disinfectant wipes tuberculocidal.
- g. Plastic bag with tie.

FLOOR

- B. Floor shall be of prime commercial quality steel of at least 14 gauge or other material equivalent in strength to 14 gauge steel. Floor shall be covered with approximately 19/32" thickness plywood, at least five ply, and shall equal or exceed properties of exterior type pressed wood or marine grade plywood, C-D Grade, as specified in standard issued by Department of Commerce. (Commercial Standard CS45-60, Douglas Fir Plywood: A Recorded Voluntary Standard at the Trade as amended.) 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.
- D. All openings between chassis and passenger-carrying compartment made due to alterations by body manufacturer must be sealed.

FLOOR COVERING

- A. Floor covering shall be of high quality, heavy duty elastomeric material with a rating of self-extinguishing (a burn rate of 0.1 mm or less) when tested in accordance with FMVSS302, paragraph S4.3 (b) meeting current NSTSP. Floor covering shall have a smooth back.
- B. Floor covering shall be permanently bonded to the sub-floor and must not blister, crack or grow with reasonable use and maintenance. Bonding of adhesive material shall be waterproof and shall be of type recommended by the manufacturer of floor covering material. All seams or joints in flooring shall be sealed with waterproof sealer.
- C. Floor covering, in the aisle area, shall be ribbed, non-skid type. Minimum overall thickness shall be 0.187".
- D. Floor covering for under seat area, top of wheel housing, operator's compartment and

toeboard shall be smooth non-skid type and shall have a minimum thickness overall of 0.125". Covering shall be securely bonded to contour of wheel housing.

- E. Cove molding shall be used along side walls and rear corners. Metal or equivalent aisle joint strips shall be used to protect joints of flooring. However, painstaking care must be exercised to assure joints are properly fitted and sealed prior to fitting strips or molding to floor. 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.
- F. Floor construction shall provide a properly sealed opening for access to fuel gauge sending unit and/or in-tank fuel pump for all buses 35 passenger and above.
- G. Floor covering shall not be black in color. EXCEPTION: Molded wheel housing covers.

FUEL PORT DOOR

- A. Body manufacturer shall furnish a fuel port door on all vehicles
- B. All diesel powered vehicles shall have a fuel door labeled (Diesel) within six inches of the door.
- C. Fuel port door shall have a securement device

HEATERS

Heating System

1. The heater shall be hot water.
2. If only one heater is used, it shall be fresh-air or combination fresh-air and recirculation type.
 3. If more than one heater is used, additional heaters may be re-circulating air type.
 - A. A mid-body heater of 50K BTU for buses that carry 65 passengers and up.
 - B. Each heater is to be independently controlled by a switch
 - C. Each heater shall be attached to a separate circuit breaker or an FET.
4. The heating system shall be capable of maintaining bus interior temperatures, as specified in test procedure SAE J2233.
5. All forced-air heaters installed by body manufacturers shall bear a name plate that indicates the heater rating in accordance with SBMTC-001, *Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment*. The plate shall be affixed by the heater manufacturer and shall constitute certification that the heater performance is as shown on the plate.
6. Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or any sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hoses shall conform to SAE J20c, *Coolant System Hoses*. Heater lines on the interior of the bus shall be shielded to prevent scalding of the driver or passengers.
7. Each hot water system installed by a body manufacturer shall include one shutoff valve in the pressure line and one shut-off valve in the return line, with both valves at the engine in an

accessible location, except that on Types A and B buses the valves may be installed in another accessible location.

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

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

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

11. At least one auxiliary fan, six inches in diameter shall be installed, suspended from above on the driver's 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

IDENTIFICATION

- A. Body shall bear words "SCHOOL BUS" in black letters at least 8" high on both front and rear of body. Lettering shall be placed as high as possible without impairment of its visibility. Lettering shall conform to "Series B" of Standard Alphabet for Highway Signs. Decals or vinyl lettering are permissible. "SCHOOL BUS" signs shall be marked with reflective National School Bus Glossy Yellow comprising background for lettering of the front and/or rear "SCHOOL BUS" signs.
- B. Every bus shall be lettered "..... COUNTY SCHOOLS", on both sides of bus, and numbered on both sides and rear. Numbers on both sides shall be near front, in line with lettering. Lettering and numbering on sides of bus shall be at least 6" high. Decals or vinyl lettering are permissible.
- C. The number of the bus shall be 5" in height, in white or yellow, displayed on either the front bumper or the crossing arm.

INSULATION

- A. Ceiling, walls, and bulkhead or bow cavities shall be fully insulated with proper material applied inside of outside panels by spray to deaden the sound.
- B. Ceiling and walls shall be fully insulated with a thermal insulation that is fire resistant, UL approved, with a minimum R-value of 5.5. Insulation shall be installed so as to prevent sagging.
- C. Additional interior noise abatement /acoustical package are permissible over and above.

INTERIOR

- A. Interior of bus shall be free of all unnecessary projections likely to cause injury. This requires inner lining on ceilings and walls. If ceiling is constructed so as to contain lapped joints, forward panel shall be lapped by rear panel and exposed edges shall be beaded, hemmed, flanged, or

otherwise treated to minimize sharp edges.

- B. Cowl shall not be modified, or accessories installed, to interfere with operator's visibility of gauges on instrument panel.
- C. Flammability of interior materials shall meet FMVSS 302.
- D. Interior color of seats, panels, head bumpers, and floor covering shall not be black.
- E. Every school bus shall be constructed so that the noise level taken at the ear of the occupant nearest to the primary vehicle noise source shall not exceed 85 dBA when tested according to the procedure found in the Noise Test Procedure - National Minimum Requirements.
- F. 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 FMVSS 108.

- B. Head Lamps

Head and tail lamps shall be combined on a single circuit, served by a separate circuit breaker or field effect transistors, (hereafter FET). There shall be no other electrical load added to the head lamp circuit.

- C. Clearance and Side-Marker Lamps

Clearance, side-marker, and identification lamps shall be protected or flush mounted and combined in a circuit controlled by the same switch.

- C. Tail and Stop (Brake) Lamps

- D. Backup Lamps

Two 7inch lamps or equivalentrequired

- F. Interior Lamps

1. Interior lamps shall include two rows of dome lamps installed on two circuits so that lamps in front half and lamps in rear half of bus is on separate circuits.
2. A stepwell light which adequately illuminates stepwell shall be provided. It shall be connected in the clearance lamp circuit and activated when the service door is opened.

- G. School Bus Alternately Flashing Signal Lamps

- a. 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 1 amber lamp is located near each red signal lamp 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 amber lamps are automatically de-energized when stop signal arms 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.

- b. Red lamps shall flash any time stop signal arm is extended.
- c. All flashers for alternately flashing red and amber signal lamps shall be enclosed in the body of a readily accessible location.
 - 1. Each school bus shall be equipped with a system consisting of four red signal lamps designed to conform to SAE Standard J887, and four amber signal lamps designed to that standard except for color, and except that their candlepower shall be at least 2 1/2 times that specified for red signal lamps. This system, stop arm, and crossing arm shall be wired through a master switch, but NOT through vehicle ignition switch.
 - 2. Shields over lamps, painted black are required
 - 3. 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.
 - 4. There shall be an indicator lamp which shall go on 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.
 - 5. Signal lamp system shall operate as follows:
 - a. With master switch on, entrance door closed, depress hand switch. Red pilot lamp and amber signals shall go on.
 - b. Open entrance door. Amber pilot lamp and amber signal lamps shall go off, and red pilot lamp and red signal lamps shall go on. Stop arm, if air or electrically powered, shall automatically extend.
 - c. Close entrance door. Red pilot lamp and signal lamps shall go off, and stop arm, if air or electrically powered, shall retract immediately.
 - d. Open entrance door without depressing hand switch. Red pilot lamp and red signal lamps shall go on. Stop arm, if air or electrically powered, shall automatically extend.
 - e. With master switch off, depressing hand switch shall not actuate the amber signal system, nor shall opening entrance door actuate the red signal system and stop arm.
 - f. 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.

- g. All loading light controls shall be to the left of the operator.

6. Installation Requirements

- a. Each flashing signal lamp shall be mounted with its axis substantially parallel to longitudinal axis of vehicle.
- b. Front and rear alternately flashing signal lamps shall be spaced as far apart laterally as practicable.
- c. Alternately flashing signal lamps shall be mounted at the front above the windshield and at the rear so that the lower edge of lens is not lower than top line of the side window.
- d. Vertical and lateral vision of the front and rear alternately flashing warning lamps shall not be obstructed by any part of the body or lamphouse insofar as standard bus body construction shall permit.
- e. Area around each lamp shall have readily visible black border for contrast purposes.
- f. A separate fuse, circuit breaker, or 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.

H. Roof Mounted Strobe Lamp

A strobe lamp, white in color, shall be mounted on the roof of the school bus. The lamp shall be a maximum of 5" in height, located on the center line of the roof four to six feet from the rear of the bus, and rear of the roof hatch. The strobe lamp shall be a double flashing Class 2, with a minimum of 10 joules.

I. Turn Signal Lamps

- 1. Shall meet the NSTSP standard.
- 2. Type AI, B, C and D vehicles shall have a protected lamp mounted on right side behind service door and on left side behind stop arm signal, wired in the turn signal circuit.

J. Emergency Warning Device

Each school bus shall be supplied with a minimum of at least three reflective triangle road warning devices in a container supplied but not mounted by the body manufacturer.

K. Exterior skirt mounted landing lamp at entrance door.

MIRRORS

A. Interior Mirror

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Interior mirror shall be either clear view laminated glass or clear view glass bonded to a backing which retains the glass in the event of breakage. Mirror shall be a minimum of 6" x 30".
EXCEPTION: Type AI and II vehicles may be 6" x 16".

B. Exterior Mirrors

1. All exterior mirrors, are to be heated and must conform to FMVSS 111.
2. Remote controlled external rear view mirrors are permissible.

MOUNTING

Body to chassis mounting shall:

- A. Meet the NSTSP standards. Provide adequate body to chassis insulation with permanently installed insulators.

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 rear wheel housing, and shall reach within approximately 9" of the ground when bus is empty. They shall be mounted at a distance from the wheels that will permit free access to spring hangers for lubrication and maintenance, and to prevent their being pulled off while vehicle is in reverse motion, or damaged by tire chains.

OVERALL LENGTH

Overall length of bus shall not exceed 45 feet

OVERALL WIDTH

Overall width of bus shall not exceed 102", excluding authorized safety equipment.

RUB RAILS

- A. There shall be at least three black rub rails located as follows:
 1. One at seat level.
 2. One at floor level.
 3. One at bottom of body skirt. EXCEPTION: Type AII vehicles.

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- B. Rub rails shall extend from the rear of the entrance door completely around the bus to point of curvature near outside cowl on left side. At least one rub rail will extend around rear of bus. EXCEPTION: Type D vehicles with rear engine.
- C. Rub rails shall be one piece except where broken by emergency door, wheel housings, battery box, access panels, 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.
- E. Rub rails shall be 4" or more in width, of 16 gauge steel or suitable material of equivalent strength, and constructed in corrugated or ribbed fashion.
- F. Rub rails shall be applied outside body or outside body posts. Pressed-in or snap-on rails do not satisfy this requirement.

SEAT BELT FOR OPERATOR

A type 2 lap belt/shoulder belt shall be provided for the operator. 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. On buses where the driver's seat and upper anchorage for the shoulder belt are 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. The assembly shall be equipped with an emergency locking retractor for the continuous belt system. On all buses except Type A that are equipped with a standard chassis manufacturer's driver's seat, the lap portion of the belt system shall be guided or anchored to prevent the driver from sliding sideways under the belt system. The lap/shoulder belt shall be designed to allow for easy adjustment in order to fit properly and to effectively protect drivers varying in size from 5th percentile adult female to 95th percentile adult male. Lap belt/shoulder belt shall be orange in color.

SEATS

- A. All seats shall have minimum depth of 15". The first row of seats on all buses shall be simultaneous load seat belt ready seats equipped with lower anchor and tether for children (LATCH). For the purpose of securing child infant seats the seats must meet FMVSS 210, FMVSS 222 and FMVSS 225 requirements. All such 39 inch and larger passenger seats must be equipped with two sets of anchorage points per bench seat. All such passenger seats with a seat width of less than 36 inches must be equipped with one set of anchorage points per bench seat
- B. All seats and crash barriers must comply with all applicable FMVSS standards
- C. No bus shall be equipped with jump seats or portable seats.
- E. Integrated child safety (with or without ISO Latch) seats are permissible except adjacent to an emergency exit window
 - 1. Integrated safety seat with 3point lap shoulder belt permissible throughout
- F. Forward-most pupil seat on right side of bus shall be located to not interfere with operator's

vision, not farther forward than the crash barrier behind operator, or rear of operator's seat when adjusted to its rear-most position.

- G. A modesty panel will be provided under the right and left front crash barrier.
- H. All restraining barriers and passenger seats shall meet the criteria contained in FMVSS 302.
- I. Operator's seat shall be of the high-back type air ride 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). It shall have an adjustment clip on the integrate 3-point belt that will adjust to any size driver. The seat shall have a lumbar support
- J. Type A-II vehicle bodies shall be equipped with restraining barriers conforming to FMVSS 222 "School Bus Passenger Seating - Crash Protection."

STEPS

- A. The first step at the entrance door shall be not less than 10 inches and not more than 14 inches from the ground when measured from the top surface of the step to the ground, based on standard chassis specifications, except that on Type D vehicles, the first step at the entrance door shall be 12 inches to 16 inches from the ground. An auxiliary step may be provided to compensate for the increase in ground-to-first-step clearance. The auxiliary step is not required to be enclosed.
- B. Step risers shall not exceed a height of 10 inches. **Exception:** When plywood is used on a steel floor or step, the riser height may be increased by the thickness of the plywood.
- C. Steps shall be enclosed to prevent accumulation of ice and snow.
- D. Steps shall not protrude beyond the side body line.

STEP TREADS

- A. All steps, including the floor line platform area, shall be covered with an elastomer floor covering having a minimum overall thickness of 0.187 inch.
- B. The step covering shall be permanently bonded to a durable backing material that is resistant to corrosion.
- C. Steps, including the floor line platform area, shall have a 1½ inch nosing that contrasts in color by at least 70% measured in accordance with the contrasting color specification in 36 CFR, Part 1192, ADA, *Accessibility Guidelines for Transportation Vehicles*.
- D. Step treads shall have the following characteristics:
 - 1. Abrasion resistance: Step tread material weight loss shall not exceed 0.40 percent, as tested under ASTM D-4060, *Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser*, (CS-17 Wheel, 1000 gram, 1000 cycle);
 - 2. Weathering resistance: Step treads shall not break, crack, or check after ozone exposure (7 days at 50 phm at 40 degrees C) and Weatherometer exposure

(ASTM D-750, *Standard Test Method for Rubber Deterioration in Carbon-Arc Weathering Apparatus*, 7 days); and

3. Flame resistance: Step treads shall have a calculated burn rate of .01 or less using the test methods, procedures and formulas listed in FMVSS No. 302, *Flammability of Interior Materials*.

STOP SIGNAL ARM AND CROSSING CONTROL ARM

- A. There shall be a stop signal arm installed on the left outside of the body which shall be equipped with a wind guard. Arm shall be of an octagonal shape with white letters and border, a red background, and be of reflective material. Two alternately flashing, high intensity, red strobe lamps (LED are permissible) visible from both sides of the sign shall be provided. The stop signal arm shall be air operated. The stop signal arm shall be capable of instantly reversing directions at anytime during its cycle and immediately returning to the open or closed position in response to the operators command through the operation of the door.
- B. A solid piece crossing control arm, mounted to the right front bumper of the bus, shall be required. The device shall be air powered. The crossing control arm shall be wired in conjunction with the stop signal arm and the alternately flashing signal lamp. Crossing arm shall be equipped with an electromagnetic or other device to hold the arm to the bumper when the arm is not activated.

STORAGE COMPARTMENT

Two metal compartment of adequate strength and capacity for storage of tire chains, tow chains, and such tools as may be necessary for minor repairs shall be provided. Such storage compartment shall be located outside passenger compartment. The dimensions of this compartment shall be a minimum of 25" long, 16" wide and 12" high. EXCEPTION: Type A vehicles are not required to meet this standard & Vehicles with air conditioning or larger luggage compartments.

A door with locks keyed alike, as well as a proper latch, shall be provided. Such compartment shall be constructed of highly non-corrosive metal, and provision for drainage of water resulting from snow and ice on tire chains shall be provided. EXCEPTION: Special Education bus compartment may be on left or right.

SUN SHIELD

Interior adjustable, transparent, tinted sun shield approximately 6" x 30" shall be provided. Sun shield must be capable of being turned to an angle of 180 degrees when not in use. EXCEPTION: Type A and B vehicles under 35 passengers, manufacturer's standard.

- B. Body manufacturers shall provide rear tow hooks on all vehicles.

UNDERCOATING/METAL TREATMENT

- A. All metal used in construction of bus body shall be zinc coated, aluminum-coated, or treated by equivalent process before bus is constructed. Excluded are such items as door handles, grab handles, interior decorative parts, and other interior plated parts.

- B. All metal parts that will be painted shall be, in addition to other requirements, chemically cleaned, etched, zinc phosphate coated, and zinc chromate or epoxy primed or conditioned by equivalent process.
- C. In providing for these requirements, particular attention shall be given 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 subjected to abrasion during vehicle operation.
- D. As evidence that above requirements have been met, samples of materials and sections used in construction of bus body, when subjected to 1000-hour salt spray test as provided for in latest revision of ASTM designation; B-117 "Standard Method of Salt Spray (Fog) Testing", shall not lose more than 10% of material by weight.
- F. Entire underside of bus body, including floor sections, cross member, chassis and below floor line side panels, shall be coated with rust-proofing compound for which compound manufacturer has issued notarized certification of compliance to bus body builder that compound meets or exceeds all performance requirements of United States Department of Defense Specification MIL-C-62218A using modified test procedures* for following requirements:
 - 1. Salt spray resistance - pass test modified to 5% salt and 1000 hours.
 - 2. Abrasion resistance - pass.
 - 3. Fire resistance - pass.

* Test panels are to be prepared in accordance with paragraph 4-6.12 of TT-C-520b with modified procedure requiring that tests be made on a 48 hour air cured film at thickness recommended by compound manufacturer.

- F. Undercoating compound shall be applied with suitable airless or conventional spray equipment to recommended film thickness and shall show no evidence of voids in cured film.

VENTILATION

- A. Body shall be equipped with suitable, controlled ventilating system of sufficient capacity to maintain proper quantity of air under operating conditions without opening of windows except in extremely warm weather.
- B. Static-type non-closable exhaust ventilation shall be installed in low-pressure area of roof.
- C. Air conditioning which meets all applicable federal standards is an approved option.
- D. At least one auxiliary fan shall be installed, suspended from above at the driver's side of the windshield, where it can be adjusted for maximum effectiveness. The fan blade shall be covered with a protective cage. The fan shall be controlled by a separate switch. Location must adhere to manufacturer's standard.

WHEEL HOUSINGS

- A. Wheel housings shall be of full open type.
- B. Wheel house openings shall allow for easy tire removal and service.
- C. Wheel housings shall be designed to support seat and passenger loads, and shall be attached to floor sheets in such manner to prevent any dust or water from entering the body.
- D. Inside height of wheel housings above floor line shall not exceed 12".
- E. Wheel housing shall provide clearance for installation and use of tire chains on single or dual power-driving wheels.
- F. Rubber fenders that adequately protect sides of body from tire spray shall be provided.

WINDSHIELD AND WINDOWS

- A. All glass in windshield, windows, and doors shall be of approved safety glass (current Safety Code for Safety Glazing Motor Vehicles Operating on Land Highways Z26.1) so mounted that permanent mark is visible, and of sufficient quality to prevent distortion of view in any direction. All glazing materials shall comply with FMVSS-205 and FMVSS-219.
- B. Windshield shall have horizontal gradient band starting slightly above operator's line of vision and gradually decreasing in lamp transmission to 20% or less at top of windshield. EXCEPTION: Type AI and II, B and D vehicles may use tinted windshield if gradient band is not available.
- C. All buses are required to be equipped with split-sash windows.
- D. Glass in all side and rear windows shall be of AS-3 grade or better, as specified by American Standards Association, Code Z-26.1.
- G. Other than emergency exits designated to comply with FMVSS No. 217, *Bus Emergency Exits and Window Retention and Release*, each side window shall provide an unobstructed opening of at least 9 inches high (but not more than 13 inches high) and at least 22 inches wide, obtained by lowering the window. One window on each side of the bus may be less than 22 inches wide.
- F. Latch shall be designed to latch positively and securely, with ease of release that would enable pupils to open in an emergency.
- G. Window drip rail which does not interfere with size of window opening shall be furnished.
- H. The operator's window shall be of sliding type. Double glazing is strongly recommended. EXCEPTION: Type AI and II vehicles, manufacturer's standard.
- I. Windshields shall comply with federal, state and local regulations.
- J. Emergency windows shall be vertically hinged

WINDSHIELD WASHERS

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- A. A windshield washer reservoir shall be furnished, and shall be at least three (3) quart capacity unless space restrictions limit size of container.
- B. Solvent shall be directed onto windshield through jets in the wiper arm.

WINDSHIELD WIPERS

Bus shall be equipped with intermittent-speed wipers. Windshield wipers shall be powered by motor(s) on all vehicles. (Must meet SAE standard J198)

WIRING

- A. All wiring and lamps shall conform to current SAE standards and FMVSS 108.
- B. Chassis to body current shall be controlled through a continuous duty or ECS solenoid of at least 105 ampere capacity.
- C. All wiring shall have an ample capacity of exceeding design load of at least 25 percent.
- D. 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.
- E. Each wire passing through metal openings shall be protected by a grommet.
- F. Wires not enclosed within the body shall be fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equally effective connectors which shall be water and corrosion resistant.
- G. Circuits
 - 1. Wiring shall be arranged into at least the following circuits:
 - a. Head, tail, stop (brake) and instrument panel lamps.
 - b. Clearance, stepwell and body control panel. Stepwell lamp shall be activated when service door handle is in the unlatched position. Control panel lamps may be on separate rheostat from instrument panel lamps.
 - c. Dome lamps.
 - d. Starter motor.
 - e. Ignition, emergency door signal and continuous duty solenoid or an electronic control system (ECS).
 - f. Turn signal lamps.
 - g. Alternately flashing red signal lamps.

- h. Horns.
 - I. Heater #1.
 - j. Heater #2.
 - k. Heater #3.
 - l. Electric wipers.
 - m. Strobe lamp.
 - n. Crossing arm.
2. Any of the above combination circuits may be subdivided into additional independent circuits.
 3. Heaters and defrosters shall require at least one additional independent circuit for each heater.
 4. Whenever possible, all other electrical functions (such as electric-type windshield wipers) shall be provided with independent and properly protected circuits.
 5. Each body circuit shall be color coded, and a diagram of the circuits shall be attached to the body in a readily accessible location.
 6. All accessories, excluding lamps, such as heaters, defrosters, etc., shall be wired to a continuous heavy duty solenoid or electronic control system (ECS) (minimum 105 ampere) activated or energized through the ignition switch and can be tested through the accessory side of the ignition switch.
- H. A separate circuit breaker or FET shall be provided for each circuit except starter motor and ignition circuits.
 - I. 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 (it shall not be of momentary type) that de-activates 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.
 - J. Buses may be equipped with a 12 volt power port in the driver's area.

NOTE: All available warranty information must be provided to the purchaser and to the State Executive Director of School Transportation as part of the bid package or upon receipt of the bus.

TRAINING REQUIREMENTS

IN THE EVENT MAJOR CHANGES ARE MADE IN SYSTEMS OR SUBSYSTEMS, THE SUCCESSFUL BIDDER MAY BE REQUIRED TO PROVIDE TRAINING FOR COUNTY SCHOOL BUS MECHANICS AND SUPERVISORS. SUCH TRAINING, IF REQUIRED, WILL BE SPECIFIED IN INVITATIONS TO BID, AND WILL INDICATE THE TYPE, EXTENT AND LOCATION OF CLASSES TO BE CONDUCTED.

**SPECIAL TRANSPORTATION VEHICLE
INTRODUCTION SPECIALLY EQUIPPED
SCHOOL BUS OR MPV**

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.

The specifications in this section are intended to supplement specifications in the Body and Chassis section. In general, specially equipped buses shall meet all the requirements of the preceding sections, plus those listed in this section. It is recognized that the field of special transportation is characterized by varied needs for individual cases and by rapidly emerging technologies for meeting individual student needs. A flexible, "common sense" approach to the adoption and enforcement of specifications for these vehicles, therefore, is prudent. As defined by 49 Code of Federal Regulations (CFR) §571.3, "*Bus* means a motor vehicle with motive power, except a trailer, designed for carrying more than ten persons" (eleven or more including the driver). This definition also embraces the more specific category, *school bus*. Vehicles with ten or fewer occupant positions (including the driver) are not classified as buses. For this reason, the federal vehicle classification, *multipurpose passenger vehicle* (49 CFR § 571.3), or MPV, must be used by manufacturers for these vehicles in lieu of the classification *school bus*. The definition of *designated seating position* in 49 CFR § 571.3 states that, in the case of "vehicles sold or introduced into interstate commerce for purposes that include carrying students to and from school or related events" and which are "intended for securement of an occupied wheelchair during vehicle operations," each wheelchair securement position shall be counted as four designated seating positions when determining the classification (whether *school bus* or *MPV*). This classification system does not preclude state or local agencies or these national specifications from requiring compliance of school bus-type MPVs with the more stringent federal standards for school buses. The following specifications address modifications as they pertain to school buses that, with standard seating arrangements prior to modification, would accommodate eleven or more occupants including the driver. If by addition of a power lift, wheelchair positions or other modifications, the capacity is reduced such that vehicles become MPVs, the intent of these specifications is to require these vehicles to meet the same specifications they would have had to meet prior to such modifications, and such MPVs are included in all references to school buses and requirements for school buses which follow.

DEFINITION

A *specially equipped school bus* is any school bus that is designed, equipped and/or modified to accommodate students with special transportation needs.

GENERAL REQUIREMENTS

1. Specially equipped school buses shall comply with the National School Transportation Specifications & Procedures, the WV Minimum Requirements for Design and Equipment of School Buses and with the Federal Motor Vehicle Safety Standards (FMVSS) applicable to their Gross Vehicle Weight Rating (GVWR) category
2. Any school bus to be used for the transportation of children who utilize a wheelchair or other mobile positioning device, or who require life-support equipment that prohibits use of the regular service entrance, shall be equipped with a power lift, unless a ramp is needed for unusual circumstances related to passenger needs.

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3. Vehicles constructed for transporting students with special transportation needs shall comply with current FMVSS 222 and U126CSR89, West Virginia Board of Education Policy 4334, Minimum Requirements for Design and Equipment of School Buses.
4. Bodies may, at the option of the manufacturer, incorporate a section approximately 35", or 9" in addition to the standard 28" section if necessary to provide maximum utilization of space for seats and wheelchairs. Proper bracing shall be added as specified in the body standards.
5. Any school bus that is used specifically for the transportation of students who are confined to a wheelchair and/or other mechanical restraining devices prohibiting their use of the regular service entrance shall be equipped with a power lift.
6. Lift shall be located on the right side of the body, in no way attached to the exterior sides of the bus but confined within the perimeter of the school bus body when not extended. (Rear emergency door lift may be installed only with written permission from the State Executive Director of School Transportation.)
7. A vehicle equipped with a power lift must contain adequate space and proper restraining devices for a minimum of one wheelchair bound passenger.
8. Each securement system location shall have a minimum clear floor area of 30" x 48". Additional floor area may be required for some applications. Consultation between the user and the manufacturer is recommended to ensure adequate area is provided.
9. A vehicle equipped with a power lift must contain adequate space and proper restraining devices for a minimum of one wheelchair bound passenger.
10. Each securement system location shall have a minimum clear floor area of 30" x 48". Additional floor area may be required for some applications. Consultation between the user and the manufacturer is recommended to ensure adequate area is provided.

AISLE

Aisle leading to emergency door from wheelchair area shall be of sufficient width to permit passage of wheelchairs (30" minimum). This aisle should be to an emergency door and the lift area. All wheelchair positions will be afforded the same available access.

FASTENING DEVICES

A. Wheelchair Restraints

1. All mobile seating must be in a forward facing direction secured with a four point tie-down system with two tie-downs at the rear and two tie-downs at the front of the device.
2. The wheelchair securement system including all hardware (attachment bolts, track, etc.) shall have been successfully tested to meet minimum impact forces of a 20 G, 30 MPH deceleration to simulate a frontal impact on the transport vehicle per Society of Automotive Engineers (SAE) J2249, Wheelchair Tiedowns and Occupant Restraint Systems for Use in Motor Vehicles.
3. 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.

4. 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.
5. All tie-downs used in the securement system for a mobile seating device must meet manufacturers' specifications and be of the automatic retractable type.
6. All tie-downs used in the securement system for a mobile seating device must be capable of adjustment in useful length of from 18" minimum to 34" maximum in order to provide sufficient flexibility to fit a majority of possible applications.
7. 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.
8. All securement straps for mobile seating devices must be marked indicating that they meet the requirements of SAE J2249.
9. The floor anchorage track system shall consist of 4 tracks and shall be "L" type

B. Occupant Restraints

1. 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.
2. 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 SAE J2249.
3. All attachment or coupling systems designed to be connected and disconnected frequently must be operable by an adult person without the use of tools or other mechanical assistance.
4. 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.
5. Adjustment devices, quick release buckles and webbing, used in the construction of the occupant restraint system must meet requirements of applicable sections of FMVSS 209 and 222.
6. 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.

- C. 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.

- D. 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.
- E. Restraining Devices - Seat frames shall be equipped with attachments or devices to which belts, restraining harnesses, or other devices may be attached. Attachment framework or anchorage devices, if installed, shall conform to FMVSS 210.

Fire Blanket

A fire blanket shall be provided with a storage pouch mounted to the wall conveniently located and identified as a fire blanket. The fire blanket shall meet CRR 16 part 1610 standard for flammability of clothing. Blanket shall be approximately 62 inches X 80 inches.

HEATERS

- A. Bus bodies shall have a minimum of one heat exchanger in rear section behind rear wheel housing of bus. Heater shall be on the left or right hand rear wall of the bus
- B. See Heaters,

IDENTIFICATION

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

PASSENGER CAPACITY RATING

See certification

POWER LIFT

- A. The power lift shall be located on the right side behind the rear wheel of the bus body. Exception: The lift may be located on the left side of the bus if, and only if, the bus is only used to deliver students to the left side of one-way streets and Type D buses
- B. All specially equipped school buses shall provide a level-change mechanism or boarding device (e.g., lift or ramp), complying with paragraph B of this section or the RAMP section, with sufficient clearances to permit a wheelchair user to reach a securement location.
- C. Vehicle lift and installation

1.General: 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*.

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

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

Lift capacity:

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

1. Controls: (See 49 CFR 571.403, S6.7, *Control systems*.)
 - a. Emergency operations: (See 49 CFR 571.403, S6.9, *Backup operation*.)
 - I. If an override switch is utilized as part of the backup system it must be designed to prevent accidental activation.
 - b. Power or equipment failures: (See 49 CFR 571.403, S6.2.2, *Maximum platform velocity*.)
 - c. Platform barriers: (See 49 CFR 571.403, S6.4.7, *Wheelchair retention*.)
 - d. Platform surface: (See 49 CFR 571.403, S6.4.2, S6.4.3, *Platform requirements*.) (See also “Wheelchair or Mobility Aid Envelope” figure at the end of this subsection.)
 - e. Platform gaps and entrance ramps: (See 49 CFR 571.403, S6.4.4, *Gaps, transitions and openings*.)
2. Platform deflection: (See 49 CFR 571.403, S6.4.5, *Platform deflection*.)
3. Platform movement: (See 49 CFR 571.403, S6.2.3, *Maximum platform acceleration*.)
 - a. Boarding direction: The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users.
 - i. Use by standees: Lifts shall accommodate persons who are using walkers, crutches, canes or braces, or who otherwise have difficulty using steps. The platform may be marked to indicate a preferred standing position. Note: This item refers to equipment specifications. (Also see section, TRANSPORTATION FOR STUDENTS WITH DISABILITIES AND SPECIAL HEALTH CARE NEEDS, Subsection D, *Special Equipment Use and Operation*, for applicable operational procedures stating that “During lift operations (including manual) no one shall be allowed to stand on the lift platform.”)
 - b. Handrails: (See 49 CFR 571.403, S6.4.9, *Handrails*.)
 - c. Circuit breaker: A resettable circuit breaker shall be installed between the power source and the lift motor if electrical power is used. It shall be located as close to the power source as possible, but not within the passenger/driver compartment.

- i. Excessive pressure: (See 49 CFR 571.403, S6.8, *Jacking prevention*.)
 - ii. Documentation: The following information shall be provided with each vehicle equipped with a lift:
 - (1) A phone number where information can be obtained about installation, repair and parts. (Detailed written instructions and a parts list shall be available upon request.)
 - (2) Detailed instructions regarding use of the lift shall be readily visible when the lift door is open, including a diagram showing the proper placement and positioning of wheelchair/mobility aids on the lift.
4. Training materials: The lift manufacturer shall make training materials available to ensure the proper use and maintenance of the lift. These may include instructional videos, classroom curriculum, system test results or other related materials.
 5. Identification and certification: Each lift shall be permanently and legibly marked or shall incorporate a non-removable label or tag that states it conforms to all applicable requirements of the current National School Transportation Specifications and Procedures. In addition and upon request of the original titled purchaser, the lift manufacturer or an authorized representative shall provide a notarized Certificate of Conformance, either original or photocopied, which states that the lift system meets all the applicable requirements of the current National School Transportation Specifications and Procedures.

RESTRAINING DEVICES, PASSENGER SEATS

Seat frames shall be equipped with attachments or devices to which belts, restraining harnesses, or other devices may be attached. Attachment framework or anchorage devices, if installed, shall conform with FMVSS 210.

SEATING ARRANGEMENTS

Flexibility in seat size and spacing to accommodate special devices shall be permitted due to the constant changing of passenger requirements. All seating shall be forward facing.

SPECIAL SERVICE ENTRANCE

- A. The opening, with doors open, shall be of sufficient width to allow the passage of wheelchairs. The minimum clear opening shall be 43" in width, and 57" " in height. Entrance shall be of sufficient width and depth to accommodate various mechanical lifts and related accessories as well as the lifting platform.
- B. A drip molding shall be installed above the opening to effectively divert water from entrance.
- C. Door posts and headers for entrance shall be reinforced sufficiently to provide support and strength equivalent to the areas of the side of the bus not used for service doors.

SPECIAL SERVICE ENTRANCE DOORS

- A. All doors shall open outwardly.

- B. Lift doors shall have devices to hold doors in the open position.
- C. All doors shall be weather sealed. On buses with double doors, they shall be so constructed that a flange on the forward door overlaps the edge of the rear door when closed.
- D. Door materials, panels and structural strength shall be equivalent to the conventional service and emergency doors. Color, rub rail extensions, lettering and other exterior features shall match adjacent sections of the body.
- E. Lift door shall have a window within one inch of the lower line of adjacent sash.
- F. Door(s) shall be equipped with a device that will actuate a flashing visible signal located in the operator's compartment when door(s) is not securely latched or open in any position other than locked and ignition is in "ON" position.
- G. A switch shall be installed so that the lifting mechanism will not operate when the lift platform door(s) is closed.
- H. When frame mounted power lift is used, door panels shall extend to bottom of body skirt.

**SPECIFICATIONS
FOR
MULTI-FUNCTIONAL SCHOOL ACTIVITY BUS (MFSAB)**

The vehicle must comply with the Definition of a Multifunction School Activity Bus in the Federal Motor Vehicle Safety Standards as listed in 49 CFR Part 571, which is the National Highway Traffic Safety Administration's Final Rule on this vehicle. This primary purpose of this vehicle will be to transport children, and as such, it must comply with all applicable Federal Motor Vehicle Safety Standards (FMVSS) for this type of vehicle and 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 tested at and received a satisfactory evaluation from the West Virginia Department of Education. The MFSAB must also meet all other Federal (to include the Americans with Disabilities Act of 1990) and applicable West Virginia laws for passenger vehicles of this type. Vehicles shall be of the latest model year in standard production and, of which, parts are stocked and warranty service is available at one or more points in West Virginia or border cities

The MFSAB is designed to provide all of 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 the specialized warning devices such as stop signs and warning lights, and they will not be school bus yellow.

The following exceptions to the West Virginia Minimum Specifications for School Buses for regular route buses shall be allowed for these vehicles:

BRAKES: Shall meet standards set forth in school bus standards for size of vehicle.

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 West Virginia Department of Education, Office of School Transportation for approval prior to the purchase or manufacture of a MFSAB.

IDENTIFICATION:

1. The bus body shall bear the words "ACTIVITY BUS" in a contrasting color at least 8 " high 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. Bus numbering on this bus may be of a contrasting color.
2. The name of the school system shall be displayed in *at least five*-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 :

All activity buses shall meet state and federal standards for normal school bus lighting and warning device requirements with the following exceptions: MFSABs may not be equipped with alternately flashing amber or red signal lamps used for loading and unloading students. MFSABs may not be equipped with stop arm signals or crossing control arms.

SEAT BELTS:

3 point lap-shoulder belts will be supplied for any MFSAB with a GVWR of 10,000 lbs and under. Shoulder belts supplied must be fully retractable and the anchorage must meet FMVSS-210.

SEATING:

All MFSAB buses shall have seats that comply with FMVSS-222. If the GVWR is 10,000 lbs and under, then it must also be equipped with 3 point lap-shoulder belts certified to meet appropriate FMVSS standards. School systems and/or vendors shall submit preliminary seating schemes to the West Virginia Department of Education, Office of School Transportation for approval prior to the purchase or manufacture of a MFSAB. Successful vendor shall coordinate with the agency issuing the purchase order in the selection of material and color and type of seats.