ARKANSAS DIVISION OF ACADEMIC FACILITIES AND TRANSPORTATION
RULES FOR THE SPECIFICATIONS
GOVERNING SCHOOL BUS DESIGN

September 1, 2008

1.00 REGULATORY AUTHORITY

1.01 These Rules shall be known as Arkansas Division of Academic Facilities and Transportation Rules for the Specifications Governing School Bus Design.

1.02 These rules are enacted pursuant to the authority of Ark. Code Ann. § 6-21- 304.

2.00 PURPOSE

2.01 It is the purpose of these Rules to establish specifications governing school bus design for the State of Arkansas.

3.00 EXPLANATIONS

3.01 The following standards address modifications as they pertain to school buses that, with standard seating arrangement prior to modification would accommodate more than 10 persons. If by addition of a power lift, mobile seating device positions or other modifications, the capacity is reduced such that vehicles become multi-purpose vehicles (MPV's), the intent of these standards is to have these vehicles be required to meet the same standards they would have had to meet prior to such modifications, and such MPV's are included in all references to school buses and requirements for school buses which follow.

4.00 SCHOOL BUS CHASSIS REQUIREMENTS

4.01 All bus chassis shall meet Arkansas Specifications included in this rule.

4.02 Chassis manufacturers shall, upon request, certify to the Arkansas Division of Academic Facilities and Transportation that their product meets minimum standards on items not covered by certification issued under requirements of the National Traffic and Motor Vehicle Safety Act.

5.00 AIR CLEANER

5.01 The engine intake air cleaner system shall be furnished and properly installed by the chassis manufacturer to meet engine manufacturer's specifications.

5.02 The intake air system for diesel engines may have an air cleaner restriction indicator properly installed by the chassis manufacturer to meet engine specifications.

6.00 AXLES

6.01 The front and rear axle and suspension system shall have a gross axle weight rating (GAWR) at ground commensurate with the respective front and rear weight loads that will be imposed by the bus.

7.00 BRAKES

7.01 A braking system, including service brake and parking brake, shall be provided.

7.02 Buses using air in the operation of the brake system shall be equipped with warning signals, readily audible and visible to the driver, that will give a continuous warning when the air pressure available in the system for braking is 60 psi (pounds per square inch) or less.

7.02.1 An illuminated gauge shall be provided that will indicate to the driver the air pressure in pounds per square inch.

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

7.02.3 Air brakes are standard on all 65-passenger units and larger. A Bendix Air Dryer (AD9) or prior approved equivalent with a heater shall be required on all air brakes. Air compressor shall be 12 cubic feet per minute (CFM's) or greater.

7.02.4 All air brake equipped buses shall be equipped with outboard drums.

7.02.5 Brakes shall be designed to Federal Motor Vehicle Safety Standards (FMVSS) 105 or 121 as applicable.

7.03 Buses using a hydraulic assist-brake system shall be equipped with warning signals, readily audible and visible to the driver, that will provide continuous warning in the event of a loss of fluid flow from primary sources or loss of electric source powering the back-up system.

7.04 The brake lines and the booster-assist lines shall be protected from excessive heat and vibration and installed in a manner which prevents chafing.

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

7.06 Automatic slack adjusters are required on all air brake units and shall be of the same brand.

8.00 FRONT BUMPER

8.01 The front bumper shall be furnished by chassis manufacturers as part of the chassis on Type 'A', 'B', and 'C' buses unless energy absorbing or other bumper options necessitate installation by the body manufacturer. When Type 'D' chassis are supplied to a body company by a chassis manufacturer, the body company shall supply the front bumper as part of the body installation.

8.02 Unless an energy absorbing bumper is used, the front bumper shall be of pressed steel channel or equivalent material at least 3/16" thick and not less than 8" wide (high) and shall extend beyond the forward-most part of the body, grill, hood, and fenders and shall extend to outer edges of the fenders at the bumper's top line. Type ‘A’ shall be to manufacture standard

8.03 Front bumper, except breakaway bumper ends, shall be of sufficient strength to permit pushing a vehicle of equal gross vehicle weight without permanent distortion to the bumper, chassis, or body.

9.00 COLOR

9.01 Chassis, including front bumper, shall be black; hood, cowl and fenders shall be National School Bus Yellow (NSBY).

9.02 Hood may be painted with non-reflective NSBY paint.

9.03 Black wheels shall be standard.

9.03.01 Yellow, silver, gray or white wheels are optional.

10.00 DRIVE SHAFT

10.01 The drive shaft shall be protected by a metal guard or guards around circumferences of the drive shaft to reduce possibility of it whipping through the floor or dropping to the ground if broken.

11.00 ELECTRICAL SYSTEM

11.01 Battery

11.01.1 The standard on all Type 'B', 'C' and 'D' diesel units will be a minimum of 1900 cold cranking amps (CCA) at 0 degrees Fahrenheit for each battery or approved equivalent. Optional equipment, when specified, will be one battery with a minimum of 850 CCA. Higher capacities may be required depending upon optional equipment and local environmental conditions.

11.01.2 All batteries in Type 'B', 'C' and 'D' buses are to be located in a sliding tray. Type ‘A’ chassis with the battery outside the engine compartment shall have a sliding tray installed or be externally accessible.

11.02 Alternator

11.02.1 Type 'A' buses up to 10,000 lbs gross vehicle weight rating (GVWR) shall have a minimum rating 130 ampere per hour alternator.

11.02.2 Type 'B', 'C', and 'D' buses shall be equipped with a heavy duty truck, bus type, or pad mount alternator meeting Society of Automotive Engineers (SAE) J 180; having a minimum output rating of 200 amperes, alternator shall be capable of producing a minimum of 50% of its maximum rated output at the engine manufacturer's recommended idle speed. Minimum alternator output for air conditioning system is 200 amp minimum. With a combination of air conditioner and lift a minimum alternator output of 270 amperes.

11.02.3 Direct-drive alternator is permissible in lieu of belt drive. Belt drive shall be capable of handling the rating capacity of the alternator with no detrimental effect on other driven components.

11.03 Electrical wires and terminals (Body and Chassis)

11.03.1 All wiring shall comply with latest SAE recommended practices. This shall include SAE J541a, SAE J1127, SAE J1708 and SAE J1128.

11.03.2 Wiring shall be of sufficient size to carry the required load without excessive voltage drop.

11.03.3 Wires shall be permanently continuous color coded or permanently number coded to easily identify the various circuits. Use of taped numbers is not acceptable.

11.03.4 Wires shall be of sufficient length to provide a loop at terminals so as to permit ample slack for directional positioning. The length shall allow replacement of end terminals twice, without pulling, stretching or replacing the wire.

11.03.5 Corrosion-resistant full ring or interlocking terminals shall be used for terminating wire ends at components. All wires shall be continuous and terminate at appropriate connector. "T" or butt connectors shall not be used. Vehicles multiplex wiring system shall be manufacture standards.

11.03.6 Battery cable terminals, component terminals and connectors exposed to the ambient shall be coated with terminal corrosion preventive compound.

11.03.7 Except for those on large wires, such as battery cables, terminals shall be machine crimped to the wiring. A ratchet type hand crimper may be used where it is not possible to use a large machine crimper.

11.03.8 Wiring shall be arranged in circuits as required and each circuit protected by a fuse, field effect transistor (FET) or circuit breaker. A system of colors and numbers shall be used and an appropriate identifying wiring diagram of each body as manufactured shall be provided to the end user.

11.03.9 Chassis manufacturers of incomplete vehicles shall install a readily accessible terminal strip or connector on the body side of the cowl, or at an accessible location in engine compartment of vehicles designed without a cowl, that shall contain the following terminals for the body connections:

11.03.9.1 Main 100 ampere body circuit
11.03.9.2 Tail lamps
11.03.9.3 Right turn signals
11.03.9.4 Left turn signals
11.03.9.5 Stop lamps
11.03.9.6 Back-up lights
11.03.9.7 Instrument panel lights (rheostat controlled)

11.03.10 A Daytime Running Lamp system meeting chassis manufacturer's specifications shall be provided.

12.00 ENGINE

12.01 Oil filter with replaceable element shall be provided and connected by flexible oil lines if it is not of built-in or engine mounted design. Oil filter shall have capacity of at least one (1) quart.

12.02 Engine (gross) Horsepower (hp) rating.

190 hp min. for 25-60 passenger
200 hp min. for 61-78 passenger
230 hp min. for 79-90 passenger

12.03 A written engine warranty is required. A minimum of 5 year - 150,000 miles (100% parts and labor) on the diesel engine for Type 'B', 'C', and 'D' units is required. Type 'A' is manufacturer's standard.

12.04 Diesel engines shall be standard; other engines shall have the manufacturer's standard warranty.

13.00 EXHAUST SYSTEM

13.01 Exhaust pipe, muffler and tailpipe shall be outside bus body compartment and attached to chassis.

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

13.03 Tailpipe shall (a) extend beyond rear axle, at least 5 inches beyond chassis frame and be mounted outside of chassis frame rail at end point, and (b) may extend to the left side of bus, behind the driver's compartment, outboard of chassis center line and shall terminate from chassis center line as follows:

Type 'A' vehicles - Manufacturer's standard; Type 'B', 'C', and 'D' vehicles - 48.5 inches (51.5 inches if the body is to be 102 inches wide). On Type 'B', 'C', and 'D' buses, no exhaust pipe shall exit beneath an emergency exit or fuel fill.

13.04 Exhaust system on gas-powered chassis shall be properly insulated from fuel tank connections by a securely attached metal shield at any point where it is 12 inches or less from tank or tank connections.

13.05 Mufflers shall be constructed of corrosion - resistant material.

14.00 FRONT FENDERS (TYPE 'C' VEHICLES)

14.01 Total spread of outer edges of front fenders, measured at fender line, shall exceed total spread of front tires when front wheels are in straight ahead position.

14.02 Fenders shall be properly braced and free from any body attachments.

14.03 Chassis sheet metal shall not extend beyond rear face of cowl on incomplete chassis.

15.00 FRAME

15.01 Frame or equivalent shall be of such design and strength characteristics as to correspond at least to standard practice for trucks of same general load characteristics.

15.02 Any primary (chassis manufacturer) or secondary manufacturer (body manufacturers) that modifies the original chassis frame shall guarantee the performance of workmanship and materials resulting from such modifications.

15.03 Any frame modification shall not be for the purpose of extending the wheelbase. Extensions of frame length are permissible only when such alterations are behind rear hanger of rear spring.

15.04 Holes in top or bottom flanges or side units of frame, and welding to frame shall not be permitted except as provided or accepted by chassis manufacturers.

16.00 FUEL TANK

16.01 Fuel tank or tanks having a 30 gallon minimum capacity with a 25 gallon actual draw shall be provided by the chassis manufacturer on 36 capacity units and smaller. The tank shall be filled and vented to the outside of the body, the location of which shall be so that accidental fuel spillage will not drip or drain on any part of the exhaust system. A fuel tank having a capacity of a minimum of 60 gallons with a 55 gallon actual draw shall be provided by the manufacturer on 37 capacity units and larger.

16.02 No portion of the fuel system which is located to the rear of the engine compartment, except the filler tube, shall extend above the top of the chassis frame rail. Fuel lines shall be mounted to obtain maximum possible protection from the chassis frame.

16.03 Fuel filter with replaceable element shall be installed between fuel tank and carburetor or injector.

16.04 Installation of an alternative fuel system shall comply with all applicable local, state and federal fire codes and National Highway Transportation Safety Administration (NHTSA) regulations.

17.00 GOVERNOR (Electronic Control)

17.01 An engine rpm governor shall be installed on all engines. When it is desired to limit road speed, a road speed governor should be installed.

17.02 A governor shall be installed to limit engine speed to maximum revolutions per minute recommended by engine manufacturer.

18.00 HEATING SYSTEM

18.01 The chassis engine shall have plugged openings for the purpose of supplying hot water for the bus heating system. The openings shall be suitable for attaching a 3/4- inch thread/hose connector.

19.00 HORN

19.01 Bus shall be equipped with dual electric horns of standard make with each horn capable of producing complex sound in bands of audio frequencies between 250 and 2,000 cycles per second and tested per SAE Standard J-377.

20.00 INSTRUMENTS AND INSTRUMENT PANEL

20.01 Chassis shall be equipped with the following instruments and gauges. (Lights in lieu of gauges are not acceptable except as noted):

20.01.1 Speedometer.

20.01.2 Odometer which will give accrued mileage (six digits with trip odometer) including tenths of miles.

20.01.3 Voltmeter.

(a) Ammeter with graduated charge and discharge with ammeter and its wiring compatible with generating capacities is permitted in lieu of voltmeter.

20.01.4 Oil-pressure gauge.

20.01.5 Water temperature gauge.

20.01.6 Fuel gauge.

20.01.7 Upper beam headlight indicator.

20.01.8 Brake indicator gauge (air).

(a) Light indicator in lieu of gauge permitted on vehicle equipped with hydraulic-over-hydraulic brake system.

20.01.9 Turn signal indicator.

20.01.10 Glow-plug indicator light where appropriate.

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

20.03 Instruments and gauges shall be mounted on instrument panel in such a manner that each is clearly visible to driver while in normal seated position.

20.04 Instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges and shift selector indicator for automatic transmission.

21.00 OPENINGS

21.01 All openings in floorboard and firewall between chassis and passenger-carrying compartment, such as for gearshift selector and parking brake lever, shall be sealed.

22.00 PASSENGER LOAD

22.01 Gross vehicle weight (GVW) is the sum of the chassis weight, plus the body weight, plus the driver's weight, plus total seated pupil weight.

22.01.1 For purposes of calculation, the driver's weight is 150 pounds.

22.01.2 For purposes of calculation, the pupil weight is 120 pounds per pupil.

22.02 Actual gross vehicle weight (GVW) shall not exceed the chassis manufacturer's GVWR for the chassis.

23.00 RETARDER SYSTEM

23.01 Retarder system, if used, shall maintain the speed of the fully loaded school bus at 19.0 mph or 30 km/hr on a 7% grade for 3.6 miles or 6 km.

24.00 SHOCK ABSORBERS

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

25.00 SPRINGS

25.01 Capacity of springs or suspension assemblies shall be commensurate with chassis manufacturer's gross vehicle weight rating.

26.00 STEERING GEAR

26.01 Steering gear shall be approved by chassis manufacturer and designed to assure safe and accurate performance when vehicle is operated with maximum load and at maximum speed.

26.02 If external adjustments are required, steering mechanism must be accessible to accomplish same.

26.03 No changes shall be made in steering apparatus which are not approved by chassis manufacturer.

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

26.05 The steering system shall be designed to provide means for lubrication of all wear-points, if wear-points are not permanently lubricated.

26.06 Tilt steering wheel is required on Type ‘B’, ‘C’ & 'D' vehicles. Tilt steering is optional on Type 'A' vehicles.

27.00 TIRES AND WHEELS

27.01 Tires and wheels of proper size and tires with load rating commensurate with chassis manufacturer's gross vehicle weight rating shall be provided.

27.02 Dual rear tires shall be provided on Type 'A' school buses.

27.03 All tires on any given axle shall be of same size and the load range of said tires shall meet or exceed the gross axle weight rating as required by FMVSS 120.

27.04 If the vehicle is equipped with optional spare tire and wheel assembly, it shall be of the same size and type as those mounted on the vehicle.

27.05 If tire carrier is required, it shall be suitably mounted in accessible location outside passenger compartment.

27.06 Steel belted tubeless radial tires shall be standard equipment.

27.07 Disc wheels are required on Type 'B', 'C', and 'D' units.

28.00 TOW EYES OR HOOKS

28.01 Tow eyes or hooks shall be furnished front and rear and attached so as not to project beyond the front or rear bumpers. Tow eyes or hooks attached to the frame (chassis) shall be furnished by chassis manufacturer. Type ‘A’ shall be exempt.

29.00 TRANSMISSION - DIFFERENTIAL

29.01 When automatic transmission is used, it shall provide for not less than three forward speeds and one reverse speed. The shift selector, if applicable, shall provide a detent between each gear position when the gear selector quadrant and shift selector are not steering column mounted. Transmission shall meet manufacturer's specifications. Automatic transmission is base specification on all units.

29.02 Gear ratio will need to be specified by the local school district representative. Otherwise, the manufacturer standard gear ratio will be delivered. District representative should consult with area mechanics to determine the proper gear ratio for local terrain and use of unit.

30.00 TURNING RADIUS

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

30.02 Chassis with a wheelbase of 265 inches or more shall have a right and left turning radius of not more than 44-1/2 feet, curb measurement.

31.00 UNDERCOATING

31.01 Chassis manufacturer, or agent thereof, shall coat undersides of steel or metallic constructed front fenders with rust proofing compound for which compound manufacturers have issued notarized certification of compliance to chassis builder that compound meets or exceeds all performance and qualitative requirements of paragraph 3.4 of Federal Specification TT-C-520B.

32.00 WEIGHT DISTRIBUTION

32.01 Weight distribution of a fully-loaded bus on a level surface shall be such as not to exceed the manufacturer's front gross axle rating and rear gross axle weight rating.

33.00 BUS BODY SPECIFICATIONS

33.01 All bus bodies shall meet Arkansas Specifications and FMVSS in effect as of September 1, 2008 or in force on the day of issuance of bid request.

34.00 AISLE

34.01 All emergency doors shall be accessible by a 12-inch minimum aisle. Primary aisle shall be unobstructed at all times by any type barrier or seat. Aisle to left side emergency door, if so equipped, may have an automatic folding seat.

34.02 The seat backs shall be slanted sufficiently to give aisle clearance of 15 inches at tops of seat backs.

35.00 BACK UP WARNING DEVICE

35.01 An automatic audible alarm shall be installed behind the rear axle and shall comply with the SAE published Backup Alarm Standards (SAE 994b).

36.00 BATTERY

36.01 Battery is to be furnished by chassis manufacturer.

36.02 The body manufacturer shall securely attach the battery on a slide-out tray or door in a closed, vented compartment in the body skirt, so that the battery is accessible for convenient servicing from the outside. Battery compartment door or cover shall be hinged at front or top, and secured by an adequate and conveniently operated latch or other type fastener.

37.00 FRONT BUMPER

37.01 On a Type 'D' school bus, if the chassis manufacturer does not provide a bumper, it shall be provided by the body manufacturer. The bumper will conform to the specifications in the chassis section.

38.00 REAR BUMPER

38.01 Bumper shall be of pressed steel channel or equivalent material, at least 3/16-inch thick, and shall be a minimum of 9.5 inches wide (high) on Type 'A', 'B', 'C', and 'D' buses, and of sufficient strength to permit being pushed by another vehicle without permanent distortion.

38.02 Bumper shall be wrapped around back corners of bus. It shall extend forward at least 12 inches measured from rear-most point of body at floor line.

38.03 Bumper shall be attached to chassis frame in such a manner that it may be easily removed; it shall be so braced as to withstand impact from a rear or side impact. It shall be so attached as to discourage hitching of rides.

38.04 Bumper shall extend at least one inch beyond the rear-most part of body surface measured at floor line.

38.05 Tow eyes or hooks shall be furnished on the rear and attached so they do not project beyond the rear bumper. Tow eyes or hooks attached to the chassis frame, shall be furnished by either the chassis or body manufacturer. The installation shall be in accordance with the chassis manufacturer's specifications.

39.00 CERTIFICATION

39.01 Body manufacturer shall, upon request, certify to the state agency having pupil transportation jurisdiction that their product meets minimum standards on items not covered by certification issued under requirements of the National Traffic and Motor Vehicle Safety Act.

39.02 Certification plate indicating maximum design capacity shall be affixed to bus body.

40.00 COLOR

40.01 The school bus body shall be painted uniform color, NSBY. Entrance door and window post may be black.

40.02 The body exterior paint trim, bumpers, rub rails, lamp hoods, emergency door lettering and arrow shall be black.

40.03 The roof of the bus may be painted white extending down to the drip rails on the sides of the body or within approximately 6" of the top of the windows except that front and rear roof caps shall remain NSBY.

41.00 COMMUNICATIONS

41.01 Buses may be equipped with AM/FM CD and/or two way radio communication system. Speakers shall be flush mounted.

42.00 CONSTRUCTION

42.01 Side Intrusion Test: The bus body shall be constructed to withstand an intrusion force equal to the curb weight of the vehicle, but shall not exceed 20,000 pounds, whichever is less. Each vehicle shall be capable of meeting this requirement when tested in accordance with the procedures set forth below.

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

42.03 The cylinder shall be placed as close as practical to the mid-point of the tested structure, spanning two internal vertical structural members. The cylinder shall be statically loaded to the required force of curb weight or 20,000 pounds, whichever is less, in a horizontal plane with the load applied from the exterior toward the interior of the test structure. Once the minimum load has been applied, the penetration of the loading cylinder into the passenger compartment shall not exceed a maximum of ten inches from its original point of contact.

There can be no separation of lapped panels or construction joints. Punctures, tears or brakes in the external panels are acceptable but are not permitted on any adjacent interior panel.

42.04 Body companies shall certify compliance with this intrusion requirement, including test results, if requested.

42.05 Construction shall be reasonably dust-proof and watertight.

43.00 CROSSING CONTROL ARM

43.01 Buses shall be equipped with a crossing control arm mounted on the right side of the front bumper. This arm when opened shall extend in a line parallel with the body side and positioned on a line with the right side front tire.

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

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

43.04 The crossing control arm shall meet or exceed SAE J1133.

43.05 The crossing control arm shall be constructed of noncorrosive or nonferrous material or treated in accordance with the body sheet metal specification (See Metal treatment).

43.06 There shall be no sharp edges or projections that could cause hazard or injury to students.

43.07 The crossing control arm shall extend approximately 70 inches (measured from the bumper at the arm assembly attachment point) when in the extended position.

43.08 The crossing control arm shall extend simultaneously with the stop arm(s) by means of the stop arm controls.

43.09 An automatic recycling interrupt switch shall be installed for temporary disabling of the crossing control arm.

43.10 The crossing control arm shall be equipped with a magnetic contact between the arm and front bumper except on air operated crossing controls.

44.00 DEFROSTERS

44.01 Defrosting and defogging equipment shall direct a sufficient flow of heated air onto the windshield, the window to the left of the driver and the glass in the

viewing area directly to the right of the driver to eliminate frost, fog and snow. The defroster unit shall have a separate blower motor in addition to the heater motors or plenum with single blower. Defrosting and defogging equipment for Type 'A' vehicles shall direct a sufficient flow of heated air onto the windshield to eliminate frost, fog and snow.

44.02 The defroster and defogging system shall conform to SAE's Standards J381 and J382.

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

44.04 Auxiliary fans are not considered defrosting or defogging systems.

44.05 Portable heaters shall not be used.

45.00 DOORS

45.01 Service Door

45.01.1 Service door shall be within the driver's control, and so designed to afford easy release and provide a positive latching device on manual operating doors to prevent accidental opening. When hand lever is used, no parts shall come together so as to shear or crush fingers.

45.01.2 Manual door controls shall not require more than 25 pounds of force to operate at any point throughout the range of operation, as tested on a 10 percent grade both uphill and downhill.

45.01.3 Service door shall be located on right side of bus, opposite and within direct view of driver.

45.01.4 Type 'A', 'B', 'C', and 'D' service door shall have a minimum horizontal opening of 24 inches and minimum vertical opening of 68 inches.

45.01.5 Service door shall be split type, sedan type, or jack-knife type.

45.01.6 Lower, as well as upper panels, shall be of approved safety glass. Bottom of lower glass panel shall not be more than 10 inches from the top surface of bottom step. Top of each upper glass panel shall not be more than 6 inches from top of door.

45.01.7 Vertical closing edges on split type or folding type entrance doors shall be equipped with flexible material to protect the children’s fingers.

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

45.01.9 On power-operated service doors, the emergency release valve, switch or device to release the service door must be placed above or to the immediate left or right of the service door and clearly labeled.

45.02 Emergency Doors

45.02.1 The emergency door shall be hinged on right side if in rear end of bus. It shall open outward and be labeled inside to indicate how it is to be opened. If double emergency doors are used on Type 'A' vehicles, they shall be hinged on the outside edge and shall have a 3-point fastening device. A device shall be used that holds the door open to prevent the emergency door from closing during emergencies and school bus evacuation drills.

45.02.2 The upper portion of emergency door shall be equipped with approved safety glass, exposed area of which shall be not less than 400 square inches. The lower portion of the rear emergency door on Type 'B', 'C', and 'D' vehicles shall be equipped with a minimum of 350 square inches of approved safety glass.

45.02.3 There shall be no steps leading to emergency door.

45.02.4 Words "EMERGENCY DOOR", in letters at least 2 inches high, shall be placed at top of or directly above the emergency door or on the door in the metal panel above the top glass, both inside and outside of the bus.

45.02.5 The emergency door shall be equipped with padding at the top edge of each door opening. Padding shall be at least 3 inches wide and 1 inch thick and extend the full width of the door opening.

45.02.6 The side emergency door, if installed, must meet the requirements as set forth in FMVSS 217, regardless of its use with any other combination of emergency exits.

45.02.7 There shall be no obstruction higher than 1/4 inch across the bottom of any emergency door opening.

45.02.8 All exterior metal door hinges which do not have stainless steel, brass or nonmetallic hinge pins or other designs that prevent corrosion shall be designed to allow lubrication to be channeled to the center 75 percent of each hinge loop without disassembly.

46.00 EMERGENCY EQUIPMENT

46.01 Fire Extinguisher

46.01.1 The bus shall be equipped with at least two pressurized, dry chemical fire extinguishers, complete with hose to meet Underwriters' Laboratories, Inc., approval. Extinguishers must be mounted in a bracket, one located in the driver’s compartment and one located on the left side of the rear emergency door exit, readily accessible to the driver and passengers. A pressure gauge shall be mounted on the extinguisher and easily read without moving the extinguisher from its mounting position. The extinguisher shall be refillable.

46.01.2 The fire extinguisher shall be of a type approved by Underwriters' Laboratories with a total rating of 2A1OBC (5 lbs each) or greater. The operating mechanism shall be sealed with a type of seal which will not interfere with the use of the fire extinguisher.

46.02 First-Aid Kits

46.02.1 Bus shall have a removable, moisture-proof and dust-proof first-aid kit mounted in an accessible place within driver's compartment. This place shall be marked to indicate its location.

46.02.2 Minimum contents shall include:
3/4" x 3" bandage w/telfa Pad
3" Bandage Compress w/telfa
2" Bandage Compress w/telfa
3" x 3" Gauze Compress
36" x 36" Gauze Compress
40" Triangular bandage, non-sterile
Gauze Bandage, 2" x 6 yards
Eye Pads, Adhesive Strips
Adhesive Tape, 1" x 2-1/2 yards
4" Blunt Scissors

46.03 Body Fluid Clean-up Kit

46.03.1 Each bus shall have a removable and moisture proof body fluid clean-up kit. It shall be properly mounted and identified as a body fluid clean-up kit.

46.04 Warning Devices

46.04.1 Each school bus shall contain at least three (3) reflective triangle road warning devices in the driver's compartment secured by a mounting bracket. The mounting location in Type 'A' vehicles is optional. These devices shall meet requirements in FMVSS 125.

47.00 EMERGENCY EXIT REQUIREMENTS

47.01 All buses shall be equipped with a total number of emergency exits required by FMVSS 217.

47.02 Side emergency exit windows when installed may be vertically hinged on the forward side of the window. No side emergency exit window will be located above a stop arm.

48.00 FLOOR

48.01 Floor in under seat area, including tops of wheelhousings, driver's compartment and toeboard, shall be covered with rubber floor covering or equivalent, having a minimum overall thickness of .125 inch.

48.02 Floor covering in aisle shall be of aisle-type rubber or equivalent, wear-resistant and ribbed. Minimum over-all thickness shall be .187 inch measured from tops of ribs.

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

48.04 Body manufacturer shall provide a screw-down plate that is secured and insulated to access fuel tank sending unit. Type 'A' is excluded from this requirement.

49.00 HEATERS

49.01 Heaters shall be of the hot-water type and/or combustion type. Combustion heaters shall meet requirements of School Bus Manufacturers Technical Council (SBMTC) 301. The tank shall be plumbed by the original manufacturer for such heater. A 41 passenger and larger school bus shall be equipped with a minimum of two (2) heaters. The front heater shall be a minimum of 78,000 BTU and the rear heater shall be a minimum of 42,000 BTU and may be of recirculating air type, or the heating system shall be capable of maintaining the temperature throughout the bus of not less than 40 degrees Fahrenheit during average minimum January temperature as established by the U.S. Department of Commerce, Weather Bureau, for the area in which the vehicle is to be operated.

49.02 If only one heater is used, it shall be of fresh-air or combination fresh-air and re-circulation type.

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

49.04 All heaters installed by body manufacturers shall bear a name plate that shall indicate the heater rating in accordance with SBMTC Standard No. 001, with said plate to be affixed by the heater manufacturer which shall constitute certification that the heater performance is as shown on the plate.

49.05 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 sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hose shall conform to SAE Standard J20c. Heater lines on the interior of bus shall be shielded to prevent scalding of the driver or passengers.

49.06 Each hot water system installed by a body manufacturer shall include a shut-off valve installed in the pressure line and one shut-off valve in the return line with both valves at or near the engine in an accessible location.

49.07 There shall be a water or air flow-regulating valve installed in the pressure line for convenient operation by the driver while seated.

49.08 All combustion type heaters shall be in compliance with current Federal Motor Carrier Safety Regulations.

49.09 Accessible bleeder valves shall be installed in an appropriate place in the return lines of body company installed heaters to remove air from the heater lines.

49.10 An exterior/interior access panel shall be provided to make heater motors, cores and fans readily accessible for service on Type 'B', 'C', and 'D' units.

50.00 IDENTIFICATION

50.01 Body shall bear words "SCHOOL BUS" in black letters at least 8 inches high on both front and rear of body or on signs attached thereto. Lettering shall be placed as high as possible without impairment of its visibility. Lettering shall conform to "Series B" of Standard Alphabets for highway signs and shall be on a retro reflective area of approximately 12" x 45" meeting U.S. Department of Transportation FHWA-FP-85 Type 2A or Type 3A.

50.02 Permit numbers and school district name on side and rear of bus and school identification on each side shall be a minimum of 6 inches in height and 3/4" wide and conform to the assigned number of the Arkansas Division of Academic Facilities and Transportation.

50.03 Except as allowed in 50.04, only signs and lettering approved by state law or regulation, limited to name of owner or operator and any numbers necessary for identification, shall appear on a school bus. School logo or mascot may only appear above the drip rail on either side of the bus or between the bottom two rub rails not to exceed 540 square inches.

50.04 An anti bullying sign and no smoking sign shall be affixed to the interior bulkhead of the bus. A no unauthorized entry sign shall be affixed on the exterior of bus immediately rear of the service door below the window and above the rub rail.

50.05 A magnetic or adhesive sticker of an American or Arkansas flag nor larger than 4 inches by 6 inches may be displayed directly below the driver’s window or directly above the driver’s window above the drip rail.

51.00 INSIDE HEIGHT

51.01 Inside body height shall be 72 inches or more, measured metal to metal, at any point of longitudinal centerline from front vertical bow to rear vertical bow. Inside body height of Type 'A' buses shall be 62 inches or more. 77 inches or more of headroom is optional.

52.00 INSULATION

52.01 Ceiling and walls shall be insulated with proper material to deaden sound, and to reduce vibration to a minimum. If thermal insulation is specified, it shall be fire-resistant and approved by Underwriters' Laboratories, Inc.

52.02 If floor insulation is required, it shall be either 5 ply, nominal 5/8 inches thick plywood, or a material of equal or greater strength and insulation R value and it will meet or exceed properties of exterior-type softwood plywood, C-D Grade as specified in standard issued by U.S. Department of Commerce. When plywood is used, all exposed edges shall be sealed.

53.00 INTERIOR

53.01 Interior of bus shall be free of all unnecessary projections, which include luggage racks and attendant handrails, likely to cause injury. This standard requires inner lining on ceilings and walls. If ceiling is constructed to contain lapped joints, forward panel shall be lapped by rear panel. All interior panels, except access panels, shall have hemmed edges. All access panels shall be hemmed or beaded.

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

53.03 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 Noise Test Procedure.

53.04 Radio speakers shall be flush mounted, if installed.

53.05 A padded shoulder rail may be installed on both sides below the side windows. Shoulder rails shall be covered in the same material as the seats.

54.00 LAMPS AND SIGNALS

54.01 Interior lamps shall be provided which adequately illuminate aisle and stepwell. Stepwell light shall be illuminated by a service door operated switch, to illuminate only when headlights and clearance lights are on and service door opened.

54.02 Body instrument panel lights shall be controlled by a rheostat switch.

54.03 School Bus Alternately Flashing Signal Lamps shall be non-sequential operating system.

54.03.1 Bus shall be equipped with two red lamps at rear of vehicle and two red lamps at front of vehicle.

54.03.2 In addition to the four red lamps described in Section 54.03.1 above, four amber lamps shall be installed as follows: one amber lamp shall be located near each red signal lamp, at same level, but closer to vertical centerline of bus; system of red and amber signal lamps shall be wired so that amber lamps are energized manually, and red lamps are automatically energized (with amber lamps being automatically de-energized) when stop signal arm is extended or when bus service door is opened.

54.03.3 Area around lens of each alternately flashing signal lamp and extending outward approximately 3 inches shall be black in color. In installations where there is no flat vertical portion of body immediately surrounding entire lens of lamp, a circular or square band, approximately 3 inches wide and 1” underneath, immediately below and to both sides of lens, shall be painted black in color on body or roof area against which signal lamp is seen (from distance of 500 feet along axis of vehicle).

Visors or hoods, black in color, with a minimum depth of four (4) inches may be provided.

54.03.4 Red lamp shall flash at any time the stop signal arm is extended.

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

54.04 Turn Signal and Stop/Tail Lamps

54.04.1 Bus body shall be equipped with rear turn signal lamps that are at least seven (7) inches in diameter, or if a shape other than round, a minimum 38 square inches of illuminated area and meet specification of the Society of Automotive Engineers. These signals must be connected to the chassis hazard wiring switch to cause simultaneous flashing of turn signal lamps when needed as vehicular traffic hazard warning. Turn signal lamps are to be placed as wide apart as practical and their centerline shall be approximately seven (7) to eight (8) inches below the rear windows. Type 'A' vehicle lamps must be 21 square inches in lens area and be in manufacturer's standard color.

54.04.2 Buses shall be equipped with four combination red stop/tail lamps.

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

(b) Two combination lamps with a minimum diameter of 4 inches, or if a shape other than round, a minimum 12 square inches of illuminated area shall be placed on the rear of the body between the beltline and the floor line. Rear license plate lamp may be combined with one lower tail lamp. Stop lamps shall be activated by the service brakes and shall emit a steady light when illuminated. Type ‘A’ buses with bodies supplied by chassis manufacturer may have manufacturer's standard stop and tail lamps.

54.04.3 Armored clearance lights may be installed. Receded or flush mounted lights are acceptable.

54.04.4 All Type 'B', 'C', and 'D' units shall be equipped with an exterior/interior access panel with lock and key or trip lever on inside of unit for access to the electrical panel.

54.04.5 Side mounted directional signals shall be installed on the left side mounted rearward of the stop signal arm and on the right side mounted rearward of the service door of all type buses.

54.05 On all buses equipped with the optional 16 unit light monitor for the front and rear lamps of the school bus, the monitor shall be mounted in full view of the driver. If the full circuit current passes through the monitor, each circuit shall be protected by a fuse or FET against any short circuit or intermittent shorts.

54.06 A white flashing strobe light shall be installed on the roof of a school bus not to exceed 1/3 the body length forward from the rear of the roof edge and behind rear roof hatch. The light shall have a single clear lens emitting light, minimum 10 Joule, 360 degrees around its vertical axis and may not extend above the roof more than maximum legal height. The strobe light may be wired to activate when the ignition switch is in the on position. A pilot light shall be included to indicate when light is in operation. A deflection guard may be installed on each unit.

55.00 METAL TREATMENT

55.01 All metal used in construction of bus body shall be zinc - coated or aluminum-coated or treated by equivalent process before bus is constructed. Included are such items as structural members, inside and outside panels, door panels and floor sills. Excluded are such items as door handles, grab handles, interior decorative parts, and other interior plated parts.

55.02 All metal parts that will be painted shall be, in addition to above requirements, chemically cleaned, etched, zinc-phosphate-coated, and zinc-chrome or epoxy-primed or conditioned by equivalent process.

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

55.04 As evidence that above requirements have been met, samples of materials and sections used in construction of bus body, when subjected to 1,000-hour salt spray test as provided for in latest revision of American Society for Testing and Materials (ASTM) Standard B-117, "Standard Method of Salt Spray (Fog) Testing", shall not lose more than 10 percent of material by weight.

56.00 MIRRORS

56.01 The mirror system shall comply with FMVSS 111 Rearview and Crossview Mirrors.

57.00 MOUNTING

57.01 Chassis frame shall support rear body cross member. Bus body shall be attached to chassis frame at each main floor sill, except where chassis components interfere, in such manner as to prevent shifting or separation of body from chassis under severe operating conditions.

57.02 Insulating material shall be placed at all contact points between body and chassis frame on all type buses, and shall be so attached to the chassis frame or body that it will not move under severe operating conditions.

58.00 NOISE SUPPRESSION SWITCH

58.01 Each bus shall be equipped with a switch mounted in the driver’s compartment to turn off all noise-producing accessories simultaneously, including heater blowers, air conditioning, defroster fans, and auxiliary fans and radios, if so equipped.

59.00 OVERALL LENGTH

59.01 Overall length of a bus shall not exceed 45 feet.

60.00 OVERALL WIDTH

60.01 Overall width of a bus shall not exceed 102 inches, excluding accessories.

61.00 RETROREFLECTIVE MATERIAL

61.01 The front and/or rear bumper may be marked diagonally 45 degrees down to centerline of pavement with two-inch ±1/4 inch wide strips of non-contrasting retro reflective material.

61.02 The rear of bus body shall be marked with strips of retro reflective National School Bus Yellow (NSBY) material to outline the perimeter of the back of the bus using material which conforms with the requirements of FMVSS 131, Table 1. The perimeter marking of rear emergency exits per FMVSS 217 and/or the use of retro reflective "SCHOOL BUS" signs partially accomplishes the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of at least 1 ¾-inch-retroreflective NSBY material shall be applied horizontally above the rear windows and above the rear bumper, extending from the rear emergency exit perimeter, marking outward to the left and right rear corners of the bus. Vertical strips shall be applied at the corners connecting these horizontal strips.

61.03 "SCHOOL BUS" signs, if not of lighted design, shall be marked with retro reflective NSBY material comprising background for lettering of the front and/or rear "SCHOOL BUS" signs.

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

61.05 Signs, if used, placed on the rear of the bus relating to school bus flashing signal lamps or railroad stop procedures may be of retroreflective material as specified by each state.

62.00 RUB RAILS

62.01 There shall be four rub rails, each painted black, located on each side of the bus, one at seat level which shall extend from rear side of entrance door completely around bus body (except for emergency door, engine door, and grill) to point of curvature near outside cowl on left side (except windows and access doors), one rub rail (no more than 10" above) at floor line, one located below side windows and one at the bottom of body skirt. Only the rub rail at (no more than 10" above) the seat level must extend around the bus body.

62.02 All rub rails shall be attached at each body post and all other upright structural members.

62.03 All rub rails shall be approximately 2.5 inches to 4.5 inches in width, shall be of approximately 20-gauge or larger steel, and shall be constructed in corrugated or ribbed fashion.

62.04 All rub rails shall be applied outside body or outside body posts; pressed-in or snap-on rub rails do not satisfy this requirement. For Type 'A' buses using chassis manufacturer's body or for Type 'B', 'C', and 'D' buses using rear luggage or rear engine compartment, rub rails need not extend around rear corners.

62.05 Rub rails are to be one piece except for end caps when used. Rear end wrap around pieces are excluded from the one piece rub rail. Rear end wrap around pieces shall not extend more than twelve (12) inches forward beyond where the flat side panel begins.

63.00 SEAT AND SEAT BELT FOR DRIVER

63.01 A type 2 lap belt/shoulder harness seat belt shall be provided for the driver. The assembly shall be equipped with an emergency locking retractor (ELR) for the continuous belt system. The lap portion of the belt shall be guided or anchored where practical to prevent the driver from sliding under it.

63.02 The driver's seat supplied by the body company shall be a six-way adjustable high back seat with a minimum seat back adjustable to 15 degrees, without requiring the use of tools, and head restraint to accommodate a 95th percentile adult male, as defined in FMVSS 208. The driver's seat shall be secured with nuts, bolts and washers or flanged-head nuts.

64.00 SEATING FOR PASSENGERS

64.01 All seats shall have a minimum cushion depth of 15 inches and must comply with all requirements of FMVSS 222. School bus design capacities shall be in accordance with FMVSS 222.

64.02 In determining seating capacity of bus, allowable average rump width shall be:

64.02.1 13 inches where 3-3 seating plan is used.

64.02.2 15 inches where 3-2 seating plan is used.

64.03 Upholstery shall conform with FMVSS 302.

64.04 Each seat leg shall be secured to the floor by a minimum of two (2) bolts, washers and nuts. Flange-head nuts may be used in lieu of nuts and washers, or seats may be track-mounted in conformance with FMVSS 222. If track seating is installed, the manufacturer shall supply minimum and maximum seat spacing dimensions applicable to the bus, which comply with FMVSS 222. This information shall be on a label permanently affixed to the bus.

64.05 All seat frames attached to the seat rail shall be fastened with a minimum of two (2) bolts, washers and nuts or flange-head nuts.

64.06 All school buses (including Type 'A') shall be equipped with restraining barriers, which conform to FMVSS 222.

64.07 A flip-up seat may be installed at any side emergency door, provided that it conforms with FMVSS 222 and aisle clearance requirements of FMVSS 217. The flip-up seat shall be free of sharp projections on the underside of the seat bottom. The underside of the flip-up seat bottoms shall be padded or contoured to reduce the possibility of clothing being snagged or personal injury during use. Flip-up seats shall be constructed to prevent passenger limbs from becoming entrapped between the seat back and the seat cushion is in the upright position. The seat cushion shall be designed to rise to a vertical position automatically when it is not occupied.

65.00 STEPS

65.01 First step at service door shall be not less than 10 inches and not more than 14 inches from ground, based on standard chassis specifications.

65.01.1 Type 'D' vehicles shall have the first step at the service door 12 to 16 inches from the ground.

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

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

65.04 Steps shall not protrude beyond side bodyline.

65.05 Handrails not less than 20 inches in length shall be provided in unobstructed location inside doorway. At least one handrail shall be installed. The handrail(s) shall assist passengers during entry or exit, and be designed to prevent entanglement, as evidenced by the passage of the NHTSA string and nut.

65.06 All Type 'B', 'C', and 'D' units shall be equipped with a three step riser.

66.00 STEP TREADS

66.01 All steps, including floor line platform area, shall be covered with 3/16 inch ribbed elastomeric floor covering that exhibits good resistance to abrasion and high coefficient of friction.

66.02 Step covering shall be permanently bonded to a durable backing material that is resistant to corrosion.

66.03 The steps, including the floor line platform area shall have a 1- ½ inch white 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. The nosing shall be an integral piece without any joint extending to the leading edge of the nosing turndown.

66.04 Steptread covering shall have the following characteristics:

66.04.1 Special compounding for good abrasion resistance and high coefficient of friction. 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, 1,000 gram, 1,000 cycle.

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

66.04.3 Step treads shall have a calculated burn rate of .01 or less using the test methods, procedures and formulas listed in FMVSS302, Flammability of Interior Materials.

67.00 STIRRUP STEPS

67.01 There shall be at least one folding stirrup step or recessed foothold and suitably located handles on each side of the front of the body for easy accessibility for cleaning the windshield and lamps except when windshield and lamps are easily accessible from the ground. Steps are permitted in or on the front bumper, in lieu of the stirrup steps, if the windshield and lamps are easily accessible for cleaning from that position. Type ‘A’ buses are exempt.

68.00 STOP SIGNAL ARM

68.01 There shall be a stop signal arm installed on left outside of body. It shall meet applicable requirements of FMVSS 131. Arm shall be of an octagonal shape with white letters and border and a red background and may be of reflective material meeting U.S. Department of Transportation FHWA FP-85 Type 2A or Type 3A. The flashing strobe lights are standard (LED lights are an allowable option) shall be connected to the alternating red flashing signal lamp circuit.

69.00 STORAGE COMPARTMENT

69.01 If tools, tire chains and/or tow chains are carried on the bus, a container of adequate strength and capacity may be provided. Such storage container may be located either inside or outside the passenger compartment but, if inside, it shall have a cover (seat cushion may not serve as this purpose) capable of being securely latched and be fastened to the floor convenient to either the service or emergency door.

69.02 Optional underneath storage space shall have a minimum of 15 cubic feet of usable storage. A locking device shall secure each entrance to storage.

70.00 SUN SHIELD

70.01 Interior adjustable transparent sun shield not less than 6" x 30" for Type 'B', 'C', and 'D' vehicles, and not less than 6" x 16" for Type 'A' vehicles with a finished edge shall be installed in a position convenient for use by the driver.

71.00 TAILPIPE

71.01 The tailpipe may be flush with, but shall not extend out more than two inches beyond, the perimeter of the body for side-exit pipe, or the bumper for rear-exit pipe.

71.02 The tailpipe shall exit to the left of the emergency exit door in the rear of the vehicle or to the left side of the bus in front or behind the rear drive axle. The tailpipe exit location on all Type 'A' buses may be according to the manufacturer's standard. The tailpipe shall not exit beneath any fuel filler location or beneath any emergency door. Rear engine buses are exempt from left side tailpipe requirement.

72.00 UNDERCOATING

72.01 Entire underside of bus body, including floor sections, cross member and below floor line side panels, shall be coated with rust-proofing compound for which compound manufacturer has issued notarized certification of compliance to the bus body builder that compound meets or exceeds all performance and qualitative requirements of paragraph 3.4 of Federal Specification TT-C-520b using modified test procedures for following requirements:

72.01.1 Salt spray resistance-pass test modified to 5% salt and 1000 hours.

72.01.2 Abrasion resistance-pass.

72.01.3 Fire resistance-pass.

72.02 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.

73.00 VENTILATION

73.01 Auxiliary fans shall meet the following requirements:

73.01.1 A right hand and left hand mount driver defroster fan shall be installed in all Type 'B', 'C', and 'D' units.

73.01.2 Fan for the left side shall be placed in a location where it can be adjusted to its maximum effectiveness.

73.01.3 Fan for the right side shall be in a location where it can be adjusted to its maximum effectiveness.

73.01.4 The fan shall be a minimum six-inch diameter.

73.01.5 Fan shall be covered with a protective cage. A separate switch shall control the fan motor.

73.02 Body shall be equipped with a suitably controlled ventilating system of sufficient capacity to maintain proper quantity of air under operating conditions without opening of windows except in extremely warm weather.

73.03 Static-type non-closable exhaust ventilation shall be installed in low-pressure area of roof.

74.00 WARRANTY

74.01 The body shall have a 5 year (from date unit is put into service)/100,000 miles warranty. The limited warranty shall include the main body structural components, rust perforation of interior and exterior sheet metal paint adhesion, and passenger/driver seat frames.

74.02 The remaining items manufactured by the final stage manufacturer shall have a two year (from date bus is put into service)/unlimited miles warranty.

74.03 All items supplied by an outside vendor shall be warranted by the final stage manufacturer for one year (from date bus is put into service)/unlimited miles.

75.00 WHEELHOUSING

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

75.02 Wheelhousing shall be attached to floor sheets in such a manner to prevent any dust, water or fumes from entering the body. Wheelhousing shall be constructed of a minimum 16-gauge steel.

75.03 The inside height of the wheelhousing above the floor line shall not exceed 12 inches.

75.04 The wheelhousing shall provide clearance for installation and use of tire chains on dual power-driving wheels.

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

76.00 WINDOWS

76.01 An adjustable split sash window shall be mounted inside of bus body between each framing post. Safety glass shall be set in an acceptable manner in a sturdy extruded or die formed frame to provide adequate support for glass. Permanent mark showing grade of glass shall be visible and glass shall be a minimum of 1/8 inch thick.

A minimum clear vertical opening of not less than nine (9) inches shall be provided by lowering top sash. Bottom sash shall be stationary. Movable window shall be controlled by an approved latch having finger-touch opener providing for ease of operation, and shall have minimum of injury prone projections. Window latches must be replaceable or rebuildable without disassembling the complete window frame or removing the window from the body. Also, individual window latches or repair parts must be available and part numbers included in the required body parts catalog. Window seals and visors or drip molding shall be installed and unit shall provide ample protection from leakage in hardest rain.

76.02 For ventilation purposes, the driver's window shall be adjustable and shall be equipped with a positive latch that can be secured from the inside of bus.

76.03 There shall be installed, in the rear door, two (2) windows (one (1) upper, one (1) lower) installed in a waterproof manner. Glass shall be same type as for side windows.

Rear side windows located at each side of emergency door shall be installed in a waterproof manner. Glass area shall be large enough to provide desirable vision to rear and shall be of same quality and grade as for side windows.

77.00 WINDSHIELD WASHERS

77.01 A windshield washer system shall be provided.

77.02 Windshield washers shall be electrically operated. The washer reservoir shall be made of hard plastic or other approved material and have a capacity of at least one-half gallon. Flexible plastic bags are not acceptable.

78.00 WINDSHIELD WIPERS

78.01 A windshield wiping system, two-speed or more, shall be provided.

78.02 The wipers shall be operated by one or more electric motors of sufficient power to operate wipers and shall meet FMVSS 104.

79.00 WIRING

79.01 All wiring shall conform to current standards of Society of Automotive Engineers.

79.02 Circuits:

79.02.1 Wiring shall be arranged in circuits as required with each circuit protected by fuse or circuit breaker or FET. A system of color and number coding shall be used and an appropriate identifying diagram shall be provided to the end user along with the wiring diagram provided by the chassis manufacturer. A system of color and number coding shall be used on buses manufacturer after January 1, 1993. The following body interconnecting circuits shall be color-coded as noted:

FUNCTION	COLOR
Left Rear Directional Light	Yellow
Right Rear Directional Light	Dark Green
Stoplights	Red
Back-up-Lights	Blue
Taillights	Brown
Ground	White
Ignition Feed, Primary Feed	Black

The color of cables shall correspond to SAE J1128.

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

(a) Head, tail, stop (brake) and instrument panel lamps.

(b) Clearance and stepwell lamps (stepwell lamp shall be actuated when service door is opened).

(c) Dome lamp. (Dual row - 3 per side, minimum on Type 'B', 'C', and 'D' units.)

(d) Ignition and emergency door signal.

(e) Turn signal lamps.

(f) Alternately flashing signal lamps.

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

79.02.4 Whenever heaters and defrosters are used, at least one additional circuit shall be installed.

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

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

79.02.7 A master disconnect - ignition operated shall be on Type 'A', 'B', 'C', and 'D' units.

79.03 All wiring shall have an amperage capacity equal to or exceeding the designed load. All wiring splices are to be done at an accessible location and noted as splices on wiring diagram.

79.04 A body wiring diagram of easily readable size shall be furnished with each bus body or affixed in an area convenient to the electrical accessory control panel.

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

79.06 All wires passing through metal openings shall be protected by a grommet.

79.07 Wires not enclosed within body shall be fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equally effective connectors.

79.08 See 11.03 - wires and terminals - for additional information.

80.00 MISCELLANEOUS

80.01 Type 'A', 'B', and 'C' units shall be furnished with an operator's manual and a body parts manual.

80.02 Each order of Type 'D' units shall be supplied with an owner’s manual, body parts manual, and chassis parts book.

81.00 GENERAL REQUIREMENTS FOR SPECIALLY EQUIPPED SCHOOL BUSES

81.01 School buses designed for transporting children with special transportation needs shall comply with specifications set forth by National Congress on School Transportation in effect on the date of manufacture.

82.00 REQUIRED QUALIFICATIONS FOR BIDDERS

82.01 Dealership shall have a direct franchise agreement with the final stage manufacturer for buses sold in Arkansas.

82.02 Dealership shall have an adequate building and facilities for repair and servicing of buses.

82.03 Dealership shall have an adequate inventory of parts for warranty and repair work.

82.04 Dealership shall have trained personnel located in Arkansas qualified for service and warranty repair on equipment covered by the final stage manufacturer.

82.05 Dealership shall have an adequate lot for storage of buses.

82.06 All shipping shall be F.O.B. dealership's warranty and service location in Arkansas.

SPECIALLY EQUIPPED SCHOOL BUS SPECIFICATIONS

INTRODUCTION

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 chassis and body sections. 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

A. Specially equipped school buses shall comply with the *National School Transportation Specifications & Procedures* and with the Federal Motor Vehicle Safety Standards (FMVSS) applicable to their Gross Vehicle Weight Rating (GVWR) category.

B. 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.

AISLES

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

GLAZING

Tinted glazing may be installed in all doors, windows and windshields consistent with federal, state and local regulations.

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 retroreflective 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

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

POWER LIFTS AND RAMPS

A. The power lift shall be located on the right side 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.

1. A ramp device may be used in lieu of a mechanical lift if the ramp meets all the requirements of the Americans with Disabilities Act (ADA) as found in 36 CFR §1192.23, *Vehicle ramp.*

2. A ramp device that does not meet the specifications of ADA, but does meet the specifications of paragraph C of this section, may be installed and used, when, and only when, a power lift system is not adequate to load and unload students having special and unique needs. A readily accessible ramp may be installed for emergency exit use. If stowed in the passenger compartment, the ramp must be properly secured and placed away from general passenger contact. It must not obstruct or restrict any aisle or exit while in its stowed or deployed position.

3. All specially equipped school buses shall provide a level-change mechanism or boarding device (e.g., lift or ramp), complying with paragraph B or C of this section, with sufficient clearances to permit a wheelchair user to reach a securement location.

B. 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.*

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.

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

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

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

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

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

8. 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.)

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

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

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

12. Boarding direction: The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users.

13. 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.")

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

15. 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.

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

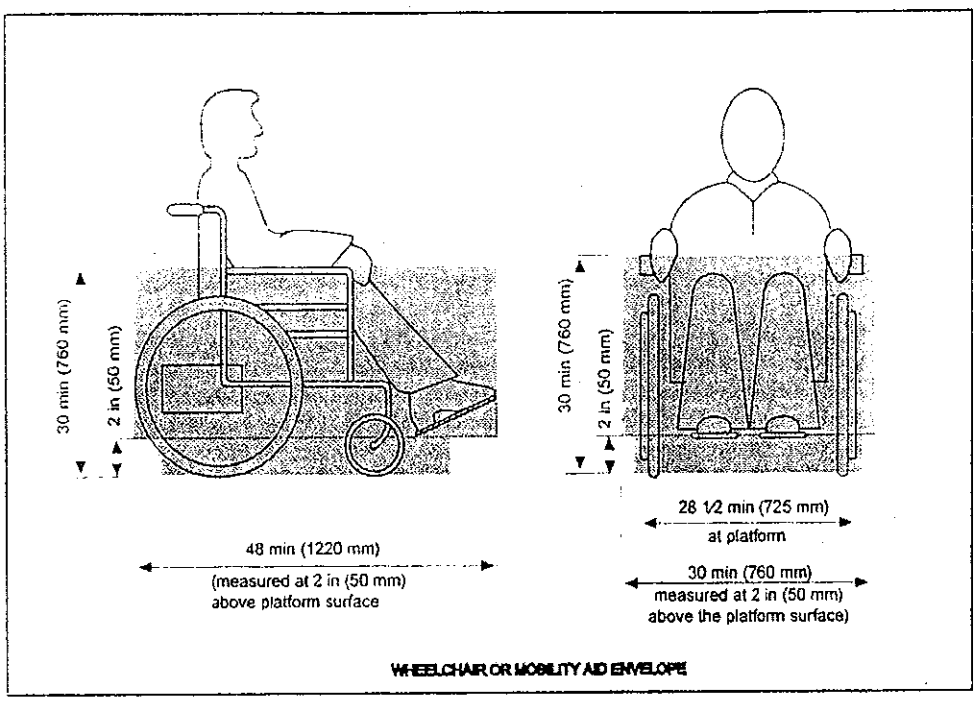
17. Documentation: The following information shall be provided with each vehicle equipped with a lift:

    (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.

18. 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.

19. 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.



WHEELCHAIR OR MOBILITY AID ENVELOPE

C. Vehicle ramp

1. If a ramp is used, it shall be of sufficient strength and rigidity to support the special device, occupant and attendant(s). It shall be equipped with a

protective flange on each longitudinal side to keep the special device on the ramp.

2. The surface of the ramp shall be constructed of non-skid material.

3. The ramp shall be equipped with handles and shall be of weight and design to permit one person to put the ramp in place and return it to its storage place.

4. Ramps used for emergency evacuation purposes may be installed in raised floor buses by manufacturers. They shall not be installed as a substitute for a lift when a lift is capable of serving the need.

REGULAR SERVICE ENTRANCE

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

B. A suitable device shall be provided to assist passengers during ingress and egress. This device shall allow for easy grasping or holding and shall have no openings or pinch points that might entangle clothing, accessories or limbs.

RESTRAINING DEVICES

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

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

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

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

SEATING ARRANGEMENTS

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

SECUREMENT AND RESTRAINT SYSTEM FOR WHEELCHAIRS AND WHEELCHAIR-SEATED OCCUPANTS

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

A. WTORS—general requirements:

1. A wheelchair tiedown and occupant restraint system installed in specially equipped school buses shall be designed, installed, and operated for use with forward-facing wheelchair-seated passengers and shall comply with all applicable requirements of FMVSS 222, *School Bus Passenger Seating and Crash Protection*, and SAE J2249, *Wheelchair Tiedown and Occupant Restraint Systems for Use in Motor Vehicles.*[1]

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

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

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

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

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

[1] SAE J2249 is currently being updated and moved to Section 18 of ANSI/RESNA Wheelchair Standards, Volume 4, Wheelchairs and Transportation. The new version is expected to be available by December 2006.

a. 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.)

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

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

B. Wheelchair Securement/Tiedown: (See 49 CFR 571.222, S5.4.1, S5.4.2.)

Each wheelchair position in a specially equipped school bus shall have a minimum clear floor area of 30 inches laterally by 48 inches longitudinally. Additional floor area may be required for some wheelchairs. Consultation between the user and the manufacturer is recommended to ensure that adequate area is provided.

C. Occupant restraint system: (See 49 CFR 571.222, S5.4.3, S5.4.4.)

SPECIAL LIGHT

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

SPECIAL SERVICE ENTRANCE

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

B. The special service entrance and door shall be located on the right side of the bus and shall be designed so as not to obstruct the regular service entrance. **Exception:** A special service entrance and door may be located on the left side of the bus only if the bus is used only to deliver students to the left side of one-way streets and its use is limited to that function.

C. The opening may extend below the floor through the bottom of the body skirt. If such an opening is used, reinforcements shall be installed at the front and rear of

the floor opening to support the floor and give the same strength as other floor openings.

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

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

SPECIAL SERVICE ENTRANCE DOORS

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

B. A single door shall be hinged to the forward side of the entrance unless this would obstruct the regular service entrance. If the door is hinged to the rearward side of the doorway, the door shall utilize a safety mechanism that will prevent the door from swinging open should the primary door latch fail. If double doors are used, the system shall be designed to prevent the door(s) from being blown open by the aerodynamic forces created by the forward motion of the bus, and/or shall incorporate a safety mechanism to provide secondary protection should the primary latching mechanism(s) fail.

C. All doors shall have positive fastening devices to hold doors in the "open" position when the special service entrance is in use.

D. All doors shall be weather sealed.

E. When manually operated dual doors are provided, the rear door shall have at least a one-point fastening device to the header or floor line of the body. The forward-mounted door shall have at least three one-point fastening devices. One shall be to the header, one to the floor line of the body, and the other shall be into the rear door. The door and hinge mechanism shall have strength that is greater than, or equivalent to, the strength of the emergency exit door.

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

G. Each door shall have windows set in a waterproof manner that are visually similar in size and location to adjacent non-door windows. Glazing shall be of the same type and tinting (if applicable) as standard fixed glass in other body locations.

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

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

J. Special service entrance doors shall be equipped with padding at the top edge of the door opening. The padding shall be at least three inches wide and one inch thick and shall extend the full width of the door opening.

SUPPORT EQUIPMENT AND ACCESSORIES

A. Each specially equipped school bus that is set up to accommodate wheelchairs or other assistive or restraint devices with belts attached shall contain at least one webbing cutter properly secured in a location within reach of the driver while belted into his/her driver's seat. The belt cutter shall be durable and designed to prevent the operator or others from being cut during use.

B. Special equipment or supplies that are used in the bus for mobility assistance, health support or safety purposes shall meet local, federal and engineering standards that may apply, including requirements for proper identification.

Equipment that may be used for these purposes includes, but is not limited to:

1. Wheelchairs and other mobile seating devices. (See subsection on Securement and Restraint System for Wheelchairs and Wheelchair-seated Occupants.)

2. Crutches, walkers, canes and other ambulating devices to assist ambulation.

3. Medical support equipment. This may include respiratory devices, such as oxygen bottles (which should be no larger than 22 cubic feet for liquid oxygen and 38 cubic feet for compressed gas) or ventilators. Tanks and valves should be located and positioned to protect them from direct sunlight, bus heater vents or other heat sources. Other equipment may include intravenous and fluid drainage apparatus.

C. All portable equipment and special accessory items, including the equipment listed above, shall be secured at the mounting location to withstand a pulling force of five times the weight of the item or shall be retained in an enclosed, latched compartment. The compartment shall be capable of withstanding forces applied to its interior equal to five times the weight of its contents without failure of the box's integrity and securement to the bus. **Exception:** If these specifications

provide specific requirements for securement of a particular type of equipment (e.g., wheelchairs), the specific specification shall prevail.

TECHNOLOGY AND EQUIPMENT, NEW

It is the intent of these specifications to accommodate new technologies and equipment that will better facilitate the transportation of students with special needs. New technology and equipment is acceptable for use in specially equipped vehicles if:

A. It does not compromise the effectiveness or integrity of any major safety system. (Examples of safety systems include, but are not limited to, compartmentalization, the eight-lamp warning system, emergency exits and the approved color scheme.)

B. It does not diminish the safety of the bus interior.

C. It does not create additional risk to students who are boarding or exiting the bus or are in or near the school bus loading zone.

D. It does not require undue additional activity and/or responsibility for the driver.

E. It generally increases efficiency and/or safety of the bus, generally provides for a safer or more pleasant experience for the occupants and pedestrians in the vicinity of the bus and/or generally assists the driver and makes his/her many tasks easier to perform.