Standards for School Buses in Montana 2012

Montana
Office of Public Instruction
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opi.mt.gov

STANDARDS FOR SCHOOL BUSES IN MONTANA 2012

GENERAL

INTERPRETATIONS

Standards for School Buses in Montana are adapted from the *2010 National School Transportation Specifications and Procedures* as adopted by the Fifteenth National Congress on School Transportation (NCST). The interpretation committee of the NCST occasionally issues an interpretation on one or more of its recommended standards. Any interpretations made by the NCST interpretations committee shall be the official interpretation of the corresponding Montana standard unless that interpretation is specifically redefined or preempted by a corresponding Montana standard, law or regulation. Complete information on the National Congress on School Transportation is available at www.NCSTOnline.org.

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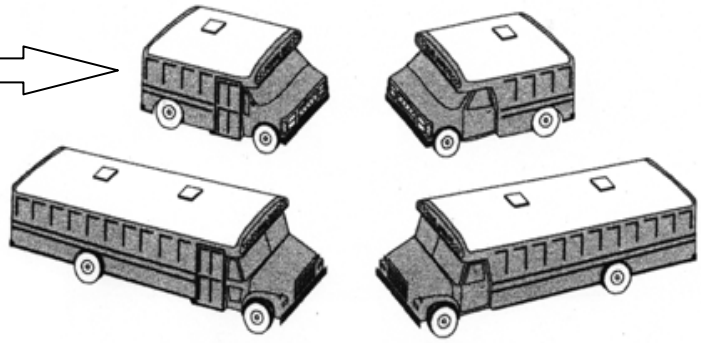
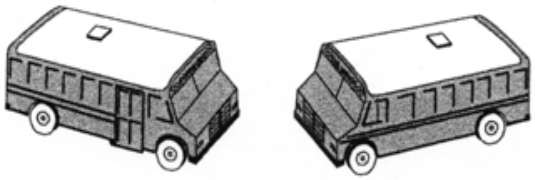
SCHOOL BUS TYPES

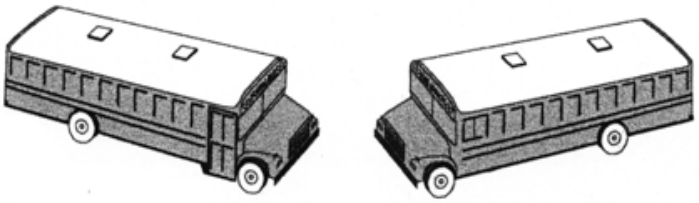
A **Type "A"** school bus is a van conversion or bus constructed utilizing a cutaway front-section vehicle with a left side driver's door. The entrance door is behind the front wheels. The definition includes two classifications: Type A1, with a Gross Vehicle Weight Rating (GVWR) less than or equal to 10,000 pounds; and Type A2, with a GVWR greater than 10,000 pounds.



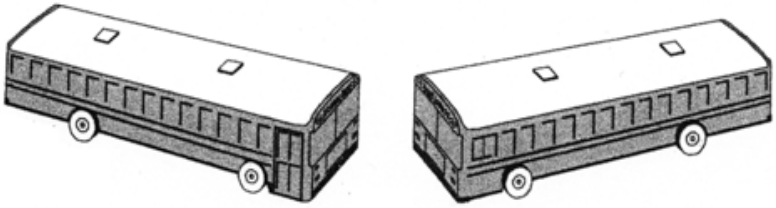
A **Type "B"** school bus is constructed utilizing a stripped chassis. The entrance door is behind the front wheels. This definition includes two classifications: Type B1, with a GVWR less than or equal to 10,000 pounds; and Type B2, with a GVWR greater than 10,000 pounds.



A **Type "C"** school bus is constructed utilizing a chassis with a hood and front fender assembly. The entrance door is behind the front wheels.



A **Type "D"** school bus is constructed utilizing a stripped chassis. The entrance door is ahead of the front wheels.



REPLACEMENT PARTS

The *Standards for School Buses in Montana* apply to all new school buses to be used in Montana. Although it is recommended that used school buses be re-equipped with parts and supplies that meet the construction standards as they are replaced through periodic maintenance and repair, it is not intended that the requirements of these standards preclude the use of replacement parts or supplies that do not meet these higher standards when said parts and supplies are not readily available for emergency and/or roadside repairs. Further, it is not intended that the use of such regular parts, because of the lack of readily availability, should incur increased liability to the operator or district should damages or risk occur as a result of the use or failure of that part or supply when such district or operator has acted in good faith in making the emergency and/or roadside repair(s). If emergency and/or roadside repairs are made with regular standard parts, or supplies, it is recommended that said parts or supplies be replaced by parts or supplies which meet or exceed the standards for school buses in Montana within 60 days. ARM 10.64.342.

AIR CLEANER

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

2. All diesel engine air filters shall include a latch-type restriction indicator that retains the maximum restriction developed during operation of the engine. The indicator should include a reset control so the indicator can be returned to zero when desired. The indicator should not reduce or replace the timing for regular maintenance.

AIR CONDITIONING SYSTEMS (OPTIONAL)

1. The following specifications are applicable to all types of school buses that may be equipped with air conditioning. This section is divided into two parts. Part A covers performance specifications and Part B covers other requirements applicable to all buses.

   A. Performance Specifications

      a. The installed air conditioning system should cool the interior of the bus down to at least 80 degrees Fahrenheit, measured at a minimum of three points, located four feet above the floor at the longitudinal centerline of the bus. The three points shall be:

         i. near the driver's location;

         ii. at the midpoint of the body; and

         iii. two feet forward of the emergency door, or, for Type D rear-engine buses, two feet forward of the end of the aisle.

      b. The test conditions under which the above performance must be achieved shall consist of:

         i. placing the bus in a room (such as a paint booth) where ambient temperature can be maintained at 100 degrees Fahrenheit;

         ii. heat soaking the bus at 100 degrees Fahrenheit with windows open for at least one hour; and

         iii. closing windows, turning on the air conditioner with the engine running at the chassis manufacturer's recommended low idle speed, and cooling the interior of the bus to 80 degrees Fahrenheit or lower within a maximum of 30 minutes while maintaining 100 degrees Fahrenheit outside temperature.

      c. Alternately, and at the user's discretion, this test may be performed under actual summer conditions, which consist of temperatures above 85 degrees Fahrenheit, humidity above 50 percent with normal sun loading of the bus and the engine running at the engine manufacturer's recommended low idle speed. After a minimum of one hour of heat soaking, the system shall be turned on and must provide a minimum 20 degrees temperature drop in the 30-minute time limit.

d. The manufacturer shall provide facilities for the user or user's representative to confirm that a pilot model of each bus design meets the above performance requirements.

B. Other Requirements

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

b. Any evaporator or ducting system shall be designed and installed so as to be free of injury-prone projections or sharp edges. Any ductwork shall be installed so that exposed edges face the front of the bus and do not present sharp edges.

c. On specially equipped school buses, the evaporator and ducting (if used) shall be placed high enough that they will not obstruct occupant securement shoulder strap upper attachment points. This clearance shall be provided along the entire length of the passenger area on both sides of the bus interior to allow for potential retrofitting of new wheelchair positions and occupant securement devices throughout the bus.

d. The body may be equipped with insulation, including sidewalls, roof, firewall, and rear, inside body bows and plywood or composite floor insulation to aid in heat dissipation and reflection.

e. All glass (windshield, service and emergency doors, side and rear windows) may be equipped with maximum integral tinting allowed by federal, state, or ANSI standards for the respective locations, except that windows rear of the driver's compartment, if tinted shall have approximately 28 percent light transmission.

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

g. Roofs may be painted white to aid in heat dissipation.

h. Air intake for any evaporator assembly(ies), except for front evaporator of Type A-1, shall be equipped with replaceable air filter(s) accessible without disassembly of evaporator case.

AISLE

1. All emergency 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 door.

AXLES

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

BACKUP WARNING ALARM

1. An automatic audible alarm shall be installed behind the rear axle and shall comply with the published Backup Alarm Standards (SAE J994B), providing a minimum of 112 dBA for rubber-tired vehicles **required on buses ordered after the effective date.**

BRAKES

1. **General Brakes**

   A. The chassis brake system shall conform to the provisions of FMVSS No. 105, No. 106 and No. 121 as applicable.

   B. The anti-lock brake system (ABS, provided in accordance with FMVSS No. 105, or

No. 121, shall provide wheel speed sensors for each front wheel and for each wheel on at least one rear axle. The system shall provide anti-lock braking performance for each wheel equipped with sensors. (Four-Channel System)

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

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

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

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

2. **Hydraulic Brakes**

A. Buses using a hydraulic-assist brake shall be equipped with audible and visible warning signals that provide a continuous warning to the driver of a loss of fluid flow from the primary source and of a failure of the back-up pump system.

3. **Air Brakes**

A. The air pressure supply system shall include a desiccant-type air dryer installed according to the manufacturers’ recommendations. The air pressure storage tank system may incorporate an automatic drain valve.

B. The chassis manufacturer should provide a necessary outlet for air-operated systems installed by the body manufacturer. This outlet shall include a pressure protection valve.

C. For air brake systems, a <u>dual</u> air pressure gauge shall be provided in the instrument panel capable of complying with CDL pre-trip inspection requirements.

D. All air brake-equipped buses may be equipped with a service brake interlock. The

parking brake cannot be released until the brake pedal is depressed.

E. Air brake systems may include a system for anti-compounding of the service brakes and parking brakes.

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

BUMPER, FRONT

1. All school buses shall be equipped with a front bumper. The front bumper shall be furnished by the chassis manufacturer as part of the chassis on all types of chassis unless there is a specific arrangement between the chassis manufacturer and body manufacturer that the body manufacturer will furnish the front bumper.

2. The front bumper shall be of pressed steel channel or equivalent material (except Type A buses having a GVWR of 14,500 pounds or less which may be OEM supplied) at least 3/16 inches thick and not less than eight inches wide (high). It shall extend beyond the forward-most part of the body, grille, hood, and fenders and shall extend to the outer edges of the fenders at the bumper's top line.

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

4. Tow eyes or hooks shall be furnished and attached so as not to project beyond the front bumper. Tow eyes or hooks attached to the frame chassis shall be furnished by the chassis manufacturer or by the body manufacturer. This installation shall be in accordance with the chassis manufacturer's standards. Note: Rear tow eyes are addressed in the Bus Body Specifications under Towing Attachment Points.

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

6. Bumper Accessories (Grill Guards): Any addition to the front bumper such as grill guards shall not hinder or obstruct (FMVSS requirements) mirrors, signals, lights and/or license plates. The addition shall be painted flat black. The addition shall not be so substantial that

it changes the Gross Vehicle Weight Rating (GVWR). The addition of a grill guard is prohibited on Type A buses.

BUMPER, FRONT-ENERGY-ABSORBING

1. 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 standards in the chassis section.

2. An optional energy-absorbing front bumper may be used, providing its design shall incorporate a self-restoring energy-absorbing system of sufficient strength to:

   A. Push another vehicle of similar GVWR without permanent distortion to the bumper, chassis, or body; and

   B. Withstand repeated impacts without damage to the bumper, chassis, or body according to the following performance standards:

      a. 7.5 mph fixed-barrier impact (FMVSS cart and barrier test)

      b. 4.0 mph corner impact at 30 degrees (Part 581, CFR Title 49)

      c. 20.0 mph into parked passenger car (Type B, C, and D buses of 18,000 lbs. GVWR or more)

3. The manufacturers of the energy-absorbing system shall provide evidence from an approved test facility (capable of performing the above FMVSS tests) that their product conforms to the above standard.

BUMPER, REAR

1. The bumper shall be pressed steel channel at least 3/16 inch thick or equivalent strength material (except for Type A buses). Type A-1 buses bumper shall be a minimum of 8 inches wide (high) and Type A-2, B, C and D buses shall be a minimum of 9.5 inches wide (high). The bumper shall be of sufficient strength to permit being pushed by another vehicle without permanent distortion.

2. The bumper shall be wrapped around back comers of the bus. It shall extend forward at least 12 inches, measured from the rear-most point of the body at the floor line and shall be flush mounted to body side or protected with an end panel.

3. The bumper shall be attached to the 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.

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

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

CEILING

1. See **Insulation and Interior**.

CERTIFICATION

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

2. The chassis manufacturer will, 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.

CHAINS, TIRE

1. See **Wheel-housing**.

CLUTCH

1. Clutch torque capacity shall be equal to or greater than the engine torque output.

2. A starter interlock shall be installed to prevent actuation of the starter if the clutch is not depressed.

COLOR

1. The chassis, including wheels and front bumper, shall be black. The Bus body, body cowl, hood, and fenders shall be in National School Bus Yellow (NSBY). The flat top surface of the hood may be non-reflective black or NSBY. (See Appendix B.)

2. The body exterior paint trim, **bumper and bumper accessories, lamp hoods, rub rails, and emergency door lettering and arrow** shall be black.

3. Optionally the roof of the bus may be painted white **extending down to the drip rails on the sides of the body** except that front and rear roof caps shall remain NSBY. (See illustration in Appendix B under Reflective Materials.)

4. Multi-Function School Activity Buses (MFSABs) shall be exempt from these requirements (color).

CONSTRUCTION

1. 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.

   A. The complete body structure, or a 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.

   B. 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 10 inches from its original point of contact. There can be no separation of lapped panels or construction joints. Punctures, tears or breaks in the external panels are acceptable but are not permitted on any adjacent interior panel.

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

2. Construction shall be reasonably dust-proof and watertight.

CROSSING CONTROL ARM (OPTIONAL)

1. Buses may 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 wheels.

2. All electrical components of the crossing control arm shall be potted and all exterior connections shall be weatherproofed.

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

4. The crossing control arm shall meet or exceed SAE Standard J1133.

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

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

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

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

the stop arm controls.

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

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

DEFROSTERS

1. Defrosting and defogging equipment shall direct a sufficient flow of heated air onto the windshield, the window to the left of the driver, and the glass in the viewing area directly to the right of the driver to eliminate frost, fog and snow.

2. The defrosting system shall conform to SAE standards J381 and J382.

3. The defroster and defogging system shall be capable of furnishing heated outside ambient air, except the part of the system furnishing additional air to the windshield; entrance door and step well may be of the recirculating air type.

4. Auxiliary fans are not considered defrosting or defogging systems.

5. Portable heaters **shall not** be used.

DOORS

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

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

C. The entrance door shall have a minimum horizontal opening of 24 inches and a minimum vertical opening of 68 inches. Type A-1 vehicles shall have a minimum opening area of 1200 square inches.

D. The entrance door shall be a split-type, sedan-type, or jack-knife type. (Split-type door includes any sectioned door, which divides and opens inward or outward.) If one section of a split-type door opens inward and the other opens outward, the front section shall open outward.

E. Lower, as well as, upper door panels shall be of approved safety glass with frost-free glazing. The bottom of each lower glass panel shall not be more than 10 inches from the top surface of the bottom step. The top of each upper glass panel when viewed from the interior shall not be more than three inches below the interior door control cover or header pad. Type A vehicles shall have an upper panel (windows) of safety glass with an area of at least 350 square inches.

F. Vertical closing edges on split-type or folding-type entrance doors shall be equipped with flexible material to protect children's fingers. Type **A-1** vehicles may be equipped with chassis manufacturer's standard entrance door.

G. There shall be no door to left of driver on Type B, C or D vehicles. All Type A vehicles may be equipped with chassis manufacturer's standard door.

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

I. On power-operated entrance 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. The emergency release valve, switch or device shall work in the absence of power.

DRIVE SHAFT

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

ELECTRICAL SYSTEM

1. **Battery**

A. The storage battery shall have minimum cold cranking capacity rating equal to the cranking current required for 30 seconds at 0 degrees Fahrenheit (-17.80 C) and a minimum reserve capacity rating of 120 minutes at 25 amps. Higher capacities may be required depending upon optional equipment and local environmental conditions.

B. The manufacturer shall securely attach the battery on a slide-out or swing-out tray in a closed, vented compartment in the body skirt so that the battery is accessible for convenient servicing from the outside. When in the stored position, the tray shall be retained by a securing mechanism capable of holding the tray [with battery(ies)] in position when subjected to a 5g load from any direction. The battery compartment door or cover if separate from the tray shall be hinged at the front. It shall be secured by a positive operated latching system or other type fastener. The door may be an integral part of the battery slide tray. The door or cover must fit tightly to the body, and not present sharp edges or snagging points.

C. All batteries are to be secured in a sliding tray except that van conversion or cutaway front-section chassis batteries may be secured in accordance with the manufacturer's standard configuration. In these cases, the final location of the battery and the appropriate cable lengths shall be according to the SBMI Design Objectives Booklet, 1990 edition, or as mutually agreed upon by the chassis and body manufacturer. In all cases, however, the battery cable provided with the chassis shall have sufficient length to allow some slack.

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

2. **Alternator**

A. All Type A-2 and Type B buses with a GVWR up to 15,000 lbs GVWR shall have a minimum **130-ampere alternator.**

B. All buses over 15,000 lbs GVWR shall be equipped with a heavy-duty truck or bus-type alternator, having a minimum output rating of 160 amperes or higher and shall produce a minimum current output of 50 percent of the rating at engine idle speed.

C. All buses equipped with an electrically powered wheelchair lift, air conditioning or other accessories, may be equipped with a device that monitors the electrical system voltage and advances the engine idle speed when the voltage drops to, or below, a pre-set level.

D. A belt alternator drive shall be capable of handling the rated capacity of the alternator with no detrimental effect on other driven components. (See SBMTC; "School Technical Reference," for estimating required alternator capacity.)

E. A direct/gear-drive alternator is permissible in lieu of belt drive.

3. **Electrical Components**

A. Materials in all electrical components shall contain no mercury.

4. **Wiring**

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

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

B. Chassis manufacturer shall install a readily accessible terminal strip or plug on the body side of the cowl, or in an accessible location in the engine compartment of vehicles designed without a cowl. The strip or plug shall contain the following terminals for the body connections:

a. Main 100 amp body circuit;

b. Tail-lamps;

c. Right-turn signal;

d. Left-turn signal;

e. Stop lamps;

f. Backup lamps; and

g. Instrument panel lights (rheostat controlled by dimmer switch).

. h. An appropriate identifying diagram (color and number coded) for electrical

circuits shall be provided to the body manufacturer for distribution to the end user.

. i. Headlight system must be wired separately from the body-controlled solenoid.

j. A daytime running lamps system shall be provided.

C. **Wiring, Body**

1. All wiring shall conform to current SAE standards.

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

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

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

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

6. Wires not enclosed within the body shall be fastened securely at intervals of not more than18 inches. All joints shall be soldered or joined by equally effective connectors, which shall be water-resistant and corrosion-resistant.

7. Wiring shall be arranged in circuits, as required, with each circuit protected by a fuse or circuit breaker. A system of color and number coding shall be used and an appropriate identifying diagram shall be provided to the end user along with the wiring diagram provided by the chassis manufacturer. The wiring diagrams shall be specific to the bus model supplied and include any changes to wiring made by the body manufacturer. Chassis wiring diagrams shall also be supplied to the end user. A system of color and number coding shall be used on buses. 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 J 1128, *Low-Tension Primary Cable*.

8. Wiring shall be arranged in at least six regular circuits as follows:
    a. Head, tail, stop (brake) clearance and instrument panel lamps;
    b. Step well lamps (shall be actuated when service door is opened);
    c. Dome lamps;
    d. Ignition and emergency door signal;
    e. Turn signal lamps; and
    f. Alternately flashing signal lamps.
9. Any of the above combination circuits may be subdivided into additional independent circuits.
10. Heaters and defrosters shall be wired on an independent circuit.
11. Whenever possible, all other electrical functions (such as sanders and electric-type windshield wipers) shall be provided with independent and properly protected circuits.
12. Each body circuit shall be coded by number or letter on a diagram of circuits and shall be attached to the body in a readily accessible location.

D. Buses may be equipped with a 12-volt power port in the driver's area.

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

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

1. **All installed emergency exits shall comply with the requirements of FMVSS No. 217.**

2. **Emergency door requirements**

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

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

C. The emergency door(s) shall be equipped with padding at the top edge of each door opening. Padding shall be at least three inches wide and 1 inch thick, and extend the full width of the door opening.

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

E. The rear emergency window shall have an assisted lifting device that will aid in lifting and holding the rear emergency window open.

3. Roof Hatches

A. Roof hatches shall be installed without the use of fasteners on the exterior of the bus.

B. The materials used in the construction of the exterior portion of the roof hatch lid shall be such type as to protect the lid from discoloration and degradation from the UV light.

4. Emergency exit requirements

A. Type A, B, C, and D vehicles shall be equipped with a total number of emergency exits as follows for the indicated capacities of vehicles. Exits required by FMVSS 217

may be included to comprise the total number of exits specified.

a. 0 to 42 Passengers = 1 emergency exit per side and 1 roof hatch.

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

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

B. 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 the stop arm.

C. Currently, the minimum requirements of FMVSS 217, when calculated to each capacity of school bus, are as follows and are exceeded by the aforementioned National Specifications:

a. One rear emergency exit door plus additional emergency exits based on the following maximum rated seating capacities:

i. 0 to 45 Passenger = no additional emergency exits.

ii. 46 to 62 Passenger = one left side emergency door or two emergency exit windows.

iii. 63 to 70 Passenger = one left side emergency door or two emergency exit windows and 1 emergency roof exit.

iv. 71 or more Passengers = one left side emergency door or two emergency exit windows, or one emergency roof exit, plus any combination of door, roof or windows necessary to meet the total amount of emergency exit area required.

b. One emergency exit door on the left side and push-out rear window plus additional emergency exits based on the following maximum rated seating capacities:

i. 0 to 57 Passenger = no additional emergency exits.

ii. 58 to 74 Passenger = one right side emergency door or two emergency exit windows.

iii. 75 to 82 Passenger = one right side emergency door or two emergency exit windows and one emergency roof exit.

iv. 83 or more Passengers = one right side emergency door or two emergency exit windows, or one emergency roof exit, plus any combination of door, roof or windows necessary to meet the total amount of emergency exit area required.

c. Each emergency exit above shall comply with FMVSS 217. These emergency exits are in addition to the rear emergency door or exit.

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

EMERGENCY EQUIPMENT

1. **Fire Extinguisher**

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

B. The fire extinguisher shall have a total rating of 2-A:1O-BC or greater. The operating mechanism shall be sealed with a type of seal that will not interfere with the use of the fire extinguisher.

C. A Halon extinguisher may be carried in addition to the dry chemical extinguisher.

2. **First-Aid Kit**

A. The bus shall have a removable moisture-proof and dust-proof first-aid kit in an accessible place in the driver's compartment. It shall be properly mounted and secured and identified as a first-aid kit. Contents of first-aid kit shall be in compliance with state standards.

B. **<u>Contents shall include:</u>**

2 - 1" x 2.5 yards adhesive tape rolls

24 - sterile gauze pads 3” x 3”

100 - 3/4” x 3” adhesive bandages

8 - 2” bandage compress

10 - 3” bandage compress

2 - 2” x 6' sterile gauze roller bandages

2 - non-sterile triangular bandages approximately 40" x 36" x 54" with 2 safety pins

3 - sterile gauze pads 36” x 36”

3 - sterile eye pads

1 - rounded-end scissors

1 - pair medical examination gloves

1 - mouth-to-mouth airway

3. **Body Fluid Clean-up Kit**

A. Each bus shall have a removable and moisture-proof body fluid clean-up kit accessible to the driver. It shall be properly mounted and identified as a body fluid clean-up kit. Contents of body fluid clean-up kit shall be in compliance with state standards. This standard shall apply retroactively to all Montana school buses. Each Body Fluid Clean-up Kit shall include but is not limited to:

2 – Sterile non-latex Gloves - 1 pr

1 - Red Bio-hazard Waste Bag w/tie

1 – Black/brown Plastic Bag w/tie

1 - Liquid Treatment System – ¾ oz

2 - Disposable Microbial Towels

2 - Antiseptic Microbial Wipe

1 - Face Mask with Eye Shield

1 - Pick up Scoop with Scraper

1 - Surface Cleaning Wipe

#10 Unit Poly White Storage Box, Empty w/Safety Seal

4. **Warning Devices**

   Each school bus shall contain at least three (3) reflectorized triangle road warning devices mounted in an accessible place that meet requirements in FMVSS 125.

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

EXHAUST SYSTEM

1. The exhaust pipe, muffler, after treatment system and tailpipe shall be outside the bus body compartment and attached to the chassis so as not to damage any other chassis compartment. **Entire system shall be free of leaks.**

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

3. The tailpipe may be flush with, or shall not extend more than 2 inches beyond, the perimeter of the body for side-exit pipe or the bumper for the rear-exit pipe. The exhaust system shall be designed such that exhaust gas will not be trapped under the body of the bus.

4. The tailpipe shall exit to the left or right of the emergency exit door in the rear of the vehicle or to the left side of the bus in front of or behind the rear drive axle. The tailpipe exit location on all Types A-1 or B-1 buses may be in accordance t the manufactures standards. The tailpipe shall not exit beneath any fuel filler location.

5. Exhaust system on a chassis shall be adequately insulated from the fuel system.

6. Muffler shall be constructed of corrosion-resistant material.

7. The exhaust system on vehicles equipped with a power lift unit may be routed to the left of the right frame rail to allow for the installation of a power lift unit on the right side of the vehicle.

FENDERS, FRONT

1. 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.
2. Front fenders shall be properly braced and shall not require attachment to any part of the body.

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FLOORS

1. Floor in under-seat area, including tops of wheel housing, driver's compartment and toe board, shall be covered with rubber floor covering or equivalent, having a minimum overall thickness of .125 inch and a minimum slip coefficient of .75 or better. All materials must meet a calculated burn rate of 0.01 or less as required by FMVSS No. 302, *Flammability of Interior Materials.* The driver's area and toe board area on all Type-A buses may be manufacturer's standard flooring and floor covering.
2. Floor covering in aisles shall be of aisle-type rubber or equivalent, wear-resistant, ribbed and a minimum slip coefficient of .75 or better. All materials must meet a calculated burn rate of 0.01 or less as required by FMVSS No. 302, *Flammability of Interior Materials.* Minimum overall thickness shall be .187 inch measured from tops of ribs.
3. 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 a type recommended by the manufacturer of floor-covering material. All seams must be sealed with waterproof sealer.
4. On Type B, C and D buses a flush-mounted, screw-down plate that is secured and sealed shall be provided to access the fuel tank sending unit and/or fuel pump. This plate shall not be installed under flooring material.

FRAME

1. The frame (or equivalent) shall be of such design and strength characteristics as to correspond at least to standard practices for trucks of the same general load characteristics which are used for highway service.

2. Any secondary manufacturer that modifies the original chassis frame shall guarantee the performance of workmanship and materials resulting from such modification.

3. Frames shall not be modified for the purpose of extending the wheelbase.

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

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

6. There shall be no trailer hitches, ball or pin type, attached to buses.

FUEL SYSTEM

1. Fuel tank or tanks having a minimum 30-gallon capacity shall be provided by the chassis manufacturer. The tank shall be filled and vented to the outside of the body, in a location where accidental fuel spillage will not drip or drain on any part of the exhaust system.

2. No portion of the fuel system, which is located outside 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.

3. Fuel filter with replaceable element shall be installed between the fuel tank and engine.

4. The fuel system shall comply with FMVSS No. 301 **and all *Federal Motor Vehicle Safety Standards* in effect on the date of manufacture of the bus**.

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

5. The actual draw capacity of each fuel tank shall be 83 percent of the tank capacity.

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

7. Installation of LPG tanks shall comply with National Fire Protection Association (NFPA) 58,

Liquefied Petroleum Gas Code.

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

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

GOVERNOR

When the engine is remotely located from the driver, the governor shall be set to limit engine speed to maximum revolutions per minute recommended by engine manufacturer, and a tachometer shall be installed so the driver while seated in a normal driving position may know the engine speed.

HANDRAILS

1. 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 test.

HEATING SYSTEM, PROVISION FOR

1. The chassis engine shall have plugged openings for the purpose of supplying hot water for the bus heating system. The engine shall be capable of supplying water having a temperature of at least 170 degrees Fahrenheit at a flow rate of 50 pounds per minute at the return end of 30 feet of one inch inside diameter automotive hot water heater hose. (SBMI Standard No. 001—Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment)

2. **Heater hose in the engine compartment and between the engine and the driver shutoff, or the first body heater, whichever comes first, shall be armored or reinforced hose such as Goodyear Hi Miler, or equivalent.**

HEATING SYSTEMS AND AIR CONDITIONING SYSTEMS

HEATING SYSTEM

1. Heater shall be hot-water and/or combustion type.
2. If only one heater is used, it shall be fresh-air or combination fresh-air and recirculating type.
3. If more than one heater is used, additional heaters may be recirculating air type.
4. The heating system shall be capable of maintaining bus interior temperatures as specified in SAE test procedure J2233.
5. Auxiliary fuel-fired heating systems are permitted, provided they comply with the following:
   A. The auxiliary heating system fuel shall utilize the same type fuel as specified for the vehicle engine.
   B. Heater(s) may be direct hot air or connected to the engine's coolant system.
   C. Auxiliary heating system, when connected to the engine's coolant system, may be used to preheat the engine coolant or preheat and add supplementary heat to the bus' heating system.
   D. Auxiliary heating systems must be installed pursuant to the manufacturer's recommendations and shall not direct exhaust in such a manner that will endanger bus passengers;
   E. Auxiliary heating systems, which operate on diesel fuel, shall be capable of operating on No. 1, No. 2 or blended diesel fuel without the need for system adjustment.
   F. The auxiliary heating system shall be low voltage; and
   G. Auxiliary heating systems shall comply with all applicable Federal Motor Vehicle Safety Standards, including FMVSS 301, *Fuel System Integrity,* and all other applicable FMVSS's, as well as with SAE test procedures.

6. All forced air heaters installed by body manufacturers shall bear a nameplate that indicates the heater rating in accordance with SBMI Standard No. 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.

7. 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 Standard J20c, *Coolant System Hoses*. Heater lines on the interior of bus shall be shielded to prevent scalding of the driver or passengers.

    a. **The heater hose in the engine compartment and between the engine and the driver shutoff, or the first body heater, whichever comes first, shall be armored or reinforced hose such as Goodyear Hi Miler, or equivalent.**

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

9. Passenger heaters – 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.

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

11. 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.

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

Passenger compartment Air Conditioning (Optional)

Specific requirements are listed in the National Standards.

HORN

Bus shall be equipped with horn or horns of standard make with each horn capable of

producing a complex sound in bands of audio frequencies between 250 and 2,000 cycles per second and tested in accordance with SAE J-377, *Horn-Forward Warning-Electric-Performance, Test, and Application.*.

HINGES

Exposed metal emergency door, lift door, and service door hinges which do not have stainless steel, brass or nonmetallic hinge pins or other design that prevents corrosion or allows complete lubrication without disassembly, shall be designed to allow complete lubrication to be channeled to the center 75 percent of each hinge loop.

IDENTIFICATION

1. 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. Letters shall conform to “Series B” of Standard Alphabets for highway signs. “SCHOOL BUS” lettering shall have a reflective background, or as an option, may be illuminated by backlighting. (See also Reflective Material—Appendix D.)
2. Lettering and numbering shall include:
   A. The district or company name or owner of the bus shall be displayed at the beltline.
   B. The bus identification number shall be displayed on the sides, on the rear, and on the front.
3. Other lettering, numbering, or symbols, which may be displayed on the exterior of the bus, shall be limited to:
   A. Bus identification number on the top of the bus, in addition to required numbering on sides, rear, and front;
   B. The location of the battery(ies) identified by the word “BATTERY” or “BATTERIES” on the battery compartment door in 2 inch lettering;
   C. Symbols or letters not to exceed 64 square inches of total display near the service

door displaying information for identification by the students of the bus or route served;

D. Manufacturer, dealer or school identification or logos;

E. Symbols identifying the bus as equipped for or transporting students with special needs as noted in SPECIALLY EQUIPPED SCHOOL BUS SPECIFICATIONS;

F. Lettering on the rear of the bus relating to school bus flashing signal lamps, railroad stop procedures, or wide turn information; and

G. Identification of fuel type in two-inch lettering adjacent to the fuel filler opening.

INSIDE HEIGHT

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

INSTRUMENTS AND INSTRUMENT PANEL

1. Chassis shall be equipped with the following instruments and gauges. (Telltale warning lamps in lieu of gauges are not acceptable, except as noted):

   A. Speedometer;

   B. Odometer, which will give accrued mileage (to seven digits), including tenths of miles, unless tenths of miles are registered on a trip odometer. Odometer must be readable without using a key;

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

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

E. Oil pressure gauge;

F. Water temperature gauge;

G. Fuel gauge;

H. High beam headlight indicator;

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

J. Turn signal indicator; and

K. Glow-plug indicator light, where appropriate.

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

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

4. Instrument and controls must be illuminated as required by FMVSS No. 101, *Controls and Displays.*

5. Multi-function gauge**s** (MFG) **are not recommended in Montana; however, if they are used they must meet the following criteria:**

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

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

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

INSULATION

1. Ceiling and walls shall be insulated. If thermal insulation is specified, it shall be fire-resistant, UL approved, and approximately 1.5 inch thick with minimum R-value of 5.5. The insulation shall be installed to prevent sagging.

2. Floor insulation shall be either 5 ply nominal 5/8 inch thick plywood, or a material of equal or greater strength and insulation R value, and it shall equal or exceed properties of the 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. Type A-1 buses may be equipped with nominal 1/2 inch thick plywood or greater insulation R-value, sound abatement, deterioration-resistant and moisture-resistant properties.

INTERIOR

1. Interior of bus shall be free of all unnecessary projections, which include luggage racks and attendant handrails, to minimize the potential for injury. This standard requires inner lining on ceilings and walls. If ceiling is constructed 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. Buses may be equipped with a storage compartment for tools, tire chains, and/or tow chains (see BUS BODY SPECIFICATIONS, Storage Compartment).

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

   A. Head protection requirements of FMVSS 222, *School Bus Passenger Seating and Crash Protection,* where applicable;

   B. Be completely enclosed and equipped with latching doors. (both door and latch must be sufficient to withstand a force of 50 pounds applied at the inside center of the door);

   C. Have all corners and edges rounded with a minimum radius of one inch or padded equivalent to door header padding;

   D. Be attached to the bus sufficiently to withstand a force equal to twenty (20) times the maximum rated capacity of the compartment; and

   E. Shall have no protrusions greater than 1/4 inch.

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

4. 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 Appendix B.

LAMPS AND SIGNALS

1. Interior lamps shall be provided which adequately illuminate aisle and step well. The step well light shall be illuminated by a service door operated switch, to illuminate only when headlights and clearance lights are on and service door is open.

2. Body instrument panel lamps shall be controlled by an independent dimmer switch or may be controlled by the dimmer that operates the gauge lighting.

3. School bus alternately flashing signal lamps shall be provided, as described by law. MFSAB's are exempt from this requirement:

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

   B. In addition to the four red lamps described above, four amber lamps shall be installed so that one amber lamp is located near each red signal lamp, at same level, but closer to vertical centerline of bus. The 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 arms are extended or when bus service door is opened.

   C. The above mentioned activation sequence can be accomplished with either a 'sequential operation' or a 'non-sequential operation' warning lamp system. While each of the systems can be configured to include components such as a master switch, amber activation switch, interrupt switch, etc., the presence (or absence) of these components does not affect the classification of the system as either 'sequential' or 'non-sequential'. Both 'sequential' and 'non-sequential' systems can be configured with a multitude of switch combinations to provide a unique system meeting specific user requirements. An amber pilot light and a red pilot light shall be installed adjacent to the driver controls for the flashing signal lamp to indicate to the driver which lamp system is activated;

   D. <u>The area around the lens of each alternately flashing signal lamp and extending outward approximately three inches to the sides and top and a minimum one inch to the bottom, shall be black in color on the body or roof area against which the signal lamp is seen (from distance of 500 feet along axis of vehicle). Visors or hoods, black</u>

in color, with a minimum depth of 4 inches may be provided;

E. Red lamps shall flash at any time the stop signal arm is extended; and

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

G. LED lamps can be used, however, if more than 1/3 of the LED lights go out, the light will be deemed inoperable and the bus must be taken out of service until repairs have been completed.

4. Turn signal and stop/tail lamps

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

B. Buses shall be equipped with amber side-mounted turn signal lamps. The turn signal lamp on the left side shall be mounted rearward of the stop signal arm and the turn signal lamp on the right side shall be mounted rearward of the service door.

C. Signal lamps on Type B, C, and D buses shall include a left and right side mounted turn signal lamp. They shall be located midway from the front axle and the rear of the bus and approximately twelve (12) inches from the bottom of the side windows. This lamp will be a standard manufacturer's design for this purpose and will have an amber color lens.

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

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

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

E. On buses equipped with a 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 circuit breaker against any short circuit or intermittent shorts.

F. A **mandatory** white flashing strobe-lamp **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, **clearly visible 50 feet or more from the rear of the bus**. The lamp shall have a single clear lens emitting light 360 degrees around its vertical axis and may not extend above the roof more than maximum legal height. A manual switch and a pilot light shall be included to indicate when light is in operation. Optionally, a strobe light may be mounted on the roof in the area directly over the restraining barrier on the driver's side and may be wired to activate with the amber alternately flashing signal lamps, continuing through the full loading or unloading cycle, with an override switch to allow activation of the strobe at any time for use in inclement weather.

5. Backup Lamps

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

B. Daytime Running Lamps (DRL)

A daytime running lamps system shall be provided.

6. **Outside Landing Light (Optional Equipment)**

An optional outside landing light may be mounted near the entrance door to allow greater visibility when loading students in the dark.

a. **This light shall be white and wired to activate when the entrance door is opened. A switch located near the driver would allow the driver to shut the light off during daylight hours.**

b. **The outside landing light shall be a skirt-mounted exterior landing light.**

c. **Upper portion of the light may be shielded to cast the light downward only.**

METAL TREATMENT

1. All metal used in construction of bus body shall be zinc-coated or aluminum-coated or treated by equivalent process before the 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.

2. All metal parts that will be painted shall be, in addition to above requirements, chemically cleaned, etched, zinc-phosphate-coated and zinc-chromate or epoxy primed or conditioned by equivalent process. This includes, but is not limited to, such items as crossing control arm and stop arm.

3. 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 boxed sections, unvented or un-drained areas and surfaces subjected to abrasion during vehicle operation.

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

MIRRORS

1. 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. The mirror shall have rounded corners and protected edges. All Type A buses shall have a minimum of a 6-inch x 16-inch mirror and Type B, C, and D buses shall have a minimum of a 6-inch x 30-inch mirror.

2. Each school bus shall be equipped with exterior mirrors meeting the requirements of FMVSS 111, *Rearview Mirrors.* The right side rear view mirror shall not be obscured by the un-wiped portion of the windshield. Mirrors shall be easily adjustable, but shall be rigidly braced so as to reduce vibration. Bumper accessories may not obstruct driver's vision as required by FMVSS 111.

3. Heated external mirrors may be used.

4. Remote controlled external rear view mirrors may be used.

MOUNTING

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

2. Insulators shall be placed at all contact points between body and chassis frame on Type A-2, B, C, and D buses, and shall be secured by a positive means to the chassis frame or body that it will prevent shifting, separation, or displacement of the insulators under severe operating conditions.

OIL FILTER

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

OPENINGS

1. All openings in the floorboard or firewall between chassis and passenger compartment, such as for gearshift selector and parking brake lever, shall be sealed.

Overall Length

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

Overall Width

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

Passenger Load

1. Actual 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.
   a. For purposes of calculation, the driver's weight is 150 pounds.
   b. For purposes of calculation, the pupil weight is 120 pounds per pupil.
2. Actual Gross Vehicle Weight (GVW) shall not exceed the chassis manufacturer's Gross Vehicle Weight Rating for the chassis nor shall the actual weight carried on any axle exceed the chassis manufacturer's G**A**WR.

Public Address System

1. Buses may be equipped with an AM/FM/audio and/or public address system having interior and exterior speakers.
2. No internal speakers, other than the driver's communication system, may be installed within four feet of the driver's seat back in its rearmost upright position.

RETARDER SYSTEM (OPTIONAL EQUIPMENT)

A 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 percent grade for 3.6 miles or 6 km.

RETRO-REFLECTIVE MATERIAL

(See also APPENDICES A and B, Retro-reflective Sheeting)

1. Front and/or rear bumper may be marked diagonally 45 degrees down to centerline of pavement with 2 1/4 inch wide strips of non-contrasting reflective material.

2. Rear of bus body shall be marked with strips of Retro-reflective NSBY material to outline the perimeter of the back of the bus using material, which conforms with the requirements of FMVSS 131, *School Bus Pedestrian Safety Devices,* Table 1. The perimeter marking of rear emergency exits per FMVSS No. 217, *Bus Emergency Exits and Window Retention and Release* and/or the use of retro-reflective "SCHOOL BUS" signs partially accomplish the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of Retroreflective NSBY material, a minimum of 1" and a maximum of 2" in width shall be applied horizontally above the rear windows and above the rear bumper extending from the rear emergency exit perimeter marking outward to the left and right rear corners of the bus. Vertical strips shall be applied at the corners connecting these horizontal strips.

3. "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.

4. Sides of bus body shall be marked with retro-reflective NSBY material at least 1 3/4 inches in width, extending the length of the bus body and located (vertically) between the floor line and the beltline.

5. Signs, if used, placed on the rear of the bus relating to school bus flashing signal lamps or railroad stop procedures may be of retro-reflective material as specified. Refer to No. 2 in this section.

ROAD SPEED CONTROL

WHEN IT IS DESIRED TO ACCURATELY CONTROL VEHICLE MAXIMUM SPEED, A VEHICLE SPEED LIMITER MAY BE UTILIZED.

RUB RAILS

1. There shall be one rub rail located on each side of bus approximately at seat cushion level which shall extend from the rear side of entrance door completely around bus body (except emergency door or any maintenance access door) to point of curvature near outside cowl on left side.

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

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

4. Rub rails shall be four inches or more in width in their finished form, shall be of 16-gauge steel or suitable material of equivalent strength, and shall be constructed in corrugated or ribbed fashion.

5. 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-2 vehicles using chassis manufacturer's body, or for Type A-1, B, C and D buses using rear luggage or rear engine compartment, rub rails need not extend around rear comers.

6. There shall be a rub rail or equivalent bracing located horizontally at the bottom edge of the body side skirts.

7. Rub rails shall be black or painted yellow with a minimum of ½ of the width covered with 3M blackout tape or equivalent.

SEATS AND RESTRAINING SYSTEM

A. PASSENGER SEATING

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

2. Any new school bus that is put into service after the effective date of this new standard may be ordered with a lap and shoulder belt system. The seat and lap/shoulder belting system shall meet the requirement of FMVSS 222, *Compartmentalization* for the protection of students that may not be restrained. This seat and seat anchorage must meet or exceed all government safety standards.

3. Used buses may not be retrofitted to include lap/shoulder belts unless the bus was built "seat belt ready" by the school bus manufacturer.

4. All seats shall have a minimum depth of 15 inches and must comply with all requirements of FMVSS No. 222. **All seat backs shall be a minimum of 24 inches from the seating reference point** School bus design capacities shall be in accordance with 49 CFR, Part 571.3 and FMVSS No. 222. In addition to the fastener that forms the pivot for each seat retaining clip, a secondary fastener may be used in each clip to prevent the clip from rotating and releasing the seat cushion unintentionally.

5. All restraining barriers and passenger seats shall be constructed with materials that enable them to meet the criteria contained in the School Bus Seats Upholstery Fire Block Test (see Appendix B).

6. 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. All seat frames attached to the seat rail shall be fastened with 2 or more bolts, washers and nuts, or with flange-head nuts. Seats may be track-mounted in conformance with FMVSS 222.

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

8. All school buses (including Type A) shall be equipped with restraining barriers conforming to FMVSS 222.

9. 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, *Bus Emergency Exits and Window Retention and Release*. The flip seat shall be free of sharp

projections on the underside of the seat bottom. The underside of the flip-up seat bottoms shall be padded or contoured to reduce the possibility of snagged clothing or injury during use. Flip seats shall be constructed to prevent passenger limbs from becoming entrapped between the seat back and the seat cushion when in upright position. The seat cushion shall be designed to rise to a vertical position automatically when not occupied.

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

SEAT – PRE-SCHOOL AGE SEATING

Passenger seats designed to accommodate a child or infant carrier seat shall comply with FMVSS No. 225, *Child Restraint Anchorage Systems.* These seats shall be in compliance with NHRSA's "Guideline for the Safe Transportation of Pre-school Age Children in School Buses." (**Note:** See A.8 above.)

Driver Seat

The driver's seat supplied by the body manufacturer shall be a high back seat. The seat back shall be adjustable to 15 degrees minimum, without requiring the use of tools. The seat shall be equipped with a head restraint to accommodate a 5th percentile female to a 95th percentile adult male, as defined in FMVSS No. 208, Occupant Crash Protection. Type A buses may utilize the standards driver's seat provided by the chassis manufacturer.

DRIVER RESTRAINT SYSTEM

1. A Type 2 lap/shoulder belt shall be provided for the driver. On buses where the driver's seat and upper anchorage for the shoulder belt are both attached t 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 the 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.

2. The assembly shall be equipped with an Emergency Locking Retractor (ELR) for the continuous belt system. On all buses except Type A equipped with standard chassis manufacturer's driver's seat, the lap portion of the belt 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 effectively protect drivers varying from 5th percentile female to 95th percentile male.

SEAT 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 regardless of the condition of the bus

SHOCK ABSORBERS

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

SIDE SKIRTS

The bus body side skirts between the front and rear axles shall extend down to within 2 inches plus or minus, of the horizontal line from the center of the front spindle to the center of the rear axle. The manufacturer may offer optional side skirt lengths that extend lower than this requirement. This measurement shall apply to a new unloaded school bus located on a flat, level surface.

STEERING GEAR

1. The steering gear shall be approved by the chassis manufacturer and designed to ensure safe and accurate performance when the vehicle is operated with maximum load and at maximum speed.
2. If external adjustments are required, steering mechanism shall be accessible to make adjustments.
3. No changes shall be made in the steering apparatus, which are not approved by the chassis manufacturer.
4. There shall be a clearance of at least two inches between the steering wheel and cowl, instrument panel, windshield, or any other surface.
5. Power steering is required and shall be of the integral type with integral valves.
6. The steering system shall be designed to provide a means for lubrication of all wear-points, if wear-points are not permanently lubricated

STEPS

1. The first step at the service 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. On chassis

modifications, which may result in increased ground clearance (such as four-wheel drive) 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.

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

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

4. Steps shall not protrude beyond the side body line.

STEP TREADS

1. All steps, including floor line platform area, shall be covered with an elastomer floor covering having a minimum overall thickness of 0.187 inch. **Any design that provides equal or greater traction is acceptable.**

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

3. Steps, including the floor line platform area, shall have a 1 ½ 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.*

4. Step treads shall have the following characteristics:

   A. Abrasion resistance: Step tread material weight loss shall not exceed 1.10 percent, as tested under ASTM D-4060, *Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser*, (DS-17 Wheel, 1000 gram, 1000 cycle);

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

   C. 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*.

STIRRUP STEPS

1. Unless the windshield and lamps are not easily accessible from the ground, there may 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. 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.

STOP SIGNAL ARM

1. The stop signal arm(s) shall comply with the requirements of FMVSS 131*, School Bus Pedestrian Safety Devices.* **The stop signal arm is a required retrofit of all school buses, effective July 1, 1987. (Reference section on lamps and signals 3.b.(4).) MFSABs are exempt from these requirements.**
2. **An optional stop signal arm may be mounted to the rear of the bus.**
3. **Any bus over 40 feet must have an additional stop signal arm mounted to the rear of the bus.**

STORAGE COMPARTMENT

1. A storage container for tools, tire chains, and/or tow chains may be located either inside or outside the passenger compartment. If inside, it shall have a cover (seat cushion may not serve this purpose) capable of being securely latched and fastened to the floor, convenient to either the service or emergency door. Luggage storage compartments accessible from the outside shall be lockable.

SUN SHIELD

1. Interior adjustable transparent sun shield not less than six inch x 30 inch for Type B, C, and D vehicles, with a finished edge, shall be installed in a position convenient for use by driver.
2. On all Type A buses the sun shield shall be installed by the chassis Manufacturer.

SUSPENSION SYSTEM

1. The capacity of springs or suspension assemblies shall be commensurate with the chassis manufacturer's GVWR.
2. Rear leaf springs shall be of a progressive rate or multi-stage design. Front leaf springs shall have a stationary eye at one end and shall be protected by a wrapped leaf, in addition to the main leaf.

THROTTLE

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

TIRES AND RIMS

1. Rims of the proper size and tires of the proper size with a load rating commensurate with chassis manufacturer's gross vehicle weight rating shall be provided. The use of multi-piece rims and/or tube-type tires shall not be permitted on any school bus ordered after December 31, 1995.

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

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

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

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

6. **Tread depth 4/32 inches on front and 2/32 inches on rear will be minimum. Retreads are allowed on rear wheels only.**

TOWING ATTACHMENT POINTS

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

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

   B. Each towing device shall have a strength rating of 13,000 pounds each, for a combined rating of 27,000 pounds with the force applied in the rearward direction, parallel to the ground, and parallel to the longitudinal axis of the chassis frame rail. For pulling and lifting purposes, tow hooks are meant to be used simultaneously. For pulling, angularity applied to the town hooks will decrease the capacities of the tow hooks.

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

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

TRACTION ASSISTING DEVICES (OPTIONAL)

1. Where required or used, sanders shall:

   A. Be of hopper cartridge-valve type;

   B. Have metal hopper with all interior surfaces treated to prevent condensation of moisture;

   C. Be of at least 100-pound (grit) capacity;

   D. Have a cover on filler opening of the hopper, which screws into place, sealing unit airtight;

   E. Have discharge tubes extending under the fender wheel housing to the front of each rear wheel;

   F. Have no-clogging discharge tubes with slush-proof, non-freezing rubber nozzles;

   G. Be operated by an electric switch with pilot light mounted on the instrument panel located so as to be exclusively controlled by the driver;

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

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

2. Automatic traction chains may be installed.

TRANSMISSION

1. Automatic transmissions shall have no fewer than three forward speeds and one reverse speed. The mechanical shift selector shall provide a detent between each gear position when the gear selector quadrant and shift selector are not steering column mounted.
2. In manual transmissions, second gear and higher shall be synchronized except when incompatible with engine power. A minimum of three forward speeds and one reverse speed shall be provided.
3. Automatic transmissions incorporating a parking pawl shall have a transmission shifter interlock controlled by the application of the service brake to prohibit accidental engagement of the transmission. 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.

TRASH CONTAINER AND HOLDING DEVICE

1. Where requested or used, the trash container shall be secured by a holding device that is designed to prevent movement and to allow easy removal and replacement; and it shall be installed in an accessible location in the driver's compartment, not obstructing passenger use of the entrance door.

TURNING RADIUS

1. A chassis with a wheelbase of 264 inches or less shall have a right and left turning radius of not more than 42.5 feet, curb-to-curb measurement.
2. A chassis with a wheelbase of 265 inches or more shall have a right and left turning radius of not more than 44.5 feet, curb-to-curb measurement.

UNDERCOATING

1. 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 requirements of SAE J1959.
2. Undercoating material shall be applied with suitable airless or conventional spray equipment to the undercoating material manufacturer recommended film thickness and shall show no evidence of voids in cured film.
3. The undercoating material shall not cover any exhaust components of the chassis.

VENTILATION

1. Mandatory auxiliary fans shall meet the following requirements:
   A. Fans for left and right sides of the windshield shall be placed in a location where they can be adjusted for maximum effectiveness and do not obstruct vision to any mirror. **Note**: All Type A buses may be equipped with one fan;
   B. Fans shall be a nominal six-inch (nominal) diameter; and
   C. Fan blades shall be enclosed in a protective cage. Each fan shall be controlled by a separate switch.
2. The bus body shall be equipped with a suitably controlled ventilating system of sufficient capacity to maintain proper quantity of air under operating conditions, without having to open windows except in extremely warm weather.
3. Static-type non-closeable exhaust ventilation shall be installed in low-pressure area of roof.
4. Roof hatches designed to provide ventilation, regardless of the exterior weather conditions, may be provided.

WARNING STATEMENTS

1. **A school may choose to add one or both of the following warning statements to the rear of the bus. These statements must be located either between the upper and lower glass panes on the rear emergency exit door, or equivalent location if rear door is absent, and /or below the rear tail/stop lights on the right side. These statements apply whether the bus is loaded or unloaded.**

   A. **"This Bus Stops At All R.R. (or Railroad) Crossings." (An equivalent message may be substituted, not to exceed total number of letters and spaces of original.)**

   B. **"STOP-Illegal to Pass When Overhead Red Lights Are Flashing." (An equivalent message may be substituted, not to exceed total number of letters and spaces of original.)**

   C. **The lettering shall conform to "series B" of Standard Alphabets for highway signs, shall be black, and shall be sized so the message will fit the available space, but not to exceed two inches.**

WHEEL HOUSING

1. The wheel housing opening shall allow for easy tire removal and service.
2. The wheel housing shall be attached to floor sheets in such a manner as to prevent any dust, water or fumes from entering the body. Wheel housing shall be constructed of at least 16-gauge (or thicker) steel.
3. The inside height of the wheel housing above the floor line shall not exceed 12 inches.
4. The wheel housing shall provide clearance for installation and use of tire chains on single and dual (if so equipped) power-driving wheels.
5. No part of the raised wheel housing shall extend into the emergency door opening.

WINDOWS

1. Each full side window, other than emergency exits designated to comply with FMVSS 217, *Bus Emergency Exits and Window Retention and Release, each side window* shall provide an unobstructed emergency opening of at least nine inches (but not more than 13 inches high) and at least 22 inches wide, obtained by lowering window. One side window on each side of the bus may be less than 22 inches wide.

2. Optional tinted and/or frost-free glazing may be installed in all doors, windows, and windshields consistent with federal, state, and local regulations. For improved visibility, frost-free glazing shall be installed in the driver's window (excluding Type A). Optional frost-free glazing may be installed in the first two windows to the rear of the entry door and/or the first window behind the driver.

See door section for entrance door glazing requirements.

WINDSHIELD WASHERS

A windshield washer system shall be provided.

WINDSHIELD WIPERS

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

2. The wipers shall be operated by one or more air or electric motors of sufficient power to operate wipers. If one motor is used, the wipers shall work in tandem to give full sweep of windshield. The wiper system shall meet the requirements of FMVSS No. 104, *Windshield Wiping and Washing Systems.*

• Specially Equipped School Buses •

INTRODUCTION

Equipping buses to accommodate students with special needs is discretionary depending upon the needs of the passengers. While one bus may be fitted with a lift, another may have seat 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 be supplementary to 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 by the entire industry that the field of special transportation is characterized by varied needs for individual cases and by a rapidly emerging technology for meeting those needs. A flexible, “common-sense” approach to the adoption and enforcement of specifications for these vehicles, therefore, is prudent.

As defined by Code of Federal Regulations (CFR) 49 §571.3, “Bus means a motor vehicle with motive power, except a trailer, designed for carrying more than 10 persons” (11 or more including the driver). This definition also embraces the more specific category, *school bus*. Vehicles with 10 or fewer passenger positions (including the driver) cannot be classified as buses. For this reason, the federal vehicle classification *multipurpose passenger vehicle* (CFR 49 §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, while requiring compliance with a less stringent set of federal standards for MPVs, does not preclude state or local agencies or these national standards from requiring compliance of school bus-type MPVs with the more stringent federal standards for school buses.

The following standards address modifications as they pertain to school buses that, with standard seating arrangements prior to modification, would accommodate more than 10 persons (11 or more including the driver). If by addition of a power lift, mobile seating device positions or other modifications, the capacity is reduced such that vehicles become MPVs, 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 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, which is designed, equipped, and/or modified to accommodate students with special transportation needs.

GENERAL REQUIREMENTS

1. School buses designed for transporting students with special transportation needs shall comply with Montana School Bus Standards, National School Transportation Specifications & Procedures and with the Federal Vehicle Safety Standards and with 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.

AISLES

1. All school buses equipped with a power lift shall provide a minimum 30-inch pathway leading from any wheelchair/mobility aid position to at least one 30 " wide emergency exit. A wheelchair securement position shall never be located directly in front of (blocking) a power lift door location. It is understood that, when provided, the lift service door is considered an emergency exit.

COMMUNICATIONS

All school buses which are used to transport individuals with disabilities should be equipped with a two-way electronic voice communication system that can be used at any point in the vehicle's route. Where no such service exists, vehicles would be exempt.

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

PASSENGER CAPACITY RATING

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

POWER LIFTS

1. 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.

2. 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.

3. **Vehicle lift and installation**

A. General: Vehicle lifts and installations shall comply with the requirements set for4th in FMVSS 403, *Platform Lift Systems for Motor Vehicles*, and FMVSS 404, *Platform Lift Installations in Motor Vehicles.*

B. Design load:

The design load of the lift shall be at least 800 pounds. Working parts, such as cables, pulleys, and shafts, which *c*an be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six (6), 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 (3), based on the ultimate strength of the material.

C. Controls Requirements

a. Controls shall be provided that enable the operator to activate the lift mechanism from either inside or outside the bus. The controls should be interlocked with the vehicle brakes, transmission, or door, or shall provide other appropriate mechanisms or systems to ensure the vehicle cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all levels (i.e., ground, curb, and intermediate positions) normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed

position.

i. Exception

(a) Where the lift is designed to deploy with its long dimension parallel to the vehicle axis and which pivots into or out of the vehicle while occupied (i.e., “rotary lift”), the requirements of this paragraph prohibiting the lift from being stowed while occupied shall not apply if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

ii. Emergency operation

(a) The lift shall incorporate an emergency method of deploying, lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer’s instructions and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied. No manual emergency operation shall require more than two (2) minutes to lower an occupied wheelchair to ground level.

iii. Power or equipment failure

(a) Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches per second or their dropping of an occupant in the event of a single failure of any load carrying component.

iv. Platform barriers

(a) The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the platform during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the platform is in its fully raised position. Each side of the lift platform that extends beyond the vehicle in its raised position shall have a barrier a minimum 1.5 inches high. Such barriers shall not interfere with maneuvering into or out of the aisle. The loading-edge barrier (outer barrier), which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically raise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the platform is more than 3 inches above the roadway or sidewalk and the platform is occupied. Alternatively, a barrier or

system may be raised, lowered, opened, closed, engaged, or disengaged by the lift operator, provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

v. Platform surface

(a) The platform surface shall be free of any protrusions over 1/4 inch high and shall be slip resistant. The platform shall have a minimum clear width of 28.5 inches at the platform, a minimum clear width of 30 inches measured from two inches above the platform surface to 30 inches above the surface of the platform, and a minimum clear length of 48 inches measured from two inches above the surface of the platform to 30 inches above the surface of the platform. (See “Wheelchair or Mobility Aid Envelope” figure in Appendix D).

vi. Platform gaps

(a) Any openings between the platform surface and the raised barriers shall not exceed 5/8 inch in width. When the platform is at vehicle floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and the vehicle floor shall not exceed 1/2 inch horizontally and 5/8 inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1.5 inches by 4.5 inches located between the edge barriers.

vii. Platform entrance ramp

(a) The outboard entrance ramp or loading-edge barrier used as a ramp and the transition plate from the inboard edge of the platform to the vehicle floor shall not exceed a slope of 1:8, measured on level ground, for a maximum rise of three inches, and the transition from roadway or sidewalk to ramp may be vertical without edge treatment up to 1/4 inch. Thresholds between 1/4 inch and 1/2 inch high shall be beveled with a slope no greater than 1:2.

viii. Platform deflection

(a) The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll or pitch) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26-inch by 26-inch test pallet at the centroid of the platform.

ix. Platform movement

(a) No part of the platform shall move at a rate exceeding 6 inches per second during lowering and lifting an occupant, and shall not exceed 12 inches per second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The

maximum platform horizontal and vertical acceleration when occupied shall be 0.3 g.

x. Boarding direction

(a) The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users.

xi. Use by standees

(a) Lifts shall accommodate persons using walkers, crutches, canes or braces, or who otherwise have difficulty using steps. The platform may be marked to indicate a preferred standing position.

xii. Handrails

(a) Platforms on lifts shall be equipped with handrails on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1 1/4 inches and 1 1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall be placed to provide a minimum 1 1/2 inch knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

xiii. Circuit breaker

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

xiv. Excessive pressure

(a) Lift design shall prevent excessive pressure that could damage the lift system when the platform is fully lowered or raised, or that could jack the vehicle.

xv. Documentation

(a) 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 and readily visible when the lift door is open, including a diagram showing the proper placement and positioning of wheelchair/mobility aids on lift.

xvi. Training materials

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

xvii. Identification and certification

(a) Each lift shall be permanently and legibly marked or incorporate a non-removable label or tag which states that it conforms to all applicable requirements of the current National Standards for School Buses. In addition, the lift manufacturer, or an authorized representative, upon request of the original titled purchaser, 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.

3. Vehicle ramp

A. 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 special device on the ramp.

B. Floor of ramp shall be constructed of non-skid material.

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

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

REGULAR SERVICE ENTRANCE

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

2. In addition to the HANDRAIL required in the BUS BODY AND CHASSIS section, an additional handrail may be provided on all SPECIALLY EQUIPPED SCHOOL BUSES. This rail shall be located on the opposite side of the entrance door from the rail required in the BUS BODY AND CHASSIS section and shall meet the same requirements for handrails.

RESTRAINING DEVICES

1. On power-lift equipped vehicles, seat frames may be equipped with attachments or devices to winch belts, restraining harnesses or other devices may be attached. Attachment framework or anchorage devices, if installed, shall conform to FMVSS 210.

2. Seat belt assemblies, if installed, shall conform to FMVSS 209.

3. Child 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 213.

SEATING ARRANGEMENTS

1. Flexibility in seat spacing to accommodate special devices shall be permitted to meet passenger requirements. All seating shall be forward-facing.

   This seating arrangement provision shall apply to all new specially equipped school buses, any older buses modified or retrofitted to carry wheelchairs/mobile seating device(s), and any older specially equipped buses whose wheelchair/mobile seating device positions are retrofitted or modified, after August 15, 1993. This provision shall apply retroactively to all specially equipped school buses after August 15, 1998.

SECUREMENT AND RESTRAINT SYSTEM FOR WHEELCHAIR/MOBILITY AID AND OCCUPANT

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* is used exclusively in reference to the device that anchors the wheelchair to the vehicle. The term *wheelchair tiedown* and *occupant restraint system (WTORS)* is used to refer to the total system used that secures and restrains both the wheelchair and the wheelchair occupant.

1. **WTORS general requirements:**

A. The Wheelchair/Mobility Aid Securement and Occupant Restraint System shall be designed, installed, and operated to accommodate passengers in a forward-facing orientation within the bus 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*. Gurney-type devices shall be secured parallel to the side of each bus.

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

C. When a wheelchair/mobility aid securement device and an occupant restraint share a common anchorage, including occupant restraint designs that attach the occupant restraint to the securement device or the wheelchair/mobility aid, the anchorage shall be capable of withstanding the loads of both the securement device and occupant restraint applied simultaneously, in accordance with FMVSS 222. (See 2 and 3 of this section.)

D. When a wheelchair/mobility aid securement device (webbing or strap assembly) is shared with an occupant restraint, the wheelchair/ mobility aid securement device (webbing or strap assembly) shall be capable of withstanding a force twice the amount as specified in 4.4(a) of FMVSS 209. (See 2 and 3 of this section.)

E. The bus body floor and sidewall structures where the securement and restraint system anchorages are attached shall have equal or greater strength than the load requirements of the system(s) being installed.

F. The occupant restraint system shall be designed to be attached to the bus body either directly or in combination with the wheelchair/mobility aid securement system, by a method, which prohibits the transfer of weight or force from the wheelchair/mobility aid to the occupant in the event of an impact.

G. When an occupied wheelchair/mobility aid is secured in accordance with the manufacturer's instructions, the securement and restraint system shall limit the movement of the occupied wheelchair/mobility aid to no more than two inches in any direction under normal driving conditions.

H. The securement and restraint system shall incorporate an identification scheme, which will allow for the easy identification of the various components and their functions. It shall consist of one of the following, or combination thereof:

   a. The wheelchair/mobility aid securement (webbing or strap assemblies) and the occupant restraint belt assemblies shall be of contrasting color or color shade.

   b. The wheelchair/mobility aid securement device (webbing or strap assemblies) and occupant restraint belt assemblies shall be clearly marked to indicate the proper wheelchair orientation in the vehicle, and the name and location for each device or belt assembly, i.e., front, rear, lap belt, shoulder belt, etc.

I. All attachment or coupling devices designed to be connected or disconnected frequently shall be accessible and operable without the use of tools or other mechanical assistance.

J. All securement and restraint system hardware and components shall be free of sharp or jagged areas and shall be of a non-corrosive material or treated to resist corrosion in accordance with section 4.3(a) of FMVSS 209.

K. The securement and restraint system shall be located and installed such that when an occupied wheelchair/mobility aid is secured, it does not block access to the lift door.

L. A device for storage of the securement and restraint system 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.

M. The entire securement and restraint system, including the storage device, shall meet the flammability standards established in FMVSS 302.

N. Each securement device (webbing or strap assembly) and restraint belt assembly shall be permanently and legibly marked or incorporate a non-removable label or tag which states that it conforms to all applicable FMVSS requirements, as well as, the current National Standards for School Buses. In addition, the system manufacturer, or an authorized representative, upon request by the original titled purchaser, shall

provide a notarized Certificate of Conformance, either original or photocopied, which states that the wheelchair/mobility aid securement and occupant restraint system meets all of the requirements as specified in FMVSS 222 and the current National School Transportation Specifications and Procedures.

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

   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.

P. The system manufacturer shall make available training materials to ensure the proper use and maintenance of the wheelchair/mobility aid securement and occupant restraint system. These may include instructional videos, classroom curriculum, system test results, or other related materials.

2. **Wheelchair/mobility Aid Securement System**

A. Each securement system location shall consist of a minimum of four anchorage points. A minimum of two anchorage points shall be located in front of the wheelchair/mobility aid and a minimum of two anchorage points shall be located in the rear. The securement anchorages shall be attached to the floor of the vehicle and shall not interfere with passenger movement or present any hazardous condition.

B. Each securement system location shall have a minimum clear floor area of 30 inches x 48 inches. Additional floor area may be required for some applications. Consultation between the user and the manufacturer is recommended to ensure adequate area is provided.

C. The securement system shall secure common wheelchair/mobility aids and shall be able to be attached easily by a person having average dexterity and who is familiar with the system and wheelchair/mobility aid.

D. As installed, each securement anchorage shall be capable of withstanding a minimum force of 3,000 pounds (13,344 Newtons) when applied as specified in FMVSS 222. When more than one securement device share a common anchorage, the anchorage shall be capable of withstanding the force indicated above, multiplied by the number of securement devices

sharing that anchorage.

E. Each securement device, if incorporating webbing or a strap assembly, shall comply with the requirements for Type 1 safety belt systems, in accordance with sections 4.2, 4.3, and 4.4(a) of FMVSS 209.

F. The securement system shall secure the wheelchair/mobility aid in such a manner that the attachments or coupling hardware will not become detached when any wheelchair/mobility aid component deforms, when one or more tires deflate, and without intentional operation of a release mechanism (e.g., a spring clip on a securement hook).

G. Each securement device (webbing or strap assembly) shall be capable of withstanding a minimum force of 2,500 pounds when tested in accordance with FMVSS 209.

H. Each securement device (webbing or strap assembly) shall provide a means of adjustment, of manufacturer's design, to remove slack from the device or assembly.

3. Occupant Restraint System

A. A Type 2A occupant restraint system, which meets all applicable requirements of FMVSSs 209 and 210, shall provide for restraint of the occupant.

B. The occupant restraint system shall be made of materials, which do not stain, soil, or tear an occupant's clothing, and which are resistant to water damage and fraying.

C. Each restraint system location shall have not less than one anchorage, of manufacturer's design, for the upper end of the upper torso restraint.

   a. The anchorage for each occupant's upper torso restraint shall be capable of withstanding a minimum force of 1,500 pounds (6,672 Newtons) when applied as specified in FMVSS 222.

D. Each wheelchair/mobility aid location shall have not less than two floor anchorages for the occupant pelvic and the connected upper torso restraint.

   a. Each floor anchorage shall be capable of withstanding a minimum force of 3,000 pounds (13,344 Newtons) when applied as specified in FMVSS 222.

   b. When more than one occupant restraint shares a common anchorage, the anchorage shall be capable of withstanding a minimum force of 3,000 pounds (13,344 Newtons) multiplied by the number of occupant restraints sharing the common anchorage in accordance with FMVSS 222.

E. Each floor and wall anchorage which secures the occupant restraint to the vehicle and which is not permanently attached, shall be of a “positive latch” design, and shall not allow for any accidental disconnection.

4. Dynamic Testing

A. The wheelchair/mobility aid securement and occupant restraint system shall be subjected to, and successfully pass, a dynamic sled test at a minimum impact speed/deceleration of 30 mph/20g’s.

B. The dynamic test shall be performed by experienced personnel using an impact simulator with proven ability to provide reliable, accurate, test results that can be replicated.

C. The dynamic test shall be performed in accordance with the procedures set forth in Appendix A of SAE J2249 “Test for Frontal Impact Crash Worthiness.”

D. The wheelchair/mobility aid used for testing purposes shall be a rigid, reusable surrogate wheelchair that complies with the requirements of Appendix D of SAE J2249 “Specification for Surrogate Wheelchair.”

E. The dynamic test shall be performed using system assemblies, components and attaching hardware that are identical to the final installation in type, configuration and positioning. The body structure at the anchorage points may be simulated for the purpose of the sled test.

F. When tested, the wheelchair/mobility aid securement and occupant restraint system shall pass the criteria specified in Section 6.2 of SAE J2249 “Performance Requirements of Frontal Sled Impact Test.” Following is an abridged summary of the criteria. (see appendix D):

a. Retain the test dummy in the test wheelchair and on the test sled with the test wheelchair in an upright position;

b. Does not show any fragmentation or complete separation of any load carrying part;

c. Does not allow the horizontal excursions of the test dummy and the test wheelchair to exceed specified limits;

d. Prevent the test wheelchair from imposing forward loads on the test dummy; and

e. Allow removal of the test dummy and the test wheelchair, subsequent to the test, without the use of tools.

Special Light

1. Doorways in which lifts are installed shall have for use during lift operation a special light providing a minimum of two foot-candles of illumination measured on the floor of the bus immediately adjacent to the lift and on the lift when deployed at the vehicle floor level.

Special Service Entrance

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

   Exception: If the lift is designed to operate within the regular service entrance, and is capable of stowing such that the regular service entrance is not blocked in any way, and that persons entering or exiting the bus are not impeded in any way, a special service entrance shall not be required.

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

   Exception: A special service entrance and door may be located on the left side of the bus if, and only if, the bus is used primarily to deliver students to the left side of one way streets and its use is limited to that function.

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

4. A drip molding shall be installed above the opening to effectively divert water from entrance.

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

Special Service Entry Doors

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

2. A single door shall be hinged to the forward side of the entrance unless doing so would obstruct the regular service entrance. If, due to the above condition, the door is hinged to the rearward side of the doorway, the door shall utilize a safety mechanism, which will

prevent the door from swinging open, should the primary door latch fail to operate properly. If double doors are used the system shall be designed to prevent the door(s) from being blown open by the wind resistance created by the forward motion of the bus, and/or incorporate a safety mechanism to provide secondary protection should the primary latching mechanism(s) fail.

3. All doors shall have positive fastening devices to hold doors in the open position.

4. All doors shall be weather sealed.

5. When manually-operated dual doors are provided, the rear door shall have at least a one-point fastening device to the header. 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 be of a strength that is greater than or equivalent to the emergency exit door.

6. 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.

7. Each door shall have windows set in rubber, which are visually similar in size and location to adjacent non-door windows. Glazing shall be of same type and tinting (if applicable) as standard fixed glass in other body locations.

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

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

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

SUPPORT EQUIPMENT AND ACCESSORIES

(See also Wheelchair or Mobility Aid Envelope—Appendix D.)

1. Each bus which is set up to accommodate wheelchair/mobility aids or other assistive or restraint devices which utilize belts, shall contain at least one belt cutter properly secured in a location within reach of the driver while belted into his/her driver's seat. The belt cutter shall meet the requirements listed in the Bus Body and Chassis section.

2. Special equipment or supplies that are used on the bus for mobility assistance, health

support, or safety purposes shall meet any local, federal, or engineering standards which may apply, including proper identification. Equipment which may be used for these purposes includes, but is not limited to:

A. Wheelchairs and other mobile seating devices. (see section on Securement System for Mobile Seating Devices/Occupant);

B. Crutches, walkers, canes, and other ambulating devices; and

C. 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.

3. 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 to the box's integrity and securement to the bus.

   Exception: If these standards provide specific requirements for securement of a particular type of equipment, the specific standard shall prevail (i.e., wheelchairs).

TECHNOLOGY AND EQUIPMENT, NEW

It is the intent of these standards to accommodate new technologies and equipment that will better facilitate the transportation of students with special needs. When a new technology, piece of equipment, or component is desired to be applied to the school bus, and it meets the following criteria, it may be acceptable.

1. It (the technology, equipment or component) shall not compromise the effectiveness or integrity of any major safety system, unless it completely replaces the system. (Examples of safety systems include, but are not limited to, compartmentalization, the eight light warning lights system, emergency exits, and the uncluttered, approved yellow color scheme.)

2. It shall not diminish the safe environment of the interior of the bus.

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

4. It shall not create undue additional activity and/or responsibility for the driver.

5. It shall generally increase efficiency and/or safety of the bus, or generally provide for a safer or more pleasant experience for the occupants and pedestrians in the vicinity of the bus, or generally assist the driver or make his/her many tasks easier to perform.

• Alternative Fuels •

INTRODUCTION

This standard is designed to be used as an overview of the alternative fuels being utilized for school transportation. The standard is not designed to replace current applicable federal, state, manufacturing or safety standards that may exceed requirements within this standard. There will be advancements in engineering and improvements in equipment fabrication methods and operating practices that differ from those specifically called for in this standard. Such deviations or improvements may provide safety and may meet the intent of and be compatible with this standard. Entities wishing to purchase alternative fuel school buses should use this section only as a starting point. More detailed specifications, including specific design and performance criteria and safety standards, should be researched by prospective purchasers of alternative fuel school buses.

GENERAL REQUIREMENTS

1. Alternative fuel school buses shall meet the following requirements:

    A. Chassis shall meet all standards previously mentioned in Bus Chassis Standards;

    B. Chassis shall meet all applicable FMVSS standards;

    C. Fuel system integrity shall allow zero (0) leakage when impacted by a mobile barrier in accordance with test conditions specified in FMVSS 301 or FMVSS 303, as applicable;

    D. Original Equipment Manufacturers (OEMs) and conversion systems using Compressed Natural Gas (CNG) shall comply with NFPA Standard 52 “Compressed Natural Gas Vehicular Fuel Systems” in effect at the time of installation. Fuel systems using liquefied petroleum gas (LPG) shall comply with the NFPA Standard 58 “Liquefied Petroleum Gases Engine Fuel Systems” in effect at the time of installation;

    E. All alternative fuel buses shall travel a loaded range of not less than 200 miles, except those powered by electricity, which shall travel not less than 80 miles;

    F. Natural gas-powered buses shall be equipped with an interior/exterior gas detection system. All natural gas-powered buses shall be equipped with a fire detection and suppression system;

G. All materials and assemblies used to transfer or store alternative fuels shall be installed outside the passenger/driver compartment;

H. All Type C and D buses using alternative fuel shall meet the same base requirements of BUS CHASSIS STANDARDS for power and gradability, i.e., at least one published net horsepower per each 185 pounds of GVWR;

I. The total weight shall not exceed the GVWR when loaded to the rated capacity;

J. The manufacturer supplying the alternative fuel equipment must provide the owner and operator with adequate training and certification in fueling procedures, scheduled maintenance, troubleshooting, and repair of alternative fuel equipment;

K. All fueling equipment shall be designed specifically for fueling motor vehicles and shall be certified by the manufacturer as meeting all applicable federal, state and industry standards;

L. All on-board fuel supply containers shall meet all appropriate requirements of the ASME code, the DOT regulations, or applicable FMVSS and NFPA Standards;

M. All fuel supply containers shall be securely mounted to withstand a static force of eight times their weight in any direction;

N. All safety devices that may discharge to the atmosphere shall be vented to the outside of the vehicle. The discharge line from the safety relief valve on all school buses shall be located in a manner appropriate to the characteristics of the alternative fuel. Discharge lines shall not pass through the passenger compartment;

O. A positive quick acting (1/4 turn) shut-off control valve shall be installed in the gaseous fuel supply lines as close to the fuel supply containers as possible. The controls for this valve shall be placed in a location easily operable from the exterior of the vehicle. The location of the valve control shall be clearly marked on the exterior surface of the bus; and

P. A grounding system shall be required for grounding of the fuel system during maintenance related venting.

CHARACTERISTICS OF ALTERNATIVE FUELS

For the purpose of this standard, alternative fuels refer to the specific fuels listed below. A brief description of each fuel and the advantages and disadvantages of each fuel are shown. Also see Appendix C, Alternative Fuels Comparison Chart.

Note: There are two other more exotic fuels being examined, hydrogen and solar power. These two energy sources are in their infancy as alternative fuels for motor vehicles, and are not covered within the scope of this document.

1. Liquid alternative fuels

A. Methanol

Methanol, a liquid at normal ambient temperatures, is colorless, and is made primarily from natural gas or coal. Extensive experiments have been conducted with auto and truck engines powered by methanol. There are a number of urban transit bus fleets currently using methanol; California has experience with methanol as an alternative fuel for school buses through their School Bus Demonstration Project.

a. Advantages:
   i. The principal advantage to methanol is that the emissions produced are quite low in particulates and NOx;
   ii. Another major advantage is that it mixes with gasoline and can be used as M85 which is 15 percent gasoline and 85 percent Methanol. Also, flexible fuel vehicles run on a blend of the two fuels;
   iii. Methanol has a high cetane rating, which assists diesel engine performance;
   iv. Methanol is biodegradable and readily assimilates with water;
   v. Methanol burns smokeless; and
   vi. Methanol is a domestically produced energy source.

b. Disadvantages:
   i. Methanol is corrosive, particularly to aluminum; engines and fuel systems specially designed to handle it use different materials, such as stainless steel;
   ii. Methanol has less than half the power per equivalent gallon (BTU value) as that of diesel fuel. For an equivalent range, this requires storage tanks twice the size of diesel tanks;
   iii. Methanol is quite toxic. Direct exposure to the human body has the potential of causing blindness and kidney failure. Since it is tasteless and colorless, it cannot be easily detected should it get into a water supply;
   iv. Methanol combustion generates high amounts of formaldehyde, a potential cancer causing substance. This can be offset with exhaust after-treatment, such as special catalytic converters;
   v. In its pure state, methanol burns with a colorless flame, so a fire is hard to see. In addition, it is highly volatile and has a relatively low flash point; and
   vi. The distribution system and infrastructure for methanol fueling are considerably less widespread than for gasoline and diesel.

B. Ethanol

Ethanol is a distilled agricultural alcohol product that is a liquid at normal ambient temperatures and is colorless. Corn is the current primary grain source. It has many of the same characteristics as methanol. Currently ethanol is used primarily in a mixture with gasoline, usually no more than 10 percent ethanol.

a. Advantages:
   i. Ethanol emissions are quite low in particulates and NOx;
   ii. Like methanol, ethanol readily mixes with gasoline;
   iii. Ethanol is biodegradable and readily assimilates with water;
   iv. Ethanol is less corrosive and less toxic than methanol; and
   v. Ethanol is a domestically produced energy source.

b. Disadvantages:
   i. The production process is extensive and the steps involved, i.e., planting, fertilizing, harvesting, shipping, processing, consume nearly as much energy as is created;
   ii. The energy output of ethanol, though higher than methanol, is still only about half that of diesel fuel, thus the range of ethanol powered vehicles is limited for a given fuel storage capacity;
   iii. Ethanol emissions have some visible smoke;
   iv. Ethanol produces formaldehyde, however, this can be offset with an exhaust after-treatment; and
   v. The distribution system and infrastructure for ethanol fueling are considerably less widespread than for gasoline and diesel.

C. Clean diesel

Clean diesel was one of the alternative fuels approved in the Clean Air Act Amendments of 1990. The first step being undertaken is further refining to reduce sulfur content and hence the significant particulate emissions caused by the sulfur. Further steps are being developed to add cetane boosters, which increase efficient combustion. Additives are also being developed to reduce aromatic hydrocarbons in the exhaust.

a. Advantages:
   i. The additional processing costs are small, so clean diesel is cost effective;
   ii. All existing diesel engines currently in service can use clean diesel without modification;
   iii. The present systems for distribution of diesel fuel are unchanged and are fully usable with clean diesel;
   iv. Clean diesel retains the low level of diesel fuel volatility. This makes it safer than many of the other alternatives; and
   v. Clean diesel has a higher BTU value per gallon or equivalent gallon than any other alternative fuel, and thus provides more engine efficiency as well as more vehicle range.

b. Disadvantages:
   i. Clean diesel is still relatively high in particulates and NOx;
   ii. Clean diesel is a fossil fuel and, as such, leaves us still dependent on foreign sources; and

iii. When operating under cold conditions, starting is a problem as with all diesel fuels.

D. Reformulated gasoline

Reformulated gasoline is a specially blended fuel with the following properties: a lower vapor pressure that reduces evaporation during operation and refueling; and more efficient combustion through the addition of high-octane oxygenates. Reformulated gasoline aromatic levels have been lowered, which provides less in the way of hydrocarbon W1 pipe emissions.

a. Advantages:
   i. Reformulated gasoline is compatible with all existing gasoline engines;
   ii. The existing fuel-delivery infrastructure is unchanged by this change in fuel properties; and
   iii. Reformulated gasoline is a cost-effective alternative in spite of some additional refining costs.

b. Disadvantages:
   i. Currently there is insufficient oxygenate production and storage (as well as transportation) to provide the oxygenate when and where it is needed;
   ii. Like regular gasoline, reformulated gasoline has a lower caloric (BTU) value than diesel and, thus, provides less engine efficiency than diesel and less range for a given fuel capacity;
   iii. Reformulated gasoline is a fossil fuel and, as such, leaves us still dependent on foreign sources; and
   iv. Present technology and federal emissions and energy standards will allow reformulated gasoline to be viable to the year 2000. Significant improvements must take place if gasoline is to be used after that time, assuming present planned regulations remain in place.

2. Gaseous alternative fuels

A. Natural gas

Natural gas is primarily methane as it comes from the well, and it burns quite cleanly in its unprocessed state. Natural gas has a higher ignition point (temperature) and a narrower fuel/oxygen mixture combustion range than other fuels. Energy is consumed in processing natural gas to achieve sufficient vehicle storage (i.e., compression or cryogenic processes). See Compressed Natural Gas and Liquid Natural Gas below.

B. Compressed natural gas (CNG)

Compressed Natural Gas, or CNG, consists primarily of mixtures of hydrocarbon gases and vapors, consisting principally of methane (CH4) in gaseous form, which is compressed for use as a vehicular fuel.

a. Advantages:
   i. Natural gas is readily available as a domestic energy source, is inexpensive, and has generally lower emissions than most other alternative fuels;
   ii. CNG already is in use as a viable alternative for light-duty vehicles. The

American Gas Association reports over 700,000 natural gas vehicles in operation in 38 countries; and

iii. The cleaner burning minimizes carbon buildup thus, increasing oil change intervals and reducing maintenance.

b. Disadvantages:

i. The pressure of CNG requires heavy storage tanks. The tanks are large even for short-range use. Those two factors reduce cargo capacity. Maintaining reasonable cargo capacity restricts tank size and limits range. Lower caloric (BTU) value per equivalent gallon than diesel also limits engine efficiency and vehicle range;

ii. The high pressure which the CNG fuel storage system must endure requires careful design and location on the vehicle, protection from damage, plus periodic maintenance and upkeep. Periodic tank testing for structural safety is required and replacement during the life cycle of the vehicle may be necessary;

iii. Refueling time is dependent on the type of fueling system used, and can be quite lengthy. There are two methods: “slow-fill” which takes from 5 to 8 hours and is typically called “overnight” or “time-fill” refueling and “fast-fill” which takes about 5 to 10 minutes and requires high-volume compression and special filling apparatus;

iv. Natural gas compression and refueling equipment is expensive and must be maintained. Fast fill capability requires an additional “cascade” of high volume storage cylinders, which adds considerable expense to the fueling station;

v. There are composition variations in natural gas and percentage of methane content from one area to another. Additional processing is required to get uniform natural gas available in all areas; and

vi. Natural gas has poor lubricative properties.

C. <u>Liquid natural gas (LNG)</u>

Liquid natural gas utilizes the same natural gas source (primarily methane) as CNG, but requires purification of the gas and cooling and storage below -260 degrees Fahrenheit to liquefy the natural gas. Converting natural gas to liquid form provides storage of a much greater amount on the vehicle than can be achieved in the gaseous state.

a. Advantages:

i. Liquid natural gas has all of the combustion advantages of compressed natural gas, is readily available, clean burning and generally produces lower emissions than alternatives other than CNG;

ii. An engine will operate just as easily on LNG as it does on CNG. Though one is stored by compression and the other by cryogenics, when either gets to the point of combustion, it is natural gas;

iii. The range of an LNG is greater than that of CNG due to the fuel density;

iv. The LNG fuel system pressure is less than 100 psig as compared to 3,000 psig in a CNG system; and

v. LNG provides almost pure methane with known performance characteristics.

b. Disadvantages:
   i. Maintaining the super-cool temperature requires large, heavy, highly insulated tanks, which still forces compromise between vehicle range and cargo carried;
   ii. Equipment to super-cool and liquefy gas is expensive to purchase, operate, and maintain;
   iii. Liquid natural gas can be kept in the insulated storage tank for 7 to 10 days. After that, it must be bled off to maintain the cold temperature required to hold the gas in liquid form;
   iv. The bleeding-off process releases hydrocarbons, which, in turn, requires treatment to avoid direct release into the atmosphere; and
   v. Natural gas has poor lubricative properties.

D. Propane (also known as LIQUEFIED PETROLEUM GAS or LPG)
Propane, or LPG, is sometimes available directly from wells, but is normally produced as a by-product of the gasoline refining process. It has been used for a number of years in light-duty commercial vehicles in urban areas around the world.

a. Advantages:
   i. Propane burns relatively clean. It emits less NOx and contains less particulate matter than diesel; and emits less carbon monoxide and fewer hydrocarbons than gasoline;
   ii. The cleaner burning minimizes carbon buildup in the engine and hence resulting in less maintenance;
   iii. Propane starts better in cold weather than either diesel or gasoline; and
   iv. The infrastructure for distribution and storage of propane is relatively widespread.

b. Disadvantages:
   i. As with CNG, propane requires large and heavy fuel tanks to achieve reasonable driving range, due to reduced engine efficiency per equivalent gallon;
   ii. Propane requires the use of relatively low compression ratios hence, has lower economy;
   iii. Propane vapors, like gasoline, are heavier than air and volatile. These explosive mixtures settle in service pits or other spots, therefore, indoor storage can be a safety concern;
   iv. As a by-product, propane is dependent on the gasoline process which limits supply. Further, it does little toward the reduction of dependency of foreign oil; and
   v. Propane has poor lubricative properties.

E. Electric power
The use of electricity as a power source for school buses is an emerging technology that is under considerable research due to the potential for reduced overall emissions. Research is centering on ways to increase the capacity and reduce the weight of batteries, as well as improving the motors used to power the vehicles and the associated electronics. Recharging technology is also developing rapidly. Most of these efforts have the goals of improving the range and performance of electric vehicles, reducing their cost, and addressing operational concerns, such as recharging.

a. Advantages:
   i. Electric power vehicles produce no tailpipe emissions;
   ii. The electricity distribution system is currently available; power lines are already in place;
   iii. Electricity can be, and often is, produced from renewable, domestic energy sources;
   iv. Electric power vehicles are extremely quiet, due to the lack of internal combustion engines;
   v. Electric school buses can be produced as hybrid vehicles, which would have a small internal combustion engine to recharge batteries, or to supply heating systems or various other chassis accessories; and
   vi The cost per mile to operate electric power vehicles is low; power source maintenance is practically nil, compared to internal combustion engines.

b. Disadvantages:
   i. Electric power vehicles have low range, due to battery weight and limited electrical storage capacity of current batteries;
   ii. Electric power vehicles may not eliminate overall emissions and/or foreign oil dependency if electricity to charge vehicle batteries is produced from coal or oil;
   iii. Current cost of electric power systems for vehicles, including batteries, is extremely high;
   iv. Battery disposal is an environmental concern; and
   v. Significant weight of current batteries limits passenger carrying capacity.

• Operations •

INTRODUCTION

The success of any school transportation operation depends largely on the performance and degree of dedication displayed by those involved. **These recommendations and requirements** are designed to assist state agencies, school and Headstart administrators and private operators in understanding their pupil transportation programs and developing applicable policies, including those for transporting students with special needs. The school bus is an extension of the classroom and as such, the ride to school should be safe and efficient in an atmosphere conducive to learning readiness. Open and honest communication between all stakeholders is vital for the success of the transportation program. Transportation is critical to the education process, and the school bus is the safest form of transportation. Therefore, transportation to and from school on a school bus shall be offered to all eligible students. Districts or the governing body responsible for pupil transportation shall have an eligibility policy, which takes safety into account, addressing distances from school for all age groups. If transportation eligibility is maximized, the result will be more students on buses.

SCHOOL TRAVEL CHOICES

Children in the United States travel to and from pre-school, school and related activities by a variety of modes. Administrators, parents and students often choose or encourage the use of modes of travel for reasons other than maximizing safety or minimizing risk (e.g., convenience, flexibility, and budget). **It is recommended that all school students be transported in a school bus**.

Each travel mode has its inherent risks, which vary from community to community, school to school and program to program, and any shifts from one mode to another can have a marked effect on the overall safety of travel for a particular community, school or program. Each state, school district, private school, Head Start agency and any other agencies or organizations transporting school-age children must assess their own situations and circumstances and apply the information presented in “The Relative Risks of School Travel – A National Perspective and Guidance for Local Community Risk Assessment” (published by the Transportation Research Board of the National Academies of Sciences and Engineering), to make sound, informed decisions. The goal is to improve safety for all children traveling to and from pre-school, school and related activities and to provide communities with the information needed to make informed choices that balance their needs and resources. **School Bus Use**

On July 6, 1999, the National Transportation Safety Board (NTSB) transmitted a Safety Recommendation letter to the Steering Committee of the 13th National Conference on School Transportation containing the findings and recommendations of the Special Investigation Report-*Pupil Transportation in Vehicles Not Meeting Federal School Bus Standards* (NTSB/SIR-99/02). This special investigation was based on the NTSB's finding in four accidents involving "nonconforming buses" that a number of children were ejected and fatally injured in three 15-passenger vans and a 25-passenger specialty bus that "did not and were not required to meet Federal school bus occupant crash protection standards." Recommendations H-99-25, issued in the letter to the National Conference on School Transportation and a number of other national associations and churches, state, "Inform their members about the circumstances of the accidents discussed in this special investigation report and urge that they use school buses or buses having occupant protection equivalent to school buses to transport children."

To assure the highest level of safety for children, consistent with the NTSB's recommendation and 45 CFR 1310, all students transported to and from public and private schools and to related school activities shall be transported in school buses as defined in Title 49, CFR Part 571 or vehicles having passenger crash protection equivalent to school buses such as multifunction school activity buses (MFSABs).

2. State Administration

A. Superintendent of Public Instruction

a. The Superintendent of Public Instruction shall provide leadership and guidance as defined in MCA 20-10-112.

B. State Pupil Transportation Director

a. The state pupil transportation director's specific duties may include, but are not limited to:
   i. Assisting in the implementation, interpretation and understanding of pupil transportation laws, regulations and policies;
   ii. Supervising the preparation of manuals, handbooks and information for distribution to local transportation personnel and private operators;
   iii. Providing assistance and direction to local school administrators on request;
   iv. Assisting local personnel in planning and conducting pupil safety education programs;
   v. Requiring and maintaining appropriate reports and records;
   vi. Assisting/consulting with groups involved in pupil transportation safety;
   vii. Representing the interests of the pupil transportation industry,
   viii. Working cooperatively with school transportation associations, school districts, parents and private contractors to promote school bus safety and efficiency; and.
   ix. Managing the state's student transportation program, which includes planning, budgeting and forecasting requirements for the operation.

A. The state Director of Student Transportation should be an active member of regional and national organizations and should participate in activities that promote student transportation safety.

3. School District Board and Administration

A. The School District's Board and Administrative duties may include but are not limited to:

a. Understanding and implementing pupil transportation laws, regulations, and policies;

b. Planning and conducting pupil safety education programs as needed;

c. Maintaining adequate records and filing appropriate reports; and,

d. Working to promote school bus safety and efficiencies, including planning and conducting a school bus driver training program.

4. Driver Inservice and Training Program

A. Introduction

a. School bus transportation is an integral part of today's educational system. The school bus driver is expected to present a strong role model for children, as well as represent the school district before the public. If the school bus driver is professional and knowledgeable, he will encourage social responsibility among the students. The driver is also able to promote general public confidence in the school transportation program. A quality driver training program is critical to the success of a school transportation program.

B. Training Program

a. A School Bus Driver Training Program exists to provide cost-effective, quality training that promotes student safety and reduces school bus accidents. The commitment to provide school bus drivers who are safe, competent and well trained should be the goal of every school district. In order to achieve that goal, each district shall develop and implement a driver-training program that meets the needs of the school district and provides appropriate training to accomplish the goal. The plan shall, upon request, be available for inspection by the Office of Public Instruction. A district approved training program shall include:

i. A continuing education program for school bus drivers providing at least 10 hours of inservice training annually, which shall include but is not limited to:

(a) Pre- and post-trip inspection training and refresher;
(b) Passenger boarding and deboarding procedures;
(c) Driving skills;
(d) Defensive driving;
(e) Railroad safety;

(f) Passenger management;

(g) Safety and emergency procedures;
(h) Special needs sensitivity and awareness;
(i) Student Safety; and

(j) Rules, policies and procedures affecting student transportation.

ii. A pre-service training program that includes but is not limited to:

(a) A continuing education program (Refer to all of section a.);
(b) The essentials of a crash prevention program, including the uniform school bus crash reporting criteria;
(c) A system to communicate procedures between administrators and parents, and between administrators and the bus company or drivers, including student discipline procedure and compliance;
(d) Emergency procedures and/or contingency plans to be followed in the event of a crash, unexpected school closing or unforeseen route change; and
(e) The appropriate use of special lighting and signaling equipment (Refer to Operational Procedures (Section 5 viiii) below).

b. The opportunity to participate in workshops, conferences and meetings where drivers can work with and learn from a group of their peers;

c. Prior to transporting students with disabilities, the driver shall receive appropriate training in compliance with Individuals with Disabilities Education Act (IDEA) and proper use of adaptive equipment; and

d. Drivers shall receive drug and alcohol education as required in the Omnibus Transportation Employee Testing Act of 1991.

5. Operational Procedures

A. District Policies and Guidelines

a. The responsible state agency and the local school district should have clear and concise policies and guidelines for the operation of their pupil transportation programs. These are important for two reasons:

i. Policies and guidelines have the effect of law when laws or regulations do not specifically address a situation; and
ii Policies and guidelines serve as the rulebook for persons charged with the administration of transportation services within the district.

b. Once established, these policies and guidelines become the basis for development of operating procedures. This allows decisions about operational details to be made at the administrative level rather than by the school board. These policies and guidelines should be precise and in writing and should cover the following topics:

i. Procedures for determining eligibility for transportation;
ii. A description of all types of transportation provided;
iii. The days on which service will be available;
iv. Essential routing constraints, such as walking distances and age/grade of pupils for whom the district will provide transportation;
v. The extent of special transportation service;
vi. The essentials of a crash prevention program, including the uniform school bus crash reporting criteria;
vii. A system to communicate procedures between administrators and parents, and between administrators and the bus company or drivers, including student discipline procedures and compliance;
viii. Emergency procedures and/or contingency plans to be followed in the event of a crash, unexpected school closing or unforeseen route change; and
ix. Use of special lighting and signaling equipment as indicated below:
    a) Use of alternately flashing amber lights to warn motorists that the bus is preparing to stop to take on or discharge students;
    b) Use of alternately flashing red lights to inform motorists that the bus is stopped on the roadway to take on or discharge passengers;
    c) Use of four-way (hazard) flashers when approaching, stopping and crossing at a railway crossing. Do not use the overhead amber lights at a railroad crossing;
    d) Operating stop arms in conjunction with the flashing red signal lamps;
    e) Use of white flashing strobe light to increase the visibility of the school bus on the roadway during adverse visibility conditions; and
    f) Use of crossing control arms, where directed to encourage children to cross properly in front of school buses.

B. Seating Requirements

a. Montana schools must follow Highway Safety Guideline #17, “Pupil Transportation Safety,” as issued by the National Highway Traffic Safety Administration, states:

    i. “Standing while school buses and school-charter buses are in motion should not be permitted. Routing and seating plans should be coordinated so as to eliminate passengers standing when a school bus or school-charter bus is in motion; and
    ii. Due to variations in sizes of children of different ages, states and school districts should exercise judgment in deciding how many students are actually transported in a school bus or school-charter bus.”

b. School buses provide the safest form of pupil transportation. An integral part of providing “safe” transportation in a school bus is that the passengers must be properly seated. From a safety perspective, a person who is either standing or improperly seated in a school bus is not afforded the benefits of the safety protection designed into the vehicle and is in increased jeopardy of injury in the event of a crash or extreme sudden driving maneuver.

c. Additionally, there must be sufficient space on the school bus seat for each passenger’s body to be completely within the seat compartment. In the event of a

crash or sudden driving maneuver, students that are not properly seated within the seat compartment may not benefit from the passenger crash protection systems built into the school bus under federal and state regulations.

d. In practice, school buses transport students of various sizes, typically from preschool students to 12th graders. While a 39-inch seat may safely accommodate three primary school-aged children, it may not safely accommodate the same number of older children. Since the size of growing children varies, the number of pupils that can safely occupy a school bus seat also changes. Consequently, the “in-use” capacity of a school bus varies depending on the size of the pupils transported. The use of a child safety seat for an infant or toddler, or of special equipment needed for a child with disabilities may further impact the “in-use” capacity of a school bus.

e. It is important to consider the size of the passengers on each school bus route when determining the “in-use” capacity of a school bus. It is recognized that at certain times, for example, at the beginning of a school year, it may not be possible to know exactly how many students will arrive at school bus stops on a route. For that reason, there may be instances where overcrowding exists temporarily on some school buses. In such situations, efforts should be made to provide safe seating to all school bus passengers in a timely and efficient manner, so that during regular operations all passengers are safely seated.

I. Transportation Other Than To and From School or Head Start

1. School- or Head Start- Related Activity Operations

Each school system or Head Start agency providing activity bus operations should have comprehensive policies and guidelines which delegate responsibility for this function to the supervisor of student transportation. To provide safe and efficient activity transportation, lines of responsibility and authority need to be defined and personnel involved must have an understanding of their respective responsibilities.

In the interest of providing the safest means of transportation available, students should be transported to school- or Head Start-sponsored activities in school buses or allowable alternate vehicles that meet state and federal standards, unless circumstances require an alternate mode of transportation as defined in regulation.

These school- or Head Start-related activity trips may include field trips that are extensions of the instructional program, athletic trips, vocational and trade training, volunteer activities and recreational outings, such as dances, picnics and overnight camping trips.

These trips range from a few miles to those extending over several days and covering large distances. The following items need to be considered when developing criteria for activity trip transportation:

a. Policies and guidelines, including:

(1) Purpose of trip (instructional, athletic, students'/spectators' recreation, etc.);

(2) Funding source (district or individual school funds, individual charge, parent group, etc.); and

(3) Administrative approval (the person(s) having authority to approve the trip and commit funds).

b. A priority guideline should be developed for trip scheduling, addressing situations when all requests cannot be accommodated.

(1) Advance notification should allow adequate time for the approval process and for making driver and vehicle arrangements.

(2) Methods of travel may include district- or agency-owned or contracted bus, commercial carrier or local transit equipment, air, boat, rail or combination of the above, private or school passenger automobile, when required by special or unique needs.

Note: Operational Guidelines for the use of buses other than school buses are outlined in APPENDIX D.

(3) A trip request form should include all necessary information for trip arrangements, special equipment, payroll, reimbursement and other local needs. (See APPENDIX D.)

(4) Adult chaperones should be required on all activity trips. Responsibilities include passenger control, with the driver having final authority.

(5) Discipline and emergency medical procedures should require a trip release for each student to be signed by parents and should include procedures concerning difficult or severe behavioral and medical problems and emergency policies and contacts.

c. Communication is essential. Drivers, students, chaperones and parents should be made aware of applicable rules and regulations. Parents should have destination information, mode of transportation, names of chaperones, meal stop information, expected departure and return times, appropriate dress and what the students should bring with them. A signed authorization for student participation from the parent or guardian is important. A detailed itinerary for all persons involved may be advisable. Identification of proper response to special medical problems in the event of an emergency en-route is necessary.

(1) Luggage accommodations, if applicable, must be included. A procedure for transporting luggage or equipment prohibited in the passenger compartment by state law and/or local regulations is necessary. Loose luggage or equipment which could cause injury or block passageways should never be transported in the passenger compartment.

(2) Policies should detail whether or not out-of-state trips are permitted and, if so, any applicable restrictions. Regulations for states to be visited should be reviewed prior to the trip.

(3) Insurance policies should be reviewed or agents contacted to determine adequacy of coverage. This is an absolute necessity for trips scheduled to another state or country.

If vehicles other than district-owned are used, the Board of Education should determine the minimum insurance coverage to be carried. A current copy of the contract or commercial carrier's insurance should be on file with the school district.

(4) Road and weather checks should be made by the designated person. School transportation personnel from other districts, state patrols, highway divisions and auto clubs are generally cooperative in supplying road information. If warranted, the weather bureau should also be contacted. A planned route and any contingent route for trips should be determined prior to initiation of the trip.

(5) Contingency plans require policies and procedures that detail persons who have authority to make decisions if the unexpected happens during a trip. Impassable roads, crashes or mechanical breakdowns are examples. Drivers and chaperones should have access to that authority's phone number. It is also advisable to obtain phone numbers of transportation personnel in various communities and school districts where activity vehicles regularly travel.

Provisions should include plans for staying overnight if conditions do not permit a safe trip home. It is advisable to develop a mutual aid directory for contact within athletic league boundaries which could provide assistance in the event of mechanical emergencies. Drivers should be trained in procedures and regulations relating to trip crashes.

(6) Driving hours shall be regulated. School districts and Head Start agencies shall have regulations based on a the Federal Motor Carrier Safety Regulation 49 CFR 395.3 (15 hours on duty of which no more than 10 hours are driving time; 8 hours continuous off-duty prior to a long trip; no more than 60 hours driving in a week).

(7) Driver selection and assignment criteria are necessary to avoid conflict and confusion. The criteria should include a driver's knowledge, skill, experience and familiarity with activity trip vehicles. The area to be traveled should also be a consideration. Drivers should be notified at least three days in advance of the trip date. Drivers who drive only activity trips should be tested periodically for driving ability and vehicle familiarity. They should hold the same license and certification as regular school bus drivers.

(8) Passenger manifests (a list of all passengers being transported) should be kept by the driver and left with proper authorities at the school or institution.

(9) Evacuation instruction, including an emergency evacuation drill, or at least verbal instructions, should be given by the driver before each trip. (See APPENDIX D.)

d. Vehicle and equipment:

(1) The following should be taken into consideration when selecting trip vehicles:

(a) Miles to be traveled;

(b) Terrain and climate conditions;

(c) Number and age group of students;

(d) Luggage and equipment requirements;

(e) Driver familiarity with the vehicle and route; and

(f) Federal Motor Carrier Safety Administration regulations, if contract operated and crossing state lines.

(2) Consideration should be given for specialized equipment, or other items needed, such as:

(a) Luggage storage;

(b) Chains (pre-fitted prior to the trip) or sanders;

(c) Extra heaters or air conditioning;

(d) Public address system;

(e) Electronics: ~~(~~am/fm radio or music system, and two-way radio~~)~~ or cellular telephone;

(f) Tires, including off-road tread or recaps on the rear axle (recaps on front axle are prohibited);

(g) Spare tire;

(h) A tool kit containing items such as a flashlight, pliers, screwdrivers, de-icer, extra chain tighteners, etc., and additional equipment for an extended trip, as may be recommended by transportation personal at the destination;

(i) Cash for telephone, fuel, bridge tolls, parking fees and personal needs;

(j) Emergency telephone numbers and other information; and

(k) Maps or Global Positioning Systems (GPS), as appropriate.

(3) Inspection requirements should be the same as for regular route buses, and a detailed check should be made prior to activity trips.

(4) School buses shall be prohibited from towing a trailer or any vehicle when students are on board the bus.

e. Training

(1) Specialized training should be provided for activity trip drivers. Training should include, but not be limited to, the following:

(a) State laws and applicable policies and rules;

(b) Familiarity with the activity trip vehicle and its components;

(c) Familiarity with specialized equipment and how to use it, including cellular telephone and onboard global positioning system (GPS);

(d) Familiarity with local and state trip requirements;

(e) Route familiarization, which might include a dry run prior to the trip date, especially if extreme conditions, terrain or road difficulties may be encountered;

(f) Discipline procedures on trips;

(g) Driving under adverse conditions (night driving, slippery roads or unfamiliar mountainous driving);

(h) Maps, destination locations and parking areas;

(i) Parking location, if other than the student destination; and

(j) Provisions for bus security at the destination.

(2) Specialized training should be provided for all trip chaperones and include at least the following:

(a) all regulation related to student rider behavior;

(b) the specific roles and responsibilities of a chaperone both on and off the vehicle as defined by applicable regulations and policies;

(c) the communication expectations between chaperone and driver; and

(d) emergency procedures, including evacuations.

2. Non-School or Head Start Agency Related Activity Operations

a. Introduction

This sub-section is intended to address the various uses of a school bus for operations other than to and from school and school-related activities.

b. Use, Procedures and Policies

(1) The school bus operator, in accordance with state regulations and/or laws governing school bus use, should establish procedures whereby school buses can be scheduled for non-routine use. Such scheduling should not conflict with, or be given priority over, the regular class-related demands for school buses by the school system or Head Start agency.

(2) The school system or Head Start agency, as part of local government or in cooperation with transportation contractors, may utilize buses during times of community emergency or crisis, when demand for other public vehicles, such as trains and transit buses, is so great as to exceed available supply.

c. Legal Requirements

(1) School buses operating on public roads and crossing state and national boundaries must adhere to the rules of the road in the jurisdictions in which they are operating. Particular attention must be paid to insurance limits and requirements given differing state regulations.

(2) All applicable permits need to be procured in accordance with applicable state and local laws, and fees paid before the trip is undertaken.

d. Operational requirements

(1) Vehicle equipment used for activities must be in good working order, well-maintained, and otherwise capable of withstanding the demands of the trip.

(2) All activity buses and drivers should comply with all applicable state and federal requirements, including Federal Motor Carrier Safety Administration Regulations applicable to inter- and intra-state passenger transportation.

(3) Aisles and exits must be kept clear and free of blockages at all times.

• APPENDIX A •
GLOSSARY OF TERMS AND DEFINITIONS

INTRODUCTION

This glossary was developed with three purposes in mind:

1. To provide easy access to the definition of terms used or referenced within the document;
2. To consolidate, in one resource, the acronyms, abbreviations and standard terms commonly used in the industry; and
3. To promote consistency throughout the industry by providing standard definitions or preferred usages for terms that may be used differently in different parts of the country.

The glossary is not intended to be definitive. There are and will be terms that are excluded and definitions that differ from regional usages. It is an attempt to reflect the language of pupil transportation which, like all language, is ever-changing.

Access panel: A body panel which must be moved or removed to provide access to one or more serviceable components,

Accessibility: Ability of vehicles and facilities to accommodate people with disabilities.

Activity trip: The transportation of students to any event sanctioned for pupil attendance or authorized by an officer, employee or agent of a public or private school, other than to-and-from school transportation. (See also field trip.)

ADA: The Americans with Disabilities Act, PLIOI-336,42USC 12101,etseq.

Adaptive device: Any item or piece of equipment used to increase, maintain or improve functional capabilities of children with disabilities. The device is also known as an assistive technology device.

Aide: (See attendant.)

Alcohol: The intoxicating agent in beverage alcohol, ethyl alcohol, or other low molecular weight alcohols including methyl and isopropyl alcohol.

Alternately flashing signal lamps: A system of red or red and amber signal lamps mounted horizontally both front and rear, intended to identify a vehicle as a school bus and to inform other users of the highway that the bus is about to stop or is stopped to load or unload children; also known as stop signal lamps, SOS lights or school bus traffic warning lights.

Alternative-fuel vehicle: A vehicle designed to operate on an energy source other than gasoline or regular grades of diesel. Such fuels include, but are not limited to, CNG, LNG, LPG, advanced diesel fuel formulations and electricity.

Bi-fuel: A vehicle designed to operate on two different fuels, but not simultaneously.

Dual fuel: A vehicle designed to operate on a mixture of two different fuels.

Hybrid power: The use of two or more power sources to provide the motive force for the vehicle (e.g. electricity to drive the wheels with internal combustion to supplement the battery).

Anchorage point: The point of attachment of a securement system or occupant restraint to the vehicle structure.

ANPR: Advanced Notice of Proposed Rulemaking. Notice published in the Federal Register by a federal agency, such as NHTSA, requesting information and inviting comment on a proposed change of regulation.

ANSI: American National Standards Institute, the organization which administers and coordinates the development of voluntary industry standards.

Antilock brakes: Brake systems with sensors that automatically control the degree of wheel slip during braking and that relieve brake pressure on wheels that are about to lock up.

Aspect ratio: Percentage used to express the ratio of a tire's height to its width; also known as tire profile.

Assessment team: A group of persons, including the parent or guardian of a student with disabilities, who develop a profile of the student in terms of his or her mental and physical functioning in order to determine the student's eligibility for special education. (See also MDC.)

Assistive device: (See adaptive device.)

Attendant: A person assigned to assist one or more individual student(s) with disabilities on a school bus or school vehicle; also known as aide or paraprofessional. (See also monitor.)

BAC: Blood or breath alcohol concentration; the measure used to determine alcohol impairment.

BAT: Breath Alcohol Technician, an individual who instructs and assists persons in the alcohol testing process and operates an EBT.

Behavior management: Methods of influencing student conduct on the school bus.

Biodiesel: Vehicle fuel made from plant matter and commonly mixed with diesel fuel in engines.

Blood borne Pathogens: Common name for standards adopted by OSHA in 29 CFR 1910, to protect workers against the health hazards of exposure to blood and other potentially infectious body fluids or materials; also refers to the pathogenic microorganisms present in human blood.

Boarding: The process of loading passengers into a school bus.

Body fluids cleanup kit: Package of materials including, but not limited to, latex gloves, disposal bag and absorbent material, used to clean up spills of potentially infected bodily fluids, under OSHA's Blood borne Pathogens regulations and Universal Precautions practices; also known as hygiene kit.

Brake: A device or mechanism used to retard and stop the speed of a moving vehicle or to prevent the movement of a stopped vehicle.

Emergency brake: A mechanism designed to stop a motor vehicle after a failure of the service brake system.

Retarder: An auxiliary braking device used to reduce brake wear.

Service brake: The primary mechanism designed to retard and stop a moving vehicle.

Parking brake: A mechanism designed to prevent the movement of a stationary motor vehicle.

Brake fade: A condition that occurs as brakes become less effective.

Bus: A motor vehicle with motive power, except a trailer, designed for carrying more than ten (10) persons.

Activity bus: A bus owned, leased or contracted by a school district and regularly used to transport students on field trips, athletic trips or other curricular or extracurricular activities, but not used for to-and-from school transportation; must meet all FMVSSs for school buses.

Charter bus: A bus that is operated under a short-term contract with a school district or other sponsor who has acquired the exclusive use of the vehicle at a fixed charge to transport students to a school-related event.

DOT bus: A school bus that meets the FMCSR standards for interstate transportation set forth in 49 CFR 390.

Intercity bus: A large bus with front doors only, high-back seats and under-floor luggage storage for high-speed, long distance trips; also known as motor coach and over-the-road coach.

Nonconforming bus: Any vehicle designed to carry more than ten (10) passengers that is used to transport children to or from school or school-related activities which does not meet the federal standards specific to school buses.

School bus: A bus owned, leased, contracted to or operated by a school or school district and regularly used to transport students to and from school or school-related activities, but not including a charter bus or transit bus; must meet all applicable FMVSSs, and is readily identified by alternately flashing lights, National School Bus Yellow paint, and the legend "School Bus."

Type A: A Type "A" school bus is a conversion or bus constructed utilizing a cutaway frontsection vehicle with a left side driver's door. This definition includes two classifications: Type A- 1, with a Gross Vehicle Weight Rating (GVWR) of 10,000 pounds or less; and Type A-2, with a GVWR greater than 10,000 pounds.

Type B: A Type "B" school bus is constructed utilizing a stripped chassis. The entrance door is behind the front wheels. This definition includes two classifications: Type B- 1, with a GVWR of 10,000 pounds or less; and Type B-2, with a GVWR greater than 10,000 pounds.

Type C: A Type "C" school bus is constructed utilizing a chassis with a hood and front fender assembly. The entrance door is behind the front wheels; also known as a conventional school bus.

Type D: A Type "D' school bus is constructed utilizing a stripped chassis. The entrance door is ahead of the front wheels; also known as transit-style school bus or forward-control vehicle.

Specially equipped: A school bus designed, equipped, or modified to accommodate students with special needs.

Transit bus: A bus designed for frequent stops, with front and back-center doors and low-back seating, operated on a fixed schedule and route to provide public transportation by indiscriminately taking on passengers at designated bus stops.

Bus body: The portion of a bus that encloses the occupant space exclusive of the bumpers, the chassis frame, and any structure forward of the forward-most point of the windshield mounting.

Bus pass: Authorization to ride a school bus other than the student's assigned bus; or prepayment for transit bus rides.

Bus yard: An area for storage and maintenance of buses.

CAA: Clean Air Act; also known as CAAA, the Clean Air Act Amendments of 1990.

Capacity: (See seating capacity.)

Capital costs: Long-term costs associated with the purchase of vehicles, buildings and property.

Captive: Refers to a non-removable attachment, part or fitting on a securement system.

Carrier: Any public school district, any public or private educational institution providing preschool, elementary or secondary education, or any person, firm or corporation under contract to such a district or institution, engaged in transporting students.

Casualty insurance: (See liability insurance.)

CDIP: Commercial Drivers Instructional Pen-nit. The learner's permit that a CDL applicant receives when he/she passes the knowledge tests; it allows the applicant to drive a CMV when accompanied by a driver with a CDL.

CDL: Commercial Drivers License.

CFR: Code of Federal Regulations.

Chassis: Vehicle frame with all operating parts, including engine frame, transmission, wheels and brakes.

Chassis starting interlock circuit: A device which prevents the engine of a bus from starting if any of the emergency exits are locked.

CW: Commercial motor vehicle. A motor vehicle defined in 49 CFR 390.5.

CWSA: Commercial Motor Vehicle Safety Act of 1986; among other things, authorization for CDL.

CNG: Compressed natural gas.

Common carrier: A public bus, train or airplane that travels on a prescribed route and schedule, and accepts passengers indiscriminately.

Communicable disease: Any illness that can be transmitted from one person to another, including most common childhood diseases, the common cold and serious illnesses such as hepatitis and AIDS.

Community transportation: Services that address all transit needs of a community, including general and special populations, such as the elderly and disabled.

Companion animal: An animal trained to provide assistance for persons with disabilities; can be a guide animal, assistive animal or service animal.

Completed vehicle: A vehicle that requires no further manufacturing operation to perform its intended function other than the addition of readily attachable components, such as mirrors or tire and rim assemblies, or minor finishing operations such as painting.

Conduct report: A form authorized by school officials for use by drivers to report instances of unacceptable behavior by school bus passengers; also known as discipline report.

Continuum of services: The range of possible options, from least restrictive to most restrictive, available to students with disabilities for transportation services.

Conspicuity: The ability of an object to be noticed and recognized without any confusion or ambiguity (SAE J 1967).

Crash, school bus: (1) A motor vehicle crash involving a school bus with or without a pupil on board, resulting in any personal injury or death or any disabling damage to one or more motor vehicles requiring the vehicle(s) to be transported away from the scene by a tow truck or other vehicle; or (2) A collision involving any vehicle or any pupil or school bus at any time during the loading or unloading process.

Preventable: A crash that could have been prevented by reasonable action on the part of the school bus driver.

Reportable: A crash required to be reported under FMCSR (i.e. a crash involving a CMV on a public road in which there is a fatality or an injury treated away from the scene, or that requires a vehicle to be towed from the scene).

Crash test: (See impact test.)

Criminal record check: The investigation of a person's criminal history through submission of fingerprints to state and/or federal authorities; also known as background check.

Crossing arm: A device attached to the front bumper of a school bus, activated during loading and unloading and designed to force the students to walk far enough away from the front of the bus to be seen by the driver; also known as crossing control arm.

CSRS: Child Safety Restraint System; a device meeting the requirements of FMVSS No. 213, designed for use in a motor vehicle to restrain, seat or position a child who weighs less than 50 pounds; also known as child safety seat and car seat.

Curb cut: Area where the street curb has been cut and sloped to allow the sidewalk to lead smoothly to the roadway.

Curb weight: The weight of a motor vehicle with standard equipment, maximum capacity of engine fuel, oil, and coolant and, if applicable, air conditioning and additional weight of optional engine, but without passengers.

Danger zone: A ten-foot area immediately surrounding the stopped school bus.

Deadhead: Movement of a bus without passengers (e.g., from school to bus yard).

Deadtime: The period between arriving at an activity trip destination and leaving the destination for the trip home; also known as waiting time and stand-by time.

Dealer: Any person who is engaged in the sale and distribution of new motor vehicles or motor vehicle equipment primarily to purchasers who, in good faith, purchase any such vehicle or equipment for purposes other than resale.

Distributor: Any person primarily engaged in the sale and distribution of motor vehicles or motor vehicle equipment for resale.

Dispatch: To relay service instructions to drivers.

DNR: Do Not Resuscitate; an order from a parent, legal guardian or court that prohibits the use of emergency measures to prolong the life of an individual.

DOT: United States Department of Transportation.

DOT driver: A driver who meets the FMCSR standards, set forth in 49 CFR 391.

Double run: One bus making two trips over the same route each morning and afternoon (e.g. first picking up high school students and then returning for elementary students.)

Downtime: The period when a vehicle is inoperative (e.g. due to mechanical failure.)

Driver applicant: A person who applies for a position as a school bus driver.

Driver training: Instructional program designed to impart knowledge and improve the skills necessary for school bus drivers, including but not limited to knowledge of the vehicle, safe driving practices, emergency procedures and passenger control.

Inservice: Training provided annually or more often to school bus-certified drivers.

Pre-service: Training provided to driver applicants prior to school bus certification and/or transporting students.

Driver qualifications: Restrictions of state and federal law which determine a person's eligibility to become a school bus driver (e.g., age limits, physical condition, criminal record, driving history, etc.)

DRL: Daytime running lamps; Head lamps that operate automatically at a reduced voltage during the day to increase the vehicle's visibility; also known as daytime running lamps.

Drug: Any substance other than alcohol considered to be a controlled substance listed on schedules I through V in 21 CFR 1308.

Dry run: A trip on a route without student passengers for driver training or familiarization of the route.

Dual brake system: (See split brake system.)

Dual fuel system: (See alternative fuel.)

DVIR: Driver vehicle inspection report. Federal, state or local approved form for reporting results of pre-trip and post-trip inspections; also known as daily vehicle inspection report and pre-trip inspection form.

Dynamic testing: The process of subjecting vehicle, mobility aid, or mobility aid/securement system components to a simulated crash condition.

EAP: Employee Assistance Program; a program of education and counseling required by 49 CFR 391 as part of a carrier's drug and alcohol testing program; may also include optional rehabilitation services.

EBT: Evidential Breath Testing device; a device approved by NHTSA for testing drivers for alcohol use.

EDR: Event Data Recorder; a device which records vehicle functions (e.g., speed change during a crash.)

EHA: The Education for all Handicapped Children Act, passed in 1975 as P.L.94-142. (See IDEA).

EPA: The United States Environmental Protection Agency.

Early bus: A bus scheduled to run prior to the regular morning run (e.g., to take children to daycare programs located in schools.)

Early intervention service: Education and related services provided to infants and toddlers from birth through two years of age.

Effective date: The date at which a regulation or standard takes effect, on or after which compliance is legally required.

Electronic voice communication system: A means by which the driver of a vehicle can communicate with a dispatcher or other person at a remote location (e.g., two-way radio, cellular phone.)

Emergency roof exit: An opening in the roof of the bus meeting the requirements of FMVSS No. 217 which provides emergency egress and sometimes ventilation; also known as roof hatch.

Emergency response plan: A detailed approach to identifying and responding to potential accidents involving hazardous substances; required for every community by the Emergency Planning and Right-to-Know Act of 1986.

Ergonomics: The study of the design of equipment to reduce human fatigue and discomfort.

Ethanol: Grain alcohol, distilled from fermented organic matter and used as a vehicle fuel.

Evacuation drill: Performance of a mock school bus evacuation in order to teach students proper emergency procedures and to provide practice in the use of emergency exits; also known as bus safety drills.

Extended-year service: Transportation provided for students subsequent to the end of the traditional school year.

Extra board driver: (See substitute driver.)

FAPE: Free Appropriate Public Education; guaranteed by the EHA for all handicapped children; it includes special education and related services, including transportation.

FBI background check: The national criminal record check.

FERPA: The Family Educational Rights and Privacy Act of 1974, 20 USC 1232, which requires confidentiality of student records in public schools, but allows access to necessary information regarding student disabilities and/or health needs to those who have a need to know, including school bus drivers.

FHWA: Federal Highway Administration, an agency of the U.S. Department of Transportation.

Field trip: The transportation of students to an event or destination which is an extension of classroom activity (i.e., a part of the curriculum). A field trip is one type of activity trip.

Final Rule: Notice published in the Federal Register by a federal agency announcing a new or changed regulation.

Final stage manufacturer: A person who performs such manufacturing operations on an incomplete vehicle that it becomes a completed vehicle.

First aid: Emergency treatment given to an ill or injured person before regular medical help is available.

Fixed route: Transportation service that runs on regular prescheduled routes, usually with bus schedules and designated bus stops.

FMCSA: Federal Motor Carrier Safety Administration; an agency of the U.S. Department of Transportation; formerly the Office of Motor Carrier Highway Safety within the Federal Highway Administration.

FMCSR: Federal Motor Carrier Safety Regulations, 49 CFR 383, 390-397, and 399; motor vehicle safety and construction standards under FMCSA that apply to commercial motor vehicles and drivers transporting passengers in interstate commerce.

FMLA: Family and Medical Leave Act; requires employers to grant time off to employees for medical reasons or to care for family members.

FMVSS: Federal Motor Vehicle Safety Standards, 49 CFR 57 1; construction standards developed and enforced by NHTSA that apply to all new motor vehicles and items of motor vehicle safety equipment.

Forward control bus: A school bus in which more than half of the engine length is rearward of the foremost point of the windshield base and the steering wheel hub is in the forward quarter of the vehicle length; also known as transit-style.

Forward-facing: Installation of the securement system in such a way that the mobile seating device and its occupant face the front of the vehicle when secured.

Four-point tiedown: A securement system in which four strap assemblies attach to the wheelchair frame at four separate points and anchor to the vehicle floor at four separate points.

FSS: Fire Suppressant System; a fire extinguisher system installed in the engine compartment of a vehicle and activated automatically in response to a fire sensor or manually in response to an alarm.

FTA: Federal Transit Administration, part of U.S. Department of Transportation; formerly Urban Mass Transit Administration (UMTA).

Fuel injection: System that uses no carburetor but sprays fuel directly into cylinders or into the intake manifold.

Glazing: The glass or glass-like portion of a window.

Laminated glass: Any glazing material that consists of one or more sheets of glass and an inboard-facing surface sheet of plastic, the components being held together by intervening plies of plastic interlayer or by the self-bonding characteristic of the inboard plastic layer.

Safety glass: Glazing material constructed, treated or combined with other materials so as to reduce, in comparison with ordinary glass, the likelihood of injury to persons as a result of contact with the glass, either broken or unbroken.

Storm window: Two or more sheets of safety glazing material separated by an airspace to provide insulating properties and fixed in a common frame or mounting.

Tempered glass: Glazing which consists of glass that has been tempered to meet the properties of safety glass.

GAWR: Gross axle weight rating, the value specified by the manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Guideline 17: A highway safety program guide for pupil transportation safety issued by NHTSA in 23 CFR 1204.; formerly Standard 17.

GVWR: Gross vehicle weight rating; the value specified by the manufacturer as the loaded weight, with passengers, of a single vehicle.

Handrail inspection tool: A device formed by tying a half-inch hex nut to a 36" cord, used to inspect school bus handrails and other areas for possible snagging hazards.

Hazard lamps: Lamps that flash simultaneously to the front and rear on the right and left sides of a vehicle, used to indicate caution; also known as four- way flashers.

Head protection zone: The empty space above and in front of each school bus passenger seat which is not occupied by side wall, window or door structure, the dimensions of which are detailed in FMVSS No. 222.

Head Start: A program initiated in 1965 to provide comprehensive child development services to pre-school children of predominantly low-income families.

Headsign: A sign above the windshield of the bus which can be changed from School Bus to other wording, such as Charter.

Health care plan: A plan of action used to outline the care for a medically fragile individual.

Highway: Any public highway, road, street, alley, parkway or other place open to public motor vehicle travel.

Horsepower: The measurement of an engine's ability to do work. One horsepower is the ability to lift 33,000 lbs. one foot in one minute.

Hours of service: The consecutive or cumulative period of time that a commercial driver may be on duty; for details see reference in the section "Transportation Other Than To and From

School" of Operational Procedures.

HOV: High Occupancy Vehicle, a vehicle that can carry two or more passengers.

ICC: The former Interstate Commerce Commission, the economic regulation agency within the Department of Transportation. The agency was disbanded in 1997 as a result of economic deregulation, and most functions were transferred to the Federal Highway Administration.

IDEA: The Individuals with Disabilities Education Act, passed in 1990 as P.L. 101-476 (Part 13) as approved in March of 1999, to replace the EHA.

IEP: Individualized Education Program, a plan including information for each child with disabilities required under P. L. 10 1 -476 (Part B).

IFSP: Individualized Family Service Plan; a written plan similar to the IEP for the family of a child receiving early intervention services required under P. L. 102-119.

Impact test: A simulated crash condition which evaluates the ability of a vehicle or any component or device to withstand crash forces; also known as sled test and crash test.

Inclusion: Integration of a student with disabilities into a regular classroom and onto a regular school bus; also known as mainstreaming.

Incomplete vehicle: An assemblage consisting, as a minimum, of frame and chassis structure, power train, steering system, suspension system and braking system (to the extent that those systems are to be part of the completed vehicle) and requiring further manufacturing operations other than the addition of readily attachable components, such as mirrors and tire and rim assemblies, or minor finishing operations such as painting, to become a completed vehicle.

Injury incident, school bus: Any non-crash injury sustained by a person while in the bus, or while boarding/leaving the bus.

Inspection: A close examination of a motor vehicle performed in accordance with local, state and/or federal requirements by an authorized agent of the local, state or federal government.

Integrated restraint system: A system in which the occupant restraint of an individual in a wheelchair/mobility aid connects directly to, and is dependent upon, the mobility aid's securement system's rear strap assemblies.

Intermediate manufacturer: A person, other than the incomplete vehicle manufacturer or the final-stage manufacturer, who performs manufacturing operations on an incomplete vehicle.

International symbol of accessibility: A white emblem on blue background used to indicate that a vehicle can accommodate individuals with disabilities.

Kneeling bus: A bus on which the front or rear end is lowered to allow easier access for passengers with disabilities.

Lap belt: A Type I belt assembly meeting the requirements of FMVSS No. 209, intended to limit movement of the pelvis.

Lap/shoulder belt: A Type 2 belt assembly meeting the requirements of FMVSS No. 210, intended to limit the movement of the pelvis and upper torso.

Lap tray: An accessory for a wheelchair or other mobile seating device, to offer support and convenience for the occupant.

Late bus: A bus scheduled to leave school at a time subsequent to the end of the school day, usually to provide transportation for students involved in after-school activities.

Layover time: Time built into a trip schedule between arrival and departure.

LEA: Local Education Agency.

Left: Left position is determined from the normal driving position as seated in the driver's seat looking in the direction of forward travel.

Liability insurance: Protection against the claims of others for injury or property damage; also known as casualty insurance.

Life cycle procurement: A procurement contract based on both the initial capital cost and the cost of operation over the life of a vehicle.

Lift: (See power lift.)

Live time: The time when students are on the bus, beginning when the first passenger boards and ending when the last passenger leaves.

LNG: Liquid Natural Gas.

Load: To pick up students at a designated bus stop or at school.

Load factor: The ratio of passengers actually carried to the vehicle's passenger capacity.

Loading zone: Any area where students are boarding or leaving a school bus.

Low-bid procurement: Competitive procedure in which the lowest bidder is awarded the contract.

Low-floor vehicle: A bus in which the floor and entrance are closer to the ground, for easier access by students with disabilities or pre-schoolers.

Longitudinal: Parallel to the longitudinal centerline of the vehicle, front to rear.

LPG: Liquid Petroleum Gas; also known as propane.

LRE: Least Restrictive Environment, a concept embodied in IDEA which requires that children with disabilities be integrated as fully as possible into situations and settings with their nondisabled peers.

Mainstreaming: (See inclusion.)

Manufacturer: Any person engaged in the manufacturing or assembling of motor vehicles or item of motor vehicle equipment, including any person importing motor vehicle equipment for resale.

MDC: Multi-Disciplinary Conference, an assessment meeting for a student with disabilities which leads to an IEP. (See also assessment team.)

Mediation: Efforts by a third party to bring about agreement between dissenting parties (e.g., labor and management or parents and school administration); usually less formal than arbitration.

Medical support equipment: Portable equipment used by students to maintain life functions, such as oxygen bottles, intravenous or fluid drainage apparatus.

Medically fragile: Refers to students who require specialized technological health care procedures for life support and/or health support.

Minibus: A small school bus, usually a Type A- I or A-2 or Type 13- 1 or B-2.

Minivan: A multi-purpose vehicle (MPV) designed to carry seven to ten passengers.

Mirrors: The system of mirrors required to be installed on school buses in accordance with FMVSS No. III and applicable state laws.

Crossview: Convex mirrors mounted on the front of the school bus and designed for student detection during loading and unloading, including elliptical, quadri spherical, banana, or standard convex; also known as System B mirrors.

Driving: Flat and convex mirrors mounted on each side of the bus designed for viewing the road along the sides to the rear while driving; also known as rearview, double nickel, west coast, or Swent A mirrors.

MIS: Management Information System; a means of data collection for analysis by management.

Mobility aid: A wheelchair or other device, either battery-powered or manual, that is used to support and convey a person with a physical disability; also known as mobile seating device.

Modesty panel: A panel located in front of a seat or row of seats, usually supported by a stanchion and cross bar, which does not meet the performance standards of a barrier as defined in FMVSS No. 222; or a short panel which extends from the bottom of a barrier to or near to the floor for the purpose of reducing the draft from the entrance door; also known as kick panel.

Monitor: A person assigned to assist the driver on a school bus or school vehicle.

Discipline: A monitor whose primary responsibility is to control behavior of students on the bus.

Safety: A monitor whose primary responsibility is to ensure the safety of students getting on and off the bus and to check the loading zone before the driver pulls out.

MPV: Multipurpose Passenger Vehicle, any vehicle with a seating capacity of ten or fewer, including the driver, which is built on a truck chassis, or with special features for occasional off-road use.

MRO: Medical Review Officer, a licensed physician with knowledge of substance abuse disorders required by 49 CFR 40 to receive and evaluate laboratory results generated by a carrier's drug testing program.

MVR: Motor Vehicle Record of the driver; also known as driving history.

NAPT: National Association for Pupil Transportation, a membership organization comprised of individuals and organizations representing all facets of school transportation.

NASDPTS: National Association of State Directors of Pupil Transportation Services, a membership organization comprised of primarily state officials responsible for pupil transportation.

National School Bus Yellow: (NSBY) The color defined in the publication "National School Bus Color Standard" SBMTC008.

NDR: National Driver Registry.

Neutral safety switch: A device which prevents the bus from starting unless the transmission is in neutral gear or the clutch is depressed.

NGV: Natural Gas Vehicle.

NHTSA: National Highway Traffic Safety Administration, an agency of the U.S. Department of Transportation.

NIST: National Institute of Standards and Technology.

Nominal dimension: A dimension which exists in name only (e.g., 5/8" plywood which is actually 19/32" thick, but is 5/8" nominal thickness.) The variation between the actual dimension and the nominal dimension is the result of manufacturing practices and tolerances.

Non-conforming van: A vehicle smaller than a bus, designed to carry seven to ten passengers and used to transport students, that does not meet FMVSS for school buses.

NPRM: Notice of Proposed Rulemaking, a notice published in the Federal Register by a federal agency of a proposed change in regulation.

NSC: National Safety Council.

NSTA: National School Transportation Association, a membership organization comprised of primarily school transportation contractor companies.

NTSB: National Transportation Safety Board, an independent federal agency authorized by Congress to investigate accidents and to issue safety recommendations.

OCR: Office of Civil Rights, an agency of the U.S. Department of Education.

OEM: Original Equipment Manufacturer.

On-board monitoring system: Computerized tracking of driver and vehicle performance, including speed, fuel consumption, etc.

Operating costs: All costs associated with running the transportation system, which are distinct from capital costs.

Operator: The carrier who is responsible for running the transportation system, regardless of ownership of the vehicle.

OSEP: Office of Special Education Programs, an agency of the U.S. Department of Education.

OSERS: Office of Special Education and Rehabilitative Services, an agency of the U.S. Department of Education.

OSHA: Occupational Safety and Health Administration, an agency of the U.S. Department of Labor.

OTETA: The Omnibus Transportation Employees Testing Act of 1991, requiring drivers holding CDLs to participate in a drug and alcohol testing program.

Out of Service: The removal of a school bus from passenger service due to a defective condition.

Overall vehicle width: The nominal design dimension of the widest part of the vehicle, exclusive of signal lamps, marker lamps, outside rearview mirrors, flexible fender extensions and mud flaps, determined with the doors and windows closed and the wheels in the straight-ahead position.

Overhang: The distance from the center of the rear axle to the rearmost end of the body or from the center of the front axle to the forward edge of the front bumper.

P. A. system: A public address system which allows the driver of a bus to communicate with persons inside and/or outside the bus through a speaker installed on the inside and/or outside of the bus, also known as external loudspeaker.

Parallel restraint system: A system in which the occupant restraint lap belt anchors directly to the floor track or plates, and is independent of the wheelchair/mobility aid securement system.

Para transit: Public transit service which is more flexible than a fixed-route system, commonly providing special service for elderly and disabled passengers.

Part B: Refers to the section of the EHA applicable to special education and related services for children with disabilities and to the implementing regulations at 34 CFR 300.

Part H: Refers to the section of the IDEA related to early intervention services for infants and toddlers and to the implementing regulations at 34 CFR 303.

Particulate trap: A device on diesel buses to clean the exhaust of particulate matter.

Passenger miles: The LOW number of miles traveled by the aggregate number of passengers on a vehicle (e.g., ten students traveling ten miles on one bus equals 100 passenger miles.)

P.L. 94-142: (See EHA.)

Postural support: A seat, belt or other component used to support a child with disabilities in a desired position but not designed or intended to provide occupant restraint in a crash; also known as positioning device.

Power base: A powered, wheeled platform used to mount a seating device for carrying an individual with a disability; usually characterized by smaller diameter tires.

Power cut-off switch: A device that cancels all power from the vehicle batteries.

Power lift: A mechanized platform designed to provide access to a vehicle for an occupied mobility aid/wheel chair; also known as a wheelchair lift.

Positive-locking: A design feature of the mobility aid securement and occupant restraint system where the attachment and anchoring hardware cannot be inadvertently released or

disengaged once properly installed.

Post-trip interior inspection: A check of the interior of the bus by the driver at the end of the run to ensure that no children or student belongings have been left behind.

Powertrain: The group of components used to transmit engine power to the wheels; includes transmission, universal joints, driveshaft, drive axles and gears; also known as drive train.

Preschool: Refers to a child between the ages of three and five years who is not yet in kindergarten or to a program serving children in that age range.

Pre-trip inspection: A systematic inspection of the bus by the driver before every trip or shift to ensure that the bus is in safe operating condition. The same procedure performed after the trip/shift is the post-trip inspection.

Privatization: The process of transferring the operation of public services from the public agencies to private companies or nonprofit organizations; also known as contracting or outsourcing.

Pusher: A school bus in which the engine is mounted in the rear of the vehicle; also known as rear-engine bus.

Pushout window: A bus window that is hinged at the top or front to enable the window to be swung upward or outward relative to the side of the bus and to provide a means of emergency egress from the bus; also known as emergency window.

Railroad crossing: The intersection of a highway, street or roadway and railroad tracks; also known as grade crossing.

Ramp: An inclined plane for use between the ground and the floor of the vehicle to permit access by persons in wheelchairs/mobility aids.

Reflective: Refers to the property of materials that cause them, when they are illuminated, to reflect the light to some extent.

Related services: Transportation and other supportive services that are required to assist a child with a disability to benefit from special education.

Remanufactured: Refers to a vehicle component that has been structurally restored.

RESNA: Rehabilitation Engineering Society of North America, an organization engaged in research and development of assistive technology for persons with disabilities.

Restraining barrier: An assembly similar to a seat back located immediately in front of a single school bus passenger seat or row of seats to provide crash protection in accordance with FMVSS No. 222; also known as barrier, crash barrier, and seat barrier.

Restraint system: A generic term for one or more devices intended to secure and protect a passenger with or without a mobility aid in a vehicle, including lap belts, lap/shoulder belts, child safety seats, safety vests, etc.

Restraint/securement system: (See securement and restraint system.)

Retractor, automatic-locking: A retractor incorporating adjustment by means of a positive self-locking mechanism which is capable of withstanding restraint forces.

Retractor, emergency-locking: A retractor that incorporates adjustment by means of a locking mechanism that is activated by vehicle acceleration, webbing movement relative to the vehicle, or automatic action during an emergency, and that is capable of withstanding restraint forces.

Retro reflective: Refers to material that is designed to return illumination of the material directly or generally back to the source of illumination.

RFP: Request For Proposals, an invitation to submit a contract proposal, less restrictive than an invitation to bid on a contract.

Ridership: The number of passengers using a transportation system during a given time period.

Right: Right position is determined from the normal driving position as seated in the driver's seat looking in the forward direction of travel.

Rim: The part of the wheel on which the tire is mounted and supported.

Risk management: Practices and procedures designed to protect against losses from accidents, passenger and worker injuries, vehicle damage and other losses, and to reduce insurance costs.

Rolling stock: The vehicles in a transportation system.

Roof hatch: (See emergency roof exit.)

Route: A designated course regularly traveled by a school bus to pick up students and take them to school, or to deliver students from school to their homes or designated bus stops.

Route miles: The total number of miles in one or more routes in the system.

Route sheet: A list of all the designated stops on a route.

Run: A complete trip on a route. (To illustrate the difference between a run and a route: it is possible to have six daily runs on the same route, i.e., one high school, one middle school, and one elementary run both morning and afternoon.)

Running gear: The wheels, axles, springs, frames and other carrying parts of the vehicle.

SAE: Society of Automotive Engineers, the leading standards-writing organization for the automotive industry.

SAP: Substance Abuse Professional, a licensed physician, psychologist, social worker or alcohol and drug counselor who is required to evaluate any employee who violates a carrier's drug and alcohol testing program.

Safety vest/harness: An upper torso restraint that supports and secures a child by attachment to the vehicle seat.

Safety patrol: Students whose duties may include acting as crossing guards and safety assistants.

Safety training: Educational programs provided for students to teach proper behavior while waiting for, riding in, boarding or leaving school buses; also known as ridership programs.

SBMTC: School Bus Manufacturers Technical Council; formerly the School Bus Manufacturers Institute (SBMI), a membership organization within NASDPTS which serves as a technical advisor regarding school buses.

School: An educational institution for children at the pre-primary, primary, elementary, or secondary level, including nursery schools and Head Start programs, but not including daycare programs.

School bus equipment: Equipment designed primarily as a system, part or component of a school bus, or any similar part or component manufactured or sold for replacement or as an accessory or addition to a school bus.

School bus stop: An area on the street or highway designated by school officials for picking up and discharging students.

School trip: (See activity trip.)

School vehicle: Any vehicle owned, leased, contracted to or operated by a school or school district and regularly used to transport students to and from school or school-related activities. Includes school buses, activity buses, vans and passenger cars, but does not include transit or charter buses.

Scooter: A motorized mobility aid with three wheels, handle bar or tiller and a swiveling seat.

SEA: State Education Agency

Seat: A device designed and installed to provide seating accommodations.

Activity seat: A seat designed for passenger comfort with contoured seats and backs with the result that passengers' positions are distinctly separate; characterized by fixed seat backs; may have arm rests and head rests; can be manufactured to meet FMVSS No. 222.

Bench seat: A seat designed to accommodate more than one passenger with no apparent partitioning between positions, which is characterized by fixed legs and a fixed back (e.g., the standard school bus seat which meets FMVSS No. 222.)

Davenport seat: A bench seat that extends from side wall to side wall at the rearmost seating position in the bus; not permitted in school buses.

Flip seat: A school bus bench seat designed so that the cushion flips up when the seat is not occupied, similar to a theater seat; used to provide aisle clearance when a passenger seat is located adjacent to a side emergency door, as required by FVMSS No. 217.

Integrated child safety seat: A child safety seat meeting the requirements of FMVSS No. 213 which is built into and thus an integral part of a bench seat.

Jump seat: A seat designed to fold down to provide supplemental seating in a bus (e.g. in the aisle, in front of the door or along the side wall); not permitted in school buses.

Reclining seat: An activity seat with a reclining seat back; not permitted in school buses.

Seat belt: (See seat restraints.)

Seating capacity: The number of designated seating positions provided in a vehicle, including the driver's position. In determining seating capacity, each wheelchair securement location shall be counted as four (4) designated seating positions.

Designed seating capacity: The theoretical passenger capacity that a vehicle would have if it were constructed with the maximum number of seating positions according to standard seating plans; also known as manufacturer seating capacity.

Reduced capacity: The capacity that is achieved when one or more seats are removed from the standard design during or after manufacture of the vehicle.

Seating position: The space on a school bus bench seat designated for one student. The number of such positions per seat is determined by dividing the width of the seat by 15" and rounding to the nearest whole number, as described in FMVSS No. 222.

Seating reference point: The manufacturer's design point, with coordinates relative to the vehicle structure, which establishes the rearmost normal driving or riding position of each designated seating position and simulates the position of the pivot center of the human torso and thigh.

Seat restraints: A passenger restraint system incorporating lap belts or lap/shoulder belts and meeting the requirements of FMVSS Nos. 209 and 210.

Section 402: Section of 23 CFR that authorizes grant funds for highway safety projects.

Section 504: Section of the Rehabilitation Act of 1973, PL 93-112, which prohibits discrimination against individuals with disabilities by any recipient of federal funding.

Securement points: Locations on the base or seat frame of the wheelchair/mobility aid where the securement system should be attached.

Securement system: The means of securing a mobile seating device to a vehicle in accordance with FMVSS No. 222, including all necessary buckles, anchors, webbing/straps and other fasteners.

Securement and restraint system: The total system which secures and restrains both a wheelchair/mobility aid and its occupant; also known as WTORS.

Self-insured: Refers to a company or school district which provides reserved funds against claims or losses.

Sensor: An electronic device installed on a school bus for the purpose of detecting animate objects in the loading zone; also known as object detection system.

Seizure: A reaction to an electrical discharge in the brain, resulting in symptoms which can range from a blank stare of a few seconds to full convulsions.

Shuttle: A trip run back and forth over a short route (e.g. between two schools.)

Skid plate: Stout metal plate attached to the underside of a vehicle to protect the oil pan, transmission, step well or fuel tank from scraping on rocks, curbs and road surface.

Slack adjuster: Adjustable device connected to the brake chamber pushrod used to make up for brake shoe wear.

SOS lights: Stop on Signal lights. (See alternately flashing signal lights.)

SOWAT: The Subcommittee on Wheelchairs and Transportation, a group acting under the auspices of RESNA to develop transportable wheelchair crashworthiness standards.

Special education: Specially designed instruction to meet the unique needs of a child with disabilities.

Specially equipped school bus: Any school bus designed, equipped or modified to accommodate students with special needs.

Split-brake system: A service brake system with two separate hydraulic circuits which, upon failure of either, retains full or partial braking ability.

Stanchion: An upright post or bar, usually installed from floor to ceiling in a bus, that provides support for other structural members and/or provides a hand-hold for passengers.

State: As used in this document, "state" shall refer to any of the 50 states and commonwealths and any United States territory, possession, or federal agency (e.g., the General Services Administration or the Department of Defense) that may consider, follow or adopt part or all of the specifications and procedures contained herein for school buses and operations.

State director: The chief government administrator in charge of a state's pupil transportation program and responsible for oversight of regulatory functions.

Stop arm: A device in the form of a red octagon extending outward from the side of a school bus to signal that the bus has stopped to load or unload passengers and meeting FMVSS No. 131; also known as stop semaphore and stop signal arm.

Stopping distance: Braking distance plus reaction distance.

Braking distance: The distance a vehicle travels between the time the brakes are applied and the time forward motion ceases.

Reaction distance: Distance a vehicle travels during the time it takes for a driver to recognize the need to stop and to apply the brakes.

Strobe light: A bright short duration light that flashes as a result of an electronic discharge of electricity through a gas.

Stroller: A light weight folding mobility aid.

Student: Any child who attends a school, as previously defined.

Student rides: The number of students transported in a given system multiplied by the number of one-way trips in a school bus. (For example, a school district that transports 1000 students provides 2000 student rides daily or 360,000 student rides to and from school annually, assuming 180 school days. To determine the total number of student rides annually, the district would add the actual or estimated number of students transported on activity trips [times 2] to the figure above.)

Substitute driver: A driver who is not assigned to a regular route but is employed to provide immediate coverage when necessary due to driver absences or emergencies; also known as spare driver and extra board driver.

Surrogate wheelchair: A wheelchair device which is subjected to impact tests to test securement and restraint systems.

Suspension system: The components of the vehicle that transmit the load of the vehicle's weight from the chassis framework to the ground, including the springs, axles, wheels, tires and related connecting components.

TDD: Telecommunication devices for the deaf.

Temperature control system: The means of heating or cooling the interior of the vehicle.

Tether: An upper anchor strap used in addition to a seat belt to hold certain types of restraint devices in place.

Tie-down system: (See securement system.)

Tire: The continuous solid or pneumatic rubber elastomeric cushion encircling a wheel intended for contact with the road.

Bias ply: A pneumatic tire in which the ply cords extending to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tire.

Low profile: A tire that has a section height that is less than 85 percent of its nominal section width (e.g., a tire with an aspect ratio of less than 0.85.)

Radial: A pneumatic tire in which the ply cords which extend to the beads are laid substantially at 90 degrees to the centerline of the tread.

Retread: A worn tire casing to which tread rubber has been affixed to extend the usable life of the tire; also known as re-capped or retreaded tire.

Siped: A tire which has been scored or cut perpendicular to the direction of rotation (across the tread) to improve traction.

Snow: A tire with an obvious aggressive or lug type tread across the entire width which is designed to be self-cleaning.

Studded: A tire to which metal protrusions have been added to improve traction.

Tire cords: The strands forming the reinforcement structure in a tire.

To-and-from school: Transportation from home to school and from school to home; also transportation from school to school or from school to job training site.

Tour: Transportation of a group on a longer trip, usually by charter bus (e.g., senior class trip to Washington.)

Tow hooks: Attachments on the chassis frame for use in towing the vehicle backwards or forwards; also known as tow eyes.

Track seating: A seating system in which seating units, including mobility aids, are secured to the vehicle structure by attaching them to tracks on the vehicle floor.

Traffic lights: Traffic signals which control the flow of traffic at intersections.

Transverse: Perpendicular to the longitudinal centerline of the vehicle (i.e., from side to side.)

Trip: The transportation of students from school to any destination, followed by a return trip back to school. The two together make a round trip.

Tripper service: Regularly scheduled mass transit service which is open to the public, and which is designed or modified to accommodate the needs of school students and personnel, using various fare collections or subsidy systems. Must be part of the regular route service as indicated in published route schedules.

Turbocharger: A device which uses the pressure of exhaust gases to drive a turbine that, in turn, pressurizes air normally drawn into the engine's chambers.

Turnkey: Partial privatization in which a school district hires a company to supply drivers, maintenance management and/or vehicles; also known as management contract.

Two-way radio: Electronic communication system which uses a designated airway for transmission between a bus and a base station.

UCRA: Universal child restraint anchorage, a standardized means of installing child restraint systems in vehicles that is independent of the seat belt system. UCRAs will be required in all new motor vehicles under 10,000 pounds, including school buses, as of September 2002.

UMTA: Urban Mass Transit Administration, predecessor to FTA.

Unload: To discharge passengers from a school bus.

Unloaded vehicle weight: The weight of vehicle with maximum capacity of all fluids necessary for operation, but without cargo or occupants or accessories that are ordinarily removed from the vehicle when they are not in use.

Universal precautions: Method of infection control designed to protect the individual from exposure to disease, which requires that all bodily fluids and secretions are treated as though they were infectious.

UST: Underground storage tank.

Vaporlock: Boiling or vaporization of fuel in the lines from excessive heat, which interferes with liquid fuel movement and in some cases, stops the flow.

Vehicle miles: The aggregate number of miles a vehicle travels in a given period.

Video system: A means of monitoring student behavior in a school bus. The system includes one or more video cameras to tape activity. Camera housing units mounted in each bus appear to hold a camera, whether or not one is actually in place; also known as surveillance.

VIN: Vehicle Identification Number, a series of Arabic numbers and Roman letters which is assigned to a motor vehicle for identification purposes.

Viscosity: A measure of internal resistance to flow or motion offered by a fluid lubricant.

Walking distance: The maximum distance a student can be required to walk to school before transportation must be provided.

Weather emergencies: Weather conditions that require a deviation from normal transportation procedures (e.g., flooding, snowstorm.)

Weight distribution: The distribution proportion of the vehicle load divided between the front and rear axles.

Wheel: A rotating load-carrying member between the tire and the hub, usually consisting of two major parts, the rim and the wheel disc, which may be integral, permanently attached or detachable.

Ball seat nut mounting: A wheel mounting system wherein the wheel centering is provided by the wheel mounting studs and the ball seat nuts which, when properly tightened, assure the centering alignment of the wheel.

Disc: The part of the wheel which is the supporting member between the hub and the rim.

Disc wheel: A permanent combination of a rim and wheel disc.

Hub: The rotating outer member of the axles assembly which provides for wheel disc mounting.

Locking ring: A removable, split rim ring that holds the rim flange in place on a multi-piece rim.

Piloted hub mounting: A wheel mounting system wherein the wheel centering is provided by a close fit between the wheel disc and the hub.

Rim: The part of the wheel on which the tire is mounted and supported.

Spoke wheel: A rotating member which provides for mounting and support of one or two demountable rims; also known as wheel for demountable rim.

Wheelbase: The distance between the front and rear axles.

Wheelchair: A seating system comprising at least a frame, seat and wheels for the support and mobility of a person with physical disabilities; also known as mobile seating device.

Wheelchair lift: (See power lift.)

ZEB: Zero-emissions bus.

ZEV: Zero-emissions vehicle.

• APPENDIX B •

School Bus Chassis And Body

NATIONAL SCHOOL BUS YELLOW

The color known as National School Bus Yellow is specified and described in the School Bus Manufacturers Technical Council publication “National School Bus Yellow Color Standard” (SBMTC-008).

BUS BODY HEATING SYSTEM TEST

1. **Scope**

This procedure, limited to liquid coolant systems, establishes uniform cold weather bus vehicle heating system test procedures for all vehicles designed to transport ten (10) or more passengers. Required test equipment, facilities and definitions are included. SAE J381 and SAE J382 establish defrosting and defogging procedures and requirements, which are hereby included by reference.

1.1 Purpose

This procedure is designed to provide bus manufacturers with a cost effective, standardized test method to provide relative approximations of cold weather interior temperatures.

2. **Definitions**

2.1 Heat Exchanger System - Means will exist for providing heating and windshield defrosting, and defogging capability in a bus. The system shall consist of an integral assembly, or assemblies, having a core assembly or assemblies, blower(s), fan(s), and necessary duct systems and controls to provide heating, defrosting and defogging functions. If the bus body structure makes up some portion of the duct system this structure or assimilation of this structure must be included as part of the system.

2.2 Heat Exchanger Core Assembly - The core shall consist of a liquid to air heat transfer surface(s), liquid inlet and discharge tubes or pipes.

2.3 Heat Exchanger-Defroster Blower - An air moving device(s) compatible with energies available on the bus body.

2.4 Coolant - A 50-50 solution of commercially available glycol antifreeze and commercial purity water. Commercial purity water is defined as that obtained from a municipal water supply system.

2.5 Heat Exchanger - Defroster Duct System - Passages that conduct inlet and discharge air throughout the heater system. The discharge outlet louvers shall be included as part of the system.

2.6 Heater Test Vehicle - The completed bus as designed by the manufacturer with, or without, a chassis, engine and driver train, including the defined heat exchanger system. If the vehicle is without a chassis, it shall be placed on the test site in such a way that the finished floor of the body is at a height, from the test site floor, equal to its installed height when on a chassis, and all holes and other openings normally filled when installed on a chassis will be plugged.

2.7 Heat Transfer - The transfer of heat from liquid to air is directly proportional to the difference between the temperatures of the liquid and air entering the transfer system, for a given rate of liquid and air flow measured in pounds per minute, and that heat removed from liquid is equal to heat given to air.

3. Equipment

3.1 Test Site - A suitable location capable of maintaining an average ambient temperature not to exceed 25 degrees Fahrenheit (-3.9 degrees Celsius for the duration of the test period. The maximum air velocity across the vehicle shall be 5 mph (8kph).

3.2 Coolant Supply - A closed loop system, independent of any engine/drive train system, capable of delivering a 50-50 (by volume) solution of anti- freeze-water, as defined in 2.4, at 150 degrees +1-5 degrees (65.5 degrees +/- 1.70C) above the test site ambient temperature, and 50 lbs (22.7 kg) per minute flow. The coolant supply device shall be equipped with an outlet diverter valve to circulate coolant within the device during its warm-up period. The valve will then permit switching the coolant supply to the bus heat exchanger system at the start of the test.

3.3 Power Equipment Supply - A source capable of providing the required test voltage and current for the heater system.

3.4 Heat Exchange Units - The heat exchangers used shall be labeled as specified by the School Bus Manufacturer's Technical Council No. 001 (Revised 4/94). The test rating of each unit, and quantity used, shall be recorded.

4. **Instrumentation**

4.1 Air Temperature

4.1.1 Interior - Recommended air temperature measuring instrumentation are thermocouples or RTD's. Thermometers are not recommended because of their slow response to rapid temperature changes. Measuring instrumentation shall be placed on alternate seat rows beginning 39 inches +/- 5 inches (99 cm +/- 13 cm) from the rear of the body, at 36 inches +/- 2 inches (91 cm +/- 5 cm) from the finished floor of the body, and on the longitudinal centerline of the body.

4.1.2 Ambient - A set of four (4) of electrically averaged temperature measuring devices shall be placed 18 inches +/- 5 inches (46 cm +/- 13 cm) from the nearest body surface, 96 +/- 5 in (243 cm +/- 13 cm) above the floor of test site. One measuring device shall be placed at each of the following locations:

(1) Midline of body forward of windshield;

(2) Midline of body aft of the rear surface; and

(3) Midway between the axles on the right and left sides of the body.

4.1.3Driver - Measuring devices shall be placed at appropriate locations to measure ankle, knee, and breath level temperatures with the driver's seat in rear-most, lowest and body center-most position.

(1) Ankle Level - Place a minimum of four (4) electrically averaged temperature measuring devices at the comers of a 10 X 10 inch (25 X 25 cm) square area, the rear-most edge of which begins 8 inches (20 cm) forward of the front edge of, and centered on, the seat cushion. The devices shall be located 3 inches +/- 0.5 in (7.5 cm +/- 1.3 cm) above floor surface.

(2) Knee Level - Place a minimum of one measuring device at the height of the front top edge of the seat cushion and on the centerline of the seat. This measurement shall be 4 inches +/- I inch (10 cm +/- 2.5 cm) forward of the extreme front edge of the seat cushion and parallel to the floor.

(3) Breath Level - Place a minimum of one measuring device 42 inches +/- 2 inches (107 cm +/- 5 cm) above the floor and 10 inches +/- 2 inches (25 cm +/- 5 cm) forward of the seat back. The forward dimension shall be measured from the upper edge of the seat back and parallel to the floor.

4.1.4(Optional) Heat Exchanger Inlet and Outlet Temperature - A minimum of four (4) electrically averaged temperature measuring devices shall be used to measure the inlet air temperature of each heat exchange unit. Additionally, a minimum of four (4) electronically averaged temperature-measuring devices shall be used to measure the outlet air temperature of each heat exchange unit. These sensors shall be placed no closer than 2.0 inches (5.1 cm) from the face of any heater core, to prevent any incidence of radiant heat transfer. Outlet sensors shall be distributed throughout the outlet air stream(s) 1.0 inches +/- .25 inches (2.5 cm +/- .6 cm) from the outlet aperture(s) of the unit heater.

4.1.5 (Optional) Defrost Air Temperature - The temperature of the defrost air shall be measured at a point in the defroster outlet(s) that is in the main air flow and which is at least one (1) inch (2.54 cm) below the plane of the defroster outlet opening. At least one temperature measurement shall be made in each outlet unit. The interior surface temperature(s) of the windshield shall be measured at a point located on the vertical and horizontal centerline(s) of the windshield.

4.1.6(Optional) Entrance Area Temperature - The temperature of the vehicle entrance area shall be measured by two (2) sets of three (3) each electrically averaged temperature measuring devices. One set of three (3) devices shall be placed one (1) inch (2.54 cm) above the lowest tread of the entrance step, equally spaced on the longitudinal centerline of the tread. The second set of devices shall be placed on the next horizontal surface above the lowest entrance step, four inches (10.2 cm) from the outboard edge of that surface, spaced identically to the first set of sensors, and placed parallel with the outboard edge of the

surface being measured.

4.2 Coolant Temperature - The temperature entering and leaving the heat changer/defroster system shall be measured as close to the entrance and exit points of the bus body as possible with an immersion thermo couple or RTD device which can be read within +/- 0.5 degrees Fahrenheit (+/- 0.3 degrees Celsius).

4.3 Coolant Flow - The quantity of coolant flowing shall be measured by means of a calibrated flow meter or weighing tank to an accuracy of at least 2 percent of set point.

4.4 Coolant Pressure - The coolant differential pressure shall be measured by suitable connection as close as possible to the inlet and outlet of the heat exchanger/defrosting system. Pressure may be read as inlet and outlet pressure and the differential calculated, or read directly as PSID. Pressure readings shall be made with the use of gauges, manometers or transducers capable of reading within +/- 0.1 psi (689.5 Pa), accurate to +/- 0.5% of full scale.

4.5 Additional Instrumentation - Additional instrumentation required for vehicle heat exchanger system testing is a voltmeter and a shunt type ammeter to read the voltage and current of the complete system. The ammeter and voltmeter shall be capable of an accuracy of +/- 1 percent of the reading.

5. Test Procedures

5.1 Install the heater test vehicle on the test site. Testing shall be conducted in such a way as to prevent the effects of solar heating. At an outdoor test site, testing shall commence and data shall be recorded during the hours following sunset and prior to sunrise, regardless of cloud cover or facility roof.

Instrumentation is required to obtain the following readings:

(a) Vehicle interior (4.1.1);

(b) Inlet coolant temperature, at entrance to the bus body (4.2);

(c) Discharge coolant temperature, at exit from the bus body (4.2);

(d) Voltage and current at main bus bar connection of driver’s control panel;

(e) Ambient temperature (4.1.2);

(f) Rate of coolant flow (4.3);

(g) Coolant flow pressure (4.4);

(h) Elapsed time (stop watch);

(i) Driver's station temperatures (4.1.3);

(j) (Optional) Heat Exchanger Inlet and Outlet Temperatures (4.1.4);

(k) (Optional) Defrost Air Temperature (4.1.5); and

(l) (Optional) Entrance Area Temperature (4.1.6).

Soak the test vehicle, with doors open, for the length of time necessary to stabilize the interior temperature for a 30 minute period as recorded by the vehicle interior temperature measuring devices, and the coolant temperature as measured by the inlet and outlet coolant temperature measuring devices, at the test site temperature, +/- 5 degrees Fahrenheit (+/- 2.5 degrees Celsius), not to exceed 25 degrees Fahrenheit (-3.9 degrees Celsius). Warm up the coolant device to the test temperature immediately prior to the start of the test. Use the coolant supply outlet diverter valve to prevent heated coolant from entering the bus heating system prior to the start of the test. At this time, set the heater controls and all fan controls at maximum, close all doors. A maximum of two windows may be left open a total of one (1) inch (2.5 cm) each. A maximum of two occupants may be in the body during the test period. Record all instrumentation readings at five-minute intervals for a period of one hour. Recording time shall begin with the initial introduction of heated coolant from the independent coolant supply. The electrical system shall be operated at a maximum of 115% of nominal system voltage +/- 0.2 volts, for example: 13.8 VDC +/0.2 volts for a 12 VDC system, and the heat exchanger system shall be wired with the normal vehicle wiring.

Optional - Additional flow rates and/or coolant temperatures may also be used to generate supplementary data. Test procedure five (5) shall be repeated for each additional flow rate and/or coolant temperature.

6. Computations

6.1 Chart and Computations - Customary Units-Data shall be recorded on Chart 6.1 or equivalent. Temperature data shall be recorded at the actual temperatures occurring at the time of testing. Air temperature data shall then be adjusted to a 0 degrees Fahrenheit base prior to the construction of graphs. This data reduction shall be directly proportional to the difference between the actual ambient temperature, at the time of test, and 0 degrees Fahrenheit (i.e., actual ambient of 18 degrees Fahrenheit shall result in a reduction of all air temperatures by 18 degrees Fahrenheit, actual ambient temperature of -8 degrees Fahrenheit shall result in an increase of all air temperatures by 8 degrees Fahrenheit). Temperature data shall be presented in graph form as well as tabular form. One graph shall be constructed for the body interior air temperatures (4.1.1) wherein the recording intervals shall be the X-axis and the degrees Fahrenheit shall be the Y-axis. A separate graph shall be constructed for the driver's temperatures (4.1.3) using the same units for the axes. Optional temperature data (4.1.4, 4.1.5, 4.1.6) may be similarly graphed separate

from the interior data.

6.1.1 Optional Computations BTU/Hr. Coolant

1. Flow of Coolant (Ww)-lb/min-measured to +/- 2 percent.
2. Temperature of Coolant into System (T-in)- degrees Fahrenheit -measured.
3. Temperature of Coolant out of System (T-out)- Fahrenheit -measured.
4. Heat Removed From Coolant (Qw)-Btu/h-calculated:

   Qw = CpWw(T-in - T-out) X 60

   Cp= Specific Heat of Coolant - Given as

   0.85 x 1.0018

   Btu/lb/degrees Fahrenheit

   Ww=No. 1

   T-in = No. 2

   T-out = No. 3

6.2 Chart and Computations - Metric Units - Data shall be recorded on Chart 6.2 or equivalent. Temperature data shall be recorded at the actual temperatures occurring at the time of testing. Air temperature data shall then be adjusted to a -18 degrees Celsius base prior to the construction of graphs. This data reduction shall be directly proportional to the difference between the actual ambient temperature, at the time of test, and -18 degrees Celsius i.e., actual ambient of -7.8 degrees Celsius shall result in a reduction of all air temperatures by 10.2 degrees Celsius, actual ambient temperature of -22.2 degrees Celsius shall result in an increase of all air temperatures by 4.2 degrees Celsius. Temperature data shall be presented in graph form as well as tabular form. One graph shall be constructed for the body interior air temperatures (4.1.1) wherein the recording intervals shall be the X-axis and degrees Celsius shall be the Y-axis. A separate graph shall be constructed for the driver's temperatures (4.1.3) using the same units for the axes. Optional temperature data (4.1.4, 4.1.5, 4.1.6) may be similarly graphed separate from the interior data.

6.2.1 Optional Computations BTU/Hr. Coolant

1. Flow of Coolant (Ww)-lb/min-measured to +/- 2 percent.
2. Temperature of Coolant into System (T-in)- degrees Celsius -measured.
3. Temperature of Coolant out of System (T-out)- Celsius -measured.
4. Heat Removed From Coolant (Qw)-Btu/h-calculated:

   Qw = CpWw(T-in - T-out) X 60

   Cp= Specific Heat of Coolant - Given as

   (0.85 x 4187j)(kg/c)

   Ww=No. 1

   T-in = No. 2

   T-out = No. 3

• APPENDIX C •

Glossary of Alternative Fuels

ARB: The abbreviation for the (California) Air Resources Board, the state agency in California which sets the states emission standards.

BTU: A unit of work or energy known as a British Thermal Unit. One BTU is the energy required to increase the temperature of one pound of water by one degree Fahrenheit.

Bi-fuel: Used to describe a bus capable of running on either of two fuels, although not simultaneously. Engines which can be switched to run on either CNG or gasoline are examples.

Carbon monoxide: A product of incomplete combustion; this gas is colorless, odorless and very poisonous. It does not contribute to smog.

Catalytic converter: An exhaust after-treatment device containing a catalytic material that is used to burn off or reduce unburned fuel or gases and thus reduce emissions, particularly NOx and hydrocarbons. Diesel converters run at cooler temperatures than do gasoline converters and require different catalysts.

Cetane number: A measure of self-ignition properties of a fuel after injection in a diesel engine. It relates to the knock properties of fuel. The higher the number, the more easily the fuel will ignite under compression; therefore, higher cetane fuels are usually preferred in diesels engines.

Combustible gas sensor: Detector capable of sensing the presence of natural gas.

Cryogenic: Relates to storage and use at very low temperatures. LNG requires cryogenic systems.

Dual-fuel engine: Also “flex fuel,” used to describe a gasoline-methanol dual-fuel engine using mixtures of gasoline and methanol, such as M85, which is 15% gasoline and 85% methanol. Dual-fuel engine can also refer to engines operating on any other mixture of fuels simultaneously, such as engines, which run on a mixture of CNG and diesel.

FMVSS: Federal Motor Vehicle Safety Standard.

Formaldehyde: A chemical compound that is a by-product of combustion from engines. Concentrations may be particularly high in emissions from engines fueled by methanol.

Fumigate: Literally means “to form a gas or disperse one gas in another.” The term is used to describe the injecting of gas, usually CNG, into the intake air of the engine.

G/bhp-hr: The amount of a pollutant generated in one hour measured in grams per brake horsepower.

GVWR: Gross Vehicle Weight Rating means the value specified by the manufacturer as the loaded weight in pounds of a single vehicle, which shall not be less than the sum of the unloaded vehicle weight, plus the rated cargo load. For school buses, the rated cargo load is 120 pounds times the vehicle’s designated seating capacity, plus 150 pounds for the driver.

Hydrocarbons: A gaseous compound formed by incomplete combustion and comprised of unburned and partially burned fuel. It combines with NOx and sunlight to form ozone and is a major contributor to smog.

Lean burn: Uses more air than is needed for theoretical complete combustion. This added air allows combustion to take place at a lower temperature, thus reducing the emissions NOx and CO.

Nebula combustion chamber: A unique high-turbulence combustion chamber in the top of a piston, which is particularly effective in efficient burning of lean gas-air mixtures.

NFPA: National Fire Protection Association

NOx: Abbreviation for nitrogen oxides, the gaseous compounds which combine with hydrocarbons and sun light to form ozone, an air pollutant that contributes to smog.

Octane number: A measure of anti-knock properties of a fuel that relates to spark ignition engines. The higher the octane number, the more resistant the engine is to knocking. Higher output and more efficient engine designs can be used with higher octanes.

Ozone: A pollutant formed from NOx, hydrocarbons and sunlight. This gas has an irritating odor, is poisonous and is used as an oxidizing agent for bleaching.

Particulate traps: An exhaust treatment device used to collect (trap) and periodically burn off particulates and other potential problem emission gases formed in engine exhaust.

Particulates: Small solid particles (soot, etc.) formed by engine combustion. Visible particulates are seen in smoke; however, invisible particles may be present in smokeless exhaust.

Pilot Ignition engine: An engine using a small quantity of diesel fuel to provide an ignition source for an alternative fuel that will not ignite on its own in a compression cycle.

Port Injection: Similar to the throttle body system except that the fuel is injected near each cylinder intake port. The injectors and their controls can be individually controlled for maximum performance and emissions control.

Reformulated gasoline: Also known as “oxygenated gasoline,” reformulated gasoline has oxygen added to improve combustion and reduce emissions.

Repower installation: A dedicated natural gas or other engine, which was not part of the original chassis at the time of manufacturing.

Stoichiometric burn: Use of fuel and air (or oxygen) in the exact ratio needed for complete combustion to generate maximum efficiency and power.

Throttle body injection: A gasoline fuel injection system in which the fuel is injected directly into the air intake pipe or manifold. No carburetor is required; electronics monitor engine variables and control the rate of fuel injected.

UL: Underwriters Laboratory.

Handrail Inspection Tool and Procedure

Across the United States, children are being injured or killed when their clothing or accessories are caught in their school bus's handrail or door as they exit the school bus. As a result, they may fall and be violently dragged by the bus and run over by its rear wheels. The most common piece of clothing that can be snagged on the handrail is a jacket with a drawstring at the waist. These drawstrings commonly have a large bobble or knot at the ends that can become lodged in the handrail. However, other articles such as scarves, long straps on backpacks or dangling key chains can also be snagged on the handrail. School bus handrails have had the same basic design for more than 30 years. However, with the current change in fashion toward oversized and baggy clothing, handrail designs have contributed to tragic and avoidable injuries and deaths. Typical handrail designs that have the potential for snagging are illustrated in Figures 1 and 2.

School bus manufacturers have taken extraordinary and costly steps to remove snagging hazards from school bus entrances. More than 4000,000 school buses have been recalled and manufacturers have absorbed the cost of the repairs. In most cases, a simple spacer can be added to the existing handrail eliminating the potential for snagging. In other cases, manufacturers have redesigned the handrail. Figures 3 and 4 illustrate handrails that have been modified.

The school bus driver is a trained professional concerned with getting children to school and returning them home safely. Driving a school bus is a demanding task. There is a lot of activity in and around the bus. The bus driver must be aware of ever-changing traffic conditions, the children on the bus, and the children who enter and exit at each school bus stop. Compounding this already complex situation is the need for the driver to maintain the school bus schedule.

The major reason for injury and death due to handrail snagging incidents is the driver's failure to notice that the child's drawstring has become snagged. The driver should observe all children, especially those with long drawstrings, oversized or baggy clothing, or other items that may become snagged in handrails, as they exit. Additionally, to ensure safety at each stop, the driver should be certain that each child has completely exited the bus and cleared the danger zones before closing the door and moving the vehicle. The driver should secure the bus and check around and underneath the bus if there is a question of whether a child has moved safely away from the bus. Finally, the driver must be alert for warnings as the bus pulls away. In many of the snagging incidents that have occurred to date, someone inside or outside the bus attempted to warn the driver that a child was being dragged by the bus.

Children' and Parent' Responsibilities

Children and parents must also accept some responsibility for ensuring that a snagging incident does not occur. While oversized and baggy clothing may represent the latest fashion trend, try to avoid choosing any article that may become caught in a school bus handrail or door. The consumer Product Safety Commission recommends that drawstrings be no more than three inches in length at the waist. Parents should caution children about attaching key rings and other items to their backpacks, as these too may become caught on the handrail or door.

Placement of Retro-reflective Markings

Side View of Surrogate Wheelchair

Top View of Surrogate Wheelchair

Front View of Surrogate Wheelchair

Vehicle Ramp 36 CFR 1192.23

(1) **Vehicle ramp:** (1) Design Load. Ramps 30 inches or longer should support a load of 600 pounds placed at the centroid of the ramp distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps shorter than 230 inches shall support a load of 300 pounds.

(2) **Ramp surface:** The ramp surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than 1/4 inch high, shall have a clear width of 30 inches, and shall accommodate both four-wheel and three-wheel mobility aids.

(3) **Ramp threshold:** the transition from roadway or sidewalk and the transition from vehicle floor to the ramp may be vertical without edge treatment up to 1/4 inch. Changes in level between 1/4 inch and 1/2 inch shall be beveled with a slope no greater than 1:2.

(4) **Ramp barrier:** Each side of the ramp shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) **Slope:** Ramps shall have the least slope practicable and shall not exceed 1:4 when deployed to ground level. If the height of the vehicle floor from which the ramp is deployed is 3 inches or less above a 6-inch curb, a maximum slope of 1:4 is permitted; if the height of the vehicle floor from which the ramp is deployed is 6 inches or less, but greater than 3 inches, above a 6-inch curb, a maximum slope of 1:6 is permitted; if the height of the vehicle floor from which the ramp is deployed is 9 inches or less, but greater than 6 inches, a maximum slope of 1:8 is permitted; if the height of the vehicle floor from which the ramp is deployed is greater than 9 inches above a 6-inch curb, a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) **Attachment:** When in use for boarding or alighting, the vehicle so that it is not subject to displacement when loading or unloading a heavy power mobility aid and that no gap between vehicle and ramp exceeds 5/8 inch.

(7) **Stowage:** A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps, including portable ramps stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop or maneuver.

(8) **Handrails:** If provided, handrails shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1-1/4 and 1-1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

APPENDIX D

School Bus Operations

TRIP REQUEST FORM

Trip date:_____ School:_____

Trip destination: _____

Depart from: _____No. of passengers:_____

Departure time: _____Arrival time: _____

Extra equipment: _____

Meal stop required? ☐yes ☐no If yes, where? _____

Equipment that will need to be transported: _____

Special needs equipment requirements: _____

Overnight travel requirement: _____

Number of adults accompanying the students: _____

Transportation requested by: _____ Date: _____

Approved by: _____ Date: _____

Reimbursement category: _____

TRANSPORTATION USE:

Vehicle assigned: _____ Driver: _____

Spot (load) time: _____ Spot location: _____

Routing information: _____

Dispatcher signature: _____ Date: _____

Time out: _____ Time in: _____ Total time: _____

Mileage out: _____ Mileage in: _____ Total miles: _____

Actual no. passengers: _____

Remarks: _____

Driver Post-Trip Inspection Report: _____

Driver signature: _____ Date: _____

Pre-trip mechanical check completed (for overnight trips or trips exceeding miles):

Technician's signature: _____ Date: _____

EVACUATION PROCEDURES for ACTIVITY TRIPS AND FIELD TRIPS

In order to ensure the safety of school bus passengers in an actual emergency, every school bus driver assigned to transport students on activity trips or field trips may assign an evacuation team prior to each trip. The team may consist of teachers, coaches, students or any other passenger. A roster should be provided to the driver, accounting for all passengers.

Passengers assigned to evacuation teams must be seated where they can effectively carry out their responsibilities in an emergency. Each evacuation team will consist of at least the following:

1. A passenger assigned to set the parking brake, turn off the engine, turn on warning flashers and to call on the radio or other means and report the incident to the Transportation Department, in case the driver is unable to do so.

2. A passenger assigned to lead passengers to a safe location at least 100 feet from the bus and to take the first aid kit off the bus.

3. Two passengers assigned to stand outside the bus, next to the entrance door, to help students exit the bus and to take the fire extinguisher.

4. Two passengers assigned to stand outside the bus, next to each ~~the~~ emergency exit door, to help students exit the bus.

In addition to assigning an evacuation team, the following information shall be discussed and/or demonstrated prior to each activity trip or field trip:

1. Location and use of the fire extinguisher;

2. Location of the first aid kit;

3. Location of the warning reflectors;

4. Location and use of all emergency exits;

5. How to shut off the engine and set the parking brake;

6. How to open the entrance door, to include, safety releases on manual, air or vacuum doors, if so equipped; and

7. Importance of passengers keeping aisles clear at all times and not blocking emergency exits.

THE DRIVER OF THIS TRIP DID ASSIGN AN EVACUATION TEAM AND EXPLAINED THE EMERGENCY PROCEDURES AND SAFE TRAVEL RULES TO OUR GROUP.

Sponsor’s/trip leader’s signature: _____Date: _____

OPERATIONAL GUIDELINES

FOR THE USE OF BUSES OTHER THAN SCHOOL BUSES

In order to ensure the safest transportation for school students, the following guidelines and procedures provide information that can be used by schools, school districts and others transporting pre-school and school-aged children when contracting for a school-charter motorcoach.

A. **DRIVERS**

The following training requirements for school-charter motorcoach drivers ~~MAY~~ shall be considered:

1. Pre-service training

   In addition to successfully completing all pre-service training provided by the employer, a school-charter motorcoach driver shall complete a required course of instruction which includes, but is not limited to, appropriate state laws, regulations and policies related to school transportation.

2. In-service training

   All school-charter motorcoach drivers shall receive a required amount of in-service training annually, with instruction on handling bodily fluids, and shall be required to maintain current first aid, card in accordance with state regulations.

B. **MOTOR CARRIERS**

The following requirements for motor carriers MAY be considered:

1. Pre-qualification list of eligible motor carriers

   The school district should establish a list of eligible companies that it will use for charter motorcoach service by pre-qualifying potential providers. Public school systems should establish this list centrally so that individual schools do not have to duplicate efforts of other schools, and so that motorcoach companies are not asked to provide the same information to multiple schools that are using the same criteria. Further, school districts may find it advantageous to join together in a consortium or other working group to cooperatively establish a regional list of eligible companies.

2. Vehicle maintenance

The school district should require documented assurance from the motor carrier that it will not knowingly require or permit the operation of any school-charter motorcoach that is not in safe operating condition or not equipped and maintained, as required by any law; or knowingly require or permit any driver to drive in violation of any law.

C. **TRIP-SPECIFIC REQUIREMENTS**

The following requirements shall be considered:

Based on specific needs of the trip, the school and the motor carrier must understand and establish in a written contract exactly what will be involved and establish methods for verifying that the motor carrier meets all criteria for a given trip.

1. Inspection

Prior to operation, the driver shall inspect each school-charter motorcoach to ascertain that it is in safe condition, it is equipped as required by all provisions of law, and all equipment is in good working order. The inspection shall include, but is not limited to:

a. All required emergency equipment, as well as, first aid and body fluid cleanup kit(s), fire extinguisher(s), reflectors;

b. All gauges, indicators and warning devices;

c. Horn(s);

d. Driver’s seat and seat belts;

e. All doors, door emergency releases, overhead hatches and windows;

f. All seats, handrails and modesty panels;

g. Interior and exterior lighting systems;

h. All heating, cooling and ventilating systems;

i. All glass and mirrors, including adjustment of mirrors;

j. Windshield wipers and washers;

k. All tires, wheels, rims and lug nuts;

l. Wheelchair restraints, tiedowns and loading devices, such as ramps and lifts; and

m. Brake system;

(1) Air compressor governor cut-in and cut-out pressures;

(2) Static pressure for air loss;

(3) Initial applied brake pressure loss;

(4) Low air pressure warning devices;

(5) Emergency stopping systems;

(6) Parking brake;

(7) Antiskid device (if equipped);

(8) Vacuum gauge, ensuring it reads not less than 15 inches of mercury (if equipped);

(9) Low vacuum warning device(s) (if equipped); and

(10) Brake pedal adjustment.

(***Note:** Draining reservoirs in dual air systems is not required.)

2. Pre-trip inspection checklist

The coordinator of the trip should complete a pre-trip inspection checklist at the time of the trip to make sure that each driver and vehicle meet all criteria immediately before departure. Motor carriers are required to meet many Federal Motor Carrier Safety Administration regulations. The company is responsible for ensuring that each driver completes a thorough pre-trip inspection prior to each trip and is further required to repair any safety-related defects discovered prior to the trip. The completion of a pretrip checklist by a trip coordinator does not relieve the company of the liability for the mechanical condition of the vehicle. The pre-trip checklist should validate the driver’s medical card, CDL license with proper endorsement and a basic review of the vehicle (e.g. lamps, safety equipment, etc.).

3. Trip report

At the completion of the driver's work or tour of duty, each driver should submit a daily documented report to the employer indicating the condition of the vehicle and noting any defects found. Whether discovered by or reported to the driver, all vehicle defects and deficiencies likely to affect safe operation or cause mechanical breakdown of the school-charter motorcoach shall be listed, and a negative report shall indicate that no such conditions are present.

4. Transportation of property:

a. Hazardous materials

Motor carriers and drivers shall not transport, or knowingly permit passengers to carry, any substance, material, or device posing an unreasonable risk to health and safety to any passenger. These restrictions shall not apply to:

(1) Portable oxygen tanks medically prescribed for, and in the possession of, a passenger and in a carrier designed for personal use;

(2) Personal-use articles in the immediate possession of a passenger; and

(3) Hazardous materials transported by a carrier subject to federal jurisdiction in compliance with provisions of 49 CFR, Part 177.

b. Fuel

Fuel shall not be transported except in the vehicle's regular fuel tanks.

c. General property

Drivers and motor carriers shall not permit any greater quantity of baggage in vehicles than can be safely and conveniently carried and safely secured. In no event shall aisles, doors, steps or emergency exits be blocked.

d. Animals

A driver or motor carrier may refuse to transport dogs or other animals except certified guide, signal or service animals. All other animals shall be securely crated and stored to eliminate the possibility of injury to passengers.

5. Transportation of passengers:

The driver shall not drive a school-charter motorcoach transporting passengers in violation of the following provisions:

a. Emergency Passenger Safety Training

Prior to travel, passengers transported in school-charter motorcoaches shall receive emergency procedure and passenger safety training as prescribed by state law and/or regulations for school passengers transported in yellow school buses. Training shall include evacuation training on the specific charter motorcoach being used for each trip.

b. Interior lighting

During darkness, the driver shall ensure that the interior lighting is sufficient for passengers to enter and exit safely and whenever otherwise deemed necessary.

c. Ejection of passengers

The driver of a school-charter motorcoach shall not allow nor require the disembarkation of any school student-passenger at any location except the scheduled destination, unless the passenger is given into the custody of a parent, guardian or any person designated by the parent, guardian, school authority or law enforcement official. In case such non-scheduled disembarkation is made, complete information will be provided to the trip coordinator at the first possible opportunity.

d. Fueling restrictions

No fueling will take place while passengers are on board the bus.

e. Seating capacity

The number of passengers shall not exceed the number of manufacturer designated safe and adequate seating spaces. Parents/adults will be provided with and be required to use Child Safety Restraint Systems suitable for the age and weight of the individual child.

f. Weight

Passengers shall not exceed the number whose weight, in addition to the weight of any property transported, can be carried without exceeding the manufacturer's maximum gross vehicle weight rating or the combined maximum rating of the tires supporting each axle.

g. Standing passengers

A school-charter motorcoach with school passengers on board shall not be put in motion until all passengers are seated. All passengers must remain seated while the vehicle is in motion, except an adult chaperone, parent, guardian or school employee acting upon a request by the driver to supervise or assist a passenger.

Passengers shall not be permitted in front of the “standee line” or forward of the drivers' seat back while the vehicle is in motion.

h. Open doors

A school-charter motorcoach shall not be put in motion until the doors are closed. The doors shall not be opened until the vehicle is stopped and the parking brake applied.

i. Emergency exits

A school-charter motorcoach shall not be put in motion with any emergency exit locked or otherwise secured against being opened from the inside or outside.

6. School-charter motorcoach accident reporting and mechanical failure

a. Whenever any school-charter motorcoach accident occurs, the driver shall stop at the scene and in addition to any requisite law enforcement and/or EMS unit, immediately notify or cause to be notified the state agency responsible for investigating accidents involving buses engaged in the transportation of school students, his or her employer, and the school district or school which the students may attend.

b. In the event of an accident or emergency, the driver shall not leave the immediate vicinity of the school-charter motorcoach to seek aid unless the bus is empty. If there are passengers on board no less than two should be sent to summon help.

c. When a school-charter motorcoach is rendered unsafe for continued operation due to accident damage or a mechanical failure, the driver shall discontinue use of the bus and notify the motor carrier of these circumstances. The driver or motor carrier shall then make the necessary arrangements to have the passengers safely transported to their destinations.

d. A school-charter motorcoach damaged by an accident or other cause shall not be driven from the location where the damage occurred until it has been inspected by a qualified person who has determined that the vehicle is safe to drive.

7. Other operational issues

a. Smoking is prohibited by the driver or any passengers either on the bus or within the loading/unloading area of the bus. (Use of tobacco on or near the school-charter motorcoach is prohibited.)

b. The driver's view of the roadway shall not be obstructed by any passenger.

c. The driver shall wear the lap or lap/shoulder belt (as equipped) at all times while the bus is in motion.

d. Headlamps shall be illuminated at all times while the bus is in motion.

e. When any passenger is on board, the driver shall not leave the driver's compartment without first stopping the engine, setting the parking brake, placing the transmission in first or reverse gear or park position and removing the ignition keys (if applicable) which shall remain in the driver's possession. (On vehicles with automatic transmissions that do not have a park position, the transmission shall be placed in neutral.)

f. School districts shall ensure that motor carriers require each school-charter motor-coach driver to demonstrate proficiency in the safe operation of each different type and size of bus requiring different driving skills in conditions of daylight, darkness, roadway, and terrain before transporting passengers in those types of vehicles in those conditions or terrain. Drivers should also receive training in bus operations under all weather conditions likely to be encountered prior to operating such vehicle(s) in those conditions. Once driver proficiency has been recorded, motor carriers shall ensure that driver proficiency is maintained as required by district policy, state regulations and federal requirements.

g. School districts shall ensure that motor carriers equip each school-charter motorcoach with at least one fully charged fire extinguisher having at least a 10 B:C rating. If the school-charter motorcoach has been designed or modified to transport passengers in wheelchairs, the vehicle shall be equipped with two extinguishers, each one rated at not less than 8 B:C one to be placed in the driver's compartment and the other at the wheelchair loading door or emergency exit. Each fire extinguisher shall be securely mounted in the school-charter motorcoach in a conspicuous place or in a clearly marked compartment, readily accessible. Each fire extinguisher shall be maintained in prescribed operating condition with a current inspection certification and equipped with some means of determining if it is fully charged.

f. First aid and body fluid cleanup kits

School districts shall require motor carriers to equip each school-charter motorcoach with readily visible, accessible and plainly marked first aid and body fluid cleanup kits. The kits shall be constructed to prevent dust and moisture from reaching the contents and must be maintained in good condition. The kits shall be easily and rapidly removable from the place secured. The required contents of school-charter motorcoach first aid and body fluid cleanup kits shall conform to state school bus specifications.

Activity Bus Use for School Activity Trips

A. General Provisions

1. Pre-service driver training

In addition to successfully completing all pre-service training provided by their employer, school activity bus drivers shall complete at least a state-required course of instruction.

2. In-service driver training

All school activity bus drivers shall receive the state-required amount of in-service training annually and shall be required to maintain ~~a~~ current first aid card, in accordance with state regulations.

3. Hours of service

Driver shall comply with the provisions of CFR 49, Part 395.5.

4. Specially equipped bus

School activity buses may be designed or modified in accordance with Federal Motor Vehicle Safety Administration regulations or the Americans with Disabilities Act requirements to transport passengers seated in wheelchairs.

5. Vehicle condition

It shall be unlawful for the driver to drive a school activity bus that is not in safe operating condition or is not equipped, as required by all provisions of law

6. Pre-trip inspection

Prior to operation, the driver shall inspect each school activity bus to ascertain that it is in safe condition, it is equipped, as required by all provisions of law and regulation, and all equipment is in good working order.

The inspection shall include, but is not limited to, the following items:

a. All required emergency equipment, as well as, first aid and body fluid cleanup kit(s), fire extinguisher(s), reflectors;

b. All gauges, indicators and warning devices;

c. Horn(s);

d. Driver's seat and seat belts;

e. All doors, door emergency releases, overhead hatches and windows;

f. All seats, handrails and modesty panels;

g. Interior and exterior lighting systems;

h. All heating, cooling and ventilating systems;

i. All glass and mirrors, including adjustment of mirrors;

j. Windshield wipers and washers;

k. All tires, wheels, rims and lug nuts;

l. Wheelchair restraints, tiedowns and loading devices (such as ramps and lifts); and

m. Brake system.

(1) Air compressor governor cut-in and cut-out pressures;

(2) Static pressure for air loss;

(3) Initial applied brake pressure loss;

(4) Low air pressure warning devices;

(5) Emergency stopping systems*;

(6) Parking brake;

(7) Antiskid device (if equipped);

(8) Vacuum gauge (if equipped), ensuring it reads not less than 15 inches of mercury;

(9) Low vacuum warning device(s) (if equipped); and

(10) Brake pedal adjustment.

*(**Note:** Draining reservoirs in dual air systems is not required.)

7. Daily report

At the completion of the driver's work or tour of duty, each driver shall submit a daily documented report (Post-trip Inspection) to the employer indicating the

condition of the vehicle and noting any defects found. Whether discovered by or reported to the driver, all vehicle defects and deficiencies likely to affect safe operation or cause mechanical breakdown of the school activity bus shall be listed, and a negative report shall indicate that no such conditions are present.

8. Repairs

The driver shall not make any repairs of the bus or its equipment except necessary emergency repairs on the road in accordance with the employer's procedures.

B. **Transportation of property**

1. Hazardous materials

Motor carriers and drivers shall not transport, or knowingly permit passengers to carry any substance, material or device posing an unreasonable risk to health and safety to any passenger. These restrictions shall not apply to:

a. Portable oxygen tanks medically prescribed for, and in the possession of, a passenger and in a carrier designed for personal use;

b. Personal-use articles in the immediate possession of a passenger; and

c. Hazardous materials transported by a carrier subject to federal jurisdiction in compliance with provisions of 49 CFR Part 177.

2. Fuel

Fuel shall not be transported except in the vehicle's regular fuel tanks.

3. General property

Drivers and motor carriers shall not permit any greater quantity of baggage in vehicles than can be safely and conveniently carried and safely secured. In no event shall aisles, doors, steps or emergency exits be blocked.

4. Animals

A driver or motor carrier may refuse to transport dogs or other animals except certified guide, signal or service animals. All other animals shall be securely crated and stored to eliminate the possibility of injury to passengers.

C. **Transportation of passengers**

The driver shall not drive a school activity bus transporting passengers in violation of the following provisions:

1. Seating capacity

The number of passengers shall not exceed the number of manufacturer designated safe and adequate seating spaces. Parents/adults will be provided with and be required to use Child Safety Restraint Systems suitable for the age and weight of the individual child.

2. Weight

Passengers shall not exceed the number whose weight, in addition to the weight of any property transported, can be carried without exceeding the manufacturer's maximum gross vehicle weight rating or the combined maximum rating of the tires supporting each axle.

3. Step wells

Passengers shall not be permitted in front of the "standee line" or forward of the driver's seat back while the vehicle is in motion.

4. Standing passengers

A school activity bus with school student-passengers on board shall not be put in motion until all passengers are seated. All passengers must remain seated while the vehicle is in motion, except an adult chaperone, parent, guardian or school employee acting upon a request by the driver to supervise or assist a passenger

5. Open doors

A school activity bus shall not be put in motion until the doors are closed. The doors shall not be opened until the vehicle is stopped and the parking brake has been applied.

6. Emergency exits

A school activity bus shall not be put in motion with any emergency exit locked or otherwise secured against being opened from the inside or outside.

7. Interior lighting

During darkness, the driver shall ensure that the interior lighting is sufficient for passengers to enter and exit safely and whenever otherwise deemed necessary.

8. Ejection of passengers

The driver of a school activity bus shall not allow nor require any school student-passenger to disembark at any location except the scheduled destination unless the passenger is given into the custody of a parent, guardian or any person designated by the parent, guardian, school authority or law enforcement official

9. Fueling restrictions.

No fueling will take place while passengers are on board the bus.

10. School activity bus accidents reporting

a. Whenever any school activity bus accident occurs, the driver shall stop at the scene and in addition to any requisite law enforcement and/or EMS units, immediately notify or cause to be notified the state agency responsible for investigating accidents involving buses engaged in the transportation of school student-passengers, his or her employer, and the school district or private school for which the students may attend.

b. In the event of an accident or emergency, a driver shall not leave the immediate vicinity of the school activity bus to seek aid unless the bus is empty. If there are passengers on board, no less than two can be sent to summon help.

11. Discontinuance from use

When a school activity bus is rendered unsafe for continued operation due to accident damage or a mechanical failure, the driver shall discontinue use of the bus and notify the motor carrier of these circumstances. The driver or motor carrier shall then make the necessary arrangements to have the passengers safely transported to their destinations.

12. Smoking is prohibited either on the bus or within the loading/unloading area surrounding the bus.

13. The driver's view of any portion of the roadway shall not be obstructed by any passenger.

14. The driver shall wear the lap or lap shoulder belt (as equipped) at all times while the bus is in motion.

15. Headlamps shall be illuminated at all times while the bus is in motion.

16. When any passenger is on board, the driver shall not leave the driver's compartment without first stopping the engine, effectively setting the parking brake, placing the transmission in first or reverse gear or park position and removing the ignition keys (if applicable), which shall remain in the driver's possession. (On vehicles with automatic transmissions that do not have a park position, the transmission shall be placed in neutral.)

17. School districts shall ensure that motor carriers require all school activity bus drivers to demonstrate proficiency in the safe operation of each different type and size of bus requiring different driving skills in conditions of daylight, darkness, roadway and terrain before transporting passengers in those conditions or terrain. Drivers shall also receive classroom training in bus operations under all weather conditions likely to be encountered prior to operating such vehicle(s) in those conditions. Once driver proficiency has been recorded, carriers shall ensure that driver proficiency is maintained.

18. Unlawful operation

a. No motor carrier shall knowingly require or permit the operation of any school activity bus that is not in safe operating condition or is not equipped and maintained as required by any law; or knowingly require or permit any driver to drive in violation of any law.

b. A school activity bus damaged by an accident or other cause shall not be driven from the location where the damage occurred until it has been inspected by a qualified person who has determined that the vehicle is safe to drive.

D. **School activity bus stops**

1. Designated stops

School activity bus stops made for receiving and discharging passengers shall be approved by the school district prior to the trip. Buses shall stop at designated stops only.

2. Prohibited stops

A school activity bus stop shall not be designated at the following locations:

a. Within 200 ft of the nearest rail of any railroad crossing or grade, except at railroad stations or on highways that parallel the railroad tracks;

b. The left hand side of any highway; or

c. On a divided or multiple-lane highway where passengers must cross the highway to board or after exiting the bus, unless traffic is controlled by a traffic officer or official traffic control signal. For the purposes of this subsection, a multiple-lane highway is defined as any highway having two or more lanes of travel in each direction.

3. Fire extinguisher

Every school activity bus shall be equipped with at least one fully charged fire extinguisher having at least a 10B:C; rating. A bus designed to transport wheelchairs shall be equipped with two extinguisher, each one rated at not less than 8B:C, one to be placed in the driver's compartment and the other at the wheelchair loading door or emergency exit.

a. Each fire extinguisher shall have been rated and labeled by one of the following test labs approved by the State Fire Marshal to test and label portable fire extinguisher for sale in the respective state.

1. Underwriters Laboratories, Northbrook, Illinois. All sizes and classifications.

2. Factory Mutual Research Corporation, Norwood, Massachusetts. Sizes 10B:C, 1A 10B:C, 2A 40B:C, 3A 40B:C, and 4A 80B:C fire extinguisher filled with Halon 1211 or Halon 301.

a. Securement

Each fire extinguisher shall be securely mounted in the school activity bus in a conspicuous place or a clearly marked compartment and shall be readily accessible.

b. Maintenance

Each fire extinguisher shall be maintained in prescribed operating condition with a current inspection certification and equipped with some means of determining if it is fully charged.

4. First aid and body fluid cleanup kit(s)

A school activity bus shall carry a readily visible, accessible and plainly marked first aid kit and a body fluid cleanup kit. The kits shall be constructed to prevent dust and moisture from reaching the contents and maintained in good condition. The kits shall be easily and rapidly removable from the place secured. The required contents of school activity bus first aid and body fluid kits shall conform to the requirements of each respective state school bus specifications.

5. Emergency Passenger Safety Training

Prior to travel, passengers transported in school activity buses shall receive emergency procedure and passenger safety training as prescribed by state law and/or regulations for school student-passengers transported in yellow school buses.