MISSISSIPPI DEPARTMENT OF EDUCATION
Ensuring a bright future for every child

SCHOOL BUS SPECIFICATIONS ~~2025-2026~~ 2026-2027

Standards effective with all new school buses purchased after July 1, 2026

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GENERAL PROVISIONS

The school bus specifications and minimum standards contained herein apply to all school transportation vehicles purchased by any public-school districts of Mississippi effective the date of this document. No school district has authority under state laws and Mississippi Board of Education regulations to purchase or use any equipment except the type approved by the Mississippi Board of Education. All public-school buses owned, operated, rented, leased, and contracted for any public-school board used to transport children to and from school or school related-events must meet or exceed the minimum requirements of these specifications, meet all applicable Federal Motor Vehicle Safety Standards (FMVSS), and meet or exceed the ~~2015~~ 2025 National School Bus Transportation Specifications and Procedures, except when in conflict with the requirements herein. In such cases, the requirements specified in this document shall prevail.

Federal regulations require that all vehicles manufactured and sold for the purpose of transporting school children meet applicable Federal Motor Vehicle Safety Standards. It is the responsibility of the manufacturer and seller to ensure all school buses are certified according to the standards. Each vehicle shall be properly serviced prior to being delivered to the school district.

Any reference to "or equal" means that manufacturers of the chassis or body (or complete bus) for which a bid is submitted shall have the authority to determine equal quality of parts and components to be considered.

A representative of the Division of Pupil Transportation, Mississippi Department of Education, Jackson, Mississippi, shall have the privilege of visiting school bus manufacturing plants of successful bidders for the purpose of inspecting school bus chassis, school bus bodies, or combinations thereof, both during construction and after completion for delivery to Mississippi school districts. Under unusual circumstances and with adequate justification, exceptions to these specifications may be granted by the Division of Pupil Transportation. In the event of a conflict between the requirements of an applicable Federal Motor Vehicle Safety Standard, as referred to in this section, and the Mississippi minimum specifications, the requirements of the FMVSS shall control. School buses not meeting Mississippi School Bus minimum specifications will not be certified by the Mississippi Department of Education.

References to Standards in the School Bus Manufacturers Technical Committee (SBMTC) and Standards in the Society of Automotive Engineers (SAE) will be throughout the document.

ABOUT THIS DOCUMENT

Mississippi School Bus Regulations and Specifications consists of the following distinct sections: *School Bus Body and Chassis Specifications, Specially Equipped School Bus Specifications, Pupil Transportation Service Vehicles, Used School Buses, Multifunctional School Activity Bus, Alternative Power Specifications, ~~and~~ Equipment for the Transportation of Pre-School Children, and School Bus Inspection Program.*

This document is designed to provide timely, clear instructions to school districts, school bus owner/operators, private contractors, manufacturers and vendors, and service personnel regarding Mississippi's school bus adopted specifications for school buses and related equipment and for standards and procedures to be incorporated in vehicle and related equipment inspections, replacements, and repairs.

With respect to specifications for school buses and related equipment, after each National Congress on School Transportation publishes its adopted changes in the National School Transportation Specifications and Procedures (available at https://www.nasdpts.org/NSTSP-Documents) or distributes interim addenda to that document, the Mississippi Department of Education may review the recommendations and revise the Mississippi School Bus Specifications accordingly.

Revisions in Mississippi statutes and/or the Mississippi Department of Education regulations will be published as amendments to this document. Compliance shall become effective as stated at the time of publication, or as otherwise specified by statute or other official document.

GUIDING PRINCIPLES

A. Information published in this document is intended to keep interested parties apprised of statutory requirements and other regulations that apply to various conditions of purchase, ownership, maintenance, inspection and disposal of school buses and related equipment.

B. The overriding principle for Mississippi's adoption of the National Congress on School Transportation's revised National School Transportation Specifications and Procedures is to provide the safest modes of transportation to and from school and school-related activities for the school children of Mississippi.

C. Specifications for school buses and related equipment are adopted so as to promote competition among manufacturers to design and construct equipment that is both reliable and affordable to school districts and independent transportation contractors.

D. Mississippi's specifications for school buses and related equipment are designed to allow for approval of the use of new inventions and improvements that are consistent with Federal Motor Vehicle Safety Standards (FMVSS), Mississippi statutes and goals of safety, security, and efficiency and that have been approved by the Mississippi Department of Education, Office of Safe and Orderly Schools, Division of Pupil Transportation.

INTENDED USE

Mississippi Code Ann. § 37-41-57 gives the State Board of Education the authority to adopt and enforce regulations of the design and operation of all school buses used for the transportation of school children when owned and operated by any school board or privately owned and operated under contract with any school board in this state. The specifications, regulations, and procedures described in this document, therefore, are intended for use by school district and other entities that have been placed under the jurisdiction of the Mississippi Department of Education, including private companies that contract with local education agencies (LEA) to provide school transportation services, and for use for manufacturers, vendors, and technicians that have specific interests in school transportation services. The document is made available, also, as a guide for charter schools and non-public schools to consider when establishing their respective regulations, specifications, and inspections.

The following terms are used throughout this document to define the applicability of Mississippi's specifications and inspection procedures for public school districts and private contractors:

A. *SHALL:* a mandatory condition. Where certain school bus designs, equipment or operations are described with the *"shall"* stipulation, it is *mandatory* that all school buses and all school bus operations meet those requirements, as written.

   Note: The word *"shall"* is also used when referring to items that are already adopted into federal laws, standards or regulations.

B. *SHOULD:* an advisory condition. Where certain school bus designs, equipment or operations are described with the word *"should,"* such items are considered to be advisable usage. In other words, the item is *recommended,* but not mandatory, for all school buses or all school bus operations.

C. *MAY:* a permissive condition. Where certain school bus designs, equipment or operations are described with the word *"may,"* such items are considered for *possible* usage. However, there is no intent that the item be required for all school buses or all school bus operations.

The vehicle specifications contained herein are intended to apply primarily to **new** vehicles, including all types of school buses, as defined under the various types of "school buses." It should be noted that vehicles with a capacity of ten (10) or fewer persons, including the driver, cannot be certified as *school buses* under federal regulations.

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DEFINITIONS OF SCHOOL BUSES

TYPE A

A Type A school bus is a conversion bus constructed utilizing a cutaway front section vehicle with a left side driver's door designed for carrying more than 10 persons. This definition includes two classifications: **Type A-1,** with a Gross Vehicle Weight Rating (GVWR) of 14,500 pounds or less; and **Type A-2,** with a GVWR greater than 14,500 pounds and less than or equal to 21,500 pounds. All Type A buses shall have dual rear wheels. Operators of 10-14 passenger Type A buses are **not** required to obtain a Commercial Driver's License (CDL). MDE has created a specific Training Curriculum for these drivers. This is a mode of pupil transportation that may offer flexibility and efficiencies to local school districts and serve to increase the pool of available drivers and meet the unique needs of their student body. Drivers of these vehicles will need to obtain a Class-D Non-CDL to operate these vehicles. Detailed licensing information can be found on the Mississippi Department of Public Safety, Driver Service Bureau website.

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 style school bus. This type also includes the cutaway truck chassis or truck chassis with cab with or without a left side door and with a GVWR greater than 21,500 pounds, designed for carrying more than ten 10 persons.

TYPE D

A Type D school bus is a body installed upon a chassis, with the engine mounted in the front, mid bus, or rear with a gross vehicle weight rating of more than 10,000 pounds, designed for carrying more than ten (10) persons. The engine may be behind the windshield and beside the driver's seat; it may be at the rear of the bus, behind the rear wheels; or between the front and rear axles. The entrance door is ahead of the front wheels. This type is also known as "transit-style school bus."

Front Engine Style

Rear Engine Style

MULTIFUNCTION SCHOOL ACTIVITY BUS (MFSAB)

A Multifunction School Activity Bus (MFSAB) shall mean a school bus whose purposes do not include transporting students to and from home or school bus stops, "as defined in 49 CFR 571.3." This subcategory of school bus meets all FMVSS for school buses except the traffic control requirements. MFSAB may be any Type A, C, or D.

SPECIAL NEEDS BUS

A Special Needs School bus shall mean any Type A, C, or D school bus as defined in this section, which has been modified to transport students requiring the use of a Wheelchair/Mobility Aid Position or Lift.

TABLE OF TYPE AND CAPACITY

TYPE(S)	CAPACITY
Type A-I Cutaway Van (Dual Wheels)	10-14, 16 - 20
Type A-II Cutaway Van (Dual Wheels)	16 – 23, 24-30
Type C - Conventional Flat Face Cowl	29-41, 42-59, 60-71, 72-83
Type D - Transit Type Front & Rear Mounted Engine	41-53, 54-65, 66-75, 76-90

SCHOOL BUS BODY AND CHASSIS SPECIFICATIONS

AIR CLEANER

A. A dry element air cleaner shall be provided.

B. 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.

AISLE

All emergency doors shall be accessible by a twelve inch (12") minimum aisle. Aisle shall be unobstructed at all times by any type of barrier, seat, wheelchair or tiedown, unless a flip seat is installed and occupied. A flip seat in the unoccupied (up) position shall not obstruct the twelve inch (12") minimum aisle to any side emergency door.

AXLES

The front and rear axle and suspension systems shall have a gross axle weight rating (GAWR), at ground commensurate with the respective front and rear weight loads of bus loaded to the rated passenger capacity.

BACK-UP WARNING ALARM

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, or shall have a variable volume feature that allows the alarm to vary from 87 dBA to 112 dBA sound level, staying at least 5 dBA above the ambient noise level.

BRAKES:GENERAL

A. The chassis brake system shall conform to the provisions of FMVSS Nos. 105, Hydraulic and Electric Brake Systems, 106, Brake Hoses, and 121, Air Brake Systems, as applicable. All buses shall have either a parking pawl in the transmission or a park brake interlock that requires the service brake to be applied to allow release of the parking brake.

B. The anti-lock brake system (ABS), provided in accordance with FMVSS No. 105, Hydraulic and Electric Brake Systems or No. 121, Air Brake Systems, shall provide wheel speed sensors for each front wheel and for each wheel on at least one rear

axle. The system shall provide anti-lock braking performance for each wheel equipped with sensors (Four Channel System).

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 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 device located on the instrument panel within reach of a seated 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.

G. All Type A, C, and D buses shall include Electronic Stability Control.

BRAKES: HYDRAULIC

Buses using hydraulic-assist brakes shall meet requirements of FMVSS 105.

BRAKES: AIR

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

B. The chassis manufacturer shall provide an accessory outlet for air-operated systems installed by the body manufacturer. This outlet shall include a pressure protection valve to prevent loss of air pressure in the service brake reservoir.

C. For air brake systems, an air pressure gauge shall be provided in the instrument panel capable of complying with Commercial Driver's License (CDL) pre-trip inspection requirements.

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

E. 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, *Air Brake Systems.*

F. All Type D buses 71 and over passenger capacity shall be equipped with air brakes.

BUMPER (FRONT)

A. School buses shall be equipped with a front bumper.

B. The front bumper on buses of Type A-2 (with GVWR greater than 14,500 pounds), Type C, and Type D shall be equivalent in strength and durability to pressed steel channel at least 3/16 inches thick and not less than 8 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. Type A buses having a GVWR of 14,500 pounds or less may be equipped with an OEM-supplied front bumper. The front bumper shall be of sufficient strength to permit being pushed by another vehicle on a smooth surface with a 5-degree, (8.7 percent) grade, without permanent distortion. The contact point on the front bumper is intended to be between the frame rails, with as wide a contact area as possible. If the front bumper is used for lifting, the contact points shall be under the bumper attachments to the frame rail brackets unless the manufacturer specifies different lifting points in the owner's manual. Contact and lifting pressures should be applied simultaneously at both lifting points.

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

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

BUMPER (REAR)

A. The bumper on Type A-1 buses shall be a minimum of 8 inches wide (high). Bumpers on Types A-2, C and D buses shall be a minimum of 9 ½ inches wide (high). The bumper shall be of sufficient strength to permit being pushed by another vehicle of similar size and being lifted by the bumper without permanent distortion.

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

C. The bumper shall be attached to the chassis frame in such a manner that it may be removed. It shall be braced to resist deformation of the bumper resulting from impact from the rear or the side. It shall be designed to discourage hitching of rides by an individual.

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

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

CAMERA SYSTEM - not brand specific (optional)

School bus camera systems shall be constructed to provide reliability to withstand extreme hot and cold temperatures, road vibrations, high humidity, and airborne dust/dirt caused by unpaved roads.

A. Interior

1. Interior camera system shall permit a minimum connection for four cameras.

2. Camera systems shall provide audio and video day/night recording.

3. May be either a hard or solid-state drive recorder system.

4. A dash camera may be installed for exterior traffic monitoring.

5. Cameras may be mounted in the front, side, back, and/or mid-ship of the bus. If mid-ship, they must be mounted off center and over a seat back. Corners and sharp edges shall be rounded or covered with a protective material.

6. Recording equipment shall be mounted as not to produce any tripping hazard if floor mounted.

7. The exterior camera system monitor may be incorporated as part of the interior rear-view mirror as long as when the monitor is inactive, it does not interfere with the normal use of the mirror.

8. The camera system hard drive/DVR shall be mounted outside the federal head impact zone, FMVSS 222 (School Bus Passenger Seating and Crash Protection).

9. Navigational devices, video event recording devices, and crash avoidance cameras mounted on the interior of the windshield shall be mounted not more than four inches below the upper edge of the area swept by the windshield wipers or not more than seven inches above the lower edge of the area swept by the windshield wipers. The devices shall be mounted outside the school bus driver's sightlines to the road, highway signs, highway signals, and students crossing in front of the bus.

B. Exterior

1. Cameras shall be a color not contrasting to its background and it shall not interfere with any safety system lettering. Back up cameras are exempt from the contrasting color requirement. These camera housings shall be black or school bus yellow.

2. Exterior cameras shall not extend over six inches from the surface of the bus.

3. Exterior cameras shall be mounted as high as possible.

4. Stop arm: Exterior camera may be mounted at or near the stop arm (see letter C).

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

   a. The back-up camera shall only activate when the bus is in reverse.

   b. The monitor to view the back-up camera video may be integrated into the interior review mirror or may be integrated as part of the dashboard.

6. Backup camera shall be used on Type D buses with a rear-engine.

7. Exterior camera system monitors shall not be mounted if it blocks the driver view in any direction.

8. Exterior camera system monitors shall only activate when the bus is in reverse for a rear camera or in park for side cameras. For buses without a park position in the transmission, the monitor shall only activate when the parking brake is applied. A forward-facing system monitor shall only activate with the red 8-way light warning system.

9. Exterior camera system monitors shall be automatically controlled without requiring driver action.

C. Stop Arm Video Monitoring Systems

If a stop arm video monitoring system is installed on a school bus, the following

minimum system requirements shall apply.

1. The system shall produce live digital and recorded video of vehicles being operated in violation of Nathan's Law.

2. The system shall produce a recorded image of the license plate.

3. The system shall record the activation status of at least one warning device (activation of either and/or the red traffic warning lights and the side stop sign) mounted on the school bus and the time, date, and location of the vehicle when the image is recorded.

4. The system shall not obscure the lettering of the side of the bus.

5. The system shall not impede or block any emergency exits.

6. Wiring shall not be mounted on the outside of the school bus and shall not be mounted inside the driver/passenger area.

7. All roof and side mounting locations shall be sealed to ensure no leaks.

8. They system shall have separate wiring from any emergency lights, alarms, etc.

9. All exterior cameras housings shall be painted NSBY.

10. The system shall operate automatically and not require driver activation.

11. Vendor/Manufacturer shall provide documentation to the locality that the system is properly mounted, and camera(s) are capturing clear video identifying a moving vehicle.

12. Vendor/Manufacturer shall warranty the complete system for at least 12 months after the school district accepts documentation of mounting.

13. Exterior camera(s) shall be designed to eliminate movement due to vandalism and rough roads.

~~CAPACITY PLATE~~

~~A label indicating the maximum design capacity of the bus shall be located near or incorporated in the bus body identification label.~~

CERTIFICATION

The chassis and body manufacturer(s) shall certify, upon request to the Mississippi Department of Education, that (their) product(s) meets Mississippi's minimum standards on items which are not covered by certification requirements of 49 CFR, Part 567:

Certification.

CHILD CHECK SYSTEM - ~~(not brand specific)~~

All school buses shall be equipped with a child check system that shall require the driver to walk through the bus to look for all children before leaving the bus. The driver shall go to the rear of the bus to deactivate the system. ~~A child check system shall be provided meeting the following specifications:~~

The child check system shall activate when the eight-way warning lights have been activated and fully cycled.

~~Once the child check system has been activated, the following procedures should take place before the driver can exit the bus (open the entrance door) without the horns sounding until the system is deactivated.~~

~~A. The door must be closed before the ignition is turned off or the key is turned to the accessory position, the driver must walk to the rear of the bus and manually operate a deactivation switch, which shall be located above the rear door or in the rear bulkhead area and clearly labeled.~~

~~B. Immediately upon deactivating, the interior dome light or such indicators shall activate to identify the system has disarmed.~~

~~C. The interior dome light shall illuminate and remain on for a minimum of 60 seconds after deactivating.~~

Any attempt to exit the bus by opening the entrance door will sound the horn until the system has been de-activated.

COLLISION MITIGATION SYSTEM (OPTIONAL)

There may be an option for passive and/or active electronic collision mitigation system(s).

COLOR

A. The school bus body shall be painted national school bus yellow.

B. The body exterior paint trim, rub rails, bumper, lamp hoods, emergency door arrow, and lettering shall be black. Electric buses may have blue bumpers. (Exceptions to school system name can be found under "Identification.")

C. The roof of the bus shall be painted white not to extend below the drip rails on the sides of the body.

D. The chassis and front and rear bumpers shall be black. Body, cowl, hood and

fenders shall be in National School Bus Yellow **(NSBY).** The flat top surface of the hood may be non-reflective NSBY.

E. Wheels may be black, chrome, or national school bus yellow. Electric school buses may have factory installed aluminum wheels or blue wheels.

F. The hood grill may be national school bus yellow, chrome, or black. Grill insert may be black. The original grill color shall not be changed by painting.

G. Multifunctional School Activity Buses shall be exempt from this requirement. (See MFSAB specifications)

COMMUNICATION SYSTEMS

Each bus shall be equipped with a two-way, voice communication system capable of providing communication with the operation's base, or at least local 911 operators where technologically feasible. All school buses that transport individuals with disabilities shall be equipped with a two-way electronic voice communication system that can be used at any point on the vehicle's route.

A. The end user shall be responsible for the purchase, installation, and maintenance of the two-way communication system.

B. CB radio systems and cell phones that are not equipped with two-way capabilities will not meet this requirement.

C. It is the responsibility of the local school system to comply with this specification.

CONSTRUCTION

Colorado Racking Load Test: All bus manufacturers shall certify that the bus body construction meets or exceeds all testing standards of the Colorado Racking Load Test. This certification is to assure adequate shear stiffness and construction strength of the bus body (See Appendix A).

Kentucky Pole Test: All bus manufacturers shall certify that the bus body construction meets or exceeds all testing standards of the Kentucky Pole Test (See Appendix B).

Construction of school bus body shall meet all requirements of FMVSS 220 (School Bus Rollover Protection), 49 CFR § 571.220, and all other applicable federal standards.

Construction shall be of prime commercial quality steel or other material with strength at least equivalent to all-steel as certified by the bus body manufacturer. All such construction materials shall be fire resistant. If roof caps are constructed of fiberglass, the fiberglass must be backed with a steel inner liner to protect the passenger compartment.

Construction shall provide reasonably dustproof and watertight unit.

Bus Body: The roof bows, body posts, strainers, stringers, floor, inner and outer linings, rub rails and other reinforcements shall be of sufficient strength to support entire weight of fully loaded vehicle on its top or side if overturned. Bus body as unit shall be designed and built to provide impact and penetration resistance.

Side Posts and Roof Bows: There shall be a body side post and roof bow fore and aft of each window opening. This may be a continuous bow or two separate pieces effectively joined.

Floor: Shall be of prime commercial quality steel of at least 14-gauge or other metal or other material at least equal in strength to 14-gauge steel. Floor shall be level from front to back and from side to side except in wheel housing, toe board, and driver's seat platform areas. When plywood is used, it shall be of one-half inch exterior B.B. Grade or equivalent and securely fastened to the existing steel floor.

Roof Strainers: Two or more roof strainers or longitudinal members shall be provided to connect roof bows, to reinforce flattest portion of roof skin, and to space roof bows. These strainers may be installed between roof bows or applied externally. They shall extend from windshield header and, when combined with rear emergency doorpost, are to function as longitudinal members extending from windshield header to rear floor body cross member. At all points of contact between strainers or longitudinal members and other structural material, attachment shall be made by means of welding, riveting or bolting.

Floor Sills: There shall be one main body sill at each side post and two intermediate body sills on approximately ten-inch centers. All sills shall be of equal height, not to exceed three inches. All sills shall extend width of body floor except where structural members or features restrict area. Main body sill shall be equivalent to or heavier than 10-gauge and each intermediate body sill shall be equivalent to or heavier than 16-gauge, or each of all sills shall be equivalent to or greater than 14-gauge. All sills shall be permanently attached to floor. Connections between sides and floor system shall be capable of distributing loads from vertical posts to all floor sills.

All openings between chassis and passenger-carrying compartment made due to alterations by body manufacturers shall be sealed.

A cover shall be provided for the opening to the fuel supply container fill pipe or charging port for battery electric powered school buses.

A moisture and rustproof removable panel shall be provided in the floor for access to the fuel supply container sender gauge. It shall be designed for prolonged use and adequate fastening to the floor.

All Type C and D shall meet the requirements of Section A below.

A. Side Intrusion Test: The bus body shall be constructed to withstand an intrusion

force equal to the curb weight of the vehicle or 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. The complete body structure, or a representative seven-body section mockup with seats installed, shall be load-tested at a location 24 ± 2 inches above the floor line, with a maximum 10-inch diameter cylinder, 48 inches long, mounted in a horizontal plane.

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. When the minimum load has been applied, the penetration of the loading cylinder into the passenger compartment shall not exceed 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. Body companies shall certify compliance with this intrusion requirement, and include test results, as requested.

B. Construction shall be reasonably dust-proof and watertight, so that the bus does not leak under normal operating conditions.

C. Body joints present in that portion of a Type A school bus body furnished exclusively by the body manufacturer shall conform to the performance requirements of FMVSS 221, "School Bus Body Joint Strength." This does not include the body joints created when body components are attached to components furnished by the chassis manufacturer.

D. Type A school bus bodies shall be equipped with restraining barriers conforming to FMVSS 222, "School Bus Passenger Seating-Crash Protection," Sections 5.2 and 5.3.

CROSSING CONTROL ARM

A. All school buses shall be equipped with a crossing control arm mounted on the right side of the front bumper. When opened, this arm shall extend in a line parallel to the body side and aligned with the right front wheel.

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

C. 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.

D. The crossing control arm shall be constructed of non-corrodible or nonferrous material or shall be treated in accordance with the body sheet metal specification.

E. There shall be no sharp edges or projections that could cause injury or be a hazard to students. The end of the arm shall be rounded.

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

G. The crossing control arm shall extend simultaneously with the stop signal arm(s), activated by stop signal arm controls.

H. An automatic recycling interrupt switch may be installed for temporarily disabling the crossing control arm.

I. 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

A. 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.

Note: The requirements of this standard do not apply to the exterior surfaces of double pane storm windows.

B. The defrosting system shall conform to SAE J381, Windshield Defrosting Systems Test Procedure and Performance Requirements-Trucks, Buses, and Multipurpose Vehicles.

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

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

E. Portable heaters shall not be used.

DOORS

A. The entrance door shall be under the driver's control, designed to afford easy release and to 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% grade, both uphill and downhill.

B. The primary 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.

D. The entrance door shall be a split-type door and shall open outward.

E. All entrance door glass shall be approved safety glass. The bottom of each lower glass panel shall be not 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 be not more than 3 inches below the interior door control cover or header pad.

F. Vertical closing edges on entrance doors shall be equipped with flexible materials.

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

H. On power-operated entrance doors, the emergency release valve, switch or device to release the entrance door must be placed above or to the immediate left or immediate right of the entrance door and must be clearly labeled. The emergency release valve, switch or device shall work in the absence of power.

I. If air or electric doors are used, the amber warning lights shall be activated from a momentary switch. A three-position switch or bezel of contrasting color to the dash, located on the panel to the right side shall activate the sequence as follows:

1. Position One - door closed; lights off.

2. Position Two - activate red lights, stop arm, and crossing control arm.

3. Position Three - red lights activated, door open, stop arm activated, and crossing control are activated.

DRIVE SHAFT

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

ELECTRICAL SYSTEM

A. Alternator (FOR INTERNAL COMBUSTION ENGINES ONLY)

1. All Type A buses with a GVWR of 15,000 pounds or less shall have a minimum 130-amp alternator. Buses equipped with an electrically powered wheelchair lift and/or air conditioning shall be equipped with the highest rated capacity available from the chassis OEM.

2. All buses over 15,000 pounds GVWR shall be equipped with a heavy-duty truck or bus-type alternator having a minimum output rating of 200 amps or higher and should produce a minimum current output of 50 percent of the rating at engine idle speed.

3. All other buses than those described in B1 equipped with an electrically powered wheelchair lift and/or air conditioning shall have a minimum alternator output of 240 amps and may be equipped with a device that advances the engine idle speed when the voltage drops to, or below, a pre-set level.

4. A belt-driven alternator shall be capable of handling the rated capacity of the alternator with no detrimental effect on any other driven components. (For estimating required alternator capacity, see School Bus Manufacturers Technical Council's publication, "School Bus Technical Reference," available at http://www.nasdpts.org.)

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

B. Low-Voltage Battery

1. The low-voltage storage batteries shall have minimum cold cranking capacity rating (cold cranking amps) equal to the cranking current required for 30 seconds at 0 degrees Fahrenheit 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.

2. The manufacturer shall securely attach the low-voltage battery on a slide-out or swing- out tray in a closed, vented compartment in the body skirt or chassis frame 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 or top. 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. Battery cables shall meet the Society of Automotive Engineers (SAE) requirements. Battery cables shall be of sufficient length to allow the battery tray to fully extend. Any chassis frame-mounted batteries shall be relocated to a battery

compartment on Type A buses.

3. All low-voltage batteries are to be secured in a sliding tray, or an accessible service tray except that on 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 agreed upon mutually by the chassis and body manufacturers. However, in all cases the battery cable provided with the chassis shall have sufficient length to allow some slack and shall be of sufficient gauge to carry the required amperage.

4. Buses with internal combustion engines may be equipped with a low-voltage battery shut-off switch. The switch is to be placed in a location not readily accessible to the driver or passengers.

5. Electric buses may have mounted twelve (12) volt batteries in an easily accessible location under the hood.

6. Buses with a high-voltage battery electric powertrain shall be equipped with a low-voltage battery shut-off switch. The switch is to be placed in a location not readily accessible to the driver or passengers.

C. High-voltage battery

1. High-voltage battery assemblies shall be protected according to federal requirements.

2. High-voltage batteries shall have a main-service disconnect that isolates the batteries and does not allow high voltage outside the battery pack.

D. Electrical Components

Materials in all electrical components shall contain no mercury.

E. Wiring, Chassis

1. All wiring shall conform to current applicable recommended practices of the Society of Automotive Engineers (SAE). All wiring shall use color and at least one other method for 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.

2. The chassis manufacturer of an incomplete vehicle shall install a readily accessible terminal strip or connector 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 connector 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. Back-up lamps; and

G. Instrument panel lamps (controlled by dimmer switch).

3. An appropriate identifying diagram (color plus a name or number code) for all chassis electrical circuits shall be provided to the body manufacturer for distribution to the end user.

4. Wiring for the headlamp system must be separate from the electronic controlled body solenoid/module.

F. Wiring, Body

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

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 a 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 than 18 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 breaker or electronic protection device. 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 shall include any changes to wiring made by the body manufacturer. Chassis wiring diagrams shall be supplied to the end user. The following body interconnecting circuits shall be color-coded, as noted:

FUNCTION	COLOR
Left Rear Directional Lamp	Yellow
Right Rear Directional Lamp	Dark Green
Stop Lamps	Red
Back-up Lamps	Blue
Tail Lamps	Brown
Ground	White
Ignition Feed, Primary Feed	Black

The color of the cables shall correspond to SAE J1128, *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 the entrance door is open
   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.

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

H. 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.

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

~~ELECTRONIC STABILITY CONTROL (ESC) (optional)~~

~~Buses should be equipped with Electronic Stability Control (ESC).~~

ELECTRIC VEHICLE CHARGING PORT

A. The high-voltage batteries shall be equipped with a system that allows the batteries to be charged via a connection to the local electrical utility grid. This connection shall be a Combined Charging System (CCS), North American Charging Standard (NACS), or SAE J1772, compatible with the charging equipment.

B. The charging receptacle/port shall be mounted/located in accordance with the manufacturer standards. The receptacle shall accommodate the minimum requirements for Level II AC charging and DC fast charging.

ELECTRIC VEHICLE DC-DC CONVERTER

A. A DC-DC converter shall be provided and deliver a minimum of 200 amps at 12VDC.

B. The converter system shall incorporate a Ground Fault Interrupt (GFI) that disconnects/isolates the high-voltage batteries in the event of a shorted circuit or water intrusion.

ELECTRIC VEHICLE HIGH-VOLTAGE SYSTEM

High Voltage-Powered Vehicles: Buses utilizing a high voltage propulsion system (60 VDC or 30 VAC) shall comply with the following:

A. The propulsion power source (batteries, fuel cells, etc.) shall be located outside the passenger compartment.

B. The propulsion power source enclosure shall be constructed to conform to the power source manufacturer's requirements and recommendations.

C. Wire, cable, and conductor insulation in the High Voltage System shall provide adequate insulation for the voltage used and for ambient temperatures ranging from - 15°F to 120°F. All high voltage wiring/cabling shall be covered with bright orange loom or otherwise labeled as HIGH VOLTAGE. All high voltage circuits shall provide adequate and automatic protection against electrical overloads caused by short circuits or other excessive current conditions through the use of

fuses, circuit breakers, and ground fault interruption.

D. Each door, cover, or other panel that affords immediate access to any high voltage area shall be plainly marked with a hazard warning label which shall read WARNING-HIGH VOLTAGE or DANGER-HIGH VOLTAGE. This label shall be located in a highly conspicuous place. All high voltage access areas shall be equipped with a lock or otherwise secured to prevent unauthorized access.

E. All high voltage circuits shall provide adequate and automatic protection against electrical overloads caused by short circuits, or other excessive current conditions through the use of fuses, circuit breakers, and ground fault interruption.

ELECTRIC VEHICLE IGNITION SYSTEM

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

B. The high voltage system shall be designed so that when the ignition switch is off, the high voltage is disconnected.

ELECTRIC VEHICLE REGENERATIVE BRAKES

In addition to service brake specifications for combustion engine buses, Electric Vehicles (EVs) shall be equipped with regenerative braking that utilizes the electric driver system in concert with the service brakes to slow the vehicle and return electrical energy to the battery system.

ELECTRIC VEHICLE SYSTEM PROTECTION

A. As part of the Battery Management System, EVs shall be equipped with an automatic shutdown to protect system components from damage caused by malfunctions such as charging/discharging faults, battery overheating, electrical overheating, degraded battery health, etc.

B. Prior to automatic shutdown, a warning or maintenance indicator shall display in the driver console to notify the driver in impending shutdown or the need for immediate maintenance and allow enough time to safely reposition and stop the bus. Gradual derating or propulsion shall occur prior to complete automatic shutdown.

EMERGENCY EQUIPMENT

A. Fire Extinguisher

1. The bus shall be equipped with at least one (1) pressurized, dry, chemical fire extinguisher, complete with hose, to meet Underwriters Laboratories, Inc., approval. The extinguisher shall be mounted 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 so as to be easily read without

moving the extinguisher from its mounted position. The fire extinguisher shall not be located in the entrance door area.

2. The fire extinguisher shall be of a type approved by Underwriter Laboratories, Inc., with a total rating of 2A:10B:C or greater and at least 5 lbs. The operating mechanism shall be sealed with a type of seal which will not interfere with the use of the fire extinguisher.

3. Fire extinguishers must comply with State Fire Codes

B. First-Aid Kit

1. 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 identified as a first aid kit. The location for the first aid kit shall be marked.

2. Each kit shall include:

2 - 1" x 2 1/2 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 - round end scissors
1 - pair ~~latex~~ medical examination gloves
1 - mouth-to-mouth airway

C. Body Fluid Clean-up Kit

1. 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.

2. Each kit shall include:

~~1 - 2 oz. package infectious liquid spill control powder~~
~~1 - odor reducing mask~~
~~2 - latex gloves~~
~~2 - antiseptic wipes~~
~~2 - paper crepe towels 1 - scraper~~
~~1 - plastic disposal bag with scoop and tie~~

4 – antiseptic BZK Towelettes

2 – biohazard Bag – w/Tie
4 – gloves, Nitrile
1 – face mask/eye shield
1 – fluid solidifier – minimum 10g
1 – scooper, plastic
1 – scoop bag
4 – paper towels
2 – germicidal wipes
1 – personal protection hair cover
1 – gown
1 – hand sanitizer – minimum - .9g each

D. Warning Devices

Each school bus shall contain at least three (3) reflectorized, triangle road warning devices that meet the requirements of FMVSS No. 125, *Warning Devices.* They shall be mounted in an accessible place.

E. Any piece of 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.

EMERGENCY EXITS

Any installed emergency exit shall comply with the design and performance requirements of FMVSS No. 217, *Bus Emergency Exits and Window Retention and Release,* applicable to that type of exit, regardless of whether or not that exit is required by FMVSS No. 217.

A. Emergency Window Requirements

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

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

B. Emergency Door Requirements

1. The exposed area of the upper panel of emergency doors shall be a minimum of 400 square inches of approved safety glazing.

2. If installed, all glass panels on emergency doors shall be approved glazing.

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

4. There shall be no obstruction higher than ¼ inch across the bottom of any emergency door opening. Fasteners used within the emergency exit opening shall be free of sharp edges or burrs.

5. Roof Hatches: Using the following standard and conforming to FMVSS 217, a head form moving at a velocity of 2 in/min, a perpendicular force applied directly to the center of the hatch lid must exceed 3100 N (700 lb.) before ANY one of the following conditions can occur:

    - The roof hatch opens (release mechanism fails).
    - The hath deforms such that an opening large enough to admit the passage of a four-inch sphere is created.
    - The inner surface of the hatch at the center has moved perpendicularly to the undisturbed surface of the hatch a distance equal to the length of the smallest chord along the surface of the hatch passing through the center divided by 4.

C. Emergency Exit Requirements

Types A, 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.

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

2. 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.

3. Simple release mechanism shall be provided on roof exits, permitting operation as emergency exits(s), assessable inside and outside the vehicle. Roof exits shall be installed, hinged toward the front.

4. Roof exits shall provide a "partially open" position along with the full width of the hatch, adequate to allow air and thereby ventilate the bus.

5. All metallic hardware shall be manufactured from corrosion-resistant materials such as aluminum, brass or stainless steel, etc. as to prevent corrosion and possible failure of the opening mechanism.

6. Use **Table 1** if the bus contains a rear emergency door or use **Table 2** if the bus contains a rear push-out emergency window AND a left side emergency door as required by FMVSS No. 217 for school buses without a rear emergency door.

TABLE 1
BUSES WITH REAR EMERGENCY DOOR
(All Front Engine Buses)

Available Combinations By Capacity	Manufacturers Equipped Capacity	Shall Have	And Shall Also Have		
		Roof Hatch	L. Side Emerg. Exit Windows	R. Side Emerg. Exit Windows	
1-42	1-42	1	1	1	
43-78	43-78	2	2	2	
79-90	79-90	2	3	3	

TABLE2
BUSES WITH REAR PUSHOUT WINDOW AND LEFT SIDE EMERGENCY DOOR
(All Rear Engine Buses)

Available Combinations By Capacity	Manufacturers Equipped Capacity	Shall Have	And Shall Also Have		
		Roof Hatch	L. Side Emerg. Exit Windows	R. Side Emerg. Exit Windows	
1-42	1-42	1	1	1	
43-78	43-78	2	2	2	
79-90	79-90	2	3	3	

D. Emergency Exit Interlock Device Requirements

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

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

EV IDENTIFICATION LABEL

A. Each EV school bus shall be identified with a permanent, diamond-shaped label located on the exterior vertical surface or near-vertical surface on the lower right rear of the school bus other than on the bumper of the vehicle.

B. The label shall be a minimum of 4.7 inches long x 3.0 inches high.

C. The marking in the label shall consist of a blue colored background, a border, and the letters "EV," one inch in height with the lightning bolt in the center.

D. In addition to the location on the right rear, labels shall be affixed to each side of the school bus, rear of the entrance door and beneath the driver's window. Example:

E. Battery disconnect label

1. A permanent label with black one-inch letters shall identify the location(s) of the battery disconnect switch or device.

2. Any instructions may be printed adjacent to the switch or device in letters ½ inch high.

EXHAUST SYSTEM (FOR INTERNAL COMBUSTION ENGINES ONLY)

A. The exhaust pipe, after-treatment system and tailpipe shall be outside the bus body compartment and shall be attached to the chassis so that any other chassis component is not damaged.

B. 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.

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

D. 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 or the tailpipe may extend through the bumper. The tailpipe exit location on all Types A-1 buses may be in accordance with the manufacturer's standards. The tailpipe shall not exit beneath any fuel filler location, emergency door or lift door.

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

F. The design of the after-treatment systems shall not allow active (non-manual) regeneration of the particulate filter during the loading and unloading of passengers. Manual regeneration systems will be designed such that unintentional operation will not occur.

G. For after treatment systems that require Diesel Exhaust Fluid (DEF) to meet

federally mandated emissions:

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

2. The DEF supply tank shall be sized to meet a minimum ratio of 3 diesel fills to 1 DEF fill.

FENDERS:FRONT

A. When measured at the fender line, the total spread of the outer edges of front fenders shall exceed the total spread of front tires when front wheels are in a straight-ahead position.

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

FIRE SUPPRESSION SYSTEMS (OPTIONAL)

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

~~B. Fire suppression system nozzles shall be located in the engine compartment, under the bus, in the electrical panel or under the dash, but they shall not be located in the passenger compartment. The system must include a lamp or buzzer to alert the driver that the system has been activated.~~ Fire suppression system shall include audio and visual alerts to notify the driver that the system has been activated.

FLOOR AND FLOOR COVERINGS

A. The floor in the under-seat area, including the tops of the wheel housing, driver's compartment, and toe board, shall be covered with rubber floor covering or the equivalent, having a minimum overall thickness of point one eight of an inch (1/8") and calculated burn rate of 0.1 or less using the test measures, procedure and formulas in FMVSS 302 Flammability of Interior Materials. The driver's area on all Type A buses may be manufacturer's standard flooring and floor covering.

B. ~~The floor covering in the aisle shall be of an aisle-type rubber or equivalent, wear-resistant and ribbed. The minimum overall thickness shall be 3/16 inch measured from the tops of the ribs~~.The floor covering in the aisles shall be ribbed or other raised pattern elastomer and have a calculated burn rate of 0.1 mm per minute or less using the test methods, procedures and formulas listed in FMVSS No. 302 Minimum overall thickness shall be .187 inch measured from tops of ribs.

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

D. On Types C and D buses, the manufacturer shall provide a screw-down plate to access the fuel tank sending unit that is secured and insulated. The plate shall be mounted so that access is readily available to repair personnel and so that the floor covering is not disturbed during the repair process.

FRAME

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

B. Making 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 the chassis manufacturer.

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

D. Any secondary manufacturer that modifies the original chassis frame shall provide a warranty at least equal to the warranty offered by the original equipment manufacturer (OEM) and shall certify that the modification and other parts or equipment affected by the modification shall be free from defects in material and workmanship under normal use and service intended by the OEM.

E. Monocoque bus chassis are not allowed.

FUEL SYSTEM

A. Fuel tank(s) having a minimum 25-gallon capacity shall be provided by the chassis manufacturer. Each tank shall be filled from and vented to the outside of the passenger compartment, and each fuel filler should be placed in a location where accidental fuel spillage will not drip or drain on any part of the exhaust system.

B. The fuel system shall comply with FMVSS No. 301, *Fuel System Integrity.*

C. All types of school buses with a design capacity of 53 and larger shall have a fuel capacity of not less than 60 gallons. Type C and D buses with a design capacity of 65 and larger may have a 100-gallon tank.

D. 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.

E. The actual draw capacity of each fuel tank shall be a minimum of 83 percent of the

tank capacity.

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

G. Installation of Liquified Petroleum Gas (LPG) tanks shall comply with National Fire Protection Association (NFPA) 58, *Liquefied Petroleum Gas Code.*

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

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

~~GOVERNOR~~

~~An electronic engine speed limiter shall be provided and set to limit engine speed, not to exceed the maximum revolutions per minute, as recommended by the engine manufacturer.~~

HANDRAILS

~~At least one handrail shall be installed~~. A handrail shall be installed on the left and right sides of the stepwell. The handrail shall be a minimum of 1" diameter and be constructed from corrosion resistant material(s). The handrails shall assist passengers during entry or exit and shall be designed to prevent entanglement, as evidenced by the passing of the National Highway Traffic Safety Administration (NHTSA) string and nut test.

HEATING SYSTEM, PROVISION FOR

The engine shall be capable of supplying coolant at a temperature of at least 170 degrees Fahrenheit at the engine coolant thermostat opening. The coolant flow rate shall be 50 pounds per minute at the return end of 30 feet of one inch inside diameter automotive hot water heater hose. (See SBMTC-001, *Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment.)*

HEATING AND AIR CONDITIONING SYSTEMS

A. Heating system

1. The heater shall be hot water combustion type, electric heating element or heat pump.

2. The front heater shall be of fresh air, or combination fresh air and re- circulating type.

3. Heater hoses and clamps shall be adequately supported and shielded to protect hoses against excessive wear due to vibration. Heater lines, cores, and elements on the interior of the bus shall be shielded to prevent scalding or burning for the driver or passengers. Heater hoses conform to SAE J20r3, June 2006 E

4. Buses shall have a minimum of two heaters: one front and one rear.

5. Additional heaters may be re-circulating air type.

6. The heating system shall be capable of maintaining bus interior temperatures, as specified in test procedure SAE J2233.

B. Auxiliary fuel-fired (Optional)

1. Auxiliary fuel-fired heating systems are permitted, provided they comply with the following:

   a. The auxiliary heating system shall utilize the same type of fuel as specified for the vehicle engine;

   b. The heater(s) may be direct, hot air-type or may be connected to the engine coolant system;

   c. An auxiliary heating system, when connected to the engine coolant system, may be used to preheat the engine coolant or preheat and add supplementary heat to the 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. All combustion heaters shall be in compliance with current Federal Motor Carrier Safety Regulations.

   f. The auxiliary heating system shall require low voltage.

   g. Auxiliary heating systems shall comply with FMVSS No. 301, *Fuel System Integrity,* and all other applicable FMVSS, as well as with SAE test procedures.

2. All forced-air heaters installed by body manufacturers shall bear a name plate

that indicates the heater rating in accordance with Standards is the School Bus Manufacturers Technical Committee (SBMTC)-001, *Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment.* The plate shall be affixed by the heater manufacturer and shall constitute certification that the heater performance is as shown on the plate.

3. Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or any sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hoses shall conform to SAE J20c, *Coolant System Hoses.* Heater lines, cores, and elements on the interior of the bus shall be shielded to prevent scalding or burning of the driver or passengers.

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

5. All heaters of hot water type 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.

6. On hot water type systems, accessible bleeder valves for removing air from the heater shall be installed in an appropriate place in the return lines of body company-installed heater.

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

C. Passenger Compartment Air Conditioning

The following specifications are applicable to all types of school buses that shall be equipped with air conditioning. This section is divided into three parts. Part 1 covers performance specifications; Part 2 covers test conditions and Part 3 covers other requirements applicable to all buses.

1. Performance Specifications

a. Standard Performance

The installed air conditioning system should cool the interior of the bus from 100 degrees to 80 degrees Fahrenheit, measured at three points (minimum) located four feet above the floor on the longitudinal centerline of the bus. The three required points shall be: (1) three feet above the center point of the horizontal driver seat surface, (2) at the longitudinal midpoint of the body, and (3) three feet forward of the rear emergency door or, for Type D rear-engine buses, three feet forward of the end of the aisle. Note for the Type A vehicles placement of the rear thermocouple should be centered in the bus over the rear axle. The independent temperature reading of each temperature probe inside the bus shall be within a range of ± 3 degrees Fahrenheit of the average temperature at the conclusion of the test.

b. High Performance

The installed air conditioning system should cool the interior of the bus from 100 degrees to 70 degrees Fahrenheit, measured at three points (minimum) located four feet above the floor on the longitudinal centerline of the bus. The three required points shall be:

- three feet above the center point of the horizontal driver seat surface,
- at the longitudinal midpoint of the body, and (3) three feet forward of the rear emergency door or, for Type D rear-engine buses,
- three feet forward of the end of the aisle. Note for the Type A vehicles placement of the rear thermocouple should be centered in the bus over the rear axle. The independent temperature reading of each temperature probe inside the bus shall be within a range of ± 3 degrees Fahrenheit of the average temperature at the conclusion of the test.

2. Test Conditions

The test conditions under which the above performance standards must be achieved shall consist of (1) placing the bus in a room (such as a paint booth) where ambient temperature can be maintained at 100 degrees Fahrenheit; (2) heat-soaking the bus at 100 degrees Fahrenheit at a point measured two feet horizontally from the top of the windows on both sides of the bus, with windows open for two hours; and (3) closing windows, turning on the air conditioner with the engine running at 1250 ± 50 RPM, and cooling the interior of the bus to 80 degrees Fahrenheit, (standard performance) or 70 degrees Fahrenheit (high performance), within 30 minutes while maintaining 100 degrees Fahrenheit outside temperature.

The manufacturer shall provide test results that show compliance with standard systems. If the bid specifies, 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.

3. 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 the bus;

   b. Evaporators and ducting systems shall be designed and installed to be free of projections or sharp edges. Ductwork shall be installed so that exposed edges face the front of the bus and do not present sharp edges;

   c. On school buses equipped with Type-2 seatbelts having anchorages above the windows, the ducting (if used) shall be placed at a height sufficient to not obstruct occupant securement anchorages. This clearance shall be provided along the entire length (except at evaporator locations) of the passenger area on both sides of the bus interior;

   d. The body shall be equipped with insulation, including sidewalls, roof, firewall, rear, inside body bows and plywood or composite floor insulation to reduce thermal transfer;

   e. All glass (windshield, service and emergency doors, side and rear windows) shall 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 shall be painted white to aid in heat dissipation; and

   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.

   i. For all buses (except Type D rear engine transit) equipped with a rear evaporator assembly, evaporator shall not encroach upon head impact zone but may occupy an area of less than 26.5 inches from the rear wall and 14 inches from the ceiling.

   j. For Type D rear engine transit buses equipped with a rear evaporator over the davenport, the evaporator assembly may not interfere with rear exit window and may not extend above the rear seating row.

HINGES

All exterior metal door hinges shall be designed to allow lubrication to be channeled to the center 75% of each hinge loop without disassembly, unless they are constructed of stainless steel, brass or non-metallic hinge pins or other designs that prevent corrosion.

HORN

The bus shall be equipped with a horn(s) of standard make with the horn(s) capable of producing a complex sound in bands of audio frequencies between 250 and 2,000 cycles per second, and tested in accordance with SAE J377, *Hom-Forward Warming- Electric-Performance, Test, and Application.*

IDENTIFICATION

A. The body shall bear the words "SCHOOL BUS" in black letters at least eight (8) inches high on both front and rear of the 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. MFSABS are exempt from these requirements.

B. Required lettering and numbering shall include:

   1. District, contractor name or cooperative shall be displayed at the beltline in letters that are a minimum of 5 inches in height.

   2. The bus identification number displayed on the sides, on the rear and on the front shall be black or contrasting unshaded numbers not less than 5 inches high.

C. Other lettering, numbering or symbols that may be displayed on the exterior of the bus shall be limited to:

   1. Bus identification number on top of the bus, in addition to required numbering on the sides, rear and front;

   2. The location of the battery(ies) identified by the word "BATTERY" "BATTERIES" or “12V BATTERIES” on the battery compartment door in two-inch lettering.

   3. Symbols or letters not to exceed 64 square inches of total display near the entrance door, displaying information for identification by the students of the bus or route served.

   4. Manufacturer, dealer or school identification or logos.

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

6. Electronic warning sign or lettering on the rear of the bus ~~related~~ relating to school bus flashing signal lamps.

7. Lettering relating to railroad stop procedures; ~~and~~

8. Identification of fuel type in 1-inch lettering adjacent to the fuel filler opening.

9. Manufacturer's identification of the Diesel Exhaust Fluid (DEF) compartment, if applicable.

10. Identification of charging port on a Battery-Electric Bus in one-inch lettering adjacent to the port location.

D. Only signs and lettering approved by state law, regulation, or authority shall appear on the bus.

INSIDE HEIGHT

The inside body height shall be seventy-two inches (72") or more, measured metal to metal, at any point on longitudinal centerline from the front vertical bow to the rear vertical bow. The inside body height of Type A-1 buses shall be sixty-two inches (62") or more. Inside height measurement does not apply to air conditioning equipment.

INSTRUMENTS AND INSTRUMENT PANEL

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

Note: Telltale warning lamps in lieu of gauges are not acceptable, except as noted.

1. Speedometer;

2. Odometer that can be read without using a key and that will give accrued mileage (to seven digits), including tenths of miles, unless tenths of miles are registered on a trip odometer.

3. Tachometer (internal combustion engines only);

Note: For Type C and D buses, a tachometer shall be installed so as to be visible to the driver while seated in a normal driving position.

4. Voltmeter (low voltage);

~~**Note:** 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.~~

5. Oil pressure gauge (internal combustion engines only);

6. Water temperature gauge;

7. Fuel gauge (internal combustion engines only);

8. DEF gauge (if quipped).

9. High beam headlamp indicator.

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

11. Turn signal indicator; ~~and~~

12. Glow-plug indicator lamp, where appropriate;

13. High-Voltage battery state of charge (electric bus only);

14. Motor Temp (electric bus only);

15. Battery available range in miles (electric bus only);

16. Battery discharge and regeneration rate (electric bus only); and

17. Battery temperature (electric bus only).

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

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

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

E. Multi-Function Gauge (MFG)

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

2. 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. If two or more functions displayed on the MFG go out of limits simultaneously, then the MFG should sequence automatically between those functions continuously until the condition(s) are corrected.

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

INSULATION

A. Thermal insulation shall be fire-resistant, UL approved, with minimum R-value of 5.5. Insulation shall be installed to prevent sagging.

B. Floor insulation shall be five-ply softwood plywood, nominal ¾-inch thickness and shall be equal to or exceed properties of the exterior-type, C-D Grade, as specified in the 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 ½-inch-thick plywood or equivalent material meeting the above requirements.

Equivalent material may be used to replace plywood, provided it has equal or greater insulation R-value, sound abatement, deterioration-resistant and moisture-resistant properties.

INTERIOR

A. The interior of the bus shall be free of all unnecessary projections, which include luggage racks and attendant handrails, to minimize the potential for injury. This specification requires inner lining on ceilings and walls. If the ceiling is constructed with lap joints, the 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 AND BODY SPECIFICATIONS, Storage Compartment.)

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

1. Head protection requirements of FMVSS No. 222, *School Bus Passenger Seating and Crash Protection,* where applicable

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

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

4. ~~Be~~ Attached to the bus sufficiently to withstand a force equal to 20 times the maximum rated capacity of the compartment; and

5. Have no protrusions greater than ¼ inch.

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

D. Every school bus shall be constructed so that the noise level at the ear of the occupant nearest to the primary vehicle noise source shall not exceed 85 dBA when tested according to the procedure described in the National School Transportation Specifications and Procedures.

LAMPS AND SIGNALS

A. Interior lamps which illuminate the aisle and the stepwell shall be provided. The stepwell lamp shall be illuminated by an entrance door-operated switch, to illuminate only when headlamps and clearance lamps are on and the entrance door is open.

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

C. School bus alternately flashing signal lamps shall be provided, as described by MS Code 63-7-23. MFSABs are exempt from this requirement.

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

2. 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 the same level, but closer to the vertical centerline of the bus. The system of red and amber signal lamps shall be wired so that amber lamps are energized manually. The red lamps are automatically energized, and amber lamps are automatically de-energized when stop signal arms and the crossing control arm are extended or when the bus entrance door is opened.

   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 nonsequential systems can be configured with a multitude of switch combinations to provide a unique

system meeting specific user requirements. An amber pilot lamp and a red pilot lamp shall be installed adjacent to the driver controls for the flashing signal lamp to indicate to the driver which lamp system is activated.

3. If air or electric doors are used, the amber lights shall be activated from a momentary switch. A three-position switch shall activate the sequence as follows:

    a. Position one-Door closed; lights off.
    b. Position two-Activate red lights, stop arm and crossing control arm.
    c. Position three-Red lights activated, door open, stop arm activated and crossing control arm activated.

4. Background color may be NSBY or glossy black.

5. Red lamps shall flash at any time the stop signal arm is extended.

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

D. Turn signal and stop/tail lamps

1. The bus body shall be equipped with amber rear turn signal lamps that are at least seven inches in diameter or, if a shape other than round, a minimum 38 square inches of illuminated area and shall 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 a vehicular traffic hazard warning. Turn signal lamps are to be placed as wide apart as practical and their horizontal centerline shall be a maximum of 12 inches below the rear window.

2. 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 entrance door.

3. 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 of 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 against any short circuit or intermittent shorts by a fuse circuit breaker, or electronic protection device.

F. A white flashing strobe lamp shall be installed on the roof of a school bus at a location not closer than 12 inches or more than 6 feet from the rear of the roof edge. However, if the bus is equipped with a roof hatch or other roof mounted equipment falling within the above-mentioned measurements, the strobe lamp may be located directly behind that equipment. The lamp shall have a single clear lens emitting light 360 degrees around its vertical axis, meeting the requirements of SAE J845. It may not extend above the roof more than the maximum legal height. A manual switch and a pilot lamp shall be included to indicate when the lamp is in operation. Optionally, the strobe lamp may be wired to activate with the amber alternately flashing signal lamps, continuing through the full loading or unloading cycle, and may be equipped with an override switch to allow activation of the strobe at any time for use in inclement weather.

G. The bus body shall be equipped with two white rear backup lamps 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.

1. Optional Additional Backup Lights shall be an additional lighting system behind the rear axle. The system shall be white, LED wired to the backup light circuit. The system shall be skirt mounted and illuminate a rectangular area on both sides of the vehicle beginning 29 inches aft of center point of the rear axle. This area shall extend outward from the vehicle sides 24 inches and rearward 30 inches with no point within this area having illumination of less than 3-foot candles as tested on a bare concrete surface. Must be OEM installed by the manufacturer.

H. A daytime-running-lamps (DRL) system shall be provided.

I. LED lighting shall be used in all exterior body lamps and signals. Eight-way loading/unloading lights and stop arm shall be strobe- type LED. Any light not integrated with the manufacturer's headlamp shall be LED. However, Generation II type (80 mA) shall be the minimum brightness when used in stop arm and alternating strobing signal lamp applications.

J. Exterior Light for Loading Zoan (optional) – If equipped, an exterior lamp or lamps to illuminate an area on the right side of the bus shall:

1. Project white light;

2. Have the illumination of the area tested for compliance with the entrance door and all windows closed, to produce a minimum illumination of 10 lux when measured at each point on the grid, as indicated in Figure 6, at a height of 0.5m (1.6 ft) and 1.0 m (3.3 ft) above the ground, with the light meter positioned so that it measures incident light on a plane oriented perpendicular to the observation direction, either from the eye point of the driver or the mirror so that the driver could observe that location;

3. Direct its light in a manner that prevents the light from shining directly into the right-side rear-view mirror and crossover mirror;

4. If not disabled by the noise suppression switch, turn on when the door is opened and when the ignition power is on;

5. Turn off approximately five seconds after the door has closed.

    a. An additional switch or other means may be installed to allow the driver to temporarily de-activate the operation of the exit lamp(s).

METAL TREATMENT

A. All metal except high-grade stainless steel or aluminum used in construction of the bus body shall be zinc-coated or aluminum-coated or treated to prevent corrosion. This includes but is/not limited to 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.

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

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

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

MIRRORS

A. The interior glass mirror shall be either laminated or tempered and shall have rounded corners and protected edges. Mirrors shall be 6 x 16 inches minimum for

Type A buses and be 6 x 30 inches minimum for Types C and D buses.

B. Each school bus shall be equipped with exterior mirrors meeting the requirements of FMVSS No. 111, *Rearview Mirrors.* The right-side rear-view mirror shall not be obscured by the unwiped portion of the windshield. Mirrors shall be easily adjustable, but shall be rigidly braced, so as to reduce vibration.

C. Heated external mirrors may be used.

D. Remote control external rear view mirrors may be used.

E. LED flashing lights integral to the cross-view mirrors may be used.

MOBILE DATA DEVICE (MDD – OPTIONAL)

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

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

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

D. While the bus is in motion, audio and visual instructions on the MDD may remain functional, but operational and tactile functions shall be disabled.

MOUNTING

A. The rear body crossmember shall be supported by the chassis frame. Except where chassis components interfere, the bus body shall be attached to the chassis frame at each main floor sill in such a manner as to prevent shifting or separation of the body from the chassis under severe operating conditions.

B. Isolators shall be installed at all contact points between the body and the chassis frame on Types A-2, C and D buses, and shall be secured by a positive means to the chassis frame or body to prevent shifting, separation, or displacement of the isolators under severe operating conditions.

MUD GUARDS (MUD FLAPS)

Mud guards shall be rubber and meet requirements of Mississippi Code Ann.§ 63-7-73. Mud guards shall be at least the width of the vehicle's tires.

NOISE SUPRESSION SWITCH ~~(Optional)~~

A manual noise suppression switch shall ~~may~~ be installed in the control panel. This switch or switch background shall be red or yellow and labeled. This switch shall be an on/off-type (not momentary) that deactivates all 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, lighting or warning systems.

OIL FILTER

An oil filter with a replaceable element shall be provided and connected by flexible oil lines if it is 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

All openings in the floorboard or firewall between the chassis and the passenger compartment (e.g., for gearshift selector and parking brakes lever) shall be sealed.

OVERALL LENGTH

The overall length of the bus shall not exceed forty-five feet (45'), excluding accessories.

OVERALL WIDTH

The overall width of the bus shall not exceed one hundred two inches (102"), excluding accessories.

PASSENGER LOAD

A. Actual gross vehicle weight (GVW) is the sum of the chassis weight plus the body weight, plus the driver's weight, plus total seated student weight. For purposes of calculation, the driver's weight is 150 pounds, and the student weight is 120 pounds per student.

B. Actual GVW shall not exceed the chassis manufacturer's GVWR for the chassis, nor shall the actual weight carried on any axle exceed the chassis manufacturer's Gross Axle Weight Rating (GAWR).

PUBLIC ADDRESS SYSTEM (Optional)

A. Buses may be equipped with an AM/FM/audio and/or public address system having interior and exterior speakers. Interior speakers shall be flush mounted with the bulkhead.

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

RETARDER SYSTEM (OPTIONAL)

A retarder system, if used, shall limit the speed of a fully loaded school bus to 19.0 mph on a 7% grade for 3.6 miles.

RETROREFLECTIVE MATERIAL

A. The front and rear bumper shall be marked diagonally 45 degrees down to the centerline of the pavement with 2" x ¼" wide strips of non-contrasting retro reflective material.

B. The rear of the bus body shall be marked with strips of retro reflective National School Bus Yellow (NSBY) material to outline the perimeter of the back of the bus using material which conforms to the requirements of FMVSS 571.131 (Table I). The perimeter marking of rear emergency exits per FMVSS 217 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 at least one-inch retro reflective **NSBY** material, a minimum of one inch and a maximum of two inches 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 rear corners of the bus. Vertical strips shall be applied at the corners connecting these horizontal strips. Multifunctional school activity buses (MFSABs) shall be exempt from these color requirements.

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

D. The sides of the bus body shall be marked with retro reflective NSBY material at least 1 ¾ in width, extending the length of the bus body and located vertically between the floor line and the belt line.

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

ROAD SPEED CONTROL

When it is desired to accurately control vehicle maximum speed, a vehicle speed limiter may be utilized.

RUB RAILS

A. There shall be one (1) rub rail located on each side of the bus approximately at the seat level which shall extend from the rear side of the entrance door completely

around the bus body (except for the emergency door or any maintenance access door) to a point of curvature near the outside cowl on the left side.

B. There shall be one (1) additional rub rail on each side located 10 inches or less above the floor line. The rub rail shall cover the same longitudinal span as the upper rub rail, except at wheel housing, and shall extend only to the longitudinal tangent of right and left rear corners.

C. Rub rails shall be attached at each body post and all other up-right structural members.

D. Each rub rails shall be four inches (4") or more in width in finished form, shall be constructed of 16-gauge steel or suitable material of equivalent strength suitable to help protect body side panes from damage. Rub rails shall be constructed in corrugated or ribbed fashion.

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

F. The bottom edge of the body side skirts shall be stiffened by application of a rub rail, or the edge may be stiffened by providing a flange or other stiffeners.

SEAT AND RESTRAINING BARRIERS

A. Passenger Seating (Capacity and Design)

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. All seats shall have a minimum cushion depth of 15 inches, a seat back height of 24 inches above the seating reference point and must comply with all other requirements of FMVSS No. 222.

3. All restraining barriers and passenger seats shall be constructed with materials that enable them to meet the criteria of the *School Bus Seat Upholstery Fire Block Test.*

4. Each seat leg shall be secured to the floor by bolts, washers and nuts in order to meet the performance requirements of FMVSS No. 222 and FMVSS 210, as applicable. ~~Flange-head nuts may be used in lieu of nuts and washers. All seat frames attached to the seat rail shall be fastened with two or more bolts, washers and nuts, or with flange- head nuts~~. Seats may be track-mounted in

conformance with FMVSS No. 222 and FMVSS 210, as applicable.

5. 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.

6. All school buses (including Type A) shall be equipped with restraining barriers which conform to FMVSS No. 222.

7. A flip~~-up~~ seat may be installed at any side emergency door. If provided, the flip~~-up~~ seat shall conform to FMVSS No. 222 and aisle clearance requirements of FMVSS No. 217, *Bus Emergency Exits and Window Retention and Release.* The flip~~-up~~ seat shall be free of sharp projections on the underside of the seat bottom. The underside of the flip~~-up~~ seat bottoms shall be padded or contoured to reduce the possibility of clothing being snagged. Flip~~-up~~ seats shall be constructed to prevent passenger limbs from becoming entrapped between the seat back and the seat cushion when the seat is in the upright position. The seat cushion shall be designed to rise to a vertical position automatically when it is not occupied.

8. Passenger seat belts may be installed ~~on large school buses over 10,000 pounds GVWR~~. If seat belt assembles are installed on ~~large~~ school buses ~~over 10,000 lbs~~, they shall be of the lap/shoulder belt configuration. Seat belt assemblies shall be installed by the manufacturer or authorized dealer and must conform to FMVSS 209. All buses equipped with lap/shoulder seat belts or Child Safety Restraint Systems (which includes integrated seats, for student seating, shall contain at least 2 seat belt cutters. One belt cutter must be properly secured in a location within reach of the driver while belted into the driver's seat. The additional belt cutter shall be properly secured in a location determined by the purchaser. Belt cutters shall be durable, designed to eliminate the possibility of the operator or others being cut during the use, and must have a full handgrip.

B. 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 the National Highway Traffic Safety Administration's (NHTSA) "Guideline for the Safe Transportation of Pre-school Age Children in School Buses."

Note: See A.8, above.

C. Buses shall be equipped with a rated capacity sticker or plate readily visible and displayed inside the bus. This shall indicate the maximum seating capacity of the bus for passengers, in addition to the driver. Buses with track seating shall indicate the maximum

seating capacity of passengers, in addition to the driver.

D. Driver Seat

1. 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.*

2. Type A buses may utilize the standard driver's seat provided by the chassis manufacturer.

E. Driver Restraint System

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

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

F. 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 webbing cutter shall be mounted in a location accessible to the seated driver in an easily detachable manner.

SHOCK ABSORBERS

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

SIDE SKIRTS

School bus body side skirts between the front and rear axles shall extend down to within two 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.

SOUND GENERATOR (ELECTRIC AND HYBRID BUSES ONLY)

A. ~~BEVs shall be equipped with a low-speed sound generator to warn other vehicles and pedestrians of the school bus's approach i.e., when approaching an intersections and crosswalks. The sound generator will remain on when the school bus is in any drive gear except reverse~~. Electric and Hybrid School Buses shall be equipped with a sound generator to warn pedestrians of the school bus's approach. The Sound generator shall conform to the SBMTC minimum sound requirements for Electric and Hybrid school buses.

B. The ~~low-speed~~ sound generator shall not emit sound while the bus is completely stopped, with the transmission in neutral or park, and with the parking brake set e.g., while loading and unloading.

STEERING GEAR

A. 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.

B. If external adjustments are required, the steering mechanism shall be accessible to make adjustments.

C. Changes shall not be made to the steering apparatus which are not approved by the chassis manufacturer.

D. There shall be a clearance of at least two inches between the steering wheel and cowl, instrument panel, windshield or any other surface.

E. Power steering is required and shall be of the integral type with integral ~~valves~~ components (valves, piston, gear drive, worm shaft, motors, etc.).

F. The steering system shall be designed to provide a means for lubrication of all wear-points that are not permanently lubricated.

STEPS

A. The first step at the entrance door shall be not less than 10 inches and not more than ~~14~~ 16 inches from the ground when measured from the top surface of the

step to the ground, ~~based on standard chassis specifications, except that on Type D vehicles, the first step at the entrance door shall be 12 inches to 16 inches from the ground~~. An auxiliary step may be provided to compensate for the increase in ground-to-first-step clearance. The auxiliary step is not required to be enclosed.

B. Step risers shall not exceed a height of 10 inches.

Note: When plywood is used on a steel floor or step, the riser height may be increased by the thickness of the plywood.

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

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

STEP TREADS

A. All steps, including the floor line platform area, shall be covered with an elastomer floor covering having a minimum overall thickness of .0187 inch.

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

C. Steps, including the floor line platform area, shall have a 1 ½-inch nosing that contrasts in color by at least 70 percent measured in accordance with the contrasting color specification in 36 CFR, Part 1192, ADA, *Accessibility Guidelines for Transportation Vehicles.*

D. Step treads shall have the following characteristics:

1. Abrasion resistance: Step tread material weight loss shall not exceed 0.40 percent, as tested under ASTM D-4060, *Standard Test Method for Abrasion*

   Resistance of Organic Coatings by the Taber Abraser, (CS-17 Wheel, 1000-gram, 1000 cycle).

2. Weathering resistance: Step treads shall not break, crack, or check after ozone exposure (seven days at 50 pphm at 40 degrees C) and Weatherometer exposure (ASTM D-750, *Standard Test Method for Rubber Deterioration in Carbon-Arc Weathering Apparatus,* seven days).

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

   Note: A spray on application type material may be used in lieu of item A. that meets the requirements of items B. through D. The material shall be applied not only to the interior surfaces of the service doorstep treads but also to the exterior,

if not covered by undercoating.

STIRRUP STEPS

If the windshield and lamps are not easily accessible from the ground, there may be at least one folding stirrup step or recessed foothold installed on each side of the front of the body for easy accessibility for cleaning. There also may be a grab handle installed in conjunction with the step. 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 ARM SIGNAL

A. The stop signal arm(s) shall comply with the requirements of FMVSS No. 131, *School Bus Pedestrian Safety Devices* and may be illuminated. MFSABs are exempt from these requirements.

B. Buses shall be equipped with one stop arm, air or electrically driven, meeting SAE J1133 and the following requirements:

1. An additional stop signal arm may be added to all Type C and D school buses. It shall be installed on the left side of the bus near the rear section of the bus and shall have one (1) "STOP" emblem facing the rear of the bus when the stop sign is in the open position (optional).

2. A light lit illuminated "Stop" sign may be installed on the rear emergency door between the upper and lower glass panels to alert a motorist directly behind the school bus (optional).

STORAGE COMPARTMENT (OPTIONAL)

A. A storage container for tools, tire chains and/or other equipment may be located either inside or outside the passenger compartment. If inside, it shall be fastened to the floor and have a cover with a positive fastening device.

B. If luggage and/or equipment is to be carried on the bus, a compartment of adequate strength and capacity may be provided. The compartment shall be side mount under body type with flush mount door and recess handle and may range from ten (10) to thirty (30) cubic feet in size.

SUN SHIELD

A. Each Type C and D school bus shall have an interior adjustable transparent sun visor with a finished edge and dimensions not less than ~~minimum measurements of~~ 6 inches by 30 inches. It shall be installed in a position convenient for use by the driver, ~~anchored on both ends, and shall be tinted transparent plastic or~~

~~plexiglass~~.

B. On all Type A buses, the sun shield shall be manufacturer's standard.

SUSPENSION SYSTEMS

A. The capacity of springs or suspension assemblies shall be commensurate with the chassis manufacturer's GVWR.

B. 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

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

TIRE AND RIMS

A. Rims and tires of the proper size and load rating commensurate with the chassis manufacturer's GVWR 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.

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

C. 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.*

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

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

TOWING ATTACHMENT POINTS

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 either by the chassis manufacturer or in accordance with the chassis manufacturer's specifications.

B. Each towing device shall have a strength rating of 13,500 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 tow 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 bumper or rearward of the rear bumper.

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

TRACTION ASSISTING DEVICES (OPTIONAL)

A. Where required or used, sanders shall:

1. Be hopper cartridge-valve type;

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

3. Have at least 100 pounds (grit) capacity;

4. Have a cover that screws in place on the filler opening of the hopper, thereby, sealing the unit airtight;

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

6. Have non-clogging discharge tubes with slush-proof, non-freezing rubber nozzles.

7. Be operated by an electric switch with a pilot lamp mounted on the instrument panel located to be exclusively controlled by the driver.

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

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

B. Automatic traction chains may be installed.

TRANSMISSION (FOR INTERNAL COMBUSTION ENGINES ONLY)

A. Automatic transmissions shall have no fewer than three forward speeds and one reverse speed. Mechanical shift selectors shall provide a detent between each gear position when the gear selector quadrant and shift selector are not steering column mounted. Automatic transmissions shall be standard for all type school buses.

B. Automatic transmissions shall have a transmission shifter interlock controlled by the application of the service brake to prohibit accidental engagement of the transmission.

TRASH CONTAINER AND HOLDING DEVICE (OPTIONAL)

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

TURNING RADIUS

A. A chassis with a wheelbase of 264 inches or less shall have a right and left turning radius of not more than 42 ½ feet, curb-to-curb measurement.

B. A chassis with a wheelbase of 265 inches or more shall have a right and left turning radius of not more than 44 ½ feet, curb-to-curb measurement.

UNDERCOATING

A. The entire underside of the bus body, including floor sections, cross member and below floor-line side panels, shall be coated with rust-proofing material for which the material manufacturer has issued to the bus body manufacturer a notarized

B. certification to the bus body manufacturer that materials meet or exceed all performance requirements of SAE J1959, Sept. 2003 Edition of the Standard.

C. The 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 the cured film.

D. The undercoating material shall not cover any exhaust components of the chassis.

VENTILATION

A. Auxiliary Fan(s) shall meet the following requirements:

B. Fan(s) shall be placed in a location where they can be adjusted for maximum effectiveness and where they do not obstruct the driver's vision to the mirrors or

interfere with the safe operation of the vehicle.

1. Fans shall have six-inch (nominal) diameter.

2. Fan blades shall be enclosed in a protective cage. Each fan shall be controlled by a separate switch.

C. The bus body shall be equipped with a suitably controlled ventilating system with capacity sufficient to maintain the proper quantity of air flow under operating conditions without having to open a window except in extremely warm weather.

D. Static-type, non-closeable exhaust ventilation shall be installed in a low-pressure area of the roof.

E. Roof hatches designed to provide ventilation in all types of exterior weather conditions may be provided.

WHEELHOUSING

A. The wheel housing opening shall allow for easy tire removal and service.

B. Wheel housings shall be attached to the floor panels in a manner to prevent any dust, water or fumes from entering the body. Wheel housings shall be constructed of 16-gauge (or thicker) steel.

C. The inside height of the wheel housings above the floor line shall not exceed 12 inches.

D. The wheel housings shall provide clearance for installation and use of tire chains on single or dual (if so equipped) power-driving wheels.

E. No part of a raised wheel housing shall extend into the emergency door opening.

WINDOWS

A. Other than emergency exits designated to comply with FMVSS No. 217, *Bus Emergency Exits and Window Retention and Release,* each side window shall provide an unobstructed opening of at least nine inches high (but not more than 13 inches high) and at least 22 inches wide, obtained by lowering the window. One window on each side of the bus may be less than 22 inches wide.

B. ~~Optional~~ Tinted and/or frost-free glazing shall be installed in all doors or windows.

C. Windshields shall comply with federal, state and local regulations.

WINDSHIELD WASHERS

A windshield washer system shall be provided.

WINDSHIELD WIPERS

A. A windshield wiping system, two speed or variable speed, with an intermittent feature shall be provided and shall be operated by a single switch. ~~The wipers shall meet the requirements of FMVSS 104~~.

B. The wipers shall meet the requirements of FMVSS No. 104, Windshield Wiping and Washing Systems. ~~The wipers shall be operated by one or more air or electric motors of sufficient power to operate the wipers. Type A-I and A-II buses utilizing the chassis manufacturer's one-piece windshield may be equipped with two wipers driven by either one or two electric motors.~~

SPECIALLY EQUIPPED SCHOOL BUS SPECIFICATIONS INTRODUCTION

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

The specifications in this section are intended to supplement specifications in the school bus body and chassis ~~and body~~ sections. In general, specially equipped buses shall meet all the requirements of the preceding sections, plus those listed in this section. ~~It is recognized that the field of special transportation is characterized by varied needs for individual cases and by rapidly emerging technologies for meeting individual student needs. A flexible, "common- sense" approach to the adoption and enforcement of specifications for these vehicles, therefore, is prudent~~. It is essential to consider both current and future needs, as well as considering a flexible approach, given the diverse needs of students with disabilities or health care needs. Long-term consideration makes it necessary to research all options available. It is prudent to consider the potential range of students being transported throughout the vehicle's lifespan. This forward-thinking approach ensures that the bus remains suitable for changing student populations over time.

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

DEFINITION

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

GENERAL REQUIREMENTS

A. Specially equipped school buses shall comply with the National School Transportation Specifications and Procedures and with the Federal Motor Vehicle Safety Standards (FMVSSs) applicable to their ~~respective model year and with~~ gross vehicle weight rating (GVWR) category.

B. Specially equipped school buses shall comply with Mississippi specifications as enumerated in the Bus Body and Chassis Specifications section of this document.

C. 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.

AIR CONDITIONING

Special needs buses shall be equipped with air conditioning. Refer to School Bus Body and Chassis Specifications, for minimum heating and air conditioning standards.

AISLES

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

COMMUNICATION SYSTEM

A. All school buses that transport individuals with disabilities shall be equipped with a two-way electronic voice communication system that can be used at any point on the vehicle's route.

B. Each bus should have a public address system capable of driver communication with passengers inside and outside the bus.

~~CRASH BARRIERS~~

~~A. A crash barrier with an aluminized courtesy panel extending to the floor and walls shall be placed between the lift and any seat position on a front-mounted lift (bench seat or wheelchair position). Stanchions are not acceptable.~~

B. There shall be a padded crash barrier approximately 8 inches in front of the forward edge of the seat cushion of all passenger seats that do not have another seat approximately 27 inches in front of them. There shall be a padded crash barrier or seat in front of any wheelchair position unless it is contiguous with and behind another wheelchair position. The forward-most barrier on both sides of the bus shall have a fullwidth, aluminized courtesy panel extending to the floor.

EVACUATION BLANKET (OPTIONAL)

A minimum of two fire-retardant, evacuation blankets, Tie Tech Evacuation Transporter Part# 1013, or equal, and a minimum of two storage pouches may be provided on buses equipped with a lift. The location to secure the evacuation blanket shall be easily accessible and determined by the purchaser at the time of the bid.

FIRE SUPPRESSION SYSTEM (OPTIONAL)

A. A fire suppression system is recommended for installation in the engine compartment.

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

C. Fire suppression system nozzles shall be located in the engine compartment, under the bus, in the electrical panel or under the dash, but they shall not be located in the passenger compartment. The system must include a lamp or buzzer to alert the driver that the system has been activated.

GLAZING

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

IDENTIFICATION

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

PASSENGER CAPACITY RATING

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

four designated seating positions.

POWER LIFTS

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

Exception: The lift may be located on the left side of the bus if, and only if, the bus is only used to deliver students to the left side of one-way streets.

B. Vehicle lift and installation

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

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

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

4. Controls: (See 49 CFR 571. 403, S6.7, *Control systems.)*

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

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

7. Platform barriers: (See 49 CFR 571. 403, S6.4.7, *Wheelchair retention.)*

8. Platform surface: (See 49 CFR 571.403, S6.4.2, S6.4.3, *Platform requirements.)* (See, also "Wheelchair or Mobility Aid Envelope" figure at the end of this subsection.)

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

10. Platform deflection: (See 49 CFR 571. 403, S6.4.5, *Platform deflection.)*

11. Platform movement: (See 49 CFR 571. 403, S6.2.3, *Maximum platform acceleration.)*

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

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

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

15. Excessive pressure: (See 49 CFR 571. 403, S6.8, *Jacking prevention.)*

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

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

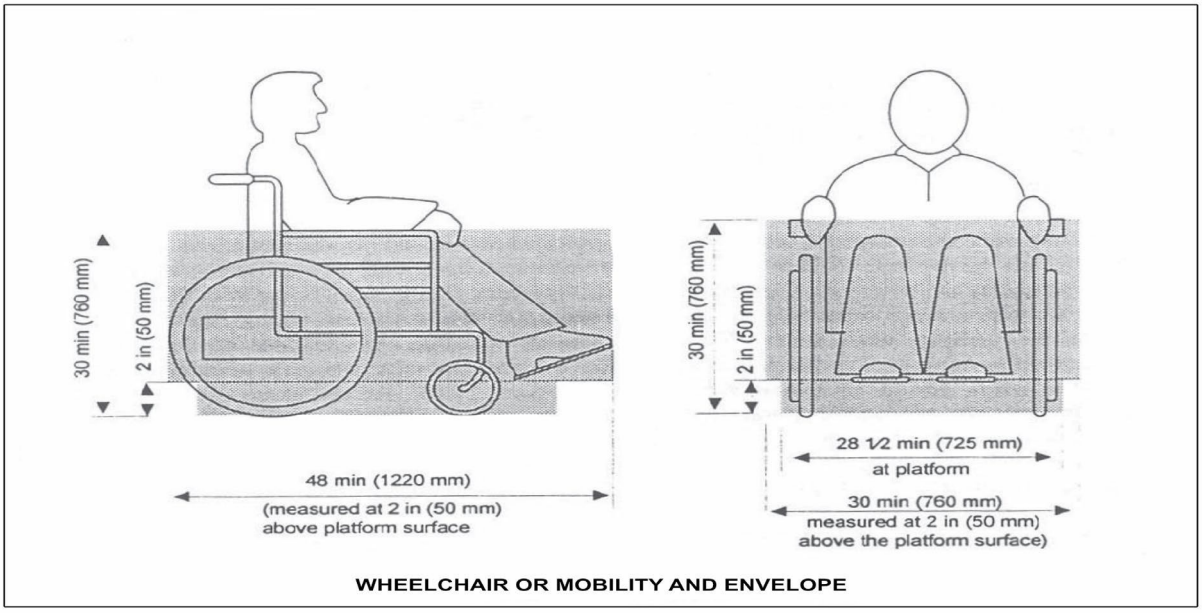
    c. Training materials: The lift manufacturer shall make training materials available to ensure the proper use and maintenance of the lift. These may include instructional videos, classroom curriculum, system test results or other related materials;

    d. Identification and certification: Each lift shall be permanently and legibly marked or shall incorporate a non-removable label or tag that states it conforms to all applicable requirements of the current National School Transportation Specifications and Procedures. In addition, and upon request of the original titled purchaser, the lift manufacturer or an authorized representative shall provide a notarized Certificate of Conformance, either original or photocopied, which states that the lift system meets all the applicable requirements of the current National School Transportation Specifications and Procedures.

~~17. Training materials: The lift manufacturer shall make training materials available to ensure the proper use and maintenance of the lift. These may include instructional videos, classroom curriculum, system test results or other related materials~~

~~18. Identification and certification: Each lift shall be permanently and legibly marked or shall incorporate a non-removable label or tag that states it conforms to all applicable requirements of the current National School Transportation~~

~~Specifications and Procedures. In addition, and upon request of the original titled purchaser, the lift manufacturer or an authorized representative shall provide a notarized Certificate of Conformance, either original or photocopied, which states that the lift system meets all the applicable requirements of the current National School Transportation Specifications and Procedures~~.



WHEELCHAIR OR MOBILITY AND ENVELOPE

REGULAR SERVICE ENTRANCE

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

~~B. 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 handrail shall be located on the opposite side of the entrance door from the handrail required in the BUS BODY AND CHASSIS section and shall meet the same requirements for handrails.~~

RESTRAINING DEVICES

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

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

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

Assemblies.

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

SEATING ARRANGEMENTS

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

SECUREMENT AND RESTRAINT SYSTEM FOR WHEELCHAIRS AND WHEELCHAIR-SEATED OCCUPANTS

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

A. WTORS-general requirements:

1. The wheelchair tiedown and occupant restraint system installed in specially equipped school buses shall be designed, installed, and operated for use with forward-facing wheelchair-seated passengers and shall comply with all applicable requirements of FMVSS 222, *School Bus Passenger Seating and Crash Protection,* and SAE J2249, *Wheelchair Tiedown and Occupant Restraint Systems for Use in Motor Vehicles.* An ANSI/RESNA WC18-compliant WTORS may be specified when transporting a wheelchair that is fully compliant with WC19 (2012), which includes a crash tested wheelchair-anchored pelvic belt;

   Note: Floor anchors must provide adjustability when transporting all types and sizes of wheelchairs.

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

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

4. A device for storage of the WTORS shall be provided. When the system is not in use, the storage device shall allow for clean storage of the system, shall keep

the system securely contained within the passenger compartment, shall provide reasonable protection from vandalism and shall enable the system to be readily accessed for use. The WTORS, including the storage device, shall meet the flammability standards established in FMVSS No. 302, *Flammability of Interior Materials.*

5. 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.

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

B. Wheelchair Securement/Tiedown: (See 49 CFR 571.403, S5.4.1, S5.4.2.) Each wheelchair position in a specially equipped school bus shall have a minimum clear floor area of 30 inches laterally by 48 inches longitudinally. Additional floor area may be required for some wheelchairs. Consultation between the user and the manufacturer is recommended to ensure that adequate area is provided.

C. Occupant restraint system: (See 49 CFR 571.403, S5.4.3, S5.4.4.) If the upper torso belt anchorage is higher than 44 inches measured from the vehicle floor, an adjustment device, as part of the occupant restraint system, shall be supplied.

SPECIAL LIGHT

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

SPECIAL SERVICE ENTRANCE

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

   ~~**Exception**~~ **Note:** A special service entrance shall not be required if the lift is designed to operate within the regular service entrance, is capable of stowing such that the regular service entrance is not blocked in any way and a person

entering or exiting the bus is not impeded in any way.

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

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

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

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

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

SPECIAL SERVICE ENTRANCE DOORS

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

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

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

D. All doors shall be weather sealed.

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

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

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

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

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

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

SUPPORT EQUIPMENT AND ACCESSORIES

A. In addition to the webbing cutter required in the SCHOOL BUS BODY AND CHASSIS section, each specially equipped school bus that is set up to accommodate wheelchairs or other assistive or restraint devices with webbing attached shall contain an additional webbing cutter properly secured in a location to be determined by the purchaser. The webbing cutter shall meet the requirements listed in the SCHOOL BUS BODY AND CHASSIS section, Seats and Restraining Barriers, ~~paragraph E~~.

B. Special equipment or supplies that are used in the bus for mobility assistance, health support or safety purposes shall meet local, federal and engineering standards that may apply, including requirements for proper identification. Equipment that may be used for these purposes includes, but is not limited to:

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

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

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

C. Each specially equipped school bus that is set up to accommodate wheelchairs or

other assistive restraint devices should be equipped with an emergency evacuation device that is certified and tested to withstand at least a 300-pound load when used as an emergency stretcher or drag. This evacuation device shall be properly secured to the bus in a location to be determined by the purchaser.

D. If transporting oxygen, refer to ~~AMO Standard 003~~ SAE J3043 Equipment Mount Testing: These mounts may be tested in accordance with the requirement of SAE J3043. (Ambulance Equipment Mount Device or Systems).

TECHNOLOGY AND EQUIPMENT, NEW

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

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

B. Items do not diminish the safety of the bus interior.

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

D. Items do not require undue additional activity and/or responsibility for the driver.

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

~~F. Approved options allowed for specifications may include the following:~~

~~1. Electronic Stability Control~~

~~2. Collision Mitigation System~~

~~3. Humprey Valve or equivalent air dump valve~~

~~4. An exterior camera system that aides the driver by projecting an image inside the rearview mirror of the driver. Any aftermarket screens are not allowed.~~

~~5. Predictive Stop Arm~~

~~6. Student Tracking Systems~~

7. Illuminated Safety Stop Arm (Must be Retroreflective)

8. Illuminated School Bus Sign

9. Clean Spray Technologies Bus Sanitation System

10. OEM Pedestrian Detection

11. Electronic Parking Brake

12. Auto Reverse Passenger Doors

13. MDT (Mobile Data Terminal)
    - As an option for school buses, the usage of navigation software is allowed during operation of the bus. The necessary, accompanying electronic devices are also allowed for navigation. The screen may be visible during navigation on said electronic device(s) during the operation of the bus. All use of this technology requires MDE approval prior to installation.

14. Clean Surface/CASPR

    - Prior to use of this product MDE approval for mounting location and/or padding is required.

15. Additional Back Up Lights

PUPIL TRANSPORTATION SERVICE VEHICLES

Pupil transportation service vehicles shall be standard production models and shall be equipped with adequate springs, axles, tires, and other load carrying components to meet GVWR requirements. Optional equipment may be purchased for service vehicles provided they appear as part of the specifications used by the respective school districts in soliciting bids on service vehicles.

USED SCHOOL BUSES

All used school buses purchased or operated by a local education agency or private contractor shall meet the Mississippi Minium Standards for School Buses for the year in which the bus was manufactured.

MULTIFUNCTIONAL SCHOOL ACTIVITY BUS SPECIFICATIONS

DEFINITION:

A Multifunctional School Activity Bus (MFSAB) is a school bus constructed to Federal Motor Vehicle Safety Standards (FMVSS) and Mississippi Minimum School Bus Specifications. It must be purchased or leased as a new bus and shall only be used for extracurricular activities. THESE BUSES SHALL NOT BE USED TO TRANSPORT STUDENTS TO AND FROM HOME, SCHOOL BUS STOPS, OR BETWEEN SCHOOLS FOR THE PURPOSE OF ATTENDANCE.

The following exceptions to the Mississippi Minimum Specifications for School Buses for regular route buses shall be allowed for Multifunction School Activity Buses.

CHILD CHECK SYSTEM

Child check systems are required on all MFSAB.

COLOR:

The local education agency (LEA) with school board approval may determine the color of the activity bus. The color scheme may utilize any combination of up to THREE colors. This combination may be in addition to the white roof. The color National School Bus Yellow (SBMTC-008 Publication) shall not be used as a part of the color scheme.

The local education agency and/or vendors shall submit preliminary color and graphic schemes to the Mississippi Department of Education, Pupil Transportation Division for approval prior to the purchase or manufacture of a Multifunctional School Activity Bus (MFSAB).

IDENTIFICATION:

A. The bus body shall bear the words "ACTIVITY BUS" in a contrasting color at least 8 inches high in the area where "school bus" is normally positioned. Lettering and numbering shall conform to FMVSS and Mississippi Minimum Specifications and shall meet reflectivity standards. Bus numbering on this bus may be of a contrasting color.

B. The name of the school district, or school shall be displayed in at least five-inch letters on both sides of the bus in the beltline area. If a school system elects to put the name of the school in the beltline, the school system shall be displayed on both sides of the bus in the rear skirt area with a minimum of 3" letters. NO SIGNS shall be applied to any area of the bus including the bumpers. Mascot logos may be placed on the bus with approval from the Mississippi Department of Education, Pupil Transportation Division.

C. No signs, logos, or other items that obstruct visibility shall be displayed on the windows of the bus. No full wraps are allowed, and no decals or modified wrapping shall cover reflective safety material.

D. Full or modified wrapping of existing regular route school buses purchased to transport students between home and school as a Multifunction School Activity Buses are not allowed.

INSPECTIONS:

Inspections by qualified technicians at the LEA shall be performed on all Multifunctional School Activity Buses (MFSAB) as required by state law and the rules and regulations of the Mississippi State Board of Education.

LIGHTING AND WARNING DEVICES:

All Multifunctional School Activity Buses (MFSAB) shall meet state and federal standards for normal school bus lighting and warning device requirements with the following exceptions:

A. Multifunctional School Activity Buses (MFSAB) shall not be equipped with alternately flashing amber or red signal lamps used for loading and unloading students.

B. Multifunctional School Activity Buses (MFSAB) shall not be equipped with stop arm signals or crossing control arms.

REGULATIONS:

These buses shall be owned by the LEA or leased from private school bus transportation contractors. All Mississippi laws, rules of the State Board of Education, and other applicable regulations pertaining to the operation of school buses and certification of school bus drivers shall apply to Multifunctional School Activity Buses.

SEATING:

Activity seats, which meet FMVSS 222 and 210, may be used in lieu of regular school bus seats. If activity seats are used, passenger seat belts are optional on Type C and Type D MFSAB. These seat belt assemblies shall be of the lap/shoulder configuration and shall be installed by the manufacturer, or authorized dealer, and must conform to FMVSS 209, 210, 222 and 225.

ALTERNATIVE POWER SPECIFICATIONS

INTRODUCTION

This section is designed to be used as an overview of the alternative fuels being utilized for school transportation. It is not designed to replace current applicable federal, state, manufacturing or safety specifications that may exceed requirements within this section. There may be advancements in engineering and improvements in equipment fabrication methods and operating practices that differ from those specifically called for in this section. Such deviations or improvements may provide safety and may meet the intent of, and be compatible with, this section. 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 specifications, should be researched by prospective purchasers of alternative fuel school buses.

GENERAL REQUIREMENTS

Alternative power school buses shall meet all the specifications in this manual and the specific requirements for the type of alternate power systems listed below:

1. Chassis shall meet all specifications previously mentioned in BUS CHASSIS SPECIFICATIONS.

2. Chassis shall meet all applicable Federal Motor Vehicle Safety Standards (FMVSS).

3. The fuel system integrity shall meet the specified leakage performance standards when impacted by a moving contoured barrier in accordance with test conditions specified in FMVSS No. 301, *Fuel System Integrity,* or FMVSS No. 303, *Fuel System Integrity of Compressed Natural Gas Vehicles,* as applicable.

4. Original equipment manufacturers (OEMs) and conversion systems using compressed natural gas (CNG) shall comply with National Fire Protection Association (NFPA) Specification 52 2013, *Compressed Natural Gas Vehicular Fuel Systems.* Fuel systems using liquefied petroleum gas (LPG) shall comply with NFPA Specification 58 2014, *Liquefied Petroleum Gases Engine Fuel Systems.*

5. Fuel tank(s) for vehicles of less than 54 passenger capacity powered by LPG or CNG shall have a minimum 40-gallon capacity. Fuel tank(s) for vehicles of 54 or more passenger capacity powered by LPG or CNG shall have a minimum 60- gallon capacity.

6. Natural gas-powered buses may be equipped with an interior/exterior gas detection system. All natural gas-powered buses may be equipped with an automatic or manual fire detection and suppression system.

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

8. All Types C and D buses using alternative fuels shall meet the same base requirements of BUS CHASSIS SPECIFICATIONS for passenger load.

9. The total weight shall not exceed the vehicle's GVWR when loaded to rated capacity.

10. 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.

11. 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.

12. All on-board fuel supply containers shall meet all appropriate requirements of the American Society for Mechanical Engineering (ASME) code, U.S. Department of Transportation (DOT) regulations or applicable FMVSSs and NFPA standards.

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

14. All safety devices that 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.

15. CNG buses shall have a positive, quick-acting (¼ turn) shut-off control valve shall be installed in each gaseous fuel supply line, as close as possible to the fuel supply containers. The valve controls shall be placed in a location easily operable from the exterior of the vehicle. The location of the valve controls shall be clearly marked on the exterior surface of the bus.

16. An electrical grounding system shall be required for grounding of the fuel system during maintenance-related venting.

17. Fuel systems identified as compatible with biodiesel must be provided with components compatible with biodiesel conforming to the specifications of ASTM 6751, *Biodiesel Standard.*

18. High Voltage-Powered Vehicles: Buses utilizing a high voltage propulsion system (more than 48 nominal volts) shall meet the requirements of FMVSS 305, *Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection,* except for the following:

    a. The propulsion power source (batteries, fuel cells, etc.) shall be located outside the passenger compartment.

    b. The propulsion power source enclosure shall be constructed to conform to the power source manufacturer's requirements and recommendations.

    c. Due to the much larger size and quantities of the propulsion power sources on larger vehicles, buses over 10,000 lbs. are permitted to exceed the 5.0-liter spillage constraint of Section S5.1, Electrolyte damage from propulsion batteries and the requirements to statically rotate the vehicle on its longitudinal axis post-test.

HIGH VOLTAGE-POWERED VEHICLES

The Mississippi School Bus Minimum Specification is the primary specification for all public-school buses in Mississippi pursuant to Mississippi Code Annotated Section 37-41-1: All applicable provisions of the Mississippi School Bus Minimum Specifications of school bus body and chassis shall be adhered to unless specifically mentioned in this section. This section and specifications listed in this section are for new electric school buses only and does not allow for the modification of any existing school bus.

Training For State Personnel, Local School District Personnel, and First Responders

The vendor shall be required to provide training for state personnel, transportation directors/supervisors, bus shop foreman, school bus mechanics/technicians, bus driver instructors, bus operators, and first responders in the safe and efficient operation, inspection, repair, maintenance, and emergency response of the bus. This training may be provided at multiple locations around the state in response to local demands.

Compliance With FMVSS and SAE

A high voltage-powered vehicle shall meet all Federal Motor Vehicle Safety Standards and all Society of Automotive Engineers standards that are applicable at time of manufacture.

HYBRID BUSES

Alternator

The alternator shall meet the applicable state specifications in the School Bus Body and Chassis section. Alternately, the alternator functions may be performed by the Hybrid Drive System Batteries.

Battery(ies)

Low Voltage Battery

The Low Voltage Battery shall meet the applicable state specifications in the School Bus Body and Chassis. Alternately, the Low Voltage Battery functions may be performed by the Hybrid Drive System Batteries.

Hybrid Drive System Batteries

A. Energy storage for the Hybrid Drive System shall be protected from crash impacts and shall be encased in a non-conductive, acid-resistant compartment. This compartment must be well ventilated to preclude the possibility of hydrogen gas buildup. Energy storage shall be located in an area and in such a way as to provide ease of service.

B. Batteries shall require automatic electrical isolation in the case of a vehicle crash.

C. The Hybrid Drive System Batteries shall allow for a minimum storage of 28 kWh for charge depletion.

D. The high voltage battery system integrity shall meet the specified spillage performance standards in accordance with test conditions specified in FMVSS No. 305 as applicable.

Battery Management System

A. The Hybrid Drive System Batteries may be equipped with a system that allows the batteries to be charged via connection to the local electric utility, otherwise known as a Plug-in Hybrid Electric system. The plug connector shall make a conductive electrical connection and shall be an Apollo 200 AMP connector by BIW Connector Systems or approved equal.

B. The Hybrid School Bus shall have equipment for monitoring the status of the batteries while the batteries remain on the vehicle. This equipment shall include the capability to balance the state of charge and monitor temperature of individual battery modules (if appropriate).

Brakes, Service

The Hybrid School Bus shall include a regenerative braking system that uses the motor and/or generator to slow the vehicle in conjunction with the service brakes while returning electrical energy to the Hybrid Drive System Batteries.

Differential Ratio

The Differential shall be compatible with the Transmission/Hybrid Drive System and provide for a minimum of 65 mph in highest gear.

Engine Equipment

A. The hybrid system shall include a system that deactivates the engine when not in use, such as, at red lights, and reactivates the engine when needed for acceleration.

B. The engine shall be equipped with system that electrically heats the engine to maintain minimum starting temperature. This system should be integrated with the Plug-in Battery Management System, if so equipped, and not require a separate electrical grid connection. The engine heater shall also heat the fuel filtration system. The engine heater shall be switched to allow this heating to be optional.

Fuel System Capability

The diesel fuel system shall be capable of operating with a 20 percent biodiesel blend (B20).

High Voltage System

A. High Voltage-Powered Vehicles: Buses utilizing a high voltage propulsion system (more than 48 normal volts) shall meet the requirements of FMVSS No. 305, *Electric Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection,* except for the following:

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

   2. The propulsion power source enclosure shall be constructed to conform to the power source manufacturer's requirements and recommendations.

   3. Due to the much larger size and quantities of the propulsion power sources on larger vehicles, buses over 10,000 lbs. are permitted to exceed the 5.0-liter spillage constraint of Section S5.1, *Electrolyte damage from propulsion batteries* and the requirements to statically rotate the vehicle on its longitudinal axis posttest.

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

C. VOLTAGE. All high voltage circuits shall provide adequate and automatic protection against electrical overloads caused by short circuits or other excessive current conditions through the use of fuses, circuit breakers, and ground fault interruption.

D. Each door, cover, or other panel that affords immediate access to any high voltage area shall be plainly marked with a hazard warning label which shall read WARNING-HIGH VOLTAGE or DANGER-HIGH VOLTAGE. This label shall be located in a highly conspicuous place. All high voltage access areas shall be equipped with a lock or otherwise secured to prevent unauthorized access.

E. The High Voltage System should be designed so that when the ignition switch is off, the propulsion motor is positively disconnected. All other accessories powered by the main propulsion battery circuit shall remain operable when the ignition switch is off.

F. All buses shall be equipped with an additional manual or automatic switch or device independent of the propulsion motor disconnect controls that permits the positive disconnection of all circuits from the Hybrid Drive System Batteries. This switch shall be operable from outside the vehicle. Each door or panel providing

access to this switch shall be plainly marked to indicate that it is a main-power-disconnect switch or device.

Ignition System

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

Transmission/Hybrid Drive System

A. The Hybrid Drive System shall work in conjunction with the chassis engine to provide motive power to the bus. This system shall be automatically controlled requiring no intervention by the driver after it has been put in forward or reverse gear. Systems that require the use of a manual clutch or require the driver to shift through a progression of gears will not be accepted.

B. The Hybrid drive controller/converter system shall incorporate a Ground Fault Interrupt (GFI) system that protects passengers and others from electrical shock if a shorted circuit or water intrusion situation occurs.

C. The bus dash shall have an indicator light that indicates whether the bus is operating in Charge Depleting or Charge Sustaining mode. Charge Depleting is an operating mode in which the state of charge of the Hybrid Drive System Battery decreases as the bus operates. At a certain minimum state of charge, the bus becomes Charge Sustaining. Charge Sustaining is an operating mode in which the Battery Management System seeks to maintain or increase the state of charge of the Hybrid Drive System Battery. The Hybrid School Bus shall have the capability to operate in both modes.

D. The Hybrid Drive System shall have a system for protecting system components from thermal damage due to electrical overload. This system should include temperature sensors at critical points and be capable of reducing Hybrid Drive System electrical power when necessary. The bus dash shall have a warning light that indicates when a Hybrid Drive System component exceeds a safe temperature.

E. The warning light should illuminate prior to critical temperature to allow sufficient time to safely stop the bus.

BATTERY ELECTRIC VEHICLES (BEV)

BACK-UP ALARM

BEVs shall be equipped with a back-up alarm to warn other vehicles and pedestrians when the school bus drive is placed in Reverse.

BATTERY(IES)

Low Voltage Battery(ies)

A. The low voltage battery shall meet the applicable state specifications.

B. At lec:1st one (1) low voltage battery will be installed to provide power to 12VDC circuits.

C. A low voltage battery shutoff switch shall be installed in the vicinity of the low voltage battery compartment in an area not easily accessible to the driver or passengers. If behind an access door or panel, the location of the low voltage battery shutoff switch must be clearly labeled on the exterior of the door or access panel.

High Voltage Battery(ies)

A. High voltage battery assemblies shall be located in between or under chassis frame rails protected by a steel cradle.

B. High voltage batteries shall have a main service disconnect that isolates the batteries and does not allow high voltage outside the battery pack.

BATTERY MANAGEMENT SYSTEM

A. The high voltage batteries shall be equipped with a system that allows the batteries to be charged via a connection to the local electric utility grid. This connection shall be a Combined Charging System (CCS) or SAE J1772, compatible with the charging equipment.

B. The charging receptacle/port shall be mounted/located in accordance with manufacturer standards. The receptacle shall accommodate the minimum requirements for Level II AC charging DC fast charging.

C. If the charging port is behind a door or an access panel, the door or access panel will be clearly labeled with the location of the charging port.

D. Vehicles shall have on-board equipment to monitor and display battery health. This displayed information shall include but is not limited to:
   1. High voltage battery state of charge
   2. Motor temp

3. Battery available range in miles
4. Battery discharge and regeneration rates
5. Battery health (temperature, battery cell balancing, as applicable, etc.)

BRAKES, SERVICE

In addition to service brake specifications for combustion engine buses, BEVs will be equipped with a regenerative braking that utilizes the electric drive system in concert with the service brakes to slow the vehicle and return electrical energy to the battery system.

DC-DC CONVERTER

A. A DC-DC converter shall be provided and deliver a minimum of 200 amps at 12VDC.

B. The converter system shall incorporate a Ground Fault Interrupt (GFI) that disconnects/isolates the high voltage batteries in the event of a shorted circuit or water intrusion.

C. Charging connection point shall be outside the passenger compartment

EXTERIOR MARKING

In addition to the marking/labeling specified this manual, BEVs will have clear markings/labeling, with the word "Electric" indicating that the school bus is electric powered.

A. Image graphics may be used in combination with words.

B. Lettering will be a minimum of two inches high, blue in color.

C. Lettering to include imagery shall be located on both sides of the school bus along the roof cap starting above the service door and ending no further than the forward edge of the second passenger window. Additional marking/labeling shall be added to the rear of the bus but shall not be placed in any windows or crowd/encroach on any required emergency/standard markings.

D. The bus numbering of electric school buses shall include the letters EV to identify the bus as an electric vehicle (EX: 25-04EV).

HEATING AND COOLING

Heaters and air conditioning shall be capable of heating and cooling the passenger and driver's compartments.

HIGH VOLTAGE SYSTEM

F. High Voltage-Powered Vehicles: Buses utilizing a high voltage propulsion system (60 VDC or 30 VAC) shall comply with the following:

1. The propulsion power source (batteries, fuel cells, etc.) shall be located outside the passenger compartment.
2. The propulsion power source enclosure shall be constructed to conform to the power source manufacturer's requirements and recommendations.

G. Wire, cable, and conductor insulation in the High Voltage System shall provide adequate insulation for the voltage used and for ambient temperatures ranging from - 15°F to 120°F. All high voltage wiring/cabling shall be covered with bright orange loom or otherwise labeled as HIGH VOLTAGE. All high voltage circuits shall provide adequate and automatic protection against electrical overloads caused by short circuits or other excessive current conditions through the use of fuses, circuit breakers, and ground fault interruption.

H. Each door, cover, or other panel that affords immediate access to any high voltage area shall be plainly marked with a hazard warning label which shall read WARNING-HIGH VOLTAGE or DANGER-HIGH VOLTAGE. This label shall be located in a highly conspicuous place. All high voltage access areas shall be equipped with a lock or otherwise secured to prevent unauthorized access.

IGNITION SYSTEM

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

B. The high voltage system shall be designed so that when the ignition switch is off, the high voltage is positively disconnected.

LOW SPEED SOUND GENERATOR

C. BEVs shall be equipped with a low-speed sound generator to warn other vehicles and pedestrians of the school bus's approach i.e., when approaching an intersections and crosswalks. The sound generator will remain on when the school bus is in any drive gear except reverse.

D. The low-speed sound generator shall not emit sound while the bus is completely stopped, with the transmission in neutral or park, and with the parking brake set e.g., while loading and unloading.

PROPULSION SYSTEM/DRIVETRAIN

A. Shall be of sufficient power and torque to propel the vehicle fully loaded up to at least 60 mph and no more than 65 mph.

B. The propulsion system may be mounted utilizing a drivetrain or positioned in a way to provide power to the wheels.

C. All propulsion systems must be contained below the floor line and cannot come into contact with the road surface.

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

SEATING

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

SYSTEM PROTECTION

A. As part of the Battery Management System, the BEV will be equipped with an automatic shutdown to protect system components from damage caused by malfunctions such as charging/discharging faults, battery overheating, electrical overheating, degraded battery health, etc.

B. Prior to automatic shutdown, a warning or maintenance indicator shall display in the driver console to notify the driver of impending shutdown or the need for immediate maintenance and allow enough time to safely reposition and stop the bus. Gradual derating of propulsion prior to complete automatic shutdown.

EQUIPMENT FOR TRANSPORTATION OF PRE-SCHOOL AGE CHILDREN

~~The school bus is important in the educational development of young children who have special needs because it is the mechanism for transporting them to and from support and development programs. Infants, toddlers, and pre-school children with or without special needs present a particular challenge for transportation personnel because school buses were not designed to transport very young children as passengers. Therefore, these children present multiple challenges to providers of school bus transportation services. Nevertheless, great strides have been made in the types of equipment used to assist pre-school children with or without special needs to safely adapt to school bus transportation.~~

~~Challenges relating to proper installation, maintenance and use of Child Safety Restraint Systems (CSRSs), including car seats, arise. Many of these challenges are addressed in NHTSA's "Guideline for the Safe Transportation of Pre-school Age Children in School Buses" (February 1999).~~

~~Each pre-school age school bus passenger should use a child safety restraint system appropriate for the child's age, weight, height and specialized needs, as determined by the IEP. Thus, a team effort is required to ensure that appropriate and proper specifications are developed for the procurement of equipment that meet the specific needs of each individual school bus passenger.~~

~~The following Federal Motor Vehicle Safety Standards are applicable in this section:~~

~~*FMVSS No. 208 Occupant Protection*~~
~~*FMVSS No. 209 Seat Belt Assemblies*~~
~~*FMVSS No. 210 Seat Belt Assembly Anchorages*~~
~~*FMVSS No. 213 Child Restraint Systems*~~
~~*FMVSS No. 217 Bus Emergency Exits and Window Retention Release*~~
~~*FMVSS No. 222 School Bus Passenger Seating and Crash Protection*~~
~~*FMVSS No. 225 Uniform Child Restraint Anchorages*~~

Each birth-to-K child (with or without a disability) shall be secured in Child Safety Restraint System (CSRS) that is appropriate for the child's age, weight, height, and development when riding on a school bus or other school transportation vehicle. A CSRS is an add-on device (or, in some cases, integrated into bus seating) that provides the positioning and safety restraint required by birth-to-K children riding in any vehicle.

Note: The acronym CSRS is used as both singular and plural.

The rationale for the National Highway Traffic Safety Administration's recommendation that all birth-to-K children use CSRS on school buses of all sizes is provided in a guidance document, "Guideline for the Safe Transportation of Preschool Age Children in School Buses" (February 1999). NHTSA's guidance document explains that its testing shows birth-to-K children should be protected by CSRS on any school bus.

For passenger vehicles, like vans, SUVs and sedans, a child occupant protection law in each state mandates the use of CSRS for all children, per the details of state code. While these laws typically exclude school buses, they require the use of CSRS in any other vehicle used for student transportation. These laws vary by state with respect to the child ages covered, but all states require children in the birth-to-K cohort to ride in a properly used CSRS or booster seat in passenger vehicles; many states require children up to much older ages to ride in a CSRS or booster in passenger vehicles, as well.

According to NHTSA and the laws of each state, lap-only and lap-shoulder belts are not CSRS. Following product instructions, children in passenger vehicles may use a booster seat (see below) to provide protection and meet state laws, but a booster is not an appropriate device to use when the vehicle is a school bus. CSRSs used in school buses must be appropriate for the individual child and must be used correctly. All of the restraint systems used for transportation must be secured to the bus seat in the manner prescribed and approved by both the school bus and CSRS manufacturer.

A. All CSRSs used in the school bus or another vehicle used to transport children must:

1. Meet requirements of FMVSS No. 213 (213b, if purchased after December 5, 2026); if purchased after June 30, 2025, must also meet FMVSS 213a;

2. Be installed~~, cleaned, maintained~~ and used according to the manufacturer's instructions; including honoring manufacturer-stated product expiration dates.

3. Not be under a recall that recommends non-use of the CSRS; if other recalls exist, they have been repaired following the instructions of the manufacturer's fix kit;

4. Have all parts intact and in working order; and

5. ~~Must not have exceeded the manufacturer's assigned expiration date~~ . Be installed only on bus seats that meet FMVSS No. 210 using a seat belt that meets FMVSS 209 or lower anchors that meet FMVSS 225 if the CSRS is a conventional type (which requires use of a seat belt or LATCH system for installation).

~~6. Be secured to a vehicle seat with a safety belt that meets FMVSS No. 209 or anchorages to meet FMVSS No. 225 or FMVSS No. 210; and~~

~~7. Use safety belts or latch systems that are installed only on bus seats that meet FMVSS No. 210.~~

~~8. Be replaced when occupied during a school bus crash as specified by the manufacturer of the CSRS.~~

To ensure that a CSRS meets all these criteria, the LEA (not the child's parent/guardian) should provide the CSRS. Maintaining this policy allows the transporter to assess CSRS suitability, now the CSRS's full history, and include the CSRS in routine care and maintenance procedures (see below). When transporters make exceptions – as they

sometimes do, for instance, when an infant's parent/guardian owns a CSRS with a carry handle that is also used for the child's non-school-related transportation—the transporter remains responsible for ensuring the CSRS is safe to use for every ride, following each of the requirements enumerated above. If any CSRS is not suitable (that is, it is not in good condition, inappropriate for the child, and/or unable to be installed and used properly) or its suitability is in doubt, an appropriate alternative CSRS shall be supplied by the transporter.

B. ~~Child Safety Restraint Systems (CSRSs)~~ Elements of Correct Installation and Use of CSRS

~~CSRSs used in school buses must be appropriate for the individual child and must be used correctly. All of the restraint systems used for transportation must be secured to the bus seat in the manner prescribed and approved by both the school bus and CSRS manufacturer.~~ The following elements of proper use apply to CSRS that are used in school buses and/or non-school bus vehicles. Always read and follow the manufacturer's instructions that come with each CSRS. Quality, hands-on training on each of these topics, offered on a routine basis, is essential for transporters of birth-to-K children.

~~1. Elements of Correct Installation of CSRSs~~

~~It is recognized that compartmentalization, the passive safety restraint system required in school buses under FMVSS No. 222, provides a higher level of safety to children over 40 pounds. Children diagnosed with medical complexities or fragility might require special securement or positioning systems.~~

a. Selection

The first step to selecting a CSRS is to identify the types/models that meet a child's age, weight, height, and development/transportation needs. From these options, select the CSRS that can be installed properly in the vehicle, will be used correctly on every ride, and meets budgetary considerations.

Children diagnosed with medical complexities or fragility might require special securement or positioning systems, per their IFSP/IEP/Section 504 Plan. However, it is appropriate for the IFSP/IEP/Section 504 Plan team to first consider whether a conventional CSRS model (or, if transporting on a school bus, a school bus child restraint system) could accommodate the child because these CSRS are typically easier to use and acquire. For all children, selection of a CSRS with a crotch strap, which will provide crash protection and prevent strangulation caused by slouching during normal driving conditions, is essential.

b. Direction

~~Position (rear- or forward-facing) and adjust recline angle accordingly. Some rear-facing seats are designed for rear-facing only and may not be used in a~~

~~forward-facing position. (Check manufacturer's instructions.)~~

Position a CSRS rear or forward facing based on product instructions relative to the child's age and size; adjust the recline angle according to instructions. Some rear-facing seats are designed to be rear-facing only and may not be used in a forward-facing position. (Check manufacturer's instructions. The list of CSRS models, below, describes the direction each CSRS type may be used.)

The rear-facing direction is most protective because it allows the child's entire back to absorb crash forces. This is essential for infants and toddlers, who have relatively large heads and bones that are soft and undeveloped. If an infant faces forward too soon, the severe pulling force of a crash could cause severe, possibly fatal, injury to their spinal cord.

Therefore, best practice, according to the American Academy of Pediatrics, is to keep children rear facing for as long as they fit a CSRS's height and weight limits, whether the vehicle is a school bus or other type of vehicle. In any vehicle, a child must *never* ride forward facing prior to age one and, in many states, the law prohibits children from riding forward facing until at least age two. Per FMVSS 213, as of June 30, 2025, all CSRS with a forward-facing mode must state 26.5 pounds or more as the minimum child weight for that mode.

Note: These laws and regulations reflect the *minimums* for turning forward. It is recommended to follow best practice and keep children rear facing as long as possible; using readily available models on the market, this is typically until at least age two or longer. The recommendation applies to school buses and non-school buses.

c. ~~Belt Paths and Harness Strap~~ Location

CSRS shall be installed only on front-facing vehicle seats, per the instructions of all CSRS manufacturers. On a school bus, use a location that will allow proper space and supervision (often a front seat) that is not in an emergency exit row. If other students will be seated on the same bench, install the CSRS by the window to allow them clearance for egress.

In a non-school bus, birth-to-K children are safer using CSRS in a rear seat. If a front seat must be used, ensure that the air bag is deactivated. Most vehicle instructions prohibit using a rear-facing CSRS in a front seat, and the laws of some states say that children must ride in the rear until they reach a specified age.

~~Use the correct belt path and harness strap slots on the CSRS as directed by the manufacturer's instructions.~~

~~**Note:** Heavy coats should be removed to ensure a tighter fit.~~

d. Installation

~~To achieve tight installation, place hand on and push down in the CSRS to compress the bus seat cushion. With the buckle(s) engaged, pull the loose end of the seat belt(s) to tighten and lock the safety belt. The CSRS should not move more than one inch forward or side-to-side when tested by grasping the seat at the belt path~~.

- Follow all manufacturer instructions for installation, which typically include the following guidance. For add-on CSRS that are installed using a seat belt or the LATCH system, ensure that the correct belt path is used, per instructions. To achieve a tight installation, use a hand to push down on the CSRS to compress the bus/vehicle seat cushion. Then, with the buckle(s) secured, pull the loose end of the webbing (of a lap belt, lower anchor attachment, or cam wrap) or the shoulder belt (of a lap-shoulder belt) to tighten the installation. The CSRS should not move more than one inch forward or side-to-side when tested by grasping the seat at the belt path. (See the USE of CSRS Tether section, below, for CSRS that require the attachment of a tether during installation.) When a CSRS with a cam wrap is properly installed, the tightened cam wrap strap should slightly indent the top of the bus seat.

- The CSRS must fit properly on the vehicle seat. CSRS installed adjacent to one another may not overhang into the aisle or press hard into each other. Unrestrained children sharing a bench with a CSRS must have enough room to be properly seated and fully protected by compartmentalization.

- To improve CSRS installation and ease of use, since late 2011, FMVSS 222 requires the non-adjustable part of a school bus's lap-only seat belt (aka 2-point seat belt) to be on the side that's relatively closer to the aisle. The buckle on this part of the seat belt must be on webbing that extends no more than one to two inches above the seat cushion, per regulation. When retrofitting older buses that have reinforced seating with a lap-only belt, or replacing existing belts with a different design, these CSRS-friendly specifications should be followed.

e. Harness Strap Use

- Follow manufacturer's instructions to properly adjust the harness that holds the child within a conventional CSRS or the straps that restrain the body for all other CSRS types, like safety vests. Check for adjustability at the shoulders, crotch strap, and hips, as well as for the proper use of manufacturer provided inserts and padding. Follow instructions for setting each of these to be appropriate for the child for first use and reassess periodically for child growth.

- Place the harness webbing over the child's body according to the CSRS instructions; it should cross both shoulders and hips and have a crotch strap routed between the legs. Adjust the harness snugly on the child for each ride. Use techniques to avoid touching sensitive areas when securing the child in the harness, like keeping the back of the hand toward the child's body. Per NHTSA, a snug strap should not allow any slack, should lie in a relatively straight line without sagging, and should not press on the child's flesh or push the child's body into an unnatural position. To test for proper snugness, slide a thumb and forefinger vertically along the harness webbing to ensure it is not possible to pinch any slack between them.

- A chest clip, which holds the harness straps across the shoulders, should be placed at the child's armpit level. A chest clip, when part of a CSRS as provided by the manufacturer, shall not be removed from the CSRS. Its function is pre-crash positioning of the harness webbing. While this is an essential function, a chest clip is not intended to provide crash restraint. Therefore, it is imperative that the buckle of the harness system also be properly used.

- Heavy coats and backpacks should be removed prior to harness use to ensure a proper fit. Do not add any additional padding underneath or behind a child, other than that supplied by the manufacturer for use with the CSRS. Use included padding according to manufacturer instructions. Always follow the CSRS instructions for adjustments that should be made to achieve proper harness fit and child positioning; if all instructions have been followed and harness fit and/or child positioning require further improvement, some instructions allow the use of firmly rolled towels or small, receiving-type blankets alongside a child's body (not head) and/or behind the CSRS's crotch strap.

- Special care must be taken when transporting children with medical devices like gastrostomy tubes, shunts, and tracheostomy tubes. The use of a CSRS (ideally in rear-facing mode, if possible) is especially advised for these children, but transporters must ensure that webbing straps are not positioned in a way that could disrupt the proper functioning of the child's medical device. (This sort of negative interaction should be considered when selecting the CSRS, as well.)

C. Types of Child Safety Restraints~~s~~ Systems

All CSRS provide restraint at a child's shoulders, hips and between the legs (crotch strap); each component is essential for protecting the child in a crash and keeping the child in position during normal transport.

CSRS types that are identified below using the term “conventional” are those that are sold through retailers and have been designed by their manufacturers for the primary use of families in non-school bus vehicles (vans, SUVs, sedans). But conventional CSRS may also be used for school transportation, including use on a school bus, provided the bus seating has adequate space and is equipped with seat belts or lower anchors for proper anchorage. For some children, a conventional CSRS is the only type that will meet their needs.

A term defined by NHTSA for another CSRS category is “school bus child restraint systems,” which includes CSRS for use only on a school bus (never a non-school bus, like a van, SUV, or sedan); this type is acquired from a manufacturer or its distributor. Any CSRS that is installed using a cam wrap falls into this category. When a cam wrap is used for installation, the entire bench behind a CSRS installed using a cam wrap shall be unoccupied or occupied only by restrained passengers, per NHTSA labeling.

The following lists the various CSRS types that may be used by transportation providers in school buses and/or non-school bus vehicles. Each CSRS’s description indicates whether the CSRS may be used in both school bus and non-school bus vehicles (vans, SUVs, sedans) or only in one of these vehicle types.

a. *Rear-facing-only conventional CSRS ~~(infant-only)~~*

~~These seats are designed for infants from birth to twenty or twenty-two pounds (manufacturer's instructions) and who usually are less than 26 inches in length. These seats are used in rear-facing position at a 45 degree recline, which provides support to the infant's head, neck and back~~.

- Bucket-style, padded CSRS with a five-point harness that typically come with a base, though instructions are usually provided for optional use in baseless mode, as well. Of the two CSRS types for rear-facing use, this type, commonly called an “infant seat,” is smaller and has a handle for carrying outside the vehicle. May be used in a school bus or non-school bus vehicle, provided the seating has adequate space and seat belts or lower anchors for anchorage.

- Designed for infants (typically from four or five pounds) up to 30 to 35 pounds and who are up to 30 to 35 inches in length, depending on the model. The child’s head must be contained within the shell of the CSRS; instructions typically require the top of the child’s head to be at least an inch from the top of the CSRS shell. These CSRS must be used in a rear-facing position only. Follow instructions for setting the CSRS to a roughly 45- degree recline, which prevents

the child's head from tipping forward and blocking the airway during normal driving conditions.

- Harness straps must be snug. Each shoulder strap must emerge from the CSRS at or the next position below the seated infant's shoulders.

b. Convertible conventional CSRS ~~(Rear-Facing)~~

~~Rear-facing infant position is designed for children from birth to twenty pounds, one year of age (manufacturer's instructions), weighing up to twenty pounds and usually less than 26 inches in length. Many CSRSs are now available to accommodate larger children (30 to 35 lbs.) in the rear- facing position. Note: See manufacturer's guidelines for weight and height restrictions. It is recommended that children ride rear facing as long as recommended or allowed by the CSRS manufacturer.~~

- CSRS with a five-point harness that have both rear- and forward-facing modes. These CSRS have a rigid, padded seating area made of plastic (and sometimes metal) that usually has deep sides that wrap around the child's body and head. May be used in a school bus or non-school bus vehicle, provided the seating has adequate space and seat belts or lower anchors for anchorage. (Some convertible CSRS, called "all-in-one," also have a booster mode that should not be used on a school bus.)

- Rear-facing mode may typically be used by children from five pounds to 40 or more pounds and up to 40 or more inches in length, depending on the model. Convertible CSRS are the only alternative to a rear-facing-only CSRS for riding rear facing; being larger, they require more vehicle space, but are the only option when children who are bigger/taller must ride rear facing. The child's head must be contained within the shell of the CSRS, following manufacturer's instructions, which typically require the child's head to be at least an inch from the top of the CSRS shell.

- Forward-facing mode is appropriate for children who have outgrown rear-facing mode. Forward-facing mode may typically be used by children who are at least 1 year old and 22 up to 50 or 65 pounds and 40 to 50 inches in height, depending on the model. (For CSRS made June 30, 2025, and after, the minimum weight to

- Set the angle of the CSRS according to the manufacturer's

instructions for the mode in use. Typically, a rear-facing convertible CSRS should be reclined to a 30- to 45-degree angle to prevent the child's head from tipping forward and blocking the airway. When forward facing, a convertible CSRS is used more upright, but many models offer semi-reclined positions, as well.

- The harness straps must emerge from the CSRS at or the next position below the seated child's shoulders when rear facing; it must emerge at or the next position above the shoulders when forward facing. When forward facing, if the child's shoulders are above the top-most position, the child is too tall to use the CSRS, even if they are within the occupant weight range.

c. ~~*Convertible*~~ *Combination conventional CSRSs* ~~*(Forward-Facing)*~~

~~Forward-facing CSRSs with five-point harness, T-Shield or tray-shield are designed for children above twenty to sixty pounds. (Rear-facing position should be maintained for as long as recommended or advised by the manufacturer.) Some forward-facing-only seats are available to accommodate larger children. Note: Some CSRSs cannot be installed properly in a twenty-inch bus seat (i.e., tray-shield and some convertible seats).~~

- Forward-facing CSRS with a rigid, padded seating area made of plastic (and sometimes metal) that has a five-point harness mode and a booster mode. May be used in a school bus or non-school bus vehicle, provided the seating has adequate space and seat belts or lower anchors for anchorage.

- In harness mode, designed for use by children at least age one and 22 pounds (26.5 for CSRS made June 30, 2025, and after, per federal regulation) and up to 50 to 65 pounds and around 50 inches in height, depending on the model. The child must be able to safely ride in a forward-facing position, so a combination CSRS must never be used by a child younger than age one and ideally not until well over age two; follow the manufacturer's specified minimum age/weight/height that's stated in instructions and any applicable state laws regarding the age at which a child may ride forward facing.

  The harness can be stowed for larger children so the CSRS can be used as a booster seat; see instructions for allowed size and age ranges. The booster mode is useful in non-school bus vehicles but

should not be used on a school bus. Nonetheless, because these types tend to be less bulky than convertible CSRS—and some models allow use by taller children—they are sometimes useful in their harness mode for children on school buses.

- An upright position is often the only option; sometimes a semi-reclined position is offered, per instructions.

- Follow instructions for harness adjustment, which typically requires the straps to emerge from the CSRS at or in the next slot above a seated child's shoulders. If the child's shoulders are above the top-most position, the child is too tall to use the CSRS, even if they are within the occupant weight range.

d. ~~*CarBeds*~~ *Booster seats (Note: For use in non-school buses only)*

~~A car bed for infants up to 20 pounds allows the infant to lie flat. The use of a car bed should be predicated on the advice of a physician or an appropriate medical support professional (e.g., physical/occupational therapist) and approved by qualified personnel at an IEP team meeting.~~

- A booster seat (aka belt-positioning booster or BPB) is a device for passenger vehicles (vans, SUVs, sedans, etc.) that elevates a child's body and guides a lap-shoulder seat belt across bones rather than soft tissue, allowing the occupant to be safely restrained by the vehicle's seat belt and benefit from its other occupant protection systems of passenger vehicles, like side air bags.

- Booster seats are designed for use by children who weigh at least 40 pounds; instructions may also state a minimum height and/or age. They may be used until a child is 80 to 120 pounds and around 57 to 60 inches, depending on the model. A child should be at least age four or five before transitioning from a CSRS with a harness to a booster seat; follow model-specific requirements provided in the instructions and any applicable state laws.

- Dedicated booster seats come in backless and/or high back designs. Other boosters are part of multi-modal CSRS, in which a harness system may be used for rear- and/or forward-facing conventional modes and then removed or stowed when the child is ready to transition using the CSRS in booster mode.

- Laws in all states require children in passenger vehicles— including those in the care of student transporters—to use a booster seat if they've outgrown the harness of a convertible or combination CSRS

before reaching a specified age, height, and/or weight. Student transporters who utilize passenger vehicles to transport birth-to-K children shall follow these laws. A child who uses a booster should continue to do so until they fit the vehicle's seat belt properly.

- Booster seats shall not be used in a school bus since, unlike passenger vehicles, school bus seats and their seat belt systems are designed to fit a child's body. Occupants who are too small to properly use a school bus's seat belt (even after adjusting it to its smallest size) or who need more support should ride in a CSRS instead.

- In alternative vehicles, a booster shall be used to position a lap-shoulder seat belt. A booster shall not be used with a lap only seat belt.

e. ~~*Specialized Positioning*~~ *Car Bed CSRS*

~~Specialized positioning seats are used only when a child does not fit in a standard CSRS or has a particular condition warranting more support. As per NHTSA's, "Child Passenger Safety Training Instructor Guide for School Buses," tether straps are not required in school buses; however, some special needs CSRSs require a tether strap. (See manufacturer's instructions and all NHTSA curricula to determine the specifics.)~~

A car bed is a CSRS for very small and/or fragile infants that allows the child to ride lying down. For any vehicle, this type of CSRS is used only on the direct advice of an infant's doctor because the child must remain in a prone, supine, or (allowed for some models) right-side lying position. Children who must ride in a car bed are not likely to be taken to school; whenever possible, an infant should be deemed stable for riding rear facing in a semi-reclined position before transportation is provided. If an infant's doctor says they must use a car bed for transport to school, all instructions from the doctor and car bed manufacturer for proper installation and use in a school bus or non-school bus vehicle shall be followed.

f. ~~*Safety Vests*~~ *Adaptive CSRS*

~~The decision to use a vest should be made by an IEP team that includes qualified personnel and the parent, and the use of safety vests should be noted on the IEP. Vest selection should be appropriate for the size and needs of the child. Proper fit must account for seasonal changes in clothing. Pre-school children, due to their age, weight, physical development and their overall mental~~

~~ability, should be securely fitted with a crotch strap supplied by the manufacturer. (Only vests required under FMVSS 213 will have a crotch strap supplied by the manufacturer. It is not optional.) Safety vests must be used only on school bus seats. The entire seat directly behind the child in the seat-mounted vest must be unoccupied or have restrained occupants. Vests shall be anchored, as specified by the manufacturer.~~

- Adaptive CSRS are models that have been specially designed to accommodate one or more needs of a child with disabilities. Models exist for a variety of purposes, including to allow use of a five-point harness by larger children, support a fully reclined position, prevent injury to fragile/sensitive areas, inhibit "escapee" behavior, or accommodate medical equipment (like casts or braces). A list of all available adaptive CSRS models, with prices, approved height/weight ranges, and other details, can be found at www.saferidenews.com (see Adaptive CR Listing under Resources).

- Adaptive CSRS are generally heavier/larger, more expensive, and have more complex use instructions than other types of CSRS. Therefore, an adaptive CSRS should be selected for a child only when other options have been evaluated and found to be unacceptable. For many conditions, a conventional CSRS (or, if transporting on a school bus, a school bus child restraint system) can provide adequate support, comfort, recline, and positioning for a birth-to-K child. However, depending on a child's needs, an IFSP/IEP/Section 504 team (with input from the child's doctor, as appropriate) may specify the permanent or temporary use of a specific adaptive model.

- While the elements of correct CSRS use (listed above) apply to adaptive CSRS, adaptive CSRS often have instructions that are not typical of other CSRS and may have specialized accessories that must be used properly. Adaptive CSRS may be used in a school bus or non-school bus vehicle, provided the seating has adequate space and allows for proper anchorage, though many models tend to be more compatible with non-school bus vehicles.

  Note: Although adaptive CSRS must meet federal standards, they are exempt from the untethered testing requirements that other CSRS must meet. So, another complexity of adaptive CSRS is that instructions typically require a tether to be attached to a designated tether anchor in the vehicle, whether in a school bus or non-school bus. See Tethering CSRS (below) for information on this topic.

g. ~~*Wheelchairs*~~ *Safety Vest CSRS*

~~All decisions regarding the use of wheelchairs in the school bus must be made by an IEP team that includes qualified personnel and the parent and should be noted on the IEP. School buses must be properly equipped to accommodate wheelchairs or other mobility devices before transporting passengers who require such devices. (See the Specially Equipped School Bus Specifications section, this document.)~~

- A webbing-based CSRS that fits around the child's torso and has attachment loops at the shoulders and hips to connect it to a seat mount installed in the vehicle.

- Safety vests may be used by children starting at 25 or 31 pounds and up to 165 to 168 pounds, depending on the model. The child must be able to safely ride in a forward-facing position, so a safety vest shall never be worn by a child younger than age 1 and ideally not until well over age two; follow the manufacturer's specified minimum age when stated in instructions and any applicable state laws regarding that age at which a child may ride forward facing. Some product instructions allow the continued use of a safety vest as a positioning device after the child reaches the upper weight limit if used under a properly worn seat belt; check instructions for other conditions that must be met for use in this mode with heavier children.

- Some safety vests attach to a seat mount that is installed on the school bus seat (traditional or FMVSS 210-compliant) using a cam wrap, which is a strap that runs through the seat bight and vertically around the seatback. A cam wrap mount (sometimes called a "portable seat mount" when used with a safety vest), shall be used only on a school bus (never on a non-school bus). IMPORTANT: Per NHTSA requirements, to protect the CSRS occupant from the negative effect of double loading the seatback in a crash, the entire bench behind a CSRS installed using a cam wrap must be unoccupied or occupied only by restrained occupants.

- Another option for some safety vests is a seat mount with a tether that is used along with a vehicle seat belt worn by a child in a safety vest, following manufacturer instructions. This seat mount type is more commonly used in non-school buses, where it is the only installation option (a cam wrap may not be used in passenger vehicles). This method is more often compatible in non-school buses because, in these vehicles, seat belts are always present and tether anchors have been required since model year 2000. (Although a safety vest used with a seat belt and a tether mount

may be used on a school bus, the bus seating and belts must meet federal requirements, and a tether anchor must be present; usually, this is not the case on a school bus. Therefore, on school buses, a cam wrap mount is more appropriate.)

- Safety vests are sized according to the child's circumference at the chest and/or hips and should be adjusted to fit snugly per manufacturer instructions. Heavy clothing like a coat should be removed before putting the safety vest on a child; a coat may be worn over a properly adjusted safety vest. A properly fitted crotch strap shall always be used on a safety vest that accommodates a child up to 80 pounds and is strongly recommended for use on all safety vests. For a child with an IFSP/IEP/Section 504 Plan, the decision to use a vest with a rear zipper closure and/or other anti-escape features should be made by the IFSP/IEP/Section 504 Plan team.

- Transportation personnel should check seat mount straps for proper installation and set-up for fit to the child during pre-trip inspections.

h. School Bus Only CSRS

- A five-point harness attached to a slim back pad and seating surface (no rigid plastic shell) that installs to school bus seating using a cam wrap. A school-bus-only CSRS shall never be used in a non-school bus vehicle.

- May be used by children starting at 20 or 25 pounds and up to 65 to 90 pounds, depending on the model. (At least one model that's available for children with disabilities can be used to a higher weight.) The child must be able to safely ride in a forward-facing position, so a school-bus-only CSRS must never be worn by a child younger than age one and ideally not until well over age two; follow the manufacturer's specified minimum age when stated in instructions and any applicable state laws regarding the age at which a child may ride forward facing.

- Installs on the school bus seat (traditional or FMVSS 210-compliant) by means of a cam wrap strap (not a seat belt), which runs through the seat bight and vertically around the seatback. Per NHTSA requirements, to protect the CSRS occupant from the negative effect of double loading the seatback in a crash, the entire bench behind a CSRS installed using a cam wrap must be unoccupied or occupied only by restrained occupants.

- The shoulder strap height should be adjusted so it is at or the next position above the seated child's shoulders. If the child's shoulders are above the top-most position, the child is too tall to use the CSRS, even if they are within the occupant weight range.

i. Belt Converter CSRS

- A webbing-based CSRS consisting of shoulder straps and a crotch strap (or straps) attached to a cam wrap or tether that, when installed, turns a seat belt (typically a lap-only belt) into a five-point harness. Must be used with a seat belt that meets FMVSS 209 on seating that meets FMVSS 210 for proper anchorage strength.

- A belt converter CSRS may be used by children starting at 25 or 31 pounds, depending on the model. Used in a school bus, a belt converter may be used up to 168 to 275 pounds, depending on the model; in a passenger vehicle (in which only the tether-mounted option may be used) follow instructions for child weight limits that apply to use of the vehicle's tether anchor(s). To use a belt converter, a child must be able to safely ride in a forward-facing position, so this type shall not be used until a child is at least age two; follow the manufacturer's specified minimum age when stated in instructions and any applicable state laws regarding the age at which a child may ride forward facing. It is also important to recognize that it takes most children longer to attain the stature and maturity needed to properly use a belt converter CSRS than other types of CSRS. Therefore, besides the child's age, these fit and use factors must also be carefully considered when assessing this CSRS type for a child.

- A belt converter that installs using a cam wrap (a strap that runs through the seat bight and vertically around the seatback) may be used only on a school bus on seating that is reinforced (meets FMVSS 210) and equipped with a seat belt (meeting FMVSS 209). Per NHTSA requirements, to protect the CSRS occupant from the negative effect of double loading the seatback in a crash, the entire bench behind a cam-wrap installed CSRS must be unoccupied or occupied only by restrained occupants.

- A belt converter that installs using a tether strap requires the seating to be reinforced and equipped with a seat belt and tether anchor. This is the only type of belt converter that may be used in non-school buses. (Although a belt converter that installs using a tether strap may be used on a school bus if the bus seating meets the requirements, the type with a cam wrap is more common and more often suitable for use on school buses.)

- The belt converter should be adjusted per the owner's manual instructions, which indicate that the shoulder and crotch straps should be made snug but must not pull the vehicle lap belt upward, off the thigh and onto the child's stomach. To provide crash protection and prevent dangerous slouching during normal driving conditions, the crotch strap shall always be used and properly adjusted.

j. Built-in (aka Integrated) CSRS

- A webbing-based CSRS that is permanently mounted to a school bus seatback as purchased from the seating manufacturer. Typically, a padded flap folds down off the seatback to reveal a five-point harness system; the flap becomes a seating surface for the child (often by folding it to provide some elevation). The CSRS's cover flap can be folded back up (often secured using Velcro) when the CSRS is not in use so that the seat can be used by older students, as well.

- Built-in CSRS typically may be used by children from 20 or 22 pounds up to 85 to 90 pounds, depending on the instructions provided by the seating manufacturer. To use a built-in CSRS, a child must be able to safely ride in a forward-facing position, so this type shall not be worn by a child younger than age one and ideally not until well over age two; follow the manufacturer's specified minimum age when stated in instructions and any applicable state laws regarding the age at which a child may ride forward facing.

- The shoulder strap height should be adjusted so it is at or the next position above the seated child's shoulders. If the child's shoulders are above the top-most position, the child is too tall to use the CSRS, even if they are within the occupant weight range.

- Although a built-in CSRS does not require installation, training on proper harness use, care, and maintenance for this type of CSRS should not be overlooked.

- While, in the past, some non-school bus vehicles were equipped with built-in CSRS, these vehicles were rare and are seldom seen in use today. Follow all vehicle manufacturer instructions for using a factory-installed built-in CSRS in a non-school bus vehicle. A non-school bus vehicle should not be retrofitted with seating with built-in CSRS made for a school bus.

D. ~~Bus Seat Designated for a Child Safety Restraint System~~ Care and Maintenance

of CSRS

As with all transportation equipment, policies and procedures should be established for cleaning and inspection of the CSRS inventory, both in use and in reserve, to ensure all CSRS are in good working order. Such policies should be in writing, and a maintenance document should be used to manage tasks and assign duties.

1. Registration: Upon acquiring any CSRS, it should be registered with the manufacturer so that the owner will be notified in the event of a recall or safety update.

2. Recalls: The CSRS inventory shall be regularly checked for recalls. In addition to responding to manufacturer notifications, this procedure should involve proactively checking for recalls periodically at www.NHTSA.gov/recalls for each model (name/model number and manufacture date) and/or by subscribing to NHTSA's email notification service and checking recalls against the transporter's CSRS inventory list. When recalls occur, a CSRS shall be pulled from use and an unrecalled, equally suitable replacement CSRS deployed until the manufacturer's recall fix has been completed and recorded.

3. Expiration: CSRS should be continually tracked for product expiration; products that exceed the manufacturer's stated lifespan should be taken out of use and replaced, as needed. Instructions and labeling typically explain how long a CSRS may be used, but if a product's expiration date is unclear, contact the manufacturer.

4. Cleaning: Procedures for cleaning CSRS shall follow each manufacturer's instructions for the specific CSRS model. Manufacturer websites typically provide cleaning information, as well. In general, the use of chemicals should be avoided when cleaning any part of a CSRS (webbing, plastic, padding, buckles and other metal parts). Check instructions to learn whether padding can be machine washed and/or dried. Follow product instructions for whether certain parts may be removed for cleaning and, if so, how to remove and replace them properly.

5. Damage Screening/Repair: CSRS used by children shall be checked over for signs of degradation due to use, including, but not limited to, fraying of harness webbing, rusting of metal parts, cracked plastic, and mildew/mold growth on any part. This should involve spot-checking CSRS with each use as well as a more thorough evaluation of all CSRS on a scheduled, routine basis. When damaging wear is identified, appropriate steps to rectify it shall be taken, which may require replacing the CSRS. Any steps taken to fix a worn CSRS shall be undertaken by contacting the product manufacturer and following its approved steps; in some cases, parts can be ordered/replaced.

6. Disposal of CSRS: Proper disposal of damaged, faulty, or expired CSRS involves destroying the CSRS (i.e., cutting harness straps, removing padding,

marking plastic as “do not use”) so that it will not be used by others by mistake. In some locales, recycling CSRS parts is an option that should be considered

~~The transportation provider should ensure installation and use in accordance with the following NHTSA guidelines:~~

1. ~~Locations of school bus seats designated for CSRSs should start at the front of the vehicle to provide drivers with quick access to the CSRS occupants.~~

2. ~~CSRS anchorages on school bus seats should meet all applicable FMVSSs.~~

3. ~~The non-adjustable end of the lap belt should be positioned at the center for a CSRS placed next to the window; or, at the aisle for a CSRS placed next to the aisle.~~

4. ~~The non-adjustable end of the lap belt must not extend more than one to two inches from the seat.~~

5. ~~When ordering new school buses, the maximum spacing specified under FMVSS No. 222, School Bus Passenger Seating and Crash Protection, (within 24 inches space from the seating reference point) is recommended for seats designated for CSRSs to provide adequate space for the CSRSs.~~

6. ~~The combined width of CSRSs and/or other passengers on a single seat does not exceed the width of the seat.~~

7. ~~If other students share seat positions with CSRSs, the CSRSs are placed in the window-seating position, excluding emergency exit windows.~~

E. ~~Medical Equipment~~ Use of CSRS Tethers

~~All decisions regarding medical equipment in the school bus should be made in accordance with state laws and regulations. Decisions regarding medical equipment should be the joint decision of trained personnel who are knowledgeable about the type of medical assistance and support a pre-school child may need while in a school bus. Decisions should be made by qualified team members in attendance at IEP meetings, including the parent. The IEP document should include all the appropriate information. Safe transportation specifications should be documented on the IEP. Some special considerations and recommendations are as follows:~~

1. ~~All medical support equipment shall be secured at the mounting location to withstand a pulling force of five times the weight of the item.~~

2. ~~Latched compartments are the preferred methods of transport.~~

3. All medical equipment should be secured below the window.

4. Oxygen equipment (liquid or gas) shall be approved by the manufacturer for transport and should be securely mounted to the bus and fastened to prevent damage and exposure to intense heat levels.

   Note: Refer to the SPECIALLY EQUIPPED SCHOOL BUS SPECIFICATIONS section.

All conventional CSRS that can be used forward facing have a tether strap to add a third point of securement that protects the occupants head when they ride forward facing. These CSRS have instructions that strongly urge that the tether strap be attached to a designated vehicle tether anchor whenever possible. However, for some CSRS, attaching the tether is a requirement, not an option.

Per FMVSS 225, passenger vehicles (SUVs, vans, sedans) made since model year 2001 must have a minimum of three tether anchors for attaching CSRS tethers, with few exceptions. Some passenger vehicles have more than three tether anchors. Whenever a forward-facing CSRS is used in a non-school bus vehicle in a seating position with a tether anchor, the tether anchor should be used, following all vehicle and CSRS instructions. When assigning a seat in a passenger vehicle for a child who rides in a forward-facing CSRS, selecting a seat equipped with a tether anchor should be a priority.

School buses of all sizes are exempt from the tether anchor requirement of FMVSS 225. However, some school bus seating has been voluntarily equipped with tether anchors. Contact the bus seating manufacturer to learn more about the availability of tether anchors on school bus seating.

If instructions for a CSRS require tethering but the seating lacks a factory-installed tether anchor (or the combined weight of the child and the CSRS exceeds a limit stated by the vehicle manufacturer for use of the tether anchor), an alternative solution shall be found that allows proper use. Options to consider include:

1. Using a different CSRS that does not require tethering. (Depending on what is written in the child's IFSP/IEP/Section 504 Plan, however, this approach may require the team to reconvene to approve a change.)

2. Serving the child using a different vehicle or moving the CSRS to a different seating position within the vehicle.

3. Retrofitting the seating with a tether anchor. This option is especially viable in school buses, provided the seating is reinforced to meet FMVSS 210. Contact the school bus manufacturer to discuss this option. It is far less likely that a passenger vehicle may be retrofitted with additional tether anchors, but it is sometimes possible for vehicles made in the 1990s. Contact the vehicle manufacturer or a dealer's parts department to discuss this option.

4. Tethering to a seat belt in the row behind the CSRS in school buses or to a third-row seat belt when a child is seated in the second row of a non-school bus. However, before using this technique, contact the CSRS and vehicle seating manufacturer to secure approval; not all manufacturers approve this tethering method. A child passenger safety technician can assist with properly tethering to a seat belt in the row behind a CSRS, which typically involves buckling a seat belt, wrapping the tether around it, and attaching the tether hook to the tether strap. When a CSRS in a school bus is tethered to a seat belt in the row behind it, the entire bench behind the CSRS shall be unoccupied.

F. ~~Special Considerations~~ Handing off Birth-to-K Children

~~Because of the dependency of young children and the need to make decisions on a case-by-case basis, the following section on special considerations is provided for guidance on a variety of issues related to the transportation of pre-school children.~~

~~1. Equipment Maintenance: Procedures should be established for scheduled maintenance, cleaning and inspection of all equipment, including CSRSs. Procedures should be in place to assure that all equipment is checked regularly for recalls and for product expiration dates. Procedures must be in place for cleaning CSRSs according to manufacturers' instructions. Proper disposal of outdated equipment is important.~~

~~**Note**: A recall list may be found at www.nhtsa.dot.gov.~~

~~2. Radios/Two Way Communication and Cell Phones~~

~~Refer to the SPECIALLY EQUIPPED SCHOOL BUS SPECIFICATIONS section.~~

1. All birth-to-K children shall be met at drop-off by a responsible person who has been pre-approved. The receiving person shall be an adult or a person of an age deemed appropriate for child supervision by child protective services.

2. Policies shall be in place that outline procedures to follow if someone is not present to receive a birth-to-K child at their stop or if a person present has not been approved for hand-off. Unmet children should be returned to the school or other pre-planned location so that school officials can attempt to contact parents/guardians for resolution.

G. Medical Equipment

1. All decisions regarding medical equipment in the school bus should be made in accordance with state laws and regulations. Decisions regarding medical equipment should be the joint decision of trained personnel who are knowledgeable about the type of medical assistance and support a school age child, infant, toddler or pre-school child may need while in a school bus;

2. Decisions should be made by qualified team members in attendance at IFSP or IEP meetings, including the parent. The IFSP or IEP document should include all the appropriate information. Safe transportation specifications should be documented on the IFSP or IEP;

3. Some special considerations and recommendations are as follows:

    a. All medical support equipment shall be secured at the mounting location to withstand a pulling force of five times the weight of the item;

    b. Latched compartments are the preferred methods of transport;

    c. All medical equipment should be secured below the window;

    d. Oxygen equipment (liquid or gas) should be approved by the manufacturer for transport and should be securely mounted and fastened to the bus to prevent damage and exposure to intense heat levels.

        Note: Refer to the SPECIALLY EQUIPPED SCHOOL BUS SPECIFICATIONS section.

H. Post-Trip and Post-Run Segment Checks

Wrimen policies and procedures shall be in place for post-trip and post-run segment checks. As with any student population, drivers are responsible for conducting a walkthrough inspection of the school bus following drop-offs at each school and after the last delivery on each run segment. Prior to departing the bus for any length of time, a walkthrough inspection must be conducted. Birth-to-K children are much more likely than older children to have fallen asleep during a school bus ride, so during a walk-through inspection, check on and under the seats for sleeping or hiding children. Identify any items that may have been dropped or left aboard the bus. Warning flag systems and/or electronic means may be used; however, the school bus driver is responsible for ensuring that the post-trip inspection has been made

SALE AND DISPOSAL OF USED PUPIL TRANSPORTATION EQUIPMENT

Mississippi Code Sections Ann. §37-7-451 through 37-7-457 provide authority for the Disposition of Property Not Needed for School Purposes. This has been considered a legal means of selling school buses that are no longer needed in the transportation program. Advertisement for competitive bids on the sale of this equipment is required under the above sections. In the event that one school district sells transportation equipment to another school district, it is necessary to comply with the provisions of Section 37-41-101(5), MS Code of 1972, amended. It is not necessary to obtain approval from the Mississippi Department of Education to dispose of said equipment.

The procedures outlined in this section should be used in order to assure the proper disposal of school buses that are sold or otherwise removed from the local education agency's school bus fleet.

If the bus is sold to another local education agency, private school, or other educational agency that will continue to use the vehicle as a school bus, only the name of the school system and the tag should be removed. If the bus is sold or traded to a dealer, only the tag should be removed. The school bus dealer will remove the name of the school district.

Federal and state law requires that school buses be equipped with signal lamps and other visual signals and markings that clearly identify the vehicle as a school bus. School buses are also equipped with specialized equipment that are designed to protect students, school bus drivers, and motorists. These visual markings, signals, and other specialized equipment, which include amber and red flashing lights, stop signs, warning signs on the rear of the bus, school bus lettering, and crossing control arms, are peculiar to school buses and may not be used on other vehicles, except as provided under Mississippi law. Accordingly, the disposal of school buses requires measures above and beyond those necessary for the disposal of other school district vehicles.

To avoid possible liability, improve security, and also ensure compliance with the law, the following procedures should be followed when disposing of buses that will no longer be used as school buses:

A. Disable the overhead amber and red flashing lamps, stop arm(s), and crossing arm used for loading and unloading students.

B. Remove all references to the entire name of the school district on the sides of the bus, not just the name of the county or city.

C. Remove the words "SCHOOL BUS" on the front and rear of the bus.

D. Remove the tag from the vehicle before the sale.

Mississippi Code Ann. §63-7-79

1. Any person who owns or operates a used school bus for the purpose of transportation or use of any kind on the public roads and highways of the State of Mississippi, other than for school purposes, shall change the color of such bus from the regular school bus color of yellow or national school bus chrome to a color in contrast to this color before such bus can be used or operated on the highways or public roads in Mississippi.

2. The vendor or owner of any school bus shall inform the purchaser in writing at or prior to the time of the sale of any bus not to be used for school purposes as to the requirements of this section.

3. Any person who shall violate the provisions of this section shall, upon conviction thereof, be fined not less than twenty-five dollars (425.00) nor more than one hundred dollars ($100.00).

APPENDIX A - COLORADO RACKING LOAD TEST

The Colorado Racking Test shall be required on or before the acceptance date of the first bus of the respective configuration.

TEST PROCEDURE:

In addition to complying with the test procedures described in FMVSS No. 220, the body manufacturers shall record and report the downward vertical movement of the force at 0, 25, 50, 75 and 100 percent of the maximum force (both loading and unloading). The expected force deflection curve is illustrated schematically in Figure 1a. Low load nonlinearities may indicate joint deformation; high load nonlinearities may indicate yielding in structural members.

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

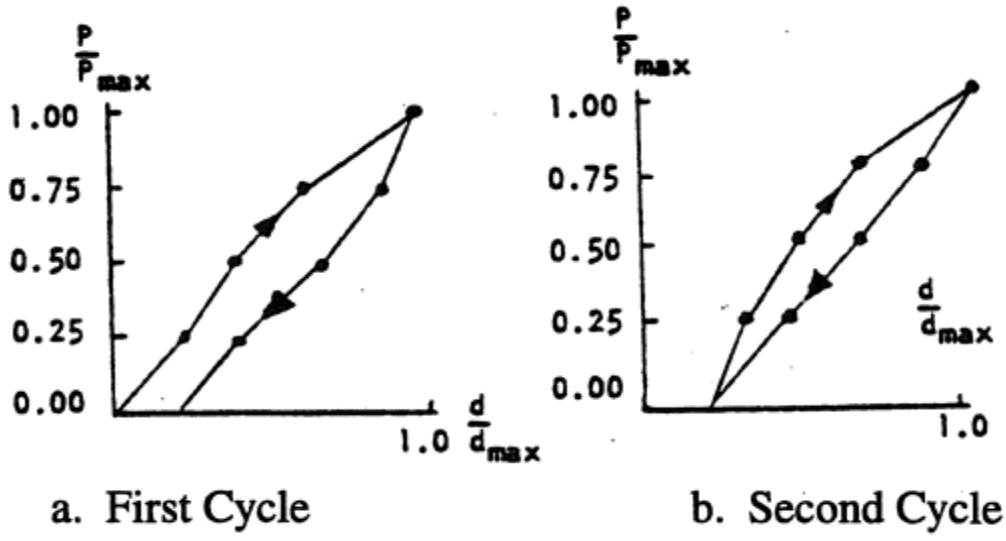


Figure 1. Static Load Test Load-Deflection Curves

A diagonal (racking) load test must be performed on types A, B, C and D school buses to assure adequate shear stiffness and strength of the bus body. Details of the test are provided below:

A two-cycle loading sequence shall be conducted following the described procedure.

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

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

2. Each emergency exit of the vehicle provided in accordance with FMVSS No. 217 shall be capable of operation as specified in that standard during the full application of the force and after release of the force.

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

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

b. The load shall be applied through a force application plate that is flat and rigid. The dimensions of the plate shall be chosen to assure that the plate edges never make contact with the vehicle skin during testing. A typical width is 18 inches, and a typical length is 20 inches less that the length of the vehicle's roof measured along its longitudinal centerline.

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

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

e. Apply additional force in a diagonally downward direction through the force application plate at a rate of not more than 0.5 inch per second until the force specified in (a) has been applied, and maintain this application of force.

f. Measure the diagonal movement of any point on the force application plate that occurred during the application of force in accordance with (b)(5), and open the emergency exits as specified in (a)(2).

g. Release all diagonal force applied through the force application plate, and operate the emergency exits as specified in (a)(2).

C. **Test Conditions:** The following conditions apply to the requirements specified in (3).

a. Temperature: The ambient temperature is between 32 degrees F and 90 degrees F.

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

D. **An alternative method** of testing for the racking load test shall be as follows:

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

A representative method of loading that employs a hydraulic jack to load a two-frame test assembly is illustrated in figure 2.

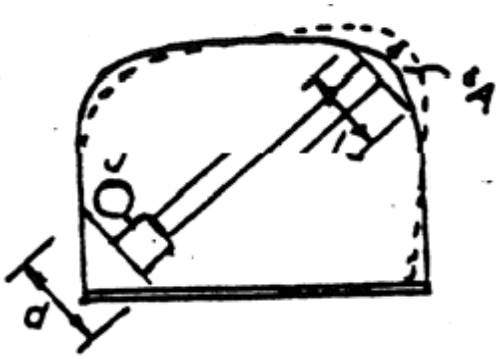
The maximum jack load for the two-frame assembly is determined by the following formula:

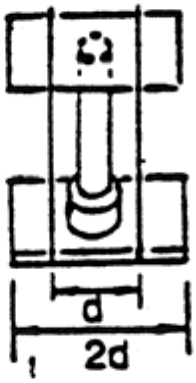
J = 2P J - maximum jack load for two-frame test assembly P = load/frame

where P = Dynamic Vehicle Weight (DVW) divided by N DVW - dynamic vehicle weight
N - total number of bus body frames and DVW = DF x GVW
DF - dynamic factor, not less than 1.5 GVW - gross vehicle weight

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

When a complete bus body is rack-loaded, the total load DVW must be distributed uniformly along the bus body. This may be accomplished by mounting a series of hydraulic jacks along the length of the bus interior. Seats may be removed to facilitate jack mounting. The rack load will be considered to be uniformly distributed when the variation in the hydraulic jack readings is less than 10 percent. A maximum load is the sum of all jack readings and shall equal DVW.





Transverse Cross Section **Side View**

Figure 2. Arrangement of Hydraulic Jack for Rack-Loading of Two-Frame Assembly

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

the full bus body. Fabrication procedures for the test assembly shall be identical to those used in normal bus body production.

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

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

Manufacturer shall specify which testing method was used and submit appropriate certification information.

APPENDIX B - KENTUCKY POLE TEST

The Kentucky Pole Test shall be required on or before the acceptance date of the first bus of the respective configuration.

TEST PROCEDURE:
The body shall be impacted at any point along the roof line on the outside surface, using an 8-inch diameter cylinder, 48 inches long, at a 30-to-45-degree angle, 1 to 3 inches above the top window line. The cylinder shall impact the roofline with the 48 inches dimension in a vertical plane with a force not to exceed 10 inches maximum to 8 inches minimum penetration of the body panels into the passenger compartment after impact.

The manufacturer shall submit appropriate certification information.

SCHOOL BUS INSPECTION

The purpose of the school bus inspection section is to standardize safety inspection criteria for local school system bus inspectors, technicians, maintenance supervisors and transportation directors to ensure that maintenance personnel are knowledgeable with the mechanical components of the school bus, know which components to inspect, how to inspect each component, and how to identify which items are in need of repair, which defects constitute an out-of-service condition, and be aware of all the applicable construction standards, laws, rules, and all other requirements. School districts are required to conduct quarterly inspections on all school buses, multifunction school activity buses, and vehicles other than school buses used for student transportation.

While this section clarifies many issues pertaining to school bus safety inspections, it will not answer all technical or interpretive questions. Please refer to the school bus manufacturer and equipment suppliers for inspection procedures as appropriate. In all instances, trained personnel must exercise professional judgment and remember that safety is the foremost consideration when inspecting school buses in Mississippi.

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OUT-OF-SERVICE CRITERIA

The purpose of the out-of-service criteria is to identify school bus components and provide tolerances the inspectors can utilize to determine if a school bus is safe for student transportation.

RESOURCE INFORMATION

49 CFR PARTS 570.1-570.63, Vehicle in Use Inspection Standards
49 CFR PARTS 400-599, Federal Motor Vehicle Safety Standards
49 CFR PARTS 393, 396, Federal Motor Carrier Safety Regulations
49 CFR APPENDIX A to Subchapter B, Minimum Periodic Inspection Standards
Commercial Vehicle Safety Alliance (CVSA) North American Uniform Out-of-Service Criteria

Note: References to these citations below may include only the number for brevity; e.g. (393.203) instead of (49 CFR, Part 393.203).

SCHOOL BUS OUT-OF-SERVICE CRITERIA

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A. INSIDE BUS
1. Emergency Equipment

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Fire Extinguisher (393.95)		
Check for the presence of a fire extinguisher and for the following:		No fire extinguisher is on bus.
1) Pressure: Check gauge.		Pressure is above or below the green zone.
2) Tag (Inspection Date): Check for the presence of inspection sticker or tag and inspection date	Inspection sticker or tag will expire before next scheduled inspection.	Tag or sticker is missing or does not verify inspection was performed within the previous 12 months. **Exception: Buses less than one year old with original fire extinguisher do not need a tag or sticker.**
3) Mounting: Check for accessibility and secure mounting.	Bracket mount is loose.	Fire extinguisher is not accessible to driver, not mounted securely or mounted in a lockable compartment not equipped with an operational ignition-warning buzzer or interlock.
4) Rating: Check for proper Underwriters Laboratory (UL) rating.		Rating is less than 2A-10BC.

(Continued on Next Page)

A. INSIDE BUS
1. Emergency Equipment

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
5) Nozzle/hose: Check for loose or damaged parts.		Hose or nozzle is loose, missing or there is excessive damage to any part of the extinguisher.
6) Safety Pin: Check for presence of safety pin and breakable, non-reusable tamper seal.		Safety pin is missing and/or tamper seal is broken. Tamper seal cannot be broken by hand or is reusable (can be opened and resealed without destroying the seal).
b. First Aid Kit		
1) Kit box and condition: A moisture and dust-proof kit box is required for buses built since 1985.		Kit is not present; kit box is not moisture-proof and dust-proof, will not stay latched and/or cannot be opened.
Check for the presence of a breakable, non-reusable tamper seal for buses built since September 1995.	Tamper seal is broken, missing or reusable (can be opened and resealed without destroying the seal).	Tamper seal cannot be broken by hand.
2) Mounting: Check accessibility and mounting of kit. Kit should be mounted in the driver's area in such a manner that it can be easily detached and made portable.		Kit is not secured, not mounted in the driver's compartment, not easily detached or mounted in a lockable compartment not equipped with an operational ignition-warning buzzer or interlock.
NOTE: Must check kit contents if seal is broken or missing (also see the NOTE on page 3).	**(Continued on Next Page)**	

CHART 1: FIRST AID KITS

BUSES MANUFACTURED FROM 1985 TO 2025

DESCRIPTION	QUANTITY
1” bandage compress (e.g., Band-Aid)	2 pkgs.
40” triangular bandage with two safety pins	1 pkg.
4” X 4” sterile gauze pads	6 pkgs. of 2 each
2” rolled bandages 6 yards in length	1 pkg.
1” roll adhesive tape 2-1/2 yards in length	1 roll
Eye dressing packet	2 pkgs.

CHART 1a: BODY FLUID CLEANUP KIT

DESCRIPTION	QUANTITY
An Environmental Protection Agency (EPA)-registered germicide (tuberculocidal) disinfectant	1
A fully disposable wiping cloth	1
A water-resistant spatula	1
Step-by-step directions	1
Odor-counteracting absorbent material	1
Latex gloves	2 pairs
Towelettes	1 pkg.
A discard bag (non-labeled paper bag with plastic liner and twist tie). This bag shall be approximately 4x6x14 inch and be of a non-safety color (i.e., not red, orange or yellow).	1

Note: In addition to scheduled inspections, all first aid and body fluid cleanup kits should be opened and inspected annually to check the condition and presence of contents according to A.1. b. and c.

A. INSIDE BUS
1. Emergency Equipment

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
3) Contents: Check that all contents are intact, have not deteriorated and are sterile. (For contents list, see chart 1.)	Bandages are missing or incomplete.	Contents are incomplete (except bandages), improper type or not usable due to contamination, age or deterioration.
c. Body Fluid Cleanup Kit		
1) Kit box and condition: Buses manufactured since 1992 require a sealed kit.		Kit is not present or not sealed, or box will not stay latched or cannot be opened.
Check for the presence of a breakable, non-reusable tamper seal for all buses manufactured since September 1995.	Tamper seal is broken, missing or reusable (can be opened and resealed without destroying the seal).	Tamper seal cannot be broken by hand.
2) Mounting: Check accessibility and mounting of kit. Kit should be mounted in the driver's area in such a manner that it can be easily detached and made portable.		Kit is not secured, not mounted in the driver's compartment, not easily detached without the use of tools, or mounted in a lockable compartment that is not equipped with an operational ignition-warning buzzer or interlock.
3) Contents: Check that all contents are intact, have not deteriorated and are sealed. (For contents list, see chart 1a.)		Contents are incomplete or not usable due to age and deterioration.
Note: Must check kit contents if seal is broken or missing.		

(Continued on Next Page)

A. INSIDE BUS
1. Emergency Equipment

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Reflectors (FMVSS 571.125)		
1) Check for proper quantity, type and condition of emergency roadside reflectors.		Not equipped with three self-standing, 17-inch triangular reflectors or any of the reflectors, or storage box is unusable due to age, damage or deterioration.
2) Check accessibility, mounting and condition of storage box. Must be securely mounted in driver's area.		Storage box is broken, will not remain latched, is not easily accessible, is not securely mounted forward of the passenger compartment, or mounted in a lockable compartment that is not equipped with an operational ignition warning buzzer or inter-lock.
3) Check for the presence of a breakable, non-reusable tamper seal for buses manufactured since September 1995.	Tamper seal is broken, missing or reusable (can be opened and resealed without destroying the seal).	Tamper seal cannot be broken by hand.

A. INSIDE BUS
2. Registration and Insurance Card

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Insurance Card Check for a valid insurance card.		Insurance card is invalid, missing or illegible.

A. INSIDE BUS
3. Shifter, Noise Abatement Switch and Neutral Safety Switch

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Shifter - Automatic Transmission		
1) Check that shifter operates easily.	Transmission gear selector does not shift easily into all gear ranges.	Shifter will not select all gear ranges.
2) Check that correct transmission gear range is indicated.	Indicator is slightly misaligned, but correctly indicates the gear range selected.	Indicator indicates the wrong gear range selected.
3) Check that shifter has a functional detent mechanism and handle (ball, knob or “T” type).	Shifter handle is loose.	Detent or handle is nonfunctional or missing.
b. Shifter - With Shifter Park Brake Option (if equipped). Same as above plus:		
1) Check that parking brake applies when shifter is placed in “P” (park) position.		Rear spring brake does not apply when shifter is in the “P” (park) position. Rear spring brake applies automatically in any gear range except the “P” (park) position.

(Continued on Next Page)

A. INSIDE BUS
3. Shifter, Noise Suppression Switch and Neutral Safety

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Noise Supression Switch (Required on buses manufactured since 2026)		
Inspect for proper operation. Switch must deactivate all non-safety-essential noise-making equipment.	Switch is not clearly labeled or not of an alternate color.	Switch/System does not work or does not deactivate required items such as AM/FM radio and CD player, heaters, defrosters, fans and air conditioners. Switch/System deactivates safety-essential items such as windshield wipers and lighting systems.
d. Neutral Safety Switch		
Check to determine that automatic transmission bus has a functional neutral safety switch that will allow the starter to operate only in park or neutral.		The starter will engage when automatic transmission is in any gear other than park or neutral.

A. INSIDE BUS
4. Engine Controls

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Key/Ignition Switch		
1) Check that ignition switch operates with a key only.		Key sticks in the switch, switch can be operated without a key or bus is equipped with a push button or non-original equipment manufacturer (OEM) starting device.
2) Must be mounted securely in the Original OEM location.		Switch is loose or not mounted in the OEM location.
3) Must freely select to all positions, i.e., start, run, off and accessory position.		Switch does not function properly in start, run, off or accessory position; is intermittent in any position; or sticks in or between any positions.

(Continued on Next Page)

A. INSIDE BUS
4. Engine Controls

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Accelerator		
1) Check condition of pedal assembly, mounting and securement.	Pedal cover worn but not causing a slippery pedal condition.	Pedal cover is worn badly or missing. Pedal assembly is modified or not mounted securely in the OEM location.
2) Inspect pedal assembly, wiring and connectors for condition and loose or missing hardware. Mechanical linkage must have dual (two) return springs.		Pedal assembly is not operating properly; wiring is loose, damaged or improperly routed; hardware is loose or missing; or mechanical type of linkage is loose, damaged or not equipped with dual return springs.
3) Check for smooth operation of pedal assembly and linkage in the accelerating and coast position.		Accelerator control and/or linkage sticks or does not operate freely.

A. INSIDE BUS
5. Gauges, Indicators, Dash and Switch Panel Lights, Engine Warning Lights/Buzzers and ABS Warning Light

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Gauges From the driver's position, check the visibility, OEM location, readability, operation, accuracy and condition of the following gauges:		
1) Speedometer and odometer	Odometer is unreadable, does not work or is not working properly.	Speedometer is unreadable, damaged, does not function or is confirmed to be inaccurate.
2) Engine oil pressure, temperature and transmission temperature	Oil pressure or temperature gauge is inaccurate or difficult to read.	Oil pressure or engine and transmission temperature gauge is unreadable, damaged or does not function.
3) Fuel	Fuel gauge is inaccurate or difficult to read.	Fuel gauge is unreadable, damaged or does not function.
4) Voltmeter or ammeter	Voltmeter or ammeter is inaccurate, damaged or difficult to read.	Voltmeter or ammeter does not work or does not indicate that alternator is charging. Refer to C.5.f. on page 106.

(Continued on Next Page)

A. INSIDE BUS
5. Gauges, Indicators, Dash and Switch Panel Lights, Engine Warning Lights/Buzzers and ABS Warning Light

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
5) Air pressure or vacuum.		Air pressure or vacuum gauge(s) are inaccurate, unreadable or not working. Air pressure gauge must read within plus or minus seven pounds per square inch (psi) (single gauge) at 100 psi.
6) Diesel exhaust fluid (DEF) level gauge.	DEF gauge is inaccurate, damaged or difficult to read.	DEF gauge does not work or is not present.
b. Indicators, Dash Lights and Switch Panel Lighting		
Check operation of indicators, dash lights and switch panel lighting.	Any illuminated indicator, dash item or switch does not light except for items listed to the right in the "Out-of-Service" column. Dimmer control (if equipped) does not function properly.	Any one of the following fails to illuminate: 1) Air or vacuum gauge or associated low warning lights 2) High-beam headlight indicator 3) Left/right turn signal and four-way hazard dash indicators 4) Speedometer 5) Shift Indicator All dash or control panel lights are inoperative.

(Continued on Next Page)

A. INSIDE BUS
5. Gauges, Indicators, Dash and Switch Panel Lights, Engine Warning Lights/Buzzers and ABS Warning Light

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Engine/Transmission Warning Lights and Buzzer Check for presence and operation of the following warning lights and audible alarms: 1) Coolant temperature dash warning light and alarm on diesel buses 2) Transmission temperature dash warning light and alarm 3) Low oil pressure, dash warning light and alarm on diesel buses		Coolant temperature dash warning light and/or alarm is inoperative. Transmission temperature light and/or alarm is inoperative. Low oil pressure, dash warning light and/or alarm is inoperative. Any of the above lights are on, indicating a critical mechanical condition.
d. ABS Warning Light Check condition of ABS warning lamp and system (if equipped). Refer to applicable vehicle technical publication for test procedures and diagnostic information.		Lamp fails to turn on during initial startup sequence. Lamp fails to turn off. System fails to operate per manufacturer's specifications.

A. INSIDE BUS
6. Air Brake System

Note: Chock bus wheels when inspection procedures require the service, parking and/or emergency brakes to be in the released position.

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Gauge(s) Check for presence of two air pressure gauges or a single gauge with dual needles. One gauge or needle should indicate air pressure available to the front air brake system, and the other should indicate air pressure available to the rear air brake system. Both gauges must be accurate to within plus or minus 7 psi at a system pressure of 100 psi.		Any gauge is missing or unreadable. Gauge is not accurate to within plus or minus 7 psi at a system pressure of 100 psi. Any gauge is not in OEM location. More than 15-psi difference in dual air brake system (dual gauges) with system built up to full pressure (100-125 psi).
b. Buildup Drain air reservoir thoroughly before making this check. Check the time required for air pressure to build up from 85 to 100 psi with engine at approximately 1,200 revolutions per minute (RPM). **Note: If air brake gauge(s) failed inspection step a. of this section, make necessary repairs prior to performing the test in step b.**		Air pressure buildup time from 85 to 100 psi at fast idle is greater than 40 seconds. **393.48(a), 396.3(a)(1), 393.3(a)(1), 393.47(b), 393.47(c), 571.121, 393.48, 393.3(a)(1), 393.45(a), 393.41, 571.105 S5.2.1 and s5.2.3(b)©**

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A. INSIDE BUS
6. Air Brake System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Governor		
Check air brake system governor operation. While building up system air pressure, note pressure at which governor cuts out (compressor quits compressing). With engine still running, pump brakes to lower air pressure until compressor cuts in (starts compressing again). Note pressure. **Note: If gauge(s) failed previous check for accuracy, do not perform this check until gauge(s) are repaired.**	Cut-out pressure is below 120 psi (for buses equipped with air dryer).	Cut-out pressure is too low (below 100 psi) or too high (above 130 psi). Difference between governor cut-out and cut-in pressure exceeds 30 psi.
d. Park/Emergency Brake		
Check condition, mounting and location of park/emergency brake valve, proper release and application of park/emergency brake and interlock(s) operation (if equipped).	Valve labeling is missing or unreadable.	Valve not mounted securely in original position; knob is missing, broken or cracked; park/emergency brake does not release and/or apply properly; or interlock(s) (if equipped) do not function properly.
With parking/emergency brake applied and service brake released, apply engine torque by placing transmission selector in “Drive” (D) and briefly accelerate the engine to approximately 1200 RPM. Vehicle should not move forward. **NOTE: If a bus is equipped with a rear diesel engine and an Allison World transmission, perform this test at approximately 900 RPM.**	.	Vehicle moves forward upon applying engine torque with park/emergency brake applied and service brake released. **393.48(a), 396.3(a)(1), 393.3(a)(1), 393.47(b), 393.47(c), 571.121, 393.48, 393.3(a)(1), 393.45(a), 393.41, 571.105 S5.2.1 and s5.2.3(b)©**

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A. INSIDE BUS
6. Air Brake System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
e. Adjustment Drain water from air reservoir(s). With engine off, wheels chocked, service and park/emergency brakes released and system air pressure at 100 psi or above: 1) Note air pressure. 2) Apply service brakes firmly and release immediately. 2) Note air pressure drop resulting from brake application. **Note: If gauge(s) failed previous check for accuracy, do not perform this check until after repairs.** **Note: Pressure drop exceeding 15 psi indicates brakes may be out of adjustment, foundation brake hardware may be worn out or damaged, and/or there is excessive water in the air reservoir(s).** **Note: Do NOT manually adjust automatic slack adjuster (ASA) type brakes during inspections. See sections D.2. "Front Brake," and D.10. "Rear Brake," for additional information.**	**(Continued on Next Page)**	System pressure drop upon service brake application is greater than 15 psi. **Note: If pressure drop exceeds 15 psi, mark item A. 6. "Out-of-Service" and follow the inspection procedures in sections D. 2., "Front Brake," and D. 10, "Rear Brake."** **Note: Adjust Manual Slack Adjuster (MSA)-equipped brakes at every required inspection.** **393.48(a), 396.3(a)(1), 393.3(a)(1), 393.47(b), 393.47(c), 571.121, 393.48, 393.3(a)(1), 393.45(a), 393.41, 571.105 S5.2.1 and s5.2.3(b)©**

A. INSIDE BUS
6. Air Brake System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Air Leaks		
1) Build up air system to at least 100 psi.		
2) Shut off engine, chock wheels and release the parking brake.		
3) With service and parking brakes in released position, check for air pressure drop for one minute. Note pressure drop, if any.	Pressure drops less than two psi per minute.	Pressure drops two or more psi per minute.
4) Firmly apply and hold service brake. Check for air pressure drop for one minute. Note pressure drop, if any.	Pressure drops less than three psi per minute.	Pressure drops three or more psi per minute.
5) During both checks, listen for any audible air leaks.		There is any audible air leak in the air brake system.
Note: If gauge(s) failed previous check for accuracy, do not perform this test until gauge(s) is repaired.		
		393.48(a), 396.3(a)(1), 393.3(a)(1), 393.47(b), 393.47(c), 571.121, 393.48, 393.3(a)(1), 393.45(a), 393.41, 571.105 S5.2.1 and s5.2.3(b)©

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A. INSIDE BUS
6. Air Brake System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
g. Low Air Warning		
Check operation of low-air warning buzzer and light by building air pressure to 100-125 psi. Shut down engine and perform the following procedure:		Light or buzzer is inoperative.
1) Turn ignition to the on position and pump brake pedal to drop air pressure. The low-air warning buzzer and light must not activate above 75 psi and must activate by 50 psi.		While dropping the air pressure, light and/or buzzer activates above 75 psi or fails to activate by 50 psi.
2) Start engine and build up air pressure. The low-air warning buzzer and light must deactivate by 75 psi.		While building pressure, light and/or buzzer continues to activate above 75 psi.
Note: If gauge(s) failed previous check for accuracy, do not perform this check until gauge(s) is repaired.		**393.48(a), 396.3(a)(1), 393.3(a)(1), 393.47(b), 393.47(c), 571.121, 393.48, 393.3(a)(1), 393.45(a), 393.41, 571.105 S5.2.1 and s5.2.3(b)©**

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A. INSIDE BUS
6. Air Brake System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
h. Park/Emergency Brake Valve Pop-Out		
Check for emergency activation of park/emergency brake valve by dropping air pressure (starting with at least 60 psi in air system) and noting pressure at which valve "pops out."		While dropping air pressure, valve automatically "pops out" above 50 psi or fails to "pop out" between 50 and 15 psi.
i. Service Brake Pedal		
Check service brake pedal assembly for adjustment, mounting, condition, operation and rubber cover pad. Check for presence of prohibited modifications and/or extender block.	Rubber cover pad is worn, but not causing a slippery pedal condition.	Rubber cover pad is missing or badly worn. Any part of pedal and assembly is damaged, loose, missing or modified. Pedal has any type of extender block. **393.48(a), 396.3(a)(1), 393.3(a)(1), 393.47(b), 393.47(c), 571.121, 393.48, 393.3(a)(1), 393.45(a), 393.41, 571.105 S5.2.1 and s5.2.3(b)©**

A. INSIDE BUS
7. Hydraulic Brakes

Note: Several inspection procedures outlined in this manual require the service, parking and/or emergency brakes in the released position. When performing these checks, bus wheels must be chocked to prevent the bus from moving.

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Note: If bus is not equipped with hydraulic brakes, proceed to the next page. **393.51(b), 393.45(a), 571.106, 393.48(a)©, 393.40(b)©, 393.3(a)(1)©, 571.105 S5.2.1 and S5.2.3(b), 393.47(a)(g), 393.48(a), 393.47(d)©**		

Since there are four distinct types of hydraulic brake systems in use on Mississippi school buses, this manual will cover each system individually. It is imperative that you know the type of system you will be inspecting to ensure that the proper inspection procedure is used.

The four types of systems are:

a. Standard Vacuum Assisted Hydraulic Brakes
b. Hydraulic Power Assisted Hydraulic Brake with Accumulator Backup
c. Hydraulic Power Assisted Hydraulic Brakes with Electric Pump Backup and Driveshaft Parking Brake Systems
d. Hydraulic Power Assisted Hydraulic Brakes with Spring Set (hydraulically released) Parking Brakes (Ford Maxi-brake(s))

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A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Standard Vacuum Assisted Hydraulic Brakes. Inspect for:		
1) Any visible seepage or leaks in the hydraulic brake system.		Any seepage or leaks are found.
2) a) Brake pedal reserve (distance from floor) upon firm brake application (engine running).		Brake pedal (reserve) is less than one inch from floor.
b) Brake pedal fade (pedal falls to floor when held down with engine running and with engine off) indicating brake system leak.		Any brake pedal fade is felt.
3) a) Vacuum gauge operation (if equipped) and low vacuum indicator light and buzzer (if equipped) with full vacuum below eight inches of mercury (hg).		Vacuum gauge (if equipped) is inoperative, inaccurate or not clearly visible. Low vacuum indicator light and buzzer do not come on below eight inches of mercury (hg).

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A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b) Brake warning light illumination with ignition key in start position. Check to ensure brake failure warning light is not on during normal operation (with and without brakes applied).		Brake failure warning light does not activate when key is moved to the start position. Brake failure warning light comes on (or stays on) during normal operation (with or without brakes applied).
c) Vacuum drop while engine is off and brakes are not applied.		Vacuum reserve drops while engine is off.
4) Vacuum Assist Booster Operation With engine off, apply brakes several times to exhaust vacuum. Depress and hold the brake pedal down while starting the engine. Pedal should fall away slightly, indicating increased pressure being applied by the assist unit.		Vacuum assist system malfunctions (pedal does not fall away slightly when engine is started.)
5) Sufficient reserve in the vacuum system to allow at least one power-assisted brake application. Check this by turning the engine off and applying the brakes.		Vacuum reserve is insufficient to allow at least one brake application.

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A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
6) All brake hardware components inside bus for secure mounting, routing and condition, including:		Brake pedal assembly, push-rod and clevis or emergency brake control assembly is insecurely mounted; poorly routed; has loose, missing or worn hardware; or is damaged.
a) Brake pedal assembly and rubber cover (if originally equipped).	Rubber cover is worn, but not causing a slippery pedal condition.	Rubber cover pad is missing or badly worn.
b) Emergency brake control assembly.		Any part of pedal and assembly is damaged, loose, missing or modified. Pedal has any type of extender block.
7) Parking Brake Operation With parking brake applied and service brake released, apply engine torque by placing transmission selector in "D" and briefly accelerate the engine to approximately 1,200 RPM. Vehicle should not move forward.		Emergency brake control is hard to operate or does not latch and release properly. Vehicle moves forward upon applying engine torque with park brake applied and service brake released.

(Continued on Next Page)

A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Hydraulic Power Assisted Hydraulic Brakes with Accumulator Backup. Inspect for:		
1) Visible seepage or leaks in the brake or hydraulic assist systems.		Any brake or hydraulic assist fluid is seeping or leaking.
2) a) Brake pedal reserve (distance from floor) upon one firm brake application (engine off, accumulator depleted).		Brake pedal does not have at least a one and a half inch of reserve distance from floor.
b) Brake pedal fade (test for at least one and a half minutes with the engine off). Firmly apply brake pedal and hold.		Pedal falls to floor (fades) when held down (engine off), indicating a brake system leak.
3) Brake warning light illumination with ignition key in start position. Check to ensure brake failure warning light is not on during normal operation (with and without brakes applied).		Brake failure warning light does not activate when key is turned to the start position or stays on during normal operation.

(Continued on Next Page)

A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
4) Power assist check:		
a) With engine off, apply the foot brake several times, and then hold the brake pedal down.		
b) Start the engine.		
c) The pedal should fall away, then push back, against your foot.		Power assist unit is malfunctioning (pedal does not fall away or push back).
d) Listen for engine drive belt squeal.		Engine drive belt is squealing.
e) Release brake pedal.		
f) Turn engine off.		
g) Depress brake pedal. Accumulator should hold enough pressure to allow two assisted brake applications.		Accumulator will not hold enough pressure for two brake applications.
5) All brake hardware components inside bus for secure mounting, routing and condition, including:		Brake pedal assembly, push-rod, clevis or emergency brake control assembly is insecurely mounted; poorly routed; has loose, missing or worn hardware; or is damaged.

(Continued on Next Page)

A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a) Brake pedal assembly and rubber cover pad (if originally equipped).	Rubber cover pad is worn, but not causing a slippery pedal condition.	Rubber cover pad is missing or badly worn. Any part of pedal and assembly is damaged, loose, missing or modified. Pedal has any type of extender block.
b) Emergency brake control assembly.		Emergency brake control is hard to operate or does not latch and release properly.
6) Parking Brake Operation With parking brake applied and service brake released, apply engine torque by placing transmission selector in "D" and briefly accelerate the engine to approximately 1,200 RPM. Vehicle should not move forward.		Vehicle moves forward upon applying engine torque with park brake applied and service brake released.

(Continued on Next Page)

A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Hydraulic Power Assisted Hydraulic Brakes with electric pump backup and driveshaft parking brake system. Inspect for:		
1) Visible seepage or leaks in the brake or hydraulic assist system.		Any brake or hydraulic assist fluid is seeping or leaking.
2) Brake warning and backup systems using the appropriate chassis manufacturer's procedure in chart 2.		The brake system does not pass all tests in chart 2.
3) a) Brake pedal distance from floor (reserve) upon one firm brake application with engine off and hydraulic boost depleted.		Brake pedal reserve is less than one inch from floor.
b) Brake pedal fade (continues to fall to floor after initial firm application) with engine off.		Any brake pedal fade is felt.
6) All brake hardware components inside bus for secure mounting, routing and condition, including:		Brake pedal assembly, push-rod, clevis or emergency brake control assembly is insecurely mounted; poorly routed; has loose, missing or worn hardware; or is damaged.

(Continued on Next Page)

A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a) Brake pedal assembly and rubber cover pad (if originally equipped).	Rubber cover pad is worn, but not causing a slippery pedal condition.	Rubber cover pad is missing or badly worn. Any part of pedal and assembly is damaged, loose, missing or modified. Pedal has any type of extender block.
b) Emergency brake control assembly.		Emergency brake control is hard to operate or does not latch and release properly.
5) Parking Brake Operation With parking brake applied and service brake released, apply engine torque by placing transmission selector in "D" and briefly accelerate the engine to approximately 1,200 RPM. Vehicle should not move forward.		Vehicle moves forward upon applying engine torque with park brake applied and service brake released.

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A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Hydraulic Power Assisted Hydraulic Brakes with Spring Set (hydraulically released) Parking Brakes (Ford Maxi brake). Inspect for:		
1) Visible seepage or leaks in the brake or power assist system.		Any brake or hydraulic assist fluid is seeping or leaking.
2) Brake warning and backup system using chart 3.		
3) Brake pedal travel: Push brake pedal down as far as possible.		The brake systems do not pass all tests in chart 3.
4) Brake pedal fade (pedal falls away to floor when held down with engine running and with engine off, indicating brake system leaks).		Brake pedal travels more than halfway down. Any brake pedal fade is felt.
5) Parking Brake Operation		
a) With engine running, release the parking brake.		
b) Check to be sure brakes are released (bus will move).		

(Continued on Next Page)

A. INSIDE BUS
7. Hydraulic Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c) Turn engine off.		
d) System must maintain pressure (keep parking brake released) for at least five minutes.		Parking brake system will not hold pressure (i.e., release brakes) for at least five minutes.
e) With parking brake applied and service brake released, apply engine torque by placing transmission selector in "D" and briefly accelerate the engine to approximately 1,200 RPM. Vehicle should not move forward.		Vehicle moves forward upon applying engine torque with park brake applied and service brake released.
6) Check all brake hardware and components inside the bus for secure mounting, routing and condition, including:		Brake pedal assembly, push-rod, clevis or emergency brake control assembly is insecurely mounted; poorly routed; has loose, missing or worn hardware; or is damaged.
a) Brake pedal assembly and rubber cover pad (if originally equipped).	Rubber cover pad is worn but not causing a slippery pedal condition.	Rubber cover pad is missing or badly worn. Any part of pedal and assembly is damaged, loose, missing or modified. Pedal has any type of extender block.
b) Emergency brake control assembly.		Emergency brake control is hard to operate or does not latch and release properly.

CHART 2

FORD

WARNING LIGHTS/BUZZER Normal Operation			
MODE	Indicator		
	Brake Lamp	Brake Electric Motor Lamp	Buzzer
1a. Engine Off/Ignition Off/no brake applied	Off	Off	Off
1b. Engine Off/Ignition Off/brake applied	Off	On	On
2. Engine Off/Ignition On or start with or without brake applied	On	On	On
3. Engine On, with or without brake applied	Off	Off	Off

GMC

MODE	Normal Operation		
	Brake Warning Light	Brake Electric Hydraulic Boost Warning Light	Tone Alarm
1. Engine off/ignition off A. No brake applied B. Brake applied	 Off On	 Off Off	 Off Off
2. Engine off/ignition on, with or without brake applied (bulb check).	On	On	On
3. Engine off/ignition on. Start with or without brake applied.	On	Off	On
4. Engine on, with or without brake applied.	Off	Off	Off

Brake Failure Warning System Checks INTERNATIONAL/NAVISTAR	
CONDITION	NORMAL OPERATION
PARK BRAKE LIGHT	
Key switch in start position with park brake released - (bulb check).	Light on
Key switch on with park brake applied.	Light on
BRAKE PRESSURE LIGHT	
Key switch off.	Light off. Electric hydraulic pump operates when service brakes are applied.
Key switch in on position. Engine not running (pump and bulb check).	Light on and electric hydraulic pump operation (some vehicles). See Navistar manual.
	Light on and electric hydraulic pump operates when service brakes are applied.
Key switch in on position and engine operating with service brakes applied.	Light off
Key switch in start position.	Light comes on momentarily and electric hydraulic pump operates.
Key switch in on position and engine operating with service brakes applied.	Light off

CHART 3
FORD HYDRAULIC, MAXI BRAKE SYSTEM
NORMAL BRAKE SYSTEM CONDITIONS

CONTROLS												RESULTS									
ENGINE		IGNITION			SERVICE BRAKE			PARKING BRAKE				SERVICE BRAKE		*ELECTRIC PUMP				PARKING BRAKE			
								OFF		ON		LIGHT		LIGHT		BUZZER		LIGHT		**BUZZER	
OFF	ON	OFF	ON	START	OFF	or	ON	RELEASED		APPLIED		OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
								PARTIALLY	FULLY	PARTIALLY	FULLY										
X		X			X				X	or	X	X		X		X		X		X	
X		X					X		X	or	X	X			X		X	X		X	
X				X	X	or	X				X		X		X		X		X		X
	X		X		X	or	X				X	X		X		X			X	X	
	X		X		X	or	X	X				X		X		X			X	X	
	X		X		X	or	X		X			X		X		X		X		X	
	X		X		X	or	X			X		X		X		X		X			X
	X		X		X	or	X				X	X		X		X				X	

* Whenever the ignition switch is in the start position, the Hydro-Max electric pump will cycle momentarily.

** Parking brake buzzer will sound momentarily during application of the parking brake in cold ambient conditions.

A. INSIDE BUS
8. Windshield Wipers and Washers

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
393.78, FMVSS 571.104, 393.60(c)		
a. Operation		
Inspect both wipers for:		
1) Swept area field of view and effectiveness of wiping.		
2) Proper operation on high and low speeds, intermittent function (if equipped), condition, and mounting of switches and knobs.	Wiper does not operate on low speed, intermittent function (if equipped) does not work properly or wiper goes past perimeter of glass.	Any wiper does not operate properly at high speed or switches or knobs are missing or loose.
3) Condition and mounting of wiper motors and linkage.		Either wiper motor or linkage is visibly damaged, loose or excessively worn.
4) Proper washer operation.	Washer nozzle is misadjusted.	Windshield washer is inoperable.
b. Park		
Inspect for parked position of wipers when turned off (electric) or when manually parked (air).		Electric wipers do not automatically return to parked position out of the driver's line of sight when turned off, or air wipers cannot be manually parked out of the driver's line of sight.
c. Blades		
Inspect blades for condition, mounting and tension.	Poor cleaning of windshield.	Either blade is missing, damaged, deteriorated, loose, does not hold proper tension against windshield or does not effectively clear driver's field of vision.

A. INSIDE BUS
9. Heaters, Defrosters, Auxiliary Dash or Heater Fan(s), Air Conditioner

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Heaters Inspect heater system for performance, operation and condition.	Coolant control valve is hard to operate. Any blower does not work on all speeds, is noisy or vibrates, or switches are loose or improperly labeled. **(Continued on Next Page)**	System is not producing heat. Any blower is extremely noisy, indicating imminent failure, or system wiring and connections are loose, damaged or chafed, creating an electrical short or high resistance. Heater hoses are cracked, swollen or badly chafed, or there is any coolant leakage inside the bus. Hose and/or component shielding is missing or does not completely cover hoses/components in a manner that protects passengers from contact with hot surfaces and prevents spraying of coolant in the event of a hose/component failure. Any portion of heating system within passenger area creates sharp edges, projections or other hazards to passengers.

A. INSIDE BUS
9. Heaters, Defrosters, Auxiliary Dash or Heater Fan(s), Air Conditioner

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
571.103 **b. Defrosters**		
Inspect defroster system for performance, operation and condition.	Any blower does not work on low speed or is noisy or vibrates, or switches are loose or improperly labeled.	Any blower is extremely noisy, indicating imminent failure, or system wiring and connections are loose, damaged or chafed, creating an electrical short or high resistance. Airflow is not present at all defroster outlets, or system does not produce adequate heat. Any defroster blower does not work on high speed.
	Any ductwork or diffusers are loose or damaged, but can still effectively route airflow.	Any ductwork or diffusers are damaged, rendering them ineffective. Any portion of defroster system within passenger area creates sharp edges, projections or other hazards to passengers.
	Fresh air control (if equipped) does not function.	

(Continued on Next Page)

A. INSIDE BUS
9. Heaters, Defrosters, Auxiliary Dash or Heater Fan(s), Air Conditioner

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Auxiliary Dash Fan (if equipped) Inspect fan for performance, operation and condition. **Note: Dash fan may be squirrel cage type and header-mounted on some buses.**	Fan does not work on low speed, is noisy or vibrates, or switches are loose or improperly labeled.	Fan is extremely noisy, indicating imminent failure or wiring or connections are loose, damaged or chafed, creating an electrical short or high resistance. Fan is missing, loose, or will not stay adjusted. Protective cage is missing, loose or damaged. Fan does not operate.
d. Passenger Air Conditioning Inspect air conditioner for performance, operation, and condition. **Note: See Bus Air Conditioning Preventive Maintenance Work Sheet.**	Any blower does not work on low speed or is noisy or vibrates, or switches are loose or improperly labeled.	Any blower is extremely noisy, indicating imminent failure, or system wiring and connections are loose, damaged or chafed, creating an electrical short or high resistance. Any portion of the evaporator system within the passenger compartment area creates sharp edges, projections or other hazards to passengers.

A. INSIDE BUS
10. Dome and Step Well Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
571.108, 571.131		
Dome and Step Well Lights		
Check passenger and driver dome lights for condition and operation. A driver dome light has been required since September 1995.	Any lens is cracked or dirty.	Any lens is broken or missing, exposing light bulb or fixture.
	Any single passenger dome light is not working.	Two or more passenger dome lights are not working.
	Dome light switch is loosely mounted.	Any driver's compartment dome light is not working.
Check step well lights for condition and operation.	Step well light is on when door is closed.	Step well light does not activate when clearance lights are on and the service door is open.
	Lens is cracked or dirty.	

A. INSIDE BUS
11. Service Door

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Operation Check service door assembly for operation, adjustment, condition, mounting and fit.	**(Continued on Next Page)**	Service door binds, will not open a minimum of 24 inches or is unsecured in the closed position. Manual door control requires more than 25 pounds of effort to open or close. Manual door control will not lock open over center, or closed latching mechanism is inoperative. Service door emergency release does not function properly. Service door opens or closes at an excessive rate and force or too slowly. Air door system leaks air. Glass is broken, cracked or has been replaced with material other than laminated or tempered safety glass. Door glass is fogged more than one inch in from edges, or visibility through the glass is poor. Door is equipped with a locking system that is not OEM factory approved.

A. INSIDE BUS
11. Service Door

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		Door assembly is damaged, not securely mounted or has excessively worn hinges, pins, bearings/bushings or other components.
	Door does not seal properly or seals are damaged, ripped or deteriorated.	Door seals are not present.
b. Overhead Pad		
Check bus for a padded safety cushion directly above the inside of the service door. Pad is required to be a minimum of three inches wide.	Pad is loose or cover has minor damage or wear.	Pad is missing or cover has excessive damage or wear, exposing foam.

A. INSIDE BUS

12. Horns

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Horns – 393.81 Check for operation of both horns while rotating steering wheel left and right and check for location and condition of horn switch.		Either horn is inoperative or both horns sound the same note. Horns are not audible at 500 feet. Horn button is not mounted in OEM location. Horn button sticks or horn button operates intermittently, such as when steering wheel is rotated.

A. INSIDE BUS
13. Mirror Adjustment and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Rear-View Mirror System (Traffic Mirrors) – 571.111		
Check exterior (flat and convex) rear-view mirrors for specifications, condition and adjustment.	Electrically controlled mirror (if applicable) is not operating properly and can still be adjusted manually.	Any required rear-view mirror is not present. Rear-view mirrors cannot be adjusted. Any mirror is cracked, broken or has reflective surface deterioration; view is diminished; or any damage is visible. Any mirror does not meet applicable specifications. Any rear-view mirror is out of adjustment. (If in doubt, consult with operations supervisors and/or driver trainers).

(Continued on Next Page)

A. INSIDE BUS
13. Mirror Adjustment and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Cross/Side-View Mirror System (Cross-walk Mirrors) 571.111 Check cross-walk/side-view mirrors for applicable specifications, condition and adjustment.		Any required cross-walk/side-view mirror is not present. Any mirror is cracked, broken or has reflective surface deterioration; view is diminished; or any damage is visible. Any mirror does not meet applicable specifications. Any cross-walk/side-view mirror is out of adjustment, i.e., mirrors do not provide driver with an indirect view of the area at ground level from the front bumper forward, including the entire width of the bus and around the left and right front corners so that the driver can see by direct vision, and/or does not provide driver with indirect vision of the area at ground level, to include the tires and service entrance on all types of buses so that view overlaps with the rear-view mirror system. (If in doubt, consult with operations supervisors and/or driver trainers).

(Continued on Next Page)

A. INSIDE BUS
13. Mirror Adjustment and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Interior Mirror – 571.111 Check interior mirror for specifications, condition and adjustment.		Interior mirror is not present. Mirror is cracked, broken or has reflective surface deterioration; or view is diminished by distortion, stickers or other items. Interior rearview mirror is not at least 6 inches x 30 inches (except Type A, which shall be a minimum of 50 square inches). Mirror does not have rounded corners and protected edges. Mirror or mounting/adjusting system is loose or cannot be adjusted by the driver.

A. INSIDE BUS
14. Driver's Seat and Seat Belt

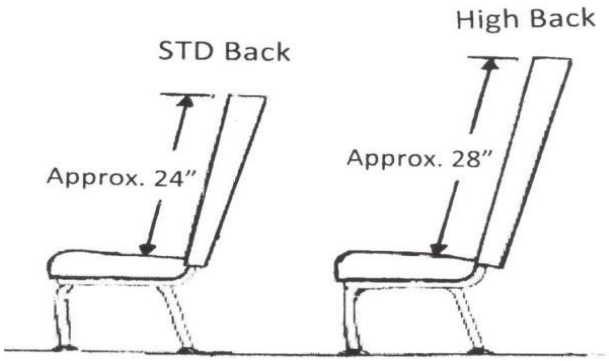
Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Driver's Seat and Belt – 393.91, 393.93(a)(b), 571.209 Inspect driver's seat and belt for specifications, condition, mounting and operation.	Seat adjustments are stiff but still operational.	Driver's seat will not adjust up, down, forward, and back (see note), and lock in position with driver in the seated, belted position; seat back will not tilt and lock into position; or adjustment hardware is loose, missing or damaged.
Buses manufactured since 1989 require high back seat with cloth insert and a three-point shoulder harness/lap belt assembly.	Seat upholstery or foam is deteriorated or damaged.	Seat assembly is unstable, cracked, damaged or loose at floor; mounting hardware is missing or not OEM or equivalent; or seat bottom or back is loose, or frame is exposed due to deterioration of upholstery or foam.
Air suspension seat required on all air brake equipped buses since September 1995.	Driver's seat belt retractor cover is loose or missing.	
The chassis manufacturer's standard seat is acceptable for Type A buses.		If equipped, seat suspension system is leaking air.
Note: The seat must have a minimum of seven (7) inches fore and aft travel and a minimum of four (4) inches up and down travel. For complete driver's seat specifications, please see the Mississippi *School Bus Minimum Specifications and Standards* manual.		Wrong type of seat, not meeting specifications, has been installed. Driver's seat belt is missing; is wrong type (i.e., not manufacturer's standard for year, make and model of bus); belt guides are insecure, damaged or not operating properly; belt is loose or routed improperly or does not extend or retract freely; buckle-and-tongue assembly does not latch or release properly; or seat belt is frayed or damaged.

A. INSIDE BUS
15. Passenger Seats

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Frames - 393.91, 393.93(a)(b), 571.209 **a.** Inspect passenger seat frames for condition, hardware and modifications.		Any seat frame tubing or welds are broken or cracked; any frame has been repaired, modified or reinforced using non-OEM approved hardware or methods or projections; or sharp edges exist.
Check for presence of non-OEM seat frames.		Any non-OEM seat frames have been installed.
b. Mounting Inspect condition of passenger seat mounting.		Mounting at floor or seat rail is loose; components are cracked, broken or damaged; or any fasteners are missing, damaged or not OEM or equivalent.

(Continued on Next Page)

A. INSIDE BUS
15. Passenger Seats

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Backs/Restraining Barriers/Modesty Panels/Padding - 393.91, 393.93(a)(b), 571.209 Inspect seat back, restraining barriers, modesty panels and padding for specifications and condition. Up to early 2007 models: Standard height padded seat backs, approximately 24 inches high measured from the seat bottom cushion. Early 2007 to present year models: High-back padded seat backs, approximately 28 inches high measured from the seat bottom cushion.  	**(Continued on Next Page)**	Any bus manufactured since April 1977 does not have a properly spaced and padded restraining barrier/modesty panel forward of any passenger seat without another seat directly ahead. Any modesty panel is missing, excessively loose or damaged, causing sharp edges or pinch points. Original thickness or density of any seat back or restraining barrier foam has been reduced due to wear, damage, deterioration or other factors so that there is no padding between any portion of seat back frame and covering. Any seat back or restraining barrier foam is the wrong type (i.e., not manufacturer standard for year, make and model of bus).

A. INSIDE BUS
15. Passenger Seats

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Bottoms		
1) Inspect seat bottoms for securement and condition.		Any seat bottom is not attached to its seat frame, or tilt-up bottoms will not latch or stay latched in the closed position.
2) Inspect automatic retracting seat bottom at side emergency door for proper operation, if equipped. Must have clear access to emergency door, with a minimum aisle width of 12 inches between seats.		Original thickness or density of any seat bottom cushion is reduced due to wear, damage, deterioration or other factors so that there is no padding between any portion of seat bottom frame and covering. Any seat bottom has a protruding edge or its plywood is broken. Any automatically retracting seat bottom will not fold down, automatically retract and stay in position when not occupied, or there is less than a 12-inch aisle width between the seat and the side emergency door.

(Continued on Next Page)

A. INSIDE BUS
15. Passenger Seats

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
e. Cuts and other upholstery damage Inspect seat upholstery for condition and specifications. **Note: Fire-blocking seat material has been required since 1989.** **Note: Punctures where no material is missing and no foam is exposed shall not be cause for removing bus from service.**		Any portion of seat bottom or back upholstery is missing, cut, torn, ripped or improperly repaired, exposing foam. Any upholstery is non-fire-blocking type for buses built since 1989.
f. Optional Integrated Child Seating Check the condition and operation of the seating system.		The integrated system does not function according to the manufacturer's operational procedures or any of the same out-of-service conditions exist that are applicable to regular passenger seats.

(Continued on Next Page)

A. INSIDE BUS
15. Passenger Seats

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
g. Passenger Securement Devices (if equipped)		
All buses equipped with two or three-point passenger securement systems shall be equipped with FMVSS No. 210 compliant seat frames and FMVSS No. 209 compliant belt assemblies in all passenger-seating positions. Check type, condition and operation of passenger securement devices.	Each two-part belt assembly is not separately color-coded. Belts are knotted or misrouted, or retractor covers are damaged or loose.	Belts will not latch, stay latched or unlatch properly or are the wrong type, missing, broken, mismatched, improperly installed or excessively frayed.
Note: Type A buses built since April 1, 1977, must have a functional seat belt at each passenger position.		
h. Webbing Cutter		
Check for presence, type, condition and mounting of the required webbing cutter. It must be mounted in a location accessible to the driver from a seated, belted position and be easily detachable.		Any required webbing cutter is missing, broken, unusable, improperly mounted or difficult to remove. Wrong type of webbing cutter.
Note: Lift-equipped buses or buses using other assistive/restraining devices containing webbing must have a second webbing cutter properly mounted in a location determined by the school district.		

A. INSIDE BUS
16. Emergency Doors, Windows, Hatches and Passenger Check System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Operation – 571.217 Inspect for operation and condition of rear emergency exit door and side emergency exit door (if equipped), door hold-open feature (for buses built after November 1993), emergency exit windows and emergency exit roof hatches.		Any emergency exit does not operate smoothly and easily to open and close fully, from the inside and outside when unlatching, opening, closing and latching (windows from inside only). Door (or rear window on rear engine (RE) buses) hold-open feature does not secure the exit in the fully open position.
	Any emergency exit handle, guard or latch mounting hardware is slightly loose.	Any emergency exit handle, guard, latch or mounting hardware is missing, or latching mechanism does not operate smoothly and secure the exit in the closed position.
	Powered roof hatch ventilator (if equipped) does not work properly.	Roof hatch is insecure in the ventilation position. Any emergency exit is equipped with any type of a hasp, lock or any other locking device, except for an OEM interlock system. Bus will start with any emergency door (or rear window on RE buses) locked.
	Roof hatch seal is damaged or dislodged. **(Continued on Next Page)**	Any emergency exit door does not seal off the entire opening when latched closed.

A. INSIDE BUS
16. Emergency Doors, Windows, Hatches and Passenger Check System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Buzzers		
Check emergency exit door(s) and window warning buzzers.		Buzzer warning system for emergency door (or rear window on RE buses) or any exit window does not function, gives false alarms or is not audible in the driver's compartment. Buzzer operation is intermittent.
c. Labeling and Pad		
1) Inspect for identification labels and operating instruction labels, for emergency doors, windows, roof hatches and hold-open device (if required).		All emergency exits are not clearly labeled "Emergency Door" or "Emergency Exit" on the inside and outside of the bus. The operating instruction labels for any emergency door (or rear window on RE buses), or roof hatch are not present on the inside of the bus (or outside, if required by applicable specifications). The operating instruction label for the emergency door hold-open device is not visible from both the inside and outside of the bus (if required).
2) Inspect emergency door header pad.	Door pad is ripped or loose.	Door pad is missing or has a protruding edge.

(Continued on Next Page)

A. INSIDE BUS
16. Emergency Doors, Windows, Hatches and Passenger Check System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Post-Trip Passenger Check System (if equipped) Check for proper operation of post-trip passenger check system according to manufacturer's specifications. **Note: Post-Trip Passenger Check System required on buses manufactured on or after July 2023.**	If equipped, post-trip passenger check system does not operate according to specifications, but requires disarming at rear of bus.	If equipped, post-trip passenger check system is inoperative.

A. INSIDE BUS
17. Windshield, Side and Rear Windows

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Glass Cracks – 393.60(c) Inspect windshield and all windows for cracks and other damage. **Note: Windshield must be laminated safety glass. All other windows can be made from laminated or tempered safety glass.**		Windshield has any cracks, chips or damage that obstructs the driver's view. Any windshield or other laminated safety glass window is cracked greater than two inches in length, or any laminated glass crack or splinter creates a sharp surface that could cause injury when touched. Any tempered safety glass is cracked. Any window rearward of the windshield is not laminated, tempered or equivalent safety glass. Any glass is missing.

(Continued on Next Page)

A. INSIDE BUS
17. Windshield, Side and Rear Windows

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Fogging, Tinting and Visibility – 393.60 Check windshield and windows for fogging, reduced visibility or improper level of tinting. **Note: Vehicle safety technologies, as defined in 49 CFR § 393.5 (i.e., camera), and mounted in accordance with 49 CFR § 393.60, are not cause to place a school bus out-of-service.**	**(Continued on Next Page)**	Any glass is fogged more than two inches in from any outer edge. Any windshield or window fogging or clouding results in reduced visibility of a mirror. Any tinting on the windshield or windows to either side of the driver in the driver's compartment (including service door) is not 70 percent light transmitting or clearer. Any tinted windows behind the driver's compartment are not 28 percent light transmitting or clearer. Visibility is reduced for any reason.

A. INSIDE BUS
17. Windshield, Side and Rear Windows

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Latches and Window Operation		
Check latches and windows for condition and operation.	Any window latch is difficult to operate, or any window does not move up and down freely.	Any window will not move fully up and down or will not stay closed. Any window has loose, damaged or protruding hardware in the passenger compartment.
d. Visor		
Check sun visors for condition and operation.		Sun visor is cracked or damaged, cannot be adjusted or will not stay in position. Visibility is reduced for any reason (clouded, dirty or has foreign objects or decals affixed). Sun visor is missing.

A. INSIDE BUS
18. Wheelchair Power Lift, Door and Securement System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Wheelchair Power Lift, Door and Securement System – FMVSS 403, 404, ADA 49 CFR 38.23) 1) Operate lift through complete cycle and inspect for proper operation according to manufacturer's specifications; inspect overall general condition, safety features including park brake interlock, manual backup system, fluid leakage/seepage, mounting, roll stop operation, warning light, buzzer operation and overall mechanical condition.	Dome light at inside lift area is inoperative. Lift door or latch does not operate smoothly. White light at exterior lift area (if originally equipped) is inoperative. **(Continued on Next Page)**	Lift door warning buzzer or light does not operate. Lift door latches, weather stripping or securement system is damaged or loose. Door switch (to prevent lift operation when the lift door is closed) or other safety override features do not function, including park brake interlock. Lift does not properly deploy, lower, raise or retract; jerks; binds; or jacks the vehicle when fully lowered. Inboard and outboard roll stops or handrails do not deploy and retract reliably to the proper positions. Lift will not stay in the fully retracted position (falls against door). Lift safety belt (if originally equipped) is damaged or missing. Lift safety interlock system is not operating according to manufacturer's specifications.

A. INSIDE BUS
18. Wheelchair Power Lift, Door and Securement System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		There is side play in excess of two inches in the lift mechanism when the platform is extended.
	Hydraulic fluid is seeping.	Hydraulic fluid is leaking.
		Lift is not securely mounted to the vehicle.
		Lift on buses manufactured in 1989 or later is not equipped with frame padding.
		Any part of the lift mechanism or hardware is damaged, missing or unsecure, including cams, clips, pins, rollers, platform fasteners and control head, cables and wiring.
		Manual backup system does not function properly.

(Continued on Next Page)

A. INSIDE BUS
18. Wheelchair Power Lift, Door and Securement System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
2) Inspect wheelchair and occupant securement (tie-down) system for proper operation, condition, mounting, type and location.	Track contains dirt/debris, but occupant securement straps and wheelchair tie-down straps can still be easily attached to or detached from the track.	Track contains excessive dirt or debris. Wheelchair tie-down track or fasteners are loose, broken, corroded or improper type (i.e., lag bolts, sheet metal screws).
Note: Beginning in 2008, each 50-inch section of tie-down track may consist of two pieces of track, with neither piece less than 16 inches long and must extend the full length of the wheelchair position, with no gaps. For buses manufactured in 2020 and later, please consult applicable specification manual for information concerning passenger securement system on buses transporting students with exceptionalities.	Optional below-chair rail lighting for wheelchair securement area (if equipped) is inoperative.	Any 50-inch wheelchair position has more than two pieces of track, or any piece of track is shorter than 16 inches. On buses manufactured before 2008, any wheelchair position does not have continuous one-piece, 50-inch tracks.
571.222		Wheelchair or occupant securement straps are broken or frayed, cannot be easily attached to or detached from track, or will not operate.
Note: Buses equipped with lifts and other assistive/restraining devices containing webbing must have a second webbing cutter properly mounted in a location determined by the school district.		Securement system for buses built between October 1983 and November 1989 is not a side-facing, track-and-belt system meeting Mississippi specifications.
		Securement system (for buses built after November 1989) is not a forward-facing wheelchair and occupant securement system meeting Mississippi specifications.
3) Check for presence, proper type, proper mounting and condition of a second durable webbing cutter.		Any required webbing cutter is missing, broken, unusable, improperly mounted, difficult to remove or of incorrect type.

A. INSIDE BUS
19. Two-Way Radio Operation

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Two-Way Radio Operation		
Inspect radio and antenna for condition, mounting, location and routing of wiring, and perform function check.	Radio will not transmit or receive.	Driver has to move out of the normal driving position to operate radio.
	Mounting is loose.	Wiring or connectors are routed or installed incorrectly, or there is the possibility of an electrical short circuit due to unsecured or damaged wiring. Any part of radio, external speaker, microphone or wiring interferes with driver's controls or blocks any of the driver's view through any portion of windshield or other window.

A. INSIDE BUS
20. Interior Wiring, Cab Hoses and Fire Wall Seals

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Interior Wiring		
Inspect visible wiring and connectors for mounting, condition, chafing, abrasion, corrosion, loose connections and improper repairs.		Any wire or connector is cut, chafed, missing insulation, routed against sharp edges or interferes with driver's controls. Any wiring is exposed within the passenger compartment.
b. Cab Hoses		
Inspect all hoses for leaks, condition, routing, abrasion and presence of heater hose shielding.	Any hose inside the bus is seeping lubricant or coolant.	Any hose is leaking, cut, chafed, routed against sharp edges or interferes with driver's controls. Any heater hose inside the bus is not shielded in a manner to prevent spraying of coolant in the event of a hose failure.
c. Firewall Seals		
Inspect firewall for any holes, cracks, unsealed openings and deteriorated or missing sound deadening/insulation material.	Sound deadening/insulation material is missing, unsecured or deteriorated.	There is any open hole or unsealed area in the firewall.

A. INSIDE BUS
21. General Condition of Bus Interior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Floor		
Inspect floor covering, plywood sub-floor (if installed), aisle and cove molding strips, and ribbed rubber in aisle for condition, adhesion, loose or missing fasteners, and/or holes and cracks.	Floor covering material is loose, deteriorated or cracked. Plywood is soft.	There are any unsealed holes or cracks through the floor to underside of bus. Aisle is not equipped with 12-inch wide ribbed rubber. Any aisle or front-area-molding strip is not securely fastened to floor, or any aisle or cove molding presents a sharp edge or protrusion. Any damage, wear or condition of the floor covering material and moldings presents a tripping hazard.
b. Stepwell		
Check specifications and condition of step well and tread.	Step tread is not sealed at inside edge where it meets next step.	Step well tread and jointing edge at aisle are not flush and securely adhered. Step well tread ribs/nubs on top surface at leading edge are worn smooth more than four inches in width. Step well support structure is not secure or is broken, or step well is rusted through.

(Continued on Next Page)

A. INSIDE BUS
21. General Condition of Bus Interior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Check stepwell area for added (non-OEM) items/equipment or any other condition that could create snagging points. If anything is suspect, perform the National Highway Traffic Safety Administration (NHTSA) string-and-nut test as described in the *National School Transportation Specifications and Procedures*.		Any Type C or D bus manufactured since December 1990 is not equipped with a three-step riser with full-width steps. Step warning decals are missing or unreadable (flat floor-equipped buses only). Any non-OEM items have been added or other condition exists that could cause snagging.
c. Grab Rail(s) Check for presence and secure mounting of entrance grab rail(s). Check grab rails for any condition that could create snagging points. If anything is suspect, perform the NHTSA string-and-nut test as described in the *National School Transportation Specifications and Procedures,* and found in this publication on page 65.		Grab rails are missing or not securely mounted. Lift-equipped buses do not have a left and right side grab rail at the entrance step well. Grab rails fail NHTSA string-and-nut test.

(Continued on Next Page)

A. INSIDE BUS
21. General Condition of Bus Interior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Paneling and Trim		
Check front, sides, rear, ceiling and driver's area paneling and trim pieces for secure fastening, projections, sharp edges, pinch points and condition.	There are loose or missing fasteners on any maintenance access panel.	Sharp edges, pinch points, excessive rust, loose fasteners or projections from paneling exist that could cause injury to passengers or driver.
		There are any non-flush-mounted speakers (except trim rings) or any other unauthorized items affixed to the interior paneling of the bus in the passenger area.
	There are graffiti, unauthorized stickers, missing paint or mildew on interior panels.	There is inappropriate graffiti that requires immediate attention, subject to district policy.
e. Broom Mounting		
Check securement and location of broom.		Broom is not securely mounted in the driver's compartment.

(Continued on Next Page)

A. INSIDE BUS
21. General Condition of Bus Interior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Loose Objects and Cleanliness		
Check to see that all objects within the bus are secured.		Loose objects such as trashcans, clothing or cleaning supplies are present that are not in a secured compartment or container.
Check cleanliness of bus.		There is excessive dirt or trash on the floor, causing a slippery condition.
Check for the presence of aerosol containers and non-aerosol liquid containers.	Trash not emptied from trash can or floor not swept.	Any aerosol cans or other containers with flammable or volatile contents are present. Any unlabeled liquid container is present. **Note: An exception to flammable or volatile contents mentioned above is granted (at the district's discretion) to facilitate the use of alcohol-based hand sanitizer. The dispenser must be mounted in accordance with the "New Technology and Equipment" section.**
g. Dog House/Engine Cover		
Inspect dog house/engine cover seals, soundproofing, weather stripping, prop-rod and latch operation.	Soundproofing is not present or is loose or deteriorated.	Seals or weather stripping are leaking and allowing air/fumes into driver's compartment. Prop-rod does not safely support the dog house/engine cover. Latches are hard to operate or do not secure the dog house/engine cover properly.

CHART 4

NUT-AND-STRING TEST

The Handrail Inspection Tool and Procedure

The inspection tool is inexpensive, and the procedure for detecting potentially fatal handrail designs is quite simple. The inspection tool is a standard one-half inch hex nut, measuring three-quarters of an inch across the flats. This nut is tied to a one-eighth inch thick cotton cord measuring 36 inches in length with overhand knots. The drawstring should have a minimum length of 30 inches when tied to the nut and attached so that a pull of at least 10 pounds does not separate the nut from, or break, the drawstring.
Steps to conduct a handrail inspection are:

- Stand on the ground outside of the bus;
- Drop the inspection tool between the handrail and step well wall, simulating the typical way students exit the bus;
- Draw the inspection tool through the handrail in a smooth, continuous slow motion; and
- Repeat this procedure a minimum of three times.

Note: It is important to drop the inspection tool over the handrail in such a way as to simulate a child exiting the bus. This is a drop-and-drag test. Do not create a snagging situation by placing the nut in an area that would not be exposed to a drawstring or other articles.

Inspection Results:
Take the bus out of service and repair it if the inspection tool catches or snags anywhere on the handrail. If the nut separates from the drawstring or the drawstring breaks, reassemble the tool and retest. If the inspection tool pulls freely without catching or snagging, the bus should not be rejected.

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B. OUTSIDE BUS

1. Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
NOTE: When checking LED lights, if 75 percent or more of the LED elements illuminate, the light is considered good. If less than 75 percent of the LED elements illuminate, the light must be replaced. 571.108, 571.131		Less than 75 percent of the LED elements illuminate.
a. Headlights		
Check both headlights for brightness, operation, condition and visible misaiming. Check high-beam indicator operation and headlight switch.	Left and right headlights are of different types (conventional, halogen or LED).	Either headlight fails to function on low and high beam, any lens or sealed beam is fogged or cracked, or light is dim. High beam indicator is inoperative. Dimmer switch sticks, is hard to operate or fails to function. Headlight switch is damaged or not securely mounted, or the knob is missing. Headlight operation is intermittent. Upon visible inspection, there is any obvious misaiming of headlights.
If equipped, check Daytime Running Lamps (DRL) or Full-Time Lights (FTL) for proper operation.	DRL or FTL system does not work according to specifications. **(Continued on Next Page)**	

B. OUTSIDE BUS
1. Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Turn Signals Check turn signals for operation, condition and specifications (see charts 6 and 7).	Any turn signal lens is cracked. **(Continued on Next Page)**	Any turn signal fails to function, does not flash or is dim. Turn signals do not flash 60 to 120 times per minute. Any required side-mounted turn signal(s) are not present per applicable Mississippi School Bus Specifications. Any turn signal is not amber in color. Any turn signal lens is damaged, darkened, faded or dirty, affecting visibility or color of the light, or white light is visible. Turn signal switch does not function properly, will not maintain selected position, or does not cancel and return to neutral position. Turn signal dash indicators fail to function or do not properly indicate position of turn signal switch and operation of signal.

B. OUTSIDE BUS
1. Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Hazard Lights		
Check four-way hazard lights for operation and condition.	Any lens is cracked or dirty.	Any four-way hazard light fails to function. Hazard lights do not flash 60 to 120 times per minute. Switch does not function or will not maintain the “on” position.
d. Brake Lights		
Check brake lights for operation, condition and specifications (see chart 7).	One brake light fails to function on buses with four brake light systems.	More than one brake light fails to function on buses with four brake light systems. Either brake light fails to function on buses with two brake light systems. Brake lights stay on after brake pedal is released.

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B. OUTSIDE BUS
1. Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		Any bus not equipped with two 7-inch and two 4-inch brake lights.
		Any brake light is not red in color.
	Any brake light lens is cracked.	Any brake light lens is damaged, darkened, faded or dirty, affecting visibility or color of the light, or white light is visible.
e. Tail Lights		
Check tail lights for operation, condition and specifications (see chart 7).	One tail light fails to function on buses with four tail light systems.	More than one tail light fails to function on buses with four brake light system.
		Either tail light fails to function on buses with two brake light system.
		Tail light operation is intermittent.
		Any bus is not equipped with two 7-inch and two 4-inch taillights.
		Any tail light is not red in color.
	Any tail light lens is cracked.	Any tail light lens is damaged, darkened, faded or dirty, affecting visibility or color of the light, or white light is visible.

(Continued on Next Page)

B. OUTSIDE BUS
1. Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Backup Lights Check backup lights for proper operation and condition (see chart 7).	One of two backup lights does not function. Any backup lens is cracked.	Any bus is not equipped with at least one functional white backup light. Backup light(s) stays on all the time or stays on in any gear position other than reverse.
g. Backup Alarm Check for presence of backup alarm (for buses manufactured since November 1990) and required decal (for buses manufactured since November 1993). Check proper operation of alarm (or variable volume alarm, if equipped) by placing transmission in reverse (engine running) and listening for alarm sound.	Decal is not visible in driver compartment in plain view of the driver. Decal is not present (for buses manufactured since November 1993). Variable volume backup alarm (if equipped) is not variable.	Backup alarm does not sound.

(Continued on Next Page)

B. OUTSIDE BUS
1. Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
h. Parking Lights		
Check parking lights for proper operation and condition (see charts 6 and 7).	One front or rear parking light fails to function on buses with four front and four rear parking light systems.	More than one front or rear parking light fails to function on buses with four front and four rear parking light systems.
	Any parking light lens is cracked or damaged.	One front or rear parking light fails to function on buses with a two parking light system. Any parking light lens is damaged, darkened, faded or dirty, affecting visibility or color of the light, or white light is visible.

B. OUTSIDE BUS
2. Clearance, Side Marker, ID Lights, Reflectors and Strobe Light

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Clearance, Side Marker and ID lights		
Check lights for operation, condition and location. Also check license plate light (see charts 6 and 7). **Note: When there are two lights factory-mounted at the top corners, the front is a clearance and the side is a side marker. When there is one light factory-mounted at the top corners, it is a clearance/side marker combination, meeting both requirements.**	Any intermediate (center) side marker light fails to function.	Any front or rear top corner-mounted clearance, side marker or clearance/side marker combination light fails to function. Any bus over 30 feet in length is not equipped with intermediate amber side marker lights on both sides. Any intermediate or front clearance, side marker, clearance/side marker combination light or ID light lens is not amber. Any rear clearance, side marker, clearance/side marker combination light or ID lens is not red.
	Any clearance or ID light lens is cracked.	Any clearance, side marker, clearance/side marker combination light or ID light lens is damaged, darkened, faded or dirty, affecting visibility or color of the light, or white light is visible.
	One or two ID lights (but not all ID lights) on the front or rear of the bus fail to function. License plate light is inoperative. **(Continued on Next Page)**	All ID lights on either the front or the rear of the bus are inoperative.

B. OUTSIDE BUS
2. Clearance, Side Marker, ID Lights, Reflectors and Strobe Light

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Reflectors Check reflectors for condition and location (see charts 6 and 7). **Note: Reflectors are required as follows:** **1) Buses over 30 feet in length: two red on rear, one red on each side at rear, one intermediate amber on each side, one amber at front and one amber front of cowl on each side.** **2) Buses under 30 feet in length: same, except intermediate amber reflectors are not required.**	Any reflector is damaged or cracked.	Any required reflectors are missing. Any required reflector is faded, significantly affecting its original color.
c. Strobe Light Check roof-mounted white flashing strobe light for operation, location and condition.		Any bus manufactured since December 1990 is not equipped with a roof-mounted white flashing strobe light mounted in the center of the roof approximately 48 inches from the rear of the bus. The strobe light on any bus built prior to December 1990 is not mounted in the center of the rear part of the roof. Strobe light does not function.

(Continued on Next Page)

B. OUTSIDE BUS
3. Pupil Warning Lights

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Pupil Warning Lights Check pupil warning lights for operation and condition according to manufacturer's specifications (see charts 6 and 7). **Note: See chart 5, for function checks. Pupil warning light hoods in the front and rear of the bus have not been required since September 1993. Strobing LED bulbs have been required on buses since 2023.**	Either of the two pupil warning pilot lights fail to function. Any pupil warning light lens is damaged but no white light is visible.	Any pupil warning light fails to function or is dim. Front and rear amber and red lights do not alternately flash (side to side). Any outer pupil warning light is not red, inner pupil warning light is not amber, or pupil warning light is not OEM or equivalent. Any pupil warning light lens is damaged and white light is visible. Any pupil warning light lens is obstructed, misaimed, dirty, darkened or faded, affecting the color of the light or reducing the visibility to less than 500 feet in bright sunlight. Pupil warning lights fail to function according to all conditions in chart 5.

CHART 5 EIGHT-LIGHT WARNING SYSTEM

NOTE: **System may not be designed in such a way that the operator is required to actuate controls in a particular sequence to achieve the desired combination of conditions.**

EXAMPLE: If the driver places the three-position switch in the amber position with the master switch on, he should not have to move the three-position switch to red or open the service door to deactivate the amber warning lights. The driver must be able to deactivate the amber warning lights by going directly from the amber to the off position.

	WITH MASTER SWITCH, CONTROL SWITCH and SERVICE DOOR IN THE FOLLOWING POSITIONS:			CONDITION OF STOP ARM(S), STOP ARM LIGHTS, AMBER WARNING LIGHTS AND RED WARNING LIGHTS MUST BE:			
	MASTER SWITCH POSITION (ON or OFF)	CONTROL SWITCH POSITION (three-positions: OFF, AMBER or RED)	SERVICE DOOR POSITION	STOP ARMS, STOP ARM LIGHTS	AMBER WARNING and PILOT LIGHTS	RED WARNING and PILOT LIGHTS	*AUDIBLE ALARM
1)	ON	OFF	CLOSED	RETRACTED, OFF	OFF	OFF	OFF
2)	ON	OFF	OPEN	RETRACTED, OFF	OFF	ON	ON
3)	ON	AMBER	CLOSED	RETRACTED, OFF	ON	OFF	OFF
4)	ON	AMBER	OPEN	RETRACTED, OFF	OFF	ON	ON
5)	ON	RED	CLOSED	EXTENDED, ON	OFF	ON	OFF
6)	ON	RED	OPEN	EXTENDED, ON	OFF	ON	OFF
7)	OFF	ANY POSITION	ANY POSITION	RETRACTED, OFF	OFF	OFF	OFF

*** Note: Effective September 1, 1992.**

B. OUTSIDE BUS
4. Stop Arm(s) and Student Crossing Arm

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Stop Arm(s)		
Check stop arm(s) for specifications, operation and condition. (See chart 6).	Any wiring is not properly routed and secured. Hinges or bushings are not adequately lubricated. Stop arm extends more than or less than 90 degrees (plus or minus five degrees). **(Continued on Next Page)**	Any wires or ground strap(s) are broken. Any stop arm light fails to function or lights do not flash 60 to 120 times per minute in an alternating pattern. Stop arm does not extend or retract, or is slow to extend or retract. Any stop arm has an air or vacuum leak or is loosely mounted, or components are badly worn. Any stop arm paint or decal is significantly faded or discolored. Stop arm does not operate according to all the conditions in chart 5. Stop arm(s) not of proper type and specifications: 1) Octagonal (since September 1, 1985) 2) Alternately flashing red lights

B. OUTSIDE BUS
4. Stop Arm(s) and Student Crossing Arm

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		3) High intensity reflectivity (since December 1990) 4) Optional Dual stop arms on Type C and Type D A stop arm decal has been installed on the forward side of the rear stop arm for buses built after September 1, 1993.
Check that rear stop-arm decal is not present on forward side of arm on buses built after September 1, 1993.		
b. Student Crossing Arm Check front bumper-mounted student crossing arm for specifications, operation, and condition. **Note: For crossing arm and stop arm requirements, see Federal Motor Vehicle Safety Standard (FMVSS) 131.**	Crossing arm extends more or less than 90 degrees (plus or minus five degrees). Hinges or bushings are not adequately lubricated.	Not equipped with student crossing arm, for buses manufactured since December 1992. Crossing arm does not extend or retract, or is slow to extend or retract. Any crossing arm has an air or vacuum leak, is loosely mounted or has badly worn components.

B. OUTSIDE BUS
5. General Condition of Bus Exterior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Mirrors – 571.111 Check all exterior mirrors, mounts and brackets for tightness and condition. See specifications for required fasteners and hardware. **Note: Exterior mirror fasteners, mounts and bracketry must be non-corrosive material on buses manufactured since 2020.**		Mirror mounts or bracket(s) are bent, broken, not secured, or have loose or missing fasteners. Any exterior mirror is broken, cracked or loose in the frame, or reflective surface is faded or deteriorated.
b. Bumpers – 393.203(e), 393.86 Check bumpers for mounting, condition and color, and check body seal on rear bumper.	Bumper is not black (MFSAB exempt) Bumper is equipped with any unauthorized stickers or decals. **(Continued on Next Page)**	Bumper is significantly bent or has protruding metal. Bumper, mounts or braces are bent, broken, not secured, or have loose or missing fasteners. Diagonal reflective striping (if equipped) is missing, significantly damaged or not reflective. Front bumper on buses built since October 1982 is not of sufficient strength to allow the front of the bus to be lifted without permanent deformation. Rear bumper to body seal is damaged or missing.

B. OUTSIDE BUS
5. General Condition of Bus Exterior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Body Damage		
Check body exterior for damage, scratches, dents, etc.	Body has small dents, scratches, etc.	Any body part is damaged or dislocated, creating a protrusion or sharp edge.
	Body has small rust spots or water leaks.	Body panels, rivets or other components are damaged or corroded so that joint strength or body structural integrity is compromised.
d. Paint		
Check paint on school bus body, trim and wheels for required coloration and condition. **Note: See Multi-Function School Activity Bus (MFSAB) paint scheme requirements.**	Paint is faded, discolored or damaged.	Paint is not National School Bus Yellow (except white roof). Trim, rub rails, warning light hoods or background are not black. Stud-piloted disk wheels and spoke hub-mounted wheels are not black, or hub-piloted wheels are not National School Bus Yellow.
e. Reflective Markings		
Check reflective markings for coloration, reflectivity and condition. Reflective markings on buses have been required since September 1995. Check for presence of reflective markings around any emergency exit door, window or roof hatch as required by FMVSS No. 217 (for buses purchased after November 1993).	Reflective markings other than those around any emergency exit as required by FMVSS No. 217 are faded, discolored, damaged or peeling. **(Continued on Next Page)**	Any required reflective markings are missing, significantly faded or discolored around any emergency exit door, window or roof hatch.

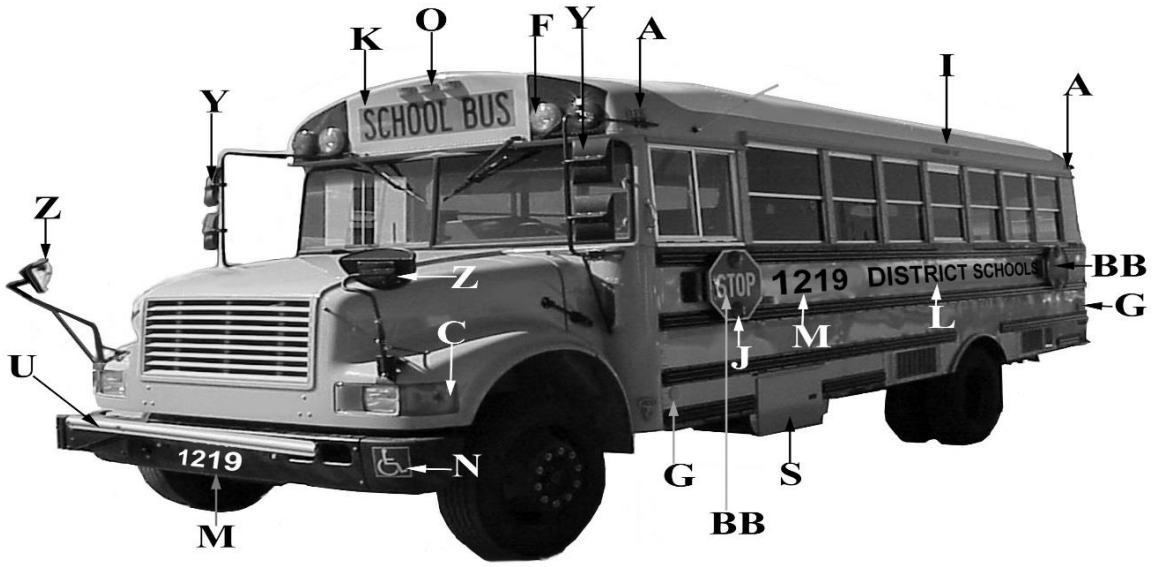
B. OUTSIDE BUS
5. General Condition of Bus Exterior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Lettering Check all lettering for required type, size, location and color (see charts 6 and 7).	Bus is not equipped with following lettering: 1) Eight-inch "SCHOOL BUS" on front and rear. 2) "*Name* District Schools" on left and right sides of body in five-inch letters.* 3) Local bus number on rear, both sides and front in five-inch minimum lettering. Any required lettering is not clearly readable. Any required lettering is not black (except handicapped symbol, local bus number if located on bumper, and/or emergency door hold-open device labeling). Exterior emergency hatch operating instructions are not clearly readable. **(Continued on Next Page)**	Bus is not equipped with the following: 1) Handicapped symbol on front and rear of wheelchair lift-equipped buses. 2) Minimum two-inch lettering "Emergency Door" at top or above emergency exit door. 3) Emergency exit windows and roof hatches labeled "Emergency Exit." 4) Fuel type lettering is not present on buses. There is not at least one local bus number and district name present on the exterior. Any required handicapped symbol is not reflective, white on blue background, and a minimum of six inches by six inches.

B. OUTSIDE BUS
5. General Condition of Bus Exterior

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
g. Emergency Door Operation – 571.217 Check emergency door for operation and condition from exterior of bus.	Emergency doors equipped with a link or strap that prevents the door from opening to far and causing damage. This should be working, not damaged, tight, and should not interfere with operation of the door. Hold open device is non-operational, bent, damaged or loose. Side emergency door seal damaged or does not effectively prevent water, and/or dirt from entering bus	Emergency door is hard to open fully from outside of bus. Emergency door latch mechanism requires more than 40 pounds to release. Emergency door handle is mounted to allow “hitching” onto the bus. Rear emergency door seal damaged or does not effectively prevent exhaust, water, and/or dirt from entering bus.
h. Engine Hood – 393.201 Check engine hood for operation, condition and safety latch.	Hood is misaligned or out of adjustment. Hood hinges are stiff or damaged, but remain operational.	Hood cannot be opened as designed. Safety latch is damaged or stiff, or does not secure the hood. Hood prop rod(s) or hold-open feature does not function properly.
i. Cleanliness Check exterior of bus for cleanliness.	Exterior of bus is dirty.	Bus is dirty to the point that visibility through any window or mirror, or brightness of any light, is significantly reduced.

CHART 205
MINIMUM LETTERING AND LIGHTING REQUIREMENTS



A. Clearance and Side Marker Lights (one intermediate on buses 30 feet or longer).

BB. Stop Arm(s)

C. Front Turn Signals and Parking Lamps

F. Pupil Warning Lights--Dual (side by side, amber and red)

G. Reflectors, one at rear body side panel, one near front of body and one intermediate (only on buses 30 feet or longer) on both sides

I. Emergency Exit Lettering

J. Double-Faced Flashing Red Lights

K. "School Bus" Lettering (front and rear) (see specifications)

L. (Name of District) District Schools (both sides)*

M. Local Bus Number (both sides and front and back)

N. Universal Handicapped Symbol (lift buses)

O. Identification Lamps

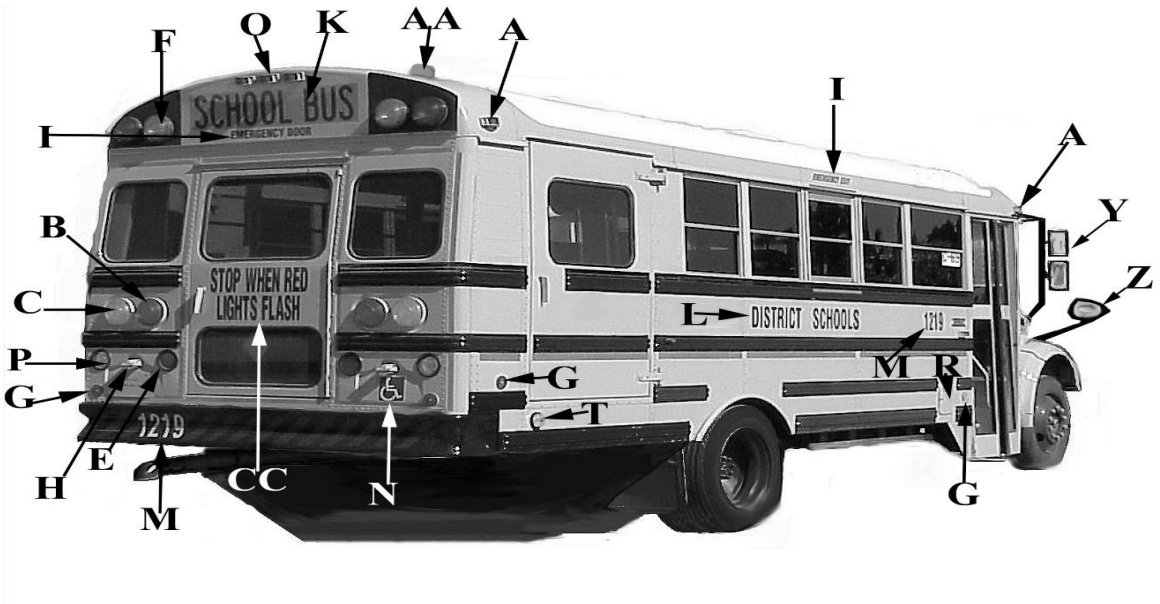
S. Battery Box

U. Pupil Crossing Arm

Y. Rear-View Mirror System (see specifications)

Z. Cross/Side View Mirror System (see specifications)

CHART 206
MINIMUM LETTERING AND LIGHTING REQUIREMENTS



A. Clearance and Side Marker Lights

B. Seven-Inch Brake/Tail/Parking Lights

C. Seven-Inch Turn Signals (amber)

E. Four-Inch Brake/Tail/Parking Lights

F. Pupil Warning Lights--Dual (side-by-side amber and red)

G. Reflectors

H. License Plate Lamp (one minimum)

I. Emergency Door and Exit Lettering

K. "School Bus" Lettering (front and rear) (see specifications)

L. (Name of District) District Schools (both sides) *

M. Local Bus Number (both sides and front and back)

N. Universal Handicapped Symbol (lift-equipped buses)

O. Identification Lamps

P. Backup Lights

R. Fuel Door and Fuel Type Lettering

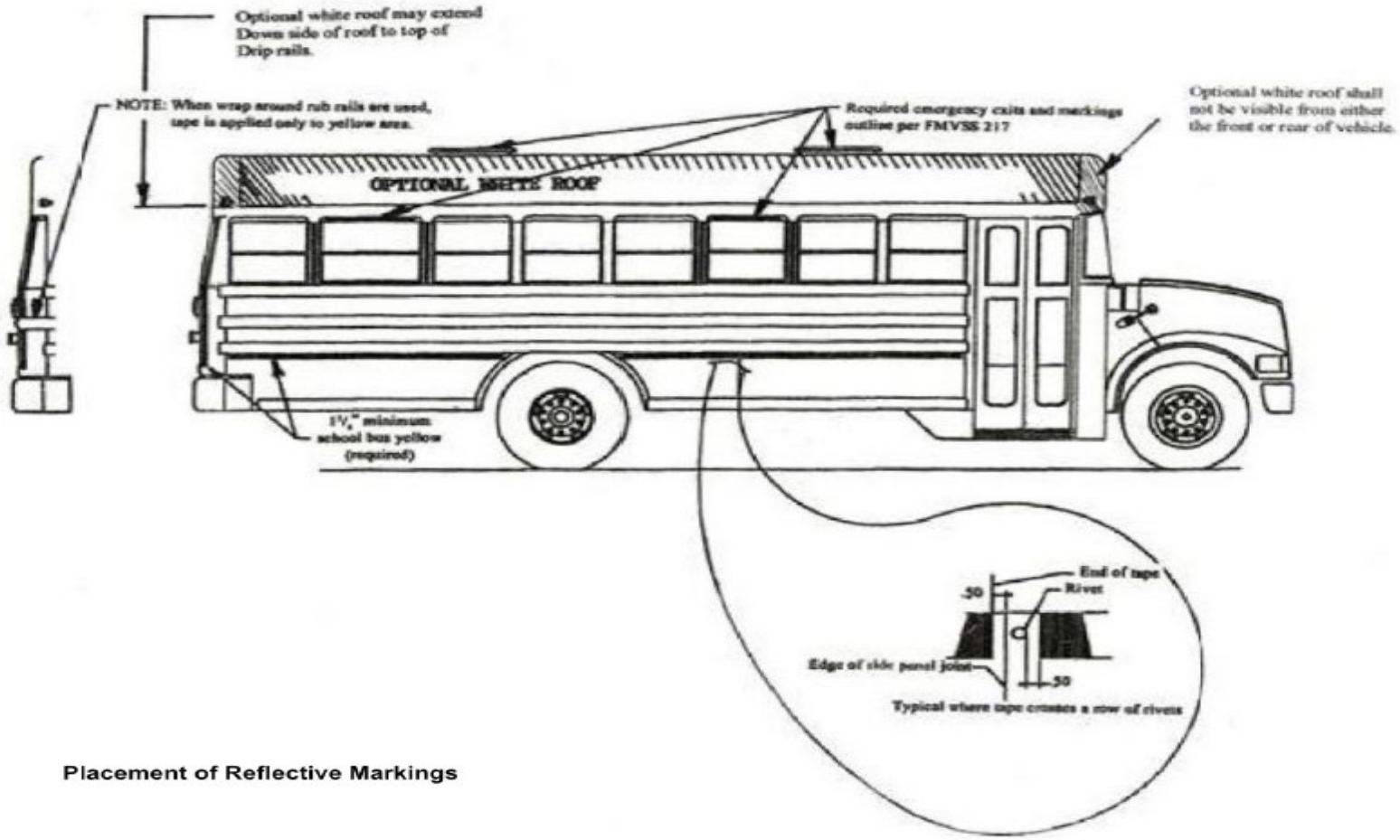
T. Wheelchair Lift Landing Light

Y. Rear View Mirror System

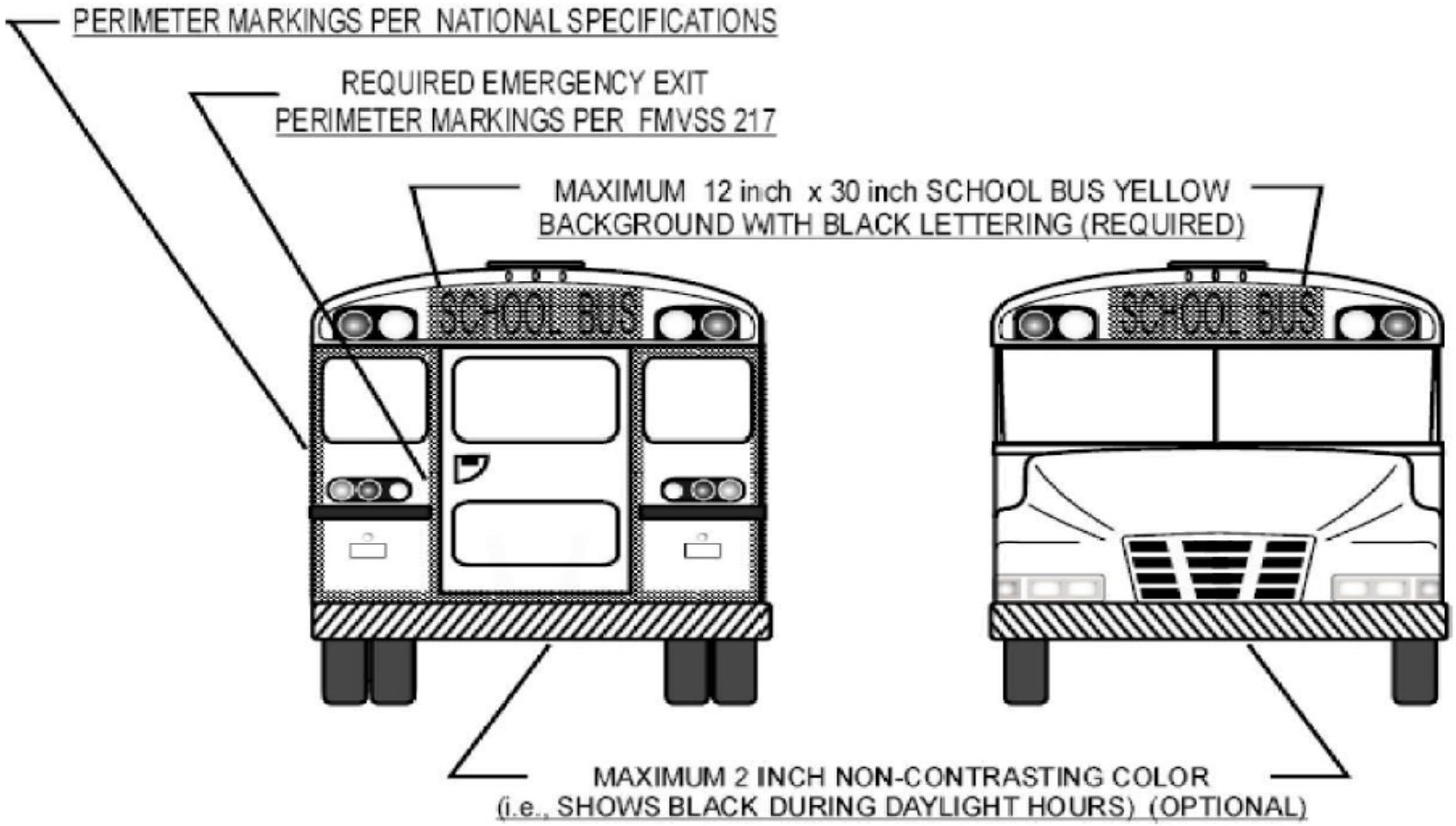
Z. Cross/Side View Mirror System

AA. Roof-Mounted White Strobe Light

CC. Rear Door Lettering (see specifications)



Placement of Reflective Markings


PERIMETER MARKINGS PER NATIONAL SPECIFICATIONS
REQUIRED EMERGENCY EXIT
PERIMETER MARKINGS PER FMVSS 217
MAXIMUM 12 inch x 30 inch SCHOOL BUS YELLOW
BACKGROUND WITH BLACK LETTERING (REQUIRED)
SCHOOL BUS
SCHOOL BUS
MAXIMUM 2 INCH NON-CONTRASTING COLOR
(i.e., SHOWS BLACK DURING DAYLIGHT HOURS) (OPTIONAL)

C. ENGINE COMPARTMENT
1. Steering

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:

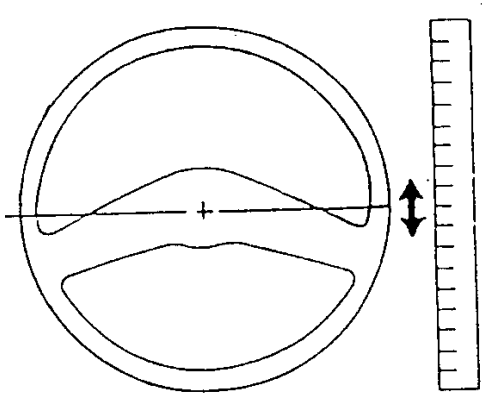
a. Steering Wheel, Play and Assist – 393.209(d), 570.60(c), 393.209(c), 393.209(a), 393.209(b) © Check condition of the steering wheel.	Steering wheel OEM covering has minor wear, cracks or looseness not exposing metal reinforcement.	Any portion of the OEM covering is loose, deteriorated, cracked or missing, exposing metal steering wheel reinforcement or interfering with usage. Steering wheel is loose on column. Steering wheel or covering is non-OEM design.
Check for play in the steering system at the steering wheel using the following procedures: 1) Visual check: From inside bus with engine running, rotate steering wheel lightly from side to side until motion can be observed at tires. Measure the free play (lash) at steering wheel outer diameter. This procedure must be performed with the vehicle on the ground. 2) To check power assist operation, run engine at fast idle, turn steering wheel a full right and left turn, and feel for binding, jamming or belt slippage.	**(Continued on Page 87)**	Free play (lash) exceeds amounts specified in chart 8. Power assist is inadequate, or there is binding, jamming or belt slippage.

CHART 8

STEERING WHEEL PLAY (LASH) MEASUREMENTS

Figure 1

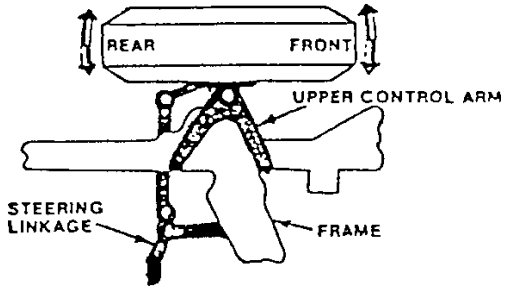
Steering Wheel Size
15 inches – 1-3/4” (4.4 cm)
16 inches - 2” (5.1 cm)
18 inches – 2-1/4” (5.7 cm)
20 inches – 2-1/2” (6.4 cm)
22 inches – 2-3/4” (7.0 cm)



STEERING LASH

Figure 2

Wheel (rim) Size:
16 inches or less - 1/4” (6.5 mm)
17 to 18 inches - 3/8” (9.5 mm)
Over 18 inches - 1/2” (13 mm)



STEERING LINKAGE PLAY - TOP VIEW

C. ENGINE COMPARTMENT
1. Steering

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Column - ©393.209(c), 393.209(d), 393.209(a), 393.209(b) Check steering column inside bus for up-and-down play (parallel to shaft), side-to-side play (perpendicular to shaft) and proper mounting.	Any column shaft yoke, coupler or joint dust boot is torn.	Column side-to-side play exceeds 1/4 inch or up-and-down play exceeds one inch. Column assembly mounting (including floor mounting plate) or fasteners are loose. Tilt/telescopic assembly (if equipped) will not stay locked in position. Steering column shaft U-joint inside the bus (if equipped) is loose, damaged or noisy after lubrication. Firewall or floor rubber boot is torn, ripped or missing. Steering column shaft U-joints, couplers, slide yokes, pinch bolts, etc., are loose, worn, damaged, have excessive play, or have loose or missing fasteners. Any column shaft yoke, coupler or joint dust boot is missing.
c. Steering Gear Box and other external components – 393.209(d), 369.3(a)(1), Check condition of the steering system using the following procedures with the vehicle on the ground (not suspended):	**(Continued on Next Page)**	Steering gear box is loose on frame or any fasteners are loose or missing.

C. ENGINE COMPARTMENT
1. Steering

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
1) With engine running, have assistant move steering wheel back and forth repeatedly to load steering components. 2) Observe the following external steering and related suspension and frame components for looseness while assistant works the steering (also see specific procedures under each component): a) Column shaft, dust boot and hardware b) Column U-joints, couplers, slide yokes (as equipped) c) Coupling at gear box d) Gear box e) Pitman arm f) Drag link g) Steering knuckle or arms h) Tie rod ends i) Idler arm (as equipped) j) Vehicle frame cross-members and frame braces, including associated rivets and fasteners for looseness and condition	**(Continued on Next Page)**	There is any binding in steering gear box. Frame braces or cross-members are cracked, loose or missing fasteners. Any axle or suspension/steering component is loose or worn beyond specifications prescribed elsewhere in this manual.

C. ENGINE COMPARTMENT
1. Steering

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
3) Have an assistant carefully rotate the steering wheel all the way to the left, then all the way to the right, to check the steering stops and power steering pressure relief valve.		Tire contacts any part of the bus frame, suspension, steering or other components.
d. Pitman Arm – 393.209(d), 396.3(a)(1), 393.209(d) Check the Pitman arm for looseness or misalignment at sector shaft splines and looseness at all joints. Check looseness of pinch bolt and fasteners and condition of Pitman arm.	Pitman arm grease fitting (if equipped) is loose or missing. **(Continued on Page 91)**	Any play is observed between Pitman arm and sector shaft. Pinch bolt at sector shaft is loose or missing. Pitman arm to steering sector shaft marks are misaligned. Pitman arm ball joint (if equipped) has more than 1/16 inch axial play (i.e., in-and-out play between the ball stud and socket; see figure 6, page 93). Pitman arm ball joint nut or cotter pin is loose or missing. Pitman arm is cracked or damaged. Any obvious welded repair

Figure 3 - Column with Yoke or U-Joint Typical

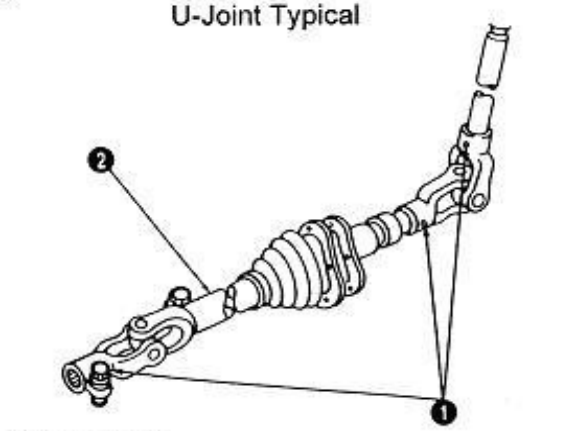


Figure 4 - Typical Flexible Type Steering Coupling

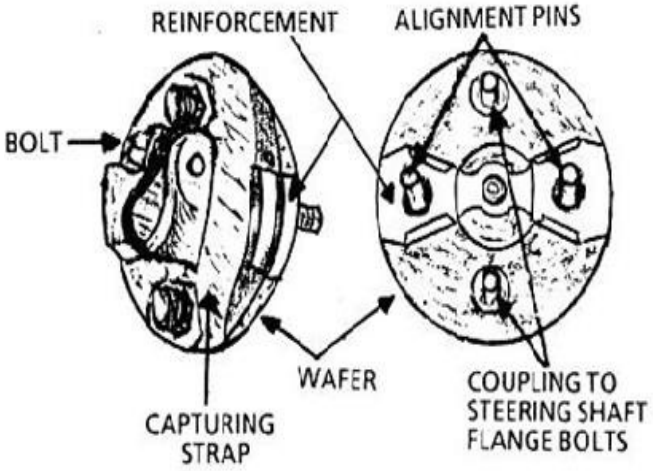
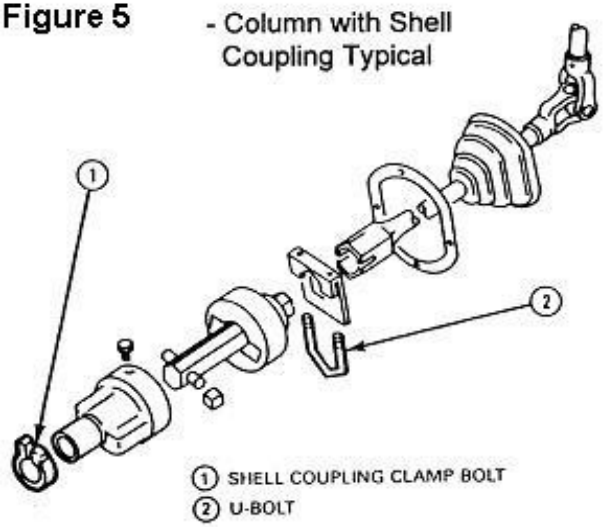


Figure 5 - Column with Shell Coupling Typical



TIGHTENING STEERING COLUMN JOINT BOLTS

WARNING: FAILURE TO MAINTAIN THE STEERING SYSTEM IN PROPER CONDITION CAN CAUSE REDUCED STEERING FUNCTION, RESULTING IN PERSONAL INJURY AND PROPERTY DAMAGE.

It is recommended that steering column joint bolts be checked for tightness every 50,000 miles or annually, whichever occurs first. **DO NOT OVERTIGHTEN THEM.**

C. ENGINE COMPARTMENT
1. Steering

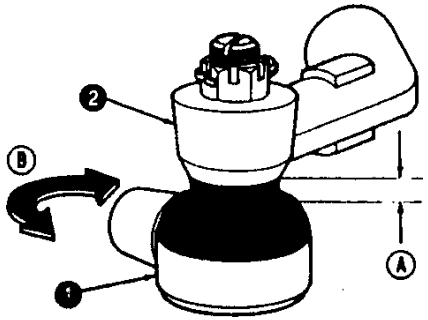
Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
e. Drag Link – 396.3(a)(1)		
Check the drag link ends, shaft and fasteners for looseness and condition.	Any grease fitting is loose, missing or will not take grease. Drag link needs lubrication. Drag link dust boots are cut, damaged or missing.	Drag link ball stud is loose in Pitman arm or upper steering arm. Any nut or cotter pin is loose or missing. Drag link shaft is damaged or bent. Drag link ends axial or horizontal play exceeds 1/16 inch (See figure 6). Horizontal socket type (adjustable) drag link end has more than 1/16 inch axial or lateral play.
f. Steering Arm		
Check upper steering arm (Ackerman arm) and left and right side lower steering arms for securement and condition.		Any steering arm is bent, cracked or damaged. Any steering arm attachment point is loose, or any fasteners or cotter pins are missing.
Check condition and securement of steering stops and lock nuts.		Either steering stop or lock is loose, damaged or missing.

(Continued on Next Page)

C. ENGINE COMPARTMENT
1. Steering

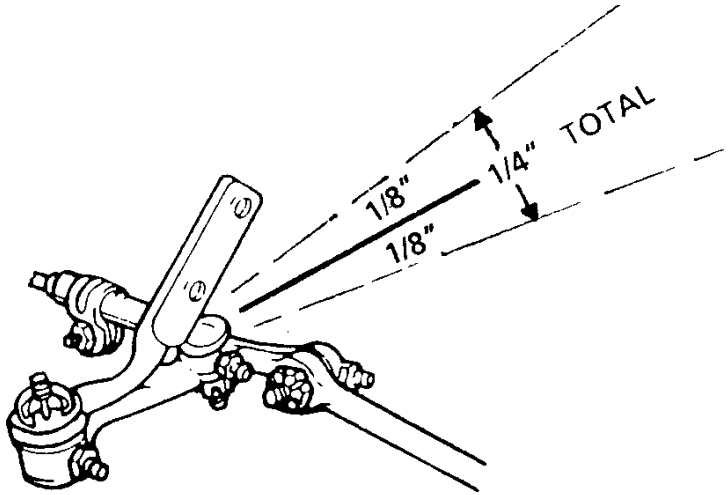
Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
g. Tie Rod and Ends Check tie rod, tie rod ends, dust boots, clamps and fasteners for looseness, damage and condition.	Tie rod end dust boots are cut, damaged or missing. Tie rod end needs lubrication. Any tie rod end grease fitting is loose, missing or will not take grease.	Tie rod to end clamps or fasteners are stripped, missing, loose or improperly positioned for proper clearance. Any tie rod or end is bent, cracked or damaged. Tie rod ends axial or horizontal play exceeds 1/16 inch. (See figure 6). Tie rod end ball stud is loose in steering arm or idler arm, has missing or loose fasteners, or has missing cotter pins.
h. Idler Arm Check idler arm assembly (as equipped) for looseness, damage and condition.	Idler arm needs lubrication. Idler arm grease fitting is loose, missing or will not take grease.	Idler arm is cracked or damaged, or cotter pin is missing. Idler arm up-and-down play is greater than 1/4 inch total (1/8 inch either direction). (See figure 7.)

Figure 6 - Checking the Rod and Drag Link End Movement



A. Movement in the axial direction must be less than 1/16 inch.
B. Tie rod/drag link free to rotate within steering arm socket.
1. Tie rod/drag link end
2. Steering arm

Figure 7 - Checking Idler Movement, Typical



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C. ENGINE COMPARTMENT
2. Batteries

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Battery Box, Door and Tray		
Check battery box, door and tray for operation, condition and securement.	Battery slide tray is corroded, dirty or hard to slide in and out.	Battery slide tray or box is loose, corroded or damaged, reducing securement of the batteries, or door does not open or will not stay latched. Battery slide tray does not slide in and out or tray lock, or stop is missing or nonfunctional.
b. Hold-down – 393.30		
Check for tightness, condition and type of battery hold-down.		Hold-down assembly is not OEM design, missing, loose, corroded or damaged, reducing securement of the batteries.
c. Battery Terminals		
Check cable terminals for cleanliness, tightness and condition.		Any cable terminal is loose, damaged, corroded or has missing terminal insulator (if equipped).
d. Battery Cables – 393.28, 396.3(a)(1)©, 393.77(b), 393.30©		
Check cable assemblies for routing, securement, condition and size.	Battery cable length or battery mounting restricts access to battery/batteries for servicing.	Cable or insulation is cracked, damaged or corroded. Cable is misrouted, unsecured or missing protective grommets, loom or other means of protection from chafing against any metal, sharp edge or hot surface. Cable is smaller than original equipment size.

(Continued on Next Page)

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C. ENGINE COMPARTMENT
2. Batteries

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		Cable appears to be too small in diameter or of excessive length (see chart 9). Flat braided engine ground cable is frayed or corroded, or ends are not secure.
e. Cleanliness Check cleanliness of battery or batteries.	Battery top or sides are corroded, greasy, dirty or wet with electrolyte.	Batteries and compartment are excessively dirty or corroded.
f. Load Test Perform battery load test on battery/batteries to check condition. Check battery/batteries for proper type and load rating.	Battery cable length or battery mounting restricts access to battery/batteries for testing.	Battery/batteries are of insufficient cold cranking amp (CCA) rating.
g. High Voltage – Electric Buses		Any high-voltage system with a dripping leak at any point. Damaged or exposed high-voltage cabling. Broke or damaged charging port on the vehicle.

CHART 9

CHARGING SYSTEMS CABLE SIZE CHART

SYSTEM VOLTAGE	RATED OUTPUT IN AMPERES	RECOMMENDED MINIMUM CHARGING CABLE GAUGE SIZE							
		4 FT. or Less	4 -7 FT.	7 -10 FT.	10 -13 FT.	13 -16 FT.	16 -19 FT.	19 -22 FT.	22 -28 FT.
12 VOLT	0 - 20	14	12	12	10	10	8	8	8
	20 - 35	12	10	8	8	6	6	6	4
	35 - 50	10	8	8	6	6	4	4	4
	50 - 65	8	8	6	4	4	4	4	2
	65 - 85	6	6	4	4	2	2	2	0
	85 - 105	6	6	4	2	2	2	2	0
	105 - 125	4	4	4	2	2	0	0	0
	125 - 150	2	2	2	2	0	0	0	00

Maximum difference between battery voltage and alternator voltage is 0.5 volt for 12-volt systems at full-rated output.

Maximum voltage drop in the sensing (#2-terminal) lead must not exceed 0.2 volt for 12-volt three-wire systems.

Cable gauge size calculation above takes into account terminal-connection resistance.

Note: When an insulated (no frame ground) charging system is installed, the length of the return circuit must be included to obtain total circuit length and determine the proper wire size.

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C. ENGINE COMPARTMENT
3. Fluid Levels and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Brake Fluid – 393.45(a), 571.106 Check brake fluid and brake power-assist hydraulic fluid (if equipped) for level and condition.		Level of brake fluid in either side of master cylinder reservoir is lower than one-quarter of an inch from top or below “add” mark. Brake fluid or power-assist fluid shows evidence of excessive water, oil or dirt contamination. Brake power-assist hydraulic fluid is below cold “add” mark.
b. Power Steering Fluid – 396.3, 396.5, 393.209 Check power steering fluid level and condition.		Power steering fluid shows evidence of excessive water, oil or dirt contamination. Power steering fluid is below cold “add” mark. No oil is observed on dipstick.
c. Oil Check engine oil level and condition.		Dipstick is missing. Engine oil level is below the “add” mark or above “full” mark. There is evidence of fuel or water contamination in the oil.

(Continued on Next Page)

C. ENGINE COMPARTMENT
3. Fluid Levels and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Transmission Fluid		
Check transmission fluid level and condition.		Dipstick is missing, broken or the incorrect type. Transmission fluid is below the “add” mark or above the “full” mark.
	Transmission fluid shows need of servicing (discoloration or smell).	Transmission fluid shows evidence of excessive dirt, metal or coolant contamination.
e. Windshield Washer Reservoir and Fluid		
Check windshield washer fluid reservoir and cap for condition, mounting and fluid level.	Reservoir is loose, washer fluid level is low and/or cap is damaged.	Reservoir is missing, leaking or empty, and/or cap is missing.

(Continued on Next Page)

C. ENGINE COMPARTMENT
3. Fluid Levels and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Coolant Check engine coolant level, condition and freeze protection. **Note: Follow manufacturer's recommendations for checking coolant condition, PH and additive package.** **Note: Use caution when opening a hot cooling system.**	Coolant level is below the "full" mark. Coolant shows evidence of excessive oil, dirt contamination, or rust and corrosion. Coolant freeze protection is minus 20 degrees Fahrenheit or lower (see chart 10). Coolant pH level is too high or too low, or coolant additive package has depleted to an unacceptable level.	Coolant level is below the "add" mark or cannot be seen in the reservoir or radiator with cap removed.

CHART 10

Freezing-Points of Antifreeze Solutions			
SOLUTION		PROTECTION	
Percentage of Antifreeze	Percentage of Water	Celsius	Fahrenheit
0%	0%	0	32
10%	90%	-3	27
12%	88%	-4	25
14%	86%	-5	23
16%	84%	-6	21
18%	82%	-7	19
20%	80%	-8	18
24%	76%	-10	14
28%	72%	-13	9
30%	70%	-15	5
32%	68%	-16	3
36%	64%	-20	-4
40%	60%	-24	-11
44%	56%	-28	-18
48%	52%	-33	-27
50%	50%	-37	-35
52%	48%	-39	-38
56%	44%	-45	-49
60%	40%	-51	-60

		Boiling Points of Antifreeze Solutions at Various Pressures				
		Pressure in Pounds per Square Inch (PSI)				
		0 PSI	**8 PSI**	**12 PSI**	**16 PSI**	**20 PSI**
Percentage of Antifreeze Solution	**0%**	212	233	242	252	260
	33%	220	240	253	260	268
	44%	224	245	257	265	272
	50%	226	248	259	267	275
	60%	231	253	264	273	280
		Boiling Points in Degrees Fahrenheit (°F)				

Note: Technicians should test engine coolant properties during every inspection using a coolant test-strip kit. Consult the OEM for recommended test kits and procedures.

C. ENGINE COMPARTMENT
4. Belts and All Hoses

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Belt(s)		
1) Tightness		
Visually and physically check all drive belts for proper tension. If available, use a tension gauge (see figure 9). If a gauge is not available, use a ruler to measure the deflection of the belt(s) up and down at the widest point between the drive and driven pulley(s) (see figure 10).	Any belt exceeds tension reading recommended by manufacturer. Using ruler method, any belt has less than half an inch deflection (too tight) when firm pressure is applied (see figure 10).	Any belt tensioner (automatic or manual) does not apply proper tension to belt. Tension on any belt is too loose (based on specifications of type tension gauge used). Tension of any belt (using ruler method) is too loose when firm pressure is applied (greater than three-quarter inch deflection).
2) Condition		
Inspect belt(s) for presence, glazing, oil contamination, dry rotting, cuts and separation of plies. Check belts for twisting or distortion.	Any belt is glazed.	Any belt is missing, oil-saturated, dry-rotted or cut, or plies of belt(s) are separated. Any belt is twisted or distorted.
3) Routing and Alignment		
Inspect belt(s) for correct routing, alignment and contact with objects other than pulleys.	Any belt is slightly misaligned. **(Continued Next Page)**	Belt misalignment is excessive and could result in failure. Any belt is making contact with objects other than pulley(s). Any belt is routed incorrectly.

CHECKING BELT TENSION AFTER TIGHTENING

Figure 9 - Checking Belt Tension
(Gauge Method)

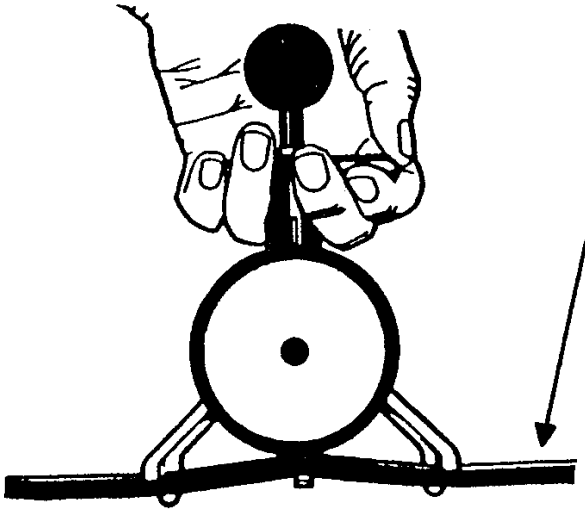
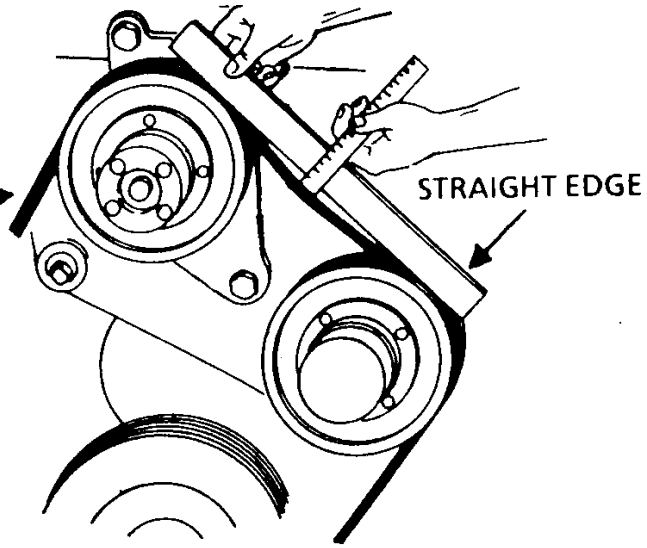


Figure 10 - Measuring Belt Tension
(Ruler Method)



C. ENGINE COMPARTMENT
4. Belts and All Hoses

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Hose(s)		
1) Clamps and Connections		
Visually and physically check that hose connections or clamp(s) are tight.	Any hose connection or clamp is loose or overtightened.	Any hose connection or clamp is stripped, damaged or overtightened, causing hose damage beyond the outer cover.
Note: References to hoses include all types of hoses located in the engine compartment and related components, including power steering, coolant, air compressor intake, vacuum, brake hydraulic assist, engine oil and transmission hoses.	Any hose connection (other than brake) is seeping.	Any brake hose is seeping or leaking.
2) Condition		
Inspect all hoses for cuts, abrasions and wear, oil saturation, dry rotting and ballooning.		Any hose is cut, abraded, worn, oil-saturated, dry-rotted or ballooned to the point that failure is likely.
3) Routing		
Inspect routing and securement of all hoses.	Any hose is misrouted or unsecured so that heat, abrasion or other damage is possible.	Any hose is misrouted or unsecured so that heat, abrasion or other damage is likely.

C. ENGINE COMPARTMENT
5. Accessory Mounting and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Air Cleaner		
Check air intake system, housing, lid, piping, gaskets, seals and clamps for leaks, securement and condition. If equipped, record air filter restriction gauge measurement.	Any portion of air intake system has minor dents or damage that is not causing air leaks.	There are intake system leaks; loose, missing or damaged components; or other conditions that could allow dust or dirt damage to internal engine parts.
Note: If air leaks are suspect, inspect for dirt/dust tracking through air cleaner assembly and intake piping.	Air filter restriction gauge is not working properly.	Air filter restriction exceeds manufacturer's specifications.
b. Power Steering Pump		
Check securement and condition of power steering pump.		Any portion of the power steering pump, mounting brackets or fasteners is cracked, damaged, loose or missing.
c. Air Compressor and Filter		
Check securement and condition of air compressor and filter assembly.	Air compressor external air filter (if equipped) is dirty.	Any portion of the air compressor, mounting brackets, fasteners or compressor air-filter system is cracked, damaged, loose or missing.

(Continued on Next Page)

C. ENGINE COMPARTMENT
5. Accessory Mounting and Condition

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Water Pump		
Check condition of water pump and pulley.	There is evidence of coolant seepage from water pump, seal, gasket surface or weep hole.	Water pump is noisy, bearing is damaged or coolant is leaking. Water pump fasteners are loose, damaged or missing to the point that failure or leaks could occur.
e. Fan		
Check fan blades, hub and fan clutch assembly for securement and condition.		Fan has any cracked, bent or broken blades. Any portion of fan mounting is loose. Fan clutch is worn or seized.
f. Alternator		
Check securement and condition of alternator assembly.	Alternator is noisy.	Any of the alternator, mounting brackets or fasteners are cracked, loose or missing. Alternator is not charging.

C. ENGINE COMPARTMENT
6. Wiring

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Routing and Condition Check routing, securement and condition of all wiring and any electrical cable in the engine compartment and related areas.	There is any slightly loose, damaged or corroded wiring connector or terminal end. Any repair has been made using improper gauge wiring.	Any wiring is misrouted, unsecured or missing protective grommets, loom or other means of protection from chafing against any metal, sharp edge or hot surfaces. There are any burnt wires, or any wires are missing insulation (other than ground straps).

C. ENGINE COMPARTMENT
7. Fuel System and Lines

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
Fuel System and Lines – 396.3(a)(1), 393.65, 393.67 Visually check the condition, operation and securement of all fuel system components, including fuel lines and routing in the engine compartment.	There is evidence of dirt, algae or water in a fuel water separator.	There is any unsecured, poorly routed or loose fuel line or hose that could cause fire due to abrasion or heat damage. Any fuel system connection is stripped, loose, cracked or leaking. Any fuel system component is damaged or not mounted securely.

C. ENGINE COMPARTMENT
8. Radiator

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Radiator and Reservoir		
Check radiator and reservoir assemblies for mounting, securement and condition.	Any portion of the radiator, reservoir or mounting system is cracked or damaged, or has loose or missing fasteners not causing leaks or failure.	Any portion of the radiator, reservoir or mounting system is cracked, damaged or has loose or missing fasteners, causing leaks or failure.
b. Cap		
Check condition of radiator cap and perform pressure test.	Radiator cap is hard to open or close.	Radiator cap is missing.
WARNING: ALWAYS USE PROPER PROCEDURES WHEN REMOVING A RADIATOR CAP.	Radiator cap leaks down slowly at rated pressure.	Radiator cap is the incorrect type or pressure rating, or fails pressure test.
c. Fan Shroud		
Check fan shroud for mounting and condition.		Fan shroud is missing, loose or has excessive damage that may interfere with the cooling fan.

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D. UNDERNEATH BUS
1. Front Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
393.207(f), 393.207(a)©, 570.61(a), 393.207(c), 393.207(d)©, 393.207 **a. Front Wheel Bearings** Inspect front wheel bearings and related components for condition and proper adjustment of bearings. With front wheels raised, grasp tire and attempt to rock wheel and move in and out to check for play. Spin tire to check for noise and condition of bearings. **Note: To correctly identify the source of any play or to determine if the play is in wheel bearings, have an assistant press and hold the foot brake pedal (ensuring the front brakes are engaged) while rechecking play. If movement disappears with brakes applied, then the play was in the wheel bearings.**	Oil or grease is seeping from hub bearing caps.	Oil or grease is leaking from hub bearing caps. Wheel bearing endplay exceeds manufacturer's specifications of 0.010-inch maximum, measured at the hub. Any noise, binding or roughness is discovered in bearings.
b. I-Beam Inspect I-beam axle assembly.		I-beam has been heated, cut or modified, or is cracked or damaged.

(Continued on Next Page)

D. UNDERNEATH BUS
1. Front Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Kingpins		
Inspect kingpin assemblies for condition and play as follows:	End cap O-rings or bolts are loose or missing.	Locking pin is backing out or missing.
Note: Wheel bearings must be adjusted properly (or wheel bearing play must be eliminated by locking brakes) before checking kingpins. Do not tighten kingpin lock (if equipped) or grease kingpins before inspecting.		
1) With front wheels raised, use a pry bar for leverage, and attempt to move the wheel in and out at the top and bottom (see figure 11).		Kingpin movement is more than 1/4 inch measured at outside edge of tire (see figure 11).
2) Place a pry bar under wheel and lift tire straight up and down to determine condition of thrust bearing.		Vertical (up and down) play in kingpin assembly is greater than 0.060 inch (see figure 12), and/or thrust bearing is damaged or missing. **Note: If play is beyond specifications, wear may be in the kingpin, axle eye, thrust bearing and/or kingpin bushings.**

(Continued on Next Page)

D. UNDERNEATH BUS
1. Front Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Shackles Inspect condition of shackles, spring hangers and pinch bolts.		Any front spring shackle or hanger is cracked, broken or has significant side wear at spring eye. Any front spring shackle or hanger is worn or pinch bolt is stripped or missing so that spring pin cannot be clamped tightly.
e. Spring Mounts Inspect spring mount bracket(s) for condition and securement.		Any front spring mount is cracked or broken. Any front spring mount-to-frame fastener is loose or missing. Frame is cracked at any spring mounting location.

(Continued on Next Page)

D. UNDERNEATH BUS
1. Front Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Pins and Bushings Inspect pins and bushings as follows: **Note: Do not grease pins and bushings before inspecting.**		
Inspect front spring pins and bushings for wear and lubrication. Check for wear with front axle loaded. Insert pry bar between spring eye and fixed point at frame and pull down. Measure total free play in pins and bushings (see figure 13).	Any spring pin assembly will not accept lubrication, or zerk (grease) fitting is damaged or missing.	Total free play (up and down) of pins and bushings exceeds 1/4 inch (two-pin type) or 1/8 inch (one-pin type). (See figure 13) Inner sleeve or rubber bushing-type spring pin assembly or assemblies are worn through, or rubber bushing is excessively worn (rubber is compacted or deteriorated, resulting in free play between rubber and spring eye or inner sleeve).
g. A-Frames and Bushings		
Inspect A-frames and bushings for condition and securement.	Rubber bushing(s) are split, deteriorated or extruded from suspension joints.	Rubber bushing(s) are worn excessively or missing. Any A-frame assembly is bent, damaged or broken, or any fasteners or brackets are loose or missing. Any A-frame, bushing or pivot arm has more than 0.05-inch free play at pivot point.

(Continued on Next Page)

D. UNDERNEATH BUS
1. Front Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
h. Ball Joints		
Inspect ball joint(s) for condition, securement and lubrication.	Zerk (grease) fitting is missing or damaged, or ball joint will not take lubrication.	Any ball joint has more than 3/32-inch axial play. Any ball joint nut is loose or missing, or cotter pin is missing. Ball joint to A-frame mounting is cracked, loose or has been welded.
i. U-Bolts		
Inspect spring U-bolts for condition and securement.	Any U-bolt is misaligned.	There is rust underneath U-bolt nuts, indicating possibility of looseness. Any U-bolt, seating plate, shock mount bracket or fastener is loose, missing, cracked or stripped.
j. Shock Absorbers		
Inspect shocks for condition and securement. **Note: A very small amount of fluid staining at the shock-piston shaft seal area is normal due to the wiping function of the shaft seal. This does not indicate a leaking shock.**		Any shock is leaking fluid. Any shock mounting or fastener is loose, missing, cracked or broken. Any shock is broken. Any shock fails to function.

(Continued on Next Page)

D. UNDERNEATH BUS
1. Front Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
k. Springs		
Inspect front springs for condition, securement and alignment.	There are any loose, missing, broken or worn spring clips. Any leaf spring or air-suspension ride height is less than manufacturer's specifications. Either front spring saddle (if equipped) is worn or missing. Rubber bumper is missing.	Any spring leaf is broken, cracked or missing. Spring eye is worn or spread such that bushings are loose in spring eye. Any coil spring(s) is non-OEM, broken or insecurely mounted, or non-OEM blocks or spacers are installed. There is any misalignment of spring leaves or other evidence that center pin is loose or broken. Either front coil or leaf spring is worn so that rubber frame bumper is damaged or worn due to frequent bottoming of front suspension. Any alignment wedge is loose or damaged. On any air bag type spring assembly, air bag is damaged or leaking.
l. Wheel Seals		
Check for condition and leakage.	Either front wheel seal is seeping.	Either front wheel seal is damaged or leaking.

Figure 11 - Kingpin Bushing Wear Check

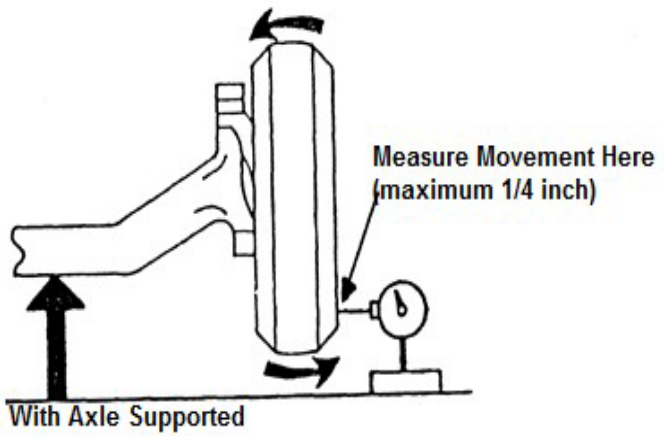


Figure 12 - Spindle Thrust Bearing Check

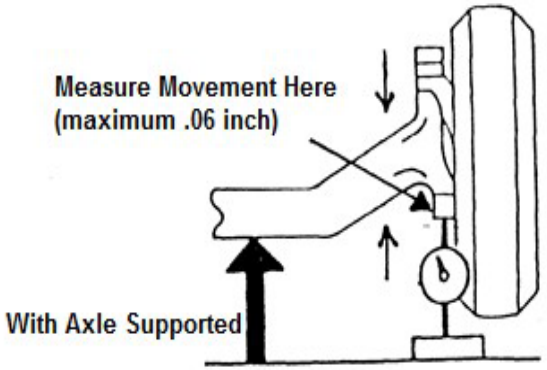
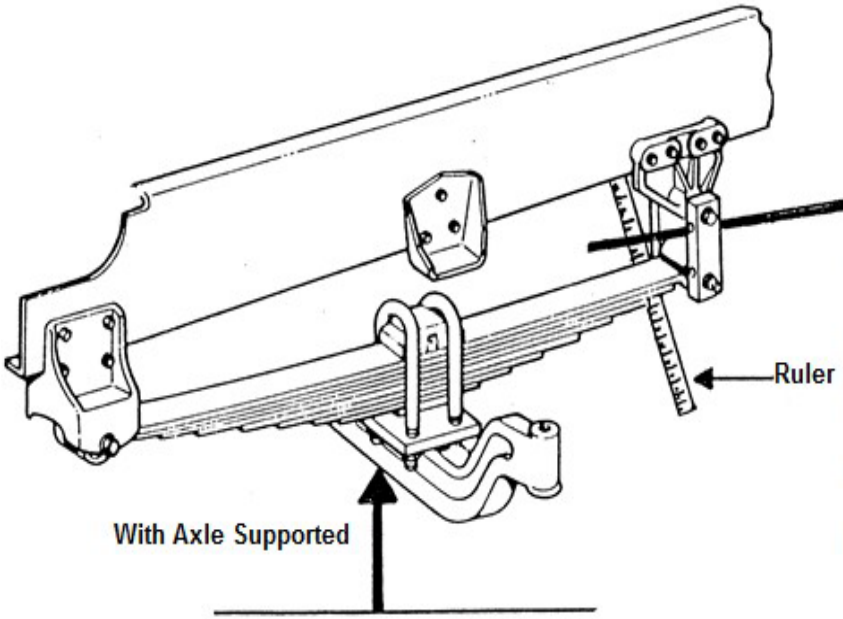


Figure 13 - Front Spring Shackle Pin and Bushing Play Check



1. Measure from top of spring leaf to bottom of frame rail. Note distance.
2. Insert pry-bar between spring eye end and shackle bracket or frame.
3. Pull end of pry-bar down sufficiently to take up any slack.
4. Measure distance again between spring and frame.
5. Measurement should not be over 1/4 inch greater than step 1 for a double pin system or greater than 1/8 inch for a single pin system.

D. UNDERNEATH BUS
2. Front Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Brake Hoses Inspect air and hydraulic front brake flexible hoses for condition, securement and routing.		Any front hydraulic brake flex hose or connection is seeping or leaking fluid, or any air brake hose is leaking air pressure. Any front brake flex hose is kinked, collapsed, bulging, has damaged plies/cord or is damaged below outer covering. Any front brake flex hose supporting brackets are damaged or have loose fasteners. Any front brake flex hose is rubbing against other components or is improperly routed.
b. Lines Inspect air and hydraulic brakes lines for routing, securement and condition.		Any brake line is bent, crimped or damaged significantly, restricting air pressure or hydraulic fluid. Any hydraulic brake line or connection is seeping or leaking fluid, or any air brake line is leaking air pressure. Any brake line is rubbing against other components or is improperly routed. Any brake line is not of OEM material, size or type.

(Continued on Next Page)

D. UNDERNEATH BUS
2. Front Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Chambers Inspect front brake chamber assemblies for securement, condition and proper size.		Any front brake chamber, mounting bracket or hardware is cracked, bent, broken or missing. Any front brake chamber or mounting fastener is damaged, loose, missing or of the wrong type. Either front chamber is not OEM size and stroke length.
d. Slack Adjusters Inspect slack adjusters and S-cam assemblies for wear, condition, operation and securement. **Note: See (brake adjustment), for procedure to check operation of ASAs.**		Any portion of slack adjuster or S-cam is missing, broken, cracked or worn beyond limits (see figure 14 and figure 15). S-cam snap ring is missing. Slack adjuster has frozen or stripped worn gear or ratchet assembly.

(Continued on Next Page)

D. UNDERNEATH BUS
2. Front Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
e. Push-Rods		
Inspect push-rod assemblies for condition, securement and alignment.		Any portion of push-rod assembly (locknut, push-rod, clevis, pin or cotter pin) is loose, missing or damaged. Push-rod is rubbing against body of chamber, or chamber is misaligned. Push-rods on left and right sides are not mounted in identical (same) slack adjuster location hole, resulting in same effective slack adjuster length.
f. Linings		
Inspect linings and foundation brake hardware for contamination, wear, damage and securement.	There is a significant difference in lining thickness between the left and right sides. **(Continued on Next Page)**	Any foundation brake assembly does not have at least one lining inspection hole. For riveted-type shoes, front brake lining is less than 3/16 inch thick (Q-type) or 1/4 inch (Q-plus-type) above shoe table at the center of the shoe. For bonded-type shoes, front brake lining is worn to within 1/16 inch of shoe table at the center of the shoe.

D. UNDERNEATH BUS
2. Front Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		Front brake lining is worn to within 1/16 inch of any rivet. Lining is broken, cracked or loose on shoe. Lining is not proper size. Friction surface is contaminated with oil, grease or brake fluid. There is any shimming material between lining and shoe. Shoe table or webbing is cracked or damaged. There is any loose, damaged or missing foundation brake hardware within the drum.
g. Disc Brake Pads Inspect disc brake pads for contamination, wear, damage and securement.	There is significant difference in pad thickness between the left and right sides of the bus. **(Continued on Next Page)**	Pad surface is contaminated, cracked, broken or missing. Thickness of friction material is less than 1/8 inch. Pad wear is uneven end-to-end exceeding 3/32 inch. Difference between the inboard and outboard pads on one side is greater than 1/8 inch.

D. UNDERNEATH BUS
2. Front Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
h. Drums Inspect front brake drum(s) for condition and size.		There is any crack (other than heat checks) in any drum. There is more than 0.060 inch wear in drum friction surface (inside diameter is more than 0.120 inch over original). There is any grease, oil or brake fluid on inside of drum. Drum is not mounted securely to hub, or fasteners are loose. Drum is not centered on hub causing it to be more than 0.010 inch out of round
i. Rotors Inspect brake rotor(s) for mounting, thickness and condition.	**(Continued on Next Page)**	Rotor mounting is not secure or has run out beyond manufacturer's specifications, causing a pulsating brake pedal. Rotor has cracks (other than heat checks) or other mechanical defects, or is contaminated with oil, grease or brake fluid. Rotor thickness is less than manufacturer's specifications stamped on rotor. Any rotor friction surface is significantly grooved or damaged.

D. UNDERNEATH BUS
2. Front Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
j. Wheel Cylinders or Calipers Inspect wheel cylinders or calipers for seepage, leaks, mounting and condition.		Any wheel cylinder or caliper is seeping, leaking, not securely mounted, or has loose or missing fasteners. There is uneven lining or pad wear, rotor or drum damage, evidence of dragging or other evidence that any wheel cylinder or caliper may be sticking.

(Continued on Next Page)

D. UNDERNEATH BUS
2. Front Brakes

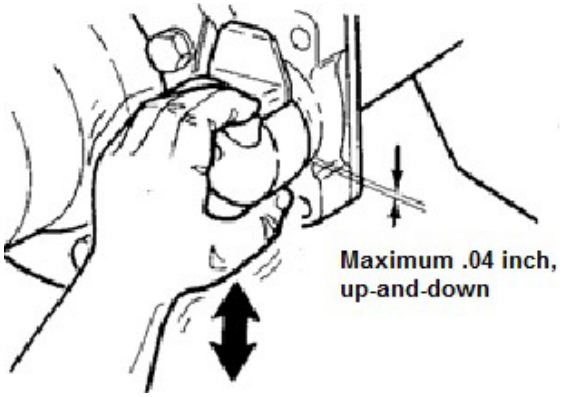
Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
k. Adjust Brakes		
1) Any brakes (air or hydraulic) without automatic adjusting capabilities must be adjusted at each inspection using the following procedure: a) Tighten brake adjuster until wheel locks up. b) Back off brake adjuster until there is a very slight drag on friction surfaces.		Any condition prevents proper adjustment of manual adjusting brakes.
2) For all MSA-equipped S-cam brakes, each brake chamber push-rod travel must be measured and brakes must be adjusted at every required inspection at all wheel positions (see figure 15). Push-rod travel must not exceed limits shown in chart 11.		Any MSA-equipped S-cam cannot be adjusted to bring push-rod travel within limits shown in chart 11.

(Continued on Next Page)

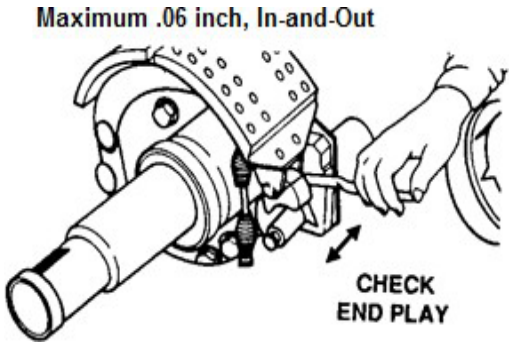
D. UNDERNEATH BUS
2. Front Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
3) Do not adjust ASA-equipped brakes. Push-rod travel must be measured and must not exceed limits shown in chart 11. If the push-rod travel measurement exceeds the limits, the foundation brakes, slack adjusters, push-rods and chambers must all be inspected and repaired or replaced, if found defective. Correctly installed and properly working ASAs should keep the brakes in adjustment throughout the life of the linings.		Any ASA is damaged or malfunctioning, or push-rod travel exceeds the limits shown in chart 11.

Figure 14



S-cam Bushing Up-and-Down Play



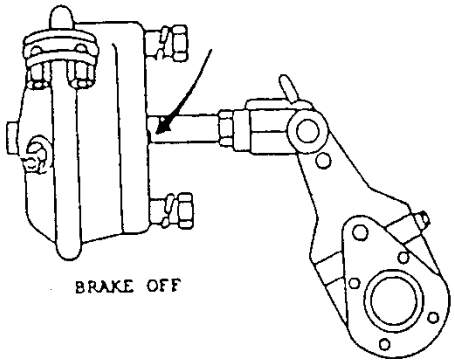
S-cam In-and-Out Play

Figure 15

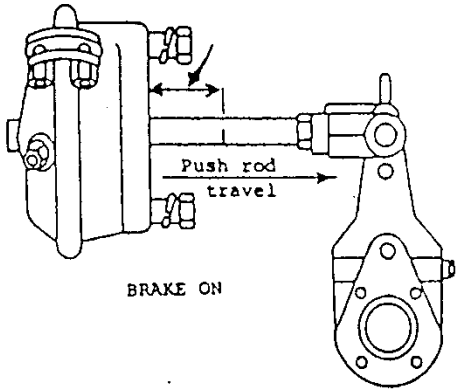
PROCEDURE FOR MEASURING PUSH-ROD TRAVEL

Brake chamber push-rod travel shall not exceed maximum stroke specifications. Performance of the brake push-rod travel inspection requires full application of the brake, with a minimum of 80 to 90 psi of air pressure application.

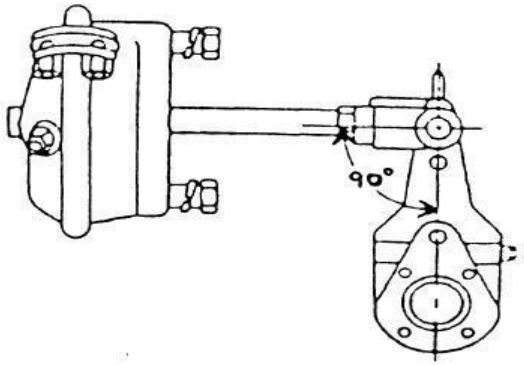
CAUTION: Chock wheels before commencing this inspection, as vehicle emergency brake(s) must be off.



With brakes off, mark push-rod at chamber.



Apply brakes and measure distance of mark from chamber.



Note: When brakes are properly adjusted and fully applied, the slack adjuster should be at an angle of 90° as measured from centerline of adjuster to push-rod.

Note: Refer to chart 11 for maximum push-rod travel (stroke) at which brake adjustment is required.

CHART 11
Dimensions in inches

CLAMP TYPE BRAKE CHAMBER

Type	Maximum Stroke	Maximum stroke with brakes adjusted	Maximum stroke at which brakes should be adjusted
6	1-5/8	Should be as short as possible without brakes dragging	1-1/4
9	1-3/4		1-3/8
12	1-3/4		1-3/8
16	2-1/4		1-3/4
20	2-1/4		1-3/4
24	2-1/4		1-3/4
30	2-1/2		2
36	3		2-1/4

"LONG STROKE" CLAMP-TYPE BRAKE CHAMBER

16	2-1/2	Should be as short as possible without brakes dragging	2
20	2-1/2		2
24	2-1/2		2
24	3		2-1/2
30	3-3/8		2-1/2

ROTOCHAMBER

9	2	Should be as short as possible without brakes dragging	1-5/8
12	2		1-5/8
16	2-1/2		2
20	2-1/2		2
24	2-1/2		2
30	3		2-1/2
36	3-1/2		2-3/4
50	4		3-1/4

AIR DISC BRAKES

12	1-3/8	Should be as short as possible without brakes dragging	1-3/8
16	1-1/2		1-3/4
20	1-5/8		1-3/4
24	1-3/4		1-3/4
30	1-7/8		2

D. UNDERNEATH BUS
3. Engine Mounts, Transmission Mounts and Starter Mounting

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Engine/Transmission Mounts Inspect engine and transmission mounts for condition and securement.		Any mounting fasteners are loose, missing or broken. Any mount is cracked or has deteriorated rubber.
b. Starter Mounting Inspect starter for securement and condition.		Any starter-mounting bolt, stud or nut is loose, damaged, broken or missing. Starter is damaged or loose. Any starter cables are loose or bare, or any positive cable could short to ground.

D. UNDERNEATH BUS
4. Transmission

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Transmission Bolts		
Inspect transmission assembly and mounting fasteners for condition and securement.	Any transmission assembly fastener is loose, missing or damaged.	Transmission is not mounted securely to flywheel housing. There is any indication that any torque converter bolt is loose or missing.
b. Linkage		
Inspect transmission linkage for routing, condition and securement.	Modulator, Throttle Valve (TV) cable or vacuum hose is routed where it is subject to excessive heat or abrasion. Any linkage hardware or fasteners are loose.	Linkage is bent, damaged, binding or severely misadjusted. Any linkage hardware or fasteners are missing, or linkage is damaged, causing a sticking or binding condition.
	Modulator or TV cable is exposed, or casing is damaged. Vacuum modulator hose is deteriorated or loose.	Vacuum-modulator hose is leaking or not connected.
c. Lines		
Inspect transmission lines for securement, routing and condition.	Any transmission line is unsecured.	Any transmission line is improper type, crimped, improperly routed, damaged or leaking.

(Continued on Next Page)

D. UNDERNEATH BUS
4. Transmission

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Filter		
Inspect transmission external filter assembly (if equipped) for securement and condition.		External filter or base is loose or leaking.
e. Cooler		
Inspect transmission cooler (as equipped) for securement and condition.	Mounting of external transmission cooler (if equipped) is not secured or has loose or missing fasteners.	Transmission cooler is cracked or damaged, or hoses and connections are leaking.

(Continued on Next Page)

D. UNDERNEATH BUS
5. Fluid Leaks

Note: Leaks and Seepage are types of fluid loss defined as follows:

"Leak" is enough fluid loss to cause dripping fluid. Leaking fluid can also be slung from rotating assemblies.
"Seepage" is fluid loss that may cause dampness or staining, but not dripping or slung fluid.

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Oil		
Inspect for engine oil leaks at all locations and determine severity.	Engine oil is seeping or slightly leaking onto any location except exhaust system.	Engine oil leakage is excessive.
	Engine oil leakage is causing deterioration of any rubber parts, such as steering linkage boots, hoses, etc.	
	There is a drip shield installed to divert leaking oil from the exhaust system.	Engine oil is dripping, slinging or being blown onto any portion of exhaust system.
b. Coolant		
Inspect all locations for coolant leaks.	There is coolant seeping at radiator, hoses, engine oil cooler, thermostat housing, head gaskets, freeze plugs, reservoir, water pump or other locations.	Coolant leakage is excessive.

(Continued on Next Page)

D. UNDERNEATH BUS
5. Fluid Leaks

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Transmission Inspect for transmission fluid leaks at all locations and determine severity.	Transmission fluid is seeping or slightly leaking onto any location except exhaust system.	Transmission fluid leakage is excessive.
	Transmission fluid is causing deterioration of any rubber parts, such as steering linkage boots, hoses, etc.	Transmission fluid is dripping on any portion of exhaust system.
d. Power Steering Inspect for power steering fluid leaks at all locations and determine severity.	Power steering fluid is seeping.	Power steering fluid is leaking.
	Power steering fluid is causing deterioration of any rubber parts, such as steering linkage boots, hoses, etc.	Power steering reservoir cap or dipstick is missing.
e. DEF Inspect for DEF fluid leaks at all locations and determine severity.	DEF fluid is seeping.	DEF fluid is leaking.

D. UNDERNEATH BUS
6. Fuel and DEF Tank

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Leaks Inspect fuel and DEF tank assembly for leaks.		There is any fuel or DEF leakage from the tank, sending unit, connections, vent or cap, or cap is missing. Any tank is cracked. Any hose connection is loose at the tank.
b. Mounting Inspect fuel and DEF tank mounting system and barrier (if equipped) for securement and condition.		Any portion of tank mounting system (including support brackets, retaining straps and chassis frame) is missing, loose, cracked or broken. Any tank mounting fasteners are loose or missing. Barrier assembly (if required) is damaged, insecurely mounted or missing.

(Continued on Next Page)

D. UNDERNEATH BUS
6. Fuel and DEF Tank

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Hoses Inspect all fuel and DEF system lines, hoses and under-bus components for routing, secure mounting and condition.		Any line or hose is unsecured or improperly routed, or subject to excessive heat or abrasion. Any line or hose is deteriorated or damaged (including cracks or any damage that may cause seepage or leaks), or clamps are loose or missing. Any fuel or DEF system filter, water separator or other component is insecurely mounted, cracked or damaged.
d. Wiring Inspect fuel tank and DEF sending unit wiring for securement, routing and condition.		Any portion of sending unit wiring (including ground) or connections is unsecured, missing insulation or routed, subject to excessive heat or abrasion.

D. UNDERNEATH BUS
7. Brake Equipment

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Brake Lines		
Inspect all brake hoses, lines and connections for routing, securement and condition.	Any brake hose or line is unsecured.	There is any audible air leak or visible hydraulic brake fluid seepage or leak.
		Any brake line or hose is improperly routed, or subject to excessive heat or abrasion.
Note: External layer weather cracking shall not be a sole cause for rejection.		Any brake line or hose is deteriorated or damaged to the point that failure could occur (i.e., frayed, thin wall; rubber contaminated with oil; crimped).
		Any brake line or hose connection is loose.
b. Brake Valves		
Inspect all brake system valves for securement and condition.		There are any audible air leaks or visible hydraulic fluid leaks or seepage from any brake valve.
		Any brake valve is not mounted securely, or is cracked or damaged.
c. Reservoir Mounting		
Inspect reservoirs (air and vacuum tanks) for securement and condition.		Any reservoir mounting, brackets, straps or fasteners are cracked, loose or missing.

(Continued on Next Page)

D. UNDERNEATH BUS
7. Brake Equipment

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Bleed Reservoirs		
1) With air system fully charged, check manual operation of safety pressure relief valve.		Safety relief valve leaks or does not release pressure.
2) Partially open manual petcock valve on the first (wet) tank.		
3) Allow draining of any moisture (water) or contamination.	There is moisture in reservoir (desiccant-type dryer only).	There is excessive sludge or oil contamination in the reservoir (more than eight fluid ounces). Reservoir leaks due to corrosion or is cracked.
e. Anti-lock Brake System (ABS)		
Perform a visual inspection of all ABS components, including wiring, connectors and controllers.		Visual inspection reveals that ABS components are loose, damaged, missing, improperly routed or non-operational. **Note: Wiring from ABS controller(s) to wheel speed sensor(s) that has been abraded or otherwise damaged, exposing any wire conductor or grounding sheath, may cause failure of the antilock brake system. This damage is considered severe.**

D. UNDERNEATH BUS
8. Driveline

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Drive shafts		
Inspect drive shafts for condition.	Any driveshaft balancing weight (if originally equipped) is missing. Driveshaft is assembled out of phase.	Any driveshaft is bent or seriously dented. There are cracks or other damage that could cause structural failure. Any center bearing bracket crack equaling 50 percent or more of the original bracket width. More than ½ inch vertical movement (with hand pressure only) of shaft in the center bearing carrier.
b. U-Joints		
Prior to lubrication, inspect U-joints or constant velocity (CV) joints (if equipped) for condition, phasing (alignment of joints), lubrication and presence of all hardware.	U-joints or CV joints are insufficiently lubricated, or grease fitting is missing, clogged or inaccessible.	There is any missing hardware or fasteners in any U-joint or CV joint assembly. Any U-joint has significant cross-shaft-to-bearing cup play, or CV joint has significant play. Any U-joint or CV joint shows evidence of significant rusting of bearings. Any bearing cup is loose in yoke. Any U-joint is cracked or broken.

(Continued on Next Page)

D. UNDERNEATH BUS
8. Driveline

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Yokes		
Inspect driveshaft yokes for condition and lubrication.	Driveshaft splines are not lubricated. Dust cap on yoke is missing. Grease fitting is missing or clogged. Cork washer in dust cap is missing.	Any yoke has significant play in splines. Any yoke is cracked or damaged.
d. Hanger Bearings		
Inspect hanger bearings and rubber insulators for condition and securement.	Hanger bearing rubber insulator is deteriorated, damaged or oil-soaked. Hanger bearing support is misaligned.	Bearing outer race is loose in insulator, or inner race is loose on shaft. There is significant play in hanger bearing. There is any loose, missing or damaged hardware or fasteners in the hanger bearing or support assembly.
e. Guards		
Inspect for presence and condition of driveshaft guards.	Any driveshaft guard is bent or damaged.	Any driveshaft guard is missing or has loose or damaged mounting fasteners.

(Continued on Next Page)

D. UNDERNEATH BUS
8. Driveline

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Driveshaft Parking Brake Inspect driveshaft parking brake assembly for condition, mounting, securement and adjustment of linings, drum, linkage and all other related hardware.		Lining is worn down to 2/32 inch from top of rivet head. Lining is contaminated with grease or oil. Lining is broken, cracked or loose. Drum is cracked or has excessive heat damage or scoring of friction surface. Any actuating or mounting hardware or fastener is damaged, loose or missing. Parking brake is not adjusted per manufacturer's specifications.

D. UNDERNEATH BUS
9. Rear Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Axle Housing Inspect axle housing for condition and leakage.	Axle housing is seeping lubricant.	Any portion of axle housing is cracked or bent. Any portion of axle housing is leaking lubricant due to cracks, porous metal or defective welds. There is any leakage at or around axle housing ends.
b. Vent Inspect condition of axle housing vent.	Vent cap is clogged. Vent hose (if originally equipped) is cracked or missing.	Axle vent is not functional or is missing.
c. Differential Inspect differential assembly for condition, lubricant level and leakage.	Lubricant level is low. Differential gaskets or seals are seeping. **(Continued on Next Page)**	Differential gaskets or seals are leaking. There is no lubricant in the differential. Any external differential hardware or fasteners are loose or missing. Differential pinion yoke nut is loose or has endplay or side play exceeding manufacturer's specifications.

D. UNDERNEATH BUS
9. Rear Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
d. Springs		
Inspect rear springs for condition, securement and alignment.	There are any loose, missing, broken or worn spring clips.	Any leaf spring is broken or missing.
	Any leaf spring or air-suspension ride height is less than manufacturer's specifications.	On any type spring assembly, airbag is damaged or leaking, or air lines and valving are damaged or leaking. Air ride pivot pins and bushings are loose. There is any misalignment of spring leaves or other evidence that centering pin is loose or broken.
	Rubber frame bumper is missing.	Either rear leaf spring is worn to the point that suspension bottoming has damaged rubber frame bumper.
e. U-Bolts		
Inspect spring U-bolts for condition and securement.	Any U-bolt is misaligned.	There is rust underneath U-bolt nuts, indicating possibility of looseness. Any U-bolt, U-bolt seating plate, shock mount bracket or nut is loose, missing, cracked or stripped.

(Continued on Next Page)

D. UNDERNEATH BUS
9. Rear Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Shock Absorbers Inspect rear shocks for condition and securement. **Note: A very small amount of fluid staining at the shock-piston shaft seal area is normal due to the wiping function of the shaft seal. This does not indicate a leaking shock.**		Any shock is broken. Any shock fails to function. Any shock mounting or fastener is loose, missing, cracked or broken. Any shock is leaking fluid.
g. Shackles Inspect rear suspension shackles, spring hangers and hanger pinch bolts for condition and securement.		Any rear spring shackle or hanger is cracked or broken. Any rear spring shackle/hanger is worn, or any pinch bolt is stripped/missing, preventing the spring pin from being clamped tightly.

(Continued on Next Page)

D. UNDERNEATH BUS
9. Rear Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
h. Pins and Bushings Inspect rear spring pins and bushings for wear and lubrication. See figure 13 for shackle-type system on checking play in pins and bushings. For other types of pin and bushing configurations, see manufacturer's service manual.	Any spring pin assembly will not accept lubrication, or grease fitting is damaged or missing. **(Continued on Next Page)**	Inner sleeve on rubber-type spring pin assemblies is worn through, or rubber bushing is excessively worn (rubber is compacted or deteriorated, resulting in free play between rubber and spring eye or inner sleeve). Rear spring pin bushing (metal-type bushing) is worn through. Total free play (up and down) of pin and bushing exceeds 1/8 inch for single pin type. On system using two pins and bushings, combined free play exceeds 1/4 inch.

D. UNDERNEATH BUS
9. Rear Suspension

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
i. Hangers Inspect hangers for mounting and condition.		Any spring hanger or bracket is cracked or broken, or any mounting fastener is loose or missing.
j. Seals Inspect rear wheel seals for condition and leakage.	There is seepage of oil or grease around axle flange or wheel seal.	Either rear wheel seal or axle flange is damaged or leaking. Any axle flange stud or nut is loose or missing.
k. Wheel Bearings Inspect rear wheel bearings for condition and proper adjustment of bearings. 1) Raise rear wheels (wheels unloaded) and release parking brake. 2) Grasp tire and attempt to rock wheel assembly to check for movement. **Note: Rear wheel bearing in-out play should be 0.000 inches.**		There is any detectable looseness or roughness in rear wheel bearings.

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Hoses Inspect rear brake flexible hoses for condition, securement and routing.		Any rear brake flex hose or connection is seeping, leaking fluid or leaking air pressure. Any rear brake flex hose is kinked, collapsed, bulging, has damaged plies or is damaged below outer covering. Any rear brake flex hose supporting brackets are damaged or have loose fasteners. Any rear brake flex hose is rubbing on or routed against other components.
b. Lines Inspect air and hydraulic brake lines for routing, securement and condition.	Brake line bracket(s) or securement system is loose or missing.	Any brake line is bent, crimped or damaged, restricting air pressure or hydraulic fluid. Any brake line or connection is seeping or leaking hydraulic fluid or leaking air pressure. Any brake line is rubbing on other components or is abraded. Any brake line is not of OEM material, size or type.

(Continued on Next Page)

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Chambers Inspect rear brake chamber assemblies for securement, condition and proper size.		Any rear chamber-mounting bracket or hardware is cracked, bent, broken or missing. Any rear brake chamber or mounting fastener is damaged, loose, missing or of the wrong type. Either rear chamber is not OEM size and stroke length.
d. Slack Adjusters Inspect slack adjusters and S-cam assemblies for wear, condition, operation and securement. **Note: See section on brake adjustment for procedure to check operation of ASA.**		Any portion of slack adjuster or S-cam is missing, broken, cracked, worn beyond limits or improperly installed. S-cam shaft and/or S-cam bushing total wear (up and down) is greater than 0.040 inch (see figure 14). S-cam in-and-out endplay is more than 0.060 inch (see figure 14). S-cam snap ring is missing. Slack adjuster has frozen or stripped worm gear or ratchet assembly.

(Continued on Next Page)

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
e. Push-Rods Inspect push-rod assemblies for condition, securement and alignment.		Any portion of push-rod assembly (locknut, push-rod, clevis, pin or cotter pin) is loose, missing or damaged. Push-rod is rubbing against body of chamber, or chamber is misaligned. Push-rods on left and right sides are not mounted in identical (same) slack adjuster location hole, resulting in same effective slack adjuster length.

(Continued on Next Page)

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
f. Linings Inspect linings and foundation brake hardware for contamination, wear, damage and securement.	There is a significant difference in lining thickness between the left and right sides. Rear brake lining is less than five-sixteenths (5/16) inch thick at center of shoe [on brake blocks with original three-fourths (3/4) inch thickness]. **(Continued on Next Page)**	Any foundation brake assembly does not have at least one lining inspection hole. For riveted-type shoes, rear brake lining is less than 1/4 inch thick at center of shoe [on brake blocks with original 3/4 inch thickness]. Rear brake lining is worn to within 1/16 inch of any rivet. For bonded type shoes, rear brake lining is worn to within 1/16 inch of shoe table (at center of shoe). Lining is broken, cracked or loose on shoe. Lining is not proper size. Friction surface is contaminated with oil, grease or brake fluid. There is any shimming material between lining and shoe. Shoe table or webbing is cracked or damaged. There is any loose, damaged or missing foundation brake hardware within the drum.

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
g. Disc Brake Pads Inspect disc brake pads for contamination, wear, damage and securement.	There is a significant difference in pad thickness between the left and right sides of the bus.	Pad surface is contaminated, cracked, broken or missing. Thickness of friction material is less than 1/8 inch. Pad wear is uneven end to end exceeding 3/32 inches. Difference between the inboard and outboard pads is greater than 1/8 inch.

(Continued on Next Page)

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
h. Drums Inspect rear brake drum(s) for condition and oversize.		There is any crack (other than heat checks) in drum. There is more than 0.060-inch wear in drum friction surface (inside diameter is more than 0.120 inch greater than original). There is any grease, oil or brake fluid on inside of drum. Drum is not mounted securely to hub, or fasteners are loose. Drum is not centered on hub, causing it to be more than 0.010 inch out of round.

(Continued on Next Page)

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
i. Rotors		
Inspect rear brake rotor(s) for mounting, thickness and condition.		Rotor is not secured or has run out beyond manufacturer's specifications, causing a pulsating brake pedal. Rotor has cracks (other than heat checks) or other mechanical defects or is contaminated with oil, grease or brake fluid. Rotor thickness is less than manufacturer's specifications as stamped on rotor. Any rotor friction surface is significantly grooved or damaged.
j. Wheel Cylinders or Calipers		
Inspect wheel cylinder(s) or caliper(s) for seepage, leaks, mounting and condition.	Any wheel cylinder or caliper dust boot is damaged or missing.	Any wheel cylinder or caliper is seeping, leaking, insecurely mounted or has loose or missing fasteners. There is uneven lining or pad wear, rotor or drum damage, evidence of dragging or other evidence that any wheel cylinder or caliper may be sticking.

(Continued on Next Page)

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
k. Adjust Brakes		
1) Any brakes (air or hydraulic) without automatic adjusting capabilities must be adjusted at each inspection using the following procedure: a) Tighten brake adjuster until wheel locks up. b) Back off brake adjuster until there is very slight drag on friction surfaces.		Any damage or condition prevents proper adjustment of manual adjusting brakes.
2) MSA-equipped brakes must be adjusted at every required inspection at all wheel positions (see figure 15). Push-rod travel must not exceed limits shown in chart 11.		Any MSA-equipped brakes cannot be adjusted to bring push-rod travel within limits shown in chart 11 of this manual.

(Continued on Next Page)

D. UNDERNEATH BUS
10. Rear Brakes

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
3) Do not adjust brakes equipped with ASAs. Push-rod travel must be measured and must not exceed limits shown in chart 11. If the push-rod travel measurement exceeds the limits, the foundation brakes, slack adjusters, push-rods and chambers must all be inspected and repaired or replaced, if found defective. Correctly installed and properly working ASAs should keep the brakes in adjustment throughout the life of the linings.		Any ASA is damaged or malfunctioning, or push-rod travel exceeds the limits shown in chart 11.

D. UNDERNEATH BUS
11. Body Securement and Structure

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Body Hold-downs Inspect for securement and condition of all body hold-downs, chassis cowl mounts and frame pads. Body hold-downs include any J-bolt, U-bolt or clamp-type hold-down used to secure body to chassis frame.	One or two body hold-downs are loose or misaligned, or there are any cracks or stripped fasteners at floor securement points. Padding between frame rails and floor sills is misaligned.	Any OEM-installed body hold-down or cowl mount is missing. Three or more body hold-downs are loose, cracked, stripped, misaligned or have missing hardware.
b. Floor Inspect condition of floor structure, sills and braces.	There are any minor cracks in floor sills, braces or welds. **(Continued on Next Page)**	There are any holes or cracks in floor sheet metal, creating an opening to the passenger compartment. Entire cross-section of any floor sill or brace is broken. There is any broken weld or mounting of a floor sill or brace, resulting in complete separation of more than one foot in length. There is any broken weld or loose mounting of the floor bracing, K-member, etc., at the front under the driver, center and step well areas (or “cab” area).

D. UNDERNEATH BUS
11. Body Securement and Structure

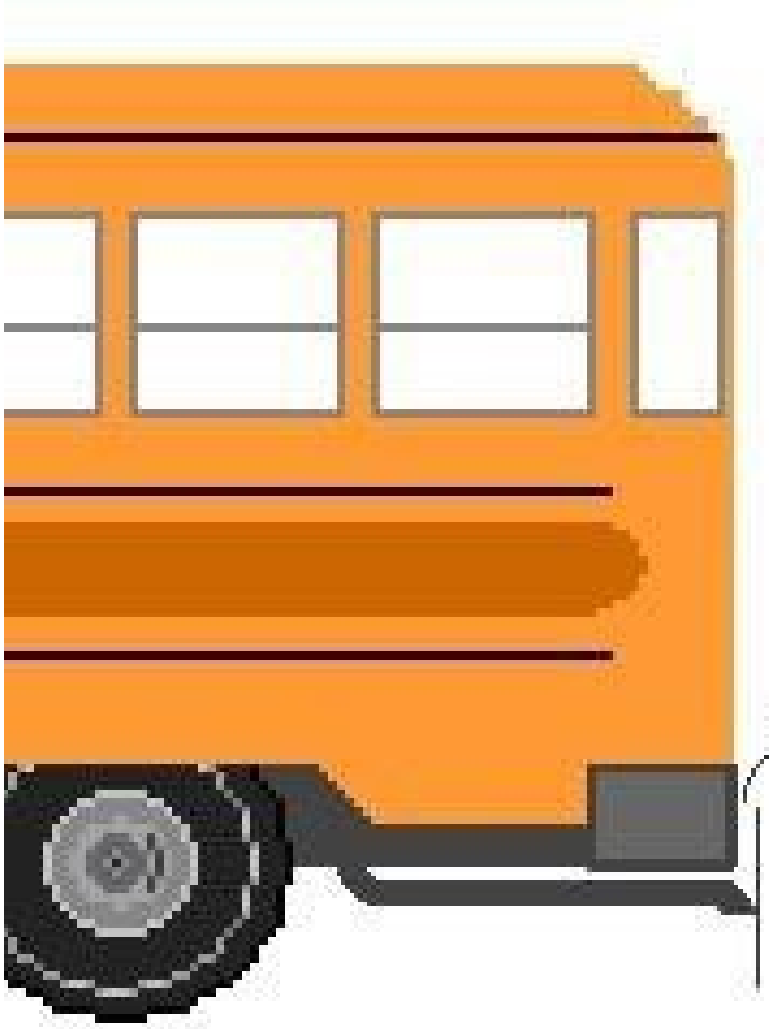
Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
c. Outriggers		
Inspect body outriggers and hardware for condition and securement.		Any OEM-installed outrigger is missing, or body outrigger is cracked or has loose or missing hardware.
d. Braces		
Inspect for condition and securement of all chassis and body braces.	There are any minor cracks in bracing underneath the body.	Any bumper brace is broken, cracked or missing.
e. Skirts		
Inspect body skirts (and luggage compartments, if equipped) for securement and condition.	Body skirt, skirt brace or luggage compartment has minor cracks, broken sheet metal or mounting points.	Luggage compartment door-latch, hinge or lock is sticking, damaged or malfunctioning.
f. Mud Flaps		
If equipped, inspect mud flaps according to manufacturer's specifications.	Any mud flap is missing.	Any mud flap is loose or damaged and may detach while bus is in route.
g. Frame Rails		
Inspect condition of chassis frame rails, cross members and all hardware attachment points.		There is any crack in either frame rail or any cross-member. There is any loose or missing rivet or other fastener securing a cross-member to the frame.

D. UNDERNEATH BUS
12. Exhaust System

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Exhaust Leaks		
Inspect for condition and securement. With engine running at operating temperature, inspect exhaust system for leaks.	There is any physical damage to exhaust system, not restricting flow or causing leaks.	Any leakage is audible or can be felt around any portion of the exhaust system, including manifold, pipe sections or any junction.
b. Mounting		
Inspect mounting of the exhaust system.	Any exhaust system hanger is not securely mounted or any exhaust pipe or clamp is loose.	Any exhaust hanger is missing, broken or detached from exhaust system or frame mounting point.
c. Mufflers and Diesel Particulate Filter (DPF)		
Inspect condition of the muffler and DPF.		The muffler or DPF is leaking, restricted or damaged.
d. DEF Components		
Inspect DEF components.		DEF tank lines or injector is loose, damaged or leaking fluid.
e. Tailpipe		
Inspect condition of tailpipe and ensure that it extends beyond the rear bumper and exits to the left of the left frame rail (for buses manufactured since 1998). If equipped with regenerative-type exhaust system or for type D rear engine buses, see model year specifications for tailpipe exceptions.	The tailpipe is cracked. There is other significant physical damage to the tailpipe.	The tailpipe is leaking, or does not extend to at least the rear outer surface of the rear bumper, or the tailpipe extends more than two inches beyond the rear outer surface of the rear bumper (see figure 16), or the tailpipe does not exit to the left of the left frame rail.

Figure 16

Tailpipe Length



Note: The end of the tailpipe (see vertical line touching rearmost point of tailpipe in illustration at left) must extend beyond the rear outer surface of the bumper for a distance no more than two inches.

D. UNDERNEATH BUS
13. Wheels and Tires

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
a. Tread Depth Inspect and measure all tires for tread depth and record measurements on inspection form.	**(Continued on Next Page)**	Tread depth of any tire is less than: • Front: 4/32 inch • Rear: 2/32 inch Tread depth is measured at three points spaced equally around the circumference of the tire in the same major tread groove. Do not measure at wear bars. Measurements for all three points must fall below the limits listed above before tire is required to be taken out of service. Measurements shall be taken at the most worn major tread groove of the tire. There is evidence of any regrooved tire. Any front tire is recapped or regrooved. There is evidence that any tire has been regrooved using a procedure not approved by tire manufacturer or dealer.

D. UNDERNEATH BUS
13. Wheels and Tires

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
b. Pressure		
With tires cold, check pressures of all tires and record measurements on the inspection form.	Any valve cap is missing.	Pressure in any tire is less than 20 percent below the maximum cold inflation pressure stated on sidewall of the tire. Pressure in any tire is more than 5 percent above the maximum cold inflation pressure stated on sidewall of the tire. There is a difference of more than 20 percent in pressure between any tires on a particular axle.
c. Damage		
Inspect for damage to wheels and tires. **Note: Weather cracking shall not be a sole cause for rejection.**	There is foreign material in the tire tread that could cause damage or loss of air pressure. **(Continued on Next Page)**	There are any cuts, abrasions or other damage to tire sidewall, resulting in exposed or damaged cord. There is any evidence of separation, bulges (other than normal manufacturer bulge) or other damage within the carcass of the tire. Any cracks run around the bead or sidewall of the tire.

D. UNDERNEATH BUS
13. Wheels and Tires

Procedures/Specifications:	Order Repaired (or note) if:	Out-of-Service if:
		Retreaded tires have any separation of the tire tread from the tire carcass that could result in tire or tread failure. Any valve stem is damaged or misaligned so that tire cannot be filled with air. Any damage exists to the lock ring assembly or groove of a multi-piece rim that could cause the lock ring not to seat fully. There are any cracks or breaks at the lugholes or any other part of a rim or cast spoke.
	There are minor dents or bends in a rim.	There are any dents, bends or non-OEM welds to a rim.
d. Matching Inspect for matching of tire construction, design, size and load rating on each axle.		There is mismatching of inner and outer dual tire diameters greater than 3/8 inch. There is any tire marked for use other than highway use. Any tire is not of proper type, size and minimum load rating according to Mississippi Specifications.

(Continued on Next Page)

D. UNDERNEATH BUS
13. Wheels and Tires

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		Not all tires on an axle are of same type (i.e., lug or rib) and size. Radial and bias ply tires are intermixed on the same axle.
e. Alignment Inspect tires for evidence of proper alignment.	Any tire is feather-edged, cupped or has uneven tread wear. Lateral run-out of any tire/rim assembly exceeds 1/4 inch.	Tires/wheels are grossly misaligned, affecting steering control.
f. Wheel Hardware 1) Inspect for presence, type, condition and securement of all wheel hardware. 2) Check for proper spacing of rear dual wheels and tires (proper spacer width).		There is improper matching of rims and lock rings. There is evidence of slippage of wheel assembly on cast spoke hub. Stud holes are elongated. Any wheel nut, stud or clamp is loose, or there is rust or corrosion, indicating possible looseness.

(Continued on Next Page)

D. UNDERNEATH BUS
13. Wheels and Tires

Procedures/Specifications	Order repaired (or note) if:	Out-of-Service if:
		Any wheel, nut, stud or clamp is broken, stripped or missing. Any improper spacer is installed between dual wheels. Any bus built since October 1987 is not equipped with disc-type (Budd) wheels.
3) Inspect for correct wheel color. (Black, Chrome, or NSBY). EVs may have Blue Rims. MFSAB are exempt.		Wheel(s) not painted the correct color.
4) Inspect for correct wheel type. **Note: Hub-pilot and stud-pilot wheels are not interchangeable.**		Incorrect wheel is installed on any axle or hub.

E. LUBRICATION AND MAINTENANCE (OPTIONAL)

Inspection Procedures:	Repair (or note) if:	Out-of-Service if:
	This section of the form is for the convenience of school districts. School districts should implement their own lubrication and maintenance policies and procedures.	

(Continued on Next Page)

E. LUBRICATION AND MAINTENANCE (OPTIONAL)

Inspection Procedures:	Repair (or note) if:	Out-of-Service if:
	This section of the form is for the convenience of school districts. School districts should implement their own lubrication and maintenance policies and procedures.	

F. ROAD TEST
1. Brake Performance

Inspection Procedures:	Repair (or note) if:	Out-of-Service if:
a. Parking Brake Check for proper operation of parking brake as follows: Apply parking brake. Place automatic transmission gear selector in drive and speed up the engine to approximately 1,200 RPM. Vehicle should not move forward.	**Note: Buses equipped with Rear Diesel Engine and Allison World Transmission should be checked at approximately 900 RPM.**	Vehicle moves forward.
b. Stopping Distance and Equalization 1) Stopping distance measurement methods. The following stopping distance requirements should be met when stopping the vehicle on a level, dry, smooth, hard surface that is free of loose material from a speed of 20 mph: a) Stopping distance can be determined by use of a decelerometer in accordance with procedures outlined in 49 CFR § 393.52.	**(Continued on Next Page)**	Decelerometer reading is not within specifications set forth in 49 CFR § 393.52 for buses with GVWR of 10,000 pounds or less (Type A bus) or buses with GVWR of 10,001 pounds or more (Type C and D buses).

F. ROAD TEST
1. Brake Performance

Inspection Procedures:	Repair (or note) if:	Out-of-Service if:
OR		
b) Stopping distance (at 20 mph from point of brake pedal application) maximum of 25 feet for buses with GVWR of 10,000 pounds or less (Type A bus) and maximum of 35 feet for buses with GVWR of 10,001 pounds or more (Type C and D buses).		Distance to stop is greater than 25 feet for buses with GVWR of 10,000 pounds or less (Type A bus), and distance to stop is greater than 35 feet for buses with GVWR of 10,001 pounds or more (Type C and D buses).
c) Check for tire flat spotting before and after conducting this test. **Note: Use of either decelerometer measurement or stopping distance measurement is acceptable. Lockup of brakes is discouraged, as it may cause extended stopping distances and tire damage (flat spotting).**	Flat spotting noted, but does not exceed minimum tread depths noted on page 158 of this manual.	Flat spotting exceeds minimum tread depths noted on page 158 of this manual. Flat spotting causes any tire to fail inspection.
2) Equalization test. Check for excessive brake pulling during the stopping distance test. (Note: Pull is excessive if steering pulls sharply and/or bus will not stop within a lane 12 feet wide).	Bus pulls, but stops, within a lane 12 feet wide. **Note: Remove hands from steering wheel while conducting the brake equalization test.**	Bus pulls sharply and will not stop within a lane 12 feet wide.

F. ROAD TEST
2. Engine, Transmission and Driveline

Inspection Procedures:	Repair (or note) if:	Out-of-Service if:
a. Engine Performance & Governor Check for starting, color and quantity of exhaust smoke, proper idle, stalling, missing/skipping or hesitation, performance when accelerating and shutdown of engine.		Engine will not start, is difficult to start or will not shut down. Engine hesitates upon acceleration, stalls, misfires or performs poorly. Any engine/emissions system warning lights or alarms are on, indicating a mechanical safety condition.
b. Automatic Transmission Check operation of shifter and transmission.		Up and down shifting is excessive, or shifts are hard. Transmission will not shift up and down through all gears. Transmission is slipping or noisy. Shift points are not within manufacturer's specifications.

F. ROAD TEST
3. Steering and Handling

Inspection Procedures:	Repair (or note) if:	Out-of-Service if:
a. Free Play Check for free play in steering.		There is excessive wandering or shimmy due to free play in steering. Bus wanders and requires excessive steering correction or effort to maintain straight-ahead driving.
b. Power Assist Check power steering assist effort when turning to the left or right.		There is no power assist. Bus is hard to turn to the left or right. There is jerking in the steering wheel when turning to the left or right.
c. Turning Radius Check and compare the left turning radius to the right turning radius.	There is a minor difference between the left turning radius and the right turning radius.	There is a significant difference between the left turning radius and the right turning radius.

(Continued on Next Page)

F. ROAD TEST
3. Steering and Handling

Inspection Procedures:	Repair (or note) if:	Out-of-Service if:
d. Steering Column		
Check up-and-down movement of steering column.		Up-and-down movement is greater than one inch.
e. Tracking		
Check vehicle steering recovery from left and right turns, wandering on rough or crowned roads, and tracking and pulling when driving straight ahead (not when stopping).	There is poor recovery on turns.	There is no recovery on turns. Bus does not track properly (front and rear wheels are not in line).
	There is minor pulling in the steering.	Bus wanders and requires excessive steering correction or effort to maintain straight-ahead driving.

BUS AIR CONDITIONING PREVENTATIVE MAINTENANCE WORKSHEET

DATE:		TECHNICIAN:
BUS NO:	Inspection Schedule: A = Annually; S = Seasonal; M = Monthly	MILEAGE:

UNDER HOOD INSPECTION	PASS	FAIL	ACTION	INSPECTION
CHECK COMPRESSOR MOUNTING HARDWARE				A
CHECK BELT(S) TENSION(S)				M
CHECK FITTINGS – TIGHT; NO OIL DEPOSITS				S
CHECK REFRIGERANT HOSES – SECURE; NO CHAFING				S
CHECK COMPRESSOR CLUTCH AIR GAP AND CONDITION				S
IF A/C SYSTEM MALFUNCTION CHECK HEAD PRESSURES				S
RECORD SYSTEM HEAD PRESSURES			HIGH SIDE | | LOW SIDE |	S
CONDENSOR INSPECTION				
CLEAN AND INSPECT COIL ASSEMBLY				S
CHECK FAN MOTOR CONDITION AND OPERATION				S
CHECK CONDENSER MOUNTING HARDWARE				A
CHECK ELECTRICAL CONNECTIONS – POSITIVE AND GROUND				S
INSPECT CONDENSER METAL HOUSING				A
CHECK MOISTURE INDICATOR AT SIGHT GLASS (DRY)				S/M
CHECK REFRIGERANT LEVEL AT SIGHT GLASS (CLEAR)				S
EVAPORATOR INSPECTION				
REPLACE/CLEAN RETURN AIR FILTER				S/M
CHECK BLWOER THREE SPEED OPERATION				S
CHECK FOR VIBRATION				A
CHECK EVAPORATOR MOUNTING HARDWARE				A
CHECK EVAPORATOR DRAIN PAN				S
CHECK CONDENSATE DRAING OPERATION				S
CHECK CONDENSATE INSULATION TAPE ON TXV FITTINGS				A
INSPECT AIR OUTLET LOUVERS				A
CLEAN COVER AND RETURN AIR GRILL				S
GENERAL INSPECTION				
CHECK CONNECTIONS AT A/C ELECTRICAL PANEL				S
CHECK FAN SPEED SWITHC OPERATION				S
CHECK THERMOSTAT OPERATION				S
LEAK TEST ALL FITTINGS AND HOSES (LOW REFRIGERANT)				S

STATUTORY REQUIREMENT FOR SAFE TRANSPORTATION OF STUDENTS

§ 37-41-53. Inspections and safety requirements for motor vehicles used for public school district transportation; condemnation of unsafe school district buses; penalties for operation of condemned bus.

(1) Each school board, person, firm or corporation transporting public school district children on the public roads, streets and highways of the state with motor vehicles shall have the motor vehicles inspected according to regulations promulgated by the State Department of Education. Each motor vehicle shall be inspected by a competent mechanic to be safe for transporting pupils on the roads, streets and highways of the state before it is released for such purpose. If the motor vehicle is found to be unsafe for transporting pupils, then it shall be properly repaired or adjusted as necessary before being used to transport pupils. The provisions of this subsection shall not apply to vehicles owned by individuals and under private contract to the school district and used exclusively for transporting members of their immediate families.

(2) The State Department of Education may inspect, at its discretion, any school bus used for transporting school district pupils to and from the public schools or for activity purposes to determine the safety of such motor vehicle for operation on the roads, streets and highways of this state. In the event a vehicle is inspected and is found to be unsafe for transporting pupils, a report shall be filed with the appropriate school district official indicating its deficiencies with recommendations for correcting such deficiencies.

(3) If it is determined that any school district buses are in such defective condition as to constitute an emergency safety hazard, those buses may be condemned and removed from service and shall not be returned to service until adequate repairs are completed and the buses are reinspected by the State Department of Education. Any school district official who approves the operation of any school bus that has been removed from service under the conditions listed above, prior to being reinspected by the State Department of Education, shall be guilty of a misdemeanor and, upon conviction, shall be punished by imprisonment in the county jail for a period not to exceed sixty (60) days, or a fine of not less than Five Hundred Dollars ($500.00) nor more than One Thousand Dollars ($1,000.00), or by both such fine and imprisonment, in the discretion of the court.

§ 37-41-57. Promulgation of regulations governing design and operation of school buses.

The State Board of Education shall adopt and enforce regulations not inconsistent with the traffic laws and regulations of this state to govern the design and operation of all school buses used for the transportation of school children when owned and operated by any school board or privately owned and operated under contract with any school board in this state. Such regulations shall by reference be made a part of any such contract with a school board. Every school board, its officers and employees, and every person employed under contract by a school board shall be subject to said regulations.

Any officer or employee of any school board who violates any of said regulations or fails to include the obligation to comply with said regulations in any contract executed by them on behalf of a school board shall be guilty of misconduct and subject to removal from office or employment. Any person operating a school bus under a contract with a school board who fails to comply with any of said regulations shall be guilty of breach of contract and such contract shall be cancelled after notice and hearing by the responsible officers of such school board.

Type School Bus____ MFSAB____

MISSISSIPPI SCHOOL BUS INSPECTION FORM

Propulsion Electric____ Alternative Fuel____ Conventional Fuel____

Bus#_____ Mileage_____ RO#_____

Date_____ Chassis/Body_____ Capacity_____ Model Year_____

School District_____ Shop Location_____

Status Codes: ✓ = item is OK; X = item needs repair or as noted; O = out of service; N/A = Not

Status Code	INSPECTION ITEMS	COMMENTS (Note Specific Deficiencies)	Tech. Initials
A. INSIDE BUS			
	1. **Emergency Equipment -** Fire Ext. (pressure/tag/mount), First Aid Kit, Body Fluid Cleanup Kit and Reflectors		
	2. **Registration and Insurance Card**		
	3. **Neutral Safety Switch, Shifter and Noise Abatement Switch**		
	4. **Engine Controls** - Key Switch, Accelerator and Engine Shutdown		
	5. **Gauges, Indicators, Dash and Switch Panel Lights, Engine Warning Lights/ Buzzers and ABS Warning Light**		
	6. **Air Brake System -** Gauge(s), Build-Up, Governor, Park Brake, Adjustment, Air Leaks, Low Air Warning, PP-1 Pop-Off and Pedal		
	7. **Hydraulic Brakes -** Warning Light, Gauge, Pedal Travel and Fade, Power Assist and Park Brake		
	8. **Windshield Wipers and Washers -** Operation, Park and Blades		
	9. **Heaters, Defrosters, Auxiliary Dash or Header Fan(s)**		
	10. **Dome and Step Well Lights**		
	11. **Service Door -** Operation, Control and Overhead Pad		
	12. **Horns**		
	13. **Mirror Adjustment and Condition -** Rear vision, Cross-view, Side-view and Interior		
	14. **Driver's Seat and Seat Belt**		
	15. **Passenger Seats -** Frames, Mounting, Pads, Cuts, Bottoms, Modesty Panels, Stanchions, Restraining Barriers, Passenger Securement Devices,& Webbing Cutter		
	16. **Emergency Doors, Windows, Hatches and Passenger Check System** Operation, Buzzers, Labeling and Overhead Pad		
	17. **Windshield, Side and Rear Windows -** Cracks, Fogging, Latches and Visor		
	18. **Wheelchair Lift, Door and Securement System -** (if equipped)		
	19. **Two-Way Radio Operation -** (if equipped)		
	20. **Interior Wiring, Cab Hoses and Fire Wall Seals**		
	21. **General Condition of Bus Interior -** Floor, Step well, Grab Rail(s), Paneling, Broom Mounting, Loose Objects Secured and Engine Cover		
B. OUTSIDE BUS			
	1. **Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights**		
	2. **Clearance, Side Marker, ID Lights, Reflectors and Strobe Light**		
	3. **Pupil Warning Lights**		
	4. **Stop Arm(s) and Student Crossing Arm -** Wiring, Air or Vacuum Leak and Decal		
	5. **General Condition of Bus Exterior -** Mirrors, Bumpers, Body Damage, Paint Reflective Marking, Lettering, Emergency Door, Engine Hood and Cleanliness		
C. ENGINE COMPARTMENT			
	1. **Steering -** Play, Column, Steering Gear Box Mounting, Pitman Arm, Drag Link, Steering Arm, Tie Rod & Ends and Idler Arm		
	2. **Batteries -** Hold Down, Terminals, Cables, Cleanliness, Slide Tray and Load Test		
	3. **Fluid Levels and Condition -** Brake, Power Steering, Oil, Transmission, Windshield Washer, Coolant (Antifreeze _____°F)		
	4. **Belts and All Hoses -** Tightness, Condition, Routing and Belt Alignment		
	5. **Accessory Mounting and Condition –** Power Steering Pump, Air Compressor and Filter, Water Pump, Fan, Alternator and Air Cleaner (Restriction gauge, if equipped) _____(H_2O)		
	6. **Wiring -** Routing and Condition		
	7. **Fuel System and Lines**		
	8. **Radiator -** Mounting, Cap, Reservoir and Fan Shroud		

Status Code	INSPECTION ITEMS	COMMENTS (Note Specific Deficiencies)	Tech. Initials
D. UNDERNEATH BUS			
	1. **Front Suspension -** I-Beam, U-Bolts, Springs, Spring Mounts, Shackles, Pins and Bushings, Shocks, Kingpins, Wheel Bearings, Seals, A-Frames, Bushings and Ball Joints		
	2. **Front Brakes -** Hoses, Lines, Chambers, Slack Adjusters, Push-rods, Linings, Drums, Rotors and Wheel Cylinders or Calipers. Check and Adjust MSA-Equipped Brakes. Do Not Adjust ASA-Equipped Brakes. Disc Brakes		
	3. **Engine Mounts, Transmission Mounts and Starter Mounting**		
	4. **Transmission -** Bolts, Linkage, Lines, Filter and Cooler		
	5. **Fluid Leaks -** Oil, Coolant, Transmission and Power Steering		
	6. **Fuel and DEF Tank -** Leaks, Mounting, Hoses, Wiring and cap		
	7. **Brake Equipment –** ABS, Lines, Valves, Reservoir Mounting and Bleed Reservoirs		
	8. **Driveline -** Shafts, U-Joints, Yokes, Hanger Bearings, Guards Driveshaft and Park brake		
	9. **Rear Suspension -** Axle Housing, Vent, Differential, Springs, U-Bolts, Shocks, Spring Shackles, Pins and Bushings, Hangers, Seals and Wheel Bearings		
	10. **Rear Brakes -** Hoses, Lines, Chambers, Slack Adjusters, Push-rods, Linings, Drums, Rotors and Wheel Cylinders or Calipers. Check and Adjust MSA-Equipped Brakes. Do Not Adjust ASA-Equipped Brakes. Disc Brakes		
	11. **Body Securement and Structure -** Hold Downs, Floor, Outriggers, Braces, Skirts, Mud Flaps and Chassis Frame Rails		
	12. **Exhaust System -** Leaks, Mounting, Muffler, Tailpipe and DEF, DPF System		
	13. **Wheels and Tires -** Tread Depth, Pressure, Damage, Matching, Alignment and Wheel Hardware		
E. LUBRICATION & MAINTENANCE (OPTIONAL)			
	1. **Change Oil and Replace Oil Filter(s)** **Qts. _____**		
	2. **Replace Fuel Filter(s) Primary/Secondary and Drain Separator**		
	3. **Replace Transmission Filter(s)** **Qts. _____**		
	4. **Replace Air Compressor Filter (if applicable)**		
	5. **Replace Power Steering Filter** **Pts. _____**		
	6. **Replace Engine Air Cleaner Filter**		
	7. **Replace Coolant Filter (if applicable)**		
	8. **Test Starting and Charging System** **Amps _____ Volts _____**		
	9. **Lubricate Chassis and Body** **Lbs. _____**		
	10. **Air Conditioning** If equipped, perform A/C system preventive maintenance according to manufacturer recommendations and district procedure.		
F. ROAD TEST			
	1. **Brake Performance -** Park Brake, Stopping Distance and Equalization		
	2. **Engine, Transmission and Driveline -** Engine Performance, Governor and Shifting		
	3. **Steering and Handling -**Free Play, Power Assist, Column, Tracking and Turning Radius		

Comments:	Tread Depth	Air Pressure	Tread Depth	Air Pressure
			RRO /32	PSI
	RF /32	PSI	RRI /32	PSI
			LRI /32	PSI
	LF /32	PSI	LRO /32	PSI

NOTE: Follow the manufacturer's inspection and maintenance procedures for any equipment not noted on this form.

Inspector's Signature: _____

Inspector's Printed Name: _____

Shop Foreman or Supervisor's Initials: _____ **Printed Name:** _____ **Bus Returned to Service Date:** _____

Type		Propulsion
School Bus X		Electric
MFSAB		Alternative Fuel X
		Conventional Fuel

MISSISSIPPI SCHOOL BUS INSPECTION FORM

Bus# 24-01 Mileage 68,000 RO# 23-1234

Date 10/5/2023 Chassis/Body IC/Thomas/BB Capacity 77 Model Year 2024

School District-MDE Shop Location-Jackson

Status Codes: ✓ = item is OK; X = item needs repair or as noted; O = out of service; N/A = Not

Status Code	INSPECTION ITEMS	COMMENTS (Note Specific Deficiencies)	Tech. Initials
A. INSIDE BUS			
✓	1. **Emergency Equipment -** Fire Ext. (pressure/tag/mount), First Aid Kit, Body Fluid Cleanup Kit and Reflectors		
✓	2. **Registration and Insurance Card**		
✓	3. **Neutral Safety Switch, Shifter and Noise Abatement Switch**		
✓	4. **Engine Controls** - Key Switch, Accelerator and Engine Shutdown		
✓	5. **Gauges, Indicators, Dash and Switch Panel Lights, Engine Warning Lights/ Buzzers and ABS Warning Light**		
✓	6. **Air Brake System -** Gauge(s), Build-Up, Governor, Park Brake, Adjustment, Air Leaks, Low Air Warning, PP-1 Pop-Off and Pedal		
N/A	7. **Hydraulic Brakes -** Warning Light, Gauge, Pedal Travel and Fade, Power Assist and Park Brake		
✓	8. **Windshield Wipers and Washers -** Operation, Park and Blades		
✓	9. **Heaters, Defrosters, Auxiliary Dash or Header Fan(s)**		
✓	10. **Dome and Step Well Lights**		
✓	11. **Service Door -** Operation, Control and Overhead Pad		
✓	12. **Horns**		
✓	13. **Mirror Adjustment and Condition -** Rear vision, Cross-view, Side-view and Interior		
✓	14. **Driver's Seat and Seat Belt**		
✓	15. **Passenger Seats -** Frames, Mounting, Pads, Cuts, Bottoms, Modesty Panels, Stanchions, Restraining Barriers, Passenger Securement Devices,& Webbing Cutter		
✓	16. **Emergency Doors, Windows, Hatches and Passenger Check System** Operation, Buzzers, Labeling and Overhead Pad		
✓	17. **Windshield, Side and Rear Windows -** Cracks, Fogging, Latches and Visor		
N/A	18. **Wheelchair Lift, Door and Securement System -** (if equipped)		
✓	19. **Two-Way Radio Operation -** (if equipped)		
✓	20. **Interior Wiring, Cab Hoses and Fire Wall Seals**		
✓	21. **General Condition of Bus Interior -** Floor, Step well, Grab Rail(s), Paneling, Broom Mounting, Loose Objects Secured and Engine Cover		
B. OUTSIDE BUS			
✓	1. **Headlights, Turn Signals, Hazard, Brake, Tail, Backup Lights, Backup Alarm and Park Lights**		
X	2. **Clearance, Side Marker, ID Lights, Reflectors and Strobe Light**	LF corner not working	RM
✓	3. **Pupil Warning Lights**		
✓	4. **Stop Arm(s) and Student Crossing Arm -** Wiring, Air or Vacuum Leak and Decal		
✓	5. **General Condition of Bus Exterior -** Mirrors, Bumpers, Body Damage, Paint Reflective Marking, Lettering, Emergency Door, Engine Hood and Cleanliness		
C. ENGINE COMPARTMENT			
✓	1. **Steering -** Play, Column, Steering Gear Box Mounting, Pitman Arm, Drag Link, Steering Arm, Tie Rod & Ends and Idler Arm		
✓	2. **Batteries -** Hold Down, Terminals, Cables, Cleanliness, Slide Tray and Load Test		
✓	3. **Fluid Levels and Condition -** Brake, Power Steering, Oil, Transmission, Windshield Washer, Coolant (Antifreeze _____ °F)		
X/O	4. **Belts and All Hoses -** Tightness, Condition, Routing and Belt Alignment	X-main belt, O-A/C belt	RM
✓	5. **Accessory Mounting and Condition –** Power Steering Pump, Air Compressor and Filter, Water Pump, Fan, Alternator and Air Cleaner (Restriction gauge, if equipped) _____(H_2O)		
✓	6. **Wiring -** Routing and Condition		
✓	7. **Fuel System and Lines**		
✓	8. **Radiator -** Mounting, Cap, Reservoir and Fan Shroud		

Status Code	INSPECTION ITEMS	COMMENTS (Note Specific Deficiencies)	Tech. Initials
D. UNDERNEATH BUS			
✓	1. **Front Suspension -** I-Beam, U-Bolts, Springs, Spring Mounts, Shackles, Pins and Bushings, Shocks, Kingpins, Wheel Bearings, Seals, A-Frames, Bushings and Ball Joints		
O	2. **Front Brakes -** Hoses, Lines, Chambers, Slack Adjusters, Push-rods, Linings, Drums, Rotors and Wheel Cylinders or Calipers. Check and Adjust MSA-Equipped Brakes. Do Not Adjust ASA-Equipped Brakes. Disc Brakes	Less than ¼ inch (Q Plus)	JM
✓	3. **Engine Mounts, Transmission Mounts and Starter Mounting**		
✓	4. **Transmission -** Bolts, Linkage, Lines, Filter and Cooler		
✓	5. **Fluid Leaks -** Oil, Coolant, Transmission and Power Steering		
✓	6. **Fuel and DEF Tank -** Leaks, Mounting, Hoses, Wiring and cap		
X	7. **Brake Equipment –** ABS, Lines, Valves, Reservoir Mounting and Bleed Reservoirs	Bleed tanks	JM
✓	8. **Driveline -** Shafts, U-Joints, Yokes, Hanger Bearings, Guards Driveshaft and Park brake		
✓	9. **Rear Suspension -** Axle Housing, Vent, Differential, Springs, U-Bolts, Shocks, Spring Shackles, Pins and Bushings, Hangers, Seals and Wheel Bearings		
✓	10. **Rear Brakes -** Hoses, Lines, Chambers, Slack Adjusters, Push-rods, Linings, Drums, Rotors and Wheel Cylinders or Calipers. Check and Adjust MSA-Equipped Brakes. Do Not Adjust ASA-Equipped Brakes. Disc Brakes		
✓	11. **Body Securement and Structure -** Hold Downs, Floor, Outriggers, Braces, Skirts, Mud Flaps and Chassis Frame Rails		
✓	12. **Exhaust System -** Leaks, Mounting, Muffler, Tailpipe and DEF, DPF System		
O	13. **Wheels and Tires -** Tread Depth, Pressure, Damage, Matching, Alignment and Wheel Hardware	R/F 1/32 inch, and low air pressure	RM
E. LUBRICATION & MAINTENANCE (OPTIONAL)			
X	1. **Change Oil and Replace Oil Filter(s)** **Qts. 28**		JM
X	2. **Replace Fuel Filter(s) Primary/Secondary and Drain Separator**		JM
N/A	3. **Replace Transmission Filter(s)** **Qts.**		
N/A	4. **Replace Air Compressor Filter (if applicable)**		
N/A	5. **Replace Power Steering Filter** **Pts.**		
N/A	6. **Replace Engine Air Cleaner Filter**		
N/A	7. **Replace Coolant Filter (if applicable)**		
X	8. **Test Starting and Charging System** **Amps 105 Volts 15.2**		JM
X	9. **Lubricate Chassis and Body** **Lbs. 1/2**		RM
X	10. **Air Conditioning** If equipped, perform A/C system preventive maintenance according to manufacturer recommendations and district procedure.		JM
F. ROAD TEST			
✓	1. **Brake Performance -** Park Brake, Stopping Distance and Equalization		
✓	2. **Engine, Transmission and Driveline -** Engine Performance, Governor and Shifting		
✓	3. **Steering and Handling -**Free Play, Power Assist, Column, Tracking and Turning Radius		

Comments: Needs rear brakes soon	Tread Depth	Air Pressure	Tread Depth	Air Pressure
D.13. Excessive front tire wear			RRO 6/32	100 PSI
	RF 1/32	50 PSI	RRI 6/32	100 PSI
			LRI 6/32	100 PSI
	LF 8/32	90 PSI	LRO 6/32	100 PSI

NOTE: Follow the manufacturer's inspection and maintenance procedures for any equipment not noted on this form.

Inspector's Signature: *Joe Mechanic*

Inspector's Printed Name: Joe Mechanic

Shop Foreman or Supervisor's Initials: BTT **Printed Name:** Bob the Technician **Bus Returned to Service Date:** 10/7/2023

Sample Repair Order

Vehicle Number	Mileage	Description of Vehicle					Repair Order #
		Make	Year	Reg.	Lift	A/C	
Date:		Organization Name:					Safety Inspection Yes ( ) No ( )
Route/Driver:		_____School District					Inspected By:
Repairs Needed:							Out-of-service Date: In Service Date:

Quantity	Parts	Est. Cost		Tech. Init.	Repairs	Time	
						Hrs.	1/10
Cost Subtotal					Total Man-Hours		

Quantity	Tires and Batteries			Filters	Mileage	Yes	No	Tune/Up-Front/Wheels-Oil	Mileage	Yes	No
				Fuel/Oil				Tune-Up			
				Air				Frt. Wheels			
				Coolant				Oil Change			
				Trans							
Total											

Sample Repair Order, Example

Vehicle Number	Mileage	Description of Vehicle					Repair Order #
		Make	Year	Reg.	Lift	A/C	
24-01	**68,000**	**IC/Thomas/ BB**	**2024**	**x**		**x**	**23-1234**

Date: **08/20/2016**	Organization Name: MDE School District	Safety Inspection Yes (**X**) No ( )
Route/Driver: 15/Petty Betty		Inspected By: Joe Mechanic
Repairs Needed: See inspection form dated 10/5/2023		Out-of-service Date: 10/5/2023
		In Service Date: 10/7/2023

Quantity	Parts	Est. Cost		Tech. Init.	Repairs	Time Hrs.	Time 1/10
1	1157 Bulb		67	RM	Replaced Bulb	0	1
1	187439CI oil filter	8	50	RM	Replaced Filter	0	1
1	LF 3949 oil filter	14	50	RM	Replaced Filter	0	1
1	1872526CI fuel filter	7	82	RM	Replaced Filter	0	1
1	PH79 fuel filter	5	32	RM	Replaced Filter	0	1
1	1875921CI fuel filter	4	90	RM	Replaced Filter	0	1
14	Quarts of Oil	11	40	RM	Changed Oil	0	2
1/2	Pounds of grease	1	50	RM	Lubricated Chassis	0	1
1.0	Labor, Mechanic (@12/hr.)	12	00	JM	Inspection Adjustments and Repairs	1	0
1.3	Labor, Helper (@8.5/hr.)	11	05	RM	Inspection Adjustments and Repairs	0	1
1.0	Tire (see cost below)			RM	Change R/F Tire	0	3
	Cost Subtotal	77	66		Total Man-Hours	2	3

Example

Quantity	Tires and Batteries			Filters	Mileage	Yes	No	Tune/Up-Front/Wheels-Oil	Mileage	Yes	No
1	11Rx22.5 new tire	197	00	Fuel/Oil	68,000	X		Tune-Up			X
				Air			X	Frt. Wheels			X
				H_20			X	Oil Change	68,000	X	
				Trans							
	Cost Total	274	66								

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ELECTRIC SCHOOL BUS OUT OF SERVICE CRITERIA

PROCEDURES/SPECIFICATIONS:

1. New or existing school buses may be equipped with a Hybrid Electric Conversion System.

2. The system must be installed by a qualified manufacturer.

3. The system must not cause any difference in the operation of the bus.

4. A control panel will be installed in the driver's area of the bus which will consist of:
    a. On/Off switch
    b. Switch must be labeled in drivers' area
    c. LED light capable of emitting a green and red color.
    d. Ground Fault Circuit Interrupter (GFCI)
    e. Standard instructions of what each LED light indications

5. The system must be mounted and properly secured to the existing frame of the bus.

6. The complete system is to be mounted underneath the bus.

7. The system will be encased in galvanized steel.

8. The steel case must be marked with a Flammable Decal.

9. Any wiring that is connected to the system MUST be wrapped/concealed in orange conduit. Except the ground wire(s) that are connected to the frame.

10. The school bus is to be marked with the proper approved decals located on the front, back, and both side of the bus indicating the bus is Electric.

11. Cooling module must have an operable fan and be cooled with antifreeze.

ORDER REPAIRED IF:

1. Not marked on the front, sides, and back indicating Electric Bus.

2. Any section of the driver shaft is not protected with a metal safety loop or if there is excessive up and down movement at any universal joint.

3. Cables are color other than orange.

4. Chaffing of any wiring.

5. Steel encasing the system is not marked with a Flammable Decal.

6. Any violation the inspector deems a violation not listed

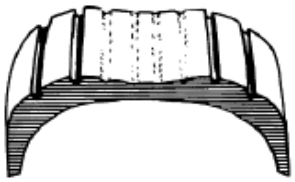
OUT OF SERVICE IF:

1. Not installed by qualified manufacturer, not secured to frame, not encased in galvanized steel.

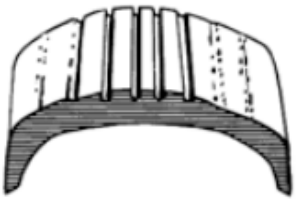
2. System effects the operation of School Bus.

There is any defect which the inspector feels would adversely affect the ability of the vehicle to stop safely.

TIRE CONDITION

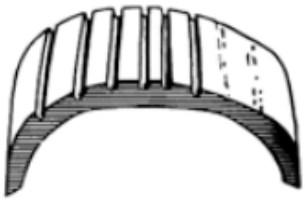


Over Inflation: Excessive wear at the center of the tread indicates that the air pressure in the tire is consistently too high. The tire is riding on the center of the tread and wearing it prematurely. Many times, this visual method of inflation (inflating the tires up until there is no bulge at the bottom) is at fault; tire inflation pressure should always be checked with a reliable tire pressure gauge.

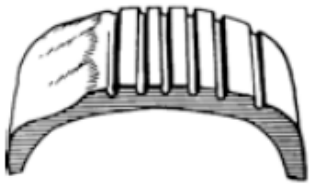


Under Inflation: This type of wear usually results from consistent under inflation. When a tire is under inflated, there is too much contact with the road by the outer treads, which wear prematurely. Tire pressure should be checked with a reliable pressure gauge. When this type of wear occurs, and the tire pressure is known to be consistently correct, a bent or worn steering component or the need for wheel alignment could be indicated. Bent steering or idler arms cause incorrect toe-in and abnormal handling characteristics on turns.

Feathering: Feathering is a condition when the edge of each tread rib develops a slightly rounded edge on one side and a sharp edge on the other. By running your hand over the tire, you can usually feel the sharper edges before you'll be able to see them. The most common cause of feathering is incorrect toe-in setting, which can be cured by having it set correctly. Occasionally toe-in will be set correctly and this wear pattern still occurs.



Side Wear: When an inner or outer rib wears faster than the rest of the tire, the need for alignment is indicated. There is excessive camber in the front suspension, causing the wheel to lean too much to the inside or outside, putting too much load on one side of the tire. Misalignment could be due to sagging springs, worn ball joints, worn control arm bushings, or worn kingpin bushings.



Cupping: Cups or scalloped dips appearing around the edge of the tread on one side or the other almost always indicate worn (sometimes bent) suspension parts. Adjustment of wheel alignment alone will seldom cure the problem. Any worn component that connects the wheel assembly to the vehicle (ball joint, kingpins, wheel bearing, shock absorber, springs, bushings, etc.) can cause this condition. Occasionally, wheels that are out of balance will wear like this, but wheel imbalance usually shows up as bald spots between the outside edges and center of the tread.

RETROREFLECTIVE SHEETING DAYTIME COLOR SPECIFICATION

The daytime color of the RETROREFLECTIVE sheeting used to enhance school bus safety requires different color tolerances in order to assure optimum safety benefit, as well as to be consistent with the color of the school bus. The color of the RETROREFLECTIVE sheeting shall conform to the table below when samples applied to aluminum test panels are measured as specified in ASTM E1164. For colorimetric measurements, material is illuminated by Standard Illuminant D65 at an angle of 45 degrees with the normal to the surface the observations are made in the direction of the normal (45/0-degree geometry). The inverse (0/45-degree geometry) with the illuminant at the normal to the surface and the observations at 45 degrees with the normal to the surface may also be used. For materials which are directionally sensitive (e.g., prismatic sheeting), the colorimetric measurements are made using circumferential illumination and viewing and the various measurements are averaged. Calculations shall be done in accordance with ASTM E308 using the CIE 1931 (2 degree) Standard Observer.

Retroreflective Sheeting Daytime Color Chromaticity Coordinates of Corner Points Determining the Permitted Color Area

	1	2	3	4
Yellow X	0.484	0.513	0.517	0.544
Y	0.455	0.426	0.482	0.455

Luminance Factor (Y%)	Minimum	10.0
	Maximum	36.0

LAP BELT CHART

Lap Belt Basics

"Buckle, Check, Tight — Your Seat Belt Is Right!"

Common Seat Belt Parts

Latch plate
Lap belt strap
Buckle

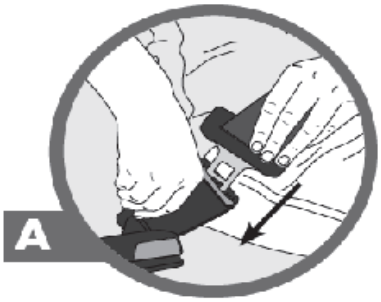
I have read and discussed these important safety instructions with my child.

Parent/Guardian Signature _____ Date _____

Child _____ Date _____

Instructor _____ Date _____

BUCKLE



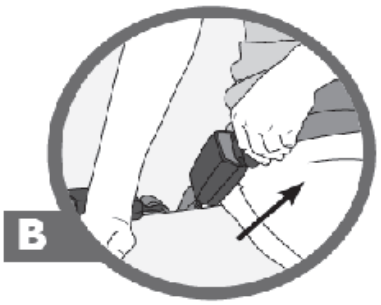
A BUCKLE the latch plate into the matching buckle after lifting the lap belt webbing from the seat and lengthening the lap belt strap. To lengthen the strap, tilt the latch plate and pull it along the strap. LISTEN for the CLICK sound when the latch plate is fastened!

Be sure to:

- Sit flat against the seatback.

- Place the lap belt around the lower body, below the waist. Do not let the belt get twisted.

CHECK



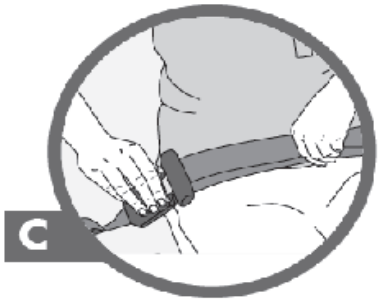
B CHECK that the buckle is connected by tugging firmly on the seat belt latch plate.

Be sure to:

- CHECK while sitting against the seatback.

- Remove any twists in the seat belt when you CHECK.

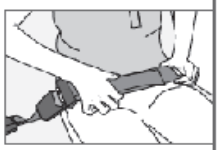
TIGHT



C TIGHTEN the lap belt by pulling on the end of the strap. Be sure that the lap belt is snug across the lower body below the waist.

Be sure to:

- Properly position lap belt below the waist, not over the stomach.



LAP BELT CHART

UNBUCKLING

1. Push the red button on the buckle and remove the latch plate from the buckle.

2. As a courtesy to the next passenger, lay the lap belt flat on the seat cushion.

IMPROPER LAP BELT USE

NEVER sit on or in front of the lap belt.

NEVER allow the belt webbing to be twisted. It should lay flat against your body.

NEVER position the lap belt too high. It should touch the lap and not cross over the waist or stomach.

NEVER insert the latch plate of your lap belt into the buckle for the seat beside you. Be sure to use your own buckle.

NEVER wear the lap belt loosely.

NEVER wear your backpack when you are seated in the bus. Place it on the floor in front of your feet.

NEVER sit on the front or side edge of your seat.

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LAP/SHOULDER BELT CHART

Lap-Shoulder Belt Basics

"Buckle, Check, Tight — Your Seat Belt Is Right!"

Common Seat Belt Parts

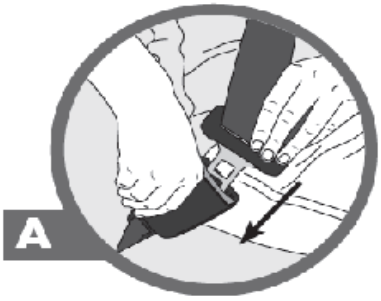
I have read and discussed these important safety instructions with my child.

Parent/Guardian Signature _____ Date _____

Child _____ Date _____

Instructor _____ Date _____

BUCKLE



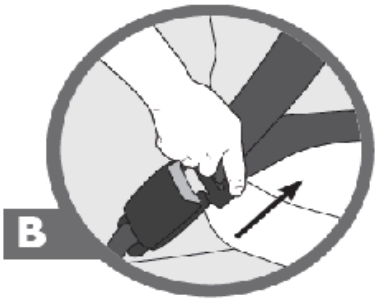
A BUCKLE the latch plate into the matching buckle after pulling out the shoulder belt webbing from the seatback. LISTEN for the CLICK sound when the latch plate is fastened!

Be sure to:

- Sit flat against the seatback.

- Place the lap-shoulder belt over shoulder and around upper body. Do not let the belt get twisted.

CHECK



B CHECK that the buckle connection is secure by tugging firmly on the seat belt latch plate.

Be sure to:

- CHECK while sitting against the seatback.

- Remove any twists in the seat belt when you CHECK.

TIGHT

C TIGHTEN the lap portion by pulling upward on the shoulder belt. Be sure that the shoulder belt is snug across the chest and crosses the center of the shoulder.

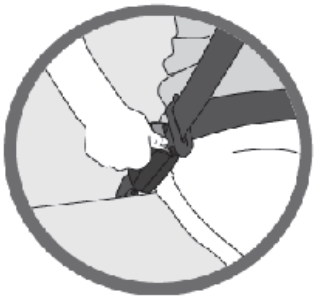
Be sure to:

- Properly position lap portion below the waist, not over the stomach.

- Position the shoulder-height adjuster at or just above the shoulder. The belt should not cross the face or neck.

LAP/SHOULDER BELT CHART

UNBUCKLING



1. Push the red button on the buckle and remove the latch plate from the buckle.
2. Allow the shoulder belt to retract into the upper seatback so webbing is not loose.

3. As a courtesy to the next passenger, move the shoulder-height adjuster up to its highest position.

IMPROPER LAP-SHOULDER BELT USE

NEVER sit in front of the buckled lap-shoulder belt.

NEVER place the shoulder belt behind your back and wear only the lap belt.

NEVER place the shoulder belt under your arm.

NEVER wear the shoulder belt or lap belt loosely.

NEVER allow the belt webbing to be twisted. It should lay flat against your body.

NEVER insert the latch plate of your shoulder belt into the buckle for the seat beside you. Be sure to use your own buckle.

NEVER wear your backpack when you are seated in the bus. Place it on the floor in front of your feet.

NEVER sit on the front or side edge of your seat.

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