

**SPECIFICATION
FOR
TEXAS SCHOOL BUSES**

A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS:

A.1. SCOPE:

This specification describes the requirements for school buses for the state of Texas. Tables of minimum requirements for each type bus covered by this specification are included in Attachment B. (Requirements for school buses included in Texas Specification No. 070-SB-99 are to be superseded by Texas Specification No. 070-SB-2003, effective date **January 1, 2003**.)

This specification is adopted as authorized under Texas Administrative Code, Title 1, Chapter 113, Subchapter A, Rule 113.33; The Education Code, Title 2, Subtitle F, Subchapter Z, Chapter 34; and the Transportation Code, Title 7, Chapter 547.

All public school buses (bodies and chassis) purchased or acquired after the effective date of this document which are owned, operated, rented, leased, and/or contracted for by any public school board in Texas, to transport children to and from school or school-related events, and shall:

- a. Meet or exceed the minimum requirements of these specifications; and,
- b. Meet all applicable Federal Motor Vehicle Safety Standards; and,
- c. Meet or exceed the 2000 National School Transportation Specifications & Procedures and other referenced specifications and standards except when in conflict with the requirements herein. In such cases, the requirements specified in this document shall prevail.

The Specifications for Texas School Buses are the Safety Standards referenced in the Education Code 34.002. A copy may be obtained at www.capitol.state.tx.us/statutes/ed/ed0003400.html#ed002.34.002

The requirements specified herein are the minimum requirements for school buses in Texas. All Attachments form a part of this specification. The date used to determine the applicability of these specifications shall be defined as the date the vendor receives the purchase order or signs a valid sales contract with the purchaser.

Other government entities may reference the Texas School Bus Specification for purchase of school buses. When so referenced, school buses purchased shall meet all requirements.

All school bus chassis and body manufacturers shall certify to the Texas Building and Procurement Commission, in the form of a letter, that all school buses offered for sale to or use by the public school systems in Texas meet or exceed all standards, specifications, and requirements as specified herein.

Used school buses purchased or operated by a public school board in Texas shall meet or exceed all Federal and State requirements for public school buses that were in effect on the date the vehicle was manufactured.

All vendors must be licensed by the Texas Motor Vehicles Division of the Texas Department of Transportation to engage in the business of selling or exchanging motor vehicles as specified in the Texas Motor Vehicle Commission Code, latest revision. For additional information see: Vernon's Texas Civil Statutes (replaced by the Texas Government Code, Title 70, Chapter nine article 4413(36)).

[http://www.capitol.state.tx.us/statutes/vn/vn0007002.html#vn002.4413\(36\)](http://www.capitol.state.tx.us/statutes/vn/vn0007002.html#vn002.4413(36)).

A.1.1. BUS SIZES:

This school bus specification includes the minimum requirements for eighteen (18) sizes of school buses used by Texas schools participating in the Foundation School Program. This specification covers the purchase of bus bodies and chassis separately as well as the purchase of complete school buses. The bus sizes are designated in terms of passenger capacity **excluding the driver** as listed below for regular seating. Capacity is based upon National Height and Weight Percentile Averages as specified in Federal Highway Safety Program Guideline No. 17. [See Paragraph B.1.1 and B.1.2.]

The passenger capacity for the bus ordered is determined for all regular seats. Specially equipped buses may reduce seating capacity.

In determining seating capacity, each wheelchair securement location and/or lift shall be counted as four designated seating positions.

In determining seat spacing, the National Highway Traffic Safety Administration (NHTSA) divides the seat width by the number 13, which represents the 12.8 inch hip breadth of a 5th percentile adult female dummy. This dummy is approximately 4-feet 11-inches tall and weighs 102 pounds. In the FMVSS formula,

7.56" to 22.4" = 1 seating position

22.44" to 37.4" = 2 seating positions

37.44" to 52.4" = 3 seating positions

Type A Dual Rear	Type C	Type D Front Engine	Type D Rear Engine
15 Passenger	35 Passenger	47 Passenger	65 Passenger
16 Passenger	47 Passenger	53 Passenger	71 Passenger
18 Passenger	53 Passenger	59 Passenger	77 Passenger
19 Passenger	59 Passenger	65 Passenger	84 Passenger
20 Passenger	65 Passenger	71 Passenger	
24 Passenger	71S Passenger (Short Wheelbase)	77 Passenger	
29 Passenger	71L Passenger (Long Wheelbase)	84 Passenger	
35 Passenger	77 Passenger		
36 Passenger			
40 Passenger			

A.1.2. Bus Types:

A.1.2.1. TYPE A:

The "Type A" school bus is a van conversion or body constructed utilizing a cutaway front-section vehicle with a left side driver's door. The entrance door is behind the front wheels. "Type A", has a gross vehicle weight rating (GVWR) over ten-thousand pounds (10,000 lbs.).

A.1.2.2. TYPE C:

A "Type C" school bus is a body installed upon a flat back cowl chassis or an integrated conventional chassis/body combination, with a hood and front fender assembly and a gross vehicle weight rating of more than ten-thousand pounds (10,000 lbs.), designed for carrying more than ten (10) persons. The engine is in front of the windshield and the entrance door is behind the front wheels. This type is also known as a "conventional school bus".

A.1.2.3 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 ten-thousand pounds (10,000 lbs.), 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 midship 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".

A.1.3. BUSES FOR STUDENTS WITH DISABILITIES:

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 lap 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. Buses equipped for students with disabilities shall meet all the requirements of the chassis and body sections as well.

As defined by the Code of Federal Regulations (CFR) 49§ 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 10 or fewer passenger positions (*excluding* the driver) cannot be classified as buses. For this reason, the federal vehicle classification multipurpose passenger vehicle (CFR 49 § 571.3, or MPV), must be used by manufacturers for these vehicles in lieu of the classification school bus. This classification system does not preclude state or local agencies or the national specifications from requiring compliance of school bus-type MPVs with the more stringent federal standards for school buses. If by addition of a power lift, mobile seating device positions or other modifications, the capacity is reduced such that vehicles become MPVs, the intent of these 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.

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

A.2. DEFINITIONS AND ABBREVIATIONS:

A.2.1. ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers.

A.2.2. ANSI: American National Standards Institute.

A.2.3. ASTM: American Society for Testing and Materials.

A.2.4. BCI: Battery Council International.

A.2.5. Commission and TBPC: Texas Building and Procurement Commission, successor to General Services Commission (GSC).

A.2.6. Conventional Bus: A school bus with the complete engine in front of the windshield and the service or entrance door behind the front wheels.

A.2.7. (Texas) Department of Public Safety and DPS: Texas Department of Public Safety.

A.2.8. Education Agency and TEA: Texas Education Agency.

A.2.9. EPA: United States Environmental Protection Agency.

- A.2.10. FMVSS:** Federal Motor Vehicle Safety Standards.
- A.2.11. Federal Guideline No. 17:** Federal Highway Safety Program Guideline Number 17.
- A.2.12. GAWR:** Gross Axle Weight Rating. Gross axle weight rating; the value specified by the manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.
- A.2.13. GVWR:** Gross Vehicle Weight Rating. Gross vehicle weight rating; the value specified by the manufacturer as the loaded weight, with passengers, of a single vehicle.
- A.2.14. Invitation for Bids and IFB:** Invitation for Bids.
- A.2.15. Knee Space:** The horizontal distance between the restraining barrier's rear surface and the seating reference point of the seat in front of which the barrier is required shall not be more than 610 mm (24 inches) measured along a horizontal longitudinal line through the seating reference point in the forward direction. See FMVSS 222(Section S.5.2.1)
- A.2.16. Manufacturer:** A fabricator of school buses, bodies, chassis, or components.
- A.2.17. MPV:** Multipurpose passenger vehicle accommodating ten (10) or less people.
- A.2.18. OPTIONS, STANDARD:** - Options most often requested by the purchaser. The Commission does not as a rule endorse options.
- A.2.19. OPTIONS, NON-STANDARD:** These are numerous options available from the bus vendors. The bus vendor representative can provide detail and information. The Commission as a rule does not endorse non-standard options.
- A.2.20. NSSB:** National Standards for School Buses (formerly National Minimum Standards).
- A.2.21. SAE:** Society of Automotive Engineers.
- A.2.22. SCAAN:** Computer analysis of engine performance.
- A.2.23. SCHOOL ACTIVITY BUS** (State Definition - Transportation Code 541.201 "Vehicles" (15)):
A school activity bus means a bus designed to accommodate more than 15 passengers, including the operator, that is owned, operated, rented, or leased by a school district, county school, open-enrollment charter school, regional education service center, or shared services arrangement and that is used to transport public school students on a school-related activity trip, other than on routes to and from school. The term does not include a chartered bus, a bus operated by a mass transit authority, or a school bus. The underlined section is where it says a school activity bus can not be a "school bus".

A.2.24. SCHOOL BUS (State Definition): A school bus means a motor vehicle that was manufactured in compliance with the federal motor vehicle safety standards for school buses in effect on the date of manufacture and that is used to transport pre-primary, primary, or secondary students on a route to or from school or on a school-related activity trip other than on routes to and from school. A school bus is a bus owned, leased, contracted to or operated by a school or school district and regularly used to transport students to and from school or school-related activities, must meet all applicable FMVSS's, and is readily identified by alternately flashing lights, National School Bus Yellow paint, and the legend "School Bus". The term does not include a chartered bus, a bus operated by a mass transit authority or school activity bus.

A.2.25. SPECIALLY EQUIPPED BUS: (Transportation Code 541.201 "Vehicles" (16)) Specially Equipped Bus: A school bus designed, equipped, or modified to accommodate students with special needs.

A.2.26 TRANSIT STYLE BUS: A school bus with the steering wheel, pedals, instruments, and other driver controls mounted as far forward as possible, usually just behind the windshield. The engine is located behind the windshield, either at the front of the bus, or at the rear of the bus, or in between these positions. The service door is located forward of the front axle.

A.2.27. VENDOR: Manufacturer's representative or dealer authorized to make sales and supply parts and services in Texas.

A.3. APPLICABLE SPECIFICATIONS AND STANDARDS:

Reference to specifications, standards and test methods shall be to those in effect on the date of the Invitation for Bid. The following publications form a part of this specification to the extent that they meet all of OSHA's requirements and others as specified herein:

A.3.1 FEDERAL HIGHWAY SAFETY PROGRAM GUIDELINES:

School bus bodies and chassis shall meet or exceed the minimum requirements of this specification and shall also meet all applicable requirements of the Highway Safety Program Guidelines No. 17. All requirements of this specification must be met unless they are in conflict with Program Guidelines No. 17 as it applies to school buses.

A.3.1.1. Federal Highway Safety Program Guidelines No. 17, Pupil Transportation Safety:

Superintendent of Documents, U.S. Government Printing Office, P. O. Box 371954,
Pittsburgh, PA 15250-7954, (202) 512-1800, Fax: (202) 512-2250,
www.access.gpo.gov/su_docs

A.3.2. FEDERAL MOTOR VEHICLE SAFETY STANDARDS (FMVSS):

Superintendent of Documents, U.S. Government Printing Office, P. O. Box 371954, Pittsburgh, PA 15250-7954, (202) 512-1800, Fax: (202) 512-2250, www.access.gpo.gov/su_docs

School bus bodies and chassis shall meet or exceed the minimum requirements of this specification and shall also meet all applicable requirements of the **Federal Motor Vehicle Safety Standards, Public Law 49 U.S.C. Chapter 301**, FMVSS, standards in effect at the time of purchase. All requirements of this specification must be met unless they are in conflict with the FMVSS as they apply to school buses.

A.3.3. NATIONAL SCHOOL TRANSPORTATION SPECIFICATIONS & PROCEDURES (NSTSP):

School bus bodies and chassis shall also meet or exceed the current NSTSP (formerly National Standards for School Buses) except when those requirements are in conflict with the requirements of this specification. In such cases, the requirements specified herein shall prevail.

A.3.3.1. NATIONAL SCHOOL TRANSPORTATION SPECIFICATIONS & PROCEDURES (NSTSP):

National School Transportation Specifications & Procedures: 2000 Revised Edition, National Conference (May, 2000). This publication is available from: Missouri Safety Center, Central Missouri State University, Humphreys Suite 201, Warrensburg, MO 64093, (660) 543-4830, Fax: (660) 543-4482.

A.3.4. OTHER REFERENCES:

References to other specifications, standards, and test methods shall be to those in effect on the date of the Invitation for Bid. The following publications form a part of this specification to the extent specified herein:

A.3.4.1. American National Standards Institute, Inc. (ANSI), 11 West 42nd Street, New York, NY 10036-8002, (212) 642-4948, Fax: (212) 840-2298, www.ansi.org

A.3.4.1.1. ANSI Z 26.1-96 -- Safety Glazing Materials for Glazing Motor Vehicle and Motor Vehicle Equipment Operating on Land Highways, including Supplement Z 26.1a.

A.3.4.2. APA-The Engineered Wood Association, P.O. Box 11700, Tacoma, WA 98411-0700, (253) 565-6600, Fax (253) 565-7265, www.apawood.org

A.3.4.2.1. Voluntary Plywood Standard PS 1-95, Construction and Industrial Plywood.

A.3.4.3. American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, (610) 832-9585, Fax: (610) 832-9555 www.astm.org

- A.3.4.3.1. **ASTM A 653/A 653M** -- Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.
- A.3.4.3.2. **ASTM A 924/A 924M** -- Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process.
- A.3.4.3.3. **ASTM D 3574** -- Test Method for Flexible Cellular Materials - Slab, Bonded, and Molded Urethane Foams.
- A.3.4.3.4. **ASTM B 117** -- Standard Practice for Operating Salt Spray (Fog) Apparatus.
- A.3.4.3.5. **ASTM E 810** -- Standard Test Method for Coefficient Retroreflection of Retroreflective Sheeting.
- A.3.4.4. **AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIRCONDITIONING ENGINEERS, INC. (ASHRAE), Customer Service, 1791 Tullie Circle NE, Atlanta, GA 30329, (800) 527-4723, Fax (404) 321-5478, www.ashrae.org**
 - A.3.4.4.1 **ASHRAE 16** — Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners.
 - A.3.4.4.2 **ASHRAE 41.1** -- Standard Method for Temperature Measurement
- A.3.4.5. **FEDERAL HIGHWAY ADMINISTRATION, United States Department of Transportation, Superintendent of Documents, U.S. Government Printing Office, P. O. Box 371954, Pittsburgh, PA 15250-7954, (202) 512-1800, Fax: (202) 512-2250, www.access.gpo.gov/su_docs**
 - A.3.4.5.1 **Federal Highway Administration FP- 85-** Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.
- A.3.4.6. **FEDERAL STANDARDS: Superintendent of Documents, U.S. Government Printing Office, P. O. Box 371954, Pittsburgh, PA 15250-7954, (202) 512-1800, Fax: (202) 512-2250, www.access.gpo.gov/su_docs**
 - A.3.4.6.1 **Federal Standard No. 595b**—Colors used in Government procurement.
- A.3.4.7. **Federal Specifications: Superintendent of Documents, U.S. Government Printing Office, P. O. Box 371954, Pittsburgh, PA 15250-7954, (202) 512-1800, Fax: (202) 512-2250, www.access.gpo.gov/su_docs**
 - A.3.4.7.1. **Federal Specification No. TT-C-490D** -- Cleaning Methods for Ferrous Surfaces and Pre-treatments for Organic Coatings.
 - A.3.4.7.2. **Federal Specification No. A-A 59295** – Corrosion Preventive Compounds, Cold Application, (For new and fielded Motor Vehicles and Trailers).

- A.3.4.7.3. **Federal Specification No. A-A 2962** – Enamel, Alkyd, Exterior, Solvent Based, Los Voc.
- A.3.4.7.4. **Federal Specification No. V-T-295E** – Thread, Nylon.
- A.3.4.7.5. **Federal Specification No. A-A 3158** – Matting, Rubber and Vinyl.
- A.3.4.8. **School Bus Manufacturers’ TECHNICAL COMMITTEE (SBMTC), School Bus Design Objectives, National Association of State Directors of Pupil Transportation Services, P.O. Box 1402, Dover, DE 19903, (800) 585-0340, Fax (302) 698-1997, www.nasdpts.org**
 - A.3.4.8.1. **SBMTC Standard No. 001** – Procedure for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment.
- A.3.4.9. **Society of Automotive Engineers, Inc. (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001, (724) 776-4970, Fax (724) 776-5760, www.sae.org**
 - A.3.4.9.1. **SAE J20** – Coolant System Hoses.
 - A.3.4.9.2. **SAE J377** – Performance of Vehicle Traffic Horns.
 - A.3.4.9.3. **SAE J383** – Motor Vehicle Seat Belt Anchorage Design Recommendations.
 - A.3.4.9.4. **SAE J514** – Hydraulic Tube Fittings.
 - A.3.4.9.5. **SAE J516** – Hydraulic Hose Fittings.
 - A.3.4.9.6. **SAE J517** – Hydraulic Hose.
 - A.3.4.9.7. **SAE J561** – Electrical Terminals – Eyelet and Spade Type.
 - A.3.4.9.8. **SAE J588** – Turn Signal Lamps for use on motor vehicles less than 2032 MM in overall width.
 - A.3.4.9.9. **SAE J639** – Safety and Containment of Refrigerant for Mechanical Vapor Compression Systems for Mobile Air Conditioning Systems.
 - A.3.4.9.10. **SAE J887** – School Bus Warning Lamps.
 - A.3.4.9.11. **SAE J994** – Alarm – Backup – Electric – Laboratory Performance Testing.
 - A.3.4.9.12. **SAE J1128** – Low Tension Primary Cable.
 - A.3.4.9.13. **SAE J1133** – School Bus Stop Arm.

A.3.4.10. STATE OF CALIFORNIA:

A.3.4.10.1. DEPARTMENT OF CONSUMER AFFAIRS, 3485 Orange Grove Ave., North Highlands, CA 95660-5595, (916) 574-2041, www.dca.ca.gov

A.3.4.10.1.1. California Technical Bulletin 117, Section A, Part I, Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture.

A.3.4.11. STATE OF TEXAS:

A.3.4.11.1. RAILROAD COMMISSION OF TEXAS (RRC), Liquefied Petroleum Gas Division, P.O. Box 12967, Austin, TX 78711-2967, (512) 463-7288, www.rrc.state.tx.us

A.3.4.11.1.1. Regulations for Compressed Natural Gas (Current Edition).

A.3.4.11.1.2. Safety Rules – Liquefied Petroleum Gas Division (Current Edition).

A.3.4.11.2. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ), formerly TEXAS NATURAL RESOURCE CONSERVATION COMMISSION (TNRCC), 12100 Park 35 Circle, Austin, TX 78753, (512) 239-1000, www.tceq.state.tx.us

A.3.4.11.2.1. Regulation IV (31 TAC CHAPTER 114), Control of Pollution from Motor Vehicles (Current Edition).

A.3.4.12. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA), 401 M Street, SW Washington, DC 20460-0003, (202) 260-2090, www.epa.gov

A.3.4.12.1. EPA – Noise Emission Standards.

A.3.4.13. GLOBAL ENGINEERING DOCUMENTS, Customer Support A105, 15 Inverness Way, Englewood, CO 80112, (800) 624-3974, Fax: (303) 792-2192, www.global.ihs.com

A.3.4.13.1. Global Engineering Documents is an information specialist company that maintains and provides standards information for numerous organizations. Copies of standards may also be ordered from Global Engineering Documents.

A.4. GENERAL INFORMATION AND REQUIREMENTS:

Any parts or components not specifically mentioned below, but which are required to provide a complete operating unit, or which are standard for the model offered, shall be included.

A.4.1. EQUIPMENT INSTALLATION:

Body and chassis manufacturers shall be responsible for installation/modification of all equipment and insure equipment conforms in strength, quality, and workmanship to accepted standards of the industry and State specifications and Federal Motor Vehicle Safety Standards of all equipment installed when the bus leaves their facility. **The distributor/dealer shall be responsible for installation/modification of all equipment and insure** equipment conforms in strength, quality, and workmanship to accepted standards of the industry and State specifications and Federal Motor Vehicle Safety Standards of all equipment added by the distributor/dealer.

A.4.2. NEW MODELS:

Each bus body and bus chassis furnished under this specification shall be new school buses of the current model year's production or the latest improved model in current production. The bidder represents that all units offered under this specification shall meet or exceed the minimum requirements specified herein.

If bidding other than current model year's production or the latest improved model in current production: the vendor must provide in writing with the bid and state in the bid document , that at the date of manufacture, the bus met all state and federal specifications.

All vendors must be licensed by the Texas Motor Vehicles Division of the Texas Department of Transportation to engage in the business of selling or exchanging motor vehicles as specified in the Texas Motor Vehicle Commission Code, latest revision.

A.4.3. ODOMETER DISCLOSURE STATEMENT:

The Truth in Mileage Act requires the selling dealer to furnish a complete odometer statement to the purchaser. This statement must be complete and shall include mileage accrued at the point of delivery. In addition to the signature of the seller/agent certifying the odometer reading, both the dealership and the name of the agent shall be printed on the Odometer Disclosure Statement. Completion of the Mileage Statement Portion of the Manufacturers Statement of Origin will satisfy this requirement.

A.4.4. SERVICING AND EQUIPPING:

All bus bodies, chassis, or complete school bus units shall be completely assembled, adjusted, and all equipment installed. All parts not specifically mentioned herein which are necessary to provide a complete school bus, bus body, or chassis shall be furnished by the successful bidder and said parts shall conform in strength, quality of materials, and workmanship to recognized industry engineering practices.

A.5. BID AWARDS:

The Commission reserves the right to accept or reject any and all bids, in whole or in part, and to waive all technicalities when these actions are determined by the Commission to be in the best interest of the State of Texas.

A.5.1. PRICE PROTECTION:

The requisitioning school district, at the district option, reserves the right to review all bids received prior to award to determine funds availability [See Paragraph B.2.1.6]. Vendors shall provide price protection for sixty (60) days from the date of the bid opening.

A.5.2. RECALL NOTIFICATION:

Manufacturer or vendor awarded will be responsible for notifying the school district or entity accepting delivery of the bus of any recall notices.

A.6. CERTIFICATION AND COMPLIANCE:

A.6.1. CERTIFICATION, ALL BIDDERS:

By signing the bid, the bidder certifies that the equipment being offered meets or exceeds all requirements and conditions of this specification **when built and on delivery of the bus**. **At point of delivery**, bidder also certifies that the addition of any option or removal of any equipment will not compromise the safety or operation or warranty of the bus in any way and the bus will continue to meet the Texas School Bus Specifications, all Federal requirements, and the National School Transportation Specification & Procedures in effect at the time the bus is manufactured. Failure to comply with all the requirements and conditions of this specification will subject the bid to rejection.

A.6.2. CERTIFICATION, SUCCESSFUL BIDDER:

The vendor (successful bidder) **must certify on the face of the invoice** that the equipment delivered meets or exceeds the requirements and conditions of this specification, and that the equipment was manufactured in accordance with the specification ***when built and on delivery of the bus***. **At point of delivery**, *the successful bidder also certifies that the addition of any option or removal of any equipment will not compromise the safety or operation or warranty of the bus in any way and the bus will continue to meet the Texas School Bus Specifications, all Federal requirements, and the National School Transportation Specification & Procedures in effect at the time the bus is manufactured*. The burden of proof for compliance with this specification shall be the responsibility of the vendor, manufacturer, or both.

A.6.3. CHASSIS PRODUCTION ORDER:

A.6.3.1. Attachment:

One (1) copy of the production order or “line setting ticket” ***or build orders (Type A)*** listing both standard and optional equipment installed on the chassis must accompany the chassis to which it pertains upon delivery of the chassis to the bus body manufacturer and to the final destination (receiving School District). The copy of this production order should be contained in a waterproof envelope and placed in the glove compartment, or it may be secured by other means which will assure positive attachment to the chassis [See Paragraph A.6.4.2.]. The production order shall be a printed form and not machine coded.

A.6.3.2. Alternative Plate:

In lieu of the production order, the information required above may be stamped on a metal plate, either on the vehicle identification plate regularly furnished or on an additional plate. The identification plate(s) shall be attached to the chassis in a conspicuous place and in an accessible position in order that it may be easily read.

A.6.3.3. Removal/Obliteration:

The production order or chassis identification plate referred to above shall not be removed from the chassis by the body manufacturer since it is for the information of the receiving school district. The vehicle identification plate shall not be obliterated when under coating or paint is applied to the area where the plate is mounted. The plate shall not be mutilated or covered when installing equipment such as the heater, heater hose, or electrical cables.

A.6.4. LITERATURE AND DRAWINGS: Each bidder shall furnish the following:

A.6.4.1. Literature:

The bidder shall have on file with the Commission, the latest pamphlets, brochures, and printed literature on the equipment the bidder proposes to furnish to this specification.

A.6.4.2. Metal Certification:

The *manufacturer* shall have on file with the Commission; a statement certifying that the metal used in Texas school buses conforms to the NSSB. NSSB requires galvanized steel to meet the requirements of the one-thousand (1000) hour salt spray test in accordance with ASTM Standard B 117 and shall not lose more than ten percent (10%) of material by weight.

A.6.4.3. Isometric Drawings:

On request by the Commission, the *manufacturer* shall provide detailed isometric drawings of the bus body showing floor panels, side posts, roof bows, bow-frames, stringers, longitudinal frame members, exterior panels, and front and rear end framing. Each component shall be identified in block form showing: 1.) the item number, 2.) the type of steel or other metal or material with strength at least equivalent to all steel, and 3.) the decimal thickness of steel used in the construction. [See Table No. Two (2)].

A.6.5. MANUFACTURER'S CERTIFICATE OF ORIGIN:

Upon receipt of payment, the vendor shall furnish the ordering school district with the Manufacturer's Certificate of Origin which shall include the mileage accrued at the time of delivery. The Certificate of Title will not meet this requirement. The manufacturer's New Vehicle Warranty and major component parts warranties shall be furnished to the receiving school district. [See Section A.10].

A.6.6. TEMPORARY LICENSE TAGS:

Temporary license tags shall be issued by the vendor for use with each new bus delivered [See Paragraph B.4.2.].

A.7. DELIVERY:

A.7.1. DELIVERY PROCEDURE:

The delivery of a bus to any specified destination may be made by any normal delivery procedure which the manufacturer or distributor utilizes. The bus body distributor must guarantee the equipment to be free of damage as a result of the type of delivery. If any damage is caused by or during delivery that can be established within **ten (10) working days** after delivery to any district, then the school must be compensated for such damage by the contractor. It shall be the obligation and responsibility of each body manufacturer to check and inspect each chassis delivered to the body manufacturer's plant to ascertain that the chassis is free of any damage which might have occurred as a result of the type of delivery.

A.7.2. DELIVERY ON SCHEDULE:

Delivery on schedule is critical. The ability to deliver as specified in the Invitation for Bid will be a factor in making awards. A vendor who fails to make delivery in accordance with the terms of the purchase order shall be liable for actual damages suffered by the State. The amount of such damages shall be determined by the Commission.

A.7.3. DELIVERY TIME:

Buses may be delivered to the receiving school districts during normal operating hours. (Monday through Friday, excluding holidays.) Vendors shall give at least a 24 hours notice of delivery. The person delivering the bus shall present a delivery receipt to the responsible school personnel and obtain that school official's signature before delivery is considered complete. [See Paragraph A.7.6.].

A.7.4. LATE DELIVERIES:

Failure by the vendor to deliver buses, caused directly by natural disaster, war, civil disturbance, Federal Law and regulations, or labor disputes, which are beyond control of the contractor, will not cause the damages described in Paragraph A.7.2. to be assessed, but will not prohibit the district from canceling the order.

A.7.5. LATE DELIVERY NOTIFICATION:

Should vendor be unable to deliver the bus by the due date, the vendor shall notify the district/entity and the Commission, in writing, a least twenty- (20) days in advance of the scheduled delivery date. The notice shall indicate the anticipated delivery date and the specific cause of this delay. Failure to notify the Commission may be cause to cancel the order. *Email notification is acceptable.*

A.7.6. PRE-DELIVERY SERVICE:

The vendor or the vendor's representative responsible for the final delivery shall include with the bus a signed certificate stating that the following service was performed and that inspection indicates the bus(s) is in good condition and ready for delivery. The following service on the chassis and body shall be performed before the bus is delivered to the receiving school district:

- A.7.6.1. Chassis lubrication, complete.**
- A.7.6.2. Check all fluid levels and maintain proper grade and types of fluids.**
- A.7.6.3. Clean interior and clean and wash exterior of bus.**
- A.7.6.4. Pre-delivery inspection and service on chassis.**
- A.7.6.5. See suggested Inspection Checklist in Attachment D.**
- A.7.6.6. See suggested Delivery Checklist in Attachment C.**

A.8. INSPECTION:

Inspection shall be by and at the discretion of the Commission or its designated agent and may be performed either at the place of manufacture, at the vendor's facility in Texas, or at the final destination, or a combination of these. The authorized State Inspector shall have access to the manufacturer's plant during all normal working hours in order to make all necessary inspections during the process of manufacture and assembly. This does not preclude the school districts' personnel from making inspections during manufacture, before or after acceptance of delivery. The school district's personnel are urged to make detailed inspections, especially upon delivery, and report any discrepancy or discrepancies to the *vendor*. If not corrected to the satisfaction of the district/entity, the district/entity should contact the Commission. Any such discrepancies found during or after manufacturing shall be immediately corrected to the satisfaction of the *district/entity*, at no charge, by the manufacturer or distributor.

- A.8.1. See suggested Inspection Checklist in Attachment D.**
- A.8.2. See suggested Delivery Checklist in Attachment C.**

A.9. TERMS, INVOICING AND PAYMENT:

A.9.1. INVOICE, VENDOR'S:

A.9.1.1. School District's Copies:

The vendor shall submit the invoice to the school district at the address shown on the purchase order. The invoice must certify that the buses delivered meet or exceed the requirements and conditions of this specification [See Paragraph A.6.2.].

A.9.1.2. PAYMENTS, DISPUTED:

If the school district believes that there is an error in an invoice submitted for payment, the school district shall notify the vendor who submitted the invoice of the alleged error not later than the twenty-first (21st.) day after the date on which the invoice is received. A copy of the notice to the vendor shall be forwarded to "Purchaser C", Procurement Division, Texas Building and Procurement Commission.

A.10. WARRANTY AND SERVICE:

A.10.1. CONTRACTOR'S RESPONSIBILITY:

Each successful bidder is ultimately responsible for and must assure the State that any warranty service shall be performed to the satisfaction of the Commission, regardless of whether the successful bidder or the bidder's agent performs the warranty work on school buses [See Paragraph A.10.4.]. If there is a question of whether it is the responsibility of the body or the chassis manufacturer to repair a given defect, then it shall automatically become the prime contractor's and/or successful bidder's responsibility to see that the repair (s) is made to the satisfaction of the receiving school district and the Commission.

Successful bidder or prime contractor shall guarantee that all warranty work shall be provided at no cost to the state, district, or government entity (100% parts and labor). *Does not include consumables under warrant .*

A.10.1.1. Delivering dealer will be responsible for towing of bus caused by manufacturer's defects during the warranty period. *Purchasing entity is responsible to contact the vendor for his decision to tow or repair at location of bus.*

Purchasing entity is responsible for notifying the delivering dealer when the bus is put in service.

A.10.2. DEFECTIVE WORKMANSHIP:

In the event that an error is discovered or conclusive proof of defective workmanship and/or materials is found on any body or chassis after acceptance and payment has been made, the successful bidder shall make such repairs as required at the vendor's expense.

A.10.3. PENALTIES:

Upon refusal of the prime contractor and/or successful bidder to make satisfactory adjustment (s), the Commission reserves the right to claim and recover from said prime contractor and/or successful bidder by due process of law, such sums as may be sufficient to correct the error or make good the defect in material and/or workmanship.

A.10.4. WARRANTY WORK AND GENERAL TERMS OF WARRANTIES:

Warranties: New Vehicles

The warranties in Section A.10.4 apply to ALL equipment unless covered in another section of the specification.

All warranties listed herein shall apply to all school buses manufactured after the effective date of these specifications and owned, operated, rented, contracted, or leased to any public school board in the state of Texas.

The Commission's purchase orders for school buses are issued to a single distributor or vendor. This distributor or vendor has the ultimate responsibility of insuring the delivery of a bus that meets Texas specifications in all details and is free of defects in materials and workmanship. In addition, the bus body and chassis are warranted against defects in materials and workmanship by the bus body manufacturing company and the chassis manufacturer, respectively. The warranty on a school bus is thus a dual warranty. The following are general terms of the warranties; however, for specific coverage of any item on a school bus, please refer to the warranty literature provided at time of vehicle delivery.

A.10.4.1. Air Conditioner:

The air conditioning manufacturer shall have service facilities available within the State of Texas. For service on units provided by chassis manufacturer, contact local chassis dealer, for service on the other makes, contact the vendor.

The total air-conditioning system on any bus so equipped shall be warranted for two (2) years unlimited mileage, from the date of delivery, including parts (excluding fluids, gases, and air filters used in normal preventive maintenance) and labor with no warranty limitation on number of operating hours. Chassis engine-driven air-conditioning compressor applications must be approved in writing by the engine manufacturer, stating that the installation will not void or reduce the engine manufacturer's warranty or extended service liabilities in any way.

A.10.4.2. Bus Body:

All material and workmanship are warranted for a minimum of twelve (12) months beginning on the date of service of the bus. For service contact the vendor identified on the school bus purchase order issued by the Commission.

A.10.4.2.1 Body warranty shall be manufacturer's standard, minimum 12 months. Required white flashing (roof-mounted) strobe light shall be warranted for 100% parts and labor coverage as follows: 12 months for flash tube; 18 months for remainder of light.

A.10.4.2.2 Stop signal arm material, *to include retro-reflective sheeting*, shall be warranted for one (1) year against cracking, delamination, bubbles, wrinkles, or significant color changes (such as fading of red background). Warranty shall include full replacement cost of material (not including labor).

A.10.4.2.3 Exterior mirror assemblies (including mounting bracket) shall be warranted (100% parts replacement coverage) for 2 years against rust and corrosion, and against any reduction in clarity of view due to discoloration or other deterioration of the lens (not including damage by use).

A.10.4.2.4 All bus body electrical wiring and switches shall be warranted for 60 months/unlimited mileage against failure, 100% parts and labor, including, but not limited to, damage resulting from wiring or connectors becoming abraded, pierced by fasteners, shorted, or otherwise damaged during manufacture or use.

A.10.4.2.5 Paint finish coats to body, hood, and cowl shall be warranted for 36 months (no mileage limit) or manufacturer's standard warranty period, 100% parts and labor, for adhesion, color retention, and gloss retention. Acceptable lower limits during the warranty period are as follows:

Adhesion:

During the 36 month warranty period, paint and priming compounds shall not fail to adhere to the bus with normal use and care.

Color Retention:

During the first 36 months from the in-service date, the color coat shall not shift colors more than four ΔE from the centroid of the national standard.

During the 36 month warranty period, the color coat shall not shift color more than eight ΔE from the centroid of the national standard.

Gloss:

During the first 36 months from the in-service date, the gloss reading shall not fall below 60 at 60°. During the 36 month warranty period, the gloss reading shall not drop below 30 at 60°.

A.10.4.3 Bus Chassis:

A.10.4.3.1 Chassis warranty shall be manufacturer's standard, or minimum of 36,000 miles or 36 months.

A.10.4.3.2 Diesel engines (including flywheel, flexplate and harmonic balancer) on Type C & D units shall be warranted for 60 months/150,000 mileage, 100% parts and labor.

A.10.4.3.3

- (a) The chassis or component supplier for all Type C, and D chassis shall warranty or provide extended service coverage for the following items, including removal and replacement, for 5 years, unlimited mileage, 100% parts and labor; (drive shafts and U-joints, differential, rear axle housing, rear axles, and rear wheel bearings), but not including gaskets and seals covered under the basic 36 month/36,000 miles chassis warranty.
- (b) Automatic transmissions shall be warranted **with manufacturer's standard warranty**, 100% parts and labor for all Type A, C and D school buses.

Basic coverage is *the manufacturer's standard warranty* as defined in the manufacturer's warranty document included with delivery of the vehicle. For service, contact the chassis or transmission dealer, or authorized service outlet as specified in the warranty pamphlet.

- (c) **Batteries:** Twelve (12) months or twelve thousand (12,000) miles, whichever ever occurs first. Battery warranties *are to be provided by the battery manufacturer*. For service contact the local dealer as specified in the battery warranty document.

A.10.4.3.4 Paint finish coats to chassis hood, fenders, and cowl shall be warranted for 36 months (no mileage limit) or manufacturer's standard warranty period, 100% parts and labor, for adhesion, color retention, and gloss retention. Acceptable lower limits during the warranty period are as follows:

Adhesion:

During the 36 month warranty period, paint and priming compounds shall not fail to adhere to the bus with normal use and care.

Color Retention:

During the first 36 months from the in-service date, the color coat shall not shift colors more than four ΔE from the centroid of the national standard.

During the 36 month warranty period, the color coat shall not shift color more than eight ΔE from the centroid of the national standard.

Gloss:

During the first 36 months from the in-service date, the gloss reading shall not fall below 60 at 60°. During the 36 month warranty period, the gloss reading shall not drop below 30 at 60°.

All measurements shall be the average of 12 readings taking at various points on the bus, but no reading shall be more than three points under the stated minimum. All readings shall be taken after the bus is thoroughly washed to remove road film and dust.

A.10.4.4 Actions to resolve problems:

A.10.4.4.1. First: Contact the chassis dealer recommended by the vendor, as shown on the school bus purchase order issued by the Commission, or any other convenient chassis dealer. If the problems are not satisfactorily resolved.

A.10.4.4.2 Second: Call the Zone Service Manager, Representative, or Engineer listed below for assistance. The dealer Principal may be asked to assist in this contact.

<p><u>BLUE BIRD CORPORATION</u> 402 Bluebird Blvd. Fort Valley, Georgia 31030 800-486-7122</p>	<p><u>CHEVROLET</u> Light-Duty Fleet Service Manager 972-541-5447</p>	<p><u>FORD</u> Heavy Truck Service Engineers Ron Canal-Houston Zone 281-320-7605</p> <p>Jerold Sheets- Dallas Zone 972-471-6254</p>
<p><u>GMC</u> Rick Deets Medium-Duty Fleet Zone Service Mgr. 810-745-7101 972-541-5150 800-332-7181</p>	<p><u>INTERNATIONAL TRUCK & ENGINE CORP.</u> 2595 Dallas Parkway, #203 Frisco, TX 75034 972-377-1200</p>	<p><u>FREIGHTLINER</u> Glen Collins Technical Sales Manager 864-206-8391</p>

A.10.4.4.3. Third: If the problems are still not satisfactorily resolved, notify the vendor by letter with a copy to:

Purchaser "C"
Procurement Division
Texas Building and Procurement Commission
P.O. Box 13047
Austin, Texas 78711-3047

A.10.4.4.4 Last: If the above action does not resolve the problem, you may use the Vendor Performance form located on the TBPC Web site at
<http://www.tbpc.state.tx.us/stpurch/vendir.html>

A.10.4.5. Delayed Warranty:

Body and chassis manufacturers' warranty policies shall allow revision of warranty start date for each vehicle to the actual in-service date by the school district. Appropriate forms to update chassis warranty shall be included in the owner-operator's packet supplied with the chassis and shall be conveyed along with the body warranty to the body builder to the district upon delivery of the completed unit. Above requirements shall apply to the basic warranties, all component warranties and any extended warranties offered or required.

In case the bus is delivered during the summer months and will not be placed in service or used until the start of the fall term, the school district can obtain a delayed warranty by:

A.10.4.5.1. Making application for the delayed warranty through the following steps, is the responsibility of the school district and must be done within fifteen (15) working days after the date the bus is delivered or the warranty starts at time of delivery:

A.10.4.5.2. Contacting the local chassis dealer for a delayed starting date for warranty service (i.e., start of school or date bus placed in service). The local dealer will verify the chassis mileage and record the starting date for bus use.

However, if the bus is used before the starting date, the delayed warranty date is voided and the warranty date automatically becomes the delivery date.

Any questions should be addressed to the local chassis dealer or to the Commission.

A.10.4.6. Tires:

Tires are covered by the tire manufacturer's adjustment policies as specified in the manufacturer's pamphlet included with the vehicle delivery.

A.10.4.7. Wheelchair Lifts:

All component parts including frame welds, gearbox, and motor are warranted for twelve (12) months and are specifically defined in the manufacturer's literature included with the vehicle delivery. Warranty on wheelchair lifts with frames manufactured of aluminum shall be minimum of twenty-four (24) months on frame rails and a minimum of eighteen (18) months on gear box and motor; all other components shall be warranted for twelve (12) months [See Attachment E - Paragraph E.1.5.1.].

Wheelchair lifts on any bus so equipped shall be warranted for two years from the updated in-service date of the vehicle. The warranty shall provide 100% coverage for parts.

B. ORDERING INFORMATION

B.1. GENERAL INFORMATION:

B.1.1. PASSENGER CAPACITY:

The definition of passenger capacity, as used in this specification, has reference to seat space (width) allotted for each pupil. This is based on National height and weight percentile averages specified in Federal Highway Safety Guidelines Standard No. 17. Approximately thirteen inches (13") per pupil has been established for designating bus body passenger capacities.

B.1.2. REDUCED PASSENGER CAPACITY:

The thirteen-inch (13") figure must be considered when ordering school buses since passenger capacity may be reduced when junior high, high school, or adult passengers are primary passengers. As an example, for larger students in which only two (2) students can be accommodated per seat, then a 71-passenger school bus may only seat about forty-seven (47) students. Other capacity buses will like wise seat fewer than the stated capacity. If there is a question about seating capacity in regular or wheelchair-equipped school buses, please consult with school bus body vendors or manufacturer before ordering.

B.2. ORDERING:

Complete school buses, school bus bodies, or school bus chassis shall be requisitioned using the Requisition Form (or a copy). More than one (1) bus may be requisitioned on one (1) form provided all are the same size and require the same options.

B.2.1. PREPARING THE REQUISITION:

B.2.1.1. COMPLETE PAGE ONE AND SECTION ONE-BUS REQUIREMENTS:

Each box on page one of the requisition form should be completed by the ordering school district.

B.2.1.2. AUTOMATIC OR MANUAL TRANSMISSION:

Note that automatic or manual transmission must be selected and checked (*If not checked, automatic transmission will be provided as standard*). State quantity and the size (capacity) of buses desired and specify the type (e.g., either Conventional or Transit) being ordered.

If a Transit bus is being requested, please indicate if the engine is to be in the front or rear.

B.2.1.3. PRE-BID DIAGRAM

Purchaser can request from vendors a pre-bid diagram for up coming bid.

B.2.1.4. FINAL DIAGRAM WITH BID

When requested in the Invitation for Bid, the vendor shall submit a copy of the final seating diagram.

B.2.1.5. FACTORY ORDER

When requested in the Invitation for Bid, the vendor shall submit a copy of the order sent to the factory.

B.2.1.6. BID REVIEW:

School districts have the right to examine bids received prior to award in order to determine funds availability. School districts shall indicate in the appropriate section on the requisition their desire to initiate this review. Vendors are required to provide price protection for sixty (60) days from the bid opening. After this review, school districts must notify the Commission of their desire to award to the lowest bidder meeting specifications before the sixty (60) day price protection time constraint expires.

B.2.1.7. STANDARD OPTIONS ON REQUISITION:

For the size bus being ordered, select the desired option(s) from the list of standard options by making a check mark or an "X" next to the number.

The Standard Options have not been reviewed by the Commission.

The addition of a Standard OPTION to the vehicle is permitted as long as the bus continues to meet the Texas School Bus Specifications, all Federal Requirements, National School Transportation Specifications & Procedures, and the following:

1. The option is listed on the purchase order as a separate option.
2. The vendor/manufacturer certifies that it will not compromise the safety or operation or warranties of the vehicle(s) in any way.

Standard options are listed in Attachment B

B.2.1.8. NON-STANDARD OPTIONS ON REQUISITION:

List any additional options not included in Section II as standard options. If an option is listed as a standard option, use the standard option number to order.

The Non-Standard Options have not been reviewed by the Commission.

The addition of a Non-Standard OPTION to the vehicle is permitted as long as the bus continues to meet the Texas School Bus Specifications, all Federal Requirements, National School Transportation Specifications & Procedures, and the following:

1. The option is listed on the purchase order as a separate option.
2. The vendor/manufacturer certifies that the device(s) will not compromise the safety or operation or warranties of the vehicle(s) in any way.

B.2.2. MAILING ADDRESS: Mail the Requisition:

Co-Op Purchasing Program
Procurement Division
Texas Building and Procurement Commission
P.O. Box 13047
Austin, Texas 78711- 3047

For further information, call: (512) 463-7817

Forms may also be faxed to: 512-463-8872 or 1-800-472-5463.

B.3. CHASSIS AND BODY SERVICE MANUALS AND PARTS BOOKS:

The vendor shall provide one complete set of chassis and body service manuals *and parts books* for each size and style of bus ordered at no cost to the district/entity, in any media form on delivery.

School districts/entities desiring additional service manuals may purchase them separately for school buses ordered by corresponding directly with the following manufacturers:

<p><u>ALLISON TRANSMISSIONS</u> Stewart & Stevenson P.O. Box 1637 Houston, TX 77251</p>	<p><u>COLLINS BUSES</u> Longhorn Bus Sales 6921 Homestead Road Houston, Texas 77028 800-392-5356</p>
<p><u>BLUE BIRD BUSES</u> Capital Bus Sales & Service P.O. Box 1758 Leander, Texas 78646-1758 800-290-3006</p>	<p><u>BLUE BIRD/COLLINS</u> Blue Star Bus Sales Ltd. 5907 – 63rd Street Lubbock, TX 79424 800-988-4170</p>
<p><u>CHEVROLET MOTOR DIVISION</u> General Motors Corporation 130 East Carpenter Irving, TX 75063</p>	<p><u>GIRADIN BUSES</u> 800-282-7981</p>
<p><u>FORD MOTOR COMPANY</u> Helm, Inc. P.O. Box 07150 Detroit, MI 48207 800-782-4356</p>	<p><u>FREIGHTLINER</u> Custom Chassis Corporation 552 Hyatt Street Dallas, TX 864-206-8607</p>
<p><u>GMC TRUCK & COACH DIVISION</u> Dysart, Service Department 31 Judson Pontiac, MI 48058</p>	<p><u>MID-BUS</u> One Stop Bus Stop 1440 So. Loop 12 Irving, Texas 75060 800-460-2877</p>
<p><u>MID-BUS Verify Information</u> One Stop 1440 S. Loop 12 Irving, TX 75060 800-460-2877</p>	<p><u>NAVISTAR INTERNATIONAL</u> Longhorn Bus Sales 6921 Homestead Road Houston, Texas 77028 800-392-5356</p>
<p><u>THOMAS BUILT BUSES</u> Thomas Bus Gulf Coast Ltd. 3575 Trailmobile Houston, TX 77013 800-378-6181</p>	<p><u>U.S. BUS</u> One Stop Bus Stop 1440 So. Loop 12 Irving, Texas 75060 800-460-2877</p>

B4. TEMPORARY LICENSE TAGS AND EXEMPT LICENSE PLATES:

B.4.1. EXEMPT LICENSE PLATES:

The following forms are required to obtain exempt license plates at the address shown:

- B.4.1.1. Form 130 U, "Application for Title."**
- B.4.1.2. Form 62A, "Application for Exempt Plates."**
- B.4.1.3. MSO (Manufacturer's Statement of Origin) or Title.**

Exempt license plates must be obtained from:

Texas Department of Transportation (TXDOT)
Division of Motor Vehicles
ATTN.: Special Plates Section
P.O. Box 26480
Chimney Corners Station
Austin, Texas 78755-0480
512-374-5010

B.4.2. TEMPORARY LICENSE TAGS:

The vendor shall issue a temporary license tag for each bus delivered. Temporary license tags are legal only for a period of twenty-one (21) days. Based on the authority of Transportation Code 503.063 (f) A dealer may issue an additional temporary cardboard buyer's tag to a person after the expiration of 21 days after the issue of a temporary cardboard buyer's tag, and the person may operate the vehicle for which the tag was issued on the additional temporary cardboard buyer's tag if the dealer has been unable to obtain on behalf of the vehicle's owner the necessary documents to obtain permanent metal license plates because the documents are in the possession of a lien holder who has not complied with the terms of Section 501.115(a) of this code. An additional tag issued under the terms of this subsection is valid for a maximum of 21 days after the date of issue.

C. BODY SPECIFICATIONS

All requirements apply to the 15- to 20-passenger buses and the 24- to 84-passenger buses except where specifically noted.

C.1. GENERAL REQUIREMENTS:

C.1.1. BODY PHYSICAL REQUIREMENTS:

The physical requirements for school bus bodies shall conform to Minimum Tables In Attachment B.

C.1.1.1. Overall Length: The overall length of a complete school bus shall not exceed forty (40) feet, *excluding safety equipment*.

C.1.1.2. Exterior Width:

All buses shall have a *maximum exterior* width of ninety-six inches (96”).

C.1.2. CEILING:

The ceiling shall be free of all projections likely to cause injury to passengers.

C.1.3. COLORS AND LETTERING:

A first quality black enamel (Color No. 17038 of Federal Standard No. 595b) or decals shall be used for lettering and trim. The properties of the black enamel shall be equal to those of the finish coat enamel. Pressure-sensitive tape or decals are acceptable for trim or lettering (e.g., EMERGENCY DOOR, EMERGENCY EXIT, SCHOOL NAME LETTERING, etc. signs) provided they are made from Faison R 200, 3M Series 180, or equal material. Exit sign and lettering shall be in compliance with FMVSS No.217.

C.1.3.1. Rear Bumper:

- A. The bumper shall be pressed steel channel at least 3/16" thick or equivalent strength material. Type A, C and D buses bumper shall be a minimum of 9-1/2" wide (high). The bumper shall be of sufficient strength to permit being pushed by another vehicle without permanent distortion.
- B. The bumper shall be wrapped 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 flush-mounted to the body sides or protected with an end panel.
- C. The bumper shall be attached to the chassis frame in such a manner that it may be easily removed. It shall be so braced as to withstand impact from the rear or the side. It shall be so attached as to discourage hitching rides by an individual.
- D. The bumper shall extend at least 1" beyond the rear-most part of the body surface measured at the floor line.
- E. A first quality black enamel (Color No. 17038 of Federal Standard No. 595b) shall be used and reflective tape may be used (see Section C.3.10.).

C.1.3.2. Body Interior:

Unless otherwise specified in the Invitation for Bid, the interior of the complete bus body shall be finished in the manufacturer's standard color except where clear-coated galvanized steel or aluminum is used [See Paragraph C.2.7.].

C.1.3.3. Body Exterior:

- A. The school bus body shall be painted National School Bus Yellow (NSBY).
- B. The body exterior paint trim shall be black.

The exterior of the bus except for bumpers, rub rails, entrance doors, and wheels shall be finished in school bus yellow (Color No. 13432 of Federal Standard No. 595b). *Entrance door may be yellow or black.*

C.1.3.4. Chassis Components:

Unless otherwise specified in the Invitation for Bid, chassis components such as wheel covers shall be painted the chassis manufacturer's standard color. *The hood shall be school bus yellow. The frame rails shall be black.*

C.1.3.5. Grilles:

Grilles may be painted either the same color as the exterior of the bus body or they may be argent, gray, **black**, or a bright finish (chrome, chromed-plastic, or anodized aluminum).

C.1.3.6. Emergency Exit Lettering:

The emergency exits shall be marked "EMERGENCY DOOR" or "EMERGENCY EXIT" both on the outside and on the inside in compliance with FMVSS NO. 217. All applicable requirements of FMVSS No. 217 relating to instructions, outlining, and markings shall be met.

C.1.3.7. Exterior Mirror Backs and Brackets:

The backs of all exterior mirrors, and all exterior mirror brackets shall be finished in lusterless black, unless they are stainless steel. (Color No. 37038).

See Attachment B, Standard Options, for stainless steel mirrors.

C.1.3.8. Rub Rails:

All rub rails, shall be painted black (Color No. 17038). Pressed-in or snap-on rub rails are not acceptable.

C.1.3.9. School Bus Lettering:

The bus body shall have the words "SCHOOL BUS" on the front roof cap, the rear roof cap, and on both sides of the bus body in black (vinyl). The letters shall be neat, clearly defined block style eight inches (8") high with one inch (1") wide strokes. Lettering on Type A buses may be six inches (6") high. The words "SCHOOL BUS" shall be between the bottom two (2) rub rails and as close to the center of the bus as possible.

"SCHOOL BUS" lettering shall have a reflective background. This is mandatory.

"SCHOOL BUS" signs, if not of lighted design, shall be marked with reflective NSBY material comprising background for lettering of the "SCHOOL BUS" signs on the front and rear end caps and both sides of bus.

C.1.3.10. School Name Lettering:

When so specified in the Invitation for Bid [See Option No. 22], the school district name shall be provided in black letters on both sides of the bus near the belt line using decals or with black paint. Lettering shall be minimum five (5") inches high with minimum five-eighths inch (5/8") block strokes and be the same size on both sides. Paint, if used, shall be equal in quality to that of the bus body paint; decals shall meet or exceed the requirements in Paragraph C.1.3. The school district should list in the space provided on the School Bus Requisition Form, the name to be placed on the bus. Characters should be typed or printed plainly on the form to ensure accurate spelling.

If so specified in the Invitation for Bids, required lettering and numbering shall include:

District or company name or owner of the bus shall be displayed between the upper two (2) rub rails.

If the school district name is not provided by the manufacturer, it is the school district's responsibility to place the district's name on the bus in accordance with Texas Transportation Code 502.2015, Section (a).

C.1.4. UNDERCOATING:

Undercoating is required to provide for insulation, sound deadening, protection from road minerals, and rust prevention, as applicable, and shall meet the following:

C.1.4.1. Application:

The entire underside of the bus body, including floor members, wheelwells, side panels below the floor level, and all metal fenders or fenders with metal liners shall be coated with one-eighth inch (1/8") thick material as specified above. The undercoating shall be applied in accordance with the undercoating manufacturer's instructions. Do not cover up or obliterate the chassis identification plate [See Paragraph A. 6.4.3.]

C.1.4.2. Material:

Insulating and undercoating materials shall be an asphalt base under body coating conforming to Federal specification A-A 59295.

C.1.5. INSULATION, NOISE:

D.5.5.1. Noise Level:

The noise level shall neither exceed EPA "Noise Emission Standards" nor eighty-five (85) decibels at the ear of the occupant in the bus nearest to the noise source in the bus. When so specified in the Invitation for Bid [See Option No. 54], the bus shall be furnished with sound abatement insulation for engine compartment.

C.1.5.2. Insulation, Thermal:

The ceilings and sidewalls shall be thermally insulated with a fire-resistant material approved by Underwriters Laboratories, Inc. to adequately reduce the noise level and to minimize vibrations. Buses shall have the equivalent of one-and-one half inches (1-1/2") of fiberglass or other insulation in the ceilings and walls including the interior of hat-shaped bows. Any insulation used shall have a minimum R-factor value of 5.75.

C.1.6. LAMPS, SIGNALS, AND WARNING DEVICES:

Each bus shall be furnished with the lamps listed below [See SBMTC Standard No. 001]:

C.1.6.1. Alternately Flashing Signal Lamps:

The bus shall be equipped with 2 red lamps at the rear of the vehicle and 2 red lamps at the front of the vehicle.

In addition to the 4 red lamps described above, 4 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 bus. The system of red and amber signal lamps shall be wired so that amber lamps are energized manually, and red lamps are automatically energized (with amber lamps being automatically de-energized) when stop signal arm is extended or when bus service door is opened. An amber pilot light and a red pilot light shall be installed adjacent to the driver controls for the flashing signal lamp to indicate to the driver which lamp system is activated.

The area around the lenses of alternately flashing signal lamps extending outward from the edge of the lamp three inches ($\pm 1/4$ inch) to the sides and top and minimum one inch to the bottom, shall be black in color on the body or roof area against which the signal lamp is seen (from distance of 500 feet along axis of the vehicle). Visors or hoods, black in color, with a minimum depth of four inches shall be provided

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

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

NOTE: See Attachment B, Standard Options, for red and yellow LED or strobe warning lights. LED or strobe warning lights must meet all requirements of FMVSS 108 and SAE J887.

C.1.6.1.1. Band: Each set of amber and red lamps shall have a minimum three-inch (3") black band around the set the lamps in each set. The color of this band shall be black enamel (Color No. 17038, Black Enamel of Federal Standard 595b). If it is not possible to provide a three-inch (3") band between the lamps in the set, the manufacturer will then provide a band as wide as possible. Any visor or hood used to shade the lights and improve visibility will not interfere with the intensity and photometric performance of the warning lights [See SBMTC Standard No. 001].

C.1.6.1.2. Mounting: If exterior panels are cut to provide an opening for installation of flush-mounted signal lamps, the lamps must have a closed cell sponge flange gasket with a minimum thickness of three-sixteenths inch (3/16") or manufacturer's standard gasket. The gasket shall be the full width of the flange on the lamp. Proper installation of the lamps shall be made in order to prevent seepage of moisture into the opening

C.1.6.1.3. Operating Instructions: Complete instructions for the detailed operation of the warning signal lamp system shall be furnished with each school bus.

C.1.6.2. Backup Lamps:

The color, requirements, and mounting of backup lamps shall be in accordance with FMVSS No. 108, except two (2) backup lamps are required by Texas Specifications.

C.1.6.3. Clearance, Identification and Side Marker Lamps:

Each bus shall be furnished with the lamps listed below. The quantities, colors, requirements, and mounting shall be in accordance with FMVSS No. 108. Each identification, clearance, and side marker lamp installed to indicate school bus height and/or width shall be protected from damage during normal operation. The protectors shall in no way interfere with the intended purpose of the lamps. The candle power of the clearance lamps shall be a minimum of 2 candle power.

C.1.6.3.1. Clearance Lamps.

C.1.6.3.2. Identification Lamps.

C.1.6.3.3. Intermediate Side Marker Lamps (not required on buses less than 30 feet long).

C.1.6.3.4. Side Marker Lamps.

C.1.6.4. Lamps:

Interior lamps shall be installed to provide uniform illumination of the interior of the bus, primarily the aisle and emergency passage way. The stepwell shall be illuminated with a separate lamp activated by opening the service door. *Stepwell lamp fixtures must be installed to prevent a burn hazard.*

The interior fixtures shall be mounted to provide uniform illumination of the passenger and driver's compartment.

C.1.6.4.1. Quantity: The quantity of interior lamps required for each bus shall be as listed below:

SCHOOL BUS SIZE (Number of Passengers)	INTERIOR DOME LAMPS (Minimum Required per Bus)
15 through 20	2
24 and 35	3
47 and 53	4
59 and 65	5
71, 77, and 84	6

C.1.6.5. Exterior Door Fixture:

There shall be a light fixture, mounted outside the bus below the beltline by the service door. The light shall be a minimum 32 candle power and light a minimum 4 foot diameter area. The light shall come on with the step well lights and illuminate the ground around the bus door. The light *must be installed to prevent a burn hazard.*

C.1.6.6. License Plate Lamp:

The color, requirements, and mounting of the license plate lamp shall be in accordance with FMVSS No. 108.

C.1.6.7. Reflex Reflectors and Intermediate Reflex Reflectors:

The quantities, colors, requirements, and mounting of reflex and intermediate reflex reflectors shall be in accordance with FMVSS No. 108, except one amber reflex reflector on the front, one (1) *red* intermediate reflex reflector on the rear shall be mounted on each side of the bus body. The amber reflex reflectors mounted near the front and on each side of the chassis are required on Texas buses in addition to the reflectors required by FMVSS No. 108. Reflectors shall be attached with screws. Rivets and glue are not acceptable.

C.1.6.8. Tail and Stop Lamps:

C.1.6.8.1. Type A:

Type "A" may use manufacturer's standard tail, stop, turn signal & back-up lamp.

C.1.6.8.2. Type C & D:

The quantities, colors, requirements, and mounting of tail and stop lamps shall be in accordance with FMVSS No. 108, except stop lamps shall be seven inches (7") in diameter and mounted at approximately the belt line level of the bus. A set of minimum four-inch (4") tail/stop lamps shall be installed below the seven-inch (7") set. Base of lamps shall be metal or durable plastic with screw lens. Lenses shall be secured to lamps by a fastening method, which requires a tool to remove the lens.

C.1.6.9. Turn-Signal/Hazard Warning Lamps:

The quantities, colors, requirements, and mountings of turn-signal/hazard warning lamps shall be in accordance with FMVSS No. 108, except rear turn-signal lamps shall be seven inches (7") in diameter. The front turn signal lamps shall be the double-face pedestal type or they shall be of the "wrap-around type" (except single-faced type on Transit buses). They shall be mounted to withstand all normal vibrations. The operating units and flasher for turn signals and vehicular hazard warning signals shall meet the requirements of FMVSS No. 108.

The rear turn signal lenses shall be yellow and brake lenses shall be red. On double-faced pedestals, the front lens shall be amber. Type A buses *may* have manufacturer's standard turn signal and brake lenses.

Buses of 36-passenger capacity or larger shall be equipped with amber side-mounted signal lights. The turn signal lamp on the left side shall be mounted rearward of the top of the stop signal arm and the turn signal lamp on the right side shall be mounted rearward of the service door. The candle power of the light shall be a minimum of 32 candle power.

C.1.6.9.1. Installation: If exterior panels are cut to provide an opening for installation of flush-mounted turn-signal lamps, the lamps must have a closed cell sponge flange gasket with a minimum thickness of three-sixteenths inch (3/16"). The gasket shall be the full width of the flange on the lamp. Proper installation of the lamp shall be made in order to prevent seepage of moisture into the opening.

C.1.6.9.2. Wiring: The exposed wiring to the signal lamps shall be enclosed in a one-piece (1-piece) waterproof loom, or equivalent, leading directly from the lamp body to the interior of the bus body. The wiring shall be supported at the lamp body and at intervals of not more than six inches (6") until it enters the bus body.

C.1.6.10. Warning Devices:

Each school bus shall be equipped with three (3) triangular warning devices meeting the requirements of FMVSS No. 125. The devices shall be packed three (3) per metal or heavy-duty plastic box, or they may be individually packed in metal or heavy-duty plastic boxes with the three (3) boxes contained within a carrier. **Container for warning devices shall be mounted in the driver's compartment and be easily removed without tools in the event of an emergency.**

C.1.7. STROBE LIGHT, Flashing :

See Standard Option Attachment B for strobe light.

C.1.8. LICENSE PLATE ATTACHMENT:

A means shall be provided to mount the license plate on the rear of the bus. It shall be designed so that the license plate will receive illumination from the clear lens on the underneath side of the taillight, or by a separate lamp.

C.1.9. OPENINGS:

All openings in the floorboard or firewall between chassis and passenger-carrying compartment, such as for gearshift lever, steering column, and auxiliary brake lever, shall be sealed. All openings between chassis and passenger-carry compartment made due to alterations by the body manufacturer must be sealed.

C.1.10. WIRING:

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

2. The chassis manufacturer shall install a readily accessible terminal strip or plug on the body side of the cowl or in an accessible location in the engine compartment of vehicles designed without a cowl. The strip or plug shall contain the following terminals for the body connection:
 - a. tail lamps;
 - b. right turn signal
 - c. left turn signal;
 - d. stop lamps;
 - e. back-up lamps;
 - f. instrument panel lights (rheostat controlled by headlamp switch)

C.1.10.1. Type A Buses

Wiring shall be arranged as required with each circuit protected by a fuse or circuit breaker. Wiring as arranged in the circuits to manufacturer's specifications are acceptable; however, the addition of another circuit for the alternatively flashing signal lamps shall be provided.

C.1.10.2. Type C, and D Buses

All connections shall be made by soldering or by an industry-approved connector. All wires shall be insulated and shall be enclosed in a fibrous loom, or equal, for protection from external damage and short circuits. The wires shall be securely attached to the body and chassis at interval of twenty-four inches (24") or less.

C.1.10.3. Accessory Wiring:

Body installed accessories shall be wired from the battery through a low voltage solenoid cut-off switch operated by the ignition key except for the eight (8) light warning system and hazard warning lights.

C.1.10.4. Color and Number Coding:

A system of color and number coding shall be used and an appropriate identifying diagram shall be provided together with the wiring diagram provided by the chassis manufacturer.

The following body interconnecting circuits shall be color-coded as noted:

FUNCTION	COLOR
Left Rear Directional Signal	Yellow
Right Rear Directional Signal	Dark Green
Stoplights	Red
Backup Lights	Blue
Taillights	Brown
Ground	White
Ignition Feed, Primary Feed	Black

The color of the cables shall conform to SAE J1128

C.1.10.5. Fusing:

Each circuit, except starting and ignition, shall be fused separately or shall have an adequate circuit breaker.

C.1.10.6. Main Circuits:

The electrical system wiring shall have at least nine (9) main circuits:

- (1) Head, tail, stop (brake), and instrument panel lamps.
- (2) Clearance and stepwell lamps.
- (3) Dome lamps.
- (4) Starter motor.
- (5) Ignition and emergency door signal.
- (6) Turn signal (directional).
- (7) Alternately flashing signal lamps.
- (8) Horn.
- (9) Heater and defroster.

C.1.10.7. NOISE ABATEMENT SWITCH

There shall be a manual noise abatement switch installed in the control panel, labeled and wired into the activation circuit for the master body circuit solenoid. This shall be a momentary type switch that deactivates all body equipment that produces noise, including at least, the radio, heaters air conditioners, fans, and defrosters. This switch shall not deactivate safety systems such as windshield wipers, or lighting systems.

C.2. CONSTRUCTION:

All Texas school buses, including those with ten-thousand pounds (10,000 lbs.) gross vehicle weight rating (GVWR) or less, shall conform to the performance requirement of FMVSS No. 221, "School Bus Body Joint Strength,". Restraining barriers shall conform to FMVSS No. 222, "School Bus Passenger Seating – Crash Protection, "Sections S.5.2 and S.5.3."

C.2.1. Type C & D Buses Steel Components:

The main steel components shall be constructed of Type I steel, except as noted in Table Two (2). The main steel components are listed below:

- C.2.1.1.** The Body Frame System: Posts, bow frames, stringers, front and rear framing, longitudinal frame members, and emergency door posts.
- C.2.1.2.** The Exterior Paneling: Side panels, rub rails, service doors, emergency doors, skirts, roof panels, window jambs (post caps), window sills, and front and rear panels including front cowl.
- C.2.1.3.** The Floor System: Floor panels, main cross members, auxiliary cross members, wheel housing, steps, and stepwell bracing.
- C.2.1.4.** The Interior Paneling: Side and ceiling panels.

C.2.2. Body-Chassis Attachment:

C.2.2.1.Type A Buses

C.2.1.2.1.1. Chassis Manufacturer's Body: The body shall be attached to the chassis frame by the manufacturer's standard clips unless the chassis is provided with the manufacturer's unitized metal floor.

C.2.2.2.Type C & D Buses

C.2.2.2.1. Body-Chassis Insulation: Anti-squeak material in continuous strips or rubber pads shall be permanently and firmly attached to the frame rails or cross members to insulate chassis from the body.

**TABLE NO. TWO (2)
STEEL REQUIREMENTS
NOMINAL METAL THICKNESSES AND ZINC COATING DESIGNATIONS ²**

Item Number	Components	Gauge	Metal Zinc Coating Designation
1	Bows, Frames	16	G 60
2	Bows, Roof	16	G 60
3	Cowl, Front	16	G 60
4	Doors, Emergency and Service:		G 60
4a	Exterior Panel	20	G 60
4b	Interior Panel	22	G 60
5	Door Posts:		
5a	Emergency Door	14	G 60
6	Floor Panels	14	G 60
7	Longitudinal Frame Members:		
7a	Floor Line	16	G 60
7b	Seat Line	16	G 60
7c	Belt Line	16	G 60
7d	Window Header Line	16	G 60
8	Panels, Exterior:		
8a	Front	20	G 60
8b	Rear	20	G 60
8c	Roof	20	G 60 or A 60
8d	Side	20	G 60 or A 60
8e	Skirts	20	G 60
9	Panels, Interior:		
9a	Headlining	22	G 60 or A 60
9b	Front Lap	22	G 60 or A 60
9c	Rear Lap	22	G 60 or A 60
9d	Lower (below windows)	22	G 60 or A 60 *
10	Posts, Side	16	G 60
11	Rub Rails:		
11a	Skirt Line	16	G 60
11b	Floor Line	16	G 60
11c	Seat Line	16	G 60
11d	Window Line	20	G 60
12	Wheel Housing	16	G 60
13	Window Sills	20	G 60 **

* Lower interior embossed panels (Item No. 9d) and stepwell wall panels shall be clear-coated galvanized steel, ASTM designation A 653/A 653M-76, or Galvalume, aluminized steel, or aluminum over steel.
** Item No. 13 may be of aluminum alloy 6063-T6 having a minimum thickness of 0.062 inch.

² It is mandatory that all components listed in Table No. Two (2) be of the above types of steel, unless otherwise specified. All other metal components not listed in Table No. Two (2) may also be zinc-coated steel. NOTE: OTHER BODY METAL OR MATERIAL USED IN CONSTRUCTION SHALL HAVE STRENGTH AT LEAST EQUIVALENT TO STEEL COMPONENTS SPECIFIED ABOVE.

NOTES TO TABLE TWO (2):

TYPE I (Regular): ASTM Specification A 924/A 924M, coating designation G 60, as specified, mill zinc-coated steel. Coated steel, except components not to be primed and painted, shall have a smooth minimized spangle surface which has been zinc phosphate treated by the steel mill or by the bus body manufacturer.

TYPE II (Alloyed): ASTM Specification A 924/A 924M, coating designation A 60, mill zinc-coated steel which has been zinc phosphate treated by the steel mill or by the bus manufacturer.

Standard ANSI tolerances allowed for metal thickness requirements.

C.2.2.3 Body-Cowl Attachment for 24- to 84-Passenger Buses:

Buses equipped with chassis manufacturer's cowl shall be furnished with the body securely attached to the rear face of the chassis cowl with a minimum of nine (9) bolts, nuts, and lock washers. On all such buses the junction between cowl and body shall be sealed to form a gas tight and watertight seam. The sealant used shall be either the best grade of molded or extruded rubber weather stripping or a good quality, pressure applied, silicone elastomer sealant.

C.2.2.4. Bus Body Length for 24- to 84-Passenger Buses:

The bus body shall extend to, or farther than, the end of the chassis frame so that all main cross members and auxiliary cross members will rest upon the chassis frame. The distance from the end of the chassis frame and the rear of the body shall not exceed six inches (6").

C.2.2.5. Caulking:

A flexible caulking compound or adhesive shall be applied to the top of all rub rails, all unwelded metal joints, and to any place where moisture could enter through the exterior panels. This does not include the fresh air intake or heater or drain openings at the bottom of the rub rails. The compound shall be applied to the required areas without voids or skips.

C.2.2.6. Chassis Frame Alterations for 24- to 84-Passenger Buses:

The body manufacturer shall not in any manner alter the 24-through 84-passenger chassis frame except to cut off the rear portion of the frame where necessary to weld bumper braces, in order to comply with the requirements of Section D.3. None of the rivets in the chassis frame shall be cut flush with the frame or removed. The body manufacturer may alter the chassis frame to adapt standard chassis to forward control. Any change must have body manufacturer's warranty.

C.2.2.7. Components 15- to 20-Passenger Buses:

All components shall be designed and constructed to support the entire weight of a complete bus when fully loaded, on its sides or top, without undue damage to the body structure. Frame members in the roof structure and corners shall resist damage on impact.

C.2.2.8. Exhaust Pipe Extension 24- to 84-Passenger Buses:

The body manufacturer shall furnish and install an exhaust pipe extension when necessary in order to insure compliance with the chassis requirements of the exhaust system [See Section D.5.5.]. The tail pipe shall extend no more than two inches (2") beyond the rear bumper. *Refer to Section D.5.5.4.*

C.2.2.9. Fasteners, Bolts and Rivets:

All bolts shall be equipped with lock washers or other acceptable devices to prevent loosening under vibration. All bolts, nuts, and washers, their nuts and washers, shall be parkerized, cadmium-plated, or otherwise rust proofed, minimum rating, SAE grade eight (8).

C.2.2.10. Fasteners, Other:

Sheet metal screws or self tapping bolts of any type shall not be used in the construction of bodies except:

C.2.2.10.1. Alignment³ of doors or in conjunction with rivets, welds, or bolts for compliance with FMVSS No. 221, as applicable, or;

³ When self-tapping bolts are used to align doors, they shall be tack-welded at the head or applied with the metal adhesive and shall not exceed the number of rivets, or bolts, nuts, and washers installed in the door hinges.

C.2.2.10.2. Attachment of exterior mirrors in certain cases [See Section C.3.8.], or;

C.2.2.10.3. Electrical wire moldings and light fixtures

C.2.2.10.4. Installation of header pads over the doors, or;

C.2.2.10.5. Installation of rub rails or emergency door handles and latches where it is impossible to use rivets or bolts, nuts, and lock washers and then only when these fasteners are used in conjunction with the manufacturer's standard metal adhesive which is used to meet joint strength requirements, or;

C.2.2.10.6. Interior panels which must be removed to give accessibility to other interior or concealed components, or;

C.2.2.10.7. Seat construction [See Section C.2.12 & C.2.13.], or;

C.2.2.10.8. Window frames when applied with the metal adhesive.

C.2.2.11. 24 to 84-Passenger Bus Fuel Filler Opening:

The body manufacturer shall provide an opening in the body panel to allow placement of fuel nozzle into the fuel tank filler neck opening. This opening in the panel must be so positioned that the filler neck, when viewed at right angles from the side, is approximately centered in the cut-out. If you pass through the skirting with the fuel nozzle, the opening shall be provided with a hinged cover so designed and constructed to remain open when fueling is in progress and remain in a totally closed position at all other times [See Paragraph C.2.9.4.1.]

C.2.2.12. Identification Plate:

Each body shall bear a permanently attached *metal* plate, *attached with rivets*, showing the name of the manufacturer and the body serial number. *The plate shall be attached in the driver's compartment. Decals and glue are not acceptable.* [See Paragraph A.6.4.2.]

C.2.2.13. Front Fenders:

Fenders: When applicable, the total spread of the outer edges of the front fenders shall exceed the total spread of the tires with the front wheels in the straight-ahead position measured at center line of axle. Front fenders shall be braced and free from any body attachment.

C.2.2.14. Wood:

The use of wood shall be limited to the construction of passenger seats, seat backs, header pads, and the bottom of any tool compartment or to insulate floors.

C.2.2.15 ACCESS PANELS:

Any panel used for access to the engine radiator and radiator overflow container and installed in the passenger compartment shall have a keyed lock. This does not include the engine cover.

C.2.3. BODY FRAME:

The complete body frame shall be formed, welded, riveted, or lock bolted, assembled and constructed in accordance with recognized engineering practices within the bus body industry to ensure compliance with all FMVSS requirements.

C.2.3.1. Longitudinal Frame Members—Type A:

The body frame shall contain, as a minimum, the following longitudinal frame members at the locations shown:

C.2.3.1.1. Rear Corner: The rear corner framing between the floor and roof and between the emergency door posts and the body corner shall be applied horizontally or vertically, or in other combinations, to provide additional impact and penetration resistance equal to that provided by frame members in body side areas. Such structural members shall be securely attached at each end.

C.2.3.1.2. Roof: Two (2) or more longitudinal members (or roof strainers) shall be provided to connect and space the roof bows and to reinforce the flattest portion of the roof skin. They shall be applied either externally or internally, shall extend from the windshield header, and shall function as continuous longitudinal members. These roof strainers shall be attached to other structural components by means of welding, riveting, or bolting. The completed roof shall meet the requirements of FMVSS No.220 and 221

C.2.3.1.3. Shoulder Level: There shall be one (1) longitudinal side strainer (or impact rail) mounted at shoulder level (window sill level) and extending at least from the front post (excluding the front door entrance) to the rear corner reinforcement. This member shall be attached to each vertical structural member. Such strainer shall be a formed (not flat) strip of metal.

C.2.3.1.4. Window/Seat Frame Area: There shall be one (1) longitudinal side strainer installed in the area between the bottom of the window and the bottom of the seat frame and extending from the front post to the rear corner reinforcement. This strainer may also be used as a means to fasten the angle used for the wall end seat support at the wheel housing. Such strainer shall be formed and attached to each vertical structural member by huck-bolting, welding, or thread-forming bolts which are tack-welded to prevent bolts from vibrating loose. A backup channel for the exterior rub rails shall be provided and fastened to each vertical structural member. In lieu of a separate backup channel, the seat level longitudinal strainer may serve as a backup channel for the seat level rub rail.

C.2.3.2. BODY FRAME – TYPE C & D BUSES

C.2.3.2.1. Design:

The frame shall have a formed shape with a minimum cross sectional depth of one-and-one-eighth inches (1-1/8"). Frame members, running from one side main cross member to the other side main cross member, may be continuous bow frames, or they may consist of side posts and roof bows. If side posts and roof bows are used, every pair of side posts must be connected by a roof bow to form the equivalent of a continuous bow frame. The side posts shall be set on not more than thirty inch (30") centers, except that one (1) side post and bow or one bow frame may be set on a maximum of thirty-eight-and-three-fourth inch (38-3/4") center, or three (3) bow frame sections not exceeding thirty-six-and-one-half inches (36-1/2") may be used in any one (1) body (up to four (4) thirty-eight-and-three-fourth inch (38-3/4") body frame sections may be used for Transit Rear Engine buses ONLY). Each of the side posts or bow frames shall be securely welded, riveted, or lock bolted to the floor system at each main cross member or to the longitudinal frame member which is located at the floor line. Each side post and/or bow frame must also be attached, as specified above, to the remaining longitudinal frame members.

C.2.3.2.2. Front Frame Section:

The front frame shall be a unitized framework of formed sections designed with the necessary stress members required to withstand the torsional stresses set up by or in the chassis. The corner posts shall extend from the bottom of the body to the windshield header and shall not cause or produce a "blind spot" for the driver. The front assembly shall be securely attached to the floor system by lock bolting, welding, or riveting and shall be securely bolted to the chassis cowl in such a manner as not to cause undue strain.

C.2.3.2.3. Longitudinal Frame Members:

The body frame shall have not less than four (4) individual side longitudinal frame members extending the full length of the body (except as interrupted by side posts or when cut for an opening for the wheel housing). One (1) each shall be located at the floor line, the seat line, the beltline, and at the window header line. The belt line longitudinal member may be replaced by an exterior rub rail, i.e., an extra rub rail in the belt line area. This rub rail shall meet requirements specified under RUB RAILS, Section C.2.9.

C.2.3.2.4. Material:

The body frame system [See Section C.2.1.1.] shall be of the type, grade, and thickness of steel specified in Table No. Two (2) or approved equal, and shall meet the requirements of FMVSS No. 220.

C.2.3.2.5. Rear Frame Section:

The rear frame shall consist of a formed sill, two (2) posts (one (1) on either side of the emergency door, extending from the sill to the roof bow and intersected by a rear header at the proper point), and suitable strainers to form a rigid framework. This framework shall be assembled and attached to the floor system by welding, riveting, or lock bolting.

C.2.4. EMERGENCY EXITS:

Texas school buses shall be provided with emergency exits, which comply with FMVSS No.217 and the following requirements.

Emergency door shall be furnished with upper glass panels, permanently closed, set in rubber or sealed against rubber. [See Paragraph C.2.20.1.3. and Paragraph C.1.3.6.]. No seat or other object shall be placed in the body that restricts the passage way to the emergency door to less than twelve inches (12"). There shall be no steps leading to the emergency door. Buses furnished to this specification shall be equipped with emergency doors meeting the description below.

C.2.4.1. 15- to 84-Passenger Buses Emergency Doors:

The emergency door shall be of the type, grade, and thickness of steel specified in Table No. Two (2) or approved equal. Emergency doors on buses furnished to this specification shall be equipped with doors meeting the requirements below and comply with the requirements of FMVSS No. 217.

C.2.4.2 Design:

C.2.4.2.1. Style II -- Single Door Type

C.2.4.2.1.1. Attachment:

- A. The door shall be hinged on the right side of the body (either side on a bus with a GVWR of 10,000 pounds or less and forward side for rear engine buses), shall open outward, and shall be designed to permit opening from both inside and outside of the bus. It shall be properly sealed against moisture and dust.
- B. The hinges for the rear emergency doors shall be attached with rivets or bolts, nuts, and lock washers. Metal screws or self-tapping bolts are not acceptable. Metal screws may be used for alignment of doors while installing rivets. Self-tapping bolts may be used for alignment if the bolt heads are tack-welded to the hinges.

C.2.4.2.2.2. Design:

Design: The rear emergency door on all except rear-engine buses⁴ shall be located in the center of the body and shall have a minimum horizontal opening of thirty inches (30") and a minimum vertical opening of forty-eight inches (48") measured from the floor level.

C.2.4.2.2.3. Glass Panels:

The glass in the rear emergency door shall have an area of not less than two-hundred-ninety-nine square inches (299 sq. in.) and shall be set solid in a waterproof manner [See Paragraph C.2.20.1.3.]. The installation of glass in the lower portion of the door is required and shall meet the same requirements (lower glass panels not required in the emergency doors of rear engine buses). The lower glass panels shall be the body manufacturer's standard size. These glass panels shall be installed securely to prevent removal by hand.

The upper portion of the emergency door shall be equipped with approved safety glazing, the exposed area of which shall be at least 400 square inches. The lower portion of the rear emergency doors on all vehicles shall be equipped with a minimum of 350 square inches of approved safety glazing.

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

All buses shall have double glass panels.

C.2.4.3. Header Board:

The head impact area on the inside at the top of the emergency door shall be protected by an energy absorbing, padded header board, three inches (3") wide and one inch (1") thick, extending the full width of the emergency door to prevent injury when accidentally impacted.

C.2.4.4. Latch:

C.2.4.4.1. Style II -- Single Door Type:

The emergency door shall be equipped with a slide-bar cam-operated lock. The slide bar shall have a minimum stroke of one inch.

C.2.4.5. Latch Handle

The movement of the latch handle through its full arc of operation shall not be obstructed by, or extended into, the area behind the rear seats at the emergency door. The handle, when in the closed position, shall meet the requirements of FMVSS No.217. The design of the latch handle shall allow quick release, but shall offer protection against accidental release. Control of the fastening devices from the driver's seat shall not be permitted. A pull handle shall be installed on the inside of the emergency door so that the door can be securely closed for positive fastening. Provisions for opening from the outside shall consist of a handle (device) designed to prevent "hitching a ride" yet allowing the door to be opened when necessary. The outside handle, when in the closed position, shall extend vertically downward from its pivot center.

C.2.4.6. Door Holding Device:

On all styles, a means (device) shall be provided to hold the swing-out type door(s) in the fully opened position (ninety degree (90°) minimum) as required by FMVSS 217.

C.2.4.7. Switch:

C.2.4.7.1. Style II -- Single Door Type

The rear emergency door latch shall be equipped with a heavy-duty electric plunger-type switch connected to a warning buzzer located in the driver's compartment. The switch shall be enclosed in an adequately protected case, and wires leading from the switch shall be concealed in the walls. The switch shall be mounted plumb, parallel, and perpendicular to the striker plate of the lock slide bar. The switch shall be installed so that the buzzer will sound before the door handle is turned far enough to permit the door to open.

C.2.4.8. Emergency Exit Requirements:

All buses shall be equipped with a total number of emergency exits as follows for the indicated *designated* passenger capacity. Exits required by FMVSS No.217 may be included to comprise the total number of exits specified. Each emergency exit below shall comply with FMVSS No.217. These emergency exits are in addition to the rear emergency door or left side emergency door on rear engine buses exit.

Zero to 42-Passenger = One (1) emergency exit per side and one (1) roof hatch.

43-to 78-Passenger = Two (2) emergency exits per side and two (2) roof hatches.

79-to 84-Passenger = Three (3) emergency exits per side and two (2) roof hatches.

NOTE: A side emergency door may be substituted for 2 emergency exit windows.

The area of an opening equipped with a wheelchair lift may be credited toward the required additional exit if the lift folds or stows in such a manner that the area is available for use by persons not needing the lift.

If there is a wheelchair lift door on 47 passenger bus, the district/entity may elect to eliminate one (1) roof hatch for the purpose of installing a roof top air conditioning unit.

C.2.5. FLOORS:

C.2.5.1. Flat Floor Vehicles

See Standard Option Attachment B for flat floors.

C.2.5.2. 15- to 84-Passenger (Type A, C, & D) Buses

The floor system [See Paragraph C.2.1.1.3.] shall be of the type, grade, and thickness of steel specified in Table No. Two (2) or approved equal [See Section C.2.1.2.]

C.2.5.2.1. Construction and Installation:

The floor panels shall run the full width of the floor and shall be supported on all outside edges by a longitudinal frame member. The floor panels shall be welded, riveted, or bolted to the main and auxiliary cross members and shall be joined to form a leak and dust proof floor. The main and auxiliary cross members shall extend the full interior width of the floor panels. The side posts or bow frames shall be securely welded, riveted, or bolted to the floor system and to the longitudinal frame members or gussets.

C.2.5.2.2. Cross Members:

The cross members shall be spaced not more than ten inches (10") center-to-center. The floor panels and cross members shall be designed and constructed to support all fixed and changeable loads under all operating conditions without deformation of the under body structure, strains to body, or fractures of member joints. The under structure shall be designed and constructed to eliminate the necessity of installing outriggers attached to the chassis except at the front entrance. The under surface of the entire floor structure, including wheel housing and stepwell, shall be sprayed with material at least one-eighth inch (1/8") thick conforming to that specified in Section C.1.5. (Undercoating).

C.2.5.2.3. Insulation:

The plywood shall be 5/8" nominal thickness, B-C Exterior marine grade manufactured in conformance with Voluntary Product Standard PS 1-95. APA Rated Sheathing, no air pockets, no cracks, no knot holes on either side, sanded both sides and treated to retard moisture. Type A-I buses may be equipped with nominal 1/2 inch-thick plywood or equivalent material meeting the above requirements. . [See Paragraph C.2.5.2.]

C.2.6. FLOOR COVERING:

C.2.6.1. Aisle Material:

- A. The floor covering in the aisles shall be of aisle-type rubber or equivalent, wear-resistant and ribbed. Minimum overall thickness shall be .187 inch measured from tops of ribs. The color shall be black.
- B. On Types C & D buses, a flush-mounted, screw-down plate that is secured and sealed shall be provided to access the fuel tank sending unit.

C.2.6.2. Installation:

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

C.2.6.3. Trim:

Seams shall be covered with extruded aluminum or stainless steel metal strips of a minimum three- sixteenths inches (3/16") high and one inch (1") wide that shall be installed on each side of the aisle, the full length of the aisle, so as to secure both the edges of the aisle covering and adjoining edges of the under seat covering. Each aisle strip shall consist of not more than three (3) pieces of the metal stripping. The strips shall be secured to the flooring with flush-mounted flat or low profile oval head screws; holes for the screws shall be countersunk. The screws shall be placed not more than nine inches (9") apart for the full length of the metal strips except that the ends of each piece of stripping shall have screws placed at not more than three fourths inches (3/4") from each end. Screws may be placed nine-and-one-half inches (9-1/2") apart only to avoid interference with floor sill members.

C.2.6.4. Under Seat Material:

The floor in the under-seat area, including tops of wheel housings, driver's compartment and toeboard, shall be covered with black rubber floor covering or equivalent, having a minimum overall thickness of .125 inch. The driver's area in all Type A buses may be manufacturer's standard flooring and floor covering. Floor covering on toeboard shall be held in place by trim strip or molding.

C.2.7. PANELS, INTERIOR:

All interior wall and ceiling panels shall be steel and of the body manufacturer's standard design except the panels beneath the window shall be clear-coated galvanized embossed steel meeting ASTM A 653/A 653M. Also the stepwell and riser panels in the service door entryway shall be clear-coated galvanized steel, embossing not required. Galvalume, aluminized steel, and aluminum over steel panels are acceptable for use beneath the windows and in the entryway. Wall and ceiling interior panels made of 0.032-inch, 3105-H14 aluminum may be used in Type A (15-and 18-passenger) buses only.

C.2.7.1. Attachment:

All interior panels shall be attached to the frame structure by bolts, rivets, or by any well-designed method utilizing self-locking panels, or locking panel strips. Regardless of the method used, the panel shall be attached so that vibration, rumbling, and popping shall be at a minimum.

C.2.7.2. Design:

Front and rear panels shall be formed to present a smooth, pleasing appearance. If the ceiling is constructed so as to contain lapped joints, the forward panel shall be lapped by the rear panel and all exposed edges shall be beaded, hemmed, flanged, or otherwise treated to minimize sharp edges.

C.2.8. PANELS, EXTERIOR:

All exterior panels shall be attached to bow frames and stringers to act as an integral part of the structural frame. They shall be installed by lapping and riveting, lapping and bolting, or by flanging and bolting to form watertight joints.

C.2.8.1. Joints:

Joints shall meet the requirements of FMVSS No. 221.

C.2.8.2. 15- to 84-Passenger (Type A, C & D) Buses

C.2.8.2.1. Attachment and Installation:

The exterior side panels shall be installed either vertically or longitudinally. Vertical panels shall be one-piece (1-piece) and shall extend from the window line to or below the floor line. Longitudinal panels shall be installed starting at or below the floor line and extending upward to the window line with each ascending panel overlapping the preceding panel. Rub rails shall not be considered as part of the paneling for covering the side.

C.2.8.2.2. Design:

The front and rear exterior panels shall be formed into the desired contours to give a smooth, pleasing appearance to the bus. The front and rear exterior roof panels shall be of not more than three (3) pieces welded or riveted together to form a continuous piece over the front and rear frame.

C.2.8.2.3. Material:

All exterior panels [See Paragraph C.2.1.1.2.] shall be of the type, grade, and thickness of steel specified in Table No. Two (2) or approved equal.

C.2.8.2.4. Undercoating:

All exterior panels shall be completely sprayed on the inside of the main exposed surfaces, and shall feather edge to the edge of the attaching members, with one-sixteenth inch (1/16") thick material conforming to that specified in Section C.1.5. The spraying shall be done after the panels are installed.

C.2.9. RUB RAILS:

All buses shall have 4 separate rub rails per side as follows:

- A. There shall be one rub rail located on each side of the bus at seat cushion level which extends from the rear side of the entrance door completely around the bus body (except the emergency door or any maintenance access door) to the point of curvature near the outside cowl on the left side.
- B. There shall be one additional rub rail located on each side at, or no more than 10 inches above, the floor line. The rub rail shall cover the same longitudinal area as the upper rub rail, except at the wheelhousings, and it shall extend only to the radii of the right and left rear corners.
- C. There shall be a rub rail located horizontally at the bottom edge of the body side skirts.
- D. There shall be a rub rail located horizontally at the bottom edge of the windows.
- E. All rub rails shall be attached at each body post and at all other upright structural members.
- F. A one-piece (1-piece) continuous rub rails of the grade, and thickness of steel specified in Table No. Two (2) or suitable material of equivalent strength shall be installed on the body as described above. Each rub rail shall be four inches or more in width in their finished form and shall be constructed in corrugated or ribbed fashion.
- G. All rub rails shall be applied outside the body or outside the body posts. (Pressed-in or snap-on rub rails do not satisfy this requirement.) For Types A, B, C and D buses using the rear luggage or the rear engine compartment, rub rails need not extend around the rear corners.

C.2.9.1. Sealings:

The top joint of each rub rail shall be sealed with a caulking compound or adhesive as specified in Paragraph C.2.1.5.

C.2.9.2. Construction:

The rub rails shall be designed and constructed to resist impact and to prevent crushing of the bus body and shall be a flanged-formed channel, longitudinally fluted, or corrugated rib surface. Ends shall be: (1) smoothly closed, or; (2) closed by a rounded or beveled metal end cap which shall be butt-or flash-welded to the rub rail, or; (3) closed by a rounded or beveled metal end cap inserted with an approximate one inch (1") sleeve inside of the rub rail and riveted in position at the top and bottom of the rub rail, or; riveted in position at the top and bottom of the rub rail flange, or; riveted in the center of the end cap, and sealed in the same manner as the top flange of the rub rails.

C.2.9.3. Drainage:

The bottom edge of each rub rail, except the pressed-in type, which may be used near the window line, shall have provisions for drainage of accumulated moisture. One (1) of the following drainage methods shall be used:

C.2.9.3.1. Slots: The bottom flange of the rub rail shall have a minimum of one inch (1") by 0.032 inch formed slots spaced on not more than twelve inch (12") centers, or;

C.2.9.3.2. Slots or Holes: One (1), one-fourth inch (1/4") diameter hole or slot per foot in the lowest part of the rub rail shall be formed, drilled or cut prior to the priming, painting, and installation of the rub rail. Holes drilled after rub rail installation or after priming and painting are not acceptable. Formed slots are preferred over drilled or cut holes.

C.2.9.4. Installation:

All rub rails shall be bolted or riveted on top and bottom to each side post and riveted on top and bottom to the exterior paneling between the side posts [See exception in Paragraph C.2.1.10.5.]. Provisions for one-piece (1-piece) rails may be accomplished by butt- or flash-welding. All welds, including those for the end caps, shall be dressed, sanded, and buffed. These rub rails shall be installed on both sides of the bus body as follows:

C.2.9.4.1. Type A, C & D (15- to 84-Passenger) Buses

C.2.9.4.1.1. Floor and Skirt Level: The floor and skirt level rub rails and the additional rub rail furnished in lieu of one longitudinal frame member shall be installed the full outside length of the body (except at wheel housings) on the right side from the service door to the rear corner radius and on the left side from the point of curvature near the outside cowl to the rear corner radius. One (1) of the floor level rails may be cut to provide an opening for the gas tank filler neck only if fuel tank furnished to meet FMVSS No. 301-75 requires the opening to be enlarged, or to meet the requirements in Paragraph C.2.1.11.

C.2.9.4.1.2. **Seat Level:** The seat level rub rail shall be installed from the service door completely around the bus body (except for emergency door and rear engine bus) to the point of curvature near the outside cowl on left side. The rails may be two-piece (2-piece) with the joint being near the rear side of the bus body. The rail extension shall be joined to the continuous side rail by one of the following: (1) butt welding; (2) jogged lapped by not less than one inch (1") and riveted, or; (3) butted with a sleeve riveted over the joint. When joining is by lapping or fastening with a sleeve, the joint must be made at the rear most body side post or preferably, the second post from the rear.

C.2.9.4.1.3. **Window Level:** The window level rub rail shall be installed the full outside length of the body on the right side from the service door to the rear corner radius and on the left side from the point of curvature near the outside cowl to the rear corner radius. The splice, if necessary, shall be located at the body post behind the rear wheelhouse, by lapping the full width of the supporting part of the post.

C.2.9.5. Location:

C.2.9.5.1. Type A, C & D (15- to 84-Passenger) Buses

One (1) rub rail shall be installed at the skirt level, one (1) at or near the floor, one (1) at or near the seat level, and one (1) near the window line. One (1) additional rub rail may be furnished in lieu of one longitudinal frame member [See Paragraph C.2.3.2.3.].

C.2.10. SEAT BARRIERS:

Seat barriers shall be furnished and installed in accordance with FMVSS No. 222. The front barriers shall not infringe upon the area required for safety and operating equipment.

C.2.10.1. Knee Space:

Knee space on all buses shall conform to FMVSS 222:

The horizontal distance between the restraining barrier's rear surface and the seating reference point of the seat in front of which the barrier is required shall not be more than 610 mm (24 inches) measured along a horizontal longitudinal line through the seating reference point in the forward direction.

C.2.11. SEATING REQUIREMENTS, DRIVER:

NOTE: FMVSS definition of 95th percentile adult male is a person possessing the dimensions and weight of the 95th percentile adult male specified in the Public Health Service Publication No. 1000, Series 11, No. 8, "Weight, Height, and Selected Body Dimensions of Adults."

C.2.11.1. All school buses shall have a driver's seat equipped with a one-piece high back designed to minimize the potential for head and neck injuries in rear impacts, providing minimum obstruction to the driver's view of passengers, and meeting applicable requirements of FMVSS 222. The height of the seat back shall be sufficient to provide the specified protection for up to a 95th percentile adult male, as defined in FMVSS 208. The driver contact area of the cushion and seat back shall be made of soil and wear resistant material. Seat shall be *squared and* centered \pm *1/2 inch* behind the steering wheel with a backrest a minimum distance of 11 inches behind the steering wheel. Seat shall be securely mounted to ensure minimal flexing of the seat and the floor panel(s).

C.2.11.2. Installation:

Driver seat installation shall meet all requirements of FMVSS 207.

C.2.11.3. Driver's Seat Access Type C & D (24- to 84-Passenger Buses):

There shall be unrestricted access to the driver's seated position from either the aisle or the right service door without the operator having to climb over the engine cover or any other object. The minimum space between the driver's seat (in the rear most position) and the engine cover or other object (except seat belt anchorage) at the floor and at the seat level shall be not less than six inches (6").

C.2.11.4. Driver's Seat Belts and Seat Belt Assembly:

A Type 2 lap/shoulder belt shall be provided for the driver. The assembly shall be equipped with an *emergency* locking retractor for the continuous belt system. On all buses except Type A 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 it. 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 location of the seat belt anchorage shall conform to SAE Standard J 383 with the driver's seat adjusted to its rear most position.

C.2.12. SEATING REQUIREMENTS, PASSENGER:

The bus passenger seats shall meet or exceed the knee spacing and crash protection requirements of FMVSS No. 222 and shall conform to the following:

C.2.12.1. Increased Seat Back Heights:

See Standard Option Attachment B for seats with increased seat back heights.

NOTE: *Seat backs with this option will have heights of approximately twenty-eight inches (28").*

C.2.13. SEAT BELTS:

C.2.13.1. Seat Belts (24- to 84-Passenger Buses)

See Standard Options Attachment B for seat belts for 24- to 84-passenger buses.

C.2.13.2. Seat Belts, Passenger (Type A):

Seat belts conforming to FMVSS No.'s 209 and 210 shall be provided for each passenger position on 15-through 20-passenger school buses, including those with a GVWR of more than ten-thousand pounds (10,000 lbs.). The seat belts shall meet the following requirements:

C.2.13.2.1. Colors:

The belt assemblies shall be alternately color coded with contrasting colors. All aisle seats on the same side of the bus shall have belts with the same color. Two (2) position seats shall use two (2) colors; three (3) position seats may use two or three (2 or 3) colors.

C.2.13.2.2. Design:

Seat belts shall be provided which are adjustable to fit passenger sizes as required by FMVSS No.'s 208 and 209 (except lights and buzzers are not required). Buckles shall be of the plastic covered push button design. Long and short ends shall be mounted alternately with the short end on the aisle. If possible, the design shall prevent fastening the belts across the aisle.

C.2.13.3. Seat Cushions:

Base: The base shall be nominal 15/32" thick, Exposure 1, APA Rated Sheathing C-D plywood with exterior grade glue, identification (span) index 32/16, manufactured in conformance with Voluntary Product Standard PS1-95, PRP 108, PS2-92 and identified as to veneer grade and glue bond type by the trademarks of an approved testing agency. Plywood with blue stain in sapwood is not acceptable.

C.2.13.3.1. 15- to 84-Passenger Buses:

All twenty-six inch (26"), thirty inch (30"), *thirty-six inch (36")* and all thirty-nine inch (39") seat cushions shall be designed and constructed to support, respectively, two or three (2 or 3) passengers of one-hundred-twenty pounds (120 lbs.) each. All seat cushion materials shall meet or exceed the requirements of FMVSS No. 302 and/or California Technical Bulletin 117. The seat cushion shall be either of one-piece (1-piece) construction or may be constructed of more than one-piece (1-piece) at the manufacturer's option. The seat cushion unit shall consist of a base, a one- or two-piece (1- or 2-piece) polyurethane foam cushion, and upholstery, meeting

NOTE: *In determining seat spacing, the National Highway Traffic Safety Administration (NHTSA) divides the seat width by the number 13, which represents the 12.8 inch hip breadth of a 5th percentile adult female dummy. This dummy is approximately 4-feet 11-inches tall and weighs 102 pounds. In the FMVSS formula,*

7.56" to 22.4" = 1 seating position

22.44" to 37.4" = 2 seating positions

37.44" to 52.4" = 3 seating positions

C.2.13.3.2. All Buses:

The one-piece foam cushions shall be solid polyurethane foam conforming to the physical requirements in Table No. 3 (re-bonded or molded polyurethane foams are not acceptable for seat cushion).

**TABLE NO. THREE (3)
ONE-PIECE CUSHION
PHYSICAL PROPERTIES
(ASTM D 3574)**

Item	One-Piece Seat Cushion
Density, lbs. / cubic foot, Minimum	1.8
Load Deflection, 4" thick @ 25% Indentation, Minimum	90
Indentation Load, ratio, 65% / 25%, Minimum	2
Compression Set, 50% Deflection (22 hrs @ 158° F), Maximum	2.0
Tensile Strength, lbs. / square inch, Minimum	10
Tensile Elongation, %, Minimum	150
Tear Resistance, Labs / inch, Minimum	1.5

The two-piece foam cushions shall be solid polyurethane foam conforming to the physical requirements in Table No. 4 (re-bonded or molded polyurethane foams are not acceptable for seat cushion). In the two-piece assembly, the top one-and-one-half inches (1-1/2") of the cushion shall be of one continuous foam piece. All parts of the seat cushion and the seat stiffeners shall be securely cemented or otherwise bonded together to form the seat cushion assembly.

TABLE NO. FOUR (4)
TWO-PIECE CUSHION ASSEMBLY
PHYSICAL PROPERTIES
(ASTM D 3574)

Item	Seat Cushion	Seat Stiffeners
Density, lbs. / cubic foot, Minimum	1.8	2.4
Load Deflection, 4" thick @ 25% Indentation, Minimum	52 ± 5	80
Indentation Load, ratio 65% / 25%, Minimum	2	3
Compression Set, 50% Deflection (22 hrs @ 158° F), Maximum	10	20
Tensile Strength, lbs. / square inch, Minimum	10	12
Tensile Elongation, %, Minimum	150	75
Tear Resistance, labs / inch, Minimum	2	2

C.2.13.3. Seat Frames:

Each school bus with a GVWR over 4,536 kg (10,000 lb) shall have lower anchorages meeting the requirements of FMVSS 225 S9. There will be two anchorages per 39 inch seat on the two (2) most forward passenger seats of the school bus.

Option:

School districts that will be transporting infants in rear facing car seats will need to change these to maximum seat spacing.

C.2.13.3.1. Design and Material:

The seat frames shall be constructed of steel of the type, size, and gauge necessary to meet the seat load deflection requirements of FMVSS No. 222. Flip seats meeting the requirements of FMVSS No. 217 may be utilized at a location to accommodate side emergency exit as required by FMVSS No 217. Seat frame legs shall be two, four, or six (2,4, or 6) pedestal type. The seat backs shall slope backward to provide a comfortable seating angle. Seat backs that are set in a vertical plane or tilt forward are not acceptable.

C.2.13.3.2. Painting Requirements:

The entire seat frame, except that section of the back frame which is padded and upholstered, shall be thoroughly cleaned, primed, and painted. The paint shall have adhesive qualities which will not permit the removal of the paint by means of the thumb nail-scratch method without first chipping a starting place [See Paragraph C.1.3.2.].

C.2.13.4. Seat Installation: Must meet FMVSS 217 and any new or additional FMVSS regulations at their effective date.

C.2.13.4.1. Aisle Width:

The standard aisle width will be a minimum of 12 inches. All school buses equipped with a power lift shall provide a minimum 30-inch aisle leading from any wheelchair/mobility aid position to at least one emergency door. A wheelchair securement position shall never be located directly in front of a power lift door location.

C.2.13.4.2. Attachment:

Each leg shall be attached to the floor with at least two (2) bolts, flat washers, lock washers, and nuts, or approved equal. Where it is impossible to use bolts and nuts at certain floor points due to main cross members or floor sill interference, thread-forming or cutting bolts and lock washers may be used.

C.2.13.4.3. Knee Spacing:

Knee space on all buses shall conform to FMVSS 222:

The horizontal distance between the restraining barrier's rear surface and the seating reference point of the seat in front of which the barrier is required shall not be more than 610 mm (24 inches) measured along a horizontal longitudinal line through the seating reference point in the forward direction.

Allowing for manufacturing tolerances, Texas requires the maximum allowable knee space on buses consistent with the overall standard body lengths [See Paragraph A.2.16. and Option No. 31.

C.2.13.4.4. Track Seating:

See Standard Option, Attachment B for track seating.

C.2.13.5. Upholstery:

The seat cushion and back units shall be covered on top, *bottom* and four (4) sides with a vinyl resin-coated upholstering material as follows:

C.2.13.5.1. Material:

All restraining barriers and passenger seats shall be constructed with materials that enable them to meet the criteria contained in the School Bus Seat Upholstery Fire Block Test. (See Appendix B, page 185 of National School Transportation Specifications and Procedures, May 2000)

C.2.13.5.2. Thread:

The upholstery material shall be securely sewn with a thread meeting the requirements of Federal Specification V-T-295E. The thread in the needle and the tread in the looper (bobbin) of double thread machines shall be size F, Type II (Twisted Bonded Multiple Cord), and size E, Type I (Twisted Soft Multiple Cord), respectively. The thread used in the needle and through the looper shall be Size F (Monofilament), Type III, for single thread machines.

C.2.14. SERVICE ENTRY WAY:

C.2.14.1. Design of Steps:

The entrance door steps shall be designed so the first step shall be not less than ten inches (10") nor more than fourteen inches (14") for "Type A", and "Type C" buses and between eleven inches (11") and sixteen inches (16") for "Type D" buses, from the ground when the bus is unloaded. Risers in each case shall not exceed a height of ten inches (10"). When plywood is used on a steel floor or step, the riser height may be increased by the thickness of the plywood. The step well shall have two or more steps.

C.2.14.1.1. 15- to 20-Passenger Buses:

Steps of adequate width and length shall be fabricated and installed outside or inside the body to meet this requirement. Provisions shall be made to prevent road splash from the wheel from accumulating on steps installed outside the body. The surface of all entrance steps shall have a *non-skid pebble-style tread*. [See Paragraph C.2.14.4: Handrail Installation Requirements]

C.2.14.1.2. 24- to 84-Passenger Buses:

Service door entrance may be equipped with a minimum of a three steps entrance. The stepwell shall not protrude beyond the side body line and shall be fully enclosed to prevent accumulation of ice, snow, and dust. The surface of all entrance steps shall have a *non-skid pebble-style tread*.

C.2.14.2. Entryway Access:

There shall be a minimum of twelve inches (12") of unrestricted access from the service door to the center aisle.

C.2.14.3. Floor Material:

The floor line platform area shall be covered with three-sixteenths inches (3/16") *reinforced* rubber treads with at least one-and-one-half inch (1-1/2") white nosing as an integral piece without any joint. A three inch (3") white rubber step edge with metal back may be substituted in the floor line platform area. Grooved design shall be such that said grooves run at ninety degree (90°) angle to long dimension of step tread. The rubber position of the step trends shall have the following characteristics:

- C.2.14.3.1. Show a Durometer or equivalent hardness of eighty-five to ninety-five (85 to 95).
- C.2.14.3.2. Special compounding for abrasion resistance and high coefficient of friction.
- C.2.14.3.3. Sufficient flexibility so that it can be bent around a one-half inch (1/2") mandrel both at one-hundred-thirty degrees (130°) and twenty degrees (20° F) without breaking, cracking, or crazing.

NOTE: See *Options Attachment B* for adding a white line to floor material at front of passenger compartment.

C.2.14.4. Handrails:

At least one handrail not less than twenty inches (20") in length shall be installed on the forward side of the right barrier. The outside surface of this handle shall be stainless steel, polished aluminum, or chrome-plated steel.. The handrail(s) shall assist passengers during entry or egress, and be designed to prevent entanglement, as evidenced by passage of the NHTSA String and Nut test.

C.2.15. SERVICE OR ENTRANCE DOORS:

Service Door

1. The service door shall be in 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 handle lever is used, no part shall come together that will shear or crush fingers. Manual door controls shall not require more than 25 pounds of force to operate at any point throughout the range of operation, as tested on a 10 percent grade both uphill and downhill.
2. The service door shall be located on the right side of the bus, opposite and within direct view of the driver.
3. The service door shall have a minimum horizontal opening of 24 inches and a minimum vertical opening of 68 inches (*for Type A*) and 72 inches (*for Types C, & D*).
4. Service door shall be a split-type and open outward
5. All door panels shall be of approved safety glass. The bottom of each lower glass panel shall not be more than ten inches from the top surface of the bottom step. The top of each upper glass panel shall not be more than three inches from the top of the door. Type A vehicles shall have an upper panel (windows of safety glass with an area of at least 350 square inches.
6. Vertical closing edges on split-type or folding-type entrance doors shall be equipped with flexible material to protect children's fingers. Type A vehicles may be equipped with the chassis manufacturer's standard entrance door.

7. There shall be no door to the left of the driver on Type C or D vehicles. All Type A vehicles may be equipped with the chassis manufacturer's standard left-side door.
8. All doors shall be equipped with padding at the top edge of each door opening. Padding shall be at least three inches wide and one-inch thick and extend the full width of the door opening.
9. *All service doors must allow for manual opening.. Power operated service doors must have an emergency release valve, and a switch or a device to release the service door must be **easily accessible** and clearly labeled.*

Powered Service Doors shall be clearly and concisely marked with operating instructions in case of power failure.

C.2.16. SKIRT REINFORCEMENT:

C.2.16.1. Type A (15- to 20-Passenger) Buses:

Side skirts of 15-through 20-passenger buses, if on commercial cut away, shall be gusseted or braced, where required, for rigidity and to prevent undue vibration.

C.2.16.2. Type C & D (24- to 84-Passenger) Buses:

Side skirts shall be gusseted or braced on not more than thirty inch (30") centers and wherever required for rigidity and to prevent vibration. If the body sections are authorized to be longer than thirty inches (30"), no more than three sections of skirt reinforcement shall be on centers up to a maximum of thirty-six inches (36"), or no more than one (1) section shall be on centers up to a maximum of thirty-eight-and-three-fourths inches (38-3/4"). Gussets should be welded to prevent corroded rivets coming loose causing weak skirt attachment.

C.2.17. VENTILATION:

The bus body shall be equipped with a, controlled ventilation system

C.2.17.1. Type C & D (24- to 84-Passenger) Buses:

A static-type, non-closeable exhaust ventilator shall be installed in the low-pressure area of roof.

C.2.18. WHEELHOUSING:

C.2.18.1. Type A Buses:

The wheel housing shall be the manufacturer's standard design. [See Paragraph C.1.4: Undercoating Requirements.]

C.2.18.2. Type C & D Buses:

The wheelhousing shall be of the type, grade, and thickness of steel specified in Table No. Two (2) or approved equal. The wheelhousing shall be constructed of a maximum of three pieces of arched design and shall be attached to form a waterproof and dust proof seam. The size of the wheelhousing shall allow for tire chain clearance. The edges inside the bus shall be rounded to prevent injury to the passengers. The wheelhousing shall be such that when attached to the body, the strength of the resulting structure shall be equivalent to or greater than that section of body that has been removed to receive the wheelhousing.

C.2.19. WINDSHIELD AND WINDOWS:

C.2.19.1. General Design:

C.2.19.1.1. Side Windows, Passenger, Standard: There shall be either a standard or a push-out type window accessible for each passenger seat except where it is not possible because of the installation of side emergency exits or lift door. Buses may have one less set of passenger windows than rows of seats provided that each seat has access to a window. [See Section C.2.4. and Paragraph C.2.19.1.2.].

Standard side windows shall open from the top only and shall operate freely. All side windows except the driver's and the service door windows, shall be split sash type with positive latch. Side windows that can be latched in an uneven position are not acceptable. The passenger side windows shall provide an opening at least twenty-two inches (22") wide and between nine and thirteen inches (9" and 13") high, with minimal obstruction by the seatbacks or other objects.

C.2.19.1.2. Side Windows, Passenger, Push-out Type: These windows shall be hinged at the top and shall be positioned for ease of egress. These windows shall provide an opening at least twenty-two inches (22") wide and thirteen Inches (13") high, with minimal obstruction by seatbacks or other objects. These windows shall meet or exceed Federal Standards. Push-out windows shall be equipped with an electrical switch connected to an audible signal automatically operated and located in the driver's compartment, which shall indicate when the window is pushed out in excess of one-half (1/2"). The switch shall be enclosed to prevent tampering. Wires leading from the switch shall be concealed in the walls. No cut-off switch shall be installed in the circuit.

NOTE: See Option Attachment B for Push-out Windows hinged at front edge instead of top.

C.2.19.1.3. Service Door and Emergency Door Windows:

All glass panels in the emergency and service doors for all buses shall be safety glass panels, except Type A – Style I, [See Section C.2.4.] permanently closed, and set in rubber or sealed against rubber.

C.2.19.1.4. Rear windows (not emergency door windows) shall be installed on each side of the rear emergency door, except Type A – Style I. Each rear window glass shall have a minimum area of one-hundred-forty square inches (140 sq. in.) and shall be set solid in a waterproof manner. These windows shall be installed securely to prevent removal by hand. A rear "push-out" window, meeting the requirements of FMVSS No. 217, shall be provided on the rearward window on rear engine buses.

C.2.19.1.5. Side Window, Driver's: The driver's window shall be a two-piece (2-piece) window of either of the following types:

(i) Two-piece (2-piece) sliding-sash type: This type will be acceptable only when the bus is equipped with an adequate air scoop to draw outside air into the driver's compartment. When driver's ventilation is drawn through the heater system, this air shall be shielded from the heat sources and a hot water cut-off valve shall be provided in the driver's compartment.

(ii) Other Type: This type of window shall have the front part opening either in or out and rear part lowering and raising by use of a regulating handle.

C.2.19.1.6. Windshield:

C.2.19.1.6.1. Type A (15- to -20-Passenger) Buses:

The windshield shall be minimum seven-thirty-seconds inch ($7/32''$) thick safety plate glass and shall be heat-absorbent, laminated AS-1 safety glass meeting ANSI Standard Z26.1, as amended.

C.2.19.1.6.2. Type C & D (24- to 84-Passenger) Buses:

The maximum width of the windshield center post shall not exceed two-and-one-half inches ($2-1/2''$). There shall be at least two inches ($2''$) of clearance between the steering wheel and the windshield, cowl, instrument panel, or any other surface.

C.2.19.2. Glazing:

Glass shall be installed in rubber channel gasket material or approved equivalent material. The glass shall be mounted so that the permanent identification mark is visible from either inside or outside of the bus. All safety glazing materials shall be approved by the Texas Department of Public Safety. The glass shall be as follows:

C.2.20.2.1. Rear and Other Windows:

The glass in the rear (side) windows, and all other windows including the driver's side *and passenger's* windows and the emergency door windows, shall be a minimum of one-eighth inch (1/8") laminated safety glass and shall be AS-2 grade as specified in ANSI Safety Code Z26.1.

C.2.20.2.2. Windshield:

The windshield shall be a minimum seven-thirty-seconds inch (7/32") thick laminated safety glass and shall be heat-absorbent, laminated AS-1 safety glass meeting ANSI Standard Z26.1, as amended.

C.2.20.3. Tinting:

C.2.19.3.1. Side Windows, Passenger:

See Standard Option Attachment B for tinting on passenger side windows.

C.2.19.3.2. Windshield:

The windshield shall have a horizontal gradient band (tinted) starting slightly above the driver's line of vision with approximately ninety percent (90%) light transmittance and gradually decreasing to a minimum of seventy percent (70%) light transmittance at the top of the windshield, or the entire windshield shall be tinted to meet the requirements, of FMVSS No.205.

C.2.20. Sun Shield

- A. An interior adjustable *transparent* sun shield, with a finished edge and not less than 6 inches x 30 inches for Types B, C, and D vehicles, shall be installed in a position convenient for use by the driver.
- B. On all Type A buses, the sun shield (visor) shall be installed according to the manufacturer's standard

C.3. ACCESSORIES, REQUIRED AND OPTIONAL:

C.3.1 24 – 84 PASSENGER BUSES ACCESS PORT:

An access port with cover plate shall be installed above the fuel sending unit. It shall be of sufficient size to service fuel sending units and fuel pumps installed in the fuel tank. An access port is not required on buses with front-mounted wheelchair lifts [See Attachment E -Paragraph E.1.7.1.].

C.3.2. BACKUP ALARM:

An automatic, audible backup warning alarm meeting the requirements of type C, 97 decibels (A), SAEJ994 shall be installed behind the rear axle.

C.3.3. Public Address System

Certain A/C systems will produce a level of background noise that may inhibit the driver's ability to communicate with the passengers.

NOTE: No speakers shall be installed in the driver's compartment (within a minimum of ten feet from the driver).

See Standard Options, Attachment B for Public Address System.

C.3.4. DEFROSTERS:

Defrosting equipment shall keep the windshield, the window to the left of the driver, and the glass in the service door clear of frost, and snow, using heat from the heater and circulation from fans. All defrosting equipment shall meet the requirements of FMVSS No 103. Any circulating fan installed on the curb side of the bus front shall be mounted on the windshield header to protect the fingers, hair, and clothing of entering and departing passengers.

C.3.5. EMERGENCY EQUIPMENT:

All school buses shall be equipped with the following emergency equipment:

C.3.5.1. Body Fluid Cleanup Kit:

Each bus shall be provided with a mounted, removable, moisture-proof metal or hard plastic body fluid cleanup kit. There shall be no advertising on the kit. ***This kit shall be mounted in the driver's area.*** This kit shall be identified as a body fluid cleanup kit, and shall NOT display the bio-hazard symbol, and contain as a minimum the following items:

- 1 -- Step-by-step instructions, with drawings/pictures, including how to take off the rubber gloves*
- 1 -- 15 oz. Chlorine-type absorbent deodorant material with odor counteractant
- 1 -- 12 oz. Germicidal spray disinfectant-EPA registered liquid
- 2 -- pair disposable latex gloves
- 4 -- 18" x 18" absorbent towels
- 1 -- pick-up spatula-water resistant
- 1 -- plastic hand broom
- 1 -- plastic dust pan
- 2 -- 14" x 19" disposal bags and ties (waterproof)
- 2 -- adhesive "BODY FLUID CLEANUP" labels
- 1 -- 12 oz. Deodorant spray
- 4 -- individually wrapped, cold sterilization wipes in foil-lined pouches
- 2 -- paper respiratory masks
- 1 -- metal or hard plastic mountable container identified as "BODY FLUID CLEANUP KIT" with orange face and black lettering – ***No Bio-hazard Symbol.***

C.3.5.2. Fire Extinguishers:

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

The fire extinguisher shall have a total rating of 2A10BC or greater. The operating mechanism shall be sealed with a type of seal that will not interfere with the use of the fire extinguisher.

C.3.5.3. First Aid Kit:

Buses shall have a removable, metal or hard plastic first aid kit container mounted in an accessible place within the driver's compartment. The compartment shall be marked to indicate the location of the kit. There shall be no advertising on the kit. The kit shall contain each item listed below in the quantity indicated:

<u>Quantity</u>	<u>Item</u>
2 --	1" x 2-1/2 yds. 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 5 yds. Sterile gauze roller bandages
2 --	non-sterile triangular bandage approx. 40" x 36" x 54", 2 safety pins
3 --	sterile gauze pads 36" x 36"
3 --	sterile eye pads
1 --	rounded end scissors
1 --	pair latex gloves
1 --	mouth-to-mouth airway

C.3.6. HEATERS AND RELATED COMPONENTS:

C.3.6.1. Heating System

- A. The heater shall be hot water.
- B. If only 1 heater is used, it shall be fresh-air or combination fresh-air and re-circulation type.
- C. If more than 1 heater is used, additional heaters may be re-circulating air type.
- D. The heating system shall be capable of maintaining bus interior temperatures as specified in SAE test procedure J2233.
- E. All forced air heaters installed by body manufacturers shall bear a name plate that indicates the heater rating in accordance with SBMTC-001. The plate shall be affixed by the heater manufacturer and shall constitute certification that the heater performance is as shown on the plate.
- F. 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. Heater lines on the interior of bus shall be shielded to prevent scalding of driver or passengers.
- G. Each hot water system installed by a body manufacturer shall include one shut-off valve in the pressure line and one shut-off valve in the return line with both valves at the engine in an accessible location, except that on all Type A and B buses, the valves may be installed in another accessible location.
- H. There shall be a water flow regulating valve installed in the pressure line for convenient operation by the driver while seated *in the driver's seat*.
- I. Accessible bleeder valves shall be installed in an appropriate place in the return lines of body company-installed heaters to remove air from the heater lines.
- J. Access panels shall be provided to make heater motors, cores and fans readily accessible for service. An outside access panel may be provided for the driver's heater.

C.3.6.2. Heater, Standard:

C.3.6.2.1. Type A Buses:

Each bus shall be equipped with the manufacturer's standard, factory-installed fresh air type heater. Controls shall be mounted on the dash.

C.3.6.1.2. Type C & D Buses:

Each bus shall be equipped with a combination fresh air and re-circulating air heater(s). The heater(s) shall be a hot water type. The Btu/hr. rating shall be in accordance with Standard SBMTC No. 001.

The standard heater for 35-passenger and larger buses shall have a minimum 90,000 BTU.

C.3.6.3. Heater, Auxiliary:

See Standard Option Attachment B for Auxiliary Heater Option.

C.3.7. MUD FLAPS:

See Standard Option Attachment B for Mud Flaps.

C.3.8. STIRRUP STEPS (Type C & D Buses):

There shall be one stirrup step and a suitably located handle on each side of the bus body front for easy accessibility in cleaning the windshield and lamps. The stirrup step on transit buses may be deleted if adequate step hole is provided in face of front bumper. *The bus must have a handle or hand hold for use with stirrup steps.*

C.3.9. MIRRORS, EXTERIOR (All Buses):

Exterior mirrors shall conform to the requirements of FMVSS No. 111. Each school bus shall be provided with exterior mirrors and brackets as described below:

See Standard Options, Attachment B for mirror options.

C.3.9.1. Mirror System, Crossover:

Two crossover mirrors shall provide a view ten feet (10') forward of the front bumper and the front eight feet (8') of the bus to the left and right sides.

C.3.9.2. Mirror System, Rearview:

Each school bus shall be equipped with exterior mirrors meeting the requirements of FMVSS No. 111.

C.3.9.3 Mounting and Mounting Brackets, Standard:

Mirror mounting and backing shall be of steel or a high-impact plastic such as a polycarbonate/polyethylene terephthalate blend, or approved equal. Where possible, mounting of all exterior mirrors to the bus body shall be by bolts nuts, and lock washers. Otherwise, No. 10 hexagon head sheet metal bolts with star lock washers or No. 10 hexagon head sheet metal screws with serrated surface shall be used. This mirror system shall be adjustable but be rigidly braced to reduce vibration.

C.3.9.4. Painting:

Brackets and assemblies of all exterior rearview and cross over mirrors shall be cleaned and prepared for painting in accordance with Federal Specification TT-C-490D, Type I or II. If painted, the metal backs of stainless steel, aluminum, and chrome-plated exterior and crossover mirrors and the backs of all other metal-backed exterior and crossover mirrors shall be finished in black (Color No. 37038 of Federal Standard No. 595b).

C.3.10. MIRRORS, INTERIOR:

A clear-vision interior rear view mirror conforming to FMVSS No. 111 shall be furnished and installed. The mirror shall be made of safety glass, have rounded corners and protected edges, and provide a rear view of the road and passengers.

- A. The mirror shall be at least six inch by sixteen inch (6" x 16") size vision area for the Type A (15 to 20 passenger) buses.
- B. The mirror shall be at least six inch by thirty inch (6" x 30") vision area for Type C and D (24 to 84 passenger) buses.

C.3.11. REFLECTIVE MATERIAL:⁸

⁸ Reflectivity of stop signal arm is addressed under Stop Signal Arm Section 3.11. Signs, if used, placed on the rear of the bus relating to school bus flashing signal lamps or railroad stop procedure may be of reflective material as specified.

Buses shall be equipped with retroreflective material meeting the following requirements. The material shall conform to the standard measurements of ASTM E-810, "Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting, and shall retain at least fifty percent (50%) of those values for a minimum of *three (3)* years. Retroreflective materials and markings shall be installed in the following locations:

C.3.11.1. Rear of Bus Body:

The rear of the bus body shall be marked with strips of reflective NSBY material to outline the perimeter of the back of the bus using material which conforms with the requirements of FMVSS No. 131, Table 1. The perimeter marking of rear emergency exits per FMVSS No. 217 and/or the use of reflective "SCHOOL BUS" signs partially accomplishes the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of at least 1- 3/4 inch reflective NSBY material shall be applied horizontally above the rear window and above the rear bumper, extending from the rear emergency exit perimeter, marking outward to the left and right rear corners of the bus. Vertical strips shall be applied at the corners connecting these horizontal strips.

C.3.11.2. Sides of Bus Body:

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

C.3.11.3. "SCHOOL BUS" Signs:

“SCHOOL BUS” signs, if not of lighted design, shall be marked with reflective NSBY material comprising background for lettering of the “SCHOOL BUS” signs on the front and rear end caps and both sides of bus.

C.3.11.4. Front and Rear Bumper

When specified in the IFB, the front and rear bumper may be marked diagonally 45 degrees down to centerline of pavement with 2 inch \pm 1/4 inch wide strips of reflective material, followed by a 2 inch \pm 1/4 inch strip of unmarked (painted black) bumper.

NOTE: See Option Attachment B for reflective material on bumpers.

C.3.12. STOP ARM:

Buses shall be equipped with one stop arm. The minimum shall be a reflectorized stop sign (both sides of the blade) with flashing red lights above and below the word “stop” on both sides. The sign(s) shall be air or electric driven and shall deploy and retract automatically.

Dual stop arms may be provided on buses *designed for* 47 passengers or larger.

A school bus stop arm meeting SAE J1133 and the following requirements shall be provided.

NOTE: If more than one stop arm is provided, all stop arms must meet SAE J1133, FMVSS 131, and the following requirements. *When two stop arms are installed on a school bus, the rearmost stop arm shall not contain any lettering, symbols, or markings on the forward side.*

C.3.12.1. Design:

The sign shall be octagon-shaped, constructed of zinc-coated steel, aluminum, or equivalent material of equal durability. It shall have a minimum one-half inch (1/2”) wide white border and the word “STOP” in white letters at least six inches (6”) high against a red background on both sides. The letters, border and background shall be of reflective materials meeting DOT FHWA FP-85. Double-faced red, alternately flashing lamps, flashing both sides, one each at the top and bottom (visible from each side of the structure) shall be connected to, and flash with the required school bus red flashing signal lamp circuit when the arm is extended, or an LED Stop Sign. The arm mechanism may be activated by air pressure, electricity, or by vacuum. The stop arm assembly shall be non-corrosive.

C.3.12.2. Mounting:

If only one stop is provided, the stop arm shall be installed on the left side of the school bus near the front cowl section. If a second stop arm is provided, it shall be installed on the left side of the bus near the rear section of the bus.

C.3.12.3. Stop Arm Options:

See Standard Options Attachment B for additional stop arm information.

C.3.13. STUDENT SAFETY CROSSING ARM:

See Standard Option, Attachment B for Crossing Arm.

Districts may wish to consider that buses be equipped with a crossing control arm mounted on the right side of the front bumper. This arm when opened shall extend in a line parallel with the body side and positioned on a line with the right side wheels.

C.3.14. WINDSHIELD WASHERS AND WIPERS:

C.3.14.1. Washers:

An electric-operated windshield washer shall be furnished and installed. The washer shall have a minimum reservoir capacity of one quart (1 qt.) of liquid and shall direct a stream of water into the path of travel of each windshield wiper blade each time the actuating button is operated.

C.3.14.2. Wipers:

A windshield wiping system, two (2) speed or variable speed, with an intermittent feature, shall be provided.

The wipers shall be operated by one (1) or more air or electric *motor*. If one (1) motor is used, the wipers shall work in tandem to give full sweep of windshield.

C.4. APROVAL PROCEDURES OF NEW BODIES, CHASSIS, ENGINES, OPTIONS AND "OR EQUAL" PRODUCTS:

See Attachment G for procedures of approval of new bodies, chassis, and engines.

See Attachment H for procedures for approval of new options.

See Attachment I for procedures for approval of new "or equal" products.

C.4.1. INSPECTION AND EVALUATION:

For additional information, see the Attachments listed above as well as:

Attachment D, School Bus Specifications Inspection Checklist.

Attachment C, School Bus Delivery Checklist.

- C.4.1.1.** The bus body, chassis and engine shall be inspected using the current School Bus Specifications Inspection checklist.
- C.4.1.2.** The bus body, chassis and engine will be evaluated and if found suitable for the intended purpose, the Commission will issue a letter to the vendor or manufacturer listing the model as approved for the capacities requested. If found not suitable, the Commission will issue a letter to the vendor or manufacturer giving the reason (s) for disapproval.
- C.4.1.3.** Once a bus body, chassis and engine are approved for one passenger capacity, other capacities of this same body differing only in length and capacity need not be inspected and evaluated prior to approval. The vendor or manufacturer shall request by letter that these other body lengths/models be approved.

D. CHASSIS SPECIFICATIONS

D.1. GENERAL REQUIREMENTS:

D.1.1. GENERAL SPECIFICATIONS:

The requirements for gross vehicle weight ratings (GVWR), front and rear gross axle weight ratings (GAWR) and tire sizes and load ranges, as specified in Attachment B for each size chassis are minimum requirements. If additional optional equipment is ordered which necessitates increased capacity ratings of any axle, springs or tires, it is the responsibility of the vendor to furnish them so proper certification can be made on the vehicle.

D.1.2. COLOR:

The chassis, including bumpers and wheels shall be enameled or powder coated black per National Standards; cowl and fenders shall be painted National school bus yellow. ***The hood may be painted in accordance with Section C.1.3.***

NOTE: For Type A buses, the bumpers and wheels shall be painted the chassis manufacturer's standard color.

D.2. AXLES, SUSPENSION, AND RELATED COMPONENTS:

D.2.1. AXLE CAPACITIES:

Axle capacities and gross axle weight ratings (GAWR) shall be as recommended by the manufacturer to accommodate all equipment on the bus.

D.2.2. BRAKES AND RELATED COMPONENTS:

D.2.2.1. Air Brakes and Associated Equipment:

Each 59 through 84 passenger chassis shall be equipped with full anti-lock air brakes and parking brake systems as standard equipment. Full air brake systems shall meet the requirements of FMVSS No. 121 as applicable to school buses.

Hydraulic brakes will be the standard for the 15 to 53 passenger buses. Anti-lock air brakes may be ordered as an option for 35 to 53 passenger buses.

The following equipment shall be furnished as follows:

D.2.2.1.1. Air Compressor: Buses equipped with air brakes shall have an air compressor of sufficient capacity to provide adequate air pressure for the air brake system. All air-brake buses shall have a minimum twelve cubic feet (12 cu. ft.) capacity.

D.2.2.1.2. Air Dryer: The air *brake system* shall be equipped with an automatic air dryer.

D.2.2.1.3. Automatic Moisture Ejectors: Automatic moisture ejector(s) shall be furnished and installed. (*One per wet tank*)

D.2.2.1.4. Automatic Slack Adjusters: Four (4) automatic slack adjusters shall be furnished and installed *on all wheels*. Either stroke or clearance sensing slack adjusters are approved.

D.2.2.1.5. Visual Brake Stroke Adjustment Indicators: Visual Brake Stroke Adjustment Indicators shall be furnished at each brake location.

D.2.2.2. Hydraulic Brakes

The hydraulic braking system shall include the service brake, an emergency brake that is a part of the service brake system and controlled by the service brake control, and parking brake. *Braking system shall meet all requirements of FMVSS 105.*

D.2.2.2.1. Warning, Low Fluid:

Hydraulic assist-boosters shall audibly and visually warn of fluid or power loss.

D.2.2.2.2. Standard Brakes:

The 15 to 24- passenger school bus chassis shall have as standard anti-lock, hydraulic service brakes, emergency stopping system, and parking brakes meeting the requirements of FMVSS No. 105-83.

D.2.3. HUBODOMETER

See Standard Options, Attachment B for hubodometer.

D.2.4 SHOCK ABSORBERS

All buses shall be provided with heavy duty shock absorbers as a minimum.

See Standard Options, Attachment B for alternative ride enhancements.

D.2.5. TIRES AND WHEELS:

D.2.5.1. TIRES:

For tire size and load range for each size chassis, see Attachment B – Minimum Requirements Tables. All tires shall be:

- A. All tires shall be steel belted radial tubeless type.
- B. All tires shall be new and the tread style furnished shall be the tire manufacturer's standard design and the brand normally furnished on regular production orders.
- C. All tires shall be "Original Equipment Line Quality."

See Standard Options, Attachment B for mud and snow tires.

D.2.5.2. Wheels:

D.2.5.2.1. Type A Buses

Both sides of all wheels, including the spare, shall be finished in the chassis manufacturer's standard color.

D.2.5.2.2. Type C, and D Passenger Buses

Both sides of all wheels, including the spare, shall be black (Color No. 17038)

D.2.5.2.3. Spare Wheels:

- A. See Standard Options, Attachment B for spare wheels.

D.3. CHASSIS FRAME AND RELATED COMPONENTS:

D.3.1. Front Bumper:

- A. School buses shall be equipped with a front bumper. The front bumper shall be furnished by the chassis manufacturer for all school bus types unless there is a specific agreement between the chassis manufacturer and body manufacturer.
- B. The front bumper shall be of pressed steel channel or equivalent material (except Type A buses having a GVWR of 14,500 pounds or less which may be OEM supplied) at least 3/16" thick and not less than 9-1/2" wide (high). It shall extend beyond forward-most part of the body, grill, hood and fenders and shall extend to the outer edges of the fenders at the bumper's top line.
- C. The front bumper, except breakaway bumper ends, shall be of sufficient strength to permit pushing a vehicle of equal gross vehicle weight without permanent distortion to the bumper, chassis, or body.
- 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 eyes. For the purpose of meeting this specification, the bus shall be empty and positioned on a level, hard surface and both tow shall share the load equally.
- E. Tow eyes or hooks **may** be furnished and attached so they do not project beyond the front bumper. Tow eyes or hooks attached to the chassis frame shall be furnished by the chassis manufacturer. NOTE: Rear tow eyes are addressed in the Body Section under Towing Attachment points
- F. On a Type D school bus, if the chassis manufacturer does not provide a bumper, it shall be provided by the body manufacturer. The bumper will conform to the standards described in the "Bus Chassis Specifications."
- G. The bumper shall be black. Bumpers for "Type A" school buses shall be the manufacturer's standard color.
- H. Mounting brackets or pre-drilled spaced holes will be provided for the installation of license plates both in the front and rear of the bus.

D.3.2. CHASSIS FRAME SIDE MEMBERS:

Each frame side member shall be of one-piece (1-piece) construction between the rear most spring hanger and the forward most spring hanger. If the frame side members are extended, such extension shall be designed, furnished, and guaranteed by the installing manufacturer. The installation shall be made by either the chassis or body manufacturer. Extensions of frame lengths are permissible only when such alterations are welded on behind the hanger of the rear spring. This specification does not permit wheel base extensions. Any welding, heating (for frame straightening or repairs), or the drilling of holes in chassis frame members shall be in accordance with chassis manufacturer's recommendations, and shall not compromise the structural integrity of the bus.

D.3.3. FUEL TANKS, CONVENTIONAL FUEL:

The fuel system shall comply with FMVSS No. 301.

Bus Size	Minimum Standard	Optional
Type A	33	55 (Ford)
Type C	60 (30 on 35 passenger)	100 (71L & 77 passenger only)
Type D	60 (40 on 47 passenger)	100 (FE-77 & 84; RE 72, 77, 84 passenger only)

D.3.4. Type C & D (35- to 84-Passenger) Bus Material:

Each tank (including auxiliary fuel tanks) shall be constructed of sixteen (16) gauge terneplate or equivalent and shall be equipped with baffles. Each tank may be mounted between the frame rails of the chassis.

D.3.5. FUEL TANKS, ALTERNATIVE FUEL:

Fuel tank(s) for alternative fuels shall meet or exceed all of the rules and regulations of the Texas Railroad Commission (RRC), the requirements of FMVSS No. 304 and others, as applicable. Capacity shall be that required to meet the range requirements of the alternative fuel option or as specified in the Invitation for Bids.

D.3.6 STEERING, POWER and TILT:

The bus shall be furnished with the chassis manufacturer's standard power steering that will provide safe and accurate performance at maximum load and speed. A factory installed tilt steering wheel/column is required.

NOTE: See Options Attachment B for telescoping steering wheel.

D.4. ELECTRICAL SYSTEM AND RELATED COMPONENTS:

D.4.1. ALTERNATORS:

This is a performance specification. Installer shall consider the following for alternators:

- A. Fourteen volt minimum (for a 12 Volt System).
- B. Ventilated and voltage controlled
- C. Current controlled, if necessary.

D.4.1.1. Buses Equipped with or without Air Conditioning and Wheelchair Lifts:

D.4.1.1.1. Alternator Performance Requirements

It is the responsibility of the installer of the wheelchair lift to provide an alternator to adequately maintain the electrical system while the bus remains at OEM idle speeds as well as standard operating speeds. The following conditions shall be considered, but not be limited, to the alternator selection and installation.

D.4.1.1.1.1. Electrical System, Maximum Amperage Draw Test

- A. The installer shall determine the total amperage draw at OEM idle speeds with all electrical items turned on. To determine the greatest draw on the electrical system, the wheelchair lift shall be in operation lifting a minimum weight of 350 pounds during the "maximum amperage draw test."
- B. The cabling shall be inspected to determine sufficient current flow from the alternator to the battery as well as to the ground to maintain proper system amperage requirements.
- C. The alternator selected shall be capable of delivering the required amperage at OEM idle speeds while not sustaining damage or causing damage to the electrical system or components at operating speeds of up to 60 MPH.

D.4.1.1.2. Cabling

With the addition of air conditioning and/or wheelchair lifts, their cabling and that of the alternator and battery system shall be increased to accommodate the increased amp load.

D.4.2. BATTERY AND RELATED COMPONENTS:

The storage battery(ies), furnished on each chassis shall have sufficient capacity to supply current for adequate operation of the engine starter, lights, signals, heater, and all other electrical equipment whether standard or optional. The batteries for all buses shall be single, dual, or 3 twelve (12) volt batteries as specified by the chassis manufacturer and meet the demands of the system whenever the electrical load exceeds the output capacity of the alternator.

**WITHOUT AIR-CONDITIONING & WHEELCHAIR LIFT
SINGLE OR DUAL
12 VOLT BATTERY(IES)**

Passenger Size	Minimum BCI Cold Cranking AMPS (CCA) at 0 degrees (0° F)	Minimum Reserve Capacity
All Buses Gasoline	600	100 minutes
15 to 24 Diesel Engines	600	100 minutes
35 to 84 Diesel Engines	1100	240 minutes
Alternate Fuel	Manufacturer Recommended	Manufacturer Recommended

**WITH AIR-CONDITIONING & WHEELCHAIR LIFT
SINGLE OR DUAL
12 VOLT BATTERY(IES)
(3 Batteries)**

Passenger Size	Minimum BCI Cold Cranking AMPS (CCA) at 0 degrees (0° F)	Minimum Reserve Capacity
All Buses Gasoline	1200 (by Chassis)	
15 to 24 Diesel Engines	1200	
35 to 84 Diesel Engines	1950 CCA	
Alternate Fuel	Manufacturer Recommended	Manufacturer Recommended

D.4.2.1. BATTERY COMPARTMENT for ALL BUSES:

The bus body manufacturer shall provide a battery compartment beneath the floor of the bus body. This compartment shall be a skirt type container, reinforced and equipped with a pullout receptacle *tray* and an outside access door. The battery compartment shall provide complete weather protection for the battery as well as total access for servicing [See Paragraph D.4.2.4.]. ***Battery securement shall be of the appropriate size for the battery(ies) provided.***

See Standard Options, Attachment B for locked battery compartment.

D.4.2.2. Type A Bus Dual Batteries:

When two (2) batteries are provided, they shall both be installed ***outside the passenger compartment with outside access.*** .

NOTE: Single batteries *may* be installed under the hood.

D.4.2.3 Cables for ALL BUSES:

See performance rating for each particular vehicle. [See Section D.4.1. and tables in D.4.2.]

Each battery cable shall be:

- A. One piece
- B. Of sufficient length to allow pull out or lift out of the battery for service or removal.
- C. Installed to allow for battery removal without causing damage to battery posts.

D.4.3. HORNS:

Each bus shall be equipped with horn(s) of standard make. Each horn shall produce audible sounds in the frequency range from two hundred fifty to two thousand (250 to 2,000) hertz and at an intensity of between eighty-two (82) and one-hundred-two (102) decibels. The sound level measurements shall be made at a distance of fifty (50) feet directly in front of the vehicle in accordance with SAE J377.

D.4.4. INSTRUMENTS AND INSTRUMENT PANEL:

- D.4.4.1.** The chassis shall be equipped with the instruments and gauges listed below. (Telltale warning lamps in lieu of gauges are not acceptable, except as noted).
 - A. Speedometer,
 - B. Odometer which will give accrued mileage (to seven digits), including tenths of miles,
 - C. Voltmeter (An ammeter with graduated charge and discharge indication is permitted in lieu of a voltmeter, however; when used, the ammeter wiring must be compatible with the current flow of the system.)
 - D. Oil pressure gauge,
 - E. Water temperature gauge,
 - F. Fuel gauge,
 - G. Upper beam headlamp indicator, (a lamp/light)
 - H. Brake indicator gauge (vacuum or air), (A telltale warning lamp indicator in lieu of a gauge is permitted on a vehicle equipped with a hydraulic-over-hydraulic brake system.)
 - I. Turn signal indicator, (a lamp/light) and
 - J. Glow-plug indicator light where appropriate.(a lamp/light)

- D.4.4.2.** All instruments shall be easily accessible for maintenance and repair.

- D.4.4.3.** 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.4.4.4** The instrument panel shall have lamps of sufficient candlepower to illuminate all instruments, gauges and shift selector indicator for the automatic transmission.

- D.4.4.5. Multi-function gauge (MFG)**
 - A. The driver must be able to manually select any displayable function of the gauge on a MFG whenever desired.
 - B. Whenever an out-of-limits condition that would be displayed on one or more functions of a MFG occurs, the MFG controller should automatically display this condition on the instrument cluster. This should be in the form of an illuminated telltale warning lamp as well as having the MFG automatically display the out-of-limits indications. Should two or more functions 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.
 - C. The use of a MFG does not relieve the need for audible warning devices, where required.

D.4.5. LAMPS:

Each bus shall be equipped with at least two clear headlamps meeting the requirements of FMVSS No. 108 and a dimmer switch located on the steering column. Parking lamps operated by a switch in common with the headlamps shall be provided.

D.4.6. TURN-SIGNAL AND VEHICULAR WARNING SIGNAL OPERATING UNITS AND FLASHERS:

The operating units and flashers for turn signals and vehicular hazard warning signals shall meet the requirements FMVSS No. 108 [See Sections C.1.7 and C.1.11.].

D.4.7. WIRING:

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

D.4.7.1. Backup lamps.

D.4.7.2. Instrument panel lights (rheostat controlled by headlamp switch).

D.4.7.3. Left turn signals.

D.4.7.4. Right turn signals.

D.4.7.5. Stop lamps.

D.4.7.6. Tail lamps.

D.5. ENGINE AND RELATED COMPONENTS:

D.5.1. AIR CLEANER:

A dry element type air cleaner shall be provided

D.5.2. AIR CLEANER RESTRICTION INDICATOR:

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.

D.5.3. COOLING SYSTEM:

The cooling system radiator shall be engine manufacturer's recommended type and shall cool the engine at all speeds in all gears. The cooling system fan shall be the reinforced type with a fan clutch.

D.5.4. ENGINES:

Approved engines listed in each table for the various size buses are the engines for which the vendor has requested approval and are usually the smallest engine in terms of performance that will meet the minimum requirements.. The approved engine tables, in the Minimum Requirements Tables in Attachment A, will be updated as new engines or additional versions of current engines are approved. Please note that only those engines approved as specified and listed either in the Texas School Bus Specification will be acceptable for school buses.

See the Approved Engine Tables in the Minimum Requirements Tables in Attachment G.

D.5.4.1 POWER REQUIREMENTS:

Each bus shall be furnished with an engine that meets or exceeds the following minimum requirements, when tested at or above the gross vehicle weight rating (GVWR) required for a given bus capacity and with all accessories except air conditioning compressor on and operating:

- D.5.4.1.1.** Acceleration from zero to fifty miles per hour (0 -- 50 mph) in sixty seconds or less.
- D.5.4.1.2.** Grade ability of one-and-one-half percent (1.5%) minimum at fifty miles per hour (50 mph).
- D.5.4.1.3.** Grade ability of five percent (5%) minimum at twenty-five miles per hour (25 mpg).
- D.5.4.1.4.** Start ability of twenty percent (20%) minimum.

D.5.5. EXHAUST SYSTEM:

D.5.5.1. Component Placement:

The exhaust pipe, muffler, and tail pipe shall be mounted under the bus and attached to the chassis frame.

D.5.5.2. Tailpipe Exit:

The tailpipe shall not exit the side of the bus anywhere within twelve inches (12") of a vertical plane through the center of the fuel filler opening and perpendicular to the side of the bus, unless protected with a metal shield to divert spilled fuel away from tailpipe. The tailpipe shall exit to the rear of the bus whenever possible.

D.5.5.3. Tailpipe:

The tailpipe shall be constructed of seamless or electrically welded tubing of minimum sixteen (16) gauge steel or equivalent, and shall extend no more than two inches (2") beyond the rear bumper. The size of the tailpipe shall not be reduced after it leaves the muffler

D.5.6. APPROVAL OF NEW ENGINES:

See procedures for adding to the Approved Engine Tables in the Minimum Requirements Tables in Attachment A.

D.6. TRANSMISSION AND RELATED COMPONENTS:

D.6.1. AUTOMATIC TRANSMISSION:

Unless otherwise specified in the Invitation for Bids, all buses shall be delivered with an automatic transmission. The automatic transmission must be appropriate to the passenger rating, G.V.WR., and engine size and type.

Purchasers desiring a heavy duty transmission for harsh terrain should seek additional information from the vendors.

See the Standard Options Attachment B for heavy duty transmissions.

NOTE: An electronic control or similar device may be installed to ensure that automatic transmissions cannot accidentally be moved out of the neutral or park gear position while the driver is not in the driver's seat.

D.6.2. DRIVE SHAFT GUARD:⁹

Each drive shaft section shall be equipped with protective metal guard or guards to prevent the shaft from whipping through the floor or dropping to the ground when broken.

⁹ Drive shaft guard is not required on rear engine, rear-drive buses.

D.6.3. MANUAL TRANSMISSIONS:

See the Standard Options Attachment B for manual transmissions.

E. SPECIALLY EQUIPPED BUSES

See Specially Equipped Buses Attachment E for requirements for specially equipped buses.

F. AIR CONDITIONING SPECIFICATION

See Air Conditioning Attachment F for requirements for air conditioning.

G.1. AVAILABILITY OF SPECIFICATIONS:

This specification is available through the Commission's web site, or by calling or writing:

Procurement Division - Specifications
Texas Building and Procurement Commission
P. O. Box 13047
Austin, TX 78711-3047
(512) 463-3414

http://www.tbpc.state.tx.us/spec_lib/numeric.html

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Return to Top

Return to Numeric Index