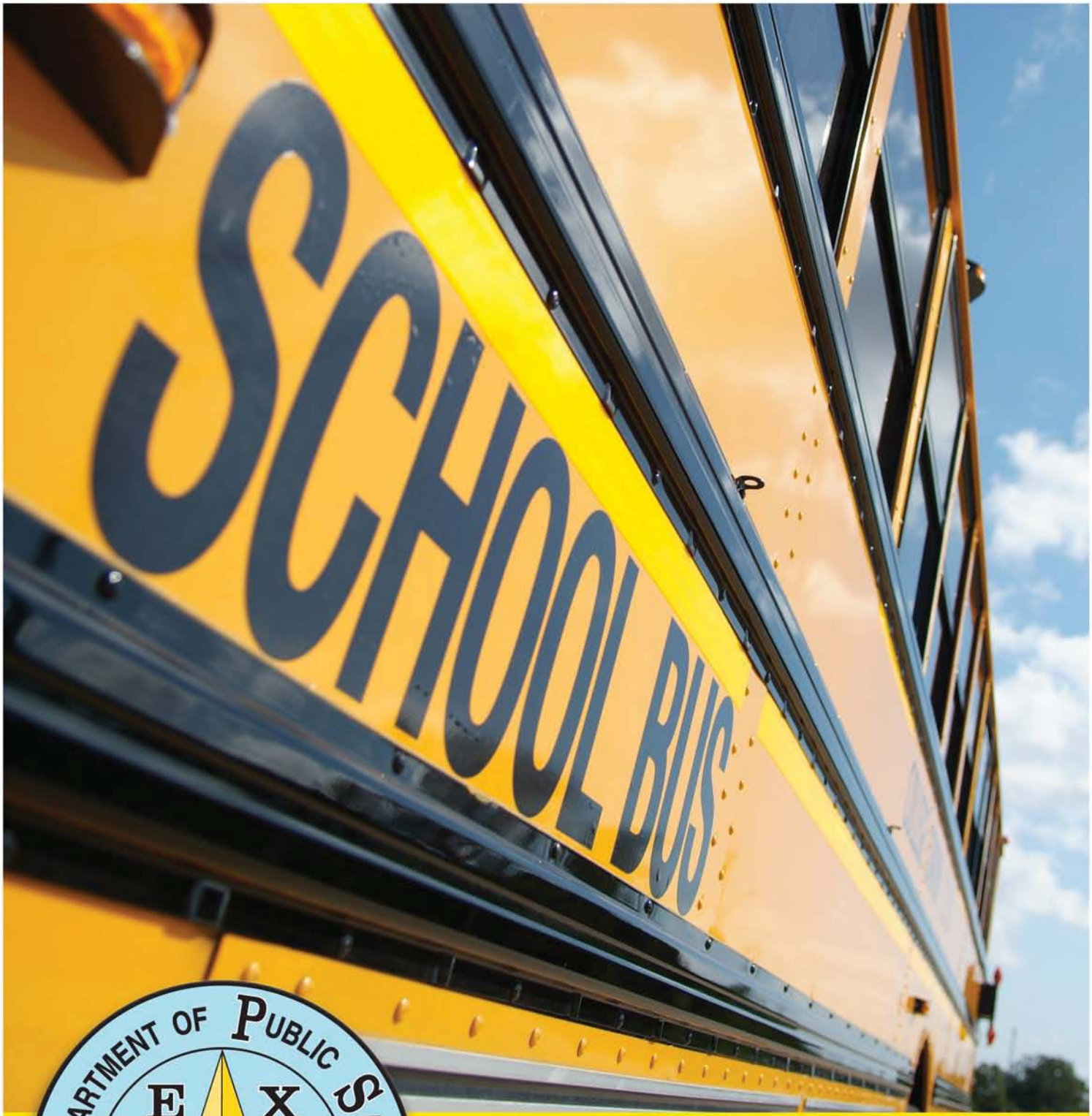


2013 TEXAS SCHOOL BUS SPECIFICATIONS

TEXAS DEPARTMENT OF PUBLIC SAFETY

Effective: March 13, 2013

TABLE OF CONTENTS

Table of Contents 1
Specifications Revisions 5

Section A - General
Definitions and Abbreviations A-1
General Information, Requirements, & Conditions A-3
Warranty Provisions A-9

Section B - Bus Body & Chassis Specifications
Aisle Width B-1
Alternator B-1
Battery(ies) B-2
Battery and Electrical Compartments B-2
Body Data (Identification) Plate B-2
Brake, Parking B-3
Brakes, Service B-3
Bumper, Front B-3
Bumper, Rear B-4
Child Check System B-4
Cooling System B-4
Daytime Running Lamps B-4
Drive Shaft Guards and Shields B-4
Driver's Seat and Seat Belt B-4
Electrical Equipment and Wiring B-5
Access Panel, Electrical B-5
Backup Alarm B-5
Circuit Breakers B-5
Emergency Exit Alarms B-5
Heater/Defroster B-5
Emergency Equipment B-6
Body Fluid Cleanup Kit B-6
Fire Extinguisher B-6
First Aid Kit B-7
Roadside Reflectors B-7
Emergency Exits B-7
Engine Equipment B-8
Engine Power Requirements B-8
Exhaust System B-8
Floor Covering B-8
Frame Side Members B-9
Front Axle Wheel Bearings and Seals B-9
Fuel Filler Opening Type C and D Buses B-9
Fuel Tank Service Access Port B-9
Fuel Tank(s) B-9
Fuel Tank(s), Alternative Fuel B-9

Fuel Water Separator B-10
Handrails B-10
Hood B-10
Horns B-10
Insulation and Sealing of Joints B-10
Lettering and Trim B-10
License Plate Holder B-11
Lights B-11
    Alternately Flashing Non-Sequential Signal Lamps B-11
    Back Up Lights B-12
    Brake/Tail Lamps B-12
    Clearance and Identification Lights B-12
    Control Panel Lighting B-12
    Exterior Door Fixture B-12
    Interior Lamps B-12
    Rear License Plate Lamp B-12
    Stepwell Lamp B-13
    Turn Signal / Hazard Warning Lamps B-13
Mirror System B-13
Noise Abatement Switch B-14
Paint and Finish B-14
Paneling B-14
Publications B-15
Reflective Marking Package B-15
Reflectors B-15
Rub Rails B-15
Seating Requirements, Passenger B-16
Service Door B-16
Shock Absorbers B-16
Sizes of Bodies B-17
Springs B-17
Steering B-17
Step Well B-17
Stirrup Steps and Handles B-17
Stop Arm B-17
Structural Design B-18
Sun Shield B-19
Tires B-19
Transmission, Automatic B-19
Turn Signals B-19
Undercoating B-19
Ventilation B-20
Wheel Housings B-20
Windows B-20
Windshield Wipers and Washers B-21
Wiring B-21
Minimum Chassis Specifications Chart (Type A Buses) B-22
Minimum Chassis Specifications Chart (Type C Diesel) B-22

Minimum Chassis Specifications Chart (Type D Front Engine) B-23
Minimum Chassis Specifications Chart (Type D Rear Engine) B-23

Section C - Specially Equipped School Buses
Doors, Special Service C-1
Electrical System C-2
Emergency Evacuation Blanket C-2
Frame & Related Components C-2
Hydraulic System and Related Components C-3
Lamps, Signals, and Warning Devices C-3
Level Test C-3
Maintenance, Training and Service C-3
Mounting and Installation C-4
Operating Controls and Safety Devices C-4
Other Requirements C-5
International Handicap Symbols C-5
Securement and Restraint System for Wheelchair/Mobility Aid and Occupant C-5
Securement and Restraint System - General C-5
Wheelchair/Mobility Aid Securement and Occupant Restraint System C-7
Support Equipment Securement and Accessories C-8
Portable Student Support Equipment C-8
Medical Support Equipment C-8

Section D - Air Conditioning
Definitions D-1
Temperature Differential D-1
Air Conditioning Test D-1
Air Conditioning System D-2
Product Support D-3
Special Requirements D-3
General Performance Requirements D-4
Controls D-4
Installation D-4
Testing D-4
Other Requirements D-5

Section E - Additional Equipment (Optional)
Procedures for Listing Standard Options E-1
Bus Body & Chassis Options E-2

Section F - Specifications Checklist
School Bus Purchaser Pre-Service Checklist F-1
Texas School Bus Specifications Checklist F-3

Section G - Additional Information G-1

Section H - Vendor Information
Manufacturers H-1
Wheelchair Lift Manufacturers H-1
School Bus Vendors (Dealers) H-2

2013 TEXAS SCHOOL BUS SPECIFICATION REVISIONS

SECTION	PAGE	CHANGE
B	6	Added Option 26 & 27 for heaters and defrosters
B	22	Changed the GVWR to 19,000 for 34-42 passenger buses on Type A Buses.
B	22	Changed the minimum fuel tank gallons to 30 for all Type A Buses.
B	22	Changed the Minimum tires to show just width of 225 for all Type A Buses.
B	22	Deleted the 14 – 29 passenger column on the Type C Diesel chart.
B	16	Added language on Seat Spacing to the Seating Requirements, passenger section.
B	22 & 23	Moved all 4 Minimum Chassis Charts to the end of Section B.
H	1 & 2	Added Trans Tech Bus and Starcraft Bus to the approved manufacturers & vendors lists. Updated contact names and addresses for manufacturers & vendors.

SECTION A
GENERAL

DEFINITIONS AND ABBREVIATIONS

- **ASTM:** American Society for Testing and Materials
- **Conventional Bus:** A school bus with the complete engine in front of the windshield and the service or entrance door behind the front wheels.
- **Department:** Texas Department of Public Safety
- **FHWA:** Federal Highway Administration; an agency of the USDOT
- **FMVSS:** Federal Motor Vehicle Safety Standards, 49 CFR 571, vehicle construction standards, enforced by law
- **Federal Guideline No. 17:** Federal Highway Safety Program Guideline Number 17
- **GAWR:** Gross Axle Weight Rating. The value specified by the manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.
- **GVWR:** Gross Vehicle Weight Rating. The value specified by the manufacturer as the loaded weight, with passengers, of a single vehicle
- **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)
- **Manufacturer:** A fabricator of school buses, bodies, chassis, or components.
- **Multi Function School Activity Bus (State Definition - Transportation Code 541.201 "Vehicles" (11-a):** A multifunction school activity 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 manufacturer other than the standards requiring the bus to display alternately flashing red lights and to be equipped with movable stop arms, and that is used to transport preprimary, primary, or secondary students on a school-related activity trip other than on routes to and from school. <u>The term does not include a school bus, school activity bus, a school-chartered bus, or a bus operated by a mass transit authority.</u>
- **MPV:** Multipurpose passenger vehicle accommodating ten (10) or less people.
- **National School Bus Yellow (NSBY):** The color defined in the publication "National School Bus Color Standard" SBMTC-008.
- **NSTSP:** 2010 National School Transportation Specifications & Procedures
- **NHTSA:** National Highway Traffic Safety Administration
- **NTSB:** National Transportation Safety Board; a Federal agency authorized by Congress to investigate vehicle accidents and make safety recommendations.
- **SAE:** Society of Automotive Engineers
- **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. <u>The term does not include a chartered bus, a bus operated by a mass transit authority, a school bus or a multifunction school activity bus.</u> The underlined section is where it says a school activity bus cannot be a "school bus or multifunction school activity bus".

- **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, 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.
- **Stock Bus:** A bus that exists in the inventory of the vendor.
- **TPASS:** Texas Procurement and Support Services (formerly the TBPC, GSC)
- **TEA or Education Agency:** Texas Education Agency
- **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.
- **USDOT:** United States Department of Transportation, a Federal department with the power to mandate vehicle construction and enforce said requirements.
- **Vendor:** Manufacturer's representative or dealer licensed to make sales and supply parts and services in Texas.

GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

This specification describes the requirements for school buses for the state of Texas. The 2011 Texas School Bus Specifications are effective upon final adoption of the Public Safety Commission.

This specification is adopted as authorized under Texas Transportation Code Title 7, Chapter 547.7015, Education Code 34.002, and Texas Administrative Code, Title 37, Part 1, Chapter 14.

The design of school bus bodies is to provide for the safety of pupils and for long range, maintenance free factors as required by Transportation Code 547.7015 and Education Code 34.002.

A copy may be obtained at www.txdps.state.tx.us/schoolbus/sbtexspecs.htm

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 (including open enrollment charter school) and private school 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;
b. Meet all applicable Federal Motor Vehicle Safety Standards

The requirements specified herein are the minimum requirements for school buses in Texas. 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 Department 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 and proof of general liability insurance to include the carrier of the insurance policy. Receipt of the letter shall precede the sale of a school bus built to these specifications.

Dealer stock school buses and used school buses purchased or operated by a public school board (including open enrollment charter schools) and private school in Texas shall meet or exceed all Federal and the State of Texas requirements for public school buses that were in effect on the date the vehicle was ordered by the vendor from the manufacturer. The vendor, prior to the bid, will inform the potential purchaser, in writing, that the vendor is offering a "stock bus". 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: http://tlo2.tlc.state.tx.us/statutes/tn.toc.htm, when this site opens scroll down to 503.021, 503.029, and 503.032.

CLARIFICATION OF SPECIFICATIONS

Should a clarification or interpretation of these Texas School Bus Specifications be requested, inquiries should be directed to the **Texas Department of Public Safety, School Transportation, Program Administrator, P.O. Box 4087, Austin, TX 78773-0525**

SCHOOL BUS TYPES

Type A: A "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 Type A bus shall be no less than 10,000 lbs. and not exceed 19,500 GVWR. The entrance door is behind the front wheels. No single rear wheel vehicles will be allowed. A Type A bus is defined in the "Minimum Chassis Specifications Chart Type A Bus", page B-22.

Type B: A "Type B" school bus is constructed utilizing a stripped chassis. The entrance door is behind the front wheels and has a GVWR of greater than 10,000 pounds. A manufacturer shall provide the minimum specifications for approval on a Type B prior to the sale of a Type B school bus in Texas.

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.). 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 Type C bus is defined in the "Minimum Chassis Specifications Chart Type C Diesel", page B-22.

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). The engine may be behind the windshield and beside the driver's seat; it may be at the rear of the bus, behind the rear wheels; or between the front and rear axles. The entrance door is ahead of the front wheels. This type is also known as "transit-style school bus". The Type D bus is defined in the "Minimum Chassis Specifications Chart Type D bus", page B-23.

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 child passenger restraint systems. 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.

BUSES FOR STUDENTS WITH DISABILITIES (continued)

As defined by the Code of Federal Regulations (CFR) 49 § 571.3, "Bus means a motor vehicle with motor 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. Manufacturers must use the federal vehicle classification of multipurpose passenger vehicle (CFR 49 § 571.3, or MPV) in lieu of the school bus classification. 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 or state 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.

EQUIPMENT INSTALLATION

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.

Body and chassis manufacturers shall be responsible for installation/modification of all equipment and ensure equipment conforms in strength, quality, and workmanship to accepted standards of the industry, 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 ensure 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.

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.

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.

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.

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.

CERTIFICATION AND COMPLIANCE

By signing the bid, the bidder certifies that the equipment being offered meets or exceeds all requirements and conditions of the bid specification on delivery of the bus. At time of delivery, bidder also certifies that the addition of any option or removal of any equipment has not compromised warranty. The burden of proof for compliance with this specification shall be the responsibility of the vendor, manufacturer, or both.

CHASSIS PRODUCTION ORDER

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. The production order shall be a printed form and not machine coded.

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.

Removal/Obliteration: The body manufacturer shall not remove the production order or chassis identification plate referred to above from the chassis. 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.

LITERATURE AND DRAWINGS

Each bidder shall furnish the following:

Literature: The bidder shall have on file with the Department, the latest pamphlets, brochures, and printed literature on the equipment the bidder proposes to furnish to this specification. Receipt of the pamphlets, brochures, and printed literature on the equipment shall precede the sale of a school bus built to these specifications.

Metal Certification: The manufacturer shall have on file with the Department; a statement certifying that the metal used in Texas school buses conforms to the NSTS&P. NSTS&P 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. Receipt of the letter shall precede the sale of a school bus built to these specifications.

Isometric Drawings: On request by the Department, 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.

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.

TEMPORARY LICENSE TAGS

The vendor shall issue temporary license tags for each new bus delivered. School districts shall contact their local county tax office to obtain their permanent license tags. A listing of county tax offices can be viewed at the following link:
http://www.dot.state.tx.us/services/vehicle_titles_and_registration/county_tax_offices/default.htm

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 the bus is damaged prior to or at delivery and if the purchaser accepts the bus, the receiving copy will denote said damage or omission. If any damage is caused by or during delivery that can be established within ten (10) working days after delivery to any district, the district must be compensated for such damage by the vendor. 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 that might have occurred as a result of the type of delivery.

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 hour 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.

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

LATE DELIVERY NOTIFICATION
Should the vendor be unable to deliver the bus by the due date, the vendor shall notify the district/entity and the Department in writing 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 purchasing entity may be cause to cancel the order or assess $50.00 per vehicle per business day for non-notification. **Email notification is acceptable.**

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 (are) in new 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, utilizing the pre-service and bus specifications checklist:

- Chassis lubrication, complete.
- Check all fluid levels and maintain proper grade and types of fluids.
- Clean interior and clean and wash exterior of bus.
- Pre-delivery inspection and service on chassis.

INSPECTION
Inspection shall be by and at the discretion of the Department 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 shall make detailed inspections, especially upon delivery, and report any discrepancy or discrepancies to the vendor, if not corrected to the said specifications, the district/entity shall contact the Department. Any such discrepancies found during or after manufacturing shall be immediately corrected, at no charge, by the manufacturer or distributor.
Note: See "School Bus Purchaser Pre-Service Checklist" and "Texas School Bus Specifications Checklist" in Section F.

WARRANTY PROVISIONS

NEW VEHICLES

All warranties listed herein shall apply to all school buses manufactured after the effective date of these specifications. 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. **The purchasing entity is responsible for notifying the delivering dealer within 90 days after the original delivery date of the bus and when the bus is placed in service.** Appropriate forms to update warranty shall be included in the owner-operator's packet supplied and shall be conveyed along with the warranty to the district upon delivery of the completed unit. Above requirements shall apply to the basic Texas minimum warranty, all component warranties, and any extended warranties offered or required.

TEXAS MINIMUM WARRANTY

The bus vendor, identified in Section H, "VENDORS Buses" shall provide an inclusive two (2) year unlimited miles warranty for school bus bodies and chassis sold as "new" by the vendor. The full inclusive warranty is "bumper-to-bumper". The bus vendor is responsible for the provisions of the warranty.

Warranty begins at the time of acceptance of the bus by the purchaser. (See the delay provision above)

In the event of a warrantable mechanical failure such that the bus cannot be safely driven to a vendor repair facility, the vendor will arrange for and pay for towing charges. In the event that the vendor cannot be contacted, the purchaser may arrange for towing to the vendors facility.

The Texas Minimum Warranty by definition does not lessen or nullify the manufacturer's warranty, which may exceed the "Texas Minimum Warranty."
Items not covered in the warranty:

- Damage from negligence
- Damage from vandalism
- Damage from acts of God
- Damage from accident
- Normal wear and tear
- Consumables (oil, filters, incandescent light bulbs) L.E.D. lights are not consumables

SECTION B
BUS BODY & CHASSIS SPECIFICATIONS

Type
A, C and D
School Buses

MINIMUM SPECIFICATIONS FOR TYPE A, C, AND D SCHOOL BUSES

AISLE WIDTH

The standard aisle width will be a minimum of twelve (12) inches.

ALTERNATOR

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

A. Minimum rated capacity of 140 amps for Type A and 175 amps for Type C & D, fourteen volt (for a 12 Volt System)
B. Ventilated and voltage controlled
C. Current controlled, if necessary
D. Buses Equipped with Air Conditioning and/or Wheelchair Lifts: Type A buses shall be equipped with the maximum rated capacity available from the chassis OEM with a minimum 200 amp alternator or dual alternators. Type C & D buses shall be equipped with an alternator(s) with high output at low RPM with a minimum rated capacity of 270 amps.
E. Alternator Performance Requirements
    1. It is the responsibility of the installer of the wheelchair lift and/or air conditioner 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.
        a. Electrical System, Maximum Amperage Draw Test
            i. 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 800 pounds during the "maximum amperage draw test."
            ii. 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.
            iii. 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 speed.
    2. Cabling of the alternator and battery system must meet or exceed the requirements of a 320 amp alternator. All 14 - 29 passenger design capacity school buses are exempt.

BATTERY (IES)

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 Type C and D buses shall be group thirty one (31) 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. See charts below:

WITHOUT AIR-CONDITIONING and/or WHEELCHAIR LIFT
12-VOLT BATTERY (IES)

Bus Type	Minimum BCI Cold Cranking AMPS (CCA) at 0 degrees (0° F)	Minimum Reserve Capacity
All Buses Gasoline	600	72 minutes
Type A Buses Diesel	1200	144 minutes
Type C & D Buses Diesel	1200	240 Minutes
All Buses Alternate Fuel	Manufacturer Recommended	Manufacturer Recommended

WITH AIR-CONDITIONING and/or WHEELCHAIR LIFT
12-VOLT BATTERY (IES)

Bus Type	Minimum BCI Cold Cranking AMPS (CCA) at 0 degrees (0°F)	Minimum Reserve Capacity
All Buses Gasoline	800	72 minutes
Type A Buses Diesel	1200	144 minutes
Type C & D Buses Diesel	1950	540 minutes
Alternate Fuel	Manufacturer Recommended	Manufacturer Recommended

BATTERY AND ELECTRICAL COMPARTMENTS

A body skirt-accessed slide out tray and battery box is required for the batteries on all Type A (diesel), C, and D bodies. When three (3) batteries are installed, the battery tray must be roll out type. Battery cables shall be long enough to allow the battery tray to be fully extended.

All Type C, and D bodies equipped with air conditioning and/or lift shall also be equipped with a sealed door compartment mounted as close as possible to the battery box with external access, for mounting circuit breakers and control circuitry for these options.

BODY DATA (IDENTIFICATION) PLATE

Each body shall bear a permanently attached metal plate, attached with rivets, showing the name of the manufacturer, the date of body manufacture, the body serial number, and the "Maximum Design Capacity" and the "Equipped Capacity". The plate shall have a space for the dealer to enter information. The dealer shall enter TX and the specification year (example TX YY). The plate shall be attached in the driver's area. Decals and glue are not acceptable.

BODY DATA (IDENTIFICATION) PLATE (continued)

Maximum Design Capacity shall be the maximum number of passengers the bus (body shell size) can carry. Equipped Capacity shall be the actual passenger capacity of the finished body, as equipped by the manufacturer, based on:

a. The number of total passengers the installed bench seats are designed to carry, and,

b. The number of wheelchair positions installed (based on wheelchair space dimensions contained in Section IV of these specifications).

An example of the format to be used for Equipped Capacity is "28 + 3 WC," meaning twenty eight (28) regular passenger seating positions plus three (3) wheelchair positions.

BRAKE, PARKING

On a school bus with a hydraulic brake, a chassis manufacturer's standard is acceptable. On air brake models, a dash-mounted control valve to spring-set the parking brake on the rear wheels is required.

BRAKES, SERVICE

Air Brakes and Associated Equipment: Each 59 - 90 passenger chassis shall be equipped with full anti-lock air brakes and parking brake systems as standard equipment (See hydraulic brakes in options, Section E). Full air brake systems shall meet the requirements of FMVSS No. 121 as applicable to school buses. The following equipment shall be furnished as follows:

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 cfm (12 cu. ft.) capacity.
2. Air Dryer: The air brake system shall be equipped with an automatic air dryer. The air dryer shall incorporate the use of a replaceable filter. The air dryer mounting shall be in a manner as to have easy access for removal of the filter without removal or loosening of the air dryer assembly mounting bolts.

BUMPER, FRONT

School buses shall be equipped with a front bumper. The chassis manufacturer for all school bus types shall furnish the front bumper unless there is a specific agreement between the chassis manufacturer and body manufacturer.

1. The front bumper shall be of pressed steel channel or equivalent material at least 3/16" thick and not less than 9 1/2" wide (high). It shall extend beyond the 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. "Type A" buses weighing 14,500 pounds or less may be equipped with an OEM supplied bumper.
2. 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.
3. The bumper shall be designed or reinforced so that it or the chassis frame rail(s) will not deform when a chain or air bumper type jack is used to raise the bus from a proper lifting location on the bumper.
4. The bumper shall be black. Bumpers for "Type A" school buses shall be the manufacturer's standard color.
5. A means shall be provided to mount the license plate for an unobstructed view.

BUMPER, REAR

Rear bumper shall be of pressed steel channel at least 3/16 inch thick, 9 1/2 inches high and flanged two (2) inches at top and bottom or otherwise designed to furnish equal flexural strength. It shall be of wrap around design and securely fastened to each chassis frame rail and braced diagonally from each end of bumper to chassis frame rail with heavy braces to permit fully loaded bus to be pushed without permanent distortion to bumper, chassis, or body. Contour of bumper shall fit contour of body in a manner to prevent hitching to or riding on bumper. An appropriate seal shall be applied between bumper and body panel, unless the gap between bumper and body panel is 1/8 of an inch or less. 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.

CHILD CHECK SYSTEM

Each school bus shall be equipped with an electronic audible and visual warning device that requires driver deactivation after the driver walks to the rear exit of the school bus checking for children.

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 reinforced type with a fan clutch.

DAYTIME RUNNING LAMPS

A Daytime Running Lamp (DRL) system meeting chassis or body manufacturer's specifications shall be provided on all school buses.

DRIVE SHAFT GUARDS AND SHIELDS

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.

DRIVER'S SEAT AND SEAT BELT

All school buses shall have a driver's seat equipped with a one (1) piece high back, suspension seat 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. 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 ± 1/2 inch behind the steering wheel with a backrest a minimum distance of eleven (11) inches behind the steering wheel. Seat shall be securely mounted to ensure minimal flexing of the seat and the floor panel(s). A Type A bus may have manufacturer's standard seat.

A Type 2, shoulder height adjustable or integrated, 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 bus **shall** contain a belt cutter **located in the driver's compartment** for use in emergencies, including evacuations. The belt cutter should be of a type that has a handgrip and is designed to eliminate the possibility of the operator or others being cut during use, and

DRIVER'S SEAT AND SEAT BELT (continued)

should be secured in a location of safekeeping within easy reach of the driver while seated behind the steering wheel.

ELECTRICAL EQUIPMENT AND WIRING

All wiring shall conform to current standards of the Society of Automotive Engineers, be coded by color, number and be insulated. All joints shall be soldered or joined by equally effective fasteners. All wires of 4-gauge or larger and any accessory wire connected directly to the battery shall have soldered ends, and the ends shall be protected with heat shrink tubing. Body wiring and connectors, including any battery cables routed by the body manufacturer, shall be routed and/or protected so as to eliminate possibility of wiring and connectors becoming abraded, pierced by fasteners, shorted, or otherwise damaged during manufacture and use. Electrical components specified below shall be provided and wiring shall be in circuits as follows:

ACCESS PANEL, ELECTRICAL

All Type C buses shall be equipped with a sealed exterior electrical access panel or must provide easy internal access to body electrical components and circuits. All Type D buses shall be equipped with a sealed exterior electrical access panel to provide easy access to body electrical components and circuits.

BACKUP ALARM

Body manufacturer shall provide a backup alarm on each bus to provide audible warning that the bus is in reverse gear. Alarm shall meet requirements of SAE J994, and shall be a minimum of 107dba.

CIRCUIT BREAKERS

Each circuit, except starting and ignition, shall be isolated and shall be protected by a circuit breaker device. For multiplex wiring systems, field effect transistors are acceptable.

EMERGENCY EXIT ALARMS

All emergency exit alarms shall be connected to the accessory side of ignition switch.

HEATER/DEFROSTER

1. The heater shall be hot water.
2. If only one (1) heater is used, it shall be fresh-air or combination fresh-air and re-circulation type.
3. If more than one (1) heater is used, additional heaters may be re-circulating air type.
4. The heating system shall be capable of maintaining bus interior temperatures as specified in SAE test procedure J2233.
5. All forced air heaters installed by body manufacturers shall bear a nameplate 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.
6. Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or any sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hoses shall meet or exceed SAE 20R3. Heater lines on the interior of bus shall be shielded to prevent scalding of driver or passengers.
7. Each hot water system installed by a body manufacturer shall include one ¼ turn ball-cock shut-off valve in the pressure line and one ¼ turn ball-cock shut-off valve in the return line with both valves at the engine in an accessible location, except that on all Type A buses, the valves may be installed in another accessible location.

HEATER/DEFROSTER (continued)

8. There shall be a water flow regulating valve or other regulating device installed in the pressure line for convenient operation by the driver while seated in the driver's seat. A ¼ turn ball-cock type coolant flow regulating valve for the heater shall be installed so that its control is accessible to the driver, but in such a location as to discourage tampering by students. This valve may be remotely located if a suitable remote control system is used.
9. 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.
10. 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.
11. 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 curbside of the bus front shall be mounted on the windshield header to protect the fingers, hair, and clothing of entering and departing passengers.

Note to above requirements: Type A buses shall have a fresh air type heater and defroster system as installed by the chassis manufacturer. (Refer to option 26 & 27)

EMERGENCY EQUIPMENT

BODY FLUID CLEANUP KIT

Each bus shall be equipped with a mounted, removable, moisture-proof hard plastic body fluid cleanup kit. Container shall be mounted in the driver's compartment and the container shall be easily removed without tools. This kit shall be identified as a body fluid cleanup kit, and shall NOT display the biohazard symbol, and contain as a minimum the following items:

Qty.	Item
1	Absorbent Powder, 2 oz bag
1	Antiseptic BZK Towelette
1	Bag, Plastic, Black w/Tie
1	Biohazard Bag w/Tie
1	Certi-Green Cleaner Towelette
1	Pair Non-latex gloves
1	Mask
1	Scoop Bag w/Scraper
2	Towel, Paper Crepe
1	Poly Box 8" x 5" x 3"

FIRE EXTINGUISHER

Each 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 removing the extinguisher from its mounted position.

The fire extinguisher shall have a total rating of 2A10BC (5lb) or greater. The operating mechanism shall be sealed with a type of seal that will not interfere with the use of the fire extinguisher.

EMERGENCY EQUIPMENT (continued)

FIRST-AID KIT

Each bus shall be equipped with a hard plastic, moisture and dust proof, removable first aid kit. Container shall be mounted in the driver's compartment and the container shall be easily removed without tools. The kit shall contain each item listed below in the minimum quantities indicated:

Qty.	Item
2	1" x 2-1/2 yard adhesive tape rolls
24	Sterile gauze pads 3" x 3"
20	3/4" x 3" adhesive bandages
8	2" bandage compress
10	3" bandage compress
2	2" x 5 yard 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 Non-latex gloves
1	Mouth-to-mouth airway
1	Basic first aid / CPR instructions included

ROADSIDE REFLECTORS

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. Container for warning devices shall be secured with a bracket mounted in the driver's compartment and the container shall be easily removed without tools.

EMERGENCY EXITS

All buses shall be equipped with a total number of emergency exits as follows for the maximum design 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 bus exits. A door holding device shall be provided to hold the swing out type emergency door(s) in the fully opened position.

Up 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 90 Passenger = Three (3) emergency exits per side and two (2) roof hatches.

Note: A side emergency door may be substituted for two (2) emergency exits on the same side of the vehicle.

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.

ENGINE EQUIPMENT

Engines shall meet or exceed the minimum engine listed in the tables found on pages B-22 and B-23.

ENGINE 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 engine related accessories on and operating.

1. Acceleration from zero to fifty miles per hour (0 - 50 mph) in sixty (60) seconds or less.
2. Grade ability of one and one half percent (1.5%) minimum at fifty miles per hour (50 mph).
3. Grade ability of five (5) percent minimum at twenty five (25) miles per hour.
4. Start ability of twenty (20) percent minimum.

EXHAUST SYSTEM

Component Placement: The exhaust pipe, muffler, and tail pipe shall be mounted under the bus and attached to the chassis frame. If the exhaust system is less than twelve (12) inches from the fuel tank, a metal shield must be installed.

Tailpipe Exit: The tailpipe shall not exit the side of the bus anywhere within twelve (12) inches 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 left side or left rear of the bus whenever possible. If tailpipe does not exit through the bumper, the gap between top of tailpipe at exit point of the vehicle must not be more than two (2) inches below the bottom of the side panel or rear bumper.

FLOOR COVERING

1. Aisle Material: The floor covering in the aisles must be seamless, be of aisle type elastomer, and wear and slip resistant. Minimum overall thickness shall be .187 inch measured from tops of ribs. Must meet the maximum burn rate of the most current *National School Transportation Specifications & Procedures*.
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 of a type recommended by the floor-covering material manufacturer. All seams must be sealed with waterproof sealer.
3. Trim: If one piece flooring is not used, seams shall be covered with extruded aluminum or stainless steel metal strips of a minimum three sixteenths (3/16) inches high and one (1) inch 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. 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 (9) inches 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 (3/4) inches from each end. Screws may be placed nine and one half (9½) inches apart only to avoid interference with floor sill members.
4. Under Seat Material: The floor in the under-seat area, including tops of wheel-housings, driver's compartment and toe-board, shall be covered with an elastomer floor covering, having a minimum overall thickness of .125 inch. Must meet the maximum burn rate of

FLOOR COVERING (continued)

the most current *National School Transportation Specifications & Procedures*. The driver's area in all Type A buses may be manufacturer's standard flooring and floor covering. Floor covering on toe-board shall be held in place by trim strip or molding.

FRAME SIDE MEMBERS

Each frame side member shall be of one (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. Either the chassis or body manufacturer shall make the installation. 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.

FRONT AXLE WHEEL BEARINGS AND SEALS

All school buses except Type A shall have oil lubricated front axle wheel bearings and seals.

FUEL FILLER OPENING TYPE C & D BUSES

The body manufacturer shall provide an opening in the body panel to allow placement of the fuel nozzle into the fuel tank filler neck opening. This opening in the panel must be positioned so that the filler neck, when viewed at right angles from the side, is approximately centered in the cutout. If the fueling nozzle must pass through the skirting the opening shall be provided with a hinged cover designed and constructed so it will remain open when fueling is in progress and remain in a totally closed position at all other times. Lettering shall be adjacent to the fuel filler opening indicating fuel type.

FUEL TANK SERVICE ACCESS PORT

An access port is required on all 35 - 90 passenger buses except front wheelchair lift equipped buses with a side-mounted fuel tank.

FUEL TANK(S)

Fuel tank(s) and fuel system shall meet requirements of FMVSS 301. Filler spout shall be located for ease in servicing. Fuel gauge compatible with tank capacity shall be supplied. See Chassis Specifications Charts in this section for required fuel tank capacity.

FUEL TANK(S), ALTERNATIVE FUELS

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.

FUEL/WATER SEPARATOR

Required on all diesel engines, it shall be of a design and installation compatible with chassis/engine application to ensure trouble free performance when properly maintained. The fuel/water separator filter may serve as the first primary engine fuel filter if approved by the engine manufacturer, or may be in addition to and ahead of the standard primary and secondary fuel filters on the engine. In addition, the fuel/water separator must be completely accessible for manufacturer's recommended servicing, with emphasis on under hood mounting location; have an electronic sensor with a dash mounted indicator or a clear drain (sight) bowl for accumulated water; and, contain a replaceable element of proper design to protect against premature fuel flow restriction or excessive passage of contaminates.

HANDRAILS

Handrails of not less than twenty (20) inches in length shall be installed on both sides of the step-well. The outside surface of this handle shall be stainless steel or polished aluminum. The handrails shall not be mounted with tapered screws to sheet metal (excluding barriers). The handrails shall assist passengers during entry or egress, and be designed to prevent entanglement, as evidenced by passage of the NHTSA String and Nut test.

HOOD

All engine hoods, covers or doors to access and check engine compartment fluid levels shall not require more than twenty five (25) pounds of force to open or close.

HORNS

Each bus shall be equipped with dual note horns or dual horns of standard make. Each horn(s) shall produce audible sounds in the frequency range from two hundred fifty (250) to two thousand (2,000) hertz. 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.

INSULATION AND SEALING OF JOINTS

Insulation, Thermal:

A. 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 (1½) inches 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. Overlapping of edge of exterior roof and side panels shall be sealed with non-hardening resilient material.
B. 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.

LETTERING AND TRIM

A. The bus body shall have the words "SCHOOL BUS" in black with yellow reflective background if not of lighted design on the front roof cap and the rear roof cap.
B. The bus body shall have the words "SCHOOL BUS" in black on both sides. The lettering must have a reflective background or black reflective lettering.

LETTERING AND TRIM (continued)

C. The school bus letters shall be neat, clearly defined block style eight (8) inches high with one (1) inch wide strokes. Lettering on Type A buses may be six (6) inches high. The words "SCHOOL BUS" shall be as close to the center of the bus as possible.

D. School Name Lettering: School name lettering shall be displayed between the upper two (2) rub rails in black letters on both sides of the bus near the belt line using decals or with black paint. Lettering shall be five (5) or six (6) inches high with minimum five eighths (5/8) inch block strokes and be the same size on both sides. If paint is used it shall be equal in quality to that of the bus body paint and the color shall be black enamel (Color No. 17038). If decals are used they shall meet or exceed the requirements of bus body paint. The lettering shall be black in color conforming to the color of black enamel (Color No. 17038). Abbreviations may be used to identify type of school district (ISD, CISD, CSD or MSD).

   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.

   The school district (contractor) logo may be added to the bus. If a logo is placed on the school bus, it must be evenly placed on both sides as near the front of the school bus as possible and may not be larger than five hundred (500) square inches.

LICENSE PLATE HOLDER

A means shall be provided to mount the license plate on the front and the rear of the bus. Any items added to the school bus must not obstruct the location of the front license plate.

LIGHTS

All exterior lighting shall be securely attached to the body surface structure. A grommet type mounting may only be used for clearance and identification marker lights.

ALTERNATELY FLASHING NON-SEQUENTIAL SIGNAL LAMPS

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

A. In addition to the four (4) red lamps described above, four (4) amber lamps shall be installed so that one (1) 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 with a master "on/off" switch so that when the master switch is "on" the red lamps will automatically operate anytime the bus service door is opened. The amber signal lights, when manually activated, will cease operation when the bus service door is opened and the red signal lamps operate. The red signal lamps shall be wired to ensure continued operation anytime the master switch is in the "on" position, even if the ignition switch is in the "off" position. The area around the lenses of alternately flashing non-sequential signal lamps extending outward from the edge of the lamp at a minimum of one (1) inch and shall be black in color. 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.

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

LIGHTS (continued)

BACK UP LIGHTS

There shall be two (2) twelve (12) square inch minimum LED backup lights.

BRAKE/TAIL LAMPS

The quantities, colors, requirements, and mounting of LED tail and stop lamps shall be in accordance with FMVSS No. 108, except stop lamps shall be a minimum of thirty eight (38) square inches and mounted at approximately the belt line level of the bus. A set of minimum four (4) inch tail/stop lamps shall be installed below the minimum of thirty eight (38) square inches set.

CLEARANCE AND IDENTIFICATION LIGHTS

LED clearance lights shall be mounted at the four (4) body corners, upper section, amber front, and red rear. Intermediate amber units are required on all units over thirty (30) feet. The headlight switch shall activate the clearance lights.

A. LED identification lights shall be mounted as follows; three (3) amber lights on the front, three (3) red lights on the rear. Front and rear shall be grouped in a horizontal row. Lamp centers shall be spaced not less than six (6) inches or more than twelve (12) inches apart, mounted as close as practical to the vertical centerline.
B. All LED clearance and identification lights shall meet current SAE requirements and Federal Motor Vehicle Safety Standards and shall:
    1. Be a sealed type light.
    2. Be surface mounted with rust proof material guard unless recessed to prevent breakage.

CONTROL PANEL LIGHTING

The control panel or switches supplied by the body manufacturer shall be illuminated, and shall have a control for varying the illumination to the control panel or switches.

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 thirty two (32) candlepower and light a minimum four (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.

INTERIOR LAMPS

Interior lamps shall be provided which adequately illuminate the aisle and step-well. There shall be installed at least four (4) recessed flush mounted interior lamps in the passenger compartment of the bus, operated by one (1) control panel mounted switch. If more than six (6) lamps are used, then an additional switch may be added to control these lamps. The driver's area shall be illuminated with an interior lamp operated by a separate switch.

REAR LICENSE PLATE LAMP

Shall be constructed and mounted to emit a white light that illuminates the rear license plate. Light may be in conjunction with the stop/tail lamp.

LIGHTS (continued)

STEP-WELL LAMP

The step-well shall be illuminated with a separate lamp activated by opening the service door when the headlight/clearance lights are on. Step-well lamp fixtures must be installed to prevent a burn hazard.

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 a minimum thirty eight (38) square inches.

A. Front: The front turn signal lamps shall be the manufacturer standard. The operating units and flasher for turn signals and vehicular hazard warning signals shall meet the requirements of FMVSS No. 108.
B. Side: Buses thirty six (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 candlepower of the light shall be a minimum of four (4) candlepower.
C. Rear: The rear turn signal lenses shall be amber of LED type.
D. Installation: 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.

MIRROR SYSTEM

A. Interior Mirror: Interior mirror shall be either clear view laminated glass or clear view glass bonded to a backing, which retains the glass in the event of breakage. Mirror shall be a minimum of 6" x 30". Mirror shall have rounded corners and protected edges.
Note: 6" x 16" Interior mirror allowed in 14-30 passenger design Type A's only.

B. Exterior Mirrors: Each school bus shall be equipped with a system of exterior mirrors complying with FMVSS 111 and meeting the following requirements.

1. Cross/side view Mirror System: The cross/side view mirror system shall provide the driver with indirect vision of an area at ground level from the front bumper forward, and the entire width of the bus, to a point where the driver can see by direct vision. The system shall also provide the driver with indirect vision of the area at ground level around the left and right front corners of the bus to include the tires and service entrance on all types of buses to a point where it overlaps with the rear vision mirror system. This mirror system shall incorporate the following features or requirements:
    a. Only one (1) mirror shall be installed at each front corner of the bus.
    b. Mirrors shall not reflect excessive glare from the bus headlights or sun into driver's eyes.
    c. Any fasteners used in the construction of the mirror and mounting brackets shall be corrosion proof.

2. Rear Vision Mirror System: A rear vision mirror system shall be provided which incorporates the following features and requirements:
    a. The mirror system shall consist of one (1) flat and one (1) convex mirror lens per side as standard. Each mirror set shall be mounted on a single

MIRROR SYSTEM (continued)

breakaway arm with positive detent or friction lock. Type A buses may be exempted from this requirement if no such arms or mounts are available.

b. Each of the four (4) required mirrors in the rear vision mirror system shall be electrically operated, remote control, rear view mirrors.
c. Any fasteners used in the construction of the mirror and mounting brackets shall be corrosion proof.

Overall exterior mirror system (cross/side view and rear vision mirrors) shall be isolated from vibration.

NOISE ABATEMENT SWITCH

There shall be a manual (on/off) noise abatement switch installed in the control panel, labeled and wired into the activation circuit for the master body circuit solenoid. This switch shall deactivate 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, two-way radios, or lighting systems.

PAINT AND FINISH

Paint finish coats to body, hood, and cowl shall be warranted for sixty (60) months unlimited mileage, one hundred (100) percent parts and labor, for adhesion, color retention, and gloss retention. Acceptable lower limits during the warranty period are as follows:

Adhesion: During the sixty (60) 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 thirty six (36) months from the in-service date, the color coat shall not shift colors more than four (4) ΔE from the centroid, as specified in SBMTC-008.

During the sixty (60) month warranty period, the color coat shall not shift color more than eight (8) ΔE from the centroid, as specified in SBMTC-008.

Gloss: During the first thirty six (36) months from the in-service date, the gloss reading shall not fall below sixty (60) at sixty (60) degrees. During the sixty (60) month warranty period, the gloss reading shall not drop below thirty (30) at sixty (60) degrees. All measurements shall be the average of twelve (12) readings taken at various points on the bus but no reading shall be more than three (3) points under the stated minimum. All readings shall be taken after the bus is thoroughly washed to remove road film and dust.

The exterior of the bus shall be painted National School Bus Yellow. Trim, lettering, rub rails and bumpers shall be black except that bumpers may be striped in accordance with National Specifications or these specifications. The interior of the bus body shall be manufacture standard color unless otherwise specified in bid.

PANELING

Interior: All interior wall and ceiling panels except wiring access 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. 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 aluminum may be used in Type A buses only. Front and rear ceiling panels shall be formed to present a smooth, pleasing appearance. If the ceiling is constructed so as to contain lapped joints, the rear panel shall lap the forward panel and all exposed edges shall be beaded, hemmed, flanged, or otherwise treated to

PANELING (continued)
minimize sharp edges.
Exterior: Exterior paneling includes all sheet metal skin forming exterior surface of body or equivalent.

PUBLICATIONS
On delivery, the vendor shall provide one complete set per order per model in any media format or as specified at time of invitation to bid by the district:

A. Operator's Manual
B. Warranty Information
C. Service Manuals (OEM of the Engine, Chassis, and Body)
D. Parts Manuals (OEM of the Engine, Chassis, and Body)
E. Complete body wiring diagram
F. Line Setting Ticket

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

REFLECTIVE MARKING PACKAGE
There shall be installed a reflective marking package as specified in the *National Specifications for School Buses*. This package shall include markings for the front, rear, and both sides. Striping on sides of bus shall be a minimum of 1" and a maximum of 2" in width meeting the ASTM D-4956-90 Type 5 reflective sheeting standard. Striping shall be installed longitudinally the length of the body at the vertical location immediately below the seat level rub rails but high enough so as to clear wheel wells, whenever possible. Short breaks in the striping at rivet locations are acceptable.

REFLECTORS
Two (2) red reflectors on rear side panels, two (2) red reflectors on rear panels, and two (2) intermediate amber reflectors on buses over thirty (30) feet.

RUB RAILS

A. There shall be one (1) rub rail on each side of bus approximately at seat level, which shall extend from entrance door post around bus body (except for emergency door) to point of curvature near cowl on left side.
B. There shall be rub rails located approximately at the floor line and bottom of outer skirt which shall cover same longitudinal area as upper rub rail, except at wheel housings, and shall extend only to radii of right and left corners.
C. There shall be a rub rail located horizontally at the bottom edge of the windows.
D. Rub rails shall be attached twice at each body post and at all other upright structural members.
E. Rub rails shall be a one (1) piece continuous construction, four (4) inches or more in width in its finished form, shall be of sixteen (16) gauge steel or equivalent, and shall be constructed in corrugated or ribbed fashion.
F. Rub rails shall be applied outside of body panels. Pressed-in or snap-in rub rails do not satisfy this requirement.
G. Drainage: The bottom edge of each rub rail shall have provisions for drainage of accumulated moisture.
H. On Type D rear engine buses the rub rail may terminate at the engine compartment.

SEATING REQUIREMENTS, PASSENGER

Seat Cushions: Seat cushion foam shall be composed of polyurethane foam conforming to ASTM D 3574. Cushion foam shall be supported by either 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, or other material that with similar resistance to degradation resulting from temperature and humidity.

All cushioned seating, backing and barrier surfaces shall be covered with a vinyl resin-coated upholstering material or equivalent. 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, of *National School Transportation Specifications and Procedures*)

Seat Spacing: Seat spacing shall not be less than 24 inches between the front of the back of each seat and the rear of the back of the seat immediately ahead. This shall be measured at cushion height on a plane parallel to the center line of the bus. The seat upholstery may be placed against the seat cushion padding, but without compressing the padding, before the measurement is taken.

SERVICE DOOR

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 twenty five (25) pounds of force to operate at any point throughout the range of operation, as tested on a ten (10) percent grade both uphill and downhill.

A. The service door shall be located on the right side of the bus, opposite and within direct view of the driver.
B. The service door shall have a minimum horizontal opening of twenty four (24) inches and a minimum vertical opening of sixty eight (68) inches for Type A and seventy two (72) inches for Types C, & D.
C. Service door shall open outward.
D. All entrance door glass shall be laminated safety glass. The bottom of each lower glass panel shall not be more than ten (10) inches from the top surface of the bottom step. The top of each upper glass panel when viewed from the interior shall not be more than three (3) inches below the interior door control cover or header pad.
E. Vertical closing edges on entrance doors shall be equipped with flexible material to protect children's fingers.
F. All doors shall be equipped with padding at the top edge of each door opening. Padding shall be at least three (3) inches wide and one (1) inch thick and extend the full width of the door opening.

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.

SHOCK ABSORBERS

Front and rear, double acting; adequate size for axle load.

SIZES OF BODIES
Overall Length: The overall length of a complete school bus body shall not exceed forty five (45) feet, *excluding safety equipment*.
Exterior Width: The overall exterior width of a complete school bus body shall not exceed one hundred and two (102) inches, *excluding safety equipment*.

SPRINGS
Front: Manufacture standard coil or double-wrap stationary end leaf spring.
Rear: Progressive or vari-ride type.

STEERING
All buses shall have factory-installed power steering, integral type. A factory installed tilt steering wheel/column is required.

STEP-WELL
The step-well and riser panels in the service door entryway shall be clear coated, galvanized or stainless steel, embossing is not required. A step-well of at least three (3) steps shall be built in the right front assembly enclosed with doors extending to bottom step. Each step shall be covered with "Pebble-Top" type elastomer, at least 3/16 inch thick, bonded to metal or durable polymer base and otherwise constructed to provide substantial support, including the leading horizontal edge which shall be Pebble Top type, white or a color that contrasts with the step tread by at least seventy (70) percent. The lower first step height shall be between ten (10) inches and fourteen (14) inches above the ground for all Type A and C buses. Type D buses shall have a lower first step height between twelve (12) inches and sixteen (16) inches from the ground. Each step must be the full width of the step-well at the point where the step is located. **Half steps or partial steps are not acceptable**.
Note: Two (2) steps are acceptable on Type A 14 - 30 passenger buses. Risers in each case shall not exceed a height of ten (10) inches.

STIRRUP STEPS AND HANDLES
A step and appropriate grab handle shall be installed on each front corner of the body to facilitate cleaning of windshield. The handle shall be stainless steel, chrome plated, or non-ferrous metal or may be made of non-metallic material of sufficient structural and mounting strength and resistant to weathering and deterioration and shall provide for secure mounting and adequate handhold. Handle shall be contoured and formed to provide a comfortable and safe grip. Steps and handles are not required on Type A 14 - 30 passenger buses.

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

A. 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 (1/2) inch wide white border and the word "STOP" in white letters at least six (6) inches high against a red background on both sides. The letters, border and background shall be of reflective materials meeting DOT FHWA FP-85 on both sides. Double-faced red, alternately flashing lamps, flashing both sides, one (1) above and below the word "STOP" each visible from both sides and shall be connected to, and flash with the

STOP ARM (continued)

required school bus red flashing signal lamp circuit when the arm is extended, or an LED Stop Sign. The stop arm assembly shall be non-corrosive.

B. Mounting: If only one (1) stop arm 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 and shall have one (1) "STOP" emblem facing the rear of the bus when the stop sign is in the open position.

C. Dual stop arms shall be provided on buses designed for forty seven (47) passengers or larger.

STRUCTURAL DESIGN

Details of design shall have a direct relationship to specifications for grades of steel in the latest edition for the design of Light Grade Cold-Formed Steel Structural Members of the American Iron and Steel Institute. Material used in the body frame structure shall conform to chemical and mechanical requirements of the listed specifications or other published specifications, including tensile and yield points, which establish properties and suitability of the steel for school bus body test code and safety requirements. All Type A, C, and D bodies shall meet the requirements of FMVSS 221 and the requirements of the most current *National School Bus Specifications and Procedures*, Side Intrusion Test.

A. All welds used in construction of body shall conform to latest applicable specifications of the American Welding Society.

B. Welds, rivets, or high-strength bolts may be used in connecting parts of the structural body. All bolts shall have provision to prevent loosening under vibratory loads. All bolts, nuts, washers, and screws used throughout the body shall be cadmium or zinc plated, or thoroughly treated in an approved manner for prevention of rust.

C. All metal used in construction of the bus body shall be zinc or aluminum coated before construction, provided that for metals twelve (12) gauge or less in thickness, either zinc or aluminum coating shall be mill applied for these components:
    1. Service door panels
    2. Emergency door panels
    3. Guard rails
    4. All exterior body panels
    5. Wheel housings
    6. Body posts and roof bows
    7. Side strainers
    8. Roof strainers
    9. Window caps
    10. Window visors where used
    11. All floor section panels and floor sills
    12. Excluded are door handles, interior decorative parts, and other interior plated parts.

D. All metal parts that will be painted shall be chemically cleaned, etched, zinc-phosphate-coated, and zinc-chromate or epoxy primed, or conditioned by equivalent process. Any areas from which primer is removed for any purpose, such as sanding, grinding, welds, etc., must be thoroughly cleaned and treated as specified and primer applied. Rivets used in assembly shall be zinc-phosphate treated unless coated with rust prevention material and primed as specified. In providing for these requirements, particular

STRUCTURAL DESIGN (continued)

attention shall be given to lapped surfaces, welded connections or structural members, cut edges, metal in which holes are punched or drilled, closed or box sections not vented or drained, and surfaces subjected to abrasion during vehicle operation.

E. As evidence that above requirements have been met, samples of materials used in construction of the bus body, when subjected to 1,000 hour salt spray test as provided for in latest revision of ASTM, Designation: B 117, "Standard Method of Salt Spray (Fog) Testing," shall not lose, after rubbing to remove corrosion, more than ten (10) percent of material by weight.

F. The front-end assembly shall be sufficiently heavy to withstand vibrations transmitted to it through chassis cowl. Windshield or corner posts must be of sturdy construction, designed so that they will not be so wide as to unnecessarily obstruct driver's view. Body shall be fastened to chassis cowl in an approved waterproof manner.

G. All bus bodies shall be constructed in square and level. There shall be no more than one (1) inch of difference from side to side and front to rear of the bus body (not counting any chassis lean or twist). All bodies shall be mounted such that all designed body contact points are in contact with the chassis frame. All bodies shall be centered on the chassis but shall be no more than one half (1/2) inch off of dead center.

Note: Type A buses may be constructed with exterior paneling of material other than steel, meeting all body manufacturer requirements and applicable FMVSS. Body structural design shall comply with all other applicable requirements above.

SUN SHIELD

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

TIRES

All tires shall be steel belted radial tubeless type.

TRANSMISSION, AUTOMATIC

All buses shall be delivered with an automatic transmission as standard (See Manual Transmission option, Section E). The automatic transmission must be appropriate to the passenger rating, GVWR, and engine size and type. Purchasers desiring a heavy-duty transmission for harsh terrain should seek additional information from the vendors.

TURN SIGNALS

Turn signals shall have a dash indicator light, self-canceling switch.

UNDERCOATING

Entire underside of body including floor members, wheel housings, and side panels below floor level shall be coated with fire resistant asphalt base, rubber base, or other undercoating material, applied by spray method to seal, deaden sound, insulate, and prevent oxidation. Any undercoating material used shall be asbestos-free. Do not cover up or obliterate the chassis identification plate.

VENTILATION

All school buses shall be equipped with an effective exhaust type ventilation system, static non-closeable type installed in low-pressure area of roof, capable of ejecting foul air under all operating conditions. System shall be adequately weatherproof and dustproof.

WHEEL HOUSINGS

Wheel housings shall be constructed of sixteen (16) gauge or heavier steel and be rigidly reinforced, shall be attached to floor and side panels in such manner as to prevent water or dust from entering body, and shall be designed for easy removal of tires. For materials see **STRUCTURAL DESIGN**; for covering see **FLOOR AND FLOOR COVERING**.

WINDOWS

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 (1) less set of passenger windows than rows of seats provided that each seat has access to a window. All glass shall be laminated safety glass.

A. 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 (22) inches wide and between nine (9) and thirteen (13) inches high, with minimal obstruction by the seatbacks or other objects.
B. Side Windows, Passenger, and Push-out Type: These windows shall be hinged at the top or front and shall be positioned for ease of egress. These windows shall provide an emergency opening at least twenty two (22) inches wide and thirteen (13) inches 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 released. 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.
C. Service Door and Emergency Door Windows: All glass panels in the emergency and service doors for all buses shall be permanently closed and shall be set in a waterproof manner.
D. Rear windows (not emergency door windows): Shall be installed on each side of the rear emergency door. Each rear window glass shall have a minimum area of one hundred forty (140) square inches 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.
E. Side Window, Driver's: The driver's window shall be a two (2) piece window of either of the following types:
    1. Two (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.

WINDOWS (continued)

2. 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.

F. Windshield: Front body section in the area of windshield shall provide for corner vision and be fitted with curved glass, three (3) or four (4) piece flat glass, or two (2) piece flat glass as approved by the Department. Glass shall be laminated safety polished plate with dark tint at top, installed in a waterproof manner and slanted to reduce glare. Glass shall meet current SAE specifications and Federal Motor Vehicle Safety Standards.

WINDSHIELD WIPERS AND WASHERS

Washers: An electric-operated windshield washer shall be furnished and installed. The washer shall have a minimum reservoir capacity of one (1) quart 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.

Wipers: A windshield wiping system, two (2) speeds 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 or opposing to give full sweep of the windshield.

WIRING

All wiring shall conform to current applicable recommended practices of the Society of Automotive Engineers for physical specifications and the Truck Maintenance Council Recommended Practice RP 129, VMRS 031-001, 032-001 for the Heavy-Duty Vehicle System Wiring Checks 12-volt Charging, 12-Volt Cranking to determine electrical characteristics of the alternator wiring circuits.

A. All wires passing through metal openings shall be protected by a grommet or loom.
B. Install a readily accessible terminal strip or connector on the body side of the cowl or in an accessible location in the engine compartment of vehicles designed without a cowl. The strip or connector shall contain the following terminals for the body connection:
   1. Main Circuits: The electrical system wiring shall have at least ten (10) main circuits:
      a. Head, tail, stop (brake), and instrument panel lamps
      b. Clearance and step well lamps
      c. Dome lamps
      d. Starter motor
      e. Ignition and emergency door signal
      f. Turn signal (directional)
      g. Alternately flashing non-sequential signal lamps
      h. Horn
      i. Heater and defroster
      j. Accessory – ignition switch activated (20 amp max)
C. All wiring shall use standard colors and number coding and each chassis shall be delivered with a wiring diagram that coincides with the wiring of the chassis.

MINIMUM CHASSIS SPECIFICATIONS CHART (TYPE A BUSES)

NO SINGLE REAR WHEEL BUSES

Maximum Design Capacity	14 - 24	25 - 33	34 - 42
Front GAWR (pounds)	4,050	4,050	4,600
Rear GAWR (pounds)	7,500	7,200	9,450
GVWR (pounds)	10,000	12,300	19,000
Minimum Engine Size	5.4L	5.4L	5.4L
Wheel Base (inches)	138	139	158
Minimum Fuel Tank Gallons	30	30	30
Minimum Tire Width	225	225	225
Minimum Rims	16 x 6	16 x 6	16 x 6
Minimum Transmission	Automatic	Automatic	Automatic

MINIMUM CHASSIS SPECIFICATIONS CHART (TYPE C DIESEL)

Maximum Design Capacity	30 - 36	42 - 54	59 - 66	71 - 83
Front GAWR (pounds)	8,000	8,000	10,000	10,000
Rear GAWR (pounds)	15,000	15,000	17,500	19,000
GVWR (pounds)	23,000	23,000	27,500	29,000
Minimum Engine Horsepower	175hp	175hp	190hp	190hp
Wheel Base (inches)	150	167	236	252
Minimum Fuel Tank Gallons	35	60	60	60
Minimum Tires	9R22.5	9R22.5	10R22.5	11R22.5
Minimum Rims	6.75	6.75	7.5	8.25
Minimum Transmission	Automatic	Automatic	Automatic	Automatic

MINIMUM CHASSIS SPECIFICATIONS CHART
TYPE D FRONT ENGINE

Maximum Design Capacity	47 - 60	65 - 72	77 - 78	83 - 90
Front GAWR (pounds)	12,000	12,000	12,000	13,220
Rear GAWR (pounds)	17,500	17,500	19,000	19,000
GVWR (pounds)	29,500	29,500	30,000	30,000
Minimum Engine Horsepower	190 hp	190 hp	190 hp	210 hp
Wheel Base (inches)	136	174	193	212
Minimum Fuel Tank Gallons	35	60	60	60
Minimum Tires	10R22.5	10R22.5	11R22.5	11R22.5
Minimum Rims	7.5	7.5	8.25	8.25
Minimum Transmission	Automatic	Automatic	Automatic	Automatic

MINIMUM CHASSIS SPECIFICATIONS CHART
TYPE D REAR ENGINE

Maximum Design Capacity	65 - 66	71 - 72	77 - 78	84 - 90
Front GAWR (pounds)	12,000	12,000	12,000	12,000
Rear GAWR (pounds)	17,500	19,000	19,000	23,000
GVWR (pounds)	29,500	30,000	30,000	35,000
Minimum Engine Horsepower	190	190	190	207
Wheel Base (inches)	181	209	238	267
Minimum Fuel Tank Gallons	60	60	60	60
Minimum Tires	10R22.5	11R22.5	11R22.5	11R22.5
Minimum Rims	7.5	8.25	8.25	8.25
Minimum Transmission	Automatic	Automatic	Automatic	Automatic

SECTION C
SPECIALLY EQUIPPED BUSES

Type

A, C, and D

School Buses

SPECIALLY EQUIPPED SCHOOL BUSES

When so specified in the Invitation for Bids to include a wheelchair lift, (See Section E, Option 75) the 14 - 90 passenger school buses shall be equipped with a wheelchair lift meeting the following requirements. All parts which are not specifically mentioned that are necessary for the unit to be complete and ready for operation, or which are normally furnished as standard equipment, shall be furnished by the successful bidder. All school buses equipped with a lift shall provide a minimum thirty (30) inch aisle leading from any wheelchair mobility aid position to at least one (1) emergency door. A wheelchair securement position shall never be located adjacent to the lift door. All parts shall conform in strength, quality, and workmanship to industry standards meeting FMVSS 403 and installed according to FMVSS 404. The wheelchair lift furnished for Option 75 shall: be operated by a twelve (12) volt DC electric-hydraulic, electro-mechanical system or a combination there of. The lifting mechanism and platform shall be capable of operating effectively with a wheelchair and occupant mass of at least eight hundred (800) pounds. The vertical lift travel of the platform shall be appropriate for the school bus type and exceed the bus floor to ground distance by a minimum of six (6) inches to allow for un-level loading conditions. The lift shall be self contained, mounted directly to the existing bus body floor and the existing body floor shall be able to pass a static load test of three (3) times the lifting capacity of the lift. The lift shall be grounded to the bus chassis with a cable of suitable gauge to ensure positive grounding of the lift.

DOORS, SPECIAL SERVICE

One (1) or two (2) special side doors with permanently closed laminated safety glass windows in each door shall be provided as follows:

Design: The special service door(s) may be the standard double or single swing-out doors furnished by the chassis manufacturer on vehicles used for converted van buses or the special service doors shall be constructed of zinc-coated steel (G-60) or equivalent meeting ASTM A-924/A 924M. Doors may be either standard widths or as required for the lift furnished. The doors shall extend from the window header to the bottom of the floor line. Doors shall be water and weather tight when closed, with lift in the travel position.

Door Holding Device: A means (device) shall be provided to hold the swing-out type door(s) in the fully opened position.

Drip Rails: Full-length drip rails shall be furnished over the special service doors, which shall direct water away from the doors.

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

Rub Rails: Exterior side(s) of special service doors shall have two (2) rub rails with end caps installed at approximately the same level as the side-rub rails. Rub rail installation shall be in accordance with the requirements outlined in "Section B, Rub Rails".

ELECTRICAL SYSTEM

All wiring and wiring connectors used in the construction of the wheelchair lift shall meet the requirements of SAE J561.

Electrical Insulation: Any component(s) such as the motor, electric wiring, switches, and any connections or parts likely to pose a safety hazard, shall be enclosed in insulated housing(s) to protect passengers and equipment.

Circuit Protection: A re-settable circuit breaker for the lift electrical system shall be located as close to the battery compartment as possible but not in the passenger compartment. The breaker must be easily accessed.

EMERGENCY EVACUATION BLANKET

A minimum of one (1) fire-retardant evacuation blanket and storage pouch shall be provided. The location to secure the evacuation blanket shall be easily accessible and determined by the purchaser at the time of the bid.

FRAME AND RELATED COMPONENTS

Frame: Lift frame shall be constructed and designed to support the platform extension, toe board, and other parts necessary for proper operation, plus a minimum of eight hundred (800) pounds of additional weight.

Design of Platform, Automatic Folding Type: The platform shall be of sturdy construction and covered with minimum one eighth (1/8) inch safety plate steel or one eighth (1/8) inch expanded metal (open grate) with maximum three fourths (3/4) inch openings. The lift platform shall have a minimum thirty two (32) inches, when measured two (2) inches above the platform surface, of clear, usable width, unobstructed by the required handrail. The minimum clear length of the platform between the outer edge barrier and the inner edge shall be forty eight (48) inches. Any portion of platform in the folded (travel) position that obstructs window vision shall be covered with expanded metal.

Handrail: The lift platform shall be equipped with two (2) handrails for security. The graspable portion of each handrail shall measure not less than thirty (30) inches and not more than thirty eight (38) inches above the platform surface, measured vertically and designed to fold when in stowed position so as not to add to the overall lift projection into the bus.

Lift Action: Lift shall be equipped with two (2) actions; power-up and controlled descent with slow (gentle) movement. Platform shall be level at all times during the raising and lowering action. A load switch shall be installed on the platform to prevent accidental folding while loading wheelchair passengers.

Safety Rails: The platform shall be equipped with safety rails on both sides, which are constructed of a minimum one eighth (1/8) inch steel and one (1) inch high. The front of the lift shall have a folding type safety rail a minimum of three (3) inches in height. Safety rail folding action may be either manual or automatic.

Toe Board: A toe board shall be furnished that is angled at approximately eight (8) degrees below horizontal.

Operations / Cycle Counter: As required by FMVSS 403 Standard.

Labeling: Each lift shall be affixed with a legible and durable nameplate. **Permanent plaques are required, decals are not acceptable.** The plaque shall include the following: Name & address of the manufacturer, Model number, Serial number, Month & Year of Manufacturing.

HYDRAULIC SYSTEM AND RELATED COMPONENTS

Electric-hydraulic wheelchair lifts shall be furnished with a hydraulic system for lift operation. The components shall include, but not be limited to, the following:

Hoses and Fittings: Hose, hose fittings, and hydraulic fittings shall meet the requirements of SAE J517, J516, and J514, respectively, for nominal size(s) furnished.

Hydraulic Cylinders: Hydraulic cylinders shall be installed for lift operations. Piston rod diameter of each cylinder shall be a minimum three fourths (3/4) inch. Cylinders shall have a minimum of thirty four (34) inches of extension action and shall lift a minimum of eight hundred (800) pounds in addition to the weight of the lift.

Hydraulic Fluid Reservoir: A reservoir for hydraulic fluid shall be furnished and installed in an accessible location to allow easy checking of the fluid level and filling as necessary. Fluid capacity and type shall be as recommended by the lift manufacturer.

Hydraulic Valves: The system shall provide valves for the following actions:

Over pressure: A pressure-limiting device to prevent over loading of the lift system design capacity.

Override: A bypass valve (or other means) shall be provided to prevent the lifting of the bus by over extending the hydraulic cylinders.

Power Failure: The system shall be equipped with a manual back up system for raising and lowering the wheelchair platform in case of power failure. No tools other than those provided and stored on the lift shall be required for manual operation.

LAMPS, SIGNALS AND WARNING DEVICES

Alternately Flashing Non-Sequential Signal Lamps; when the master switch is on, opening the lift door shall activate the red warning lights with the ignition off or on.

LEVEL TEST

The sides of any bus provided with a wheelchair lift shall be within plus or minus two (2) inches of each other when measured from comparable points on each side to the ground with the bus empty and parked on a level hard surface (such as concrete). Chassis springs and suspension shall be adjusted as necessary to provide a level bus when the additional weight of a wheelchair lift is installed.

MAINTENANCE, TRAINING AND SERVICE

Documents: A comprehensive operator's, maintenance, and parts manual(s) shall be provided for the lift with each bus. Parts manuals must be designed so that all replaceable parts are illustrated by line drawings and such parts are numbered on the illustration, with a part description on a separate list under the corresponding part number. Part descriptions should be annotated appropriately with the part number, a proper description (part name) and the quantity required for the application listed in the drawing. Any maintenance actions that, if done improperly, could result in an unsafe condition must be identified and clearly emphasized in the maintenance manual. All components which must be isolated or identified for ease of troubleshooting and diagnosis, such as electrical wiring and components or hydraulic lines, hoses, or valves must be clearly identified in the service manual as to their specific functions and relation to other parts.

MAINTENANCE, TRAINING AND SERVICE (continued)

Maintenance Accessibility: All systems or components serviced, as part of the periodic maintenance of the lift, whose failure may cause a safety hazard or a road call, shall be readily accessible for service and inspection. To the extent practicable, removal or physical movement of components unrelated to the specific maintenance and/or repair tasks involved shall be unnecessary. Relative accessibility of components, measured in time required to gain access, shall be inversely proportional to frequency of maintenance and repair of the components.

Wheelchair Lift and Securement System Literature and Training: The following information shall be provided with each vehicle equipped with a securement system:

A. Detailed installation, service and parts manual.
B. Detailed instructions for the proper use of the wheel chair securement and occupant restraint system.
C. The vendor shall be responsible for providing for lift and securement training. This training could be audiovisual or hands on by a qualified representative of the manufacturer of the lift and securement equipment.

MOUNTING AND INSTALLATION

Installation shall be such that vibrations will be minimal. The wheelchair lift shall be installed by the bus body manufacturer or authorized dealer of the lift manufacturer. The lift may be mounted on the front right curbside or right rear curbside of the school bus body floor. It shall be securely bolted in place through the floor using the lift manufacturers' recommended fastening system. The bus floor and frame shall be reinforced as required to support the lift and load. The tail pipe may be routed anywhere between the frame rails to provide sufficient clearance for the lift, but shall not exit in the lift area.

OPERATING CONTROLS AND SAFETY DEVICES

Operating Switches: Controls for each movement of the lift shall be through a remote pendant-type control (or equivalent) equipped with automatic return-to-off switches. Electrical cables shall be copper, rubber insulated and of sufficient length to allow operation of the lift from inside and outside of bus.

Warning and Safety Devices:

Safety Switch: A safety switch shall be installed at or near the service door to prevent operation of the lift except when all special service doors are open.

Warning Light: A signal light, mounted near the other dashboard instruments, shall warn the driver when the ignition switch is activated and the special service doors are open or ajar, i.e., not completely closed.

OTHER REQUIREMENTS

Wheelchair lift-equipped school buses shall also be provided with the following:

Floor Covering: The floor in the wheelchair area and the area in the lift entryway shall be smooth and free of projections. Aisle floor covering shall be the same as required in Section B, Floor and Floor Covering.

Flooring: When plywood is used to cover existing steel floors on specially equipped buses, it shall conform to Section B, Floor and Floor Coverings. See Options, Section E Option 22 for marine grade plywood.

Interior Lamp, Lift Compartment: The lift compartment shall have one (1) interior lamp installed in the roof panel above the center of the lift compartment; or one (1) lamp shall be installed in the roof panels on each side of the lift door to illuminate the platform entryway area. The lamp(s) shall be minimum fifteen (15) candlepower each and shall be one (1) of the examples listed in Section B, Lights, Interior Lights.

INTERNATIONAL HANDICAP SYMBOLS

School buses with wheelchair lifts shall display four International Handicapped Symbols in the following locations: the front and rear of the bus, and both sides below the window line. These emblems shall be white on a blue background, between six (6) inches and twelve (12) inches in size, and shall be of a high intensity reflector material meeting U.S. Department of Transportation FHWAFP-85 Standards.

SECUREMENT AND RESTRAINT SYSTEM FOR WHEELCHAIR/MOBILITY AID AND OCCUPANT

For purposes of better understanding the various aspects and components of this section, the term securement or phrase securement system is used exclusively in reference to the device(s), which secure the wheelchair/mobility aid. The term restraint or phrase restraint system is used exclusively in reference to the device(s) used to restrain the occupant of the wheelchair/mobility aid. The phrase securement and restraint system is used to refer to the total system, which secures and restrains the wheelchair/ mobility aid and the occupant.

Securement and Restraint System – General

A. The wheelchair/mobility aid securement and occupant restraint system shall be designed, installed, and operated to accommodate passengers in a forward-facing orientation within the bus and shall comply with all applicable requirements of FMVSS 222. Gurney-type devices shall be secured parallel to the side of each bus. Securement system hardware and attachment points for the forward-facing system shall be provided.

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

C. A wheelchair/mobility aid securement device and an occupant restraint shall share an integrated lap and shoulder belt with a common anchorage, including occupant restraint designs that attach the occupant restraint to the securement device or the wheelchair/mobility aid, the anchorage shall be capable of withstanding the loads of both the securement device and occupant restraint when applied simultaneously, in accordance with FMVSS 222. For more information see "Wheelchair/Mobility Aid Securement System" in the next Section.

Securement and Restraint System – General (continued)

D. The bus body floor and sidewall structures where the securement and restraint system anchorages are attached shall have equal or greater strength than the load requirements of the system(s) being installed.
E. The occupant restraint system shall be designed to attach to the bus body either directly or in combination with the wheelchair/mobility aid securement system by a method, which prohibits the transfer of weight or force from the wheelchair/mobility aid to the occupant in the event of an impact.
F. When an occupied wheelchair/mobility aid is secured in accordance with the manufacturer's instructions, the securement and restraint system shall limit the movement of the occupied wheelchair/mobility aid to no more than two (2) inches in any direction under normal driving conditions.
G. The securement and restraint system shall incorporate an identification scheme, which will allow for the easy identification of the various components and their functions. It shall consist of one (1) of the following, or combination thereof:
    1. The wheelchair/mobility aid securement (webbing or strap assemblies) and the occupant restraint belt assemblies shall be of contrasting color or color shade.
    2. The wheelchair/mobility aid securement device (webbing or strap assemblies) and occupant restraint belt assemblies may be clearly marked to indicate the proper wheelchair orientation in the vehicle, and the name and location for each device or belt assembly, i.e., front, rear, lap belt, shoulder belt, etc.
H. All attachment or coupling devices designed to be connected or disconnected frequently shall be accessible and operable without the use of tools or other mechanical assistance.
I. All securement and restraint system hardware and components shall be free of sharp or jagged areas and shall be of a non-corrosive material or treated to resist corrosion in accordance with 4.3(a) of FMVSS 209.
J. The securement and restraint system shall be located and installed such that when an occupied wheelchair/mobility aid is secured, it does not block access to the lift door.
K. A device for storage of the securement and restraint system shall be provided. When the system is not in use, the storage device shall allow for the clean storage of the system, shall keep the system securely contained and shall enable the system to be readily accessed for use.
L. The entire securement and restraint system, including the storage device, shall meet the flammability standards established in FMVSS 302.
M. Each securement device (webbing or strap assembly) and restraint belt assembly shall be permanently and legibly marked or incorporate a non-removable label or tag which states that it conforms to all applicable FMVSS requirements, as well as the current *National School Transportation Specifications & Procedures*. In addition, the system manufacturer, or an authorized representative, upon request by the original titled purchaser, shall provide a notarized Certificate of Conformance, either original or photocopied, which states that the wheelchair/ mobility aid securement and occupant restraint system meets all of the requirements as specified in FMVSS 222 and the current *National School Transportation Specifications & Procedures*.

Securement and Restraint System – General (continued)

N. The following information shall be provided with each vehicle equipped with a securement and restraint system:
   1. Phone numbers where information can be obtained about installation, repair, and parts. (Detailed written instructions and a parts list shall be available upon request.)
   2. Detailed instructions regarding use, including a diagram showing the proper placement of the wheelchair/mobility aids and positioning of securement devices and occupant restraints, including correct belt angles.

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

P. In addition to the webbing cutter required in the Drivers Seat and Seat Belt section (B-4), each specially equipped school bus that is set up to accommodate wheelchairs or other assistive or restraint devices with belts attached shall contain an additional webbing cutter properly secured in a location to be determined by the purchaser. The belt cutter shall meet the requirements listed in the Drivers Seat and Seat Belt section (B-4).

Wheelchair / Mobility Aid Securement and Occupant Restraint System

A. Occupant restraint belt assemblies and anchorage shall also be certified to meet the requirements of FMVSS No.'s 209 and 210.

B. Each location for the securement of a wheelchair/mobility aid shall have a minimum of four anchorage points. A minimum of two (2) anchorage points shall be located in front of the wheelchair/mobility aid and a minimum of two (2) anchorage points shall be located in the rear. The securement anchorage shall be attached to the floor of the vehicle and shall not interfere with passenger movement or present any hazardous condition.

C. Each securement system location shall have a minimum clear floor area of thirty (30) inches by forty eight (48) inches. Additional floor area may be required for some applications. Consultation between the user and the manufacturer is recommended to ensure adequate area is provided.

D. The securement system shall secure common wheelchair/mobility aids and shall be easily attached by a person having average dexterity and who is familiar with the system and wheelchair/ mobility aid. The wheelchair securement system including all hardware (attachment bolts, track, etc.) shall have been successfully tested to meet minimum impact forces of a 20 G, 30 MPH deceleration to simulate a frontal impact on the transport vehicle per the Society of Automotive Engineers (SAE) J2249, Wheelchair Tie Down and Occupant Restraint Systems for use in Motor Vehicles. The securement systems shall be labeled that the products meets SAE J2249 standards.

SUPPORT EQUIPMENT AND ACCESSORIES

The following is recommended by the *National School Transportation Specifications & Procedures* for support equipment and accessories. It is included here for the information of school districts. The following items are not required to be provided by the body manufacturer unless specified in the Invitation for Bid.

Portable student support equipment or special accessory items shall be secured at the mounting location to withstand a pulling force of five (5) times the weight of the item, or shall be retained in an enclosed, latched compartment. Examples of special items are crutches, walkers, canes, and similar devices.

Medical support equipment items are to be secured as specified above. These items include oxygen bottles, ventilators, and other items.

SECTION D
AIR
CONDITIONING

AIR CONDITIONING SPECIFICATIONS

DEFINITIONS

- **Manufacturer:** References to "manufacturer" in this section refer to the "A/C Equipment Manufacturer".
- **Contractor:** References to "contractor" in this section refer to the company responsible for the temperature reduction test.
- **Vendor:** Company selling the bus.

This is a performance specification.
A test must be performed by the vendor, unbiased, independently certified, and documented by a third party capable of performing the testing procedures as outlined below for each series of buses. **(Certified in-house testing facility may be acceptable.)** Tests shall be performed at the expense of the vendor. Test data must be provided to the purchaser upon written request. **The purchaser must be able to replicate the test and results.** However, if the A/C system presented does not pass after three (3) tests, the manufacturer shall supply another system to meet the requirements.

SERIES OF BUSES TO BE TESTED	
Passengers	**Bus Types**
14 - 42	Type A
14 - 53	Type C & D
59 - 72	Type C & D
77 - 90	Type C & D

TEMPERATURE DIFFERENTIAL

Shall be held under the following conditions:

1. Air conditioning system will be designed to operate at 110º F, 50% humidity, and full sunshine.
2. All doors and vents closed and under a steady state condition.
3. All interior bus temperature measurements must fall within the comfort range of 30º F cooler than outside ambient temperature, plus or minus 3º F.

AIR CONDITIONING TEST

1. The Contractor will test the air conditioning system by placing the Manufacturer's bus in a heat booth or similar surroundings, then heat saturate the *entire bus (interior) such that the interior of the bus shall have a maximum temperature of 110º F and a minimum of, no less than, 100º F.* The bus shall be heat saturated for a minimum of two (2) hours. Inside temperatures are measured at the three (3) described locations as stated below.

AIR CONDITIONING TEST (continued)

2. The A/C system shall be manually controlled from the driver's area. The air conditioning system must be capable of lowering the inside temperature from 110º F maximum (100º F minimum) and a humidity rating no less than fifty (50) percent to a comfort range of 30º F cooler than the outside ambient temperature plus or minus 3º F in thirty (30) minutes or less with all the doors and windows closed and the main engine operating at three fourths (3/4) of maximum rated RPM, tested in a controlled facility environment. Measurements will be taken four (4) feet above the floor along the aisle at the following locations:
    a. Driver's seat
    b. In the center or mid point of the bus
    c. Over the rear drive axle
    d. None can be in the direct path of the air exiting the evaporator
3. After the inside temperature has reached a uniform saturation of 110º F maximum (100º F minimum), all doors, windows and vents will be closed and the air conditioning test will begin. The main drive engine may be operated up to three fourths (3/4) of the maximum RPM, controlled by a throttle regulator. The inside temperature at the driver's seat, mid-point, and at the rear of the bus will be monitored throughout the test period. Exterior temperature will be at an average 110º F maximum (100º F minimum) and be monitored for the test duration. Outside test instruments shall be mounted at the bumper and/or fender on the four "corners" of the bus body.
4. After thirty (30) minutes the inside temperatures must attain the comfort range of 30º F cooler than the outside ambient temperature plus or minus 3º F at all three (3) points identified above. Temperature will be measured in five (5) minute increments, inside and outside of the bus. No single probe will vary more than 5º F. Measurements will be recorded and held for review by prospective purchasers.
5. Manufacturer may have a representative present during the test for observation purposes only. Results of the air conditioning test will be available to the purchaser in advance of the bid opening.

AIR CONDITIONING SYSTEM

1. Vendor shall include a stamped metal data plate under the hood indicating the type and quantity of refrigerant used for each unit installed. A second copy of the information shall be included in the delivery folder.
2. Serpentine belt configuration is preferred.
3. High and low pressure cut out safety switches are required.
4. Written documentation, both labeling and the service manual shall describe refrigerant capacities within each system on the vehicle, i.e., "curbside system capacity" and "street-side system capacity". Each air conditioning unit shall be affixed a stamped metal data plate. The data plate shall include the following information:
    a. Name and address of the manufacturer
    b. Model
    c. Compressor
    d. Condenser
    e. Re-circulation and ventilation of air quantity in (CFM).
    f. The type and quantity of refrigerant used for each system installed.
5. Alternator (See Section B, Bus Body & Chassis Specifications)
6. As an option, when requested in the IFB, the air conditioning system shall be supplied with a drier with two (2) back-seated valves.

PRODUCT SUPPORT

1. Parts books and/or software providing a complete listing of all parts and supplies to repair and maintain A/C systems specified in this bid contract shall be provided by the manufacturer. A minimum of two (2) copies of the parts books (or if web based then 1 copy is acceptable) and/or software per complete unit shall be provided at the time of delivery. "Complete listing" is defined as all components represented in the complete installation of A/C system bid.
2. Service manuals providing recommended preventative maintenance, service intervals, and "trouble shooting" procedures for repair and maintenance shall be provided at the time of delivery. A minimum of two (2) copies of the service manuals (or if web based then 1 copy is acceptable) and/or software per complete unit shall be provided at the time of delivery.
3. Vendor is responsible for registration of warranties for air conditioning system.
4. The vendor upon request must provide a copy of the performance test results for each series of bus purchased.

SPECIAL REQUIREMENTS

Unless otherwise noted, all school buses ordered with air conditioning shall be furnished with the following:

Insulation:

a. Plywood (5/8 inch), or equivalent material, shall be installed over the existing or manufacturer's standard steel floor for insulation. When an equivalent material is used to replace plywood, it must provide equal or greater insulation R-value, sound abatement, deterioration-resistant and moisture resistant properties of five eighths (5/8) inch plywood. Except Type A where one half (1/2) inch is acceptable.
b. Air conditioned buses shall have the equivalent of one and one half (1½) inches of fiberglass or other insulation in the ceilings and walls including the interior of hat-shaped bows. The insulation shall have a minimum R-factor value of 5.75.
c. The body must be equipped with insulation, including sidewalls, roof, firewall, rear, inside body bows, and floor insulation to aid in heat dissipation and reflection.
d. Plywood or equivalent insulating material shall be securely fastened to the metal floor structure. Insulating material thickness shall not vary or move in such a way as to distort the elastomer floor covering material making a higher edge on one side of the seam at the joint.

Note: See Section E, Option 22 for marine grade plywood

Tinting:

The side windows and windshield of air conditioned buses shall be furnished as follows. All tinting materials used shall be in compliance with the Texas Department of Public Safety regulations.

Note: Maximum tinting shall be furnished with air conditioned buses. It is not necessary to order Option 78 in Section E.

a. Side Windows, Passenger: All tinting shall conform to Texas Administrative Code Title 37, Part 1, Chapter 23, Subchapter C, Rule 23.42, Inspection Items, Procedures and Requirements. "Dark tinting" is not permitted on the windshield or any window used for driving purposes.

Tinting (continued):

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

Beneficial Options: See Section E, Option 77 for white roof.

GENERAL PERFORMANCE REQUIREMENTS

The method to determine a uniform guideline for air conditioning systems in school buses shall conform to the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc., ASHRAE 41.4-1986. Air conditioning systems shall:

1. Be furnished to meet the requirements of this specification and shall be the mechanical vapor compression refrigeration type.
2. Have sufficient power for simultaneous cooling, circulating, and dehumidifying the air.
3. Be provided with refrigerant that must be nontoxic, nonflammable, and non-explosive.
4. Be manufactured to conform to the requirements of SAE J639.
5. Be of the current year's production.
6. Details not specifically defined herein shall be in accordance with the manufacturer's standard commercial practice for products of this type.
7. Have stand-alone grounding system for evaporator and condenser fan systems.
8. Have all power and grounding come directly from the battery.
9. All air conditioning systems will conform to this specification.

CONTROLS

All air conditioning controls shall be located within the drivers reach while seated and operating the vehicle. The controls shall be of the manufactures design with a minimum of three (3) operating speeds, OFF is not considered an operating speed.

INSTALLATION

Installing Dealer: Installation of the air conditioning system(s) shall be by the bus body company or by an authorized manufacturer's air conditioning dealer who normally stocks, sells, installs, and services a unit of the type being furnished.

Protection of Components: Any skirt-mounted air conditioning component or component mounted underneath the bus shall be provided with shielding to protect these components from mud or road debris.

NOTE: NO INSTALLATION OF ANY AIR CONDITIONING UNITS OR SYSTEMS SHALL, UNDER ANY CIRCUMSTANCES, VOID THE CHASSIS MANUFACTURER'S ENGINE WARRANTY.

TESTING

Testing shall be done by, or at the direction of the Department and/or the receiving school district or other entity. Tests shall be performed on buses furnished. **The air conditioning manufacturer bears** the cost of the **initial** test. The cost of additional tests shall be the responsibility of the requester of the test if the air conditioning system has already been certified as passing the test and passes the retest.

OTHER REQUIREMENTS

Availability of Service and Repair Parts: Bidder shall have on file with the Department a list, with address and contact information, of factory-authorized companies or individuals that stock repair parts and who can perform service on the products furnished. **Bidder must provide a means for the parts to be received within three (3) days of receipt of order.**

SECTION E
ADDITIONAL EQUIPMENT (OPTIONAL)

ADDITIONAL EQUIPMENT (OPTIONAL)

Options must be installed by the bus manufacturer or vendor prior to delivery of the bus. Not all options are available for all sizes and/or models of buses and are subject to change. Questions may be directed to vendors.

The addition of any listed Additional Equipment (Optional) to the vehicle is permitted as long as the bus continues to meet the Texas School Bus Specifications, all Federal Requirements and the following:

1. The option is listed on the purchase order as a separate option.
2. The successful bidder/vendor certifies that the options being offered will meet or exceed all requirements and conditions of the listed options at the manufacture, installation, and time of delivery.

OPTION NO.	DESCRIPTION
1.	**Acoustical ceiling panels** Sound reduction insulation panels for the interior roof of the bus. a. ____ First two (2) body sections b. ____ All body sections
2.	**Adjustable Pedals** Option for accelerator and brake control pedals to be adjustable to accommodate different sizes of drivers.
3.	**Air conditioning**, performance standard State style and system preferred _____
4.	**Alternately flashing non-sequential signal lamps** _____ LED Strobe Loading Lights
5.	**Alternative fuel engines,** O E M Supplied The power units (engines) furnished for the respective size and style bus shall be operable on alternative fuels, as determined by the Texas Commission on Environmental Quality (TCEQ). The power unit shall be the chassis manufacturer's standard or optional engine for the vehicle type, which meets or exceeds the power requirements specified herein, at the engine manufacturer's rated operating speed. The engine may be of a standard production design or retrofitted for alternative fuels only by the engine Original Equipment Manufacturer (OEM) or any duly certified and/or approved manufacturer designated by the OEM, and certified/ licensed by the Texas Railroad Commission (RRC), as applicable. The engine shall be of such design and construction that it will give an even flow of power at all engine speeds without undue vibration, strain, or overheating of engine components. The fuel system shall meet all applicable FMVSS and The Railroad Commission of Texas certification and/or licensing requirements. These vehicles shall be fully operational at delivery to the district without any additional modification or adjustments. Alternatively fueled engines shall be OEM warranted for a period of not less than five (5) years/fifty thousand (50,000) miles, and shall include all engine and emission parts and fuel system components. The engine manufacturer or approved designate, may upgrade engines in the field to improve durability, reliability, or emissions with the approval of the ordering agency. Compressed Natural Gas (CNG): The engine shall be capable of operating on compressed natural gas, as defined herein, in a mono- or bi-fuel mode, as specified in the Invitation for Bid. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for compressed natural gas and be enclosed in a cage meeting the same requirements as required for traditional fuels. (Internal check valves may be furnished in lieu of cages.) Minimum mileage range shall be seventy five (75) miles or as specified in the Invitation for bid.

	Alternative fuel engines, O E M Supplied (continued) Liquefied Petroleum Gas (LPG): The engine shall be capable of operating on liquefied petroleum gas, as defined herein. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for liquefied petroleum gas. Minimum mileage range shall be seventy five (75) miles or as specified in the Invitation for bid. (Select From Types below) _____Compressed Natural Gas (CNG) ____mono ____Bi fuel _____Liquefied Petroleum Gas (LPG) ____mono ____Bi fuel
6.	**Alternator** Increased capacity of alternator to a minimum of: Choose Alternator size: _____ 200 amps _____270 amps _____320 amps
7.	**Battery compartment** – locking Locking battery box having outside access. Keyed the same as any other storage compartments.
8.	**Brakes, air** (For 35 - 53 passenger buses, see Section B-3)
9.	**Communication device** System mounted in driver's compartment for communication between driver and district's management. Ordering entity must state current system for compatibility. Vendor must provide system compatible with: _____(state brand name)
10.	**Crossing gate (student safety crossing arm)** The bus shall be equipped with a crossing control arm mounted on the right side of the front bumper. This arm when opened shall extend in a line parallel with the body side and positioned on a line with the right side wheels. All components of the crossing control arm and all connections shall be weatherproof. The crossing control arm shall incorporate system connectors (electrical or air) at the gate and shall be easily removable to allow for towing of the bus. The crossing control arm shall meet or exceed SAE J1133. The crossing control arm shall be constructed of non-corrosive or nonferrous material or treated in accordance with the body sheet metal specification. There shall be no sharp edges or projections that could cause hazard or injury to students. The crossing control arm shall extend approximately seventy (70) inches (measured from the bumper at the arm assembly attachment point) when in the extended position. The crossing control arm shall extend simultaneously with the stop arm(s) by means of the stop arm controls. a. ____ Air Powered Crossing Gate b. ____ Electric Powered Crossing Gate

	Crossing gate (student safety crossing arm) (continued) c. ____ Electro-magnetic latch d. ____ Deployment override switch (single cycle)
11.	**Cruise control** Chassis manufacturer's standard automatic speed maintenance control system with resume speed feature.
12.	**Defroster/heater** Auxiliary right hand defroster/heater with a separate core.
13.	**Differential, no spin** A locking type no-spin rear differential. This differential shall be fully automatic in operation. Selection switches are not allowed.
14.	**Digital video recorder** Records the passenger compartment of bus with date and time notation. List (brand & type preferred) _____ List quantity of cameras and mounting locations _____
15.	**Door, air or electric powered service** Manufacturer's standard powered by electricity or air, clearly and concisely marked with operating instructions in case of power failure. The door must have a manual override to enable the door to open. **Note:** Air may not be available on all buses. a. _____ Air b. _____ Electric
16.	**Driver Seat Belt Alarm** The driver's seat belt shall be high visibility orange or lime green in color on all buses except Type A. All Type C and D buses must be equipped with a continuous audible and visual warning signal activated when the driver's seat belt is not fastened and the ignition is in the on position. The warning signal shall be different from low air or emergency exit buzzer. Type A buses must be equipped with warning buzzers as per manufacturer's standard.

17.	**Driver's seat with air or hydraulic suspension** The air control for height adjustment shall be within easy reach of the driver in the seated position. The seat cushion shall be a minimum of nineteen & one half (19½) inches wide, shall be fully contoured for maximum comfort, and shall have a minimum of four (4) adjustment positions to allow changes in seat bottom angle. Hydraulic suspension seats may have a minimum seat cushion width of nineteen (19) inches. Backrest shall include adjustable lumbar support. The seat shall have a minimum of seven (7) inches fore and aft travel, adjustable with the driver in the seated position. This requirement applies to the seat mechanism. The seat shall have a minimum four (4) inches up and down travel. Seat back shall include adjustability of tilt angle. All adjustments shall be by fingertip controls without the use of tools. Air suspension seats shall be dampened by dual shock absorbers acting independently. Not available on Type A chassis. The seat shall comply with all applicable FMVSS standards. a. _____ Air Suspension b. _____ Hydraulic Suspension c. _____ Integrated Lap/Shoulder Safety Belt
18.	**Engine, diesel** Indicate minimum horsepower required: _____
19.	**Engine, gasoline** Indicate minimum horsepower required: _____
20.	**Flat floor** (Desirable and used often in conjunction with the use of wheelchairs.) Where available, buses shall be equipped with an unobstructed flat floor design (i.e., no wheel wells and no step-up from the entrance area to the passenger area). Chassis manufacturer shall make provisions for "flat floor effects" and shall include as a minimum, low profile tires and modified rear suspension, etc., to permit elimination of body wheel wells without tires making contact with the underside of floor during wheel jounce conditions. (On Type D, transit style buses the Flat Floor begins after front wheel wells. Not available if engine is in the rear of the bus.) Headroom requirements shall remain the same as a standard vehicle and shall accommodate either a low headroom vehicle or an optional high-headroom vehicle.
21.	**Floor covering** Specify color: _____ One (1) piece floor covering _____ Bonded Floor covering _____ Contact vendors for available colors.

22.	**Floor insulation plywood** The physical thickness shall be no less than five eighths (5/8) inch. (one half (1/2) inch for Type A) a. _____ BC Grade exterior type b. _____ Pressure Treated c. _____ Marine Grade **Note:** Marine Grade plywood should extend life of floor where moisture is a problem.
23.	**Flooring with recessed track** Flooring with four (4) recessed tracks parallel to the aisle of the bus. State number of wheelchair positions and/or track-mounted passenger seating required. a. _____ Wheelchair b. _____ Track seating The school district must maintain the seat spacing according to FMVSS 222.
24.	**Fuel tank**, Manufacturer's largest capacity. Bidder to state size in gallons.
25.	**Headroom maximum** Increased height of bus ceiling for maximum headroom for stated size of bus. (Bidder to specify in inches)
26.	**Heater, rear,** (auxiliary under seat mounted with heater water circulating pump) It shall be mounted near the rear of the bus and in such a manner so as not to interfere with the securing of seats to the floor. The Btu/hr. rating shall be in accordance with SBMTC Standard No. 001. Heated conduits inside the buses shall be insulated or shielded to prevent injury to the driver or passengers. The heater shall have a minimum output rating (re-circulating air rating, not fresh air intake rating) as follows: 14 - 35 passenger buses do not require a water circulating pump. 24 - 42 passenger buses: 40,000 Btu/hr. 47 passenger and larger buses: 75,000 Btu/hr.

27.	**Heater, rear,** (auxiliary wall mounted with heater water circulating pump for buses with wheelchair lift) It shall be mounted near the rear of the bus and in such a manner so as not to interfere with the securing of seats to the floor. The Btu/hr. rating shall be in accordance with SBMTC Standard No. 001. Heated conduits inside the buses shall be insulated or shielded to prevent injury to the driver or passengers. The heater shall have a minimum output rating (re-circulating air rating, not fresh air intake rating) as follows: 14 - 35 passenger buses do not require a water-circulating pump. 24 - 42 passenger buses: 40,000 Btu/hr. 47 passenger and larger buses: 75,000 Btu/hr.
28.	**Hood** – Non Reflective Paint a. ___ Yellow b. ___ Black
29.	**Hub odometer** Chassis shall be equipped with one (1) hub odometer with standard mounting bracket, which shall be calibrated in miles and installed by the manufacturer. a. ___ Left rear wheel (driver's side) b. ___ Right rear wheel (passenger's side)
30.	**Hydraulic brakes** (59 - 90 passenger buses, see Section B-3)
31.	**Knee spacing maximum** Maximum spacing between seats as allowed by FMVSS No. 222; requires deleting one (1) row (6 positions of seats), which will reduce seating capacity.
32.	**Low profile tires** Reduced tire size, which allows for lower bus height.
33.	**Mirrors** Rosco _____ Mirror Lite_____ Specify model and type _____ Shall be remote control and meet the requirements of FMVSS No.111
34.	**Mirrors, exterior rear view – stainless steel mounting** Exterior rearview mirror mounting brackets shall meet or exceed the requirements of Section B-13, mirror system and the mirror mounting shall be made of stainless steel.
35.	**Mirrors, exterior rear view – heated** Electrically heated, designed to remove snow and/or ice from mirrors.

36.	**Mud flaps**, with Brackets, mounted Rubberized mud flaps, complete with brackets, shall be installed behind each set of wheels. The mud flaps shall be comparable in size to the width of rear wheel housing and shall reach within approximately eight (8) inches off the ground when the bus is empty. They shall be mounted at a distance from the wheels that will permit free access to spring hangers for lubrication, and to prevent their being pulled off when the bus is moving in reverse. **Note:** Mud flaps may display the manufacturer's logo. a. _____ Rear mud flaps only b. _____ Both front and rear mud flaps
37.	**P.A. System/Radio** Internal public address system to be used by driver, with speaker placed for equal hearing of all passengers. No speakers in driver's compartment or minimum of six (6) feet from driver's head. Check all items to include: a. _____ PA System (internal) b. _____ PA System (internal/external) c. _____ AM/FM radio d. _____ CD e. _____ Cassette
38.	**Parking Brake Interlock** All non-park pawl transmissions shall incorporate a park brake interlock that requires the service brake to be applied to allow release of the parking brake.
39.	**Reflective material for bumpers** The front and/or rear bumper are marked diagonally forty five (45) degrees down to centerline of pavement with two (2) inch wide strips of yellow or black reflective material, followed by a two (2) inch strip of unmarked (painted black) bumper. a. _____ Front Bumper b. _____ Rear Bumper
40.	**Roof-top warning lamp** The lamp shall have a single clear lens emitting light. Revolving three hundred sixty (360) degrees around a vertical axis. The Light source shall be minimum of fifty (50) candlepower and flash eighty (80) to one hundred and twenty (120) times per minute. The base of the lamp shall be metal or approved equal and installed by a method, which seals out dust and moisture. A manual switch is required for operation and a pilot light to indicate when the light is in operation shall be included. Wiring shall be installed inside the bus walls. The warning light shall be permanently installed near the centerline on the school bus roof not more than one third (1/3) of the body length forward from the rear edge of the bus roof. It shall not extend above the roof more than approximately six and one half (6½) inches.

41.	**Seat anchorages** State the number of LATCH positions or lap belts needed. _____.
42.	**Seat: Lap belt ready** Compliant with FMVSS 210 and no lap belts included.
43.	**Seat: Lap/shoulder belt (Indicate _____# of seating positions)** Lap/Shoulder belts meeting FMVSS 209 & 210 may be added to any size school bus. Indicate the number of seating positions requiring lap/shoulder belts in the space above. If you specify lap/shoulder belts when ordering a Type A school bus, lap belts will be omitted. **Note:** Ordering lap/shoulder belts may reduce the seating capacity of the school bus.
44.	**Seating lap belts** Lap Belts are Optional (for each passenger seating position). Lap belts conforming to FMVSS No.'s 209 and 210 are provided for each passenger position. 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 (2) or three (3) colors. Seat belts shall be provided which are adjustable to fit passenger sizes as required by FMVSS No.'s 208 and 209. Buckles shall be of the plastic covered push button design. The non-adjustable end shall be on the aisle side and may not extend more than two (2) inches out of the bight of the seat. If possible, the design shall prevent fastening the belts across the aisle. **Note:** Installation of seating lap belts may reduce seating capacity. Lap belts are standard for Type A (less than 10,000 GVWR)
45.	**Seating Requirements, Passenger** All buses shall be equipped with eight (8) designated seating positions that incorporate rigid lower anchorages or lap belts for the installation of portable child restraints. If anchorages are provided, they shall comply with the requirements of FMVSS 225 as applicable to school buses. If lap belts are provided, the manufacturer must install an adequate number of lap belts to secure eight (8) portable child restraints. If the number of seats on the bus will not allow for eight (8) positions, the maximum number possible shall be installed. A school bus ordered with activity style seats is exempt from this requirement. This requirement shall not reduce the seating capacity of the school bus. **Note:** FMVSS 225, General Exceptions excludes school buses from the tether anchorage requirements. Tether anchorages are not required nor prohibited by this specification for any size school bus. The non-adjustable end shall be on the aisle side and not extend more than two (2) inches out of the bight of the seat.

46.	**Seating, passenger (with integrated child restraint system)** Indicate quantity of seating positions: _____ Integral means "a built-in feature". Systems that are not built into the seat do not qualify. Seats that are thirty nine (39) inches wide will have two (2) integrated positions. Seats that are less than thirty six (36) inches wide may have one (1) integrated position.
47.	**Seats, activity style** Designed for extended travel usage. Two (2) seating positions per seat, contoured with additional padding.
48.	**Security system door locks** a. _____ For service door and emergency exit doors, does not lock wheelchair lift door. (With ignition disconnect on emergency door.) b. _____ For all bus access panels doors.
49.	**Sound abatement insulation for engine compartment** Extra sound insulation for Type C buses (Shall reduce interior noise by 4 decibels, minimum).
50.	**State inspection and sticker prior to delivery** Vendor completes all state or commercial required inspections necessary to put bus into service prior to delivery. a. _____ State safety inspection b. _____ DOT commercial inspection
51.	**Stop arm – higher visibility** a. _____ Strobe light b. _____ Flashes & spells the word "STOP" in LED lights c. _____ Two red LED lights flash on and off
52.	**Stop arm – rear (dual)** Additional stop arm with reflective material on rear side of blade. The sign shall be air or electric driven and shall be deployed and retracted automatically. It shall not contain lettering, symbols or markings on the forward side. a. _____ Two red flashing strobe lights b. _____ Flash and spelling out the word "STOP" LED lights c. _____ Two red LED lights flash on and off

53.	**Stop warning sign – LED** LED sign that uses words to tell drivers behind bus that it is in the process of stopping.
54.	**Storage – for drivers – locking in front header** Locking compartment designed to hold driver's personal possessions.
55.	**Storage – tool compartment** A metal container shall be provided for storage of tire chains, tow chains, and such tools as may be necessary for minor emergency repairs. This storage container shall be located either inside or outside the passenger compartment and shall be equipped with a latch, no lock. However, if it is located inside the passenger compartment, it shall be provided with a separate cover, and shall be fastened to the floor in the right front or the right rear of the bus. A seat cushion shall not be used as this cover. a. _____ With locking door or lid
56.	**Storage - under body – locking luggage compartments** Under Body compartment for storage, with locking doors, keyed alike opening to the outside of bus. Designed to carry passenger luggage and/or equipment. **Note:** This option may not be available depending on the bus type, engine location, size and increased fuel tank size.
57.	**Suspension**, improved ride, air Designed to provide an enhanced, more comfortable ride than standard suspension. Rear axle only.
58.	**Suspension,** improved ride, mechanical Designed to provide an enhanced, more comfortable ride than standard suspension. Rear axle only.
59.	**Tachometer** To indicate the engine's RPM. Not available on Type A chassis.
60.	**Telescoping Steering Wheel** Easily adjustable to varying lengths. Increases flexibility for the driver when ordered in addition to the standard tilt function.
61.	**Tire carrier** Tire carrier shall be suitably mounted outside of the passenger compartment in an accessible location under the bus. May not be available with extra capacity fuel tank. Check with manufacturer for availability.
62.	**Tires, mud and snow tread** Designed with a tread style for added traction in snow and/or mud. (Rear wheels only) (Not available on 14 - 30 passenger Type A chassis)

63.	**Tow hooks,** front and/or rear Mounted tow hooks (loops are acceptable); with minimum horizontal pull capacity of 13,500 pounds each. Tow eyes or hooks shall be attached so they do not project beyond the front or rear bumper. **Note:** May not be available on all size buses. a. _____ Front only b. _____ Rear only c. _____ Both locations
64.	**"Transit style" Type D Bus (ENGINE located in the FRONT of the bus)** The engine is behind the windshield and, beside the driver's seat; the entrance door is ahead of the front wheels.
65.	**"Transit style" Type D Bus (ENGINE located in the REAR of the bus)** The engine is at the rear of the bus, behind the rear wheels; the entrance door is ahead of the front wheels.
66.	**Transmission** – extended warranty Vendor to state manufacturer's basic months and mileage, and additional months and mileage. **Note:** Optional full extended warranty, see Option 72.
67.	**Transmission** – heavy duty, automatic To upgrade from a standard automatic transmission. Purchasers desiring a heavy-duty transmission should seek additional information from the vendors. Bidder to state brand and torque rating.
68.	**Transmission** – manual The transmission shall be: Synchromesh type (all gears except first and reverse). The input torque capacity shall be at least equal torque developed by the engine. 35 - 90 passenger buses: Transmissions with five (5) forward (direct in fifth) and one (1) reverse speed. The clutch in buses equipped with manual transmissions shall have a torque capacity not less than ten (10) percent in excess of the maximum net torque output of engine. All chassis for the twenty four (24) through fifty nine (59) passenger buses with manual transmissions shall be equipped with a minimum twelve (12) inch diameter clutch. A starter interlock shall be installed to prevent actuation of the starter if the clutch is not depressed.
69.	**Trip recorder** Tamper-proof electronic recording system with memory for driver and bus identification. Computerized with compatible software for down loading information. Reports daily driver start times, over speed incidents, and compiles complete vehicle information with specific route comparisons.

70.	**Turn signal lamps - side mounted, in addition to** Total of two (2) per side of bus, front and rear mounted with minimum four (4) candlepower bulbs.
71.	**Ventilation fan(s)** Fan(s) for left and/or right sides of the windshield shall be placed in a location(s) where the fan(s) can be adjusted for maximum effectiveness and where the fan(s) do not obstruct vision to any mirror. Top Left Mounted: _____ Top Center Mounted: _____ Top Right Mounted: _____
72.	**Warranty** Optional extended warranty including transmission. Check with manufacturer for availability.
73.	**Wheel,** spare a. Wheel only b. Tire & wheel (without carrier)
74.	**Wheel,** spare, mounted (with carrier but no tire) a. Wheel, spare, mounted with carrier but no tire b. Wheel, spare, mounted (with carrier and tire) May not be available with extra capacity fuel tanks or on all chassis/buses. Check with manufacturer for availability.
75.	**Wheelchair lift** Indicate location of wheelchair lift and quantity of wheelchair positions. a. _____ Front curb side mounted _____ Quantity of positions b. _____ Middle curb side mounted _____ Quantity of positions c. _____ Rear curb side mounted _____ Quantity of positions **See Section C:** Will reduce seating capacity because a wider aisle is needed. Check with manufacturer for floor plan & availability. **Note:** Purchaser must check whether track or non-track seating is requested. _____ Track _____ Non-Track
76.	**Wheelchair lift, occupant restraint belt** The handrails shall be connected with an occupant restraint belt. a. _____ Retractable b. _____ Non-Retractable
77.	**White roof** The roof of the bus painted white.

78.	**Window glass, dark tint, passenger side windows** All tinting shall meet the Texas Department of Public Safety requirements and inspection procedures, please verify regulations before completing the order.
79.	**Windows, push-out, <u>ADDITIONAL</u>** (for emergency exits) _____ Indicate quantity per side. These are in addition to the emergency exits required in Section B, Emergency Exits.

PROCEDURES FOR LISTING STANDARD OPTIONS

Procedures for listing as Published Options for 14 - 90 passenger school buses shall be as follows:

Submit a request to the Department that an option be considered for the Published Option List. Manufacturer's literature and specifications for the option shall be sent with the request.

Vendor/manufacturer shall include certification that the option will in no way effect the safety and integrity of any equipment on or operation of the school bus.

The Department will review the request and information.

Should a demonstration be necessary or sample required for testing, the vendor will be contacted. Information regarding the demonstration or testing will be provided at that time.

If approved, a detailed description of the option will be added to the next Texas School Bus Specifications listing.

SECTION F
SPECIFICATIONS CHECKLIST

SCHOOL BUS PURCHASER PRE-SERVICE CHECKLIST

Purchasing Entity: Retain this completed form with the title to the bus

Bus Number Assigned:		**Year Model:**	
Passenger Capacity:		**VIN No.:**	
Body Manufacturer:		**Body I.D. Number:**	
Engine Manufacturer:		**Engine Type:**	
Engine Arrangement Number:		**Engine Serial Number:**	
Engine O.T. Number:		**Chassis No.:**	
Transmission Type:		**Transmission Serial Number:**	
Front Axle:		**Tank Capacity:**	
Rear Axle:		**Serial Number:**	
Primary Fuel Type:		**Alternate Fuel Type:**	
Date of Delivery:		**Delivered Mileage:**	

The following page must be completed before this bus is placed into service.

SCHOOL BUS PURCHASER PRE-SERVICE CHECKLIST (continued)

The following must be completed before this bus is placed into service.

A. ENGINE COMPARTMENT

☐ Check and top-off all fluid levels
☐ Check for Oil, Fuel, and Coolant leaks
☐ Check all belts for proper tensioning
☐ Check all belts for proper alignment
☐ Check freedom of throttle and ensure full throttle
☐ Check for unusual noises and/or vibrations

B. AIR CLEANER

☐ Check filter element positioning and tightness
☐ Check cover and hold-down clamps for retention
☐ Check air inlet pipe for clearance/obstructions
☐ Tighten all air induction system clamps

C. TRANSMISSION

☐ Check for proper operation of neutral and reverse switches
☐ Check and top-off all fluid levels
☐ Check for oil and coolant leaks
☐ Check hose fitting tightness
☐ Check for proper operation of shift system

D. BRAKE SYSTEM

☐ Check for any air leaks
☐ Check operation of park brake
☐ Check for leaks at wheels
☐ Check routing of airlines for clearance

E. STATE INSPECTION AND DRIVERS AREA

☐ State or DOT Inspection completed
☐ License plates installed
☐ All lights working
☐ Windshield washer operating
☐ Windshield wipers operating
☐ Heaters and defrosters working
☐ Seats securely bolted to the floor
☐ All publications included

F. STEERING SYSTEM

☐ Check hydraulic system for leaks & top-off
☐ Check hose routing and clearance
☐ Check hose ends for leaks and tightness
☐ Check for cotter keys installed and property spread on all steering components

G. REAR AXLE

☐ Check and top off oil level
☐ Check for leaks
☐ Check for proper vent operation

H. CAB AREA

☐ Triangular warning device mounted
☐ First Aid Kit mounted
☐ Bio Hazard Kit mounted
☐ Fire Extinguisher mounted and charged

I. FUEL SYSTEM

☐ Check fuel line routing for clearance, leakage, kinks and mounting tightness

J. AIR CONDITIONING (if applicable)

☐ Check for proper operation and refrigerant leaks

K. WHEELS AND TIRES

☐ Inspect tires for damage
☐ Check for proper inflation

L. TORQUE ALL WHEEL NUTS

☐ Right front
☐ Left front
☐ Right rear
☐ Left rear

COMPLETED BY: _____ **DATE:** _____

NOTES: _____

TEXAS SCHOOL BUS SPECIFICATIONS CHECKLIST
Inspection Checklist for School Bus Body/Chassis

Inspector		Contact	
ISD		Phone	
Req. No		PO Box	
VIN		Ser No	
Vendor		Body Mfg	
Order Date		Deliver By	
Body Size		Chassis	
Inspection Date			

(1) ENGINE COMPARTMENT

____**Alternator** **B-1**

1. Check amperage _____

Without A/C or Lift	With A/C or Lift
Type A - 140	Type A - Maximum available OEM
Type C & D - 175	Type C & D - 270

____**Horsepower** **B-22**

1. Check horsepower _____

   _____ Note horsepower required from chart.

____**Steering, power** **B-17**

1. Required as standard equipment
2. Factory installed tilt steering wheel/column is required

____**Washer, windshield** **B-21**

1. Reservoir, minimum of one quart, electric operated
2. Leaking _____Yes _____No

(2) FRONT LIGHTS AND SIGNALS

____**Lights, daytime running** **B-4**

1. Meets manufacturer's specification
2. Required on all school buses

____**Lights, clearance and identification** **B-12**

1. Must be LED
2. Three (3) amber on top close to vertical centerline
3. Lamp centers spaced not less than six (6) or more than twelve (12) inches apart
4. Activated by the headlight switch
5. Sealed type light
6. Surface mounted with rust proof material guard unless recessed
7. Use a universal type sealed electrical plug connector

____**Lights, alternately flashing non-sequential signal** **B-11**

1. Must be LED
2. Two (2) red, two (2) amber (towards center)
3. Black background – one (1) inch to the sides & top – one (1) inch to bottom
4. Amber manual, red automatic when door opens or stop signal arm is extended
5. Lights sealed with three and sixteenths (3/16) inch thick sponge flange or manufacturer's standard gasket
6. Lights shall be wired independently of ignition switch
7. Wheelchair lift door shall activate warning lights when open
8. Amber and red pilot lights installed adjacent to the driver controls

____**Turn signal, hazard warning lights** **B-19**

1. Front – manufactured standard meeting FMVSS 108
2. Two (2) red, two (2) amber (towards center)
3. Left side mounted rearward of the top of the stop signal arm
4. Right side mounted rearward of the service door

____**Lights, exterior door fixture** **B-12**

1. Illuminates ground around service door
2. Activates with step well light
3. Mounted outside below the beltline by the service door
4. Light must be installed to prevent a burn hazard

(3) REAR LIGHTS AND SIGNALS

____**Lights, backup** **B-12**

1. Two (2) four (4) inch required (to meet FMVSS No. 108)

____**Lights, tail and stop** **B-12**

1. Must be LED
2. Two (2) required FMVSS 108
3. Metal or durable plastic base
4. Snap – on lens not acceptable
5. Stop lamps to be thirty eight (38) square inches minimum, and mounted near belt line
6. A set of four (4) inch minimum tail/stop lamps shall be installed below the thirty eight (38) square inch set

____**Lights, clearance and identification** **B-12**

1. Must be LED
2. Three (3) red on top close to vertical centerline
3. Lamp centers spaced not less than six (6) or more than twelve (12) inches apart
4. Activated by headlight switch
5. Sealed type light
6. Surface mounted with rust proof material guard unless recessed
7. Use a universal type sealed electrical plug connector

____**Lights, alternately flashing non-sequential signal** **B-11**

1. Must be LED
2. Two (2) red, two (2) amber (towards center)
3. Amber manual, red automatic when door opens or stop signal arm is extended
4. Lights shall be wired independently of ignition switch
5. If master switch is on the W/C lift door shall activate the warning lights when open

____**Turn signal, hazard warning lamp** **B-13**

1. Must be LED
2. Meeting FMVSS 108
3. Be amber

(4) OTHER

____**Bumper, front** **B-3**

1. Pressed steel channel or equivalent material (except Type A 19,500 GVWR or less may have OEM supplied bumper
2. At least three sixteenths (3/16) inch thick and not less than nine (9) and one half (1/2) inches wide (high)
3. Black (Type A mfg standard color)
4. Means provided to mount license plate for unobstructed view

____**Mirror system (all buses)** **B-13**

1. Interior Mirror
   a. Six (6) inches by thirty (30) inches
   b. Rounded corner
   c. Protected edges
   d. Type A buses shall be no smaller than fifty (50) square inches
2. Rear Vision
   a. Must be adjusted by remote from the driver's seat
   b. System consists of one flat and one convex lens per seat
   c. Mounted on a single breakaway arm with positive detent or lock
   d. Any fasteners shall be corrosion proof
   e. Type A buses may be exempt if no such cross/side brackets are available
3. Cross/Side View
   a. One on each corner right and left front
   b. Not reflect excessive glare from the headlights into driver's eyes
   c. Any fasteners shall be corrosion proof

____**Steps, stirrup w/handle** **B-17**

1. Installed on each front corner of body to facilitate cleaning of windshield
2. On or in bumper for forward control buses
3. Handle to be stainless steel, chrome plated, non-ferrous or equivalent
4. Not required on Type A 14 - 30 passenger buses

(5) SIDES

____**Battery** **B-2**

1. Gasoline busses – 600/72 minute BCI rating
2. Type C & D diesel buses – 1100/240 minutes BCI rating
3. Type A diesel buses with or without AC or wheelchair lift – 1200/144 minute BCI rating
4. Gasoline buses with AC or wheelchair lift – 800/72 minute BCI rating
5. Type C & D buses with AC or wheelchair lift – 1950/540 minute BCI rating

____**Battery and electrical compartments** **B-2**

1. Skirt mounted slide-out tray and battery box on Type A diesel, C, and D bodies
2. Cables shall have sufficient length to allow full extension of compartment
3. When three batteries are installed, the battery tray must be a roll out type
4. Type C and D bodies with A/C lift shall have a compartment mounted as close as possible near the battery box for mounting circuit breakers

____**Door, service** **B-16**

1. Passenger minimum size twenty four (24) inch by sixty eight (68) inch (Type A) and twenty four (24) inch by seventy two (72) inch (Type C&D)
2. Manually, pneumatically, or electrically operated
3. Power doors must allow for emergency manual operation
4. Manual control shall not require more than twenty five (25) pounds of force to operate on a ten (10) percent grade
5. Located on right side opposite driver and open outwards
6. Laminated safety glass in both upper and lower sections and set in rubber
7. Vertical edges equipped with flexible material
8. Head-impact area protected by energy absorbing padding minimum three (3) inches wide, one (1) inch thick, full width of door opening
9. Bottom of lower glass max ten (10) inches from top of bottom step
10. Top of upper glass not more than three (3) inches from top of door

____**Fuel filler opening (Type C & D)** **B-9**

1. Hinged cover to remain open when fueling or closed at all other times
2. Lettering adjacent to fuel filler opening indicating fuel type

____**Lights, intermediate identification** **B-12**

1. Must be LED
2. Not required on buses less than thirty (30) feet long
3. Sealed type light
4. Surface mounted with rust proof material guard unless recessed
5. Use a universal type sealed electrical plug connector

____**School bus lettering** **B-10**

1. "School Bus" on both sides, front and rear roof caps
2. Eight (8) inch high, six (6) inch on Type A buses, one (1) inch wide stroke, black block letters.
3. "School Bus" front & rear in black lettering with yellow reflective background if not lighted design
4. "School Bus" on both sides located between bottom two (2) rub rails, the same height and near the center of the school bus.
5. "School Bus" both sides in black with reflective background or reflective lettering.

____**School name lettering** **B-10**

1. School name lettering on both sides
2. Lettering shall be between the upper two (2) rub rails near the belt line
3. Five (5) or six (6) inch lettering five eighths (5/8) inch block stroke lettering
4. Paint or decals (black in color)
   *School district or contractor logo may also be added as near to the front of both sides of the bus as possible. The logo may not be larger than 500 square inches.

____**Rub rails, black** **B-15**

Four (4) required: one (1) at window level, one (1) at seat level, one (1) at floor level and one at skirt level. The rails shall be one-piece continuous construction, four (4) inch or more in width, made of sixteen (16) gauge steel and constructed in corrugated or ribbed fashion.

1. Seat level from the entrance doorpost around body (except emergency door) to point of curvature near cowl on left side
2. Window level at the bottom edge of the windows
3. Floor line & bottom of outer skirt shall cover same longitudinal area as seat level rail except at wheel housings and shall extend only to radii of right and left corners
4. All rub rail ends must be closed
5. All rub rails must be bolted or riveted at top and bottom to each side post and to exterior panels between posts
6. All rub rails must have drainage: bottom edge of each rail shall have provisions for drainage of accumulated moisture

____**Reflectors** **B-15**

Three (3) each side lower part of body: rear (red), *middle (amber) and front (amber)

*Not required on buses less than thirty (30) feet long

____**Stop arm** **B-17**

1. The stop arm should be on the left side near front cowl section
2. Octagon-shaped, constructed of zinc-coated steel, aluminum, or equivalent material of equal durability
3. One half (1/2) inch white border
4. The word "STOP" in six (6) inch white letters (both sides) with red background
5. Letters, border, and background shall be of reflective material
6. Two (2) double-faced red, alternately flashing lamps (1 top and 1 bottom)

Note: Dual stop arms required on forty seven (47) passengers and larger (optional for less than 47 passengers), the second sign does on the left side near rear section. Stop arm shall have one "STOP" emblem facing the rear of the bus.

(6) OTHER

____**Bumper, rear** **B-4**

1. Pressed steel channel
2. 3/16" x 9½" minimum (unless chassis manufacturer's standard on 15 - 20 passenger buses)
3. Bolted to chassis frame and braced
4. Not permanently attached to body
5. Wrap around body design
6. Contour designed to prevent hitching to or riding on bumper
7. Painted black
8. Apply seal between bumper and body panel unless gap is 1/8" or less

____**License plate holder** **B-11**

1. Means to mount the license plate on front and rear of the bus body
2. Items added to the bus must not obstruct the location of the front license plate
3. Illuminated (rear plate only)

(7) INSIDE

____**Alarm, backup** **B-5**

1. Automatic, audible warning that the bus is in reverse gear, located behind the rear axle
2. Meet SAE J994 requirements and be 107dba minimum sound level

____**Access, entry/aisle** **B-1**

1. Twelve (12) inches between seats
2. Thirty (30) inch aisle width from wheelchair position to one (1) emergency door

____**Body fluid clean-up kit** **B-6**

1. Securely mounted in the driver area, but easily removed without tools
2. Labeled as a body fluid clean-up kit (see spec for contents)
3. Moisture-proof hard plastic kit
4. No display of the biohazard symbol

____**Covering/Molding, floor** **B-8**

1. Aisle - .187" (3/16) thick ribbed rubber or equivalent
2. Other areas - .125" (1/8) thick rubber
3. Driver's compartment and toe board covering held in place by molding/trim strip (3/16" x 1")
4. Permanently bonded to floor and must not crack
5. Metal strips between aisle and area under the seats
6. Flat or low profile oval head screws in countersunk holes, not more than nine (9) inches apart and with three fourths (3/4) inches each (9 1/2 ok, but only to avoid floor sill members)
7. Seams shall be covered using aluminum or stainless steel trim and countersunk screws
8. Seams sealed with waterproof sealer

____**Emergency exit** **B-7**

1. Buzzer to sound in driver's compartment when unlatched
2. "Emergency Door" or "Emergency Exit" in two (2) inch high black painted letters at top or over door
3. Handle in aisle are to met FMVSS 217 requirements
4. Operating instructions near handle
5. Inside and outside pull handle (see specs for latch details)
6. Inside header board full width of door, three (3) inches wide & one (1) inch thick
7. Door size thirty (30) inches by forty eight (48) inches (style 2, single door type)
8. Upper & lower glass panels (Upper panel, two hundred and ninety nine (299) square inches minimum. Lower panel manufacturer's standard)
9. Reflective material around perimeter on rear of bus

____**Emergency roadside reflectors** **B-7**

1. Three (3) triangular warning devices, meeting FMVSS No. 125
2. Stored in a metal or heavy-duty plastic box in driver's compartment
3. Container shall be secured with a bracket and shall be easily removed without use of tools

____**Extinguisher, fire:** **B-6**

1. Mounted in a bracket in driver's compartment
2. Dry chemical type
3. Five (5) pound 2A10BC or larger
4. U/L approved
5. Pressure gauge mounted and easily read without moving the extinguisher

____**Heater / Defroster** **B-5**

1. Heater shall be hot water
2. If only one (1), shall be fresh-air or combination fresh-air and re-circulation type
3. If more than one (1), additional heaters may be re-circulating air type
4. All forced air heaters bear nameplate indicating the heater rating
5. Hoses supported to guard against excessive wear due to vibration
6. Have an accessible one fourth (1/4) turn ball-cock shut-off valve in the pressure line
7. Have an accessible one fourth (1/4) turn ball-cock shut-off valve in the return line
8. Water flow-regulating valve installed in pressure line for operation by the driver
9. Accessible bleeder valves in the return lines
10. All defrosting equipment shall meet requirements of FMVSS #103

____**Horn** **B-10**

1. Must have dual note or dual horns

____**Kit, first aid** **B-7**

1. Hard plastic, moisture and dust proof kit
2. Easily removable without tools
3. Mounted in driver compartment (see spec for list of contents)

____**Lamp, interior** **B-12**

1. Mounted to provide adequate illumination of the aisle & step-well
2. At least four (4) recessed flush mounted interior lights in passenger area with one (1) switch
3. If more than six (6) lights are used, an additional switch may be used
4. Driver area shall be illuminated with a light operated with a separate switch

____**Lamp, step well** **B-13**

1. Actuated by opening service door when the headlight/clearance lights are on
2. Must be installed to prevent a burn hazard

____**Mirror, interior** **B-13**

1. Minimum 6" x 30" with rounded corners and protected edges
2. Either clear-view laminated glass or clear-view glass bonded to a backing
3. Type A can have a minimum of fifty (50) square inches

____**Body data (identification) plate** **B-2**

1. Permanently attached metal plate, with rivets, in driver's area
2. Decals and glue are not acceptable
3. Indicate manufacturer, date of body manufactured, body serial number, and maximum design capacity and equipped capacity
4. Indicate State and specification year manufactured for Ex: TX YY

____**Reflective material** **B-15**

1. Rear of bus
   a. Horizontal above rear windows
   b. Horizontal above rear bumper
   c. Vertical strips connecting one (1) & two (2) above
   d. Minimum one (1) inch and a maximum of two (2) inches in width of reflective yellow material
2. Rear/Front of Bus
   Reflective yellow background of "School Bus" signs (if not lighted)
3. Side of Bus
   a. Minimum one (1) inch and a maximum of two (2) inches in width of reflective yellow material full length of bus
   b. Vertical location immediately below the seat rub rail
   c. Reflective yellow background of "School Bus" signs (if not lighted)
4. Bumpers, Front and Rear (optional)
   a. Forty five (45) degree diagonal yellow or black strips, two (2) inch to one quarter (¼) inch wide reflective material
   b. Reflective material spaced two (2) inch to one fourth (¼) inch apart

____**Seat, barriers/panels** **B-16**

1. Barrier in front of each front passenger seat (see spec for details)
2. Minimum twenty (20) inch, metal hand rail on both sides of entry door (snag-proof design)
3. Must be upholstered

____**Seat, driver** **B-4**

1. High back suspension seat Type C & D buses only
2. Cushion and seat back made of soil and wear resistant material
3. Squared and centered +/-1/2 inch behind steering wheel
4. Backrest a minimum of eleven (11) inches behind steering wheel
5. Securely mounted to ensure minimal flexing
6. Type A bus may have manufacturer's standard seat
7. Shoulder height adjustable or integrated lap/shoulder belt with automatic retractors in mounting brackets

____**Side emergency exits and roof hatch(es)** **B-7**

Reflective material around perimeter each exit

1. Up to forty two (42) passengers – one (1) exit per side and one (1) roof hatch
2. Forty three (43) to seventy eight (78) passengers – two (2) emergency exits per side and two (2) roof hatches
3. Seventy nine (79) to ninety (90) passengers – three (3) emergency exits per side and two (2) roof hatches

   Note: A side emergency door may be substituted for two (2) emergency exits on the same side of the vehicle

____**Steering** **B-17**

1. Chassis manufacturer's standard power steering
2. Tilt steering wheel/column required

____**Step-well** **B-17**

1. Type D (24 - 90 passengers)
   a. First step twelve (12) to sixteen (16) inches from ground, unloaded
   b. Three (3) steps with risers max of ten (10) inches
   c. Fully closed
   d. Each step shall be covered with pebble top elastomer at least 3/16 inches thick
2. Type A & C (15 - 90 passengers)
   a. First step not more than ten (10) to fourteen (14) inches from ground, unloaded
   b. Three (3) steps with risers max of ten (10) inches on Type C. Two (2) steps are acceptable Type A (14 - 30 passengers).
   c. Fully enclosed
   d. Each step shall be covered with pebble top elastomer at least 3/16 inches thick

____**System, defroster/defogger** **B-5**

1. Must have system to adequately defrost and defog windshield, driver's window, and entrance door glasses
2. If fan(s) used, must be mounted on windshield header, curb side

____**Ventilation** **B-20**

1. All school buses effective exhaust ventilation system
2. Static non-closable type on low-pressure area of roof

____**Visor, sun** **B-19**

1. Type A (35 - 42 passengers) and Type C & D school buses
   a. Minimum 6" x 30" with finished edge
   b. Shall be adjustable and convenient for driver
2. Type A (14 - 30 passenger) school buses
   a. Shall be manufacturer's standard

____**Windshield / Window** **B-20**

1. Windshield tinted to reduce glare
   a. Gradient tinted or fully tinted
   b. AS-1 type
2. Driver's window
   a. 2-piece, front part opens in or out, rear part lowered by handle or t-piece sliding sash type <u>with</u> air scoop
   b. AS-2 type, tinted AS-3 type
3. Side window
   a. Split sash type with positive latch
   b. Width - 22"
   c. Vertical opening (9" minimum – 13" maximum)
   d. Weather tight
   e. Unacceptable if can be individually latched in uneven positions
   f. STD AS-2 type, tinted AS-3 type
4. Rear windows
   a. One each side of emergency door
   b. 140 square inches minimum area
   c. AS-2 type or AS-3

____**Wipers, windshield** **B-21**

1. Two (2) wipers and one (1) or two (2) motors required
2. Two (2) speeds or variable w/intermittent feature

____**Wiring (24 - 90 passengers)** **B-21**

1. Minimum of nine (9) circuits
2. Fused separately or have adequate circuit breaker
3. Color-coded
4. Insulated and in fibrous loom or equal
5. Connections by soldering or by industry approved connectors

(8) UNDERNEATH

____**Absorber, shock (all heavy duty)** **B-19**

1. Front and rear, double acting
2. Adequate size for axle load

____**Brakes, air** **B-3**

1. Required as standard on all 59 - 90 passenger buses
2. Automatic air dryer
3. Air dryer shall have a replaceable filter with access to replace filter without removing or loosing the air dryer assembly bolts

____**Frame Side Member** **B-9**

1. Each frame side member shall be of one (1) piece construction between rear and forward spring hanger
2. Extensions are permissible only when such alterations are welded behind rear spring
3. Wheel base extensions are not permitted

____**Guard, drive shaft** **B-4**

Required for each drive shaft section

____**System, exhaust** **B-8**

1. Must be under the bus body and attached to chassis frame
2. If exhaust system is less than twelve (12) inches from fuel tank or if the tail pipe is located under the fuel filler opening, a metal shield must be installed. (see specs for details)
3. Tail pipe shall extend no more than two (2) inches beyond rear bumper

____**Transmission** **B-19**

All bus sizes to be equipped with manufacturer's standard automatic transmission unless otherwise specified

____**Undercoating** **B-19**

1. 1/8" thick, asphalt base
2. Entire underside including floor, step well, wheel wells, side panels below floor level, and metal fenders
3. Inside of exposed exterior panels, after panels installed

(9) GENERAL

____**Handicapped equipment** **C-5**

1. Forward facing orientation
2. Four (4) International Handicapped Symbols
   a. One (1) each on the front and rear of the bus
   b. Both sides of the bus below the window line
3. White on blue background, twelve (12) inch maximum

____**Length, body** **B-17**

Forty five (45) feet maximum (24 - 90 passengers)

____**Options** **Section E**

Check each option listed on the purchase order to insure each one is installed on bus as stated in the specification

____**Screw, sheet metal**

Prohibited except for electrical wire moldings, light fixtures or necessary removable interior panels, or seat back construction, header pads, and when used with metal adhesive in window frames and in certain construction (see rub rails - section B-18)

____**Tank, fuel Type C & D** **B-9**

Access port with cover for fuel sending unit

____**Wheelchair lift** **C-3**

1. Lift and platform shall be capable of operating effectively while lifting at least eight hundred (800) pounds
2. See FMVSS 403/404 Certification Checklist **F-18**

____**Width, body** **B-17**

One hundred and two (102) inch maximum, exterior width

____**Wood**

None, except as called for in seats, seat backs, bottom of tool compartments, as insulation over metal floors, and header pads

Standard Wheelchair Lift Inspection Checklist

NOTE: For DOT Public Use Lifts.

⚠ WARNING

The following procedure requires checking equipment on the vehicle while the vehicle is in gear and the parking brake is released. A qualified vehicle operator is needed inside the vehicle at the driver's station. A second qualified operator is required outside the vehicle to operate the Wheelchair Lift.

Chock the vehicle wheels.

All Lifts:

Release the vehicle brakes and shift the vehicle into gear.

Try to open the Lift Access Door and unfold the Lift platform.

☐ The Lift platform must not unfold from the stowed position when the vehicle is set to move under its own power.

Shift the vehicle back to Park or Neutral & set the brakes. Open the Lift Access Door & unfold the Lift platform to the vehicle floor level. Try to release the vehicle brakes and shift the vehicle into gear.

☐ The vehicle must not be able to move when the Lift platform is deployed.

While the Lift operator is in the bus, lower the platform down so that the Lift platform is approximately 2" below the vehicle floor.

☐ Measure the threshhold area to make sure that it is at least 18" deep.

Step onto the middle of the threshhold area.

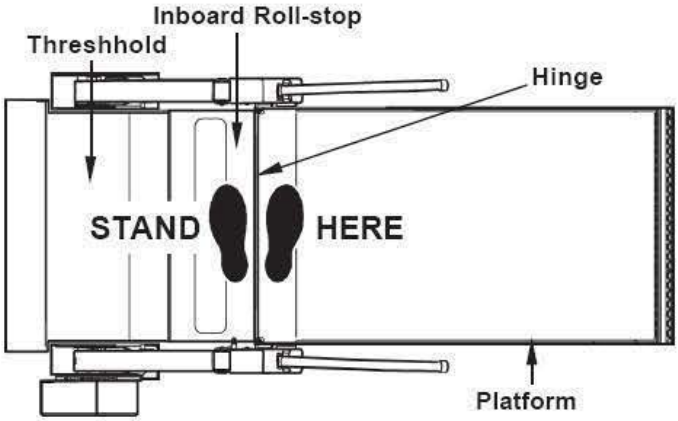
☐ The visual and audible warnings must activate & remain activated until you step off of the threshhold area and back on the vehicle floor.

☐ Make sure that the Lift platform lights are illuminated.

Raise the Lift platform to the vehicle floor and make sure that the Inboard Roll-stop has completely bridged onto the threshold area. Then stand with one foot on the inside edge of the platform (hinge area) and one foot on the hinge area of the Inboard Roll-stop (see diagram).

☐ The platform must not fold when you press the Fold button.

☐ The Inboard Roll-stop must not raise when you press the Down button.



Standing Over the Hinge Area on Platform & Inboard Roll-stop

Standard Wheelchair Lift Inspection Checklist - Continued

Maxon & Braun Lifts Only:

Step onto the platform with both feet. Ride the platform down to the ground until the Outboard Roll-stop is completely open. Stand on the Outboard Roll-stop, and activate the UP button until the Lift stops.

☐ Make sure that the Lift did not raise more than 3" before it stopped.

☐ The Outboard Roll-stop must not fold while you are standing on it.

Ricon Lifts Only:

Unfasten the seat belt while lowering the Lift platform.

☐ Make sure that the Lift stops when you unfasten the seat belt.

☐ Make sure that you can not raise or lower the platform until the seat belt is fastened.

All Lifts:

Raise the platform to the floor level. Note the number of lifts on the operations counter. _____

Lower the Lift all the way to the ground, and then raise the Lift all the way to the floor. Again note the number of lifts on the operations counter. _____

☐ Make sure the lower/raise function was counted on the operations counter.

Vehicle I.D. (VIN) # : _____

Wheelchair Lift Serial # : _____

Checked By: _____

Date: _____

NOTE: If the lift does not pass this inspection, it is recommended that it not be placed in service and that you contact your vehicle dealer.

SECTION G
ADDITIONAL INFORMATION

ADDITIONAL INFORMATION

AIR BRAKES

Note: For Type C & D (59 - 90 passengers) buses, air brakes are standard the purchaser may wish to investigate the use of air brakes before changing to conventional brakes.

COMMUNICATION DEVICE

Note: For all buses, the purchaser may wish to investigate the possible safety and communication merits of the bus driver having the capability to communicate with the district's management through two-way radio, etc.

DIESEL ENGINES

Note: Diesel engines are standard for Type A, C, and certain D (15 - 90 passengers) buses. The purchaser may wish to investigate the possible safety, fuel economy, and maintenance for diesel engines before choosing another power source.

DRIVER'S SEAT, AIR RIDE SUSPENSION

Note: For Type C & D buses, the purchaser may wish to investigate the comparative merits of an improved ride for the driver through the use of an adjustable air ride suspension seat.

FLAT FLOOR FOR WHEELCHAIR BUSES

Note: For Type A, C & D buses, the purchaser may wish to investigate the comparative merits of a flat floor bus for special education needs.

FLOOR COVERING, LIGHT REFLECTING

Note: For all buses, the purchaser may wish to investigate the use of floor coverings in colors other than black. Visibility is enhanced through the use of light gray, blue, and green. These colors may be obtained at little or no additional cost.

FLOOR MOUNTED ACCELERATOR AND/OR BRAKE PEDAL

Note: If the intended purchase of a larger bus is for extended drive times (route or activity), the purchaser may wish to investigate floor mounted accelerator and/or brake pedals. Floors mounts provide additional driver comfort and reduce fatigue. These controls are standard in non-school transit buses.

PUBLIC ADDRESS SYSTEM

Note: For Type D buses, the purchaser may wish to investigate the possible merits of the installation of a public address system to better communicate with the passengers.

REAR AXLE, AIR RIDE or EQUAL IMPROVED RIDE SUSPENSION

Note: For Type A, C & D buses, the purchaser may wish to investigate the comparative merits of an improved ride by the use of air ride or mechanical ride improvements for the passengers.

ADDITIONAL INFORMATION (continued)

SEAT FRAMES

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

STUDENT SAFETY CROSSING CONTROL ARM

Note: For all types of buses, the purchaser may wish to investigate the possible safety merits of the installation of a student safety crossing control arm.

TRACKS (Floor track for WC and occupant restraint systems)

Note: "Tracks" are metal braces, which are fastened to the floor of the bus to assist in the securement of wheelchairs. The braces (tracks) can be purchased which are level or flat to the floor or above the floor. The vendor can provide detailed information.

VEHICLE FLOORING

Insulation: Plywood or alternative flooring: Standard is BC Exterior.

Note: For all types of buses, the purchaser may wish to investigate the possible long-term maintenance benefits of the use of treated or marine grade plywood.

WHEELCHAIR LIFT PLACEMENT

Note: When requested, the vendor will provide information and coordination of a floor plan to best locate a wheelchair lift.

SECTION H
VENDOR
INFORMATION

SCHOOL BUS MANUFACTURER - SPECIFICATIONS REPRESENTATIVE

MANUFACTURER	CONTACT	ADDRESS	CITY, STATE, ZIP	TELEPHONE
Blue Bird Corporation	Tony Woodard	PO Box 937	Fort Valley, GA 31030	478-822-2174
Collins Bus Corporation	DeWayne Lock	PO Box 2946	Hutchinson, KS 67504-2946	620-662-9000 x455
Micro Bird	Philip Turner	3000 Girardin St.	Drummondville, Quebec, Canada, J2E 0A1	1-819-477-8222 x418
	Nadia James			1-819-477-2012 x428
IC Bus, LLC	Ron Briggler	751 South Harkrider	Conway, AR 72032	501-505-2412
Thomas Built Buses	Ricky Stanley	PO Box 2450	High Point, NC 27261	336-841-5927
Trans Tech	Brian Barrington	7 Lake Station Rd.	Warwick, NY 10990	855-988-2333
Starcraft Bus	Jay Nine	2367 Century Drive	Goshen, IN 46528	574-596-8292

WHEELCHAIR LIFT MANUFACTURERS

MANUFACTURER	CONTACT	ADDRESS	CITY, STATE, ZIP	TELEPHONE
The Braun Corporation	Colton Walle	631 W. 11th Street	Winamac, IN 46996	913-749-7873
Ricon Corporation	Larry McNutt	7900 Nelson Road	Panorama City, CA 91402	818-267-3075
Maxon Lift Corporation	Mark Johnson	11921 Slauson Ave.	Santa Fe Springs, CA 90670	817-680-0352
	Jeff Kraus	11921 Slauson Ave.	Santa Fe Springs, CA 90670	281-359-5958

SCHOOL BUS VENDORS (DEALERS)

MANUFACTURER	VENDOR	CONTACT	ADDRESS	CITY, STATE, ZIP	TELEPHONE
Blue Bird Corporation	Blue Star Bus Sales, LTD	Wayne Dever	5907 63rd Street	Lubbock, TX 79424	800-988-4170
	Rush Bus Centers	Lee Banks	16345 IH-35 North	Selma, TX 78154	877-578-7428
Collins Bus Corporation	Alliance Bus Group	Brad Hudson	820 Office Park Circle	Lewisville, TX 75057	800-880-5620
	Rush Bus Centers-Dallas	Cheryl Bell	4910 Transport St.	Dallas, TX 75247	800-460-2877
Micro Bird	Blue Star Bus Sales, LTD	Wayne Dever	5907 63rd Street	Lubbock, TX 79424	800-988-4170
	Rush Bus Centers	Lee Banks	16345 IH-35 North	Selma, TX 78154	877-578-7428
IC Bus, LLC	Longhorn Bus Sales	Jack Connell	6921 Homestead Road	Houston, TX 77028	800-392-5356
Thomas Built Buses	Thomas Bus Gulf Coast	Kathy Counseller	8806 Mississippi	Houston, TX 77029	800-481-6564
Trans Tech	National Bus Sales	Whitney Ramsey	15580 Hwy 114	Justin, TX 76247	817-636-6340
Starcraft Bus	National Bus Sales	Brent Roy	15580 Hwy 114	Justin, TX 76247	817-636-2365