2005
Texas

SCHOOL BUS SPECIFICATIONS

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ADDENDUM 03/03/2005
This addendum is for 2005 Texas School Bus Specifications
Section B Chassis Specifications

Page B-2
ALTERNATOR E.2.

2. Cabling of the alternator and battery system must meet or exceed the requirements of a 320 amp. alternator.

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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 nine (9) 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 signal lamps
        h. Horn
        i. Heater and defroster
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.

ADDENDUM 04/28/2005
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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 inches and not more than thirty eight 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.

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2005 Texas School Bus Specifications Revisions

SECTION	PAGE	CHANGE
A	4	Clarified the term "Dealer Stock School Bus"
A	4	Requires the receipt of certification letter and proof of insurance prior to the sale of the first school bus meeting these specifications.
A	4	Set GVWR to a maximum of 14,050 pounds for Type A school buses.
A	4	Added the definition of a Type B school bus back into the specifications to leave the market open for new product development.
A	7	Requires the receipt of metal certification letter and literature & drawings prior to the sale of the first school bus meeting these specifications.
A	8	Added fee of $50.00 per day for failure to notify purchaser of late delivery.
A	9	Changed the warranty to a minimum 2-year bumper to bumper warranty.
B	2	Set the required alternator for Type A buses to a minimum of 145 amps.
B	2	Set the required alternator for Type C, & D buses to a minimum of 175 amps.
B	2	Set the required alternator for all Type C, & D school buses with air conditioning or wheelchair lift to a minimum of 270 amps.
B	3	Batteries for Type C, & D school buses shall be Group 31 Twelve (12) volt batteries.
B	3	Updated chart for battery cold cranking amps & minimum reserve capacity.
B	7	Cabling & wiring including that of the alternator & battery system shall be of a double ought (#00) size.
C	2	When three batteries are installed the battery tray must be a roll out type.
C	2	The body fluids kit shall be easily removed without tools.
C	4	Added the requirements of a 1/4-turn ball-cock valve.
C	6	The first aid kit shall be easily removed without tools.
C	8	Requires the manufacturer to place the school name lettering on the school bus before delivery. The option for the school district to apply the school name lettering was removed.
C	9	Allows a school district (contractor) to add logo to the school

		bus. The location and the maximum size of the logo are covered.
C	9	Added the requirement for the alternating flashing lights to work even if the ignition switch is in the off position.
C	11	Changed the side turn signal light candlepower from 32 to the manufacture standard of 4.
C	14	Passenger seating requirements for LATCH was clarified to show the requirements of rigid lower anchorages. Allowed a vendor to use lap belts in place of rigid lower anchorages.
D	2	Added the requirement to meet FMVSS 403 & 404.
E	2	Clarified the requirement for the number of AC tests to be preformed by defining a series of buses.
E	3	Changed labeling to require a metal data plate and a list of information to include on the data plate.
E	4	Eliminated section on alternators and referred the reader to section B Alternators.
F	3	Updated Option 2 Alternator to allow for an increase in capacity for alternators.
F	3	Option 14 was modified to allow the choice of mud flaps on the front of a school bus.
F	6	Option 31 was modified to clarify electro magnetic mount to read as electro magnetic latch.
F	9	Modified option 50 to also require remote control mirrors.
F	10	The school name lettering option that was previously allowed in the 2004 specification was deleted.
F	13	Added the choice to option 76 for a middle curbside mounted wheelchair lift.
G	2-12	Updated the specifications checklist to match the 2005 specifications.
I	2-3	Add section I Vendor Information to include contact information for: "School Bus Manufacturer - Specification Representatives", School Bus Vendors (Dealers), and Wheelchair Lift companies.

Section A

DEFINITIONS

GENERAL INFORMATION

WARRANTY PROVISIONS

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.
- **FHWA**: Federal Highway Administration; an agency of the USDOT
- **FMVSS**: Federal Motor Vehicle Safety Standards, 49CFR 571, vehicle construction standards, enforced by law
- **Federal Guideline No. 17**: Federal Highway Safety Program Guideline Number 17
- **GAWR**: Gross Axle Weight Rating. Gross axle weight rating; the value specified by the manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.
- **GVWR**: Gross Vehicle Weight Rating. Gross vehicle weight rating; the value specified by the manufacturer as the loaded weight, with passengers, of a single vehicle
- **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.
- **MPV**: Multipurpose passenger vehicle accommodating ten (10) or less people.
- **Multifunction School Activity Bus (MFSAB):** A MFSAB is a sub category of a school bus. It must meet all FMVSS's of a school bus except traffic control devices (flashing light and stop arm and may not be painted in national school bus yellow). The MFSAB cannot be used to transport students from home to school or school to home.
- **NSTSP**: 2000 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, or a school bus.</u> The underlined section is where it says a school activity bus cannot be a "school 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, National School Bus Yellow paint, and the legend "School Bus". The term does not include a chartered bus, a bus operated by a mass transit authority or school activity bus.

- **SPECIALLY EQUIPPED BUS:** (Transportation Code 541.201 "Vehicles" (16)) Specially Equipped Bus: A school bus designed, equipped, or modified to accommodate students with special needs.
- **STOCK BUS**: A bus that exists in the inventory of the vendor.
- **TBPC or Commission**: Texas Building and Procurement Commission (formerly the General Services Commission, 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.
- **TXDPS, DPS, Department:** Texas Department of Public Safety
- **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 2005 Texas School Bus Specifications are effective January 1, 2005 and supersede the 2004 Texas School Bus Specifications.

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.

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) in Texas, to transport children to and from school or school-related events, and shall:

a. Meet or exceed the minimum requirements of these specifications; and,
b. Meet all applicable Federal Motor Vehicle Safety Standards

The Specifications for Texas School Buses are the Safety Standards referenced in the Education Code 34.002 and Transportation Code 547.7015. A copy may be obtained at: ***www.txdps.state.tx.us/schoolbus/links.htm***

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 Texas Department of Public Safety, 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) 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://www.capitol.state.tx.us/statutes/tr/tr0050300toc.html when this site opens scroll down to 503.021, 503.029, and 503.032.

Changes or 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, Program Administrator, School Transportation, 1617 East Crest Drive, Waco, Tx 76705-1598.**

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 not exceed 14,050 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-8.
>
> **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 bus, page B-8

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-9.

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.

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 classification school bus. This classification system does not preclude state or local agencies or the national specifications from requiring compliance of school bus-type MPVs with the more stringent federal 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 insure equipment conforms in strength, quality, and workmanship to accepted standards of the industry and State specifications and Federal Motor Vehicle Safety Standards of all equipment installed when the bus leaves their facility. The distributor/dealer shall be responsible for installation/modification of all equipment and insure equipment conforms in strength, quality, and workmanship to accepted standards of the industry and State specifications and Federal Motor Vehicle Safety Standards of all equipment added by the distributor/dealer.

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

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

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

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

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.

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 hours notice of delivery. The person delivering the bus shall present a delivery receipt to the responsible school personnel and obtain that school official's signature before delivery is considered complete.

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:

- 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.
- See suggested Pre-service Checklist in Section G
- See suggested Specifications Checklist in Section G.

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 are urged to make detailed inspections, especially upon delivery, and report any discrepancy or discrepancies to the vendor. If not corrected to the satisfaction of the district/entity, the district/entity should contact the Department. Any such discrepancies found during or after manufacturing shall be immediately corrected to the satisfaction of the district/entity, at no charge, by the manufacturer or distributor.

> **Note:** See "School Bus Purchaser Pre-service Checklist" and "Texas School Bus Specifications Checklist" in Section G.

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 bus is put 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 I, "VENDORS Buses" shall provide an inclusive two (2) year unlimited miles warranty for buses 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 (or see the delay provision above).

In the event of a mechanical or manufacture error such that the bus cannot be safely driven to a vendor repair facility, the vendor will arrange for and pay for normal towing charges.

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
CHASSIS
SPECIFICATIONS

Type
A, C and D
School Buses

BASIC MINIMUM SPECIFICATIONS
FOR SCHOOL BUS CHASSIS
FOR MOUNTING TYPE A, C, AND D SCHOOL BUS BODIES

The specifications set forth in this section are descriptive of Type A (14-30 passenger capacity with dual rear wheels), C, and D school buses. 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.

ALTERNATOR

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

A. Minimum rated capacity of 145 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: All chassis except Type A shall be equipped with an alternator 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 speeds of up to 60 MPH.
    2. Cabling of the alternator and battery system must meet or exceed the requirements of a 320 amp. alternator.

Deleted: and wiring including that

Deleted: be adequate to accommodate the increased amp load of the air conditioning and/or a wheelchair lift system. The vendor will notify the bus manufacturer of the increased amp load-wiring requirement.

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 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)

Passenger Size	**Minimum BCI Cold Cranking AMPS (CCA) at 0 degrees (0° F)**	**Minimum Reserve Capacity**
All Buses Gasoline	600	72 minutes
Type A Diesel Engines	1200	144 minutes
Type C & D Buses Diesel	1100	240 Minutes
All Buses Alternate Fuel	Manufacturer Recommended	Manufacturer Recommended

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

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

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

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

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.

A. 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 14,050 pounds or less may be equipped with an OEM supplied bumper.
B. 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.
C. 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.
D. The bumper shall be black. Bumpers for "Type A" school buses shall be the manufacturer's standard color.
E. A means shall be provided to mount the license plate for an unobstructed view.

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, except Type A buses.

DRIVESHAFT 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.

ENGINE EQUIPMENT

Engines shall meet or exceed the minimum engine listed in the tables found on pages B-8 and B-9.

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.

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

EXHAUST SYSTEM

B. Component Placement: The exhaust pipe, muffler, and tail pipe shall be mounted under the bus and attached to the chassis frame.
C. Tailpipe Exit: The tailpipe shall not exit the side of the bus anywhere within twelve inches (12”) of a vertical plane through the center of the fuel filler opening and perpendicular to the side of the bus, unless protected with a metal shield to divert spilled fuel away from tailpipe. The tailpipe shall exit to the rear of the bus whenever possible.
D. Tailpipe: The tailpipe shall be constructed of seamless or electrically welded tubing of minimum sixteen (16) gauge steel or equivalent, and shall extend no more than two inches (2") beyond the rear bumper. The size of the tailpipe shall not be reduced after it leaves the muffler.

FRAME SIDE MEMBERS

Each frame side member shall be of one-piece (1-piece) construction between the rear most spring hanger and the forward most spring hanger. If the frame side members are extended, such extension shall be designed, furnished, and guaranteed by the installing manufacturer. 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/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.

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), ATERNATIVE 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.

HOOD

Engine hood on Type C buses shall not require more than 20 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 to two thousand (250 to 2,000) hertz. The sound level measurements shall be made at a distance of fifty feet (50') directly in front of the vehicle in accordance with SAE J377.

SHOCK ABSORBERS

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

SPRINGS

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

STEERING

Shall have factory-installed power steering, integral type. A factory installed tilt steering wheel/column is required.

TIRES AND WHEELS

All tires shall be steel belted radial tubeless type. All wheels shall be hub-piloted disc type.

TRANSMISSION, AUTOMATIC

All buses shall be delivered with an automatic transmission as standard. 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 with lead wires on steering column for body manufacturer's attachment.

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 nine (9) 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 signal lamps
        h. Horn
        i. Heater and defroster

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.

Deleted: 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.

Deleted: Cabling and wiring including that of the alternator and battery system shall be of a double ought (#00) size except Type A.

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Minimum Chassis Specifications Chart
Type A Buses

NO SINGLE REAR WHEEL BUSES

Passenger Design Capacity	14-24	29-30
Front GAWR (pounds)	4050	4050
Rear GAWR (pounds)	6084	8600
GVWR (pounds)	10000	12000
Minimum Engine Size	6.0L	6.0L
Wheel Base (inches)	138	139
Minimum Fuel Tank Gallons	33	33
Minimum Tires	225/75	225/75
Minimum Rims	16X6	16X6
Minimum Transmission	4 SP	4SP
# of Forward Gears	4	4
Minimum Alternator Amps	145	145

Minimum Chassis Specification Chart
Type C Diesel

Passenger Design Capacity	30-36	42-54	59-66	71-77
Front GAWR (pounds)	8000	8000	10000	10000
Rear GAWR (pounds)	15000	15000	17500	19000
GVWR (pounds)	23000	23000	27500	29000
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	2500 PTS	2500 PTS	2500 PTS	2500 PTS
# of Forward Gears	5	5	5	5
Minimum Alternator Amps	175	175	175	175

Minimum Chassis Specifications Chart

Type D Front Engine

Passenger Design Capacity	47-60	65-72	77-78	83-84
Front GAWR (pounds)	12000	12000	12000	13220
Rear GAWR (pounds)	17500	17500	19000	19000
GVWR (pounds)	29500	29500	30000	30000
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	2500 PTS	2500 PTS	2500 PTS	2500 PTS
# of Forward Gears	5	5	5	5
Minimum Alternator Amps	175	175	175	175

Minimum Chassis Specifications Chart

Type D Rear Engine

Passenger Design Capacity	65-66	71-72	77-78	84
Front GAWR (pounds)	12000	12000	12000	12000
Rear GAWR (pounds)	17500	19000	19000	23000
GVWR (pounds)	29500	30000	30000	35000
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	2500 PTS	2500 PTS	2500 PTS	Manufacturer Recommended
# of Forward Gears	5	5	5	5
Minimum Alternator Amps	175	175	175	175

Section C
Body
Specifications

Type A, C, & D
School Buses

MINIMUM TEXAS SCHOOL BUS BODY SPECIFICATIONS

The specifications set forth in this section are descriptive of Type A (14-30 passenger capacity with dual rear wheels), C, and D school buses. 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.

BATTERY SLIDE OUT TRAY

A body skirt-mounted slide out tray and battery box is required for the batteries on all Type A (diesel), C, and D bodies. When three 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 compartment mounted near but not greater than 24 inches from 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". The plate shall have a space for the dealer to enter information. The dealer shall enter TX and the specification year (example TX 05). The plate shall be attached in the driver's area. Decals and glue are not acceptable.

BODY FLUID CLEANUP KIT

Each bus shall be provided with a mounted, removable, moisture-proof metal or hard plastic body fluid cleanup kit. Container shall be mounted in the driver's compartment and the container shall be easily removed without tools in the event of an emergency. 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:

1 -- Step-by-step instructions, with drawings/pictures, including how to take off the rubber gloves
1 -- 15 oz. Chlorine-type absorbent deodorant material that will counteract the odor
1 -- 12 oz. Germicidal spray disinfectant-EPA registered liquid
2 -- pair disposable non-latex gloves
4 -- 18" x 18" absorbent towels
1 -- pick-up spatula-water resistant
1 -- plastic hand broom
1 -- plastic dustpan
2 -- 14" x 19" disposal bags and ties (waterproof)
2 -- adhesive "BODY FLUID CLEANUP" labels
1 -- 12 oz. Deodorant spray
4 -- individually wrapped, cold sterilization wipes in foil-lined pouches

2 -- paper respiratory masks
1 -- metal or hard plastic mountable container identified as "BODY FLUID CLEANUP KIT" with orange face and black lettering – No Bio-hazard Symbol.

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 wraparound 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" 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.

DRIVER'S SEAT AND SEAT BELT

All school buses shall have a driver's seat equipped with a one-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 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 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.

DOOR HOLDING DEVICE

A door holding device shall be provided to hold the swing-out type emergency door(s) in the fully opened position.

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 an exterior electrical access panel or must provide easy internal access to body electrical components and circuits. All Type D buses shall be equipped with an 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 107dba plus or minus 4dba sound level.

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 DOOR BUZZER

Emergency door (and window) buzzer shall be connected to accessory side of ignition switch.

HEATER/DEFROSTER

A. The heater shall be hot water.
B. If only one (1) heater is used, it shall be fresh-air or combination fresh-air and re-circulation type.
C. If more than one (1) heater is used, additional heaters may be re-circulating air type.
D. The heating system shall be capable of maintaining bus interior temperatures as specified in SAE test procedure J2233.
E. All forced air heaters installed by body manufacturers shall bear a 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.
F. Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or any sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hoses shall conform to SAE J20c. Heater lines on the interior of bus shall be shielded to prevent scalding of driver or passengers.
G. Each hot water system installed by a body manufacturer shall include one 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.
H. 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.

I. Accessible bleeder valves shall be installed in an appropriate place in the return lines of body company-installed heaters to remove air from the heater lines.
J. Access panels shall be provided to make heater motors, cores and fans readily accessible for service. An outside access panel may be provided for the driver's heater.
K. 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.

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.

Zero to 36-Passenger = One (1) emergency exit per side and one (1) roof hatch.
41 to 48- Passenger = One (1) emergency exit per side and two (2) roof hatches.
53-to 78-Passenger = Two (2) emergency exits per side and two (2) roof hatches.
79-to 84-Passenger = Three (3) emergency exits per side and two (2) roof hatches.

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

EMERGENCY 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 mounted in the driver's compartment and the container shall be easily removed without tools in the event of an emergency.

FIRE EXTINGUISHER

The bus shall be equipped with at least one UL-approved pressurized, dry chemical fire extinguisher. The extinguisher shall be mounted (and secured) in a bracket, located in the

driver's compartment and readily accessible to the driver and passengers. A pressure gauge shall be mounted on the extinguisher and shall be easily read without 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.

FIRST-AID KIT

Buses shall have a removable, metal or hard plastic moisture and dust proof first aid kit. Container shall be mounted in the driver's compartment and the container shall be easily removed without tools in the event of an emergency. The kit shall contain each item listed below in the minimum quantities indicated:

Quantity	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 approximately 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

FLOOR AND FLOOR COVERING

A. The floor system in all buses shall be of 14-gauge steel with a metal zinc coating designation of G60. Other metal or materials used in construction shall have strength at least equivalent to steel components specified.
B. **Construction and Installation:** The floor panels shall run the full width of the floor and shall be supported on all outside edges by a longitudinal frame member. The floor panels shall be welded, riveted, or bolted to the main and auxiliary cross members and shall be joined to form a leak and dust proof floor. The main and auxiliary cross members shall extend the full interior width of the floor panels. The side posts or bow frames shall be securely welded, riveted, or bolted to the floor system and to the longitudinal frame members or gussets
C. **Cross Members:** The cross members shall be spaced not more than ten inches (10") center-to-center except Type A buses. The floor panels and cross members shall be designed and constructed to support all fixed and changeable loads under

all operating conditions without deformation of the under body structure, strains to body, or fractures of member joints. The under structure shall be designed and constructed to eliminate the necessity of installing outriggers attached to the chassis except at the front entrance. The under surface of the entire floor structure, including wheel housing and step-well, shall be sprayed with material at least one-eighth inch (1/8") thick conforming to that specified in Undercoating, Section C-5.

D. Floor Covering:

1. **Aisle Material:** The floor covering in the aisles will be of aisle-type rubber or equivalent, wear resistant and ribbed. Minimum overall thickness shall be .187 inch measured from tops of ribs.
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:** Seams shall be covered with extruded aluminum or stainless steel metal strips of a minimum three- sixteenths inches (3/16") high and one inch (1") wide that shall be installed on each side of the aisle, the full length of the aisle, so as to secure both the edges of the aisle covering and adjoining edges of the under seat covering. The strips shall be secured to the flooring with flush-mounted flat or low profile oval head screws; holes for the screws shall be countersunk. The screws shall be placed not more than nine inches (9") apart for the full length of the metal strips except that the ends of each piece of stripping shall have screws placed at not more than three fourths inches (3/4") from each end. Screws may be placed nine and one half inches (9-1/2") apart only to avoid interference with floor sill members.
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 rubber floor covering or equivalent, having a minimum overall thickness of .125 inch. The driver's area in all Type A buses may be manufacturer's standard flooring and floor covering. Floor covering on toe-board shall be held in place by trim strip or molding.

FUEL ACCESS PORT:

A fuel access port is required on all thirty-five through eighty four (35-84) passenger buses except front wheelchair equipped buses.

FUEL FILLER OPENING TYPE C and 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 you pass through the skirting with the fuel

nozzle, 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.

HANDRAILS

Handrails of not less than twenty inches (20") in length shall be installed on both sides of the stairwell. The outside surface of this handle shall be stainless steel, polished aluminum, or chrome-plated steel. 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.

HEATER / DEFROSTER

See ELECTRICAL EQUIPMENT AND WIRING

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 inches (1-1/2”) of fiberglass or other insulation in the ceilings and walls including the interior of hat-shaped bows. Any insulation used shall have a minimum R-factor value of 5.75. 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.
C. The school bus letters shall be neat, clearly defined block style eight inches (8”) high with one-inch (1”) wide strokes. Lettering on Type A buses may be six inches (6”) high. The words “SCHOOL BUS” shall be 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 inch (5/8”) 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).

1. 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.
2. 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 500 square inches.

LICENSE HOLDER

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

LIGHTS

ALTERNATELY FLASHING 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 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 and amber signal lamps shall be wired to ensure activation anytime the master switch is in the "on" position, even if the ignition switch is in the "off" position. 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 enclosed in the body in a readily accessible location.

Note: The lamps shall be wired independently and not wired through the ignition switch. This will allow removal of the ignition key without affecting operation of the alternately flashing eight warning signal lamps.

BACK UP LIGHTS

There shall be two (2) four-inch (4") backup lights on the rear of all bodies with a universal type sealed electrical plug connector.

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-inch (4") 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 30 feet. The headlight switch shall activate the clearance lights.

A. LED Identification lights shall be mounted as follows; three (3) amber on the front, three (3) red on the rear. Front and rear shall be grouped in a horizontal row. Lamp centers shall be spaced not less than six (6) nor 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.
    3. Use a universal type sealed electrical plug connector.

CONTROL PANEL LIGHTING

The control panel or switches supplied by the body manufacturer shall be illuminated, and shall have an independent 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 LIGHTS

Interior lamps shall be installed to provide uniform illumination of the interior of the bus, primarily the aisle and emergency passage way. The interior fixtures shall be mounted to provide uniform illumination of the passenger and driver's compartment.

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

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

STEPWELL 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: Interior mirrors on Type A shall be a minimum of fifty (50) square inches.
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 (1) one mirror shall be installed at each front corner of the bus.
        b. Mirrors shall not reflect excessive glare from the bus headlights into driver's eyes.
        c. Any fasteners used in the construction of the mirror and mounting brackets shall be corrosion proof.
C. **Rear Vision Mirror System:** A rear vision mirror system shall be provided which incorporates the following features and requirements:
    1. System shall consist of one aerodynamic mirror head, containing one flat and one convex mirror lens per side as standard. Each mirror set shall be mounted on a single breakaway arm with positive detent or lock. Type A buses may be exempted from this requirement if no such brackets are available.

2. Each of the four required mirrors in the rear vision mirror system shall be electrically operated, remote control, rear view mirrors.
3. 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

Prior to the application of the finish coats to body, hood, and cowl, all surfaces shall be cleaned of grease, foreign matter, excessive body caulking, and sealing material and treated as per paint manufacturer's recommendation for proper paint adhesion. National School Bus Yellow paint shall meet National Specifications for color and shall have a finished gloss rating of at least eighty-five (85) at sixty degrees (60°) and a distinctness of image rating of an average of at least fifty (50) measured using the same method specified for gloss. Paint shall be applied for a total dry thickness of at least 1.8 mils over all painted surfaces. 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 minimize sharp edges.
EXTERIOR: Exterior paneling includes all sheet metal skin forming exterior surface of body. Exterior paneling should be of 20-gauge steel minimum thickness and shall be attached to bow frames to act as an integral part of structural frame. Twenty two (22) gauge steel is allowed on Type A 30 passenger or less.

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 at least 1 3/4 inches wide 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 amber reflectors shall be mounted on the sides of the bus body near the front even if chassis incorporates amber reflectors at or near the front of the chassis cowl area, and two red reflectors on rear side panels, two red reflectors on rear panels, and two 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 doorpost 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-piece (1-piece) continuous construction, four (4) inches or more in width in its finished form, shall be of sixteen (16)-gauge steel, 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:

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 8 portable child restraints. The minimum number of positions required by FMVSS 225 for school buses with a GVWR of 10,000 lbs or less may be included to comprise the total number of eight (8) required in this specification. 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 2 inches out of the bight of the seat. All Type A buses shall be equipped with a lap belt for each designated seating position.

Seat Cushions: The base shall be nominal 15/32" thick, Exposure 1, APA Rated Sheathing C-D plywood with exterior grade glue, identification (span) index 32/16, manufactured in conformance with Voluntary Product Standard PS1-95, PRP 108, PS2-92 and identified as to veneer grade and glue bond type by the trademarks of an approved testing agency. The foam cushions shall be solid polyurethane foam conforming to ASTM D 3574. Re-bonded or molded polyurethane foams are not acceptable for seat cushions.

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

Upholstery: All seat cushion surfaces shall be covered with a vinyl resin-coated upholstering material. All restraining barriers and passenger seats shall be constructed with materials that enable them to meet the criteria contained in the School Bus Seat Upholstery Fire Block Test. (See Appendix B, page 185 of National School Transportation Specifications and Procedures, May 2000)

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 pounds (25 lbs) of

force to operate at any point throughout the range of operation, as tested on a 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 inches ("24") and a minimum vertical opening of sixty-eight (68") (for Type A) and seventy-two (72") (for Types C, & D).
C. Service door shall open outward.
D. All door panels shall be of approved safety glass. The bottom of each lower glass panel shall not be more than ten inches from the top surface of the bottom step. The top of each upper glass panel shall not be more than three inches (3") from the top of the door.
E. Vertical closing edges on entrance doors shall be equipped with flexible material to protect children's fingers.
F. There shall be no door to the left of the driver on Type C or D vehicles. All Type A vehicles may be equipped with the chassis manufacturer's standard left-side door.
G. All doors shall be equipped with padding at the top edge of each door opening. Padding shall be at least three inches (3") wide and one-inch (1") thick and extend the full width of the door opening.
H. 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.

SIZES OF BODIES

Overall Length: The overall length of a complete school bus body shall not exceed forty feet (40'), *excluding safety equipment*.
Exterior Width: The overall exterior width of a complete school bus body shall not exceed ninety-six inches, (96") *excluding safety equipment*.

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 70%. The lower (first) step height shall be between ten inches (10") and fourteen inches (14") above the ground for all Type A and C buses. Type D buses shall have a lower (first) step height between twelve inches (12") and sixteen inches (16") 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 steps are acceptable on Type A buses. Risers in each case shall not exceed a height of ten inches (10").

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 buses.

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 2000 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 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 percent (10%) 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 inch (1") 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 inch (1/2") 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.

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

lamp circuit when the arm is extended, or an LED Stop Sign. The stop arm assembly shall be non-corrosive.

B. **Mounting:** If only one stop is provided, the stop arm shall be installed on the left side of the school bus near the front cowl section. If a second stop arm is provided, it shall be installed on the left side of the bus near the rear section of the bus and shall have one (1) "STOP emblem facing the rear of the bus when the stop sign is in the open position.

Dual stop arms may be provided on buses designed for forty-seven (47) passengers or larger. See Section F, Option 69.

SUN SHIELD

An interior adjustable tinted transparent sun shield, with a finished edge and not less than 6 inches x 30 inches (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.

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

24-84 passenger 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 less set of passenger windows than rows of seats provided that each seat has access to a window.

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

B. **Side Windows, Passenger, Push-out Type:** These windows shall be hinged at the top and shall be positioned for ease of egress. These windows shall provide an emergency opening at least twenty-two inches (22") wide and thirteen inches (13") high, with minimal obstruction by seatbacks or other objects. These windows shall meet or exceed Federal Standards. Push-out windows shall be equipped with an electrical switch connected to an audible signal automatically operated and located in the driver's compartment, which shall indicate when the window is 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 safety glass panels, 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 square inches (140 sq. in.) and shall be set solid in a waterproof manner. These windows shall be installed securely to prevent removal by hand. A rear "push-out" window, meeting the requirements of FMVSS No. 217, shall be provided on the rearward window on rear engine buses.

E. **Side Window, Driver's:** The driver's window shall be a two-piece (2-piece) window of either of the following types:
   1. Two-piece (2-piece) sliding-sash type: This type will be acceptable only when the bus is equipped with an adequate air scoop to draw outside air into the driver's compartment. When driver's ventilation is drawn through the heater system, this air shall be shielded from the heat sources.
   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 or four-piece flat glass, or two-piece flat glass as approved by the Department of Public Safety. 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 quart (1 qt.) of liquid and shall

direct a stream of water into the path of travel of each windshield wiper blade each time the actuating button is operated.

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.

SECTION D

SPECIALLY EQUIPPED BUSES

TYPES A, C, AND D BUSES

SPECIALLY EQUIPPED BUSES

When so specified in the Invitation for Bids to include a wheelchair lift, (See Section F Option #76) the 15 through 84 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 30-inch aisle leading from any wheelchair mobility aid position to at least one 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. All wheelchair positions shall be forward facing. The wheelchair lift furnished for option #76 shall: be operated by a twelve (12) volt DC electric-hydraulic, electro-mechanical system or a combination there of. The lift shall have a minimum capacity rating of 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 inches (6”) to allow for un-level loading conditions. The lift shall be self contained and mounted directly to the existing bus body floor. The lift shall be grounded to the bus chassis with a cable of suitable gauge to insure positive grounding of the lift.

DOORS, SPECIAL SERVICE:

One or two (1 or 2) special side doors with 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) 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 (90^0 position minimum).

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 inches (3") wide and a minimum of one inch (1") 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 C: RUB RAILS".

ELECTRICAL SYSTEM:

All wiring and wiring connectors used in the construction of the wheelchair lift shall meet the requirements of SAE J561. The vendor will notify the manufacturer if an after market installation is planned. The vendor is responsible for an electrical up-grade. (See; Section B, ALTERNATOR, Section C, BATTERY SLIDE OUT TRAY and ELECTRICAL EQUIPMENT & WIRING sections.)

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 or battery compartment. The breaker must be easily accessed.

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 pounds (800 lbs.) of additional weight.

Design of Platform, Automatic Folding Type: The platform shall be of sturdy construction and covered with minimum one-eighth inch (1/8") safety plate steel or one-eighth inch (1/8") expanded metal (open grate) with maximum three-fourths inch (3/4") openings. The lift platform shall have a minimum thirty-two inches (32") 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 inches (40"). 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 be less than thirty inches (30") and not more than thirty-eight inches (38") 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 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 inch (1/8") steel and one inch (1") high. The front of the lift shall have a folding type safety rail a minimum of three inches (3") 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 degrees (8°) below horizontal.

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 and address of the manufacturer
Model number

Deleted: s

Deleted: approximately

Deleted: twenty-five-and-three-fourths

Deleted: 25-3/4

Deleted: in height and a minimum eighteen inches (18") in length

Deleted: The handrails shall be connected with an occupant restraint belt, which is electrically interlocked with the lift. The belt shall be connected to the handrails at a height of at least 24 inches. The lift will only operate when the belt is engaged.

Serial number
Month & year of manufacturing

LAMPS, SIGNALS, AND WARNING DEVICES:

Alternately Flashing Signal Lamps: If ordered with a wheelchair lift door, the lift door shall be considered an entrance door and shall activate warning lights when open.

LEVEL TEST:

The sides of any bus provided with a wheelchair lift shall be within plus or minus two inches (± 2") 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.

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 inch (3/4"). Cylinders shall have a minimum of thirty-four inches (34") of extension action and shall lift a minimum of eight hundred pounds (800 lbs.) 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.

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 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 C: FLOOR AND FLOOR COVERING.

Flooring: When plywood is used to cover existing steel floors on specially equipped buses, it shall conform to Section C: Floor and floor coverings. See Options, Section F, option #44 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 C LIGHTS, INTERIOR LIGHTS.

UNIVERSAL HANDICAP SYMBOLS:

School buses with wheelchair lifts shall display four Universal 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 inches (6”) and twelve inches (12") in size, and shall be of a high intensity reflectorized 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 both 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.
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 2" 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 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.

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.

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 anchorage points shall be located in front of the wheelchair/mobility aid and a minimum of two anchorage points shall be located in the rear. The securement 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 30" by 48". 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.

Belt Cutter:

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

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.

SUPPORT EQUIPMENT SECUREMENT:

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 E

AIR CONDITIONING

SECTION E

AIR CONDITIONING SPECIFICATIONS

DEFINITIONS:

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

This is a performance specification. The BTU requirement is an **option (see Section F Option # 28).**

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. All tests performed shall be demonstrated to the satisfaction of the DPS Specifications Committee. ***The purchaser or Committee must be able to replicate the test and results***. However, if the A/C system presented does not pass after 3 tests, the manufacturer shall supply another system to meet the requirements.

SERIES OF BUSES TO BE TESTED	
14-30	Type A
35-40	Type A
35-53	Type C & D
59-71	Type C & D
77-83	Type C & D

A. THIS TEMPERATURE DIFFERENTIAL SHALL BE HELD UNDER THE FOLLOWING CONDITIONS:

1. Air conditioning system will be designed to operate at 110 ° 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 30 º F cooler than outside ambient temperature, plus or minus 3 º F.

B. 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.

2. The air conditioning system shall have sufficient capacity to maintain an inside temperature of approximately 30 º F cooler than outside ambient temperature throughout the bus with an outside temperature of 110 º F maximum (100 º F minimum) and a humidity rating no less than fifty percent (50%). Electrical circuit shall have an on/off switch at A/C panel that can only be operated by maintenance personnel. 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 110 º F maximum (100 º F minimum) to a comfort range of 30 º F cooler than the outside ambient temperature plus or minus 3 º F in thirty (30) minutes or less with all the doors and windows closed and the main engine operating at ¾ 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 110 º F maximum (100 º 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 ¾ 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 110 º F maximum (100 º 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 30 º F cooler than the outside ambient temperature plus or minus 3 º 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.

C. 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 pate. The data plate shall include the following information:

A. Name and address of the manufacturer.
B. Model
C. Compressor
D. Condenser
E. Cooling capacity of the installed system (in BTU/hr.).
F. Re-circulation and ventilation of air quantity in (CFM).
G. The type and quantity of refrigerant used for each system installed.

5. Alternator (See Section B Chassis)
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.

D. 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 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 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.

E. SPECIAL REQUIREMENTS:

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

1. Insulation:

a. Minimum five-eighths inch (5/8") nominal thickness plywood shall be installed over the existing or manufacturer's standard steel floor for insulation. Except type A where 1/2 inch is acceptable.
b. Air-conditioned buses shall have the equivalent of one-and-one-half inches (1-1/2") of Fiberglass or other insulation in the ceilings and walls including the interior of hat-shaped bows.
c. The insulation shall have a minimum R-factor value of 5.75.
d. The body must be equipped with insulation, including sidewalls, roof, firewall, rear, inside body bows and plywood or composite floor insulation to aid in head dissipation and reflection.
NOTE: See Section F, Option 44 for marine grade plywood

2. 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 F.

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.

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

3. **White Roof:** See Section F Option # 77 for white roof.
4. **Extra cooling:** See Section F Option #29 for extra cooling.

F. GENERAL AND 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.
10. Shall meet the requirements of the following table:

OPTIONAL MINIMUM BTU AIR CONDITIONING COMPONENT REQUIREMENTS

Bus Size	Capacity BTU/hr.	No. of Compressor(s)	Condenser(s) Location/No.	Evaporator(s) Location/No.
15-30 passenger Type A	68,000	2 – (1) OEM (1) 10 cubic in.	2 - (1) OEM mtd. (1)-skirt mtd.	2 - (1) Front (1)- Rear
35-40 - Type A Extra Cool	78,000	2 – (1) OEM (1) 10 cubic in.	2 - (1) OEM mtd. (1) skirt mtd.	2 - (1) Front (1) - rear
35-42 passenger Type C	80,000	2 – 10 cubic in.	2 - skirt mtd.	2-1 each side
47-53 pass.	93,000	2 – 10 cubic in.	2 - skirt mtd.	2-1 each side

Type C&D				
59-71-pass. Type C&D	108,000	2 – 10 cubic in.	2-skirt mtd.	2-1 each side
77-83 pass. Type C&D	120,000	2 – 12 cubic in.	2-skirt mtd.	2-1 each side
77-83 Type C&D Extra Cool	126,000	2 – 12 cubic in.	2-skirt mtd.	3-1 one side -2 one side

Systems that are ordered by BTU ratings may or may not meet the performance test requirements.

G. 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 operating speeds, OFF is not considered an operating speed**.**

H. INSTALLATION:

1. 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.
2. 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.

I. 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.

J. OTHER REQUIREMENTS:

AVAILABILITY OF SERVICE AND REPAIR PARTS: Bidder shall have on file with the Department, a list of factory-authorized companies or individuals, and their addresses 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 3 days of receipt of order.***

SECTION F

OPTIONS

OPTIONS

SECTION F

Options must be installed bus 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 OPTION (LISTED OR NOT LISTED) to the vehicle is permitted as long as the bus continues to meet the Texas School Bus Specifications, all Federal Requirements, National School Transportation Specifications & Procedures, and the following:

1. The option is listed on the purchase order as a separate option.
2. The vendor/successful bidder 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.

CHASSIS OPTIONS

OPTION NO.	DESCRIPTION
1.	**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 Natural Resources Conservation Commission (TNRCC). 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

OPTION NO.	DESCRIPTION
	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. 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
2.	**Alternator** Increased capacity of alternator to a minimum of: Choose Alternator size: **_____** 200amps _____270amps
3.	**Brakes, Air** (For 35 through 53 passenger buses)
4.	**Chassis, Long Wheelbase** (For only 24, 35, and 71 passenger buses) Requires minimum two hundred seventy four inch (274") wheelbase for 71-passenger conventional bus only; or one hundred fifty two inch (152") wheelbase for 24-passenger bus only; or one hundred sixty seven inch (167") wheelbase for 35-passenger bus only.
5.	**Cruise Control** Chassis manufacturer's standard automatic speed maintenance control system with resume speed feature.
6.	**Differential, No Spin (35-71 Passenger Buses only)** A locking type no-spin rear differential. This differential shall be fully automatic in operation. Selection switches are not allowed.
7.	**Engine, Diesel** (Indicate minimum horsepower required:_____)
8.	**Engine, Gasoline** (Indicate minimum horsepower required:_____)
9.	**Fuel Tank**, Manufacturer’s largest capacity Bidder to state size in gallons.

OPTION NO.	DESCRIPTION
10.	**Hood** – Non Reflective Paint 10. A. ___ Yellow 10. B. ___ Black
11.	**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 11. A. ___ Left rear wheel (driver's side) 11. B. ___ Right rear wheel (passenger's side)
12.	**Hydraulic Brakes** (59 - 77 passenger buses)
13.	**Low profile tires** (Not available on Type A buses) Reduced tire size, which allows for lower bus height.
14.	**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 inches (8") of 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 manufacturers logo. 14. A. _____Rear mud flaps only 14. B. _____ Both front and rear mud flaps
15.	**Sound Abatement Insulation for engine compartment** Extra sound insulation for Type C buses (Shall reduce interior noise by four (4) decibels, minimum).
16.	**Suspension,** Improved Ride, Mechanical Designed to provide an enhanced, more comfortable ride than standard suspension. Rear axle only.
17.	**Suspension**, Improved Ride, Air Designed to provide an enhanced, more comfortable ride than standard suspension. Rear axle only.
18.	**Telescoping Steering Wheel** Easily adjustable for different size drivers. Can be changed by driver while seated in driver's seat. Note: May not be available on all size buses.
19.	**Tires, Mud and Snow Tread**

OPTION NO.	DESCRIPTION
	Designed with a tread style for added traction in snow and/or mud. (Rear wheels only). (Not available on 14 to 30 passenger Type A chassis)
20.	**Tow Hooks,** front and/or rear Mounted tow hooks (loops are acceptable); with minimum horizontal pull capacity of 28,000 pounds. 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. 20. A. _____ Front only 20. B. _____ Rear only 20. C. _____ Both locations
21.	**Transmission** – Extended Warranty Vendor to state manufacturer's basic months and mileage, and additional months and mileage.
22.	**Transmission** – Heavy Duty, Automatic To upgrade from a 2500 PTS series transmission. Purchasers desiring a 3000 PTS heavy-duty transmission should seek additional information from the vendors. Bidder to state brand and torque rating.
23.	**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. 24-passenger buses: transmissions with four forward and one reverse speed. 35- to 77-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 percent (10%) in excess of the maximum net torque output of engine. All chassis for the 24- through 59-passenger buses with manual transmissions shall be equipped with a minimum twelve-inch (12") diameter clutch. A starter interlock shall be installed to prevent actuation of the starter if the clutch is not depressed.
24.	**Wheel,** Spare, not mounted (without carrier, tire, or tube).
25.	**Wheel,** Spare, Mounted (with carrier but no tire). Wheel, Spare, Mounted with Carrier but no tire; For Type C & D buses only; Not available on Type A chassis - May not be available with extra capacity fuel tanks. Check with manufacturer for availability.
26.	**Tachometer** To indicate the engine's RPM. Not available on Type A chassis.

OPTION NO.	DESCRIPTION
	BODY OPTIONS
27.	**Acoustical ceiling panels** Sound reduction insulation panels for the interior roof of the bus. 27. A. ____ First two body sections 27. B. ____ All body sections
28.	**Air Conditioning,** Standard Cooling [See Section E-5] _____ Rating Based on BTU's
29.	**Air Conditioning,** Extra Cooling Additional cooling may be ordered for 14- through 84-passenger school buses. This is intended for use in buses operated under severe conditions (e.g., buses with handicapped lifts where the doors remain open for long periods of time, buses operated in urban areas with slow, stop-and-go traffic, etc.). Ordering this option will provide a Btu/hr. capacity equal to the next passenger-capacity category, as shown in Section E, see minimum table in E-6.
30.	**Battery Compartment** – Locking Locking battery box having outside access. Keyed the same as any other storage compartments.
31.	**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 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. 31A ____ Air Powered Crossing Gate 31B ____ Electric Powered Crossing Gate 31C ____ Electro-magnetic latch
32.	**Communication Device**

OPTION NO.	DESCRIPTION
	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)
33.	**Defroster/heater** (Auxiliary right hand defroster/heater with a separate core.
34.	**Driver's Dome Light** Separate interior light for driver use, on separate switch.
35.	**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 19-1/2 inches wide, shall be fully contoured for maximum comfort, and shall have a minimum of four adjustment positions to allow changes in seat bottom angle. Hydraulic suspension seats may have a minimum seat cushion width of 19 inches. Backrest shall include adjustable lumbar support. The seat shall have a minimum of 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 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. 35. A. _____ Air Suspension 35. B. _____ Hydraulic Suspension
36.	**Door, Air or Electric Powered Service** Manufacturer's standard powered by electricity or air that are 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. 36. A. _____ Air 36. B. _____ Electric
37.	**Emergency Door Holding Device:** A built in hinged door holding device in lieu of standard equipment.
38.	**Fans:** (Defroster) Fans shall be mounted on the top left side and the top right side of the windshield. Each fan shall have a metal cage and operate with minimum two speeds.
39.	**Fan** (Driver) Auxiliary, 6-inch minimum, metal cage, minimum two speed, fan mounted to provide additional air movement to driver. Electrical powered controlled by

OPTION NO.	DESCRIPTION
	separate switch.
40.	**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.
41.	**Flooring with Recessed Track** Flooring with four recessed tracks parallel to the aisle of the bus. State number of wheelchair positions and/or track-mounted passenger seating required _____. The school district must maintain the seat spacing according to FMVSS 222.
42.	**Floor Covering** – Color Specify color: **_____**
43.	**Floor Covering** – White line (No Standing) White line as part of floor covering material, which extends across aisle at entrance to passenger seating.
44.	**Floor Insulation Plywood** The physical thickness shall be no less than 5/8 inch. (1/2 inch for Type A) 44. A. _____ Non Treated 44. B. _____ Treated, Marine Grade Note: Marine Grade plywood should extend life of floor where moisture is a problem.
45.	**Headroom Maximum,** Increased height of bus ceiling for maximum headroom for stated size of bus. (Bidder to specify in inches).
46.	**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

OPTION NO.	DESCRIPTION
	intake rating) as follows: (24 - 35-passenger) buses: 40,000 Btu/hr. (47-passenger and larger) buses: 75,000 Btu/hr.
47.	**Heater, Rear,** auxiliary wall 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: (24 - 35-passenger) buses: 40,000 Btu/hr. (47-passenger and larger) buses: 75,000 Btu/hr.
48.	**Knee Spacing Maximum** (Maximum spacing between seats as allowed by FMVSS No. 222; requires deleting one (1) row (six (6) positions) of seats, which will reduce seating capacity.
49.	**Exterior lights** High visibility, light emitting diodes (LEDs) lights in place of incandescent lights: 49. A. _____ LED Loading lights 49. B. _____ Strobe Loading lights 49. C. _____ Back up lights
50.	**Mirrors, "Super Nickel" Style** Shall be remote control and meet the requirements of FMVSS No.111
51.	**Mirrors, exterior rear view** – Stainless Steel mirror backing and mounting. Exterior rearview mirror backs and mounting brackets shall meet or exceed the requirements of Section C-11 & C-12, Mirror System and the mirror backing and mounting shall be made of stainless steel.
52.	**Mirrors, exterior rear view** – Heated Electrically heated, designed to remove snow and/or ice from mirrors.
53.	**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 feet from driver's head. **Check all items to include:** 53. A. ____ PA System (internal) 53. B. ____ PA System (internal - external) 53. C. ____ am/fm radio 53. D. ____ CD 53. E. ____ Cassette
54.	**Reflective Material for Bumpers**

OPTION NO.	DESCRIPTION
	The front and/or rear bumper are marked diagonally 45 degrees down to centerline of pavement with 2 inch wide strips of reflective material, followed by a 2 inch strip of unmarked (painted black) bumper. 54. Specify color_____ 54. A. _____ Front Bumper 54. B. _____ Rear Bumper
55.	**Roof-top Warning Lamp (Strobe)** The lamp shall have a single clear lens emitting light. Revolving three hundred sixty degrees (360°) around a vertical axis. The Light source shall be minimum of fifty (50) candlepower and flash eighty to one-hundred-and-twenty (80-120) 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 inches (6-1/2"). White flashing (roof-mounted) warning light shall be warranted for 100% parts and labor coverage for 12 months.
56.	**Seat Backs, Increased Height** Seat back heights shall be increased four inches (4") over the seat back heights required by FMVSS No. 222 and have heights of approximately twenty-eight inches (28"). (Not available on 14 to 20 passenger buses)
57.	**Seating Lap Belts:** Type C & D: 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 or three (2 or 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 2 inches out of the byte of the seat. If possible, the design shall prevent fastening the belts across the aisle. <u>Note: Installation of seating lap belts may reduce seating capacity.</u>
58.	**Seat: Lap Belt Ready:**

OPTION NO.	DESCRIPTION
	Compliant with FMVSS 210 and no lap belts included.
59.	**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 will reduce the seating capacity of the school bus.
60.	**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 39 inches wide will have 2 integrated positions. Seats under 39 inches wide will have 1 integrated position.
61.	**Seats, Activity Style** Designed for extended travel usage. Two seating positions per seat, contoured with additional padding.
62.	**Security System Door Locks** 62. A. _____For service door and emergency exit doors, does not lock wheelchair lift door. (With ignition disconnect on emergency door). 62. B. _____For all bus access panels doors.
63.	**Seat Anchorages:** 8 lower anchorages are required on all school buses. State the number of additional anchorages needed _____.
64.	**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.
65.	**Storage – For Drivers** – Locking in front header Locking compartment designed to hold driver's personal possessions.
66.	**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

OPTION NO.	DESCRIPTION
	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. 66. A. _____ With locking door or lid.
67.	**State Inspection and Sticker prior to delivery** Vendor completes all state or commercial required inspections necessary to put bus into service prior to delivery. 67. A. _____ State Safety Inspection 67. B. _____ DOT Commercial Inspection
68.	**Stop Arm – Higher Visibility** 68. A. _____ Strobe Light 68. B. _____ Flashes & spells the word "STOP" in LED lights 68. C. _____ Two red LED lights flash on and off
69.	**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, lighting, symbols or markings on the forward side. 69. A. _____ Two red flashing Strobe Lights 69. B. _____ Flash and spelling out the word "STOP." LED lights 69. C. _____ Two red LED lights flash on and off
70.	**Stop Warning Sign – LED** LED sign that uses words to tell drivers behind bus that it is in the process of stopping.
71.	**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.
72.	**"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.
73.	**"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.
74.	**Turn Signal Lamps -Side mounted, in addition to:**

OPTION NO.	DESCRIPTION
	Total of 2 per side of bus, front and rear mounted with minimum 4 candlepower bulbs
75.	**Video Camera with recorder** Records the passenger compartment of bus with date and time notation. With a 6-hour minimum recording time. List **_____** brand & type preferred. 75. A. **_____** Videotape 75. B. **_____** Digital
76.	**Wheelchair Lift, Folding Platform Type,** **_____** Indicate quantity of wheelchair positions **_____** 76. A. Front curb side mounted **_____** 76. B. Middle curb side mounted _____ 76. C. Rear curd side mounted **See Section D:** Will reduce seating capacity because a wider aisle is needed. Check with manufacturer for floor plan & availability.
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 C, Emergency Exits.
80.	**Windows, push-out,** hinged on front edge (for emergency exits). Standard push-out windows are hinged on top edge.

PROCEDURES FOR LISTING STANDARD OPTIONS

Procedures for listing as Published Options for 14- through 84-passeenger school buses shall be as follows:

Submit a request to the DPS Specifications Advisory Committee that an option be considered for the Published Option List. Manufacturer's literature and specifications for the option should be sent with the request.

Vendor/manufacturer should 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 DPS will review the request and information. Copies will be furnished to the School Bus Specification Advisory committee.

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

Upon completion of the demonstration or testing, a report will be provided to the School Bus Specification Advisory Committee that the option be accepted or rejected.

The School Bus Specification Advisory Committee will act on the recommendation and, if approved, the generic description of the option will be added to the next Texas School Bus Specifications listing.

SECTION G

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

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 and/or 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 Inspection completed, license plates installed.
- ☐ All lights working.
- ☐ Windshield washer operating.
- ☐ Windshield wipers operating.
- ☐ Heaters and Defrosters working.
- ☐ Seats securely bolted to the floor.

F. STEERING SYSTEM
- ☐ Check and top-off hydraulic system and check for leaks.
- ☐ 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
- ☐ First Aid Kit mounted.
- ☐ Bio Hazard Kit mounted.
- ☐ Fire Extinguisher mounted and charged.
- ☐ Triangular warning device mounted

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.

M. SAFETY
- ☐ Inspection/Sticker.

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		

SPECIFICATION

(1) ENGINE COMPARTMENT

____ ALTERNATOR: B-2
1. Check Amperage _____

____ HORSEPOWER: B-8
1. Check horsepower_____

____ STEERING, Power: B-6
1. Required as standard equipment.
2. Factory installed tilt steering wheel/column is required.

____ WASHER, Windshield: C-19
1. Reservoir to be minimum of one quart, electric operated.
2. Leaking? ___ yes ___ no

(2) FRONT LAMPS AND SIGNALS

____ LAMP, Daytime Running: B-4
1. Meets manufacturer's specification.
2. Not required on Type A buses.

____ LAMP, Identification: Must be LED C-10
1. 3 amber on top close to vertical centerline.
2. Lamp centers spaced not less than six (6) or more than twelve (12) inches apart.
3. Activated by the headlight switch.
4. Sealed type light.
5. Surface mounted with rust proof material guard unless recessed.
6. Use a universal type sealed electrical plug connector.

____ LAMPS, Alternately Flashing Signal: C-9
1. 2 red, 2 amber (towards center).
2. Black background - 3 inches (+or - 1/4) to the sides & top - 1 inch to bottom.
3. Amber manual, red automatic when door opens or stop signal arm is extended.
4. Lights sealed with 3/16"-thick sponge flange or manufacturer's standard gasket.
5. Lights shall be wired independently of ignition switch.
6. Wheelchair lift door shall activate warning lights when open.
7. Amber and red pilot lights installed adjacent to the driver controls.

____ TURN SIGNAL /Hazard Warning Lamps: C-11
1. Front – manufactured standard IAW FMVSS 108.
2. Side – buses of 36 PAX or larger equipped with amber side mounted lights.

3. Left side mounted rearward of the top of the stop signal arm.
4. Right side mounted rearward of the service door.

____ Lamp, Exterior C-10
1. Illuminates ground around service door.
2. Activates with step well light.
3. Mounted outside below the beltline by the service door.

(3) REAR LAMPS AND SIGNALS

____ LAMPS, Backup: C-9
2 four inch required (to meet FMVSS No. 108)

____ LAMPS, Tail and Stop: Must be LED C-9
____ a. 24 thru 83 pass
1. 2 required FMVSS 108
2. Metal or durable plastic base
3. Snap – on lens not acceptable
4. Stop lamps to be minimum of 38 square inches and mounted near belt line.
5. A set of 4" minimum tail/stop lamps shall be installed below the 38 square inch set.
____ b. 14 thru 20 pass. Manufacturer's standard.

____ LAMP, Identification: Must be LED Buses 80 inches or more in width. C-10
1. 3 red on top close to vertical centerline.
2. Lamp centers spaced not less than 6 or more than 12 inches apart.
3. Activated by headlight switch.
4. Sealed type light.
5. Surface mounted with rust proof material guard unless recessed.
6. Use a universal type sealed electrical plug connector.

____ LAMPS, Alternately Flashing Signal: C-10
1. 2 red, 2 amber (amber towards center).
2. Amber manual, red automatic when door opens or stop signal arm is extended.
3. Lights sealed with 3/16" – thick sponge flange or manufacturer's standard gasket.
4. Lights shall be wired independently of ignition switch.
5. Wheelchair lift door shall activate warning lights when open.

____ TURN SIGNAL/Hazard Warning Lamp: Must be LED C-11
1. IAW FMVSS 108.
2. Be amber.

(4) OTHER

____ BUMPER, Front: B-4
1. Pressed steel channel or equivalent material (except Type A > 14,050 GVWR OEM supplied.
2. At least 3/16" thick and not less than 9 1/2 inches wide (high).
3. Black (Type A mfg standard color)
4. Means provided to mount license plate for unobstructed view.

____ REARVIEW MIRROR: (All buses): C-11

____ a. **Exterior: Must be adjustable by remote from the driver's seat.**
1. System consists of one aerodynamic mirror head containing one flat and one convex lens per side.
2. Mounted on a single breakaway arm with positive detent or lock.
3. Any fasteners shall be corrosion proof.

____ b. **Crossover**

1.Right and left front.
2. Not reflect excessive glare from the headlights into driver's eyes.
3. Any fasteners shall be corrosion proof.

____ **STEPS** Stirrup w/Handle: C-16

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

(5) SIDES

____ **BATTERY:** B-3

1. All buses gasoline - 600/72 minute BCI rating
2. All buses diesel - 1100/240 minutes BCI rating
3. With AC & wheelchair lift, all buses gasoline - 800/72 minute BCI rating
4. With AC & wheelchair lift, all Type A diesel – 1200/144 minute BCI rating
5. With AC & wheelchair lift, Type C & D buses – 1950/540 minute BCI rating

____ **COMPARTMENT, Battery:** C-2

1. Skirt- mounted slide-out tray & battery box on Type A diesel, C, and D bodies.
2. Mounted beneath floor on chassis frame with sufficient length cables.
3. When three batteries are installed the battery tray must be a roll out type.

____ **DOOR, Service:** C-14

1. Passenger minimum size 24" x 68" (Type A) and 24" x 72" (C & D).
2. Manually, pneumatically, or electrically operated.
3. Must also allow for emergency manual operation.
4. Manual control not require more than 25 pounds of force to operate.
5. Located on right side and open outward.
6. Approved 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 3" wide, 1" thick, full length of door.
9. Bottom of lower glass max 10" from top of bottom step.
10. Top of upper glass not more than 3" from top of door.

____ **SCHOOL BUS LETTERING**: C-8

1. "School Bus" on both sides, front and rear roof caps.
2. 8" high, 6" on Type A buses, 1" wide stroke, black block letters. Decals on APL are acceptable.
3. Located between bottom two rub rails and in center if possible.
4. Same height on both sides
5. Must have reflective background.

____ **SCHOOL NAME LETTERING:** C-8

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 5/8 inch block stroke lettering
4. Paint or decals

* 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.

____ **OPENING, Fuel Filler:** Type C & D C-7

Hinged cover to remain open or closed.

____ RAILS, Rub: C-13

Four (4) required: one at window level, one at seat level, one at floor level and one at skirt level. The rails shall be one piece 4" or more wide made of 16 gauge steel and painted black.

____ a. Window Level

1. From door or cowl to rear corner radius.
2. 1 piece

____ b. Seat Level

From service door completely around bus to left cowl, except emergency door

____ c. Floor & Skirt Level

1. Service door to rear corner radius and cowl to rear corner radius except wheel housing. May be cut for gas filler and/or battery compartment opening, if necessary.
2. One-piece each side.

____ d. Shape

1. Constructed in corrugated or ribbed fashion.
2. Ends closed.

____ e. Bolted or riveted at top and bottom to each side post and to exterior panels between posts.

____ f. Drainage: Bottom edge of each rail have provisions for drainage of accumulated moisture.

____ REFLECTORS: C-13

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

* Not required on buses less than 30 feet long.

____ STOP ARM: C-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 inch white border.
4. The word "STOP" in "6" white letters (both sides) with red background.
5. Reflective material all around.
4. 2 double-faced red, alternately flashing lamps. (1 top and 1 bottom).

* Dual stop arms on 47 pass and larger (optional) and the second sign goes on the left side near rear section.

____ LAMPS, Clearance & Side marker: (24-83 pass.) C-10

1. 3 each side near top, rear red (LED), middle* and front amber.
2. Sealed type light.
3. Surface mounted with rust proof material guard unless recessed.
4. Use a universal type sealed electrical plug connector.

* Not required on buses less than 30 feet long.

____ WHEEL, Dual Rear: (Single rear wheel are not allowed) B-7

1. Require 8.25x 22.5 Hub piloted disc wheel where 11R22.5 tires are furnished.
   Size wheel: _____ Size tire: _____
2. Steel belted radial tubeless type.
3. Wheel studs & fasteners – SAE 8 grade or higher

(6) OTHER

____ BUMPER, Rear: C-3

1. Hitch proof, pressed steel channel.
2. 3/16" x 9 1/2" minimum (unless chassis manufacturer's standard on 15-20 pass buses)
3. Bolted to chassis frame and braced.
4. Not permanently attached to body.
5. Wrap around body design.
6. Painted black.
7. Apply seal between bumper and body panel unless gap is 1/8' or less.

____ DOOR HOLDING DEVICE (EMERGENCY): C-3

A means shall be provided to hold swing-out door in a fully opened position. (90° minimum)

____ LICENSE PLATE ATTACHMENT: C-9

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: C-4

1. Automatic, audible warning that the bus is in reverse gear, located behind the rear axle.
2. Meet SAE J994 requirements and be 107dba +/- 4dba sound level.

____ ACCESS, Entry/Aisle: C-14

1. 12" between seats (30" aisle width from wheelchair position to one emergency door)
2. 6" minimum between driver's seat and other objects

____ BODY FLUID CLEAN-UP KIT: C-2

1. Securely mounted in the driver area, but removable.
2. Labeled as a body fluid clean-up kit. (See Spec for contents)
3. Moisture-proof metal or hard plastic kit.
4. No display of the biohazard symbol.

____ COVERING/MOLDING, Floor: C-6

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 9" apart and within ¾" each end. (9½" okay, 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

____ DEVICE, Warning: C-5

1. 3 triangular, meeting FMVSS No. 125
2. Securely mounted with a strap in metal or heavy-duty plastic box in driver's compartment
3. Container shall be easily removed without use of tools

____ DOOR, Emergency: C-5

1. Buzzer to sound in driver's compartment when unlatched
2. "Emergency Door" or "Emergency Exit" in 2" high black painted letters at top or over door
3. Handle in aisle area to meet FMVSS 217 requirement
4. Operating instructions near handle.
5. Inside and outside pull handle. (See Specs for latch details)
6. Inside header board full width of door, 3" wide & 1" thick.
7. Door size 30" x 48" (style 2, single door type)
8. Upper & lower glass panels. (Minimum 299 sq. inches top panel. Lower panel manufacturer's standard)
9. Door holding device (90^0 position minimum) C-3
10. Reflective material around perimeter on rear of bus C-13

____ EXTINGUISHER, Fire: C-5

1. Mounted in a bracket in driver's compartment

2. Dry chemical type
3. 5 lb. 2A10BC *or larger*
4. U/L approved
5. Pressure gauge mounted and easily read without moving the extinguisher.

____ HEATER/DEFROSTER: C-4

1. Heater shall be hot water
2. If only one, shall be fresh-air or combination fresh-air and re-circulation type.
3. If more than one, 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 ¼ turn ball-cock shut-off valve in the pressure line.
7. Have an accessible ¼ 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: Must have dual note or dual horns. B-6

____ KIT, First Aid: C-6

1. Metal or 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: C-10

Mounted to provide uniform illumination of the passenger and driver's compartment.

Check one	School Bus Passenger Size	# Dome Lights
	14 thru 20 passengers	2
	24 thru 35 passengers	3
	47 thru 53 passengers	4
	59 thru 65 passengers	5
	71 thru 84 passengers	6

____ LAMP, Step well: C-10

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

____ MIRROR, Interior: C-11

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 50 square inches.

____ BODY DATA (IDENTIFICATION) PLATE: C-2

1. Permanently attached metal plate, with rivets, in driver's area.
2. Decals and glue are not acceptable.
3. Indicate manufacturer and body serial number, and maximum design capacity.
4. Indicate State and specification year manufactured for. IE: TX05

____ REFLECTIVE MATERIAL: C-13

____ a. Rear of Bus:

1. Horizontal above rear windows.
2. Horizontal above rear bumper.
3. Vertical strips connecting 1 & 2 above
4. Minimum 1 ¾" reflective yellow material

____ b. Rear/Front of Bus:

Reflective yellow background of "School Bus" signs (if not lighted)

____ c. Side of Bus
1. Minimum 1 ¾" reflective yellow material full length of bus
2. Vertical location immediately below the seat rub rail
3. Reflective yellow background of "School Bus" signs.(if not lighted)

____ d. Bumpers, Front and Rear (Optional)
1. 45^0 diagonal strips, 2" ± ¼" wide reflective material
2. Reflective material spaced 2"± ¼" apart

____ SEAT, Barriers/Panels: C-14
1. Barrier in front of each front passenger seat (See Spec for details)
2. Minimum 20"metal hand rail on both sides of entry door (Snag-proof design)
3. Must be upholstered

____ SEAT, Driver's: C-3
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 11 inches behind steering wheel
5. Securely mounted to ensure minimal flexing
6. Type A bus may have manufacturer's standard seat
7. Lap/shoulder belt with automatic retractors in mounting brackets

____ SEAT, Passenger: C-14
1. All buses have eight (8) designated seating positions with rigid lower anchorages or lap belts for the installation of portable child restraints.
2. All positions should be as far forward as possible.
3. Activity style seats are exempt from the above requirement
4. Not reduce the seating capacity of the bus
5. Lap belts for each position required on Type A
6. Non-adjustable end be on the aisle side and not extend more than 2 inches from seat bight
7. Fire resistant vinyl upholstery

____ SIDE EMERGENCY EXITS AND ROOF HATCH (ES): C-5
Reflective material around perimeter each exit
1. 0 to 36 passengers - 1 emergency exit per side and 1 roof hatch
2. 41 to 48 passengers - 1 emergency exit per side and 2 roof hatches
3. 53 to 78 passengers - 2 emergency exits per side and 2 roof hatches
4. 79 to 84 passengers - 3 emergency exits per side and 2 roof hatches

____ STEPS: C-15
____ a. Type D 24 thru 83 passengers
1. First step 12" to 16" from ground, unloaded
2. 3 steps with risers max of 10"
3. Fully enclosed
4. Each step shall be covered with pebble top elastomer at least 3/16 inches thick

____ b. Type A & C 15 thru 83 passengers
1. First step not more than 10" to 14" from ground, unloaded
2. 3 steps with riser max of 10" Type C, 2 steps are acceptable on Type A
3. Fully enclosed
4. Each step shall be covered with pebble top elastomer at least 3/16 inches thick

____ SYSTEM, Defroster/Defogger: C-4
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.

____ SYSTEM, Ventilation: C-18

1. 24-84 passengers only (static, non closeable type)
2. Non- closable exhaust ventilator shall be installed in low-pressure area of roof.

____ VISOR, Sun: C-18

____ a. 24 thru 83 passengers
- 1. Minimum 6" x 30" with finished edge
- 2. Shall be adjustable and convenient for driver

____ b. 15 thru 20 passengers
(Manufacturer's standard)

____ WHEEL, Steering, Power B-6

1. Chassis manufacturer's standard power steering
2. Tilt-required

____ WINDSHIELD/WINDOW: C-18

____ a. Windshield tilted to reduce glare
- 1. Gradient tinted or fully tinted
- 2. AS-1 type

____ b. Driver's window
- 1. 2-piece, front part opens in or out, rear part lowered by handle or 2-piece sliding sash type with air scoop
- 2. AS-2 type, tinted AS-3 type

____ c. Side window
- 1. Split sash type with positive latch
- 2. Width-22"
- 3. Vertical opening (9" minimum – 13" maximum)
- 4. Weather tight
- 5. Unacceptable if can be individually latched in uneven positions
- 6. STD AS-2 type, tinted AS-3 type

____ d. Rear Windows
- 1. One each side of emergency door
- 2. 140 sq. inches minimum area
- 3. AS-2 type or AS-3

____ WIPERS, Windshield: C-19

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

____ WIRING: (24 thru 83 passengers) B-7

1. Minimum of 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-6

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

____ BOLT, Seat Hold Down: C-14

1. Must be bolts (at least 2), washers, lock washers and nuts or equal.
2. Where bolts with washers and nuts are impossible, thread forming or cutting bolts with lock washers may be used.

____ BRAKES, Air: B-3

1. Required as std. on all 59 thru 84 passenger buses
2. Moisture ejector and slack adjustors required (2 front, 2 at rear)
3. Automatic air dryer
4. Visual brake-stoke adjustment indicators

____ CROSS-MEMBER, Floor: C-6

Spaced not more than 10 inches center-to-center except on Type A buses.

____ FRAME, Chassis: B-5

1. Each frame side member shall be of one-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-5

1. Must be under the bus body and attached to chassis frame.
2. If exhaust system is less than 12" from fuel tank (gasoline) 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 2" beyond rear bumper.

____ TRANSMISSION: B-7

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

____ UNDERCOATING: C-18

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: D-5

1. Forward facing orientation
2. Four (4) Universal Handicapped Symbols
    a. One each on the front and rear of the bus
    b. Both sides of the bus below the window line
3. White on blue background, 12" maximum
4. See Wheelchair Lift checklist if so equipped

____ LENGTH, Body: 40' maximum (24-83) C-15

____ OPTIONS: Sec. F

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).

____ TANK, Fuel Type C & D: B-6
Access port with cover for fuel sending unit

____ WIDTH, Body: C-15
96” maximum, *exterior width*

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

SECTION H

ADDITIONAL INFORMATION

SECTION H

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, portable telephone, etc.

FLAT FLOOR FOR WHEELCHAIR BUSES:

NOTE: For Type C & D (35 to 77 passenger) buses, the purchaser may wish to investigate the comparative merits of a flat floor bus for special education needs.

DRIVER'S SEAT, AIR RIDE SUSPENSION:

NOTE: For Type C & D (35 to 84 passenger) 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 VEHICLES:

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.

SEAT FRAMES:

Option: School districts that will be transporting infants in rear facing car seats will need to change these to maximum seat spacing.
Note: Gray is the optional color for flooring material for improved light reflection and "cleaner appearance".

STUDENT SAFETY, STOP ARM:

NOTE: For Type C & D (47 to 84 passenger) buses, the purchaser may wish to investigate the possible safety merits of the installation of a second stop arm.

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.

AIR BRAKES:

NOTE: For Type C & D (35 to 53 passenger) buses, air brakes are standard the purchaser may wish to investigate the use of air brakes before changing to conventional brakes.

REAR AXLE, AIR RIDE or EQUAL IMPROVED RIDE SUSPENSION:

NOTE: For Type C & D (35 to 84 passenger) 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.

Mounting:

NOTE: When requested, vendor is required to coordinate the floor plan with the district prior to preparation of the invitation for bids.

PUBLIC ADDRESS SYSTEM:

NOTE: For Type D (65 to 84 passenger) buses, the purchaser may wish to investigate the possible merits of the installation of a public address system to better communicate with the passengers.

DIESEL ENGINES:

NOTE: Diesel engines are standard for Type A, C, and certain D (15 to 71 passenger) buses, the purchaser may wish to investigate the possible safety, fuel economy, and maintenance for diesel engines before choosing another power source.

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.

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.

WHEELCHAIR LIFT PLACEMENT:

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

SECTION I

VENDOR INFORMATION

SCHOOL BUS MANUFACTURER - SPECIFICATIONS REPRESENTATIVE

Manufacturer	Contact	Address	City, State, Zip	Telephone
Blue Bird Corporation	Kenneth Allen	PO Box 937	Fort Valley, GA 31030	478-822-2375
Collins Bus Corporation	DeWayne Lock	PO Box 2946	Hutchinson, KS 67504-2946	620-662-9000 x455
Corbeil	Gary Plumpton	6081 E 82nd Street, Suite 420	Indianapolis, IN 46250-1535	317-585-1930
Girardin Mini Bus	Maurice Ierfino	Trans Canada Highway	Drummondville (Quebec) J2B 6V4	819-477-8222
IC Corporation	Jayne Fahle	751 South Harkrider	Conway, AR 72032	501-505-2167
Mid Bus	Stan Lowe	505 East Jefferson Street	Bluffton, OH 45817-1398	419-358-2500
Thomas Built Buses	Ricky Stanley	PO Box 2450	High Point, NC 27261	336-841-5927
US Bus Corporation	Michael Sykes	3927 Elizabeth Street	Richmond, IN 47374	765-939-3984

SCHOOL BUS VENDORS (DEALERS)

Manufacturer	Vendor	Contact	Address	City, State, Zip	Telephone
Blue Bird Corporation	Blue Bird Corporation	Chris McClung			214-387-0850
	Blue Star Bus Sales, LTD	Wayne Dever	5907 63rd Street	Lubbock, TX 79424	800-988-4170
	Capital Bus Sales & Service of Texas, Inc	Don Paull	PO Box 1758	Leander, TX 78646-1758	800-290-3006
Collins Bus Corporation	Blue Star Bus Sales, LTD	Wayne Dever	5907 63rd Street	Lubbock, TX 79424	800-988-4170
	Lasseter Bus & Mobility Inc.		820 Office Park Circle	Lewisville, TX 75057	800-880-5620
	Longhorn Bus Sales	Jack Connell	6921 Homestead Road	Houston, TX 77028	800-392-5356
	One Stop Bus Stop, Inc.	Cheryl Gaines	PO Box 177127	Irving, TX 75017	800-460-2877
Corbeil Bus	Southwest Bus Sales	Jim Finlay	18900 Northwest Freeway	Houston, TX 77065	281-517-7039
	Ron Carter Autoland	E.D. McMurry	3205 FM528	Alvin, TX 77511	800-486-6701

Girardin Minibus	Ron Carter Autoland	E. D. McMurry	3205, FM 528	Alvin, TX 77511	800-486-6701
IC Corporation	Longhorn Bus Sales	Jack Connell	6921 Homestead Road	Houston, TX 77028	800-392-5356
Mid Bus	Lasseter Bus & Mobility Inc.		820 Office Park Circle	Lewisville, TX 75057	800-880-5620
	One Stop Bus Stop, Inc.	Cheryl Gaines	PO Box 177127	Irving, TX 75017	800-460-2877
Thomas Built Buses	Thomas Bus Gulf Coast	Gregg Peterson	8806 Mississippi	Houston, TX 77029	800-481-6564
U.S. Bus Corporation	One Stop Bus Stop, Inc.	Cheryl Gaines	PO Box 177127	Irving, TX 75017	800-460-2877
Van-Con	Southwest Bus Sales	Jim Finlay	18900 Northwest Freeway	Houston, TX 77065	281-517-7039

WHEELCHAIR LIFT MANUFACTURERS

Manufacturer	Contact	Address	City, State, Zip	Telephone
The Braun Corporation	Matt Beck	PO Box 310	Winamac, IN 46996	800-946-6158
Ricon Corporation	Gerald Dann			800-322-2884
Maxon Lift Corporation	Steve Hall	2620 Crestfield Place	Round Rock, TX 78681	512-246-9309