

# **STATE OF TEXAS**

## **1998**

### **MODEL SCHOOL BUSES**

**Texas Specification No.  
070-SB-98**

**General Services Commission  
Central Procurement Services  
1711 San Jacinto Street  
P. O. Box 13047  
Austin, TX 78701-3047**

**GENERAL SERVICES COMMISSION  
1998 BUS REQUISITION SCHEDULE**

<u>REQUISITION DUE DATE</u>	<u>BID ADVERTISED</u>	<u>SCHEDULED DELIVERY*</u>
12-20-97	1-15-98	7-31-98
1-30-98	2-18-98	8-31-98
2-28-98	3-18-98	9-30-98
3-28-98	4-16-98	10-31-98
4-30-98	5-21-98	11-30-98
5-30-98	6-18-98	12-31-98
6-27-98	7-16-98	1-31-99
7-31-98	8-20-98	2-28-99
8-28-98	9-17-98	3-31-99
9-26-98	10-15-98	4-30-99
10-31-98	11-19-98	5-31-99
11-26-98	12-17-98	6-30-99
12-30-98	1-21-99	7-31-99

\*If a delivery date falls on a Saturday or Sunday, the actual delivery date shall be the first business day after the scheduled delivery date. If you have special requirements or need to bid a bus outside of this schedule, contact Purchaser "U" at 512-463-3369.

**1999 BUS REQUISITION SCHEDULE**

<u>REQUISITION DUE DATE</u>	<u>BID ADVERTISED</u>	<u>SCHEDULED DELIVERY*</u>
1-29-99	2-18-99	8-31-99
2-27-99	3-18-99	9-30-99
3-27-99	4-15-99	10-31-99
4-30-99	5-20-99	11-30-99
5-29-99	6-17-99	12-31-99
6-26-99	7-15-99	1-31-99
7-31-99	8-19-99	2-28-2000
8-28-99	9-16-99	3-31-2000
9-30-99	10-21-99	4-30-2000
10-30-99	11-18-99	5-31-2000
11-26-99	12-16-99	6-30-2000
12-31-98	1-20-2000	7-31-2000

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## SPECIFICATION FOR TEXAS SCHOOL BUSES

### A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS:

#### A.1. SCOPE:

- 1.1. **BUS SIZES:** This school bus specification includes the minimum requirements for fourteen (14) sizes of school buses used by Texas Schools participating in the Foundation School Program. This specification covers the purchase of bus bodies and chassis separately as well as the purchase of complete school buses. The bus sizes are designated in terms of passenger capacity exclusive of the driver, as listed below for regular seating. Capacity is based upon National Height and Weight Percentile Averages as specified in Federal Highway Safety Program Guideline No. 17. [See Paragraph B.1.2.]

15 <sup>1</sup> Passenger	16 <sup>1</sup> Passenger	18 <sup>1</sup> Passenger	19 <sup>1</sup> Passenger	20 <sup>1</sup> Passenger
24 <sup>1</sup> Passenger	35 <sup>1</sup> Passenger	47 <sup>1</sup> Passenger	53 <sup>1</sup> Passenger	59 <sup>1</sup> Passenger
65 <sup>1</sup> Passenger	71S <sup>1</sup> Passenger (Short Wheelbase)	71L <sup>1</sup> Passenger (Long Wheelbase)	77 <sup>1</sup> Passenger	83 <sup>1</sup> Passenger
<sup>1</sup> Seating capacity will be reduced from the above whenever wheelchair positions and/or maximum seat spacing are specified for a given size bus (See Paragraphs A.1.3. and B.1.)				

#### 1.2. BUS TYPES:

- 1.2.1. **TYPE A (I & II):** The "Type A" school bus is a conversion or body constructed upon a van-type or cutaway front-section vehicle with a left side driver's door, designed for carrying more than ten (10) persons. This definition shall include two (2) classifications: "Type A-I", with a gross vehicle weight rating (GVWR) over ten-thousand pounds (10,000 lbs.); and "Type A-II", with a gross vehicle weight rating (GVWR) of ten-thousand pounds (10,000 lbs.) and under.
- 1.2.2. **TYPE B:** A "Type B" school bus is a conversion or body constructed and installed upon a van or front section vehicle chassis, or stripped chassis, with a gross vehicle weight rating of more than ten-thousand pounds (10,000 lbs.), designed for carrying more than ten (10) persons. Part of the engine is beneath and/or behind the windshield and beside the driver's seat. The entrance door is behind the front wheels.
- 1.2.3. **TYPE C:** A "Type C" school bus is a body installed upon a flat back cowl chassis with a gross vehicle weight rating of more than ten-thousand pounds (10,000 lbs.), designed for carrying more than

## **A: General Information, Requirements and Conditions**

ten (10) persons. All of the engine is in front of the windshield and the entrance door is behind the front wheels.

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

- 1.3. **SPECIAL EDUCATION BUSES:** Special education buses for impaired passengers may contain less than fifteen (15) passenger and wheelchair positions combined, but not less than ten (10) passenger positions combined or they cannot be certified as school buses. These vehicles, used for transporting special education school children, that contain fewer than ten (10) passenger positions are classified as Multipurpose Passenger Vehicles (MPV's) by the Federal government. They will be designated by the State of Texas as "school buses" for the purposes of this specification. The State of Texas requires that MPV's used as school buses shall meet the same standards they would meet if built to accommodate ten (10) or more passengers even though they must be certified as Multipurpose Passenger Vehicles.

### **A.2. DEFINITIONS AND ABBREVIATIONS:**

- 2.1. **ASHRAE:** American Society of Heating, Refrigeration and Air Conditioning Engineers.
- 2.2. **ANSI:** American National Standards Institute.
- 2.3. **ASTM:** American Society for Testing and Materials.
- 2.4. **BCI:** Battery Council International.
- 2.5. **Commission and GSC:** General Services Commission.
- 2.6. **Conventional Bus:** A school buss with all of the engine in front of the windshield and the service or entrance door behind the front wheels.
- 2.7. **Department of Public Safety and DPS:** Texas Department of Public Safety.
- 2.8. **Education Agency and TEA:** Texas Education Agency.
- 2.9. **EPA:** United States Environmental Protection Agency.
- 2.10. **FMVSS:** Federal Motor Vehicle Safety Standards.
- 2.11. **Federal Guideline No. 17:** Federal Highway Safety Program Guideline Number 17.
- 2.12. **Forward Control 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. All of 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.

- 2.13. GAWR: Gross Axle Weight Rating.
- 2.14. GVWR: Gross Vehicle Weight Rating.
- 2.15. Invitation for Bids and IFB: Invitation for Bids.
- 2.16. Knee Space: The horizontal distance from the front center of a seat back to the rear center of the seat back (or barrier) immediately ahead, measured at approximately four inches (4") above the seat cushion.
- 2.17. Manufacturer: A fabricator of school buses, bodies, chassis, or components.
- 2.17. MPV: Multipurpose passenger vehicle accommodating ten (10) or less people.
- 2.18. NSSB: National Standards for School Buses (formerly National Minimum Standards).
- 2.19. SAE: Society of Automotive Engineers.
- 2.20. SBMTC: School Bus Manufacturer's Technical Committee.
- 2.21. SCAAN: Computer analysis of engine performance.
- 2.22. Semi-forward Control Bus: A bus in which part of the engine is beneath and/or behind the windshield and beside the driver's seat.
- 2.23. Vendor: Manufacturer's representative or dealer authorized to make sales and supply parts and services in Texas.
- 2.24. VESC: Vehicle Equipment Safety Commission.

**A.3. APPLICABLE SPECIFICATIONS AND STANDARDS:**

- 3.1. **FEDERAL HIGHWAY SAFETY PROGRAM GUIDELINES:** School bus bodies and chassis shall meet or exceed the minimum requirements of this specification and shall also meet all applicable requirements of the Highway Safety Program Guidelines No. 17. All requirements of this specification must be met unless they are in conflict with Program Guidelines No. 17 as it applies to school buses.
  - 3.1.1. Federal Highway Safety Program Guidelines No. 17, Pupil Transportation Safety: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
- 3.2. **FEDERAL MOTOR VEHICLE SAFETY STANDARDS (FMVSS):** School bus bodies and chassis shall meet or exceed the minimum requirements of this specification and shall also meet all applicable requirements of the FMVSS and those which are finally adopted. All requirements of this specification must be met unless they are in conflict with the FMVSS as they apply to school buses:

## **A: General Information, Requirements and Conditions**

- 3.2.1. Federal Motor Vehicle Safety Standards, Public Law 89-563:  
Superintendent of Documents, U.S. Government Printing Office,  
Washington, DC 20402:**
  - 3.2.1.1. FMVSS No. 103 -- Windshield Defrosting and Defogging Systems.**
  - 3.2.1.2. FMVSS No. 105 -- Brakes, Hydraulic Service, Emergency and  
Parking.**
  - 3.2.1.3. FMVSS No. 108 -- Lamps, Reflective Devices, and Associated  
Equipment.**
  - 3.2.1.4. FMVSS No. 111 -- Rearview Mirrors - Passenger Cars and  
Multipurpose Passenger Vehicles.**
  - 3.2.1.5 FMVSS No. 121 -- Air Brake Systems - Buses and Trailers.**
  - 3.2.1.6. FMVSS No. 125 -- Warning Devices.**
  - 3.2.1.7. FMVSS No. 131 -- School Bus Pedestrian Safety Devices.**
  - 3.2.1.8. FMVSS No. 205 -- Glazing Materials.**
  - 3.2.1.9. FMVSS No. 208 -- Occupant Crash Protection.**
  - 3.2.1.10. FMVSS No. 209 -- Seat Belt Assemblies - Passenger Cars,  
Multipurpose Passenger Vehicles, Trucks and Buses.**
  - 3.2.1.11. FMVSS No. 210 -- Seat Belt Assembly Anchorages.**
  - 3.2.1.12. FMVSS No. 217 -- Bus Emergency Exits and Window Retention  
and Release.**
  - 3.2.1.13. FMVSS No. 220 -- School Bus Roll-over Protection.**
  - 3.2.1.14. FMVSS No. 221 -- School Bus Body Joint Strength.**
  - 3.2.1.15. FMVSS No. 222 -- School Bus Seating and Crash Protection.**
  - 3.2.1.16. FMVSS No. 301 -- Fuel System Integrity.**
  - 3.2.1.17. FMVSS No. 302 -- Flammability of Interior Materials - Passenger  
Cars, Multipurpose Passenger Vehicles, Trucks, and Buses.**
  - 3.2.1.18. FMVSS No. 303 -- Fuel System Integrity, Alternative Fuels.**
  - 3.2.1.19. FMVSS No. 304 -- Compressed Natural Gas Fuel Container  
Integrity.**

- 3.3. NATIONAL STANDARDS FOR SCHOOL BUSES (NSSB): School bus bodies and  
chassis shall also meet or exceed the current NSSB (formerly National Minimum  
Standards) except when those requirements are in conflict with the requirements  
of this specification. In such cases, the requirements specified herein shall prevail.**



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- 3.3.1. **National Standards for School Buses, 1995 Revised Edition, National Standards Conference (May, 1995), National Safety Council, 425 North Michigan Avenue, Chicago, IL 60611.**
- 3.4. **OTHER REFERENCES: References to other specifications, standards, and test methods shall be to those in effect on the date of the Invitation for Bid. The following publications form a part of this specification to the extent specified herein:**
  - 3.4.1. **AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI), 1430 Broadway, New York, NY 10018:**
    - 3.4.1.1. **ANSI Z26.1-90 -- Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways, Safety Code for, including Supplement Z26.1a.**
  - 3.4.2 **AMERICAN PLYWOOD ASSOCIATION, P.O. Box 11700, Tacoma, WA 98411:**
    - 3.4.2.1. **U.S. Plywood Standard PS 1-83.**
  - 3.4.3. **AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), 1916 Race Street, Philadelphia, PA 19103:**
    - 3.4.3.1. **ASTM A 446 -- Standard Specification for Sheet Steel, Zinc Coated (Galvanized) by the Hot Dip Process, Structural (Physical) Quality.**
    - 3.4.3.2. **ASTM A 525 -- Standard Specification for General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process.**
    - 3.4.3.3. **ASTM D 3574 -- Standard Specification for Standard Test Method for Testing Cellular Materials - Slab Bonded and Molded Urethane Foam.**
    - 3.4.3.4. **ASTM B 117 -- Standard Specification for Method of Salt Spray (Fog) Testing.**
  - 3.4.4. **AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS, INC. (ASHRAE), Circulation Department, 345 East 47th Street, New York, NY 10017:**
    - 3.4.4.1. **ASHRAE 16-69 -- Methods of Testing for Rating of Room Air Conditioners.**
  - 3.4.5. **FEDERAL HIGHWAY ADMINISTRATION, United States Department of Transportation, Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402:**
    - 3.4.5.1. **Federal Highway Administration FP-85 - Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.**
  - 3.4.6. **FEDERAL STANDARDS: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402:**
    - 3.4.6.1. **Federal Standard No. 595a -- Colors.**

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### 3.4.7. FEDERAL SPECIFICATIONS: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402:

3.4.7.1. Federal Specification No. TT-C-490B -- Cleaning Methods and Pretreatment of Ferrous Surfaces For Organic Coating.

3.4.7.2. Federal Specification No. TT-C-520B -- Coatings Compound, Bituminous, Solvent Type Underbody, (For Motor Vehicles).

3.4.7.3. Federal Specification No. TT-E-489 -- Enamel, Alkyd, Gloss (For Exterior and Interior Surfaces).

3.4.7.4. Federal Specification No. V -T-295D -- Thread, Nylon.

3.4.7.5. Federal Specification No. ZZ-M- 71D -- Matting, Rubber and Vinyl.

### 3.4.8. SCHOOL BUS MANUFACTURERS' TECHNICAL COMMITTEE (SBMTC), School Bus Design Objectives, National Association of State Directors of Pupil Transportation Services, 116 Howe Drive, Dover, DE 19901.

3.4.8.1. SBMI Standard No. 001 -- Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment.

### 3.4.9. SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE), 400 Commonwealth Drive, Warrendale, PA 15096:

3.4.9.1. SAE J20e -- Coolant System Hoses.

3.4.9.2. SAE J377 -- Performance of Vehicle Traffic Horns.

3.4.9.3. SAE J383 -- Motor Vehicle Seat Belt Anchorages - Design Recommendations.

3.4.9.4. SAE J514 -- Hydraulic Tube Fittings.

3.4.9.5. SAE J516 -- Hydraulic Hose Fittings.

3.4.9.6. SAE J517 -- Hydraulic Hose.

3.4.9.7. SAE J561 -- Electrical Terminals - Eyelet and Spade Type.

3.4.9.8. SAE J588 -- Turn Signal Lamps for use on motor vehicles less than 2032 millimeter in overall width.

3.4.9.9. SAE J639 -- Safety Practices for Mechanical Vapor Compression Refrigeration Equipment or Systems Used to Cool Passenger Compartments of Motor Vehicles.

3.4.9.10. SAE J887 -- School Bus Warning Lamps.

3.4.9.11. SAE J994b -- Alarm - Backup - Electric - Performance, Test, and Application.

3.4.9.12. SAE J1128 -- Low Tension Primary Cable.

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**3.4.9.13. SAE J1133 -- School Bus Stop Arm.**

**3.4.10. STATE OF CALIFORNIA:**

**3.4.10.1. DEPARTMENT OF CONSUMER AFFAIRS, 3485 Orange Grove Ave., North Highlands, CA 95660.**

**3.4.10.1.1. California Technical Bulletin 117, Section A, Part I, Seat Cushion Compression Test.**

**3.4.11. STATE OF TEXAS:**

**3.4.11.1. RAILROAD COMMISSION OF TEXAS (RRC), Liquefied Petroleum Gas Division, P.O. Box 12967, Austin, TX 78711-2967:**

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

**3.4.11.1.2. Safety Rules -- Liquefied Petroleum Gas Division (Current Edition).**

**3.4.11.3. TEXAS NATURAL RESOURCE CONSERVATION COMMISSION (TNRCC), 12100 Park 35 Circle, Austin, TX 78753:**

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

**3.4.12. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA), Waterside Mall, 401 M Street, S.W., Washington, DC 20460:**

**3.4.12.1. EPA -- Noise Emission Standards.**

**3.4.13. VEHICLE EQUIPMENT SAFETY COMMISSION (VESC), Suite 908, 1030 15th Street, N.W., Washington, DC 20005:**

**3.4.13.1. VESC -- Regulation 6.**

**3.4.13.2. VESC -- Regulation 10.**

**A.4. GENERAL INFORMATION AND REQUIREMENTS:**

**4.1. EQUIPMENT INSTALLATION:** Requirements and accessories, either standard or optional, furnished under this specification shall be installed by body, chassis, or product manufacturer except air conditioners, tachographs, tachometers, and wheelchair lifts may be installed by authorized service representatives. Installation of such items shall conform in strength, quality, and workmanship to the accepted standards of the industry.

**4.2. NEW MODELS:** Each bus body and bus chassis furnished under this specification shall be new school buses of the current 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.

## A: General Information, Requirements and Conditions

- 4.3. **ODOMETER DISCLOSURE STATEMENT:** The Truth in Mileage Act requires the selling dealer to furnish a complete odometer statement to the purchaser. This statement must be complete and shall include mileage accrued at the point of delivery. In addition to the signature of the seller/agent certifying the odometer reading, both the dealership and the name of the agent shall be printed on the Odometer Disclosure Statement. Completion of the Mileage Statement Portion of the Manufacturer's Statement of Origin will satisfy this requirement.
- 4.4. **SERVICING AND EQUIPPING:** All bus bodies, chassis, or complete school bus units shall be completely assembled, adjusted, and all equipment installed. All parts not specifically mentioned herein which are necessary to provide a complete school bus, bus body, or chassis shall be furnished by the successful bidder and said parts shall conform in strength, quality of materials, and workmanship to recognized industry engineering practices.
- 4.5. **VENDOR GROSS VEHICLE WEIGHT RATINGS SELECTION<sup>1</sup>:** The requirements for gross vehicle weight ratings (GVWR), gross axle weight ratings (GAWR) (front and rear), and tire size and load range for each size chassis are specified in Table No.'s Three through Seven (3 through 7) and Table No.'s Twelve through Twenty-eight (12 through 28), and are minimum requirements. These requirements are for small type school bus (15- through 20-passenger), conventional, and semi-forward control type school buses (24- through 77-passenger), forward control type school bus (47- through 77-passenger), and a transit type school bus (83-passenger) with standard equipment. The added weights of optional equipment such as alternative fuel storage tanks, air conditioning, lifts for the physically impaired and other heavy accessories were not considered in establishing the capacity ratings to be certified for the chassis. If additional optional equipment is ordered, which necessitates increased capacity ratings of either axles, springs, or tires, it is the responsibility of the vendor to furnish them so that proper certification can be made on the vehicle.

A.5. **BID AWARDS:** The Commission reserves the right to accept or reject any and all bids, in whole or in part, and to waive all technicalities when these actions are determined by the Commission to be in the best interest of the State of Texas. Failure to receive a satisfactory chassis or body bid shall not prohibit the awarding of contracts to others by the Commission, when in the best interest of the State.

- 5.1. **PRICE PROTECTION:** The requisitioning school district, at the districts option, reserves the right to review all bids received prior to award to determine funds availability [See Paragraph B.2.1.5]. Vendors shall provide price protection for sixty (60) days from the date of the bid opening.

### A.6. CERTIFICATION AND COMPLIANCE:

- 6.1. **BUS BODY WORK ORDER:** The work order which accompanies the bus body through the production line during the process of manufacture must show the related Commission Purchase Order Number that was issued to the bus body company or the distributor. The work order must also show the appropriate item number of the purchase order or the name of the school. One (1) copy of the work order must accompany the bus to its final destination.

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<sup>1</sup> Paragraph A.4.5 is not applicable for chassis only which are used by the State of Texas for remounting of bus bodies.

**A: General Information, Requirements and Conditions**

- 6.2. **CERTIFICATION, ALL BIDDERS:** By signing the bid, the bidder certifies that the equipment being offered meets or exceeds all requirements and conditions of this specification. Failure to comply with all the requirements and conditions of this specification will subject the bid to rejection.
- 6.3. **CERTIFICATION, SUCCESSFUL BIDDER:** The vendor (successful bidder) must certify on the face of the invoice that the equipment delivered meets or exceeds the requirements and conditions of this specification and that the equipment was manufactured in accordance with this specification. The burden of proof for compliance with this specification shall be the responsibility of the vendor, manufacturer, or both.
- 6.4. **CHASSIS PRODUCTION ORDER:**
- 6.4.1. **Attachment:** One (1) copy of the production order or "line setting ticket" listing both standard and optional equipment installed on the chassis must accompany the chassis to which it pertains upon delivery of the chassis to the bus body manufacturer and to the final destination (receiving School District). The copy of this production order should be contained in a waterproof envelope and placed in the glove compartment, or it may be secured by other means which will assure positive attachment to the chassis [See Paragraph A.6.4.2.]. The production order shall be a printed form and not machine coded.
- 6.4.2. **Alternative Plate:** In lieu of the production order, the information required above may be stamped on a metal plate, either on the vehicle identification plate regularly furnished or on an additional plate. The identification plate (s) shall be attached to the chassis in a conspicuous place and in an accessible position in order that it may be easily read.
- 6.4.3. **Removal/Obliteration:** The production order or chassis identification plate referred to above shall not be removed from the chassis by the body manufacturer since it is for the information of the receiving school district. The vehicle identification plate shall not be obliterated when undercoating 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.
- 6.5. **LITERATURE AND DRAWINGS:** Each bidder shall furnish the following:
- 6.5.1. **Isometric Drawings:** The bidder shall have on file with the Commission, detailed isometric drawings of the bus body showing floor panels, side posts, roof bows, bow-frames, strainers, longitudinal frame members, exterior panels, and front and rear end framing. Each component shall be identified in block form showing: 1.) the item number, 2.) the type of steel or other metal or material with strength at least equivalent to all steel, and 3.) the decimal thickness of steel used in the construction. [See Table No. Nine (9)].
- 6.5.2. **Number of Drawings:** On construction items, one (1) drawing will suffice; however, additional drawings shall be furnished on special items and changes or deviations from common construction whenever such change affects any size bus. All drawings submitted will be treated as confidential information. Drawings must be approved by the Commission.

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- 6.5.3. Literature: The bidder shall have on file with the Commission, the latest pamphlets, brochures, and printed literature on the equipment the bidder proposes to furnish to this specification.
- 6.5.4. Metal Certification: The bidder shall have on file with the Commission, a statement certifying that the metal used in Texas School Buses conforms to the NSSB. NSSB requires galvanized steel to meet the requirements of the one-thousand (1,000) hour salt spray test in accordance with ASTM Standard B 117 and shall not lose more than ten percent (10%) of material by weight.
- 6.6. MANUFACTURER'S STATEMENT OF ORIGIN: The vendor, successful bidder, shall furnish the Commission with the Manufacturer's Statement of Origin which shall include the mileage accrued at the time of delivery to the school district. The Certificate of Title will not meet this requirement. The manufacturer's New Vehicle Warranty and major component parts warranties [See Paragraph A.10.4.] shall be furnished to the receiving school district. [See Paragraph A.7.6.].
- 6.7. TEMPORARY LICENSE TAGS: Red temporary license tags shall be issued by the vendor for use with each new bus delivered [See Paragraph B.4.2.].

### A.7. DELIVERY:

- 7.1. DELIVERY PROCEDURE: The delivery of a bus to any specified destination may be made by any normal delivery procedure which the manufacturer or distributor utilizes<sup>2</sup>. The bus body distributor must guarantee the equipment to be free of damage as a result of the type of delivery. If any damage is caused by or during delivery that can be established within six (6) months after delivery to any district, then the school must be compensated for such damage by the contractor. It shall be the obligation and responsibility of each body manufacturer to check and inspect each chassis delivered to the body manufacturer's plant to ascertain that the chassis is free of any damage which might have occurred as a result of the type of delivery.
- 7.2. DELIVERY ON SCHEDULE: Delivery on schedule is critical. The ability to deliver as specified in the Invitation for Bid will be a factor in making awards. A vendor who fails to make delivery in accordance with the terms of the purchase order shall be liable for actual damage suffered by the State. The amount of such damages shall be determined by the Commission.
- 7.3. DELIVERY TIME: Buses may be delivered to the receiving school districts only between the hours of 8:00 a.m. and 4:00 p.m. Monday through Friday, excluding holidays. Deliveries at other times are not to be made without at least 24 hours notice and only then with the expressed written consent and approval of the receiving school district. The person delivering the bus shall present a delivery receipt to the responsible school personnel and obtain that school official's signature before delivery is considered complete. [See Paragraph A.7.6.]

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<sup>2</sup> Under no circumstances shall a bus be used as a towing vehicle prior to or during delivery to its destination. A private passenger vehicle may be towed behind the bus to be used by the delivery person to use to return to their place of origin.

**A: General Information, Requirements and Conditions**

- 7.4. **LATE DELIVERIES:** Failure by the vendor to deliver buses, caused directly by natural disaster, war, civil disturbance, Federal Law and regulations, or labor disputes, which are beyond control of the contractor, will not cause the damages described in Paragraph A.7.2. to be assessed, but will not prohibit the district from canceling the order.
- 7.5. **LATE DELIVERY NOTIFICATION:** The vendor shall notify the Commission and the district, in writing, at least twenty (20) days in advance of the scheduled delivery date. The notice shall indicate the anticipated delivery date and the specific cause of this delay. Failure to notify the Commission shall be cause to disqualify the bid.

In addition, a vendor who has orders for buses which have not been delivered in accordance with the terms of the purchase order shall submit a monthly report to "Purchaser U", Central Procurement Services, General Services Commission by the fifteenth (15th) day of each month. The report shall contain the following information: (1) purchase order number; (2) school district name; (3) reason for the late delivery; (4) current status; and (5) expected delivery date.

- 7.6. **PRE-DELIVERY SERVICE:** The vendor or the vendor's representative responsible for the final delivery shall attach a signed certificate to the bus stating that the following service was performed and that inspection indicates the bus is in good condition and ready for delivery. The following service on the chassis and body shall be performed before the bus is delivered to the receiving school district:

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

- A.8. **INSPECTION:** Inspection shall be by and at the discretion of the Commission or its designated agent and may be performed either at the place of manufacture, at the vendor's facility in Texas, or at the final destination, or a combination of these. The authorized State Inspector shall have access to the manufacturer's plant during all normal working hours in order to make all necessary inspections during the process of manufacture and assembly. This does not preclude the school districts' personnel from making inspections during manufacture, before or after acceptance of delivery. The school district's personnel are urged to make detailed inspections, especially upon delivery, and report any discrepancy or discrepancies to the Commission. Any such discrepancies found during or after manufacturing shall be immediately corrected to the satisfaction of the Commission, at no charge, by the manufacturer or distributor.

- A.9. **TERMS, INVOICING AND PAYMENT:**

- 9.1. **INVOICE, VENDOR'S:**

- 9.1.1. **SCHOOL DISTRICT'S COPIES:** The vendor shall submit the invoice to the school district at the address shown on the purchase order. The invoice must certify that the buses delivered meet or exceed the requirements and conditions of this specification. [See Paragraph A.6.3.].

## A: General Information, Requirements and Conditions

- 9.1.2. **PAYMENTS, DISPUTED:** If the school district believes that there is an error in an invoice submitted for payment, the school district shall notify the vendor who submitted the invoice of the alleged error not later than the twenty-first (21st) day after the date on which the invoice is received. A copy of the notice to the vendor shall be forwarded to "Purchaser U", Central Procurement Services, General Services Commission.

### A.10. WARRANTY AND SERVICE<sup>3</sup>:

- 10.1. **CONTRACTOR'S RESPONSIBILITY:** Each successful bidder is ultimately responsible for and must assure the State that any warranty service shall be performed to the satisfaction of the Commission, regardless of whether the successful bidder or the bidder's agent performs the warranty work on school buses [See Paragraph A.10.4.]. If there is a question of whether it is the responsibility of the body or the chassis manufacturer to repair a given defect, then it shall automatically become the prime contractor's and/or successful bidder's responsibility to see that the repair (s) is made to the satisfaction of the receiving school district and the Commission.
- 10.2. **DEFECTIVE WORKMANSHIP:** In the event that an error is discovered or conclusive proof of defective workmanship and/or materials is found on any body or chassis after acceptance and payment has been made, the successful bidder shall make such repairs as required at the vendor's expense.
- 10.3. **PENALTIES:** Upon refusal of the prime contractor and/or successful bidder to make satisfactory adjustment (s), the Commission reserves the right to claim and recover from said prime contractor and/or successful bidder by due process of law, such sums as may be sufficient to correct the error or make good the defect in material and/or workmanship.
- 10.4. **WARRANTY WORK AND GENERAL TERMS OF WARRANTIES:** The Commission's purchase orders for school buses are issued to a single distributor or vendor. This distributor or vendor has the ultimate responsibility of insuring the delivery of a bus that meets Texas specifications in all details and is free of defects in materials and workmanship. In addition, the bus body and chassis are warranted against defects in materials and workmanship by the bus body manufacturing company and the chassis manufacturer, respectively. The warranty on a school bus is thus a dual warranty. The following are general terms of the warranties; however, for specific coverage of any item on a school bus, please refer to the warranty literature provided at time of vehicle delivery.
- 10.4.1. **Air Conditioner:** Basic coverage for chassis and body parts is for twelve (12) months as specified in manufacturer's warranty document. The air conditioning manufacturer shall have service facilities available in each of the five (5) zones within the State of Texas [See Figure No. Three (3)]. For service on units provided by chassis manufacturer, contact local chassis dealer; for service on other makes, contact the vendor.

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<sup>3</sup> Warranty registrations must be completed and mailed to initiate warranty.



A: General Information, Requirements and Conditions

10.4.2. Automatic Transmission: Basic coverage is for twelve (12) months, twelve-thousand (12,000) miles, whichever occurs first, and as more specifically defined in the manufacturer's warranty document included with delivery of the vehicle. For service, contact the chassis or transmission dealer, or authorized service outlet as specified in the warranty pamphlet.

10.4.2.1. Allison Transmission Division (ATD) transmissions are warranted for thirty-six (36) months, unlimited mileage, at one-hundred percent (100%) cost of parts and labor. An extended warranty for forty-eight (48) months or sixty (60) months is available at extra cost.

10.4.3. Batteries: Twelve (12) months or twelve-thousand (12,000) miles, whichever occurs first. Battery warranties are included with the chassis warranty. For service contact the local dealer as specified in the battery warranty document.

10.4.4. Bus Body: A minimum of twelve (12) months beginning on the date of delivery to the user. For service contact the vendor identified on the school bus purchase order issued by the Commission.

10.4.5. Bus Chassis: Twelve (12) months or twelve-thousand (12,000) miles, whichever occurs first, beginning on the date of delivery [See delayed chassis warranty, Paragraph A.10.4.6.]. For warranty service and repairs on the bus chassis:

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

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

CHEVROLET

Light-Duty Fleet Service Manager  
972-541-5447

DALLAS ZONE

Jerold Sheets  
Heavy Truck Service Engineer  
972-417-6254

<- FORD ->

HOUSTON ZONE

Ron Canal  
Heavy Truck Service Engineer  
281-320-7605

GMC

Rick Deets  
Medium-Duty Fleet Zone Service Mgr.  
810-745-7101  
972-541-5150  
1-800-322-7181 Woodfiel

NAVISTAR

Mike Laird  
Regional Service Manager  
972-450-3100

FREIGHTLINER

Patrick Burns  
Technical Sales Manager  
864-488-8720

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

**Purchaser "U"  
Central Procurement Services  
General Services Commission  
P. O. Box 13047  
Austin, Texas 78711-3047**

**10.4.5.4. Last:** If the above action does not resolve the problem, you may use the form provided in the appendix of this specification to contact the Commission.

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

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

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

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

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

**10.4.7. Diesel Engines, Mid-Range (35-83 passenger):** Five (5) years or fifty-thousand (50,000) miles, whichever occurs first. Extended warranties are available at extra cost. For service contact the chassis dealer.

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

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

## **B. ORDERING INFORMATION**

### **B.1. GENERAL INFORMATION:**

- 1.1. **PASSENGER CAPACITY:** The definition of passenger capacity, as used in this specification, has reference to seat space (width) allotted for each pupil. Based on National height and weight percentile averages specified in Federal Highway Safety Guidelines Standard No. 17. Approximately thirteen inches (13") per pupil has been established for designating bus body passenger capacities.
- 1.2. **REDUCED PASSENGER CAPACITY:** The thirteen inch (13") figure must be considered when ordering school buses since passenger capacity may be reduced when junior high, high school, or adult passengers are primary passengers. As an example, for larger students in which only two (2) students can be accommodated per seat, then a 71-passenger school bus may only seat about forty-eight (48) students. Other capacity buses will likewise seat fewer than the stated capacity. If there is a question about seating capacity in regular or wheelchair-equipped school buses, please consult with school bus body vendors or manufacturers before ordering.

- B.2. **ORDERING:** Complete school buses, school bus bodies, or school bus chassis shall be requisitioned using the Requisition Form (or a copy) furnished within this document. Please refer to the facsimile requisition form on the pages following the options. More than one (1) bus may be requisitioned on one (1) form provided all are the same size. "Chassis" or "Bodies" only should be ordered on separate requisitions from "complete" school buses:

### **2.1. PREPARATION OF THE REQUISITION:**

- 2.1.1. **COMPLETE UPPER SECTION:** All of the information requested in the upper portion of the requisition form should be completed by the ordering school district with the exception of the space provided for the Commission Requisition Number. This space is for Commission use only. Note that automatic or manual transmission must be selected and checked (vendor's choice otherwise). State quantity and the size (capacity) of buses desired and specify the type (e.g., either Conventional or Forward Control) being ordered. PLEASE NOTE THAT THE REQUISITION FORM IS VALID UNTIL MODIFIED.
- 2.1.2. **SELECT REGULAR OPTIONS:** Select from the list of regular options for the size bus being ordered, the desired option (s) by making a check mark or an "X" next to the number.
- 2.1.3. **BID REVIEW:** School districts have the right to examine bids received prior to award in order to determine funds availability [See Paragraph A.5.1.]. School districts shall indicate in the appropriate section on the requisition their desire to initiate this review. Vendors are required to provide price protection for sixty (60) days from the bid opening. After this review, school districts must notify the Commission of their desire to award to the lowest bidder meeting specifications before the sixty (60) day price protection time constraint expires.

## B: Ordering Information

2.2. SPECIAL OPTIONS: List, on the back of the requisition, or on a separate sheet of paper with the requisitioning agency or school district letterhead, any listed special optional equipment required by item number. First, check to see if the item is listed in the above Regular Options; if so use that list for ordering. This second sheet should be dated and identified with the School District Requisition Number.

2.3. MAILING ADDRESS: Mail the Requisition and the Certification Form to:

Purchaser "U"  
Central Procurement Services  
General Services Commission  
P. O. Box 13047  
Austin, Texas 78711-3047

For further information, call: (512) 463-3369

B.3. SERVICE OR SHOP MANUALS: School districts desiring chassis service or shop manuals may obtain them separately for school buses ordered by corresponding directly with the following manufacturers:

ALLISON TRANSMISSIONS

Stewart & Stevenson  
P.O. Box 1637  
Houston, TX 77251

CHEVROLET MOTOR DIVISION

General Motors Corporation  
130 East Carpenter  
Irving, TX 75063

DODGE DIVISION

Dymet Distribution Service  
P. O. Box 360450  
Strongsville, OH 44136

FORD MOTOR COMPANY

Helm, Inc.  
P.O. Box 07150  
Detroit, MI 48207  
1-800-782-4356

GMC TRUCK & COACH DIVISION

Dysart, Service Department  
31 Judson  
Pontiac, MI 48058

NAVISTAR INTERNATIONAL

P. O. Box 655334  
Dallas, TX 75265

FREIGHTLINER

Custom Chassis Corporation  
552 Hyatt Street  
Gaffney, SC 29341  
1-864-488-8607

FOR SHOP MANUALS AND/OR INFORMATION ON SCHOOL BUS BODY OPTIONS, ETC.,  
CONTACT:

BLUE BIRD/COLLINS

Bridges-Hemphill  
Enterprises, Inc.  
1501 N Elm  
Denton, TX 76201  
1-800-633-8513

CARPENTER/MID-BUS

Statewide Bus Sales  
1440 S Loop 12  
Irving, TX 75060  
1-800-460-2877

THOMAS

Longhorn Bus Sales  
6921 Homestead Rd.  
Houston, TX 77028  
1-800-392-5356

AmTRAN, GENESIS & US BUS

Texas School Bus Center, Inc.  
4800 E. Seventh St.  
Austin, TX 78702  
1-800-382-8390

VAN-CON

Texas Bus Sales  
1605 W. 34th St.  
Houston, TX 77206-0213  
1-800-342-8737

Lasseter Bus & Mobility  
4455 Alpha Rd., Suite, 102  
Dallas, TX 75244  
1-800-880-5620

B4. TEMPORARY LICENSE TAGS AND EXEMPT LICENSE PLATES:

- 4.1. EXEMPT LICENSE PLATES: The following forms are required to obtain exempt license plates at the address shown:

4.1.1. Form 130 U, "Application for Title."

4.1.2. Form 62A, "Application for Exempt Plates."

4.1.3. MSO (Manufacturer's Statement of Origin) or Title.

Exempt license plates must be obtained from:

Texas Department of Transportation (TxDOT)  
Division of Motor Vehicles  
ATTN.: Special Plates Section  
P.O. Box 26480  
Chimney Corners Station  
Austin, Texas 78755-0480  
512-374-5020

- 4.2. TEMPORARY LICENSE TAGS: The vendor shall issue with each bus delivered, temporary, red, license tags [See Paragraph A.6.7.]. TEMPORARY LICENSE TAGS ARE LEGAL ONLY FOR A PERIOD OF TWENTY (20) DAYS.

## B: Ordering Information

### B.5. REGULAR OPTIONS

#### 15- THROUGH 20-PASSENGER BUSES

##### REGULAR OPTION NO.

##### DESCRIPTION

1. Air Conditioning<sup>4</sup>, Standard Cooling [See Paragraph H].
2. Air Conditioning, extra cooling [See Paragraph H.1.5].
4. Alternator, one-hundred ampere (100 amp) minimum for "Type A" buses and minimum of one-hundred-thirty ampere (130 amp) for "Type B" buses Required with Option No.'s 1 or 35. [See Paragraph D.4.1.3.].
8. Diesel Engine [See Tables Three (3) through Seven (7)].
10. Door, Powered Service, manufacturer's standard (Not available on Sedan type doors) [See Paragraph C.2.14.3.].
11. Door, Service, Automotive Sedan Type (for 18- and 19-passenger buses only; [See Figure Number One (No. 1) and Tables Five and Six (5-6)].
12. Fuel Tank, Increased Capacity, conventional fuels [See Paragraph D.3.3.2.].
13. Glazing, Dark Tint, Passenger Side Windows, a minimum light transmittance of thirty percent (30%) and a maximum light transmittance of forty percent (40%) [See Paragraph C.2.19.3.].
14. Heater, Rear, auxiliary [See Paragraph C.3.4.].
15. Hubodometer [See Paragraph D.2.2.4.].
16. Knee Spacing (maximum allowed by FMVSS No. 222; requires deleting one (1) row of seats (five (5) positions) which will reduce seating capacity. (Not available on 16- and 19-passenger buses).

Regular Seating Capacity	15	16	18	19	20
Rows of Seats	3	4	4/5	4	4
Minimum Knee Space, inches	27	27	27	28	28

17. Laminated Safety Plate Glass, AS-2 or better [See Paragraph C.2.19.2.2.].
18. Reflective Material: [See Paragraph C.3.7.].
19. School Name Lettering, both sides of bus [See Paragraph C.1.4.9.].
20. Seat Belts (Standard on 15-20 passenger buses)

<sup>4</sup> Special Requirements: Option No. One (1) requires a minimum one-hundred ampere (100 amp) alternator and five-eighths inch (5/8") nominal thickness plywood installed over the steel floor.

- 21. Security System Lock, All Doors (with ignition disconnect on emergency door).
- 22. Sound Abatement Insulation (shall reduce interior noise by four (4) decibels, minimum).
- 23. Student Safety Crossing Gate [See Paragraph C.3.10.].
- 24. Strobe Light, Roof-mounted [See Paragraph C.3.8.].
- 25. Tachograph, zero to eighty miles per hour (0-80 mph), twelve (12) volt (with seven (7) day four-and-seven-eighths inch (4-7/8") disc chart and electronic clock/speedometer/recorder; [See Paragraph D.5.6.].
- 30. Tool Compartment [See Paragraph C.3.11.].
- 31. Wheel, Spare, unmounted (without carrier, tire, or tube); [See Paragraph D.2.6.2.].
- 35. Wheelchair Lift, Folding Platform Type, Right Curb Side Mounted (15-20 passenger buses only; with \_\_\_\_\_ wheelchair positions. Will reduce seating capacity)<sup>5</sup>
- 36. Wheelchair Restraints, Webbed-belt Type (for unusual wheelchairs which cannot otherwise be restrained); [See Paragraph G.3.].
- 37. White Roof [See Paragraph C.1.4.2.].
- 38. Windows, push-out, additional (for emergency exit), (indicate quantity per side) \_\_\_\_\_ [See Paragraph C.2.4.2.].
- 39. Passenger Seats, specialized with integral child restraint system. Integral means "a built-in feature," systems not built into the seat do not qualify. (Indicate quantity).

## REGULAR OPTIONS

### 24- THROUGH 77-PASSENGER BUSES

REGULAR OPTION NO.	DESCRIPTION
1.	Air Conditioning <sup>6</sup> , Standard Cooling [See Paragraph H].
2.	Air Conditioning, extra cooling (Not available on 77-passenger buses) [See Paragraph H.1.5.].
3.	Alternative Fuel Engines (Availability selective. Select from 3A or 3B): 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 [See Paragraph D.5.3.3.]. 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.
3A.	Compressed Natural Gas (CNG): The engine shall be capable of operating on compressed natural gas, as defined herein, in a mono- or bi-fuel mode, as specified in the Invitation for Bid. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank (s) shall be constructed of appropriate material for a fuel storage system for compressed natural gas and be enclosed in a cage meeting the same requirements as required for traditional fuels. (Internal check valves may be furnished in lieu of cages.) Minimum mileage range shall be seventy-five (75) miles or as specified in the Invitation for Bid.
3B.	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.

<sup>6</sup> Special Requirements: Option No. One (1) requires a minimum one-hundred-thirty ampere (130 amp) alternator and five-eighths inch (5/8") nominal thickness plywood installed over the steel floor.



4. Alternator, One-hundred-thirty ampere (130 amp) minimum (required with Option No.'s 1, 33 or 34); [See Paragraph F.4.1.2.].
5. Axle, Rear, Two-speed (Not available with automatic transmission).
6. Brakes, Hydraulic (for 24-, 35-, 47-, and 53-passenger buses only).
7. Chassis, Long Wheelbase (Requires minimum two-hundred-seventy-four inch (274") wheelbase for 71-passenger conventional bus only; or one-hundred-fifty-seven inch (157") wheelbase for 24-passenger bus only).
8. Diesel Engine (For 24- through 77-passenger buses); [See conventional buses in Tables 12 through 28.]
9. Differential, No-spin.
10. Door, Powered Service, manufacturer's standard [See Paragraph E.2.15.5.].
12. Fuel Tank, Increased Capacity, conventional fuel [See Paragraph F.3.3.2.].
13. Glazing, Dark Tint, Passenger Side Windows, a minimum light transmittance of thirty percent (30%) and a maximum light transmittance of forty percent (40%) [See Paragraph E.2.19.3.1.].
14. Heater, Rear, auxiliary [See Paragraph E.3.6.].
15. Hubodometer [See Paragraph D.2.2.4.].
16. Knee Spacing (Maximum allowed by FMVSS No. 222; requires deleting one (1) row (six (6) positions) of seats which will reduce seating capacity).

Regular Seating Capacity	24	35	47	53	59	65	71-S	71-L	77
Rows of Seats	4	5	7	8	9	10	11	11	12
Minimum Knee Space, inches	27	28	28	27.75	28	27.75	27.75	27.75	27.75

17. Laminated Safety Plate Glass, AS-2 or better [See Paragraph E.2.19.2.2.].
18. Low profile tires.
19. Mud Flaps, with Brackets, Mounted [See Paragraph E.3.10.]. There shall be no advertisement on mud flaps.
20. Reflective Material [See Paragraph E.3.9.].
21. School Name Lettering, both sides of bus [See Paragraph E.1.4.9.].
22. Seat Backs, Increased Height [See Paragraph E.2.13.1.].
23. Seat Belts (For each passenger seating position); [See Paragraph E.3.13.].
24. Security System Lock, All Doors (With ignition disconnect on emergency door).

## B: Ordering Information

- 25. Sound Abatement Insulation (shall reduce interior noise by four (4) decibels, minimum).
- 26. Student Safety Crossing Gate [See Paragraph E.3.16.].
- 27. Strobe Light, Roof-mounted [See Paragraph E.3.12.].
- 28. Tachograph, Zero to eighty miles per hour (0-80 mph), twelve (12) volt (with seven (7) day four-and-seven-eighths inch (4-7/8") disc chart and electronic clock/speedometer/recorder; [See Paragraph F.5.9.].
- 29. Tachometer (To indicate engine RPM).
- 30. Tires, Mud and Snow Tread (For Rear Wheels only).
- 31. Tool Compartment [See Paragraph E.3.17.].
- 32. Wheel, Spare, Unmounted (Without carrier, tire, or tube); [See Paragraph F.2.6.2.2.].
- 33. Wheel, Spare, Mounted (with carrier but not tire and tube; carrier not available on 24-passenger bus); [See Paragraph F.2.6.2.1.].
- 34. Wheelchair Lift, Folding Platform Type, Front Curb Side Mounted (For 24-through 71-passenger bus only); [See Paragraph G.]<sup>7</sup>.
- 35. Wheelchair Lift, Folding Platform Type, Rear Curb Side Mounted. Same as Option No. 35 (for 15-20 passenger buses) except floor-mounted on rear curb side of bus [See Paragraph G.]<sup>6</sup>. This option is recommended only for buses which will have a regular attendant in addition to the driver.
- 36. Wheelchair Restraints, Webbed-belt Type (For unusual wheelchairs which cannot otherwise be restrained); [See Paragraph G.3.].
- 37. White Roof [See Paragraph E.1.4.1.].
- 38. Windows, push-out, additional (for emergency exit), (Indicate quantity per side) \_\_\_\_\_ [See Paragraph E.2.19.1.5.].
- 39. Passenger seats, specialized with integral child restraint system. Integral means "a built-in feature," systems not built into the seat do not qualify. (Indicate quantity).

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<sup>7</sup>

For Option Nos. 33 and 34, the school district must specify the number of wheelchair positions required on bus.

## REGULAR OPTIONS

## 83-PASSENGER BUSES

REGULAR OPTION NO.	DESCRIPTION
1.	Air Conditioning <sup>8</sup> , Standard Cooling [See Paragraph H].
2.	Air Conditioning, extra cooling [See Paragraph H.1.5.].
3.	Alternative Fuel Engines (Availability selective. Select from 3A or 3B): 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 [See Paragraph D.5.3.3.]. 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.
3A.	Compressed Natural Gas (CNG): The engine shall be capable of operating on compressed natural gas, as defined herein, in a mono- or bi-fuel mode, as specified in the Invitation for Bid. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank (s) shall be constructed of appropriate material for a fuel storage system for compressed natural gas and be enclosed in a cage meeting the same requirements as required for traditional fuels. (Internal check valves may be furnished in lieu of cages.) Minimum mileage range shall be seventy-five (75) miles or as specified in the Invitation for Bid.
3B.	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.

<sup>8</sup> Special Requirements: Option No. One (1) requires a minimum one-hundred-thirty ampere (130 amp) alternator and five-eighths inch (5/8") nominal thickness plywood installed over the steel floor.

## B: Ordering Information

4. Alternator, One-hundred-thirty ampere (130 amp) minimum (Required with Option No.'s 1, 33 or 34); [See Paragraph F.4.1.2.]
- Note: Regular Option Numbers Five through Eight (5--8) are not applicable on the 24-passenger through 77-passenger buses.
9. Differential, No-spin.
10. Door, Powered Service, manufacturer's standard [See Paragraph E.2.15.5.].
12. Fuel Tank, Increased Capacity, Conventional fuel [See Paragraph F.3.3.2.].
13. Glazing, Dark Tint Passenger Side Windows, Minimum Light Transmittance of thirty percent (30%) and maximum Light Transmittance of forty percent (40%) [See Paragraph E.2.19.3.1.].
14. Heater, Rear, auxiliary [See Paragraph E.3.6.].
15. Hubodometer [See Paragraph D.2.2.4.].
16. Knee spacing (Maximum allowed by FMVSS No. 222; requires deleting one (1) row (six (6) positions) of seats which will reduce seating capacity).

Regular Seating Capacity	83
Rows of Seats	13
Minimum Knee Space, inches	27

17. Laminated Safety Plate Glass, AS-2 or better [See Paragraph E.2.19.2.2.].
18. Low Profile Tires.
19. Mud Flaps, with Brackets, Mounted [See Paragraph E.3.10.]. There shall be no advertisement on the mud flaps.
20. Reflective Material [See Paragraph E.3.9.].
21. School Name Lettering, both sides of bus [See Paragraph E.1.4.9.].
22. Seat Backs, Increased Height [See Paragraph E.2.13.1.].
23. Seat Belts (For each passenger seating position); [See Paragraph E.3.13.].
24. Security System Lock, All Doors (With ignition disconnect on emergency door).
25. Sound Abatement Insulation (Shall reduce interior noise by four (4) decibels, minimum).
26. Student Safety Crossing Gate. [See Paragraph E.3.16.].
27. Strobe Light, Roof-mounted [See Paragraph E.3.12.].

**B: Ordering Information**

- 28. Tachograph, Zero to eighty miles per hour (0-80 mph), twelve (12) volt (with seven (7) day four-and-seven-eighths inch (4-7/8") disc chart and electronic clock/ speedometer/recorder; [See Paragraph F.5.9.].
- 29. Tachometer (To indicate engine RPM).
- 30. Tires, Mud and Snow Tread (For Rear Wheels only).
- 31. Tool Compartment [See Paragraph E.3.17.].
- 32. Wheel, Spare, Mounted (With carrier but not tire and tube); [See Paragraph F.2.6.2.2.].
- 38. White Roof [See Paragraph E.1.4.1.].
- 39. Windows, push-out, Additional (for emergency exit), (Indicate quantity per side) [See Paragraph E.2.19.1.5.].
- 40. Passenger seats, Specialized with integral child restraint system. Integral means "a built-in feature," systems not built into the seat do not qualify. (Indicate quantity).

## **C. 15- THROUGH 20-PASSENGER BODY SPECIFICATIONS**

### **C.1. GENERAL REQUIREMENTS:**

- 1.1. **BODY PHYSICAL REQUIREMENTS:** The physical requirements for 15- through 20-passenger school bus bodies shall conform to Table No. One (1). [See Option No. 15 and Paragraph A.1.3.]:

**TABLE NO. ONE (1)  
PHYSICAL REQUIREMENTS**

Column (1) MINIMUM SIZE	Column (2) OVERALL BODY WIDTH	Column (3) KNEE SPACINGS <sup>1</sup>	Column (4) SEAT WIDTH LEFT <sup>2</sup> RIGHT	Column (5) CENTER AISLE WIDTH	Column (6) FLOOR-TO-CEILING HEIGHT <sup>3</sup>
Number of Passengers	Inches, Maximum	Inches, Minimum	Inches, Minimum	Inches, Minimum	Inches, Minimum
15	96	24	30* -- 30**	12	6
16	96	25	30* -- 30	12	72
18	96	24	30 -- 30**	12	63
19	96	25	39* -- 26	12	62
20	96	25	39 -- 26	12	72
<sup>1</sup> Column No. 3: <u>Knee space</u> is defined as the horizontal distance from the front center of a seat back to the rear center of the seat back or barrier immediately ahead, measured at approximately four inches (4") above the seat cushion.					
<sup>2</sup> Column No. 4: * <u>Left</u> rear seat shall have minimum width of twenty-six inches (26"). **Twenty-six inches (26") is permitted if twenty-six and/or thirty-nine inches (26"/39") combination is provided.					
<sup>3</sup> Column No. 6: <u>Floor-to-ceiling height</u> shall be measured in the center of the body between the Number Two pillar and the last side body pillar ahead of the rear roof slope.					

- 1.1.1. **Interior Width:** Fifteen passenger (15-) through 20-passenger school buses shall have a minimum interior width of seventy inches (70") at the shoulder level of a seated ninety percentile (90%) male passenger [See Table No.'s Three through Seven (3-7)].
- 1.2. **BUMPERS, REAR:** The rear bumper shall be either the chassis manufacturer's standard bumper or it shall be furnished by the body manufacturer. It shall be secured to the rear chassis frame and it shall be designed so as to prevent "hitching of rides" by obtaining a toe-hold thereon. The bumper shall not be permanently attached to the bus body. The bumper fabricated by the bus body manufacturer shall be of pressed steel channel at least three-sixteenths inch (3/16") thick by eight inches (8") high and shall wrap around the body, extending forward for at least twelve inches (12") on each side. It must be bolted to the chassis frame and braced with material of at least equal impact ratio as the material in the bumper.
- 1.3. **CEILING:** The ceiling shall be free of all projections likely to cause injury to passengers. [See Table No. One (1) and Paragraph C.2.8.].

- 1.4. **COLORS AND LETTERING:** A first quality black enamel (Color No. 17038 of Federal Standard No. 595a) or decals shall be used for lettering and trim. The properties of the black enamel shall be equal to those of the finish coat enamel. Pressure-sensitive tape or decals are acceptable for trim or lettering (e.g., EMERGENCY DOOR, EMERGENCY EXIT, SCHOOL NAME LETTERING, etc. signs) provided they are made from Faison R 200, 3M Series 180, or approved equal material. Exit signs and Lettering shall be in compliance with FMVSS No. 217.
- 1.4.1. **Bumpers:** Bumpers for "Type A" school buses shall be the manufacturer's standard color; bumpers for "Type B" school buses shall be finished in black (Color No. 17038).
- 1.4.2. **Body Exterior:** The exterior of the complete bus except for rub rails shall be finished in school bus yellow (Color No. 13432 of Federal Standard No. 595a). The hood may be coated with non-reflective school bus yellow paint. When so specified in the Invitation for Bid (See Option No. 38), the school bus roof shall be painted white. The white paint on the roof shall extend from the back of the front cap to the front of the rear cap and from a point on each side of the bus which is no lower than the top of the windows and no higher than the start of the roof curvature. The white paint shall be the same quality as the paint on the remainder of the school bus.
- 1.4.3. **Body Interior:** Unless otherwise specified in the Invitation for Bid, the interior of the complete bus body shall be finished in the manufacturer's standard color except where clear-coated galvanized steel or aluminum is used [See Paragraph C.2.8.].
- 1.4.4. **Emergency Exit Lettering:** The emergency exits shall be marked "EMERGENCY DOOR" or "EMERGENCY EXIT," both on the outside and/or on the inside in compliance with FMVSS No. 217. All applicable requirements of FMVSS No. 217 relating to instructions, outlining, and markings shall be met.
- 1.4.5. **Exterior Mirror Backs:** The metal backs of all exterior mirrors, if painted, shall be finished in lusterless black (Color No. 37038; [See Paragraphs C.3.5.3 and C.3.5.5.].
- 1.4.6. **Grilles:** Grilles may be painted either the same color as the exterior of the bus body or they may be argent, gray, or a bright finish (chrome, chromed-plastic, or anodized aluminum).
- 1.4.7. **Logos:** No logo, trademark, insignia, or letters shall be placed on bumpers or mud flaps. A small metal or plastic plate designating body manufacturer's name may be attached to the bus body. A logo of reasonable size, which has been approved by the Commission, may be placed on the exterior bus body.
- 1.4.8. **Rub Rails:** All rub rails, except the pressed-in type window level rub rails, shall be painted black (Color No. 17038). The pressed-in type rub rails shall be painted either black (Color No. 17038) or school bus yellow (Color No. 13432) at the option of the manufacturer.

- 1.4.9. **School Bus Lettering:** The bus body shall have the words "SCHOOL BUS" on the front roof cap, the rear roof cap, and on both sides of the bus body applied with black paint (Color No. 17038 of Federal Standard No. 595a). The letters shall be neat, clearly defined block style eight inches (8") high with one inch (1") wide strokes. The words "SCHOOL BUS" shall be at the same level on each side of the bus (i.e., same height above bottom of skirt). Lettering shall be placed as high as possible without impairment of its visibility.

"SCHOOL BUS" lettering shall have a reflective background. This is not optional. Option No. 19, Reflective Materials, applies only to: diagonal marking of front and/or rear bumpers; outlining the rear perimeter of the bus body; and striping the sides of the bus body.

Required lettering and numbering shall include:

District or company name or owner of the bus shall be displayed in the beltline.

Bus identification number shall be displayed on the front, the rear, and the sides of the bus body.

- 1.4.10. **School Name Lettering:** When so specified in the Invitation for Bid [See Option No. 20], the school district name shall be provided in black letters on both sides of the bus near the belt line using decals or with black paint. Lettering shall be minimum five (5") inches high with minimum five-eighths inch (5/8") block strokes. Paint, if used, shall be equal in quality to that of the bus body paint; decals shall meet or exceed the requirements in Paragraph C.1.4. Maximum number of characters in one (1) line of the name is limited to thirty (30). The school district should list in the space provided on the School Bus Requisition Form [See sample form on Page 168], the name to be placed on the bus. Characters should be typed or printed plainly on this form to ensure accurate spelling.

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

- 1.4.12. **Wheel Covers:** Wheel covers may be bright metal.

- 1.5. **INSULATION, NOISE:** Each school bus shall be constructed so that the noise level measured at the ear of the occupant nearest the primary vehicle noise source shall not exceed eighty-five (85) decibels, when tested in accordance with the procedure given in the Noise Test Procedure of NSSB. [See Option No. 24].
- 1.6. **INSULATION, THERMAL:** The ceilings and sidewalls shall be thermally insulated with a fire-resistant material approved by Underwriters Laboratories, Inc. to adequately reduce the noise level and to minimize vibrations. Buses shall have the equivalent of one-and-one-half inches (1-1/2") of fiberglass or other insulation in the ceilings and walls including the interior of hat-shaped bows. Any insulation used shall have a minimum R-factor value of 5.77.
- 1.7. **LAMPS, SIGNALS, AND WARNING DEVICES:** Each bus shall be furnished with the lamps listed below [See SBMI Standard No. 001]:



- 1.7.1. Alternately Flashing Signal Lamps: Each school bus shall be equipped with eight (8) warning signal lamps, four (4) red and four (4) amber, working in an automatic or -sequential integrated system. The signal lamps shall conform to the design, installation, location and operating requirements in Paragraph S4.1.4. of FMVSS No. 108:

*"S4.1.4. Each school bus shall be equipped with a system of . . .*

*". . . (b) Four (4) red signal lamps designed to conform to SAE Standard J887, "School Bus Red Signal Lamps," July 1964, and four (4) amber signal lamps designed to conform to that standard, except for their color, and except that their candlepower shall be at least two-and-one-half (2-1/2) times that specified for red signal lamps. Both red and amber lamps shall be installed in accordance with SAE Standard J887, except that:*

*"(i) Each amber signal lamp shall be located near each red signal lamp at the same level, but closer to the vertical centerline of the bus; an*

*"(ii) The system shall be wired so that the amber signal lamps are activated only by manual or foot operation, and if activated, are automatically deactivated and the red signal lamps automatically activated when the bus entrance door is opened."*

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.

- 1.7.1.1. Band: Each set of amber and red lamps shall have a minimum three inch (3") black band around the set and a three inch (3") band between the lamps in each set. The color of this band shall be black enamel (Color No. 17038, Black Enamel of Federal Standard 595a). If it is not possible to provide a three inch (3") band between the lamps in the set, the manufacturer will then provide a band as wide as possible. Any visor or hood used to shade the lights and improve visibility will not interfere with the intensity and photometric performance of the warning lights [See SMI Standard No. 001].
- 1.7.1.2. Mounting: If exterior panels are cut to provide an opening for installation of flush-mounted signal lamps, the lamps must have a closed cell sponge flange gasket with a minimum thickness of three-sixteenths inch (3/16"). The gasket shall be the full width of the flange on the lamp. Proper installation of the lamps shall be made in order to prevent seepage of moisture into the opening
- 1.7.1.3. Operating Instructions: Complete instructions for the detailed operation of the warning signal lamp system shall be furnished with each school bus.
- 1.7.2. Backup Lamps: The color, requirements, and mounting of backup lamps shall be in accordance with FMVSS No. 108, except two (2) backup lamps are required by Texas Specifications.

- 1.7.3. **Identification Lamps:** Each bus with an overall width of eighty or more inches (80+) shall be furnished with identification lamps installed on the front and rear, three (3) amber lamps in the front and three (3) red lamps in the rear. The lamps shall be installed as close as practicable to the top and vertical centerline with lamp centers spaced not less than six inches (6") or more than twelve inches (12") apart. Each identification lamp shall be the armored flush mounting type for protection of the lens from damage during normal operation. Armored protectors shall in no way interfere with the intended purpose of the lamps. The armored type protectors shall be Grote Manufacturing Company, Madison, Indiana 47250, Model No.'s 45012 and 45013, or K-D Lamp Company, 1910 Elm Street, Cincinnati, Ohio 45210, Model Nos. 38469-901 and 40268-301, or approved equal. [See SBMI Standard No. 001 and FMVSS No. 108].

Example of an approved equal: Peterson Model - PM 122.

- 1.7.4. **Interior and Stepwell Lamps:** A minimum of two (2) interior dome lamps shall be installed to properly and adequately illuminate the entire aisle and emergency passageway. The stepwell shall be illuminated by a separate lamp activated by opening the service door. The stepwell lamp shall have a metal bezel.
- 1.7.5. **License Plate Lamp:** The color, requirements, and mounting of the license plate lamp shall be in accordance with FMVSS No. 108.
- 1.7.6. **Operating Units and Flashers:** The operating units and flashers for turn-signals and vehicular hazard warning signals shall meet the requirements of FMVSS No. 108.
- 1.7.7. **Tail and Stop Lamps:** The quantities, colors, requirements, and mounting of tail and stop lamps shall be in accordance with FMVSS No. 108.
- 1.7.8. **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.
- 1.7.9. **Warning Devices:** Each school bus shall be equipped with three (3) triangular warning devices meeting the requirements of FMVSS No. 125. The devices shall be packed three (3) per metal or heavy-duty plastic box, or they may be individually packed in metal or heavy-duty plastic boxes with the three (3) boxes contained within a carrier. Warning devices shall be securely mounted in the driver's compartment. Triangular warning devices furnished shall be approved by the Texas Department of Public Safety.
- 1.8. **LICENSE PLATE HOLDER:** A license plate holder shall be mounted on the rear of the bus body. The holder shall be designed so that the license plate will receive illumination from the clear lens on the underneath side of the tail light, or by a separate lamp.

**C: 15- Throught 20-Passenger Body Specifications**

- 1.9. **OPENINGS:** All openings in the floorboard or firewall between chassis and passenger carrying compartment, such as for gearshift lever, steering column, and auxiliary brake lever, shall be sealed. Openings between chassis and passenger compartment made due to alterations by the body manufacturer must be sealed.
- 1.10. **UNDERCOATING:** Undercoating is required to provide for insulation, sound deadening, protection from road minerals, and rust prevention, as applicable, and shall meet the following:
- 1.10.1. **Application:** The entire underside of the bus body, including floor members, wheelwells, side panels below the floor level, and all metal fenders or fenders with metal liners shall be coated with one-eighth inch (1/8") thick material as specified above. The undercoating shall be applied in accordance with the undercoating manufacturer's instructions. Do not cover or obliterate the chassis identification plate [See Paragraph A.6.4.3.].
- 1.10.2. **Material:** Insulating and undercoating materials shall be an asphalt base underbody coating conforming to Federal Specification TT-C-520B, such as R-477-139, manufactured by Daubert Chemical Co., Chicago, Illinois 60638 or Lion Nokorode Emulsion 331 as manufactured by Lion Oil Company, El Dorado, Arkansas 71730, or an approved equal. An example of an approved equal is Tectyl MC121B, manufactured by Ashland Petroleum Company, Box 391, Ashland, Kentucky 41101, applied to a dry film thickness greater than twenty (20) mils.
- 1.11. **WIRING:** All wiring shall conform to the current standards of the SAE. Wiring shall be arranged as required with each circuit protected by a fuse or circuit breaker. Wiring as arranged in the circuits to manufacturer's specifications are acceptable; however, the addition of another circuit for the alternatively flashing signal lamps shall be provided.
- 1.11.1. **Accessory Wiring:** Body-installed accessories shall be wired from the battery through a low voltage solenoid cut-off switch operated by the ignition key except for the eight (8) light warning system and hazard warning lights.
- 1.11.2. **Color and Number Coding:** A system of color and number coding shall be used and an appropriate identifying diagram shall be provided together with the wiring diagram provided by the chassis manufacturer.

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

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

The color of the cables shall conform to SAE J1128.

**1.11.3. Fusing:** Each circuit, except starting and ignition, shall be fused separately or shall have an adequate circuit breaker. Two (2) extra fuses for each size of fuse installed on the bus by the body manufacturers, shall be conveniently mounted on the bus body.

**1.11.4. Main Circuits:** The electrical system wiring shall have at least nine (9) main circuits:

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

**C.2. CONSTRUCTION:**

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

**2.1.1. Body-Chassis Attachment:**

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

2.1.1.2. **Other Bodies:** If other than chassis manufacturer's standard metal floor is furnished, the body shall be attached to the chassis by the chassis manufacturer's standard clips and, in addition, the following:

- (i) **Body-Chassis Insulation:** Anti-squeak material in continuous strips or rubber pads shall be permanently and firmly attached to the frame rails or cross members to insulate the chassis from the body.
- (ii) **U-bolts<sup>9</sup>:** A minimum of two (2) U-bolts shall also be used on each frame rail to attach the body to the chassis frame. The four (4) U-bolts shall be fitted with lock washers and nuts and, after the nuts have been securely tightened, the threads of each U-bolt shall extend a minimum of one-half inch (1/2") past the nuts. Minimum diameter of the U-bolt threads shall be seven-sixteenths inch (7/16").

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

2.1.3. **Components:** All components shall be of adequate design and shall be of sufficient strength and safety factor to support the entire weight of a complete bus when fully loaded, on its sides or top, without undue damage to the body structure. The body shall have sufficient frame members in the roof structure and corners to provide adequate safety and to resist damage on impact. Construction shall be such as to provide a reasonable dustproof and watertight unit.

<sup>9</sup> School buses with floors installed by the body manufacturer and equipped with any combination of wheelchair lift positions and conventional seats shall have a minimum of four (4) U-bolts. Two (2) installed on each frame rail.

- 2.1.4. Fasteners, Bolts and Rivets: All bolts and rivets used in the manufacture of the school bus body shall be high strength metal. All bolts shall be equipped with lock washers or other acceptable devices to prevent loosening under vibration. All bolts, nuts, and washers except U-bolts, their nuts and washers, shall be parkerized, cadmium-plated, or otherwise rustproofed.
- 2.1.5. Fasteners, Other: Sheet metal screws or self-tapping bolts of any type shall not be used in the construction of bodies except:
  - 2.1.5.1. Alignment<sup>10</sup> of doors or in conjunction with rivets, welds, or bolts for compliance with FMVSS No. 221, as applicable, or;
  - 2.1.5.2. Attachment of exterior mirrors in certain cases [See Paragraph C.3.5.3.], or;
  - 2.1.5.3. Electrical wire moldings and light fixtures, or;
  - 2.1.5.4. Installation of header pads over the doors, or;
  - 2.1.5.5. Installation of rub rails or emergency door handles and latches where it is impossible to use rivets or bolts, nuts, and lock washers and then only when these fasteners are used in conjunction with the manufacturer's standard metal adhesive which is used to meet joint strength requirements, or;
  - 2.1.5.6. Interior panels which must be removed to give accessibility to other interior or concealed components, or;
  - 2.1.5.7. Seat construction [See Paragraph C.2.12.4.2.], or;
  - 2.1.5.8. Window frames when applied with the metal adhesive.
- 2.1.6. Front Body Section: The front body section of the school bus from the windshield forward shall be of the bus body manufacturer's or chassis manufacturer's standard design and shall contain, but not be limited to, the following components:
  - 2.1.6.1. Fenders: Properly braced fenders with the total spread of the outer edges exceeding the total spread of the front tires when the front wheels are in the straight-ahead position.
  - 2.1.6.2. Grille: A sufficiently reinforced grille assembly.
  - 2.1.6.3. Hood: Hood cover with latching mechanism providing access to the forward part of the engine.
  - 2.1.6.4. Lamps: Headlamps and parking/turn-signal lamps as required by FMVSS No. 108.

<sup>10</sup>

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

- 2.1.7. **Steering Wheel Placement:** There shall be at least a two inch (2") clearance between the steering wheel and the cowl, instrument panel, or any other surface.
- 2.2. **ACCESS PANELS:** Any panel used for access to the engine radiator or radiator overflow container and installed in the passenger compartment shall have a keyed lock. This does not include the engine cover.
- 2.3. **BODY FRAME:**
  - 2.3.1. **Longitudinal Frame Members:** The body frame shall contain, as a minimum, the following longitudinal frame members at the locations shown:
    - 2.3.1.1. **Rear Corner:** The rear corner framing between the floor and roof and between the emergency door posts and the body corner shall be applied horizontally or vertically, or in other combinations, to provide additional impact and penetration resistance equal to that provided by frame members in body side areas. Such structural members shall be securely attached at each end.
    - 2.3.1.2. **Roof:** Two (2) or more longitudinal members (or roof strainers) shall be provided to connect and space the roof bows and to reinforce the flattest portion of the roof skin. They shall be applied either externally or internally, shall extend from the windshield header, and shall function as continuous longitudinal members. These roof strainers shall be attached to other structural components by means of welding, riveting, or bolting. The completed roof shall meet the requirements of FMVSS No. 220.
    - 2.3.1.3. **Shoulder Level:** There shall be one (1) longitudinal side strainer (or impact rail) mounted at shoulder level (window sill level) and extending at least from the front post (excluding the front door entrance) to the rear corner reinforcement. This member shall be attached to each vertical structural member. Such strainer shall be a formed (not flat) strip of metal.
    - 2.3.1.4. **Window/Seat Frame Area:** There shall be one (1) longitudinal side strainer installed in the area between the bottom of the window and the bottom of the seat frame and extending from the front post to the rear corner reinforcement. This strainer may also be used as a means to fasten the angle used for the wall end seat support at the wheel housing. Such strainer shall be formed and attached to each vertical structural member by huck-bolting, welding, or thread-forming bolts which are tack-welded to prevent bolts from vibrating loose. A backup channel for the exterior rub rails shall be provided and fastened to each vertical structural member. In lieu of a separate backup channel, the seat level longitudinal strainer may serve as a backup channel for the seat level rub rail.
- 2.4. **EMERGENCY EXITS:** Texas school buses shall be provided with emergency exits which comply with FMVSS No. 217 and those requirements as listed below:

2.4.1. Emergency Doors: Buses furnished to this specification shall be equipped with emergency doors meeting the description below. Fifteen passenger (15-) and 18-passenger buses shall be equipped with emergency doors meeting the requirements of either "Style I" (two-door type) or "Style II" (single door type). Sixteen passenger (16-), 19-passenger, and 20-passenger buses shall be furnished with Style II door only; double rear emergency doors will not be accepted. Either style emergency door shall be furnished with upper glass panels, permanently closed, set in rubber or sealed against rubber. [See Paragraph C.2.19.2. and Paragraph. C.1.4.4.]. No seat or other object shall be placed in the body that restricts the passageway to the emergency door to less than twelve inches (12"). There shall be no steps leading to the emergency door.

2.4.1.1. Design, "Style I" Emergency Door (Two (2) Door Type for 15- and 18-passenger buses only): Both of the rear doors shall be for emergency exit use and provided with the following:

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

2.4.1.1.2. Fastening: The two (2) door emergency exit, located at the rear of the bus, shall be equipped with a fastening device that will secure each door at the top and at the bottom. The fastening device on the first opened door shall permit opening of the door from both the inside and the outside of the bus. The fastening device shall permit opening of the other door from the inside of the bus. Both fastening devices shall be designed to be quickly released but shall offer protection against accidental release. A suitable instruction sign shall be located on the inside of the door near the fastening device on the first-opened door, to indicate its method of operation. The outside handle, when in the closed position, shall extend vertically downward from its pivot center.

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

2.4.1.1.4. Latch: Both the key type and/or the inside push-pull type rear cargo door locks, as installed by the original vehicle manufacturer, shall be either completely removed or shall be made inoperable. If made inoperable, precautions shall be taken to assure that the lock mechanism (s) cannot, through vibration or other means, cause the emergency exit door to become locked either from the inside or the outside of the bus.



2.4.1.1.5. Switch: The emergency door shall be equipped with an electrical switch connected to an audible signal automatically operated and located in the driver's compartment which shall indicate the unlatching of this door and 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.

2.4.1.2. Design, "Style II" Emergency Door (Single Door Type):

2.4.1.2.1. Attachment: The emergency door may be hinged on the right or left side of the body, shall open outward, and shall be designed to permit opening from both inside and outside of the bus. It shall be properly sealed against moisture and dust.

2.4.1.2.2. Design: The emergency door shall be located in the center rear of the body and shall have a minimum horizontal opening of thirty inches (30") and a minimum vertical opening of forty-eight inches (48") measured from the floor level. It shall be properly sealed against moisture and dust.

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

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

2.4.1.2.5. Latch: The emergency door shall be equipped with a slide bar rack and pinion (cam) operated latch. The slide bar shall be approximately one-and-one-fourth inches (1-1/4") wide and three-eighths inch (3/8") thick and shall have a minimum stroke of one-and-one-eighth inches (1-1/8"). The slide bar shall be spring loaded so as to retain the bar in the closed position and have a minimum of one inch (1") of horizontal bearing surface beyond the edge of the door frame when the door lock is in a latched position.

2.4.1.2.6. Latch Handle: The movement of the latch handle through its full arc of operation shall not be obstructed by, or extended into, the area behind the rear seats at the emergency door. The handle, when in the closed position, shall meet the requirements of FMVSS No. 217. The design of the latch handle shall allow quick release, but shall offer protection against accidental release. Control of the fastening devices from the driver's seat shall not be permitted.

A pull handle shall be installed on the inside of the emergency door so that the door can be securely closed for positive fastening. Provisions for opening from the outside shall consist of a handle (device) designed to prevent "hitching a ride" yet allowing door to be opened as necessary. The outside handle, when in the closed position, shall extend vertically downward from its pivot center.

2.4.1.2.7. Switch: The emergency door latch shall be equipped with a heavy-duty electric plunger type switch connected to a warning buzzer located in the driver's compartment. The switch shall be enclosed in an adequately protected case, and wires leading from switch shall be concealed in the walls. The switch shall be installed so that the buzzer will sound before the door handle is turned far enough to permit the door to open. Switch shall be Cole-Hersee's No. 9118 having an upset end (knob) on the plunger head.

2.4.2. Emergency Exit Requirements: "Type A", "Type B", "Type C", and "Type D" vehicles shall be equipped with a total number of emergency exits as follows for the indicated capacities of vehicles. Exits required by FMVSS No. 217 may be included to comprise the total number of exits specified.

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

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

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

Each emergency exit above shall comply with FMVSS No. 217. These emergency exits are in addition to the rear emergency door or exit.

In addition to the audible warning required on emergency doors by FMVSS No. 217 additional emergency exits may also be equipped with an audible warning device.

2.5. FLOORS: The standard floor construction of the bus body manufacturer shall be used if a steel floor is not furnished with the bus chassis. If the floor is furnished with the chassis, then the floor shall be covered with material as described below:

2.5.1. Installation: Plywood shall be installed in the areas under all seats including the driver's seat. It may be cut to fit around any permanently-attached driver's seat provided by the chassis manufacturer.

2.5.2. Material: The floor shall be covered with plywood securely attached to the existing steel floor. The plywood shall be five-eighths inch (5/8") nominal thickness, A-C or B-B Exterior grade manufactured in conformance with U.S. Product Standard PS 1-83. CDX interior grade plywood with exterior glue is acceptable when all surfaces including the edges of the wood are covered or sealed against the exterior environment.

**2.6. FLOOR COVERING:**

- 2.6.1. **Aisle Material:** Floor covering in the aisle shall be the aisle-type, fire-resistant rubber or equivalent, and shall be nonskid, wear-resistant, and ribbed. Minimum overall thickness shall be three-sixteenths inch (3/16") measured from tops of ribs. Rubber aisle floor covering shall meet Federal Specification ZZ-M-71D.
- 2.6.2. **Installation:** Floor covering must be permanently bonded to floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be type recommended by the manufacturer of floor-covering material. All seams must be sealed with waterproof sealer.
- 2.6.3. **Underseat Material:** The floor in the underseat area, including wheelwells, and the areas under the driver's seat and wheelchairs, shall be covered with fire-resistant, rubber floor covering or equivalent having minimum overall thickness of one-eighth inch (1/8").

**2.7. PANELS, EXTERIOR:** Exterior panels shall be steel; however, front door fairings and front and rear end-caps only may be fiberglass or heavy-duty plastic.

- 2.7.1. **Attachment and Installation:** All exterior panels shall be attached to bow frames and strainers so as to act as an integral part of the structural frame. They shall be installed by lapping and riveting, lapping and bolting, or by flanging and bolting and in such a manner as to form watertight joints.
- 2.7.2. **Joints:** Joints shall meet the requirements of FMVSS No. 221.

**2.8. PANELS, INTERIOR:** All interior wall and ceiling panels shall be steel and of the body manufacturer's standard design except the panels beneath the windows shall be clear-coated galvanized embossed steel meeting ASTM A 446. Also the stepwell and riser panels in the service door entryway shall be clear-coated galvanized steel, embossing not required. Galvalume, aluminized steel, and aluminum over steel panels are acceptable for use beneath the windows and in the entryway. Interior panels made of 0.032 -inch, 3105-H14 aluminum may be used in 15- and 18- passenger buses only.

- 2.8.1. **Attachment:** All interior panels shall be attached to the frame structure by bolts, rivets, or by any well-designed method utilizing self-locking panels, or locking panel strips. Regardless of the method used, the panels shall be attached so that vibration, rumbling, and popping shall be at a minimum.
- 2.8.2. **Design:** Front and rear panels shall be formed to present a smooth, pleasing appearance. If the ceiling is constructed so as to contain lapped joints, the forward panel shall be lapped by the rear panel and all exposed edges shall be beaded, hemmed, flanged, or otherwise treated to minimize sharp edges.

**2.9. RUB RAILS:** Two (2) separate, one-piece (1-piece) continuous rub rails of the type, grade, and thickness of steel specified in Table No. Nine (9) or approved equal, shall be installed on the body as described below. The minimum finished width of all rub rails shall be four inches (4"):

- 2.9.1. Construction: The rub rails shall be of ample strength to resist impact and to prevent crushing of the bus body and shall be a flanged-formed channel, longitudinally fluted, or corrugated rib surface. Ends shall be: (1) smoothly closed, or; (2) closed by a rounded or beveled metal end cap which shall be butt- or flash- welded to the rub rail, or; (3) closed by a rounded or beveled metal end cap inserted with an approximate one inch (1") sleeve inside of the rub rail and riveted in position at the top and bottom of the rub rail, or; riveted in position at the top and bottom of the rub rail flange, or; riveted in the center of the end cap, and sealed in the same manner as the top flange of the rub rails.
- 2.9.2. Drainage: The bottom edge of each rub rail, except the pressed-in-type which may be used near the window line, shall have provisions for drainage of accumulated moisture. One (1) of the following drainage methods shall be used:
- 2.9.2.1. Slots: The bottom flange of the rub rail shall have a minimum of one inch (1") by 0.032 inch formed slots spaced on not more than twelve inch (12") centers, or;
- 2.9.2.2. Slots or Holes: One (1), one-fourth inch (1/4") diameter hole or slot per foot in the lowest part of the rub rail drilled prior to the priming, painting, and installation of the rub rail shall be provided. Holes drilled after rub rail installation or after priming and painting are not acceptable. Formed slots are preferred over drilled or cut holes.
- 2.9.3. Installation: All rub rails shall be bolted or riveted on top and bottom to each side post and riveted on top and bottom to the exterior paneling between the side posts [See exception in Paragraph C.2.1.5.5]. Provisions for one-piece (1-piece) rails may be accomplished by butt- or flash-welding. All welds, including those for the end caps, shall be dressed, sanded, and buffed.
- Both rub rails shall be installed the full outside length of the body on the right side from the rear of the service door to the point of curvature at the rear of the bus and on the left side from the point of curvature near the outside cowl to the point of curvature at the rear of the bus. When the upper rub rail is extended to the rear of the bus and joining is by lapping or fastening with a sleeve, the joint shall be located at the rearmost body side post or preferably, the second post from the rear. Rub rails are not required on the left (driver's) door if this door is furnished by the chassis manufacturer.
- 2.9.4. Location: One (1) rub rail shall be installed at or near the floor level, and the other at the seat level, or at the window level, or in between the seat and window level.
- 2.9.5. Sealing: The top joint of the rub rail shall be sealed with a caulking compound or adhesive as specified in Paragraph C.2.1.2.

- 2.10. SEAT BARRIERS: Barriers shall be furnished and installed in accordance with FMVSS No. 222. Barriers shall also be provided with the following:

- 2.10.1. Handrail: A grab handle or handrail of sufficient length to assist entering and exiting passengers shall be installed on the forward side of the right barrier. The outside surface of this handle shall be stainless steel, polished aluminum, or chrome-plated steel. The design shall provide a smooth installation which would eliminate the possibility of clothing or other articles becoming caught upon ingress or egress from the vehicle.
- 2.10.2. Knee Space: Knee space between these barriers and the front of each front passenger seat shall be at least twenty-four inches (24") for 15- and 18-passenger and twenty-five inches (25") for 16-, 19-, and 20-passenger buses when measured from the modesty panel to the front of the seat back at the center of the seat approximately four inches (4") above the seat cushion.
- 2.10.3. Upholstery: Barriers shall be covered with upholstery meeting the requirements of Paragraph C.2.12.5.
- 2.11. SEATING REQUIREMENTS, DRIVER:
  - 2.11.1. Design: The base of the driver's seat shall be of the adjustable pedestal type or the platform type having an adjustment range of approximately four inches (4") "Fore and Aft." The back of the driver's seat shall be heavily padded and form-fitted ("Type B" and "Type C" only). Driver's seat supplied by the body company shall be high back suspension seat with a minimum seat back adjustment of fifteen degrees (15°), not requiring the use of tools, and with a head restraint to accommodate a 95th percentile adult male, as defined in FMVSS No. 208. The driver's seat shall be secured with nuts, bolts, and washers or flanged-headed nuts.
  - 2.11.2. Driver's High Back Seat, Optional: When so specified in the Invitation for Bid (or when a GMC/Chevrolet chassis is furnished) a high back driver's seat shall be provided with a minimum seat back adjustment of fifteen degrees (15°) and with a head restraint to accommodate a 95th percentile adult male, as defined in FMVSS No. 208, and shall meet all of the applicable requirements of Paragraph C.2.11.1. ("Type B" and "Type C" only).
  - 2.11.3. Installation: The driver's seat, when installed by the body manufacturer, shall be mounted with bolts, flat washers, lock washers, and nuts except where it is impossible to use bolts and nuts at certain floor points due to main cross members or floor sill interference. Thread-forming or cutting bolts and lock washers may be used at these points. Driver seat positioning and range of adjustments shall be designed to accommodate comfortable actuation of the foot control pedals by ninety-five percent (95%) of the male/female adult population.
  - 2.11.4. Seat Belts and Seat Belt Assembly: Three (3) point, "Type II" seat belt assembly conforming to FMVSS No. 209 shall be provided for the driver. The belt assembly shall be equipped with an emergency locking retractor (ELR) for the continuous belt assembly. The location of the seat belt anchorage shall conform to SAE Standard J383 with the driver's seat adjusted to its rearmost position. A "Type II" seat belt with a standard shoulder harness, when provided, does not require a retractor at the stationary fastening bracket; however, this mounting bracket must be

within easy reach of the seated driver. The seat belt assembly shall be anchored in such a manner or guided at the seat frame so as to prevent the driver from sliding sideways from under the belt.

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

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

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

2.12.1.2. Design: Seat belts shall have a buckle end and an attaching end 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. Long and short ends shall be mounted alternately with the short end on the aisle. If possible, the design shall prevent fastening the belts across the aisle.

- 2.12.2. Seat Cushions: All seat cushion units thirty inches (30") wide or less shall be designed to adequately support two (2) passengers of one-hundred-twenty pounds (120 lbs.) each. All seat cushions over thirty inches (30") wide shall be designed to adequately support three (3) passengers of one-hundred-twenty pounds (120 lbs.) each. The seat cushion shall consist of a base, foam cushion, and upholstery meeting the following requirements:

- 2.12.2.1. Base: The base shall be nominal one-half inch (1/2") thick, interior grade, C-D plywood with exterior grade glue, identification index 32/16, manufactured in conformance with U.S. Product Standard PS 1-83 and identified as to veneer grade and glue bond type by the trademarks of an approved testing agency. Plywood with blue stain in sapwood is not acceptable.

Alternatively, the base may be made of "Donnite" material, manufactured by the Donnite Corporation, Flora & Harrison, Plymouth, Indiana 45563, of equal or better strength and thickness.

- 2.12.2.2. Foam Cushion: The bus body manufacturer's standard full dimension urethane foam material shall be used for the seat cushion material.

**2.12.3. Seat Frames:**

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

**2.12.3.2. Painting Requirements:** The entire seat frame, except that section of the back frame which is padded and upholstered, shall be thoroughly cleaned, primed, and painted. The paint shall have adhesive qualities which will not permit the removal of the paint by means of the thumbnail-scratch method without first chipping a starting place [See Paragraph C.1.4.3].

**2.12.4. Seat Installation:**

**2.12.4.1. Aisle Width:** The minimum aisle width between rows of seats shall be twelve inches (12"), except a thirty inch (30") aisle is required if regular seating is provided between the rear emergency door and wheelchair position on wheelchair equipped buses [See Paragraph G.1.7.3].

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

**2.12.4.3. Knee Spacing:** The seats shall provide knee spacing as normally furnished by the manufacturer for this seating capacity but not less than twenty-four inches (24") for the 15- and 18-passenger buses. [See Paragraph A.2.13.: Definition of knee space.] Knee spacing for the 16- through 20-passenger bus shall be not less than twenty-four inches (24") [See Table One and Option No. 16].

**2.12.4.4. Track Seating:** Seats may be track mounted in conformance with FMVSS No. 222. If track seating is installed, the manufacturer shall supply minimum and maximum seat spacing dimensions applicable to the bus, which comply with FMVSS No. 222. This information shall be on a label permanently affixed to the bus.

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

**2.12.5.1. Material:** These materials shall be fire-resistant and shall meet or exceed the Boston Fire Block Test in the National School Bus Standards. They shall be artificial leather.

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

2.12.5.3. Welting: There shall be welting on exposed seams of the seat back and cushion.

2.13. SERVICE ENTRYWAY: The entrance door steps shall be designed so that the first step shall not be more than ten to fourteen inches (10 -- 14") from the ground when the bus is unloaded. Step risers shall not exceed a height of ten inches (10"). When plywood is used on a steel floor or step, the riser height may be increased by the thickness of the plywood. Steps of adequate width and length shall be fabricated and installed outside or inside the body to meet this requirement. Provisions shall be made to prevent road splash from the wheel from accumulating on steps installed outside the body. The surface of all entrance steps shall have a nonskid material applied. [See Paragraph C.2.10.1.: Handrail Installation Requirements] A suitable device (s) shall be designed and installed to prevent injury or fatality of passengers from being dragged. At least one such device shall assist passengers during entry or egress, and be of such design to eliminate entanglement.

2.14. SERVICE OR ENTRANCE DOORS: Fifteen (15)- through 20-passenger buses shall be equipped with a service or entrance door which shall be located on the right side near the front of the bus and in direct view of the driver.

NOTE: Fifteen (15)-passenger buses may have either a "Style I" or a "Style II" service door at the manufacturer's option. Sixteen (16)-passenger buses shall have a "Style II" (tall) service door (no option). Eighteen (18)- and 19-passenger buses shall have a "Style II" (tall) service door unless Option No. 11 a for sedan type door is designated by the ordering school district. Twenty (20)-passenger buses shall have a "Style II" (tall) service door (no option). [See Table No. Two (2): Comparison of small buses.] This door shall have a positive latching mechanism to eliminate the possibility of an inadvertent door opening during a frontal crash or roll-over.

2.14.1. Attachment: "Style I" doors shall be attached by the chassis manufacturer's standard method. The hinges for "Style II" service entrance doors shall be attached with rivets or bolts, nuts, and lock washers. Metal screws or self-tapping bolts are not acceptable. Metal screws may be used for alignment of "Style II" doors while installing rivets. Self-tapping bolts may be used for alignment if the bolt heads are tack-welded to the hinges [See Paragraph C.2.1.5.1.].

2.14.2. Design, "Style I" (Sedan Type) Service Door: This service or entrance door shall be of one-piece (1-piece) and shall have a minimum horizontal opening of approximately twenty-eight inches (28") and a minimum vertical opening of approximately fifty-three inches (53").



The door shall be manually operated. The door control must be the hand lever type, driver- operated, and shall be designed to afford easy release and to prevent accidental opening. When so specified in the Invitation for Bid [See Option No. 11], 18- and 19-passenger buses shall be furnished with sedan type "Style I" service doors.

- 2.14.3. Design, "Style II" (Tall) Service Door<sup>11</sup>: This service or entrance door shall be the two-piece (2-piece) or folding type and shall have a minimum horizontal opening of approximately twenty-four inches (24") and a minimum vertical opening of approximately sixty-eight inches (68"). The doors shall be operated from controls at or near the bus driver's seated position. The doors shall be either operated manually or when so specified in the Invitation for Bid [See Option No. 10], actuated electrically or by air pressure or vacuum and shall allow manual opening in case of an emergency. To prevent accidental opening while the bus is in motion, the door opening system shall require at least a one-hundred-twenty-five pound (125 lb.) force applied to its center in order to manually open the door. Both vertical closing edges of the door shall be equipped with rubber or rubberized materials to protect passenger's fingers.
- 2.14.4. Driver's Visibility: Service or entrance doors shall have lower and upper glass panels [See Paragraph C.2.14.5.], or, if a sedan-type door, a system of mirrors and glass panels to provide the driver a clear view of entering passengers as well as the passenger landing area. Whichever style of door is used, provision shall be made using either glass panels or mirrors to give the seated driver a view of at least the upper seven-and-one-half inches (7-1/2") of a thirty inch (30") rod placed upright on the ground at any point along a line one foot outboard from the service door entrance and between the front and rear of the service door.
- 2.14.5. Glass Panels: "Style II" service or entrance doors shall have glass panels of approved safety glass [See Paragraph C.2.19.2.: Installation Requirements]. Bottom of each lower glass panel shall be not more than ten inches (10") from the top surface of the bottom step. The top of each upper glass panel shall be not more than six inches (6") from the top of the door. "Type A" buses shall have upper glass panels (window) of safety glass with a minimum area of three-hundred-fifty square inches (350 sq. ins.).
- 2.14.6. Header Board: The head impact area on the inside top of the service or entrance door shall be protected by an energy-absorbing, padded header board, three inches (3") high and one inch (1") thick, extending the full width of the opening, to prevent injury when accidentally impacted.
- 2.15. SIDE DOORS OF CONVERTED VANS: The side doors of converted van shall be made inoperable by one of the following:
  - 2.15.1. Removal: The cargo doors on the side of converted vans shall be removed and the area reinforced and covered with riveted-on exterior and interior paneling.

<sup>11</sup> Powered Service Doors shall be clearly and concisely marked with operating instructions in case of power failure.

- 2.15.2. Side Reinforced: The doors may be left in place but shall be reinforced and made permanently inoperable by means other than the use of rub rails on the outside of the body.
- 2.16. SKIRT REINFORCEMENT: Side skirts of 15- through 20-passenger buses, if on commercial cutaway or stripped chassis, shall be gusseted or braced, where required, for rigidity and to prevent undue vibration.
- 2.17. VENTILATION: The bus body shall be equipped with a suitable, controlled ventilation system of sufficient capacity to maintain a satisfactory ratio of outside to inside air under normal operating conditions without opening windows except in warm weather.
- 2.18. WHEELHOUSING: The wheelhousing shall be the manufacturer's standard design. [See Paragraph C.1.10.: Undercoating Requirements.]
- 2.19. WINDSHIELD AND WINDOWS:
- 2.19.1. General Design:
- 2.19.1.1. Side Windows, Passenger, Standard: There shall be either a standard or a push-out type window for each passenger seat except where it is not possible because of the installation of side emergency exits [See Paragraphs C.2.4.2 and C.2.19.1.2]. Standard side windows shall open from the top only and shall operate freely. All side windows except the driver's and the service door window, shall be the split sash type with positive latch. Side windows that can be latched in an uneven position are not acceptable. They shall be furnished with a latching mechanism which will allow each window to be latched in a position not more than six inches (6") from the top. The passenger side windows shall provide an unobstructed opening twenty-two inches (22") wide and between nine and ten inches (9 -- 10") high. These windows shall include a metal stop pin, bar, or similar device to ensure that the windows can be lowered only within the mandatory limit. These latches and related mechanism (excluding the thumb regulator) shall be manufactured of metal. When in a closed position, all windows shall be weather-tight.
- 2.19.1.2. Side Windows, Passenger, Push-out Type<sup>12</sup>: At the manufacturer's option, 15- through 20-passenger buses may be provided with one (1) push-out side window in lieu of an emergency exit on each side [See Paragraphs C.2.4.1 and C.2.4.2 and Option No. 39]. These windows shall be hinged at the top and shall be positioned for ease of egress. These push-out windows shall be the body manufacturer's standard push-out passenger windows meeting or exceeding Federal Standards.

<sup>12</sup>

Push-out windows shall be equipped with an electrical switch connected to an audible signal automatically operated and located in the driver's compartment which shall indicate when the window is pushed out in excess of one-half inch (1/2"). The switch shall be enclosed to prevent tampering. Wires leading from the switch shall be concealed in the walls. No cut-off switch shall be installed in the circuit.

- 2.19.1.3. Service Door and Emergency Door Windows: The windows of either style emergency door and "Style II" service doors [See Paragraph C.2.4.1.] shall be furnished with upper glass panels permanently closed and set in rubber or sealed in rubber.
- 2.19.1.4. Windshield: The maximum width of the windshield center post shall not exceed two-and-one-half inches (2-1/2"). There shall be at least a two inch (2") clearance between the steering wheel and the windshield, cowl, instrument panel, or any other surface.
- 2.19.2. Glazing: Glass shall be installed in rubber channel gasket material or approved equivalent material. The glass shall be mounted so that the permanent identification mark is visible from either inside or outside of the bus. All safety glazing materials shall be approved by the Department of Public Safety. All exposed edges of glass shall be banded. The glass shall be as follows:
  - 2.19.2.1. Rear and Other Windows: The glass in the rear (side) windows, and all other windows including the driver's side windows and the emergency door windows, shall be a minimum of one-eighth inch (1/8") safety plate glass and shall be AS-2 or AS-3 grade as specified in ANSI Safety Code Z26.1.
  - 2.19.2.2. Safety Plate Glass: When so specified in the Invitation for Bid [See Option No. 16], all windows shall be AS-2 grade or better safety plate glass.
  - 2.19.2.3. Side Windows, Passenger: The glass in all passenger side windows (including push-out type emergency exit windows) shall be a minimum of one-eighth inch (1/8") safety plate glass and shall be AS-2 grade or better, as specified in ANSI Safety Code Z26.1.
  - 2.19.2.4. Windshield: The windshield shall be minimum seven-thirty-seconds inch (7/32") thick safety plate glass and shall be heat-absorbent, laminated AS-1 safety glass meeting NSI Standard Z26.1, as amended.
- 2.19.3. Tinting<sup>13</sup>:
  - 2.19.3.1. Side Windows, Passenger: When so specified in the Invitation for Bid [See Option No. 13], passenger side windows and push-out type emergency windows only shall be tinted to minimum light transmittance of thirty percent (30%), and a maximum light transmittance of forty percent (40%) using AS-3 grade glass. This is defined as "dark tinting" and is not permitted on the windshield or any window used for driving purposes.

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

**C.3. ACCESSORIES, REQUIRED AND OPTIONAL:**

- 3.1. **BACKUP ALARM:** An automatic, audible backup warning alarm meeting the requirements of Type C, 97 d (A), SAE J994b (except for twelve (12) volt system) shall be installed behind the rear axle.
- 3.2. **DEFROSTERS:** Defrosting equipment shall keep the windshield, the window to the left of the driver, and the glass in the service door clear of fog, 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 used in defogging and installed on the curb side of the bus front shall be mounted on the windshield header so as to protect the fingers, hair, and clothing of entering and departing passengers.
- 3.3. **EMERGENCY EQUIPMENT:** Fifteen passenger (15-) through 20-passenger school buses shall be equipped with the following emergency equipment:
- 3.3.1. **Body Fluid Cleanup Kit:** Each bus shall be provided with a removable and moisture-proof body fluid cleanup kit. It shall be properly mounted and identified as a Body Fluid Cleanup Kit. This kit shall contain as a minimum, the following items mounted in a removable metal or hard plastic kit:
- 1 -- 15 oz. chlorine-type absorbent deodorant material (or equal)
  - 1 -- 12 oz. germicidal spray disinfectant
  - 2 -- pair disposable latex gloves
  - 4 -- 18" x 18" absorbent towels
  - 1 -- plastic pick-up spatula
  - 1 -- plastic hand broom
  - 1 -- plastic dust pan
  - 2 -- 14" x 19" disposal bags and ties (waterproof)
  - 2 -- adhesive "BIO-HAZARD" 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 container identified as "BIO-HAZARD" with black symbol and lettering on orange mountable case.

**3.3.2. Fire Extinguishers:** School buses shall be equipped with a fire extinguisher, as listed below:

**3.3.2.1. Standard Fire Extinguisher:** Each bus shall be equipped with at least one (1) refillable stored pressure Multipurpose Dry Chemical type (or approved equal) fire extinguisher of minimum five pounds (5 lbs.) capacity, mounted in extinguisher manufacturer's automotive type bracket, and located in driver's compartment in full view of and readily accessible to driver. The fire extinguisher shall bear the Underwriters Laboratory Listing Mark of no less than 2A 10-B:C rating. Extinguishers shall be furnished with a hose, pressure gauge, and metal head.

**3.3.3. First Aid Kit:** Buses shall have a removable metal first aid kit container mounted in an accessible place within the driver's compartment. The compartment shall be marked to indicate the location of the kit. Number of units and contents for each kit shall be as follows:

- 2 -- 1 in. x 2 1/2 yds. adhesive tape rolls
- 24 -- sterile gauze pads 3 in. x 3 in.
- 100 -- 3/4 in. x 3 in. adhesive bandages
- 8 -- 2 in. bandage compress
- 10 -- 3 in. bandage compress
- 2 -- 2 in. x 6 yds. sterile gauze roller bandages
- 2 -- non-sterile triangular bandage approx. 40 in. x 54 in., 2 safety pins
- 3 -- sterile gauze pads 36 in. x 36 in.
- 3 -- sterile eye pads
- 1 -- rounded end scissors
- 1 -- pair latex gloves
- 1 -- mouth-to-mouth airway

**3.4. HEATERS AND RELATED COMPONENTS:**

- 3.4.1. Heater, Standard:** Each bus shall be equipped with a factory-installed fresh air type heater regularly offered as standard vehicle manufacturer's accessory for this type of vehicle. Controls shall be mounted on the dash.
- 3.4.2. Heater, Auxiliary:** When so specified in the Invitation for Bid [See Option No. 14], an auxiliary hot water type heater shall be furnished and installed in the rear of the passenger compartment of the bus. Heated conduits inside the bus shall be insulated or shielded to prevent injury to the driver or passengers.
- 3.4.3. Bleeder Valves:** Any heater (s) installed by the body manufacturer shall have accessible air bleeder valves installed in the return lines.
- 3.4.4. Service Accessibility:** Heater motors, cores, and fans shall be readily accessible for service. Access panels (removable without removing driver's seat) shall be provided as required for maintenance.

## C: 15- Through 20-Passenger Body Specifications

- 3.5. **MIRRORS, EXTERIOR:** Exterior mirrors shall conform to the requirements of FMVSS No. 111. Each 15- through 20-passenger school bus shall be provided with exterior mirrors and brackets as described below:
- 3.5.1. **Mirror System, Crossover:** The crossview 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 crossview 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.
- 3.5.2. **Mirror System, Rearview:** The rearview mirror system shall be capable of providing a view along the left and right sides of the bus which will provide the driver with a view of the rear tires at ground level, a minimum of two-hundred feet (200 ft.) to the rear of the bus and at least twelve feet (12 ft.) perpendicular to the side of the bus at a distance of thirty-two feet (32 ft.) back from the front bumper.
- 3.5.3. **Mounting and Mounting Brackets, Standard:** Mirror mounting and backing shall be of steel or a high-impact plastic such as a polycarbonate/polyethylene terephthalate blend, or approved equal. Mounting of all exterior mirrors to the bus body shall be by means of bolts, nuts, and lock washers, where possible; otherwise No. 10 hexagon head sheet metal bolts with star lock washers or No. 10 hexagon head sheet metal screws with serrated surface shall be used. This system of mirrors shall be easily adjustable but be rigidly braced so as to reduce vibration.
- 3.5.4. **Mirror Backing and Mounting, Stainless Steel, Optional:** When so specified in the Invitation for Bid, exterior rearview mirror backs and mounting brackets shall meet or exceed all of the applicable requirements of Paragraph C.3.5.3; above except the mirror backing and mounting shall be made of stainless steel.
- 3.5.5. **Painting:** Brackets and assemblies of all exterior rearview and crossover mirrors shall be cleaned and prepared for painting in accordance with Federal Specification TT-C-490B, Type I or II. The metal backs of stainless steel, aluminum, and chrome-plated exterior and crossover mirrors, if painted, and the backs of all other metal-backed exterior and crossover mirrors shall be black (Color No. 37038 of Federal Standard No. 595a).
- 3.6. **MIRRORS, INTERIOR:** A clear-vision interior rearview mirror conforming to FMVSS No. 111, with at least six inch by sixteen inch (6" x 16") size vision area, affording a good view of the road to the rear as well as of the passengers, shall be furnished and installed. The mirror shall be made of safety glass and have rounded corners and protected edges.
- 3.7. **REFLECTIVE MATERIAL<sup>14</sup>:** When so specified in the Invitation for Bid [See Option No. 19], buses shall be equipped with reflective material meeting the following

<sup>14</sup> Reflectivity of stop signal arm is to be addressed under Stop Signal Arm Section. Signs, if used, placed on the rear of the bus relating to school bus flashing signal lamps or railroad stop procedure may be of reflective material as specified.

requirements. The material shall be automotive engineering grade or better, shall meet the initial reflectance values in DOT FHWA FP-85 and shall retain at least fifty percent (50%) of those values for a minimum of six (6) years. Reflective materials and markings shall be installed in the following location:

- 3.7.1. Front and/or rear bumper may be marked diagonally forty-five degrees (45°) down to centerline of pavement with two inch (2") plus or minus one-fourth inch ( $\pm 1/4$ ") wide strips of non-contrasting reflective material.
- 3.7.2. Rear of bus body shall be marked with a strip of reflective National School Bus Yellow (NSBY) material to outline the perimeter of the back of the bus using material which conforms with the requirements of FMVSS 571.131 Table One (1). The perimeter marking of rear emergency exits per FMVSS No. 217 and/or the use of reflective "school bus" signs per Paragraph 3.7.3 below partially accomplish the objective of this requirement. To complete the perimeter marking the back of the bus, strips of at least one-and-three-fourths inch (1-3/4") reflective NSBY material shall be applied horizontally above the rear windows and above the rear bumper extending from the rear emergency exit perimeter marking outward to the left and right rear corners of the bus; and vertical strips shall be applied at the corners connecting these horizontal strips.
- 3.7.3. Sides of bus body shall be marked with reflective National School Bus Yellow material at least one-and-three-fourths inch (1-3/4") in width, extending the length of the bus body and located (vertically) between the floor line and the beltline.
- 3.8. STROBE LIGHT, Flashing: When so specified on Invitation for Bid [See Option No. 26], an optional white flashing strobe light meeting the following requirements shall be provided:
  - 3.8.1. Design: The lamp shall have a single clear lens emitting light flashing three-hundred-and-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.
  - 3.8.2. Mounting: The strobe light shall be permanently installed near the centerline on the school bus roof and not more than one-third of the body length forward of 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").

- 3.9. STOP ARM: A school bus stop arm meeting SAE J1133 and the following requirements shall be provided:
- 3.9.1. Design: The sign shall be octagon-shaped, constructed of zinc-coated steel or aluminum. It shall have a minimum one-half inch (1/2") wide white border and the word "STOP" in white letters at least six inches (6") high against a red background on both sides. The letters, border and background shall be of reflective materials meeting DOT FHWA FP-85. Double-faced red, alternately flashing lamps, or LED Stop Sign, flashing both sides, one each at the top and bottom (visible from each side of the structure) shall be connected to, and flash with the required school bus red flashing signal lamp circuit when the arm is extended. The arm mechanism may be activated by air pressure, electricity, or by vacuum.
  - 3.9.2. Mounting: The stop arm shall be installed on the left side of the school bus near the front cowl section.
- 3.10. STUDENT SAFETY CROSSING ARM: When so specified in the Invitation for Bid [See Option No. 25], each bus shall be equipped with a student safety crossing arm which shall meet or exceed SAE Standard J 1133. It shall be extended and retracted simultaneously with stop arm by means of the stop arm control. It shall be mounted to the right side of the front bumper by means of a four (4) point mounting assembly. All components and connections shall be weatherproofed. The unit shall be easily removable for the purpose of towing of the bus. The unit shall be constructed of nonferrous material or treated as per the body sheet metal standard and shall contain no sharp edges or projections that could cause hazard or injury to students. The crossing arm shall extend seventy-two inches (72") from the front bumper and shall not open more than ninety degrees (90°) when in the "extended" position. The mechanism may be activated by air pressure, electricity, or be vacuum.
- 3.11. SUN VISOR: An adjustable sun visor with a minimum size of five inches by sixteen inches (5" x 16") shall be installed above the interior windshield on the driver's side. The sun visor shall not interfere with the driver's full view of the rearview mirrors. A right sun visor is manufacturer's option.
- 3.12. TOOL COMPARTMENT: When so specified in the Invitation for Bid [See Option No. 30], a metal container of adequate strength and capacity 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 capable of being securely latched. However, if it is located inside the passenger compartment, it shall be provided with a separate cover, and shall be fastened to the floor in the right front or the right rear of the bus. A seat cushion shall not be used as this cover.
- 3.13. WINDSHIELD WASHERS AND WIPERS:
- 3.13.1. Washers: A vacuum- or electrical-operated windshield washer shall be furnished and installed. The washer shall have a minimum reservoir capacity of one (1) quart of fluid and shall direct a stream of water into the path of travel of each windshield wiper blade each time the actuating button is operated.



- 3.13.2. Wipers: A windshield wiping system, two (2) speed or variable speed, with an intermittent feature, shall be provided. The wipers shall be operated by one (1) or more air or electric motors of sufficient power to operate wipers. If one (1) motor is used the wipers shall work in tandem to give full sweep of windshield.

C.4. APPROVAL OF NEW BUS BODIES: Procedures for approving a new bus body for 15-through 20-passenger school buses shall be as follows in the order indicated:

4.1. SUBMISSION OF REQUEST: Submit a written request that the body be approved along with the following:

4.1.1. Letter: Letter stating that the body meets or exceeds each and every applicable requirement in Texas Specification No. 070-SB-98.

4.1.2. Literature and drawings: [See Paragraph A.6.5.].

4.2. REVIEW OF REQUEST: The Commission will review the literature and drawings and advise the vendor or manufacturer by letter of the results of this review. A copy of this letter will be furnished to the School Bus Committee. If this review verifies that the bus body meets or exceeds the requirements of this specification, the vendor or manufacturer shall arrange for the school bus to be brought to Austin, Texas for inspection and evaluation by the Commission and the Texas School Bus Committee.

4.3. INSPECTION AND EVALUATION<sup>15</sup>:

4.3.1. The bus body shall be inspected using the current School Bus Inspection Check List.

4.3.2. The bus body will be evaluated and if found suitable for the intended purpose, the Commission will issue a letter to the manufacturer listing the model as approved for the capacities requested. If found not suitable, the Commission will issue a letter to the vendor or manufacturer giving the reason (s) for disapproval.

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Once a bus body is approved for one passenger capacity, other capacities of this same body differing only in length and capacity need not be inspected and evaluated prior to approval. The vendor or manufacturer shall request by letter that these other body lengths/models be approved.

## C: 15- Through 20-Passenger Body Specifications

- C.5. **COMPARISON OF SMALL BUS BODIES:** Table Number Two (2) lists the features of the various body configurations for 15- through 20-passenger school buses. The 24-passenger bus body configurations are included in this Table for reference. [See Figure No. One (1) for the various chassis types available for some of these school bus bodies.]

**TABLE NUMBER TWO (2)  
COMPARISON OF SMALL SCHOOL BUS BODIES**

Passenger Capacity	Service Door	Emergency Door	Rear Wheels	Min. Body Width <sup>1</sup>	Body Sides	Min. Interior Height	Chassis Type	Body Mfg. & Model/Name/No.
15	Sedan	Dual	Single	70"	Sloping	62"	Van	Econo, Reddi-Bus, Van-Con
15	Tall	Dual or Single	Single	75"	Straight or Sloping	64"	Van or Cutaway	Bantam, Super Bantam, Guide DW
15	Tall	Dual	Dual	90"	Sloping	72"	Cutaway	Micro-Bird, Minotaur SRW, Guide DW
15	Tall	Single	Dual	87"	Straight	62"	Cutaway	VSS
16	Tall	Single	Dual	90"	Straight	72"	Cutaway	Chaperone, ClassMate, Micro-Bird, VSS, Bussette, Spr. Btm, MB-20 Guide DW
18	Tall	Dual	Single	70"	Sloping	64"	Van or Cutaway	
18	Tall	Dual or Single	Single	75"	Straight	64"	Van or Cutaway	Bantam, Super Bantam, Guide SW
18 (w/ Option No. 15)	Sedan	Dual	Single	70"	Sloping	63-1/2"	Van or Cutaway	Bantam, Super Bantam, Van Con
19	Tall	Single	Dual	87"	Straight	72"	Cutaway	Chaperone, ClassMate, Micro-Bird, Minotaur, VSS, Spr. Btm., MB-20, Guide DW, Grand Bantam
19 (w/ Option No. 11)	Sedan	Single	Dual	87"	Straight	62"	Cutaway	Vanguard
20	Tall	Single	Dual	78"	Straight	72"	Cutaway or Stripped Cadet	Spr. Btm., MB-20, Guide DW, Minotaur G.P., Mini-Bird Cadet, Grand Bantam
<sup>1</sup> Minimum interior width at shoulder line for the models listed.								

**Note:**

Bantam	=	Collins	Econo	=	Collins	MB-20	=	Blue Bird
Guide SW	=	MidBus	Micro-Bird	=	Blue Bird	Super Bantam	=	Collins
Guide DW	=	MidBus						
Cadet	=	Carpenter	Mighty-Mite	=	Thomas	VSS	=	Ward
			Mini-Bird	=	Blue Bird	Van Con	=	Van Con
ClassMate	=	Carpenter	Minotaur	=	Thomas	Grand Bantam	=	Collins