

F. 24- THROUGH 83-PASSENGER CHASSIS SPECIFICATIONS

F.1. GENERAL REQUIREMENTS:

- 1.1. **GENERAL SPECIFICATIONS:** The requirements for gross vehicle weight ratings (gross vehicle weight rating (GVWR), gross axle weight ratings (front and rear) (GAWRs) and tire sizes and load ranges, as specified in Table No.'s Twelve through Twenty-eight (12 -- 28) for each size chassis are minimum requirements [See Paragraph A.4.5]. The requirements are for school buses with standard equipment. The added weights of optional equipment such as alternative fuel storage tanks, air conditioning, luggage racks, lifts for the physically impaired or 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.
- 1.2. **COLOR:** The chassis, including bumpers and wheels shall be enameled or powder coated black (Color 17038); cowl, fenders and hood shall be painted school bus yellow (Color 13432).

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

2.1. AXLES:

- 2.1.1. **Axle Capacities:** Axle capacities and gross axle weight ratings (GAWRs) shall be as specified in Table No.s' Twelve through Twenty-eight (12 --28) for each make of vehicle. Increased axle capacities shall be furnished to accommodate optional equipment such as diesel engines or other heavy accessories as required [See Paragraphs A.4.5, F.1.1, and G.1.7.2.].
- 2.1.2. **Rear Axle Ratios:** Rear axle ratios shall be compatible with the required engines and gradeability requirements for school buses driven at governed top rated road speeds of fifty-five miles per hour (55 mph) minimum [See Paragraph F.5.3.4.].

2.2. BRAKES AND RELATED COMPONENTS:

- 2.2.1. **Air Brakes and Associated Equipment:** Each 59-, 65-, 71-, 77- and 83-passenger chassis shall be equipped with full anti-lock air brakes and parking brake systems as standard equipment. Full air brake systems shall meet the requirements of FMVSS No. 121 as applicable to school buses. The following equipment shall be furnished as follows:
 - 2.2.1.1. **Air Compressor:** Buses equipped with air brakes shall have an air compressor of sufficient capacity to provide adequate air pressure for the air brake system. The air compressor on 83-passenger buses shall have a minimum twelve cubic feet (12 cu. ft.) capacity.
 - 2.2.1.2. **Air Tanks:** The air tank (s) shall be equipped with automatic valves to drain condensation from the tanks.
 - 2.2.1.3. **Automatic Moisture Ejectors:** Automatic moisture ejectors shall be furnished and installed.

- 2.2.1.4. Automatic Slack Adjusters: Four (4) automatic slack adjusters shall be furnished and installed, two (2) at the front and two (2) at the rear.
- 2.2.1.5. Visual Brake Stroke Adjustment Indicators: Visual Brake Stroke Adjustment Indicators shall be furnished at each brake location.
- 2.2.2. Hydraulic Brakes: The 24-, 35-, 47- and 53- passenger school bus chassis shall have as standard, hydraulic service brakes, emergency stopping system, and parking brakes meeting the requirements of FMVSS No. 105-83. If so specified in the Invitation for Bid [See Option No. 6], the 59-, 65-, 71-, and 77-passenger school buses shall be equipped with hydraulic brakes.
 - 2.2.2.1. The hydraulic braking system shall include the service brake, an emergency brake that is a part of the service brake system and controlled by the service brake control, and a parking brake.
- 2.3. HUBODOMETER, OPTIONAL: When so specified in the Invitation for Bid [See Option No. 15], chassis shall be equipped with one (1) hubodometer with standard mounting bracket which shall be calibrated in miles and installed by the manufacturer. The preferred mounting location is on the right rear axle drive wheel. The hubodometer shall be one of the following:
 - 2.3.1. Accu-Trak, Standard Car Truck, Park Ridge, IL 60068.
 - 2.3.2. Engler Instruments, 250 Culver Ave., Jersey City, NJ 07305.
 - 2.3.3. Veeder-Root, Hartford, CT 06102.
- 2.4. SHOCK ABSORBERS: Two (2) front heavy-duty, double-acting shock absorbers shall be installed.
- 2.5. SPRINGS: Springs or suspension assemblies shall be of ample resiliency under all load conditions and of adequate strength to sustain the loaded bus without evidence of overload. Springs or suspension assemblies shall be designed to carry their proportional share of the gross vehicle weight as shown in Tables No.'s Twelve through Twenty-eight (12 -- 28). Rear springs shall be of the progressive type. If leaf type front springs are used, stationary eyes shall be protected by a full wrapper leaf in addition to the main leaf.
- 2.6. TIRES AND WHEELS:
 - 2.6.1. Tires: All standard tires shall be the steel belted radial tubeless type. All tires shall be new and the tread style furnished shall be the tire manufacturer's standard design and the brand normally furnished on regular production orders. All tires shall be "Original Equipment Line Quality." Schools may order Mud and Snow tread design tires [See Option No. 29]. For tire size and load range for each size chassis, see Table No.'s Twelve through Twenty-eight (12 -- 28).
 - 2.6.2. Wheels: Each chassis shall be equipped with six (6) standard steel disc type wheels. When so specified in the Invitation for Bid [See Option No.'s

31 and 32], the following optional wheels and carrier shall be furnished on the chassis as indicated:

2.6.2.1. Wheel, Spare, Mounted with Carrier but not tire (or tube); For 35-through 83-passenger only; See Option No. 32³¹.

2.6.2.2. Wheel, Spare, Unmounted without Carrier, Tire, or Tube); For 24-through 77-passenger buses; See Option No. 31.

F.3 CHASSIS FRAME AND RELATED COMPONENTS:

- 3.1. **BUMPER, FRONT:** The front bumper shall be furnished by the chassis manufacturer and must extend to the outer edges of the body at the bumper top line (to assure maximum fender protection). The front bumper shall be heavy duty transit type, not less than three-sixteenth inches by nine-and-one-half inch (3/16" x 9-1/2") steel (nine-and-three-fourth inches (9-3/4")) for the 83-passenger bus). It must be of sufficient strength to permit pushing a vehicle of equal gross weight without permanent distortion to the bumper, chassis, or body. The bumper shall be painted black (Color No. 17038).
- 3.2. **CHASSIS FRAME SIDE MEMBERS:** Each frame side member shall be of one-piece (1-piece) construction between the rear most spring hanger and the forward most spring hanger. If the frame side members are extended, such extension shall be designed, furnished, and guaranteed by the installing manufacturer. The installation shall be made by either the chassis or body manufacturer. Extensions of frame lengths are permissible only when such alterations are welded on behind the hanger of the rear spring. This specification does not permit wheelbase extensions. Any welding, heating (for frame straightening or repairs), or the drilling of holes in chassis frame members shall be in accordance with chassis manufacturer's recommendations.
- 3.3. **FUEL TANKS, CONVENTIONAL FUEL:** Standard and auxiliary fuel tanks shall meet FMVSS No. 301 as applicable to school buses and shall meet the current design objectives of the SBMTC. Fuel tanks installed on Texas school buses shall have a minimum "draw" of eighty-three percent (83%) of capacity.
 - 3.3.1. **Fuel Tank (s), Standard:** The standard fuel tank for 47- through 83-passenger school buses shall have a minimum capacity of sixty (60) gallons, except the 47- and 53-passenger forward control bus may have a minimum capacity of thirty-five (35) gallons. The 24- and the 35-passenger buses shall have fuel tanks with minimum capacities of twenty (20) and thirty (30) gallons, respectively. The tank (s) shall be mounted, filled, and vented entirely outside the body [See Paragraph F.5.5.3.].
 - 3.3.2. **Fuel Tank (s), Optional:** When so specified in the Invitation for Bid [See Option No. 12], the 24- and the 83-passenger buses shall be furnished with minimum capacity fuel tank or tanks of thirty (30) and ninety (90) gallons, respectively. The optional fuel tank for the 24-passenger bus shall be furnished and installed by the chassis manufacturer. Thirty-five (35-) through 59- passenger buses do not have optional fuel tanks available. Sixty-five (65-) and 77-passenger buses shall have a minimum one-hundred (100) gallon total capacity optional fuel tank (s).

³¹ Carrier not available for 24-passenger bus; spare wheel only is available on this option.

- 3.3.3. **Material:** Each tank (including auxiliary fuel tanks) shall be constructed of sixteen (16) gauge terneplate or equivalent and shall be equipped with baffles. Each tank may be mounted between the frame rails of the chassis.
- 3.4. **FUEL TANKS, ALTERNATIVE FUEL:** Fuel tank (s) for alternative fuels [See Option No. 3] shall meet or exceed all of the rules and regulations of the Texas Railroad Commission (RRC), the requirements of FMVSS No. 304 and others, as applicable. Capacity shall be that required to meet the range requirements of the Option or as specified in the Invitation for Bids.
- 3.5. **HOOD, TILTING:** A forward-tilting hood, giving access to the engine compartment shall be furnished on conventional bus chassis (except 24- and 83-passenger buses).
- 3.6. **STEERING, POWER:** The bus shall be furnished with the chassis manufacturer's standard power steering which will provide safe and accurate performance at maximum load and speed. The mechanism must provide for easy adjustment for lost motion unless the unit doesn't require adjustment due to design. No changes shall be made in the power steering apparatus which are not approved by the chassis manufacturer.

F.4. ELECTRICAL SYSTEM AND RELATED COMPONENTS:

- 4.1. **ALTERNATORS:** The twelve (12) volt alternators with rectifier shall have the electrical outputs and the minimum charging rates shown below when tested in accordance with SAE rating at the manufacturer's recommended engine speed. These alternators shall be ventilated and voltage controlled and, if necessary, current controlled. Dual belt drive or a single serpentine belt shall be used with the alternators provided on the 35- through 83-passenger buses:
- 4.1.1. **Alternator, Standard:** The 24- through 83-passenger buses shall have a standard alternator with a minimum electrical output of one-hundred-thirty amperes (130 amps).
- 4.1.2. **Alternator, Optional:** When so specified in the Invitation for Bid [See Option No. Four (4)], the 24- through 83-passenger chassis shall have an alternator with a minimum electrical output of one-hundred-sixty amperes (160 amps).
- 4.1.3. **Alternators, Other:** School buses equipped with the following equipment shall have alternators meeting the following requirements:
- 4.1.3.1. **Air-Conditioned Buses:** Buses equipped with air conditioning shall have alternators with a minimum electrical output of one-hundred-thirty amperes (130 amps).
- 4.1.3.2. **Wheelchair Lift-Equipped Buses:** Buses equipped with wheelchair lifts shall have alternators with a minimum electrical output of one-hundred-thirty amperes (130 amps).
- 4.1.3.3. **Air-Conditioned and Wheelchair-Equipped Buses:** Buses equipped with both air conditioning and wheelchair lifts shall have alternators with a minimum electrical output of one-hundred-sixty amperes (160 amps).

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4.2. BATTERY AND RELATED COMPONENTS: The storage batteries furnished on each chassis shall have sufficient capacity to supply current for adequate operation of the engine starter, lights, signals, heater, and all other electrical equipment. The batteries for 24- through 83-passenger school buses shall have an potential of six or twelve (6 or 12) volts and meet the following:

4.2.1. Battery, Diesel Engines: Batteries shall be single or dual twelve (12) volt or dual six (6) volt as specified by the chassis manufacturer. The minimum performance level shall be a BCI cold cranking capacity (CCA) of not less than four-hundred-fifty amperes (450 amps) at zero degrees (0°F) with a minimum one-hundred-thirty (130) minute reserve capacity except for the 24-passenger bus which shall have a minimum three-hundred-sixty (360) cold cranking capacity (CCA) and one-hundred (100) minute reserve capacity.

4.2.2. Battery, Gasoline Engines: Batteries shall be twelve (12) volts with a minimum performance level of BCI cold cranking capacity (CCA) of not less than three-hundred-sixty amperes (360 amps) a zero degrees (0°F) with a minimum one-hundred (100) minute reserve capacity.

4.2.3. Battery (s), Alternative Fueled Vehicles: Dedicated alternative fueled vehicles shall have batteries meeting or exceeding those required for a gasoline engine school bus with comparable horsepower.

4.2.4. Battery Cables: The battery cables shall be one piece and of sufficient length to allow pull out or lift out of the battery for servicing or removal and arranged so as to prevent damage to the battery posts when removed.

4.2.5. Mounting: The preferred battery mounting location for gasoline-powered buses is outside the body shell under the hood in an adequate carrier and readily accessible for maintenance and removal from above or outside. [See Paragraph E.2.3.].

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

4.4. INSTRUMENTS AND INSTRUMENT PANEL: The bus shall be equipped with the following nonglare illuminated instruments (controlled by an independent rheostat³²), and gauges mounted for easy maintenance and repair and clearly visible to the seated driver. Indicator warning lights in lieu of gauges are not acceptable.

4.4.1. Air Pressure Gauge (air brake equipped).

4.4.2. Ammeter (or Voltmeter) with graduated charge and discharge indications.

4.4.3. Fuel Gauge.

³² If the intensity of the body-installed panel lamps is controlled, then the intensity control shall not be accomplished by the same rheostat that controls the chassis instrument lamps, unless the body company designs and installs the rheostat to accomplish both.

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- 4.4.4. Glow Plug Indicator Light (for diesel buses with glow plugs only).
- 4.4.5. High Beam Headlamp Indicator.
- 4.4.6. Odometer (Six (6) digits, i.e., register to 99,999.9 miles).
- 4.4.7. Oil Pressure Gauge.
- 4.4.8. Speedometer.
- 4.4.9. Vehicle manufacturer's standard keyed ignition switch.
- 4.4.10. Water temperature gauge.
- 4.5. **LAMPS:** Each bus shall be equipped with at least two clear headlamps meeting the requirements of FMVSS No. 108 and a dimmer switch located on or near the steering column. Adequate parking lamps operated by a switch in common with the headlamps shall be provided.
- 4.6. **WIRING:** The chassis manufacturer shall provide a readily accessible terminal strip or plug on the body side of the cowl, or at an accessible location within the engine compartment, with the following minimum terminals for the body connections:
 - 4.6.1. Backup Lamps.
 - 4.6.2. Instrument Panel Lights (rheostat controlled by head lamp switch).
 - 4.6.3. Left Turn signals.
 - 4.6.4. Right turn signals.
 - 4.6.5. Stop lamps.
 - 4.6.6. Tail lamps.

F.5. ENGINE AND RELATED COMPONENTS:

- 5.1. **AIR CLEANER:** Each chassis shall be equipped with a factory-installed maximum capacity, heavy-duty replaceable dry element type air cleaner. The intake air system for diesel engines shall have an air cleaner restriction indicator properly installed by the chassis manufacturer to meet manufacturer's engine specifications.
- 5.2. **COOLING SYSTEM:** The cooling system radiator shall be heavy-duty with increased capacity to cool the engine at all speeds in all gears. The cooling system fan shall be the heavy-duty reinforced type with a fan clutch. Thin pressed fan blades are not acceptable.
- 5.3. **ENGINES:** Approved engines listed in each table for the various size buses are the engines for which the vendor has requested approval and are usually the smallest engine in terms of performance that will meet the requirements listed below. Other approved engines which the vendor may provide with a given chassis will be listed also in an Approved Products List (APL). The APL will be updated as new engines or additional versions of current engines are approved. Please note that only those engines approved as specified below and listed either in the Texas School Bus Specification or in the Class 070-SB-APL will be acceptable for school buses.

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- 5.3.1. Diesel Engines:** When so specified in the Invitation for Bid [See Option No. Eight (8)], a bus chassis having a gasoline engine listed as standard, shall be furnished with a four (4) cycle diesel engine. Diesel engines are standard for 47-through 77-passenger and the 83-passenger forward control buses.
- 5.3.2. Gasoline Engines:** Engines for the 24- through 71-passenger conventional and semi-forward control, and the 77-passenger school buses shall be of the gasoline type unless otherwise specified in the Invitation for Bids. Approved engines are listed in Table No.'s Twelve through Twenty-eight (12 -- 28) and in the Class 070-SB APL.
- 5.3.3. Alternative Fuel Engines:** When so specified in the Invitation for Bid [See Option No. Three (3)], the 24- through 83 passenger buses shall be equipped by the chassis manufacturer (or approved designator) with engines capable of operating on alternative fuels.
- 5.3.4. Power Requirements:** Each bus shall be furnished with an engine that meets or exceeds the following minimum criteria See Paragraph F.5.3.5.7. Notes], when tested at or above the gross vehicle weight rating (GVWR) required for a given bus capacity and with all accessories except air conditioning compressor on and operating:
- 5.3.4.1.** Acceleration from zero to fifty miles per hour (0--50 mph) in sixty (60) seconds or less.
 - 5.3.4.2.** Gradeability of one-and-one-half percent (1.5%) minimum at fifty miles per hour (50 mph).
 - 5.3.4.3.** Gradeability of five percent (5%) minimum at twenty-five miles per hour (25 mph).
 - 5.3.4.4.** Startability of twenty percent (20%) minimum.
 - 5.3.4.5.** Top speed of fifty-five miles per hour (55 mph) minimum at the manufacturer's rated rpm for the governed engine.
- 5.5. EXHAUST SYSTEM:**
- 5.5.1. Component Placement:** The exhaust pipe, muffler, and tailpipe shall be mounted under the bus and attached to the chassis frame.
- 5.5.2. Noise Level:** The noise level shall neither exceed EPA "Noise Emission Standards" nor eighty-five (85) decibels at the ear of the occupant in the bus nearest to the noise source in the bus. When so specified in the Invitation for Bid [See Option No. 24], the bus shall be furnished with sufficient sound insulation to reduce the noise level to less than eight-six (86) decibels measured at the same place.
- 5.5.3. Tailpipe:** The tailpipe shall be constructed of seamless or electrically welded tubing of sixteen (16) gauge steel or equivalent, and shall extend at least five inches (5") beyond the chassis frame. The size of the tailpipe shall not be reduced after it leaves the muffler.

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5.5.4. Tailpipe Exit: The tailpipe of a gasoline-powered bus shall not exit the side of the bus anywhere within twelve inches (12") of a vertical plane through the center of the fuel filler opening and perpendicular to the side of the bus, unless protected with a metal shield to divert spilled fuel away from tailpipe.

5.6. FUEL FILTER: Each diesel engine shall be equipped with a fuel filter of the full-flow design, installed between the fuel tank and the injector pumps.

5.7. GOVERNOR: A governor set to the manufacturer's recommended maximum engine speed (RPM) shall be installed by the engine manufacturer. When engine is remotely located from driver, the governor shall be set to limit engine speed to maximum revolutions per minute recommended by engine manufacturer, and a tachometer shall be installed so the engine speed may be known to the driver.

5.8. OIL FILTER: Each chassis shall be equipped with a factory-installed, minimum one quart (1 qt.) capacity oil filter with a replaceable element or cartridge type. It shall be connected by flexible oil lines if it is not of the built-in or engine-mounted design.

5.9. TACHOGRAPH: When so specified in the Invitation for Bid [See Option No. 27], a tachograph containing a combination clock/speedometer/recorder shall be installed on the dashboard. The tachograph shall be Argo Model (s) 1310-6, Veeder-Root Model AB-1407, or approved equal.

5.10. THROTTLE: The force required to operate the throttle shall not exceed sixteen pounds (16 lbs.) throughout the full range of accelerator pedal travel.

D.6. APPROVAL OF NEW ENGINES: Procedures for approving a new bus engine for 15- through 20-passenger school buses shall be as follows in the order indicated:

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

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

6.1.2. Literature and applicable power curves showing horsepower and torque:

6.2. REVIEW OF REQUEST: The Commission will review the literature and performance charts 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 engine 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 if requested.

F.7. TRANSMISSION AND RELATED COMPONENTS: The 24- through 77-passenger school buses shall be equipped with a manual or an automatic transmission whichever is selected by the school district on the school bus requisition form. **Note:** An electronic control or similar device may be installed to ensure that automatic transmissions cannot accidentally be moved out of the neutral or park gear position while the driver is not in the driver's seat.

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- 7.1. **AUTOMATIC TRANSMISSION, CHASSIS MANUFACTURER'S:** Unless otherwise specified in the Invitation for Bid, the 24-passenger bus shall be furnished with a minimum three (3) forward speed automatic transmission which shall be the chassis manufacturer's standard automatic transmission for this type of chassis.
- 7.2. **AUTOMATIC TRANSMISSION (ATD MODEL AT 545):** Unless otherwise specified in the Invitation for Bid, the 35- through 71-passenger and the 77-passenger conventional buses shall be furnished with a minimum four (4) forward speed automatic transmission. The transmission shall be the ATD Model AT 545, or approved equal [See Paragraph F.6.], unless an ATD Model MT-643 is required to match engine torque. The application will conform to the manufacturer's recommended capacity limits of 30,000 gross vehicle weight rating (GVWR) and/or four-hundred-forty-five pounds per foot (445 lb.-ft.) maximum torque rating for AT-545 transmissions.
- 7.3. **AUTOMATIC TRANSMISSION (ATD MODEL MT-643):** Unless otherwise specified in the Invitation for Bid, the 77- and 83-passenger forward control buses (and others, as required by increased torque rating of optional or standard engines), shall be furnished with a minimum four (4) forward speed automatic transmission. The transmission shall be the ATD Model MT-643, or approved equal.
- 7.4. **DRIVE SHAFT GUARD³³:** Each drive shaft section shall be equipped with protective metal guard or guards to prevent the shaft from whipping through the floor or dropping to the ground when broken.
- 7.5. **MANUAL TRANSMISSIONS:** Unless otherwise specified in the Invitation for Bid, the manual type transmission shall be furnished on all 24- through 77-passenger buses (but not the 83-passenger bus, which require an automatic transmission). The transmission shall be the synchromesh (all gears except first and reverse) type. It shall be of sturdy construction, and the input torque capacity shall be at least ten percent (10%) above the maximum net torque developed by the engine. Its design shall provide for four forward and one reverse speeds for the 24-passenger chassis, and five (5) forward (direct in fifth) and one (1) reverse speed for 35-, 47-, 53-, 59-, 65-, 71-, and 77-passenger chassis.
- 7.6. **MANUAL TRANSMISSION CLUTCH:** The clutch in buses equipped with manual transmissions shall have a torque capacity not less than ten percent (10%) in excess of the maximum net torque output of engine. The diameter of the clutches for the various sizes of buses equipped with manual transmissions shall be as follows:
- 7.6.1. **Twelve inch (12") Clutch:** All chassis for the 24-, 35-, 47-, 53-, and 59-passenger buses with manual transmissions shall be equipped with a minimum twelve inch (12") diameter clutch.

³³ Drive shaft guard is not required on rear engine, rear-drive bus.

TABLE NO. TWELVE (12)
24-PASSENGER BUS CHASSIS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
Refer to General Requirements, Page 7

24-Passenger ITEM	1998 Min. Rqmts.	GMC/Chevrolet P31042/P31442 P31062	Navistar 3600 Navistar 3400
GVWR, lbs.	14500	14500	16500/ 16500
GAWR, lbs. Front	5000	5000	6000 6000
GAWR, lbs. Rear	11000	11000	10500 10500
Axle Capacity, lbs. Front	5000	5000	6000 6000
Axle Capacity, lbs. Rear	11000	11000	13500 13500
Wheelbase, in.	133/152	133/157	138/152 154
Chassis Length, in.	As Shown	238.8/262.8	268.8/274.8 259.8
Track, in. Front	65.2	65.2	81.0 81.0
Track, in. Rear	66.7	66.7	82.0 82.0
Gasoline Engine, L ¹	**2	5.7L-V8	*1 *1
SAE Gross Horsepower	**2	180	*1 *1
SAE Gross Torque, lb-ft	**2	295	*1 *1
Transmission: Automatic, Gears	4 spd	4L80E/A4OD	AT-542/545 AT-542/545
Transmission: Manual, Fwd. Gears	4 spd	NA	NA NA
Tires, Steel Belted Radial	Tubeless		
Size & Load Range	As Shown	8.00R19.5E	225-70R19.5F 225/70R19.5F
Wheels, Rear	Dual	Dual	Dual Dual
Alternator, Amperes	100	100	100 105
¹ * See diesel engine, Option No. 8.			
² ** See minimum power requirements in Paragraph F.5.3.4.			

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Diesel Engines [Option No. 8]

24-Passenger ITEM	1998 Min. Rqmts.	Navistar 3600 Navistar 3400
Engine Displacement, L.	**1	7.3T-V8 T-444E
SAE Gross Horsepower	**1	175 175
SAE Gross Torque, lb-ft.	**1	430 430
***See minimum power requirements in Paragraph F.5.3.4.		

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

24-PASSENGER BUS BODIES

The following bodies are available on semi-forward control or stripped chassis:

24-Passenger ITEM	1998 Min. Rqmts.	Blue Bird Mini-Bird MB-20	Carpenter Cadet	Thomas Minotaur GP/Vista	MidBus/ SC 429 SC 529	US Bus GP/Eagle
Interior Headroom, in.	73	74/77	77	73	79	78
Interior Width, in.	90	90.5	90	90	90	91
Service Door	As Shown	Tall	Tall	Tall	Tall	Tall

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TABLE NO. THIRTEEN (13)
35-PASSENGER CONVENTIONAL BUS³⁴
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
Refer to General Requirements, Page 7

CHASSIS		B	N	F
35-Passenger Conv. ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3800* ¹ 3600* ¹ 3400* ¹	Freightliner FS-65
GVWR, lbs.	21500	23100	21500 21500 19500	23000
GAWR, lbs. Front	6000	8100	6000 6000 6000	8000
GAWR, lbs. Rear	15000	15000	15500 15500 13500	15000
Axle Capacity, lbs. Front	6000	8100	6000 6000 6000	8000
Axle Capacity, lbs. Rear	15000	15000	15500 15500 15500	15000
Wheelbase, in.	151	157/175	152/170 152 170	150
Cowl-to-Axle, in.	127	133/151	127 155 102	128
Back of Cab-to-Axle, in.				
Cowl-to-Frame End, in.	217	223/244	217 245 188	205
Back of Cab-to-Frame End, in.				
Gasoline Engine CID** ²	*** ³	6.0L-V8	* ¹ * ¹ * ¹	* ¹
SAE Gross Horsepower	*** ³	225	* ¹ * ¹ * ¹	* ¹
SAE Gross Torque, lb-ft.	*** ³	340	* ¹ * ¹ * ¹	* ¹
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545 AT-545 AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	M5 M5 NA	M5

³⁴ Buses ordered in this capacity (35-Passenger) may be either Conventional or Semi-forward control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

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Brakes: Front Disc Rotor, in.	As Shown	14.75 x1.34	15 x 1.44 15 x 1.44 15 x 1.44	15.00 x 1.44
Brakes: Rear Lining/Rotor, in.	As Shown	14.75 x1.34	15 x 1.44 15 x 1.44 15 x 1.44	15.00 x 1.44
Tires, Steel Belted Radial	Tubeless			
Size & Load Range	9R22.5F	9R22.5F	9R22.5F 9R22.5F 225/70R19.5F	9R22.5F
Wheels: Rear	Dual	Dual	Dual Dual Dual	Dual
Wheels: Rim Size, in.	6.75	7.5	6.75 6.75 6.75	8
¹ *Furnished with diesel engine only, Option No. 8.				
² **See diesel engine, Option No. 8.				
³ ***See minimum power requirements in Paragraph F.5.3.4.				

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. See Option 3A.

DIESEL ENGINES [Option No. 8]

35-Passenger ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3600/3800 3400	Freightliner FS-65
Engine Displacement, L.	*** ¹	6.6T-I6	7.3T-V8 T-444E	5.9T-I6
SAE Gross Horsepower	*** ¹	170	175 175	175
SAE Gross Torque, lb-ft.	*** ¹	420	430 430	420
GAWR, Front	6000	8100	6000 6000	8000
¹ ***See minimum power requirements in Paragraph F.5.3.4.				

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4.]

35-PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combination are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas	MidBus	Freightliner
Models	CS-18	1808	SB1808	0510/0511/0600	SC-629	FS-65
Chassis Available	N	B, N	N	N-S, N	N	B, S, T

F. 24- Through 83-Passenger Chassis Specifications

TABLE NO. FOURTEEN (14)
47-PASSENGER CONVENTIONAL BUS³⁵
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
Refer to General Requirements, Page 7

CHASSIS		B	N	F
47- Passenger Conv. ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3800* ¹ 3600* ¹ 3400* ¹	Freightliner FS-65
GVWR, lbs.	21500	23100	21500 21500 21500	23000
GAWR, lbs. Front	6000	8100	6000 6000 6000	8000
GAWR, lbs. Rear	15000	15000	15500 15500 15500	15000
Axle Capacity, lbs. Front	6000	8100	6000 6000 6000	8000
Axle Capacity, lbs. Rear	15000	15000	15500 15500 15500	15000
Wheelbase, in.	193	193	193 193 202	191
Cowl-to- Axle, in.	168	169	168 196	169
Back of Cab-to-Axle, in.			134	
Cowl-to-Frame End, in.	274	279	274 302	262
Back of Cab-to-Frame End, in.			246	
Gasoline Engine CID**2	***3	6.0L-V8	*1 *1 *1	*1
SAE Gross Horsepower	***3	225	*1 *1 *1	*1
SAE Gross Torque, lb-ft.	***3	340	*1 *1 *1	*1
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545 AT-545 AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	M5 M5 NA	M5

³⁵

Buses ordered in this capacity (47-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

F. 24- Through 83-Passenger Chassis Specifications

Brakes: Front Disc Rotor, in.	As Shown	14.75 x 1.34	15 x 1.44 15 x 1.44 15 x 1.44	15.00 x 1.44
Brakes: Rear Lining/Rotor, in.	As Shown	14.75 x 1.34	15 x 1.44 15 x 1.44 15 x 1.44	15.00 x 1.44
Tires, Steel Belted Radial	Tubeless			
Size & Load Range	9R22.5F	9R22.5F	9R22.5F 9R22.5F 245/70R 19.5G	9R22.5F
Wheels: Rear	Dual	Dual	Dual Dual Dual	Dual
Wheels: Rim Size, in.	6.75	7.5	6.75 6.75 6.75	7.5
¹ *Furnished with diesel engine only, Option No. 8.				
² **See diesel engine, Option No. 8.				
³ ***See minimum power requirements in Paragraph F.5.3.4.				

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option 3A].

DIESEL ENGINES [Option No. 8]

47-Passenger ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3600/3800 3400	Freightliner FS-65
Engine Displacement, L.	***1	6.6T-I6	7.3T-V8 T-444E	5.9T-I6
SAE Gross Horsepower	***1	170	175 175	175
SAE Gross Torque, lb-ft.	***1	420	430 430	420
GAWR, Front	6000	8100	6000 6000	8000
¹ ***See minimum power requirements in Paragraph F.5.3.4.				

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

47-PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas	MidBus	Freightliner
Models	CS-23	2311	SB2304	0701/0710	SC829	FS-65
Chassis Available	N	B, N	N	N-S, N	N	B, S, T

TABLE NO. FIFTEEN (15)
47-PASSENGER FORWARD CONTROL BUS³⁶
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
 Refer to General Requirements, Page 7

CHASSIS		B	S	N	T-A
47- Passenger ITEM	1998 Min. Rqmts.	Blue Bird TCFE	Carpenter Counselor	Navistar Genesis	Thomas Saf-T-Liner MVP-EF
GVWR, lbs.	26500	26500	30000	29500	30000
GAWR, lbs. Front	11340	11340	12080	12000	11340
GAWR, lbs. Rear	15500	15500	19000	17500	19000
Axle Capacity, lbs. Front	12000	12000	12080	12000	13200
Axle Capacity, lbs. Rear	17000	17000	19000	17500	19000
Wheelbase, in.	132	132	143	144	136
Cowl-to-Axle, in.	NA	NA	NA	NA	NA
Cowl-to-Frame End, in.	NA	NA	NA	NA	NA
Gasoline Engine CID ^{****1}	****2	7.0L-V8	**3	**3	**3
SAE Gross Horsepower	****2	235	**3	**3	**3
SAE Gross Torque, lb-ft.	****2	385	**3	**3	**3
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	NA	NA	NA
Brakes: Front Disc Rotor, in. ⁴	As Shown	15 x 1.44	15.4 x 2.88	15 x 1.44	16.5 x 5
Brakes: Rear Lining, in.	As Shown	15 x 1.44	15.4 x 2.88	15 x 1.44	16.5 x 7
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	10R22.5F	10R22.5G	10R22.5G	10R22.5G	10R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.5	7.5	8.25	8.25	7.50
^{1****} See diesel engine, Option No. 8.					
^{2****} See minimum power requirements in Paragraph F.5.3.4.					
^{3**} Furnished with diesel engine only, Option No. 8.					
^{4*} Furnished with air brakes only.					

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option 3A].

DIESEL ENGINES [Option No. 8]

47-Passenger ITEM	1998 Min. Rqmts.	Blue Bird TC2000	Carpenter	Navistar Genesis	Thomas MVP-EF
Engine Displacement, L.	***1	5.9T-I6	5.9T-I6	7.6T-I6	5.9T-I6
SAE Gross Horsepower	***1	190	190	175	190
SAE Gross Torque, lb-ft.	***1	475	475	430	475
GAWR, Front	11340	11340	12080	12000	11340
^{1****} See minimum power requirements in Paragraph F.5.3.4.					

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee, [See Paragraph F.5.3.4.].

³⁶

Buses ordered in this capacity (47-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

F. 24- Through 83-Passenger Chassis Specifications

DEDICATED CNG ENGINES [Option No. 3A]

59-Passenger ITEM	1998 Min. Rqmts.	Hercules	GM/Stewart-Stevenson (mono/bi-fuel versions)
Engine Displacement, L.	***1	5.6L	7.0L
SAE Gross Horsepower	***1	190	195
SAE Gross Torque, lb-ft.	***1	440	315
GAWR, Front	As Shown	13200	11340
1***See minimum power requirements in Paragraph F.5.3.4.			

47-PASSENGER FORWARD CONTROL BODIES

The following Body/Chasis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas
Models	IS2700	TCFE2504	027-2609	O9O8
Chassis Available	N, S	B	C	T-A

TABLE NO. SIXTEEN (16)
53-PASSENGER CONVENTIONAL BUS³⁷
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
 Refer to General Requirements, Page 7.

CHASSIS		B	N	N-S	F
53-Passenger Conventional. ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3800* ¹	Navistar- SEMI**** ⁴ 3600	Freightliner FS-65
GVWR, lbs.	23000	23100	23500	23500	23000
GAWR, lbs. Front	8000	8100	8000	8000	8000
GAWR, lbs. Rear	15000	15000	15500	15500	15000
Axle Capacity, lbs. Front	6000	8100	6000	6000	8000
Axle Capacity, lbs. Rear	15000	15000	15500	15500	15000
Wheelbase, in.	211	211	218	218	215
Cowl-to-Axle, in.	187	187	193	221	193
Cowl-to-Frame End, in.	305	307	305	333	291
Gasoline Engine CID** ²	*** ³	6.0L-V8	* ¹	* ¹	
SAE Gross Horsepower	*** ³	225	* ¹	* ¹	
SAE Gross Torque, lb-ft.	*** ³	340	* ¹	* ¹	
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes: Front Disc Rotor, in.	As Shown	14.75 x 1.34	15 x 1.44	15 x 1.44	15 x 1.44
Brakes: Rear Lining/Rotor, in.	As Shown	14.75 x 1.34	15 x 1.44	15 x 1.44	15 x 1.44
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	9R22.5F	9R22.5F	9R22.5F	9R22.5F	9R22.5F
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	6.75	7.5	6.75	6.75	8
¹ *Furnished with diesel engine only, Option No. 8.					
² **See diesel engine, Option No. 8.					
³ ***See minimum power requirements in Paragraph F.5.3.4.					

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option 3A].

DIESEL ENGINES [Option No. 8]

53-Passenger ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3600/3800	Freightliner FS-65
Engine Displacement, L.	*** ¹	6.6T-I6	5.9T-V8	5.9T-I6
SAE Gross Horsepower	*** ¹	170	175	175
SAE Gross Torque, lb-ft.	*** ¹	420	430	420
GAWR Front	6000	8100	6000	8000
¹ ***See minimum power requirements in Paragraph F.5.3.4.				

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4.].

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Buses ordered in this capacity (53-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

F. 24- Through 83-Passenger Chassis Specifications

PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas	Freightliner
Models	CS-25	2508	SB2508	0801/0810	FS-65
Chassis Available	N	B, N	N	N-S, N	B, S, T

TABLE NO. SEVENTEEN (17)
53-PASSENGER FORWARD CONTROL BUS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
Refer to General Requirements, Page 7

CHASSIS		B	S	N	T-A
53-Passenger ITEM	1998 Min. Rqmts.	Blue Bird TCFE	Carpenter Counselor	Navistar Genesis	Thomas Saf-T-Liner MVP-EF
GVWR, lbs.	27800	27800	30000	30000	30000
GAWR, lbs. Front	11340	11340	12080	12000	11340
GAWR, lbs. Rear	17000	17000	19000	17500	19000
Axle Capacity, lbs. Front	12000	12000	12080	12000	13200
Axle Capacity, lbs. Rear	17000	17000	19000	17500	19000
Wheelbase, in.	136	146	143	144	136
Cowl-to-Axle, in.	NA	NA	NA	NA	NA
Cowl-to-Frame End, in.	NA	NA	NA	NA	NA
Gasoline Engine, L.**1	***2	7.0L-V8	****3	****3	****3
SAE Gross Horsepower	***2	235	****3	****3	****3
SAE Gross Torque, lb-ft.	***2	385	****3	****3	****3
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	NA	NA	NA
Brakes: Front Disc Rotor, in.	As Shown	15 x 1.438	14.75 x 2.5	15 x 1.44	16.5 x 5
Brakes: Rear Lining/Rotor, in.	As Shown	15 x 1.438	15.4 x 2.88	15 x 1.44	16.5 x 7
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	10R22.5F	10R22.5G	11R22.5G	11R22.5G	10R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.50	7.50	8.25	8.25	7.50
¹ **See diesel engine, Option No. 8.					
² ***See minimum power requirements in Paragraph F.5.3.4.					
³ Furnished with diesel engine only, Option No. 8.					

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option No. 3A]

DIESEL ENGINES [Option No. 8]

53-Passenger ITEM	1998 Min. Rqmts.	Blue Bird TCFC	Carpenter	Navistar Genesis	Thomas MVP-EF
Engine Displacement, L.	***1	5.9T-I6	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	***1	190	190	175	190
SAE Gross Torque, lb-ft	***1	475	475	430	475
GAWR, Front	11340	11340	12080	12000	11340
¹ ***See minimum power requirements in Paragraph F.5.3.4.					

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4.].

F. 24- Through 83-Passenger Chassis Specifications

DEDICATED CNG ENGINES [Option No. 3A]

59-Passenger ITEM	1998 Min. Rqmts.	Hercules	GM/Stewart-Stevenson (Mono/Bi-fuel versions)
Engine Displacement, L.	*** ¹	5.6L	7.0L
SAE Gross Horsepower	*** ¹	190	195
SAE Gross Torque, lb-ft.	*** ¹	440	315
GAWR, Front	As Shown	13200	11340
¹ ***See minimum power requirements in Paragraph F.5.3.4.			

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4.].

53-PASSENGER FORWARD CONTROL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas
Models	IS2806	TCFE2701	027-2711	908
Chassis Available	N, S	B	C	T-A

TABLE NO. EIGHTEEN (18)
59-PASSENGER CONVENTIONAL BUS³⁸
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	N	N-S	F
59-Passenger Conventional.	1998 Min.	Blue Bird	Navistar	Navistar-	Freightliner
ITEM	Rqmts.	CV200	3800	SEMI****35	FS-65
				3600*¹	
GVWR, lbs.	25500	26180	25500	25500	25500
GAWR, lbs. Front	8000	8100	8000	8000	8000
GAWR, lbs. Rear	17500	18080	17500	17500	17500
Axle Capacity, lbs. Front	8000	8100	8000	8000	8000
Axle Capacity, lbs. Rear	17500	19000	17500	17500	17500
Wheelbase, in.	234	241	236	236	234
Cowl-to-Axle, in.	211	217	211	239	212
Cowl-to-Frame End, in.	319	342	329	357	319
Gasoline Engine, L. ** ²	*** ³	6.0L-V8	* ¹	* ¹	* ¹
SAE Gross Horsepower	*** ³	225	* ¹	* ¹	* ¹
SAE Gross Torque, lb-ft.	*** ³	340	* ¹	* ¹	* ¹
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes: Front Lining, in.	As Shown	15.00 x 4.0 0	15.00 x 4.0 0	15.00 x 4.0 0	15.00 x 4.00
Brakes: Rear Lining, in.	As Shown	16.50 x 7.00	16.50 x 7.00	16.50 x 7.00	16.5 x 7.00
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	10R22.5F	10R22.5F	10R22.5F	10R22.5F	10R22.5F
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.5	7.5	7.5	7.5	8
¹ *Furnished with diesel engine only, Option No. 8.					
² **See diesel engine, Option No. 8.					
³ ***See minimum power requirements in Paragraph F.5.3.4.					

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option No. 3A]

DIESEL ENGINES [Option No. 8]

59-Passenger	1998 Min.	Blue Bird	Navistar	Freightliner
ITEM	Rqmts.	CV200	3600/3800	FS-65
Engine Displacement, L.	*** ¹	6.6T-I6	T444E	5.9T-I6
SAE Gross Horsepower	*** ¹	190	175	175
SAE Gross Torque, lb-ft.	*** ¹	420	430	420
GAWR, Front	8000	8100	8000	8000
¹ ***See minimum power requirements in Paragraph F.5.3.4.				

F. 24- Through 83-Passenger Chassis Specifications

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

59-PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas	Freightliner
Models	CS-28	2800	SB2800	0901/0910	FS-65
Chassis Available	N	B, N	N	N-S, N	B, S, T

F. 24- Through 83-Passenger Chassis Specifications

TABLE NO. NINETEEN (19)
59-PASSENGER FORWARD CONTROL DIESEL BUS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	N	T	S	T-A
59- Passenger FC ITEM	1998 Min. Rqmts.	Blue Bird TCFE/TCRE* ¹ **2	Navistar Genesis RE*** ³	Thomas Saf-T-Liner MVP-ER*** ³	Carpenter Counselor	Thomas Saf-T-Liner MVP-EF
GVWR, lbs.	27800	27800/30340	29500	28380	30000	30000
GAWR, lbs. Front	11340	11340/11340	12000	13200	12080	13200
GAWR, lbs. Rear	17000	17000/19000	17500 19000	19000	19000	19000
Axle Capacity, lbs. Front	12000	12000/12000	12000	13200	18080	13200
Axle Capacity, lbs. Rear	17000	17000/19000	17500 19000	19000	19000	19000
Wheelbase, in.	155	160/193	162/168	181	164	155
Engine Displacement, L.	*¹	5.9T-I6	7.6T-I6/ 7.3-V8	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	*¹	190	175	190	190	190
SAE Gross Torque, lb-ft.	*¹	475	430	475	475	475
Transmission** ² : Automatic, Gears/Model	4 spd	MT-643	AT-545	MT-643/ AT-545	MT643/ AT-545	MT-643/ AT-545
Transmission** ² : Manual, Fwd. Gears	5 spd	M5	NA	M5	NA	NA
Brake Lining, in. Front	As Shown	15.0 x4	15.0 x4	15.0 x4	16.5 x 5	16.5 x 5
Brake Lining, in. Rear	As Shown	16.5 x 7	16.5 x 7	16.5 x 7	16.5 x 7	16.5 x 7
Tires, Steel Belted Radial	Tubeless					
Size & Load Range	10R22.5F	10R22.5G	10R22.5G	10R22.5F	11R22.5G	10R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.5	7.5	8.25	7.5	8.25	7.5
¹ *See minimum power requirements in Paragraph F.5.3.4.						
² **Direct in fourth gear (automatic); direct in fifth gear (manual).						
³ ***Rear Engine.						

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

DEDICATED CNG ENGINES [Option No. 3A]

59-Passenger ITEM	1998 Min. Rqmts.	Hercules	GM/Stewart-Stevenson Blue Bird (Mono/Bi-fuel versions)
Engine Displacement, L.	***¹	5.6L	7.0L
SAE Gross Horsepower	***¹	190	195
SAE Gross Torque, lb-ft.	***¹	440	315
GAWR, Front	As Shown	13200	10300
¹ ***See minimum power requirements in Paragraph F.5.3.4.			

59-PASSENGER FORWARD CONTROL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas
Models	IS3009 RE3011	TCFE2905 TCFE3204	027-2908	1109/1008/110H
Chassis Available	N	B	C	T, T-A

TABLE NO. TWENTY (20)
65-PASSENGER CONVENTIONAL BUS³⁹
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	N	N-S	F
65-Passenger Conventional. ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3800	Navistar- Semi**** ³⁶ 3600* ¹	Freightliner FS-65
GVWR, lbs.	26500	27080	27500	27500	26500
GAWR, lbs. Front	9000	9000	10000	10000	9000
GAWR, lbs. Rear	17500	18080	17500	17500	17500
Axle Capacity, lbs. Front	9000	9000	10000	10000	9000
Axle Capacity, lbs. Rear	17500	19000	17500	17500	17500
Wheelbase, in.	252	259	254	254	252
Cowl-to-Axle, in.	229	235	229	257	230
Cowl-to-Frame End, in.	348	370	359	387	348
Gasoline Engine, L.** ²	*** ³	6.0L-V8	* ¹	* ¹	* ¹
SAE Gross Horsepower	*** ³	225	* ¹	* ¹	* ¹
SAE Gross Torque, lb-ft.	*** ³	340	* ¹	* ¹	* ¹
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes: Front Disc Rotor, in.	As Shown	15.00 x 4.00	15.0 x 4.00	15.0 x 4.00	15.0 x 4.00
Brakes: Rear Lining, in.	As Shown	16.50 x 7.00	16.50 x 7.00	16.50 x 7.00	16.50 x 7.00
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	10R22.5F	10R22.5F	10R22.5F	10R22.5F	10R22.5F
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.5	7.5	7.5	7.5	7.5
¹ *Furnished with diesel engine only, Option No. 8.					
² **See diesel engine, Option No. 8.					
³ ***See minimum power requirements in Paragraph F.5.3.4.					

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option 3A].

³⁹ Buses ordered in the capacity (65-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

DIESEL ENGINES [Option No. 8]

65-Passenger ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3600/3800	Freightliner FS-65
Engine Displacement, L.	***1	6.6T-I6	7.3T-V8	5.9T-I6
SAE Gross Horsepower	***1	170	175	175
SAE Gross Torque, lb-ft.	***1	420	430	420
GAWR, Front	9000	9000	10000	9000
1 ***See minimum power requirements in Paragraph F.5.3.4.				

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

65-PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas	Freightliner
Models	CS-30	3004	SB3004	1001/1010	FS-65
Chassis Available	N	B, N	N	N-S, N	B, S, T

TABLE NO. TWENTY-ONE (21)
65-PASSENGER FORWARD CONTROL DIESEL BUS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	N	T	S	T-A
65-Passenger FC ITEM	1998 Min. Rqmts.	Blue Bird TCFE/TCR E* ¹	Navistar Genesis RE* ¹	Thomas Saf-T-Liner MVP-ER* ¹	Carpenter Counselor	Thomas Saf-T-Liner MVP-EF
GVWR, lbs.	27800	27800/ 30340	29000 30000	28380	30000	30000
GAWR, lbs. Front	10300	11340/ 11340	12000	10300	12080	11340
GAWR, lbs. Rear	17000	17000/ 19000	17500 19000	18080	19000	19000
Axle Capacity, lbs. Front	12000	12000	12000	13200	12080	13200
Axle Capacity, lbs. Rear	17000	17000/ 19000	17500 19000	19000	19000	19000
Wheelbase, in.	174	174/221	180/222	181	185	174
Diesel Engine Displacement, L.	**2	5.9T-I6	7.6T-I6 7.3-V8	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	**2	190	175	190	190	190
SAE Gross Torque, lb-ft.	**2	475	430	475	475	475
Transmission*** ³ : Automatic, Gears/Model	4 spd	AT-545/ MT-643	AT-545	MT643/ AT-545	MT643/ AT-545	MT643/ AT-545
Transmission*** ³ : Manual, Fwd. Gears	5 spd	M5		M5	NA	NA
Brake Lining, in. Front	As Shown	15.0 x 4	15.0 x 4	15.0 x 4	16.5 x 5	16.5 x 5
Brake Lining, in. Rear	As Shown	16.5 x 7	16.5 x 6	16.5 x 7	16.5 x 7	16.5 x 7
Tires, Steel Belted Radial	Tubeless					
Size & Load Range	10R22.5F	10R22.5G	10R22.5G	10R22.5F	11R22.5G	10R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.5	7.5	8.25	7.5	8.25	7.5
¹ *Rear Engine.						
² **See minimum power requirements in Paragraph F.5.3.4.						
³ ***Direct in fourth gear (automatic); direct in fifth gear (manual).						

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

F. 24- Through 83-Passenger Chassis Specifications

DEDICATED CNG ENGINES [Option No. 3A]

65-Passenger ITEM	1998 Min. Rqmts.	Hercules	GM/Stewart-Stevenson Blue Bird (Mono/Bi-fueled versions)
Engine Displacement, L.	*** ¹	5.6L	7.0L
SAE Gross Horsepower	*** ¹	190	195
SAE Gross Torque, lb-ft.	*** ¹	440	315
GAWR, Front	As Shown	132000	11340
¹ ***See minimum power requirements in Paragraph F.5.3.4.			

65-PASSENGER FORWARD CONTROL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas
Models	RE3302/IS3300	3007/3204	027-3207	1209/1008/110H
Chassis Available	N	B	C	T, T-A

TABLE NO. TWENTY-TWO (22)
71S-PASSENGER CONVENTIONAL BUS⁴⁰
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Short Wheelbase, Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		N	N-S	B	F
71S-Passenger Conventional. ITEM	1998 Min. Rqmts.	Navistar 3800	Navistar- Semi **** ³⁷ 3600* ¹	Blue Bird CV200	Freightliner FS-65
GVWR, lbs.	28000	28000	28000	28000	28000
GAWR, lbs. Front	9000	10000	10000	9000	9000
GAWR, lbs. Rear	19000	19000	19000	19000	19000
Axle Capacity, lbs. Front	9000	10000	10000	9000	9000
Axle Capacity, lbs. Rear	19000	19000	19000	19000	19000
Wheelbase, in.	254	254	254	254	252
Cowl-to-Axle, in.	229	229	229	250	230
Cowl-to-Frame End, in.	349	349	349	405	378
Gasoline Engine, L. ** ²	*** ³	* ¹	* ¹	6.0L-V8	* ¹
SAE Gross Horsepower	*** ³	* ¹	* ¹	225	* ¹
SAE Gross Torque, lb-ft.	*** ³	* ¹	* ¹	340	* ¹
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes: Front Lining, in.	As Shown	15.0 x 4.00	15.0 x 4.00	15.0 x 4.00	15.0 x 4.00
Brakes: Rear Lining, in.	As Shown	16.50 x 7.00	16.50 x 7.00	16.50 x 7.00	16.50 x 7.00
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	11R22.5G	11R22.5G	11R22.5G	11R22.5G	11R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	8.25	8.25	8.25	8.25	8.25
¹ *Furnished with diesel engine only, Option No. 8.					
² **See diesel engine, Option No. 8.					
³ ***See minimum power requirements in Paragraph F.5.3.4.					

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option 3A].

⁴⁰

Buses ordered in this capacity (71 S-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

F. 24- Through 83-Passenger Chassis Specifications

DIESEL ENGINES [Option No. 8]

71S-Passenger ITEM	1998 Min. Rqmts.	Navistar 3600/3800	Blue Bird CV200	Freightliner FS-65
Engine Displacement, L.	***1	T444E	6.6T-I6	5.9T-I6
SAE Gross Horsepower	***1	175	170	175
SAE Gross Torque, lb-ft.	***1	430	420	420
GAWR, Front	9000	10000	9000	9000
1 ***See minimum power requirements in Paragraph F.5.3.4.				

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

71S-PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Carpenter	Thomas	Blue Bird	Freightliner
Models	CS-32	SB3201	1100/1101	3201	FS-65
Chassis Available	N	N	N	B, N	B, S, T

TABLE NO. TWENTY-THREE (23)
71L-PASSENGER CONVENTIONAL BUS⁴¹
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Long Wheelbase, Full Air Brake Standard)
Refer to General Requirements, Page 7

CHASSIS		B	N	N-S	F
71L-Passenger Conventional ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3800	Navistar-Semi^{****38} 3600^{*1}	Freightliner FS-65
GVWR, lbs.	28000	28000	28000	28000	28000
GAWR, lbs. Front	9000	9000	10000	10000	9000
GAWR, lbs. Rear	19000	19000	19000	19000	19000
Axle Capacity, lbs. Front	9000	9000	10000	10000	9000
Axle Capacity, lbs. Rear	19000	19000	19000	19000	19000
Wheelbase, in.	274	274	276	276	276
Cowl-to-Axle, in.	250	250	251	279	254
Cowl-to-Frame End, in.	378	405	387	415	378
Gasoline Engine, L. ^{**2}	***3	6.0L-V8	*1	*1	*1
SAE Gross Horsepower	***3	225	*1	*1	*1
SAE Gross Torque, lb-ft.	***3	340	*1	*1	*
Transmission: Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Transmission: Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes: Front Lining, in.	As Shown	15.00 x 4.00	15.00 x 4.00	15.00 x 4.00	15.00 x 4.00
Brakes: Rear Lining, in.	As Shown	16.50 x 7.00	16.50 x 7.00	16.50 x 7.00	16.50 x 7.00
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	11R22.5G	11R22.5G	11R22.5G	11R22.5G	11R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	8.25	8.25	8.25	8.25	8.25
¹ *Furnished with diesel engine only, Option No. 8.					
² **See diesel engine, Option No. 8.					
³ ***See minimum power requirements in Paragraph F.5.3.4.					

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. [See Option 3A].

⁴¹ Buses ordered in this capacity (71 L-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

F. 24- Through 83-Passenger Chassis Specifications

DIESEL ENGINES [Option No. 8]

71L-Passenger ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3600/3800	Freightliner FS-65
Engine Displacement, L.	*** ¹	6.6T-I6	T444E	5.9T-I6
SAE Gross Horsepower	*** ¹	170	175	175
SAE Gross Torque	*** ¹	420	430	420
GAWR, Front	9000	9000	10000	9000
¹ ***See minimum power requirements in Paragraph F.5.3.4.				

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

71L-PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas	Freightliner
Models	CS-32	3310	SB3201	1101/1110	FS-65
Chassis Available	N	B, N	N	N-S, N	B, S, T

F. 24- Through 83-Passenger Chassis Specifications

TABLE NO. TWENTY-FOUR (24)
71-PASSENGER FORWARD CONTROL DIESEL BUS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	N	T	S	T-A
71-Passenger FC ITEM	1998 Min. Rqmts.	Blue Bird TCFE/ TCRE*¹	Navistar Genesis RE*¹	Thomas MVP-ER*¹	Carpenter Counselor	Thomas Saf-T-Liner MVP-ER
GVWR, lbs.	27800	27800/ 30340	29500 30000	30000	30000	30000
GAWR, lbs. Front	11340	11340	12000	11000	12080	11340
GAWR, lbs. Rear	17000	17000/ 19000	17500 19000	19000	19000	19000
Axle Capacity, lbs. Front	12000	12000	12000	13200	12080	13200
Axle Capacity, lbs. Rear	17000	17000/ 19000	17500 19000	19000	19000	19000
Wheelbase, in.	193	195/249	198/222	238	199	193
Diesel Engine Displacement, L.	**2	5.9T-I6	7.6T-I6 7.3-V8	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	**2	190	190	190	190	190
SAE Gross Torque, lb-ft.	**2	475	485	475	475	475
Transmission*** ³ : Automatic, Gears/Model	4 spd	AT-545/ MT-643	AT-545	MT643/ AT-545	MT643/ AT-545	MT643/ AT-545
Transmission*** ³ : Manual, Fwd. Gears	5 spd	M5	NA	M5	NA	NA
Brake Lining, in. Front	As Shown	15.0 x 4	15.0 x 4	15.0 x 4	16.5 x 5	16.5 x 5
Brake Lining, in. Rear	As Shown	16.5 x 7	16.5 x 7	16.5 x 7	16.5 x 7	16.5 x 7
Tires, Steel Belted Radial	Tubeless					
Size & Load Range	10R22.5G	10R22.5G	11R22.5G	10R22.5G	10R22.5G	10R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.5	7.5	8.25	7.5	8.25	7.5
¹ *Rear Engine.						
² **See minimum power requirements in Paragraph F.5.34.						
³ ***Direct in fourth gear (automatic); direct in fifth gear (manual).						

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

F. 24- Through 83-Passenger Chassis Specifications

DEDICATED CNG ENGINES [Option No. 3A]

71-Passenger ITEM	1998 Min. Rqmts.	Hercules	GM/Stewar-Stevenson Blue Bird (Mono/Bi-fueled versions)
Engine Displacement, L.	***1	5.6L	7.0L
SAE Gross Horsepower	***1	190	195
SAE Gross Torque, lb-ft.	***1	440	315
GAWR, Front	As Shown	13200	11340
***See minimum power requirements in Paragraph F.5.3.4.			

71-PASSENGER FORWARD CONTROL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas
Models	IS3503 RE3505	TCFE3408 TCRE3700	027-3404	1903/1208/120H
Chassis Available	N	B	C	T/ T-A

F. 24- Through 83-Passenger Chassis Specifications

TABLE NO. TWENTY-FIVE (25)
77-PASSENGER CONVENTIONAL BUS⁴²
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	N	F
77-Passenger Conventional. ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3800/3600	Freightliner FS-65
GVWR, lbs.	28000	28000	28000	28000
GAWR, lbs. Front	9000	9000	10000	9000
GAWR, lbs. Rear	19000	19000	19000	19000
Axle Capacity, lbs. Front	9000	9000	10000	9000
Axle Capacity, lbs. Rear	19000	19000	19000	19000
Wheelbase, in.	274	274	251/279	276
Cowl-to-Axle, in.	250	250	387/415	254
Cowl-to-Frame End, in.	387	405	387	406
Gasoline Engine, L. ^{**1}	***2	6.0L-V8	*1	*1
SAE Gross Horsepower	***3	225	*1	*1
SAE Gross Torque, lb-ft.	***3	340	*1	*1
Transmission ^{****3} : Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545
Transmission ^{****4} : Manual, Fwd. Gears	5 spd	M5	M5	M5
Brake Lining, in. Front	As Shown	15.0 x 4.00	15.0 x 4.00	15.0 x 4.00
Brake Lining, in. Rear	As Shown	16.5 x 7.00	16.5 x 7.00	16.5 x 7.00
Tires, Steel Belted Radial	Tubeless			
Size & Load Range	11R22.5G	11R22.5G	11R22.5G	11R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	8.25	8.25	8.25	8.25
¹ **See diesel engine, Option No. 8.				
² ***See minimum power requirements in Paragraph F.5.3.4.				
³ ****Direct in fourth gear (automatic); direct in fifth gear (manual).				

NOTE: This gasoline engine is available in a bi-fuel (CNG/Gasoline) mode. (See Option 3A.)

⁴² Buses ordered in this capacity (77-Passenger) may be either Conventional or Semi-forward control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bid.

F. 24- Through 83-Passenger Chassis Specifications

DIESEL ENGINES [Option No. 8]

77-Passenger Conv. ITEM	1998 Min. Rqmts.	Blue Bird CV200	Navistar 3800	Freightliner FS-65
Engine Displacement, L.	*** ¹	6.6T-I6	T444E	5.9T-I6
SAE Gross Horsepower	*** ¹	170	175	175
SAE Gross Torque, lb-ft.	*** ¹	420	430	420
GAWR, Front	9000	9000	10000	9000
¹ ***See minimum power requirements in Paragraph F.5.3.4.				

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

77-PASSENGER CONVENTIONAL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas	Freightliner
Model	CS-34	3310	SB3405	1200/1201	FS-65
Chassis Available	N	B, N	N	N	B, S, T

F. 24- Through 83-Passenger Chassis Specifications

TABLE NO. TWENTY-SIX (26)
77-PASSENGER FORWARD CONTROL DIESEL BUS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	N	T	S	T-A
77-Passenger FC ITEM	1998 Min. Rqmts.	Blue Bird All American TCFC/RE* ¹	Navistar Genesis RE* ¹	Thomas MVP-ER* ¹	Carpenter Counselor	Thomas Saf-T-Liner MVP-EF
GVWR, lbs.	30000	35480/ 30000	30000	30000	32200	30000
GAWR, lbs. Front	11000	12480/ 12000	12000	11000	12080	11340
GAWR, lbs. Rear	19000	23000/ 19000	19000	19000	19000	19000
Axle Capacity, lbs. Front	12000	13200/ 12000	12000	13200	13200	13200
Axle Capacity, lbs. Rear	19000	23000/ 19000	19000	19000	19000	19000
Wheelbase, in.	212	220/277 /216	216/249	238	227	212
Diesel Engine Displacement, L.	**2	8.3T-I6/5.9 T-I6	7.6T-I6 7.3-V8	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	**2	210/190	190	190	190	190
SAE Gross Torque, lb-ft.	**2	605/484	485	475	475	475
Transmission*** ³ : Automatic, Gears/Model	4 spd	MT-643 ⁴ / AT-545	AT-545	MT-643/ AT-545	MT-643 ⁴	MT-643/ AT-545
Transmission*** ³ : Manual, Fwd. Gears	5 spd	M5	NA	M5	NA	NA
Brake Lining, in. Front	As Shown	15.0 x 4	15.0 x 4	15.0 x 4	16.5 x 5	16.5 x 5
Brake Lining, in. Rear	As Shown	16.5 x 7	16.5 x 7	16.5 x 7	16.5 x 7	16.5 x 7
Tires, Steel Belted Radial	Tubeless					
Size & Load Range	10R22.5G	11R22.5G	11R22.5G	10R22.5G	11R22.5G	10R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	7.5	8.25	8.25	7.5	8.25	7.5
¹ *Rear Engine.						
² **See minimum power requirements in Paragraph F.5.3.4.						
³ ***Direct in fourth gear (automatic); direct in fifth gear (manual).						
⁴ Equal or, as required.						

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

F. 24- Through 83-Passenger Chassis Specifications

DEDICATED CNG ENGINES [Option No. 3A]

77-Passenger ITEM	1998 Min. Rqmts.	Hercules	GM/Stewart-Stevenson Blue Bird (Mono/Bi-fueled versions)
Engine Displacement, L.	*** ¹	5.6L	7.0L
SAE Gross Horsepower	*** ¹	190	195
SAE Gross Torque, lb-ft.	*** ¹	440	315
GAWR, Front	As Shown	13200	12000
¹ ***See minimum power requirements in Paragraph F.5.3.4.			

77-PASSENGER FORWARD CONTROL BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas
Models	IS3706 RS3708	AAFC3611 TCRE3700 TCRC3700	027-3608	1309/1308/130H
Chassis Available	N	B	C	T/T-A

F. 24- Through 83-Passenger Chassis Specifications

TABLE NO. TWENTY-SEVEN (27)
83-PASSENGER FORWARD CONTROL DIESEL BUS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Front Engine, Full Air Brake Standard)

Refer to General Requirements, Page 7

CHASSIS		B	S	N	T-A
83-Passenger FC (Front Engine) ITEM	1998 Min. Rqmts.	Blue Bird TCFC/AAFC	Carpenter Counselor	Navistar Genesis RE	Thomas Saf-T-Liner MVP-EF
GVWR, lbs.	32200	34200/ 36200	34200	32200	32200
GAWR, lbs. Front	13200	13200	13200	13200	13200
GAWR, lbs. Rear	19000	23000	21000	19000	19000
Axle Capacity, lbs. Front	13200	13200	13200	13200	13200
Axle, Capacity, lbs. Rear	19000	23000	21000	19000	19000
Wheelbase, in.	229 nom.	237/242	241	234/276	231
Engine Displacement, L.	*1	8.3T-I6	5.9T-I6	7.6T-I6 7.3-V8	5.9T-I6
SAE Gross Horsepower	*1	210	210	190	210
SAE Gross Torque, lb-ft.	*1	60	520	485	520
Transmission, Automatic**2	MT-643	MT-643	MT-643	MT-643	MT-643
Brake Lining, in. Front	As Shown	16.5 x 5.00	16.5 x 5.00	16.5 x 5.00	16.5 x 5.00
Brake Lining, in. Rear	As Shown	16.5 x 7.00	16.5 x 7.00	16.5 x 7.00	16.5 x 7.00
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	11R22.5H	11R22.5H	11R22.5H	11R22.5H	11R22.5G
Wheels: Rear	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	8.25	8.25	8.25	8.25	8.25
¹ *See minimum power requirements in Paragraph F.5.3.4.					
² **Direct in fourth gear.					

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

DEDICATED CNG ENGINES [Option No. 3A]

83-Passenger ITEM	1998 Min. Rqmts.	Hercules	GM/Stewart-Stevenson Blue Bird (Mono/Bi-fueled versions)
Engine Displacement, L.	***1	5.6L	7.0L
SAE Gross Horsepower	***1	190	195
SAE Gross Torque, lb-ft.	***1	440	315
GAWR, Front	As Shown	13200	12000
¹ ***See minimum power requirements in Paragraph F.5.3.4.			

F. 24- Through 83-Passenger Chassis Specifications

83-PASSENGER (FRONT ENGINE) BODIES

The following Body/Chassis combinations are available as indicated:

BODIES	AmTran	Blue Bird	Carpenter	Thomas
Models	IS3909 RE3911	3904/3903	027-3900	1408
Chassis Available	N	B	C	T-A

F. 24- Through 83-Passenger Chassis Specifications

TABLE NO. TWENTY-EIGHT (28)
83-PASSENGER FORWARD CONTROL DIESEL BUS
[SEE PARAGRAPH B.1.2.: REDUCED PASSENGER CAPACITY]
(Rear Engine. Full Air Brake Standard)

Refer to General Requirements, Page 7

83-Passenger FC (Rear Engine) ITEM	1998 Min. Rqmts.	Blue Bird All American AARE3903	Blue Bird TCRE3904	Thomas Saf-T-Liner MVP-ER 1405/140H	Carpenter Counselor RE	Genesis RE3911
GVWR, lbs.	36200	36200	36200	36200	36200	36200
GAWR, lbs. Front	13200	13200	13200	13200	13200	13200
GAWR, lbs. Rear	23000	23000	23000	23000	23000	23000
Axle Capacity, lbs. Front	13200	14600	13200	13200	13200	13200
Axle Capacity, lbs. Rear	23000	23000	23000	23000	23000	23000
Wheelbase, in.	267	270	277	267	280	276
Engine Displacement, L.	* ¹	8.3T-I6	5.9T-I6	5.9T-I6	5.9T-I6	7.3-V8
SAE Gross Horsepower	* ¹	210	210	210	210	210
SAE Gross Torque, lb-ft.	* ¹	605	484	605	520	605
Transmission, Automatic ** ²	MT-643	MT-643	MT-643	MT-643	MT-643	MT-643
Brake Lining, in. Front	As Shown	16.5 x 5	16.5 x 5	16.5 x 6	16.5 x 5	16.5 x 6
Brake Lining, in. Rear	As Shown	16.5 x 7	16.5 x 7	16.5 x 8.6	16.5 x 7	16.5 x 8.5
Tires, Steel Belted Radial	Tubeless					
Size & Load Range	11R22.5H	11R22.5H	11R22.5H	11R22.5H	11R22.5H Ft. 12R22.5H Rear	11R22.5H
Wheels: Rear	Dual	Dual	Dual	Dual	Dual	Dual
Wheels: Rim Size, in.	8.25	8.25	8.25	8.25	8.25	8.25
¹ *See minimum power requirements in Paragraph F.5.3.4.						
² **Direct in fourth gear.						

Engines listed on this page are approved to meet or exceed power requirements under normal operating conditions. Other engines must be submitted for approval by the School Bus Committee [See Paragraph F.5.3.4].

DEDICATED CNG ENGINES [Option No. 3A]

83-Passenger ITEM	1998 Min. Rqmts.	Hercules
Engine Displacement, L.	*** ¹	5.6L
SAE Gross Horsepower	*** ¹	190
SAE Gross Torque, lb-ft.	*** ¹	440
GAWR, Front	As Shown	13200
¹ ***See minimum power requirements in Paragraph F. 5.3.4.		

G. WHEELCHAIR LIFT SPECIFICATION

FLOOR-MOUNTED WHEELCHAIR LIFT, ELECTRIC (HYDRAULIC OR MECHANICAL)

- G.1. GENERAL REQUIREMENTS:** When so specified in the Invitation for Bid [See Option No.'s 33, 34, and 35], the 15- through 77-passenger school buses shall be equipped with a wheelchair lift meeting the following requirements. All parts which are not specifically mentioned, that are necessary for the unit to be complete and ready for operation, or which are normally furnished as standard equipment, shall be furnished by the successful bidder. All parts shall conform in strength, quality, and workmanship to industry standards. All wheelchair positions shall be forward facing.
- 1.1. GENERAL DESIGN:** The lift furnished for these options [See Option No.'s 33, 34, and 35] shall be a floor-mounted, twelve (12) volt DC electric-hydraulic or electric-mechanical operated wheelchair lift with a minimum eight-hundred pounds (800 lbs.) lifting capacity. The vertical lift (platform travel) shall be a minimum of thirty inches (30"). The unit shall be self-contained and mounted directly to the existing bus body floor.
- 1.2. DOORS, SPECIAL SERVICE:** One or two (1 or 2) special side doors with windows in each door shall be provided as follows:
- 1.2.1. Design:** The special service door (s) may be the standard double swing-out doors or sliding door (with glass) furnished by the chassis manufacturer on vehicles used for converted van buses or the special service doors shall be constructed of zinc-coated steel (G-60) with a minimum thickness of 0.396 inches meeting ASTM A-525. Doors may be either standard widths or as required for the lift furnished. The doors shall extend from the window header to the bottom of the floor line. Doors shall be water- and weather-tight when closed and the lift is in the travel position.
- 1.2.2. Door Holding Device:** A means (device) shall be provided to hold the swing-out type door (s) in the fully opened position.
- 1.2.3. Door Operation:** The opening and closing operation of the door (s) may be manual, vacuum, pneumatic, or electrical. Controls for doors other than those manually operated shall be located in the driver's compartment and designed for easy manual opening in case of an emergency. [See Paragraph G.1.8.].
- 1.2.4. Drip Rails:** Full length drip rails shall be furnished over the special service doors to direct water away from the doors.
- 1.2.5. Header Board:** The head impact area on the inside at the top of the special service door shall be protected by an energy absorbing, padded header board, three inches (3") wide and one inch (1") thick, extending the full width of the door to prevent injury when accidentally impacted.
- 1.2.6. Installation:** Doors constructed by the body manufacturer shall be installed using piano or butt type hinges and attached to body by means of rivets or bolts, nuts, and lock washers. Neither metal screws nor self-tapping bolts are acceptable except for alignment purposes; when used for this purpose these types of fasteners shall be tack-welded at the head.

G. Wheelchair Lift

- 1.2.7. Rub Rails: Exterior side (s) of special service doors shall have two (2) rub rails with end caps installed at approximately the same level as the side rub rails. Rub rail installation shall be in accordance with the requirements outlined in Paragraphs C.2.9 and E.2.10.
- 1.3. ELECTRICAL SYSTEM: All wiring and wiring connectors used in the construction of the wheelchair lift shall meet the requirements of SAE J561:
 - 1.3.1. Alternator: Wheelchair lift-equipped buses shall be provided with alternators with the following performance for the following sizes of school buses:
 - 1.3.1.1. Fifteen-passenger (15-) Through 20-passenger Buses: "Type A" and "Type B" buses equipped with wheelchair lifts shall have alternators with a minimum electrical output of one-hundred-thirty amperes (130 amps).
 - 1.3.1.2. Twenty-four-passenger (24-) Through 77-passenger Buses: A minimum output rating of one-hundred-thirty amperes (130 amps).
 - 1.3.2. Electrical Insulation: Any component such as the motor, electric wiring, switches, and any connections or parts likely to pose a safety hazard, shall be enclosed in insulated housing (s) to protect passengers and equipment.
 - 1.3.3. Motor: The motor shall be a heavy-duty, twelve (12) volt DC type, equipped with shaft bearings.
- 1.4. ELECTROMECHANICAL SYSTEMS: Electromechanical hydraulic lift systems shall be furnished with worm screw or similar device for lift action.
- 1.5. FRAME AND RELATED COMPONENTS:
 - 1.5.1. Frame: Frame of lift shall be constructed of heavy-duty steel and designed to support the platform extension, toeboard, and other parts necessary for proper operation, plus a minimum of eight-hundred pounds (800 lbs.) of additional weight. An aluminum frame may be substituted for steel provided the wheelchair lift warranty is upgraded [See Paragraph A.10.4.9.].
 - 1.5.2. Platform, Automatic Folding Type:
 - 1.5.2.1. Design: The platform shall be of sturdy construction and covered with minimum one-eighth inch (1/8") safety plate steel or one-eighth inch (1/8") expanded metal (open grate) with maximum three-fourth inch (3/4") openings. The lift platform shall have a minimum thirty inch (30") clear, usable width, unobstructed by the required handrail [See Paragraph G.1.5.2.2.]. The minimum clear length of the platform between the outer edge barrier and the inner edge shall be forty inches (40"). Any portion of platform in the folded (travel) position which obstructs window vision shall be covered with expanded metal.

- 1.5.2.2. **Hand Rail:** The lift platform shall be equipped with at least one (1) handrail for security. The handrail shall be approximately twenty-five-and-three-fourth inches (25-3/4") in height and a minimum eighteen inches (18") in length and designed to fold when in stowed position so as not to add to the overall lift projection into the bus.
- 1.5.2.3. **Lift Action:** Action of the lift must be power-up and controlled descent with slow (gentle) movement. Design of the platform shall be such that it will be level at all times during the raising and lowering action. A load switch shall be installed on the platform to prevent accidental folding while loading wheelchair passengers.
- 1.5.2.4. **Safety Rails:** The platform shall be equipped with safety rails on both sides of minimum one-eighth inch (1/8") steel and one inch (1") high. The front of the lift shall have a folding type safety rail not less than three inches (3") in height. Safety rail folding action may be either manual or automatic.
- 1.5.2.5. **Toeboard:** A toeboard shall be furnished that is angled at approximately eight degrees (8°) below the horizontal.
- 1.6. **HYDRAULIC SYSTEM AND RELATED COMPONENTS:** Electric-hydraulic wheelchair lifts shall be furnished with a hydraulic system for lift operation. The components shall include, but not be limited to, the following:
 - 1.6.1. **Hoses and Fittings:** Hose, hose fittings, and hydraulic fittings shall meet the requirements of SAE J517, J516, and J514, respectively, for nominal size (s) furnished.
 - 1.6.2. **Hydraulic Cylinders:** Hydraulic cylinders shall be installed for lift operations. Piston rod diameter of each cylinder shall be not less than three-fourth inch (3/4"). Cylinders shall have a minimum of thirty-four inches (34") of extension action and shall be capable of lifting a minimum of eight-hundred pounds (800 lbs.) in addition to the weight of the lift.
 - 1.6.3. **Hydraulic Fluid Reservoir:** A reservoir for hydraulic fluid shall be furnished and installed in an accessible location to allow easy checking of the fluid level and filling as necessary. Fluid capacity and type shall be as recommended by the lift manufacturer.
 - 1.6.4. **Hydraulic Valves:** The system shall provide valves for the following actions:
 - 1.6.4.1. **Override Action:** A bypass valve (or other means) shall be provided to prevent the lifting of the bus by over extending the hydraulic cylinders.
 - 1.6.4.2. **Power Failure:** The system shall also be equipped with either a relief valve or other mechanical means for raising or lowering the wheelchair platform in case of power failure.

G. Wheelchair Lift

- 1.6.4.3. **Speed:** Adjustable valves shall be provided to control the raising and lowering speed of the lift.
- 1.6.5. **Weather/Dust Protection:** Exposed hydraulic cylinders, pumps, and any other parts requiring protection from the weather, or dust, or any other foreign objects for proper durable operation shall be properly sealed.
- 1.7. **MOUNTING AND INSTALLATION:** Installation shall be such that vibrations will be minimal. The wheelchair lift shall be installed by the bus body manufacturer or authorized dealer for lift manufacturers.
 - 1.7.1. **Fuel Access Port:** [See Paragraph E.3.1.] A fuel access port is required on all 35- through 83-passenger buses except front wheelchair equipped buses.
 - 1.7.2. **Level Test:** The sides of any bus provided with a wheelchair lift shall be within plus or minus two inches ($\pm 2"$) of each other when measured from comparable points on each side to the ground with the bus empty and parked on a level hard surface (such as concrete). Chassis springs and suspension shall be adjusted as necessary to provide a level bus when the additional weight of a wheelchair lift is installed [See Paragraphs A.4.5., D.1.1., and F.1.1.].
 - 1.7.3. **Mounting:** The lift shall be mounted on the front right (curb) side [See Option No. 33] rear curb-side [See Option No. 34] or front or rear [See Option No. 35] of the school bus body floor and securely bolted in place⁴³. Floor frame shall be reinforced as required to support the lift and load. Lift shall be positioned approximately thirty-six inches (36") behind the main entrance door for the 18- and 24- through 77-passenger buses leaving sufficient space for one (1) regular bus seat or one (1) wheelchair. If the body is designed so space specified above is not available, the lift shall be mounted as far forward as practical to minimize floor space loss. (Tail pipe may be routed anywhere between the frame rails to provide sufficient clearance for the lift.)
- 1.8. **OPERATING CONTROLS AND SAFETY DEVICES:**
 - 1.8.1. **Operating Switches:** Controls for each movement of the lift shall be through a remote pendant-type control (or equivalent) which has automatic return-to-off switches. Electrical cables shall be good quality copper, covered by heavy-duty rubberized sheath and of sufficient length to allow operation of the lift from inside and outside of bus.
 - 1.8.2. **Warning and Safety Devices:**
 - 1.8.2.1. **Safety Switch:** A safety switch shall be installed at or near the service door to prevent operation of the lift except when all special service doors are substantially open.

⁴³ School District may specify rear curb side mounting of lift and wheelchair positions for the 18- and 24- through the 77-passenger buses only and mounted as above [See Option No. 34] in order to place the required minimum thirty inch (30") wide aisle in the rear portion of the bus [See Paragraphs C.2.12.4.1. and E.2.13.5.1.]. This will increase the seating capacity for regular passengers in the front section since a narrower aisle, minimum twelve inches (12"), may be used in this area. This option is recommended only for those buses which will have a regular attendant in addition to the driver.

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

G.2. OTHER REQUIREMENTS: Wheelchair lift-equipped school buses shall also be provided with the following:

- 2.1. **FLOOR COVERING:** The floor in the wheelchair area and the area in the lift entryway shall be smooth and free of projections. Aisle floor covering shall be the same as required in Paragraph E.2.7.
- 2.2. **FLOORING:** Any plywood flooring used to cover the existing steel floors (e.g., See Paragraph C.2.5.2.) on wheelchair-equipped buses shall be CDX grade.
- 2.3. **INTERIOR LAMP, LIFT COMPARTMENT:** The lift compartment shall have one (1) interior lamp installed in the roof panel above the center of the lift compartment; or one (1) lamp shall be installed in the roof panels on each side of the lift door to illuminate the platform entryway area. The lamp (s) shall be minimum fifteen (15) candlepower each and shall be one (1) of the approved lamps listed in Paragraph E.1.7.4.2.
- 2.4. **SECUREMENT SYSTEM LITERATURE:** The following information shall be provided with each vehicle equipped with a securement system:
 - 2.4.1. Detailed instructions, including a parts list, regarding installation and use of the system.
 - 2.4.2. Detailed instructions, including a diagram, regarding the proper placement and positioning of the system, including correct belt angles.
- 2.5. **PAINTING:** The interior and exterior of the special service doors lifts shall be primed and painted in accordance with the painting requirements in Paragraph E.1.10. as follows:
 - 2.5.1. **Interior:** The interior of the special service door (s) of wheelchair lifts shall be painted to match the manufacturer's standard interior color of the bus on which it is installed.
 - 2.5.2. **Exterior:** The exterior of special service doors shall be primed and painted in accordance with painting requirements in Paragraph E.1.10.
- 2.6. **UNIVERSAL HANDICAP SYMBOLS:** School buses with wheelchair lifts shall display the Universal Handicapped Symbols on the front of one (1) side and the rear of the other side below the window line of the bus. These emblems shall be white on a blue background, shall not exceed twelve inches (12") in size, and may be of a high intensity reflectorized material meeting U.S. Department of Transportation FHWA FP-85 Standards.

G.3. SECUREMENT SYSTEM FOR MOBILE SEATING DEVICE/OCCUPANT:

- 3.1. The school bus body shall be designed for positioning and securement of mobile seating devices and occupants in a forward-facing orientation. Securement

system hardware and attachment points for the forward-facing system shall be provided.

- 3.2. Mobile seating device securement system shall utilize four (4) point tie-downs, with a minimum of two (2) body floor attachment points located at the rear of the space designated for the mobile seating devices and a minimum of two (2) body floor attachment points at the front of the space.
- 3.3. A "Type II" Occupant Securement System shall provide for securement of the occupant's pelvic lap area and upper torso area.
- 3.4. The mobile seating device/occupant securement system shall be successfully, dynamically sled-tested at a minimum impact speed/force of thirty miles per hour (30 mph/20 G'S). The dynamic test shall be performed using system components and hardware (including attachment hardware) which are identical to the final installation in type, configuration, and positioning. The body structure at the attachment points may be simulated for the purpose of the sled test, but the simulated structure used to pass the sled test may not exceed the strength of the attachment structures to be used in the final body installation. The mobile seating device used for test purposes shall be a fifth percentile (50%) male test dummy as specified in FMVSS Part 571.208, S6.1.2, 6.1.3, and 6.1.4. The test dummy shall be retained within the securement system throughout the test and forward excursion shall be such that no portion of the test dummy's head or knee pivot spouts passes through a vertical transverse plane intersecting the forward-most point of the floor space designated for the mobile seating device. All hardware shall remain positively attached throughout the test and there shall be no failure of any component. Each mobile seating device belt assembly including attachment hardware and anchorages shall be capable of withstanding a force of not less than two-thousand-five-hundred pounds (2,500 lbs.). This will provide equal mobile seating device securement when subjected to forces generated by forward, rear or side impact.
- 3.5. Occupant securement belt assemblies and anchorages shall also be certified to meet the requirements of FMVSS No.'s 209 and 210.
- 3.6. The occupant securement system must be designed to be attached to the bus body either directly or in combination with the mobile seating device securement system, by a method which prohibits the transfer of weight or force from the mobile seating device to occupant in the event of an impact.
- 3.7. All securement system attachments or coupling hardware not permanently attached shall be a "positive latch" type to prohibit accidental disconnecting.
- 3.8. All attachment or coupling systems designed to be connected or disconnected frequently shall be accessible and operable without the use of tools or other mechanical assistance.
- 3.9. All securement system hardware and components shall be free of sharp or jagged areas and shall be of a non-corrosive material or treated to resist corrosion.
- 3.10. The occupant securement system shall be made of materials which do not stain, soil, or tear an occupant's clothing.

- 3.11. No mobile seating device securement system hardware shall be placed so that a mobile seating device can be placed blocking access to lift door.

G.4. **SUPPORT EQUIPMENT AND ACCESSORIES:** The following is recommended by the National Standards for School Buses for support equipment and accessories. It is included here for the information of school districts. The following are not required to be provided by the body manufacturer unless specified in the Invitation for Bid.

- 4.1. **SUPPORT EQUIPMENT SECUREMENT:** Portable student support equipment or special accessory items shall be secured at the mounting location to withstand a pulling force of five (5) times the weight of the item, or shall be retained in an enclosed, latched compartment. Such special items, if used, shall meet specifications and/or include the following:

- 4.1.1. **Belt Cutter:** The bus shall contain a belt cutter for use in emergencies, including evacuations. The belt cutter should be designed to eliminate the possibility of the operator or others being cut during use, and should be secured in a location of safekeeping such as a first aid kit.

- 4.1.2. **Crutches, Walkers, Canes, and Similar Devices:** These items to be secured as specified above.

- 4.1.3. **Medical Support Equipment:** These items include oxygen bottles, ventilators, and other items. These items shall be secured as specified above.

H. AIR CONDITIONING SPECIFICATION

H.1. SPECIAL REQUIREMENTS: Unless otherwise noted, all school buses ordered with air conditioning shall be furnished with the following:

- 1.1. **ALTERNATOR:** "Type A" and "Type B" buses equipped with air conditioning shall be furnished with an alternator with a minimum output rating of one-hundred amperes (100 amps) and one-hundred-thirty amperes (130 amps), respectively. "Type C" and "Type D" buses equipped with air conditioning shall be furnished with an alternator with a minimum output rating of one-hundred-thirty amperes (130 amps). "Type A" and "Type B", "Type C", and "Type D" buses equipped with air conditioning and wheelchair lifts shall be furnished with alternators with a minimum output rating of one-hundred-sixty amperes (160 amps).
- 1.2. **INSULATION:** Minimum five-eighth inch (5/8") nominal thickness plywood shall be installed over the existing or manufacturer's standard steel floor for insulation [See Paragraph C.2.5.]. Air-conditioned buses shall have the equivalent of one-and-one-half inches (1-1/2") of Fiberglas or other insulation in the ceilings and walls including the interior of hat-shaped bows. The insulation shall have a minimum R-factor value of 5.77.
- 1.3. **TINTING:** The windshield and all windows of air-conditioned school buses shall be tinted to reduce the heat load of the system, meeting the requirements of Option No. 13 for dark tinting. (NOTE: It is not necessary to order Option 13; it must be furnished.)
- 1.4. **WHITE ROOF:** When so specified in the Invitation for Bid [See Option No. 38], the roofs of buses equipped with air conditioning shall be painted white, meeting the requirements of Option No. 38 and Paragraphs C.1.4.2. and E.1.4.1.
- 1.5. **EXTRA COOLING:** When so specified in the Invitation for Bid [See Option No. 2], additional cooling may be ordered for 15- through 71-passenger school buses. This is intended for use in buses operated under severe conditions (e.g., buses with handicapped lifts where the doors remain open for long periods of time, buses operated in urban areas with slow, stop-and-go traffic, etc.). Ordering this option will provide a Btu/hr. capacity equal to the next passenger-capacity category, as shown in Table No. Twenty-nine (29). (For example, an 18-passenger school bus with this option would be furnished with a fifty-three-thousand (53,000) Btu/hr. capacity air conditioning system instead of the standard forty-thousand (40,000) Btu/hr. unit)

H.2. GENERAL AND PERFORMANCE REQUIREMENTS: Air-conditioning systems furnished to meet the requirements of this specification shall be the mechanical vapor compression refrigeration type. Each air conditioning system shall have sufficient power for simultaneous cooling, circulating, cleaning, and dehumidifying the air. The refrigerant for the system must be nontoxic, nonflammable, and nonexplosive. The air conditioning system shall be manufactured to conform to the requirements of SAE J639. Air conditioning units furnished under this specification shall be of the current year's production. Details not specifically defined herein shall be in accordance with the manufacturer's standard commercial practice for products of this type. Table Twenty-nine No. (29) lists the components and the appropriate ratings required by this specification:

TABLE TWENTY-NINE (29)
MINIMUM AIR CONDITIONING COMPONENT REQUIREMENTS

Bus Size	Capacity BTU/hr.	Air Flow CFM	Compressor (s)/ No.	Condenser (s) Location/No.	Evaporators Location/No.
15-passenger	19,000	1,000	1	1--skirt mtd. (or eng. comp.)	1--Front & Rear
16-20-passenger	40,000	1,200	1	1--skirt mtd.	1-- Rear (no dash unit included)
24-35-passenger	53,000	1,300	1	1	1--Rear
47-passenger	80,000	1,900	2	2	2--1 Front & 1 Rear
53-71-passenger ¹	93,000	2,000	2	2	2--1 each side
77-83-passenger ¹	108,000	2,400	2	2	2--1 each side
¹ Except rear engine buses may be single units provided they meet or exceed the BTU/cfm requirement.					

2.1. CONTROLS: A control box or panel, which shall be located in the driver's compartment, shall be permanently installed to house inside temperature and fan speed controls. The control box or panel shall be positioned so that the driver shall be able to operate the air conditioning controls while seated in the driver's seat and operating the bus. The fan (s) (blower) shall have a minimum of two (2) operating speeds ("off" is not considered an operating speed).

2.2. INSTALLATION:

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

2.2.2. Workmanship: Poor, shoddy installation will be grounds for immediate rejection of the complete bus.

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

NOTE: No installation of any air conditioning units or systems shall, under any circumstances, void the chassis manufacturer's engine warranty.

H.3. COMPONENTS: The following is a list of components required for air conditioning systems [See Paragraph H.2.]. Any parts or components not specifically mentioned below, but which are required to provide a complete operating unit, or which are standard for the model offered, shall be included:

3.1. BLOWER UNIT: The blower unit shall be of heavy-duty, commercial design and shall circulate air over the evaporator (s) to cool the passenger compartment. Fans shall be of the centrifugal or axial type and quiet in operation. Unless they are self-contained, fan motor (s) shall have bearings of the permanent lubrication type and designed to operate on the twelve (12) volt DC system of the school bus. The blower unit (s) shall not increase the ambient noise level of the unloaded school bus while parked with the engine idling more than five (5) decibels when measured in the center of the bus.

H. Air Conditioning Specifications

- 3.2. **COMPRESSORS⁴⁴:** Compressors shall be of the air conditioning or chassis manufacturer's standard design. Lubrication of all moving parts shall be accomplished automatically. An automatic (electric) clutch shall be provided on each compressor. The compressor size shall be as required to meet the performance requirements above. Compressor (s) shall be compatible with the engine speed.
- 3.3. **CONDENSERS:** The condenser (s) shall be as recommended by the manufacturer of the unit. The air conditioning manufacturers shall use their standard condenser fabrication and installation practices.
- 3.4. **DASH OUTLETS:** Unless otherwise specified in the Invitation for Bid, air conditioners on 16- through 19-passenger school buses will not have in-dash air outlets. In-dash outlets are required on 15-passenger buses equipped with air conditioning.
- 3.5. **EVAPORATOR (COOLING COIL):** Air conditioning manufacturers shall use standard cooling coil, fabrication and installation practices.
- 3.6. **REFRIGERANT DRYER:** A dryer with a minimum of ten ounce (10 oz.) of desiccant shall be installed in the refrigerating circuit. The system shall be designed and installed in accordance with the manufacturer's standard practice to insure optimum performance and ease of service/replacement.
- H.4. **TESTING:** Testing shall be done by, or at the direction of, the General Services Commission and/or the receiving school district. Tests shall be performed on buses furnished. In the event the bus air conditioning system fails to meet or exceed all conditions and requirements of this specification, the cost of the test shall be borne by the supplier.
- H.5. **OTHER REQUIREMENTS:**
- 5.1. **AVAILABILITY OF SERVICE AND REPAIR PARTS:** An adequate supply of repair parts normally required for most maintenance and warranty repair shall be carried in stock within the State of Texas. Bidder shall include with each bid, or have on file with the Purchasing Division of this Commission, a list of factory-authorized companies or individuals, and their addresses, who stock repair parts and who can perform service on the products furnished.
- NOTE: Requirement in Paragraph A.10.4.1. The air conditioning manufacturer shall have service facilities available in each of the five (5) zones within the State of Texas that stock repair parts normally required for warranty service and regular repair [See Figure No. Three (3)].
- 5.2. **INTRODUCTION BOOKS:** One (1) copy of complete maintenance and operating instructions shall accompany each air conditioned bus upon delivery. If a parts list is required by the school district the district should contact the vendor supplying the equipment.

⁴⁴

Compressors shall be geared so that their speed does not exceed the manufacturer's maximum recommended sustained speeds at a road speed of sixty miles per hour (60 mph) in high gear.

H. Air Conditioning Specifications

- 5.3. LABELING: Each air conditioning unit shall have affixed a legible and durable nameplate with the following information:
 - 5.3.1. Name and address of the manufacturer.
 - 5.3.2. Cooling Capacity of the installed unit (in Btu/hr.), based upon the smallest rating of any component in the system.
 - 5.3.3. Recirculation and ventilation of air quantity in (CFM).
- 5.4. WARRANTY: The complete air conditioning system, including all components, shall be warranted for a period of one (1) year, unlimited mileage, from the date of delivery.

FIGURE No. THREE (3)

REQUIRED SERVICE FACILITY ZONES WITHIN THE STATE OF TEXAS

I. Availability of Specifications

- I. AVAILABILITY OF SPECIFICATIONS:** This specification is available through the Commission's web cite, or by calling or writing:

Bid Services
General Services Commission
P.O.Box 13047
Austin, TX 78711-3047
(512) 463-3416
http://www.gsc.state.tx.us/spec_lib

FOR ASSISTANCE

SCHOOL BUSES

NOTE TO SCHOOL DISTRICTS: You may want to communicate with the Commission using this form to describe problems you are having with your school buses. However, you should first attempt to have the complaint corrected by the body vendor or chassis dealer, whichever is applicable. Refer to Paragraph A.10.4. for a list of the names and titles of individuals in the various organizations to contact for service. Then, if you are not satisfied with the repairs or corrections made, or if nothing is done to alleviate the problem, please use a copy of the following form to inform the Commission.

DATE:

SCHOOL DISTRICT NAME:

CITY:

ZIP:

CONTACT NAME:

AREA CODE & PHONE NUMBER:

PASSENGER CAPACITY (Circle One): 15 16 18 19 20 24 35 47 53 59 65 71S 71L77 83

BODY MAKE (Check One):

Blue Bird	Chevrolet	Dodge	Ford	GMC
Thomas	Navistar	Crane Carrier	Transi Corp	

FIRM OR DEALER NAME:

NAME OF PERSON CONTACTED:

STATE NATURE OF COMPLAINT OR PROBLEM

(Be specific, use additional sheets, if necessary)

Mail To: "Purchaser U"
General Services Commission
P.O. Box 13047
Austin, TX 78711-3047

APPROVED -- SCHOOL BUS GASOLINE ENGINES

LEGEND: C = Conventional Bus, FC = Forward Control Bus, FE = Front Engine Bus, RE = Rear Engine Bus, SC = Short Wheelbase Conventional Bus, LC = Long Wheelbase Conventional Bus.

MANUFACTURER

GASOLINE ENGINES CAPACITY

	15	16	18	19	20	24	35	47	53	59C	59FC	65C	65FC
DODGE													
Displacement	5.9L		5.9L										
SAE Gross hp	190		190										
Axle Ratio	3.54		3.54										
Trans. Auto.***	A727		A727										
G.M.C.													
Displacement	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L
SAE Gross hp	201	201	201	201	201	201	225	225	225	225	255	215	255
Axle Ratio							7.17	7.17	7.17	7.17	**	7.17	**
Tran. Auto.***	400	400	400	400	400	400	AT545	AT545	AT545	AT545	AT545	AT545	AT545

MANUFACTURER

NATURAL GAS ENGINES (OEM--FURNISHED) CAPACITY

	15	16	18	19	20	24	35	47	53	59C	59FC	65C	65FC	71C
HERCULES														
Displacement							5.6T	5.6T	5.6T	5.6T	5.6T	5.6T	5.6T	5.6T
SAE Gross hp							190	190	190	190	190	190	190	190
Axle Ratio							**	**	**	**	**	**	**	**
Trans. Auto.***							AT545	AT545	AT545	AT545	AT545	AT545	AT545	AT545
TECOGN/GMC														
(7.0L-mono-fuel) -														
Bluebird/Stewart &														
Stevenson (6.01 bi- and														
mono-fuel) Displacement														
SAE Gross hp							6.0L	7.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L
Axle Ratio							210	195	210	210	195	210	195	210
Trans. Auto.***							**	**	**	**	**	**	**	**
							AT545	AT545	AT545	AT545	AT545	AT545	AT545	AT545

APPROVED -- SCHOOL BUS DIESEL ENGINES

LEGEND: C = Conventional Bus, FC = Forward Control Bus, FE = Front Engine Bus, RE = Rear Engine Bus, SC = Short Wheelbase Conventional Bus, LC = Long Wheelbase Conventional Bus.

MANUFACTURER

DIESEL ENGINES - CAPACITY

	15	16	18	19	20	24	35	47	53	59C	59FC	65C	65FC
CATERPILLAR													
Displacement							6.6T	6.6T	6.6T	6.6T		6.6T	
SAE Gross hp							170-200	170-200	170-200	170-200		170-200	
Axle Ratio							**2	**	**	**		**	
Trans. Auto.***1							AT545	AT545	AT545	AT545		AT545	
CUMMINS/ FORD DIESEL													
Displacement							5.9T	5.9T	5.9T	5.9T	5.9T	5.9T	5.9T
SAE Gross hp							160-190	160-190	160-190	160-190	180	160-190	180
Axle Ratio							**	**	**	**	**	**	**
Trans. Auto.***							AT545	AT545	AT545	AT545	AT545	AT545	AT545
FORD/NAVISTAR													
Displacement	7.3N	7.3N	7.3N										
SAE Gross hp	180	180	180										
Axle Ratio	**	**	**										
Trans. Auto.***													
GENERAL MOTORS													
Displacement	6.5	6.5	6.5	6.5	6.5	6.5							
SAE Gross hp	160-V8	160-V8	160-V8	160-V8	160-V8	160-V8							
Axle Ratio													
Trans. Auto.***	A4OD	A4OD	A4OD	A4OD	A4OD	A4OD							
N.I.C. (T444E)													
Displacement						7.3T	7.3T	7.3T	7.3T	7.3T	7.3T	7.3T	7.3T
SAE Gross hp						160-230	160-230	160-230	160-230	160-230	175-230	160-230	175-230
Axle Ratio						**	**	**	**	**	**	**	**
Trans. Auto.***						AT542/5	AT545	AT545	AT545	AT545	AT545	AT545	AT545
N.I.C. (DT466)													
Displacement							7.6T	7.6T	7.6T	7.6T	7.6T	7.6T	7.6T
SAE Gross hp							170-230	170-230	170-230	170-230	170-230	170-230	170-230
Axle Ratio							**	**	**	**	**	**	**
Trans. Auto.***							AT545	AT545	AT545	AT545	AT545	AT545	AT545

^{1**} Rear axle ratio, as required.

^{2***} Minimum acceptable transmission listed. Transmission **MUST** be adequately matched with engine torque and approved by the engine manufacturer

APPROVED -- SCHOOL BUS BODIES

Bus Size	Configuration/Mfg.	Blue Bird	Carpenter	Collins	Mid Bus	Thomas	US. Bus	Van Com
15	Van Conversion or Cutaway	Micro Bird	-	Bantam Econobus Super Bantam	Guide	0402 0412	Universe	V-15
16	Commercial Cutaway	Micro Bird MB-20	SCL1706 SCL1801	-	Guide	0406	SturdiBus	-
18	Van Conversion	-	-	Bantam Super Bantam	Guide	-	SturdiVan	V-18
19	Commercial Cutaway	Micro Bird MB-20	SCL1706 SCL1801	Super Bantam Grand Bantam	Guide	-	SturdiBus	-
20	Stripped Chassis	Mini Bird MB-20	WSCV1808	Grand Bantam	-	0404, 0417 0407	Eagle	-
24	Conventional Cutaway Semi-Fwd-Control	2103 2307 MB-20	WSCV2100 WSCV2107 -	-	-	0500 041G 0501	Eagle	-
35	Conventional Semi-Fwd-Control	1808, 2005	SB1808	-	-	0510, 0600 0501	Eagle	-
47	Forward Control Conventional Semi-Fwd-control	TC2000 2304 -	SFT2902 SB2304 -	-	-	0908 0710 0701	-	-
53	Forward Control Conventional Semi-Fwd-control	TC2000 2508 -	SFT2902 SB2508 -	-	-	0908 0810 0801	-	-
59	Forward Control Conventional Semi-Fwd-control	TC2000 2800, 2807 -	SFT3303 SB2800 -	-	-	1105/110H 0910 0901	-	-
65	Forward Control Conventional Semi-Fwd-control	TC2000 3004, 3011 -	SFT3303 SB3004 -	-	-	120H/1205, 1108 1010 1001	-	-
71S	Forward Control Conventional Semi-Fwd-control	TC2000 3201 -	SFT3507 SB3201 -	-	-	1100 1101	-	-
71L	Forward Control Conventional Semi-Fwd-control	3208 -	SB3201 -	-	-	1110 1101	-	-
77	Forward Control Conventional Semi-Fwd-control	3604, 3611 3310 -	SFT3711 SB3405 -	-	-	130H, 1308 1200 1201	-	-
83	Forward Control	3,907	SFT3906/SPT3908	-	-	1318, 1405/140H	-	-

OPEN MARKET
School Bus Purchase Requisition
Texas Specification No. 070-SB-98
GENERAL SERVICES COMMISSION
Central Procurement Services
P. O. Box 13047
Austin, Texas 78711-3047
Attention: Purchaser U

District Name _____

County/District No. _____

GSC Req. # _____

Estimated Total \$ _____

Typed Name and Title of Contact Person		Mailing Address	
Telephone _____ Fax _____		Bus Delivery Address if Different from Above	
Typed Name of Superintendent	Date	Telephone	Signature

NOTE: THE SIGNATURE OF THE SUPERINTENDENT IS REQUIRED FOR CERTIFICATION THAT FUNDS ARE AVAILABLE FOR THIS PURCHASE AND TO PROCESS THIS REQUISITION.

School Districts have the right to review the bids received prior to award in order to determine funds availability. Please note time constraints relative to this review process (see Par. B.2.1.4.)

Do you wish to review bids received? ____ Yes ____ No **(Note: Bid referral may delay delivery up to 30 days)**

Instructions: For information on bus options, see the current *Texas School Bus Specifications*. The completed form should be submitted as indicated below. For further information, contact Purchaser "U" (512) 463-3369.

Section 1 - Bus Requirements

Quantity: _____ Automatic Transmission: ____ Yes ____ No Type: ____ Conventional
Size: ____ Passenger School Bus (For 24 thru 77 passengers) ____ Forward Control
(See Par. B.1.2 for Reduced Passenger Capacities)

Section II - Regular Bus Options: Check all regular options to be included.

1	Air conditioning, standard cooling	13	Glazing, Dark Tint Passenger Slide Windows (Min. 30%, Max. 40% light transmittance)
2	Air conditioning, extra cooling (n/a for 77-83 Pass. Buses.)	14	Heater, Rear (Auxiliary)
3	Alternative fuel engines, O.E.M. Supplied (____3A. Compressed Natural Gas (Select from A or B) CNG ____ mono ____ bi fuel ____3B. Liquefied Petroleum Gas (LPG)	15	Hubodometer
4	Alternator, Increased Capacity	16	Knee Spacing (Maximum; requires deletion of one row (6 positions) of seats, which will reduce seating capacity)
5	Axle, Rear, Two Speed (24-71 pass. buses only) (N/A with automatic transmission)	17	Laminated Safety Plate Glass
6	Brakes, Hydraulic (59-77-pass, buses only)	18.	Low Profile Tires (24-83 pass. buses only)
7	Chassis, Long Wheelbase conventional 24 and 71 pass. only).	19	Mud Flaps, with Brackets, Mounted
8	Diesel Engine. (Insert Horsepower in Special Option A, Back Page)	20	Reflective Material
9	Differential, No-Spin (24-71 Pass. Bus Only)	21	School Name Lettering (type EXACTLY as required: _____)
10	Door, Powered Service (N/A with automotive type door)	22	Seat Backs, Increased Height
11	Door, Service, Automotive (Sedan-type, Manually operated (24-71 Pass. Bus Only)	23	Seat Belts (Required on all 15-20 passenger buses)
		24	Security System Lock, All Doors
		25	Sound Abatement Insulation

District Name _____

County District No. _____

27	Strobe Light , roof-mounted
28	Tachograph
29	Tachometer (to indicate engine RPM)
30	Tires, Mud and Snow Tread
31	Tool Compartment
32	Wheel, Spare , (without carrier and tire/tube)
33	Wheel, Spare, Mounted (On carrier, without tire)

34	Wheelchair Lift, Folding Platform Type, <u>Front Curb</u> Side Mounted (24 - 71 Pass. Buses Only; with _____ Wheelchair Positions. Will reduce seating capacity. <i><u>Indicate number required.</u></i>
35	Wheelchair Lift, Folding Platform Type, <u>Rear Curb</u> Side Mounted (24 - 71 Pass. Buses Only; with _____ Wheelchair Positions. Will reduce seating capacity. <i><u>Indicate number required.</u></i>
36	Wheelchair Lift, Folding Platform Type, <u>Right Curb</u> Side Mounted (15 - 20 Pass. Buses Only; with _____ Wheelchair Positions. Will reduce seating capacity. <i><u>Indicate number required.</u></i>
37	Wheelchair Restraints, Webbed-Belt Type (15 - 71 Passenger buses only)
38	Windshield Wipers, Intermittent
39	White Roof
40	Windows, Push-out , additional, (for emergency exit). _____ <i><u>Indicate number required.</u></i>
41	Passenger Seats, specialized (with integral child restraint). _____ <i><u>Indicate number required.</u></i>

NOTES: **Discard all previous editions form.** Use only this form to order school buses. NA means Not Available/Not Applicable. Forward this form and any attachments to GSC at the address shown above.

SECTION III - Special Options:

List any requested additional options that do not appear in current state specifications.

A. Diesel Engine Horsepower [] Minimum

J. _____

B. _____

K. _____

C. _____

L. _____

D. _____

M. _____

E. _____

N. _____

F. _____

O. _____

G. _____

P. _____

H. _____

Q. _____

I. _____

R. _____

GENERAL INDEX

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Memo

TO: Public School District Purchasing Departments
FROM: *DP* Don Phelps, Purchaser "U", General Services Commission
DATE: January 7, 1997
SUBJECT: **Texas Specification No. 070-SB-97 for 1997 Model School Buses**

Enclosed is your district copy for the above referenced specification. Each school district purchasing department is provided a copy of this specification at no charge. Additional copies are available at \$3.00 per copy. Mail cost are additional if not mailed through Inter-Agency Mail.

Call the GSC's Bid Services Specification Telephone Order Line at 512/463-3416 to order additional copies. This is an automated service. Follow the prompts given and your order will be mailed to you.

Questions regarding the availability and distribution of this specification should be directed to:

Angela Richmond, Manager, Bid Services:

phone: 512/463-3415

fax: 512/463-7073

e-mail: anglea.richmond@notes.gsc.state.tx.us