

F. 24- THROUGH 83-PASSENGER CHASSIS SPECIFICATIONS

- 5.3.5.4. The vendor must obtain the cooperation of one of the named school districts in agreeing to test the bus and to provide a report to the GSC Specification Section on the form provided (see copy of the form entitled, "Three-Month Test of New School Bus Engines," on Page 117).
- 5.3.5.5. The vendor or manufacturer shall then contact the GSC Purchaser and TEA School Bus Committee Representative about ordering the school bus with the subject engine.
- 5.3.5.6. The bus shall be tested for a period of not less than three months during the regular nine-months school term, preferably on a variety of routes and on activity trips.
- 5.3.5.7. Upon receipt of the school district's report, the Specification Section will make a recommendation at the next meeting of the School Bus Committee that the engine be accepted or rejected.
- 5.3.5.8. The School Bus Committee will act on this recommendation and, if approved, the engine will be added to the Class 070-SB APL.

NOTES: Once an engine is approved in one horsepower and torque version, other power versions of this same engine need not be tested in a school bus prior to approval. For approval, the vendor or manufacturer shall follow Par. F.5.3.5.1, and, in addition, state the rear axle ratio recommended for the size bus for which approval is requested. Then the engine will be added to the Class 070-SB-APL which will show the SAE net horsepower and SAE net torque as well as the rear axle ratio for the particular application.

THE VALUES OF DISPLACEMENT, HORSEPOWER, AND TORQUE LISTED IN THE FOLLOWING TABLES UNDER EACH MANUFACTURER ARE NOT MINIMUM VALUES AND SHOULD NOT BE CONSTRUED AS SUCH. THE ONLY MINIMUM REQUIREMENTS FOR THE PERFORMANCE OF ENGINES IN 24- THROUGH 83-PASSENGER SCHOOL BUSES IN THE STATE OF TEXAS ARE THE FIVE REQUIREMENTS LISTED IN PARAGRAPH F.5.3.4. (There are additional requirements for engines, either implied or specified, separate from the above performance requirements.)

- 5.4. **ENGINE WARNING SYSTEM** - An engine warning system shall be provided for the 35- through 83-passenger diesel-powered buses and shall be chassis factory-installed. Audible signals (which may be also be visual) shall indicate to the driver when the oil pressure is too low and/or the engine temperature is too high for safe operation. These signals shall begin within 8 seconds or less after the condition begins in order that the engine can be shut down before permanent damage occurs. A manual engine shut-down device is preferred.

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 85 dB(A) at the ear of the occupant in the bus nearest to the noise source in the bus. When so specified in the Invitation for Bids (see Option No. 24), the bus shall be furnished with the noise level not exceeding 86 dB(A) measured at the same place.
- 5.5.3. **Tailpipe** - The tailpipe shall be constructed of seamless or electrically welded tubing of 16-gauge steel or equivalent, and shall extend at least 5 inches beyond the chassis frame. The size of the tailpipe shall not be reduced after it leaves the muffler.
- 5.5.4. **Tailpipe Exit** - The tailpipe of a gasoline-powered bus shall not exit the side of the bus anywhere within 12 inches of a vertical plane through the center of the fuel filler opening and perpendicular to the side of the bus, unless protected with a metal shield to divert spilled fuel away from tailpipe.

- 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.

F. 24- THROUGH 83-PASSENGER CHASSIS SPECIFICATIONS

- 5.7. **GOVERNOR** - A governor set to the manufacturer's recommended maximum engine speed (RPM) shall be installed by the chassis manufacturer.
- 5.8. **OIL FILTER** - Each chassis shall be equipped with a factory-installed, minimum one-quart 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 Bids (see Option 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.

F.6. 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.**

- 6.1. **AUTOMATIC TRANSMISSION, CHASSIS MANUFACTURER'S** - Unless otherwise specified in the Invitation for Bids, the 24-passenger bus shall be furnished with a minimum three forward speed automatic transmission which shall be the chassis manufacturer's standard automatic transmission for this type of chassis.
- 6.2. **AUTOMATIC TRANSMISSION (ATD MODEL AT 545)** - Unless otherwise specified in the Invitation for Bids, the 35- through 71-passenger and the 77-passenger conventional buses shall be furnished with a minimum four forward speed automatic transmission. The transmission shall be the ATD Model AT 545, or approved equal (see Par. F.6. above), 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 GVWR and/or 445 lb.-ft. maximum torque rating.
- 6.3. **AUTOMATIC TRANSMISSION (ATD MODEL MT-643)** - Unless otherwise specified in the Invitation for Bids, the 77- and 83-passenger forward control buses shall be furnished with a minimum four forward speed automatic transmission. The transmission shall be the ATD Model MT-643, or approved equal.
- 6.4. **DRIVE SHAFT GUARD** - 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.

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

- 6.5. **MANUAL TRANSMISSIONS** - Unless otherwise specified in the Invitation for Bids, the manual type transmission shall be furnished on all 24- through 77-passenger buses (but not the 83-passenger bus, which requires 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 10 percent 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 forward (direct in fifth) and one reverse speed for 35-, 47-, 53-, 59-, 65-, 71-, and 77-passenger chassis.
- 6.6. **MANUAL TRANSMISSION CLUTCH** - The clutch in buses equipped with manual transmissions shall have a torque capacity not less than 10 percent 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:
 - 6.6.1. **12-inch Clutch** - All chassis for the 24-, 35-, 47-, 53-, and 59-passenger buses with manual transmissions shall be equipped with a minimum 12-inch diameter clutch..
 - 6.6.2. **13-inch Clutch** - All chassis for 65-, 71-, and 77-passenger buses with manual transmissions shall be equipped with a minimum 13-inch diameter clutch or a clutch with equivalent performance.

24-PASSENGER BUS TABLE

TABLE 12
24-PASSENGER BUS CHASSIS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

24-Passenger ITEM	Refer to General Requirements, Page 4	
	1992 Min. Rqmts.	GMC/Chevrolet P31042/P31442
GVWR, lbs	14500	14500
GAWR, lbs - Front	5000	5000
- Rear	11000	11000
Axle Capacity, lbs - Front	5000	5000
- Rear	11000	11000
Wheelbase, in	133/157	133/157
Chassis Length, in	as shown	238.8/262.8
Track, in - Front	65.2	65.2
- Rear	66.7	66.7
Gasoline Engine CID*	**	350-V8EFI
SAE Gross Horsepower	**	201
SAE Gross Torque, lb-ft	**	318
Transmission:		
Automatic, Gears	4 spd	A4OD
Manual, Fwd. Gears	4 spd	M4/NA
Tires, Steel Belted Radial Tubeless		
Size & Load Range	as shown	8R19.5E
Wheels, Rear	Dual	Dual
Alternator, amperes	105	105

*See diesel engine Option 8.

**See minimum power requirements in Par. F.5.3.4.

DIESEL ENGINES (Option 8)

24-Passenger ITEM	1992 Min. Rqmts.	GMC/CHEVROLET P31042/P31442
Engine Displacement, L.	**	6.2N-V8
SAE Gross Horsepower	**	164
SAE Gross Torque, lb-ft	**	302

**See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following bodies are available on stripped chassis:

24-PASSENGER BUS BODIES

24-Passenger ITEM	1992 Min. Rqmts.	Blue Bird	Carpenter	Thomas
		Mini-Bird	Cadet	Mighty Mite
Interior Headroom, in	73	77	77	73
Interior Width, in	90	90.5	90	90
Service Door	as shown	Tall	Tall	Tall

35-PASSENGER CONVENTIONAL BUS TABLE

TABLE 13
35-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

		Refer to General Requirements, Page 4			
CHASSIS		B	N	N-S	F
35-Passenger Conv.	1992	B.B.	NIC	NIC-Semi****	FORD
ITEM	Min.	B7	3700*	3600*	B600
	Rqmts.				
GVWR, lbs	21500	22000	21500	21500	23000
GAWR, lbs - Front	6000	7500	6000	6000	8000
- Rear	15000	15000	15500	15500	15000
Axle Capacity, lbs - Front	6000	7500	6000	6000	8000
- Rear	15000	15000	15500	15500	15000
Wheelbase, in	151	157	152	170	151
Cowl-to-Axle, in	127	133	127	127	127
Cowl-to-Frame End, in	217	223	217	217	231
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	14.75 x 1.31	15 x 1.43	15 x 1.43	15.38 x 1.53
- Rear Lining, in	as shown	14.75 x 1.31	15 x 1.43	15 x 1.43	15.00 x 6.00
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
- Rim Size, in	6.75	6.75	6.75	6.75	6.75

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: 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 Bids.

DIESEL ENGINES (Option 8)

35-Passenger	1992	B.B.	NIC	FORD
ITEM	Min.	B7	3600/3700	B600*
	Rqmts.			
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	6000	7500	6000	8000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

35-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-17	1808/2005	77SB1808	0510/0511/0600	2F1802
Chassis Available	N.F	B,N,F	N.F	N-S,N.F	N.F

47-PASSENGER CONVENTIONAL BUS TABLE

TABLE 14
47-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

		Refer to General Requirements, Page 4			
CHASSIS		B	N	N-S	F
47-Passenger Conv.	1992	B.B.	NIC	NIC-Semi****	FORD
ITEM	Min.	B7	3700*	3600*	B600*
	Rpts.				
GVWR, lbs	21500	22000	21500	21500	23000
GAWR, lbs - Front	6000	7500	6000	6000	8000
- Rear	15000	15000	15500	15500	15000
Axle Capacity, lbs - Front	6000	7500	6000	6000	8000
- Rear	15000	15000	15500	15500	15000
Wheelbase, in	193	193	193	193	193
Cowl-to-Axle, in	168	169	168	168	169
Cowl-to-Frame End, in	274	279	274	274	280
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	14.75 x 1.31	15 x 1.43	15 x 1.43	15.38 x 1.53
- Rear Lining, in	as shown	14.75 x 1.31	15 x 1.43	15 x 1.43	15.00 x 6.00
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
- Rim Size, in	6.75	6.75	6.75	6.75	6.75

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: 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 Bids.

DIESEL ENGINES (Option 8)

47-Passenger	1992	B.B.	NIC	FORD
ITEM	Min.	B7	3600/3700	B600
	Rpts.			
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.96T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	6000	7500	6000	8000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

47-PASSENGER CONVENTIONAL BODIES

BODIES	AnTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-22	2304	77SB1808	0701/0710	2F1802
Chassis Available	N,F	B,N,F	N,F	N-S, N,F	N,F

47-PASSENGER FORWARD CONTROL BUS TABLE

TABLE 13
47-PASSENGER FORWARD CONTROL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

Refer to General Requirements, Page 4				
CHASSIS	B	S	N	
47-Passenger ITEM	1992 Min. Rqmts.	Blue Bird TC2000**	Crane 4000**	NIC 3900**
GVWR, lbs	26500	26300 (air brake) 26500 (hyd brake)	26500	29500
GAWR, lbs - Front	10300	10300	10300	12000
- Rear	15500	15500 (air brake) 17000 (hyd brake)	17000	17500
Axle Capacity, lbs - Front	10800	12000	10800	12000
- Rear	17000	17000	17000	17500
Wheelbase, in	132	132	146	159
Cowl-to-Axle, in	n/a	n/a	n/a	n/a
Cowl-to-frame end, in	n/a	n/a	n/a	n/a
Gasoline Engine CID***	****	**	**	**
SAE Gross Horsepower	****	**	**	**
SAE Gross Torque, lb-ft	****	**	**	**
Transmission:				
Automatic, Gears/Model	4 Spd	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 Spd	M5	n/a	M5
Brakes - Front Disc Rotor, in	as shown	15 x 1.438	15.00 x 4.00	15 x 2.88
- Rear Lining, in	as shown	15 x 1.438	15.50 x 6.00	15 x 2.88
Tires, Steel Belted Radial	Tubeless			
Size & Load Range	10R22.5F	10R22.5F	10R22.5F	11R22.5G
Wheels - Rear	Dual	Dual	Dual	Dual
- Rim Size, in	7.5	7.5	7.50	8.25

*Furnished with air brakes only.

**Furnished with diesel engine only, Option 8.

***See diesel engine option 8.

****See minimum power requirements in Par. F.5.3.4.

DIESEL ENGINES (Option 8)

47-Passenger ITEM	1992 Min. Rqmts.	Blue Bird TC2000	Crane 4000	NIC 3900
Engine Displacement, L.	***	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	***	190	180	170
SAE Gross Torque, lb-ft	***	475	445	400
Front GAWR	10300	10300	10300	10300

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

47-PASSENGER FORWARD CONTROL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS2707/NS2602	TCFC251	SFT3000	----	2N2806
Chassis Available	N,S	B	N	----	N

53-PASSENGER CONVENTIONAL BUS TABLE

TABLE 16
53-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

Refer to General Requirements, Page 4

CHASSIS		B	N	N-S	F
53-Passenger Conv.		B.B.	NIC	NIC-Semi****	FORD
ITEM	1992 Min. Rqmts.	B7	3700*	3600*	B600*
GVWR, lbs	21500	22500	21500	21500	23000
GAWR, lbs - Front	6000	7500	6000	6000	8000
- Rear	15000	15000	15500	15500	15000
Axle Capacity, lbs - Front	6000	7500	6000	6000	8000
- Rear	15000	15000	15500	15500	15000
Wheelbase, in	211	211/229	218	218	217
Cowl-to-Axle, in	187	187/205	193	193	193
Cowl-to-Frame End, in	305	307	305	305	323
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	14.75 x 1.31	15 x 1.43	15 x 1.43	15.38 x 1.53
- Rear Lining, in	as shown	14.75 x 1.31	15 x 1.43	15 x 1.43	15.00 x 6.00
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
- Rim Size, in	6.75	6.75	6.75	6.75	6.75

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: 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 Bids.

DIESEL ENGINES (Option 8)

53-Passenger	1992	B.B.	NIC	FORD
ITEM	Min. Rqmts.	B7	3600/3700	B600
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	1605
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	6000	7500	6000	8000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

53-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-24	2508	77SB2508	0801/0810	2F2503
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

53-PASSENGER FORWARD CONTROL BUS TABLE

TABLE 17
53-PASSENGER FORWARD CONTROL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

		Refer to General Requirements, Page 4		
CHASSIS		B	N	S
53-Passenger	1992	Blue Bird	NIC	Crane
ITEM	Min.	TC2000**	3900**	4000*
	Rqmts.			
GVWR, lbs	26500	26500	29500	26500
GAWR, lbs - Front	10300	10300	12000	10300
- Rear	17000	17000	17500	17000
Axle Capacity, lbs - Front	10800	12000	12000	10800
- Rear	17000	17000	17500	17000
Wheelbase, in	146	146	159	146
Cowl-to-Axle, in	n/a	n/a	n/a	n/a
Cowl-to-frame end, in	n/a	n/a	n/a	n/a
Gasoline Engine CID***	****	**	**	**
SAE Gross Horsepower	****	**	**	**
SAE Gross Torque, lb-ft	****	**	**	**
Transmission:				
Automatic, Gears/Model	4 Spd	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 Spd	M5	M5	n/a
Brakes - Front Disc Rotor, in	as shown	15 x 1.438	15 x 2.88	15.0 x 4
- Rear Lining, in	as shown	15 x 1.438	15 x 2.88	16.5 x 6
Tires, Steel Belted Radial	Tubeless			
Size & Load Range	10R22.5F	10R22.5F	11R22.5G	10R22.5F
Wheels - Rear	Dual	Dual	Dual	Dual
- Rim Size, in	7.50	7.50	8.25	7.50

*Furnished with air brakes only

**Furnished with diesel engine only, Option 8.

***See diesel engine option 8.

****See minimum power requirements in Par. F.5.3.4.

DIESEL ENGINES (Option 8)

53-Passenger	1992	Blue Bird	NIC	Crane
ITEM	Min.	TC2000	3900	4000
	Rqmts.			
Engine Displacement, L.	***	5.9T-16	5.9T16	5.9T-16
SAE Gross Horsepower	***	190	170	180
SAE Gross Torque, lb-ft	***	475	400	445
Front GAWR	10300	10300	10300	10300

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

53-PASSENGER FORWARD CONTROL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS2707/NS2805	TCFC2701	SFT3000	----	2N2806
Chassis Available	N,S	B	N	----	N

59-PASSENGER CONVENTIONAL BUS TABLE

TABLE 18
59-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

		Refer to General Requirements, Page 4			
CHASSIS		B	N	N-S	F
59-Passenger Conv.	1992	B.B.	NIC	NIC-Semi****	FORD
ITEM	Min.	B7	3700*	3600*	B600*
	Reqs.				
GVWR, lbs	25500	25580	25500	25500	25500
GAWR, lbs - Front	7500	7500	8000	8000	9000
- Rear	17500	18080	17500	17500	17500
Axle Capacity, lbs - Front	7500	7500	8000	8000	9000
- Rear	17500	19000	17500	17500	17500
Wheelbase, in	236	241	236	236	237
Cowl-to-Axle, in	211	217	211	211	213
Cowl-to-Frame End, in	329	342	329	329	345
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	15.00 x 4.00	15.0 x 3.50	15.0 x 3.50	15.00 x 4.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 6.00	16.5 x 6.00	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
- Rim Size, in	7.5	7.5	7.5	7.5	7.5

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: Buses ordered in this capacity (59-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bids.

DIESEL ENGINES (Option 8)

59-Passenger	1992	B.B.	NIC	FORD
ITEM	Min.	B7	3600/3700	B600
	Reqs.			
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	6000	7500	6000	8000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

59-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-26	2800/2807	77SB2800	0901/0910	2F2701
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

59-PASSENGER FORWARD CONTROL DIESEL BUS TABLE

TABLE 19
59-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

		Refer to General Requirements, Page 4				
CHASSIS		B	N	T	S	
59 Passenger FC	1992	Blue Bird	NIC	Thomas	Crane*	
ITEM	Min.	TC2000	3900	SAF-T-LINER	4000	
	Reqts.			MVP 1109***		
GVWR, lbs	26500	27800	29500	28380	26500	
GAWR, lbs - Front	10300	10300	12000	10300	10300	
- Rear	17000	17000	17500	18080	17000	
Axle Capacity, lbs - Front	10800	12000	12000	13200	10800	
- Rear	17000	17000	17500	19000	17000	
Wheelbase, in	160	160	184	181	160	
Engine Displacement, L.	*	5.9T-I6	5.9T-I6	5.9T-I6	5.9T-I6	
SAE Gross Horsepower	*	190	170	190	180	
SAE Gross Torque, lb-ft	*	475	400	475	445	
Transmission:**						
Automatic, Gears/Model	4 Spd	AT-545	AT-545	AT-545	AT-545	
Manual, Fwd. gears	5 Spd	M5	M5	M5	n/a	
Brake Lining, in - Front	as shown	15.0 x 4	15.0 x 4	15.0 x 4	15.0 x 6	
- Rear	as shown	16.5 x 7	16.5 x 6	16.5 x 7	16.5 x 6	
Tires. Steel Belted Radial	Tubeless					
Size & Load Range	10R22.5F	10R22.5F	11R22.5G	10R22.5F	10R22.5F	
Wheels - Rear	Dual	Dual	Dual	Dual	Dual	
- Rim Size, in	7.5	7.5	8.25	7.5	7.5	

*Furnished with air brakes only

*See minimum power requirements in Par. F.5.3.4.

**Direct in fourth gear (automatic); direct in fifth gear (manual).

***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 Par. F.5.3.4.).

NOTE: The NIC 5.9T is the model DT-360 diesel engine.

The following Body/Chassis combinations are available as indicated:

59-PASSENGER FORWARD CONTROL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS2910/NS3008	TCFC28210	SFT300	1109	2N3009
Chassis Available	N,S	B	N	T	N

65-PASSENGER CONVENTIONAL BUS TABLE

TABLE 20
65-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

		Refer to General Requirements, Page 4			
CHASSIS		B	N	N-S	F
65-Passenger Conv.	1992	B.B.	NIC	NIC-Semi****	FORD
ITEM	Min. Rqmts.	B7	3700*	3600*	B600*
GVWR, lbs	25580	25580	27500	27500	26500
GAWR, lbs - Front	7500	7500	10000	10000	9000
- Rear	17500	18080	17500	17500	17500
Axle Capacity, lbs - Front	7500	7500	10000	10000	9000
- Rear	17500	19000	17500	17500	17500
Wheelbase, in	238	241/262	254	254	255
Cowl-to-Axle, in	217	217/238	229	229	231
Cowl-to-Frame End, in	359	363/370	359	359	377
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	15.00 x 4.00	15.0 x 3.50	15.0 x 3.50	15.00 x 41.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 6.00	16.5 x 6.00	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
- Rim Size, in	7.5	7.5	7.5	7.5	7.5

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: Buses ordered in this 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 Bids.

DIESEL ENGINES (Option 8)

65-Passenger	1992	B.B.	NIC	FORD
ITEM	Min. Rqmts.	B7	3600/3700	B600
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	9000	9000	10000	9000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

65-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-29	3004/3011	77SB3004	1001/1010	2F2905
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

65-PASSENGER FORWARD CONTROL DIESEL BUS TABLE

TABLE 21
65-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

Refer to General Requirements, Page 4					
CHASSIS	B	N	T	S	
65-Passenger FC	1991	Blue Bird	NIC	Thomas	Crane*
ITEM	Min.	TC2000	3900	SAF-T-LINER	4000
	Reqmts.			MVP 1109***	
GVWR, lbs	26500	27800	29500	28380	26500
GAWR, lbs - Front	10300	11340	12000	10300	10800
- Rear	17000	17000	17500	18080	17000
Axle Capacity, lbs - Front	10800	12000	12000	13200	10800
- Rear	17000	17000	17500	19000	17000
Wheelbase, in	174	174	197	181	180
Diesel Engine Displacement, L.	*	5.9T-I6	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	*	190	170	190	180
SAE Gross Torque, lb-ft	*	475	400	475	445
Transmission:**					
Automatic, Gears/Model	4 Spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 Spd	M5	M5	M5	n/a
Brake Lining, in - Front	as shown	15.0 x 4	15.0 x 4	15.0 x 4	15.0 x 4
- Rear	as shown	16.5 x 6	16.5 x 6	16.5 x 7	16.0 x 6
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	10R22.5F	10R22.5G	11R22.5G	10R22.5F	10R22.5F
Wheels - Rear	Dual	Dual	Dual	Dual	Dual
- Rim Size, in	7.5	7.5	8.25	7.5	7.5

*Furnished with Air Brakes only.

*See minimum power requirements in Par. F.5.3.4.

**Direct in fourth gear (automatic); direct in fifth gear (manual).

***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 Par. F.5.3.4.).

NOTE: The NIC 5.9T is the Model DT-360 diesel engine.

The following Body/Chassis combinations are available as indicated:

65-PASSENGER FORWARD CONTROL BODIES

BODIES	AnTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS3201/NS3211	TCFC3007	77SFT3000	1209	2N3300
Chassis Available	N.S	B	N	T	N

71-PASSENGER SWB CONVENTIONAL BUS TABLE

TABLE 22
71S-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Short Wheelbase, Full Air Brake Standard)

		Refer to General Requirements, Page 4			
CHASSIS		B	N	N-S	F
71S-Passenger Conv.	1992	B.B.	NIC	NIC-Semi****	FORD
ITEM	Min. Rqmts.	B7	3700*	3600*	B600*
GVWR, lbs	28000	28000	28000	28000	28000
GAWR, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Axle Capacity, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Wheelbase, in	254	259	254	254	255
Cowl-to-Axle, in	229	235	229	229	231
Cowl-to-Frame End, in	349	384	349	349	377
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	16.50 x 5.00	15.0 x 4.00	15.0 x 4.00	15.00 x 4.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 7.00	16.5 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
- Rim Size, in	8.25	8.25	8.25	8.25	8.25

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

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

DIESEL ENGINES (Option 8)

71S-Passenger	1992	B.B.	NIC	FORD
ITEM	Min. Rqmts.	B7	3600/3700	B600
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	9000	9000	10000	9000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

71S-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-31	3201	77SB3201	1100/1110	2F3200
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

71-PASSENGER LWB CONVENTIONAL BUS

TABLE 23
71L-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Long Wheelbase, Full Air Brake Standard)

		Refer to General Requirements, Page 4			
CHASSIS		B	N	N-S	F
71L-Passenger Conv.	1992	B.B.	NIC	NIC-Semi****	FORD
ITEM	Min.	B7	3700*	3600*	B600*
	Reqs.				
GVWR, lbs	28000	28000	28000	28000	28000
GAWR, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Axle Capacity, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Wheelbase, in	274	274	274	276	275
Cowl-to-Axle, in	250	250	251	251	251
Cowl-to-Frame End, in	384	384	387	387	387
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	16.50 x 5.00	15.0 x 4.00	15.0 x 4.00	15.00 x 4.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 7.00	16.5 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
- Rim Size, in	8.25	8.25	8.25	8.25	8.25

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

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

DIESEL ENGINES (Option 8)

71L-Passenger	1992	B.B.	NIC	FORD
ITEM	Min.	B7	3600/3700	B600
	Reqs.			
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	9000	9000	10000	9000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

71L-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-31	3208	77SB3208	1101/1110	2F3200
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

71-PASSENGER FORWARD CONTROL DIESEL BUS TABLE

TABLE 24
71-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

Refer to General Requirements, Page 4					
CHASSIS		B	N	T	S
71-Passenger FC	1991	Blue Bird	NIC	Thomas 1309	Crane*
ITEM	Min. Rqmts.	TC2000	3900	MVP	4000
GVWR, lbs	26500	26500	29500	30000	27000
GAWR, lbs - Front	10800	11340	12000	11000	10800
- Rear	17000	17000	17500	19000	17000
Axle Capacity, lbs - Front	10800	12000	12000	13200	10800
- Rear	17000	17000	17500	19000	17000
Wheelbase, in	195	195	197	238	195
Diesel Engine Displacement, L.	*	5.9T-I6	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower	*	190	185	190	180
SAE Gross Torque, lb-ft	*	475	435	475	445
Transmission:**					
Automatic, Gears/Model	4 Spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 Spd	M5	M5	M5	n/a
Brake Lining, in - Front	as shown	15.0 X 4	15.0 X 4	15.0 X 4	15.0 x 4
- Rear	as shown	16.5 X 7	16.5 X 7	16.5 X 7	16.5 x 6
Tires, Steel Belted Radial	Tubeless				
Size & Load Range	10R22.5G	10R22.5G	11R22.5G	10R22.5G	10R22.5G
Wheels - Rear	Dual	Dual	Dual	Dual	Dual
- Rim Size, in	7.5	7.5	8.25	7.5	7.5

*Furnished with air brakes only.

**See minimum power requirements in Par. F.5.3.4.

**Direct in fourth gear (automatic); direct in fifth gear (manual).

***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 Par. F.5.3.4.).

NOTE: The NIC 5.9T is the Model DTA-360 diesel engine.

The following Body/Chassis combinations are available as indicated:

71-PASSENGER FORWARD CONTROL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS3404/NS3502	TCFC3211	77SFT3510	1309	2N3503
		TCFC3306			
Chassis Available	N, S	B	N	T	N

77-PASSENGER CONVENTIONAL BUS TABLE

TABLE 25
77-PASSENGER CONVENTIONAL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

Refer to General Requirements, Page 4

CHASSIS		B	N	F
77-Passenger Conv.	1992	B.B.	NIC	Ford
ITEM	Min.	B7	3700*	B600*
	Rqmts.			
GVWR, lbs	28000	28000	28000	28000

GAWR, lbs - Front	9000	9000	9000	9000
- Rear	19000	19000	19000	19000

Axle Capacity, lbs - Front	9000	9000	9000	9000
- Rear	19000	19000	19000	19000

Wheelbase, in	274	274	276	275

Gasoline Engine CID**	***	366-V8EFI	*	*
SAE Gross Horsepower	***	210	*	*
SAE Gross Torque, lb-ft	***	340	*	*

Transmission:****				
Automatic, Gears/Model	4 Spd	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 Spd	M5	M5	M5

Brake Lining, in - Front	as shown	15.0 x 4	15.0 x 4	15.0 x 4
- Rear	as shown	16.5 x 7	16.5 x 7	16.5 x 7

Tires, Steel Belted Radial	Tubeless			
Size & Load Range	11R22.5G	11R22.5G	11R22.5G	11R22.5G

Wheels - Rear	Dual	Dual	Dual	Dual
- Rim Size, in	8.25	8.25	8.25	8.25

*Furnished with diesel engine only, Option 8.

**see diesel engine Option 8.

***see minimum power requirements in Par. F.5.3.4.

****Direct in fourth gear (automatic); direct in fifth gear (manual).

DIESEL ENGINES (Option 8)

77-Passenger Conv.	1992	B.B.	NIC	Ford
ITEM	Min.	B7	3700	B600
	Rqmts.			
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

77-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Model	SS-33	3310	77SB3310	1200	2N3403
Chassis available	N,F	B,N,F	N,F	N,F	N,F

77-PASSENGER FORWARD CONTROL DIESEL BUS TABLE

TABLE 26
77-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

Refer to General Requirements, Page 4					
CHASSIS		B	N	T	S
77-Passenger FC	1991	Blue Bird	NIC	Thomas	Crane*
		All American		1309	
ITEM	Min.	3611/ TC-2000*	3900	MVP	4000
	Route.				
GVWR, lbs	29500	33280/30000	29500	30000	29800
GAWR, lbs - Front	11000	12080/12000	12000	11000	12000
- Rear	17500	21200/19000	17500	19000	19000
Axle Capacity, lbs - Front	12000	13200/12000	12000	13200	12000
- Rear	17500	23000/19000	17500	19000	19000
Wheelbase, in	212	223/216	212	238	216
Diesel Engine Displacement, L.	*	8.3T-16/ 5.9T-16	5.9T-16	5.9T-16	5.9T-16
SAE Gross Horsepower	*	210/190	185	190	180
SAE Gross Torque, lb-ft	*	605/475	435	475	445
Transmission:**					
-Automatic, Gears/Model	4 Spd	MT-643 ^a /AT-545	AT-545	AT-545	MT-643 ^a
Manual, Fwd. Gears	5 Spd	M5	M5	M5	n/a
Brake Lining, in - Front	as shown	15.0 X 4	15.0 X 4	15.0 X 4	15.0 x 4
- Rear	as shown	16.5 X 7	16.5 X 7	16.5 X 7	16.5 x 7
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
- Rim Size, in	8.25	8.25	8.25	8.25	8.25

*Furnished with air brakes only.

*See minimum power requirements in Par. F.5.3.4.

**Direct in fourth gear (automatic); direct in fifth gear (manual).

***Rear Engine.

^a - 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 Par. F.5.3.4.).

NOTE: The NIC 5.9T is the Model DT-360 diesel engine.

The following Body/Chassis combinations are available as indicated:

77-PASSENGER FORWARD CONTROL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS3607/NS3705	AAFC3611	77SFT3707	1309	2N3706
		TCFC3700			
Chassis Available	N.S.	B	N	T	N

83-PASSENGER FORWARD CONTROL (FRONT ENGINE) DIESEL BUS TABLE

TABLE 27
83-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Front Engine, Full Air Brake Standard)

Refer to General Requirements, Page 4			
CHASSIS	B	N	
83-Passenger FC (Front Engine)	1992	Blue Bird	NIC
ITEM	Min. Rmts.	All American 3903	3900
GVWR, lbs	32200	36200	32200
GAWR, lbs - Front	13200	13200	13200
- Rear	19000	23000	19000
Axle Capacity, lbs - Front	13200	13200	14000
- Rear	19000	23000	19000
Wheelbase, in	229	242	229
Engine Displacement, L.	*	8.3T-16	5.9T-16
SAE Gross Horsepower	*	210	185
SAE Gross Torque, lb-ft	*	605	485
Transmission, Automatic**	MT643	MT643	MT643
Brake Lining, in - Front	as shown	16.5 X 5	16.5 x 5
- Rear	as shown	16.5 X 7	16.5 x 7
Tires, Steel Belted Radial	Tubeless		
Size & Load Range	11R22.5H	11R22.5H	11R22.5H
Wheels - Rear	Dual	Dual	Dual
- Rim Size, in	8.25	8.25	8.25

*See minimum power requirements in Par. F.5.3.4.

**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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

83-PASSENGER (FRONT ENGINE) BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Wayne
Models	KS3810	3903	77SFT3904	2N3909
Chassis Available	N	B	N	N

83-PASSENGER FORWARD CONTROL (REAR ENGINE) DIESEL BUS TABLE

TABLE 28
83-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Rear Engine, Full Air Brake Standard)

Refer to General Requirements, Page 4			
83-Passenger FC (Rear Engine) ITEM	1992 Min. Rqmts.	Blue Bird All American AARE3903	Thomas Saf-T-Liner 1405
GVWR, lbs	36200	36200	36200
GAWR, lbs - Front	13200	13200	13200
- Rear	23000	23000	23000
Axle Capacity, lbs - Front	13200	13200	13200
- Rear	23000	23000	23000
Wheelbase, in	267	270	267
Engine Displacement, L.	*	8.3T-I6	8.3T-I6
SAE Gross Horsepower	*	210	210
SAE Gross Torque, lb-ft	*	605	605
Transmission, Automatic**	MT643	MT643	MT643
Brake Lining, in - Front	as shown	16.5 x 5	16.5 x 6.0
- Rear	as shown	16.5 x 7	16.5 x 8.6
Tires, Steel Belted Radial	Tubeless		
Size & Load Range	11R/22.5H	11R22.5H	11R22.5H
Wheels - Rear	Dual	Dual	Dual
Wheels, Rim Size, in	8.25	8.25	8.25

*See minimum power requirements in Par. F.5.3.4.

**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 Par. 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 Bids (see Options 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 Options 33, 34, and 35) shall be a floor-mounted, 12V DC electric-hydraulic or electric-mechanical operated wheelchair lift with a minimum 800 pounds lifting capacity. The vertical lift (platform travel) shall be a minimum of 30 inches. The unit shall be self-contained and mounted directly to the existing bus body floor.

1.2. DOORS, SPECIAL SERVICE - One or two 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 Par. G.1.8. for lift operating controls.)

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, 3 inches wide and one inch 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.

1.2.7. Rub Rails - Exterior side(s) of special service doors shall have two 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. 15- Through 20-passenger Buses - Type A buses equipped with wheelchair lifts shall have alternators with a minimum electrical output of 100 amperes.

1.3.1.2. 24- Through 77-passenger Buses - A minimum output rating of 130 amperes.

G. WHEELCHAIR LIFT SPECIFICATIONS

- 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, 12V 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 800 pounds of additional weight. (An aluminum frame may be substituted for steel provided the wheelchair lift warranty is upgraded (see Par. 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 1/8-inch safety plate steel or 1/8-inch expanded metal (open grate) with maximum 3/4-inch openings. The lift platform shall have a minimum 30-inch clear, usable width, unobstructed by the required handrail (See Par. G.1.5.2.2. below). The minimum clear length of the platform between the outer edge barrier and the inner edge shall be 40 inches. 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 handrail for security. The handrail shall be approximately 25-3/4 inches in height and a minimum 18 inches 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 1/8-inch steel and one inch high. The front of the lift shall have a folding type safety rail not less than 3-inches 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 8 degrees 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 3/4 inch. Cylinders shall have a minimum of 34 inches of extension action and shall be capable of lifting a minimum of 800 pounds 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.

G. WHEELCHAIR LIFT SPECIFICATIONS

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.

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 Par. 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 ± 2 inches of each other when measured from comparable points on each side to the ground with the bus empty and parked on a level hard surface (such as concrete). Chassis springs and suspension shall be adjusted as necessary to provide a level bus when the additional weight of a wheelchair lift is installed (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 34) or front or rear (see Option 35) of the school bus body floor and securely bolted in place (see NOTE below). Floor frame shall be reinforced as required to support the lift and load. Lift shall be positioned approximately 36 inches behind the main entrance door for the 18- and 24- through 77-passenger buses leaving sufficient space for one regular bus seat or one 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.)

NOTE: 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 34) in order to place the required minimum 30-inch wide aisle in the rear portion of the bus (see Par. C.2.13.4.2. and Par. E.2.13.5.1.). This will increase the seating capacity for regular passengers in the front section since a narrower aisle (minimum 12 inches) 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. 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.

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. WHEELCHAIR LIFT SPECIFICATIONS

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 Par. E.2.7.
- 2.2. FLOORING** - Any plywood flooring used to cover the existing steel floors (e.g., see Par. C.2.5.2.) on wheelchair-equipped buses shall be CDX grade.
- 2.3. INTERIOR LAMP, LIFT COMPARTMENT** - The lift compartment shall have one interior lamp installed in the roof panel above the center of the lift compartment; or one 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 15 candlepower each and shall be one of the approved lamps listed in Par. 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 Par. 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 Par. E.1.10.
- 2.6. UNIVERSAL HANDICAP SYMBOLS** - School buses with wheelchair lifts shall display the Universal Handicapped Symbols on the front of one 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 12 inches 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-point tie-downs, with a minimum of two body floor attachment points located at the rear of the space designated for the mobile seating devices and a minimum of two body floor attachment points at the front of the space.
- 3.3.** A Type 2 Occupant Securement System shall provide for securement of the occupant's pelvic lap area and upper torso area.

G. WHEELCHAIR LIFT SPECIFICATIONS

3.4. The mobile seating device/occupant securement system shall be successfully, dynamically sled-tested at a minimum impact speed/force of 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 50th percentile 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 points passes through a vertical transverse plane intersecting 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 2,500 pounds. This will provide equal mobile seating device securement when subjected to forces generated by forward, rear or side impact.

3.4.1. The belt materials at each space designated for the mobile seating device and the occupant restraint system shall be similar in size and fabric.

3.5. Occupant securement belt assemblies and anchorages shall also be certified to meet the requirements of FMVSS 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 Bids.)

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 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.

E. AIR CONDITIONING SPECIFICATIONS

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

- 1.1. ALTERNATOR** - Type A buses equipped with air conditioning shall be furnished with an alternator with a minimum output rating of 100 amperes. Types B, C, and D buses equipped with air conditioning shall be furnished with an alternator with a minimum output rating of 130 amperes. Type A and Type B, C, and D buses equipped with air conditioning and wheelchair lifts shall be furnished with alternators with a minimum output rating of 130 amperes and 160 amperes, respectively.
- 1.2. INSULATION** - Minimum 5/8-inch nominal thickness plywood shall be installed over the existing or manufacturer's standard steel floor for insulation (see Par. C.2.5. for plywood requirements including installation requirements). Air-conditioned buses shall have the equivalent of 1-1/2 inches 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 Bids (see Option 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 Bids (see Option 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 29. (For example, an 18-passenger school bus with this option would be furnished with a 53,000 Btu/hr. capacity air conditioning system instead of the standard 40,000 Btu/hr. unit.)

E.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 29 lists the components and the appropriate ratings required by this specification:

TABLE 29
AIR CONDITIONING COMPONENTS (minimum requirements)

BUS SIZE	CAPACITY, Btu/hr.	AIR FLOW, CFM	COMPRESSOR(S) /No.	CONDENSER(S), Location/No.	EVAPORATORS, Location/No.
15 pass.	19,000	1,000	1	1-skirt mtd. (or eng. comp.)	1 - Front & rear
16-20 pass.	40,000	1,200	1	1-skirt mtd.	1 - rear (no dash unit included)
24-35 pass.	53,000	1,300	1	1	1 - rear
47 pass.	78,000	1,900	2	2	1 - rear
53-71 pass.*	84,000	2,000	2	2	2 - 1 each side, staggered
77-83 pass.*	108,000	2,400	2	2	2 - 1 each side, staggered

* except rear engine buses may be single units provided they meet or exceed the BTU/cfm requirement.

H. AIR CONDITIONING SPECIFICATIONS

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 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 Par. H.2. above). 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 12V 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 5 dB. when measured in the center of the bus.

3.2. COMPRESSORS - 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.

NOTE: Compressors shall be geared so that their speed does not exceed the manufacturer's maximum recommended sustained speeds at a road speed of 60 mph in high gear.

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 Bids, 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 their standard cooling coil, fabrication and installation practices.

3.6. REFRIGERANT DRYER - A dryer with a minimum of 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. AIR CONDITIONING SPECIFICATIONS

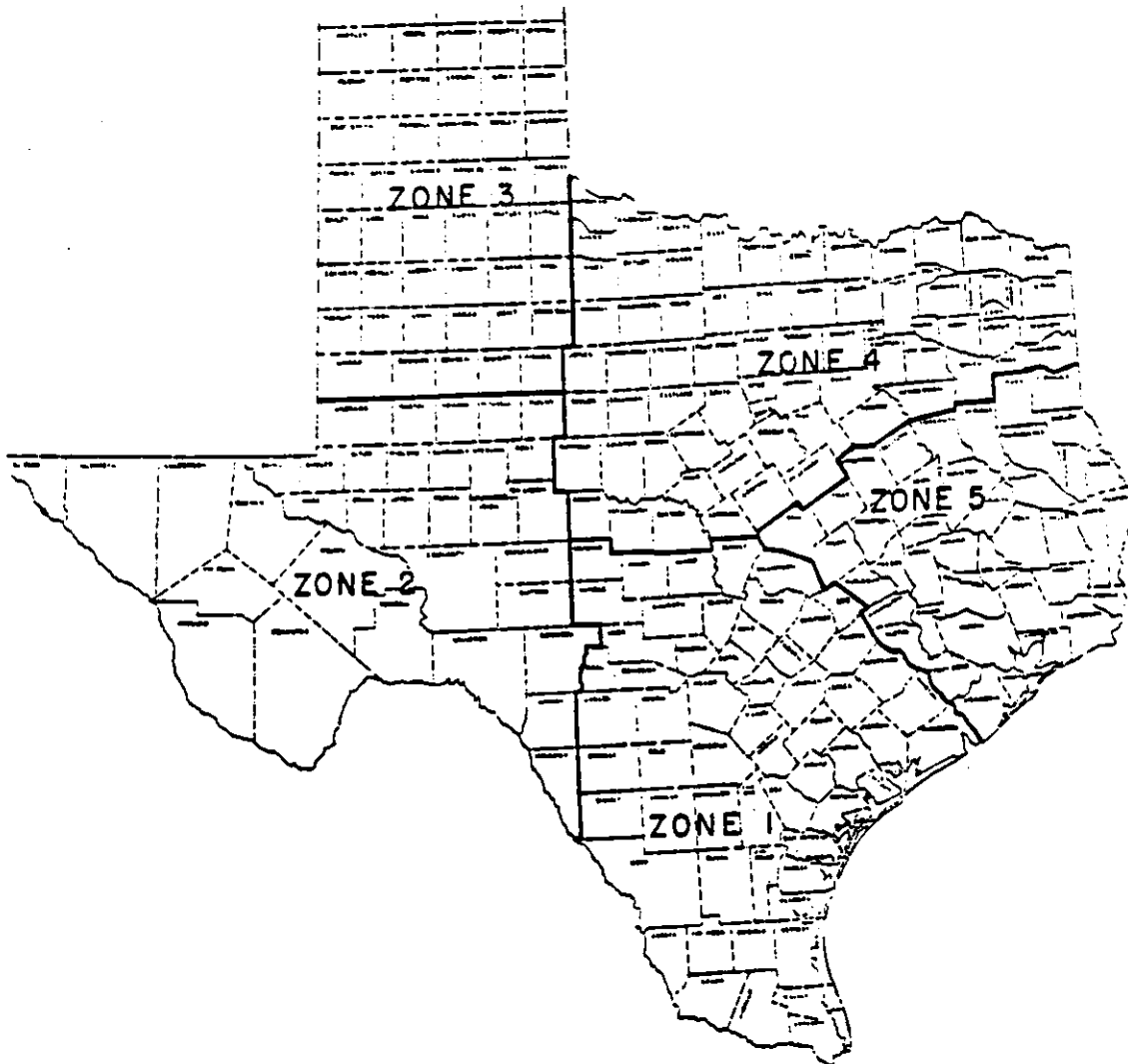
H.5. OTHER REQUIREMENTS -

- 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 PAR. A.10.4.1. THE AIR CONDITIONING MANUFACTURER SHALL HAVE SERVICE FACILITIES AVAILABLE IN EACH OF THE 5 ZONES WITHIN THE STATE OF TEXAS THAT STOCK REPAIR PARTS NORMALLY REQUIRED FOR WARRANTY SERVICE AND REGULAR REPAIR (SEE FIG.3)

FIGURE 3

REQUIRED SERVICE FACILITY ZONES WITHIN THE STATE OF TEXAS



E. AIR CONDITIONING SPECIFICATIONS

- 5.2. INSTRUCTION BOOKS** - One 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.
- 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 year, unlimited mileage, from the date of delivery.

I.1. AVAILABILITY OF SPECIFICATIONS -

Copies of this specification may be obtained from:

SPECIFICATION SECTION
General Services Commission
P. O. Box 13047
Austin, Texas 78711-3047
Phone (512) 463-3411

SCHOOL BUSES

_____ Date _____
 _____ Name of School District _____
 _____ Texas _____
 _____ Address _____ City _____ (Zip) _____
 Phone Number _____ Name to Contact _____
 (Area Code) _____
 BC Number _____ Date Delivered _____

Chassis Make (Please check): ☐ Blue Bird ☐ Chevrolet ☐ Dodge ☐ Ford ☐ GMC
☐ Thomas ☐ Navistar ☐ Crane Carrier ☐ TransiCorp

Firm (Dealer) and Name of Person	Contacted

[illegible]

Please mail to: SPECIFICATIONS/INSPECTIONS SECTION
General Services Commission
P.O. Box 13047
Austin, Texas 78711-3047

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**THREE MONTH TEST OF NEW SCHOOL BUS ENGINES**

Note to School District: It would be helpful in our deliberation on approval of school bus engines if the attached form could be completed at the end of the test period on the bus engine you have agreed to test and evaluate. Please add any information that you think may be significant. In this test we believe that different drivers should be allowed to drive the bus and give their opinions of its suitability for school bus use.

New Engine Evaluation

(Please check or complete appropriate item)

Description

Engine size: _____ Liters or, Engine type: _____ Gasoline (mono) _____ Gasoline (w/dual alt. fuel _____ (type))
 _____ CID _____ Diesel (mono) _____ Diesel (w/dual alt. fuel _____ (type))

Engine Manufacturer _____ Naturally aspirated _____ Turbocharged

Chasis Manufacturer _____ Dedicated (mono) alternative fuel (indicate type):

_____ Compressed natural gas (CNG)

Rear axle ratio _____ Liquefied petroleum gas (LNG)

_____ Other (specify) _____

___ Automatic ___ Manual Transmission, ___ Air conditioner, ___ Wheelchair lift, ___ Air or ___ Hydraulic Brakes,

_____ Tire Size, Luggage Rack ___ Top ___ Bottom

Installed in _____ passenger _____ bus body
 (Body Manufacturer's Name)

BEGIN DATE _____ DISTRICT _____ END DATE _____

Tests

Loaded with approximately 120 pounds for each passenger space with an approximate 150-pound driver, please conduct the following five tests if possible:

(We will need to know if criteria different from that recommended are used.)

1. Acceleration - 0 to 50 MPH in 60 seconds or less: From a standing start on a level stretch of asphalt or concrete highway, record with a stop watch the time required to reach 50 MPH. _____ Time in seconds rounded to the nearest 0.1 second.
2. * Grade of 1.5% minimum @ 50 MPH: From a running start, drive the bus at 50 MPH up a grade of approximately 1.5%. Most federal highways have maximum grades of 3.0% except overpasses which are steeper. Record the speed at the summit _____ Miles per hour.
3. * Grade of 5.0% minimum - @ 25 MPH: From a running start, drive the bus at 25 MPH up a grade of approximately 5.0%. Most state highways have maximum grades of 7.0%. Record the speed at the summit _____ Miles per hour.
4. Startability - 20.0%: If possible locate a grade of approximately 20.0 degrees. (Your local Highway Department engineering may be able to help you locate grades.) Park the bus on the foot of the hill facing upward then start the engine and drive up the hill. If no 20.0% grade is available, use the steepest hill in the district. Est. grade _____ %.

* Grades of 1.5% and 5.0% rise 1.5 and 5.0 feet, respectively, in a 100 foot distance.

5. Speed - 55 MPH: With the engine speed governor connected and operating, determine if the bus will reach a minimum of 55 MPH on a level stretch of asphalt or concrete highway.
 Complies: _____ Yes _____ No

Documentation

6. Record the hubodometer reading at the beginning and end of a 2- or 3-month period and the amount of fuel used. Calculate the overall fuel consumption _____ Miles per gallon.

7. Document any warranty work or other repairs required on the test bus. _____

8. Note regular maintenance performed and any unusual problems such as excessive oil consumption or fluid leaks. _____

Operation on a Regular Route

Average daily mileage: _____ Miles Starting: _____ O.K. _____ Hard to start
Acceleration: _____ Adequate _____ Poor, Comments: _____
Temperature: Runs _____ O.K. _____ Hot Adequate power fully loaded? _____ Yes _____ No
Oil Consumption: _____ Miles/qt. Regular Route Fuel Consumption: _____ Miles/gal.

Operation on an Activity Trip

Maintain 50 mph Loaded? _____ Yes _____ No Comments: _____
Oil Consumption: _____ Miles/qt. Activity Trip Fuel Consumption: _____ Miles/gal.
Maximum Lawful Speed up Steepest Hill: _____ MPH Power: _____ O.K. _____ Need more
List any problems or comments concerning operation on an Activity Trip: _____

Is this engine suitable for transportation needs in your District? _____ Yes _____ No

Signatures _____ Superintendent _____ Transportation Director Date _____

We thank you for your cooperation and assistance in providing written results of this engine test and the recommendations of your Administration, Drivers and Mechanics.

Earl Tipton
TEA

Pat Martin
GSC

Ken Hailey
DPS

TEXAS SCHOOL BUS COMMITTEE

ADDITIONAL REMARKS:

Return To: Specification/Inspection Section
General Services Commission
P.O. Box 13047
Austin, TX 78711-3047

MAJOR COMPONENTS CHART - SMALL BUS
MAJOR COMPONENTS CHART - 1992 MODEL YEAR
SMALL SCHOOL BUSES

MAJOR COMPONENTS		15	16	18	19	20	PAGE NO.
ALTERNATOR:							
Amps, Min - Std-Gas/Diesel	75/65	75/65	75/65	75/65	75/65	75/65	40
- Opt-Type A/B	100/130	100/130	100/130	100/130	100/130	100/130	40
- w WC Lift-A/B	100/130	100/130	100/130	100/130	100/130	100/130	40,109
- w A/C-A/B	100/130	100/130	100/130	100/130	100/130	100/130	40,114
- w both-A/B	130/160	130/160	130/160	130/160	130/160	130/160	40
BATTERY:							
Diesel Engine -							
CCA, Amp, Min	MS	MS	MS	MS	MS	MS	40
Reserve, Minutes, Min	MS	MS	MS	MS	MS	MS	40
Gasoline Engine -							
CCA, Amp, Min	360	360	360	360	360	360	40
Reserve, Minutes, Min	100	100	100	100	100	100	40
BRAKES:							
Standard	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	39
Optional	NA	NA	NA	NA	NA	NA	--
ENGINES:							
Diesel	Opt	Opt	Opt	Opt	Opt	Opt	41
Gasoline	Std	Std	Std	Std	Std	Std	41
Alternative fuel	Opt	Opt	Opt	Opt	Opt	Opt	
EMERGENCY DOOR GLASS, LOWER							
	n/a	n/a	n/a	n/a	n/a	n/a	--
FUEL TANK, Gal, Min - Std							
	21	21	21	21	21	21	40
- Opt	30	30	30	30	30	30	40
HEATER, Btu/hr - Std							
	MS	MS	MS	MS	MS	MS	35
- Opt Aux.	MS	MS	MS	MS	MS	MS	35
KNEE SPACING, Min - Std							
	24	25	24	25	25	25	19
- Opt	27	27	27	28	28	28	19
TILT HOOD							
	n/a	n/a	n/a	n/a	n/a	n/a	--
TIRES:							
Truck Steel Belt Radial -							
Tubeless	MS	MS	MS	MS	MS	MS	39
Size	MS	MS	MS	MS	6R19.5E		39
TRANSMISSIONS/CLUTCHES:							
Automatic -	Std	Std	Std	Std	Std	Std	39
Model	MS	MS	MS	MS	MS	MS	39
Standard -							
Fwd. Gears	NA	NA	NA	NA	NA	NA	--
Clutch Size, in, Min	NA	NA	NA	NA	NA	NA	--
U-BOLTS, NO., Min							
	NA	NA	NA	NA	4		23
WHEELS:							
Steel Disc	Std	Std	Std	Std	Std	Std	39
Cast Spoke	NA	NA	NA	NA	NA	NA	39
LEGEND: AC = Air Conditioning; Amp = Amperes; Aux. = Auxiliary; CCA = Cold Cranking Amperes; Fwd. = Forward; Gal = Gallon; Hyd = Hydraulic; in = inches; M4/M5 = Manual 4-spd/5-spd Transmission; Min = Minimum; MS = Manufacturer's Standard; NA = Not Available/Not Applicable; Opt = Optional; Std = Standard; WC = Wheelchair							

MAJOR COMPONENTS CHART - LARGE BUS
MAJOR COMPONENTS CHART - 1992 MODEL YEAR
LARGE SCHOOL BUSES

MAJOR COMPONENTS	PASSENGER CAPACITY									PAGE
	24	35	47	53	59	65	71	77	83	
ALTERNATOR: Amps, Min - Std	90	90	90	90	90	90	90	90	100	80
- Opt	130	130	130	130	130	130	130	130	130	80
- w WC Lift or AC	130	130	130	130	130	130	130	130	130	80,109
- w WC Lift & AC*	160	160	160	160	160	160	160	160	160	80,114
<hr/>										
BATTERY: Diesel Engine -										
CCA, Amp, Min	450	450	450	450	450	450	450	450	450	80
Reserve, Minutes, Min	130	130	130	130	130	130	130	130	130	80
Gasoline Engine -										
CCA, Amp, Min	360	360	360	360	360	360	360	360	NA	80
Reserve, Minutes, Min	100	100	100	100	100	100	100	100	NA	80
<hr/>										
BRAKES: Standard	Hyd	Hyd	Hyd	Hyd	Air	Air	Air	Air	Air	78
Optional	NA	NA	NA	NA	Hyd	Hyd	Hyd	Hyd	NA	78
<hr/>										
ENGINES: Diesel	Opt	Opt	Opt**	Opt**	Opt**	Opt**	Opt**	Opt**	Std	82
Gasoline	Std	Std	Std	Std	Std	Std	Std	Std	NA	82
Alternative fuel	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt	
<hr/>										
EMERGENCY DOOR GLASS, LOWER	Std	Std	Std	Std	Std	Std	Std	Std	Std	60
<hr/>										
FUEL TANK, Gal, Min - Std	30	30	35	35	60	60	60	60	60	80
- Opt	30	NA	NA	NA	NA	NA	NA	NA	90	80
<hr/>										
HEATER, Btu/hr - Std	45,000	45,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	73
- Opt Aux.	40,000	40,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	73
<hr/>										
KNEE SPACING, Min - Std	24	25	25	25	25	25	24.75 ^a	25	24.75	50
- Opt	27	28	28	27.75	28	27.75	27.50 ^b	27.75	27.75	51
<hr/>										
TILT HOOD, CONV. CHASSIS:	NA	Std	Std	Std	Std	Std	Std	Std	NA	80
<hr/>										
TIRES: Steel Belt Radial -										
Tubeless	Std	Std	Std	Std	Std	Std	Std	Std	Std	79
Size	8R	9R	9R	9R	10R	10R	11R	11R	11R	
	19.5.E	22.5F	22.5F	22.5F	22.5F	22.5F	22.5G	22.5G	22.5H	79
<hr/>										
TRANSMISSIONS/CLUTCHES:										
Automatic -	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Std	84
Model	MS	AT-545	AT-545	AT-545	AT-545	AT-545	AT-545	AT-545 ^c	MT-643	84
Standard -										
Fwd. Gears	M4	M4	M5	M5	M5	M5	M5	M5	NA	84
Clutch Size, in, Min	12	12	12	12	12	13	13	13	NA	84
<hr/>										
U-BOLTS, NO., Min	4	6	6	6	6	8	8	8	8	56
<hr/>										
WHEELS: Steel Disc	Std	Std	Std	Std	Std	Std	Std	Std	Std	79
Cast Spoke	NA	Opt	Opt	Opt	Opt	Opt	Opt	Opt	NA	79

LEGEND: AC = Air Conditioning; Amp = Amperes; Aux. = Auxiliary; CCA = Cold Cranking Amperes; Fwd = Forward; Hyd = Hydraulic; M4/M5 = Manual 4-spd/5-spd Transmission; Min = Minimum; MS=Manufacturer's Standard; NA = Not Available/Not Applicable; Opt = Optional; Std = Standard;

NOTES: WC = Wheelchair
^a = 25.00" on 71-passenger Long Wheelbase School Bus; ^b = 27.75" on 71-passenger Long Wheelbase School Bus; ^c = MT 643 on 77-passenger Forward-control School Bus or where required to match engine torque.

TILT HOODS NOT APPLICABLE TO FORWARD CONTROL BUSES.

*See Par. H for Self-contained Air Conditioning Units.

**Diesel Engine Required on 53- to 71-passenger Forward Control Buses.

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TEXAS SPECIFICATIONS NO. 070-2B-92

STUDY TOPICS

MANUFACTURER	15	16	18	19	20	24	35	47	53	59C	68C	71SC	71YC	77FC	83FE	83R
CAPACITY																
DOZCO	5.9L	5.9L														
CID	190	190														
SAE Gross hp	190	190														
SAE Ratio	3.54	3.54														
Trans. Auto.	A727	A727														
GM																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
INTERNATIONAL																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245	215	235	215	235		
SAE Ratio	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Trans. Auto.	400	400	400	400	400	400	A7545	A7545	A7545	A7545	A7545	A7545	A7545	A7545		
MAZDA																
CID	5.7L	5.7L	5.7L	5.7L	5.7L	5.7L	6.0L	6.0L	6.0L	7.0L	6.0L	7.0L	6.0L	7.0L		
SAE Gross hp	201	201	201	201	201	201	228	228	228	245						

Discussion

[illegible][illegible]

Políticas de Ocio y Espectáculos - AS

LEGEND:

C=Conventional Bus,	FC=Forward Control Bus,	FE=Front Engine Bus,	FE=Short Wheelbase Conventional Bus
I=Long Wheelbase Conventional Bus			

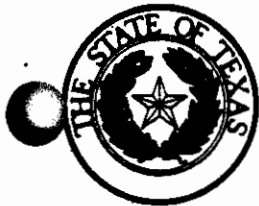
070-88-92 01/01/92
Revised 03/25/92
Revised 08/13/92

APPROVED PRODUCTS LIST - SCHOOL BUS BODIES

TEXAS SPECIFICATIONS NO. 070-SB-92

BUS Size	Configuration/Mfg.	SEMI- COACH	MODEL BLD	CAMPENTER	COLUMNS	STUDY- COMP.	END BUS	SEMI- VAN COM	END (AERIAL)	WAYNE
15	Van Conversion or Cutaway	Star	Micro BLD	-	Bantam Econobus SuperBantam	Sturdivan	0406	V-15	V98	2M10L
16	Commercial Cutaway	Star	Micro BLD	SC11706 SC11801	-	Sturdivan	0406	-	V98-16	2M10L
18	Van Conversion	Star	-	-	Bantam SuperBantam	Super Sturdivan	-	V-18	-	-
19	Commercial Cutaway	Star	Micro BLD	SC11706 SC11801	-	Super Sturdivan	0406	-	V98-19	2M10L
20	Stripped Chassis	Star	Mini BLD	WSCV1908 Cadet	-	-	0404, 0417 0407	-	V98-20	-
24	Conventional	Star	2103 2307	WSCV2100 WSCV2107	-	-	0900 0917 0607	-	-	-
35	Semi-Fwd-Control	Star	-	-	-	-	-	-	-	-
47	Forward Control Conventional	Star	1908, 2005 FC2000 2304	77SB1908 77SB2304	-	-	0510, 0600 0710 0701	-	SS-17	2F1902 KS, MS SS-22 2F2300
53	Forward Control Conventional	Star	FC2000 2308	77SB2310 77SB2308	-	-	0903 0810 0801	-	MS, KS SS-24	2M/C3806 2F2303
59	Forward Control Conventional	Star	FC2000 2800, 2807	77SB2321 77SB2800	-	-	1109, 1103 0910 0901	-	KS, MS SS-26	2M/C3009 2F2701
65	Forward Control Conventional	Star	FC2000 3004, 3011	77SB2321 77SB3004	-	-	1209 1010 1001	-	KS, MS SS-29	2M/C3300 2F2905
71S	Forward Control Conventional	Star	FC2000 3201	77SB23503 77SB3201	-	-	1309 1100 1101	-	KS, MS SS-31	2M/C3503 2F3200
71L	Conventional	Star	3208	77SB3201	-	-	1110 1101	-	SS-31	2F/C3200
77	Forward Control Conventional	Star	3604, 3611 3310	77SB23707 -	-	-	1309 1200 1201	-	KS, MS PC33704	2M/C3706 2F3403
83	Forward Control	Star	3907	77SB23904	-	-	1403	-	MS, KS	2M/C3909

070-SB-92 01/01/92
Revised 03/23/92
Revised 08/13/92



General Services Commission

1711 San Jacinto P.O. Box 13047

Austin, Texas 78711-3047

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ANNE S. WYNNE
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EXECUTIVE DIRECTOR
JOHN POULAND

March 25, 1992

TO: HOLDERS OF TEXAS SPECIFICATION NO. 070-SB-92
(1992 SCHOOL BUSES)

RE: Amendment # 1

Please remove the following pages from your copy of this Texas specification: 1-2, 3-4, 7-8, 11-20, 25-26, 39-42, 49-52, 57-58, 69-70, 77-80, 95-100, and 111-112, and replace them with the attached sheets correspondingly numbered.

A Revised issue of the Approved Products List (APL) is also enclosed.

Please note that at the bottom left of the attached pages appear the words (for example):

"03/25/92 - Changed by Am. # 1"

A vertical bar [|] has been inserted in the left margin to indicate changes from the last issue.

Thank you for your cooperation.

Sincerely,

A handwritten signature in cursive script that reads "Troy C. Martin".

Troy C. Martin
Specifications/Inspection Chief

TCM:RCD

Enclosures

c: Ray Brewer
Pat Martin
Ralph Simonson
School Bus Committee

EFFECTIVE DATE:
January 01, 1992



TEXAS SPECIFICATION
No. 070-SB-92
Supersedes No. 070-SB-91

SPECIFICATION

for

TEXAS SCHOOL BUSES

A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

A.1. SCOPE -

- 1.1 **BUS SIZES** - This school bus specification includes the minimum requirements for fourteen sizes of school buses used by Texas Schools participating in the Foundation School Program. This specification covers the purchase of bus bodies and chassis separately as well as the purchase of complete school buses. The bus sizes shall be designated in terms of passenger capacity (exclusive of the driver) as listed below for regular seating ("CAPACITY" is based upon national height and weight percentile averages as specified in Federal Highway Safety Program Standard No. 17. See Par. B.1.2.):

15* Passenger	19* Passenger	35* Passenger	59* Passenger	71* Passenger (Long WB)
16* Passenger	20* Passenger	47* Passenger	65* Passenger	77* Passenger
18* Passenger	24* Passenger	53* Passenger	71* Passenger	83* Passenger

(Short WB)

*NOTE: Seating capacity will be reduced from the above whenever wheelchair positions and/or maximum seat spacing are specified for a given size bus (see Par. A.1.3 and Par. B.1.).

- 1.2. **BUS TYPES** - Each bus shall have seating arrangements for the capacities designated:

- 1.2.1. 15-passenger bus shall be the van conversion or commercial cutaway semi-forward control type.
- 1.2.2. 16-passenger bus shall be the commercial cutaway semi-forward control type.
- 1.2.3. 18-passenger bus shall be the van conversion type.
- 1.2.4. 19-passenger bus shall be the commercial cutaway semi-forward control type.
- 1.2.5. 20-passenger bus shall be the stripped chassis semi-forward control type.
- 1.2.6. 24-passenger bus shall be the stripped chassis semi-forward control type.
- 1.2.7. 35-passenger bus shall be the conventional or semi-forward control type.
- 1.2.8. 47-passenger bus shall be the conventional, forward*, or semi-forward control type.
- 1.2.9. 53-passenger bus shall be the conventional, forward*, or semi-forward control type.
- 1.2.10. 59-passenger bus shall be the conventional, forward*, or semi-forward control type.
- 1.2.11. 65-passenger bus shall be the conventional, forward*, or semi-forward control type.
- 1.2.12. 71-passenger bus shall be the conventional, forward*, or semi-forward control type.
- 1.2.13. 77-passenger bus shall be the conventional, forward*, or semi-forward control type.
- 1.2.14. 83-passenger bus shall be the forward control* transit type.

*Diesel only.

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

A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

A.2. DEFINITIONS -

- 2.1. **ASHRAE** means American Society of Heating, Refrigeration and Air Conditioning Engineers.
- 2.2. **ANSI** means American National Standards Institute.
- 2.3. **ASTM** means American Society for Testing and Materials.
- 2.4. **BCI** means Battery Council International.
- 2.5. **Commission** and **GSC** mean General Services Commission.
- 2.6. **Conventional Bus** means a school bus with all of the engine in front of the windshield and the service or entrance door behind the front wheels.
- 2.7. **Department of Public Safety** and **DPS** mean Texas Department of Public Safety.
- 2.8. **Education Agency** and **TEA** mean Texas Education Agency.
- 2.9. **EPA** means United States Environmental Protection Agency.
- 2.10. **FMVSS** means Federal Motor Vehicle Safety Standards.
- 2.11. **Federal Standard No. 17** means Federal Highway Safety Program Standard Number 17.
- 2.12. **Forward Control Bus** means a school bus with the steering wheel, pedals, instruments, and other driver controls mounted as far forward as possible, usually just behind the windshield. All of the engine is located behind the windshield, either at the front of the bus, or at the rear of the bus, or in between these positions. The service door is located forward of the front axle.
- 2.13. **Knee Space** means the horizontal distance from the front center of a seat back to the rear center of the seat back (or barrier) immediately ahead, measured at approximately 4 inches above the seat cushion.
- 2.14. **Manufacturer** means a fabricator of school buses, bodies, chassis, or components.
- 2.15. **MPV** means a multipurpose passenger vehicle accommodating ten or less people.
- 2.16. **NSSB** means National Standards for School Buses (formerly National Minimum Standards).
- 2.17. **SAE** means Society of Automotive Engineers.
- 2.18. **SEMI** means School Bus Manufacturer's Institute.
- 2.19. **SCAAN** means a computer analysis of engine performance.
- 2.20. **Semi-forward Control Bus** means a bus in which part of the engine is beneath and/or behind the windshield and beside the driver's seat.
- 2.21. **Vendor** means a manufacturer's representative or dealer authorized to make sales and supply parts and services in Texas.
- 2.22. **VESC** means Vehicle Equipment Safety Commission.

A.3. APPLICABLE SPECIFICATIONS AND STANDARDS -

- 3.1 **FEDERAL HIGHWAY SAFETY PROGRAM STANDARD** - School bus bodies and chassis shall meet or exceed the minimum requirements of this specification and shall also meet all applicable requirements of the Highway Safety Program Standard No. 17. All requirements of this specification must be met unless they are in conflict with Standard No. 17 as it applies to school buses:
 - 3.1.1. **Federal Highway Safety Program Standard No. 17, Pupil Transportation Safety** - Supt. of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
- 3.2. **FEDERAL MOTOR VEHICLE SAFETY STANDARDS** - School bus bodies and chassis shall meet or exceed the minimum requirements of this specification and shall also meet all applicable requirements of the Federal Motor Vehicle Safety Standards (FMVSS). All requirements of this specification must be met unless they are in conflict with the FMVSS as they apply to school buses:
 - 3.2.1. **Federal Motor Vehicle Safety Standards (Public Law 89-563)** - Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402:
 - (1) FMVSS No. 103 - Windshield Defrosting and Defogging Systems.
 - (2) FMVSS No. 105 - Brakes, Hydraulic Service, Emergency and Parking.
 - (3) FMVSS No. 108 - Lamps, Reflective Devices, and Associated Equipment.
 - (4) FMVSS No. 111 - Rearview Mirrors - Passenger Cars and Multipurpose Passenger Vehicles.
 - (5) FMVSS No. 121 - Air Brake Systems - Buses and Trailers.
 - (6) FMVSS No. 125 - Warning Devices.
 - (7) FMVSS No. 205 - Glazing Materials.
 - (8) FMVSS No. 208 - Occupant Crash Protection.
 - (9) FMVSS No. 209 - Seat Belt Assemblies - Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses.
 - (10) FMVSS No. 210 - Seat Belt Assembly Anchorages.
 - (11) FMVSS No. 217 - Bus Window Retention and Release.
 - (12) FMVSS No. 220 - School Bus Roll-over Protection.
 - (13) FMVSS No. 221 - School Bus Body Joint Strength.
 - (14) FMVSS No. 222 - School Bus Seating and Crash Protection.
 - (15) FMVSS No. 301 - Fuel System Integrity.
 - (16) FMVSS No. 302 - Flammability of Interior Materials - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses.

A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

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

3.3.1. National Standards for School Buses, 1990 Revised Edition, National Standards Conference (May, 1990), National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

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

3.4.1. American National Standards Institute, Inc. (ANSI), 1430 Broadway, New York, NY 10018:

- (1) ANSI Z26.1 - Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways, Safety Code for, including Supplement Z26.1a - 1969.

3.4.2. American Plywood Association, P.O. Box 11700, Tacoma, Washington 98411:

- (1) U.S. Plywood Standard PS 1-83.

3.4.3. American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103:

- (1) ASTM A 446 - Standard Specification for Sheet Steel, Zinc Coated (Galvanized) by the Hot Dip Process, Structural (Physical) Quality.
(2) ASTM A 525 - Standard Specification for General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process.
(3) ASTM D 3574 - Standard Specification for Standard Test Method for Testing Cellular Materials - Slab Bonded and Molded Urethane Foam.
(4) ASTM B 117 - Standard Specification for Method of Salt Spray (Fog) Testing.

3.4.4. American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. (ASHRAE), Circulation Department, 345 East 47th Street, New York, NY 10017:

- (1) ASHRAE 16-69 - Methods of Testing for Rating of Room Air Conditioners.

3.4.5. Federal Highway Administration, United States Department of Transportation, Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402:

- (1) Federal Highway Administration FP-85 - Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects.

3.4.6. Federal Standards - Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402:

- (1) No. 595a - Colors.

3.4.7. Federal Specifications - Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402:

- (1) TT-C-490B - Cleaning Methods and Pretreatment of Ferrous Surfaces For Organic Coating.
(2) TT-C-520B - Coatings Compound, Bituminous, Solvent Type Underbody, (For Motor Vehicles).
(3) TT-E-489 - Enamel, Alkyd, Gloss (For Exterior and Interior Surfaces).
(4) V-T-295D - Thread, Nylon.
(5) ZZ-M-71D - Matting, Rubber and Vinyl.

3.4.8. School Bus Manufacturers' Institute (SBMI), Engineering Committee, 7508 Ben Avon Road, Bethesda, Maryland 20817:

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

A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

3.4.9. Society of Automotive Engineers, Inc. (SAE), 400 Commonwealth Drive, Warrendale, Pennsylvania 15096:

- (1) SAE J20e - Coolant System Hoses.
- (2) SAE J377 - Performance of Vehicle Traffic Horns.
- (3) SAE J383 - Motor Vehicle Seat Belt Anchorages - Design Recommendations.
- (4) SAE J514 - Hydraulic Tube Fittings.
- (5) SAE J516 - Hydraulic Hose Fittings.
- (6) SAE J517 - Hydraulic Hose.
- (7) SAE J561 - Electrical Terminals - Eyelet and Spade Type.
- (8) SAE J588 - Turn Signal Lamps for use on motor vehicles less than 2032 mm in overall width.
- (9) SAE J639 - Safety Practices for Mechanical Vapor Compression Refrigeration Equipment or Systems Used to Cool Passenger Compartments of Motor Vehicles.
- (10) SAE J887 - School Bus Warning Lamps.
- (11) SAE J994b - Alarm - Backup - Electric - Performance, Test, and Application.
- (11) SAE J1128 - Low Tension Primary Cable.
- (13) SAE J1133 - School Bus Stop Arm.

3.4.10. STATE OF CALIFORNIA -

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

- (1) California Technical Bulletin 117, Section A, Part I, Seat Cushion Compression Test.

3.4.11. STATE OF TEXAS -

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

- (1) Regulations for Compressed Natural Gas (November, 1990),
- (2) Safety Rules-Liquefied Petroleum Gas Division (Nov., 1990)

3.4.11.2. TEXAS AIR CONTROL BOARD, 12124 Park Circle, Austin, TX 78753:

- (1) Regulation IV (31 TAC CHAPTER 114), Control of Pollution from Motor Vehicles (Rev. Aug. 30, 1991)

3.4.12. United States Environmental Protection Agency (EPA), Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460:

- (1) EPA - Noise Emission Standards.

3.4.13. Vehicle Equipment Safety Commission (VESC), Suite 908, 1030 15th Street, N.W., Washington, D.C. 20005:

- (1) VESC - Regulation 6.
- (2) VESC - Regulation 10.

A.4. GENERAL INFORMATION AND REQUIREMENTS -

- 4.1. EQUIPMENT INSTALLATION** - Requirements and accessories, either standard or optional, furnished under this specification shall be installed by body, chassis, or product manufacturer except air conditioners, tachographs, tachometers, and wheelchair lifts may be installed by authorized service Representatives. Installation of such items shall conform in strength, quality, and workmanship to the accepted standards of the industry.
- 4.2. NEW MODELS** - Each bus body and bus chassis furnished under this specification shall be new school bus of the current year's production or the latest improved model in current production. The bidder represents that all units offered under this specification shall meet or exceed the minimum requirements specified herein.
- 4.3. ODOMETER DISCLOSURE STATEMENT** - The Truth in Mileage Act requires the selling dealer to furnish a complete odometer statement to the purchaser. This statement must be complete and shall include mileage accrued at the point of delivery. In addition to the signature of the seller/agent certifying the odometer reading, both the dealership and the name of the agent shall be printed on the Odometer Disclosure Statement. (Completion of the Mileage Statement Portion of the MSO will satisfy this requirement.)

A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

- 7.5. LATE DELIVERY NOTIFICATION** - At least 20 days in advance of the final delivery date, the successful, complete unit bidder shall notify the Commission and the receiving school district in writing, when a known delay precludes delivery of a unit on time.

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

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

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

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

A.9. TERMS, INVOICING AND PAYMENT -

9.1 INVOICE, VENDOR'S -

- 9.1.1. **School District's Copies** - The vendor shall submit the invoice to the school district at the address shown on the purchase order. The invoice must certify that the buses delivered meet or exceed the requirements and conditions of this specification. (See Par. A.6.3.)

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

A.10. WARRANTY AND SERVICE -

- 10.1. CONTRACTOR'S RESPONSIBILITY** - Each successful bidder is ultimately responsible for and must assure the State that any warranty service shall be performed to the satisfaction of the Commission, regardless of whether the successful bidder or the bidder's agent performs the warranty work on school buses (see Par. A.10.4.). If there is a question of whether it is the responsibility of the body or the chassis manufacturer to repair a given defect, then it shall automatically become the prime contractor's and/or successful bidder's responsibility to see that the repair(s) is made to the satisfaction of the receiving school district and this Commission.
- 10.2. DEFECTIVE WORKMANSHIP** - In the event that an error is discovered or conclusive proof of defective workmanship and/or materials is found on any body or chassis after acceptance and payment has been made, the successful bidder shall make such repairs as required at the vendor's expense.
- 10.3. PENALTIES** - Upon refusal of the prime contractor and/or successful bidder to make satisfactory adjustment(s), the Commission reserves the right to claim and recover from said prime contractor and/or successful bidder by due process of law, such sums as may be sufficient to correct the error or make good the defect in material and/or workmanship.

A. GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

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

NOTE: WARRANTY REGISTRATIONS MUST BE COMPLETED AND MAILED TO INITIATE WARRANTY.

- 10.4.1. Air Conditioner** - Basic coverage for chassis and body parts is for 12 months as specified in manufacturer's warranty pamphlet. The air conditioning manufacturer shall have service facilities available in each of the 5 zones within the State of Texas (see Fig. 3). (For service on units provided by chassis manufacturer, contact local chassis dealer; for service on other makes, contact the vendor.)
- 10.4.2. Automatic Transmission** - Basic coverage is for 12 months, 12,000 miles, whichever occurs first, and as more specifically defined in the manufacturer's warranty pamphlet included with delivery of the vehicle. (For service, contact the chassis or transmission dealer, or authorized service outlet as specified in the warranty pamphlet.)
- (1) Allison Transmission Division (ATD) transmissions (see below) are warranted for 50,000 miles or 12 months at 100% cost of parts and labor; 50,001 miles to 62,500 miles or 15 months at 80% cost of parts; 62,501 to 75,000 miles or 18 months at 60%; 75,001 to 87,500 miles or 21 months at 40%; and 87,501 to 100,000 miles or 24 months at 20%. An extended warranty is available at extra cost.
- 10.4.3. Batteries** - 12 months or 12,000 miles, whichever occurs first. (For service contact the local dealer as specified in the battery warranty pamphlet.) Battery warranties are included with the chassis warranty.
- 10.4.4. Bus Body** - A minimum of 12 months beginning on the date of delivery to the user. For service contact the vendor identified on the school bus purchase order issued by the Commission.
- 10.4.5. Bus Chassis** - 12 months or 12,000 miles, whichever occurs first, beginning on the date of delivery (see delayed chassis warranty, Par. A.10.4.6., below). For warranty service and repairs on the bus chassis:
- 10.4.5.1. First**, contact the chassis dealer recommended by the vendor (as shown on the school bus purchase order issued by the Commission) or any other convenient chassis dealer. If the problems are not satisfactorily resolved,
- 10.4.5.2. Second**, call the Zone Service Manager, Representative, or Engineer listed below for assistance (the dealer Principal may be asked to assist in this contact):

CHEVROLET

Conrad Tupper
Light-Duty Fleet Service Manager
713-460-7333

DALLAS ZONE

Don Yegan
Heavy Truck Service Engineer
214-417-6303

<- FORD ->

HOUSTON ZONE

Ron Canal
Heavy Truck Service Engineer
713-680-4269

GMC

Ron Martini
Medium-Duty Fleet Zone Service Manager
214-541-5150
1-800-322-7181 Ext. 219

NIC

Ray T. Barton
Regional Service Manager
214-881-3545

B. ORDERING INFORMATION

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

AID TRANSMISSIONS

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

CHEVROLET MOTOR DIVISION

General Motors Corporation
P. O. Box 40911
Houston, Texas 77040

DODGE DIVISION

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

FORD MOTOR COMPANY

Service Publications
7388 North End Station
Detroit, Michigan 48202
313-455-9052

GMC TRUCK AND COACH DIVISION

Dysart, Service Department
31 Judson
Pontiac, MI 48058

NAVISTAR INTERNATIONAL COMPANY

P.O. Box 655334
Dallas, Texas 75265

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

BLUE BIRD/COLLINS

Bridges-Hemphill Enterprises, Inc.
Route 1, Box 409-2
Denton, TX 76201

CARPENTER

Statewide Bus Sales
4000 Irving Blvd.
Dallas, TX 75247

LEWIS

Dallas Bus Sales
3621 Works
Dallas, TX 76218

MID-BUS/VAN-COM/WAYNE

GENESIS by AmTRAN
Conwell Smith Sales
P.O. Box 1551
Austin, TX 78767

THOMAS

Longhorn Bus Sales
P.O. Box 20362
Houston, Texas 77225

AmTRAN/WARD

Texas School Bus Center, Inc.
4800 E. Seventh St.
Austin, TX 78702

B.4. TEMPORARY LICENSE TAGS AND EXEMPT LICENSE PLATES -

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

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

Exempt license plates must be obtained from:

Texas Department of Transportation (TxDOT)
Division of Motor Vehicles
P.O. Box 26480
Chimney Corners Station
Austin, Texas 78755-0480

ATTN.: Special Plates Section

4.2. TEMPORARY LICENSE TAGS - The vendor shall issue with each bus delivered, temporary (Red) license tags (see Par. A.6.7.). **THESE TEMPORARY TAGS ARE LEGAL TO USE FOR A PERIOD OF 20 DAYS ONLY.**

B. ORDERING INFORMATION

B.5. REGULAR OPTIONS -

15- THROUGH 20-PASSENGER BUSES

**REGULAR
OPTION NO.**

DESCRIPTION

1. Air Conditioning, Standard Cooling (see Par. H.).

NOTE: Special Requirements - Option 1 requires a minimum 130 ampere alternator and 5/8" nominal thickness plywood installed over the steel floor.

2. Air conditioning, extra cooling (n/a on 77-passenger buses) (See Par. H.1.5.)

3. Alternative fuel engines - (Select from 3A or 3B) The power units (engines) furnished for the respective size and style bus shall be operable on alternative fuels, as determined by the Texas Air Control Board. The power unit shall be the chassis manufacturer's standard or optional engine for the vehicle type, which meets or exceeds the power requirements specified herein, at the engine manufacturer's rated operating speed. The engine may be of a standard production design or retrofitted for alternative fuels only by the engine Original Equipment Manufacturer (OEM) or any duly certified and/or approved manufacturer designated by the OEM, and certified/licensed by the Texas Railroad Commission. The engine shall be of such design and construction that it will give an even flow of power at all engine speeds without undue vibration, strain, or overheating of engine components. The fuel system shall meet all applicable FMVSS and Texas Railroad Commission certification and/or licensing requirements. These vehicles shall be fully operational at delivery to the district without any additional modification or adjustments (see Par. D.5.3.3.). Alternatively fueled engines shall be OEM warranted for a period of not less than five years/50,000 miles, and shall include all engine and emission parts and fuel system components. The engine manufacturer or approved designate, may upgrade engines in the field to improve durability, reliability, or emissions with the approval of the ordering agency.

3A. Compressed Natural Gas (CNG) - The engine shall be capable of operating on compressed natural gas as defined herein. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for Compressed Natural Gas. Minimum mileage range shall be 75 miles or as specified in the Invitation for Bids.

3B. Liquefied Petroleum Gas (LPG) - The engine shall be capable of operating on liquefied petroleum gas as defined herein. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for Liquefied Petroleum Gas. Minimum mileage range shall be 75 miles or as specified in the Invitation for Bids.

4. Alternator, 100 ampere minimum for Type A buses and minimum of 130 ampere for Type B buses (required with option(s) 1 or 35 see Par. F.4.1.2.).
8. Diesel Engine (See Table 3 through 7).
10. Door, Powered Service, manufacturer's standard (n/a on Sedan type doors) (see Par. E.2.15.5.)
11. Door, Service, Automotive Sedan Type (for 18- and 19-passenger buses only; see Fig. 1 and Tables 5 and 6).
12. Fuel Tank, Increased Capacity, conventional fuels (30-gallon minimum capacity; See Par. D.3.3.2.).
13. Glazing, Dark Tint, Passenger Side Windows, Minimum Light Transmittance of 30% and maximum Light Transmittance of 40% (see Par. C.2.19.3.).
14. Heater, Rear, auxiliary (see Par. E.3.6. for size and installation requirements).

B. ORDERING INFORMATION

15. Knee Spacing (maximum allowed by FMVSS No. 222; requires deleting one row of seats (5 positions) which will reduce seating capacity. (n/a on 16- and 19-pass. buses)
- | | | | | | |
|----------------------------|----|----|-----|----|----|
| Regular Seating Capacity | 15 | 16 | 18 | 19 | 20 |
| Rows of Seats | 3 | 3 | 4/5 | 3 | 3 |
| Minimum Knee Space, inches | 27 | 27 | 27 | 28 | 28 |
16. Laminated Safety Plate Glass, AS-2 or better (see Par. C.2.19.2.2.).
19. Reflective material - (See Par. C.3.7. for required placement).
20. School Name Lettering, both sides of bus (see Par. C.1.4.9.).
23. Security System Lock, All Doors (with ignition disconnect on emergency door).
24. Sound Abatement Insulation (shall reduce interior noise by 4 dB(A), minimum).
25. Option deleted
26. Strobe Light, Roof-mounted (see Par. C.3.8.).
27. Tachograph, 0-80 mph, 12 volt (with 7-day 4-7/8 inch disc chart and electronic clock/speedometer/recorder; see Par. D.5.6.).
30. Tool Compartment (see Par. C.3.11.).
31. Wheel, Spare, unmounted (without carrier, tire, or tube; see Par. D.2.6.2.).
35. Wheelchair Lift, Folding Platform Type, Right Curb Side Mounted (15-20 pass. buses only; with _____ wheelchair positions. Will reduce seating capacity.)
- NOTE: For Option No. 35 the school district must specify the number of wheelchair positions required on bus.
36. Wheelchair Restraints, Webbed-belt Type (for unusual wheelchairs which cannot otherwise be restrained; see Par. G.3.).
38. White Roof (see Par. C.1.4.2.)
39. Windows, push-out, additional (for emergency exit), (indicate quantity per side) (see Par. C.2.4.2. for standard requirement.)

B. ORDERING INFORMATION

REGULAR OPTIONS

24- THROUGH 77-PASSENGER BUSES

REGULAR OPTION NO.

DESCRIPTION

1. **Air Conditioning, Standard Cooling (see Par. H.).**
NOTE: Special Requirements - Option 1 requires a minimum 130 ampere alternator and 5/8" nominal thickness plywood installed over the steel floor.
2. **Air conditioning, extra cooling (n/a on 77-passenger buses) (See Par. H.1.5.)**
3. **Alternative fuel engines - (Select from 3A or 3B) The power units (engines) furnished for the respective size and style bus shall be operable on alternative fuels, as determined by the Texas Air Control Board. The power unit shall be the chassis manufacturer's standard or optional engine for the vehicle type, which meets or exceeds the power requirements specified herein, at the engine manufacturer's rated operating speed. The engine may be of a standard production design or retrofitted for alternative fuels only by the engine Original Equipment Manufacturer (OEM) or any duly certified and/or approved manufacturer designated by the OEM, and certified/licensed by the Texas Railroad Commission. The engine shall be of such design and construction that it will give an even flow of power at all engine speeds without undue vibration, strain, or overheating of engine components. The fuel system shall meet all applicable FMVSS and Texas Railroad Commission certification and/or licensing requirements. These vehicles shall be fully operational at delivery to the district without any additional modification or adjustments (see Par. F.5.3.3.). Alternatively fueled engines shall be OEM warranted for a period of not less than five years/50,000 miles, and shall include all engine and emission parts and fuel system components. The engine manufacturer or approved designate, may upgrade engines in the field to improve durability, reliability, or emissions with the approval of the ordering agency.**
 - 3A. **Compressed Natural Gas (CNG) - The engine shall be capable of operating on compressed natural gas as defined herein. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for Compressed Natural Gas. Minimum mileage range shall be 75 miles or as specified in the Invitation for Bids.**
 - 3B. **Liquefied Petroleum Gas (LPG) - The engine shall be capable of operating on liquefied petroleum gas, as defined herein. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for Liquefied Petroleum Gas. Minimum mileage range shall be 75 miles or as specified in the Invitation for Bids.**
4. **Alternator, 130 ampere minimum (required with option(s) 1, 35 or 36; see Par. F.4.1.2.)**
5. **Axle, Rear, Two-speed.**
6. **Brakes, Hydraulic (for 59-, 65-, 71-, and 77-passenger buses only).**
7. **Chassis, Long Wheelbase (requires minimum 274-inch wheelbase for 71-passenger conventional bus only; or 157-inch wheelbase for 24-passenger bus only).**
8. **Diesel Engine (for 24- through 77-passenger buses; see conventional buses in Tables 12 through 28).**
9. **Differential, No-spin.**
10. **Door, Powered Service, manufacturer's standard (see Par. E.2.15.5.)**
12. **Fuel Tank, Increased Capacity, conventional fuel (for 24-passenger buses only; see Par. F.3.3.2.).**
13. **Glazing, Dark Tint, Passenger Side Windows, Minimum Light Transmittance of 30% and maximum Light Transmittance of 40% (see Par. E.2.19.3.1.).**

B. ORDERING INFORMATION

14. Heater, Rear, auxiliary (see Par. E.3.6. for size and installation requirements).
 15. Knee Spacing (maximum allowed by FMVSS no. 222; requires deleting one row (6 positions) of seats which will reduce seating capacity).

Regular Seating Capacity	24	35	47	53	59	65	71-S	71-L	77
Rows of Seats	4	5	7	8	9	10	11	11	12
Minimum Knee Space, inches	27	28	28	27.75	28	27.75	27.5	27.75	27.5
 16. Laminated Safety Plate Glass, AS-2 or better (see Par. E.2.19.2.2.).
 17. Option deleted
 18. Mud Flaps, with Brackets, Mounted (see Par. E.3.10.). There shall be no advertisement on the mud flaps.
 19. Reflective material - (See Par. E.3.11. for required placement.).
 20. School Name Lettering, both sides of bus (see Par. E.1.4.9.).
 21. Seat Backs, Increased Height (see Par. E.2.13.1.).
 22. Seat Belts (for each passenger seating position; see Par. E.3.13.).
 23. Security System Lock, All Doors (with ignition disconnect on emergency door).
 24. Sound Abatement Insulation (shall reduce interior noise by 4 dB(A), minimum).
 25. Option deleted
 26. Strobe Light, Roof-mounted (see Par. E.3.12.).
 27. Tachograph, 0-80 mph, 12 volt (with 7-day 4-7/8 inch disc chart and electronic clock/speedometer/recorder; see Par. F.5.9.).
 28. Tachometer (to indicate engine RPM).
 29. Tires, Mud and Snow Tread (for Rear Wheels only).
 30. Tool Compartment (see Par. E.3.17.).
 31. Wheel, Spare, unmounted (without carrier, tire, or tube; see Par. F.2.6.2.3.).
 32. Wheel, Spare, Mounted (with carrier but not tire and tube; carrier not available on 24-passenger bus; see Par. F.2.6.2.2.).
 33. Wheelchair Lift, Folding Platform Type, Front Curb Side Mounted (for 24-through 71-passenger bus only; see Par. G.).
 34. Wheelchair Lift, Folding Platform Type, Rear Curb Side Mounted. Same as Option 35 (see 15-20 pass. buses) except floor-mounted on rear curb side of bus (see Par. G.). This option is recommended only for buses which will have a regular attendant in addition to the driver.
- NOTE: For Option Nos. 33 and 34, the school district must specify the number of wheelchair positions required on bus.
36. Wheelchair Restraints, Webbed-belt Type (for unusual wheelchairs which cannot otherwise be restrained; see Par. G.3.).
 37. Wheels, Cast Spoke, All Wheels (see Par. F.2.6.2.1.) 35-77 passenger buses only.
 38. White Roof (see Par. E.1.4.1.)
 39. Windows, push-out, additional (for emergency exit), (indicate quantity per side) (see Par. E.2.19.1.5. for standard requirement.)

B. ORDERING INFORMATION**REGULAR OPTIONS****63-PASSENGER BUSES****REGULAR
OPTION NO.****DESCRIPTION**

1. Air Conditioning, Standard Cooling (see Par. H.).

NOTE: Special Requirements - Option 1 requires a minimum 130 ampere alternator and 5/8" nominal thickness plywood installed over the steel floor.

2. Air conditioning, extra cooling (n/a on 77-passenger buses) (See Par. H.1.5.)

3. Alternative fuel engines - (Select from 3A or 3B) The power units (engines) furnished for the respective size and style bus shall be operable on alternative fuels, as determined by the Texas Air Control Board. The power unit shall be the chassis manufacturer's standard or optional engine for the vehicle type, which meets or exceeds the power requirements specified herein, at the engine manufacturer's rated operating speed. The engine may be of a standard production design or retrofitted for alternative fuels only by the engine Original Equipment Manufacturer (OEM) or any duly certified and/or approved manufacturer designated by the OEM, and certified/licensed by the Texas Railroad Commission. The engine shall be of such design and construction that it will give an even flow of power at all engine speeds without undue vibration, strain, or overheating of engine components. The fuel system shall meet all applicable FMVSS and Texas Railroad Commission certification and/or licensing requirements. These vehicles shall be fully operational at delivery to the district without any additional modification or adjustments (see Par. F.5.3.3.). Alternatively fueled engines shall be OEM warranted for a period of not less than five years/50,000 miles, and shall include all engine and emission parts and fuel system components. The engine manufacturer or approved designate, may upgrade engines in the field to improve durability, reliability, or emissions with the approval of the ordering agency.

3A. Compressed Natural Gas (CNG) - The engine shall be capable of operating on compressed natural gas as defined herein. The engine, fuel system, and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for Compressed Natural Gas. Minimum mileage range shall be 75 miles or as specified in the Invitation for Bids.

3B. Liquefied Petroleum Gas (LPG) - The engine shall be capable of operating on liquefied petroleum gas, as defined herein. The engine, fuel system and all components shall meet all applicable FMVSS requirements. The fuel tank(s) shall be constructed of appropriate material for a fuel storage system for Liquefied Petroleum Gas. Minimum mileage range shall be 75 miles or as specified in the Invitation for Bids.

4. Alternator, 130 ampere minimum (required with option(s) 1, 35 or 36; see Par. F.4.1.2.)
9. Differential, No-spin.
10. Door, Powered Service, manufacturer's standard (see Par. E.2.15.5.)
12. Fuel Tank, Increased Capacity, conventional fuel (90-gallon minimum capacity; see Par. F.3.3.2.).
13. Glazing, Dark Tint Passenger Side Windows, Minimum Light Transmittance of 30% and maximum Light Transmittance of 40% (see Par. E.2.19.3.1.).
14. Heater, Rear, auxiliary (see Par. E.3.6. for size and installation requirements).
15. Knee spacing (maximum allowed by FMVSS No. 222; requires deleting one row (6 positions) of seats which will reduce seating capacity).

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

B. ORDERING INFORMATION

16. Laminated Safety Plate Glass, AS-2 or better (see Par. E.2.19.2.2.).
17. Option deleted
18. Mud Flaps, with Brackets, Mounted (see Par. E.3.10.). There shall be no advertisement on the mud flaps.
19. Reflective material - (See Par. E.3.11. for required placement.).
20. School Name Lettering, both sides of bus (see Par. E.1.4.9.).
21. Seat Backs, Increased Height (see Par. E.2.13.1.).
22. Seat Belts (for each passenger seating position; see Par. E.3.13.).
23. Security System Lock, All Doors (with ignition disconnect on emergency door).
24. Sound Abatement Insulation (shall reduce interior noise by 4 dB(A), minimum).
25. Option deleted
26. Strobe Light, Roof-mounted (see Par. E.3.12.).
27. Tachograph, 0-80 mph, 12 volt (with 7-day 4-7/8 inch disc chart and electronic clock/speedometer/recorder; see Par. F.5.9.).
28. Tachometer (to indicate engine RPM).
29. Tires, Mud and Snow Tread (for Rear Wheels only).
30. Tool Compartment (see Par. E.3.17.).
32. Wheel, Spare, Mounted (with carrier but not tire and tube; see Par. F.2.6.2.2.).
38. White Roof (see Par. E.1.4.1.)
39. Windows, push-out, additional (for emergency exit), (indicate quantity per side) (see Par. E.2.19.1.5. for standard requirement.)

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School Bus Purchase Requisition

District Name _____

Texas Specification No. 070-SB-92

County-District No. _____

Effective 1/92 - 12/92

TEXAS EDUCATION AGENCY

Transportation Division

1701 North Congress Avenue

Austin, Texas 78701-1497

FOR TEA USE ONLY

Approved by: _____

Date: _____

Authority for Data Collection: TEC 11.12 and 21.165

Planned Use of Data: Required information necessary to purchase school buses.

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 the Transportation Division at (512) 463-9185.

Section I—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 bus options to be included.

- | | |
|---|---|
| <input type="checkbox"/> 1. Air conditioning, standard cooling | <input type="checkbox"/> 21. Seat Backs, Increased Height |
| <input type="checkbox"/> 2. Air conditioning, extra cooling (n/a for 77-83 pass. buses) | <input type="checkbox"/> 22. Seat Belts (standard on all 15-20 passenger buses) |
| <input type="checkbox"/> 3. Alternative fuel engines - (Select from A or B) | <input type="checkbox"/> 23. Security System Lock, All Doors |
| <input type="checkbox"/> 3A. Compressed Natural Gas (CNG) | <input type="checkbox"/> 24. Sound Abatement Insulation |
| <input type="checkbox"/> 3B. Liquefied Petroleum Gas (LPG) | <input type="checkbox"/> 25. Option Deleted |
| <input type="checkbox"/> 4. Alternator, increased capacity | <input type="checkbox"/> 26. Strobe light, Roof-mounted |
| <input type="checkbox"/> 5. Axle, Rear, Two-speed (24-71-pass. buses only) | <input type="checkbox"/> 27. Tachograph |
| <input type="checkbox"/> 6. Brakes, Hydraulic (59-77-pass. buses only) | <input type="checkbox"/> 28. Tachometer (to indicate engine RPM) |
| <input type="checkbox"/> 7. Chassis, Long Wheelbase conventional 24 and 71 pass. buses only) | <input type="checkbox"/> 29. Tires, Mud and Snow Tread |
| <input type="checkbox"/> 8. Diesel Engine | <input type="checkbox"/> 30. Tool Compartment |
| <input type="checkbox"/> 9. Differential, No-spin (24-71 pass. buses only). | <input type="checkbox"/> 31. Wheel, Spare (without carrier and tire/tube) |
| <input type="checkbox"/> 10. Door, Powered Service (n/a with automotive type door) | <input type="checkbox"/> 32. Wheel, Spare, Mounted (with carrier, but without tire/tube) |
| <input type="checkbox"/> 11. Door, Service, Automotive sedan-type, manually operated for 18 and 19 pass. buses only) | <input type="checkbox"/> 33. Wheelchair Lift, Folding Platform Type, Front Curb Side Mounted (24-71 pass. buses only; with _____ wheelchair positions. <i>Will reduce seating capacity.</i>) |
| <input type="checkbox"/> 12. Fuel Tank, Increased Capacity (15-24 and 83 pass. buses only) | <input type="checkbox"/> 34. Wheelchair Lift, Folding Platform Type, Rear Curb Side Mounted (24-71 pass. buses only; with _____ wheelchair positions. <i>Will reduce seating capacity.</i>) |
| <input type="checkbox"/> 13. Glazing, Dark Tint Passenger Side Windows (min. 30%, max. 40% light transmittance.) | <input type="checkbox"/> 35. Wheelchair Lift, Folding Platform Type, Right Curb Side Mounted (15-20 pass. buses only; with _____ wheelchair positions. <i>Will reduce seating capacity.</i>) |
| <input type="checkbox"/> 14. Heater, Rear (auxiliary) | <input type="checkbox"/> 36. Wheelchair Restraints, Webbed-belt Type (15-71 passenger buses only) |
| <input type="checkbox"/> 15. Knee spacing (maximum; requires deleting one row (6 positions) of seats which will reduce seating capacity). | <input type="checkbox"/> 37. Wheels, Cast Spokes, All Wheels |
| <input type="checkbox"/> 16. Laminated Safety Plate Glass | <input type="checkbox"/> 38. White Roof |
| <input type="checkbox"/> 17. Option Deleted | <input type="checkbox"/> 39. Windows, push-out, additional, for emergency exit. Indicate extra number requested, per side _____ |
| <input type="checkbox"/> 18. Mud Flaps, with Brackets, Mounted | |
| <input type="checkbox"/> 19. Reflective material | |
| <input type="checkbox"/> 20. School Name Lettering (type EXACTLY as required): | |

NOTES: Discard all previous editions of this form. Use only this form to order 1992 school buses. NA means Not Available/Not Applicable. Return this form with a copy and any attachments to TEA at the address shown above.

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

NOTE: THE SIGNATURE OF THE SUPERINTENDENT AND THE FOLLOWING INFORMATION MUST BE COMPLETE TO PROCESS THIS REQUISITION -

Number of motor vehicles used for transporting school children _____

If more than 50, the alternative fuel certification on the reverse must be completed.

Section III—Special Options:

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

A. _____

F. _____

B. _____

G. _____

C. _____

H. _____

D. _____

I. _____

E. _____

J. _____

ALTERNATIVE FUEL CERTIFICATION

- A. ____ This requisition is for the purchase of an alternative fueled school bus with an original equipment manufactured engine. The alternative fuel is to be _____ (indicate CNG, LPG, electricity or other fuel designated as an alternative fuel in the rules of the Texas Air Control Board).
- B. ____ This requisition is for the purchase of a school bus that will be converted to alternative fueled operation. By signature hereon, we certify the anticipated conversion date is _____ days following delivery. We also understand that the conversion must be completed prior to the bus being placed in service, unless undue hardship would result. In the case of potential undue hardship, the Commission may approve use of the vehicle for one or more periods of 90 days following delivery before it is converted to alternative fuel operation.
- C. ____ A valid, current waiver, number _____, is on file with the General Services Commission.

C. 15- THROUGH 20-PASSENGER BODY SPECIFICATIONS

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

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

- ... (b) Four red signal lamps designed to conform to SAE Standard J887, 'School Bus Red Signal Lamps,' July 1964, and four amber signal lamps designed to conform to that standard, except for their color, and except that their candlepower shall be at least 2-1/2 times that specified for red signal lamps. Both red and amber lamps shall be installed in accordance with SAE Standard J887, except that:
- (i) Each amber signal lamps shall be located near each red signal lamp at the same level, but closer to the vertical centerline of the bus; and
 - (ii) The system shall be wired so that the amber signal lamps are activated only by manual or foot operation, and if activated, are automatically deactivated and the red signal lamps automatically activated when the bus entrance door is opened."

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

- 1.7.1.1. Band - Each set of amber and red lamps shall have a minimum 3-inch black band around the set and a 3-inch band between the lamps in each set. The color of this band shall be black enamel (Color No. 17038, Black Enamel of Federal Standard 595a). If it is not possible to provide a 3-inch band between the lamps in the set, the manufacturer will then provide a band as wide as possible. Any visor or hood used to shade the lights and improve visibility will not interfere with the intensity and photometric performance of the warning lights (see SBI Standard No. 001).
- 1.7.1.2. Mounting - If exterior panels are cut to provide an opening for installation of flush-mounted signal lamps, the lamps must have a closed cell sponge flange gasket with a minimum thickness of 3/16 inch. The gasket shall be the full width of the flange on the lamp. Proper installation of the lamps shall be made in order to prevent seepage of moisture into the opening.
- 1.7.1.3. Operating Instructions - Complete instructions for the detailed operation of the warning signal lamp system shall be furnished with each school bus.
- 1.7.2. Backup Lamps - The color, requirements, and mounting of backup lamps shall be in accordance with FMVSS No. 108, except two backup lamps are required by Texas specifications.
- 1.7.3. Identification Lamps - Each bus with an overall width of 80 or more inches shall be furnished with identification lamps installed on the front and rear, three amber lamps in the front and three red lamps in the rear. The lamps shall be installed as close as practicable to the top and vertical centerline with lamp centers spaced not less than six inches or more than twelve inches apart. Each identification lamp shall be the armored flush mounting type for protection of the lens from damage during normal operation. Armored protectors shall in no way interfere with the intended purpose of the lamps. The armored type protectors shall be Grote Manufacturing Company, Madison, Indiana 47250, Model Nos. 45012 and 45013, or KD Lamp Company, 1910 Elm Street, Cincinnati, Ohio 45210, Model Nos. 38469-901 and 40268-301, or approved equal. (See SBI Standard No. 001 and FMVSS No. 108 for the types and proper location of these lamps.)

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

C. 15- THROUGH 20-PASSENGER BODY SPECIFICATIONS

- 1.7.4. Interior and Stepwell Lamps - A minimum of two interior dome lamps shall be installed to properly and adequately illuminate the entire aisle and emergency passageway. The stepwell shall be illuminated by a separate lamp activated by opening the service door. The stepwell lamp shall have a metal bezel.
- 1.7.5. License Plate Lamp - The color, requirements, and mounting of the license plate lamp shall be in accordance with FMVSS No. 108.
- 1.7.6. Operating Units and Flashers - The operating units and flashers for turn-signals and vehicular hazard warning signals shall meet the requirements of FMVSS No. 108.
- 1.7.7. Tail and Stop Lamps - The quantities, colors, requirements, and mounting of tail and stop lamps shall be in accordance with FMVSS No. 108.
- 1.7.8. Turn-Signal/Hazard Warning Lamps - The quantities, colors, requirements, and mountings of turn-signal/hazard warning lamps shall be in accordance with FMVSS No. 108.
- 1.7.9. Warning Devices - Each school bus shall be equipped with three triangular warning devices meeting the requirements of FMVSS No. 125. The devices shall be packed three per metal or heavy-duty plastic box, or they may be individually packed in metal or heavy-duty plastic boxes with the three boxes contained within a carrier. Warning devices shall be securely mounted in the driver's compartment. Triangular warning devices furnished shall be approved by the Texas Department of Public Safety.
- 1.8. LICENSE PLATE HOLDER - A license plate holder shall be mounted on the rear of the bus body. The holder shall be designed so that the license plate will receive illumination from the clear lens on the underneath side of the tail light, or by a separate lamp.
- 1.9. OPENINGS - All openings in the floorboard or firewall between chassis and passenger-carrying compartment, such as for gearshift lever, steering column, and auxiliary brake lever, shall be sealed. All openings between chassis and passenger-carry compartment made due to alterations by the body manufacturer must be sealed.
- 1.10. UNDERCOATING - Undercoating is required to provide for insulation, sound deadening, protection from road minerals, and rust prevention, as applicable, and shall meet the following:
 - 1.10.1. Application - The entire underside of the bus body, including floor members, wheelwells, side panels below the floor level, and all metal fenders or fenders with metal liners shall be coated with 1/8-inch thick material as specified above. The undercoating shall be applied in accordance with the undercoating manufacturer's instructions. Do not cover up or obliterate the chassis identification plate (see Par. A.6.4.3.).
 - 1.10.2. Material - Insulating and undercoating materials shall be an asphalt base underbody coating conforming to Federal Specification TT-C-520B, such as R-477-139, manufactured by Daubert Chemical Co., Chicago, Illinois 60638 or Lion Nokorode Emulsion 331 as manufactured by Lion Oil Company, El Dorado, Arkansas 71730, or an approved equal. An example of an approved equal is Tectyl MC121B, manufactured by Ashland Petroleum Company, Box 391, Ashland, Kentucky 41101, applied to a dry film thickness greater than 20 mils.
- 1.11. WIRING - All wiring shall conform to the current standards of the SAE. Wiring shall be arranged as required with each circuit protected by a fuse or circuit breaker. Wiring as arranged in the circuits to manufacturer's specifications are acceptable; however, the addition of another circuit for the alternatively flashing signal lamps shall be provided.
 - 1.11.1. Accessory Wiring - Body-installed accessories shall be wired from the battery through a low voltage solenoid cut-off switch operated by the ignition key except for the eight light warning system and hazard warning lights.

C. 15- THROUGH 20-PASSENGER BODY SPECIFICATIONS

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

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

3.4. HEATERS AND RELATED COMPONENTS -

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

3.5. MIRRORS, EXTERIOR - Exterior mirrors shall conform to the requirements of FMVSS No.

111. Each 15- through 20-passenger school bus shall be provided with exterior mirrors and brackets as described below:

- 3.5.1. Mirror System, Crossover** - The crossview mirror system shall provide the driver with indirect vision of an area at ground level from the front bumper forward and the entire width of the bus to a point where the driver can see by direct vision. The crossview system shall also provide the driver with indirect vision of the area at ground level around the left and right front corners of the bus to include the tires and service entrance on all types of buses to a point where it overlaps with the rear vision mirror system.
- 3.5.2. Mirror System, Rearview** - The rearview mirror system shall be capable of providing a view along the left and right sides of the bus which will provide the driver with a view of the rear tires at ground level, a minimum of 200 feet to the rear of the bus and at least 12 feet perpendicular to the side of the bus at the rear axle line.
- 3.5.3. Mounting and Mounting Brackets, Standard** - Mirror mounting and backing shall be of steel or a high-impact plastic such as a polycarbonate/polyethylene terephthalate blend, or approved equal. Mounting of all exterior mirrors to the bus body shall be by means of bolts, nuts, and lock washers, where possible; otherwise No. 10 hexagon head sheet metal bolts with star lock washers or No. 10 hexagon head sheet metal screws with serrated surface shall be used. This system of mirrors shall be easily adjustable but be rigidly braced so as to reduce vibration. Each exterior rear vision mirror shall be mounted in the brackets and assemblies shown on Texas General Services Commission Drawings numbered 040-35(1), 040-35(3), 040-35(4), 040-35(5), 040-35(6) and 040-35(7), dated November 15, 1968. The brackets shall be mounted on the left front and right front of the bus body and cowl. The parts, as shown on drawings numbered 040-35(2) and 040-35(3), must be formed to fit the individual configuration of each manufacturer's body and cowl design. Long dimensions of Texas mirror brackets may be adjusted as required to fit the configurations of buses.

C. 15- THROUGH 20-PASSENGER BODY SPECIFICATIONS

3.5.4. Mirror Backing and Mounting, Stainless Steel, Optional - When so specified in the Invitation for Bids, exterior rearview mirror backs and mounting brackets shall meet or exceed all of the applicable requirements of Par C., 3.5.3.; above except the mirror backing and mounting shall be made of stainless steel.

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

3.6. MIRRORS, INTERIOR - A clear-vision interior rearview mirror conforming to FMVSS No. 111, with at least 6" x 16" size vision area, affording a good view of the road to the rear as well as of the passengers, shall be furnished and installed. The mirror shall be made of safety glass and have rounded corners and protected edges.

3.7. REFLECTIVE MATERIAL - When so specified in the Invitation for Bids (see Option 19), buses shall be equipped with reflective material meeting the following requirements. The material shall be automotive engineering grade or better, shall meet the initial reflectance values in DOT FHWA FP-85 and shall retain at least 50% of those values for a minimum of six years. Reflective materials and markings shall be installed in the following location:

3.7.1. Front and/or rear bumper shall be marked diagonally 45° down to centerline of pavement with 2-inch wide strips of non-contrasting reflective material.

3.7.2. Rear of bus body shall be marked with a strip of reflective National School Bus Yellow material no greater than 2 inches in width to be applied to the back of the bus, extending from the left lower corner of the "SCHOOL BUS" lettering, across to left side of the bus, then vertically down to the top of the bumper; across the bus on a line immediately above the bumper to the right side, then vertically up to a point even with the strip placement on the left side, and concluding with a horizontal strip terminating at the lower right corner of the "SCHOOL BUS" lettering.

3.7.3. "SCHOOL BUS" signs shall be marked with reflective National School Bus Yellow material comprising background for lettering of the front and/or rear "SCHOOL BUS" signs.

3.7.4. Side of bus body shall be marked with reflective National School Bus Yellow Material at least 6 inches but not more than 12 inches in width, extending the length of the bus body and located (vertically) as close as practicable to the beltline.

NOTE: See Par.. 3.9.1. for requirements for placement of reflective materials on stop arms.

3.8. STROBE LIGHT, Flashing - When so specified on Invitation for Bids (see Option No. 26), an optional white flashing strobe light meeting the following requirements shall be provided:

3.8.1. Design - The lamp shall have a single clear lens emitting light flashing 360 degrees around a vertical axis. The light source shall be minimum of 50 candlepower and flash 80-120 times per minute. The base of the lamp shall be metal or approved equal and installed by a method which seals out dust and moisture. A manual switch is required for operation and a pilot light to indicate when the light is in operation shall be included. Wiring shall be installed inside the bus walls.

3.8.2. Mounting - The strobe light shall be permanently installed near the centerline on the school bus roof and not more than one-third of the body length forward of the rear edge of the bus roof. It shall not extend above the roof more than approximately 6.5 inches.

3.9. STOP ARM - A school bus stop arm meeting SAE J1133 and the following requirements shall be provided:

C. 15- THROUGH 20-PASSENGER BODY SPECIFICATIONS

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

3.9.2. Mounting - The stop arm shall be installed on the left side of the school bus near the front cowl section.

3.10. SUN VISOR - An adjustable sun visor with a minimum size of 5 inches by 16 inches shall be installed above the interior windshield on the driver's side. The sun visor shall not interfere with the driver's full view of the rearview mirrors. A right sun visor is manufacturer's option.

3.11. TOOL COMPARTMENT - When so specified in the Invitation for Bids (see Option No. 30), a metal container of adequate strength and capacity shall be provided for storage of tire chains, tow chains, and such tools as may be necessary for minor emergency repairs. This storage container shall be located either inside or outside the passenger compartment and shall be capable of being securely latched. However, if it is located inside the passenger compartment, it shall be provided with a separate cover, and shall be fastened to the floor in the right front or the right rear of the bus. A seat cushion shall not be used as this cover.

3.12 WINDSHIELD WASHERS AND WIPERS -

3.12.1. Washers - A vacuum- or electrical-operated windshield washer shall be furnished and installed. The washer shall have a minimum reservoir capacity of one quart of fluid and shall direct a stream of water into the path of travel of each windshield wiper blade each time the actuating button is operated.

3.12.2. Wipers - Each bus shall be equipped with two, 2-speed or variable speed, electric motor-driven windshield wipers.

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

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

4.1.1. Letter - Letter stating that the body meets or exceeds each and every applicable requirement in Texas Specification No. 070-SB-92.

4.1.2. Literature and drawings - See Par. A.6.5.

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

4.3. INSPECTION AND EVALUATION -

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

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

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

C. 15- THROUGH 20-PASSENGER BODY SPECIFICATIONS

C.5 COMPARISON OF SMALL BUS BODIES - Table 2 lists the features of the various body configurations for 15- through 20-passenger school buses. The 24-passenger bus body configurations are included in this Table for reference. (See Fig. 1 for the various chassis types available for these school bus bodies.)

TABLE 2
COMPARISON OF SMALL SCHOOL BUS BODIES

Passenger Capacity	Service Door	Emergency Door	Rear Wheels	Min.* Body Width	Body Sides	Min. Interior Height	Chassis Type	Body Mfg. & Model/Name/No.
15	Sedan	Dual	Single	70"	Sloping	62"	Van	Econo, Reddi-Bus, Van-Con,
15	Tall	Dual or Single	Single	75"	Straight	64"	Van	Bantam, Super Bantam
15	Tall	Dual	Dual	90"	Sloping	72"	Cutaway	Micro-Bird, Minotaur,
15	Tall	Single	Dual	87"	Straight	62"	Cutaway	Busette
16	Tall	Single	Dual	90"	Straight	72"	Cutaway	Chaperone, Clipper, Micro-Bird, VSS, Busette
18	Tall	Dual	Single	70"	Sloping	64"	Van	Lewis (Diesel only)
18	Tall	Dual or Single	Single	75"	Straight	64"	Van	Bantam, Super Bantam
18 (with Op. 15)	Sedan	Dual	Single	70"	Sloping	63-1/2"	Van	Bantam, Super Bantam, VanCon, Lewis (Diesel only)
19	Tall	Single	Dual	87"	Straight	72"	Cutaway	Chaperone, Clipper, Micro-bird, Minotaur, VSS
19 (with Op. 11)	Sedan	Single	Dual	87"	Straight	62"	Cutaway	Busette, Vanguard
20	Tall	Single	Dual	78"	Straight	72"	Stripped	Cadet, Mighty-Mite, Mini-Bird
24	Tall	Single	Dual	90"	Straight	72"	Stripped	Cadet, Mighty-Mite, Mini-Bird

*minimum interior width at shoulder line for the models listed.

Note: Bantam = Collins Econo = Collins Reddi-Bus = Lewis
Busette = MidBus Micro-Bird = Blue Bird Super Bantam = Collins
Cadet = Carpenter Mighty-Mite = Thomas VSS = Ward
Chaperone = Wayne Mini-Bird = Blue Bird Van Con = Van Con
Clipper = Carpenter Minotaur = Thomas

D. 15- THROUGH 20- PASSENGER CHASSIS SPECIFICATIONS

TABLE 3
15-PASSENGER BUS CHASSIS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY)

Refer to General Requirements, Page 4

15-Passenger ITEM	1992 Min.	Chev/GMC G31305/G31303	Chev/GMC G31605 (Ext)	Dodge B350	Ford Cutaway E 350**	Ford (Ext) Cutaway E350**
Rm'ts.						
GVWR, lbs	8510	(D) 8600/9200	8600	8510	9600	9000
GAWR, lbs, - Front	3170	3880/4100	3880	3170	3900	3400
- Rear	5340	5360/5360	5360	5340	6084	6195
Axle Capacity, lbs - Front	3600	3900/4100	3900	3600	4600	4600
- Rear	5500	5700/6000	5700	5500	6340	6340
Wheelbase, in	125.0	125.0	146.0	127.6	138.0	138.0
Chassis Length, in as required		202.2	223.2	222.9	206.8	231.8
Track, in - Front	67.8	68.6/68.6	68.6	67.8	70.0	70.0
- Rear	65.1	67.4/67.4	67.4	65.1	66.0	66.0
Gasoline Engine CID	*	350-V8EFI	350-V8EFI	360-V8	**	**
SAE Gross Horsepower	*	201	201	190	**	**
SAE Gross Torque, lb-ft	*	318	318	292	**	**
Transmission, auto	A3	A40D	A40D	A3	A40D	E40D
Tires, Steel Belted Radial		LT225/ 75R16E	LT225/ 75R16E	LT225/ 75R16E	LT245/ 75R16E	LT245/ 75R16E
Size & Load Range		(D w/ dual)				
Wheels, Rear	as shown	Single/Dual	Single	Single	Single	Single
Alternator, amperes	75	85	85	75	130	130

*See minimum power requirements in Par. D.5.3.4.

**Furnished with diesel engine only (see Option 8).

Diesel Engine (Option 8)

15-passenger ITEM	1992 Min. Rm'ts.	Chevrolet/GMC G31605 G31305/G31303	Ford E 350
Engine Displacement, L.	*	6.2N-V8	7.3N-V8
SAE Gross Horsepower	*	164	180
SAE Gross Torque, lb-ft	*	302	345
Alternator, amperes	100	100	100

*See minimum power requirements in Par. D.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 Par. D.5.3.4.).

15-PASSENGER BODIES

15-Passenger ITEM	1992 Min. Rm'ts.	Blue Bird Micro-Bird	Collins Spr-Bantam/ Econo	Lewis Van-Con Rackli-Bus	MidBus Busette	Ward Vanguard
Interior						
Headroom, in	63.0	74.0	65.0	65.0	63.5	63.0
Interior Width:						
Floor Line, in	72.0	90.5	78.0	75.0	72.0	89.25
Shoulder Line, in	70.0	90.5	78.0	75.0	70.0	87.42
Service Door						
Type	as shown	Tall	Sedan or Tall	Tall	Sedan	Sedan
Rear Wheels	as shown	Dual	Single	Single	Single	Dual
Chassis Type	as shown	Cutaway	Cutaway or Van	Van	Van Cutaway	Cutaway

16-PASSENGER BUS TABLE

TABLE 4
16-PASSENGER BUS CHASSIS
 (SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

16-Passenger ITEM	Refer to General Requirements, Page 4		
	1992 Min. Rqmts.	Chevrolet/GMC G31303	Ford E 350**
GVWR, lbs	10000	10000	10000
GAWR, lbs - Front	3800	3900	3800
- Rear	7200	7200	7810
Axle Capacity, lbs - Front	3900	3900	4600
- Rear	7500	7500	7800
Wheelbase, in	125	125	138
Chassis Length, in	as required	197.6	237.4
Track, in - Front	69.3	69.3	70.0
- Rear	73.2	74.0	73.2
Gasoline Engine CID	*	350-V8EFI	**
SAE Gross Horsepower	*	201	**
SAE Gross Torque, lb-ft	*	318	**
Transmission, Auto	A4	A40D	E40D
Tires, Steel Belt Radial	Tubeless	LT225/ 75R16D	LT225/ 75R16D
Size & Load Range			
Wheels, Rear	Dual	Dual	Dual
Alternator, amperes	85	85	95

*See minimum power requirements in D.5.3.4.

**Furnished with diesel engine only, Option 8.

DIESEL ENGINE (Option 8)

16-Passenger ITEM	1992 Min. Rqmts.	Chevrolet/GMC G31303	Ford E 350
Engine Displacement, L.	*	6.2N-V8	7.3N-V8
SAE Gross Horsepower	*	164	180
SAE Gross Torque, lb-ft	*	302	345
Alternator, amperes	100	100	100

*See minimum power requirements in D.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 D.5.3.4.)

The following bodies are available on commercial cutaway chassis in this configuration:

16-PASSENGER BODIES (Wide Body, Straight Side, Style 2 Service Door*)

16-Passenger ITEM	1992 Min. Rqmts.	AmTran/Ward VSS16	Blue Bird Micro-Bird	Carpenter SCL	Thomas Minotaur**	Wayne Chaparron
Interior Headroom, in	72	74	74.0	74	72	72.0
Interior Width, in	90	90	90.5	90	90	90.75

*Conventional Bus Door - minimum 68" tall and 24" wide, folds or separates in the middle to open.

**Not available with a diesel engine except as a wheelchair-equipped bus (14-passenger).

18-PASSENGER BUS TABLE

TABLE 3
18-PASSENGER BUS CHASSIS
 (SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

Refer to General Requirements, Page 4			
18-Passenger ITEM	1992 Min. Rqmts.	Ford E 350 Cutaway	Chev/GMC G31303
GVWR, lbs	9200	9600	9200
GAWR, lb.- Front	3900	3900	4100
- Rear	5360	6084	5360
Axle Cap., lbs - Front	4600	4600	4700
- Rear	6000	7800	6000
Wheelbase, in	138	138	146
Chassis Length, in			
Engine, CID	*	**	350-V8EFI
SAE Gross HP	*	**	201
SAE Gross Torque, lb-ft	*	**	318
Transmission, Auto	A4	E40D	A40D
Tires, Steel Belted Radial	Tubeless		
Size & Load Range	as shown	LT245/ 75R16E	LT225/ 75R16E
Wheels, Rear	Single	Single	Single
Alternator, amperes	100	100	100

*See minimum power requirements in D.5.3.4.

**Furnished with diesel engine only, Option 8.

DIESEL ENGINE (Option 8)

18-Passenger ITEM	1992 Min. Rqmts.	Chevrolet/GMC G31303	Ford E 350
Engine Displacement, L.	*	6.2N-V8	7.3N-V8
SAE Gross Horsepower	*	164	180
SAE Gross Torque, lb-ft	*	302	345
Alternator, amperes	100	100	100

*See minimum power requirements in D.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 D.5.3.4.)

The following bodies are available on van conversion chassis:

18-PASSENGER BUS BODIES				
(With Dual (or Single) Rear Emergency Door)				
18-Passenger ITEM	1992 Min. Rqmts.	Collins Super Bantam	Lewis Reddi Bus	Van Con 18-Pass.
Overall Length	220.0	220/246.8	245.0	236.0
Interior Height	63	64	65	63.0
Interior Width	75	75	75	72.0
Entrance Door Height*	53	53/74	70	65.0
Passenger Seats (26"-39" Benches):				
Left Side, rows	4 or 5	4 or 5	5	5
Curb Side, rows	4 or 5	4 or 5	4	5
Knee Space, in	24	24	26	26
Aisle Width, in	13	13	15	15

*Option 11 allows automotive type (Style 1) service doors.

19-PASSENGER BUS TABLE

TABLE 6
19-PASSENGER BUS CHASSIS
 (SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)

Refer to General Requirements, Page 4			
19-Passenger ITEM	1992 Min. Rqmts.	Chev/GMC G31303	Ford E350 Cutaway
GVWR, lbs	10000	10000	10000
GAWR, lbs - Front	3900	3900	3900
- Rear	7200	7200	7810
Axle Capacity, lbs - Front	3900	3900	4600
- Rear	7500	7500	7800
Wheelbase, in	125	125	138
Chassis Length, in	as required	197.6	232.4
Track, in - Front	69.3	69.3	70.0
- Rear	73.2	74.0	73.2
Gasoline Engine CID	*	350-V8EFI	**
SAE Gross Horsepower	*	201	**
SAE Gross Torque, lb-ft	*	318	**
Transmission, Auto	A4	A40D	E40D
Tires, Steel Belted Radial	Tubeless	LT225/	LT225/
Size & Load Range	as shown	75RI6D	75RI6D
Wheels, Rear	Dual	Dual	Dual
Alternator, amperes	85	85	130

*See minimum power requirements in D.5.3.4.

**Furnished with diesel engine only, Option 8.

DIESEL ENGINE (Option 8)

19-Passenger ITEM	1992 Min. Rqmts.	Chevrolet/GMC G31303	Ford E350
Engine Displacement, L.	*	6.2N-V8	7.3N
SAE Gross Horsepower	*	164	180
SAE Gross Torque, lb-ft	*	302	345
Alternator, amperes	100	100	100

*See minimum power requirements in D.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 D.5.3.4.).

The following bodies are available on commercial cutaway chassis in this configuration:

19-PASSENGER BUS BODIES

19-Passenger ITEM	1992 Min. rqmts.	AmTran/Ward Vanguard*/ V8819	Blue Bird Micro-Bird	Carpenter SCL Clipper	Thomas Minotaur	MidBus Busette	Wayne Chaperone
Interior headroom, in	63	74	74	74	72	63	72
Interior width, in	84	90	90.5	90	90	84.72	90.75
Service door	as shown	sedan*/ tall	tall	tall	tall	sedan*	tall

*Available only with Option 11, Sedan-type Service Door.

E. 24- THROUGH 83-PASSENGER BODY SPECIFICATIONS

- 1.7.4. Interior and Stepwell Lamps - Interior lamps shall be installed to properly and adequately illuminate the entire aisle and emergency passageway. The stepwell shall be illuminated with a separate lamp activated by opening the service door. The fixtures shall have white or clear plastic lenses attached to metal receptacles. The stepwell lamp shall also have a metal bezel. The lamps shall be designed for a 12-volt electrical system and shall have installed a minimum 15 candlepower lamp bulb. The fixtures shall be mounted so as to provide adequate illumination of the passenger and driver's compartment. Spacing of the lamp fixtures shall be the option of the bus body manufacturer.

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

<u>SCHOOL BUS SIZE</u> (Number of Passengers)	<u>INTERIOR CEILING LAMPS</u> (Minimum Required per Bus)
24 and 35	3
47 and 53	4
59 and 65	5
71, 77, and 83	6

- 1.7.4.2 Stepwell and interior lamps approved are as follows:

<u>MANUFACTURER</u>	<u>CATALOG NUMBER</u>	
	<u>Dome Lamps</u>	<u>Stepwell Lamps</u>
Arrow Safety Device Co.	043, 036	(Equivalent lamps
Cardinal Mfg. Co.	1271-G1	with metal bezels)
Grote Mfg. Co.	230 (61031)	
K-D Lamp Co.	KD530-12	
Weldon Inc.	8005	

- 1.7.5. License Plate Lamp - The color, requirements, and mounting of the license plate lamp shall be in accordance with FMVSS No. 108.
- 1.7.6. Reflex Reflectors and Intermediate Reflex Reflectors - The quantities, colors, requirements, and mounting of reflex and intermediate reflex reflectors shall be in accordance with FMVSS No. 108, except one amber reflex reflector on the front, one amber intermediate reflex reflector on buses 30 feet or longer, and one red reflex reflector on the rear shall be mounted on each side of the bus body. The amber reflex reflectors mounted near the front and on each side of the chassis are required on Texas buses in addition to the reflectors required by FMVSS No. 108.
- 1.7.7. Tail and Stop Lamps - The quantities, colors, requirements, and mounting of tail and stop lamps shall be in accordance with FMVSS No. 108, except stop lamps shall be 7 inches in diameter and mounted at approximately the belt line level of the bus. A set of minimum 4-inch tail/stop lamps shall be installed below the 7-inch set. Base of lamps shall be metal or durable plastic preferably with screw lens. Lenses shall be secured to lamps by a fastening method which requires a tool to remove the lens. The lamps shall be Grote 78002 or 78102 taillight, KD Lamp Company Models 258-2601 or 258-2605, or approved equal.
- Example of an approved equal: Truck-Lite Model 90-91.
- 1.7.8. Turn-Signal/Hazard Warning Lamps - The quantities, colors, requirements, and mountings of turn-signal/hazard warning lamps shall be in accordance with FMVSS No. 108, except rear turn-signal lamps shall be 7 inches in diameter. The front turn-signal lamps shall be the double-face pedestal type or they shall be of the "wrap-around type" (except single-faced type on forward control buses). They shall be mounted in such a manner so as to be capable of withstanding all normal vibrations. On double-faced pedestals, the front lens shall be amber; the rear lens shall be red or amber, or a shade between red and amber. The operating units and flasher for turn-signals and vehicular hazard warning signals shall meet the requirements of FMVSS No. 108.

E. 24- THROUGH 83-PASSENGER BODY SPECIFICATIONS

- 1.7.8.1. Installation - If exterior panels are cut to provide an opening for installation of flush-mounted turn-signal lamps, the lamps must have a closed cell sponge flange gasket with a minimum thickness of 3/16 inch. The gasket shall be the full width of the flange on the lamp. Proper installation of the lamp shall be made in order to prevent seepage of moisture into the opening.
- 1.7.8.2. Wiring - The exposed wiring to the signal lamps shall be enclosed in a one-piece waterproof loom, or equivalent, leading directly from the lamp body to the interior of the bus body. The wiring shall be supported at the lamp body and at intervals of not more than 6 inches until it enters the bus body.
- 1.7.9. Warning Devices - Each school bus shall be equipped with three triangular warning devices meeting the requirements of FMVSS No. 125. The devices shall be packed three per metal or heavy-duty plastic box, or they may be individually packed in metal or heavy-duty plastic boxes with the three boxes contained within a carrier. Warning devices shall be securely mounted in the driver's compartment. Triangular warning devices furnished shall be approved by the Texas Department of Public Safety.
- 1.8. LICENSE PLATE HOLDER - A recessed license plate holder shall be mounted on the left rear of the bus body. The recess shall be minimum of 3/8-inch deep at the top and shall be located so that the license plate will receive illumination from the clear lens on the underneath side of the tail light, or by a separate lamp.
- 1.9. OPENINGS - All openings in the floorboard or firewall between chassis and passenger-carrying compartment, such as for gearshift lever, steering column, and auxiliary brake lever, shall be sealed. All openings between chassis and passenger-carrying compartment made due to alterations by the body manufacturer must be sealed.
- 1.10. PAINTING -
 - 1.10.1. Preparation and Cleaning -
 - 1.10.1.1. Surface Preparation - The method used in the cleaning and preparation of all surfaces to be primed shall be equal to that specified by Federal Specification TT-C-490B for equivalent use. The final preparation for priming shall include a careful inspection to make certain that all surfaces to be primed will permit optimum adhesion of all paint films.
 - 1.10.1.2. Surface Cleaning - All interior and exterior panels and rub rails to be painted or coated shall be thoroughly cleaned to remove all rust, grease, weld slag, and other foreign material prior to priming. Any welds on the components for the bus body or chassis shall be dressed, sanded, buffed, and thoroughly cleaned to remove any slag and to properly prepare the welds for priming. After proper cleaning, these components shall be thoroughly rinsed. Neither the cleaning process nor the rinses shall impair the zinc phosphate coating of the panels or rub rails.
 - 1.10.2. Primer Coat - After the components have been thoroughly cleaned and prepared as described above, they shall be totally primed and dried. These components may be primed and dried either prior to or after installation. All components such as rivet or bolt heads and damaged areas shall be thoroughly cleaned and primed.

NOTES: Components of the body frame system need not be primed, except for welds. All processes and methods used in the priming operation shall be in accordance with the best recognized industrial practices. Primers shall be those recommended by the paint manufacturer supplying the finish coat enamels. Primers may be any color.

Clear-coated panels are required below the passenger windows and in the stepwell (see Par. E.2.9.).

E. 24- THROUGH 83-PASSENGER BODY SPECIFICATIONS

2.12.5. **Seat Belts and Seat Belt Assembly** - A Type 2 seat belt assembly conforming to FMVSS No. 209 shall be provided for the driver. The belt assembly shall be equipped with at least one reel-type emergency locking retractor (ELR) for the continuous belt assembly. The location of the seat belt anchorage shall conform to SAE Standard J383 with the driver's seat adjusted to its rearmost position. The anchored ends of the belt assembly shall be fitted with a minimum 8-inch semi-rigid plastic boot which will prevent that portion of the belt between the buckle and the retractor reel from contacting the floor and to keep the belt from hitting the feet of the passengers in the front seat directly behind the driver. The seat belt assembly shall be anchored in such a manner or guided at the seat frame so as to prevent the driver from sliding sideways from under the belt.

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

2.13.1. **Seat Back Heights** - When so specified in the Invitation for Bids (see Option 21), seat back heights shall be increased 4 inches over the seat back heights required by FMVSS No. 222.

NOTE: Seat backs with this option will have heights of approximately 28 inches.

2.13.2. **Seat Belts, Passenger, Optional** - (see Par. E.3.13.).

2.13.3. **Seat Cushions** - All 26-inch and all 39-inch seat cushions shall be designed to adequately support, respectively, two and three passenger of 120 pounds each. All seat cushion materials shall meet or exceed the requirements of FMVSS No. 302 and/or California Technical Bulletin 117. The seat cushion shall be either of one-piece construction or may be constructed of more than one piece at the manufacturer's option. The seat cushion unit shall consist of a base, a one- or two-piece polyurethane foam cushion, and upholstery, meeting the following requirements:

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

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

2.13.3.2. **Foam Cushion Assembly, One-Piece Polyurethane Foam** -

- (i) **Construction** - The seat cushion dimensions shall be in accordance with the nominal dimensional requirements as shown in Fig. 2.
- (ii) **Design** - The one-piece foam cushion shall be solid polyurethane foam conforming to the physical requirements in Table No. 10 (rebonded or molded polyurethane foams are not acceptable for seat cushion).

TABLE NO. 10

**ONE-PIECE CUSHION
PHYSICAL PROPERTIES
(ASTM D 3574)**

ITEM	ONE-PIECE SEAT CUSHION
Density, lbs/cubic foot, Min	1.8
Load Deflection, 4" thick @ 25% Indentation, Min	90
Indentation Load, Ratio, 65%/25%, Min	2.3
Compression Set, 50% Deflection (22 hrs @ 158°F), Max.	20
Tensile Strength, lbs/square inch, Min	10
Tensile Elongation, %, Min	150
Tear Resistance, lbs/inch, Min	1.5

E. 24- THROUGH 83-PASSENGER BODY SPECIFICATIONS

2.13.3.3. Foam Cushion Assembly, Two-piece Polyurethane -

- (i) Construction - The seat cushion assembly shall be fabricated in accordance with the nominal dimensional requirements as shown in Fig. 2. In the two-piece assembly, the top 1-1/2 inches of the cushion shall be of one continuous foam piece. All parts of the seat cushion and the seat stiffeners shall be securely cemented or otherwise bonded together to form the seat cushion assembly shown in Fig. 2.
- (ii) Design - The two-piece foam cushion assembly shall be constructed of unfilled polyurethane foam conforming to the physical requirements in Table No. 11 (rebonded polyurethane foams are not acceptable for seat cushion or seat stiffeners):

TABLE NO. 11

TWO-PIECE CUSHION ASSEMBLY
PHYSICAL PROPERTIES
(ASTM D 3574)

ITEM	SEAT CUSHION	SEAT STIFFENERS
Density, lbs/cubic foot, Min	1.8	2.4
Load Deflection, 4" thick @ 25% Indentation Min	52 \pm 5	80
Indentation Load, Ratio, 65%/25%, Min	2.3	2.5
Compression Set, 50% Deflection (22 hrs @ 158°F), Max.	10	20
Tensile Strength, lbs/square inch, Min	10	12
Tensile Elongation, %, Min	150	75
Tear Resistance, lbs/inch, Min	1.5	1.5

2.13.4. Seat Frames -

- 2.13.4.1. Design and Material - The seat frames shall be constructed of steel of the type, size, and gauge necessary to meet the seat load deflection requirements of FMVSS No. 222. Seat frames legs shall be two, four, or six pedestal type. The seat backs shall slope backward to provide a comfortable seating angle. Seat backs that are set in a vertical plane or tilt forward are not acceptable.
- 2.13.4.2. Painting Requirements - The entire seat frame, except that section of the back frame which is padded and upholstered, shall be thoroughly cleaned, primed, and painted. The paint shall have adhesive qualities which will not permit the removal of the paint by means of the thumbnail-scratch method without first chipping a starting place (see also Par E.1.10.).

2.13.5. Seat Installation -

- 2.13.5.1. Aisle Width - The minimum aisle width between rows of seats shall be 12 inches except a 30-inch aisle is required if regular seating is provided between the rear emergency door and any wheelchair positions on wheelchair-equipped buses (see Par. G.1.7.3.).
- 2.13.5.2. Attachment - Each leg shall be attached to the floor with at least 2 bolts, flat washers, lock washers, and nuts, or approved equal. Where it is impossible to use bolts and nuts at certain floor points due to main cross members or floor sill interference, thread-forming or cutting bolts and lock washers may be used.
- 2.13.5.3. Knee Spacing - Allowing for manufacturing tolerances, Texas requires the maximum allowable knee space on buses consistent with the overall standard body lengths (see Par. A.2.13. for the definition of knee spacing and Option No. 15 for increased knee space on all 24- through 71-passenger buses). These minima are generally not less than the following (see Table No. 8):
 - (i) 24 inches for the 24-passenger bus
 - (ii) 24 3/4 inches for the short wheelbase 71- and the 83-passenger buses.
 - (iii) 25 inches for all other 35- through 77-passenger buses.

E. 24- THROUGH 33-PASSENGER BODY SPECIFICATIONS

3.6.3. Heater, Auxiliary - When so specified in the Invitation for Bids (see Option 14), a second recirculating heater shall be furnished. It shall be mounted near the rear of the bus and in such a manner so as not to interfere with the securing of seats to the floor, as specified in Par. E.2.13.5.2. The Btu/hr. rating shall be in accordance with SBMI Standard No. 001. Heated conduits inside the buses shall be insulated or shielded to prevent injury to the driver or passengers. The heater shall have a minimum output rating (recirculating air rating - not fresh air intake rating) as follows:

3.6.3.1. 24- and 35-passenger Buses - 40,000 Btu/hr.

3.6.3.2. 47-passenger and Larger Buses - 60,000 Btu/hr.

NOTE: Auxiliary heaters on diesel-powered buses shall be furnished with a water circulating pump.

3.6.4. Installation - The standard heater shall be installed near the front of the bus body with the controls readily accessible to the driver; the auxiliary heater shall be installed near the rear of the bus. Heater hose connections shall be installed above the floor of the bus body and through the firewall to the engine compartment. Heated conduits inside the bus shall be insulated or shielded to prevent injury to the driver or passengers. The length of the hot water hoses shall be as short as possible consistent with good installation practices; however, the hoses shall not be installed in such a manner so as to interfere with normal engine maintenance operations, such as the removal of the engine air cleaner. The hoses shall not dangle or rub against the chassis or sharp edges and shall not interfere with or restrict the operation of any motor function, such as the spark advance of an automatic distributor. Heater hose shall conform to SAE 20R3, Class C, as defined in SAE Standard J20e. Each heater installation shall include two all brass shutoff valves or cocks. Installation of the shutoff valves or cocks shall be as close as possible to the water pump and motor block outlets. The hoses shall be adequately supported to guard against excessive wear due to vibration. These cutoff valves or cocks shall be installed as follows:

3.6.4.1. One between the heater hose connection and the water pump outlet,
and

3.6.4.2. One between the heater hose connection and the engine block.

3.6.5. Service Accessibility - Heater motors, cores, and fans shall be readily accessible for service. Access panels (removable without removing driver's seat) shall be provided as required for maintenance.

3.7. LUGGAGE RACK - Option deleted.

E. 24- THROUGH 83-PASSENGER BODY SPECIFICATIONS

- 3.8. MIRRORS, EXTERIOR** - Exterior mirrors shall conform to the requirements of FMVSS No. 111. Each school bus shall be provided with exterior mirrors and brackets as described below:
- 3.8.1. Mirror System, Crossover** - The crossview mirror system shall provide the driver with indirect vision of an area at ground level from the front bumper forward and the entire width of the bus to a point where the driver can see by direct vision. The crossview system shall also provide the driver with indirect vision of the area at ground level around the left and right front corners of the bus to include the tires and service entrance on all types of buses to a point where it overlaps with the rear vision mirror system.
 - 3.8.2. Mounting and Mounting Brackets, Standard** - Mirror mounting and backing shall be of steel or a high-impact plastic such as a polycarbonate/polyethylene terephthalate blend, or approved equal. Mounting of all exterior mirrors to the bus body shall be by means of bolts, nuts, and lock washers, where possible; otherwise No. 10 hexagon head sheet metal bolts with star lock washers or No. 10 hexagon head sheet metal screws with serrated surface shall be used. This system of mirrors shall be easily adjustable but be rigidly braced so as to reduce vibration. Each exterior rear vision mirror shall be mounted in the brackets and assemblies shown on Texas General Services Commission Drawings Numbered 040-35(1), 040-35(3), 040-35(4), 040-35(5), 040-35(6) and 040-35(7), dated November 15, 1968. The brackets shall be mounted on the left front and right front of the bus body and cowl. The parts, as shown on Drawings Numbered 040-35(2) and 040-35(3), must be formed to fit the individual configuration of each manufacturer's body and cowl design. Long dimensions of Texas mirror brackets may be adjusted as required to fit the configurations of buses.
 - 3.8.3. Mirror Backing and Mounting, Stainless Steel, Optional** - When so specified in the Invitation for Bids, exterior rearview mirror backs and mounting brackets shall meet or exceed all of the applicable requirements of Par. E.3.8.3. above except the mirror backing and mounting shall be made of stainless steel.
 - 3.8.4. Painting** - Brackets and assemblies of all exterior rearview and crossover mirrors shall be cleaned and prepared for painting in accordance with Federal Specification TT-C-490B, Type I or II. The metal backs of stainless steel, aluminum, and chrome-plated exterior and crossover mirrors, if painted, and the backs of all other metal-backed exterior and crossover mirrors shall be finished in black (Color No. 37038 of Federal Standard No. 595a).
 - 3.8.5. Rearview Mirror system** - the rearview mirror system shall be capable of providing a view along the left and right sides of the bus which will provide the driver with a view of the rear tires at ground level, a minimum of 200 feet to the rear of the bus and at least 12 feet perpendicular to the side of the bus at the rear axle line.
- 3.9. MIRRORS, INTERIOR** - A clear-vision, interior rearview mirror conforming to FMVSS No. 111, with at least 6" x 30" size vision area, affording a good view of the road to the rear as well as of the passengers, shall be furnished and installed. The mirror shall be made of safety glass and have rounded corners and protected edges.
- 3.10. MUD FLAPS** - When so specified in the Invitation for Bids (see Option 18), mud flaps of durable, heavy-duty rubberized construction, complete with brackets, shall be installed behind each set of rear wheels. The mud flaps shall be comparable in size to the width of rear wheelhousing and shall reach within approximately 8 inches of the ground when the bus is empty. They shall be mounted at a distance from the wheels that will permit free access to spring hangers for lubrication, and to prevent their being pulled off when the bus is moving in reverse. There shall be no advertisement on the mud flaps.

E. 24- THROUGH 83-PASSENGER BODY SPECIFICATIONS

- 3.11. REFLECTIVE MATERIAL** - When so specified in the Invitation for Bids (see Option 19), buses shall be equipped with reflective material meeting the following requirements. The material shall be automotive engineering grade or better, shall meet the initial reflectance values in DOT FHWA FP-85 and shall retain at least 50% of those values for a minimum of six years. Reflective materials and markings shall be installed in the following locations:
- 3.11.1. Front and/or rear bumper shall be marked diagonally 45° down to centerline of pavement with 2-inch wide strips of non-contrasting reflective material.
 - 3.11.2. Rear of bus body shall be marked with a strip of reflective National School Bus Yellow material no greater than 2 inches in width to be applied to the back of the bus, extending from the left lower corner of the "SCHOOL BUS" lettering, across to left side of the bus; then vertically down to the top of the bumper, across the bus on a line immediately above the bumper to the right side, then vertically up to a point even with the strip placement on the left side, and concluding with a horizontal strip terminating at the lower right corner of the "SCHOOL BUS" lettering.
 - 3.11.3. "SCHOOL BUS" signs shall be marked with reflective National School Bus Yellow material comprising background for lettering of the front and/or rear "SCHOOL BUS" signs.
 - 3.11.4. Side of bus body shall be marked with reflective National School Bus Yellow Material at least 6 inches but not more than 12 inches in width, extending the length of the bus body and located (vertically) as close as practicable to the beltline.
- NOTE:** See Par.. 3.15.1. for requirements for placement of reflective materials on Stop arms.
- 3.12. STROBE LIGHT, Flashing** - When so specified on Invitation for Bids (see Option 26), an optional white flashing strobe light meeting the following requirements shall be provided:
- 3.12.1. Design - The lamp shall have a single clear lens emitting light revolving 360 degrees around a vertical axis. The light source shall be minimum of 50 candlepower and flash 80-120 times per minute. The base of the lamp shall be metal or approved equal and installed by a method which seals out dust and moisture. A manual switch is required for operation and a pilot light to indicate when the light is in operation shall be included. Wiring shall be installed inside the bus walls.
 - 3.12.2. Mounting - The strobe light shall be permanently installed near the centerline on the school bus roof not more than one-third of the body length forward from the rear edge of the bus roof. It shall not extend above the roof more than approximately 6.5 inches.
- 3.13. SEAT BELTS, PASSENGER** - When so specified in the Invitation for Bids (see Option 22), seat belts conforming to FMVSS Nos. 209 and 210 shall be provided for each passenger position. The seat belts shall meet the following requirements:
- 3.13.1. Colors - The belt assemblies shall be alternately color coded with contrasting colors. All aisle seats on the same side of the bus shall have belts with the same color. Two-position seats shall use two colors; three-position seats may use two or three colors.
 - 3.13.2. Design - Seat belts shall have a buckle end and an attaching end which are adjustable to fit passenger sizes as required by FMVSS Nos. 208 and 209 (except lights and buzzers are not required). Buckles shall be of the plastic-covered push button design. Long and short ends shall be mounted alternately with the short end on the aisle. If possible, the design shall prevent fastening the belts across the aisle.
- 3.14. STIRRUP STEPS** - There shall be one stirrup step and a suitably located handle on each side of the bus body front for easy accessibility in cleaning the windshield and lamps. The stirrup step on forward-control buses shall be on or in the bumper. Stirrup steps are not required on the 24-passenger bus unless necessary to clean windshield and windows.

E. 24- THROUGH 83-PASSENGER BODY SPECIFICATIONS

3.15. STOP ARM - A school bus stop arm meeting SAE J1133 and the following requirements shall be provided:

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

3.15.2. **Mounting** - The stop arm shall be installed on the left side of the school bus near the front cowl section.

3.16. SUN VISOR - A two-post, adjustable sun visor with a minimum size of 6 by 30 inches and a minimum thickness of 1/8 inches and constructed of tinted Plexiglas shall be furnished on each bus. Means shall be provided for tension adjustment. It shall be installed above the interior windshield on the driver's side or it may be mounted to the inside rearview mirror at each end using lock type nuts. If this type of mounting is used, the mirror shall have an adjustable reinforcing bracket at each end to reduce any vibration distortion caused by the weight of the sun visor.

3.17. TOOL COMPARTMENT - When so specified in the Invitation for Bids (see Option No. 30), a metal container of adequate strength and capacity shall be provided for storage of tire chains, tow chains, and such tools as may be necessary for minor emergency repairs. This storage container shall be located either inside or outside the passenger compartment and shall be capable of being securely latched. However, if it is located inside the passenger compartment, it shall be provided with a separate cover, and shall be fastened to the floor in the right front or the right rear of the bus. A seat cushion shall not be used as this cover.

3.18. WINDSHIELD WASHERS AND WIPERS -

3.18.1. **Washers** - A vacuum-, electric-, or air-operated windshield washer shall be furnished and installed. The washer shall have a minimum reservoir capacity of one quart of liquid and shall direct a stream of water into the path of travel of each windshield wiper blade each time the actuating button is operated.

3.18.2. **Wipers** - Each bus shall be equipped with two, 2-speed electric motor-driven heavy-duty windshield wipers. The arms and blades shall be of sufficient size to provide clear vision for the driver during a heavy rain. The motors furnished shall be guaranteed to operate the wipers under all driving conditions and shall be American Bosch Model NWC, or approved equal.

E.4. APPROVAL OF NEW BUS BODIES - Procedures for approving a new bus body for 24- through 83-passenger school buses shall be as follows in the order indicated:

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

4.1.1. **Letter** - Letter stating that the body meets or exceeds each and every applicable requirement in Texas specification No. 070-SB-92.

4.1.2. **Literature and drawings** - See Par. A.6.5.

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

59-PASSENGER CONVENTIONAL BUS TABLE

TABLE 16
59-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

Refer to General Requirements, Page 4

CHASSIS		B	N	N-S	F
59-Passenger Conv.	1992	B.B.	NIC	NIC-Semi****	FORD
ITEM	Min. Rqmts.	B7	3700*	3600*	B600*
GVWR, lbs	25500	25580	25500	25500	25500
GAWR, lbs - Front	7500	7500	8000	8000	9000
- Rear	17500	18080	17500	17500	17500
Axle Capacity, lbs - Front	7500	7500	8000	8000	9000
- Rear	17500	19000	17500	17500	17500
Wheelbase, in	236	241	236	236	237
Cowl-to-Axle, in	211	217	211	211	213
Cowl-to-Frame End, in	329	342	329	329	345
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	15.00 x 4.00	15.0 x 3.50	15.0 x 3.50	15.00 x 4.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 6.00	16.5 x 6.00	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
- Rim Size, in	7.5	7.5	7.5	7.5	7.5

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: Buses ordered in this capacity (59-Passenger) may be either Conventional or Semi-forward Control configuration, at the option of the vendor, unless otherwise specified in the Invitation for Bids.

DIESEL ENGINES (Option 8)

59-Passenger	1992	B.B.	NIC	FORD
ITEM	Min. Rqmts.	B7	3600/3700	B600
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	6000	7500	6000	8000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

59-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-26	2800/2807	77SB2800	0901/0910	2F2701
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

59-PASSENGER FORWARD CONTROL DIESEL BUS TABLE

TABLE 19
59-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

		Refer to General Requirements, Page 4				
CHASSIS		B	N	T	S	
59 Passenger FC	ITEM	1992 Min. Rqmts.	Blue Bird TC2000	NIC 3900	Thomas SAF-T-LINER MVP 1109***	Crane* 4000
GVWR, lbs		26500	27800	29500	28380	26500
GAWR, lbs - Front		10300	10300	12000	10300	10300
- Rear		17000	17000	17500	18080	17000
Axle Capacity, lbs - Front		10800	12000	12000	13200	10800
- Rear		17000	17000	17500	19000	17000
Wheelbase, in		160	160	184	181	160
Engine Displacement, L.		*	5.9T-I6	5.9T-I6	5.9T-I6	5.9T-I6
SAE Gross Horsepower		*	190	170	190	180
SAE Gross Torque, lb-ft		*	475	400	475	445
Transmission:**						
Automatic, Gears/Model		4 Spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. gears		5 Spd	M5	M5	M5	n/a
Brake Lining, in - Front		as shown	15.0 x 4	15.0 x 4	15.0 x 4	15.0 x 6
- Rear		as shown	16.5 x 7	16.5 x 6	16.5 x 7	16.5 x 6
Tires. Steel Belted Radial		Tubeless				
Size & Load Range		10R22.5F	10R22.5F	11R22.5G	10R22.5F	10R22.5F
Wheels - Rear		Dual	Dual	Dual	Dual	Dual
- Rim Size, in		7.5	7.5	8.25	7.5	7.5

*Furnished with air brakes only

*See minimum power requirements in Par. F.5.3.4.

**Direct in fourth gear (automatic); direct in fifth gear (manual).

***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 Par. F.5.3.4.).

NOTE: The NIC 5.9T is the model DT-360 diesel engine.

The following Body/Chassis combinations are available as indicated:

59-PASSENGER FORWARD CONTROL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS2910/NS3008	TCFC28210	SFT300	1109	2N3009
Chassis Available	N, S	B	N	T	N

65-PASSENGER CONVENTIONAL BUS TABLE

TABLE 20
65-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

Refer to General Requirements, Page 4

CHASSIS 65-Passenger Conv. ITEM	1992 Min. Rqmts.	B B.B. B7	N NIC 3700*	N-S NIC-Semi**** 3600*	F FORD B600*
GVWR, lbs	25580	25580	27500	27500	26500
GAWR, lbs - Front	7500	7500	10000	10000	9000
- Rear	17500	18080	17500	17500	17500
Axle Capacity, lbs - Front	7500	7500	10000	10000	9000
- Rear	17500	19000	17500	17500	17500
Wheelbase, in	238	241/262	254	254	255
Cowl-to-Axle, in	217	217/238	229	229	231
Cowl-to-Frame End, in	359	363/370	359	359	377
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	15.00 x 4.00	15.0 x 3.50	15.0 x 3.50	15.00 x 41.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 6.00	16.5 x 6.00	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
- Rim Size, in	7.5	7.5	7.5	7.5	7.5

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: Buses ordered in this 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 Bids.

DIESEL ENGINES (Option 8)

65-Passenger ITEM	1992 Min. Rqmts.	B.B. B7	NIC 3600/3700	FORD B600
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	9000	9000	10000	9000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

65-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-29	3004/3011	77SB3004	1001/1010	2F2905
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

65-PASSENGER FORWARD CONTROL DIESEL BUS TABLE

TABLE 21
65-PASSENGER FORWARD CONTROL DIESEL BUS
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Full Air Brake Standard)

		Refer to General Requirements, Page 4				
CHASSIS		B	N	T	S	
65-Passenger FC	1991	Blue Bird	NIC	Thomas	Crane*	
ITEM	Min.	TC2000	3900	SAF-T-LINER	4000	
	Rgnts.			MVP 1109***		
GVWR, lbs	26500	27800	29500	28380	26500	
GAWR, lbs - Front	10300	11340	12000	10300	10800	
- Rear	17000	17000	17500	18080	17000	
Axle Capacity, lbs - Front	10800	12000	12000	13200	10800	
- Rear	17000	17000	17500	19000	17000	
Wheelbase, in	174	174	197	181	180	
Diesel Engine Displacement, L.	*	5.9T-I6	5.9T-I6	5.9T-I6	5.9T-I6	
SAE Gross Horsepower	*	190	170	190	180	
SAE Gross Torque, lb-ft	*	475	400	475	445	
Transmission:**						
Automatic, Gears/Model	4 Spd	AT-545	AT-545	AT-545	AT-545	
Manual, Fwd. Gears	5 Spd	M5	M5	M5	n/a	
Brake Lining, in - Front	as shown	15.0 x 4	15.0 x 4	15.0 x 4	15.0 x 4	
- Rear	as shown	16.5 x 6	16.5 x 6	16.5 x 7	16.0 x 6	
Tires, Steel Belted Radial	Tubeless					
Size & Load Range	10R22.5F	10R22.5G	11R22.5G	10R22.5F	10R22.5F	
Wheels - Rear	Dual	Dual	Dual	Dual	Dual	
- Rim Size, in	7.5	7.5	8.25	7.5	7.5	

*Furnished with Air Brakes only.

*See minimum power requirements in Par. F.5.3.4.

**Direct in fourth gear (automatic); direct in fifth gear (manual).

***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 Par. F.5.3.4.).

NOTE: The NIC 5.9T is the Model DT-360 diesel engine.

The following Body/Chassis combinations are available as indicated:

65-PASSENGER FORWARD CONTROL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	KS3201/NS3211	TCFC3007	77SFT3000	1209	2N3300
Chassis Available	N, S	B	N	T	N

71-PASSENGER STD CONVENTIONAL BUS TABLE

TABLE 22
71S-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Short Wheelbase, Full Air Brake Standard)

		Refer to General Requirements, Page 4			
CHASSIS		B	N	N-S	F
71S-Passenger Conv.	1992	B.B.	MIC	MIC-Semi****	FORD
ITEM	Min.	B7	3700*	3600*	B600*
	Rqmts.				
GVWR, lbs	28000	28000	28000	28000	28000
GAWR, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Axle Capacity, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Wheelbase, in	254	259	254	254	255
Cowl-to-Axle, in	229	235	229	229	231
Cowl-to-Frame End, in	349	384	349	349	377
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	16.50 x 5.00	15.0 x 4.00	15.0 x 4.00	15.00 x 4.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 7.00	16.5 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
- Rim Size, in	8.25	8.25	8.25	8.25	8.25

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

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

DIESEL ENGINES (Option 8)

71S-Passenger	1992	B.B.	MIC	FORD
ITEM	Min.	B7	3600/3700	B600
	Rqmts.			
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	9000	9000	10000	9000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

71S-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-31	3201	77SB3201	1100/1110	2F3200
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

71-PASSENGER LOW CONVENTIONAL BUS

TABLE 23
71L-PASSENGER CONVENTIONAL BUS****
(SEE PAR. B.1.2. ON REDUCED PASSENGER CAPACITY.)
(Long Wheelbase, Full Air Brake Standard)

Refer to General Requirements, Page 4					
CHASSIS	B	N	N-S	F	
71L-Passenger Conv.	B.B.	NIC	NIC-Semi****	FORD	
ITEM	Min. Rqmts.	B7	3700*	3600*	B600*
GVWR, lbs	28000	28000	28000	28000	28000
GAWR, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Axle Capacity, lbs - Front	9000	9000	9000	9000	9000
- Rear	19000	19000	19000	19000	19000
Wheelbase, in	274	274	274	276	275
Cowl-to-Axle, in	250	250	251	251	251
Cowl-to-Frame End, in	384	384	387	387	387
Gasoline Engine CID**	***	366-V8EFI	*	*	*
SAE Gross Horsepower	***	210	*	*	*
SAE Gross Torque, lb-ft	***	340	*	*	*
Transmission:					
Automatic, Gears/Model	4 spd	AT-545	AT-545	AT-545	AT-545
Manual, Fwd. Gears	5 spd	M5	M5	M5	M5
Brakes - Front Disc Rotor, in	as shown	16.50 x 5.00	15.0 x 4.00	15.0 x 4.00	15.00 x 4.00
- Rear Lining, in	as shown	16.50 x 7.00	16.5 x 7.00	16.5 x 7.00	16.50 x 7.00
Tires, Steel Belted Radial	Tubeless	11R22.5G	11R22.5G	11R22.5G	11R22.5G
Size & Load Range	11R22.5G				
Wheels - Rear	Dual	Dual	Dual	Dual	Dual
- Rim Size, in	8.25	8.25	8.25	8.25	8.25

*Furnished with diesel engine only, Option 8.

**See diesel engine option 8.

***See minimum power requirements in Par. F.5.3.4.

****NOTE: Buses ordered in this capacity (71L-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 8)

71L-Passenger	1992	B.B.	NIC	FORD
ITEM	Min. Rqmts.	B7	3600/3700	B600
Engine Displacement, L.	***	6.6T-I6	7.3N-V8	5.9T-I6
SAE Gross Horsepower	***	170	170	160
SAE Gross Torque, lb-ft	***	420	332	400
Front GAWR	9000	9000	10000	9000

***See minimum power requirements in Par. 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 Par. F.5.3.4.).

The following Body/Chassis combinations are available as indicated:

71L-PASSENGER CONVENTIONAL BODIES

BODIES	AmTran/Ward	Blue Bird	Carpenter	Thomas	Wayne
Models	SS-31	3208	77SB3208	1101/1110	2F3200
Chassis Available	N,F	B,N,F	N,F	N-S,N,F	N,F

H. AIR CONDITIONING SPECIFICATIONS

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 buses equipped with air conditioning shall be furnished with an alternator with a minimum output rating of 100 amperes. Types B, C, and D buses equipped with air conditioning shall be furnished with an alternator with a minimum output rating of 130 amperes. Type A and Type B, C, and D buses equipped with air conditioning and wheelchair lifts shall be furnished with alternators with a minimum output rating of 130 amperes and 160 amperes, respectively.
- 1.2. **INSULATION** - Minimum 5/8-inch nominal thickness plywood shall be installed over the existing or manufacturer's standard steel floor for insulation (see Par. C.2.5. for plywood requirements including installation requirements). Air-conditioned buses shall have the equivalent of 1-1/2 inches 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 Bids (see Option 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 Bids (see Option 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 29. (For example, an 18-passenger school bus with this option would be furnished with a 53,000 Btu/hr. capacity air conditioning system instead of the standard 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 29 lists the components and the appropriate ratings required by this specification:

TABLE 29
AIR CONDITIONING COMPONENTS (minimum requirements)

BUS SIZE	CAPACITY, Btu/hr.	AIR FLOW, CFM	COMPRESSOR(S) /No.	CONDENSER(S), Location/No.	EVAPORATORS, Location/No.
15 pass.	19,000	1,000	1	1-skirt mtd. (or eng. comp.)	1 - Front & rear
16-20 pass.	40,000	1,200	1	1-skirt mtd.	1 - rear (no dash unit included)
24-35 pass.	53,000	1,300	1	1	1 - rear
47 pass.	78,000	1,900	2	2	1 - rear
53-71 pass.*	84,000	2,000	2	2	2 - 1 each side, staggered
77-83 pass.*	108,000	2,400	2	2	2 - 1 each side, staggered

* except rear engine buses may be single units provided they meet or exceed the BTU/cfm requirement.

H. AIR CONDITIONING SPECIFICATIONS

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 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 Par. H.2. above). 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 12V 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 5 dB. when measured in the center of the bus.

3.2. COMPRESSORS - 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.

NOTE: Compressors shall be geared so that their speed does not exceed the manufacturer's maximum recommended sustained speeds at a road speed of 60 mph in high gear.

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 Bids, 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 their standard cooling coil, fabrication and installation practices.

3.6. REFRIGERANT DRYER - A dryer with a minimum of 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.