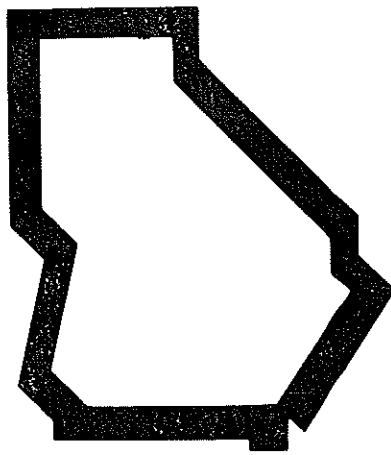


Georgia School Bus



Specifications

**Pupil Transportation Section
Facilities and Transportation Division
Office of Administrative Services
Georgia Department of Education
Atlanta, Georgia 30334-5050
Werner Rogers
State Superintendent of Schools
Revised — August 10, 1989**

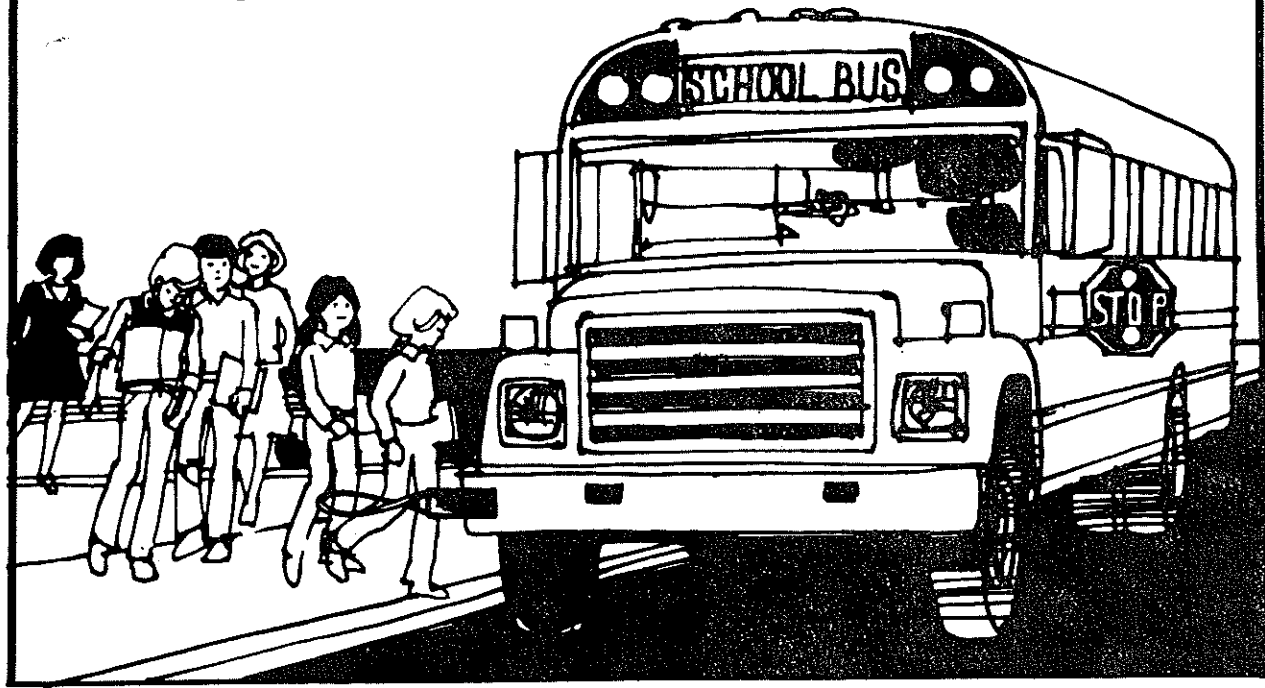


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PART I

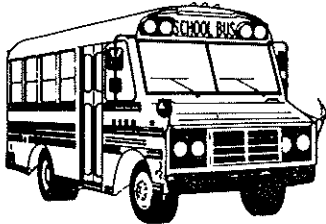
SCHOOL BUS DEFINITIONS

SMALL SCHOOL BUS
TYPE A



A Type "A" school bus is a conversion or body constructed upon a van-type compact truck or a front-section vehicle, with a gross weight rating of 10,000 pounds or less, designed for carrying more than 10 persons; 16 passengers or less on single rear wheels with a maximum of 20 passengers on dual rear wheels.

METROPOLITAN SCHOOL BUS
TYPE B



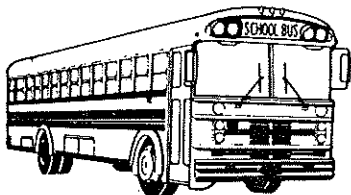
A Type "B" school bus is a conversion or body constructed and installed upon a van or front-section vehicle chassis, or stripped chassis, with a vehicle weight rating of more than 10,000 pounds, designed for carrying more than 10 persons. Part of the engine is beneath and/or behind the windshield and beside the driver's seat. The entrance door is behind the front wheels.

CONVENTIONAL SCHOOL BUS
TYPE C



A Type "C" school bus is a body installed upon a flat back cowl chassis with a gross vehicle weight rating of more than 10,000 pounds, designed for carrying more than 10 persons. All of the engine is in front of the windshield and the entrance door is behind the front wheels.

TRANSIT SCHOOL BUS
TYPE D



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

PART II
CHASSIS SPECIFICATIONS
 CONVENTIONAL AND TRANSIT SCHOOL BUSES
 TYPES C AND D

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NOTE: Where there is conflict between Georgia and Federal Specifications, Federal Specifications shall prevail. Buses must meet Georgia Specifications to the extent that National Minimum Standards are exceeded or the item is specifically addressed; otherwise, National Minimum Standards are considered as a minimum.

1. Air Cleaner - The engine intake air cleaner shall be furnished and properly installed by the chassis manufacturer to meet engine specifications.
2. Alternator - The alternator shall have an output of at least 105 amperes, "SAE rating," with a minimum charging rate of 50 amperes at manufacturer's recommended idle speed. Dual belt or equivalent single poly V belt drive shall be used with the alternator.

The conventional chassis manufacturer shall install a readily accessible electrical terminal so that the body electrical system can be connected through the chassis ammeter. The connector shall be a 10-32 (3/16") stud and nut or equivalent.

Seating Capacity	29-48	53-72	73-90
Alternator Size Amps	105	105	140

3. Axle Weight - Minimum Front and Rear GAWR - If a diesel engine is quoted, springs, axle and ratio must be compatible. Body and chassis manufacturers shall coordinate the axle and chassis requirement for the total payload.

<u>GAS</u>	<u>CONVENTIONAL</u>						<u>TRANSIT</u>		
	29-36	47-48	53-54	59-60	65-66	71-72	41-72	73-90	
Seating Capacity								Puller	
Front	6,000	6,000	6,000	7,000	7,500	8,000	10,800	12,080	
Rear	12,400	14,200	14,200	16,160	17,000	17,500	17,000	20,000	
<u>DIESEL</u>									
Seating Capacity	29-36	47-48	53-54	59-60	65-66	71-72	41-72	73-90	73-84
								Puller	Pusher
Front	6,000	6,000*	7,000*	8,000*	9,000	9,000	10,800	13,180	12,080
Rear	12,400	14,200	14,200	16,160	17,000	17,500	17,000	20,000	21,200

*Exception: DT466 requires a 7,000 front axle on 47-48, a 7,500 front axle on 53-54, and a 9,000 front axle on 59-60 (if the bus is equipped with air brakes).

4. Battery - Conventional - The storage battery shall have a minimum cold cranking capacity rating of 0 degrees Fahrenheit (-17.8c) of 525 amperes and a minimum reserve capacity of 130 minutes at 25 amperes.

4. Battery - Conventional (Continued)

It shall be temporarily mounted to the chassis. The body company shall remount it on the left side so that the center line of the battery is 52 inches back of the cowl. The chassis manufacturer shall furnish one-piece battery cables at least 36 inches longer than normally required to accommodate the battery when it is located 52 inches back of cowl.

Diesel-equipped conventional buses shall be equipped with storage batteries of sufficient cranking Performance and Reserve Capacity for the type and size engine, but not less than offered as standard equipment.

5. Battery - Transit - The storage battery (or batteries) shall have a combined minimum cold cranking capacity rating of 0 degrees Fahrenheit (-17.8c) of 525 amperes and a minimum reserve capacity of 30 minutes at 25 amperes. The battery cables should be sufficient in length to reach the battery and shall be provided by the chassis manufacturer. The body shall have the battery mounted on a sliding tray in an enclosed compartment in the side of the skirt of the body. The battery may be located in the engine compartment.

Diesel-equipped transit buses shall be equipped with storage battery (or batteries) of sufficient cranking Performance and Reserve Capacity for the type and size engine used, but not less than offered as standard equipment.

6. Brakes - All air brake systems shall meet current FMVSS 121. Fifty-nine (59) passenger and larger buses shall be equipped with full air brakes. (Purchaser's Option: Hydraulic brakes are acceptable.) [See Item 7 - Brakes - Types, Service and Size.] A Monroe Standard or approved equal moisture ejector shall be installed on the primary tank. The moisture ejector shall be actuated by the governor unloader port and must operate automatically each time the compressor "cuts in" and "cuts out." The ejector must have the capacity to eject up to three ounces (1.64 cubic inches) of liquid material each time the ejector operates. It must be a piston-type ejector with an aluminum body, stainless steel spring, bronze piston and exhaust and with a threaded discharge end cap.

(Optional: Air Dryer. With optional air dryer, moisture ejector may be eliminated.)

Air brake systems shall use cam type brakes on all wheels. The rear brake lining shall be block type with a minimum thickness of 3/4". (Optional: Automatic slack adjusters on air brake systems.)

All chassis equipped with hydraulic brakes shall meet current FMVSS 105, and be equipped with a brake warning indicator. On gasoline powered chassis, a separate vacuum reservoir of not less than 1000 cubic inches shall be furnished, installed, and protected by a check valve if necessary to service any vacuum powered chassis accessories. A suitable parking brake shall be provided.

On combination hydraulic systems, the system must be self-adjusting.

6. Brakes (Continued)

When a driveline mounted parking brake is used, it shall be operated by an orscheln type lever. The size shall be the largest available, not less than 9x3 inches. Diesel buses equipped with hydraulic/hydraulic brakes must be equipped with a manual fuel shut-down to enable the engine to operate without stored or generated electrical power. (Unit may be installed in the field by authorized factory personnel prior to delivery to the purchaser.)

Friction material for all brakes shall be non-asbestos.

7. Brakes - Types, Service and Size - Refer to the following chart concerning brake types, service and size.

Seating Capacity	CONVENTIONAL				TRANSIT	
	29-30	35-54	59-66	71-72	41-72	73-90
Types	Hyd.	Hyd.	* Full Air	* Full Air	* Full Air	Full Air
<u>DRUM</u> Service Brake (Sq. In.)	380	480	576	606	622	792
Size-Front	14x2½	15x3	15x3	15x3½	15x4	16½x5
Size-Rear	15x4	15x5	16½x6 *	16½x6 *	16½x6	16½x7
<u>DISC</u>			15x7 Hyd.	15x7 Hyd.		
<u>FRONT</u>						
Area (Sq. In.)	74.2	74.2	* 77.6	* 77.6	* 82.8	** 81.4
Rotor Size	14 $\frac{3}{4}$ x1 $\frac{5}{16}$	14 $\frac{3}{4}$ x1 $\frac{5}{16}$	14 $\frac{3}{4}$ x1 $\frac{5}{16}$	14 $\frac{3}{4}$ x1 $\frac{5}{16}$	15x1 $\frac{7}{16}$	15 $\frac{3}{8}$ x1 $\frac{7}{16}$
Caliper	Twin Piston	Twin Piston	Twin Piston	Twin Piston	Twin Piston	
<u>Rear</u>						
Area (Sq. In.)	74.2	74.2	* 79.12	* 79.12	* 82.8	109.9
Rotor Size	14 $\frac{3}{4}$ x1 $\frac{5}{16}$	14 $\frac{3}{4}$ x1 $\frac{5}{16}$	15x1.43	15x1.43	15x1.43	15 $\frac{3}{8}$ x1 $\frac{3}{4}$
Caliper	Twin Piston	Twin Piston	Twin Piston	Twin Piston	Twin Piston	

*Purchaser's Option: Hy-power (with electrical backup) hydraulic disc brakes on all wheels or hydraulic disc front and drum rear with spring-set parking brake.

**Purchaser's Option: Air Disc.

NOTE: Purchaser's Option must be specifically requested by the local school system.

8. Bumper, Front - Conventional - The front bumper shall be furnished by the chassis manufacturer as part of the chassis. The front bumper must extend to the outer edge of the fenders (to assure maximum fender protection) and shall be of sufficient strength to permit pushing a vehicle of equal GVWR without distortion to bumper, body, or chassis. The bumper shall be full width heavy duty.

Bumper, Front - Transit - The bumper shall be furnished by the body manufacturer.

9. Color - The chassis, including wheels and front bumper, shall be National School Bus Black. Vehicles with multi-piece wheels, the rims may be black or the original equipment manufacturer's standard color. On conventional type chassis, the hood, cowl, and fenders shall be National School Bus Yellow. Hood may be painted with non-reflective paint.

10. Cooling System - The cooling system shall be the manufacturer's heavy duty reinforced type. The cooling system radiator shall be of sufficient capacity to cool the motor at all speeds in all gears at maximum temperature of this area and be securely mounted.

11. Cowl to Rear Axle Measure - Minimum Measurements in Inches

Seating Capacity	29-36	47-48	53-54	59-60	65-66	71-72	Transit
Minimum Measurement	119	161	189	210	224	245	N/A

12. Crankcase - The crankcase shall have closed type ventilator system.

13. Drive Shaft - The drive shaft shall be protected by metal guard(s) or shield to prevent its ripping through floor or dropping to ground if broken. Exception: Rear engine buses.

14. Minimum Engine Size - See charts on Pages B-5 and B-6.

(Horsepower requirements for diesel engines shall be minimum 145 horsepower in 29-48 passenger; 160 horsepower in 53-54 passenger; and 170 horsepower in 59-72 passenger.)

WARRANTY: Diesel engines in Types C and D buses shall be covered by a written warranty for five (5) years, 150,000 mileage, 100% parts and labor. Warranty shall cover engine, fuel pump, turbo charger and oil-related parts of the engine.

14. MINIMUM ENGINE SIZE

Conventional Chassis: Series or Model Number
 Differential Ratio and Minimum Engine Size

NOTE: The differential ratio used with diesel engines should be determined by the use and road speed of the vehicle. (The vehicle shall be capable of attaining a road speed of 55 MPH.)

NOTE: A higher or lower numerical differential ratio may be desired on gasoline-powered buses, as determined by use and road speed of the vehicle.

PURCHASER'S OPTION

DIESEL

GAS

Capacity	Chevrolet and GMC	International	Ford	Chevrolet and GMC
35-36	Detroit Diesel 8.2 L	1853 6-DT360 *	Ford Diesel 6.6 L	B6P042 6.83 8-366 cu.in.
47-48	8.2 L	1853 6-DT360 *	6.6 L	B6P042 6.83 8-366 cu.in.
53-54	8.2 L	1853 6-DT466 * 6-DT360	6.6 L	B6P042 6.83 8-366 cu.in.
59-60	8.2 L	1853 6-DT466 * 6-DT360	6.6 L	B6P042 6.83 8-366 cu.in.
65-66	8.2 L	1853 6-DT466 * 6-DT360	6.6 L	B6P042 6.83 8-366 cu.in.
71-72	8.2 L	1853 6-DT466 * 6-DT360	6.6 L	B6P042 6.83 8-366 cu.in.

*PURCHASER'S OPTION: 7.3 Liter in 1753 Chassis

NOTE: Purchaser's Option must be specifically requested by the local school system.

14. MINIMUM ENGINE SIZE

Conventional Chassis: Series or Model Number
Differential Ratio and Minimum Engine Size

NOTE: The differential ratio used with diesel engines should be determined by the use and road speed of the vehicle. (The vehicle shall be capable of attaining a road speed of 55 MPH.)

CAPACITY		73-90			
		41-72			
MANUFACTURER	CUMMINS	DETROIT	CATERPILLAR	CUMMINS	DETROIT
BLUE BIRD	6BT 5.9 4.78 6-359 cu.in.		3208A *3208TA 8-636 8-636 cu.in. cu.in.	6CT 8.3 4.63 6-505 cu.in.	*8.2 TA 8-500 cu.in.
			3208 *3208 T-225 8-636 8-636 cu.in. cu.in.		*8.2 T 8-500 cu.in.
CHEVROLET/GMC		8.2 8-500 cu.in.			*8.2 T 5.29 8-500 cu.in.
THOMAS			3208-210 *3208 T-225 8-636 *3208 T-250 cu.in. 4.62 8-636 cu.in.		*8.2 T 8-500 cu.in.

NOTE: Any engine and differential ratio within the 73-90 can be used in the 41-72.

*Turbo-charged engine.

15. Exhaust System - The exhaust system shall (a) extend beyond the rear axle and shall extend at least five (5) inches beyond the chassis frame and be mounted outside the chassis rail at end point, or (b) may extend to, but not beyond, the body limits on the left side of the bus beyond the driver's compartment outboard of the chassis centerline, but not more than two (2) feet forward of the rear wheels.
16. Frame - When frame side members are used, they shall be of one-piece construction. If frame side members are extended or reinforced, such extension and reinforcement shall be designed and furnished by the chassis or body manufacturer with their guarantee, and the installation shall be made by either the chassis or body manufacturer and guaranteed by the company making said installations. Extensions of frame lengths are permissible only when such alterations are behind the rear hanger of the rear spring and/or in front of the front spring hanger, and shall not be for the purpose of extending the wheelbase.
17. Fuel Tank - The tank and installation shall conform to FMVSS 301. The tank shall be mounted directly on the right side of the chassis frame entirely outside the body of the bus. Buses equipped with a lift may have the tank mounted on the left side. The tank shall be equipped with adequate baffles. A drain plug at least 1/4" in diameter shall be provided in the center of the bottom of the tank. Forty-seven (47) passenger buses and larger shall be equipped with a single 60-gallon fuel tank of not less than 50-gallon draw down. Thirty-five (35) passenger and smaller buses shall be equipped with 30-gallon tanks. The fuel tank gauge shall be compatible to the tank size with no more than ten percent error at empty reading.
18. Fuel/Water Separator - Diesel chassis shall be equipped with a fuel and water separator of a design compatible with engine to ensure trouble-free performance when properly maintained. Must contain a replaceable element fuel filter of proper design to protect against premature fuel flow restriction or excessive passage of contaminants.
19. Governor - The chassis shall be equipped with a governor set at the manufacturer's recommended RPM.
20. Headlights - Headlights shall meet SAE and FMVSS 108.
21. Heating System Provisions - The chassis shall have plugged openings for the purpose of supplying hot water for the bus heating system. The opening shall be suitable for attaching 3/4 inch pipe thread/hose connector. The engine shall be capable of supplying water having a temperature of at least 170° F at a flow rate of 50 pounds per minute at the return end of 30 feet of one inch inside diameter automotive hot water heater hose.
22. Hood - The hood shall be fiberglass and tilt design.
23. Horn - Dual - Each horn shall be capable of producing complex sound in bands of audio frequencies between approximately 250 and 2,000 cycles per second and tested per SAE Standard J-377.

24. Instruments and Gauges - The chassis shall be equipped with the following instruments and gauges:
 - a. A speedometer-odometer which will indicate the accrued mileage, including tenths of a mile.
 - b. A voltmeter with graduated scale.
 - c. Oil pressure gauge.
 - d. Water temperature gauge.
 - e. Fuel gauge.
 - f. Upper beam headlight indicator.
 - g. Engine warning system consisting of buzzer and light, to notify driver of low engine oil pressure and/or coolant overheating condition.
25. Instrument Panel - The instrument panel shall have lamps of sufficient candle-power to illuminate all instruments and gauges.
26. Manual/Catalog - With each order, the successful bidder shall provide one shop manual and one parts catalog that will include complete coverage for the chassis bid.
27. Oil Filter - Replaceable element oil filter shall be provided. If the oil filter is not attached to the engine, a flexible line shall be used to connect the filter to the engine. The oil filter shall be a full flow type.
28. Power Steering - All school bus chassis shall be equipped with a hydraulic power steering unit compatible to the series model number of the chassis and the GVWR of the school bus.
29. Pre-Delivery Service - A complete pre-delivery service shall be performed at the school bus body plant after the body has been mounted, in compliance with the attached form (DE Form 0540, August 1986).
30. Rim Size - Rim size shall meet the current standard of the Tire and Rim Association. Consult the following chart for the appropriate rim size.

Standard Rim Tubeless

	CONVENTIONAL			TRANSIT	
	29-36	47-54	59-72	41-72	73-90
Seating Capacity	29-36	47-54	59-72	41-72	73-90
Size	6"	6 3/4"	7 1/2"	7 1/2"	7 1/2"

Purchaser's Option (Tube Type) - Two-piece is desirable; three-piece is acceptable.

	29-36	47-54	59-72	41-72	73-90
	Seating Capacity	29-36	47-54	59-72	41-72
Size	6"	6 1/2"	7"	7"	7 1/2"

NOTE: Must be in compliance with GAWR on Page B-1.

31. Shock Absorbers - Shock absorbers shall be of heavy-duty, double-acting design and shall be provided on both the front and rear of the chassis in accordance with GVWR of the vehicle.
32. Springs - Capacity of springs or suspension assemblies shall be commensurate with chassis manufacturer's gross vehicle weight rating. The front eye of the front spring shall be double wrapped.
33. Tires - All tires on a given vehicle shall be of the same size and ply rating. Consult the chart below for size and ply rating. Tires must be tubeless and steel radial design.

	CONVENTIONAL				TRANSIT	
	29-36	47-54	59-60	65-72	41-72	73-90
Seating Capacity	29-36	47-54	59-60	65-72	41-72	73-90
Size	8R22.5	9R22.5	10R22.5	10R22.5	11R22.5	11R22.5
Ply Rating	10 (E)	10 (E)	10 (E)	12 (F)	12 (F)	14 (G)

(Purchaser's Option: Tube Type - Radial or Bias Ply)

NOTE: Must be specifically requested by the local school system.

	CONVENTIONAL				TRANSIT	
	29-36	47-54	59-60	65-72	41-72	73-90
Seating Capacity	29-36	47-54	59-60	65-72	41-72	73-90
Size	7.50x20	8.25x20	9.00x20	9.00x20	10.00x20	10.00x20
Ply Rating	10 (E)	10 (E)	10 (E)	12 (F)	12 (F)	14 (G)

34. Tow Hooks - The chassis shall be equipped with tow hooks, attached so as not to project beyond the front bumper.
35. Transmission - Automatic - The automatic transmission shall have at least four (4) forward gear ratios, with down shift inhibitors, plus integral torque converters which shall provide for an overall starting torque ratio in a forward range of at least 5.9:1. The transmission shift quadrant shall provide four (4) forward drive ranges plus neutral and reverse ranges. Within the range selected, ratio changes shall be effected automatically and at full engine power, if desirable, and without use of an engine disconnect clutch. A transmission shift diagram shall be provided and mounted on the instrument panel or embossed on the handle of the gear shift lever. The neutral starting switch shall be designed and located so that the vehicle will not start in any position other than neutral. The automatic transmission system shall meet FMVSS 102.

	CONVENTIONAL		TRANSIT	
	29-54	59-72	41-72	73-90
Seating Capacity	29-54	59-72	41-72	73-90
Automatic Transmission	AT545	AT545	AT545	MT643

(Option: MT643 Transmission may be equipped with an output retarder activated by the service brake pedal.)

36. Transmission - Mechanical (Purchaser's Option) - Only single speed axles are to be used. A transmission shift diagram shall be provided and mounted on the instrument panel or embossed on the handle of the gear shift lever. All gears shall be synchronized except for first and reverse. Wide ratio only. The highest gear shall be direct drive. The transmission input rating shall be at least 10% in excess of maximum torque of the engine used.

	GAS		DIESEL
	29-54	59-72	29-72
Seating Capacity			
Forward Speed	4	5	5
Clutch Size (Inches)	12	13	14

NOTE: Must be specifically requested by the local school system.

37. Turn Signals - Two front directional signals shall be provided and installed by the chassis manufacturer and shall be in compliance with FMVSS 108. These signals are to be operated by a steering post mounted, self-cancelling directional signal switch with an illuminated "ON" indicator(s) in compliance with FMVSS 108. The chassis manufacturer will furnish a self-cancelling directional signal switch. Fender-mounted directional signals are required.

Exception: On Transit buses, fender-mounted directional signals do not apply.

The design of the turn signal system shall be such that the failure of any signal light to function will cause the illuminated indicator to indicate its malfunction. A variable load flasher that conforms to FMVSS 108 may be accepted in lieu of the illuminated indicator system. All lamps shall be post-grounded by use of ground wire or a strap running from the lamp socket to the bus body.

38. Undercoating - The chassis manufacturer shall coat the metallic portion underside of front fenders with rust-proofing compound for which compound manufacturers have notarized certification of compliance to chassis builder that compound meets or exceeds all performance and qualitative requirements of paragraph 3.4 of Federal Specifications TT-C-520b using modified test.

39. Vehicle Weights - Minimum GVWR

<u>GAS</u>	<u>CONVENTIONAL</u>						<u>TRANSIT</u>		
Seating Capacity	29-36	47-48	53-54	59-60	65-66	71-72	41-72	73-90 Puller	
Weight	18,400	20,200	20,200	23,160	24,500	25,000	26,000	32,080	
<u>DIESEL</u>									
Seating Capacity	29-36	47-48	53-54	59-60	65-66	71-72	41-72	73-90 Puller	73-84 Pusher
Weight	18,400	20,200	21,200	24,100	25,000	26,500	26,500	33,200	33,280

NOTE: Items listed as Purchaser's Options must be specifically requested by the local school system.

Georgia Department of Education
**School Bus Chassis Pre-Delivery Service
 And Adjustment Check Sheet**

Owner's Name _____ Address _____ City, State, Zip Code _____ Dealer _____ City, State, Zip Code _____ Servicing Organization _____ City, State, Zip Code _____ Repair Order Number _____	Engine Number _____ Transmission Number _____	Vehicle Serial Number _____ Axle Number _____
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NOTE: The following operations are to be performed and necessary adjustments completed. Check applicable shop manual for current specifications for all vehicles.

A. Operations with Bus Raised

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Inspect brakes <ul style="list-style-type: none"> <input type="checkbox"/> Leaks in hoses, lines, connections, etc. <input type="checkbox"/> Lines properly installed, supported and clipped to eliminate interference <input type="checkbox"/> Check parking brake lining, cable and mechanical linkage <input type="checkbox"/> Drain air tanks, if equipped 2. Inspect steering for proper assemble and bent, broken or disconnected components. <p style="margin-left: 20px;">NOTE: Make sure all cotter keys are locked in place.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pitman and steering arms <input type="checkbox"/> Drag link <input type="checkbox"/> Idler arms <input type="checkbox"/> Relay rod <input type="checkbox"/> Tie rod and ends <input type="checkbox"/> Wheel stop adjustment <input type="checkbox"/> Check power steering cylinder attachments and hose connections <input type="checkbox"/> Check steering gear housing mounting bolts 3. <input type="checkbox"/> Inspect complete fuel system for leaks <ul style="list-style-type: none"> <input type="checkbox"/> Inspect fuel tank and lines for proper attachment (fittings, clips, etc.) 4. <input type="checkbox"/> Inspect cooling system for leaks 5. <input type="checkbox"/> Inspect engine for oil leaks | <ol style="list-style-type: none"> 6. Inspection of transmission <ul style="list-style-type: none"> <input type="checkbox"/> Proper lube level <input type="checkbox"/> Leaks 7. Inspection of propeller shaft <ul style="list-style-type: none"> <input type="checkbox"/> U-joints, U-bolts, or cap screws, etc. 8. Inspection of differential <ul style="list-style-type: none"> <input type="checkbox"/> Proper lube level <input type="checkbox"/> Leaks around housing and pinion oil seals <input type="checkbox"/> Breather 9. Inspection of suspension <ul style="list-style-type: none"> <input type="checkbox"/> Spring assemblies – front and rear. "U" bolts – front and rear 10. <input type="checkbox"/> Inspect condition of tires for damage and proper inflation. Inspect for bent or damaged wheels and rims 11. <input type="checkbox"/> Check all exhaust system components and connections, and check for proper alignment 12. <input type="checkbox"/> Check clutch slave cylinder push rod adjustment 13. <input type="checkbox"/> Lubricate all chassis and suspension fittings <p style="margin-left: 20px;">NOTE: Refer to lube chart in Maintenance Manuals.</p> |
|--|---|

B. Operations with Bus on Floor

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Check engine <ul style="list-style-type: none"> <input type="checkbox"/> Oil level <input type="checkbox"/> Oil leaks 2. <input type="checkbox"/> Inspect wet type air cleaner for oil level 3. <input type="checkbox"/> Check all belts for proper tension and condition 4. <input type="checkbox"/> Check cooling system for 20-degree anti-freeze protection. Add coolant solution as required. 5. Inspect cooling system for leaks <ul style="list-style-type: none"> <input type="checkbox"/> Radiator core <input type="checkbox"/> Surge tank <input type="checkbox"/> Water pump <input type="checkbox"/> Heater and radiator hoses <input type="checkbox"/> Tighten all hose connections | <ol style="list-style-type: none"> 6. Check steering – general <ul style="list-style-type: none"> <input type="checkbox"/> Check steering gear lube level <input type="checkbox"/> Tighten steering column mountings <input type="checkbox"/> Inspect U-joints or couplings 7. Check power steering <ul style="list-style-type: none"> <input type="checkbox"/> Fluid level <input type="checkbox"/> Inspect pump, hoses and connections for interference 8. Check battery <ul style="list-style-type: none"> <input type="checkbox"/> Hold-down clamps and mounting plate, cables for routing and interference <input type="checkbox"/> Water level <input type="checkbox"/> Specific gravity – if below 1,230 charge 9. <input type="checkbox"/> Check front wheel toe-in |
|---|--|

(continued)

(B continued)

10. Check brake master cylinder
 - Fluid level
 - Pedal free travel
11. Check clutch
 - Master cylinder push rod adjustment
 - Master cylinder fluid level
 - Cylinders and lines for leaks
 - Pedal free travel on mechanical linkage units
12. Torque all wheel nuts and axle shaft nuts; check wheel, rim and clamp alignment
13. Test all lights and adjust headlight aim as required
14. Check air brake low pressure warning buzzer or vacuum/hydraulic brake low vacuum warning buzzer for operation
15. Start engine
 - Check engine oil pressure
 - Check time required to build air brake reservoir pressure to 60-70 P.S.I. (maximum allowable 5 minutes at fast idle)
 - Check air brake low pressure warning buzzer or vacuum/hydraulic brake low vacuum warning buzzer (Air brake buzzer should quit when 60-70 P.S.I. air pressure is obtained.)
 - Check all instruments for operation and appearance
16. Check air brakes
 - Compressor governor adjustment (should maintain 120 P.S.I.)
 - Air leaks in lines or fittings (pressure drop should not exceed 2 P.S.I. in one minute with engine stopped and brakes applied)
 - Sufficient air reserve for one full brake application with engine stopped and brakes applied
17. Check vacuum/hydraulic brake system
 - Sufficient vacuum reserve for two full brake applications with engine stopped and system fully charged (Brake pedal should have no tendency to fall away from the foot as engine is started while foot pressure is maintained on pedal.)
 - Check brake pedal travel with engine operating
18. Check distributor dwell and ignition timing
19. Engine idle speed -- adjust
20. Check operation of
 - Horn
 - Windshield wipers and washers
 - Neutral safety switch
21. Check for correct transmission shift pattern plate or decal on knob that it is located in view of the driver

C. Road Test

1. Check for satisfactory operation
 - Speedometer operation
 - Parking brake
 - Service brake
 - Clutch
 - Steering
 - Differential
 - Engine operation
 - Engine governor operation in lower gears
 - Transmission (manual)
 - Transmission (automatic) manual control linkage operation
 - Transmission (automatic) check shift points

D. Buses with Automatic Transmission

1. Inspect for leaks and check oil level

E. Delivery to Customer

1. Place Warranty and Owner Protection Plan, Protect-O-Plate and Owner's & Driver's Manual in glove compartment
2. Place third copy of Pre-Delivery Work Sheet in glove compartment

F. General Appearance

1. Inspect, align and adjust where necessary
 - Hood, fenders and latches
2. Touch-up paint where necessary -- hood and fenders

This is to verify that the vehicle described above has received all the services and adjustments listed on this worksheet.

Signed: Technician

Supervisor

Copy Distribution

- 1 - Dealer
- 2 - Servicing Organization
- 3 - Placed in Vehicle

PART III

BODY SPECIFICATIONS

METROPOLITAN, CONVENTIONAL AND TRANSIT SCHOOL BUSES

TYPES B, C AND D

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PART III

BODY SPECIFICATIONS

NOTE: Where there is conflict between Georgia and Federal Specifications, Federal Specifications shall prevail. Buses must meet Georgia Specifications to the extent that National Minimum Standards are exceeded or the item is specifically addressed; otherwise, National Minimum Standards are considered as a minimum.

1. Back-up Lights - Two (2) back-up lights shall be provided, one on each side of the rear of the bus body. These lamps shall be a minimum of 3 1/2 inches and will be wired so that the lights are activated when the transmission is in reverse.
2. Barriers - Barriers to meet FMVSS 222 must be furnished in front of forward facing seats which do not have another seat within the distance specified by FMVSS 222. A barrier located at the stepwell shall have a kick/modesty panel installed between the bottom of the barrier and the floor and between the leg(s) and wall to ensure that pupils will not slip into the stepwell.
3. Battery Compartment - The body manufacturer shall securely mount the battery(ies) on a sliding tray in an enclosed, vented compartment in the side of the skirt of the body. The battery compartment door shall have a lock fastener operated by the same key as the Gasoline Filler Door. The lock shall be an Illinois Tumbler Lock No. 5412W or an approved equal. Two keys shall be provided with each lock.
4. Body Assembly - The body assembly shall be designed to withstand vibrations transmitted through the chassis cowl. The cowl panel shall be of a minimum U.S. Standard gauge number 14, and shall be shaped to fit snugly against the chassis cowl in an approved watertight manner. The windshield or corner post should be of sturdy construction having a minimum thickness equal to U.S. Standard gauge number 14, and shall be designed so as not to obstruct the driver's vision.
5. Bumper, Rear - The rear bumper shall be furnished and secured to the rear body frame by the body manufacturer and so designed to prevent hitching of rides thereon. The rear bumper shall be a one-piece bumper of pressed steel channel at least 3/16 inch by 9 3/4 inches and must be bolted to the chassis side frames and braced with material of equal impact ratio to that of the bumper. The bumper shall not be permanently attached to the body.
6. Bus Sizes - This specification covers the school bus bodies most commonly used in Georgia. The basic requirement of the various sizes of school bus bodies shall conform to the following chart.

6. Bus Sizes (Continued)

BASIC REQUIREMENT CHART

TYPE B

Seating Capacity 2-2, 3-2 and 3-3 Plans Minimum Rump Width of 13 inches	Wheel Base
18-22-26	125
22-27-32	133
26-32-38	157

TYPES C AND D

No. of Rows of Seats	Seating Capacity 3-3 Plan Rump Width of 13 Inches	Minimum Measurement Cowl to Center Line of Rear Axle (In Inches)
5	29-30	119
6	35-36	119
8	47-48	161
9	53-54	189
10	59-60	210
11	65-66	224
12	71-72	245
12 or More	71 and Larger	*Transit

Maximum overall length of a bus including bumpers shall be 40 feet.

*Available in Puller or Pusher.

7. Circulation Fan - A 6" adjustable circulation fan with guard shall be mounted in the upper or lower front left hand corner of the bus.
8. Clearance and Marker Lights - Combination clearance and marker lights shall be installed at each of the four roof corners. The two front lights shall be amber in color; the two rear lights shall be red in color. A cluster of three lights shall be mounted between the clearance and marker lights in the front and the rear of the bus at the roof line. Lights shall be armour type.
9. Color - The school bus body shall be painted uniform color, National School Bus Yellow, according to the specifications available from General Services Administration. The rear bumper shall be National School Bus Black. The body trim, if used, shall be National School Bus Black. Decals are not acceptable on the outside of the body.

Option: The roof of a school bus may be painted white; however, the front and rear roof caps must remain yellow. The white roof may not extend beyond the drip rail on the side.

10. Control Panel - There shall be installed accessible to the driver an enclosed electrical accessory panel in which shall be located all relays, switches including heater and defroster, junction block, circuit breakers, flasher unit and door buzzer. Panel shall have a metal door for entrance into electrical panel with an adequate fastener. Panel lights shall be controlled by an independent rheostat switch.

11. Defroster (Windshield) - The body shall be so equipped as to provide ducted, forced warm air to both right and left sides of the windshield. It shall be equipped with a right side heater-defroster system of not less than 50,000 B.T.U. capable of delivering warm forced air to the right windshield and service door. The total air volume moved shall be adequate to keep both right and left windshield free of frost or condensation.

Exception: Right side auxiliary heater is not required on transit buses.

Exception: On Type B vehicles, the defroster shall keep the windshield, the window to the left of the driver, and the glass in the viewing area to the right of the driver clear and shall meet FMVSS 103.

12. Disabled Vehicle Warning Devices - School bus shall come equipped with disabled vehicle hazard warning devices that meet Federal Motor Vehicle Safety Standard Reg. 125 to be displaced according to state law in the event of a prolonged stop on a street or highway. Reflectors to be fitted in a case and conveniently mounted in the driver's compartment.

13. Driver's Seat - The driver's seat cushion and seat back shall be the semi-bucket type. The seat covering shall be cloth or combination cloth and vinyl. The seat back shall be designed to give the driver's back support from side to side, as well as to the rear for protection against being thrown from the seat when the bus is turned abruptly while in motion. The driver's seat shall be securely mounted on supporting cross members or braces from the cross members. This bucket construction shall be a minimum of 1 1/2 inches deep. Seat shall have a minimum 4-inch adjustment front to rear, and a minimum 4-inch adjustment up and down. Front to rear adjustment shall be designed for finger tip control without use of tools. Seat cushion may be heavily padded over a minimum of 16 - 2 3/4 inch O.D. hour glass type coil springs with all coils not less than 10 gauge. Cushion board shall be a minimum of 3/8 inch thick plywood. Seat cushions shall be a minimum of 18 inches wide x 16 inches deep x 5 inches thick and 20 inches in height, or a seat of an approved equal quality.

A semi-bucket type seat and back padded with foam rubber or its equal may be used. This seat shall have a minimum size of 18 inches width x 20 inches height x 1 1/2 inches thick x 16 inches deep.

14. Driver's Window¹ - The driver's window shall be a two-piece window of either of the following types:

¹All glass used shall be so mounted that a permanent identification mark is visible and be of sufficient quality as to prevent distortion of view in any direction.

14. Driver's Window (Continued)

- a. The front part opening either in or out and rear part lowering and raising by use of a regulating handle.
- b. The two-piece sliding-sash type will be acceptable.

15. Electrical Systems - Wiring - All wiring shall conform to standards of the Society of Automotive Engineers, shall be color and number coded, insulated and protected by a covering of fibrous loom or approved equal. All joints shall be soldered or joined by equally effective connectors. Wiring shall be arranged in circuits as follows.

- a. Head, tail, stop (brakes) and instrument panel
- b. Clearance and stepwell lamps. Stepwell lamps shall be actuated when service door is opened.
- c. Dome lamps
- d. Ignition and emergency door signal
- e. Turn signals
- f. Stop arm and alternately flashing signal lamps
- g. Heater
- h. All body electrical circuits, with the exception of hazard warning lights, shall be operated through a solenoid actuated through the ignition switch.

Wiring through drilled holes in body shall be grommet protected.
Wiring extending over sharp edges shall be protected by tubular loom.

16. Emergency Exits

Emergency Exit - Door - A suitable all-steel emergency door shall be provided at the rear center of the body or in case of rear engine buses, located on the left side of the body with a minimum twelve (12) inch clear aisle. A flip-up seat is not allowed to obtain a 12-inch clear aisle on rear engine buses. The door shall provide an emergency exit conforming to the requirements of FMVSS 217. The bottom of the opening provided shall not be above the floor line of the body interior.

The door shall be securely hinged with one piano type or two (2) heavy duty pin-type hinges and shall open outward. Piano type hinges shall be equipped with a brass or stainless steel rod. The emergency door shall be designed to open from the inside and outside of the bus and shall be equipped with a fastening device which may be quickly released, but is designed to offer protection against accidental release. Control from the driver's seat shall not be permitted. Provision for opening from the outside shall consist of a nondetachable device designed to prevent hitching-to, but to permit opening when necessary.

The emergency door shall be equipped with a slide-bar cam-operated lock. The slide bar shall have a minimum stroke of one (1) inch. The emergency lock shall be equipped with a suitable electric plunger-type switch and two (2) buzzers, one located in the driver's compartment and one located near the emergency door that meet FMVSS 217. The switch

16. Emergency Exit - Door (Continued)

shall be enclosed and the wires leading from the switch shall be concealed in the body. The switch shall be installed so that the plunger of the switch contacts the farthest edge of the slide bar in such a manner that a slight movement of the slide bar will immediately close the circuit on the switch and activate the buzzer.

The door lock shall be equipped with an interior handle that extends approximately to the center of the emergency door. It shall lift up to release the lock.

A large laminated or tempered safety glass panel shall be provided in the upper and lower part of the door, the exposed size of the glass being not less than 400 square inches, the bottom not less than 350 square inches. The glass shall be securely mounted in rubber and in a fully watertight manner. The entire rear door shall be properly contoured and weather stripped to provide a rain-tight fit with the bus body. No steps are to be provided for the emergency door.

Inside of door header shall be padded with an energy-absorbing material a minimum of three inches wide.

Emergency Exits - Push-out Windows - Each side of the body shall be equipped with at least one (1) full-hinged push-out type split-sash window, approximately midway between front and rear passenger compartment. Emergency push-out windows shall have a positive latch and shall be so constructed and equipped as to actuate an audible signal when latch is moved. Words "EMERGENCY EXIT" in letters at least two (2) inches high, shall be affixed on (or directly above) emergency window on the inside and outside.

Emergency Exit - Roof(s) - The school bus body shall be equipped with combination emergency exit/roof ventilators, Transpec Safety vents, or equivalent, as follows:

1. 48-passenger and less shall be equipped with one (1) emergency exit-roof ventilator, located approximately the center of the body.
2. 53-passenger and larger shall be equipped with two (2) emergency exit-roof ventilators, located approximately the first quarter and the rear quarter of the bus body.
3. A static-type non-closeable exhaust ventilator may be included as an integral part of the roof ventilator.
4. Simple release handles shall be provided permitting operation as emergency exit(s), accessible inside and outside the vehicle. Unit shall be installed with the hinge toward the front.

17. Emergency Window - Required on rear engine buses. Window shall comply with FMVSS 217-76 and shall be provided with an automatic device which shall maintain the emergency window in an open position when activated.
18. Entrance - A stepwell having not fewer than two (2) steps shall be built into the front assembly, completely enclosed with doors extending to bottom step. Each step shall have a minimum thickness of 14-gauge steel. The steps and floor level entrance shall be covered with ribbed rubber of a heavy duty tread type not less than 3/16" thick, with a white forward nosing, bonded to a 22-gauge steel back. The entrance (bottom step) shall be not more than 16 inches from the ground line; the distance between steps shall be approximately equal.

Exception: Transit buses, Type D, shall have a three (3) step stepwell.

19. Exterior Lighting - Full exterior lighting shall be furnished to comply with the Motor Vehicle Laws and Regulations of the State of Georgia and the Federal Regulations.
20. Exterior Mirror - Two exterior clear-view, rear view mirrors shall be mounted forward, one to the left and one to the right of the driver. The area of each mirror shall be not less than 50 square inches overall. Each mirror shall be firmly supported and adjustable to give the driver clear views past left rear and right rear of bus.

Two exterior convex type mirrors shall be mounted forward, one to the left and one to the right of the driver. Each mirror shall be a minimum of 6 x 6 inches overall, rectangular in shape and shall have a minimum 21-inch to a maximum 30-inch radius of curvature on the convex. Each mirror shall be firmly supported and adjustable to give the driver a clear view of the left rear wheels and the immediate adjacent area and the right rear wheels and the immediate adjacent area.

Breakaway mounting brackets shall be affixed to the bus so as to be securely fastened to the structural frame members of the bus body.

The convex type mirrors shall not be part of or attached to the exterior rear view mirrors. Convex type mirror head and the rear view type mirror head shall be mounted so as to have a minimum of two (2) inches distance between the two.

Indirect Visibility: Each bus shall have a mirror system which will provide a clear, unobstructed view of the area in front of the bus and the area immediately adjacent to the left and right front wheels and at the entrance door when tested to the following.

Indirect Vision Mirrors: When a rod 30 inches long is placed upright on the ground at any point along a traverse line one (1) foot forward of the forward-most point of a school bus and extending the width of the bus, at least 7 1/2 inches of the length of the rod shall be visible to the driver, either by direct view or by means of an indirect visibility system.

The following types shall contain at least the following:

20. ^{MIRROR} Exterior Window (Continued)

	LH Convex <u>Rearview</u>	LH Convex <u>Crossview</u>	RH Convex <u>Crossview</u>	RH Convex <u>Rearview</u>
Type B	X	X	X	X
Type C	X	X	X	X
Type D	X		X	X

Testing Option: Elliptical or hemispherical mirrors may be substituted on a two-for-one basis if indirect visibility requirements are met.

21. Exterior Paint - The exterior of the body shall be painted National School Bus Yellow Enamel; the exterior of the complete bus body shall have a uniform finish coating of National School Bus Yellow. The body sides shall be trimmed in National School Bus Black in a manner approved by the Transportation Section, Georgia Department of Education.

22. Exterior Side Panels - Exterior side panels shall have a minimum thickness of not less than 20-gauge sheet steel (or an equivalent material), free of scale and buckles and shall be securely riveted or bolted to roof bows or body posts. Spot welding of side panels will not be acceptable. Panels shall extend below the floor line to form a skirt of pleasing dimensions and appearance. The skirt shall be adequately supported and braced to the under body structure. The side panels shall be cut away at the wheel housings to permit easy rear wheel removal and shall be suitably reinforced at this point. Bolts may be used when it is impossible to use rivets.

23. Fire Extinguisher - One pressurized, rechargeable, dry chemical type, fire extinguisher complete with hose, approved by Underwriters Laboratories, Inc., with a total rating of 2A10BC or greater. Extinguisher must be mounted in a bracket located in the driver's compartment and readily accessible to the driver and passengers. A pressure gauge shall be mounted on the extinguisher so as to be easily read without moving the extinguisher from the mounted position.

24. First-Aid Kit - Bus shall have Grade A metal first-aid kit, mounted in full view and in accessible place in driver's compartment. The number of units and contents shall be as designated:

4-inch bandage compress	2 pkgs.
2-inch bandage compress	1 pkg.
1-inch adhesive compress	2 pkgs.
40-inch triangular bandage with two safety pins	2 pkgs.
Eye dressing packet	1 pkg.
24 x 72-inch Gauze Compress	1 pkg.
Wire Splint	1 pkg.

25. Flasher Lights - The body shall be equipped with four (4) red flasher lights and four (4) amber warning lights. These lights are to be a minimum of 5 3/4 inches sealed beam with a 7" lens meeting current SAE Specifications.

Hoods are required and shall be designed to have a visor effect over the top of the lights. Lights shall have a black area of approximately 3" around lens. Four (4) lights are to be mounted on the front of the body above the windshield and four (4) lights are to be mounted on the rear roof of the body above the rear windows. Flasher lights shall be securely grounded to some clean metal surface in the bus body. The lights are to be operated in the following manner:

- a. With entrance door closed, depress manual push button. Amber pilot light and amber warning lights flash.
- b. Open entrance door. Amber pilot and amber warning lights go off and red pilot and red warning lights flash. Stop arm is automatically extended and lights on stop arm flash.
- c. Close entrance door. All lights go out and stop arm retracts automatically.
- d. Open entrance door without depressing manual push button. No lights flash nor does stop arm extend.
- e. With entrance door open, depress manual push button. Red pilot and red warning lights flash. Stop arm is automatically extended and lights on stop arm flash.

The circuit shall be constructed in such a manner so that one front and one rear light shall flash alternately with the other front and rear lights.

Monitor, dual warning and rear belt line lights. Electric monitor for dual warning lights front and rear, back-up, tail, stop and directional lamps. Mounted on front upper inner panel above driver. Gives positive indication of individual lamp operation.

26. Floor Covering - The floor in the underseat area, including the wheel housings and driver's compartment and toeboard, shall be covered with fire resistant rubber floor covering. This material shall have a minimum thickness of .125 inch. The wheel housing covering shall be seamless, molded, one-piece rubber.

The rubber composition of the floor covering to be used under the seats, wheel housings, and driver's compartment shall be of the same composition as the floor covering used in the aisle of the bus.

Floor covering in the aisle shall be of aisle type rubber, non-skid, wear-resistant ribs. The overall thickness shall be .1875 inch.

26. Floor Covering (Continued)

Floor covering must be permanently bonded to the floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be of type recommended by manufacturer of floor covering material. All seams shall be sealed with waterproof sealer and covered with a protective molding.

The floor and floor covering material shall have an opening cut over the fuel tank in the area of the fuel sending unit and/or in-tank fuel pump, allowing the removal of the fuel sending unit and/or fuel pump. This opening shall be sealed and covered by a metal plate attached to the flooring with metal screws.

27. Floor Structure - The floor material shall be not less than 14-gauge steel. All floor joints shall be gas tight to prevent the entrance of engine exhaust gases. Each joint in the floor sheet shall be made over a supporting cross member. In no case shall the distance between the floor supporting cross members be greater than eleven (11) inches. A sectional type floor design with flanged edges of adjacent sections bolted, welded or riveted together to form a cross member will be acceptable. There shall be a main beam at each floor joint and at least two intermediate beams between. All beams shall be equal in length, except where structural members of features restrict the area. All beams shall bear upon the chassis channels. All cross members shall have a minimum thickness equal to U.S. Standard 14-gauge, or the main body sills shall have a minimum thickness equal to U.S. Standard 10-gauge and the intermittent sills shall have a minimum thickness equal to U.S. Standard gauge 16.

The connections between the roof bows and/or side post and sills shall be capable of distributing the load from the vertical posts to all floor sills. Body structure shall meet requirements of FMVSS 220.

On Type B vehicles, the floor shall be level except for wheelhousing, toeboard, and operator's platform area.

28. Gasoline Filler Opening Door - A suitable door of 16-gauge steel having a lock fastener shall be installed over gasoline filler opening on side of body. The lock shall be an Illinois Tumbler Lock No. 5412W or an approved equal. Two keys shall be provided with each lock.

Exception: Type B vehicles - Manufacturer's Standard.

29. Glass - All glass not specified below shall be of the laminated or tempered "safety glass" type conforming to the requirements of the American Standard Safety Code for Safety Glazing Materials. Type AS 2.

The windshield glass shall be made of flat laminated safety polished plate and shall have a minimum thickness of 7/32 inch; AS 1.

The driver's window may be of the tempered safety glass type; AS 2.

29. Glass (Continued)

The entrance door glass may be "tempered" glass; AS 2.

All glass shall be legibly and permanently marked.

30. Heater - A heavy-duty combination fresh air and recirculating air heater shall be provided. A duct shall be provided with a separate blower, along the left side of the body and extending to the approximate center of the third seat. The heater shall be a hot water type rated at not less than 85,000 B.T.U. per hour per the SBMI test code at free delivery. The heater shall have electric motor driven fan or fans. The total air moved by the heater shall be not less than 500 cu. ft. per minute, part of which shall be fresh air drawn through the fresh air inlet located on or near the cowl below the windshield or driver's window. A heavy-duty tube and fin type brass or copper core shall be furnished. The heater core shall be set in rubber or shall be otherwise suitably supported in a manner to minimize shocks and strains which might produce core leaks.

Hose connections to core inlet and outlet shall be suitably supported to prevent vibrations being transferred to the core and causing leaks. All switches for the control of the heater fan motors shall be grouped with motor protection fuses or circuit breakers in a manner to provide maximum accessibility. A suitable water control valve shall be provided on the heater within easy reach of the driver.

If the fresh air intake is located on the side of the bus below the driver's window, there shall be a sheet steel air scoop of approved design mounted in such a manner as to provide a slight pressurized air supply into the heater when the bus is in motion. The air scoop shall be made of not less than 20-gauge steel and shall be securely fastened to the body panel with sheet metal screws. The heater shall be located at the driver's left and shall rest upon the floor of the body and against the body wall. Exception: Transit Buses.

Each heater water circuit installation shall include a brass 3/4" gate valve installed as near the engine as possible in both the supply and return lines. Accessible bleeder valves shall be installed in an appropriate place in the return lines of body company installed heaters to remove air from the heater lines.

The heater hoses should be as short as possible but must not interfere with normal motor maintenance practices. The hose shall not rub against sharp edges nor interfere with or restrict the operation of motor functions such as the spark advance, etc. Heater lines on the interior of the bus shall be shielded to prevent scalding of the driver or passengers.

Exception: Rear heater duct not required on transit or buses equipped with rear seat heater. A rear underseat heater of not less than 40,000 B.T.U. and a heat booster pump are required on transit buses.

30. Heater (Continued)

Exception: Metropolitan Type B buses shall be equipped with a high output 80,000 B.T.U. fresh air type heater.

NOTE: Also see Section 10 (Defroster).

31. Insulation - The body panels (side, roof, and front and rear including corners) and roof bows shall be insulated completely with not less than 1 1/2" of fiberglass insulation material which is fire and moisture resistant, or approved equal. Insulation material shall be approved by Underwriters Laboratories, Inc.

The entire underside of the body, including wheel housings, shall be coated to a minimum thickness of 1/16" with high quality automotive type underseal, Federal Specification TT-C-520b or approved equal, to protect the body from rust and to seal and insulate the floor.

32. Interior Lighting - An adequate well-protected stepwell light shall be provided for all buses. Interior lights shall be face mounted ceiling lights and not fewer than:

16 to 27 Capacity	- 2 Lights
28 to 46 Capacity	- 3 Lights
47 to 58 Capacity	- 4 Lights
59 to 70 Capacity	- 5 Lights
71 to 78 Capacity	- 6 Lights
79 to 90 Capacity	- 7 Lights

33. Interior Mirror - One rear view non-glare mirror 6 inches x 30 inches in size, having a metal frame and back, shall be securely attached on the windshield header and so located as to give the driver a clear view of the entire interior of the bus and road behind.

34. Interior Paint - The interior of the body shall be painted with the body manufacturer's standard color, unless otherwise specified in the bid. Body shall be properly masked before applying interior paint. One prime coat, one mist finish coat, and one full finish coat applied with a hot spray process and baked will be required on panels and ceilings. Metal shall be cleaned and paint applied as stated above.

35. Interior - Panels, Floor and Windows - The body shall be of double wall construction throughout except for floor and windows. The interior panels shall be not less than 22-gauge sheet steel securely fastened to frame members in an approved manner.

Panels shall be so designed and fastened to minimize vibrations and rumble and shall be installed so as to be easily removed. There shall be a cove moulding installed at the junction of the side paneling and the floor. A suitable metal strip or moulding shall be directly below the side windows or an approved equally effective design. If the ceiling is constructed so as to contain lapped joints, forward panels shall be lapped by rear panels and exposed edges shall be beaded, hemmed, flanged, or otherwise treated to minimize sharp edges.

36. Lettering - Exterior - "Decals Not Permitted." Lettering and numbering shall conform to "Series B" of Standard Alphabets for Highway Signs and shall be painted on body and shall include the following: On the sides, the words " County Schools" or " City Schools" shall be printed with 5-inch high black letters. On the front of the roof panel of outer visor shall be placed the words, "School Bus" in 8-inch high black letters. On the rear of the bus, "School Bus" shall be painted in 8-inch high black letters. The words "Emergency Door" shall appear near the top of the emergency door in 2-inch high black letters. Lettering must not interfere with the words "SCHOOL BUS." No other lettering or motto will be permitted.

A black 6-inch high number, as furnished by the county, shall be painted on both sides and in the rear of the bus. The number shall be located in an appropriate place near the entrance on the right side, and in front of the stop arm on the left side. The rear number shall be located under the right tail light. A minimum 4-inch high yellow number shall be located on the left side of the front bumper. A privately owned bus shall carry the owner's name in black 3-inch high letters under the number on the right side of the bus.

(Paint used in lettering shall be an approved synthetic enamel.)

37. License Holder - Two combination tail and stop lights located on left rear and right rear of body. The bus number shall be painted on the right hand side in not less than four (4) inch numerals. The top of the numerals shall be one (1) inch below the light.
38. Metal Surfaces - All metal surfaces shall be chemically cleaned, phosphate coated and primed before assembly. After the body has been assembled, the prime coat shall then be cleaned and one mist finish coat and one full finish coat are applied with a spray process and baked.
39. Metal Treatment - The metal used in construction of bus body of 12 gauge or less in thickness shall be zinc or aluminum coated or treated by equivalent process before bus is constructed. (Included are such items as structural members, inside and outside panels, floor panels and floor sills; excluded are door handles, grab handles, interior decorative parts, and other interior painted or plated parts.) All metal parts that will be painted shall be (in addition to above requirements) chemically cleaned, etched, zinc-phosphate-coated, and zinc-chromate or epoxy-primed or conditioned by equivalent process.

In providing for these requirements, particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges, punched or drilled hole areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subjected to abrasion during vehicle operation.

As evidence that above requirements have been met, samples of materials and sections used in construction of bus body, when subjected to 1,000 hour salt spray test as provided for in latest revision of ASTM

39. Metal Treatment (Continued)

Designation: B117, "Standard Method of Salt Spray (Fog) Testing,"² shall not lose more than ten percent of material by weight.

40. Mounting - The body shall be attached to the chassis frame by means of the manufacturer's regular clips. Shear bolts or other equally effective device may be used to prevent slippage. Anti-squeak material or rubber pads shall be used to insulate the body from the chassis.

The body shall be securely attached to the rear face of the cowl with the attachment provided by the chassis manufacturer or other equally effective device. The junctions shall be sealed with the best grade of sealant to form a gas-tight and watertight seam.

41. Name Plate - There shall be installed in each bus body, above the windshield or above driver's window a manufacturer's name plate, on which shall be shown the name of the manufacturer, serial number of body, designed capacity, equipped capacity, and date built.

42. Openings - The openings shall be provided for servicing, removing or repairing any chassis components, such as the clutch, transmission, etc., which must be reached through the floor. Wheel housings shall be the full open type to provide maximum access to tires and wheels. Their thickness shall be of not less than 16-gauge steel and shall be securely attached to floor sheets to prevent any water or dust from entering the body. The height of the wheel housings shall not be greater than the distance from the floor to the underside of the seats. The size of the wheel house shall be such that tire chains will have proper clearance.

All openings between chassis and passenger carrying compartment made due to alteration by body manufacturer must be sealed.

43. Passenger Seats - The backside of all pupil seats shall be constructed alike except that the rear row of seats is not required to meet the forward and rearward performance of dynamic requirements of FMVSS 222. Seats shall be forward facing and shall be spaced to obtain a minimum of 24-inch hip to knee room measured horizontally at seat cushion level at the transverse centerline of seat. (Greater seat spacing may be specified on local bids not to exceed the maximum allowable per FMVSS 222.) All seats shall be 39 inches wide and approximately 14 inches deep except for left rear seat which may be 26 inches to provide for emergency egress as required by FMVSS 217. Right front seats may be 26 inches to allow for additional entrance aisle space. Seats shall be arranged to provide a minimum of 12 inches aisle space. A row of two seats shall be provided for each six passengers in determining the passenger capacity of the body.

Exception: Type B vehicles may use seats less than 39 inches.

²American Society of Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

44. Projections - The interior of the bus shall be free of all unnecessary projections likely to cause injury to the passengers.
45. Rear Window - A rear window shall be installed on each side of the rear emergency door. Each rear window shall have a minimum glass area of 140 square inches and shall be set solid in a waterproof manner.

Exception - Rear Engine Transit Buses.

46. Reflectors - Two amber and four red reflectors shall be installed on the body. These reflectors may be plastic type mounted in or on aluminum or plastic frames and 3" minimum in diameter. All reflector installations shall meet Federal Safety Standard FMVSS 108.
47. Roof - The roof shall be made of not less than 20-gauge sheet steel panels formed to fit the roof bows. Panel joints shall overlap at the bows for the full width of the bows and shall be securely riveted to each bow flange. All joints shall be adequately sealed to render them completely watertight.
48. Roof Bows and Post - Roof bows and body post may be one-piece or three-piece construction. When roof bows and post are separate and jointed at the window header, the connections shall be such as to develop the full strength of the cross section.

Bows and post shall have a minimum thickness equal to U.S. Standard 16 gauge and shall have a minimum depth of 1 1/4 inches. Bows or posts shall be securely anchored to the floor structure, except at the wheel house.

49. Roof Strainer - Two or more roof strainers or longitudinal members shall be provided to connect the roof bows and to reinforce the flattest portion of the roof skin. These members shall be a minimum thickness equal to U.S. Standard 16-gauge metal 3" wide before forming. These strainers may be installed between roof bows or applied externally.

The roof strainers shall extend from the windshield header and when combined with the rear emergency door post are to function as longitudinal members extending from the windshield header to the rear floor body cross member. At all points of contact between strainers or longitudinal members and other structural material, attachment shall be made by means of welding, riveting or bolting.

50. Rub Rails - Externally applied rub rails shall be installed on each side of the bus body. The minimum thickness shall be U.S. Standard gauge 16. These rails shall be corrugated or profiled to provide maximum strength. (1) One rub rail shall be located under the window sills. It shall begin at the entrance door post and extend to the rear body post on the right side of the bus body, and shall begin at the windshield post and extend to the rear body post on the left side of the bus body.

50. Rub Rails (Continued)

The above rub rail may be omitted only when the internal longitudinal member below the window meets or exceeds the requirement of the rub rail. (2) The seat level rub rail shall begin at the entrance door post on the right side of the body and except for the emergency door, extend around the rear of the body to the left windshield post. (3) The floor level rub rail shall begin at the entrance door post on the right side of the bus body and extend to the rear body post, and shall begin at the left windshield post and extend to the rear body post on the left side of the bus body except for the openings at the wheelwells. (4) A rub rail at the bottom of the skirt shall begin at the entrance door post and extend to the left windshield post with the exception of the openings at the wheelwells and the bumper.

Rub rails shall be securely attached at least twice to each body post within their length. Splices are not allowed unless rub rail is extended around rear corner radius and must be made at a body post near the rear of body. No exception other than is caused by location of battery box door, engine doors, side emergency door, and electrical panel access door.

51. Screws, Bolts, Nuts, and Washers - All screws within reach of children shall be Phillips head or clutch head type. All bolts, nuts, screws, and washers used in the construction of the body shall be Parkerized, cadmium plated, or thoroughly treated to prevent rust.
52. Seat Belt/Shoulder Harness - Shall also be equipped with a Type 2 lap belt/shoulder harness seat belt assembly for the driver. The design shall incorporate a fixed female pushbutton-type latch on the right side at seat level and a male buckle (tongue) on the left retracting side. The assembly shall be equipped with an Emergency Locking Retractor (ELR) for the shoulder belt and an Automatic Locking Retractor (ALR) for the lap belt. The shoulder belt and the lap belt shall be separately adjoined at the tongue, and the lap belt shall be equipped with an anti-cinch device to prevent its "ratcheting down" during operation. The lap belt shall be guided or anchored at the seat frame so as to prevent the driver from sliding sideways under it. The seat belt assembly and anchorage shall meet applicable Federal Motor Vehicle Safety Standards.
53. Seat Cushions - Seats and back cushions of all seats shall be designed to safely support designated number of pupils under normal road conditions encountered in school bus service. Seat, seat back cushion, crash barrier, header pads, and the underneath portion of the seat shall be covered with an Aramid Kevlar or approved equivalent fire block material having 42-ounce finished weight, 54-inch width, and finished vinyl coating of 1.06 broken twill or other material with equal tensile strength, tear strength, seam strength, adhesion strength, resistance to abrasion, resistance to cold, and flex separation. All padding and coverings to be of fire-resistant material meeting FMVSS 302. Seats shall be padded to meet FMVSS 222. Back cushions shall be constructed so as to eliminate exposed screws or bolts which contribute to vandalism.

54. Seat Frame and Mounting - The seat frame, excluding mountings and reinforcements, shall be made of steel tubing. Each seat leg shall be secured to the floor by a minimum of two (2) bolts, washers, and nuts, or washer/nut combination. Seat mounting shall meet FMVSS 222.

All seat frames shall be fastened to the seat rail with two (2) bolts, washers, and nuts, or washer/nut combination.

55. Service Door - The entrance door shall be a double wall, all steel, jack-knife (forward folding) outward opening for in-out (split-type), located at the right front corner of the body and controlled by the driver through a manual or power device of approved construction. The door shall be adequately supported on piano type hinges, and shall be provided with suitable weather stripping. The manual door control linkage shall be of such design as to prevent inadvertent opening, including a manual over-center locking feature, plus a manual locking catch.

If the door is a split-type design, a safety gap of approximately two (2) inches shall be allowed between the two halves of the door, and this opening shall be filled by means of suitable flexible safety flaps securely attached to the door. The door shall completely enclose the stepwell and when fully opened shall provide an entrance of not less than 24 inches. The door shall be so designed and the weather stripping so mounted that there is no tendency for the stripping to dislodge during opening and closing operations. Two glassed-in openings shall be provided in each door half with panes securely mounted in rubber. A suitable drip moulding or rail to shed water out of the door area shall be provided. A suitable grab handle or rail shall be mounted on the right hand or left hand side of the entrance well. This handle shall be of sufficient length to accommodate small as well as larger pupils. The handle shall be a minimum of 1" O.D. steel with a stainless steel coating with a minimum thickness of .018 inch.

Inside of door header shall be padded with a pad of at least 3 inches wide and one inch thick and extend the full width of the door.

56. Side Windows - The side windows shall be aluminum or zinc coated steel, split-sash type. The windows and frames shall be designed and constructed to guarantee a rain-tight, weather-tight dry body well. A suitable drip rail, visor or similar water shedding device shall be provided for each window. The last window on each side may be set in rubber--without provision for adjustment if the body design makes it impracticable to install an adjustable window at this point. Minimum window width shall be 22 inches. The amount of window travel shall be not less than 9 inches or more than 12 inches. The top sash shall be controlled by a latch with no exterior protrusion.
57. Static Load Test - Body structure shall meet requirements of FMVSS 220.
58. Steering Wheel - There shall be a distance of at least two (2) inches between steering wheel and cowl, instrument panel, windshield, and any other surface.

59. Stop Arm - There shall be installed on the left outside of the body an electric-operated, high-intensity, reflectorized stop arm equipped with four (4) alternating flasher lights, which shall be connected to the alternately red flashing signal lamp circuits. SMC Model 4910, or approved equal, for giving public due notice that the bus is making a stop. The stop arm shall be of an octagonal shape with high-intensity, reflectorized sheeting of white letters and border and a red background; sheeting shall be warranted for ten (10) years.

(Purchaser Option: Vacuum-operated (SMC Model 910) or air-operated (SMC Model 2910) stop sign: Valve to operate device shall actuate switch through a solenoid to operate flasher stop lights and stop arm lights. Vacuum line shall be copper or nylon vacuum hose to meet SAE J844D and connected to auxiliary tank of 1000 cubic inch capacity furnished by body manufacturer. Line fittings shall be brass. Buses equipped with air accessories shall be equipped with a pressure protection valve between the air source and the air accessories.)

60. Crossing Gate - Buses shall be equipped with a crossing gate. The gate, when activated, shall extend a minimum of 5'6" from the face of the front bumper. The gate shall be on the right side of the front bumper and shall be activated by the same switch controlling the stop arm and work in conjunction with the stop arm. The crossing gate shall be electrically operated. The gate shall, to the extent possible, be black in color so as not to distract from the appearance of a school bus when not in use.

(Purchaser's Option: Vacuum or air-operated crossing gate.)

Option: In addition to the crossing gate, a system may operate buses equipped with a "Child Guard."

61. Stop and Tail Lights - Large - A 7-inch plain red lamp shall be mounted on each side of the rear of the bus body just inside the turn signals. The stop lights shall be wired into the chassis stop light circuit. Lamps shall be Weldon 1010 or an approved equal.
62. Structural Components - The body shall consist of the floor system, bows, posts, bow frames, strainers, front and rear framing, sheet metal exterior skin, wheel housings, and rub rails.
63. Sun Visor - The minimum size of the transparent sun visor is to be 6"x30". The sun visor shall be securely mounted to the body above the windshield and double mounted in a heavy-duty adjustable bracket.
64. Tail Lights - Each bus shall be equipped with two combination tail and stop lights emitting a red light plainly visible for 500 feet. One tail light shall be mounted on the left side of the rear of the bus body above the license holder and the other at approximately the same position on the right side of the rear of the bus body. The tail lights shall be wired into the chassis lighting system.

65. Tail Pipe - The tail pipe shall extend to, but not beyond perimeter of the body.
66. Tow Hooks - The body shall be equipped with tow hooks, attached so as not to project beyond the rear bumper.
67. Turn Signal Units - The front two (2) directional signals shall be provided and installed by the chassis manufacturer in compliance with Federal Regulations. The bus shall be equipped with two (2) side-mounted directional lights mounted on the side toward the front of the bus; one near the stop signal on the left and one on the right side to the rear of service door of the bus, Grote 200 or approved equal.

The rear two 7" lights with an amber arrow on inside of lens shall be face mounted. The turn signals shall be Cats-Eye 45A, Weldon 1000, or approved equal. These turn signals shall be mounted just under the windows on the outside corners of the rear of the bus.

68. Ventilation - The body shall be equipped with a ventilation system suitably controlled of sufficient capacity to maintain proper quantity of air without opening windows except in extremely warm weather. A static type exhaust roof ventilator shall be installed in low pressure area of roof panel. The ventilator shall be designed to provide full protection from rain and to exhaust air from within the bus body by creating a low pressure area while the bus is in motion.
69. Window Headers - An internal window header shall be located at the roof line and shall make a complete loop around the body of the bus. It shall be securely fastened to all roof bows or body posts.

An additional internal longitudinal structural member shall be located between the window and floor lines.

The window headers and longitudinal structural members shall be a minimum of 16-gauge metal three (3) inches wide before forming. These members are to be fastened to each vertical structural member.

The fastening method employed shall be such that the strength of the members is fully utilized.

70. Windshield Cleaning Steps - A folding windshield step and a convenient chrome, other non-corrosive metal, or equivalent non-corrosive material handle shall be installed on each side of the body on lower section of cowl for easy accessibility for cleaning the windshield. The handle shall be a heavy-duty handle, approximately 8" in length with 1 1/2" clearance. The handle shall be attached to the bus by four (4) non-corrosive metal fasteners.

Exception: Transit - windshield step may be in or on top of front bumper.

71. Windshield and Windows - Glass in windshield shall be heat-absorbent, laminated plate. Windshield shall be large enough to permit driver to see roadway clearly, shall be slanted to reduce glare, and shall be installed between front corner posts that are designed and placed to afford minimum obstruction to driver's view of roadway.

Windshield shall have horizontal gradient band starting slightly above line of driver's vision and gradually decreasing in light transmission to 20 percent or less at top of windshield. Exception: Transit 71 capacity or larger. Glass in windshield shall be tinted, heat-absorbent, laminated plate. A curved two-piece or a flat four-piece windshield may be used. The windshield wiper and blades are to be a heavy duty type with the arm a minimum of 24" and the wiper blade a minimum of 17".

72. Windshield Wipers and Washers - Bus shall be equipped with two positive-action, two-speed or variable speed windshield wipers of air or electric type. If electric type is used, one heavy duty two-speed electric motor driven windshield wiper shall be provided for each half of the windshield. The wiper arm shall be a minimum of 15 inches, and the wiper blade shall be a minimum of 17 inches. The motors furnished shall be guaranteed to operate the wipers under all driving conditions and shall be American Bosch Model WWC, Autolite ERT, or their equal.

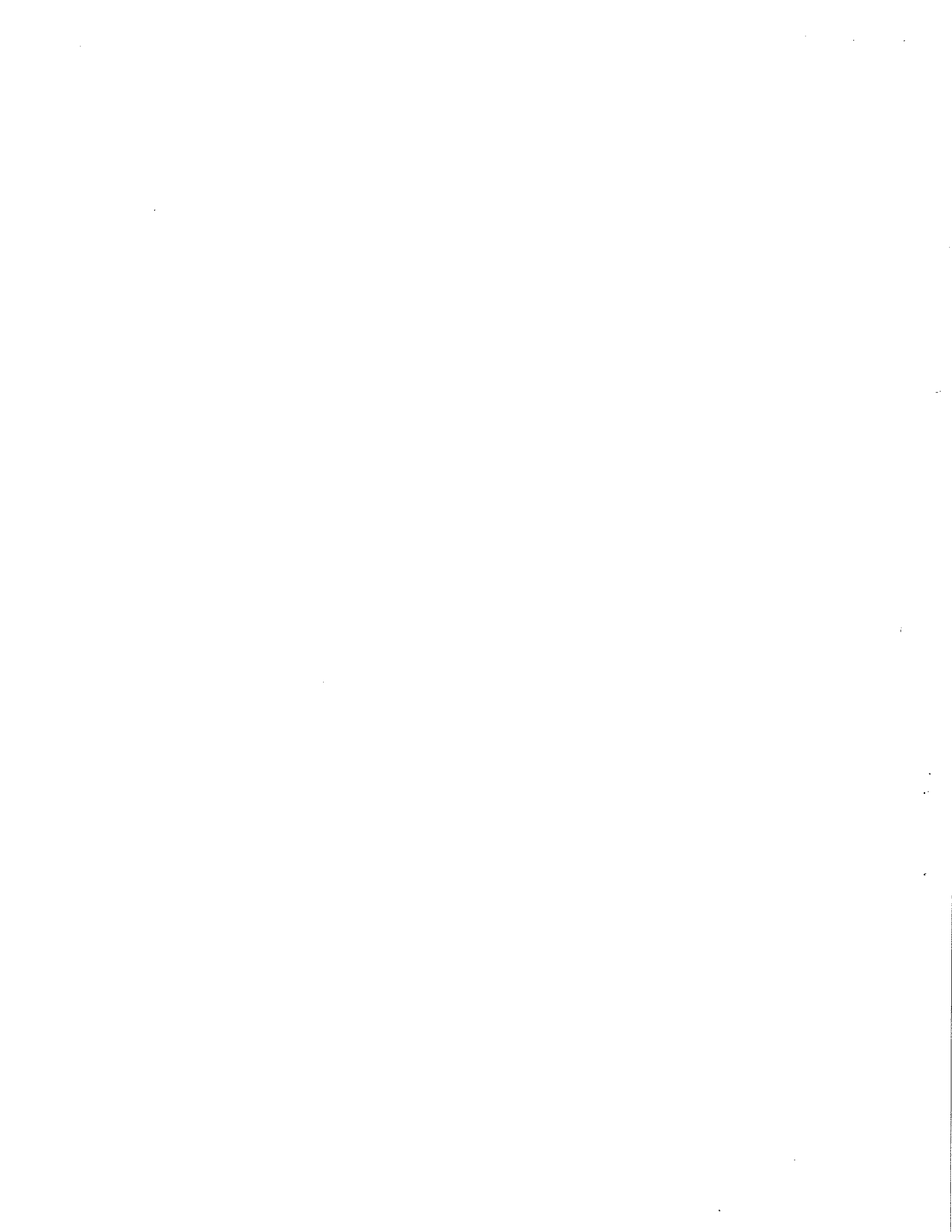
Exception: Transit buses shall be equipped with a minimum 24-inch windshield wiper arm and a minimum 17-inch blade.

An electric, air, or vacuum-operated windshield washer shall be furnished and installed and shall be activated by means of a dashboard mounted switch. The water reservoir shall be made of rigid plastic and shall be mounted under the hood on the conventional and metropolitan or in the driver's compartment on the transit. The container shall have a minimum capacity of two quarts. The windshield washer nozzle shall direct a continuous stream of water into the path of the wiper blades until the mechanism is turned off. The nozzle of the washer shall be securely mounted to the cowl and clear of the hood.

PART IV
CHASSIS SPECIFICATIONS
METROPOLITAN SCHOOL BUSES
TYPE B

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NOTE: Where there is conflict between Georgia and Federal Specifications, Federal Specifications shall prevail. Buses must meet Georgia Specifications to the extent that National Minimum Standards are exceeded or the item is specifically addressed; otherwise, National Minimum Standards are considered as a minimum.

1. Air Cleaner - The engine intake air cleaner shall be furnished and properly installed by the chassis manufacturer to meet engine specifications.
2. Alternator or Generator - Chassis shall be equipped with an alternator or generator having a minimum charging rate of 105 amperes in accordance with SAE rating procedures.
3. Axles or Other Types of Suspension - Front and rear axles or other types of suspensions shall not be loaded beyond chassis manufacturer's GAWR capacity (at ground). If a diesel engine is quoted, springs, axle and ratio must be compatible. Body and chassis manufacturers shall coordinate the axle and chassis requirement for the total payload.

<u>Wheel Base</u>	<u>Front GAWR</u>	<u>Rear GAWR</u>
125 in.	5,000 lbs.	7,900 lbs.
133 in.	5,000 lbs.	11,000 lbs.
157 in.	5,000 lbs.	11,000 lbs.
189 in.	6,000 lbs.	14,200 lbs.
218 in.	7,000 lbs.	16,160 lbs.
235 in.	7,500 lbs.	16,160 lbs.
254 in.	7,500 lbs.	17,500 lbs.
274 in.	9,000 lbs.	19,000 lbs.

4. Battery - Storage battery shall have a minimum cold cranking capacity rating at 0 degrees Fahrenheit (-17.8c) of 515 amperes and a minimum reserve capacity of 120 minutes at 25 amperes. The chassis manufacturer shall temporarily mount the battery on the chassis frame. The final location of the battery and the appropriate cable lengths shall be according to the SBMI Design Objective Booklet, 1980 Edition.

Diesel powered buses shall be equipped with storage batteries of sufficient cranking Performance and Reserve Capacity for the type and size engine, but not less than offered as standard equipment.

5. Brakes

Service Brake - Chassis shall be equipped with hydraulic dual system brakes and shall meet FMVSS 105. Power disc front brakes shall be provided if available on model chassis used.

5. Brakes (Continued)

Parking Brake - Chassis shall be equipped with a parking brake capable of holding vehicle on a twenty (20) percent grade under full legal load and shall meet FMVSS 105.

Brake system provided on stripped chassis shall comply with the brake standards set forth in Part II supra.

6. Bumpers - Front and Rear

Front Bumper - Shall be furnished by chassis manufacturer as part of the chassis and shall be bolted to chassis frame and be painted National School Bus Black.

Rear Bumper - Shall be furnished by chassis manufacturer when body to be mounted to chassis is less than eighty (80) inches in width, and bumper shall be bolted to chassis frame.

7. Color - Chassis, wheels, and front bumper shall be painted National School Bus Black.

8. Differential

a. Chassis shall be equipped with a single speed differential.

b. Gear ratio - 7,900 lbs. axle - 4.56; 11,000 lbs. axle - 5.29; 14,200 lbs. and up - 6.83 (Lower numerical differential is permissible.)

9. Engine - Minimum Gasoline 350 cubic inch V-8; Diesel 6.2 Liter.

10. Exhaust System - The exhaust system shall be constructed to carry exhaust gases from the engine to a point beyond the rear wheel and extending to the side edge or to the back bumper of the bus.

11. Fuel Tank - Chassis manufacturer shall provide the largest fuel tank available with a minimum capacity of 30 gallons. Installation shall meet FMVSS 301. Stripped chassis shall comply with fuel tank in Part II supra.

12. Fuel/Water Separator - Diesel chassis shall be equipped with a fuel and water separator of a design compatible with engine to ensure trouble-free performance when properly maintained. Must contain a replaceable element fuel filter of proper design to protect against premature fuel flow restriction or excessive passage of contaminants.

13. Heating System Provisions - Chassis engine shall provide inlet and outlet holes in accessible locations for attachment of bus heating system water lines. Each water heater circuit installation shall include a brass 3/4" gate valve installed as near the engine as possible in both the supply and return lines.

14. Horns - Dual, each horn capable of producing sounds in bands of audio-frequencies between approximately 250 and 2,000 cycles per second and tested per SAE Standard J-377.
15. Instruments - Chassis shall be equipped with the following instruments and gauges.
- a. Speedometer (in miles and kilometers) with odometer which will give accrued mileage, including tenths of a mile.
 - b. Voltmeter with graduated scale.
 - c. Oil pressure gauge.
 - d. Water temperature gauge.
 - e. Fuel gauge.
 - f. Upper beam indicator.
16. Oil Filter - Chassis manufacturer shall provide an oil filter or replaceable element or cartridge with a minimum capacity of .85 quart.
17. Passenger Load
- a. Gross Vehicle Weight (i.e., wet chassis weight, plus body weight, plus driver's weight of 150 lbs., plus weight of maximum seated pupil load based on not less than 120 lbs. per pupil) shall not exceed maximum gross vehicle weight rating as established by the manufacturer.
 - b. The Gross Vehicle Weight Ratings (GVWR's) shown are not calculated minimums, but are recommended GVWR's for chassis of buses with capacities as stated.

<u>Wheel Base</u>	<u>G.V.W.R.</u>
125	11,500
133	14,500
157	14,500
189	20,200
218	23,160
235	23,660
254	25,000
274	28,000

18. Power or Gradeability - The gross vehicle weight of any school bus shall not exceed 185 pounds per certified net published horsepower of the engine at the manufacturer's recommended maximum governed revolutions per minute. Stripped chassis shall comply with engine requirements in Part II supra.

19. Shock Absorbers - Chassis shall be equipped with front and rear heavy duty shock absorbers, compatible with manufacturer's rated axle capacity.

20. Steering - Chassis shall be equipped with hydraulic power steering.

21. Tires and Rims

a. Minimums for tire and rim sizes shall be equal to or exceed those recommended in the following chart. (Tubeless optional)

<u>Wheel Base</u>	<u>Size</u>	<u>Ply</u>	<u>Rim Size</u>
125	7:50 x 16"D	8	16" x 6"
133	8:00 x 19.5"E	10	19.5" x 6"
157	8:00 x 19.5"E	10	19.5" x 6"

Tires and rims provided on stripped chassis shall comply with the Tire and Rim Standards set forth in Part II supra.

b. Chassis equipped with body in excess of eighty (80) inches in width, shall be equipped with dual rear wheels.

c. Chassis manufacturer shall provide a spare rim for vehicles 38 passengers or less.

22. Transmission - Automatic transmission in the 400 series is required and shall meet FMVSS 102. Stripped chassis shall comply with transmission in Part II supra.

23. Weight Distribution - Weight distribution of fully loaded bus on level surface shall be such as to not exceed the manufacturer's Front Gross Axle Weight Rating (GAWR) and Rear Gross Axle Weight Rating (GAWR).

24. Wheelbase - Range 125 - 274 inches (determined by body length and seating capacity).

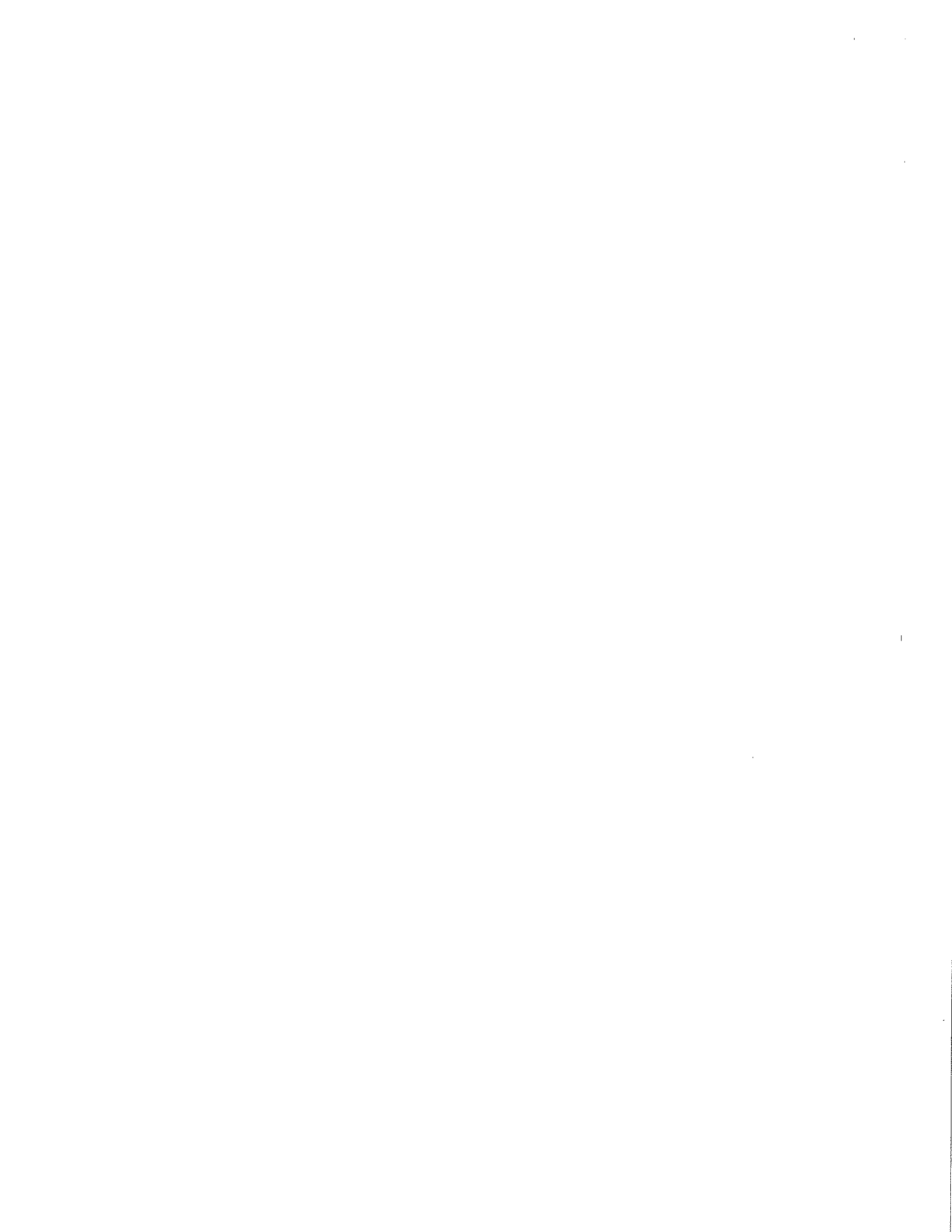
PART V

BODY SPECIFICATIONS

EXCEPTIONAL CHILD BUS

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NOTE: Where there is conflict between Georgia and Federal Specifications, Federal Specifications shall prevail. Buses must meet Georgia Specifications to the extent that National Minimum Standards are exceeded or the item is specifically addressed; otherwise, National Minimum Standards are considered as a minimum.

1. Aisle - The aisle leading from the wheelchair position to the emergency door(s) shall be a minimum of 30 inches to allow a wheelchair to be moved between the two rows of seats in the event an emergency evacuation of the bus is necessary.
2. Fastening Devices - Wheelchair fastening devices shall be provided and attached to the floor or walls or both to enable securement of wheelchairs in the vehicle. The devices must be of the type that requires human intervention to unlatch or disengage. The fastening devices must be designed to withstand forces up to 2,000 pounds per tiedown leg or clamping mechanism or 4,000 pounds total for each wheelchair, whichever is the lesser of the two.

Additional fastening devices may be needed to restrain the student due to the many different configurations of chairs and exceptionalities.

3. Fuel Tank - A fuel tank meeting FMVSS 301 mounted on the left or right side of chassis frame or between chassis frame rails will be furnished by the chassis manufacturer.
4. General Requirements - Bus body structure and equipment shall conform to Georgia Chassis and Body Specifications - Conventional, Transit, Metropolitan, and Small School Buses approved by the State Board of Education except for modifications necessary for installation of special equipment listed herein.

Any school bus purchased for the transportation of physically handicapped children shall be equipped with a powered lift. Lift shall be located on right side of the body, in no way attached to the exterior but confined within the perimeter of the standard school bus body.

5. Lift Uprights, Barriers and Chain
 - a. Heavy-duty padded panels shall extend above floor level on both fore and aft side of the special service opening to prevent students from falling in the lift opening when the lift is lowered. The width of the panels shall be equal to the depth of the floor opening.
 - b. A covered chain shall be fastened to rear panel with hook and eye for attachment to forward panel, with through the floor lift.
 - c. There shall be a padded barrier in front of all forward-facing passenger seats that do not have another seat in front of it. The

5. Lift Uprights, Barriers, and Chain (Continued)

barrier shall meet FMVSS 222. Kick/modesty panels shall be installed between the bottom of the barrier(s) and the floor and between the leg(s) and wall to ensure that pupils will not slip under the barriers.

6. Passenger Restraining Devices

When restraining devices are specified, one shall be provided for each seated passenger. Buckles must be non-reflective.

7. Passenger Seats - All passenger seats shall be forward facing.

8. Power Lift

- a. Unit or lift must be of a standard make by a nationally known manufacturer and approved by the Department of Education. A circuit breaker or fuse shall be installed between power source and lift motor. Lifting mechanism shall have a minimum capacity of 800 lbs. Power unit shall be an electro-hydraulic, self-contained motor pump, valve and reservoir unit or approved equal. Lifting cylinder shall have honed surfaces. The piston rod shall be ground, polished and chrome-plated. All hydraulic oil hoses must conform to or be better than SAE Specification 100-R3. Hose fittings and metal hydraulic lines shall be made of material other than galvanized pipe. The electric motor for the hydraulic pump must have a duty cycle 1:1. When the drive motor and hydraulic pump are located inside the bus, it shall be installed in such a manner so as not to interfere with the movement of wheelchairs through the bus aisle. It shall be enclosed to prevent transported students from coming in contact with the unit and it shall be readily accessible to service personnel for routine service and for maintenance. When the hydraulic pump and drive motor are installed below the floor level, they shall be enclosed in a box accessible through a door installed in the body skirt.

No lift shall be mounted in the rear of the bus nor blocking an emergency exit.

Any vendor marketing lifts in Georgia shall guarantee repair or replacement parts availability within 72 hours of notice.

- b. The lift platform shall provide for power operation up and power or gravity-down. Gravity-down lifts must have a pressure compensated valve located at the end of the cylinder; the time period for descent shall be 6 seconds or longer. When the lift platform is in the fully up position, it shall be locked in position mechanically by means other than a support, or lug, on the door. The lift mechanism shall be equipped with adjustable limit switches and/or by-pass valves to prevent excessive pressure

8. Power Lift (Continued)

from building in the hydraulic system when the platform reaches the full up position or the ground. The lift travel shall be as near vertical as possible according to lift design. A swing arm design that travels in an arc is not acceptable.

- c. Lift platform shall conform to door and floor opening. All edges of platform shall be designed to restrain wheelchairs and operator's feet from becoming entangled during raising and lowering process. Platform ends shall be fitted with full-width shields which extend above floor when lift platform is in lowered position.
- d. Lift platform shall have a minimum size of 30 inches width and 44 inches length, and shall be equipped with a folding handrail.
- e. Power lifts shall be so equipped that they may be manually raised in the event of power failure of the power lift mechanism, and must be capable of raising a 400 pound load.
- f. Platform floor surface is to be covered with ribbed-surfaced rubber, 1/8" minimum thickness, RCA or approved equal, except when platform is made of expanded metal. Edges of platform and adjacent floor shall be properly finished and all seams covered with molding as required for bus floor. Flexible seals designed to keep dirt, water and fumes out when in a locked position shall be installed along platform edges.
- g. Lifts installed in buses of 35 capacity body shell or larger may be through the floor type and adjacent under-floor areas, three sides, shall be closed off with properly designed shields when platform is in lowered position.
- h. A self-adjusting, non-skid metal ramp of a width to minimize incline to lift platform and of sufficient strength to support the front wheels of a wheelchair with student shall be hinged to door side of lift platform. Control over lowering and placement of ramp shall be convenient to attendant when standing on platform.

When installed in bus bodies longer than 20 feet, it shall be power operated.

- i. Positioning of power lift unit shall be controlled by momentary type switch mounted within bus and adjacent to lift, convenient to attendant when standing upon lift platform and when the lift is in any position. An actuating switch shall be installed in the circuit so that the lift mechanism will not operate when the lift platform doors are closed.
- j. With the exception of floor molding, no metal screws are to be used in fabrication of platform assembly.

8. Power Lift (Continued)

- k. Alternator shall have an output of at least 100 amperes.
- l. The rear heater shall be at least 35,000 B.T.U.

9. Regular Service Door Entrance

- a. Stainless grab rails shall be provided on each side of this entrance and shall be placed in such a manner as to afford easy accessibility to small children entering or leaving the bus. The grab rail forward of the door is not required when the forward folding door is used.
- b. When in open position, service doors shall not obscure any portion of grab rails.

10. Special Lights - Two lights shall be provided for the lift, one located inside the bus over the special service door and one located in the skirt near the lift, to provide light for the lift platform when lowered. The exterior light shall be a minimum of 3 1/2 inches, comparable to the backup lights, and both lights shall be operated from a single switch located in the door area.

11. Special Service Doors

- a. A single door may be used for enclosing an opening that is not more than 40" wide.
- b. Lift openings more than 40" wide shall be enclosed by two (2) doors of equal width.
- c. All doors must open outwardly.
- d. If body opening extends through body skirt, doors shall extend to bottom of body skirt. When ramps are used, door or doors shall extend from window header to below floor line covering the ramp container.
- e. All doors shall be weather sealed and so constructed that a flange on the forward door overlaps the edge of rear post or door when closed. Design shall provide positive means of holding door, or doors, in open position during lift operation. Friction type catches are not acceptable.
- f. When manually operated dual doors are provided, rear door shall have at least a one-point fastening arrangement to header. Forward mounted door shall have a two-point fastening device extending to header and to rear door or platform door. These locking devices shall afford maximum safety when doors are in the closed position. Doors shall be hinged to body side using a heavy

11. Special Service Doors (Continued)

duty piano-type hinge fitted with brass pin. When single door is used, locking device shall meet requirements for emergency door lock.

- g. All doors shall have positive fastening devices to hold doors in the open position.
- h. Door materials, panels and structural strength shall be equivalent to the conventional service and emergency doors. Color, rub rail extensions, lettering, and other exterior features shall match adjacent sections of the body.
- i. Each door shall have glass window set in rubber compatible with and set to the lower line of adjacent sash.
- j. Doors shall be equipped with a device that will actuate an audible or visible signal located in the driver's compartment when not securely closed.

12. Special Service Opening

- a. There shall be an enclosed service opening located on the right side of bus. If it is located forward of rear wheels, it shall be located away from the regular service entrance so any fully opened, forward-mounted door will not obstruct the conventional service entrance. Minimum clear opening shall be 30" for a ramp or lift.
- b. Door posts, headers and floor sections around this special opening shall be reinforced to provide strength and support equivalent to adjacent side wall and floor construction of an unaltered model.
- c. Inside of door header shall be padded with a pad of at least 3 inches wide and one inch thick and extend the full width of the door.
- d. A drip molding shall be installed above opening so as to effectively spill water from entrance.

13. Windows - Systems may wish to specify tinted windows in Exceptional Child Bus.

NOTE: When purchasing a lift bus, the width and length of the lift platform should be sufficient to accommodate the types of wheelchairs used.

PART VI

BODY AND CHASSIS SPECIFICATIONS

SMALL SCHOOL BUS

TYPE A

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NOTE: Where there is conflict between Georgia and Federal Specifications, Federal Specifications shall prevail. Buses must meet Georgia Specifications to the extent that National Minimum Standards are exceeded or the item is specifically addressed; otherwise, National Minimum Standards are considered as a minimum.

CHASSIS --- MINIMUM EQUIPMENT REQUIRED

1. Air Cleaner - The engine intake air cleaner shall be furnished and properly installed by the chassis manufacturer to meet engine specifications.
2. Alternator - 60 amp. minimum.
3. Battery - Shall have a minimum cold cranking capacity rating of 0 degree Fahrenheit (-17.8c) of 465 amperes and a minimum reserve capacity of 120 minutes at 25 amperes.

Diesel-powered buses shall be equipped with storage batteries of sufficient cranking Performance and Reserve Capacity for the type and size engine, but not less than offered as standard equipment.
4. Back-up Lights - Shall meet National Minimum Standards.
5. Brakes - Shall be power assisted self-adjusting, dual hydraulic. Disc front brakes shall be provided if available on model chassis used. Largest brake size available on the vehicle.
6. Chassis - The chassis shall be of American design and manufacture.
7. Defroster - Defrosting equipment shall keep the windshield, the window to the left of the operator and the glass in the service door clear of fog, frost and snow. All defrosting equipment shall meet FMVSS-103. Each hot water system installed by a body manufacturer shall include a shut off valve installed in the pressure and return lines at or near the engine in an accessible location.
8. Differential Ratio - Shall be compatible with engine and transmission used.
9. Drive Shaft - Shall be protected by a metal guard to prevent it from dropping to the ground if broken.
10. Engine Size - Minimum Gasoline 300 cubic inch, V-8; Diesel 6.2 Liter or 7.3 Liter.
11. Exhaust System - Equipped with corrosive resistant mufflers. Exhaust system on gas-powered chassis shall be properly insulated from fuel tank connections by a securely attached metal shield at any point where it is 12 inches or less from tank or tank connections.

12. Fuel Tank - Minimum 20 gallons. Fuel/water separator required on diesel-powered buses; see Part II supra.
13. Glass - Exposed edges - bonded or beveled.
14. GVWR - Minimum 8,200 lbs.
15. Horns - Two suitable horns shall be provided which shall conform to SAE Standard J.377.
16. Mirrors - Right and left outside mirrors shall be a minimum of 50 square inches, securely mounted.
17. Oil Filter - Replacement element or cartridge type.
18. Shock Absorbers - Two front and two rear, double acting, compatible to GVWR of the vehicle.
19. Springs - To be compatible with axle capacity and GVWR of the vehicle.
20. Steering - The bus shall be equipped with power steering.
21. Suspension, Front and Rear - Front and rear suspension shall be compatible with GVWR.
22. Tires - Comply with GVWR as set by FMVSS and be certified by chassis manufacturer. Minimum Size 8.00 x 16.5, 8-ply rating. (Vehicles with single rear wheels shall be equipped with 10-ply rated tires.) Tires are to be mounted on the Tire and Rim Association's preferred rim for the tire used. All tires on a given vehicle shall be of the same size ply rating.
23. Transmission - Automatic, compatible with GVWR.
24. Turn Signals - The front two (2) directional signals shall be provided and installed by the chassis manufacturer in compliance with Federal Regulations.
25. Undercoating - Unit to be completely undercoated.
26. Warranty - The chassis manufacturer shall provide a warranty for each chassis.
27. Wheel Base - Shall be a minimum of 123 inches.
28. Windshield Washer - A windshield washer which will effectively clean the entire windshield area. Windshield washer equipment shall meet FMVSS - 104.
29. Windshield Wipers - Two variable speed windshield wipers shall meet FMVSS - 105.
30. Wiring - Meet SAE requirements.

BODY -- MINIMUM EQUIPMENT REQUIRED

1. Barrier - A barrier/padded guard panel shall be placed forward of all seats not having another passenger seat in front of it.
2. Circulation Fan - A 6" adjustable circulation fan shall be mounted in the driver's area.
3. Clearance and Marker Lights - Combination clearance and marker lights shall be installed at each of the four roof corners. The two front lights shall be amber in color, the two rear lights shall be red in color. The body entrance shall be provided with an adequate well-protected stepwell light. A cluster of three lights shall be mounted between the clearance and marker lights in the front and the rear of the bus at the roof line. Lights shall be armour type.
4. Disabled Vehicle Warning Devices - School bus shall come equipped with disabled vehicle hazard warning devices that meet Federal Motor Vehicle Safety Standard Reg. 125 to be displaced according to state law in event of a prolonged stop on street or highway.
5. Dome Lights - A minimum of two face-mounted dome lights shall be provided.
6. Electrical System - Wiring - All wiring shall conform to standards of the Society of Automotive Engineers, shall be color and number coded, insulated and protected by a covering of fibrous loom or approved equal. All joints shall be soldered or joined by equally effective connectors. Wiring shall be arranged in circuits as follows.
 - a. Head, tail, stop (brakes) and instrument panel
 - b. Clearance and stepwell lamps. Stepwell lamps shall be actuated when service door is opened.
 - c. Dome lamps
 - d. Ignition and emergency door signal
 - e. Turn signals
 - f. Stop arm and alternately flashing signal lamps
 - g. Heater
 - h. All body electrical circuits, with the exception of hazard warning lights, shall be operated through a solenoid actuated through the ignition switch.

Wiring through drilled holes in body shall be grommet protected. Wiring extending over sharp edges shall be protected by tubular loom.

Exception: Converted Vans.

7. Emergency Exits

Emergency Door - One or two door design with fixed glass in top of door. Single door design shall have glass in the lower part not less than 350 square inches. The door to be placed in the rear of the bus with door control both inside and outside of vehicle. The interior handle shall lift up to release the lock.

Push-out Windows - Each side of the body shall be equipped with at least one (1) full-hinged, push-out type split-sash window, approximately midway between front and rear passenger compartment. Emergency push-out windows shall have a positive latch and shall be so constructed and equipped as to actuate an audible signal when latch is moved. Words "EMERGENCY EXIT" in letters at least two (2) inches high shall be affixed on (or directly above) emergency window on the inside and outside.

Roof Exit - The school bus body shall be equipped with a combination emergency exit/roof ventilator, Transpec Safety vent, or equivalent. The emergency exit/roof ventilator shall be located approximately in the center of the body. A static-type, non-closeable exhaust ventilator may be included as an integral part of the roof ventilator.

Simple release handles shall be provided, permitting operation as emergency exit(s), accessible inside and outside the vehicle. Unit shall be installed with the hinge toward the front.

8. Fire Extinguisher - One pressurized, rechargeable, dry chemical type, fire extinguisher complete with hose, approved by Underwriters Laboratories, Inc., with a total rating of 2A10BC or greater. Extinguisher must be mounted in a bracket located in the driver's compartment and readily accessible to the driver and passengers. A pressure gauge shall be mounted on the extinguisher so as to be easily read without moving the extinguisher from the mounted position.

9. First-Aid Kit - Bus shall have Grade A metal first-aid kit, mounted in full view and in accessible place in driver's compartment. The number of units and contents shall be as designated.

4-inch bandage compress	2 pkgs.
2-inch bandage compress	1 pkg.
1-inch adhesive compress	2 pkgs.
40-inch triangular bandage with two safety pins	2 pkgs.
Eye dressing packet	1 pkg.
24 x 72 inch Gauze Compress	1 pkg.
Wire splint	1 pkg.

10. Flasher Lights - The body shall be equipped with four (4) red flasher lights and four (4) amber warning lights. These lights are to be a minimum of 5 3/4 inches sealed beam with 7" lens meeting current SAE Specifications.

10. Flasher Lights (Continued)

Hoods are required and shall be designed to have a visor effect over the top of the lights. Lights shall have a black area of approximately 3" around lens. Four (4) lights are to be mounted on the front of the body above the windshield and four (4) lights are to be mounted on the rear roof of the body above the rear windows. Flasher lights shall be securely grounded to some clean metal surface in the bus body. The lights are to be operated in the following manner:

- a. With entrance door closed, depress manual push button. Amber pilot light and amber warning lights flash.
- b. Open entrance door. Amber pilot and amber warning lights go off and red pilot and red warning lights flash. Stop arm is automatically extended and lights on stop arm flash.
- c. Close entrance door. All lights go out and stop arm retracts automatically.
- d. Open entrance door without depressing manual push button. No lights flash nor does stop arm extend.
- e. With entrance door open, depress manual push button. Red pilot and red warning lights flash. Stop arm is automatically extended and lights on stop arm flash.

The circuit shall be constructed in such a manner so that one front and one rear light shall flash alternately with the other front and rear lights.

Monitor, dual warning and rear belt line lights. Electric monitor for dual warning lights front and rear back-up, tail, stop, and directional lamps. Mounted on front upper inner panel above driver. Gives positive indication of individual lamp operation.

Exception: Monitor for converted vans shall be an electric monitor for dual warning lights front and rear. Mounted on front upper inner panel above driver. Gives positive indication of individual lamp operation.

11. Floor - The floor shall be of fire resistant material. The floor shall be level except in wheel housing and operator's platform area.
12. Floor Covering - The center aisle and stepwell shall be ribbed rubber. The overall thickness shall be .1875 inch. The steps, including floor line platform area, shall be ribbed rubber of heavy-duty tread type not less than 3/16" thick, with a white forward nosing. The floor covering, to cover the total floor area including the driver's compartment and toeboard, shall be fire resistant rubber with a minimum thickness of .125 inch.

13. Glass - All glass including windshield shall meet National Minimum Standards.
14. Header Pad - All doors shall be equipped with a padding at the top edge of each door opening. Pad shall be at least 3 inches wide and one inch thick and extend the full width of the door.
15. Headroom - The inside body height measured metal to metal from floor to ceiling at any point on the longitudinal center line between the front and rear vertical bows shall be at least 60 inches.
16. Insulation - The body panels (side, roof, and front and rear including corners) and roof bows shall be insulated completely with not less than 1 1/2" of fiberglass insulation material which is fire and moisture resistant, or approved equal. Insulation material shall be approved by Underwriters Laboratories, Inc.

The entire underside of the body, including wheel housings, shall be coated to a minimum thickness of 1/16" with high quality automotive type underseal, Federal Specification TT-C-520b or approved equal, to protect the body from rust and to seal and insulate the floor. Not required on heat shields placed between exhaust system and body, which are provided to reduce the temperature on chassis manufacturer's applied floor.

17. Interior Mirror - Inside mirror, minimum of 6 x 16 inches safety glass, shall be securely attached on the windshield header and so located as to give the driver a clear view of the entire interior of the bus and road behind. Shall not obstruct the clear view of the driver.
18. Lettering - Exterior - On the rear and the front, between the red flasher lights of the bus, shall be painted in 8" black letters the words "SCHOOL BUS."

The words "_____ County or City Schools" shall be painted in 5" black letters on each side; the bus number in 5" black numerals on each side and rear of bus. "Emergency Door" in 2" black letters on the inside and outside at the top or above the door, so long as it does not interfere with the words "SCHOOL BUS." A minimum 4-inch yellow number shall be located on the left side of the front bumper. No other lettering or motto will be permitted on the bus.

19. Mirror

Indirect Visibility: Each bus shall have a mirror system which will provide a clear, unobstructed view of the area in front of the bus and the area immediately adjacent to the left and right front wheels and at the entrance door when tested to the following.

19. Mirror (Continued)

Indirect Vision Mirrors: When a rod 30 inches long is placed upright on the ground at any point along a traverse line one (1) foot forward of the forward-most point of a school bus and extending the width of the bus, at least 7 1/2 inches of the length of the rod shall be visible to the driver, either by direct view or by means of an indirect visibility system.

The small school bus shall contain at least the following:

	LH Convex <u>Rearview</u>	LH Convex <u>Crossview</u>	RH Convex <u>Crossview</u>	RH Convex <u>Rearview</u>
Type A	X	X	X	X

Testing Option - Elliptical or hemispherical mirrors may be substituted on a two-for-one basis if indirect visibility requirements are met.

20. Name Plate - There shall be installed in each bus body, above the windshield or above driver's window, a manufacturer's name plate, on which shall be shown the name of the manufacturer, serial number of body, designed capacity, equipped capacity, and date built.
21. Paint - Outside Body - National School Bus Yellow. Option: The roof may be painted white; however, the front and rear roof caps must remain yellow. The white roof may not extend beyond the drip rail on the side.
- Lettering and Trim - National School Bus Black.
- Interior Paint - Light color coordinated with seats and trim.
22. Passenger Seats - Shall be forward facing and shall be spaced a minimum of 24 inch hip to knee room. There shall be a minimum individual seating width of 13 inches provided for each student. The seats shall be arranged with a minimum of 12 inches between seat rows for aisle space.
23. Roof and Wall Panels - Shall be insulated and free from projections likely to cause injury to passengers.
24. Rub Rails - Two externally applied rub rails shall be provided, one approximately at seat level which shall extend from rear side of entrance door completely around bus body (except emergency door) to a point of curvature near outside cowl on left side, and the other approximately at floor level. Rub rails shall be constructed of 16-gauge longitudinally corrugated or profiled steel of four-inch minimum width. All rub rails shall be one piece. Splices are not allowed unless rub rail is extended around rear corner radius and must be made at a body post near the rear of the body. Exception: Rub rails on vehicles using chassis manufacturer's body need not extend around rear corners.

25. Seat Belt - A locking retractor type seat belt shall be provided for the driver. Each belt section shall be booted so as to keep the buckle and button-type latch off the floor and within easy reach of the driver. Belt 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.
26. Seating Capacity - Range to 20 passenger. (Vehicles with single rear wheels shall be limited to a maximum of 16 seating capacity.)
27. Seat Cushions - Seats and back cushions of all seats shall be designed to safely support designated number of pupils under normal road conditions encountered in school bus service. Seat, seat back cushion, crash barrier, and the underneath portion of the seat shall be covered with an Aramid Kevlar or approved equivalent fire-block material having 42-ounce finished weight, 54-inch width, and finished vinyl coating of 1.06 broken twill or other material with equal tensile strength, tear strength, seam strength, adhesion strength, resistance to abrasion, resistance to cold, and flex separation. All padding and coverings to be of fire-resistant material meeting FMVSS 302. Seats shall be padded to meet FMVSS 222. Back cushions shall be constructed so as to eliminate exposed screws or bolts which contribute to vandalism.
28. Service Door - On right side opposite driver with driver control in easy reach of driver. Stepwell lamp(s) shall be actuated when the service door is opened.
29. Side Strainer - There shall be one or more side strainers to connect vertical structural members and to provide impact and penetration resistance in event of contact with other vehicles or objects. Such strainers shall be formed (not in flat strips) from metal of at least 16 gauge and 3 inches wide. This strainer is to be installed in area between bottom of window and bottom of seat frame and shall be fastened to each vertical structural member.
30. Static Load Test - The bus shall be constructed with sufficient strength to meet all requirements of FMVSS 220 for school bus roll-over protection.
31. Stop and Tail Lights-Large - A 7-inch plain red lamp shall be mounted on each side of the rear of the bus body just inside the turn signals. The stop lights shall be wired into the chassis stop light circuit. Lamps shall be Weldon 1010 or an approved equal.
32. Stop Arm - There shall be installed on the left outside of the body an electric-operated reflectorized stop arm equipped with four (4) alternating flasher lights, which shall be connected to the alternately red flashing signal lamp circuits. SMC Model 4910, or approved equal, for giving public due notice that the bus is making a stop. The stop arm shall be of an octagonal shape with white letters and border and a red background.

32. Stop Arm (Continued)

(Purchaser's Option: Vacuum-operated (SMC Model 910) valve to operate device shall actuate switch through a solenoid to operate flasher stop lights and stop arm lights. Vacuum line shall be copper or nylon vacuum hose to meet SAE J844D and connected to auxiliary tank of 1000 cubic inch capacity furnished by body manufacturer. Line fittings shall be brass.)

33. Crossing Gate - Buses shall be equipped with a crossing gate. The gate, when activated, shall extend a minimum of 5'6" from the face of the front bumper. The gate shall be on the right side of the front bumper and shall be activated by the same switch controlling the stop arm and work in conjunction with the stop arm. The crossing gate shall be electrically operated. The gate shall, to the extent possible, be black in color so as not to distract from the appearance of a school bus when not in use.

(Purchaser's Option: Vacuum-operated crossing gate.)

Option: In addition to the crossing gate, a system may operate buses equipped with a "Child Guard."

34. Sun Shield - Interior adjustable transparent sun shield not less than 6" x 16" with a finished edge shall be installed in a position convenient for use by driver.

35. Turn Signals - The rear two 7" lights with an amber arrow on inside of lens shall be face mounted. The turn signals shall be Cats-Eye 45A, Weldon 1000, or approved equal. These turn signals shall be mounted just under the windows on the outside corners of the rear of the bus.

The bus shall also be equipped with two (2) side-mounted directional lights mounted on the side toward the front of the bus; one near the stop signal on the left and one on the right side to the rear of the service door of the bus. Grote 200 or approved equal.

36. Windows - Shall be of split-sash type set in heavy gauge structural steel body openings.

