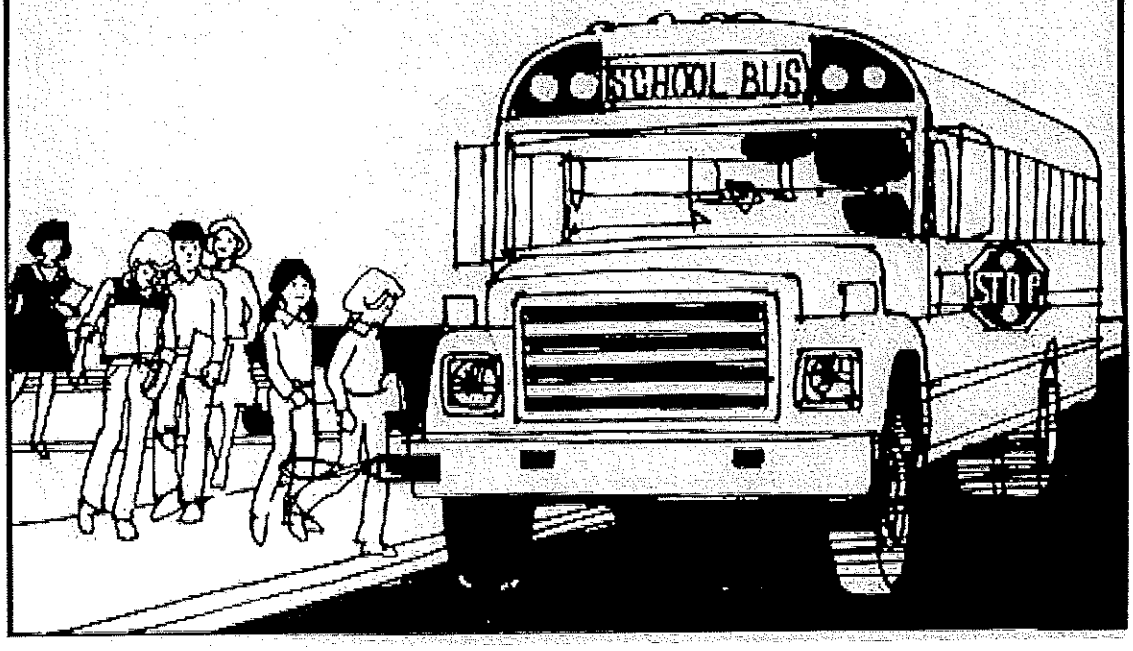
Georgia School Bus Specifications

Georgia Department of Education
Kathy Cox
State Superintendent of Schools



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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 or cutaway front-section vehicle with a left side driver's door, designed for carrying more than 10 persons. This definition shall include two classifications: Type A-I, with a Gross Vehicle Weight Rating (GVWR) less than or equal to 10,000 pounds; and Type A-II with a GVWR greater than 10,000 pounds. Sixteen passenger or less may be single rear wheeled; 17 passenger and larger shall be dual wheeled.
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 gross 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 and has a gross vehicle weight rating of more than 10,000 pounds, designed for carrying more than 10 persons. The entire 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, and has a gross vehicle weight rating of more than 10,000 pounds, designed for carrying more than 10 persons. The engine may be beside the driver's seat; it may be at the rear of the bus, behind the rear wheels, or midship between the front and rear axles. The entrance door is ahead of the front wheels.

PART II
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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 School Transportation Specifications and Procedures are exceeded or the item is specifically addressed; otherwise, 2000 National School Transportation Specifications and Procedures 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 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 inch) 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 Gross Axle Weight Rating (GAWR) - Body and chassis manufacturers shall coordinate the axle and chassis requirement for the total payload.

	CONVENTIONAL						TRANSIT			
Seating Capacity	29-36	47-48	53-54	59-60	65-66	71-72	35-42 Puller	43-72 Puller	73-90 Puller	71-84 Pusher
Front	6,000	6,000	7,000	8,000	9,000	9,000	10,000	10,800	13,180	12,000
Rear	12,400	14,200	15,000	16,160	17,500*	18,500*	15,000	17,000	20,000	21,000

* See Fuel Tank

4. Battery(ies) - The storage battery(ies) shall have a total of 1,250 cold cranking amps at 0°F. The chassis manufacturer shall temporarily mount the batteries on the chassis frame. The cable lengths shall be in according to the SBMTC School Bus Design Objectives, 1996 edition.

   Exception: The battery(ies) may be located in the engine compartment on rear engine transit buses.

5. Brakes - All air brake systems shall meet current FMVSS 121. Fifty-nine passenger and larger buses shall be equipped with full air brakes. (Purchaser's Option: Hydraulic brakes are acceptable.) [See Item 6 - Brakes - Types, Service and Size.]

   Air Dryer is required.

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 inch. Automatic slack adjustors shall be installed on air brake systems.

All chassis equipped with hydraulic brakes shall meet current FMVSS 105, and be equipped with a brake-warning indicator. A suitable parking brake shall be provided. (On combination hydraulic systems, the system shall be self-adjusting.)

When a driveline mounted parking brake is used, it shall be operated by an orscheln type or a power actuated lever. The size shall be the largest available, not less than 9 X 3 inches.

Friction material for all brakes shall be non-asbestos.

1. Brakes - Types, Service and Size

Seating Capacity	29-30	35-54	59-66	71-72	41-72	73-90
Types	Hydraulic	Hydraulic	Full Air *	Full Air *	Full Air *	Full Air
DRUM						
Service Brake	380 Sq. In.	480 Sq. In.	576 Sq. In.	606 Sq. In.	622 Sq. In.	755 Sq. In.
Size-Front	14 X 2 1/2	15 X 3	15 X 3	15 X 3 1/2	15 X 4	16 1/2 X 5
Size-Rear	15 X 4	15 X 5	16 1/2 X 6	16 1/2 X 6	16 1/2 X 6	16 1/2 X 7
			* 15 X 7 Hyd.	* 15 X 7 Hyd.		
DISC			*	*	*	**
Front						
Area	74.2 Sq. In.	74.2 Sq. In.	77.6 Sq. In.	77.6 Sq. In.	82.8 Sq. In.	81.4 Sq. In.
Rotor Size	14 3/4 X 1 5/16	14 3/4 X 1 5/16	14 3/4 X 1 5/16	14 3/4 X 1 5/16	15 X 1 7/16	15 3/8 X 1 7/16
Caliper	Twin Piston	Twin Piston	Twin Piston	Twin Piston	Twin Piston	
Rear						
Area	74.2 Sq. In.	74.2 Sq. In.	79.12 Sq. In.	79.12 Sq. In.	82.8 Sq. In.	109.9 Sq. In.
Rotor Size	14 3/4 X 1 5/16	14 3/4 X 1 5/16	15 X 1.43	15 X 1.43	15 X 1.43	15 3/8 X 1 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 springset parking brake.

**Option: Air Disc.

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

7. 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.

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

8. Color - The chassis, including wheels and front bumper, shall be glossy 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. The hood may be painted with non-reflective paint.

9. 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 engine to the manufacturer's requirements at all speeds in all gears at maximum temperature of this area and be securely mounted.

10. Cowl to Rear Axle Measure - Minimum measurement 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

11. Drive Shaft - The drive shaft(s) shall be protected by metal guard(s) or shields to prevent its ripping through floor or dropping to ground if broken.

Exception: Rear engine transit buses.

12. Minimum Engine Size - See charts on pages B-4, B-5.

(Horsepower requirements shall be minimum 170 horsepower in 29-54 passenger; 190 horsepower in 59-72 passenger; and 210 horsepower in 73-90 passenger.)

WARRANTY: Engines in type C and D buses shall be covered by a **WRITTEN WARRANTY** for five years, 150,000 mileage, 100% parts and labor. Warranty shall cover engine, fuel pump(s), turbo charger, **all electronic engine components and oil-related parts of the engine.**

13. Exhaust System - The exhaust system shall (a) extend beyond the rear axle and shall extend at least five 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 feet forward of the rear wheels.

12. MINIMUM ENGINE SIZE

Conventional Chassis: Series or Model Number

Minimum Engine Size

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

Capacity	Blue Bird	Freightliner	International
29-30	Caterpillar 3126E/C7	FS-65 Caterpillar 3126E/C7 MBE 906	3800 DT 466E T 444E
35-36	Caterpillar 3126E/C7	FS-65 Caterpillar 3126/C7 MBE 906	3800 DT 466E T 444E
47-48	Caterpillar 3126E/C7	FS-65 Caterpillar 3126E/C7 MBE 906	3800 DT 466E T 444E
53-54	Caterpillar 3126E/C7	FS-65 Caterpillar 3126E/C7 MBE 906	3800 DT 466E T 444E
59-60	Caterpillar 3126E/C7	FS-65 Caterpillar 3126E/C7 MBE 906	3800 DT 466E T 444E
65-66	Caterpillar 3126E/C7	FS-65 Caterpillar 3126E/C7 MBE 906	3800 DT 466E T 444E
71-72	Caterpillar 3126E/C7	FS-65 Caterpillar 3126E/C7 MBE 906	3800 DT 466E T 444E

12. MINIMUM ENGINE SIZE

Transit Chassis
Minimum Engine Size

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

CAPACITY	*35 - 72*			*CAPACITY*	*73 - 90*	
MANUFACTURER	*Mercedes - Benz*	*CUMMINS*	*INTERNATIONAL*	*CATERPILLAR*	*CUMMINS*	*INTERNATIONAL*
INTERNATIONAL			*DT 466E 6-466 cu. in. T 444E*			*DT 466E 6-466 cu. in.*
BLUE BIRD		*ISB 5.9 6-359 cu. in.*		*3126E/C7 7.2 L.*	*ISC 8.3 6-505 cu. in.*	
THOMAS	*MBE 906*	*ISB 5.9 6-359 cu. in.*		*3126E/C7 7.2 L.*	*ISC 8.3 6-505 cu. in.*	

NOTE: *Any engine within the 73 - 90 capacity can be used in the 35 - 72 capacity*

14. Frame - The frame shall be treated to inhibit corrosion for the life of the 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 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.

15. Fuel Tank - The tank and installation shall conform to FMVSS 301. The tank shall be equipped with adequate baffles. A drain plug at least 1/4 inch in diameter shall be provided in the center of the bottom of the tank. Forty-seven passenger buses and larger shall be equipped with a single 60-gallon fuel tank of not less than 50-gallon draw down. Forty-two 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. **NOTE: The fuel tank may be mounted in the rear between the frame rails to better distribute the weight. The chassis provider (type C) shall provide a rear axle with a GAWR of 1000 lbs. additional capacity to carry the additional weight attributed to the relocation of the fuel tank.**

16. 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 contaminates.

17. Governor - The chassis shall be equipped with a governor set at the manufacturer's recommended RPM.

18. Headlights - Headlights shall meet SAE and FMVSS 108.

19. 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 ¾-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.

20. Hood - The hood shall be fiberglass and tilt design.

21. 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.

22. 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, which may be accomplished by a Trip meter.
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.

23. Instrument Panel - The instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges.

24. 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.**

25. 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 full flow type.

26. 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.

27. 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).

28. Rim Size - Rim size shall meet the current standard of the Tire and Rim Association. Consult the following chart for the appropriate rim size.

	CONVENTIONAL			TRANSIT	
Seating Capacity	29-36	47-54	59-72	35-72	73-90
Size	6"	6 3/4"	7 1/2"	7 1/2"	7 1/2"

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

29. 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.

30. 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.

31. 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	
Seating Capacity	29-36	47-54	59-60	65-72	35-72	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: Low Profile Tires

32. Tow Hooks - The chassis shall be equipped with tow hooks, attached so as not to project beyond the front bumper.

33. Transmission - Automatic - The automatic transmission shall have at least five forward gear ratios, with down shift inhibitors, plus integral torque converter which shall provide for an overall starting torque ratio in a forward range of at least 5.9:1. Converter shall be equipped with converter lockup. Transmission shall be electronically controlled and compatible to the required electronic engine. The transmission shift quadrant shall provide five forward drive ranges plus neutral and reverse ranges. Within the range selected, ratio changes shall be affected 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 gearshift 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	
Seating Capacity	29-54	59-72	35-72	73-90
Automatic Transmission	**2000**	**2000**	**2000**	**3060**

(Optional: Allison Output Retarder: The Allison 2000 and 3000 Series Transmissions may be equipped with an output retarder activated by the service brake pedal.)

34. 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-canceling directional signal switch with an illuminated "ON" indicator(s) in compliance with FMVSS 108. The chassis manufacturer will furnish a self-canceling 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.

35. 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.

36. Vehicle Weights - Minimum GVWR

	CONVENTIONAL						TRANSIT			
Seating Capacity	29-36	47-48	53-54	59-60	65-66	71-72	35-42 Puller	43-72 Puller	73-90 Puller	71-84 Pusher
Weight	18,400	20,200	21,200	24,160	26,500	27,500	25,000	27,800	33,100	33,000

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

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	Vehicle Serial Number
Transmission Number	**Axle Number**

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

1. Inspect brakes
   - ☐ Leaks in hoses, lines, connections, etc.
   - ☐ Lines properly installed, supported and clipped to eliminate interference
   - ☐ Check parking brake lining, cable and mechanical linkage
   - ☐ Drain air tanks, if equipped
2. Inspect steering for proper assemble and bent, broken or disconnected components

   NOTE: Make sure all cotter keys are locked in place.
   - ☐ Pitman and steering arms
   - ☐ Drag link
   - ☐ Idler arms
   - ☐ Relay rod
   - ☐ Tie rod and ends
   - ☐ Wheel stop adjustment
   - ☐ Check power steering cylinder attachments and hose connections
   - ☐ Check steering gear housing mounting bolts
3. ☐ Inspect complete fuel system for leaks
   - ☐ Inspect fuel tank and lines for proper attachment (fittings, clips, etc.)
4. ☐ Inspect cooling system for leaks
5. ☐ Inspect engine for oil leaks
6. Inspection of transmission
   - ☐ Proper lube level
   - ☐ Leaks
7. Inspection of propeller shaft
   - ☐ U-joints, U-bolts, or cap screws, etc.
8. Inspection of differential
   - ☐ Proper lube level
   - ☐ Leaks around housing and pinion oil seals
   - ☐ Breather
9. Inspection of suspension
   - ☐ Spring assemblies – front and rear. "U" bolts – front and rear
10. ☐ Inspect condition of tires for damage and proper inflation. Inspect for bent or damaged wheels and rims
11. ☐ Check all exhaust system components and connections, and check for proper alignment
12. ☐ Check clutch slave cylinder push rod adjustment
13. ☐ Lubricate all chassis and suspension fittings

    NOTE: Refer to lube chart in Maintenance Manuals.

B. Operations with Bus on Floor

1. Check engine
   - ☐ Oil level
   - ☐ Oil leaks
2. ☐ Inspect wet type air cleaner for oil level
3. ☐ Check all belts for proper tension and condition
4. ☐ Check cooling system for 20° anti-freeze protection. Add coolant solution as required.
5. Inspect cooling system for leaks
   - ☐ Radiator core
   - ☐ Surge tank
   - ☐ Water pump
   - ☐ Heater and radiator hoses
   - ☐ Tighten all hose connections
6. Check steering – general
   - ☐ Check steering gear lube level
   - ☐ Tighten steering column mountings
   - ☐ Inspect U-joints or couplings
7. Check power steering
   - ☐ Fluid level
   - ☐ Inspect pump, hoses, and connections for interface
8. Check battery
   - ☐ Hold-down clamps and mounting plate, cables for routing and interference
   - ☐ Water level
   - ☐ Specific gravity – if below 1,230 charge
9. ☐ Check front wheel toe-in
10. Check brake master cylinder
    - ☐ Fluid level
    - ☐ Pedal free travel
11. ☐ Torque all wheel nuts and axle shaft nuts; check wheel, rim, and clamp alignment
12. ☐ Test all lights and adjust headlight aim as required

(continued)

(B continued)

13. ☐ Check air brake low pressure warning buzzer or vacuum/hydraulic brake low vacuum warning buzzer for operations
14. 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
15. 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
16. 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
17. ☐ Check distributor dwell and ignition timing
18. ☐ Engine idle speed – adjust
19. Check operation of
    - ☐ Horn
    - ☐ Windshield wipers and washers
    - ☐ Natural safety switch
20. ☐ Check for correct transmission shift pattern plate or decal on knob that it is located in view of the drive

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 (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

TYPES B, 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 School Transportation Specifications and Procedures are exceeded or the item is specifically addressed; otherwise, 2000 National School Transportation Specifications and Procedures are considered as a minimum.

1. Back-up Alarm - An automatic, audible back-up alarm of at least 112 dbA meeting SAE J994b, shall be installed behind the rear axle.

2. Back-up Lights - Two 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.

3. 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 step well shall have a kick/modesty panel installed between the bottom of the barrier and the floor and between the legs(s) and wall to ensure that pupils will not slip into the step well.

4. 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 Fuel Filler Door. The lock shall be an Illinois Tumbler Lock No. 5412W or an approved equal. Two keys shall be provided with each lock.

5. 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.

6. 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.

7. 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.

TYPE B

Seating Capacity 2-2 Plan Minimum Rump Width of 13"	Seating Capacity 3-2 Plan Minimum Rump Width of 13"	Seating Capacity 3-3 Plan Minimum Rump Width of 13"	
18	22	26	
22	7	32	133
26	32	38	157

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Number or Rows of Seats	Seating Capacity 3-3 Plan Rump Width of 13 inches	Minimum Measurement Cowl to Center 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.

8. Child Check System – **a child check system shall be provided meeting the following specifications.**

   The child check system alarm will not be activated until the warning lights/stop arm system has fully cycled. Once the child check system has been activated, whenever the driver turns the ignition to the "OFF" position the driver must walk to the rear of bus to de-activate the child check system. Any attempt to exit the bus by opening the entrance door a 112 db alarm will sound until system has been de-activated.

9. Circulation Fan - A 6" adjustable circulation fan with guard shall be mounted in the upper or lower front left hand corner of the bus.

10. 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 roofline.

    Lights shall be armour type.

11. 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 glossy black. The body trim, if used, shall be glossy black.

    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.

12. 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 adequate rheostat switch.

13. 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 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.

14. Disabled Vehicle Warning Devices - School bus shall come equipped with disabled vehicle hazard warning devices that meet FMVSS. 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 or under the rear passenger seat.

15. Driver's Seat - The driver's seat shall be of the high back type with a minimum seat back adjustment of 15 degrees and with a head restraint to accommodate a 95 percentile adult male (95 percentile adult male as defined in FMVSS 208). The driver's seat shall be secured with nuts, bolts, and washers or flange-headed nuts. The covering shall be cloth or a combination cloth and vinyl. Seat shall have a minimum 4-inch adjustment floor to rear, and a minimum 4-inch adjustment up and down. Front to rear adjustment shall be designed for fingertip control without use of tools.

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

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.

17. 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 step well lamps. Step well 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.

18. 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-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 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. Provisions 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 inch. The emergency lock shall be equipped with a suitable electric plunger-type switch and two buzzers, one located in the driver's compartment and one located near the emergency door that meet FMVSS 217. The switch 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.

The rear emergency door shall have a wedge hinge device or approved equal to maintain the emergency door open at intervals up to 110-degree opening. The device shall not require any action on the part of the user beyond pushing the door past the interval opening points. The device shall be corrosion-resistant and hold the door at various points, unless the pull of gravity will cause the door to remain open to its fullest extent. The device shall permit the user to close the door from inside or outside of the bus.

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 3 inches wide.

If a side emergency door is necessary to meet the minimum square inches required for emergency exits, it must meet FMVSS 217. A flip seat is permissible at the side emergency door.

Emergency Exits - Push-Out Windows - Each side of the body shall be equipped with full-hinged push-out type split-sash window(s) in the following capacity vehicles.

Designed Seating Capacity	Number of Windows Per Side
0-42	1
43-78	2
79-90	3

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 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 Dual Purpose Safety vents, or approved equal, as follows:

1. Forty-two designed seating capacity and less shall be equipped with one emergency exit-roof ventilator, located approximately the center of the body.

2. Forty-three designed seating capacity and larger shall be equipped with two emergency exit-roof ventilators, located approximately the first quarter and the rear quarter of the bus body. The rear exit should be located in the third roof panel from the rear of the roof edge.

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.

5. Shall provide a "partially open" position along the full width of the hatch adequate to allow air to enter or exit and thereby ventilate the bus.

***Purchaser's Option**: Specialty Manufacturing roof hatch number 8945.

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

19. 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.

20. Entrance - The first step at the service door shall not be less than 12 inches and not more than 16 inches from the ground, based on standard chassis specifications. Step risers shall not exceed a height of 10 inches. (When plywood is used on a steel floor or step, the riser height may be increased by the thickness of the plywood.)

    Each step shall have a minimum thickness of 14-gauge steel. The steps and floor level entrance shall be covered with ribbed rubber or equivalent material of a heavy duty tread type not less than 3/16" thick, with a white forward nosing, bonded to a 22-gauge steel back. Steps shall not protrude beyond the side bodyline and shall be enclosed to prevent accumulation of ice and snow.

    A suitable device shall be provided to assist passengers during entry or egress. This device shall allow for easy grasping or holding and shall have no opening or pinch points which might entangle clothing, accessories or limbs.

    Exception: Type D buses shall have the first step 11 to 16 inches from the ground.

21. Exterior Lighting - Full exterior lighting shall be furnished to comply with the Motor Vehicle Laws and Regulations of the State of Georgia and with Federal Regulations.

22. Exterior Mirror - Each school bus shall be equipped with a system of exterior mirrors (as defined in FMVSS 111.)

a. Rear Vision Mirror: The mirror system shall be capable of providing a view along the left and right sides of the vehicle, which will provide the driver with a view of the rear tires at ground level.

b. Crossview Mirror System: The crossview mirror system shall meet or exceed the requirements of FMVSS 111. The crossview mirror system shall also provide drivers of varying heights the field of vision prescribed in the aforementioned standard, once locked into place, without any need for readjustment. The crossview mirror shall be an aspherical mirror of an elliptic paraboloid shape (Lo-Mar Model 330 or equivalent) in order to provide an image of the prescribed area around the bus that is easily discernible for the driver.

c. This system of mirrors shall be easily adjustable but be rigidly braced so as to reduce vibration.

23. Exterior Paint - The exterior paint 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 Division, Georgia Department of Education.

24. Exterior Side Panel - 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.

25. 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.

26. a. 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 gauge compress	1 pkg.

1-pair latex gloves	1 pkg.
1 mouth-to-mouth airway	1 pkg.

b. Body Fluid Clean-up Kit - Bus shall have a removable and moisture proof body fluid clean-up kit. It shall be properly mounted and identified as a body fluid clean-up kit. The body fluid clean-up kit shall contain at least the following:

1-pair latex gloves
1-pick up spatula
1-pkg. absorbent deodorant
1-wiping cloth
1-ready-to-use hospital grade disinfectant
1-individual portion of antiseptic hand rinse
1-contaminated materials bag and tie

27. Flasher Lights - The body shall be equipped with four red flasher lights and four amber warning lights. These lights are to be a minimum of 5 3/4 inches sealed beam with a 7-inch 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 inches around lens. Four lights are to be mounted on the front of the body above the windshield and four 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 **or in the front dash instrument panel**. Gives positive indication of individual lamp operation.

A white flashing strobe shall be installed on the roof of the school bus in the second roof panel approximately four feet forward from the rear of the roof edge. Light shall have a single clear lens emitting light 360 degrees around its vertical axis and may not extend above the roofline approximately 4 1/2 inches. The roof-mounted strobe shall be wired so

that it is activated by the manual 8-lamp flasher light switch and deactivated when the entrance door is closed. The system must also have an auxiliary switch to permit the operator to turn the light on in inclement conditions without activating the 8-light system. A pilot light must be included to indicate when light is in operation.

28. 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 or equivalent floor covering. This material shall have a minimum thickness of .125 inch. The wheel housing covering shall be seamless, molded, one-piece.

    The 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, non-skid, wear-resistant ribs. The overall thickness shall be .1875 inch.

    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, chemically bonded or heat welded.

    The floor and floor covering materials 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.

29. 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 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 posts 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 wheel housing, toeboard, and operator's platform area.

30. Fuel Filler Opening Door - A suitable door of 16-gauge steel having a lock fastener shall be installed over fuel 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.

31. Glass - All glass shall meet FMVSS 205.

32. Heater - A heavy-duty combination fresh air and recirculating air heater shall be provided. A duct shall be provided along the left side of the body extending beyond the driver's compartment. 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.

    The heating system shall be so designed as to enable the driver to regulate the heated airflow in the driver's compartment.

    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 suitably 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 ¾ inch gate valve or quarter turn ball seat 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: A rear underseat heater of not less than 80,000 B.T.U. and a heat booster pump are required on 73 passenger and larger.

    Exception: Type B buses shall be equipped with a high output 80,000 B.T.U. fresh air type heater; or a combined heater/defroster system of 110,000 B.T.U.

    Note: Also see Section 12 (Defroster).

33. Insulation - The body panels (side, roof, front, and rear including corners) and roof bows shall be insulated completely with not less than 1 1/2 inches 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 11-C-520b or approved equal, to protect the body from rust and to seal and insulate the floor.

34. Interior Lighting - An adequate well-protected step well light shall be provided for all buses. Interior lights shall be face mounted ceiling lights and fewer than:

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

35. 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. Buses equipped with tinted windows may use a clear mirror of the same size.

36. 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.

37. 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 molding installed at the junction of the side paneling and the floor. A suitable metal strip or molding 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.

38. Lettering - Exterior - 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 bus 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 taillight. 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. Vinyl lettering may be used if the lettering used has a warranty of 10 years.)

39. 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 4-inch numerals. The top of the numerals shall be 1-inch below the light.

40. 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.

41. 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 American Society of Testing Materials.

Designation: B117, "Standard Method of Salt Spray (Fog) Testing,"[1] shall not lose more than ten percent of material by weight.

42. 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 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.

[1]American Society of Testing Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

43. 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 seating capacity, reduced capacity**, and date built.

44. 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 wheelhouse 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.

45. 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.

46. Projections – The interior of the bus shall be free of all unnecessary projections likely to cause injury to the passengers.

47. 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.

48. Reflective Material - Rear of bus shall be marked with strips of reflective National School Bus Yellow (NSBY) material to outline the perimeter of the back of the bus using material which conforms with the requirements of FMVSS 571.131 Table 1. The perimeter marking of rear emergency exits per FMVSS 217 and/or the use of reflective **"SCHOOL BUS"** signs partially accomplish the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of at least 1 3/4" reflective NSBY material shall be applied horizontally above the rear windows and above the rear bumper extending from the rear emergency exit perimeter marking outward to the left and right rear corners of the bus; and vertical strips shall be applied at the corners connecting these horizontal strips.

"SCHOOL BUS" signs, if not of lighted design, shall be marked with reflective NSBY material comprising background for lettering of the front and/or rear **"SCHOOL BUS"** signs.

Sides of bus body shall be marked with reflective NSBY material at least 1 3/4" in width, extending the length of the bus body and located (vertically) between the floor line and the beltline.

Bumpers may be stripped with horizontal 2-inch black solid stripe engineering grade or better.

49. 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-inch minimum in diameter. All reflector installations shall meet Federal Safety Standards FMVSS 108.

50. Roof - The roof shall be made of not less than 20-gauge sheet steel panels formed to fit the roof bus. All joints shall be adequately sealed to render them completely watertight.

51. Roof Bows and Post - Roof bows and body post may be one-piece or three- piece construction. When roof bows and post are separated 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 wheelhouse.

52. 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 inches 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 doorpost 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.

53. 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 windowsills. It shall begin at the entrance doorpost 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. 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 doorpost 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 doorpost 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 wheel wells. (4) A rub rail at the bottom of the skirt shall begin at the entrance doorpost and extend to the left windshield post with the exception of the openings at the wheel wells 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.

54. 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 Parker zed, cadmium plated, or thoroughly treated to prevent rust.

55. Seat Belt/Shoulder Harness - A type 2 lap belt/shoulder harness seat belt shall be provided for the driver. The assembly shall be equipped with an emergency locking retractor (ELR) for the continuous belt system. The lap portion of the belt shall be guided or anchored where practical to prevent the driver from sliding sideways under it.

56. 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.

57. 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 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 bolts, washers, and nuts, or washer/nut combination.

58. Service Door - The entrance door shall be a double wall steel **or aluminum**, outward opening or jackknife (forward folding), 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 or pivot-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 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 step well 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 molding or rail to shed water out of the door area shall be provided.

    Inside of door header shall be padded with a pad of at least 3 inches wide and 1 inch thick and extend the full width of the door.

59. 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 that 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.

60. Static Load Test - Body structure shall meet requirements of FMVSS 220.

61. Steering Wheel - There shall be a distance of at least 2 inches between steering wheel and cowl, instrument panel, windshield, and any other surface.

62. Stop Arm - There shall be installed on the left outside of the body an electric-operated, Diamond Grade, reflectorized stop arm equipped with four alternating flasher lights or high intensity (Light Emitting Diode) L.E.D. lights that flash and spell out the word "STOP" which shall be connected to the alternately red flashing signal lamp circuits. The stop arm shall be of an octagonal shape with Diamond Grade, reflectorized sheeting of white letters and border and a red background meeting FMVSS 131 and sheeting shall be warranted for 10 years.

    (Purchaser Option: Air-operated stop sign: Valve to operate device shall actuate switch through a solenoid to operate flasher stop lights and stop arm lights. 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.)

63. 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.

(Purchaser's Option: Air-operated crossing gate may be requested; chassis must be equipped or bid with the power source.)

When both the stop arm and the crossing gate are air operated each device shall be equipped with a separate solenoid and pressure regulator.

64. 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 stoplights shall be wired into the chassis stop light circuit. Lamps shall be Weldon 1010 or an approved equal.

65. 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. The exterior roof caps, service access panels, and light panels shall be of steel except that fiber glass or other composite materials may be used if all Federal Motor Vehicle Safety Standards are met and if the manufacturer can show that the material used is durable under normal operating conditions.

66. Sun Visor - The minimum size of the transparent sun visor is to be 6 inches x 30 inches. The sun visor shall be securely mounted to the body above the windshield and double mounted in a heavy-duty adjustable bracket.

67. Tail Lights - Each bus shall be equipped with two-combination tail and stop lights emitting a red light plainly visible for 500 feet. One taillight 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 taillights shall be wired into the chassis lighting system.

68. Tail Pipe - The tail pipe shall extend to, but not beyond perimeter of the body.

69. Tow Hooks - The body shall be equipped with tow hooks, attached so as not to project beyond the rear bumper.

70. Turn Signal Units - The front two directional signals shall be provided and installed by the chassis manufacturer in compliance with Federal Regulations. The bus shall be equipped with two 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-inch 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.

71. 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.

72. Window Headers - An internal window header shall be located at the roofline 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 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.

73. 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 inches in length with 1 1/2 inch clearance. The handle shall be attached to the bus by four non-corrosive metal fasteners.

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

74. 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 be tinted and 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. 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 inches and the wiper blade a minimum of 17 inches.

75. Windshield Wipers and Washers - Bus shall be equipped with two positive- action, two-speed or variable speed windshield wipers **including an intermittent feature**, 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 of 24-inch windshield wiper arm and a minimum 17-inch blade.

An electric, or air-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.

PART IV

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 School Transportation Specifications and Procedures are exceeded or the item is specifically addressed; otherwise, 2000 National School Transportation Specifications and Procedures are considered as a minimum.

1. Aisle - The aisle leading from the wheelchair position to at least one exit door and the lift area 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

   a. Body shall be designed for positioning and securement of mobile seating devices and occupants in a forward-facing orientation. Securement system hardware and attachment points for the forward- facing system shall be provided.

   b. Mobile seating device securement system shall utilize four-point tie- downs, with a minimum of two body floor attachment points located at the rear of the space designated for the mobile seating device and a minimum of two body floor attachment points at the front of the space.

   c. A Type 2 occupant securement system shall provide for securement of the occupant's pelvic lap area and upper torso area, with height adjustable shoulder restraint.

   d. The mobile seating device/occupant securement system shall be successfully dynamically sled-tested at a minimum impact speed/force of 30 mph/20 G's. The dynamic test shall be performed using system components and hardware (including attachment hardware), which are identical to the final installation in type, configuration, and positioning. The body structure at the attachment points may be simulated for the purpose of the sled test, but the simulated structure used to pass the sled test may not exceed the strength of the attachment structure to be used in the final body installation. The mobile seating device used for test purposes shall be a 150 pound powered wheelchair and the occupant shall be a 50th percentile male test dummy as specified in FMVSS Part 571.208. Measurements shall be made on the test dummy during the test for head acceleration, upper thorax acceleration, and upper leg compressive force. These measurements shall not exceed the upper limits set forth in FMVSS Part 571.208, S6.1.2, 6.1.3, and 6.1.4. The test dummy shall be retained within the securement system throughout the test and forward excursion shall be such that no portion of the test dummy's head or knee pivot point passes through a vertical transverse plane intersecting the forward-most point of the floor space designated for the mobile seating device. All hardware shall remain positively attached throughout the test and there shall be no failure of any component. Each mobile seating device belt assembly including attachment hardware and anchorages shall be capable of withstanding a force of not less than 2,500 pounds. This will provide equal mobile seating device securement when subjected to forces generated by forward, rear or side impact.

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

e. Occupant securement belt assemblies and anchorages shall also be certified to meet the requirements of FMVSS 209 and 210.

f. The occupant securement system must be designed to be attached to the bus body either directly or in combination with the mobile seating device securement system, by a method, which prohibits the transfer of weight or force from the mobile seating device to the occupant in the event of an impact.

g. All securement system attachments or coupling hardware not permanently attached shall be a "positive latch" type or hook with automatic self-tensioning and self locking retractors, to prohibit accidental disconnecting.

h. All attachment or coupling systems designed to be connected or disconnected frequently shall be accessible and operable without the use of tools or other mechanical assistance.

i. All securement system hardware and components shall be free of sharp or jagged areas and shall be a non-corrosive material or treated to resist corrosion.

j. The occupant securement system shall be made of materials, which do not stain, soil, or tear an occupant's clothing.

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

l. The following information shall be provided with each vehicle equipped with a securement system.

(1) Detailed instructions, including a parts list, regarding installation and use of the system.

(2) Detailed instructions, including a diagram, regarding the proper placement and positioning of the system, including correct belt angles.

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. 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 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.

b. There shall be either a seatback, FMVSS barrier, or padded stanchion with modesty panel in front of the forward most wheelchair position.

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. Track seating that meets standard 222 is acceptable.

8. Power Lift

a. Unit or lift must be of a standard make by a national 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 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 44 inches in length, width shall be capable of accommodating a 30-inch cube, and shall be equipped with folding handrails.

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, l/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 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.

k. Alternator shall have an output of at least 100 amperes.

l. The rear heater shall be at least 50,000 B.T.U.

m. Fire Suppression System - The engine compartment shall be protected by a vehicle thematic (VT model type) fire extinguisher system with NAF S-111 liquid clean agent. The system shall be activated by a quartzoid thermal release bulb spray nozzle pre set at 286 degrees Fahrenheit and mounted down wind from potential ignition points. The thermal release bulb spray nozzle shall be connected to a steel canister capable of

holding sufficient amount of liquid vaporizing suppressant to protect the fire hazard area. The fire suppressant shall be non-corrosive and shall not leave any residue after discharge (a flexible distribution hose shall be used when the canister is mounted in the passenger compartment). A pressure gauge shall be provided on the canister to allow service personnel to monitor status of the charge of the canister. The system shall be capable of being activated whether the engine is running or not. A warning light shall be provided to alert the driver when the system is activated.

9. Seatbelt Cutter

Seat Belt Cutter – a seatbelt cutter is required.

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 44" wide.

b. Lift openings more than 44" wide shall be enclosed by two 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-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 sidewall 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.

[Buses with flat floors must be equipped with low-profile tires.]

PART V

BODY AND CHASSIS SPECIFICATIONS

SMALL SCHOOL BUS

TYPE A

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BODY -- MINIMUM EQUIPMENT REQUIRED

Note: Where there is conflict between Georgia and Federal Specifications, Federal Specifications shall prevail. Buses must meet Georgia Specifications to the extent that National School Transportation Specifications and Procedures are exceeded or the item is specifically addressed; otherwise, 2000 National School Transportation Specifications and Procedures 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 -100 amp. minimum.

3. Battery - Shall have a minimum cold cranking capacity rating of 0 degrees Fahrenheit (-17.8c) of 465 amperes and a minimum reserve capacity of 120 minutes of 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 shall be used.

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 V-8; Diesel 5.9 Liter or T 444E.

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 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 and ply rating.

23. Transmission - Automatic, compatible with GVWR.

24. Turn Signals - The front two 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. Back-up Alarm - An automatic, audible back-up alarm of at least **112 dbA** meeting SAE J994b, shall be installed behind the rear axle.

2. Barrier - A barrier/padded guard panel shall be placed forward of all seats not having another passenger seat in front of it.

3. Circulation Fan - A 6" adjustable circulation fan shall be mounted in the driver's area.

4. 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 adequate well-protected step well light. A cluster of three lights shall be mounted between the clearance and marker lights in the front and the rear of the roofline. Lights shall be armour type.

5. Disabled Vehicle Warning Devices - School bus shall come equipped with disabled vehicle hazard warning devices that meet FMVSS 125 to be displaced according to state law in event of a prolonged stop on street or highway.

6. Dome Lights - A minimum of two face-mounted dome lights shall be provided.

7. 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 step well lamps - (Step well lamps shall be actuated when service door is open.)
   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 activated through the ignition switch.

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

   Exception: Converted Vans.

8. 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. The door shall have a wedge hinge device or approved equal to maintain the emergency door open at intervals up to 110-degree opening. The device shall not require any action on the part of the user beyond pushing the door past the interval opening points. The device shall be corrosion-resistant and hold the door various points, unless the pull of gravity will cause the door to remain open to its fullest extent. The device shall permit the user to close the door from inside or outside of the bus.

Push-out Windows - Each side of the body shall be equipped with at least one 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 the latch is moved. Words **"EMERGENCY EXIT"** in letters at least 2 inches 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 Dual Purpose Safety Vent, or approved 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 or the roof ventilator.

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

***Purchaser's Option**: Specialty Manufacturing roof hatch number 8945.

9. 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.

10. a. 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.

1-pair latex gloves	1 pkg.
1-mouth-to-mouth airway	1 pkg.

b. Body Fluid Clean-up Kit - Bus shall have a removable and moisture proof body fluid clean-up kit. It shall be properly mounted and identified as a body fluid clean-up kit. The body fluid clean-up kit shall contain at least the following:

1-pair latex gloves
1-pick-up spatula
1-pkg. absorbent deodorant
1-wiping cloth
1-ready-to-use hospital grade disinfectant
1-individual portion of antiseptic hand rinse
1-contaminated materials bag and tie

11. Flasher Lights - The body shall be equipped with four red flasher lights and four amber warning lights. These lights are to be a minimum of 5 3/4 inches sealed beam with 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 lights are to be mounted on the front of the body above the windshield and four 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. Exception; the monitor on converted vans shall be an electric monitor for dual warning lights front and rear. The

monitor shall be mounted on front upper inner panel above driver. Gives positive indication of individual lamp operation.

A white flashing strobe light shall be installed on the roof of the school bus approximately four feet forward from the rear of the roof edge. Light shall have a single clear lens emitting light 360 degrees around its vertical axis and may not extend above the roof **approximately** 4 1/2 inches. The roof-mounted strobe shall be wired so that it is activated by the manual 8-lamp flasher light switch and deactivated when the entrance door is closed. The system must also have an auxiliary switch to permit the operator to turn the light on in inclement conditions without activating the eight light system. A pilot light must be included to indicate when the light is in operation.

12. Floor - The floor shall be of fire resistant material. The floor shall be level except in wheel housing and operator's platform area.

13. Floor Covering - The center aisle and step well shall be ribbed rubber or equivalent floor covering. The overall thickness shall be .1875 inch. The steps, including floor line platform area, shall be of a 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 of the same composition used in the aisle of the bus and have a minimum thickness of .125 inch.

14. Glass - All glass including windshield shall meet National Minimum Standards.

15. 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.

16. Headroom - The inside body height measured metal to metal from floor to ceiling at any point longitudinal centerline between the front and rear vertical bows shall be at least 60 inches.

17. Insulation - The body panels (side, roof, 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 heat shields placed between exhaust system and body, which are provided to reduce the temperature on chassis manufacturer's floor.

18. 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.

19. Lettering - Exterior - On the rear and the front, between the red flasher lights of the bus, shall be the words **"SCHOOL BUS"** in 8-inch black letters.

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.

Vinyl lettering may be used if the lettering used has a warranty of 10 years.

20. Mirror - Each school bus shall be equipped with a system of exterior mirrors (as defined in FMVSS 111.)

a. Rear Vision Mirror: The mirror system shall be capable of providing a view along the left and right sides of the vehicle which will provide the driver with a view of the rear tires at ground level, a minimum distance of 200 feet to the rear of the bus and at least 12 feet perpendicular to the side of the bus at a distance of 32 feet back from the front bumper.

b. Crossview Mirror System: The crossview mirror system shall meet or exceed the requirements of FMVSS 111. The crossview mirror system shall also provide drivers of varying heights the field of vision prescribed in the aforementioned standard, once locked into place, without any need for readjustment. The crossview mirror shall be an aspherical mirror of an elliptic paraboloid shape (Lo-Mar Model 330 or equivalent) in order to provide an image of the prescribed area around the bus that is easily discernible for the driver.

21. 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.

22. 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 shall be National School Bus Black.

Interior Paint - Light color coordinated with seats and trim.

23. 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.

24. Roof and Wall Panels - Shall be insulated and free from projections likely to cause injury to passengers.

25. 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 or equivalent metals of four-inch minimum width. All rub rails shall be one piece. Splices are not allowed unless rub rails 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.

26. 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.

27. Seating Capacity - Range to 20 passenger. (Vehicles with single rear wheels shall be limited to a maximum of 16 seating capacity.)

28. 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 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.

29. Service Door - On right side opposite driver with driver control in easy reach of driver. Step well lamp(s) shall be actuated when the service door is opened.

30. 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 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.

31. Static Load Test - The bus shall be constructed with sufficient strength to meet all requirements of FMVSS 220 for school bus rollover protection.

32. 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 stoplights shall be wired into the chassis stop light circuit. Lamps shall be Weldon 1010 or approved equal.

33. Stop Arm - There shall be installed on the left outside of the body an electric-operated Diamond Grade reflectorized stop arm equipped with four alternating flasher lights or high intensity L.E.D. (Light Emitting Diode) that flash and spell out the word "STOP" which shall be connected to the alternately red flashing signal lamp circuits. The stop arm shall be of an octagonal shape with Diamond Grade reflectorized sheeting of white letters and border and a red background meeting FMVSS 131 and sheeting shall be warranted for 10 years.

    (Purchaser's Option: Vacuum-operated stop arm: 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.)

34. 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.

    (Purchaser's Option: Vacuum-operated crossing gate may be requested if chassis is equipped with power source.)

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

35. Sun Shield - Manufacturers standard.

36. Turn Signals - The rear two 7-inch 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 side-mounted directional lights mounted on the side toward the front of the bus; one near the stop arm on the left and one on the right side to the rear of the service door. Grote 200 or approved equal.

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

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

Georgia Department of Education
Pupil Transportation
Atlanta, Georgia 30334
May 2003