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ED 017 149 EF 001 295

MINIMUM STANDARDS FOR SCHOOL BUSES IN LOUISIANA.

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LOUISIANA ST. DEPT. OF EDUC., BATON ROUGE

REPORT NUMBER BULL-NO-1069 PUB DATE 66

EDRS PRICE MF-$0.25 HC-$1.76 42P.

DESCRIPTORS- *SCHOOL BUSES, EQUIPMENT STANDARDS, MOTOR VEHICLES,

DETAILED MINIMUM STANDARDS ARE GIVEN FOR SCHOOL BUSES. SECTIONS COVER BUS CHASSIS, BODIES, VEHICLES FOR HANDICAPPED CHILDREN, AND ILLUSTRATION OF BUS LAYOUTS. (JT)

STATE DEPARTMENT OF EDUCATION

OF LOUISIANA

1966

BULLETIN No. 1069

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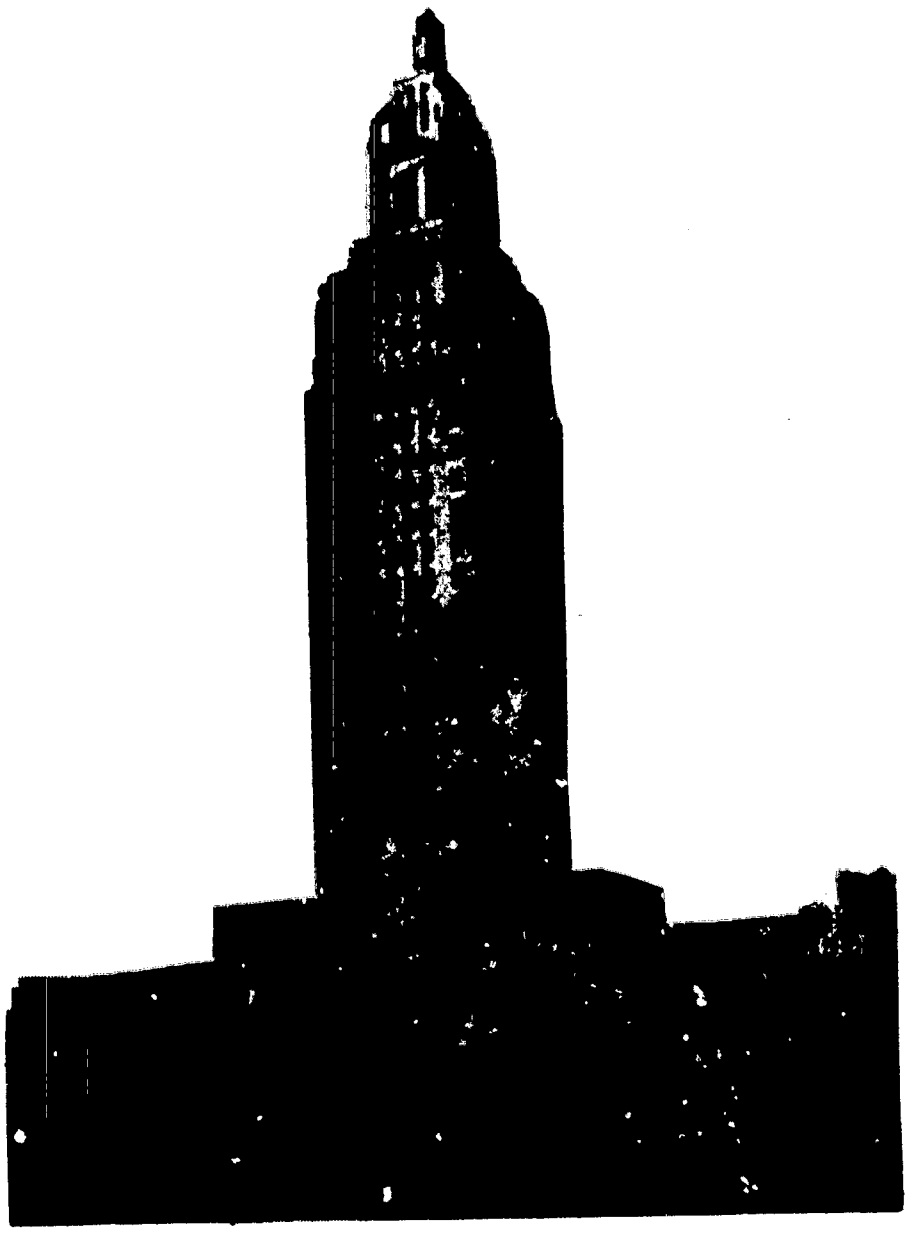

DEPARTMENT OF PUBLIC SAFETY

Approved by the
STATE BOARD OF EDUCATION
August 5, 1966

Issued by
STATE DEPARTMENT OF PUBLIC EDUCATION

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William J. Dodd, Superintendent

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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MINIMUM STANDARDS FOR LOUISIANA SCHOOL BUSES

The Bus Chassis

AIR CLEANER -

Bus shall be equipped with adequate oil-bath or dry-element type air cleaner mounted outside passenger compartment.

AXLES -

1. Front axle or other type of suspension assembly shall be of sufficient capacity at ground to support such load on front axle as would be imposed by actual average gross vehicle weight plus 10 percent.
2. Rear axle shall be full-floating type. Rear axle or other type of suspension assembly shall have gross weight rating at ground equal to or exceeding that portion of total load which is supported by rear suspension assembly. (See specifications on pages 30, 31 and 32)

Exception - transit and metropolitan vehicles

1. Front axle shall be wide-track, heavy-duty bus type and shall have gross weight rating at ground equal to or exceeding that portion of total load which is supported by front axle.
2. Rear axle shall be full-floating, heavy-duty bus type and shall have gross weight rating at ground equal to or exceeding that portion of total load which is supported by rear axle.

BATTERY -

1. Storage battery, as established by manufacturer's rating, shall be of sufficient capacity to care for starting, lighting, signal devices, heating, and other electrical equipment.
2. No bus shall be equipped with battery of less than 70 ampere hours at 12 volts, measured at 20-hour rate.
3. When battery is to be mounted outside of engine compartment, it may be temporarily mounted to chassis. Body company will permanently mount battery on sliding tray located so that center line of battery is 52 inches back of cowl. One-piece battery cables shall be provided by chassis manufacturer, such cables to be at least 36 inches longer than normally required, to accommodate battery when located 52 inches to rear of cowl. One-piece battery cables shall be provided by chassis manufacturer, such cables to be at least 36 inches longer than normally required, to accommodate battery when located 52 inches to rear of cowl.

BRAKES -

1. Four-wheel brakes, adequate at all times to control bus when fully loaded, shall be provided.
2. Foot or service brakes shall, at all times, be capable of stopping complete unit (i.e., wet chassis weight,[1] plus body weight, plus driver's weight, without pupils) from speed of 20 miles per hour in not more than 30 feet, such distance to be measured from point at which movement of service brake pedal or control begins. Tests for stopping distance shall be made on substantially level (not to exceed plus or minus 1-percent grade), dry, smooth, hard surface that is free from loose material.

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[1] With oil, water, and full tank of fuel.

3. a. Chassis shall be equipped with auxillary brake capable of locking rear wheels and capable of holding vehicle on any grade on which it is operated under any conditions of loading on a surface free from snow or ice. Operating controls of such auxiliary brake shall be independent of operating controls of service brakes.
   b. Under test conditions outlined in Item 2 above, auxiliary brake shall be capable of stopping vehicle from speed of 20 miles per hour in measured distance of 50 feet.
4. Chassis carrying body of 36 or greater basic pupil capacity shall be equipped with full compressed-air brakes, vacuum-actuated power or assistor-type brakes, or compressed-air-over-hydraulic brakes. (See table under Body sizes, page 14)
   a. Such installation shall be made by authorized representative of chassis or brake manufacturer and shall conform to recommendation of that manufacturer.
   b. Hydraulic line pressure shall not exceed recommendation of chassis or brake manufacturer.
   c. Total reservoir capacity (see Item d(1) below) shall be at least 1,650 cubic inches for full compressed-air systems, and at least 1,000 cubic inches for vacuum-actuated systems and for compressed-air-over-hydraulic systems.
   d. Buses having full compressed-air systems shall be equipped with:
      (1) at least two reservoirs (or one vessel divided into two compartments) connected in series
      (2) safety valve mounted on first reservoir to protect air-brake system against excessive air pressure and check valve mounted in optional location
      (3) air gauge mounted on instrument panel to register air pressure in air-brake system (see Instruments and instrument panel, page 12)
      (4) audible low-pressure indicator to warn driver if air pressure in air-brake system falls below 60 pounds per square inch.
   e. Buses having vacuum-actuated or compressed-air-over hydraulic systems shall be equipped with check valve located between source of supply and reservoir.
5. Brake system vacuum tank installed by chassis manufacturer shall be used exclusively for operation of brakes. System shall include suitable and convenient connection for installation of separate vacuum reservoir with capacity of not less than 1,000 cubic inches, furnished and installed by body manufacturer and protected by check valve, for actuation of other vacuum-powered accessories. Engine shall be protected by proper filters.

Following provisions for brakes shall supersede those shown above on all school bus chassis manufactured after January 1, 1967:

1. Service brakes:
   a. Stopping ability of service brake system. Service brake system shall be designed and constructed so that by application of single control unit vehicle can be stopped within distances specified in (1) and (2), below. Stopping distance requirement tests shall be conducted in accordance with SAE J658[2] and with vehicle loaded (MGVW - Manufacturer's gross vehicle weight).
      (1) Brakes shall be designed to have capability of developing deceleration of 14 fpsps (feet per second per second) from speed of 20 mph at pedal effort of not more than 75 pounds.

[2]Service Brake Performance, recommended practice of Society of Automotive Engineers.

(2) Stopping distance test with brakes cold shall be conducted after proper conditioning according to SAE J880[3] and vehicle shall stop, from speed of 20 mph, within following distances at pedal effort of not more than 200 pounds:
(a) 10,000 pounds GWV and under----------25 feet
(b) Over 10,000 pounds GVW----------35 feet

(3) Brake balance shall be such that, when tested at speed of 20 mph under any normal condition of loading within MGVW (manufacturer's gross vehicle weight), deceleration of 12 fpsps (feet per second per second) can be achieved without locking wheels on any axle.

b. Energy absorption - horsepower rating. Energy absorption capability of brakes, when tested in accordance with procedure established by SAE J880[3] or equivalent, shall be not less than 12 plus $\frac{1.4GVW}{1000}$.

c. Travel reserve of air brake actuator or hydraulic brake pedal. Brake actuator travel, when measured statically at actuating force required for compliance with Item 1a(2) above, shall be not more than 60 percent of available travel.

d. Reservoirs required. Every brake system which employs air or vacuum shall include following reservoir capacity:
(1) Air brake system shall have reservoir capacity which is equal to or greater than 12 times total volume of all brake actuators at full travel.
(2) Vacuum brake system shall have reservoir used exclusively for brakes, with capacity of not less than 1,000 cubic inches, and shall be adequate to insure loss in pressure at full stroke application of not more than 30 percent.
(3) Brake system shall include suitable and convenient connection for installation of separate vacuum reservoir with capacity of not less than 1,000 cubic inches, furnished and installed by body manufacturer and protected by check valve, for actuation of other vacuum-powered accessories. Engine shall be protected by proper filters.

e. Safeguarding of air or vacuum system reservoir. Brake system reservoir shall be "so safeguarded by a check valve or equivalent device that in the event of failure or leakage in its connection to the source of compressed air or vacuum, the stored air or vacuum shall not be depleted by the leak or failure."[4] Means shall be provided to establish air check valve to be in working order.[5]

f. Gauges. A vehicle using air or vacuum in operation of brake system shall be equipped with illuminated gauge, accurate to within 10 percent of actual reservoir pressure, which will indicate to driver, in case of
(1) air brakes: pressure in psi (pounds per square inch) which is available for operation of brakes; or
(2) vacuum brakes: vacuum in inches of mercury which is available for operation of brakes.

g. Warning devices. In addition to gauges required in f above, vehicle

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[3]Brake Rating System Test Code - Commercial Vehicles, recommended practice of Society of Automotive Engineers.
[4]Uniform Vehicle Code, 1962 revision, Section 12-301, (i), 3.
[5]Interstate Commerce Commission, Motor Carrier Safety Regulations, Paragraph 193.50, (b), as amended (effective date December 31, 1962).

shall be equipped with warning signal, readily audible or visible to driver, which will give continuous warning to driver when in case of
(1) air brakes: air pressure in system available for braking is 60 psi (pounds per square inch) and less; or
(2) vacuum brakes: vacuum in system available for braking is 8 inches of mercury and less.

2. Emergency stopping system:
   a. General. Brake system(s) shall perform emergency stopping function and be so designed and constructed that single failure anywhere in brake system which performs service brake function, excepting mechanical parts of wheel brake assemblies and brake pedal and brake pedal attachment to brake valve(s) or master cylinder(s), will not leave vehicle without operative brakes capable of stopping vehicle when loaded up to and including manufacturer's rated GVW (gross vehicle weight) at any legal speed and in accordance with requirements of b and c, below.
   b. Emergency stopping performance requirements. Following performance shall be obtained under road and test conditions outlined in 1a above:
      (1) Vehicle, when loaded to manufacturer's GVW (gross vehicle weight) capacity, shall be brought to stop from speed of 20 mph in measured distance of 85 feet.
      (2) Deceleration of not less than 6 fpsps (feet per second per second) shall be maintained throughout stop from 20 mph.
   c. Control requirements of emergency stopping system. Control of emergency stopping system shall be designed and constructed:
      (1) to permit modulated control by driver of brake application and release; and
      (2) to prevent release of brakes by driver unless energy is available for re-application.

3. Parking brakes:
   Parking brake system shall be designed and constructed to meet following requirements:
   a. Parking brake shall hold vehicle stationary, or to limit of traction of braked wheels, on 20-percent grade under any condition of legal loading and on surface free from snow, ice, and loose material.
   b. When applied, parking brake shall remain in applied position with capability set forth in 3a above, despite exhaustion of source of energy used for application or despite leakage of any kind.

BUMPER, FRONT - (Rear bumper - see page 15)

1. Front bumper shall be furnished by chassis manufacturer as part of chassis.
2. Front bumper must extend to outer edges of fenders at bumper top line (to assure maximum fender protection) and be of sufficient strength to permit pushing vehicle of equal gross weight without permanent distortion to bumper, chassis, or body.

CERTIFICATION -

Chassis manufacturers will, upon request, certify to state departments of education that their product meets minimum standards on following items:

a. axles
b. brakes
c. exhaust system noise level
d. horn
e. power and gradeability
f. springs.

CLUTCH -

All chassis of 48- through 60-pupil capacity having mechanical type transmission shall be equipped with clutch of 12-inch minimum diameter. Chassis of 66 and greater pupil capacity having mechanical type transmission shall be equipped with clutch of 13-inch minimum diameter or clutch of equivalent performance.

COLOR -

Chassis, including wheels and front bumper, shall be black;[6] hood, cowl, grill and fenders shall be in national school bus chrome yellow.[7]

DRIVE SHAFT -

Drive shaft shall be protected by metal guard or guards to prevent it from whipping through floor or dropping to ground if broken.

ELECTRICAL SYSTEM -

Chassis manufacturer shall install readily accessible electrical terminal so that body and chassis electrical load can be recorded through chassis ammeter without dismantling or disassembling chassis component. Chassis wiring system to terminal shall have minimum 100-ampere capacity. Chassis ammeter and wiring shall be compatible with generating capacity, and ammeter shall be capable of recording continuous draw of 100 amperes.

EXHAUST SYSTEM -

1. Exhaust pipe, muffler, and tailpipe shall be outside bus body and attached to chassis.
2. Tailpipe shall be constructed of seamless or electrically welded tubing of 16-gauge steel or equivalent and shall extend at least 5 inches beyond chassis frame.
3. Size of tailpipe shall not be reduced after it leaves muffler.
4. Exhaust system shall be properly insulated from fuel tank and tank connections by securely attached metal shield at any point where it is 12 inches or less from tank or tank connections.
5. Noise level shall not exceed 125 sones as measured by Beranek-Armour-ATA Equivalent Tone Method.[8]
6. Muffler shall be constructed of corrosion-resistant material.

FENDERS, FRONT -

1. Total spread of outer edges of front fenders, measured at fender line, shall exceed total spread of front tires when front wheels are in straight-ahead position.
2. Front fenders shall be properly braced and free from any body attachment.
3. Chassis sheet metal shall not extend beyond rear face of cowl.

FRAME -

1. Frame or equivalent shall be of such design as to correspond at least to standard practice for trucks of same general load characteristics which are used for severe service.

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[6]Federal Standard No. 595, black enamel #17038. Color chips are available from General Services Administration, Business Service Center, Region 3, 7th and D Streets, S. W., Washington, D. C. 20407.

[7]Federal Standard No. 595, chrome yellow enamel #13432. Color chips are available from source given in footnote 6.

[8]Automobile Manufacturers Association, 320 New Center Building, Detroit, Michigan 48202.

2. When frame side members are used they shall be of one-piece construction. If frame side members are extended, such extension shall be designed and furnished by chassis or body manufacturer with his guarantee, and installation shall be made by either chassis or body manufacturer and guaranteed by company making installation. Extensions of frame lengths are permissible only when such alterations are behind rear hanger of rear spring and shall not be for purpose of extending wheelbase.
3. Holes in top or bottom flanges of frame side rail shall not be permitted except as provided in original chassis frame. There shall be no welding to frame side rails except by chassis or body manufacturer.

FRAME LENGTHS - see table under body sizes on page 14.

FUEL TANK -

1. Fuel tank shall have minimum capacity of 30 gallons, be made of 16-gauge terneplate or equivalent, and be mounted directly on right side of chassis frame entirely outside body.
2. Flexible gasoline- and oil-proof connection shall be provided at engine end of fuel feed line.
3. Tank shall be equipped with adequate baffles.
4. Engine supply line shall be taken from top of tank.
5. Drain plug of at least $\frac{1}{4}$-inch diameter shall be located in center of bottom of tank.
6. Fill-pipe cap shall be of such design as to minimize spillage of fuel when bus turns corners in either direction. If venting of fuel tank is done other than through fill-pipe cap, cap shall be of nonvented type.[9]
7. Fuel filter with replaceable element shall be installed between fuel tank and carburetor.
8. Fuel tank, fittings, or lines shall not extend above top of chassis frame rail.
9. If tank sizes other than 30 gallons are supplied, location of front of tank and filler spout must remain as specified below.
   Note: Measurements shown below are for guidance of chassis manufacturers and serve only to prevent need for replacement of original tank. Inspectors concerned with state or local approval of vehicle need not consider them unless tank does not fit.
   a. Tank shall not extend in height above side member of chassis.
   b. Distance from center line of chassis to outside of tank shall not be more than 39 inches.
   c. Bottom of tank shall not be more than 14 inches below top of frame.
   d. Distance from cowl to front of tank shall be 42 inches minimum.
   e. Distance from cowl to center of fill-pipe cap shall be 57 inches.
   f. Distance from center line of chassis to center of fill-pipe cap shall be 44 inches with plus or minus tolerance of $\frac{1}{2}$ inch permitted.
   g. Center of fill-pipe cap shall be 1 inch below top of frame with plus or minus tolerance of $\frac{1}{4}$ inch permitted.

Exception - small vehicles

Fuel tank shall be mounted, filled, and vented outside body.

Exception - transit and metropolitan vehicles

1. Fuel tank shall have minimum capacity of 30 gallons, be made of 16-gauge terneplate or equivalent, and be mounted away from left side of bus entirely outside passenger compartment.

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[9]See provisions for fuel systems in current Motor Carrier Safety Regulations of Interstate Commerce Commission, obtainable from Superintendent of Documents, Washington, D. C. 20401. Price, 30 cents

2. Bottom of tank shall not be exposed below skirt of body side paneling.
3. Engine supply line shall be taken from upper portion of tank and shall be adequately protected.
4. Drain plug of at least ¼-inch diameter shall be located in bottom of tank.
5. Fill-pipe cap shall be entirely outside passenger compartment.

Exception - Vehicles of less than 54-passenger capacity constructed for transporting handicapped children
Fuel tank may be located behind rear wheels, inside or outside chassis frame, with fill-pipe located on right side of body.

GENERATOR OR ALTERNATOR -

Generator or alternator with rectifier shall have maximum output of at least 60 amperes (in accordance with Society of Automotive Engineers rating) with a minimum charging of 15 amperes at manufacturer's recommended engine idle speed (12-volt system), and shall be ventilated and voltage-controlled and, if necessary, current-controlled. Dual belt drive shall be used with generator or alternator.

Exception - small vehicles

Generator or alternator with rectifier shall have maximum output of at least 40 amperes with 12-volt system, and shall be ventilated and voltage-controlled and, if necessary, current-controlled.

GOVERNOR -

Engine governor is permissible and where used shall be set at manufacturer's recommended maximum engine speed. When it is desired to limit road speed, road-speed governor should be installed.

Exception - transit and metropolitan vehicles

When engine is remotely located from driver, governor shall be installed to limit engine speed to maximum revolutions per minute recommended by engine manufacturer, or tachometer shall be installed so engine speed may be known to driver.

HEATING SYSTEM, PROVISION FOR -

Chassis engine shall provide inlet and outlet holes in accessible locations for attachment of bus heating system water lines.

Also see Heaters, page 20.

HORN -

1. Bus shall be equipped with horn or horns of standard make, each horn capable of producing complex sound in band of audiofrequencies between approximately 250 and 2,000 cycles per second and having total sound level of 110 decibels within these frequency limits when measured at point on axis of horn 3 feet from exit of horn.
2. Sound-level measurements shall be made with meter that complies with American Standard Z24.3-1944, or current revision thereof, as promulgated by American Standards Association, Inc.[10] Measurement shall be made with meter set to flat response (C weighting network).
3. Sound-level measurements shall be made with horn or horns installed on bus. There shall be no reflecting walls or obstacles other than ground and vehicle closer than 100 feet from horn during sound-level measurements.
4. If louder horn is desired, it shall be capable of producing sound level of 120 decibels under conditions specified above.

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[10] 10 East Fortieth Street, New York, New York 10016.

INSTRUMENTS AND INSTRUMENT PANEL -

1. Chassis shall be equipped with following instruments and gauges (lights in lieu of gauges are not acceptable):
   a. Speedometer.
   b. Odometer which will give accrued mileage including tenths of miles.
   c. Ammeter with graduated charge and discharge, both ammeter and its wiring to be compatible with generating capacities and capable of handling continuous current draw of 100 amperes.
   d. Voltmeter with graduated scale (optional item)
   e. Oil-pressure gauge
   f. Water-temperature gauge
   g. Fuel gauge
   h. Upper-beam headlamp indicator
   i. Air-pressure or vacuum gauge, where air or vacuum brakes are used, and audible low-pressure indicator to warn driver if air pressure in air-brake system falls below 60 pounds per square inch. See Brakes, page 5.
   j. Windshield wiper switch
2. All instruments shall be easily accessible for maintenance and repair.
3. Above instruments and gauges shall be mounted on instrument panel in such manner that each is clearly visible to driver in normal seated position.
4. Instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges.

OIL FILTER -

Oil filter of replaceable element or cartridge type shall be provided and shall be connected by flexible oil lines if it is not of built-in or engine-mounted design. Oil filter shall have oil capacity of at least 1 quart.

OPENINGS -

All openings in floorboard or firewall between chassis and passenger-carrying compartment, such as for gearshift lever and auxiliary brake lever, shall be sealed unless altered by body manufacturer. (See Construction on page 15)

PASSENGER LOAD -

1. Average actual GVW (gross vehicle weight) is sum of average chassis weight, plus average body weight, plus 150 pounds for driver's weight, plus total seated pupil weight (based on 115 pounds per pupil).
2. Recommended chassis manufacturer's rated GVW (gross vehicle weight) is weight assigned to complete vehicle.
3. Manufacturer's gross vehicle weight rating shall be furnished in duplicate (unless more are requested by state department of education) by manufacturer to each state department of education. State department of education shall, in turn, transmit such rating to each other state agency responsible for development or enforcement of state standards for school buses. (see Specifications on pages 30, 31 and 32)

SHOCK ABSORBERS -

Bus shall be equipped with front and rear double-acting shock absorbers compatible with manufacturer's rated axle capacity.

SPRINGS -

1. Springs or suspension assemblies shall be of ample resiliency under all load conditions and of adequate strength to sustain loaded bus without evidence of overload.

2. Springs or suspension assemblies shall be designed to carry their proportional share of gross vehicle weight in accordance with requirement for Weight Distribution as shown on pages 13 and 14.
3. If rear springs are used, they shall be of progressive type.
4. If leaf-type front springs are used, stationary eyes shall be protected by full wrapper leaf in addition to main leaf.

STEERING GEAR -

1. Steering gear shall be approved by chassis manufacturer and designed to assure safe and accurate performance when vehicle is operated with maximum load at maximum speed.
2. Steering mechanism shall provide for easy adjustment for lost motion.
3. No changes shall be made in steering apparatus which are not approved by chassis manufacturer.
4. There shall be clearance of at least 2 inches between steering wheel and cowl instrument panel, windshield, or any other surface.
5. Power steering is permissible if approved by chassis manufacturer.

TIRES AND RIMS -

1. Tire sizes shall be as shown in table of specifications, pages 30, 31 and 32.
2. Rim sizes shall be based upon current standards of Tire and Rim Association.[11] See specifications pages 30, 31 and 32.
3. In order to allow for reasonable tolerance, total weight imposed on any tire shall not be greater than 10 percent above current standard of Tire and Rim Association.[11]
4. Dual rear tires shall be provided on all vehicles.
5. All tires on given vehicle shall be of same size and ply rating except front tires and they must comply with current standards of Tire and Rim Association.
6. Spare tire, if required, shall be suitably mounted in accessible location outside passenger compartment.

TRANSMISSION -

1. Mechanical type transmission shall be synchromesh except first and reverse gears. Its design shall provide not less than four forward and one reverse speeds.
2. Automatic transmissions are permissible.

Exception - small vehicles

Three-speed transmissions are acceptable.

UNDERCOATING -

Chassis manufacturer shall coat undersides of front fenders with fire-resistant, asphalt base, rubber base, or other undercoating material, applied by spray method, in order to seal, to deaden sound, to insulate, and to prevent oxidation, at least 1/8".

Also see Undercoating on pages 27 and 28.

WEIGHT DISTRIBUTION -

Weight distribution of fully loaded bus on level surface shall be such that not more than 75 percent of gross vehicle weight is on rear tires and not more than 35 percent is on front tires.

Exception - transit and metropolitan vehicles

With engine inside front of body: If entrance door is ahead of front wheels, not more than 75 percent of gross vehicle weight shall be on rear tires nor more

[11]Current standards may be obtained from Tire and Rim Association, Comand Building, 34 North Hawkins Avenue, Akron, Ohio 44313, or from tire manufacturers.

than 50 percent on front tires. If entrance door is behind front wheels, not more than 75 percent of gross vehicle weight shall be on rear tires nor more than 40 percent on front tires. With engine in rear: Not more than 75 percent of gross vehicle weight shall be on rear tires nor more than 40 percent on front tires.

The Bus Body

AISLE -

1. Minimum clearance of all aisles, including aisle (or passageway between seats) leading to emergency door, shall be 12 inches. (See Item 2f under Doors, Page 18)
2. Aisle supports of seat backs shall be slanted away from aisle sufficiently to give aisle clearance of 15 inches at tops of seat backs.

Exception - transit and metropolitan vehicles

With engine inside front of body: Minimum distance between stanchion at rear of entrance step-well and engine cover shall be 14 inches measured at floor level.

BATTERY -

1. Battery is to be furnished by chassis manufacturer.
2. When battery is mounted outside of engine compartment by chassis manufacturer, body manufacturer shall securely attach battery on slide-out tray in closed, vented compartment in body skirt whereby battery may be exposed to outside for convenient servicing. Battery compartment door or cover shall be secured by adequate and conveniently operated latch or other type fastener.

(See also page 5)

BODY SIZES -

Bodies for conventional body-on-chassis type vehicles shall be limited to lengths shown in table below. Sizes are based on 27-inch center-to-center spacing between rows of forward-facing seats, over-all width of 96 inches, center aisle width of 12 inches, and average rump width of (a) 13 inches for 3-3 seating plan and (b) 15 inches for 3-2 seating plan. Body lengths are measured from back of cowl to rear of body at floor level.

Number of rows of seats	Pupil Capacity: 3-3 plan; rump width of 13 inches	Pupil Capacity: 3-2 plan; rump width of 15 inches	Maximum body length (in inches)	Minimum measurement, cowl to center line of rear axle (in inches)	Minimum measurement cowl to end of frame (in inches)
4	24	20	178	102	173
5	30	25	196	123	187
6	36	30	222	125	210
7	42	35	250	~~112~~ 125	~~240~~ 210
8	48	40	277	160	268
9	54	45	304	192	295
10	60	50	332	211	322
11	66	55	355	229	349

Exception - small vehicles

Small vehicle may vary in capacity up to 23 pupils, may be narrower than large vehicle, and body may have been converted from one originally manufactured for other purposes.

Exception - transit and metropolitan vehicles

Measurements in preceding table do not apply.

BUMPER, FRONT - see page 8

BUMPER, REAR -

1. Rear bumper shall be of pressed steel channel at least 3/16-inch thick and 8 inches wide (high).
2. It shall be wrapped around back corners of bus. It shall extend forward at least 12 inches, measured from rear-most point of body at floor line.
3. Bumper shall be attached to chassis frame in such manner that it may be easily removed, shall be so braced as to develop full strength of bumper section from rear or side impact, and shall be so attached as to prevent hitching of rides.
4. Rear bumper shall extend beyond rear-most part of body surface at least 1 inch, measured at floor line.

CEILING - see Insulation on page 21, and Interior Panels on page 21.

CHAINS - see Item 4 under Wheel Housings on page 28.

COLOR -

1. School bus body including hood, cowl, grill, and fenders shall be painted uniform color, national school bus chrome,[12] according to specifications available from General Services Administration.
   The color known as National School Bus Chrome Yellow was designated as such by the 1939 National Conference on School Bus Standards. The National Bureau of Standards of the U. S. Department of Commerce assisted in developing this color and its colorimetric specifications, as follows:

C. I. E. Chromaticity coordinates		Daylight reflectance Y (%)			Dominant wavelength (in millicrons)			Excitation purity p (%)		
x	y	max.	std.	min.	max.	std.	min.	max.	std.	min.
.5211	.4549	--	41.	40.	584.5	583.5	582.5	--	93.7	89.0

   Available from the General Services Administration, Business Service Center, Region 3, Seventh D Streets, S. W., Washington, D. C. 20407, are copies of Federal Specification TT-E-489c entitled Enamel, Alkyd, Gloss, (for Exterior and Interior Surfaces). This document gives technical requirements; sampling, inspection, and test procedures; preparation for delivery instructions; and other information needed by paint manufacturers supplying specific colors of paint.
2. Rear bumper and lettering shall be black.[13]
3. Body trim, if used shall be black.[13]

CONSTRUCTION -

1. Construction shall be of prime commercial quality steel or other metal or other material with strength at least equivalent to all-steel as certified by bus body manufacturer. All such construction materials shall be fire-resistant.
2. Construction shall provide reasonably dustproof and watertight unit.
3. Bus body (including roof bows, body posts, strainers, stringers, floor, inner and outer linings, rub rails, and other reinforcements) shall be of sufficient strength to support entire weight of fully loaded vehicle on its top or side

[12]See footnote 7.

[13]See footnote 6.

if overturned. Bus body, as unit, shall be designed and built to provide impact and penetration resistance.

As evidence that bus body meets this standard, all body manufacturers shall furnish, for each current body model, certification in duplicate (unless more are requested by state department of education) that bus body meets Static Load Test Code for School Bus Body Structure.[14] Copies of Code will be furnished by School Bus Manufacturers Institute to each state department of education. State department of education will in turn transmit copies of Code and individual model certificates to individual state agencies responsible for development and/or enforcement of state standards for school buses.

Details involved in testing bus body structure will remain as shown in Code; to qualify under Code; however, deflections of body structure must not exceed following measurements:

a. deflection at center of roof bow----------3.00 inches
b. deflection of each side pillar at window sill level----------1.00 inch
c. deflection at center of floor---------- .40 inch.

4. Floor shall be of prime commercial quality steel of at least 14-gauge or other metal or other material at least equal in strength to 14-gauge steel. Floor shall be level from front to back and from side to side except in wheel housing, toeboard, and driver's seat platform areas.
5. Roof strainers: Two or more roof strainers or longitudinal members shall be provided to connect roof bows, to reinforce flattest portion of roof skin, and to space roof bows. These strainers may be installed between roof bows or applied externally. They shall extend from windshield header and, when combined with rear emergency door post, are to function as longitudinal members extending from windshield header to 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.

   After load as called for in Static Load Test Code has been removed, none of following defects shall be evident:

   a. Failure or separation at joints where strainers are fastened to roof bows.
   b. Appreciable difference in deflection between adjacent strainers and roof bows.
   c. Twisting, buckling, or deformation of strainer cross section.
6. Side strainer(s), in addition to the required guard rails on page 24 : There shall be one or more side strainers or longitudinal members to connect vertical structural members and to provide impact and penetration resistance in event of contact with other vehicles or objects. Such strainer(s) shall be formed (not in flat strip) from metal of at least 16-gauge and 3 inches wide.

   Side strainer(s) shall be installed in area between bottom of window and bottom of seat frame and shall extend completely around bus body except for door openings and body cowl panel. Side strainer(s) shall be fastened to each vertical structural member in any one or any combination of following methods as long as stress continuity of member(s) is maintained:

   a. Installed between vertical members.
   b. Installed behind panels but attached to vertical members.

   Fastening method employed shall be such that strength of strainer(s) is fully utilized.
7. Rear corner reinforcements: Rear corner framing of bus body between floor and window sill and between emergency door posts and last side body posts shall consist of at least three structural members applied horizontally or vertically

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[14]Obtainable from School Bus Manufacturers Institute, an Industry Division of Truck Body and Equipment Association, Inc., 1012 Fourteenth Street, N. W., Washington, D. C. 20005.

or in another combination to provide additional impact and penetration resistance equal to that provided by frame members in areas of sides of body. Such structural members shall be securely attached at each end.

8. a. Floor sills: There shall be one main body sill at each side post and two intermediate body sills on approximately 10-inch centers. All sills shall be of equal height not to exceed 3 inches. All sills shall extend width of body floor except where structural members of features restrict area.
   Main body sill shall be equivalent to or heavier than 10-gauge and each intermediate body sill shall be equivalent to or heavier than 16-gauge, or each of all body sills shall be equivalent to or greater than 14-gauge.
   All sills shall be permanently attached to floor.
   b. Connections between sides and floor system shall be capable of distributing loads from vertical posts to all floor sills. As evidence that this requirement is fulfilled, none of following conditions shall occur during or after application of load, as called for in Static Load Test Code:
   (1) Appreciable difference in deflection between adjacent sills.
   (2) Failure or separation in joints where floor, floor sills, and sides connect.
   (3) Twisting, buckling, or deformation of floor sill cross sections.
9. All openings between chassis and passenger-carrying compartment made due to alterations by body manufacturer must be sealed. (See Openings, Page 12)

Exception - small vehicles
Items 1 through 9 do not apply to small vehicles not manufactured specifically as school buses.

Exception - transit type vehicles
Item 8a does not apply.

DEFROSTERS -

Defrosters shall be of sufficient capacity to keep windshield, window to left of driver, and glass in entrance door clear of fog, frost, and snow. This may be done by using fans or by taking heat directly from approved heater or auxiliary heaters.

DOORS -

1. Service door:
   a. Service door shall be power or manually operated, under control of driver, and so designed as to afford easy release and prevent accidental opening. When hand lever is used, no parts shall come together so as to shear or crush fingers.
   b. Service door shall be located on right side of bus opposite driver and within his direct view.
   c. Service door shall have minimum horizontal opening of 24 inches and minimum vertical opening of 68 inches.
   d. Service door shall be of split type. (Split-type door includes any sectioned door which divides and opens inward or outward.) If one section of split-type door opens inward and other opens outward, front section shall open outward.
   e. Lower as well as upper panels shall be of approved safety glass. (The Director of Public Safety shall approve and maintain a list of the approved types of safety glass, conforming to recognized specifications, for safety as defined in this Chapter, and the motor vehicle bureau shall not issue a license for or re-license any motor vehicle subject to the provisions of this Chapter, unless such motor vehicle be equipped, as herein provided, with such approved type of glass. LRS: 32:361.) Bottom of lower glass

panel shall not be more than 35 inches from ground when bus is unloaded. Top of upper glass panel shall not be more than 6 inches from top of door.

f. Vertical closing edges shall be equipped with flexible material to protect children's fingers.

g. There shall be no door to left of driver. (This shall not be interpreted to conflict with Item 2a below.)

2. Emergency door and emergency window:

a. Emergency door shall be located in center of rear end of bus or in rear half of left side of bus if engine is so located as to make it impossible to place door in center of rear end.

b. Emergency door shall have minimum horizontal opening of 24 inches and minimum vertical opening of 48 inches measured from floor level.

c. Emergency door shall be hinged on right side if in rear end of bus and on front side if on left side of bus. It shall open outward and shall be labeled inside to indicate how it operates.

d. Upper portion of emergency door shall be equipped with approved safety glass, exposed area of which shall be not less than 400 square inches. (See Item 1 under Windshield and windows, page 28)

e. There shall be no steps leading to emergency door.

f. No seat or other object shall be so placed in bus as to restrict any part of passageway leading to either rear or left-side emergency door to opening smaller than rectangle of 12 inches in width and 48 inches in height, measured from floor level.

g. Words "EMERGENCY DOOR," both inside and outside in letters at least 2 inches high, shall be placed directly above emergency door.

h. If emergency door is located on left side of bus:

(1) Window at rear shall be designed as emergency exit and shall be no smaller than 16 inches in height and 54 inches in width on buses 80 inches or more in width; it shall be no smaller than 16 inches in height and 48 inches in width on buses less than 80 inches in width. Window shall be hinged from top and devised and operated to insure against accidental closing in emergency.

(2) Paneling is required to cover space between top of rear divan seat and inside surface of emergency window at rear.

i. Words "EMERGENCY EXIT," in letters at least 2 inches high, shall be placed directly above emergency window on inside and directly below it on outside.

j. (1) Emergency door and emergency window shall be designed to be opened from inside and outside of bus and shall be equipped with fastening device which may be quickly released but is designed to offer protection against accidental release. Control from driver's seat shall not be permitted. Provision for opening from outside shall consist of non-detachable device so designed as to prevent hitching-to, but to permit opening when necessary.

Emergency door shall be equipped with slide-bar, cam-operated lock. Slide bar shall have minimum stroke of 1 inch. Emergency door lock shall be equipped with suitable electric plunger-type switch connected with buzzer located in driver's compartment. Switch shall be enclosed in metal case, and wires leading from switch shall be concealed in bus body. Switch shall be so installed that plunger contacts farthest edge of slide bar in such manner that any movement of slide bar will immediately close circuit on switch and activate buzzer.

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

(2) Emergency window in rear shall be equipped with latch (or latches) on inside, connected with electrical buzzer that will actuate when latch is being released.

It shall also be equipped on outside with nondetachable fastening device so designed as to prevent hitching-to, but to permit opening from the outside.

Exception - small vehicles

Substitute following standards for those above:

1. Service door shall be located to right of driver and shall be manually controlled from driver's seat by over-center control for bus-type conveyance.
2. Emergency door:
   a. Emergency door shall be located in center of rear end of bus and shall be equipped with fastening device for opening from inside and outside body, which may be quickly released but is designed to offer protection against accidental release. Metal guard shall be placed over door control on inside. Control from driver's seat shall not be permitted. Provision for opening from outside shall consist of device designed to prevent hitching-to, but to permit opening when necessary.
   b. Door shall open either vertically or horizontally. When vertical-type door is used, there shall be unobstructed aisle at least 12 inches wide.
   c. Emergency door shall be marked "EMERGENCY DOOR" on inside.
   d. There shall be no steps leading to emergency door.
   e. No seat or other object shall be placed in bus which restricts passageway to emergency door to less than 12 inches.

ELECTRICAL SYSTEM -

1. Battery - see pages 5 and 14.
2. Generator or alternator - see page 11.
3. Lamps and signals - see page 22.
4. Wiring - see page 28.
5. See also Electrical System,, page 9.

EMERGENCY WINDOW - see Item 2 under Doors, page 18.

FIRE EXTINGUISHER -

1. Bus shall be equipped with at least one dry-chemical type fire extinguisher of at least 2½-pound capacity, mounted in extinguisher manufacturer's bracket of automotive type, and located in driver's compartment in full view of and readily accessible to driver.
2. Fire extinguisher shall bear label of Underwriters' Laboratories, Inc.,[15] showing rating of not less than 8-B:C.[16]

FIRST AID KIT -

1. Bus shall carry Grade A metal first-aid kit and Type II contents conforming to specifications as set forth in current Federal Specification GG-K-391a,[17] mounted in full view and in accessible place in driver's compartment.
2. Number of units and contents shall be designated by proper state authorities from following GG-K-391a table:

[15] 207 East Ohio Street, Chicago, Illinois 60611.

[16] 8-B:C denotes amount of chemical needed to extinguish 8-square-foot type B fire (flammable liquid) or type C fire (electrical).

[17] Obtainable from General Services Administration, Business Service Center, Region 3, 7th and D Streets, S. W., Washington 25, D. C. Price 15 cents.

Item	16-Unit	24-Unit	36-Unit
Bandage compress, (sterile gauze pads) 4-inch.....	2	2	5
Bandage compress, (sterile gauze pads) 2-inch.....	1	1	3
Adhesive absorbent bandage (adhesive tape) 1 inch....	2	3	4
Triangular bandage, 40-inch.....	1	2	4
Gauze bandage, 4-inch.....	1	2	2
Absorbent-gauze compress.....	1	2	2
Burn compound, 1/8 - ounce.....	2	2	1
Burn compound 5/8 - ounce.....	-	-	2
Eye-dressing unit.....	-	1	1
Antiseptic applicators (swab type) (iodine or nitromersol tincture N.F. or thimersol N.F.).....	2	3	4
Ammonia inhalants.....	1	1	2
Ammonia ampules.....	-	1	2
Wire splints.....	1	2	2
Tourniquet and forceps.....	2	2	2

FLOOR - see Construction on page 15.

FLOOR COVERING -

1. Floor in underseat area, including tops of wheel housings, driver's compartment, and toeboard, shall be covered with fire-resistant rubber floor covering or equivalent having minimum over-all thickness of .125 inch.
2. Floor covering in aisle shall be of aisle-type fire-resistant rubber or equivalent, non-skid, wear-resistant, and ribbed. Minimum over-all thickness shall be .140 inch measured from tops of ribs. Rubber floor covering shall meet Federal Specification ZZ-M-71b.[18]
3. Floor covering must be permanently bonded to floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be of type recommended by manufacturer of floor-covering material. All seams must be sealed with waterproof sealer.

Exception - small vehicles

Floor covering on small vehicles not manufactured specifically as school buses shall be manufacturer's standard.

HEATERS -

1. Each bus shall be equipped with a hot-water, fresh-air and recirculating type three fan heater capable of a minimum free delivery of 80,000 B.T.U., fresh air 60,000 B.T.U. and recirculating air at 50,000 B.T.U.
2. All hot-water heaters used shall bear name plate rating in accordance with Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment,[19] plate to be affixed by heater manufacturer. Copies of the Code shall be furnished in duplicate (unless more are requested by state department of education) by School Bus Manufacturers Institute to each state department of education. State department of education shall, in turn, transmit such Code to each other state agency responsible for development or enforcement of state standards for school buses.

[18]Obtainable from Superintendent of Documents, Washington, D. C. 20401.

[19]Obtainable from School Bus Manufacturers Institute, an Industry Division of Truck Body and Equipment Association, Inc., 1012 Fourteenth Street, N. W., Washington, D. C. 20005.

3. Heaters shall be capable of maintaining inside temperature of 50 degrees Fahrenheit at average minimum January temperatures as established by U. S. Department of Commerce, Weather Bureau.[20]

Exception - small vehicles

Item 2 does not apply to vehicles not specifically manufactured as school buses.

IDENTIFICATION -

1. Shall be in black enamel, decals not permitted.
2. Body shall bear words "SCHOOL BUS" in black letters at least 8 inches high on both front and rear of body or on signs attached thereto. Lettering shall be placed as high as possible without impairment of its visibility. Lettering shall conform to "Series B" of Standard Alphabets for Highway Signs.[21]
3. Words "STOP ON SIGNAL" shall be painted on rear of bus. Word "STOP" by itself shall not be used. Height of letters shall be a minimum of 6 inches black lettering.
4. Only signs and lettering approved by state law or regulation, limited to name of owner or operator and any number necessary for identification including parish schools, shall appear on sides of bus.
   a. There shall be the name of the parish schools in black lettering a minimum of 6 inches on both sides of the bus.
   b. Name and address of owner shall be on the left side of the bus opposite of the driver's seat in black lettering a minimum of 3 inches.

INSIDE HEIGHT -

Inside body height shall be nominal 72 inches or more, measured metal to metal, at any point on longitudinal center line from front vertical bow to rear vertical bow.

Exception - small vehicles

Standard does not apply.

INSULATION -

Ceiling and walls shall be insulated with proper material to deaden sound and to reduce vibrations to a minimum. Insulating materials shall be an asphalt-base underbody coating conforming to Federal Specification No. TT-C-520a, latest amendment, and shall be applied where and as specified herein. The requirement for the coating material in Sections titled "EXTERIOR", "FLOOR", "INTERIOR", "UNDER-COATING", and "WHEEL HOUSING" is to provide for insulation, sound deadening, protection from road minerals, and rust prevention as applicable.

INTERIOR PANELS -

1. All interior panels shall be of the type, grade and thickness of steel specified in Construction, page 15. Front and rear panels shall be formed to present a smooth, pleasing appearance. Roof panels shall be continuous from header to header. All joints shall be neat and smooth.
2. All interior panels shall be attached to the frame structure by bolts, rivets or by any well-designed method utilizing self-locking panels, locking panel strips, or clips. Regardless of the method used, the panels shall be so

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[20] Washington, C. C. 20235

[21] Designed by U. S. Bureau of Public Roads for Joint Committee on Uniform Traffic Control Devices. A full-scale layout (40 inches over-all length) of words "SCHOOL BUS" as here specified, with suggestions for application, is available from National Commission on Safety Education, 1201 Sixteenth Street, N. W., Washington, D. C. 20036, Price, 50 cents. One copy of this layout may be used repeatedly as guide for placing specified lettering on buses.

securely attached that vibration, rumble and popping will be at a minimum. All interior panels shall be sprayed, on the outside, over the main surfaces, and shall featheredge to within 2 inches of the edge of the attaching member with 1/16-inch thick material conforming to Federal Specification No. TT-C-520a or lined with $1\frac{1}{2}$-inch thick fiberglass, provided that the metal has been rustproofed.

LAMPS AND SIGNALS - (See figures on pages 39 and 40)

1. All lamps and their installation shall conform to current standards and recommended practices of Society of Automotive Engineers.[22]
2. Head lamps: Bus shall be equipped with head lamps.
3. Clearance and side-marker lamps: Clearance and side-marker lamps (amber at front, red at rear) shall be mounted as high as possible on permanent structure of bus and in such manner as to indicate extreme width of body. Clearance lamps and side-marker lamps may be in combination.
   a. Two red reflectors on the rear of bus.
   b. Two reflectors on each side, one at or near the front and one at or near the rear. Front reflector shall be amber and rear red.
   c. Reflectors shall be mounted at a height not less than 24 inches and not higher than 60 inches above the ground on which the vehicle stands, except that if the highest part of the permanent structure of the vehicle is less than 24 inches the reflector at such point shall be mounted as high as that part of the permanent structure will permit.
4. Tail and stop (brake) lamps:
   a. Bus shall be equipped with two tail lamps and two stop (brake) lamps not in combination, emitting red light plainly visible for distance of 500 feet to rear. Stop (brake) lamps shall have light intensity at least equal to that of Class A turn signal lamps as established by Society of Automotive Engineers. Stop light shall be Cats Eye No. 35S or its equivalent.
   b. Tail lamps shall be mounted not less than 40 inches from surface on which vehicle stands. Stop (brake) lamps shall be as high as practicable but below window line, and spaced as far apart laterally as practicable but not less than 3 feet. Measurements shall be taken from lamp centers.
5. License-plate lamp: Bus shall be equipped with rear license-plate illuminator. This lamp may be combined with one of tail lamps.
6. Interior lamps: Interior lamps shall be provided which adequately illuminate aisle and step-well.
7. School bus alternately flashing red signal lamps:
   Definition: School bus alternately flashing red signal lamps are lamps mounted at same horizontal level, intended to identify vehicle as school bus and to inform other users of highway that such vehicle is stopped or about to stop on roadway to take on or discharge school children.
   a. Bus shall be equipped with two red lamps at rear of vehicle and two red lamps at front of vehicle, which shall be controlled by manually actuated switch and when actuated shall flash alternately at rate of 60 to 120 cycles per minute. "On" period shall be long enough to permit bulb filament to come up to full brightness. No brake-operated switch shall be permitted.
   b. There shall be visible or audible means of giving clear and unmistakable indication to driver when signaling system is turned on.
   c. Installation recommendations:
      (1) Each signal lamp shall be mounted with its axis substantially parallel to longitudinal axis of vehicle.
      (2) Front and rear signal lamps shall be spaced as far apart laterally

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[22] 485 Lexington Avenue, New York, New York 10017

as practicable, but in no case shall spacing between lamp centers be less than 40 inches.

(3) Signal lamps shall be mounted at front on same horizontal center line and above windshield, and at rear on same horizontal center line so that lower edge of lens is not lower than top line of side window opening.

(4) Vision of front signal lamps to front and rear signal lamps to rear shall be unobstructed by any part of vehicle from 5 degrees above to 10 degrees below horizontal and from 30 degrees to right and 30 degrees to left of center line of vehicle.

(5) Area around lens of each alternately flashing red signal lamp and extending outward approximately 3 inches shall be painted black.[23] In installations where there is no flat vertical portion of body immediately surrounding entire lens of lamp, circular or square band of black[23] approximately 3 inches wide, immediately below and to both sides of lens, shall be painted on body or roof area against which signal lamp is seen (from distance of 500 feet along axis of vehicle).

(6) Each lamp shall be mounted with its aiming plane vertical and normal to the vehicle axis.

8. Turn signal lamps: Bus shall be equipped with Class A turn signal lamps that meet specifications of Society of Automotive Engineers.[24] These signals must be independent units and may be equipped with four-way hazard warning switch to cause simultaneous flashing of turn signal lamps when needed as vehicular traffic hazard warning.
   a. Turn signal should be Cats Eye No. 45 SAE A-1 or its equivalent.
9. Flags and flares:
   a. School bus shall carry at all times at least two red cloth flags not less than 12 inches square and means for mounting for use in warning traffic in event of prolonged stops on highway.
   b. Bus shall carry at least three red electric lanterns, or at least three red emergency reflectors, to be displayed according to state law in event of prolonged stops on highway.

METAL TREATMENT -

All metal used in construction of bus body shall be copper bearing- 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, stanchions, interior decorative parts, and other interior plated parts.)

All metal parts that will be painted shall be (in addition to above requirements) chemically cleaned, etched, zinc-phosphate-coated, and zinc-chromate or epoxy-primed or conditioned by equivalent process.

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

As evidence that above requirements have been met, samples of materials and sections used in construction of bus body, when subjected to 1,000-hour salt spray test as provided for in latest revision of ASTM Designation: B 117, "Standard Method of Salt Spray (Fog) Testing,"[25] shall not lose more than 10 percent of material by weight.

Exception - small vehicles

Standard does not apply to small vehicles not specifically manufactured as school buses.

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[23]See footnote 6.

[24]485 Lexington Avenue, New York, New York 10017.

[25]American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103.

MIRRORS -

1. Interior clear-view mirror shall be at least 6 by 30 inches over-all, to afford good view of pupils and roadway to rear. If not metal-backed and framed, mirror shall be of laminated plate safety glass.[26] It shall have rounded corners and protected edges.
2. Two exterior clear-view, rearview mirrors shall be provided, one to left and one to right of driver. Area of each mirror shall be not less than 50 square inches over-all. Each mirror shall be firmly supported and adjustable to give driver clear views past left rear and right rear of bus.
3. Exterior convex mirror at least $7\frac{1}{2}$ inches in diameter shall be located either on left or right side of bus in such manner that seated driver may observe, through its use, areas to front or side of bus where direct observation is not possible.

MOUNTING -

1. Chassis frame shall extend to rear edge of rear body cross member. Bus body shall be attached to chassis frame in such manner as to prevent shifting or separation of body from chassis under severe operating conditions.
2. Body front shall be attached and sealed to chassis cowl in such manner as to prevent entry of water, dust, and fumes through joint between chassis cowl and body.
3. Insulating material shall be placed at all contact points between body and chassis frame. Insulating material shall be approximately $\frac{1}{4}$ inch thick, shall have quality of sidewall of automobile tire, and shall be so attached to chassis frame or body member that it will not move under severe operating conditions.

Exception - small vehicles

Standard does not apply to vehicles not specifically manufactured as school buses.

OVER-ALL LENGTH -

Over-all length of bus shall not exceed 35 feet.

OVER-ALL WIDTH -

Over-all width of bus shall not exceed 96 inches.

POSTS -

Roof bows and body posts shall be of one piece or no more than three piece construction. If the roof bows and body posts are more than one piece construction, the body manufacturer shall guarantee the construction against structural failure for a period of five years. Bows and posts shall have a minimum thickness equal to U. S. standard 16 gauge and have a minimum depth of 1 3/4 inch. Bow or post shall be securely anchored to the floor, floor beams, or a longitudinal member at the floor line. Bows and posts will be spaced on maximum of 30-inch centers with a maximum of two sections of not over 39-inch centers.

RUB RAILS -

1. There shall be one rub rail located on each side of bus approximately at seat level which shall extend from rear side of entrance door completely around bus body (except for emergency door) to point of curvature near outside cowl on left side.
2. There shall be one rub rail located approximately at floor line which shall cover same longitudinal area as upper rub rail, except at wheel housing, and shall extend only to radii of right and left rear corners.

[26]Current Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways (Z26.1), obtainable from American Standards Association, Inc., 10 East Fortieth Street, New York, New York 10016.

3. Both rub rails shall be attached at each body post and all other upright structural members.
4. Both rub rails shall be 4 inches or more in width, shall be of 16-gauge steel, and shall be constructed in corrugated or ribbed fashion.
5. Both rub rails shall be applied outside body or outside body posts. Pressed-in or snap-on rub rails do not satisfy this requirement.

Exception - small vehicles
Standard does not apply to small vehicles not manufactured specifically as school buses.

SEAT BELT FOR DRIVER -
Seat belt for driver shall be provided, belt to comply with current specifications and recommended practices of Society of Automotive Engineers[27] except that belt shall be fastened to bus floor immediately behind driver's seat when adjusted to its rear-most position.

SEATS -
1. All seats shall have minimum depth of 14 inches.
2. In determining seating capacity of bus, allowable average rump width shall be:
   a. 13 inches where 3-3 seating plan is used
   b. 15 inches where 3-2 seating plan is used. (See table under Body size, page 14)
3. All seats shall be forward-facing and shall be securely fastened to that part or parts of bus which support them. (See Item 2 under Aisle, page 14)
4. No bus shall be equipped with jump seats or portable seats.
5. Forward-most pupil seat on right side of bus shall be located so as not to interfere with driver's vision, not farther forward than guard rail behind driver or rear of driver's seat when adjusted to its rear-most position.
6. Minimum center-to-center seat spacing shall be 27 inches. Distance between driver's seat when adjusted to its rear-most position and front face of seat-back of forward-most pupil seat on left side of bus shall not be less than 24 inches measured at cushion height.
7. Seat cushion shall be constructed with springs, foam rubber, polyurethane foam, or other equivalent material. If springs are used, there shall be at least 21 springs per cushion. Padding used to cover springs may be cotton, rubberized hair, foam rubber, or other equivalent material. If cotton or similar material is used, padding for cushions shall be at least 2 inches thick, except for reasonable distance from edge of cushion to allow for curve of edges. If sponge rubber, rubberized hair, or similar material is used, its thickness shall be at least 1 inch, except for edges of cushion. If foam rubber or polyurethane foam is used without springs, its thickness in cushion shall be approximately 5 inches and it shall be depressed not more than 80 percent when distributed weight of 345 pounds is applied to it. If cotton or similar material, rubberized hair, foam rubber, or polyurethane foam is used in seat back rests, it shall be approximately 2 inches thick and shall not be depressed more than 80 percent when distributed weight of 300 pounds is applied to it. Seat covering shall be artificial leather equal to coated fabrics, 42-ounce finished weight, 54 inches wide, reinforced backing of 1.06 broken twill. Padding and covering on all seats shall be of material that will not flash or explode upon contact with spark or open fire. Seams of seat cushions shall be made of good qualify welt.
8. Minimum distance between steering wheel and back rest of driver's seat shall be 11 inches. Driver's seat shall be strongly attached, shall have vertical

[27] 485 Lexington Avenue, New York, New York 10017.

adjustment, and shall have fore-and-aft adjustment of not less than 4 inches.

9. Minimum of 36-inch headroom for sitting position above top of undepressed cushion line of all seats shall be provided. Measurement shall be made vertically not more than 7 inches from side wall at cushion height and at fore-and-aft center of cushion.
10. Backs of all seats of similar size shall be of same width at top and of same height from floor and shall slant at same angle with floor.
11. Where grab handles on seats are used, they shall be enclosed.
12. Fiber-glass seats may be used provided that they meet the following standards:
    a. Fiber-glass seats must meet all foregoing provisions for seats except those concerning construction of seat cushions and seat backs.
    b. Fiber-glass seats shall combine rigid construction of welded tubular steel with contoured matched die-formed or hand-sprayed molded plastic shell. Exposed steel shall be stainless steel or shall be finished with baked enamel.
    c. Plastic shells shall consist of good commercial grade, fire-resistant, color-pigmented resin reinforced with glass fibers in such manner as to avoid resin-rich sections. Shells shall be shaped to provide maximum comfort.
    d. Both metal frames and plastic shells shall have rounded corners and be free from sharp edges.

Exception - small vehicles

Substitute following standards for those above:

1. All seats shall be securely fastened to body of vehicle.
2. Seats shall be covered with fire-resistant padding material and comfortably upholstered with adequate padding. (Not applicable to fiber-glass seats.)
3. Jump seats or portable seats shall not be used.
4. Allowable average rump width in determining seating capacity of bus shall be 13 inches.
5. All seats shall be at least 14 inches in over-all depth.
6. All seats shall be forward-facing seats and so placed that distance from center to center measured at top center of backs shall be not less than 27 inches.

STANCHIONS AND GUARD RAILS -

1. Vertical stanchion shall be installed at right rear corner of driver's seat in such position as neither to interfere with adjustment of driver's seat nor to obstruct 12-inch aisle. Guard rail, approximately 30 inches above floor, and so placed as not to interfere with fore-and-aft adjustment of driver's seat, shall extend from vertical stanchion to left-hand wall behind driver's seat.
2. Vertical stanchion shall be installed at rear of entrance step-well from roof to floor. Placement shall not restrict passageway at any level to less than 24 inches nor aisle to less than 12 inches.
3. Guard rail and step-well guard panel shall be installed from step-well stanchion to right-hand wall to prevent children in front seat from being thrown into step-well in case of sudden stop. Guard rail shall be approximately 30 inches above floor and its guard panel shall not restrict entrance passageway to less than 24 inches at any level. Panel shall extend from guard rail to within 2 inches of floor. If panel extends over or into step-well opening, it must be flanged at floor line so as to close any opening between panel and floor.
4. Clearance between step-well guard panel and first pupil seat shall be at least 24 inches measured from panel to front face of seat back at cushion height.
5. All stanchions and guard rails shall be minimum of 1-inch outside diameter

and stainless steel clad.

Exception - small vehicles

Standard does not apply to vehicles not specifically manufactured as school buses.

STEERING WHEEL - see Item 4 under Steering gear on page 13.

STEPS -

1. First step at service door shall be not less than 12 inches and not more than 16 inches from ground, based on standard chassis specifications.
2. Service door entrance may be equipped with two-step or three-step step-well. Risers in each case shall be approximately equal. When plywood floor is used on steel, differential may be increased by thickness of plywood used.
3. Steps shall be enclosed to prevent accumulation of ice and snow.
4. Steps shall not protrude beyond side body line.
5. Grab handle not less than 10 inches in length shall be provided in unobstructed location inside doorway.
6. Surface of steps shall be of non-skid material.

Exception - small vehicles

Steps (if any) on small vehicles not manufactured specifically as school buses shall be manufacturer's standard.

STIRRUP STEPS -

There shall be one stirrup step and suitably located handle on each side of front of body for easy accessibility for cleaning windshield and lamps.

Exception - small vehicles

Standard does not apply to vehicles not specifically manufactured as school buses.

STOP SIGNAL ARMS -

Each school bus shall be equipped with two semaphore arms mounted on the left side of bus, one as near the front of the cab of the bus as practicable, and the other as near the rear of the cab of the bus as practicable, said semaphore arms to be painted red, with the word "Stop" on each side thereof in white letters not less than 6 inches in height, with said semaphore arms folded back against the side of the bus when at rest, capable of being extended perpendicular to the side of the bus with controls operated by the driver. Vacuum line shall be of copper tubing.

Recommended semaphore arms are Campco Model No. 1075 and 1800 and Traffic Master Model No. 100 and 400.

STORAGE COMPARTMENT -

Metal container of adequate strength and capacity for storage of tire chains and/or tow chains and such tools as may be necessary for minor emergency repairs while bus is enroute shall be provided. Such storage container may be located either inside or outside passenger compartment but, if inside, it shall have cover (seat cushion may serve for this purpose) and be fastened to floor in right rear portion of bus.

SUN SHIELD -

Interior adjustable sun shield not less than 6 by 16 inches in size shall be installed above windshield.

TAILPIPE -

Tailpipe shall not extend beyond rear bumper.

UNDERCOATING -

Entire underside of body, including floor members and side panels below floor

level shall be coated with fire-resistant, asphalt base, rubber base, or other undercoating material, applied by spray method, in order to seal, to deaden sound, to insulate, and to prevent oxidation. At least 1/8-inch-thick material conforming to Federal Specification No. TT-C-520a is preferred.

VENTILATION -

1. Body shall be equipped with suitable, controlled ventilating system of sufficient capacity to maintain proper quantity of air under operating conditions without opening of windows except in extremely warm weather.
2. If static-type exhaust roof ventilators are desired, they shall be installed in low-pressure area of roof panel.

WHEEL HOUSINGS -

1. Wheel house openings shall allow for easy tire removal and service.
2. Wheel housings shall be designed to support seat and passenger loads and shall be attached to floor sheets in such manner as to prevent any dust or water from entering the body.
3. Inside height of wheel housings above floor line shall not exceed 10 inches.
4. Wheel housings shall provide clearance for dual wheels as established by National Association of Chain Manufacturers.[28]

Exception - small vehicles
Standard does not apply to small vehicles not manufactured specifically as school buses.

WIDTH - see Over-all width on page 24.

WINDSHIELD AND WINDOWS -

1. All glass in windshield, windows, and doors shall be of approved safety glass,[29] so mounted that permanent mark is visible, and of sufficient quality to prevent distortion of view in any direction. (See Doors, page 17.)
2. Each full side window shall provide unobstructed emergency opening at least 9 inches high and 22 inches wide, obtained by lowering of window.
3. Knockout-type, split-sash windows may be used.
4. All exposed edges of glass shall be banded.

WINDSHIELD WASHERS -

Windshield washers shall be optional but, where required, they shall conform to body manufacturer's recommendations as to type and size for bus on which they are to be used.

WINDSHIELD WIPERS -

Each bus shall be equipped with two (2) heavy-duty 2-speed electric or vacuum motor-driven windshield wipers. The arms and blades shall be of sufficient size to give clear vision for the driver. The two motors furnished shall be guaranteed to operate the wipers under all driving conditions and shall be American Bosch Model WWC or equivalent. All controls shall be placed so they can be operated by driver while in a sitting position.

WIRING -

1. All wiring shall conform to current standards of Society of Automotive Engineers.[30]

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[28] 111 West Washington Street, Chicago, Illinois 60602

[29] See footnote 26

[30] 485 Lexington Avenue, New York, New York 10017.

2. Circuits:
   a. Wiring shall be arranged in at least nine regular circuits, as follows:
      (1) head, tail, stop (brake), and instrument panel lamps
      (2) clearance lamps
      (3) dome and step-well lamps
      (4) starter motor
      (5) ignition and emergency door signal
      (6) turn signal lamps
      (7) alternately flashing red signal lamps
      (8) horn
      (9) heater and defroster
   b. Any of above combination circuits may be subdivided into additional independent circuits.
   c. The windshield wipers shall be provided with independent and properly protected circuits.
   d. Each body circuit shall be color coded and a diagram of the circuits shall be attached to the body in a readily accessible location.
3. A separate fuse or circuit breaker shall be provided for each circuit except starter motor and ignition circuits.
4. All wires within body shall be insulated and protected by covering of fibrous loom (or equivalent) which will protect them from external damage and minimize dangers from short circuits. Whenever wires pass through body member, additional protection in form of appropriate type of insert shall be provided.
5. Wires not enclosed within body shell shall be fastened securely at intervals of not more than 24 inches. All joints shall be soldered or joined by equally effective connectors.

Exception - small vehicles
Wiring shall be manufacturer's standard.

CHASSIS SPECIFICATIONS

Table No. I

36 Passenger School Bus Chassis Requirements

	Minimum Requirements
Tire Size and Ply	7.50-20-8
Rim Size	6.0
Gross Vehicle Weight	17,000
Cubic Inch Displacement	265
Torque: Net	236
Horsepower: Net	130
Transmission Speeds Forward	4
Square Inch Brake Lining	385
Wheelbase - Inches	~~187~~ 149
Cowl to Axle - Inches	~~162~~ 125
Cowl to End of Frame - Inches	~~268~~ 210
Front Axle Gross Weight Rating	5,000
Rear Axle Gross Weight Rating	15,000
Clutch	12"

Table No. II

42 Passenger School Bus Chassis Requirements

	Minimum Requirements
Tire Size and Ply	7.50-20-10
Rim Size	6.0
Gross Vehicle Weight	17,000
Cubic Inch Displacement	265
Torque: Net	236
Horsepower: Net	130
Transmission Speeds Forward	4
Square Inch Brake Lining	385
Wheelbase - Inches	~~187~~ 149
Cowl to Axle - Inches	~~162~~ 125
Cowl to End of Frame - Inches	~~268~~ 210
Front Axle Gross Weight Rating	5,000
Rear Axle Gross Weight Rating	15,000
Clutch	12"

Table No. III

48 Passenger School Bus Chassis Requirements

	Minimum Requirements
Tire Size and Ply	7.50-20-10
Rim Size	6.0
Gross Vehicle Weight	~~17,000~~ 19,000
Cubic Inch Displacement	292
Torque: Net	255
Horsepower: Net	150
Transmission Speeds Forward	4
Square Inch Brake Lining	385
Wheelbase - Inches	187
Cowl to Axle - Inches	162
Cowl to End of Frame - Inches	268
Front Axle Gross Weight Rating	5,000
Rear Axle Gross Weight Rating	15,000
Clutch	12"

Table No. IV

54 Passenger School Bus Chassis Requirements

	Minimum Requirements
Tire Size and Ply	8.25-20-10
Rim Size	6.5
Gross Vehicle Weight	~~22,000~~ 19,000
Cubic Inch Displacement	300
Torque: Net	260
Horsepower: Net	155
Transmission Speeds Forward	4
Square Inch Brake Lining	385
Wheelbase - Inches	217
Cowl to Axle - Inches	192
Cowl to End of Frame - Inches	295
Front Axle Gross Weight Rating	~~7,000~~ 5,000
Rear Axle Gross Weight Rating	15,000
Clutch	12"

Table No. V

60 Passenger School Bus Chassis Requirements

	Minimum Requirements
Tire Size and Ply	8.25-20-10
Rim Size	6.5
Gross Vehicle Weight	~~22,000~~ 26,000
Cubic Inch Displacement	315
Torque: Net	280
Horsepower: Net	~~160~~ 152
Transmission Speeds Forward	4
Square Inch Brake Lining	448
Wheelbase - Inches	235
Cowl to Axle - Inches	211
Cowl to End of Frame - Inches	322
Front Axle Gross Weight Rating	~~7,000~~ 6,000
Rear Axle Gross Weight Rating	15,000
Clutch	12"

Table No. VI

66 Passenger School Bus Chassis Requirements

	Minimum Requirements
Tire Size and Ply	9.00-20-10
Rim Size	7.0
Gross Vehicle Weight	23,000
Cubic Inch Displacement	~~325~~ 300
Torque: Net	286
Horsepower: Net	~~164~~ 170
Transmission Speeds Forward	4
Square Inch Brake Lining	448
Wheelbase - Inches	253
Cowl to Axle - Inches	229
Cowl to End of Frame - Inches	349
Front Axle Gross Weight Rating	7,000
Rear Axle Gross Weight Rating	16,000
Clutch	13"

VEHICLES FOR TRANSPORTING HANDICAPPED CHILDREN

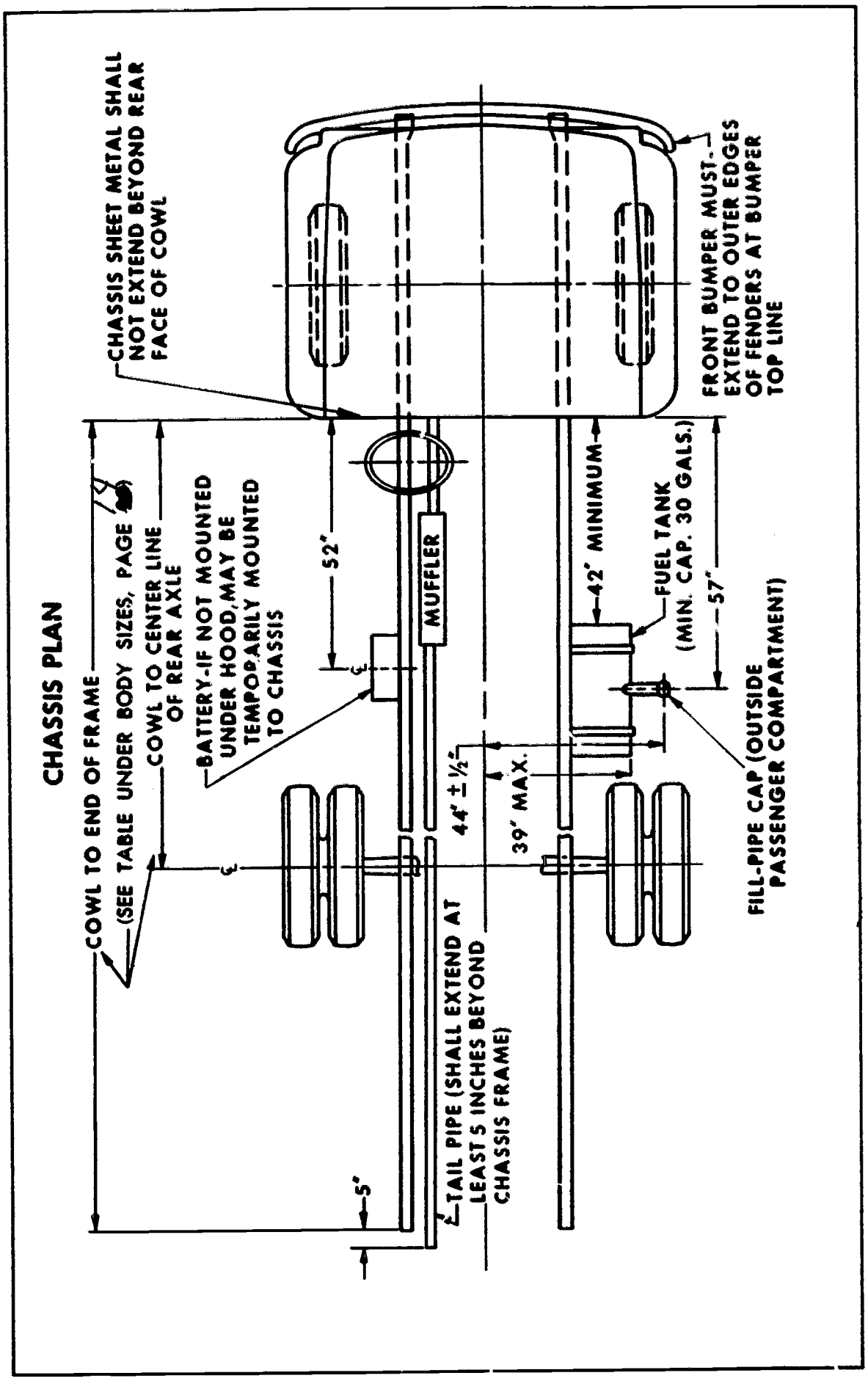
GENERAL REQUIREMENTS

Vehicles constructed for transporting handicapped children shall comply generally with minimum standards for school buses but, because of use of special equipment, certain modifications in these minimum standards must be made. This section lists, with respect to vehicles constructed or modified for transportation of handicapped children, (a) standards for special equipment, and (b) exceptions required in minimum standards for school buses.

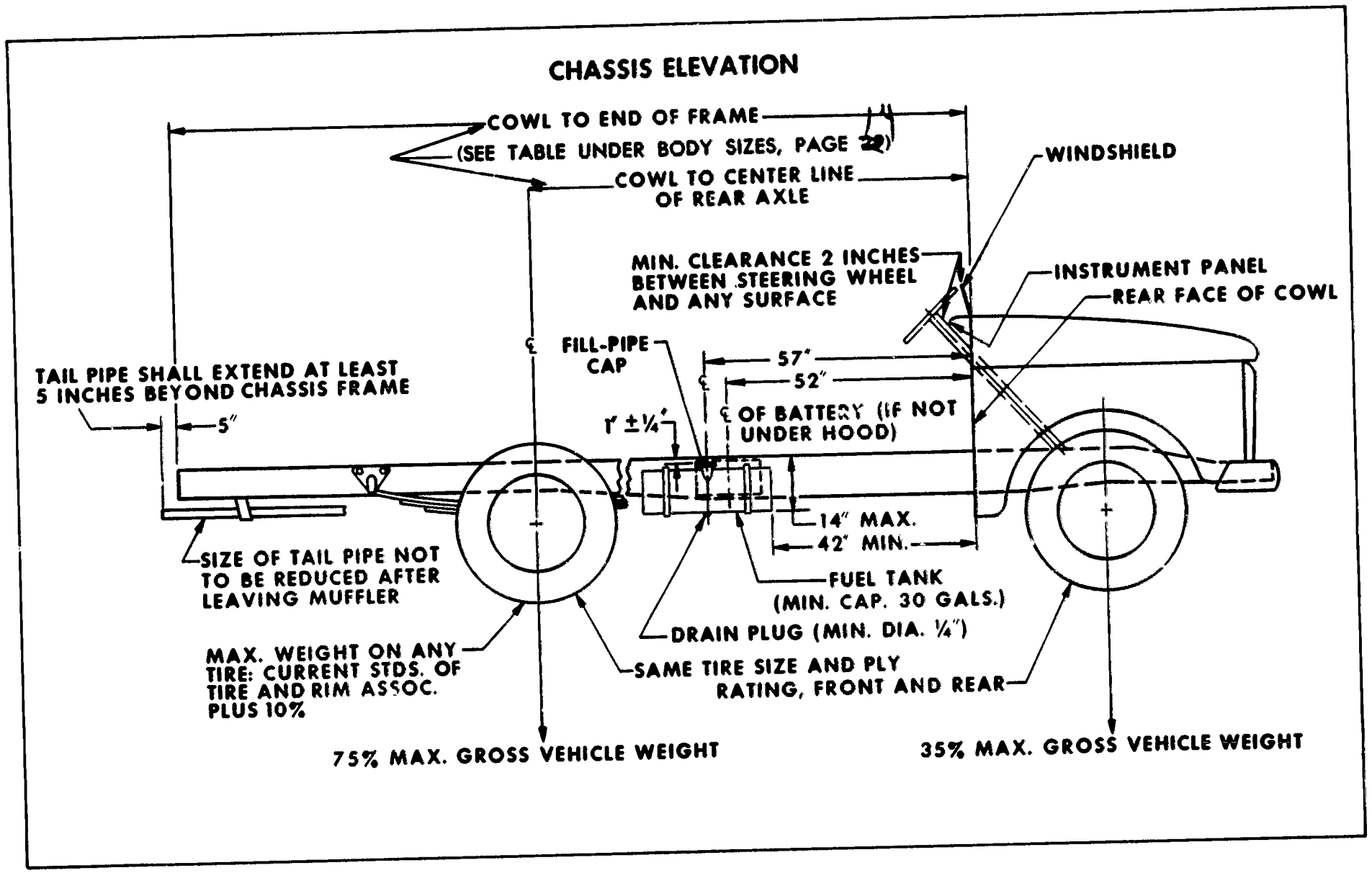
SPECIAL EQUIPMENT

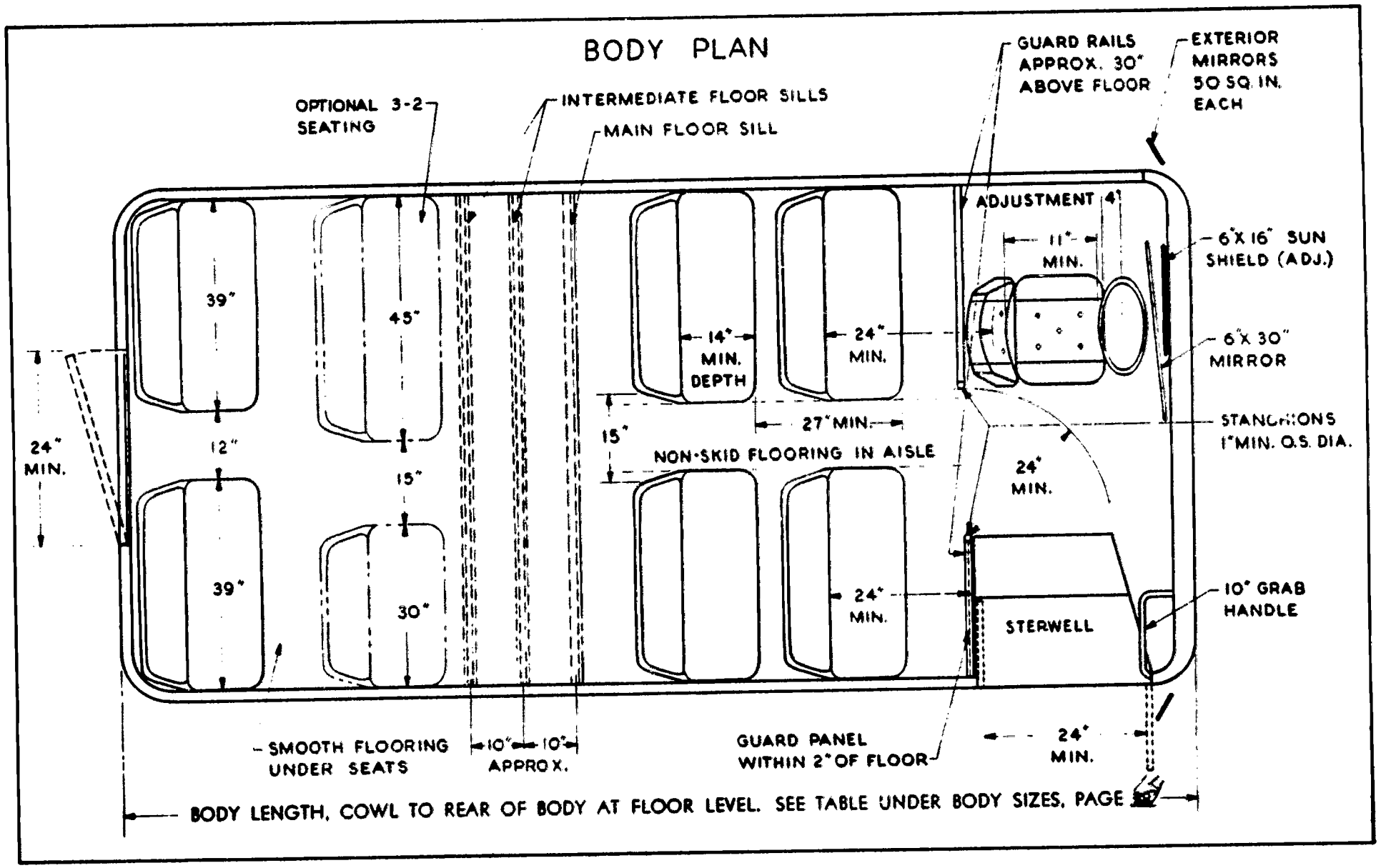
1. Special service door:
   a. Special door opening shall be located on right side of bus and far enough to rear to prevent door, when open, from obstructing front right service door. Door opening shall be not less than 48 inches in width.
   b. Door shall be made of two panels of approximately equal width, equipped with hinges and hinged to side of bus, and each panel shall open outward. Forward panel shall be provided with overlapping flange to close space where door panels meet and weather seal shall be provided to close all door edges.
   c. Door shall be equipped with at least one-point fastening device on rear panel to floor or header and at least two-point fastening device to floor and header on forward door panel, both manually operated.
   d. Door shall be equipped with device that will actuate audible or visible signal located in driver's compartment when doors are not securely closed.
   e. Each door shall contain fixed or movable window aligned with lower line of other windows of bus and as nearly as practical of same size as other bus windows.
   f. Each door panel shall open outward and positive fastening device shall be installed to hold door in open position.
   g. Door panels shall be constructed to be equivalent in strength and materials to other school bus doors.
   h. When ramps are used, door panels shall extend below floor line to cover ramp container opening. When power lifts are used, door panels shall extend below to full length of skirt.
   i. Door posts and headers shall be reinforced sufficiently to provide support and strength equivalent to areas of side of bus not used for service doors. Outriggers from chassis shall be installed at front and rear of door opening to support floor with same strength as other floor portions.
2. Ramp:
   a. If ramp is used, it shall be of sufficient strength and rigidity to support wheel chair, occupant, and attendant. It shall be equipped with protective flange on each longitudinal side to keep wheel chair on ramp.
   b. Floor of ramp shall be covered with non-skid material.
   c. Ramp shall be of weight, and equipped with handle or handles, to permit one person to put ramp in place and to return it to storage place.
   d. Provisions shall be made to secure ramp to side of bus for use without danger of detachment, and ramp shall be connected to bus at floor level in such manner as to permit easy access of wheels of wheel chair to floor of bus.
   e. Ramp shall be at least 88 inches in length and width of ramp shall conform generally to width of door opening.
   f. Dustproof and waterproof enclosed container shall be provided if ramp is stored under floor.

3. Power lift:
   a. If power lift is used, it shall be of sufficient capacity to lift wheel chair, occupant, and attendant.
   b. Power lift shall be mounted to chassis frame.
   c. Power lift platform shall be not less than 26 inches in width nor less than 45 inches long, including guard panels or rails.
   d. Power lift platform shall be covered with non-skid material.
   e. Self-adjusting steel or equivalent ramp of sufficient width to minimize incline to lift platform shall be attached to lift platform. Ramp shall be equipped with skid-resistant surface.
   f. Power lift unit shall be controlled from panel within bus and adjacent to lift and be capable of operation by attendant standing upon lift when lift is in any position.
   g. Device shall be installed which will be used to prevent operation of lift until doors are opened.
4. Stanchions:
   Stanchion, guard rail, and guard panel shall be installed at both rear and front edges of special service door opening extending into bus. If power lift is used, chain shall be installed between stanchion posts to enclose area of power lift.
5. Fastening devices for wheel chairs:
   Positive fastening devices shall be provided, attached to floor or walls or both, that will securely hold wheel chairs in position when in bus.
6. Seat restraining devices:
   Seat frames shall be equipped with rings or other devices to which belts or restraining harnesses may be attached.
7. Aisles:
   All aisles, including aisles leading to emergency door, shall be wide enough to permit passage of wheel chair.
8. Special light:
   Light shall be placed inside bus, over special service door, and shall be operated from door area.
9. Grab handles:
   Grab handles shall be provided on each side of front right service door on buses constructed for transportation of handicapped children.
10. Fuel tank:
    See Exception - vehicles of less than 54 passenger capacity constructed for transporting handicapped children, under Fuel tank, page 11.

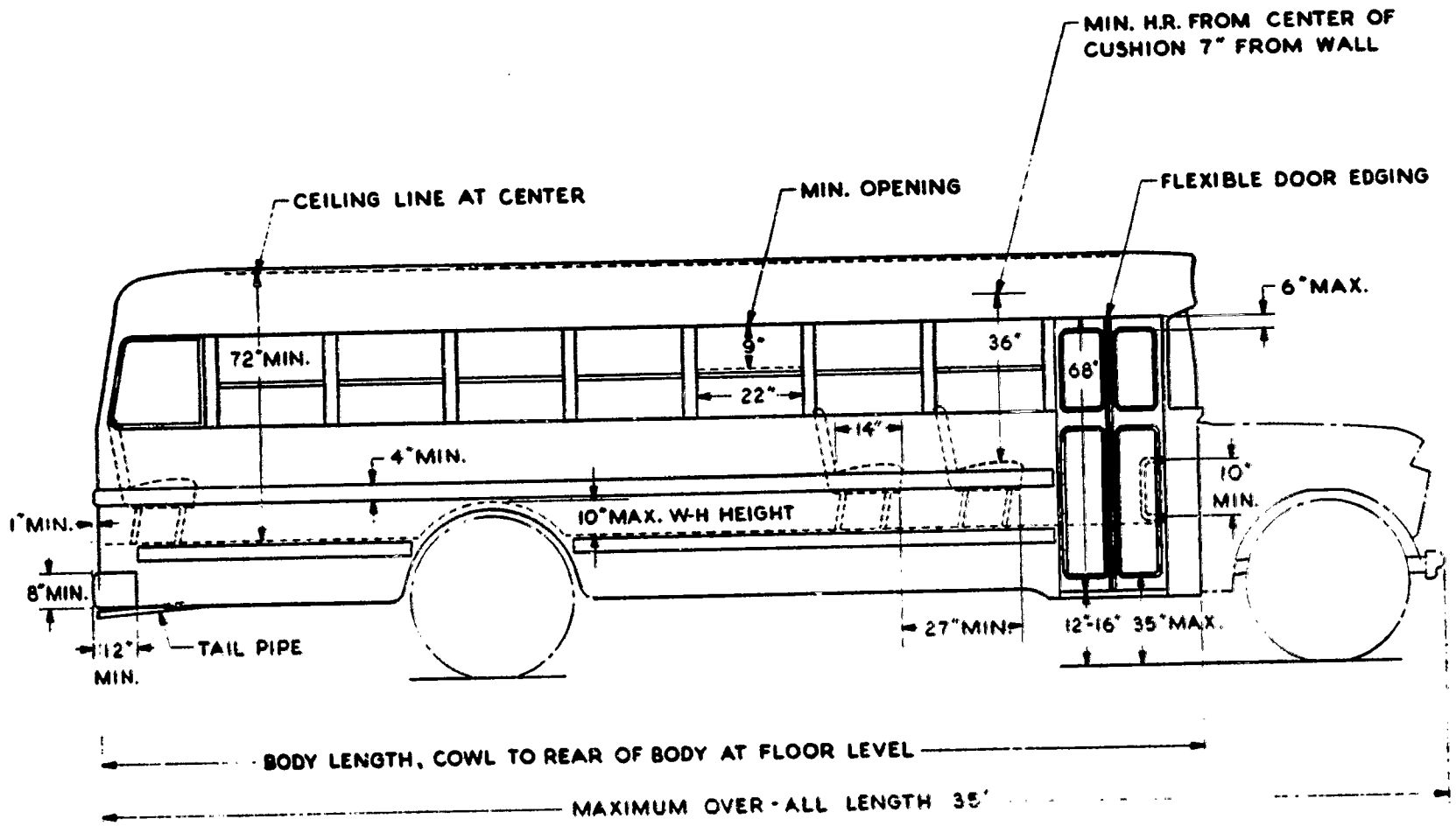

CHASSIS PLAN
OF FRAME
UNDER BODY SIZES, PAGE
COWL TO CENTER LINE OF REAR AXLE
BATTERY-IF NOT MOUNTED UNDER HOOD, MAY BE TEMPORARILY MOUNTED TO CHASSIS
COWL TO END OF
(SEE TABLE UNDE
CHASSIS SHEET METAL SHALL NOT EXTEND BEYOND REAR FACE OF COWL
FRONT BUMPER MUST EXTEND TO OUTER EDGES OF FENDERS AT BUMPER TOP LINE
52"
MUFFLER
42" MINIMUM
FUEL TANK (MIN. CAP. 30 GALS.)
57"
44" ± ½"
39" MAX.
FILL-PIPE CAP (OUTSIDE PASSENGER COMPARTMENT)
TAIL PIPE (SHALL EXTEND AT LEAST 5 INCHES BEYOND CHASSIS FRAME)
5"

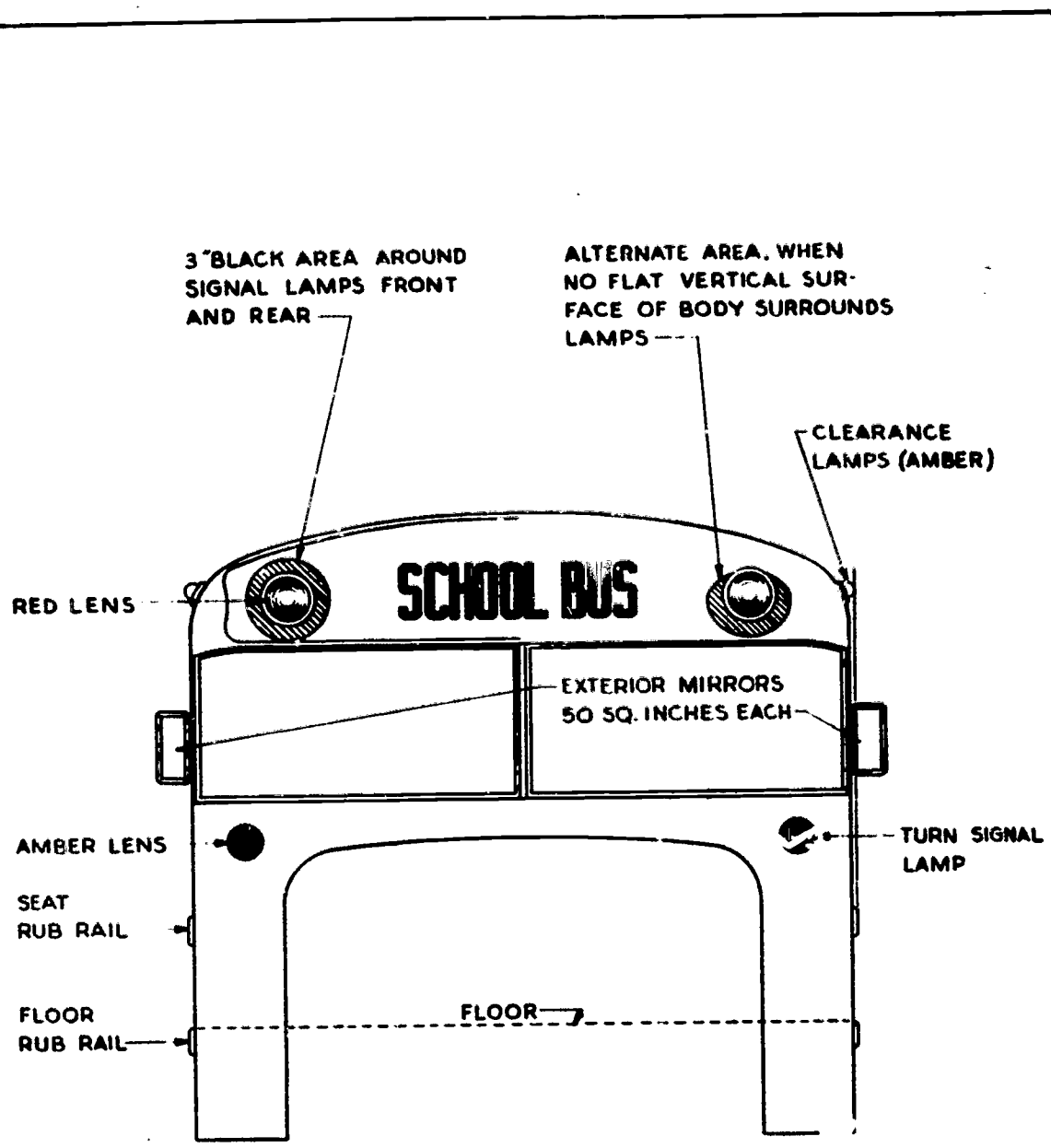
CHASSIS ELEVATION



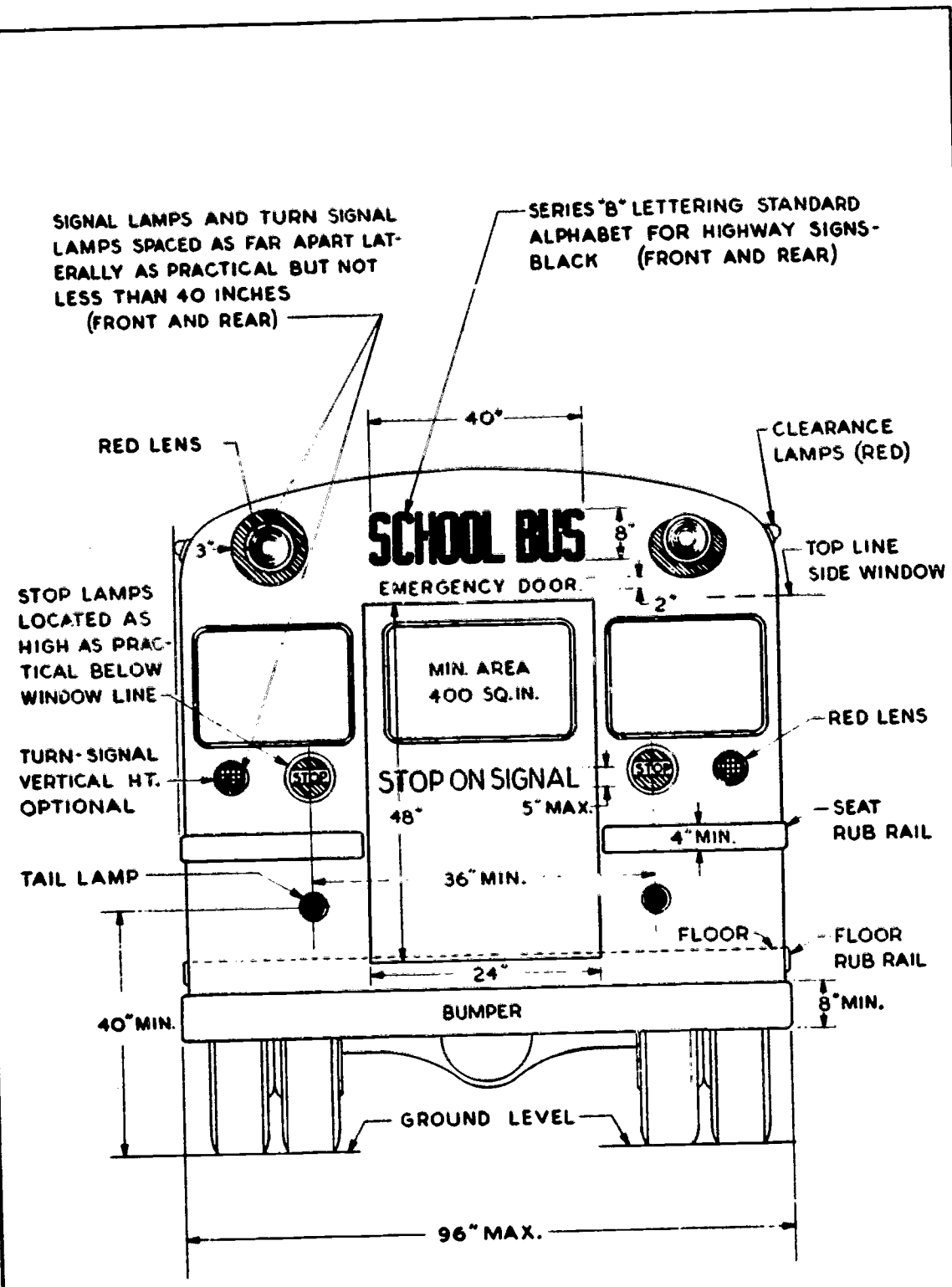

BODY PLAN
OPTIONAL 3-2 SEATING
INTERMEDIATE FLOOR SILLS
MAIN FLOOR SILL
GUARD RAILS APPROX. 30" ABOVE FLOOR
EXTERIOR MIRRORS 50 SQ. IN. EACH
ADJUSTMENT 4"
11" MIN.
6"X 16" SUN SHIELD (ADJ.)
6"X 30" MIRROR
39"
45"
14" MIN. DEPTH
24" MIN.
27" MIN.
15"
NON-SKID FLOORING IN AISLE
24" MIN.
12"
15"
STANCHIONS 1" MIN. O.S. DIA.
24" MIN.
39"
30"
24" MIN.
STERWELL
10" GRAB HANDLE
SMOOTH FLOORING UNDER SEATS
10"
10" APPROX.
GUARD PANEL WITHIN 2" OF FLOOR
24" MIN.
BODY LENGTH, COWL TO REAR OF BODY AT FLOOR LEVEL. SEE TABLE UNDER BODY SIZES, PAGE

BODY ELEVATION





FRONT ELEVATION



REAR ELEVATION

ADDENDA

To: All Body & Chassis Manufacturers and All Superintendents & Supervisors of Transportation for the Parish School Boards

From: School Transportation Section, State Department of Education

Subject: Revised Minimum Specifications on 1967 School Bus Chassis and 1967 School Bus Bodies

Date: March 6, 1967

	36 Pass.	42 Pass.	48 Pass.	54 Pass.	60 Pass.	66 Pass.
Tire Size and Ply	7.50-20-8	7.50-20-10	7.50-20-10	8.25-20-10	8.25-20-10	9.00-20-10
Rim Size	6.0	6.0	6.0	6.5	6.5	7.0
Gross Vehicle Weight	18,000	18,000	19,000	19,000	20,000	23,000
Cubic Inch Displacement	265	265	292	300	315	340
Torque: Net	236	236	255	260	280	286
Horsepower: Net	130	130	150	155	157	170
Transmission Speeds Forward	4	4	4	4	4	4
Square Inch Brake Lining	385	385	385	385	448	448
Wheelbase - Inches	149	149	187	217	235	253
Cowl to Axle - Inches	125	125	162	192	211	229
Cowl to End of Frame - Inches	210	210	268	295	322	349
Front Axle Gross Weight Rating	5,000	5,000	5,000	5,500	6,000	7,000
Rear Axle Gross Weight Rating	13,000	13,000	15,000	15,000	15,000	16,000
Clutch	12"	12"	12"	12"	12"	13"

GVW Plate Must Appear on All Chassis for Inspection Purposes

Page 8, Paragraph 2, Bulletin No. 1069 - Emergency Stopping System. You may eliminate this section which pertains to vacuum-actuated power or assistor-type brakes, or compressed-air-over-hydraulic brakes except on full compressed-air brakes as these brakes are the only ones this is available for at the present time.

Page 21, Paragraph 4-a, Bulletin No. 1069 - Identification. This lettering shall be a minimum of 5 inches.

Page 24, Bulletin No. 1069 - Posts. In the second sentence eliminate the words: <u>If the roof bows and body posts are more than one piece construction, the.</u> Make this sentence to read: "All body manufacturers shall guarantee the construction against structural failure for a period of five years."

Metal stripping on center aisle mats and floorboard mats of school buses may be used.

<u>PLEASE NOTE AND MAKE NECESSARY CHANGES ESPECIALLY ON THE CHASSIS TABLES IN YOUR COPY OF BULLETIN NO. 1069.</u>