4501-5-03 **School bus body standards for type B, C, and D.**

(A) Aisle.

(1) Minimum clearance between seats shall be twelve inches at seat level and fourteen inches at top of seat back.

(2) On type D transit forward control front engine buses the aisle shall not be less than twelve inches between engine cover and any other object (measured at floor level). Hold-down fastening devices used on engine cover shall be designed to prevent hooking or catching on shoes or clothing.

(B) Batteries.

Body manufacturer shall provide a drawer-type pull-out tray on all type B, C, and D buses. The batteries shall be enclosed by a compartment constructed of mill-applied zinc steel provided with drain ports, hold-down carrier mounted so as to avoid blocking filler ports, and latching device to prevent accidental opening. Drawer assembly shall be covered with acid-resistant paint. Rustproofing shall be provided and applied to battery box. Battery tray shall be equipped with a positive locking device to keep tray from sliding completely out to prevent battery from being dropped. Exception: Type D rear engine buses – battery may be located in engine compartment.

~~(1) Batteries and all battery cables shall be provided by the chassis manufacturer.~~

~~(2) Body manufacturer shall provide a drawer-type pull-out tray on all type B, C, and D buses. The batteries shall be enclosed by a compartment constructed of mill-applied zinc steel provided with drain ports, hold-down carrier mounted so as to avoid blocking filler ports, and locking device to prevent accidental opening. Drawer assembly shall be covered with acid-resistant paint. Rustproofing shall be provided and applied to battery box. Battery tray shall be equipped with a positive locking device to keep tray from sliding completely out to prevent battery from being dropped. Exception: Type D rear engine buses – battery may be located in engine compartment.~~

(C) Rear bumper

(1) Rear bumper shall be of sufficient strength to permit lifting the bus with a bumper type lift for servicing and shall be one piece, heavy-duty type of pressed steel channel, at least three-sixteenths inch of thickness and a minimum of eight inches in height after forming.

(2) Rear bumper shall be wrapped around back corners of bus and extend forward

at least twelve inches, measured from rear-most point of body at floor line. Rear bumper shall also protect rear corners of body by extending beyond the body exterior side panels. The bend of the rear bumper at the rear body corners shall be sufficient to allow the entire contour of the forward end of the rear bumper to extend no more than one inch beyond the body line of the exterior side panels.

(3) Bumper shall be fastened to chassis frame side rails in such a manner as to develop full strength of bumper section from rear or side impact. Bracing materials shall have an impact ratio comparable to that of bumper material and shall be fastened at the ends and radii of the bumper, attached to the side of the frame only and not to the body at any point.

(4) Rear bumper shall extend beyond rear-most part of body surface at least one inch, measured at floor line.

(5) No spaces, projections, or cutouts that will permit a handhold are permitted.

(6) Two rear tow hooks shall be installed, with the hooks and their mounting of sufficient strength to tow the vehicle at the vehicle's curb weight.

(7) Front ends of the bumper shall be enclosed by endcaps or other protective metal or shall have the ends rounded or tucked in and shall be free from sharp edges or projections likely to cause injury or snagging.

(8) A rubber or metal strip shall be installed to close any opening exceeding one-fourth inch between rear bumper and body metal.

(9) The rear bumper vertical distance between the bottom of the bumper and the ground shall not exceed thirty inches when the vehicle is empty.

(D) Color of body exterior and interior.

(1) Body exterior.

(a) All exterior body and chassis sheet metal including fiberglass shall be painted with polyurethane paint or equivalent.

(b) Components to be ~~painted~~ black:

(i) Lettering and numbering.

(ii) Bumpers.

(iii) Floor level rub rail.

(iv) Seat level rub rail.

(v) Background area and hoods for warning light system.

~~(c) White painted exterior roof panels are permitted.~~

(2) All interior panels, walls, and roof surfaces shall be painted by the body manufacturer.

~~All school bus body construction components except paragraphs (D)(1) and (D)(2) of this rule shall be of prime commercial quality mill-applied zinc-coated steel or composites must meet or exceed current strength and durability and all applicable FMVSS. The zinc plating shall be one hundred twenty grams per meter two minimum coating weight (grade sixty) or equivalent applied by either hot dipping or electroplating. All such construction materials shall be fire resistant. Door handles, grab handles, interior decorative parts, other interior plated parts, and components heavier than twelve gauge are excluded.~~

~~(4)~~(3) Paint finish coats to bus body, hood, cowl, and all attaching sheet metal and fiberglass parts shall be warranted for sixty months with no mileage limit, one hundred percent parts and labor, for adhesion and color retention.

~~(5)~~(4) Paint shall be applied for a total dry thickness at a minimum of one and eight tenths mils over all painted surfaces.

~~(6) Conventional bus hoods may be painted flat black~~

(E) Body construction.

(1) All school bus body construction components except, door handles, grab handles, interior decorative parts, other interior plated parts, and components heavier than twelve-gauge, shall be of prime commercial quality mill-applied zinc coated steel or composite materials. Components must meet or exceed current strength and durability and all applicable FMVSS. The zinc plating shall be one hundred twenty grams per meter square minimum coating weight (grade sixty) or equivalent applied by either hot dipping or electroplating. All such construction materials shall be fire resistant.

(2) All metal surfaces that will be painted shall be chemically cleaned, etched, zinc-phosphate coated, and zinc-chromate or epoxy-primed, or conditioned by equivalent process.

(3) In providing for the requirements in paragraphs (F)(1) and (F)(2) of this rule, particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges, punched or drilled holed areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subject to abrasion during vehicle operation.

(4) Upon final assembly of the school bus body and after mounting body upon chassis, the total unit strength of the school bus shall meet or exceed all strength criteria as established by FMVSS 571.220 and 571.221.

(5) Body construction shall provide a dustproof and watertight unit.

~~(6) When water leaks or dust leaks occur during the first twenty-four months of use, which are due to workmanship at point of manufacturer, these leaks shall be repaired entirely at the expense of the school bus body manufacturer as a part of the regular warranty.~~

~~(7)~~(6) Floor.

(a) The floor shall be not less than fourteen-gauge mill applied zinc-coated steel. The zinc plating shall be one hundred twenty grams per meter square minimum coating weight (grade sixty) or equivalent applied by either hot dipping or electroplating.

(b) There shall be a main floor cross member of at least ten-gauge steel or equivalent placed at each side post extending the full width of the floor plate and permanently attached.

(c) There shall be a minimum of two intermediate floor cross ~~member~~ members of at least sixteen-gauge steel placed equally between the main floor cross members and permanently attached.

~~(8)~~(7) All three longitudinal side strainers and members shall be a minimum of sixteen-gauge steel and three inches wide.

(a) There shall be one longitudinal side strainer or impact rail mounted at belt line, windowsill level, and extending at least from the front main

vertical post, excluding the front door entrance, to the last main vertical post on each side of body. This member shall be attached at each vertical post.

(b) There shall be one longitudinal side strainer mounted at the side window header level and extended completely around the school bus body. This member shall be attached at each vertical post.

(c) An additional longitudinal side strainer is permitted and shall form an integral part of the school bus body construction and meet all fastening requirements.

(d) Side strainers used in basic construction at floor level and extending above floor line may be utilized as mounting base at wall line for rail-mounted seats.

~~(9)~~(8) Rub rails.

(a) Body manufacturers shall install one rub rail at approximately seat level, except for opening for engine compartment side door in a type D bus. This rail shall extend from the main vertical post behind the entrance door to the forward-most vertical post on the left side of the body, including left side emergency door.

(b) A second rub rail shall be installed at approximately the floor line and cover the same longitudinal area as the seat level rail, except at wheel housings, and shall extend to the radii of right and left rear corners. ~~A third rub or snow rail may be installed on lower edge of skirt panel. Rail may be painted either black or national school bus yellow~~.

(c) All rub rails shall be attached at each body post and all other upright structural members.

(d) All rub rails shall be four inches or more in width after formed and shall be a minimum of sixteen-gauge steel, corrugated, or ribbed pattern.

(e) All rub rails shall be mounted outside body panels.

(f) External longitudinal members are permissible in addition to all previously specified members if they form an integral part of the body construction and meet the fastening requirements.

~~(10)~~(9) Two or more roof strainers or longitudinal members shall be provided to connect, 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 the windshield header and are to function as continuous longitudinal roof members. 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.

~~(11)~~(10) Rear corner construction of the bus body between the floor and windowsill and between the emergency door posts and last vertical side posts shall consist of at least three structural members which will provide impact and penetration resistance equal to or greater than that provided by frame members in the sides of the body. Such structural members shall be securely attached at each end.

~~(12)~~(11) If the ceiling is so constructed to contain lap joints, the forward panel shall be lapped by the rear panel and the exposed edges shall be beaded, hemmed, flanged or otherwise treated to minimize sharp edges.

~~(13)~~(12) All body components shall be designed and constructed so as to avoid the entrapment of moisture.

(F) Defroster.

(1) Defroster system shall exceed society of automotive engineers standard J381~~-J382~~ performance requirements without use of auxiliary fan and with three gallons per minute one hundred seventy degree water applied.

(2) ~~All manufacturers shall demonstrate the capabilities of their heating and defrosting system prior to bid award upon request.~~ Supplemental coolant additive level shall meet engine original equipment manufacturer specifications. Levels shall be recorded at pre-delivery.

(3) A defroster system of sufficient capacity to keep windshield area, left front side window to rear of the driver's vision, and service door glass area free ~~or~~ of condensation or ice under all possible combinations of pupil load and climatic conditions shall be installed.

(4) Defroster system shall be capable of providing at least sixty percent fresh air.

(5) Two adjustable six-inch auxiliary defroster fans shielded with small mesh metal

or polypropylene guards shall be installed.

(a) Fans shall be mounted to complement the defroster system used by the manufacturer.

(b) Auxiliary defroster fans shall be controlled individually by ~~two-speed~~ multi-speed switches located in the electrical control panel.

(G) Doors and emergency exits.

(1) Service doors.

(a) Service door shall be outward opening split type on all type B, C, and D buses. Service door shall be air, electric, or manually operated. Door shall be under the control of the driver and designed to afford easy release and prevent accidental opening. When a manual lever is used, no parts shall come together so as to shear or crush fingers. Lever shall be equipped with an approved safety latch to prevent accidental opening which will lock in the over-center position when door is fully opened. Manually operated doors shall require no more than twenty-five pounds of pull to close and may be hydraulically assisted.

(b) Manual door control mechanism shall be heavy-duty bearing type, adjustable for wear, non-corrosive, anodized steel, or equivalent.

(c) Service door shall be located on right side of bus opposite the driver and within the driver's direct view.

(d) Service door shall have minimum horizontal opening of twenty-four inches and minimum vertical opening of sixty-eight inches.

(e) Glass in service door shall provide maximum area of visibility for operation of bus.

(f) All edges of service door shall be sealed by flexible rubber or equivalent material to prevent air from entering door entrance when closed.

(g) There shall be no safety rail or handholds mounted on the service door.

(h) There shall be a head bumper pad installed on the inside at the top of the entrance door. This pad shall be approximately four inches in width and

extend across the entire top of the entrance door opening and shall meet FMVSS 571.302, flammability of interior materials.

(i) Service door shall have suitable access for easy lubrication.

(j) All electrically or air-operated service doors shall be equipped with a switch or lever located in either hinged panel above the entrance door or above the passenger side windshield that have emergency and normal positions. The switch or lever shall be identified by a decal with the heading ~~"Entrance Door Operation."~~ "ENTRANCE DOOR OPERATION" or "EMERGENCY RELEASE". The words ~~"Emergency"~~ "EMERGENCY" and ~~"Normal"~~ "NORMAL" will be placed where switch lever is located when in these positions.

(i) When the switch or lever is in the emergency position, it will override door control in driver's area making it non-operational in any of the door control positions.

(ii) Whenever the switch or lever is placed in the emergency position, it will allow the service door to be opened or closed freely in the event of an emergency.

(iii) Air door switches and distribution block that control eight light warning systems shall be securely fastened near the door control valve in the switch panel and shall be easily accessible for service or repair.

~~(k) When the switch or lever is in the emergency position, it will override door control in driver's area making it non-operational in any of the door control positions.~~

~~(l) Whenever the switch or lever is placed in the emergency position, it will allow the service door to be opened or closed freely in the event of an emergency.~~

~~(m) Air door switches and distribution block that control eight light warning systems shall be securely fastened near the door control valve in the switch panel and shall be easily accessible for service or repair.~~

(2) Emergency doors.

(a) Emergency doors shall meet FMVSS 571.217 and be designed to be opened from inside and outside of bus and shall be equipped with a fastening device which may be quickly released, but is designed to offer

protection against accidental release. An interior handle shall be provided to pull the door shut from the inside which may be used as a protection against accidental release.

(b) ~~All emergency doors shall be equipped with slide bar-cam or gear-operated latch.~~ Emergency door latch shall be equipped with suitable electric plunger type switch connected to two buzzers, with one located at emergency door and the other in driver's compartment. Switch shall be enclosed in metal or equivalent composite material case, and wires leading from switch shall be concealed in the school bus body. Switch shall be so installed that plunger contacts farthest edge of slide bar in such a manner that any movement of slide bar will immediately close circuit on switch and activate both buzzers and all dome lights, driver dome light excluded. ~~A separate interior handle shall be provided to pull the door shut from the inside.~~

Buzzers and dome lights will be operational with the key in the on-off or accessory positions. Power for the emergency lighting and buzzers shall be supplied by a twelve volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(c) Exterior door handle shall be of permanent hitch-proof design and mounted with enough clearance to permit opening without touching door surface.

(d) All emergency door openings shall be completely weather-stripped.

(e) Operation instructions for opening the door shall be lettered or declared on the inside of the emergency door.

(f) There shall be no step-type mechanism in the use of the emergency door.

(g) No seat, chassis or body component shall be installed in the aisleway leading to the emergency door~~.~~, in violation of FMVSS 571.217, bus emergency exits. ~~This requirement does not apply to a rear engine type D bus.~~

(h) Emergency door shall display the words "Emergency Door" both inside and outside in letters at least two inches high. Words shall be placed directly above the emergency door or on the upper portion of the door.

(i) Rear emergency door.

(i) On all buses, except rear-engine transits, an emergency door shall be located in the rear of the school bus body and centered with respect to the body.

(ii) Emergency door shall have a minimum horizontal opening of twenty-four inches and a minimum vertical opening of forty-eight inches measured from floor level.

(iii) Rear emergency door shall be hinged on right side and shall open outward.

(iv) The rear emergency door shall contain upper and lower glass panels ~~and shall be accompanied by a number designating glazing standard from american national institute, two tempered or better and comply with FMVSS 571.205~~. Glass in emergency door shall provide maximum area of visibility for safe operation of school bus.

~~(v) Glass in emergency door shall provide maximum area of visibility for safe operation of school bus.~~

~~(vi)~~(v) There shall be a head bumper pad installed over the emergency door on the inside of the school bus body. This pad shall be at least the width of the door opening. Padding shall be of the same material as the padding used over the service door exit.

(j) Left side emergency door.

(i) On all rear-engine transit school buses, a side emergency door shall be located in the rear half of the left side of the bus body. The door shall be hinged on the front side. A theater type flip up seat bottom is permitted to achieve a minimum twelve inch aisle.

(ii) If a door sill or heater line extends above the floor line, a ramp shall be provided covering the area over which a foot must pass as an individual exits through the door.

(3) Emergency side window exits.

(a) All type B, C, and D school buses shall be equipped with side window emergency exits.

(b) School buses with designed maximum seating capacity of less than fifty shall have two emergency swing out windows, one on each side located midway between the front and rear side windows.

(c) School buses with a designed maximum seating capacity of fifty or larger shall have ~~two~~ four emergency swing out windows. ~~on the right and left side of the body. These windows should be located in the front and rear third of the bus~~ The emergency windows shall be evenly distributed on both sides of the bus and appropriately spaced. No side emergency exit window will be located above a stop arm.

~~(d) Emergency window glass shall be accompanied by a number designating glazing standard from american national standards institute, two tempered or better.~~

~~(e)~~(d) Emergency window shall display the words ~~"Emergency Exit"~~ "EMERGENCY EXIT" in letters at least two inches high, both inside and outside the window. Words shall be placed no more than three inches directly above window.

~~(f)~~(e) Emergency windows shall activate an emergency door buzzer in driver's compartment and all dome lights when not fully latched, driver dome lights excluded. Buzzer and dome lights shall be operational with key in the on-off and accessory positions. Power for the emergency lighting and buzzers shall be supplied by a twelve-volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

(f) Operating instructions for opening windows shall be lettered or decaled on the inside below the window or on the window. If lettered on the window, lettering shall be located at the bottom of the window and shall not be a view obstruction.

(4) Emergency windows, type D rear-engine buses.

(a) An emergency window shall be installed above the engine compartment and shall be no smaller than sixteen inches in height and fifty-four inches in width.

~~(b) Emergency window glass shall be accompanied by a number designating glazing standard from american national standards institute of two tempered or better.~~

~~(c)~~(b) Windows shall be hinged from top and provided with a device to ensure against accidental ~~locking~~ closing during an emergency.

~~(d)~~(c) Emergency window in rear shall be equipped with a latch on the inside, and also be equipped with a handle of ~~hitch-proof~~ hitch-proof design which will permit opening from the outside.

~~(e)~~(d) Emergency window shall display the words ~~"Emergency Exit"~~ "EMERGENCY EXIT" in letters at least two inches high, both inside and outside the window. Words shall be placed no more than three inches directly above window.

~~(f)~~(e) Emergency windows shall activate an emergency door buzzer in the driver's compartment and all dome lights when not fully latched, driver dome lights excluded. Buzzer and dome lights will be operational with key in the on-off or accessory positions. Power for the emergency lighting and buzzers shall be supplied by a twelve -volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

~~(g)~~(f) If the type D bus is equipped with a left side emergency door, then only one emergency swing out side window is required on the left side of the body midway between the driver window and the left side emergency door.

(5) Emergency roof ~~escape-exit type~~ hatch-type B, C, and D buses.

(a) Buses that have fifty or larger designed maximum capacity shall have a minimum of two ~~roof ventilator~~ emergency ~~escape exits~~ hatches located in the front third and rear third of the bus.

(b) Buses that are less than fifty capacity shall have a minimum of one ~~roof ventilator~~ emergency ~~escape exit~~ hatch located in the middle of the bus.

(c) A buzzer shall sound and all interior dome lights (driver 's dome light excluded) and emergency door buzzer located in driver's compartment shall be activated when the hatch is opened in the escape position. Buzzer and dome lights shall be operational with key in "ON-OFF" or accessory positions. Power for emergency lighting and buzzer shall be supplied by twelve volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker.

~~(c) Roof escape hatches/vents shall be adjustable and of sufficient capacity to provide adequate fresh air under operating conditions without the opening of windows, except in extremely warm weather. This vent shall have multi-positions and shall be static-type with exhaust vent. The vent shall have a release handle or handles permitting operating as an emergency exit which can be opened from inside or outside the school bus. A buzzer shall sound when the vent is opened in the escape position. All interior dome lights (driver dome lights excluded) and emergency door buzzer located in driver's compartment shall be activated when the roof hatch is open past the vent position. Buzzer and dome lights shall be operational with key in "on-off" or accessory positions. Power for emergency lighting and buzzer shall be supplied by twelve volt supply line going to the body continuous duty solenoid. The system shall be protected by a circuit breaker. Buses have one combination unit located in the middle of the bus. Buses with fifty passenger designed maximum capacity, or greater, shall have two combination vents installed in the bus. The multi-functional roof vents/emergency exits must meet all requirements of FMVSS 571.217.~~

(d) If a bus is not manufactured with a static vent, the hatch shall be a static-type with exhaust vent.

(e) Emergency roof hatches shall meet all requirements of FMVSS 571.217.

(H) Emergency equipment shall be mounted in the driver's compartment area in an easily accessible location.

(1) Bus shall be equipped with at least one dry-chemical-type fire extinguisher of at least five-pound capacity, 3A - 40 B.C. rating, mounted in a quick release-type bracket and easily accessible from the driver compartment. The extinguisher shall be equipped with a dial-type graduated gauge which indicates loss of pressure. Fire extinguisher shall be of the type that permits the dry-chemical case to be refilled by ordinary procedures. Fire extinguisher shall be equipped with metal head.

(2) First aid kits shall be dustproof, plainly labeled, mounted in a location easily accessible to the driver, and securely mounted in a metal or plastic container minimum units for the school bus shall be as follows: A sixteen-unit kit shall be used on buses less than fifty designed maximum capacity. A twenty-four unit kit is required for buses of fifty or more designed maximum capacity.

(3) Contents of sixteen-unit first aid kit:

3 Units - 1 inch adhesive compress

2 Units - 2 inch bandage compress

1 Unit - 3 inch bandage compress

1 Unit - 4 inch bandage compress

1 Unit - 3 inch×3 inch plain gauze pads

1 Unit - 4 inch gauze roller bandage

2 Units - plain absorbent gauze - 1/2 square yard

2 Units - plain absorbent gauze - 24 inch×72 inch

3 Units - Triangular bandages

(4) Contents of twenty-four-unit first aid kit:

4 Units - 1 inch adhesive compress

3 Units - 2 inch bandage compress

2 Units - 3 inch bandage compress

1 Unit - 4 inch bandage compress

1 Unit - 3 inch×3 inch plain gauze pads

2 Units - 4 inch gauze roller bandage

4 Units - plain absorbent gauze-1/2 square yard

3 Units - plain absorbent gauze-24 inch×72 inch

4 Units - triangular bandages

(5) Three triangle reflectors with weighted stands shall be properly encased for easy storage. Six thirty-minute fusees shall be encased with the triangle reflectors. The triangle reflectors shall meet FMVSS 571.125. The reflectors and ~~fuses~~ fusees shall be encased together in a heavy-duty container. A ~~lockable~~ latchable metal bracket shall be provided to hold these items and shall be mounted within easy access of the driver.

(6) One body fluid kit shall be required. ~~Body fluid clean-up kits shall meet all applicable state and federal regulations.~~ The kit shall contain the following

items:

(a) Effective chlorine absorbent deodorant.

(b) Effective germicidal detergent. If detergent contains alcohol, no more than one fluid ounce is permitted in a single-use disposable container.

(c) Single-use, disposable bag.

(d) Single-use, disposable scraper.

(e) Minimum of one pair of disposable, single-use, effective protective gloves.

(f) Effective hand rinse. If hand rinse contains alcohol, no more than one-half fluid ounce is permitted in a single-use disposable container.

(g) The body fluid clean-up kit shall be easily accessible to the driver in the area of the first aid kit and shall be securely mounted in a metal or plastic container.

(h) If alcohol is included, the body fluid clean-up kit shall not contain more than one and one-half fluid ounces of alcohol.

~~(H)~~(I) Floor covering.

(1) All floor covering shall be fire resistant and permanently bonded to the floor and must not crack or lose its adhesive power when vehicle is subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and recommended by the manufacturer of the floor covering material.

(2) Underseat areas shall have a smooth fire-resistant floor covering, having a minimum overall thickness of one-eighth inch. The entire joint between the floor covering and the wall of the school bus body shall be covered with a curved, fitted, rust-free metal or composite molding or reformed interior panel.

(3) Driver's compartment floor area shall provide sure footing when wet and be of the same quality material as the underseat floor covering. The driver's compartment floor covering shall be permanently bonded to the floor. A floor

mat is not acceptable.

(4) Center aisle covering shall be fire-resistant, non-skid, wear-resistant and ribbed. Minimum thickness shall be one hundred eighty-seven thousandths inch measured from the top of the ribs.

(5) A manual transmission inspection plate shall be installed for easy servicing of the clutch and transmission. The plate shall be installed above the regular floor covering when possible and shall not be undercoated.

(6) Brake, gear shift, and accelerator boots supplied by the chassis manufacturer shall be installed by the school bus body manufacturer.

(7) Metal, ~~or~~ composite molding, bonding or non-metal welding is acceptable.

(a) Metal, ~~or~~ composite molding, bonding or non-metal welding shall cover all floor-covering joints between the ribbed center aisle and smooth underseat floor covering.

~~(b) Cove molding is required at the junction of the floor covering and side wall. Molding may be formed to the side wall panel or separate cover base.~~

~~(c)~~(b) Molding around the wheel-well and floor covering shall be provided to seal floor covering with the wheel well.

~~(8) Accelerator boot will be used around the accelerator rod passing through the toe-board or floorboard to prevent fumes or dust from entering the driver's compartment.~~

~~(9) Entrance step treads, including the edge at floor level, shall be of the same quality as the aisle material and shall be formed with a minimum turndown lip of three-fourths inch. Step treads shall have an integral white, yellow or orange nosing of one and one-half inch or more or use diagonal stripes. treads shall be permanently bonded to the metal steps and sealed to prevent water from getting underneath the step tread.~~

~~(10)~~(8) A fuel access plate shall be installed for easy access to fuel gauge mechanism and shall be installed above the regular floor covering when possible. The access plate shall not be undercoated. Panel shall be ~~identical to floor material in thickness and coating and shall be~~ sealed to prevent any leakage or moisture. Interior shall not be undercoated. Diamond plate may be used as an access panel.

~~(11)~~(9) Floor covering on top step landing shall be one piece.

(J) The fuel fill opening in the body skirt shall be equipped with a hinged cover held closed by a spring or other conveniently operated device. The mechanism that holds this cover closed shall be sufficient to keep it closed under severe operating conditions. The fuel fill opening shall be large enough to permit the entire pump nozzle to pass through the opening and reach the fill neck of the fuel tank.

(K) Glass

(1) All glass shall be manufactured and maintained as follows:

Location	Glass Type	Rating
Service Door	Laminated	AS 1
Emergency Door	Tempered	AS 2 or 3
Emergency Window	Tempered	AS 2 or 3
Windshield	Laminated	AS 1
Driver's Side Glass		
And Glass To The Right		
Of The Driver	Laminated	AS 1
All Other Glass		
Behind The Driver	Tempered	AS 2 or 3

~~(K)~~(L) Heaters.

(1) School bus heating systems shall provide evenly distributed heat throughout the bus body and provide defrosting for windshield and entrance door.

~~(2) Heaters shall have the capability of providing evenly distributed heat creating a temperature rise to fifty degrees fahrenheit inside body shell when soaked in ambient temperature of zero degree fahrenheit for fifteen hours.~~

~~(3)~~(2) All school buses shall be equipped with three or more hot water heaters capable of maintaining inside temperature of fifty degrees fahrenheit ~~with one~~

~~hundred fifty degree fahrenheit water being delivered to the system at a rate of six gallons per minute~~ using an ambient temperature of zero degrees to ten degrees fahrenheit.

~~(4)~~(3) Type D transit-buses shall be equipped with front heaters. Conventional-type buses shall be equipped with right and left front heaters~~,~~. A third heater is required on all type B, C, and D school buses and is to be mounted to the rear of the rear wheel well. ~~an integrated defroster system with the capacity to provide heat for the front part of the bus driver's compartment to keep the windshield area, service door glass, driver's left glass area and step-well clear of moisture, ice and snow, shall be provided.~~

~~(5) Type D transit-buses shall be equipped with front heater(s). An integrated defroster system with the capacity to provide heat for the front part of the bus and the driver's compartment, to keep windshield area, driver's left glass area, service door glass area and step-well clear of moisture, ice and snow, shall be provided.~~

~~(6)~~(4) Hot water heaters shall display the name plate rating in accordance with the standard code for testing and rating automotive bus hot water heater and ventilating equipment.

~~(7) A third heater is required on all type B, C, and D school buses and is to mounted to the rear of the rear wheel well.~~

~~(8)~~(5) ~~Two-speed~~ multi-speed switches shall operate all heater fans independently.

~~(9)~~(6) All hot water lines shall be ~~a minimum of one inch inside diameter and shall be~~ enclosed.

~~(10)~~(7) Heater cores and fans shall be completely encased, but designed to permit servicing heating assembly by removing all or part of the case.

~~(11)~~(8) Heater hose installation in the engine compartment shall include two brass shut-off valves able to shut off coolant completely when necessary.

(a) One shut-off valve shall be mounted between the water pump inlet and heater hose connection.

(b) One shut-off valve shall be mounted between the motor block and the heater hose connection.

~~(12)~~(9) The body manufacturer shall add the required amount of ~~permanent ethylene-glycol base~~ appropriate antifreeze to protect the cooling system to minus twenty degrees fahrenheit tested at normal engine temperature.

~~(13)~~(10) There shall be a heater water-flow regulating valve installed for convenient operation when the driver is in a normal seated position.

~~(14) Heater cores shall meet the following test standards:~~

~~(a) Static pressure test of one hundred fifty pounds per square inch.~~

~~(b) Cycle test of twenty to fifty pounds per square inch hydraulic surge pressure, four hundred fifty thousand cycles minimum.~~

~~(L)~~(M) The hood engine cover on type D buses must be secured when open to prevent accidental closing while engine is being checked.

~~(M)~~(N) Body shall display the following identification:

(1) "School Bus" in black letters at least eight inches high on both front and rear of body. Lettering shall be placed as high as possible without impairment of visibility. ~~The background for the school bus lettering may be reflective grade five or equivalent yellow tape on the front and rear of the school bus body.~~

(2) "Stop" on the rear of the school bus in letters approximately ten inches high on the door or the center of the school bus.

(3) Name of the school district shall appear on both sides of the vehicle at the belt line and be at least five inches high.

(4) County of the school district shall appear on both sides of the vehicle in ~~five-inch~~ a minimum of three-inch letters with the name, unless the name of the city or exempted village appears as a part of the school district name.

(5) Ownership of the vehicle shall appear on the entrance door side in two-inch high letters to the rear of the entrance door.

(6) Local school bus numbers shall be five inches high and shall be located as follows:

(a) On body ~~above~~ near the entrance door;

(b) ~~On the rear in the area of the right side of the tail light~~Centered below the right lower tail light.

(c) On the left side in the ~~vicinity~~ area of the driver's window;

(d) On the front in the area designated by the buyer.

(7) Buses shall be marked with reflectorized material as follows ~~(See Appendix A)~~:

(a) All reflectorized material shall be prismatic retro-reflective super-high intensity grade five or equivalent. The reflectorized material shall meet or exceed the initial reflective value as outlined in ~~federal highway administration (ASTM D4956-90~~ASTM D4956-01~~)~~. ~~The color specification shall require a minimum reflectance of fifteen for white-silver.~~

(b) All reflective material shall be able to retain at least fifty percent of the reflective values for a minimum of seven years.

(c) All reflective material shall be warranted against peeling, cracking, separation and lifting due to weather conditions, pressure, and mechanical washing for a minimum of seven years.

(d) Reflective yellow material two inches in width (plus/minus one quarter inch) shall be applied to both corners of the rear of the bus and extend from the bumper vertically up to the top of the rear windows.

(e) Three seven by ~~fourteen inch~~ fourteen-inch wide pieces of white-silver reflective material shall be applied to the front and rear of the bus to accommodate the state identification and local bus numbers as follows:

(i) One seven by fourteen inch piece of white-silver reflective material shall be applied and centered on the front bumper. If the bumper is manufactured with the holes in the center for two hooks, the seven by fourteen piece of material may be located on the driver's side of the bumper. If the bumper is less than six inches in height, a seven by fourteen inch plate will be permanently attached to the bumper to accommodate the seven by fourteen inch reflective material.

(ii) In the rear, two seven by fourteen inch pieces of white-silver

reflective material shall be applied and centered on the flat surface under the left and right lower tail lights.

~~(f) The local bus number shall be applied and centered below the right lower tail light in five inch black numbers.~~

~~(g)~~(f) All emergency doors, windows, and roof ~~escape~~ hatches shall be outlined around the outside perimeter with one inch yellow reflective material. Roof hatches may be white reflective material.

~~(h)~~(g) Reflective material used on stop signs shall be red grade five or equivalent.

~~(N)~~(O) Inside body height shall be seventy-two inches or more measured metal-to-metal at any point on longitudinal center line from front vertical bow to rear vertical bow.

~~(O)~~(P) Insulation.

(1) Bus body shall be fully insulated in the roof and all body panels to deaden sound, reduce vibrations and heat transfer. Insulation, one-inch minimum thickness, in addition to the usual sprayed on material, shall be a fiberglass or equal and fire-resistant material.

(2) A plywood floor shall be applied on top of the steel floor. Floor covering shall be applied on top of the plywood. Plywood shall be five-eighths inch five-ply type CD exterior grade. Plywood shall extend to fire-wall and under the driver's seat. Plywood shall be sanded and vacuumed before covering is applied. waterproof sealing material shall be applied to seams in the section of plywood floor. Plywood shall be four feet by eight feet sections, pieced only as necessary. Waterproof sealing applied on top of the plywood to hold the floor covering is considered as one method of sealing the seams in the plywood floor ~~and is acceptable~~.

~~(P)~~(Q) Interior.

(1) Interior of the school bus shall be free of all projections.

(2) All school buses shall require inner lining on ceiling and walls and shall include sound abatement package in the driver area. The interior sound level at the driver's seating position shall not exceed ninety decibels when measured in accordance with test procedures found in 49 CFR 393.94C.

~~(Q)~~(R) Lamps and signals.

All lamps herein listed and their installation shall conform to current standards and recommendations of the society of automotive engineers and meet FMVSS 571.108.

(1) Construction of components.

~~(a) All lamps, reflectors and their installation shall conform to FMVSS where applicable, society of automotive engineers J887, and the national standard for school transportation where not covered by federal standards or additional requirements stated herein.~~

~~(b)~~(a) Directional signal, stop light, taillight, marker light, clearance light, identification light, back up light and reflector lenses shall be of acrylic plastic or meet SAE J576/SAE J579. Alternately flashing red and amber signal lamps shall be sealed beam of acrylic plastic lens construction. Body-mounted stop lamps, directional signals and red signal lamps shall be visible throughout one hundred eighty degrees.

~~(c)~~(b) All exterior lamp sockets shall be zinc-plated or chromated steel, or other suitable non-corrosive materials such as plastic or stainless steel.

~~(d)~~(c) Alternately flashing red signal lamps, body-mounted directional signals and stop lamps shall be grounded by attaching a ground wire or strap from the lamp socket or negative side of the bulb or ground wire included in the wiring.

~~(e)~~(d) Wiring shall conform to current society of automotive engineers standards. A one hundred amp continuous body ~~load~~ disconnect solenoid of one hundred amperes continuous-duty shall be supplied and installed so that when the ignition switch is in the off position, all body electrical circuits will be inoperative, except the ~~directional signals,~~ hazard warning, stop light, ~~back up light,~~ marker lights, ~~clearance, identification, and head lamp circuits~~ headlamps, passenger emergency dome lights and buzzers and emergency override switch for warning lights.

(e) The service door step-well light shall be wired with the marker light circuit and activated by a switch controlled by the service door. The light shall be a minimum of six candlepower.

~~(2) Additional requirements.~~

~~(a) The service door step well light shall be wired with the marker light circuit and activated by a switch controlled by the service door. The light shall be a minimum of six candlepower.~~

~~(3)~~(2) Passenger dome lights and emergency lighting.

(a) Passenger dome lights when activated shall adequately and uniformly illuminate aisleway to three to four foot candles.

(b) All dome light bulbs shall have a minimum candle power of fifteen.

(c) All dome lights shall be equipped with shatter-proof, clear plastic or polycarbonate lenses.

~~(4) Emergency dome light operation, emergency doors, roof escape hatches, push-out windows, all interior dome lights (driver dome light excluded) and emergency door buzzers located at emergency door and driver's compartment shall be activated whenever an emergency door handle is lifted to be opened. All interior dome lights (driver dome lights excluded) and the emergency door buzzer located in driver's compartment shall be activated whenever an emergency window handle is lifted to be opened or when a roof escape hatch is opened past the vent position. Buzzers and dome lights shall be operational with key in "On", "Off", and accessory positions. Power for emergency lighting and buzzers shall be supplied by the twelve volt supply line going to the continuous duty solenoid. The system shall be protected by a circuit breaker.~~

~~(a) The emergency lighting system shall be wired so that when it is activated with the key in the "Off" position, it will not allow for an electrical feed back through the dome light switch or to power any accessories that normally would be fed by the continuous duty solenoid when the key is in the "On" or "Accessory" position.~~

~~(5)~~(3) Passenger dome lights shall be controlled by a single switch in the driver's console. Power shall be provided by the switched side of the continuous duty solenoid when key is on the "On" or "Accessory" position and shall be protected by a circuit breaker.

~~(6)~~(4) A single driver dome light shall be provided and controlled by a single switch in the driver's console. ~~Power to the switch shall be provided by the switched side of the continuous duty solenoid when the ignition key is in the "On" or "Accessory" position and shall be protected by a circuit breaker.~~

~~(7)~~(5) Directional signals.

(a) Side and rear directional signals shall be wired to operate properly with the front directional signals supplied by the chassis manufacturer on all conventional-type school buses. Transit-type school buses shall have front, side, and rear directional signals installed by the manufacturer.

(b) School bus body manufacturer shall install required signal lamps to the directional signal control switch so all directional signal lamps shall be operative. The directional signal system shall be installed on an integral part of the hazard warning signal switch activated by an independent switch furnished by the chassis manufacturer.

(c) Color of lenses shall be amber. All rear directional signals installed by the body manufacturer shall be double-optic and at least seven inches in diameter. Side directional signals shall be armor protected.

(d) Two seven-inch back up lights are required and shall be mounted on or below the belt line on the school bus body. Back up lights shall conform with FMVSS 571.108.

(e) All school buses shall be equipped with an audible electrical warning device, automatically actuated when the bus is in reverse gear. Device shall be one hundred seven decibels or more, meeting society of automotive engineers J994. Device shall be mounted behind rear axle, between frame rails, and shall emit intermittent sound. Device to be provided and installed by body manufacturer.

~~(8) Two back up lights are required and shall be mounted on or below the belt line on the school bus body. Back up lights shall conform with FMVSS 571.108. These lamps shall have white lenses at least seven inches in diameter and shall be a minimum of thirty-two candle power.~~

~~(9)~~(6) School bus alternately flashing warning signal lamp.

(a) Each school bus body shall be equipped with a system of four red signal lamps and four amber signal lamps. Both red and amber lamps shall be installed in accordance with society of automotive engineers J887.

(i) Each amber signal lamp shall be located near each red signal lamp, at the same level, but closer to the vertical center line of the bus.

(ii) The system shall be wired so that the amber signal lamps are activated only by a manual momentary switch, and if activated, are automatically deactivated when the bus entrance door is open.

(b) These lamps shall flash at a designated rate from sixty to one hundred twenty cycles per minute.

(c) Operation of warning lights and stop arm system:

(i) Power for the eight light warning system shall be provided by the body continuous duty solenoid when the key is in the "on" position.

(ii) With the key in the "On" position and master switch on, green pilot light shall illuminate to indicate system is ready for operation.

(iii) With entrance door closed and the manual momentary (amber) start switch activated and released, the amber pilot light and amber warning lights shall flash.

(iv) When the entrance door ~~handle~~ is moved toward the open position, the amber pilot and the amber warning lights shall ~~go~~ turn off and the red pilot and the red warning lights shall flash and stop arm shall automatically extend and lights on the stop arm shall flash.

(v) When entrance door is closed, all lights shall go out and the stop arm shall retract automatically. The entrance door switch that activated the red lights in the light system shall be located in a position by a cover or guard that will prevent the switch from being activated or deactivated by pupils boarding or leaving the bus.

(vi) With entrance door open and the manual momentary (amber) start switch activated and released, the red pilot and red warning lights shall flash and the stop arm shall automatically extend, and the lights on stop arm shall flash.

(vii) An emergency system for extending the stop arm and flashing the red warning lights on the bus body and the stop arm shall be installed on each bus body.

(viii) A red emergency override on/off switch shall be installed in the bus body electrical accessory panel ~~in an area isolated from the other switches~~. This switch shall be installed with a standard switch identification decal with the words "Emergency Warning Lights."

(ix) The emergency override system shall operate the red pilot light, the red warning lights and automatically extend the stop arm with lights flashing in any door position. System shall operate with key in the on/off or accessory position.

(x) Power for the emergency override system shall be taken off the twelve volt supply line going to the body continuous duty solenoid and shall be protected by a circuit breaker.

(xi) The master and momentary activating switches and pilot lights shall be in a position that is clearly accessible and visible to the driver. The amber and red pilot light lenses shall be approximately one-half inch in diameter.

(xii) If the bus is equipped with a crossing gate, it shall extend and retract in the same manner as outlined for the stop sign.

(d) Installation requirements.

(i) Each flashing signal lamp shall be mounted with its axis substantially parallel to longitudinal axis of vehicle.

(ii) Front and rear alternately flashing signal lamps shall be spaced as far apart laterally as practicable.

(iii) Alternately flashing signal lamps shall be mounted at the front above the windshield and at the rear so that the lower edge of the lens is not lower than the top line of the side window.

(iv) Vertical and lateral vision of the front and rear alternately flashing warning lights shall not be obstructed by any part of the body of the lamp-house insofar as standard bus body construction will permit.

(v) A square or rectangular area around the lens of each alternately

flashing signal light and extending outward approximately three inches shall be painted black. In installations where there is no flat vertical portion of the body immediately surrounding the entire lens of the lamp, a square or rectangular band of black, approximately three inches wide, immediately below and to both sides of the lens, shall be painted on the body or roof area against which signal light is visible from a distance of five hundred feet along the axis of the vehicle.

(7) Each bus shall be equipped with two double-optic combination stop and double-optic taillamps with a diameter of not less than seven inches with plain red lens, emitting red light plainly visible from a distance of five hundred feet to the rear. These lamps shall be as high as practical but below the window line and spaced as far apart laterally as practicable, but not less than three feet. Measurements shall be taken from lamp centers. The stop lights are to be activated by the brake switch.

~~(10)~~(8) All school bus body lamps and reflectors shall comply with FMVSS 571.108~~, clearance lamps~~.

~~(a) Body shall be equipped with a red armored clearance lamp at each of the rear corners and an amber armored clearance lamp at each of the front corners. These lamps shall be mounted at the highest and widest positions of these corners.~~

~~(b) Body shall be equipped with an amber armored intermediate or mid-body marker or clearance light on both sides. These lamps shall be mounted in accordance with FMVSS 571.108.~~

~~(c)~~(a) ~~Armored clearance lamps shall~~All marker, clearance and identity lamps shall be armored and conform to society of automotive engineers code PC.

~~(d)~~(b) These clearance lamps shall be connected to the chassis headlight circuit and shall be activated by the chassis headlight switch.

~~(R)~~(S) All school buses shall be equipped with mirrors meeting the requirements of FMVSS 571.111. ~~All mirrors shall be heated and fully adjustable.~~

(1) Interior rear view mirror shall be a minimum of six by thirty inches.

(2) All exterior mirrors shall be heated and fully adjustable.

~~(2)~~(3) Mirror assemblies may include stainless steel materials as necessary

(including mounting bracketry), and be warranted one hundred percent replacement coverage for thirty-six months against rust and ~~corporation~~ corrosion~~,~~ and against any reduction in clarity of view due to discoloration or other deterioration of the lens.

~~(S)~~(T) Mounting of body on chassis.

(1) Insulating material shall be placed between all main cross-sill and intermediate members. Insulating material shall be at least one-fourth inch thick and shall be attached to chassis frame or body members so that the body will not move under severe operating conditions.

(2) Chassis frame shall extend to rear edge of rear body cross member.

(3) Bus body shall be attached to chassis frame in such a manner as to prevent shifting or separation of the body from the chassis under severe operating conditions.

(4) Body front shall be attached and sealed to the chassis cowl in such a manner as to prevent entry of moisture.

~~(T)~~(U) All buses shall be equipped with two front fender mud flaps and two rear mud flaps.

~~(U)~~(V) All openings created in mounting of bus body to chassis shall be sealed by body manufacturer to prevent entrance of gases, dust or moisture into passenger and driver's compartments.

~~(V)~~(W) Overall length of a school bus shall not exceed forty feet.

~~(W)~~(X) ~~Over all~~Overall width of a school bus shall not exceed one hundred and two inches, excluding mirrors.

~~(X)~~(Y) Seat belt and upper torso restraint system for driver.

(1) A locking retractor-type seat belt for driver shall be provided. Belts shall be equipped with protective boots of sufficient quality and strength to keep it retracted and off the floor and within easy reach of the driver. Belt shall be adjustable on one side only and keep the driver from sliding sideways under the belt.

(2) Belt and emergency locking retractor upper torso restraint shall be installed in compliance with current federal and society of automotive engineers standards.

(3) An emergency locking retractor upper torso restraint shall be provided and shall work in unison with the seat belts.

~~(Y)~~(Z) Driver's seat.

(1) Minimum distance between steering wheel and back rest of driver's seat shall be eleven inches. Driver's seat shall have vertical adjustment of not less than four inches and horizontal adjustment of not less than four inches.

(2) ~~All sewing on cushions and backs shall be single-stitched, with a minimum of number twelve four-ply glaze finish thread of the best grade or its approved equivalent.~~ Seams in cushions and seat backs shall be forty-two ounces or equivalent material strength as upholstery.

(3) The driver's seat ~~must be covered with flame-barrier, fire-retardant seat material and must pass the "School Bus Upholstery Fire Block" test~~ and driver's area shall have a barrier meeting FMVSS 571.222 positioned immediately behind the driver's area.

~~(Z)~~(AA) Passenger seats.

(1) All seating and restraining barrier design and construction must meet the provisions of FMVSS 571.222. all seat back barriers must be a minimum of twenty-eight inches in height, as measured from the intersection of the forward surface of the seat back and the underpressed surface of the seat cushion. The top surface of the barriers shall be the same height as the top surfaces of the seat backs.

(2) All seats shall have a minimum depth of fifteen inches.

(3) All seats shall be forward-facing.

(4) School buses with left side emergency door(s) may be equipped with one jump seat. Such seat will be located only immediately adjacent to side emergency exit(s) and shall conform to all applicable federal standards.

(5) Seats shall be mounted so as to provide a minimum of thirty-six inches headroom for sitting position above the top of undepressed cushion line of all seats. Measurement shall be made vertically not more than seven inches from side wall at cushion height and at fore and aft center of cushion.

(6) Seat construction.

(a) Backs of all seats shall be same width at the top and same height from floor, also slanting at the same angle with the floor.

(b) Seat, seat back cushion, seat bottom and crash barrier shall be covered with flame-barrier fire-retardant seating material. Such material must pass the "Fire Block" test.

(i) The flame will not spread to seat back in front of the fire.

(ii) The flames on the rear seat will self-extinguish.

(iii) The flame-barrier, fire retardant seating material will successfully prevent the underlying padding material from being exposed to the flames.

(c) All seat backs and rails shall be covered with energy-absorbing padding material as required by FMVSS 571.222.

(d) A passenger seat cushion retention system shall be employed to prevent the passenger seat cushion from disengaging from the seat frame in the event of an accident. Each seat cushion retention system shall be capable of withstanding a vertical static load equal to a minimum of five times the weight of the cushion. The system shall also be capable of withstanding a forward or rearward static load equal to twenty times the weight of the cushion.

(e) A barrier/padded guard panel in compliance with FMVSS 571.222 shall be placed forward of all seats not having another passenger seat in front ~~of it~~.

~~(AA)~~(BB) Service door steps.

(1) The first step of the service door shall be not less than six inches and not more

than sixteen inches from the ground.

(2) Service door entrance shall be equipped with three steps. Risers in each case shall be approximately equal.

(3) Steps shall be enclosed to prevent accumulation of ice and snow.

(4) Steps shall not protrude beyond side body line.

(5) Grab handles of maximum length, but not less than ten inches long, shall be installed on both sides of the interior step-well area. These handles shall be stainless steel clad. Both grab handles shall be securely fastened and designed so as to prevent clothing or any other item from being caught.

(6) Surface of steps shall be of non-skid material.

(a) Steps shall be covered with first-quality step covering material which shall have non-skid characteristics and be of ~~non-skid or corrugated~~ ribbed or pebble design. Step covering shall have a turned-down nosing of a contrasting color of either white, yellow, or bright orange.

(b) Step covering shall be securely fastened to the steps in a manner that will minimize tripping. This requires that the heads of mounting screws or bolts be below the top surface of the step tread.

(7) The service door steps shall have a barrier that is in compliance with FMVSS 571.222 positioned between the stairwell and the passenger compartment.

~~(BB)~~(CC) Access steps

(1) Steps shall be installed on each side of the school bus to allow access to windshield for cleaning.

(2) Grab handles shall be securely mounted in a suitable position.

~~(CC)~~(DD) Sun visor.

The school bus shall be equipped with at least one interior adjustable transparent sun visor, folding type, which is a minimum of six by thirty inches in size.

~~(1) The school bus shall be equipped with at least one interior adjustable transparent sun visor, folding type, which is a minimum of six by thirty~~

~~inches in size.~~

~~(2) A right sun visor which is at least six by sixteen inches in size is permitted.~~

~~(DD)~~(EE) Wheel-housings.

(1) Wheel-house shall be attached to floor components in such a manner to prevent water, dust or fumes from entering the bus body.

(2) Wheel-house openings shall allow for easy tire removal and service.

(3) Inside height of wheel-housing above floor line shall not exceed ten inches.

(4) Wheel-housing shall provide clearance for dual wheels to permit the installation of tire chains.

~~(EE)~~(FF) ~~Windshield and windows shall meet FMVSS 571.205~~Windows.

~~(1) All glass in windshields shall be approved laminated safety glass with the rating of one or better, as specified by the American national standards institute.~~

~~(2) Glass in windshield shall be heat-absorbent, laminated plate. Windshield shall be large enough to permit the driver to see the roadway clearly, installed to reduce glare, and be installed between front corner posts that are designed and placed to provide maximum visibility for the driver.~~

~~(3)~~(1) ~~Window to the immediate right of driver (entrance door) and left of driver shall be accompanied by a number designating glazing standard from american national standards institute, two laminated safety glass.~~ Driver's side window shall be capable of opening and be equipped with a lock-type closure.

~~(4) Windshield shall have enough horizontal gradient band starting slightly above line of driver's vision and gradually decreasing in light transmission to twenty percent or less at the top of the windshield. Windshield may be fully tinted in lieu of above. Windshield and windows to the immediate right and left of the driver must have minimum of seventy percent light transmittance.~~

~~(5) All glass in side windows and doors behind the driver's position shall be AS-2 or AS-3 tempered glass or better.~~

~~(6)~~(1) Each side window shall be double sash and provide unobstructed emergency opening at least nine inches high and twenty-two inches wide, obtained by

lowering the upper sash. All exposed edges of glass shall be banded.

~~(7)~~(2) Individual windows shall not have a vertical opening greater than twelve inches. Stops shall be installed where needed to obtain this dimension.

~~(FF)~~(GG) Windshield wipers.

(1) Bus body to be equipped with two heavy-duty windshield wipers.

(2) ~~Each windshield wiper~~ Windshield wipers to be operated by ~~a separate~~ one or more electric ~~motor~~motors.

(3) Windshield ~~wiper~~wipers shall be controlled with one switch. ~~switch~~ Switch shall provide ~~two-speed~~ multi-speed operation and shall incorporate an intermittent position.

(4) Wipers shall be wet arm type.

(5) The windshield wiper ~~motors~~ motor or motors shall have sufficient power and the wiper arms and blades shall be of sufficient length to provide the largest cleaning area possible.

(6) Wiper blades shall be a minimum of sixteen inches in length. The blade holders shall be the type that permit replacement of only the rubber blade.

(7) The left side windshield wiper shall be so positioned that the approximate center of the wiped area will be directly in front of the driver in a normal seated position. The right side windshield wiper shall be so positioned that the wiped area will provide the driver with maximum vision to the right in a normal seated position.

~~(GG)~~(HH) Windshield washers.

~~(1) The school bus body shall be equipped with an electrically operated windshield washer by which a stream of washing fluid is directed to both sides of the windshield in the approximate center of the wiped area.~~

~~(2)~~(1) The windshield washer fluid reservoir shall have a minimum capacity of two quarts in a rigid plastic container. It shall be mounted ~~in the engine~~ outside the passenger compartment in a position readily accessible for refilling~~, except type D school buses~~.

~~(3)~~(2) Windshield washer shall incorporate a check valve in supply line. Check valve will not allow washer fluid to drain back into washer tank when not in use.

~~(III)~~(II) Wiring

(1) All wiring shall conform to current society of automotive engineers standards. All wires shall be coded and numbered as required by the ~~"1995 National Standards for School Transportation"~~ "2000 National School Transportation Specifications and Procedures". Wiring diagrams must be made available to school bus owners.

(2) There shall be no less than ~~eight~~ nine regular circuits, as follows:

(a) Head, tail, stop (brake), and instrument panel lamps.

(b) Clearance and step-well lamps.

(c) Dome.

(d) Starter motor.

(e) Ignition and emergency door signal.

(f) Turn signal lamps.

(g) Alternately flashing red and amber signal lamps.

(h) Horn.

(i) Heaters and defrosters.

(3) Any of the above combination circuits may be subdivided into additional independent circuits.

~~(4) Whenever heaters and defrosters are used, at least one additional circuit shall be installed.~~

~~(5)~~(4) ~~Whenever possible, all~~ All other electrical functions~~, such as sanders and electric-type windshield wipers,~~ shall be provided with independent and

properly protected circuits.

~~(6)~~(5) Each body circuit shall be color coded and a diagram of the circuits shall be attached to the body in a readily accessible location.

~~(7)~~(6) A circuit breaker or equivalent protection device shall be provided for each major circuit except starter motor and ignition circuits.

~~(8)~~(7) All wires within body shall be insulated and protected by a covering which will protect them from external damage and minimize dangers from short circuits. Whenever wires pass through body members, additional protection in the form of an appropriate type of insert shall be provided.

~~(9)~~(8) Wires not enclosed within body shell shall be fastened securely at intervals of not more than twenty-four inches. All joints shall be soldered or joined by equally effective connectors.

~~(II)~~(JJ) Stop arm sign specifications.

(1) All school buses shall be equipped with an octagonal "Stop" sign. The background shall be a minimum of eighteen inches in height and eighteen inches in width and shall be reflective material, red in color with white lettering. The sign shall be so mounted as to not interfere with the driver's vision to the rear when the sign is extended. The standard octagonal sign shall contain two flashing red lamps which are visible from both sides of the extended sign. ~~Red strobe lights may be used in place of the flashing lights.~~

(2) The word "Stop" shall be in reflective white letters on both sides of the sign. The sign shall be vacuum, electric or air-power controlled and so constructed as to lock in extended and closed position.

~~(3) The stop arm shall operate when the service door is opened and when the red flashing warning lights come on during the warning light cycle.~~

~~(4) Reflective material for stop sign shall be high intensity retro-reflective sheeting, grade five or equivalent.~~

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