

## **581-053-0517**

### **Minimum Standards for School Bus Bodies**

(1) Aisle:

(a) Minimum clearance of all aisles shall be 12 inches;

(b) Aisle supports of seat backs shall be slanted away from aisle sufficiently to give aisle clearance of 15 inches at tops of seat backs.

(2) Battery:

(a) Battery is to be furnished by chassis manufacturer;

(b) When battery is mounted as described in electrical section, Battery of Chassis Standard, i.e., the body manufacturer shall securely attach battery on slide-out or swing-out tray in closed, vented compartment in body skirt whereby battery may be accessible for convenient servicing and removal from the outside. Battery compartment door or cover shall be hinged at front or top and secured by adequate and conveniently operated latch or other type fastener. This includes Type A-1, A-2 buses unless the battery(ies) are mounted assessable under the hood;

(c) Access to battery through body floor not permitted;

(d) Buses may be equipped with a battery shut-off switch. The switch is to be placed in a location not readily accessible to the driver or passengers.

(3) Body Sizes: It is the body supplier's responsibility to determine that the completed body-on-chassis type bus will fulfill weight distribution requirements as explained in OAR 581-053-0512, Bus Chassis, section (30), Weight Distribution. Body manufacturer shall determine the vehicle's maximum designed and equipped passenger capacity and post it along with GVWR and vehicle compliance information.

(4) Bumper (Front): See OAR 581-053-0512, Bus Chassis, section (6) Bumper, Front. Deer guards may be added to a front bumper to protect the front grill. Deer guards may not be in any portion of the driver's forward view, including use of all mirrors.

(5) Bumper (Rear):

(a) Rear bumper for all body on chassis units shall be of pressed steel channel or equivalent material at least 3/16-inch thick and eight inches wide (high), and of sufficient strength to permit pushing by another vehicle without distortion. Type A-1 and A-2 buses (not body on chassis) may be manufacturers' standard;

(b) Bumper for all body on chassis units shall wrap around back corners of bus. It shall extend forward at least 12 inches, measured from rear-most point of body at floor line. Type A-1 and A-2 buses (not body on chassis) may be manufacturers' standard;

(c) 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 the insertion of small fingers between the body and bumper;

(d) Bumper shall extend beyond rear-most part of body surface at least one inch, measured at floor line;

(e) An energy absorbing rear bumper may be used providing a self-restoring energy absorbing bumper system so attached as to prevent the hitching of rides and of sufficient strength to:

(A) Permit pushing by another vehicle without permanent distortion to the bumper, chassis, or body;

(B) Withstand repeated impacts without damage to the bumper, chassis, or body according to the following performance standards:

(i) 2.0 MPH fixed barrier impact (FMVSS cart and barrier test);

(ii) 4.0 MPH corner impact at 30 degrees (Part 581 CFR Title 49);

(iii) 5.0 MPH buses (Part 581 CFR Title 49).

(C) The manufacturer of the energy absorbing system shall provide evidence from an approved test facility (capable of performing the above FMVSS tests) that their product conforms to the above.

(6) Ceiling: See section (19) of this rule, Insulation, and section (20), of this rule, Interior.

(7) Color:

(a) The school bus body shall be painted a uniform National School Bus Yellow. The body exterior paint trim, bumper, lamp hoods, and emergency door lettering shall be black. The roof of the bus may be painted white. The white color may extend across the roof down to the drip rails or within 6 inches above the passenger windows on the sides of the bus except that front and rear caps shall remain National School Bus Yellow. Retroflective material may be used as trim on rear bumper. Beltline lettering may be yellow;

(b) Retroflective material approved by the Department of Education shall be installed as a background for the required school bus lettering both on the front and rear of the body of buses purchased after September 1, 1993. Maximum dimensions: 12" x 36", unless equipped with approved lighted school bus signs. Retroflective material shall have reflective values equal or greater than 3M Scotchlite Diamond Grade and retain at least 50 percent of those values for a minimum of six years;

(c) Additional retroreflective material, if used, shall be automotive engineering grade or better, meeting initial reflectance values in FHWA FP-85 and retaining at least 50 percent of those values for a minimum of six years. Retroreflective materials and markings, if used, may include any or all of the following:

(A) Front and rear bumper: may be marked diagonally 45 degrees down to centerline of pavement with two-inch wide strips of noncontrasting reflective material;

(B) Rear of the bus body may be marked with a strip of retroreflective National School Bus Yellow matching material no greater than two inches wide to be applied to the back of the bus, extending from the left lower corner of the "SCHOOL BUS" lettering, across to the left side of the bus; then vertically down to the top of the bumper; across the bus on a line immediately above the bumper to the right side, then vertically up to a point even with the strip placement on the left side, and concluding with a horizontal strip terminating at the right lower corner of the "SCHOOL BUS" letter;

(C) Sides of bus body: may be marked with retroreflective National School Bus Yellow matching material comprising background for letters at least six inches but no more than twelve inches in width, extending the length of the bus body and located (vertically) as close as practicable to the beltline. Two-inch wide reflective material having high intensity reflectance values (3M Scotchlite Diamond Grade or equivalent) may be substituted for the six inch to twelve-inch wide materials;

(D) See appendix for diagram defining locations of marking referred to above.

(8) Construction:

(a) 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;

(b) Construction shall provide a water-tight and reasonably dustproof unit;

(c) Must meet or exceed applicable federal motor vehicle safety standards for construction, effective April 1, 1977.

(9) Crossing Arm: A crossing arm may be mounted on the front of a school bus in accordance with the following specifications:

(a) Installed on the front bumper as close as practicable to the right (curb) side, opening left to right and providing an extension of the curbside of bus;

(b) Arm shall be located at least 18 inches but not more than 24 inches above ground level and in the closed position; arm shall not cover numbers on license plate;

(c) Installed in a manner to limit the outward deployment to 90 degrees from the front bumper;

(d) Arm shall extend 70 inches from the front bumper in its extended position;

(e) Arm shall be activated through the existing bus safety light system assuring the driver is required to take no additional action to either deploy or retract the arm. No outward movement of the arm may occur before red flashing sequence begins;

(f) Override switches are prohibited;

(g) Crossing arm must be safeguarded from damage due to pushing or pulling by hand through the use of a clutch-like device or equivalent, double spring hinges are not acceptable);

(h) The arm may be equipped with an amber flashing light that functions only when the arm is in the fully extended position;

(i) Entire unit shall have no sharp edges or other projections that could injure children or others due to casual contact;

(j) Unit shall provide secure mounting opportunities to prevent misalignment or failure due to extreme weather conditions;

(k) Shall meet or exceed all requirements in SAE Standard J1133;

(l) Shall be either air, vacuum, or electrically operated and in conformance to section (39)(g) of this rule;

(m) Crossing arm color shall either appear in an unpainted state or comply with trim requirements listed in section (7)(a) of this rule;

(n) All components and connections shall be weatherproofed.

(10) Defrosters:

(a) Defrosting and defogging equipment shall direct a sufficient flow of heated air onto the windshield, the window to the left of the driver and the glass in the viewing area directly to the right of the driver to reduce the amount of frost, fog and snow;

(b) The defroster units shall have separate blower motors, in addition to the heater motors. Type A-1 and A-2 buses may have manufacturers' standard defrosters;

(c) A right front windshield and door defrosting unit with a separate hot water core and separate blower motors shall be provided on Type C buses;

(d) The defrosting system shall conform to SAE performance standards J-381 and 382;

(e) The defroster and defogging system shall be capable of furnishing heated outside ambient air, except that part of the system furnishing additional air to the windshield, entrance door and stepwell may be of the recirculation air type;

(f) Auxiliary fans are not to be considered as a defrosting and defogging system:

(A) Auxiliary fans, if used, must be mounted above the windshield, so as not to interfere with the driver's vision of the roadway, mirrors or students outside the bus;

(B) The fan blades shall be covered with a protective cage.

(11) Doors: Service Door:

(a) Service door shall be under control of driver, and so designed as to afford easy release and provide a positive latching device for manual operating door so as to afford easy release and prevent accidental opening. When hand lever is used, no part 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 direct view;

(c) Service door shall have minimum horizontal opening of 24 inches and minimum vertical opening of 68 inches. Type A-1 and A-2 buses shall have a minimum opening of 1,200 square inches;

(d) Service door shall be of split type, (*sedan type*) or jack-knife 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. Manual door controls shall not require more than 25 pounds of force to operate at any point throughout the range of operation;

(e) If power operated, pressure shall be controlled by a regulator valve or switch and provision shall be made for opening the door manually in the event of driver disability or mechanical failure. Emergency release valve or switch for power operated doors shall be located in an accessible place, in plain view, as near the service door as practicable. Valve or switch shall be properly identified and "open" and "closed" position plainly marked;

(f) Lower as well as upper panels shall be of approved safety glass. Bottom of lower glass panel shall not be more than ten inches from top surface of bottom step. Top of upper glass panel shall not be more than six inches from top of door. Type A-1 and A-2 buses shall have a minimum 350 square inch upper glass panel;

(g) Vertical closing edges shall be equipped with flexible material to protect children's fingers. Type A-1 and A-2 buses may be equipped with chassis manufacturers' standard entrance door;

(h) There shall be no door to left of driver. (This shall not be interpreted to conflict with emergency doors or windows.) Type A-1 and A-2 and B buses may be equipped with manufacturers' left side driver's door;

(i) All doors shall be equipped with an energy absorbing pad at the top edge of each door opening. Pad shall be at least 3 inches wide and 1 inch thick and extend the full width of the door opening. Pad not required on Type A-1 and A-2 and B buses, left side driver's door.

(12) Emergency Exits:

(a) All buses purchased after January 1, 1999 shall be equipped with required emergency exits and identification listed in 49 CFR Part 571 FMVSS 217 as it has been adopted by National Highway Traffic Safety Administration for June 9, 1995 implementation plus all applicable standards specified in this rule: These rule changes apply to buses ordered after July 1, 2004

(b) For buses equipped with a rear emergency door additional exits as listed below:

(A) Buses designed or equipped with a passenger capacity of 1-22 shall provide [one of] the following:

(i) 2 swing-out windows, one on each side of the bus approximately mid-point of the passenger compartment and One FMVSS 217 complying roof hatch; or

(ii) Side windows with a 12 inch vertical drop and One FMVSS 217 complying roof hatch.

(B) Buses designed or equipped with a passenger capacity of 23 to 45 shall provide:

(i) One FMVSS 217 complying left side emergency door and One FMVSS 217 complying roof hatch; or

(ii) Two FMVSS 217 complying swing-out windows one on each side of the bus approximately mid-point of the passenger compartment and One FMVSS 217 complying roof hatch.

(C) Buses designed or equipped with a passenger capacity of 46 to 62 shall provide:

(i) One FMVSS 217 complying left side emergency door and One FMVSS 217 complying roof hatch; or

(ii) Four FMVSS 217 complying swing-out windows; two on each side of the bus approximately mid-point of the passenger compartment, but not immediately adjacent to each other and one FMVSS 217 complying roof hatch.

(D) Buses designed or equipped with a passenger capacity of 63 and above shall provide:

(I) One FMVSS 217 complying left side emergency door and One FMVSS 217 complying roof hatch; or

(iii) Four FMVSS 217 complying swing-out windows; two on each side of the bus approximately mid-point of the passenger compartment, but not immediately adjacent to each other and One FMVSS 217 complying roof hatch.

(c) For buses equipped with a rear push-out window, a left side emergency door shall be provided and the following additional exits as listed below:

(A) Buses designed or equipped with a passenger capacity of 1-22 shall provide one of the following:

(i) Two FMVSS 217 swing-out windows, one on each side of the bus approximately mid-point of the passenger compartment; or

(ii) Side windows with a 12 inch vertical drop and One FMVSS 217 complying roof hatch.

(B) Buses designed or equipped with a passenger capacity of 23-45 shall provide:

(I) Two FMVSS 217 complying swing-out windows and One FMVSS 217 complying roof hatch.

(C) Buses designed or equipped with a passenger capacity of 46-57 shall provide:

(i) One FMVSS 217 complying right side door and One FMVSS 217 complying roof hatch; or

(ii) Four FMVSS 217 complying swing-out windows and One FMVSS 217 complying roof hatch.

(D) Buses designed or equipped with a passenger capacity of 58 and above shall provide:

(i) One FMVSS 217 complying right side door and One FMVSS 217 complying roof hatch; or

(ii) Four FMVSS 217 complying swing-out windows; and One FMVSS 217 complying roof hatch

(d) Selection of the added exits (if any) necessary to comply with the "additional emergency exit area" requirements of FMVSS 217 shall be made by the vehicle purchaser in conformance to applicable rules;

(e) Manufacturer shall identify all emergency exits used for calculations relating to FMVSS 217 compliance and list the daylight (clear) opening for each exit;

(f) A document identifying the following shall be provided by the vehicle seller to the Oregon Department of Education and bus purchaser prior to the bus being introduced into a bus system for the first time:

(A) Bus manufacturer;

(B) Bus identification number;

(C) Bus designed and equipped passenger capacity;

(D) Bus purchaser and district(s) served;

(E) All emergency exits used for FMVSS 217 compliance; and

(F) Total square inches/square cm clear opening for each emergency exit provided in the bus.

(g) Swing out windows shall provide a minimum clear opening of 18" x 24". If side emergency swing-out windows can be opened from outside the bus the words "Emergency Exit" shall be placed directly above the window in letters at least two inches high on the exterior of the bus. If the words "Emergency Exit" are placed on the exterior of the bus above swing-out windows inoperable from outside, the label must include the following statement in letters approximately one inch high "Operates From Inside Only."

(h) Rear emergency door exits:

(A) Type A-1 and A-2 buses with double rear emergency doors shall be hinged on the outside and have a three point fastening device;

(B) Upper portion of emergency door shall be equipped with approved safety glazing, exposed area of not less than 400 square inches;

(C) Lower portion of rear emergency door shall be equipped with approved safety glass and shall have an exposed area of not less than 350 square inches of approved safety glazing. Type A-1 and A-2 buses are not required to have lower rear emergency door glazing;

(D) There shall be no steps leading to emergency door;

(E) Clearance between outside emergency door handle and the emergency door shall not exceed 1/4-inch when handle is in closed position. Handle shall not provide a firm handhold to someone trying to "hitch" a ride. Handles shall be positioned to prevent snagging of clothing or pinching of fingers;

(F) Emergency door hinge shall not provide an opening for insertion of fingers when door is closed;

(G) If emergency door is lockable, provision must be made to prevent the bus from starting while the door is locked. An audible warning that does not affect engine operation shall be provided to alert the driver should the door be locked while the bus is in operation;

(H) An adequately padded head bumper shall be placed on the interior directly above any emergency exit door opening. The pad shall extend the full width of the door opening and shall be at least three inches wide and one inch thick.

(i) Approximately one inch/three centimeter retroreflective exterior perimeter marking shall be yellow in color, of automotive engineering grade material, and in compliance with both the retroreflective requirement of FMVSS and durability specifications listed in National Minimum Standards for reflective material;

(j) Roof emergency exit:

(A) Roof emergency exit, when required, shall be installed in a school bus body in accordance with FMVSS 217;

(B) A roof exit shall be waterproof and provide a minimum clear opening of 16" x 16"; and have an audible warning signal able to be heard at the driver's area. These rule changes apply to buses ordered after July 1, 2004

(C) Roof exit may also serve as a roof ventilator; however, this may not be used in place of the required static vent.

(13) Emergency Equipment:

(a) Belt cutter: Each bus equipped with passenger seat belts or webbed restraining devices shall have a belt cutter mounted in the driver's compartment, readily accessible and in plain view of the driver. Device shall be of a design offering protected cutting edges to prevent accidental or intentional injury to drivers or passengers;

(b) Emergency road reflectors:

(A) Each bus shall be equipped with at least three DOT triangle reflectorized disabled vehicle warning devices;

(B) Reflectors must be in a container securely mounted with nut-and-bolt fasteners enhanced with large flat (fender) washers or held in place by a nut-and-bolt mounted metal bracket that also protects and secures the container lid. Both shall be located in an accessible location. Reflectors shall not be mounted in any engine compartment;

(C) If not mounted in plain view of the driver, the location shall be clearly designated.

(c) Body fluid cleanup kit: Buses purchased after September 1, 1993 shall have a removable moisture proof and dust proof body fluid cleanup kit, mounted in an accessible place within the driver's compartment. This place shall be marked to identify its location. Contents shall include at least the following items:

(A) Two pair rubber/latex gloves;

(B) Two four-ounce packages of stabilized chlorine absorbent deodorant (or equivalent) capable of stabilizing at least 1 litre/36 fl. oz. of body fluids;

(C) One spatula for pick up of congealed fluid;

(D) One plastic bag in which to place congealed fluid;

(E) One red plastic bag with tie, identified for infectious waste and as a bio-hazard;

(F) One two-ounce bottle of germicidal detergent to apply to a contaminated area;

(G) Four paper towels to wipe up contaminated area;

(H) One one-ounce antiseptic alcohol hand rinse (or equivalent);

(I) One placard of step by step use instructions;

(J) Germicidal detergents, stabilized chlorine absorbent deodorant, alcohol hand rinse, or their equivalents shall provide documentation of EPA approval regarding their microbiological efficacy for at least the following:

(i) Staphylococcus aureus;

(ii) Pseudomonas aeruginosa;

(iii) Salmonella choleraesuis;

(iv) Streptococcus species;

(v) Herpes simplex Type II;

(vi) HIV (Associated with AIDS);

(vii) Fungi (athlete's foot);

(viii) Poliovirus; and

(ix) Tuberculosis.

(K) Documentation of efficacy for Hepatitis B may be hospital or test studies. The certified effective shelf life of these products shall be a minimum of 12 months. Product expiration date shall be clearly displayed on all time-sensitive products.

(d) Fire extinguishers:

(A) Each bus shall be equipped with at least one pressurized, dry, chemical type fire extinguisher, mounted in a bracket and located in the driver's compartment, readily accessible and in plain view of the driver. A pressure gauge shall be mounted on the extinguisher so as to be readily read without removing the extinguisher from its mounted position;

(B) The fire extinguisher shall be of a type approved by the Underwriters Laboratories, Inc., with a rating of not less than 2 A-10 BC. The extinguisher shall have a minimum five pound capacity and equipped with a hose and nozzle;

(C) The operating mechanism shall be sealed with a type of seal that will not interfere with the use of the fire extinguisher;

(D) Extinguishers with plastic heads are not permitted.

(e) First aid kit:

(A) Each bus shall have a readily removable, moisture proof and dustproof first-aid kit container mounted in an accessible place within driver's compartment. If not mounted in plain view of the driver, the location shall be clearly designated;

(B) The first aid kit contains a minimum of 24 units that shall include the following:

(i) One 1" adhesive compress -- 16 per unit;

(ii) Two 2" bandage compress -- 4 per unit;

(iii) Two 3" bandage compress -- 2 per unit;

(iv) Two 4" bandage compress -- 1 per unit;

(v) Two 3" x 3" plain gauze pads -- 4 per unit;

(vi) Two 2" x 6 yards gauze roller bandage -- 1 per unit;

(vii) Three 1/2 square yard gauze;

(viii) Three 24" x 72" gauze;

(ix) Four Triangular bandage;

(x) One 1/2 x 5 yard adhesive tape-one per unit;

(xi) One round nose scissors and tweezers. Latex gloves-one pair; and

(xii) One microshield for mouth to mouth airway (to lay on top of other contents).

(C) Specific local requirements may be substituted in lieu of 2 units of 1/2 square yard gauze.

(14) Floor:

(a) Floor in underseat area, including tops of wheelhousing, driver's compartment and toeboard, shall be covered with rubber floor covering or equivalent having minimum overall thickness of .125 inch:

(A) Floor covering in aisle shall be of aisle-type fire-resistant rubber or equivalent, wear-resistant and ribbed or equivalent non-slip material. Minimum overall thickness shall be .1875 inch measured from tops of ribs;

(B) 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.

(b) Edge of floor at stepwell shall be treated as a step edge and shall be protected as required in section (37)(c) of this rule;

(c) A vapor and liquid proof inspection plate provided for access to the fuel tank sending unit is permissible;

(d) A subfloor of 5-ply plywood, at least 5/8 inch nominal thickness or equivalent, may be installed over the standard school bus floor. Plywood shall equal or exceed properties of exterior-type softwood plywood, C-D grade as specified in standards issued by the Department of United States Commerce. Floor shall be level from front to back and from side to side except for wheelhousing, toeboard and driver's seat platform areas;

(e) For Type A-1 and A-(1)2 buses that are not constructed with a standard school bus floor, the existing metal floor in the passenger area shall be covered with not less than 1/2-inch nominal thickness exterior C-D grade plywood. All plywood seams shall extend from side to side (laterally), longitudinal seams not permitted.

(15) Heaters:

(a) At least one heater of hot water type is required in all buses;

(b) If only one heater is used, it shall be of fresh-air or combination fresh-air and recirculation type;

(c) If more than one heater is used, additional heaters may be of recirculation air type;

(d) The heating system shall be capable of maintaining throughout the bus a temperature of not less than 50 degree Fahrenheit at average minimum January temperature as established by the U.S. Department of Commerce, Weather Bureau, for the area in which the vehicle is to be operated;

(e) All heaters installed by body manufacturers shall bear a name plate which shall indicate the heater rating in accordance with SBMI Standard No. 001, said plate to be affixed by the heater manufacturer which shall constitute certification that the heater performance is as shown on the plate;

(f) Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or sharp edges, and shall not interfere with or restrict the operation of any engine function. Heater hose shall conform to SAE J20c. Heater hoses on the interior of the bus shall be shielded to prevent scalding of the driver or passengers;

(g) Each hot water heater system installed by a body manufacturer shall include a shutoff valve installed in the pressure and return lines near the engine in an accessible location. There shall be a water flow regulating valve or airflow regulating door for the front heater installed for convenient operation by the driver while seated;

(h) Return heater lines on body company installed heaters shall be equipped with bleeder valves in an accessible location to allow for removal of heater line air;

(i) Combustion type heaters may be installed and shall comply with all the following:

(A) The combustion type heater must be installed outside the passenger compartment;

(B) Exhaust exit from the heater must meet the same location requirements as for engine exhaust;

(C) The heater must have been tested by a qualified laboratory and certified as complying with the following regulations:

(i) Code of Federal Regulations, CFR 300-399, Transportation Heaters, 393.77 and CFR 49: Part 571, Transportation: Motor Vehicle Safety Standard 301; Fuel System Integrity;

(ii) American Institute of Electrical and Electronic Engineers, IEEE1: Temperature Limits in Rating Electrical Equipment;

(iii) UL 307A: Liquid Fuel-Burning Heating Appliances, UL 756C: Polymeric Materials -- Use in Electrical Equipment, and UL 796: Printed Wiring Boards;

(iv) TE-12: Impact Testing of Vehicular Components.

(D) Provide isolation valves at the heater for both the coolant feeder and return lines;

(E) Heater must be equipped with a pressure relief valve preset to release any internal system pressure over 50 psi;

(F) An impact switch for the heater's electric fuel pump that will stop the pump with special inertial mechanics.

(j) Portable heaters may not be used.

(16) Identification:

(a) School bus bodies shall bear the words "School Bus" in black letters at least eight inches high and of proportionate width on both front and rear of body. Lettering shall be placed as high as possible without impairment of its visibility;

(b) A warning sign, calling attention to the school bus stop law shall be installed on the rear of all school buses. It shall be centered on the back of the bus and occupy the space, belt high, directly beneath the upper window in the rear door. Signs on transit type buses shall occupy approximately the same area. Signs on Type A buses with double rear door having obstructions such as door handles and recessed license plate holders that prevent sign centering shall be placed completely on the right side (rear) door in a manner that all reflective letters are located on that door and as high

on the lower portion of the door as practicable in relationship to the door handle, but the top of the sign may be no more than four inches below handle shaft. Sign shall conform to the following:

(A) Decals with white reflectorized letters conforming to retroreflective requirements listed in section (7)(c) of this rule mounted on a flat black background;

(B) Decal shall have lettering as shown below:

UNLAWFUL TO PASS (3 inches in height)  
WHEN (1 inches in height)  
RED LIGHTS FLASH (3 inches in height)

(C) Electronic Motorist alert sign may be installed on the rear of school buses. This sign shall illuminate and flash a message with a minimum of three inputs: (1) when the hazard warning lights are activated, illuminate and flash an amber caution alert message and or (2) when the amber School Bus Safety Lights are activated, illuminate and flash an amber caution alert message or (3) when the red School Bus Safety Lights are activated, illuminate and flash a red warning message to motorist. Assembly must be sealed weather tight construction approximately 23 ½" X 8 ¾" X 1 3/8" in size. The minimum viewing angle from the rear of the bus shall be 30 degrees (15 degrees on each side of perpendicular axis). Hazard warning light display message shall be amber "CAUTION STOPPING"; School Bus Safety amber light display message shall be alternating amber "CAUTION" then "STOPPING"; School Bus Safety red light display message shall be alternating red "STOP" (within an octagon outline) then "DO NOT PASS". Frequency of standard alternating message flash and or alternating different message flash may be controlled by hazard warning and School Bus Safety Light flashers. Illumination intensity and quantity of L.E.D. lights shall be sufficient to result in a clear legible message.

(i) Mounting on front engine buses, device shall be located in the most attainable vertical center of rear emergency door, between upper and lower windows in the lowest possible mounting position.

(ii) Mounting on rear engine buses, device shall be vertically centered and horizontally adjacent to the left and right upper brakes lights as possibly.

(iii) Electronic Motorist alert sign may also be installed on the front of buses if they are mounted and used on the rear of buses. This sign must be wired and activated in same manor as the sign on the rear of buses. Sign shall be mounted on the front of the bus, below the windshield, vertically and horizontally centered as possible.

(D) It is prohibited for any school bus to display a warning sign, which does not meet B or C in this section *the above requirements*;

(c) The name of the school district IE: (and contractor company name if applicable) contractor company name shall be placed on the side of each bus. Such signs shall appear in the area directly below the side windows and the letters and figures in such signs shall not be less than four inches nor more than six inches in height and of proportionate width;

(d) School team name or contractor's insignia may be placed above the side windows on the front portion of the bus body. All such lettering must be approved by the Pupil Transportation Section of the Oregon Department of Education;

(e) At least one bus identification number at least four inches in height shall be placed on a flat vertical surface on each side and on the front and rear of the bus. At least one complete unit number shall be visible from any point 50 feet from the bus. Symbols may be used in lieu of numbers. Type A-1 and A-2 bus numbers may be three inches in height. Bus identification numbers are not required if the school has only one route bus;

(f) Only signs and lettering approved by state law or by the regulations of the Department of Education shall appear on the inside or outside of a school bus.

(17) Inside Height: Clear inside body height shall be 72 inches or more measured at any point on the longitudinal center line from front vertical bow to rear vertical bow. Type A bus height shall be not less than 62 inches.

(18) Instruments, Gauges, Indicators: Body manufacturer shall in no manner obstruct the driver's visibility of required instruments, gauges or indicators provided by the chassis manufacturer. Body instrument panel lights shall be controlled by an independent rheostat switch.

(19) Insulation:

(a) Ceiling and walls in all new buses purchased after September 1, 1985, shall be insulated with proper material to deaden sound and to reduce vibration to a minimum. Thermal insulation of fire-resistant and non-water absorbing material approved by Underwriters Laboratories, Inc., is required in body ceiling and walls;

(b) If floor insulation is desired it must be 5-ply, at 5/8-inch thick plywood as specified in section (14) of this rule.

(20) Interior:

(a) Interior of bus shall be free of all unnecessary projections likely to cause injury including luggage/book racks on buses purchased after September 1, 1993 or retrofitting occurring after that date. This standard requires inner lining on ceilings and walls. If ceiling is constructed so as to contain lapped joints, forward panel shall be lapped by rear panel and exposed edges shall be beaded, hemmed, flanged or otherwise treated to minimize sharp edges;

(b) Ceiling of bus shall be free of all projections that can cause injury in the event of a collision or rollover (see section (30) of this rule.);

(c) All materials used in the interior of a school bus body shall meet the requirements of Federal Motor Vehicle Safety Standard No. 302, Flammability of Interior Materials;

(d) Construction of buses manufactured after September 1, 1993 shall assure noise level taken at the ear of the occupant nearest to the primary vehicle noise source shall not exceed 85 DBA when tested according to the procedure found in the Appendix (Noise Test Procedure).

(21) Lamps and Signals:

(a) All lamps on exterior of bus shall conform with and be installed as required by Oregon Motor Vehicle law and the Federal Motor Vehicle Safety Standard No. 108, effective January 1985;

(b) Headlamps, when furnished by body manufacturer, shall be of proper intensity and adjustment as specified by Oregon Motor Vehicle law;

(c) Stop-tail lamps: Buses shall be equipped with four combination red stop-tail lamps. Two combination lamps with a minimum 38 square inches of illuminated area shall be mounted on the rear of the bus on the beltline or immediately below. Two combination lamps with a minimum 12 square inches of illuminated area shall be placed on the rear of the body between the beltline and the floor line. Rear license plate lamp may be combined with one lower tail lamp. Stop lamps shall be activated by the service brakes and shall emit a steady light when illuminated. Type A-1 and A-2 buses with bodies supplied by chassis manufacturer may have manufacturer's standard stop and tail lamps;

(d) Clearance and identification lights: Each bus shall be equipped with clearance and identification lights as required by Oregon Motor Vehicle law and Federal Motor Vehicle Safety Standard No. 108;

(e) Reflectors: Each bus shall be equipped with reflectors as required by Oregon Motor Vehicle law and Federal Motor Vehicle Safety Standard No. 108;

(f) Directional signals: Each bus shall be equipped with front and rear turn signal lamps that conform to requirements of the Oregon Motor Vehicle law. Lamps shall have a minimum illuminated area of 38 square inches. Lamps shall be amber in color whether mounted at the front or rear. Type A-1 and A-2 buses may be equipped with manufacturer's standard front turn signals. Signal lamps shall be independent units and connected to chassis-supplied turn signal switch and four-way hazard warning switch to cause simultaneous flashing of turn signal lamps when needed as vehicular traffic hazard warning. A turn signal lamp with a minimum of 4 candlepower shall be mounted on each body side at approximately seat level height, located to the rear of the entrance door on the right side of the body and approximately the same location on the left side. These are to be connected to and function with the regular turn signal lamps. Type B buses may have the right side body turn signal forward of the entrance door;

(g) Back-up lamps: Two back-up lamps shall be provided in accordance with Federal Motor Vehicle Safety Standard 108;

(h) Back-up warning alarm: An automatic audible alarm shall be installed on the rear of all buses purchased after November 1, 1985, that complies with the Society of Automotive Engineers (SAE 994 Backup Alarm Standard). Alarm minimum shall be 107 db;

(i) Interior dome lamps: Interior lamps shall be provided which will adequately illuminate interior aisles. There shall be at least one interior lamp for every two rows of passenger seats. One or two rear dome lamp(s) shall be wired through a separate switch. Separate circuit for rear dome lamp(s) is not required on buses with less than five rows of seats;

(j) Stepwell lamp: A stepwell lamp shall be provided which will adequately illuminate the entire stepwell. The lamp circuit shall be wired through the headlamp or clearance lamp system and shall be activated only when the door is opened;

(k) School Bus Safety Lights:

(A) Each school bus shall be equipped with a system meeting FMVSS 108 consisting of four red signal lamps designed to conform to SAE Standard J887, "School Bus Red Signal Lamps," July 1964, and four amber signal lamps designed to that standard, except for color, and except that their candle power shall be at least 2-1/2 times that specified for red signal lamps. Lamps shall have minimum of 17.25 square inches and shall be clearly visible in direct sunlight from a distance of 500 feet along axis of vehicle;

(B) The system shall be wired so that the system is activated by a manually operated spring-loaded switch clearly labeled and distinguishable from other switches. A circuit master switch is permitted if the manually operated activating switch and the master switch are together in one switch;

(C) For buses equipped with power-controlled entrance doors, an additional spring loaded switch that will activate the red school bus safety lights prior to opening entrance door is permissible;

(D) The flashing mechanism shall be capable of carrying the full current load of the signal system;

(E) Right and left signal lamps shall flash alternately. Each signal lamp shall flash not less than 60 or more than 120 flashes per minute. The "on" period shall be long enough to permit bulb filament to come up to full brightness;

(F) Pilot lamps/monitors:

(i) Each bus shall be equipped with two, 3/8-inch illuminated pilot lamps -- one amber and one red - - to indicate when the respective amber or red system is actuated. Pilot lamps shall be placed within a 140° field of vision for a 95th percentile female anthropomorphic test dummy seated in a normal driving position. Pilot lamps shall also provide an unmistakable indication that the flasher system is operating and an unmistakable indication if any circuit is broken, any lamp is not operating or the system is not otherwise functioning normally unless a separate monitoring system performs all those functions; or

(ii) Each bus shall be equipped with a monitor system utilizing 3/8-inch illuminated red and amber lamps to indicate when the respective amber or red system is actuated. Monitor shall be placed within a 140° field of vision for a 50th percentile anthropomorphic test dummy seated in a normal driving position. Monitor shall also provide an unmistakable indication that the flasher system is operating and an unmistakable indication if any circuit is broken, any lamp is not operating or the system is not functioning normally.

(G) School Bus Safety Light system shall operate as follows:

(i) With entrance door closed, depress activation switch. Amber pilot light and amber bus safety lights shall go on;

(ii) Open entrance door; amber bus safety lights shall go off, and red pilot light and red bus safety lights shall go on;

(iii) Close entrance door; pilot and bus safety lights shall go off;

(iv) Reopen entrance door without depressing hand switch; no bus safety lights shall go on. Depress hand switch, red pilot light and red bus safety lights shall go on.

(H) There shall be a canceling switch that will deactivate the amber bus safety lights and flasher sequence if they are accidentally activated or if the driver discovers there is no need to make a stop after activating the switch;

(I) Installation requirements:

(i) Both red and amber signal lamps shall be installed in accordance with SAE Standard J887, except that each amber signal lamp shall be located near each red signal lamp, at the same level, but closer to the vertical centerline of the bus. Each signal lamp shall be mounted with its axis substantially parallel to the longitudinal axis of the vehicle;

(ii) Front and rear alternately flashing bus safety lights shall be spaced as far apart laterally as practicable;

(iii) Alternately flashing bus safety lights 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 windows;

(iv) Vertical and lateral vision of the front and rear alternately flashing warning bus safety lights shall not be obstructed by any part of the body or lamphouse insofar as standard bus body construction will permit;

(v) Where practicable, the area around lens of each alternately flashing warning bus safety light and extending outward at least 3 inches or more shall be painted black;

(vi) Front amber school bus safety lights shall be visible (directly or indirectly) from the driver's area inside the bus;

(vii) A separate fuse or circuit breaker, adequate to prevent damage to the system in the event of a short circuit, shall be provided between the power source and flasher system.

(J) Strobe Lamp:

(i) A white flashing lamp, approved by the Oregon Department of Education, may be installed on the longitudinal center of the roof on rear half of the bus but no closer than one foot from the rear of

the bus body. The lamp shall have a single clear lens emitting light 360 degrees around its vertical axis and may not extend above the roof more than 6-1/2 inches or maximum legal vehicle height;

(ii) The lamp shall have a separate switch and be wired through the vehicle hazard lamp system. A pilot lamp to indicate when the light is in operation is required.

(22) Metal Treatment:

(a) All metal used in construction of bus body shall be zinc- or aluminum-coated or treated by equivalent process before bus is constructed. Included are such items as structural members, inside and outside panels and floor sills; excluded are such items as door handles, grab handles, interior decorative parts and other interior plated parts;

(b) 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;

(c) In providing for these requirements, particular attention shall be given 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;

(d) As evidence that above requirements have been met, samples of materials and sections used in construction of bus body, when subjected to 1000-hour salt spray test as provided for in latest revision of ASTM designation, B-117 "Standard Method of Salt Spray (Fog) Testing," shall not lose more than 10 percent of material by weight.

(23) Mirrors:

(a) Exterior Mirror Systems:

(A) All buses purchased after September 1, 1993 shall be equipped with mirror systems complying with 49 CFR Part 571, FMVSS 111 as adopted by the National Highway Traffic Safety Administration for December 3, 1993 implementation, plus all applicable standards specified in this rule;

(B) Manufacturer shall certify compliance with mirror and direct/indirect visibility standards listed in the aforementioned FMVSS 111 and provide copy to bus purchaser for all buses manufactured prior to January 1, 1994.

(b) Interior Mirror:

(A) Interior mirror shall be either clear view laminated glass or clear view glass bonded to a backing which retains the glass in the event of breakage[s]. Mirror shall be a minimum of 6" x 30". Mirror shall have rounded corners and protected edges;

(B) Type A buses shall be equipped with a mirrors shall be a minimum of 6" x 16". Mirror shall have rounded corners and protected edges;

(C) Bus seller shall certify compliance with mirror and direct/indirect visibility standards listed in the aforementioned FMVSS 111 and provide a copy to used bus purchasers when certification is not available from manufacturer for all buses manufactured prior to January 1, 1994.

(24) Mounting:

(a) Chassis frame shall support rear body cross member. Bus body shall be attached to chassis frame at each main floor sill, except where chassis components interfere, in such a manner as to prevent shifting or separation of body from chassis under severe operating conditions;

(b) Body front shall be attached and sealed to chassis in such manner as to prevent entry of water, dust or fumes through joint between chassis cowl and body;

(c) When floor is provided by bus body manufacturer, adequate insulating padding shall be placed at all contact points between body and chassis frame. Insulating material shall be approximately 1/4-inch thick and shall be so attached as to prevent movement under severe operating conditions.

(25) Mud Flaps:

(a) Mud flaps or splash aprons are required for rear wheels on all school buses and shall be provided by the body manufacturer;

(b) Flaps shall be of heavy-duty rubberized material or equivalent and shall extend at least the full width of tires from a point above the center of the tires to a point not more than ten inches above the surface of the highway when such vehicle is empty.

(26) Overall Length: Maximum length for school buses shall be limited to 40 feet (see OAR 581-053-0512, Bus Chassis, section (33), Turning Radius: ORS 818.080).

(27) Overall Width: Overall width of bus shall not exceed the maximum permitted by Oregon Motor Vehicle laws.

(28) Overhang: Body shall be so mounted as to comply with requirements described in chassis weight distribution standard. Body length extending beyond the rear axle shall not exceed three-fourths the length of the vehicle's wheel base per Oregon Vehicle Code.

(29) Racks: The installation of any kind of exterior luggage rack outside the bus is prohibited. This does not prohibit enclosed luggage compartments.

(30) Radios and Public Address Systems:

(a) Interior speakers mounted in the ceiling panels or side panels shall be either flush mounted or may protrude not more than 1-1/2 inches if the speaker housing is free of any corners or projections

which can cause injury by striking with the head or in the event of a collision or rollover. Speakers protruding more than 1-1/2 inches may be mounted in the vertical end panels above the windshield or back windows as long as speakers are free of corners or projections that could cause injury;

(b) Speakers shall not be placed above any aisle;

(c) Buses purchased after November 1, 1985, shall be equipped with a public address system having interior and exterior speakers and a switch to separate from inside and outside.

(31) Rub Rails:

(a) 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 and access panel(s)) to point of curvature near outside cowl on left side;

(b) There shall be one rub rail located approximately at floor line which shall cover same longitudinal area as upper rub rail, except at wheelhousing, and shall extend only to radii of right and left rear corners;

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

(d) Both rub rails shall be four inches or more in width, shall be of 16-gauge steel, suitable material of equivalent strength, and shall be constructed in corrugated or ribbed fashion;

(e) Both rub rails shall be applied to the outside body or outside body posts. Pressed-in or snap-on rub rails do not satisfy this requirement. For Type A-1 and A-2 buses using chassis manufacturer's body, or Type B, C and D buses using rear luggage or engine compartment, rub rails need not extend around rear corners.

(32) Sanders: Where used, sanders shall:

(a) Be of hopper cartridge-valve type;

(b) Have metal hopper with all interior surfaces treated to prevent condensation of moisture;

(c) Be of at least 100 pound (grit) capacity;

(d) Have cover on filler opening of hopper, which screws into place, sealing unit airtight;

(e) Have discharge tubes extending to front of each rear wheel under fender;

(f) Have no-clogging discharge tubes with slush-proof, nonfreezing rubber nozzles;

(g) Be operated by electric switch with telltale light mounted on instrument panel;

(h) Be exclusively driver-controlled.

(33) Seat Belt:

(a) A Type 2 lap belt/shoulder harness seat belt shall be provided for the driver, a driver's seat with an integrated Type 2 lap/shoulder belt may be substituted. Each belt section shall be bootied to keep belt and the button or buckle type latch off floor when not in use. Shoulder belt assemblies on Type B, C, and D buses shall provide for a height adjustment of at least four inches at its upper point of attachment to the bus. Belt shall be anchored or guided in a manner at the seat frame to prevent the driver from sliding sideways when belt is in use. Locking retractors may be either an ELR (Emergency Locking Retractor) or an ALR (Automatic Locking Retractor). All ALR equipped buses received after July 1, 1989, must include an approved anti-cinching device;

(b) Seat belts for passengers: Passenger seat belts may be installed in school buses with a GVWR of more than 10,000 pounds. The attachments, belts and installation shall meet the requirements of Federal Motor Vehicle Safety Standard Nos. 208, 209 and 210 as they apply to school buses with a GVWR of 10,000 pounds or less.

(34) Seats and Crash Barriers:

(a) Seats and barriers shall meet requirements of Federal Motor Vehicle Safety Standard No. 222;

(b) All seats shall have minimum depth of 15 inches;

(c) In determining seating capacity of bus, the minimum allowable rump width shall be 13 inches;

(d) Seat, seat back cushion and crash barrier shall be covered with a material having a minimum 42-ounce finished weight, 54-inch width and finished vinyl coating of 1.06 broken twill, or other material with equal tensile strength, tear strength, seam strength, adhesion strength, resistance to abrasion, resistance to cold, and flex separation. Material shall meet or exceed the criteria contained in the School Bus Seat Upholstery Fire Block Test for all buses purchased after September 1, 1993 (see Appendix);

(e) All seats shall be forward facing and shall be securely fastened to that part(s) of bus that support them with a nut-and-bolt type of fastener. Each seat leg shall be secured to the floor by a minimum of two nut-and-bolt type fasteners of at least grade 5 SAE strength. Sheet metal screw-type fasteners without a nut are not acceptable, except in areas where it is not possible to install a nut-and-bolt type fastener. Type A-1 and A-2 bus seat fasteners shall meet the requirements of Federal Motor Vehicle Safety Standards 209 and 210;

(f) No bus shall be equipped with jump seats or portable seats. Flip-up seats at side emergency exit doors are allowed;

(g) Seat spacing shall not be less than 24 inches between the front of the back of each seat and the rear of the back of the seat immediately ahead. This shall be measured at cushion height on a plane parallel to the center line of the bus;

(h) Driver's seat shall be so located in relationship to the steering wheel that the driver may assume a natural position while driving, have a clear view of the road, and sufficient leg room to operate safely and effectively the brake and clutch pedals and accelerator without cramping or interference. Minimum distance between steering wheel and back rest of driver's seat shall be 11 inches. Driver's seat shall have a fore-and-aft adjustment of not less than four inches and shall on Type B, C, and D buses be capable of being raised and lowered at least three inches and shall be strongly attached to comply with acceptable installation procedures:

(A) Driver's seat supplied by the body company shall be a high back (*suspension*) seat with a minimum seat back adjustment of 15 degrees, not requiring the use of tools, and with a head restraint to accommodate a 95th percentile female anthropomorphic dummy as defined in FMVSS 208. The driver's seat shall be secured with nuts, bolts, and washers or flanged-headed nuts;

(B) Driver's seat positioning and range of adjustment shall be designed to accommodate comfortable actuation of the foot control pedal by 95 percent of the adult female population.

(i) Each passenger seat and driver's seat shall have a positive type retention system to prevent the seat cushion from disengaging from the seat frame at the front and rear in the event of an accident or rollover.

(35) Steering Wheel: (See OAR 581-053-0512(29), Steering Gear, also.) Steering wheel outside circumference shall have at least two inches of clearance at all points.

(36) Steps:

(a) Service door entrance may be equipped with two-step or three-step stepwell. Risers in each case shall be approximately equal and shall not exceed 10 inches in height. When plywood floor is used on steel, differential may be increased by thickness of plywood used:

(A) First step at service door shall be not less than 10 inches and not more than 14 inches from ground, based on standard chassis specifications;

(B) Type D buses shall be equipped with a three-step stepwell. First step at service door shall not be less than 12 inches and not more than 16 inches from the ground based on standard chassis specifications.

(b) Steps shall be enclosed to prevent accumulation of ice and snow;

(c) Steps shall not protrude beyond side body line;

(d) Steps (if any) on Type A-1 and A-2 buses not manufactured originally as school buses may be chassis manufacturer's standard;

(e) At least one grab handle not less than 20 inches in length shall be provided to assist passengers during entry or egress in unobstructed locations inside doorway. Grab handle shall be designed,

installed and maintained to minimize the opportunity for entanglement of passenger clothing and belongings.

(37) Step Treads:

(a) All steps, including floor line platform area, shall be covered with 3/16-inch rubber floor covering or other materials equal in wear resistance and abrasion resistance to top grade rubber;

(b) Metal back of tread, minimum 24-gauge cold roll steel, shall be permanently bonded to ribbed rubber;

(c) 3/16-inch ribbed step tread shall have a 1-1/2-inch white nosing as integral piece without any joint;

(d) Rubber portion of step treads shall have the following characteristics:

(A) Special compounding for good abrasion resistance and high coefficient of friction;

(B) Flexibility so that it can be bent around a 1/2-inch mandrel both at 130 degrees F and 20 degrees F without breaking, cracking or crazing;

(C) Show a durometer hardness 85 to 95.

(38) Steps, Windshield Access: There shall be at least one folding step or recessed foothold and suitably located handles on each side of the front of the body for easy accessibility for cleaning the windshield and lamps except when windshield and lamps are easily accessible from the ground. Standard does not apply to chassis not originally manufactured as school buses.

(39) Stop Signal Arms: All buses purchased after September 1, 1993 and all buses in service after August 1, 1995 shall be equipped with stop signal arms mounted in accordance with the following requirements:

(a) Shall meet all applicable requirements of the Federal Motor Vehicle Safety Standard 49 CFR 571.131;

(b) Shall be installed on the left side of the bus; the vertical center of the stop blade shall be at least seven inches but not more than 14 inches below the window line, on the first body post to the rear of the driver or as close as practicable;

(c) Shall be a octagon shaped sign 18 inches wide and 18 inches long exclusive of the mounting bracket. A windguard shall be provided. All sheet metal parts shall be 16 gauge metal or heavier;

(d) Shall have the word "STOP" on both sides in white letters six inches high and of proportionate width on a red background. The outer edge shall have a white border one-half inch wide. All other parts of the assembly shall be painted black;

(e) Shall be equipped with two, four-inch, double faced alternating flashing red lamps to be mounted near the perimeter of the sign with a minimum of 12 inches spacing between lamp centers. The stop arm and lamps shall be wired to the circuit of the flashing red warning lamps mounted on the front and rear of the bus and shall operate simultaneously with the red bus safety lamps. Lamps shall be LED or strobe ORS 820.105;

(f) May be reflectorized:

(A) Reflectorized material shall be of automotive engineering grade or better;

(B) Reflectorized material may be retroreflective or reflective.

(g) Shall be either air, vacuum, or electrically operated:

(A) Air operated stop arms:

(i) Air may be supplied from an air accessory tank or from the first (wet) tank;

(ii) If source is from the first (wet) tank a pressure protection valve shall be installed to prevent the tank air supply from falling below 60 pounds;

(iii) Stop arm system must have a pressure regulating valve;

(iv) All fittings shall be brass.

(B) Vacuum operated stop arms:

(i) Vacuum shall be supplied from a separate accessory tank. Tank shall be protected by a check valve;

(ii) All fittings shall be brass.

(40) Sun Visor: Interior adjustable sun visor, not less than 6 by 30 inches in size, shall be installed above windshield in position convenient for use by driver. If transparent visor is used, it shall be of such material so as not to prevent distinguishing between the colors of red and green traffic signals. Vehicles not originally manufactured as school buses may be equipped with manufacturer's standard visor. Buses purchased after November 1, 1985, shall have visors with protected edges.

(41) Tail Pipe: (See OAR 581-053-0512, Bus Chassis, section (14))

(42) Tool Compartment: A metal container of adequate strength and capacity for storage of tire chains, tow chains and such tools as may be necessary, may be provided. Container may be located inside or outside of passenger compartment. If inside, it shall have a cover and positive type latch to prevent opening in event of a severe impact or bus rollover, and shall be attached to the floor with a nut and bolt fastener, or may be securely attached to a seat frame under a seat.

(43) Tow Hooks:

(a) Type C buses shall be equipped with two rear tow hooks, or one center tow hook tied to both frame rails, that have sufficient strength to pull or be pulled by another vehicle of the same GVWR. Tow hooks shall be installed in order that no permanent distortion to the body or chassis will result if the bus must be towed. (See also OAR 581-053-0512, Bus Chassis, section (31), Tow Hooks);

(b) Type D vehicles shall be equipped with two rear tow hooks or tow eyes, and at least one front tow hook or eye, mounted or capable of immediate mounting. Hooks or eyes shall have sufficient strength to pull or be pulled by another vehicle of the same GVWR.

(44) Under carriage luggage compartments: Luggage compartments may be installed on the outside of the bus mounted below the floor level or in the rear of the bus. Access to compartments must be from the outside only. Compartment doors must have a positive retention to hold the doors open. Compartment doors must be lockable. These rule changes apply to buses ordered after July 1, 2004

(45) Undercoating:

(a) Entire underside of bus body, including floor sections, cross member and below floor line side panels, shall be coated with rust-proofing compound for which compound manufacturer has issued notarized certification of compliance to bus body builder that compound meets or exceeds all performance and qualitative requirements of paragraph 3.4 of Federal Specification TT-C-520b using modified test procedures\* for following requirements:

(A) Salt spray resistance -- pass test modified to five percent salt and 1,000 hours;

(B) Abrasion resistance -- pass;

(C) Fire resistance -- pass.

(b) Undercoating compound shall be applied with suitable airless or conventional spray equipment to recommended film thickness and shall show no evidence of voids in cured film. \*Test panels are to be prepared in accordance with paragraph 4 6.12 of TT-C-520a with modified procedure requiring that tests be made on a 48-hour air cured film at thickness recommended by compound manufacturer.

(46) Ventilation:

(a) 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;

(b) Static-type nonclosable exhaust ventilation shall be installed in low-pressure area of roof.

(47) Video surveillance cameras may be mounted inside or on either the forward or rear bulkhead, or to the ceiling in compliance with the following requirements:

(a) Surface mounted camera/camera housing/recording devices shall be mounted as far forward (if forward mounted) or as far rearward (if rear mounted) as possible and directly above the center of the windshield/rear window, and shall not:

(A) Extend into the passenger compartment more than 9 inches;

(B) Extend down from the ceiling more than five inches;

(C) Be more than five inches wide;

(D) Interfere with the rear view mirror or sun visor.

(b) Recording devices or their housings shall not be mounted overhead in the passenger compartment;

(c) **Video** cameras/housings (**not recorders**) **may be mounted overhead in** the passenger compartment, **provided they are over the seating area, but not over any part of the aisle**, all edges must be rounded and/or protected with enclosure of shatterproof construction;

(d) Flush mounted cameras/housings may be mounted in any position in the front or rear bulkhead or ceiling provided that any modification to the body, in order to achieve flush mounting does not compromise the structural integrity of the body panels;

(e) All video related devices mounted to the interior bus body shall be securely fastened in a manner to prevent separation from the bus body in the event of collision or mishap;

(f) Recording devices/housings must allow ready access for camera and video recording medium removal with out the use of tools;

(g) All electrical connections shall be made with UL approved wiring and terminals, and protected by grommets any place it passes through metal panels. Any electrical load added to the vehicles electrical system shall be protected with appropriate over current device (fuse).

(48) Weight Distribution:

(a) Weight distribution of fully loaded bus on level surface shall be such as to not exceed the manufacturer's front Gross Axle Weight Rating (GAWR) and rear Gross Axle Weight Rating;

(b) 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. Type B and D buses with engine inside front of body and entrance door ahead of front wheels shall have not more than 75 percent of gross vehicle weight on rear tires or more 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 not 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 or more than 40 percent on front tires.

(49) Wheelhousing:

- (a) The wheelhousing opening shall allow for easy tire removal and service;
- (b) Wheelhousing shall be attached to floor sheets in such a manner as to prevent any dust, water or fumes from entering the body. Wheelhousing shall be constructed of 16-gauge steel, or other material of equal strength;
- (c) The inside height of the wheelhousing above the floor line shall not exceed 12 inches;
- (d) The wheelhousing shall provide clearance for installation and use of tire chains on single and dual (if so equipped) power-driving wheels;
- (e) No part of a raised wheelhousing shall extend into the emergency door opening.

(50) Windshield and Windows:

(a) All glass in windshield, windows and doors shall be of approved safety glass so mounted that its identification mark is visible and of a quality to prevent distortion in any direction. All glazing materials shall be on the approved list of the Oregon Department of Motor Vehicles;

(b) Windshield shall be of safety plate glass AS-1 grade as specified by American National Standards Institute Safety Code Z26.1-1966;

(c) Windshield glass may be heat absorbing and may have a horizontal gradient band starting slightly above the line of the operator's vision and gradually decreasing in light transmission to 20 percent or less at the top of the windshield in compliance with Federal Motor Vehicle Safety Standard 205;

(d) Glass in all side windows, doors and rear windows shall be AS-2 or better grade, as specified in Z26.1-1966, or AS-4 coated abrasion resistant rigid plastic meeting requirements of Federal Motor Vehicle Safety Standard 205. Rigid plastic cannot be used for windshields or windows immediately to the left or right of the driver;

(e) Side windows shall conform to the following:

(A) Buses shall provide full drop or split sash windows which provide an unobstructed opening of at least 12 inches and not more than 14 inches in height, obtained by lowering the sash, and at least 22 inches in width. Type A-1 and A-2 buses may have a full drop or split sash windows which provide an unobstructed opening of at least 9 inches and not more than 13 inches in height, obtained by lowering the sash, and at least 22 inches in width, provided the bus has 2 swing-out windows.

(B) One window on each side of the bus may be less than 22 inches in width.

(51) Windshield Washers: Bus shall be equipped with electric or air operated windshield washers.

(52) Windshield Wipers: Bus shall be equipped with two windshield wipers of air or electric type that meets FMVSS 104 powered by motor or motors of at least two speeds and with sufficient power to operate wipers under severe weather conditions. Type A-1 and A-2 bus manufacturer's standard is permitted.

(53) Wind deflectors may be installed according to manufacturer's standards on the rear roof to deflect snow, dust and dirt from the rear window.

(54) Wiring:

(a) All wiring shall conform to current standards of Society of Automotive Engineers;

(b) Circuits:

(A) Wiring shall be arranged in circuits, as required, with a circuit protection system. A system of color or number coding shall be used for all buses purchased after September 1, 1993 and an appropriate identifying diagram shall be provided the end user along with the wiring diagram provided by the chassis manufacturer. The following interconnecting circuits shall be color coded as noted:

(i) Left rear directional light -- yellow;

(ii) Right rear directional light -- dark green;

(iii) Stop lights -- red;

(iv) Back-up lights -- blue;

(v) Tail lights -- brown;

(vi) Ground -- white;

(vii) Ignition feed, primary feed -- black;

(viii) The color of cables shall correspond to SAE J1128.

(B) Wiring shall be arranged in at least seven regular circuits, as follows:

(i) Head, tail, stop (brake) and instrument panel lamps;

(ii) Clearance and stepwell lamps (stepwell lamp shall be activated when service door is opened);

(iii) Dome lamp;

(iv) Ignition and emergency door signal;

(v) Turn signal lamps;

(vi) School Bus Safety Lights;

(vii) Heaters and defrosters.

(C) Any of above combination circuits may be subdivided into additional independent circuits;

(D) Whenever possible, all other electrical functions (such as sanders and electric-type windshield wipers) shall be provided with independent and properly protected circuits.

(c) The entire electrical system of the body shall be designed for the same voltage as the chassis on which the body is mounted;

(d) All wiring shall have an amperage capacity equal to or exceeding the designed load. All wiring splices are to be done at an accessible location and noted as splices on wiring schematic;

(e) Each body circuit shall be coded by number or letter on a diagram of easily readable size and be furnished with each bus body or affixed in an area convenient to the electrical accessory control panel;

(f) Body power wire is to be attached to special terminal on the chassis;

(g) All wires passing through metal openings shall be protected by a grommet;

(h) Wires not enclosed within body shall be fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equally effective connectors and shall be moisture and corrosion resistant.

[Publications: Publications referenced are available from the agency.]

Stat. Auth.: ORS 327.013 & 820.100 - 820.120

Stats. Implemented: ORS 327.013, 820.100, 820.105, 820.110 & 820.120

Hist.: 1EB 17-1985, f. 10-29-85, ef. 11-1-85; EB 16-1987(Temp), f. 7-30-87, ef. 9-27-87; EB 30-1987, f. & ef. 12-9-87; EB 44-1988, f. 12-16-88, cert. ef. 1-1-89; EB 21-1993, f. & cert. ef. 6-2-93; ODE 11-1999, f. & cert. ef. 2-12-99; ODE 30-1999, f. 12-13-99, cert. ef. 12-14-99; ODE 16-2004, f. & cert. ef. 8-4-04; ODE 10-2005, f. & cert. ef. 11-15-05; ODE 26-2007, f. & cert. ef. 10-26-07