

Ohio State Highway Patrol

Approved Option List for Ohio School Bus

Prepared by the Office of Licensing and Commercial Standards

Effective September 1, 2003

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Summary of changes

1. New heading – Glass
 - a. All other glass behind the driver may be laminated AS 2 or AS 3.
 - b. The glass, in front of the service door, in the transition panel of a Type A bus may be tempered AS 1 or AS 2.

This list is prepared and maintained in compliance with
Ohio Administrative Code 4501-5-09.

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Air conditioning:

Installed prior to 9-1-2003 - Units cannot protrude into the head impact zone of any passenger seat.

Installation or bid date of bus after 9-1-2003 - Units can not protrude into the head impact area of any passenger seat as described in FMVSS 571.222. The units cannot decrease the inside body height per rule 4501-5-03 (O) and 4501-5-06 (M) effective 9-1-2003. The units shall not decrease the headroom at the entrance door, steps, aisle way or any emergency door.

No unit shall interfere with any emergency exit in violation of FMVSS opening requirements.

Air conditioning units may be installed above the rear emergency door under the following conditions:

- Shall not interfere with any emergency exit in violation of FMVSS opening requirements.
- Shall not extend into the passenger area of the vehicle beyond the following dimension:
 - Measuring from the interior surface of the emergency door at the location of the door latch, twelve inches excluding padding.
- All exposed edges shall be rounded or padded.
- Padding shall meet FMVSS 571.302

Air suspension systems.**Alarm systems:**

Audible warning alarm: The alarm may be located on the firewall or the front of the school bus, to work in conjunction with the warning light system. May do one or both:

- The audible warning will sound to alert pedestrians that the bus is about to move. The audible warning will sound after the entrance door has been closed. The alarm shall be installed to manufacturer's recommendations.
- The audible warning will sound to alert pedestrians that the bus is approaching the bus stop. The warning shall activate with the cycling of the amber warning lights. The audible warning will stop when the entrance door has been opened. The alarm shall be installed to manufacturer's recommendations.

No automated warning sounds or announcements shall be permitted when the entrance door is open and students are boarding or leaving the school bus.

Alarm system may be installed which requires the driver to go the rear of the bus to deactivate. An on-board internal alarm on the system may also be used. Directions for

disarming these types of alarms shall be displayed on the front bulkhead in the driver's area.

Drawstring alarm system in the entrance door.

Audio Devices:

AM/FM radios, cassette, compact disc players must be permanently mounted, either OEM or automotive style aftermarket. If aftermarket, must be installed per manufacturers instruction.

Automatic radiator shutters.

Automatic tire chains:

Power-operated but must be controlled from the driver compartment.

Auxiliary fuel-fired heaters:

These auxiliary heaters should use the same fuel as the engine is designed to use. These heaters can be either direct hot air systems or connected to the engine's coolant system. When connected to the engine, the heaters can be used to preheat the engine for starting, or to preheat and add supplementary heat to the bus's heating system. These heaters must be installed pursuant to manufacturer's recommendations so as not to exhaust in a manner which will endanger passengers. The heater should not require adjustment if fuel is being changed from "Diesel-1" to "Diesel- 2" or a blend, and should be equipped with low voltage protection. These heaters must meet all applicable federal and society of automotive engineers tests.

Battery box and fuel tank:

On buses used to transport pupils with disabilities, the battery box and fuel tank may be located by the manufacturer to provide equal weight distribution to compensate for power lift weight.

Battery emergency disconnect switch:

Must be installed and maintained to manufacturers specifications.

Broom, snow brush, ice scraper, and trash container:

May be installed without a letter of authorization. All equipment must be properly secured in the driver's area.

Clocks:

Either OEM or automotive style aftermarket. If aftermarket, must be installed per manufacturers specifications.

Cruise control:

Installed by school bus manufacturer or authorized dealer.

Diesel engine starting systems.

Doors:

Entrance service door lock. This lock may only be installed if a key is required to move the lock from the unlocked position to the locked position.

Rear emergency door lock. Bus engine will not start when the door is locked (starter interlock).

Service door may be black.

Note:

- Special service doors shall not be black.
- Left side driver's door on type A and A II buses shall not be black.
- A sedan door used in place of a service door on a type A bus shall not be black.

Drive wheel sanders.

Dual tire air pressure equalizing system.

Eight lamp warning system:

LED "strobelike" effects may be used in the eight lamp warning system. All lamps shall conform to Federal Motor Vehicle Safety Standards 571.108 S5.1.4, SAE J887 and Ohio School Bus Construction Standards. All eight yellow and red lamps must alternate between left and right at a rate between sixty and one hundred twenty cycles per minute.

The "strobe" effect must appear as a flash of varying intensity and not as separate flashes.

All the warning lamps, amber and red, must "strobe" in the same pattern. The same pattern is defined as the same number of flashes per lamp before the system alternates to the other side.

Electrical fuses:

If a bus is equipped with a fuse box, proper assortment of replacement electrical fuses may be carried.

Electronic control module or vehicle electronic control system:

In lieu of a body continuous duty solenoid and protection by a circuit breaker or similar language throughout 4501-5, the school bus manufacturer may install an electronic control module or a vehicle electronic control system may be installed which provides the same function and protection.

Electronic Pre-Trip Recorders:

The installation of sensors on the bus are allowed if:

- Does not interfere with the safe operation of the bus.
- Does not cover any required markings.
- No larger than two (2) inches by two (2) inches in size.

Electronic sensors:

Installed for detecting persons or object(s) in blind spots.

Emergency Window Exit Markings:

May be placed in any one of the following locations:

- On top edge of window glass. (inside and/ or outside)
- Above the window frame on the flat metal roof-liner up to twelve inches directly above the window frame. (inside)
- Above the window frame on the flat surface of the roof above the drip rail and rivets. (outside)

Engine hour meter.**Engine monitoring systems:**

These systems shall warn the driver, by use of a light or audible signal, that the engine is in need of attention. Such systems may not automatically shut off the engine.

Fiberglass replacement fenders and cowl pieces.**Flat floors.****Floor Coverings:**

Floor coverings (under seat and aisle) may be smooth, ribbed or pebbled. Prior to installation, the installer/manufacture of the product must provide in writing that the material meets the appropriate construction standards for floor coverings. All optional floor covering products shall be approved by the Ohio School Bus Construction Standards Advisory Committee before installation.

Fold-out step:

Installed at the regular service entrance which will provide for the step level to be no more than six inches to ground level. The fold-out step may be power activated or manually operated.

Glass:

All other glass behind the driver may be laminated AS 2 or AS 3.

The glass, in front of the service door entrance, in the transition panel of Type A bus may be tempered AS 1 or AS 2.

Heated windshield wipers and heated washer fluid units.**Horn:**

May be equipped with a horn(s) of standard make which meet the following performance standard: capable of producing complex sound in band of audio frequencies from two hundred fifty to two thousand hertz and having total sound level of one hundred to one hundred twenty decibels within these frequency limits when measured at fifty feet from the vehicle.

Air horn.

Hoses.

All hoses shall meet SAE standards for type of use.

Insulation:

Equivalent non-wood material may be applied on top of the steel floor in lieu of plywood provided the material has equal or greater insulation R-value. The material shall be moisture resistant. Prior to installation, the installer/manufacturer of the product must provide in writing that the material meets the appropriate construction standards for insulation. All optional insulation products shall be approved by the Ohio School Bus Construction Standards Advisory Committee before installation.

Interlock Systems:

Service brake interlock:

- Service door - A system may be installed which automatically applies the service brakes when the red warning lights are activated and the service door is opened. If the service brake interlock system malfunctions a continuous amber light, mounted on the driver's control panel with an identification label and a unique audible warning will activate. The system will do a self-test when activated with the amber warning light and audible warning momentarily going on and off indicating the system is working.
- Lift door - A system may be installed which automatically applies the service brake when the lift door is open. If the service brake interlock malfunctions a continuous amber light, mounted on the drivers control panel with an identification label, and a unique audible warning will activate. May be installed to meet FMVSS 571.403/404.

Transmission/Parking Brake Interlocking Devices:

Interlocking device which will "lock" the transmission/parking brake. Prior to installation of the device, the device and installation must be approved by the guidelines established by OAC 4501-5-09.

Lettering/Markings/Symbols:

Vinyl stick-on lettering in lieu of painted-on letters, either on original equipment or as replacement letters.

Reflective markings:

- Additional markings permitted as follows: may be installed as a package or individually.
- The background for the bus lettering, on the front and the rear of the body, may be reflective grade five or equivalent yellow tape. This does not supercede the requirement of white-silver reflective material background for the bus ID numbers and the rear bus number.

- Reflective yellow material two inches in width may be applied to both sides of the bus. The reflective material shall run parallel to and below the lower edge of the floor rub rail.
- “STAY BACK 10 FEET” in four-inch white-silver material may be applied and centered to the front and rear bumpers. Letters shall be italicized and be of the helvetica type font.
- Rear bumper may be marked diagonally forty-five degrees with two-inch wide strips of yellow grade five material two inches apart.
- Two pieces of super high intensity (yellow) grade (five) reflective material (maximum six-inch width) applied to both sides of the school bus at the belt line, between the rub rails, running the length of the body as practical. The school name shall be applied on the reflective material.

American Flag Decal:

- Maximum of two.
- Overall size of each decal shall not exceed six (6) inches by eleven (11) inches.
- The decal(s) shall not be affixed where the decal(s) will be a view obstruction for the driver.
- The decal(s) shall not interfere with any other markings required by Ohio school bus construction standards.

Universal handicap symbols:

Buses with wheelchair lifts, used for transporting children with physical disabilities, may display two universal handicap symbols located below the window line, such emblems shall be white on blue and shall not exceed twelve inches in size and may be reflective.

Route number or marker bracket beside entrance door.

Roof ID Numbers: Shall be black in color. Must measure 18 inches tall by 10 inches wide with a brush stroke of three inches.

Lights/Lamps:

Red emergency exit lights to mark inside emergency doors/windows.

Lamp monitoring system.

Fog lamps. A maximum of two-fog lamps amber in color.

Daytime running lights.

Lighted school bus signs.

White strobe light. One allowed, between sixty (60) to two hundred forty (240) flashes per minute. Strobe light shall be installed on the top center of the bus toward the rear.

Heavy-duty marker and clearance lights. Clearance lights meeting the requirements of FMVSS 571.108 may be recessed into body parts in lieu of armor protection.

A twenty-candlepower under-hood light.

Light emitting diode lamps and halogen lamps, which meet applicable requirements of FMVSS 571.108.

Additional lighting as approved by the Americans with Disabilities Act and installed by the school bus manufacturer.

Additional rear illumination lighting shall only operate when vehicle is in reverse gear. The lighting may be installed under the body in the area of the rear axle, one surface or flush mounted lamp on each side in the body skirt behind the rear wheel, or two surface or flush mounted on rear of body with one each on opposite sides of the emergency door. The light shall be white in color. Maximum of two auxiliary lamps permitted. Auxiliary lighting shall be at a candle power and location not to glare into other traffic.

Back-up Lamps:

If a shape other than the seven inch round, two back-up lamps shall be installed meeting FMVSS 571.108. The back up lamps shall be identical in location, shape(s) and size(s) on each side of the emergency door.

Headlight Shields:

- Installed to reduce glare from crossover mirrors.
- The shields (eyebrows) shall not cover, reduce the effectiveness or interfere with the headlight.

Rear Turn Signals:

If a shape other than seven inch round, the rear turn signals shall have a minimum of 38 square inches of illuminated surface area each and shall meet SAE specifications. The rear turn signals shall be amber and identical in shape and size.

Tail/Brake Lamps:

If a shape other than seven inch round, the tail/ brake lamps shall have a minimum of 38 square inches of illuminated surface area each. The tail/ brake lamps shall be identical in shape and size. Location shall be the same as the requirement for the round seven inch tail/brake lamp.

Master-on switch:

The master-on switch may be omitted for the eight-way warning light system if the system is always “on” when ignition key is in the “on” position. If the master-on-switch is omitted, the eight-way system shall be designed to be able to cancel the amber warning lights of the eight-way system without the need of opening the service door.

Mirror:

Interior observation mirror. One may be mounted at the rear of the school bus above the emergency door. This mirror must be made of shatterproof high-stress Plexiglas or equivalent. The edges of mirror must be protected with heavy vinyl coating. This mirror shall not exceed eighteen inches by twenty-four inches and shall have dual-mounting brackets.

Remote-controlled mirrors. Must meet FMVSS 571.111 for school buses.

These mirrors must be controlled from the driver compartment and may include the day/night option.

Monitoring devices:

The use of various types of monitoring devices are allowed to record vehicle movement, speed, revolution per minute, and other measurements.

Mud Flaps/Fender Moldings:

A system for suppressing flying spray on a wet surface. Such a system may consist of filament-type, which is installed around the fender wheels.

A full width mud flap or a full width filament type plastic skirt may be placed at the rear wheels.

Rubber fender extensions.

Noise suppression switches:

May be installed to turn off noise making devices. Switch shall not be a momentary type. Shall be an on/off type that does not require the driver to hold the switch in any position while operating the school bus.

Oil-lubricated wheel bearings.

Operation of warning lights and stop arm system (eight-way warning lights):

Only the school bus manufacturer may deviate from the operation of warning lights as described in 4501-5-03 and 4501-5-06. Prior to any changes by the school bus manufacturer, the changes shall be presented in writing to the Ohio School Bus Construction Standards Advisory Committee and the Ohio Department of Education. Both the Ohio School Bus Construction Standards Advisory Committee and the Ohio Department of Education shall agree that the proposed operational changes enhance the safety of the children and the motoring public. If requested by either the Ohio School Bus Construction Standards Advisory Committee or the Ohio Department of Education a school bus shall be prepared with the changes and the school bus manufacturer will provide a live demonstration.

If the operational changes are permitted, the school bus manufacturer/dealer at the time of delivery to the owner of the bus shall provide written instructions detailing the operation of the system.

Any optional operation of warning lights and stop arm system, if after practical use, may be ordered to be removed at the school bus manufacturer's expense if the system is found to create unforeseen unsafe conditions. The director of public safety shall make the determination if the system is to be removed.

Paint trim: This option is no longer in effect as of January 1, 2007.

Window sash, window posts and window trim may be black in color. Any bus manufactured prior to January 1, 2007, with this option is allowed to continue to be painted as from the manufacturer. This option may not be added to any bus, if the option was not applied at time of manufacture.

Panels:

Body panels if other than steel or composite material may be used only if meets FMVSS 571.221.

Special padded/foam covered panels may be installed on the interior walls (to prevent head injury to self-abusive children) following these guidelines:

- The padded panels shall be constructed of the same materials used in the construction of the bus seat(s).
- The special panel may cover the window.
- The panel(s) shall be attached to the sidewall of the bus.
- The panels shall not obstruct any portion of an emergency window or exit.
- Materials used in the construction of the special panels shall comply with FMVSS 571.302.

Power Outlet:

12-volt dc covered power outlet in driver's area.

Power ventilator.**Pressurized automatic lubrication systems:**

Such systems shall apply lubrication to specific components at a predetermined mileage interval.

Prism:

Mounted to the upper window of the rear emergency door, designed to give the driver a wide-angle view of the area immediately behind the school bus.

Public address system:

An outside speaker is permitted. If an outside speaker is used, it shall be yellow or gray in color.

Ramp device:

May be installed to load and unload students.

Ramps shall be of nonskid construction. Ramp shall be of weight and design, and equipped with handle(s), to permit one person to put ramp in place and return it to its storage place. Ramp storage must protect ramp from dirt and weather.

Rear emergency window glass:

On Type D rear engine school bus, the glass in the emergency window may be laminated if the window is designed to be open from the inside and outside of the bus.

Rear window air dam:

To direct wind down across the back of the bus to keep the rear window clean.

Right-side sun visor:

Must be at least six inches by sixteen inches in size.

Safety lugs and clamps:

May be used on wheels that use multi-piece rims.

School bus crossing control arms/gates:

Gates shall be activated automatically with the initiation of the red warning lights.

Seat belt cutter:

Will be stored in the first aid kit or securely mounted to the left of the driver.

Seats:

Adjustable air drivers seat (six-way or eight-way).

Child restraint seats built into regular school bus seats that meet FMVSS 571.213.

Seat belt seats or seat belt ready seats. Seat belt seats and seat belt ready seats shall meet all applicable FMVSS.

Sound abatement package:

Overall length of the bus.

Spare tire and rim:

Must be securely mounted underneath the vehicle.

Speed retarder system:

Performance standard – shall maintain the speed of a fully loaded school bus at 19.0 mph on a seven (7) percent grade for 3.6 miles.

If equipped with electro-magnetic retarder(s) shall have increased electrical system capacity commensurate with the needs of the retarder system.

Pilot lights shall indicate when retarder is in operation.

The driver shall be able to disengage the system when road/weather conditions warrant.

Stop arm options:

The stop arm may be equipped with either:

- Two red flashing strobe lights (Strobe lights shall be six to ten joules).
- Light emitting diode “STOP” sign.

A second stop arm is allowed. The rearmost stop arm shall meet all applicable sections of FMVSS 571.131. This rearmost stop arm shall not contain any lettering, symbols or markings on the forward side. The front side of the rearmost stop arm shall be red or school bus yellow. The forward side of the rearmost stop arm shall not be reflectorized.

Storage compartments:

Storage compartments outside the school bus under the floor and in place of the skirt side panels.

Equipment type storage boxes, supplied by manufacturers, installed under the bus seats.

An emergency equipment cabinet installed in the driver's compartment to include the body fluid cleanup kit, fire extinguisher, first aid kit, and the highway warning kit. This cabinet, if installed, shall be labeled in contrasting colored letters at least two inches high and identify the contents within and shall not protrude into the driver or passenger impact zones as established in FMVSS 571.222. The cabinet shall not decrease the headroom at the entrance door, steps, aisle way or any emergency door.

Fireproof storage pouch may be secured to the barrier behind the driver's seat or on barrier at stair well.

Tachograph.

Tailpipe:

May extend through the rear bumper on all buses. Tailpipe must extend through but not beyond the bumper. (4501-5-02 (K) (5)).

Third rub rail:

Installed on the lower edge of the body skirt. If installed shall be painted black or yellow.

Tilt or tilt telescoping steering wheel.

Windows:

Tinted windows pursuant to section 4513.241 of the Revised Code and in compliance with FMVSS 571.205.

Due to various vehicle designs, in the passenger area, one window on each side of the bus may be less than the required 22 inches in width and may be non-opening.

Insulated windows – Window frame shall not protrude into the passenger compartment.

Tow hooks:

Mounted on front.

Two-way radios:

Either OEM or aftermarket. If aftermarket, must installed per manufacturers specifications.

Undercoating:

Must comply with Federal Specification A-A-59295 or equivalent. Federal Specifications can be found at www.dsp.dla.gov or at General Services Administration, Federal Supply Service, FSS product Acquisition Center, Supply Division (FLAS), Washington, DC 20406.

Video camera or similar technology:

Installed inside and/or outside the bus to monitor safety situations.

White painted exterior roof panels:

Prior Installed Options:

Any options installed prior to the effective date of this option list, under the previous School Bus Standards (OAC 4501-5-09 and 45-1-5-10), will continued to be allowed if in compliance with the appropriate construction standard.

Any option installed after the effective date of the revised 4501-1-09 shall meet the requirements of this list.