**Section 436.APPENDIX D Electrical System Wiring through Fenders**

a) ELECTRICAL SYSTEM WIRING

1) Circuits

PROCEDURES/SPECIFICATIONS:

Circuits arranged to manufacturer's specifications are acceptable. Circuits may be added as necessary.

MFSABs must be equipped with a noise suppression switch that is capable of turning off noise producing accessories including, but not limited to, heater blowers, defroster fans, auxiliary fans and radios.

REJECT VEHICLE IF:

Breaks in insulation are present. Not on proper circuit or properly wired.

Noise suppression switch is missing or does not function.

2) Fuses

PROCEDURES/SPECIFICATIONS:

For buses equipped with electrical systems that utilize fuses, two extra fuses for each size fuse used on the bus shall be conveniently mounted for easy access on the bus body.

REJECT VEHICLE IF:

If required, fuses are not present or are not conveniently mounted for easy access.

3) Switches

PROCEDURES/SPECIFICATIONS:

Check operation and condition.

REJECT VEHICLE IF:

Switches are not operating properly or are missing.

4) Wiring

PROCEDURES/SPECIFICATIONS:

All wires shall be properly insulated and securely attached at not more than 18.1 inches (460 mm) intervals. Check condition.

REJECT VEHICLE IF:

Insulation is frayed or missing. Wiring not securely attached.

b) EMERGENCY EXITS

PROCEDURES/SPECIFICATIONS:

All buses must be equipped with either a rear emergency door or a left side emergency door and a rear emergency window. (See 49 CFR 571.217.)

All emergency exits shall be outlined around the perimeter of the exit with a minimum one inch wide retroreflective tape or decal. The retroreflective tape or decal shall be placed on the exterior surface of the MFSAB.(See 49 CFR 571.217.)

Exceptions:Retroreflective tape can be located on the rear bumper provided the space under the emergency exit door is not adequate to accommodate the tape or provided rivets are present that prohibit the tape from being applied properly.

Optional emergency roof hatches are allowed. They must be installed according to manufacturer's specifications.

Open and close roof hatches (required or optional) to verify their operation.

REJECT VEHICLE IF:

Emergency exits do not meet requirements. Roof hatches do not open.

1) Side

PROCEDURES/SPECIFICATIONS:

Inside release mechanism must be protected against accidental release; easily accessible; and readily operated manually without the use of remote control, power device, or tool.

Shall be hinged on front side and open outward. Shall be equipped with safety glass (or equivalent). Glass shall be located in upper portion of the door. Door shall be of at least the same gauge metal as the body. Shall be 24 inches or more clear horizontal opening, with forward edge of opening in line with the rearmost edge of a seat back. Shall have 45 inches or more clear vertical opening. Door and rubber seal must not be defective. (See Alarms and Locks in subsection (b)(4) for requirements.)

There must be at least 11.7 inches (30 cm) measured from the door opening to the seat back in front. If there is no flip-up seat present, a guard barrier must be installed in front of the seat to the rear of the door. (See 49 CFR 571.217.)

REJECT VEHICLE IF:

Release mechanism is not protected, accessible, or operable (inside and outside); unable to open easily; hinge is located at incorrect location; location and size of opening is incorrect. General condition of door and/or rubber seal is defective.

2) Rear

PROCEDURES/SPECIFICATIONS:

Inside release mechanism must be protected against accidental release; easily accessible; readily operated manually without use of remote control, power device or tool.

Shall have permanently attached inside and outside release handles. Outside release handle must be non-hitchable.

Rear exit shall hinge on right; open outwards; have a 24 inch or more clear horizontal opening and 45 inch or more clear vertical opening above floor. Glazing shall be installed in upper and lower portions. Door and rubber seal must not be defective. (See Alarms and Locks in subsection (b)(4) for requirements.)

REJECT VEHICLE IF:

Inside release mechanism is not protected. Inside and outside release mechanisms are not accessible or do not operate properly. Outside release mechanism is hitchable. Door does not open easily. Location of hinge is incorrect. Size of opening is incorrect. Glazing does not meet requirements. General condition of door and/or rubber seal is defective.

3) Window

PROCEDURES/SPECIFICATIONS:

When the emergency door is located on the left side, a rear emergency window shall be provided. Minimum 16 inches high and 48 inches wide. Designed to be opened from the inside or the outside. Hinged on top, designed and operated to insure against accidental closing in an emergency. Inside handle shall provide for quick release. Outside handle shall be nondetachable and nonhitchable. (See Alarms and Locks in subsection (b)(4) for requirements.)

Optional emergency windows are allowed. They must be labeled "Emergency Exit" in letters at least two inches high, of a color that contrasts with its background, located at the top of or directly above the window on the inside surface of the bus.

REJECT VEHICLE IF:

If equipped, operating mechanisms do not function. Glass is cracked or broken.

4) Alarms and Locks

PROCEDURES/SPECIFICATIONS:

Both audible and visible alarms shall alert the driver when engine is running and any emergency exit door either:

A) Is not fully latched, or

B) Is locked.

An audible alarm shall alert the driver when engine is running and any emergency exit window either:

A) Is not fully latched, or

B) Is locked.

The engine starting system shall not operate while any emergency exit door or window (optional or required) is locked (i.e., release mechanism that requires a key or combination, a "hasp lock" or a sliding latch) from either inside or outside the bus.

Alarm cut-off or "squelch" control is prohibited.

On a van conversion, any rear cargo door inside locks of the type installed by the chassis manufacturer (such as commonly used in cars − "push/pull" type) shall be made inoperable. The mechanism cannot, through jarring, vibration, etc., cause the door to become locked and be inoperable from the inside or outside.

Exception: No alarm is required for roof hatches.

REJECT VEHICLE IF:

Alarms do not alert driver as required. Locks do not meet requirements.

c) ENTRANCE DOOR

1) Physical Requirements

PROCEDURES/SPECIFICATIONS:

The service entrance shall have a minimum vertical opening of 1.7 m (67") and a minimum horizontal opening of 610 mm (24").

Door shall be located to right of operator and operated by an over-center control. Upper portions of door shall be safety glass or equivalent. Vertical closing edges shall be equipped with flexible material for a proper seal and to prevent injury.

Each door on the right side of the vehicle, hinged or sliding, except the service door shall be made permanently inoperable by means other than the rub rail on the outside of the body.

The service door shall be either manually or power operated by the seated driver. When in the closed and secured position, the door operating mechanism shall prevent accidental opening but shall afford prompt release and opening by the driver. No exposed parts of a door operating mechanism shall come together so as to shear or crush fingers. The vertical closing edges of a service door shall be padded to lessen chance of injury.

A power operated door shall be equipped for emergency manual operation in case of power failure. Instructions for emergency operation of a power operated door shall be affixed permanently on the interior of the door in letters at least 12 mm (.5") high.

REJECT VEHICLE IF:

Binding or jamming is evident, malfunctions, over-ride device on power operated door does not function, control not accessible by driver.

Door is missing, loose, or damaged. Rubber seal is missing or torn.

2) Locks and Alarms

PROCEDURES/SPECIFICATIONS:

A service door lock is not required, but if any type of service door locking system is installed on the bus, the system shall conform to at least one of the following:

A) The locking system shall not be capable of preventing the driver from easily and quickly opening the service door from inside the vehicle; or

B) A locking system that is capable of preventing the bus driver from easily and quickly opening the service door shall include an audiovisual alarm. The alarm shall be audible and visible and must alert the driver when the engine is running and the service door is locked. An alarm disconnect, "squelch control", or other alarm defeating or weakening device shall be prohibited; or

C) A locking system shall not be capable of preventing the bus driver from easily and quickly opening the service door except when a person outside the bus uses a key that is not capable of locking more than one of at least 1000 of the door manufacturer's key locking systems.

REJECT VEHICLE IF:

Locks and alarms do not meet requirements. Bent, worn or dislocated parts that would delay quick door release and opening are present.

d) EXHAUST SYSTEM

PROCEDURES/SPECIFICATIONS:

1) General

"Exhaust system" includes each component used to conduct gas from an engine exhaust port (manifold) to an authorized exit point, including each sealing, connecting, and supporting component. Exhaust system shall be outside body and attached to chassis. Size of tail pipe shall not be reduced after it leaves muffler. Any flexible component that contains exhaust gas shall be of stainless steel. System shall not leak. System shall have an outlet at its discharge ends only.

Exhaust system shall be shielded from either accidental contact, "hitching to", or "standing on", except that no shielding is required at the discharge end. A chassis or body component may provide required shield.

AGENCY NOTE: As mandated by the United States Environmental Protection Agency (USEPA), diesel-powered engines manufactured after December 31, 2006 are required to meet stricter standards that will reduce emissions of particulate matter and nitrogen oxides into the atmosphere. School bus manufacturers may be required to modify exhaust systems to meet the USEPA requirements, e.g., mufflers may be replaced with after-treatment devices that significantly reduce toxins released into the atmosphere. Modifications to exhaust systems made in compliance with the USEPA requirements are acceptable, provided they do not impact the safe operation of the school bus.

REJECT VEHICLE IF:

All parts of system are not securely fastened and supported.

Any part of system is leaking or missing.

Any part of system contains holes not made by manufacturer.

Exhaust system does not meet requirements.

2) Discharge

PROCEDURES/SPECIFICATIONS:

The exhaust pipe, muffler and tail pipe shall be outside the bus body and attached to the chassis.

The exhaust system shall be insulated from any insulated wire, flammable material, brake hose or line, or fuel system component by a securely attached metal shield at any point where the exhaust system is 11.8 inches (300 mm) or less (four inches (101.6 mm) or less if diesel powered engine) from the components listed in this subsection (d)(2).

The shielding of engine compartment components shall be governed by the chassis manufacturer's standards.

The tail pipe may meet the chassis manufacturer's standard configuration. However, the tail pipe shall not exit beneath any fuel filler location or beneath any emergency exit door.

The tail pipe shall extend out to, but not more than, 1 inch beyond the perimeter of the body, the bumper or the rub rail.

Each gas conducting component that is not of stainless steel shall be of commercial heat and corrosion resistant exhaust system material and shall be nonflexible.

REJECT VEHICLE IF:

Exhaust discharge system does not meet requirements.

Exhaust discharge location is "hitchable".

Exhaust fumes are released towards a door or other opening into bus body.

e) FENDERS

PROCEDURES/SPECIFICATIONS:

Shall be properly braced and free from any body attachment.

There shall be approximately one inch located between front fenders and back face to cowl.

REJECT VEHICLE IF:

Fenders are not solid or in bad condition.

Sharp edges are evident.

Fenders are loose or protrude out.