**Section 436.APPENDIX B Battery or Batteries through Bumper, Front**

a) BATTERY OR BATTERIES

PROCEDURES/SPECIFICATIONS:

A minimum of one battery must be installed. Two or more suitably connected batteries may also be installed.

When rated in conformance with SAE Standard J537 (September 2000) the batteries shall provide a current flow for engine cranking no less than the engine manufacturer's recommended Cold Cranking Current (amperes for 30 seconds) at -18o C (0o F) or, at the purchaser's option, at -29o C (-20o F).

When rated in conformance with SAE Standard J537 (September 2000) the batteries shall provide a Reserve Capacity (duration of 25 ampere current flow) at 27o C (80o F) no less than 135 minutes.

Battery or batteries may be mounted either in the engine area or outside of the passenger/driver area in a separate battery compartment.

REJECT VEHICLE IF:

Battery or batteries are: not securely mounted; excessively corroded; of insufficient capacity.

b) BATTERY CABLES

PROCEDURES/SPECIFICATIONS:

Check condition.

REJECT VEHICLE IF:

Cables are corroded or are not securely attached.

c) BATTERY COMPARTMENT (optional)

PROCEDURES/SPECIFICATIONS:

When the battery is mounted outside the engine compartment, it shall be welded or bolted in a closed, weather-tight, and vented compartment that is located and arranged so as to provide for convenient routine servicing. The battery compartment door, or cover, shall be secured by a manually operated latch or other fastener. A latch or fastener must be designed in such a fashion as to keep the door closed when in the latched position. Each electrical cable connecting the battery in this carrier to the body or chassis shall be one piece between the terminal connector and the first body or chassis terminal connector.

REJECT VEHICLE IF:

If present, battery compartment does not meet requirements.

d) BRAKES

PROCEDURES/SPECIFICATIONS:

Every motor vehicle shall be equipped with two separate means of applying the brakes and they shall be so constructed that failure of any one part of the operating mechanism shall not leave the motor vehicle without brakes. (See Section 12-301(a) of the Illinois Vehicle Equipment Law.)

REJECT VEHICLE IF:

Brakes do not meet requirements.

1) Backing Plate

PROCEDURES/SPECIFICATIONS:

Check condition.

REJECT VEHICLE IF:

Backing plate is in poor condition.

2) Drums/Discs

PROCEDURES/SPECIFICATIONS:

Inspect drums and/or discs for cracks or for being worn or reworked beyond the manufacturer's minimum limits.

REJECT VEHICLE IF:

Worn or reworked beyond the manufacturer's minimum limits.

3) Emergency/Parking Brake

PROCEDURES/SPECIFICATIONS:

Emergency/parking brake system must apply brakes to at least two wheels. (See Section 12-301(a) of the Illinois Vehicle Equipment Law.)

AGENCY NOTE: Micro brakes are not considered a separate means of braking and are not acceptable.

Procedures for testing:

A) Apply operating control fully.

B) Check actuating mechanism for release.

Brake Performance Test:

Using Drive-On Pad Type Tester:

i) Drive vehicle onto brake machine pads at 4-8 m.p.h.

ii) Apply emergency/parking brakes to bring vehicle to a halt. Do not lock wheels.

iii) Note the braking forces registered by the brake machine.

Using Roll-On Type Tester:

i) Position axle with emergency brake onto roller.

ii) Apply emergency brake but do not lock wheels.

REJECT VEHICLE IF:

Emergency/parking brake does not meet requirements.

A) Not equipped with emergency/parking brakes. Operating mechanism does not hold in the applied position.

B) Actuating mechanism does not fully release when release control is operated properly.

Brake Performance Test:

Drive-On Tester:

Machine does not register a total braking force of at least 20% of vehicle empty weight. Braking forces at opposite wheels on same axle vary more than 20%.

Roll-On Tester:

Machine does not register a total braking force of at least 20% of vehicle empty weight. Braking forces at opposite wheels on same axle vary more than 20%.

4) Emergency Brake Ratchet (Pedal or Lever)

PROCEDURES/SPECIFICATIONS:

Must be in proper adjustment. If vehicle was manufactured with a warning light, it must be visible when emergency brake is activated.

REJECT VEHICLE IF:

Emergency brake ratchet or warning light does not meet requirements.

5) Pedal Clearance (Service Brakes)

(See PEDALS at Appendix H.)

6) Power Systems

A) Air

i) Air Pressure

PROCEDURES/SPECIFICATIONS:

With air system fully charged (compressor governor "cut-out") run engine at low idle. Make one full (maximum) brake application and immediately record reservoir air pressure.

Apply and release brakes until pressure indicated on the air gauge is at least 10 psi (i.e., pounds per square inch) below governor "cut-in" pressure. Run engine at high idle and determine seconds required to raise reservoir pressure from recorded pressure.

REJECT VEHICLE IF:

Time required to raise air pressure from recorded to cut-out is more than 30 seconds. Air gauge is missing or does not operate.

ii) Low Pressure Warning Device

PROCEDURES/SPECIFICATIONS:

Complete the following steps to evaluate low pressure warning device.

1) Before starting the engine, apply brakes and release until low air pressure warning device functions.

2) Start the engine.

3) Apply service brakes and release until air compressor is activated.

4) Continue to run engine until compressor cut-out pressure is reached.

5) Record compressor cut-out pressure.

6) Shut engine off.

Determine if low pressure warning device is missing or inoperative.

If located in the driver's forward field of view, the warning device can be a visual device only. If not located in the driver's front view, the device must be both audible and visible.

Record the reading found on the pressure gauge at which the low pressure warning device functions.

REJECT VEHICLE IF:

Missing or inoperative low pressure warning device. Device does not meet requirements.

Low pressure warning device does not operate at 55 psi or one half cut-out pressure, whichever is less.

B) Electric/Hydraulic

PROCEDURES/SPECIFICATIONS:

Turn key to "off" position. Depress service brake pedal. Electric hydraulic pump must come "on" (listen).

REJECT VEHICLE IF:

Electric pump does not operate properly or is absent.

C) Hydraulic

PROCEDURES/SPECIFICATIONS:

Inspect booster belts, supports, tubes, hoses, connections and general condition. Clean reservoir and cover as necessary and check master cylinder fluid level. Do not contaminate fluid.

Turn key to "on" position. Warning signal must come on (look/listen). Depress brake pedal lightly. Start engine. Pedal must move down slightly (feel). Warning signal must go "off" (look/listen).

REJECT VEHICLE IF:

Belt is slack or worn; tube or hose is damaged; any part leaks or is cracked; master cylinder fluid is below manufacturer's recommended capacity.

Either booster or warning signal does not operate properly.

D) Vacuum/Hydraulic

PROCEDURES/SPECIFICATIONS:

Inspect tanks, chambers, hoses, tubes, connectors, clamps, and booster air cleaner.

Inspect supports and attachments.

With engine off, repeatedly apply service brakes until vacuum is depleted, with medium pressure on brake pedal, and start engine; release brake and operate engine until maximum vacuum is established; stop engine; apply service brakes hard.

With brakes still applied, start engine; after one minute of running engine, check "Low Vacuum" indicator.

REJECT VEHICLE IF:

Any component is restricted, collapsed, scraped, cracked, loose, or broken. Booster air cleaner is clogged.

Any support or attachment is broken. Any connecting line or other component is not attached or supported so as to prevent damage from scraping or rubbing.

Foot pedal does not fall away from foot when engine is started; insufficient vacuum reserve to permit one full service brake application after engine is off without actuating "low vacuum" indicator; valve or diaphragm leaking.

7) Service Brakes

PROCEDURES/SPECIFICATIONS:

Must be equipped with service brakes on all wheels. (See Section 12-301(a)(5) of the Illinois Vehicle Equipment Law.)

Must be equipped with a "split system" on service brakes. (See 49 CFR 571.105.)

Power-assisted service brakes are required. (See 49 CFR 571.105.)

If the bus is equipped with an anti-lock braking system (ABS), verify the ABS warning light is not illuminated and has not been made inoperable.

REJECT VEHICLE IF:

Service brakes do not meet requirements. ABS warning light is illuminated or has been made inoperable.

Brake Performance Test:

PROCEDURES/SPECIFICATIONS:

Using Drive-On Pad Type Brake Tester:

Check vehicle's stopping ability before testing.

Drive vehicle onto brake machine pads at 4-8 m.p.h.

Apply service brakes to bring vehicle to a halt. Do not lock wheels.

Note the braking forces registered by the brake machine.

Using Roll-On Type Tester:

Each axle must be tested separately. Transmission must be in neutral when testing brakes on any drive axle.

Drive front axle onto rollers. Start roller motor. Apply service brakes but do not lock wheels.

Repeat the above steps for each axle.

The total braking force on a vehicle must be determined by adding the results of the test on each axle.

REJECT VEHICLE IF:

Drive-On Tester:

Machine does not register a total braking force of at least 60% of the vehicle empty weight.

Computerized tester does not register a total braking force of at least 45% of the vehicle empty weight.

Roll-On Tester:

Machine does not register a total braking force of at least 60% of the vehicle empty weight. Braking forces at opposite wheels on same axle vary more than 20%.

e) BUMPER, FRONT

PROCEDURES/SPECIFICATIONS:

Manufacturer's standard for vehicle or an equivalent bumper that meets or exceeds manufacturer's standards. Black color is not required.

The entire front bumper must be of metal construction unless an energy absorbing bumper is used.

Bumper must be solidly attached and free from damage or sharp edges.

REJECT VEHICLE IF:

Front bumper does not meet requirements. Bumper is not solidly attached. Sharp edges are present.