**Section 441.APPENDIX B Battery or Batteries through Bumper, Front**

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| a) | BATTERY OR  BATTERIES | | | | | | | |  | | | | |
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|  | | | | | | | | | PROCEDURES/SPECIFICATIONS:  One or more batteries may be mounted either in engine compartment or on outside of passenger/driver area. Battery (or batteries together) in a 12 volt system shall be rated, when new, to provide the following:  Engine manufacturer's recommended Cold Cranking Current (amperes for 30 seconds) at -18 degrees C (0 degree F) or, at the purchaser's option, at -29 degrees C (-20 degrees F).  The battery(s) shall provide a Reserve Capacity (duration of 25 ampere current flow) at 27 degrees C (80 degrees F) for no less than 135 minutes.  Low rate discharge capacity of 90 ampere-hours or more (20 hour discharge test at 80 degrees F).  Exception: A bus manufactured in August 1974 or earlier may have a 70 ampere-hour battery, in a 12 volt system. | | | | |
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|  | | | | | | | | | REJECT VEHICLE IF:  Battery or batteries are not securely mounted; excessively corroded; of insufficient capacity. | | | | |
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| b) | BATTERY  CABLES | | | | | | | |  | | | | |
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|  | | | | | | | | | REJECT VEHICLE IF:  Cables are corroded or are not securely attached. | | | | |
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| c) | BATTERY  CARRIER | | | | | | | |  | | | | |
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|  | | | | | | | | | 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. | | | | |
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| 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.* (Section 12-301(a) of the Illinois Vehicle Equipment Law) | | | | |
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|  | | 1) | | Backing  Plate | | | | |  | | | | |
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|  | | 2) | | Drums/  Discs | | | | |  | | | | |
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|  | | | | | | | | | PROCEDURES/SPECIFICATIONS:  Inspect drums and/or discs for cracks or for being worn or reworked beyond the manufacturer's minimum limits. | | | | |
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|  | | | | | | | | | REJECT VEHICLE IF:  Worn or reworked beyond the manufacturer's minimum limits. | | | | |
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|  | | 3) | | Emergency/  Parking  Brake | | | | |  | | | | |
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|  | | | | | | | | | PROCEDURES/SPECIFICATIONS:  *Emergency/parking brake system must apply brakes to at least two wheels.* (Section 12-301(a) of the Illinois Vehicle Equipment Law) | | | | |
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|  | | AGENCY NOTE: | | | | | | | Micro brakes are not considered a separate means of braking and are not acceptable.  Procedures for testing: | | | | |
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|  | | | | | | | | | 1) | | Apply operating control fully. | | |
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|  | | | | | | | | | 2) | | Check actuating mechanism for release. | | |
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|  | | | | | | | | | Brake Performance Test:  Using Drive-On Pad Type Tester: | | | | |
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|  | | | | | | | | | 1) | Drive vehicle onto brake machine pads at 4-8 m.p.h. | | | |
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|  | | | | | | | | | 2) | Apply emergency/parking brakes to being vehicle to a halt. Do not lock wheels. | | | |
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|  | | | | | | | | | Using Roll-On Type Tester: | | | | |
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|  | | | | | | | | | 1) | Position axle with emergency brake onto roller. | | | |
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|  | | | | | | | | | REJECT VEHICLE IF:  Emergency/parking brakes does not meet requirements.  Procedures for testing: | | | | |
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|  | | | | | | | | | 1) | Not equipped with emergency /parking brakes. Operating mechanism does not hold in the applied position. | | | |
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|  | | | | | | | | | 2) | Actuating mechanism does not fully release when release control is operated properly. | | | |
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|  | | | | | | | | | 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%. | | | | |
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|  | | 4) | | Emergency  Brake  Ratchet  (Pedal or  Lever) | | | | |  | | | | |
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|  | | 5) | | Pedal  Clearance  (Service  Brakes) | | | | |  | | | | |
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|  | | 6) | | Power  Systems | | | | |  | | | | |
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|  | | | | | A) | Air | | |  | | | | |
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|  | | | | | | | | i) | Air Pressure | | | | |
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|  | | | | | | | | | | | | 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. | |
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|  | | | | | | | | | | | | 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. | |
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|  | | | | | | | ii) | | Low Pressure Warning Device | | | | |
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|  | | | | | | | | | | | | PROCEDURES/SPECIFICATIONS:  Complete the following steps to evaluate low pressure warning device. | |
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|  | | | | | | | | | | | | 1) | Before starting the engine, apply brakes and release until low air pressure warning device functions. |
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|  | | | | | | | | | | | | 2) | Start the engine. |
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|  | | | | | | | | | | | | 3) | Apply service brakes and release until air compressor is activated. |
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|  | | | | | | | | | | | | 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. For buses manufactured before September 1, 1974, the device can be either audible or visible.  Record the reading found on the pressure gauge at which the low pressure warning device functions. | |
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|  | | | | | B) | Electric/  Hydraulic | | | | | |  | |
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|  | | | | | | | | | | | | PROCEDURES/SPECIFICATIONS:  Turn key to "off" position. Depress service brake pedal. Electric hydraulic pump must come "on" (listen). | |
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|  | | | | | C) | Hydraulic | | | | | |  | |
|  | | | | | | | | | | | | PROCEDURES/SPECIFICATIONS:  Inspect booster belt(s), 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). | |
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|  | | | | | | | | | | | | 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. | |
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|  | | | | | D) | Vacuum/  Hydraulic | | | | | |  | |
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|  | | | | | | | | | | | | PROCEDURES/SPECIFICATIONS:  Inspect tank(s), 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, 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. | |
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|  | | | | | | | | | | | | REFJECT 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. | |
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|  | | 7) | Service  Brakes | | | | | | | | |  | |
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|  | | | | | | | | | | | | PROCEDURES/SPECIFICATIONS:  *Must be equipped with service brakes on all wheels.* (Section 12-301(a)(5) of the Illinois Vehicle Equipment Law)  Must be equipped with a "split system" on service brakes. (49 CFR 571.105)  Power-assisted service braes are required. (49 CFR 571.105) | |
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|  | | | | | A) | Brake  Inspection  Report | | | | | |  | |
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|  | | | | | | | | | | | | PROCEDURES/SPECIFICATIONS:  Verify Brake Inspect Report for following (refer to Section 441.Illustration C for example of form): | |
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|  | | | | | | | | | | | | 1) | Vehicle Identification Number (VIN), make and year must correspond to the bus presented for inspection. |
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|  | | | | | | | | | | | | 2) | The Brake Inspection Report must indicate the date and mileage at time the brake inspection was performed. If date is more than one year prior to time of inspection or mileage has exceeded 10,000 miles, a brake inspection must be performed. |
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|  | | | | | | | | | | | | Exception: If the bus has operated less than 10,000 miles and less than 12 months have passed since the bus was manufactured, a Brake Inspection Report is not required. Write "Less than 10,000 miles and less than one year old" in the remarks section on the Vehicle Inspection Report. | |
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|  | | | | | B) | Brake  Performance  Test | | | | | |  | |
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|  | | | | | | | | | | | | 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. | |
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|  | | | | | | | | | | | | Using Roll-On Type Tester:  When using roller-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. | |
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| e) | BUMPER,  FRONT | | | | | | | | | | |  | |
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|  | | | | | | | | | | | | PROCEDURES/SPECIFICATIONS:  Either channel type, formed of rolled steel at least .177 inch (4.5 mm) (approximately 3/16 inch) thick, or approved energy absorbing type.  Buses manufactured in August 1974 or later must have 7.9 inches (200 mm) or more vertical black face.  Bumper must extend to outer edges of fenders and other front end sheet metal. Must be of strength to permit pushing vehicle of equal weight without permanent distortion.  (See CROSSING CONTROL ARM in Section 441.Appendix C for requirements.)  Exception: Buses manufactured prior to September 1974 are exempt from bumper thickness and 7.9 inches face requirement.  Exception: For buses that meet the definition of a Type I-A school bus, as defined in Section 441.40, the front bumper may meet manufacturer's specifications when the Type I-A school bus is equipped with a driver side air bag. | |
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|  | | | | | | | | | | | | REJECT VEHICLE IF:  Font bumper does not meet thickness, face height and color requirements. Must be solidly attached, in good condition, free from damage and sharp edges. | |
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(Source: Amended at 25 Ill. Reg. 3283, effective February 20, 2001)