

## ***MSP/MCD DECAL APPLICATION POLICY FOR SCHOOL BUSES***

### **BRAKE SYSTEM**

#### **Brake Systems: General**

The brake system shall comply with federal specifications applicable for the specific year of the vehicle. MCLA 257.1810

**YELLOW:** Required components improperly mounted

**YELLOW:** Torn dust boot on caliper piston allowing debris to enter piston bore

**RED:** Defective brakes includes any brake that meets one of the following criteria:

- Absence of effective braking action upon application of the service brakes such as brake linings, failing to move or contact braking surface upon application
- Vehicle does not comply with federal specifications
- Missing or broken mechanical components
- Loose brake components including air chambers, spiders, camshaft support brackets and calipers
- A part or parts are defective or worn beyond specifications
- Required braking components missing

#### **Hydraulic System**

Hydraulic hoses and tubes.

**RED:** Hoses or tubing are leaking, flattened, restricted, or distorted. Chafed to cord or cracked exposing cords

Wheel cylinders and calipers

**RED:** Wheel cylinder or caliper leaks

Master cylinders and gasket

**YELLOW:** Master cylinder gasket is torn or misshapen

Reservoirs

**YELLOW:** Level in either reservoir is more than ½ empty

**RED:** Level in either reservoir is more than ¾ empty

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**BRAKE SYSTEM (cont.)**

**Condition of Linings and Pads - All measurements must be done with steel tape or ruler**

Bonded Linings

**RED:** Thinnest point is less than 1/16 inch

Riveted Linings

**RED:** Thinnest point is less than 1/16 inch

All Linings

**YELLOW:** Lining is broken/cracked

**RED:** Friction surface is contaminated with oil or grease - grease on top of shoe is not cause for rejection

**RED:** Lining is not firmly attached to shoe

**Pads - Disc Brakes**

**RED:** Any pad is 3/16 inch or less on vehicles with GVWR more than 10,000 lbs

**RED:** Any pad is 1/16 inch or less on vehicles with GVWR of less than 10,000 lbs

**RED:** Any pad not firmly attached to shoe

**Dual Hydraulic Circuits**

Brake warning light

**RED:** Light fails to come on when ignition is in start position

**RED:** Light comes on when brake pedal depressed and engine is running

**Test Procedures for Hydraulic Brakes with Electric Boost**

Key off, depress brake pedal, motor should run

**RED:** Electric boost fails to run.

Key on, engine off, light, buzzer and motor should come on

**RED:** Light or buzzer fails to operate.

Key on, engine off, depress brake pedal, motor should run

**RED:** Pump fails to run.

Prior to April 22, 1985, the key had to be in the "on" position and the brake pedal depressed to activate the boost assist motor.

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### **BRAKE SYSTEM (cont.)**

#### **Hydraulic System with Hydraulic Pump Assist**

Apply pressure with key off and on

**RED:** Brake electric assist motor does not operate

Apply pressure with engine started

**RED:** Brake pedal does not drop slightly with pressure applied

**RED:** Brake warning lamp stay on when engine is running

Fluid reservoir and belts

**YELLOW:** Fluid level in pump reservoir is low or belt is badly worn

**YELLOW:** Fluid leaks

**RED:** Any visible and constantly dripping leak with service brakes applied at any point in the system

#### **Hydraulic System with Vacuum Assist**

With engine off and no vacuum in system, depress brake pedal with 25 pounds of force. While maintaining that force, start the engine. Pedal should fall slightly.

**RED:** Brake pedal does not drop slightly under force when the engine starts

#### **Vacuum Reserve**

Build full vacuum, shut engine off and make as many full brake applications as possible

**RED:** Vacuum reserve is insufficient to make three full applications after engine is shut off

#### **Low Vacuum Indicators**

On vehicles with low vacuum indicators, build full vacuum, shut off engine and reduce vacuum by making a series of moderate brake applications. A flasher or buzzer signal should function when vacuum reaches 8 inches Hg on gauge.

**RED:** Indicator fails to function when system is reduced to 8 inches HG vacuum

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### **BRAKE SYSTEM (cont.)**

#### **Check Valve**

A check valve to prevent loss of stored vacuum shall safeguard system.

**RED:** Check valve is inoperative or missing

#### **Brake Drums on Air and Hydraulic Systems**

##### Drum friction surface

**YELLOW:** Substantial cracks on the friction surface extending to open edge - short hairline heat check cracks should not be considered

Inspect for cracks on the outside of the drum.

**RED:** There are external cracks.

Inspect for contaminated friction surface.

**RED:** Friction surface is contaminated with oil, grease or brake fluid

Measure inside diameter of drum using a drum micrometer

**RED:** Inside diameter of drum is greater than diameter stamped on drum.

#### **Disc Brake Systems**

##### Rotor friction surface and rotor heat fins

**RED:** Rotor friction surface and/or heat fins with cracks to open edge

Measure thickness of rotor using an OD Micrometer

**RED:** Exceeds manufacturer specifications or as marked on rotor

##### Caliper and anchor plate sliding surfaces

**RED:** Caliper froze on slides

**RED:** Piston froze in bore

**RED:** Caliper anchor plate is welded or brazed *CVSA Out-of-Service Criteria, April 1, 2001*

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### **BRAKE SYSTEM (cont.)**

Mechanical components e.g., drums, linings, cables, return springs, and anchor pins

**RED:** There is oil or grease on the drum or lining. The lining is worn through to the steel band or rivets.

**RED:** Mechanical parts are missing, broken or badly worn.

#### **Parking Brake**

Apply parking brake with engine running at idle. Slightly accelerate with vehicle in either drive or second gear.

**RED:** Parking brake fails to hold

**RED:** Parking brake does not apply or release completely

#### **Airlines: Hoses, Tubing and Connections** *FMVSS 570.1 to 570.63*

**YELLOW:** Lines and hoses chafed by moving parts

**YELLOW:** Lines or hoses contacting exhaust system except on diesel fueled buses

**RED:** Lines and hoses that are leaking, broken, crimped, cracked, bulged under pressure or severely chafed, or with exposed cords

**RED:** Airlines contacting exhaust components on other than diesel operated buses

#### **Valves: Check, High Pressure Relief, Inversion**

**RED:** If valves are inoperative

**RED:** Fails to function properly

**RED:** Air tanks manufactured with high-pressure relief valves are not maintained as manufactured

#### **Compressor**

Proper build up time 50-90 psi within 3 minutes at fast idle; 1500 rpm for gas and 1100 rpm for diesel engines.

**RED:** Build up time is more than 3 minutes

Proper governor cut in and cut out times - minimum 80 psi; maximum 135 psi

**RED:** Cut in pressure is less than 80 psi or cut out pressure is greater than 135 psi

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### **BRAKE SYSTEM (cont.)**

#### Proper mounting and belt condition

**YELLOW:** Belts frayed, cracked or loose

**YELLOW:** Loose mounting

#### **Air Component Height**

##### Air reservoirs and components

**YELLOW:** Reservoirs or components are less than 15 inches from the road surface

#### **Moisture Ejectors/Air Dryers**

**RED:** Inoperative or missing

#### **Low Air Warning Device**

**RED:** Low air warning device is inoperative

**RED:** System does not activate at ½ cut out pressure or 60 psi, which ever is less

#### **Brake Chamber Size, Push Rod Stroke, and Slack Adjuster Length**

##### Size chambers

**RED:** Air chamber size is mismatched on same axle

##### Push rod stroke

**YELLOW:** Retracted push rod lengths differ more than ½” on same axle other than steering axle

**RED:** Push rod stroke is mismatched by 1/2” or more on steering axle

**RED:** Push rod stroke exceeds adjustment limits - see chart

##### Slack adjuster length

**RED:** Vehicles manufactured after October 20, 1994 not equipped with automatic slack adjusters

**RED:** Slack adjuster length is mismatched on steering axle

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**BRAKE SYSTEM (cont.)**

**Air Leaks**

With system fully charged, stop engine and record pressure drop (psi/min) with brakes fully applied.

**RED:** Air leak(s) that exceed(s) 3 psi/min

**RED:** An audible air leak at the brake chamber or any other location except at a proper fitting

With system fully charged, stop engine and record pressure drop (psi/min) with brakes fully released

**RED:** Air leak(s) that exceed(s) 2 psi/min

**RED:** An audible air leak at the brake chamber or any other location except at a proper fitting

**Pre FMVSS 121 Vehicles: Parking/Emergency Brakes**

Fully apply the parking/emergency brake. Deplete the service reservoir air and make several applications with the parking/emergency brake.

**YELLOW:** Brakes do not release simultaneously

**RED:** Brakes fail to hold when applied

**RED:** Spring brakes fail to apply or release fully when control valve is operated

**RED:** Reserve air is insufficient to allow for at least 3 brake applications