§ 393.46 Exhaust system or any other source of high temperatures.

(c) Nonmetallic brake tubing. Coiled nonmetallic brake tubing may be used for connections between towed and towing motor vehicles or between the frame of a towed vehicle and the unsprung subframe of an adjustable axle of the motor vehicle if—

(1) The coiled tubing has a straight segment (pigtail) at each end that is at least 51 mm (2 inches) in length and is encased in a spring guard or similar device which prevents the tubing from kinking at the fitting at which it is attached to the vehicle; and

(2) The spring guard or similar device has at least 51 mm (2 inches) of closed coils or similar surface at its interface with the fitting and extends at least 38 mm (1½ inches) into the coiled segment of the tubing from its straight segment.

(d) Brake tubing and hose connections. All connections for air, vacuum, or hydraulic braking systems shall be installed so as to ensure an attachment free of leaks, constrictions or other conditions which would adversely affect the performance of the brake system.

[70 FR 48050, Aug. 15, 2005]

§ 393.47 Brake actuators, slack adjusters, linings/pads and drums/rotors.

(a) General requirements. Brake components must be constructed, installed and maintained to prevent excessive fading and grabbing. The means of attachment and physical characteristics must provide for safe and reliable stopping of the commercial motor vehicle.

(b) Brake chambers. The service brake chambers and spring brake chambers on each end of an axle must be the same size.

(c) Slack adjusters. The effective length of the slack adjuster on each end of an axle must be the same.

(d) Linings and pads. The thickness of the brake linings or pads shall meet the applicable requirements of this paragraph—

(1) Steering axle brakes. The brake lining/pad thickness on the steering axle of a truck, truck-tractor or bus shall not be less than 4.8 mm (3/16 inch) at the shoe center for a shoe with a continuous strip of lining; less than 6.4 mm (3/4 inch) at the shoe center for a shoe with two pads; or worn to the wear indicator if the lining is so marked, for air drum brakes. The steering axle brake lining/pad thickness shall not be less than 3.2 mm (1/8 inch) for air disc brakes, or 1.6 mm (1/4 inch) or less for hydraulic disc, drum and electric brakes.

(2) Non-steering axle brakes. An air braked commercial motor vehicle shall not be operated with brake lining/pad thickness less than 6.4 mm (3/4 inch) or to the wear indicator if the lining is so marked (measured at the shoe center for drum brakes); or less than 3.2 mm (1/8 inch) for disc brakes. Hydraulic or electric braked commercial motor vehicles shall not be operated with a lining/pad thickness less than 1.6 mm (5/32 inch) (measured at the shoe center) for disc or drum brakes.

(e) Clamp, Bendix DD–3, bolt-type, and rotochamber brake actuator readjustment limits. (1) The pushrod stroke must not be greater than the values specified in the following tables:

<table>
<thead>
<tr>
<th>Type</th>
<th>Outside diameter</th>
<th>Brake readjustment limit: standard stroke chamber</th>
<th>Brake readjustment limit: long stroke chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4 1/4 in. (114 mm)</td>
<td>1 1/4 in. (31.8 mm)</td>
<td>1 1/4 in. (31.8 mm)</td>
</tr>
<tr>
<td>9</td>
<td>5 1/2 in. (133 mm)</td>
<td>1 in. (34.9 mm)</td>
<td>1 1/4 in. (34.9 mm)</td>
</tr>
<tr>
<td>12</td>
<td>5 1/8 in. (145 mm)</td>
<td>1 1/8 in. (34.9 mm)</td>
<td>1 in. (44.5 mm)</td>
</tr>
<tr>
<td>16</td>
<td>5 1/4 in. (162 mm)</td>
<td>1 1/8 in. (44.5 mm)</td>
<td>1 1/4 in. (44.5 mm)</td>
</tr>
<tr>
<td>20</td>
<td>5 1/2 in. (172 mm)</td>
<td>1 1/4 in. (44.5 mm)</td>
<td>1 3/8 in. (50.8 mm)</td>
</tr>
<tr>
<td>24</td>
<td>7 1/2 in. (184 mm)</td>
<td>1 3/8 in. (50.8 mm)</td>
<td>1 3/8 in. (50.8 mm)</td>
</tr>
<tr>
<td>30</td>
<td>8 5/8 in. (206 mm)</td>
<td>1 3/8 in. (63.5 mm)</td>
<td>1 3/8 in. (63.5 mm)</td>
</tr>
<tr>
<td>36</td>
<td>9 1/8 in. (229 mm)</td>
<td>1 3/4 in. (57.2 mm)</td>
<td>2 1/2 in. (63.5 mm)</td>
</tr>
</tbody>
</table>

1 For type 20 chambers with a 3-inch (76 mm) rated stroke.

2 For type 24 chambers with a 3-inch (76 mm) rated stroke.
§ 393.48 Brakes to be operative.

(a) General rule. Except as provided in paragraphs (b), (c), and (d) of this section, all brakes with which a motor vehicle is equipped must at all times be capable of operating.

(b) Devices to reduce or remove front-wheel braking effort. A commercial motor vehicle may be equipped with a device to reduce the front wheel braking effort (or in the case of a three-axle truck or truck tractor manufactured before March 1, 1975, a device to remove the front-wheel braking effort) if that device meets the applicable requirements of paragraphs (b)(1) and (2) of this section.

(1) Manually operated devices. Manually operated devices to reduce or remove front-wheel braking effort may only be used on buses, trucks, and truck tractors manufactured before March 1, 1975. Such devices must not be used unless the vehicle is being operated under adverse conditions such as wet, snowy, or icy roads.

(2) Automatic devices. Automatic devices must not reduce the front-wheel braking force by more than 50 percent of the braking force available when the automatic device is disconnected (regardless of whether or not an antilock system failure has occurred on any axle). The device must not be operable when the brake control application pressure exceeds 85 psig (for vehicles equipped with air brakes) or 85 percent of the maximum system pressure (for vehicles which are not equipped with air brakes).

(c) Exception. Paragraph (a) of this section does not apply to—

(2) For actuator types not listed in these tables, the pushrod stroke must not be greater than 80 percent of the rated stroke marked on the actuator by the actuator manufacturer, or greater than the readjustment limit marked on the actuator by the actuator manufacturer.

(f) Wedge brake adjustment. The movement of the scribe mark on the lining shall not exceed 1.6 mm (1/16 inch).

(g) Drums and rotors. The thickness of the drums or rotors shall not be less than the limits established by the brake drum or rotor manufacturer.

[70 FR 48051, Aug. 15, 2005, as amended at 77 FR 46638, Aug. 6, 2012]