

# BRAKE SYSTEM DIAGNOSIS

## ROAD TESTING THE BRAKES

### BRAKE TEST

The brakes should be tested on a dry, clean, reasonably smooth and level roadway. A true test of brake performance cannot be made if the roadway is wet, greasy or covered with loose dirt so that all the tires do not grip the road equally. The testing will be adversely affected if the roadway is crowned so as to throw the weight of the vehicle toward the wheels on one side or if the roadway is so rough that the wheels tend to bounce.

Test the brakes at different vehicle speeds with both light and heavy pressure; however, avoid locking the wheels and sliding the tires on the roadway. Locked wheels and sliding tires do not indicate brake efficiency since heavily braked turning wheels will stop the vehicle in less distance than locked wheels. More tire-to-road friction is present with a heavily braked turning tire than with a sliding tire.

## EXTERNAL CONDITIONS THAT AFFECT BRAKE PERFORMANCE

1. **Tires**—Tires having unequal contact and grip on the road will cause unequal braking. The tires must be equally inflated and the tread pattern of the right and left tires must be about equal.
2. **Vehicle Loading**—When the vehicle has unequal loading, the most heavily loaded wheels require more braking power than the others.
3. **Front Wheel Bearings**—Loose front wheel bearings permit the disc to tilt and have spotty contact with the linings causing erratic action.
4. **Front End Alignment**—Misalignment of the front end, particularly in regard to limits on camber and caster, will cause the brakes to pull to one side.

# DIAGNOSIS OF BRAKE SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
<b>Uneven Brake Action (Brakes Pull)</b>	<ol style="list-style-type: none"><li>1. Incorrect tire pressure.</li><li>2. Front end out of alignment.</li><li>3. Loose suspension parts.</li><li>4. Worn out brake lining.</li><li>5. Incorrect lining material.</li><li>6. Malfunctioning caliper assembly.</li><li>7. Loose calipers.</li><li>8. Contaminated brake linings.</li><li>9. Malfunctioning rear brakes.</li><li>10. Leaking wheel or piston cylinder seal.</li><li>11. Restricted brake tubes or hoses.</li><li>12. Unmatched tires on the same axle.</li></ol>	<ol style="list-style-type: none"><li>1. Inflate evenly on both sides to specifications.</li><li>2. Check and align to specifications.</li><li>3. Check all suspension mountings.</li><li>4. Replace with lining of correct material.</li><li>5. Replace with linings of correct material.</li><li>6. Check for frozen or sluggish pistons and the lubrication of the retainer bolts. Caliper should slide.</li><li>7. Check and torque.</li><li>8. Repair as necessary. Replace linings in complete axle sets.</li><li>9. Check for inoperative self adjusters. Weak return springs. Leaking wheel cylinders.</li><li>10. Repair as necessary.</li><li>11. Check for collapsed rubber hoses or damaged lines. Repair as necessary.</li><li>12. Same style tires with about the same tread should be used on the same axle.</li></ol>

## DIAGNOSIS OF BRAKE SYSTEM (CONT.)

PROBLEM	POSSIBLE CAUSE	CORRECTION
<b>Brakes Squeak</b>	<ol style="list-style-type: none"> <li>1. Worn out linings.</li> <li>2. Glazed brake lining.</li> <li>3. Heat spotted rotors or drums.</li> <li>4. Weak or incorrect brake shoe retention springs.</li> <li>5. Contaminated brake linings.</li> <li>6. Incorrect lining material.</li> <li>7. Brake assembly attachments missing or loose.</li> <li>8. Excessive brake lining dust.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace linings.</li> <li>2. Replace linings.</li> <li>3. Check per instructions. If within specifications machine the rotor or drum.</li> <li>4. Replace with new retention springs.</li> <li>5. Repair as necessary. Replace linings in complete axle sets.</li> <li>6. Replace with linings of correct material.</li> <li>7. Repair as necessary.</li> <li>8. Clean dust from brake assembly.</li> </ol>
<b>Brake Pedal Pulsates</b>	<ol style="list-style-type: none"> <li>1. Excessive rotor lateral runout.</li> <li>2. Rear drums out of round.</li> <li>3. Heat spotted rotors or drums.</li> <li>4. Incorrect wheel bearing adjustments.</li> <li>5. Out of balance wheel assembly attachments missing or loose.</li> <li>6. Brake assembly attachments missing or loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check per instructions. If within specifications machine the rotor.</li> <li>2. Check per instructions. If within specifications machine the drum.</li> <li>3. Check per instructions. If within specifications machine the rotor or drum.</li> <li>4. Repair as necessary.</li> <li>5. Repair as necessary.</li> <li>6. Repair as necessary.</li> </ol>
<b>Excessive Pedal Effort</b>	<ol style="list-style-type: none"> <li>1. Leaking vacuum system.</li> <li>2. Malfunctioning power brake unit.</li> <li>3. Worn out linings.</li> <li>4. Malfunctioning proportioning valve.</li> <li>5. Incorrect lining material.</li> <li>6. Incorrect wheel cylinder.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair as necessary.</li> <li>2. Repair as necessary.</li> <li>3. Replace linings.</li> <li>4. Repair as necessary.</li> <li>5. Replace with linings of correct materials.</li> <li>6. Replace with correct size wheel cylinder.</li> </ol>
<b>Excessive Pedal Travel</b>	<ol style="list-style-type: none"> <li>1. Insufficient fluid in master cylinder reservoir.</li> <li>2. Air in brake system.</li> <li>3. Malfunctioning self adjusters.</li> <li>4. Master cylinder.</li> <li>5. Incorrect wheel bearing adjustment.</li> <li>6. Improperly adjusted master cylinder pushrod.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill reservoir with approved brake fluid. Check for leaks and air in the system. Check indicator light.</li> <li>2. Check for leaks in lines, wheel cylinders, or master cylinder. Bleed the system.</li> <li>3. Repair as necessary.</li> <li>4. Replace or repair as necessary.</li> <li>5. Repair as necessary.</li> <li>6. Adjust master cylinder pushrod.</li> </ol>