

# BRAKE SYSTEM TROUBLESHOOTING



## Brake Caliper

CONDITION	CAUSE	CORRECTION
<b>No pressure to brake.</b>	<ol style="list-style-type: none"> <li>1. Empty fluid reservoir.</li> <li>2. Damaged hydraulic system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill reservoir to correct level with specified fluid.</li> <li>2. Repair hydraulic system.</li> </ol>
<b>Piston does not move.</b>	<ol style="list-style-type: none"> <li>1. No pressure to brake.</li> <li>2. Piston cocked in bore.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill reservoir to correct level with specified fluid,</li> <li>2. Piston diameter worn below OE specifications: <ul style="list-style-type: none"> <li>• Replace piston</li> </ul> </li> <li>Caliper bore diameter worn below OE specifications: <ul style="list-style-type: none"> <li>• Replace caliper housing</li> </ul> </li> </ol>
<b>Brake leaking.</b>	<ol style="list-style-type: none"> <li>1. Loose bleeder screw.</li> <li>2. Loose inlet fitting.</li> <li>3. Damaged inlet fitting.</li> <li>4. Worn or damaged O-rings and/or backup rings.</li> <li>5. Loose adjuster pin nut.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten bleeder screw to OE specifications.</li> <li>2. Tighten inlet fitting.</li> <li>3. Replace inlet fitting.</li> <li>4. Replace O-rings and/or backup rings. Inspect piston for wear and damage. Service as necessary.</li> <li>5. Tighten adjuster pin hex nut to OE specifications.</li> </ol>
<b>Vehicle does not move.</b>	<ol style="list-style-type: none"> <li>1. Parking brake applied.</li> <li>2. Damaged hydraulic system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Release parking brake.</li> <li>2. Repair hydraulic system.</li> </ol>
<b>Brakes dragging on disc and running too hot.</b>	<ol style="list-style-type: none"> <li>1. Pressure above OE apply specifications when brakes are released.</li> <li>2. Vehicle or equipment not operated correctly.</li> <li>3. Piston cocked in bore.</li> <li>4. Incorrect adjuster assembly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair hydraulic system so that pressure is in line with the OE specifications of the assembly when brakes are released.</li> <li>2. Advise operator on correct vehicle or equipment operation.</li> <li>3. Piston diameter worn: <ul style="list-style-type: none"> <li>• Replace piston</li> </ul> </li> <li>Caliper bore diameter worn: <ul style="list-style-type: none"> <li>• Replace caliper housing</li> </ul> </li> <li>Tapered lining wear: <ul style="list-style-type: none"> <li>• Replace linings.</li> </ul> </li> <li>4. Check and adjust.</li> </ol>
<b>Brakes do not apply or not enough braking force.</b>	<ul style="list-style-type: none"> <li>• Wedge assembly installed wrong.</li> <li>• Power unit installed wrong.</li> <li>• Leak or restriction in brake lines or valves.</li> <li>• Hydraulic cylinder seal or air chamber diaphragm damaged.</li> <li>• Air in hydraulic system.</li> <li>• Brakes not adjusted correctly.</li> <li>• Grease or other contamination on brake linings.</li> <li>• Linings worn, damaged or missing.</li> <li>• Low fluid level in master cylinder or reservoir.</li> <li>• Low operating pressure at hydraulic cylinder.</li> </ul>	<ul style="list-style-type: none"> <li>• Install correctly.</li> <li>• Install correctly.</li> <li>• Repair brake lines or valves.</li> <li>• Repair or replace hydraulic cylinder or air chamber.</li> <li>• Remove air from hydraulic system.</li> <li>• Adjust brakes.</li> <li>• Clean or replace brake linings.</li> <li>• Repair or replace linings.</li> <li>• Fill to correct level.</li> <li>• Inspect hydraulic system and correct cause of low pressure.</li> </ul>
<b>Brake does not hold vehicle on a grade.</b>	<ol style="list-style-type: none"> <li>1. Brake pressure is not released.</li> <li>2. Brake not adjusted properly.</li> <li>3. Worn or damaged spring washers.</li> <li>4. Vehicle parked on a grade over 15%.</li> <li>5. Brakes not burnished.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair brake system as required.</li> <li>2. Adjust brakes.</li> <li>3. Remove and replace spring washers.</li> <li>4. Park vehicle on less than a 15% grade.</li> <li>5. Burnish brakes.</li> </ol>

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<p><b>Spring brake not holding.</b></p>	<ul style="list-style-type: none"> <li>• Power spring(s) not fully released (spring is caged).</li> <li>• Air or hydraulic pressure that holds spring(s) in compressed position is not fully released.</li> <li>• Brakes not adjusted correctly.</li> <li>• Power spring(s) weak or broken.</li> <li>• Grease or other contamination on brake linings.</li> </ul>	<ul style="list-style-type: none"> <li>• Release (uncage) power spring(s).</li> <li>• Repair air or hydraulic system.</li> <li>• Adjust brakes correctly.</li> <li>• Replace spring(s).</li> <li>• Clean or replace brake linings.</li> </ul>
<p><b>Brakes dragging.</b></p>	<ul style="list-style-type: none"> <li>• Not enough air or hydraulic pressure to hold spring brake in compressed (off) position.</li> <li>• Brake lines connected to wrong ports.</li> <li>• Leaks in brake lines or seals of spring brake.</li> <li>• Wheel bearings not adjusted correctly.</li> <li>• Drum has runout above OE specifications.</li> <li>• Shoe return springs are weak, damaged or missing.</li> <li>• Restriction in brake line or valve does not permit complete release of system pressure when brake pedal is released.</li> <li>• Plungers corroded or cannot retract completely.</li> <li>• Plunger seal damaged or installed wrong.</li> <li>• Air in hydraulic system.</li> <li>• Residual system pressure.</li> </ul>	<ul style="list-style-type: none"> <li>• Repair air or hydraulic system.</li> <li>• Connect lines to correct ports.</li> <li>• Repair or replace brake lines or seals.</li> <li>• Adjust wheel bearings.</li> <li>• Repair or replace drum.</li> <li>• Replace shoe return springs.</li> <li>• Repair or replace brake lines or valves.</li> <li>• Repair or replace plungers.</li> <li>• Replace seal. Install correctly.</li> <li>• Remove air from hydraulic system.</li> <li>• Reduce or remove residual pressure.</li> </ul>
<p><b>Brakes dragging.</b></p>	<ul style="list-style-type: none"> <li>• Not enough air or hydraulic pressure to hold spring brake in compressed (off) position.</li> <li>• Brake lines connected to wrong ports.</li> <li>• Leaks in brake lines or seals of spring brake.</li> <li>• Wheel bearings not adjusted correctly.</li> <li>• Drum has runout above the OE specifications.</li> <li>• Shoe return springs are weak, damaged or missing.</li> <li>• Restriction in brake line or valve does not permit complete release of system pressure when brake pedal is released.</li> <li>• Plungers corroded or cannot retract completely.</li> <li>• Plunger seal damaged or installed wrong.</li> <li>• Air in hydraulic system.</li> <li>• Residual system pressure.</li> </ul>	<ul style="list-style-type: none"> <li>• Repair air or hydraulic system.</li> <li>• Connect lines to correct ports.</li> <li>• Repair or replace brake lines or seals.</li> <li>• Adjust wheel bearings.</li> <li>• Repair or replace drum.</li> <li>• Replace shoe return springs.</li> <li>• Repair or replace brake lines or valves.</li> <li>• Repair or replace plungers.</li> <li>• Replace seal. Install correctly.</li> <li>• Remove air from hydraulic system.</li> <li>• Reduce or remove residual pressure.</li> </ul>

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CONDITION	CAUSE	CORRECTION
Brake does not release.	<ol style="list-style-type: none"> <li>Damaged hydraulic system.</li> <li>Piston cocked in bore.</li> <li>Hydraulic pressure too low, (below OE specifications).</li> <li>Worn or damaged seals and/or back-up rings.</li> <li>Piston does not move.</li> <li>Worn or damaged spring washers.</li> </ol>	<ol style="list-style-type: none"> <li>Repair hydraulic system.</li> <li>Replace housing if large end of bore exceeds OE specifications or small end of bore exceeds OE specifications. Replace piston if large end diameter is worn below OE specifications or small end diameter is worn below OE specifications.</li> <li>Increase hydraulic pressure to OE specifications.</li> <li>Replace seals and/or back-up rings.</li> <li>Replace housing if large end of bore exceeds OE specifications or small end of bore exceeds OE specifications. Replace piston if large end diameter is worn below OE specifications or small end diameter is worn below OE specifications.</li> <li>Remove and replace spring washers.</li> </ol>

## Air over Hydraulic Actuating System

CONDITION	CAUSE	CORRECTION
Brakes will not apply.	Brakes not bled of air allowing master cylinder to bottom.	Bleed system and brakes.
	Reservoir located below master cylinder restricting oil flow.	Relocate reservoir above master cylinder to allow gravity feed.
	Feed-line from reservoir restricted or too small.	Insure free flow is set to OE specifications.
	Master cylinder power piston not retracting to seat, closing off inlet.	Adjust rotochamber push rod attachment.
	Master cylinder power piston struck in cylinder bore.	Free piston by removing obstruction. If cylinder wall or piston OD is excessively damaged, replace with new part.
	Vacuum trapped In reservoir.	Insure vent air passage in reservoir.
	Insufficient oil reserve.	Keep reservoir filled with hydraulic oil.
	Check valve in master cylinder power piston not closing.	Insure free motion of ball in check valve and remove all foreign particles.
	Master cylinder adjuster not working.	Remove floating piston assembly and blow with mouth into small hole on face of piston. If air Passes, replace with new part.
	Packing on master cylinder power piston not sealing.	Replace packing with new Carlisle replacement part.
	Supply line leaking.	Check lines and fittings to insure sealing.
Master cylinder leaking at mounting bracket joint.	Air pressure inadequate.	Air pressure at rotochamber should be not less than 80 psi with brakes applied. Correct air system as required to obtain 80 psi min.
	Packing not sealing.	Replace all master cylinder packing's.
Brake leaking.	Expander tube nozzle packing not sealing.	Replace packing's and inspect connector block nozzle hole for surface damage. If surface does not appear satisfactory for sealing, replace connector with new part.

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CONDITION	CAUSE	CORRECTION
Automatic adjusters not working.	<ul style="list-style-type: none"> <li>• Adjusting pawl installed backward.</li> <li>• Pawl cannot move freely in its bore.</li> <li>• Worn pawl or actuator teeth.</li> <li>• Pawl spring weak or broken.</li> <li>• Adjusting bolt cannot move freely in actuator.</li> <li>• Detent or clip on shoe retainer are damaged and let adjusting bolt rotate with actuator.</li> <li>• Adjusting plunger not installed at leading end of shoe</li> <li>• Plunger seal damaged or installed wrong.</li> <li>• Shoe return springs are weak, damaged, missing or stretched.</li> <li>• Adjusting bolt wound back too far.</li> </ul>	<ul style="list-style-type: none"> <li>• Install pawl correctly.</li> <li>• Repair or replace pawl or plunger housing.</li> <li>• Replace pawl or actuator and lubricate.</li> <li>• Replace pawl spring.</li> <li>• Repair or replace bolt or actuator and lubricate.</li> <li>• Repair or replace detent or clip.</li> <li>• Install adjusting plunger at leading end of shoe.</li> <li>• Replace seal. Install correctly.</li> <li>• Replace shoe return springs.</li> <li>• Check that bolt rotates freely in actuator. Adjust brakes.</li> </ul>
Cannot attain proper brake adjustment	<ol style="list-style-type: none"> <li>1. Clamp bolt not loose.</li> <li>2. Spring washers not assembled correctly.</li> <li>3. Spring washers slipped out of position.</li> <li>4. Spring washers worn or damaged.</li> <li>5. Adjustment procedure not followed correctly.</li> <li>6. Adjusting bolt or yoke threads galled or stripped.</li> </ol>	<ol style="list-style-type: none"> <li>1. Loosen clamp bolt to finger tight.</li> <li>2. Assemble spring washers into correct configuration.</li> <li>3. Adjust spring washers into proper position on spring retainer.</li> <li>4. Replace damaged spring washers. If brake adjustment produces over 0.060 inch (1.524 mm) lining to disc clearance, spring washers are worn out and must be replaced.</li> <li>5. Repeat adjustment procedure.</li> <li>6. Replace adjusting bolt and/or yoke. Apply anti- seize compound to threads.</li> </ol>

## Brake Friction/ Linings

CONDITION	CAUSE	CORRECTION
Damaged linings.	<ol style="list-style-type: none"> <li>1. Lining thickness worn below OE specifications.</li> <li>2. Lining wear not even.</li> <li>3. Cracked or broken linings.</li> <li>4. Oil or grease on linings.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace linings.</li> <li>2 Inspect piston. Service as necessary. Caliper bore diameter worn greater than the max wear recommended in the OE specifications: <ul style="list-style-type: none"> <li>• Replace caliper</li> </ul> <i>Inspect housing for clogged fluid passages:</i> <ul style="list-style-type: none"> <li>• Service as necessary</li> </ul> <i>Worn end plates:</i> <ul style="list-style-type: none"> <li>• Replace end plates</li> </ul> </li> <li>3. Replace linings.</li> <li>4. Replace linings.</li> </ol>

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<p><b>Braking force not equal or lining wear not even.</b></p>	<ul style="list-style-type: none"><li>• Hydraulic cylinder seal or air chamber diaphragm damaged.</li><li>• Wedge rod pulled out of wedge guide on push rod of air chamber or pulled out of piston in hydraulic cylinder.</li><li>• Wedge rollers and cage pulled out of slots in plungers.</li><li>• Plungers corroded or cannot move freely.</li><li>• Brakes not adjusted correctly.</li><li>• Grease or other contamination on brake linings.</li><li>• Brake shoes installed backward.</li><li>• Brake linings installed in wrong positions on shoes.</li><li>• Drum has runout above OE specifications.</li><li>• Wheel bearings not adjusted correctly.</li><li>• Linings that are not the specified kind are installed.</li></ul>	<ul style="list-style-type: none"><li>• Repair or replace hydraulic cylinder or air chamber.</li><li>• Install wedge rod correctly.</li><li>• Install wedge correctly.</li><li>• Repair or replace plungers.</li><li>• Adjust brakes.</li><li>• Clean or replace brake linings.</li><li>• Install brake shoes correctly.</li><li>• Install linings in correct positions.</li><li>• Repair or replace drum.</li><li>• Adjust wheel bearings.</li><li>• Replace with specified linings.</li></ul>
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