



Disc and Drum Brake Diagnostic Chart

Caution: It is imperative that the braking ability is verified before any road testing is performed. Test the brakes at low speed to be sure the vehicle stops properly. Road test must be performed in a safe area where traffic laws may be observed to protect both the public and personal safety.

Troubleshooting guide for Disc Brakes

Condition	Cause	Remedy
Low pedal. Pedal may go towards the floor on first application, but is O.K. on subsequent applications.	Pad and plate knock-back caused by loose wheel bearings or faulty front suspensions.	Adjust or tighten parts or replace faulty parts, as necessary.
	Leak in hydraulic system.	Check master cylinder, wheel cylinders, calipers, tubes, and hoses for leakage; repair or replace faulty parts.
	Air in hydraulic system.	Bleed hydraulic system.
	Poor quality brake fluid (low boiling	Drain hydraulic system and fill with

<p><i>*Vehicles equipped with power brakes. (see additional Power Brake Diagnostic Chart in Power Brake Catalog)</i></p>	<p>point).</p> <p>Low brake fluid level.</p> <p>Weak brake hoses that expand under pressure.</p> <p>Improperly adjusted manual master cylinder pushrod.</p> <p>*Improperly adjusted power brake hydraulic pushrod.</p> <p>Master cylinder piston seals worn or damaged causing bypassing.</p>	<p>approved brake fluid.</p> <p>Fill master cylinder and bleed hydraulic system.</p> <p>Replace defective hoses.</p> <p>Adjust pushrod (if car has adjustable pushrod).</p> <p>Adjust pushrod.</p> <p>Apply and hold brake pedal look for bubbles or fluid swirl at compensating port in reservoir. Replace master cylinder.</p>
<p>Hard Pedal. Excessive pedal pressure required to stop vehicle.</p> <p><i>*Vehicles equipped with power brakes. (see additional Power Brake Diagnostic Chart in Power Brake Catalog)</i></p>	<p>Grease or brake fluid on brake pads.</p> <p>Glazed brake pads.</p> <p>Clogged master cylinder tubes or hoses.</p> <p>Seized master cylinder piston(s).</p> <p>*Low engine vacuum supply to power brake.</p> <p>*Loose or leaking vacuum hose to power brake.</p> <p>*Defective power brake vacuum check valve.</p> <p>*Faulty power brake.</p>	<p>Repair grease seal or caliper, as necessary, and replace pads and plates in axle sets.</p> <p>Verify correct application, replace pads as axle set and observe proper break-in procedures.</p> <p>Replace tubes or hoses, as necessary.</p> <p>Repair or replace master cylinder.</p> <p>Tune or repair engine to obtain correct vacuum.</p> <p>Tighten clamps or replace hose, as required.</p> <p>Replace check valve.</p> <p>Replace power section of power brake.</p>

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Condition	Cause	Remedy
<p>Grabby brakes. Severe reaction to pedal pressure.</p> <p><i>*Vehicles equipped with power brakes. (see additional Power Brake Diagnostic Chart in Power Brake Catalog)</i></p>	<p>Incorrect pads or loose pads on plate.</p> <p>Grease or brake fluid on pads.</p> <p>Loose caliper or caliper mounting bracket.</p> <p>Rough or corroded master cylinder bore.</p> <p>Binding brake pedal linkage.</p> <p>*Faulty power brake.</p>	<p>Replace with correct pads and plates in axle sets.</p> <p>Repair grease seal or caliper, as necessary, and replace pads and plates in axle sets.</p> <p>Tighten to specifications.</p> <p>Repair or replace master cylinder.</p> <p>Free up, lubricate and replace worn parts.</p> <p>Replace power section of power brake.</p>
<p>Springy or spongy pedal. Pedal has soft, springy or spongy feel when depressed.</p>	<p>Poor quality brake fluid (low boiling point).</p> <p>Weak brake hoses that expand under pressure.</p> <p>Air in hydraulic system.</p>	<p>Drain hydraulic system and fill with approved brake fluid.</p> <p>Replace defective hoses.</p> <p>Pump pedal then release and look for a return of fluid out of compensating port in master cylinder reservoir. Bleed hydraulic system.</p>
<p>Car pulls to one side.</p>	<p>Incorrect or loose pads.</p> <p>Grease or brake fluid on pads.</p> <p>Loose caliper or caliper mounting bracket.</p> <p>Caliper piston sticking.</p>	<p>Replace with correct pads and plates in axle sets.</p> <p>Repair grease seal or caliper, as necessary, and replace pads and plates in axle sets.</p> <p>Tighten to specifications.</p> <p>Repair or replace caliper.</p>

	<p>Faulty suspension parts / alignment.</p> <p>Mismatched tires / pressures.</p>	<p>Repair suspension system.</p> <p>Check and match for correct size and pressures.</p>
<p>Noise and chatter. Squealing, clicking or scraping noise upon brake application.</p>	<p>Pads not seated properly to rotor.</p> <p>Worn-out pads (plates rubbing rotor).</p> <p>Bent, damaged, or incorrect pads and plates.</p> <p>Foreign material imbedded in pad.</p> <p>Rough surface.</p>	<p>Replace pads and perform break-in procedure.</p> <p>Replace pads and plates in axle sets.</p> <p>Replace with correct pads and plates in axle sets.</p> <p>Replace pads and plates in axle sets.</p> <p>Resurface to factory specs.</p>
<p>One front brake has excessive drag.</p>	<p>Sticking caliper piston.</p> <p>Swollen caliper piston seal.</p> <p>Improperly adjusted push rod and/or switch.</p>	<p>Repair or replace caliper.</p> <p>Repair caliper, flush hydraulic system, and fill with approved fluid.</p> <p>Check and adjust as necessary.</p>

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Condition	Cause	Remedy
<p>Pulsating / vibrating brake pedal.</p>	<p>Excessive variation in rotor thickness.</p> <p>Excessive lateral runout in rotor.</p>	<p>Refinish or replace rotor.</p> <p>Check with dial indicator to T.I.R. spec., and refinish or replace rotor.</p> <p>Front brake pulsation test:</p> <p>From 20 mph with transmission in neutral, LIGHTLY apply the brakes to</p>

	<p>Rust / contamination on hub surface.</p> <p>Excessive lateral runout in front hub.</p> <p>Worn or damaged front-wheel bearings.</p>	<p>stop the car. If there is pulsation, turn the vehicle 180 degrees to change the phase of the rotors and repeat the stop. If the pulsation is still present it is only one rotor, if the pulsation is reduced or gone, it is both rotors. The thickness variation on each rotor will go in and out of phase with each other after turning and reduce and/or cancel the effects on pulsation.</p> <p>Use 100A garnet or 150J aluminum oxide paper to clean surfaces.</p> <p>Check hub face with dial indicator, replace if out of spec., (Ford=0.002)</p> <p>Replace bearings.</p>
<p>Decreasing brake pedal travel.</p>	<p>Plugged master cylinder compensating port(s).</p> <p>Swollen master cylinder cups.</p> <p>Improperly adjusted push rod and/or switch.</p>	<p>Repair or replace master cylinder.</p> <p>Repair or replace master cylinder, flush hydraulic system, and fill with approved brake fluid.</p> <p>Check and adjust as necessary.</p>
<p>All brakes drag, but brake adjustment is correct.</p>	<p>Binding brake pedal.</p> <p>Soft or swollen rubber parts caused by incorrect or contaminated brake fluid.</p> <p>Plugged master cylinder compensating port(s).</p>	<p>Free up and lubricate.</p> <p>Replace all rubber parts, flush hydraulic system, and fill with approved brake fluid.</p> <p>Repair or replace master cylinder.</p> <p>Check and adjust as necessary.</p>

	Improperly adjusted push rod and/or switch.	
One brake drags.	<p>Loose or worn front-wheel bearings.</p> <p>Defective brake hose or hydraulic tube (preventing return of brake fluid).</p> <p>Improperly adjusted push rod and/or switch.</p>	<p>Adjust to specifications or replace.</p> <p>Replace defective hose or tube, as necessary.</p> <p>Check and adjust as necessary.</p>

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Troubleshooting Guide for Drum Brakes

Condition	Cause	Remedy
Low Pedal. Pedal may sink towards the floor.	<p>Excessive clearance between drums and linings.</p> <p>Automatic adjusters not working.</p> <p>Bent or distorted brake shoes.</p> <p>Leak in hydraulic system.</p> <p>Air in hydraulic system.</p> <p>Poor quality brake fluid (low boiling point).</p> <p>Low brake fluid level.</p> <p>Weak brake hoses that expand under pressure.</p> <p>*Improperly adjusted manual master</p>	<p>Set parking brake and pump brake pedal. If pedal height raises and is normal, adjust Brakes</p> <p>Make several forward and reverse brake stops; if pedal does not come up, repair automatic adjusters.</p> <p>Replace shoes and linings in axle sets.</p> <p>Check master cylinder, wheel cylinders, tubes, and hoses for leakage; repair or replace faulty parts.</p> <p>Bleed hydraulic system.</p> <p>Drain hydraulic system and fill with approved brake fluid.</p> <p>Fill master cylinder and bleed hydraulic system.</p>

<p><i>*Vehicles equipped with power brakes. (see additional Power Brake Diagnostic Chart in Power Brake Catalog)</i></p> <p><i>† Vehicles equipped with Rear Wheel Anti-lock Brakes.</i></p>	<p>cylinder pushrod.</p> <p>Improperly adjusted power brake hydraulic pushrod.</p> <p>Residual pressure check valves not holding pressure in lines.</p> <p>Master cylinder piston seals worn or damaged causing bypassing.</p> <p>†Dump valve in RWAL/RABS valve operating during rear ABS operation.</p> <p>†Dump valve in RWAL/RABS valve leaking into accumulator during non-ABS operation.</p>	<p>Replace defective hoses.</p> <p>Adjust pushrod (if car has adjustable pushrod).</p> <p>Adjust pushrod.</p> <p>Repair or replace master cylinder.</p> <p>Pump brake pedal look for bubbles or fluid swirl at compensating port in reservoir. Replace master cylinder.</p> <p>Test drive to verify normal condition, repair not required.</p> <p>Pump up brake pedal several times until hard and release, then look for long duration of fluid swirl at compensating port. If so replace RWAL/RABS valve.</p>
<p>Springy or spongy pedal</p> <p>Pedal has soft, springy, or spongy feel when depressed.</p>	<p>Bent or distorted brake shoes.</p> <p>Shoes not centered in drum.</p> <p>Cracked or thin drums.</p> <p>Poor quality brake fluid (low boiling point).</p> <p>Weak brake hoses that expand under pressure.</p> <p>Air in hydraulic system.</p>	<p>Replace shoes and linings in axle sets.</p> <p>Adjust anchor pins (if car has adjustable anchor pins).</p> <p>Replace drums in axle sets.</p> <p>Drain hydraulic system and fill with approved brake fluid.</p> <p>Replace defective hoses.</p> <p>Bleed hydraulic system.</p>

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Condition	Cause	Remedy
One brake drags.	Weak or broken shoe return springs. Improper brake shoe adjustment. Sticking wheel cylinder pistons. Swollen wheel cylinder cups. Bent or distorted brake shoe. Loose or worn front-wheel bearings. Defective brake hose or hydraulic tube (preventing return of brake fluid).	Replace return springs. Adjust shoes and repair self adjuster, as necessary. Repair or replace wheel cylinders. Repair or replace wheel cylinder, flush system, and fill with approved fluid. Replace shoes and linings in axle sets. Adjust to specifications or replace. Replace defective hose or tube, as necessary.
Pulsating brake pedal.	Out-of-round drums.	Refinish or replace drums in axle sets. Rear brake pulsation test: From a speed of 10-15 mph place transmission in neutral, LIGHTLY apply the parking brake, make sure the release is held, or if "push to release", GENTLY apply the parking brake until the vehicle slows down. Let the vehicle come to a complete stop before pushing the park brake pedal to release. Observe: Does the park brake pedal pulsate or is there a noticeable vibration. Visual inspection, measure and repair.

	<p>Bent rear axle, shaft / housing or hub.</p> <p>Worn or damaged wheel bearings.</p>	<p>Replace axle components.</p> <p>Replace bearings.</p>
<p>Hard pedal. Excessive pedal pressure is required to stop car.</p> <p><i>*Vehicles equipped with power brakes (see additional Power Brake Diagnostic Chart in Power Brake Catalog)</i></p>	<p>*Poor quality brake linings and brake fade.</p> <p>Grease or brake fluid on linings.</p> <p>Glazed linings.</p> <p>Damaged or distorted shoes.</p> <p>Scored, barrel-shaped, or bell-mouthed drums</p> <p>Clogged master cylinder tubes or hoses.</p> <p>Seized master cylinder piston(s).</p> <p>*Low engine vacuum supply to power brake.</p> <p>*Loose or leaking vacuum hose to power brake.</p> <p>*Defective power brake vacuum check valve.</p> <p>*Faulty power brake.</p>	<p>Replace with approved shoes and linings in axle sets.</p> <p>Repair grease seal or wheel cylinder, as necessary, and replace shoes and linings in axle sets.</p> <p>Sand lining surface or replace shoes and linings in axle sets.</p> <p>Replace shoes and linings in axle sets.</p> <p>Refinish or replace drums in axle sets.</p> <p>Replace tubes or hoses, as necessary.</p> <p>Repair or replace master cylinder.</p> <p>Tune or repair engine to obtain correct vacuum.</p> <p>Tighten clamps or replace hose, as required.</p> <p>Replace check valve.</p> <p>Replace power section of power brake.</p>
Condition	Cause	Remedy
<p>Grabby brakes. Severe reaction to pedal pressure.</p>	<p>Incorrect or distorted shoes.</p> <p>Incorrect linings or loose linings on shoes.</p>	<p>Replace with correct shoes and linings in axle sets.</p> <p>Replace with correct shoes and</p>

<p><i>*Vehicles equipped with power brakes (see additional Power Brake Diagnostic Chart in Power Brake Catalog)</i></p>	<p>Grease or brake fluid on linings.</p> <p>Shoes not centered in drums.</p> <p>Loose or distorted brake backing plate.</p> <p>Scored, hard spotted, or out-of-round drums.</p> <p>Rough or corroded master cylinder bore.</p> <p>Binding brake pedal linkage.</p> <p>Faulty Proportioning Valve.</p> <p>*Faulty power brake.</p>	<p>linings in axle sets.</p> <p>Repair grease seal or wheel cylinder, as necessary, and replace shoes and linings in axle sets.</p> <p>Adjust anchor pins (if car has adjustable anchor pins).</p> <p>Tighten or replace backing plate.</p> <p>Refinish or replace drums in axle sets.</p> <p>Repair or replace master cylinder.</p> <p>Free up, lubricate and replace parts as necessary.</p> <p>Pressure check system balance and replace.</p> <p>Replace power section of power brake.</p>
<p>Brakes drag.</p>	<p>Binding brake pedal.</p> <p>Soft or swollen rubber parts caused by incorrect or contaminated brake fluid.</p> <p>Plugged master cylinder compensating port(s).</p> <p>Seized parking brake cables.</p> <p>Improper brake shoe adjustment.</p> <p>Defective brake hose or hydraulic tube (preventing return of brake fluid).</p>	<p>Free up and lubricate.</p> <p>Replace all rubber parts, flush hydraulic system, and fill with approved brake fluid.</p> <p>Repair or replace master cylinder.</p> <p>Free up and lubricate cables or replace. Adjust Shoes and repair self adjusters, as necessary.</p> <p>Replace defective hose or tube, as necessary.</p>
<p>Noise and chatter.</p> <p>Squealing, clicking, or scraping sound when brakes applied.</p>	<p>Bent, damaged, or incorrect shoes.</p> <p>Worn-out linings (shoes rubbing drum).</p>	<p>Replace with correct shoes and linings in axle sets.</p> <p>Replace shoes and linings in axle sets.</p>

	<p>Foreign material imbedded in linings.</p> <p>Broken shoe return springs, shoe hold-down pins, or shoe hold-down springs.</p> <p>Rough, grooved, or dry shoe ledges or pads on backing plate.</p> <p>Cracked or threaded drums (lathe marks).</p> <p>Rough surface.</p>	<p>Replace shoes and linings in axle sets.</p> <p>Replace defective parts.</p> <p>Smooth shoe ledges and pads and apply high temperature lubricant.</p> <p>Replace drums in axle sets.</p> <p>Resurface to factory specs.</p>
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Condition	Cause	Remedy
Decreasing brake pedal travel.	<p>Weak or broken shoe return springs.</p> <p>Sticking wheel cylinder piston.</p> <p>Plugged master cylinder compensating port(s).</p> <p>Swollen master cylinder cups.</p> <p>Improperly adjusted rear shoes</p>	<p>Replace return springs.</p> <p>Repair or replace wheel cylinder.</p> <p>Repair or replace master cylinder.</p> <p>Repair or replace master cylinder, flush hydraulic system, and fill with approved brake fluid.</p> <p>Set parking brake, pump pedal, if pedal is higher inspect and adjust rear shoes.</p>

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