

Brake servicing should receive greater care and attention than the maintenance of most other parts of the car. With something as important as braking you can't afford to make mistakes.

The information provided here gives some helpful professional guides to fault diagnosis and general maintenance and servicing.

### Fault Diagnosis Key:

1. **Fault**
2. **Causes**
3. **Action**

1. **Fade (pedal becomes harder with less effect during application).**
2. Incorrect lining material. Badly lined shoes. Distorted shoes. Overloaded vehicle. Excessive braking. Rear brakes not working properly.
3. Renew pads and/or shoes as necessary. Decrease vehicle load. Inspect system.

1. **Spongy Pedal.**
2. Air in system. Badly lined shoes. Shoes distorted or incorrectly set. Faulty drums. Weak master cylinder mounting. Distorted squeal deterrent shims.
3. Use hose clamps to locate problem. Check for air in the system, bleed if necessary. Check condition and setting of shoes and drums - renew as necessary. Check master cylinder mounting.

1. **Long pedal travel.**
- 2a. Disc brakes. Excessive hub and float (loose or worn bearings). Discs 'running out' pushing pads back. Incorrect master cylinder.
- 3a. Use hose clamps to locate problem. Rotate disc on hub, check disc run-out does not exceed 0.004 inch. Check hub end float. Check hub / disc mounting faces.
- 2b. Drum brakes. Brakes need adjustment . Fluid leak. Blocked filler cap vent.
- 3b. Check brake adjustment. Check for fluid leak. Adjust brakes or rectify leak. Check master cylinder filler cap vent.

1. **All brakes binding.**
2. No clearance at master cylinder push rod. Seals swollen (contamination). Servo faulty.
3. Check for clearance at the master cylinder. Clean and renew all rubber parts. Renew servo.

1. **Rear brakes binding.**
2. Brakes or handbrake maladjusted.
3. Check brake adjustment and handbrake lineage.

1. **One brake binding.**
2. Seized pistons. Shoe springs weak or broken.

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3. Check for seized pistons or weak shoe springs. Repair or renew parts as necessary.

### 1. Hard pedal - poor braking.

2. Incorrect linings. Glazed linings. Linings wet, greasy or not bedded correctly. Servo unit inoperative. Seized caliper pistons. Incorrect master cylinder.
3. Renew pads or shoes if incorrect or greasy etc. or if glazed. Check servo vacuum hose for obstructions; repair or renew servo if necessary. Check caliper for damage, repair as necessary. Renew master cylinder if incorrect.

### 1. Brakes pulling.

2. Faulty drums or discs. Seized pistons or pads. Variation of linings. Unsuitable tyres or pressure. Greasy linings. Lining material worn below recommended limits. Faulty suspension or steering. Worn shock absorbers.
3. Examine drums and linings, discs or pads. Check for seized pistons. Renew worn pads or shoes. Check suspension, steering and shock absorbers - repair or renew as necessary.

### 1. Fall in fluid level.

2. Worn disc pads. External leak.
3. Check pads for wear and entire system for hydraulic fluid leakage. Fit new components or pipes if necessary.

### 1. Disc brake squeal-pad rattle.

2. Worn retaining pins. No pad damping shims or springs. Incorrect pad material.
3. Renew retaining pins or discs. Fit damping shims or springs. Fit correct pads. Use Wingate Squeal Deterrent on backplate.

### 1. Uneven or excessive pad wear.

2. Disc corroded. Discs badly scored. Pads require inter-changing. Partially seized pads or pistons.
3. Check the disc for corrosion or scoring and renew if necessary. Interchange pads, renew pads or pistons.

### 1. Loss of pedal (pedal travels to bulkhead - no braking effect).

2. Master cylinder failure. Burst flexible hose or pipe. Fluid seal leaking. Overheating and vaporisation of old brake fluid - usually due to overloaded vehicle or excessive brake usage.
3. Fit new master cylinder. Fit new pipes or hoses. Use hose clamps to locate problem, fit new seals or preferably new unit. Change brake fluid.

### 1. Pedal 'flutter'.

2. Distorted discs or oval drums.
3. Use hose clamps to locate problem. Renew faulty discs or drums.

## DISC PADS

1. Pads worn smoothly and both same approximate thickness.



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2. Measure pad material thickness. Replace at 3mm or less.
3. Remove dirt from pad apertures in caliper body. Smear anti-squeal grease on pad back plate and retaining pins. Remove scale and rust from edge of disc. Fit pads, pump pedal until firm.

### 1. Pads worn smoothly but thickness varies from one to another.

- 2a. Compare with pads in same position on opposite wheel. If similar wear pattern, then satisfactory. Replace if material thickness is 3mm or less, subject to checks opposite.
- 3a. Remove dirt from pad apertures in caliper body. Smear Wingate anti-squeal grease on shims, pad back plate and retaining pins. Remove scale and rust from edge of disc. Fit pads, pump pedal until firm.
- 2b. Check caliper operation - pads must clamp disc immediately; if not, caliper may need servicing. (NOTE : on brake release, slight rubbing is normal).
- 3b. If pistons seized - never clean up corroded pistons, fit new ones.
- 2c. Check pad aperture, where pads sit, for corrosion and pad binding.
- 3c. Remove corrosion from pad aperture in caliper body. Use anti-squeal grease on metal back plate to aperture contact surfaces.
- 2d. Check pad retaining pins are free from corrosion and pads move freely.
- 3d. Remove pins, clean if practicable, grease and refit.

### 1. Pads ridged and grooved.

2. Check condition of disc. Braking surfaces of disc should be free from heavy grooving and polished for full width of pad. Light corrosion permissible on perimeter.
3. Remove scale and rust from edge of disc; if corroded or badly scored, replace.

### 1. Pads material crazed.

2. If deeper than surface crazing, with bluing apparent, it has been overheated. Check the four previous check points. Caused by excessive or prolonged brake use. Braking surfaces of disc should be free from heavy grooving and polished for full width of pad. Light corrosion permissible on perimeter.
3. Remove scale and rust from edge of disc.

## CALIPER

### 1. One piston only moving.

2. Check caliper piston dust cover - probably damaged, allowing dirt and water etc. to enter and cause piston seizure.
3. Overhaul caliper, use kit and new pistons if necessary. Never split caliper halves where bolted together. Never use release oil on caliper pistons. Carefully blow out pistons with air or hydraulic pressure. Keep fingers clear.

### 1. Caliper leaking.

2. Caliper may need replacing (or resealing if in good condition).
3. Overhaul caliper, use kit and new pistons if necessary. Never split caliper halves where bolted together.

## BRAKE SHOES

1. **Front and rear brakes - Even shoe wear.**
  2. Check lining thickness. Bonded shoes - replace at 1/16" thickness.
  3. De-adjust shoes fully. Fit rubber band around cylinder to retain piston. Clean and smear all metal to metal contact points with Wingate Brake Grease.
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1. **Front brakes (i.e. with two wheel cylinder) - Unequal wear along lining.**
  2. Check brake adjustments.
  3. Fit new shoes if taper wear is excessive. Adjust regularly.
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1. **Front brakes (i.e. with two wheel cylinder) - Unequal shoe wear on same brake.**
  2. Check that all wheel cylinders operate. Check for broken or weak shoe return springs.
  3. Replace seized or leaking wheel cylinders. Use hose clamp to prevent fluid loss whilst renewing cylinder. Avoid overstressing when fitting.
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1. **Front brakes (i.e. with two wheel cylinder) - Unequal wear across shoe lining.**
  2. Check that shoe slides on brake backplate. Look for corrosion. Check for broken or weak hold down springs. Shoe 'pads' on backplate worn.
  3. Clean and grease all metal to metal contact points. Use same type as original. Fit new backplate.
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1. **Rear brakes (with sliding wheel cylinder) - Excessive wear on one shoe only.**
  2. Check that wheel cylinder slides on brake backplate. Look for corrosion between backplate and cylinder. Check wheel cylinder for leaks or seizure. Check for uneven wear along or across shoe lining.
  3. Replace faulty wheel cylinders. Smear brake grease between cylinder, backplate and cylinder clips. Do not eject piston - press gently on pedal. Use Wingate hose clamp to prevent fluid loss whilst renewing cylinder.
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1. **Rear brakes (with fixed wheel cylinder) - Excessive wear on one shoe.**
  2. Check that both pistons in wheel cylinder operate, do not eject pistons - gently press on pedal, look for leaks or seizure. Check for uneven wear along or across shoe lining.
  3. Replace faulty wheel cylinders. Use Wingate hose clamp to prevent fluid loss whilst renewing cylinder.
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1. **Front and rear brakes - grooved shoe lining.**
  2. Check for drum corrosion or grooving.
  3. Never skim drum beyond recommended limits; if corrosion or grooving is severe, replace drum.

## SHOE RETURN SPRINGS

1. **Weak or broken springs causing brake drag.**
2. Check for loose or broken springs. Heat and age cause weakening of springs, even though they may look satisfactory.
3. Replace faulty springs; sketch positions before replacing. For maximum lining life always fit new springs when changing shoes.

## HOLD DOWN SPRINGS

1. **Weak or broken springs.**
2. Check for loose or broken springs and shoe wear across lining.
3. Lubricate spring / shoe contact area.

## WHEEL CYLINDERS

1. **Seized pistons. Leaking piston seals.**
  2. Check piston movement. Check for fluid in cylinder boot and on outside of cylinder.
  3. Do not eject piston - press gently on pedal. Do not reseal unless bore is in perfect condition. Replace or resleeve if in doubt.
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1. **Sliding wheel cylinder - no movement on backplate.**
  2. Check piston moves freely. Check cylinder sliding surface. Check hand brake lever dust cover for damage.
  3. If piston free, and backplate not corroded, clean and grease backplate / cylinder sliding surfaces and rebuild. If components faulty, replace. Grease hand brake lever pivots in wheel cylinder. If clevis pinhole in lever is elongated, fit new lever and pin to avoid long hand brake travel.

## REAR BRAKE ADJUSTERS

1. **Unit de-adjustment - check for wear.**
  2. Stem should 'click'; if this is not the case or it turns easily, adjuster is excessively worn.
  3. There is no effective repair method for rear adjusters. Do not oil or grease front adjuster snail cams. Replace faulty units.
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1. **Stem seized.**
  2. No excess force should be required to adjust or de-adjust. If excess force required, stem may be seized.
  3. Use release oil on stem - do not allow oil to contact shoes or rubber components - work stem backwards and forwards. Strip and regrease when free.

## DRUMS

1. **Braking surface scored.**

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2. If surface is scored, check shoes for wear.
3. Never skim drum beyond recommended limits - if in doubt, renew. To remove drum always back off adjusters. Auto adjust drum brakes usually have release mechanism to collapse shoes from drum. Where drum is seized to hub, apply release oil and tap front face of drum with soft hammer. Replace badly worn shoes.

### 1. Braking surface corroded.

2. If surface corroded, brake may not be operating - check action of wheel cylinder and adjusters.
3. Never skim drum beyond recommended limits - if in doubt renew. To remove drum always back off adjusters. Auto adjust drum brakes usually have release mechanism to collapse shoes from drum. Where drum is seized to hub, apply release oil and tap front face of drum with soft hammer.

## MASTER CYLINDER

### 1. Leakage or failure.

2. Check for correct level of fluid. (Remember as disc pads wear, the fluid level will drop gradually). Any sudden drop should be investigated immediately).
3. If fluid level low and there is leakage at pedal end of master cylinder, it needs resealing or replacing. Brake fluid will damage paintwork - if spilt, wash immediately with plenty of cold water. Where applicable, always disconnect master cylinder push rod from pedal first. Trap clean polythene sheet between reservoir and cap and fit plastic plugs from new unit into old one to avoid excess fluid loss.

### 1. Brake Bind.

2. Check for contamination of rubber parts (swollen seals). Check for push rod clearance, where applicable.
3. If contaminated, flush out system with clear meths and fit new rubber parts including hoses.

## HYDRAULIC CONNECTIONS

### 1. Pipe or hose joint 'wet'.

2. Check for leaks. Prior to refitment, check pipe nuts for 'bell mouthing' of end.
3. Carefully file down if practicable; if not, replace the components as necessary. Use hose clamps where practical to save fluid and bleed time.

## MECHANICAL SERVO UNIT

### 1. Poor or no servo assistance.

2. Check for sound. With engine running press brake pedal several times. Each time a slight hiss should be heard from servo. Apply and release pedal. If continuous hiss - servo faulty. Check rubber vacuum hose is not brittle, blocked or soft. Check connection points for security.
3. Internal valves not closing, fit new servo or Wingate rebuilt servo. It is often possible to remove servo from between master cylinder and bulkhead without

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disturbing hydraulics. Ease metal brake pipe away gently. Petrol contamination may have caused internal swelling. Always use correct type hose, not garden hose piping.

1. **No servo assistance with engine off (Test with vehicle stationary).**
2. Check for vacuum leakage. Run engine for 1 minute. Switch off. Leave for 2 minutes. Press brake pedal twice. Full servo operation should occur both times. Listen for hiss.
3. Renew non-return valve if no servo assistance occurs.

1. **Brakes binding on.**
2. With front of car on axle stands start engine. Leave for 30 seconds. Apply brake several times. Release pedal. Wheels should turn almost immediately pedal released. Stop engine pump pedal until all hissing stops.
3. Servo fault or incorrect master cylinder servo clearance, consult expert. If brakes still bind consult expert.