

## HYDRAULIC BRAKE TROUBLE SHOOTING

### BRAKE INSPECTION & TESTING

Inspect brakes at frequent intervals for pedal reserve (clearance between pedal pad and toeboard with pedal firmly depressed, while brakes are cold). Increase pedal reserve by adjusting brake shoe to drum clearance. Brakes should be tested on dry, clean, reasonably smooth, level roadway (not with wheels jacked up). Test at different speeds both with light and heavy pressure. **CAUTION** — Do not lock wheels and slide tires on roadway.

### CONDITIONS AFFECTING BRAKE PERFORMANCE

Following external conditions may affect brake performance and should be corrected before proceeding with trouble shooting of brake mechanism:

**Tires** — Should be same size on each side of vehicle with approximately same tread design and inflation.

**Loading** — Wheels should be equally loaded, as heavily loaded wheels require more braking power.

**Suspension** — Faulty shock absorbers, incorrect front end alignment, or loose wheel bearings may give impression brakes are too severe.

### TROUBLE SHOOTING DRUM BRAKES

#### LOW PEDAL OR EXCESSIVE TRAVEL

Fluid low. Improper brake fluid. Air in system. Hoses expand under pressure. Wheel bearings or steering parts loose. Improper brake adjustment. Distorted shoes or linings. Master cylinder or power assist unit malfunction. Defective brake lines. Improper brake pedal free travel.

#### PEDAL APPLIED; NO BRAKING ACTION

Air in system. Leak past primary cup in master cylinder. Piston pushed back into bores. Hydraulic leak. Rear brakes out of adjustment.

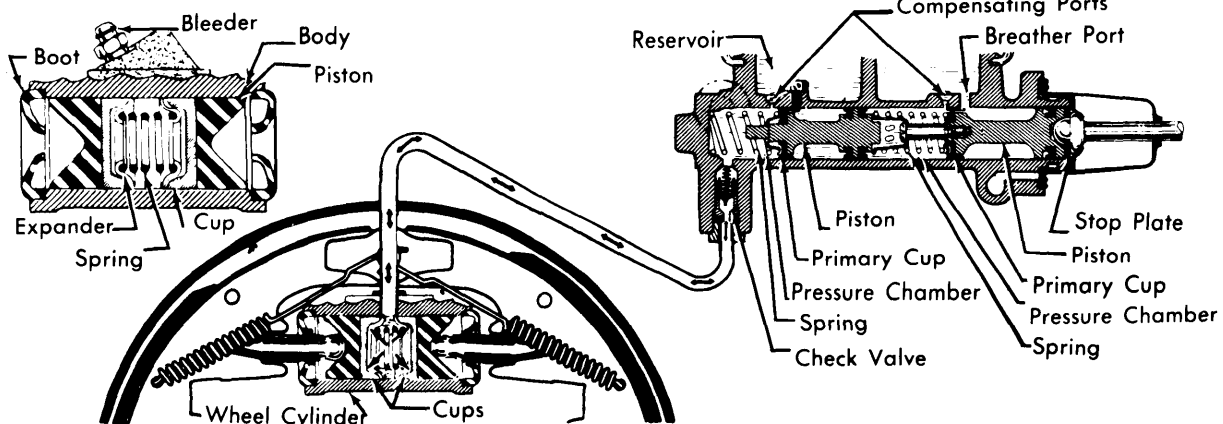


Fig. 1 Cutaway View of Typical Hydraulic Brake System

#### ONE WHEELS DRAGS

Front wheel bearings loose. Shoes adjusted too tight. Shoe return spring broken or weak. Piston stuck or cups distorted. Clogged line or hose. Drum out-of-round. Loose anchor pin. Distorted shoe. Defective lining.

#### REAR BRAKES DRAG

Improper adjustment. Parking brake cable frozen.

#### ALL WHEELS DRAG

Improper adjustment. Defective master cylinder. Improper adjustment of master cylinder push rod. Pedal linkage binding. Defective power unit.

#### VEHICLE PULLS TO ONE SIDE

Uneven tire treads. Worn front end parts. Incorrect front end alignment. Front wheel bearings loose. Loose steering. Loose backing plate or anchor pins. Loose or broken springs or "U" bolts. Improper lining. Improper adjustment. Defective drum. Loose or broken return spring. Defective wheel cylinder. Improper wheel cylinder size. Clogged or crimped line.

#### BRAKES SQUEAK OR NOISY

Improper lining. Lining loose on shoe. Foreign material on lining. Shoes scraping backing plate. Improper adjustment. Defective drum. Defective wheel cylinder. Weak or broken return springs. Loose anchor pin, wheel cylinder, or backing plate. Brake drum silencer spring missing (if equipped).

#### BRAKES FADE (FAIL TO HOLD)

Excessive heat build-up. Improper linings. Drums too thin. Lining soaked with fluid or oil. Improper fluid.

#### PULSATING BRAKE PEDAL

Drums out-of-round. Loose brake drum. Worn or loose bearings. Bent rear axle.

#### HARD PEDAL

Grease or fluid on lining. Improper brake lining or fluid. Improper adjustment. Pedal linkage binding. Faulty master cylinder. Glazed linings. Defective brake drums.

## HYDRAULIC BRAKE TROUBLE SHOOTING (Cont.)

### BRAKES CHATTER

Improper shoe adjustment. Loose backing plate. Foreign material on lining. Weak or broken return spring. Loose wheel bearings. Drum out-of-round. Distorted or misaligned shoes. Frozen strut rod bushings.

### SNAPPING NOISE IN FRONT END

Grooved backing plate pad. Lack of lubrication on moving parts. Loose drums or backing plate. Loose or worn front end parts. Defective lining.

### POWER BRAKE UNIT DOES NOT BOOST

**Test For Power Unit Operation** – Stop engine and apply pedal pressure several times to remove all vacuum from system. Hold pressure on pedal and start engine. Pedal will move slightly forward when cylinder is operating.

**Power Unit Does Not Operate** – Vacuum check valve stuck closed. Vacuum pipe bent, broken or closed. Insufficient engine vacuum. Blocked air inlet. Air valve sticking in diaphragm. Faulty diaphragm. Faulty piston seal. Internal leaks.

## TROUBLE SHOOTING DISC BRAKES

### LOW PEDAL OR EXCESSIVE TRAVEL

Fluid level low. Air in system. Defective brake lines. Defective caliper. Distorted pads or linings. Master cylinder or power assist unit malfunction. Misaligned piston and pad assembly. Low pedal after hard cornering or driving on rough road (pump pedal to correct). Disc runnout excessive. Damaged caliper piston seal. Metering valve for front brakes not working. Caliper seals soft or swollen. Improper brake pedal free travel.

### HARD PEDAL

Master cylinder or power unit malfunction. Brake fluid, oil, or grease on linings. Lines or hoses kinked, dented, or collapsed. Cylinder cups swollen. Linings worn. Incorrect lining. Frozen or seized pistons. Metering valve or cylinder bores corroded. Pedal linkage binding.

### PULLING OR GRABBING

Defective master cylinder. Defective caliper. Grease or fluid on linings. Defective brake lines. Metering valve malfunctioning. Power unit malfunctioning. Defective rotor. Loose or broken front end parts. Defective rear drum. Unmatched tires. Loose or broken rear springs.

### PEDAL GOES SLOWLY TO FLOOR

Air in system. Hoses or lines soft (expand under pressure) or damaged. Master cylinder primary cup damaged, bore worn, or corroded. Improper fluid. Bleeder screw open.

### NOISE, CHATTER, OR PULSATION

Defective rotor. Disc pad or rotor out of parallel. Anti-rattle spring missing or out of position. Excessive clearance between disc pad and caliper. Disc pad rubbing on caliper housing. Caliper binding on mounting bolts. Rear drums defective. Wheel bearings loose. Wheel nuts loose. Wear sensor contacting rotor.

### DRAGGING BRAKES

Defective brake line or hose. Defective master cylinder. Residual pressure valve installed in outlet to front brakes. Power unit push rod out of adjustment. Sticking pedal linkage. Metering valve defective or incorrectly installed. Defective power unit. Defective caliper.

### REAR BRAKES SKIDDING (HARD PEDAL APPLICATION)

Defective proportioning valve.