# 1963-73 OPEL

**All Models (1963-73)**

## DESCRIPTION

Opel brake system consists of a hydraulically operated footbrake and a lever operated handbrake. Front brakes are disc type consisting of two major components: a brake rotor (disc) and a caliper with friction pads. Caliper is attached to wheel hub flange and centered on hub shoulder. Caliper halves each house a piston and fluid seal. A sheet metal plate preventing piston from rotating is installed between friction pad and piston. Rear brake assembly houses two brake shoes activated by wheel cylinders. Shoes are held by return springs, pins and spring retainers. Master cylinder is either single or tandem type, the latter being installed on later model vehicles. Master cylinder houses a brake warning valve that signifies, by a light on instrument panel, any pressure loss. Models equipped with disc brakes utilize a power brake booster.

## ADJUSTMENT

### DISC BRAKES

Disc brakes are self adjusting, therefore no adjustment in service is required.

### DRUM BRAKES

Turn forward brake shoe eccentric in direction of arrows on backing plate, while rotating brake drum in a forward direction, until brake shoe contacts brake drum, then back off eccentric until brake drum just rotates freely. Repeat operation at rear brake shoe eccentric, while turning drum in a backward direction.

### PARKING BRAKE

Parking brake should be adjusted when lever must be pulled in excess of eight ratchet notches to fully apply brakes. To adjust, release parking brake lever, and loosen equalizer nut and lock nut. Pull parking brake lever up three ratchet notches, and adjust nuts until rear brakes just begin to bind. Tighten lock nut, and recheck brake operation. *NOTE — If problem is not corrected, inspect condition of rear brake shoes.*

### PEDAL FREE PLAY

**W/O Power Assisted Brakes** — Remove adjusting bolt lock nut at brake pedal, and rotate push rod eccentric to obtain pedal free play of ¼".

**W/Power Assisted Brakes** — Loosen pedal push rod adjuster lock nut. Turn push rod adjuster to lengthen or shorten push rod, until brake pedal free play is ¼".

### BLEEDING SYSTEM

Begin with either front or rear brake system. *NOTE — On 1966-67 Kadette bleed disc brakes first.* In each system begin with wheel cylinder nearest master cylinder. With pressure on pedal open bleed fitting and push pedal its full travel. When pedal is fully depressed close fitting and let pedal return to fully released position. Repeat procedure on other circuit. Continue bleeding procedure until all air is bled from system.

## REMOVAL & INSTALLATION

### POWER BRAKE UNIT CHECK VALVE REPLACEMENT

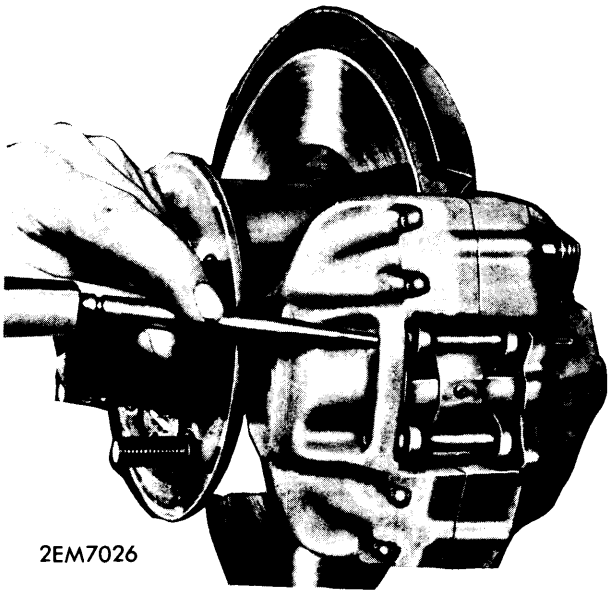
Valve must be replaced, it cannot be repaired. When a new valve is installed, replace short hose near intake manifold and long hose on booster unit.

### POWER BRAKE UNIT FILTER REPLACEMENT

Only under severe conditions does filter need replacing. To remove, pry retainer from housing and pull filter from thrust rod. Install new filter, slide retainer over control housing and seal it with a hammer. Push protective cap in position.

### LINING REPLACEMENT (DISC BRAKES)

**Removal** — Raise car and remove front wheels. Drive dowel pins inward. Remove friction pads from brake caliper. While apart check rubber seals for wear. If seals are hard or brittle replace. *See Brake Caliper Overhaul in this Section.*



2EM7026

**DOWEL PIN REMOVAL**

**Installation** — Using suitable tool (J-22430), press both pistons to bottom of their bores. Install new friction pads in brake caliper. Pads must fit freely in caliper recess. *NOTE — If new friction on pads are not free, shave excess from pad corners or high spots.* Using a punch, install one dowel pin from inboard side through caliper and friction pad stop. Install new retaining spring under previously installed dowel pin. Install second dowel pin. Depress brake pedal several times to adjust friction pads to rotor.

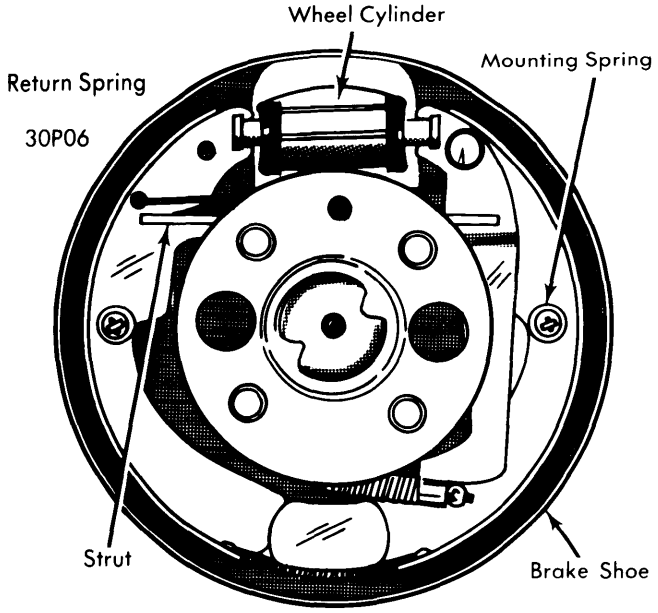
*NOTE — Friction pads have a 125 mile break in period, when hard braking should be avoided.*

### LINING REPLACEMENT (DRUM BRAKES)

**Removal** — Remove tire, wheel and drum. Release both brake shoe return springs. Remove retaining springs and pins. Lift shoes out of wheel cylinder and off backing plate.

**Installation** — Secure new brake shoes to backing plate with springs and pins. Fit shoes into wheel cylinders. Reposition brake drum, wheel and tire.

## 1963-73 OPEL (Cont.)




**DRUM BRAKE ASSEMBLY (TYPICAL)**

### BRAKE CALIPER

**Removal** – Remove front wheels and friction pads from brake caliper. Loosen brake line to brake caliper union nut. Remove caliper brake hose bracket from steering knuckle. Disconnect brake pipe from brake hose. Extract caliper mounting bolts and lift off caliper.

**Installation** – To install, reverse removal procedure. *NOTE – Ensure brake caliper and steering knuckle surfaces are dirt free. If caliper mounting bolts are replaced only use ones of equal quality.*

### BRAKE ROTOR (DISC)

**Removal** – Remove front tire and wheel. Disconnect brake caliper (complete) from steering knuckle mount. Remove wheel bearings and lift off rotor assembly. To disassemble wheel hub from rotor, place assembly in vise and, using suitable tool (J-21737), remove star headed bolts. Prior to pulling hub from rotor, index mark relationship. To reassemble hub and rotor, reverse removal procedure noting the following: Ensure contact surfaces of brake rotor and wheel hub are free from dirt, high spots and burrs. If assembly bolts are replaced, use only ones of equal quality and tighten to specifications.

**Installation** – Repack wheel bearings and attach brake rotor with hub assembly to steering knuckle. Adjust front wheel bearing and tighten brake caliper to steering knuckle bolts. *NOTE – See Wheel Bearing Adjustment in WHEEL ALIGNMENT Section.* Install tire and wheel.

### MASTER CYLINDER (SINGLE)

**Removal** – Disconnect three brake lines from master cylinder and plug open ends. Remove two bolts holding master cylinder to firewall. Lift cylinder from engine compartment.

**Installation** – To install, reverse removal procedure.

### MASTER CYLINDER (TANDEM)

**Removal** – Disconnect master cylinder brake lines. On models with brake booster, remove support-to-fender bolts and cylinder-to-booster retaining nuts and lift off master cylinder. On models without booster, remove master cylinder hold-down bolts and lift off master cylinder.

**Installation** – Set master cylinder onto actuating rod and secure with bolts in position. Attach brake booster, if necessary. Tighten nuts and bolts to specifications. Models with brake booster, attach front mounting bracket. Connect brake lines and bleed hydraulic system.

### POWER BRAKE BOOSTER (DISC BRAKE ONLY)

**Removal** – Disconnect brake lines from master cylinder and vacuum line from booster unit. Remove four nuts and washers holding booster to support. Remove master cylinder support. Loosen thrust rod nut and unscrew piston push rod. Remove assembly from vehicle.

**Installation** – Using a new seal ring, assemble master cylinder to brake booster and tighten nuts to specifications. Position assembly in brake booster bracket and thread piston push rod to thrust rod. Install brake booster washers and nuts, tightening to specifications. Install master cylinder support to fender. Connect vacuum line. Adjust piston push rod on thrust rod until pedal freeplay is 1/4". Reconnect brake lines and bleed system.

### SPLASH SHIELD

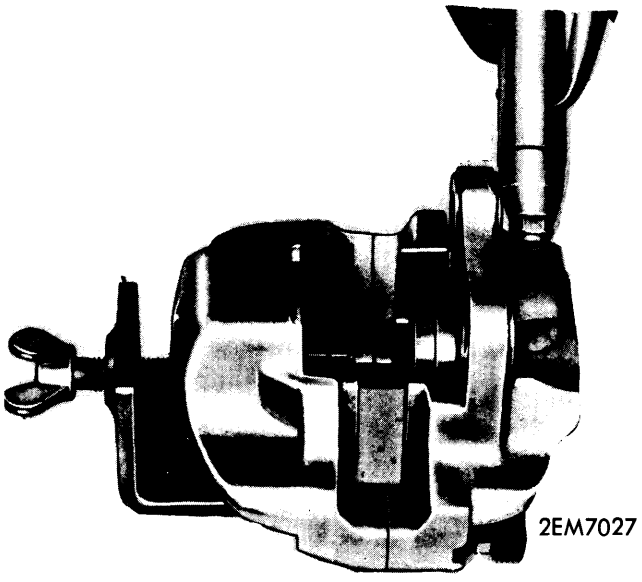
**Removal** – Remove brake caliper and rotor. Remove screws from both sides of shield. Remove lower steering arm and rotor shield to steering knuckle bolt. Lift off shield and gasket.

**Installation** – To install, reverse removal procedure and tighten steering knuckle bolt to specifications.

## OVERHAUL

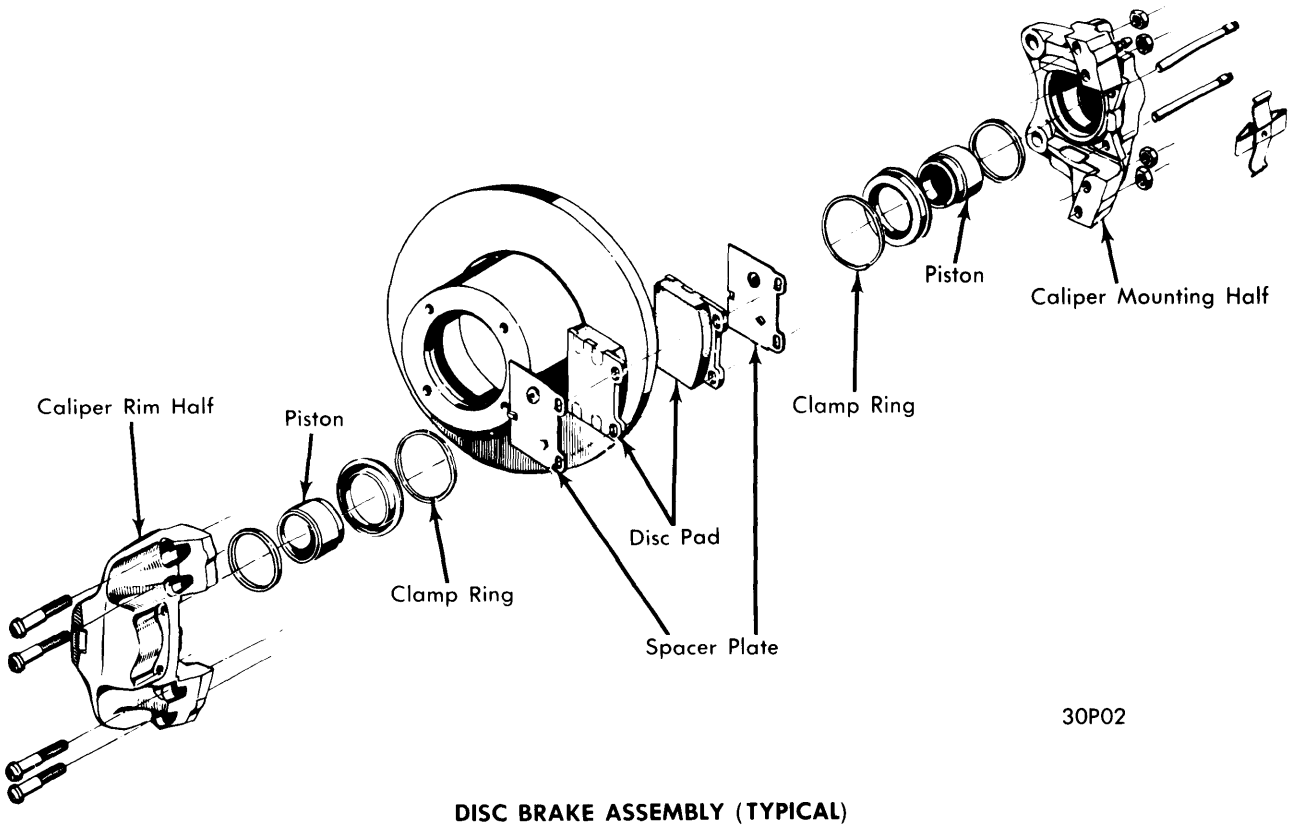
### BRAKE CALIPER

**Disassembly** – Remove brake pipe from brake caliper. *NOTE – Do not separate caliper halves.* Pry clamp rings from rubber seals and remove seals. Using suitable tool (J-22429), remove piston first from caliper rim half and then from caliper mounting half. To force piston from caliper mounting half, place mounting clamp on caliper rim and tighten wing nut so rubber plate seals caliper rim bore. Connect air hose to brake inlet and force out piston. *NOTE – When removing piston, use extreme caution.*




**PISTON REMOVAL (RIM HALF)**

## 1963-73 OPEL (Cont.)




**DISC BRAKE ASSEMBLY (TYPICAL)**

**Cleaning & Inspecting** – Clean all parts in approved grade brake fluid or alcohol. Check all components for wear. If cylinder bores are scored or rusted, replace with a complete new caliper assembly. If pistons are damaged, replace even if bores do not require renewal.

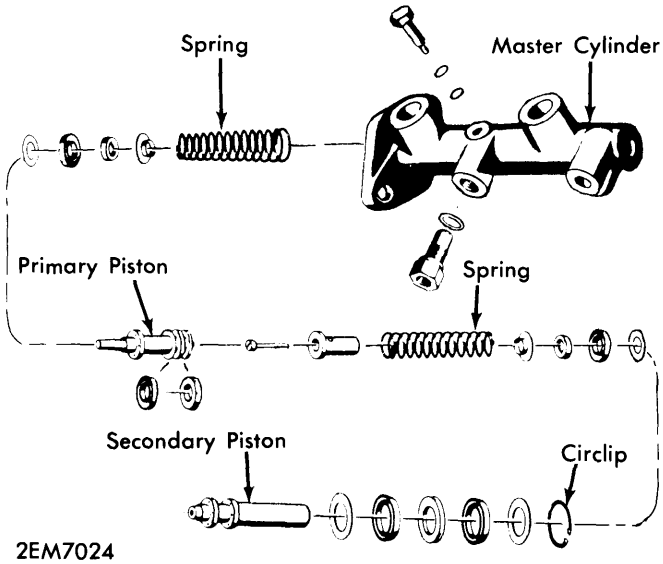
**Reassembly** – Insert fluid seals into grooves of brake caliper bores. While caliper is in vise, install pistons. Use piston-to-friction pad spacer as a gauge. Locate relieved edge of piston 20° to horizontal during installation procedures. Push piston, hollow end toward brake rotor, into caliper bore. Push piston into bore its full travel: piston should align itself. Install second piston in same manner.

### MASTER CYLINDER (SINGLE)

**Disassembly** – Drain master cylinder. Remove snap ring and stop ring. Remove inner components from cylinder. Remove reservoir, washer and master cylinder. *NOTE – Master cylinder reservoir has left-hand threads.*

**Cleaning & Inspecting** – Clean master cylinder and appropriate parts with approved grade brake fluid. Replace master cylinder if bore has imperfections. *NOTE – Honing is not recommended.* Clean by-pass and compensating ports if restricted.

**Reassembly** – Dip all internal parts in brake fluid and insert them into cylinder bore. Push into bore, install stop washer and lock ring. Check master cylinder for free operation and proper lock ring seating.




**TANDEM MASTER CYLINDER**

### MASTER CYLINDER (TANDEM)

**Disassembly** – Drain master cylinder and remove sealing plugs from housing. Remove static pressure valves. Push piston slightly into cylinder and insert a suitable piece of welding rod into feed port. This will keep piston in desired location. Remove stop screw and circlip from cylinder body and withdraw both pistons, with springs. Remove stop screw from piston in rear brake circuit and remove all components. Also remove components from intermediate piston of front circuit.

## 1963-73 OPEL (Cont.)

**Cleaning & Inspecting** – Clean all parts in approved grade brake fluid. Inspect inner components and replace if necessary.

**Reassembly** – Assemble front and rear pistons. Coat cylinder bore, sliding surfaces and seals with brake fluid. Insert pre-assembled intermediate piston with thrust spring seat into bore. Using a drift, push piston into housing and insert a piece of welding rod to retain front brake curcuit in position. Install stop screw and seal ring. Insert pre-assembled rear piston into cylinder and secure circlip. Check piston free movement and install washers under stop screw (if necessary). Remove welding rod positioner and, using another size welding rod (.020-.024"), check compensating ports. Reposition static pressure valves. Install new sealing plugs and refit reservoir.

**TIGHTENING SPECIFICATIONS**

| Application | Ft. Lbs. (mkg) |
|---|---|
| Master Cylinder-to-Firewall | 15 (2.0) |
| Master Cylinder-to-Booster | |
| "GT" | 14 (1.9) |
| All Others | 12 (1.6) |
| Brake Booster-to-Support | 11 (1.5) |
| Caliper-to-Steering Knuckle | 72 (10.0) |
| Backing Plate-to-Steering Knuckle | |
| Lower Bolt | 22 (3.0) |
| Upper Bolt | 47 (6.5) |
| Backing Plate-to-Axle Housing | 43 (5.9) |
| Brake Unions | 22 (3.0) |

**DISC BRAKE ROTOR SPECIFICATIONS**

| Application | Disc Diameter | Lateral Runout | Parallelism | Original Thickness | Minimum Refinish Thickness | Discard Thickness |
|---|---|---|---|---|---|---|
| All Models | 9.370" | .004" | .0006" | .430" | .394" | ..... |

**BRAKE DRUM SPECIFICATIONS**

| Application | Drum Diameter | Original Diameter | Maximum Refinish Diameter | Discard Diameter |
|---|---|---|---|---|
| All Models | 9.060" | 9.060" | 9.090" | 9.100" |