OPEL

1900
Manta

DESCRIPTION

Brake system consists of a pedal operated hydraulic service brake system, and a lever operated mechanical parking brake system. Front brakes are disc type consisting of two major components: a brake rotor (disc) and a caliper with friction pads. Caliper is attached to steering knuckle, and centered on wheel hub shoulder. Caliper halves each house a piston and a fluid seal. A sheet metal spacer plate is installed between friction pad and piston. Rear brake drum houses two brake shoes which are activated by a single dual piston wheel cylinder on each side. Brake shoes are held to backing plates by return springs, mounting pins, and pin springs. Master cylinder is tandem dual piston type, and houses a brake warning valve which signals any pressure loss in system through a light on the instrument panel. Vacuum assisted power brakes are available on all disc brake equipped vehicles.

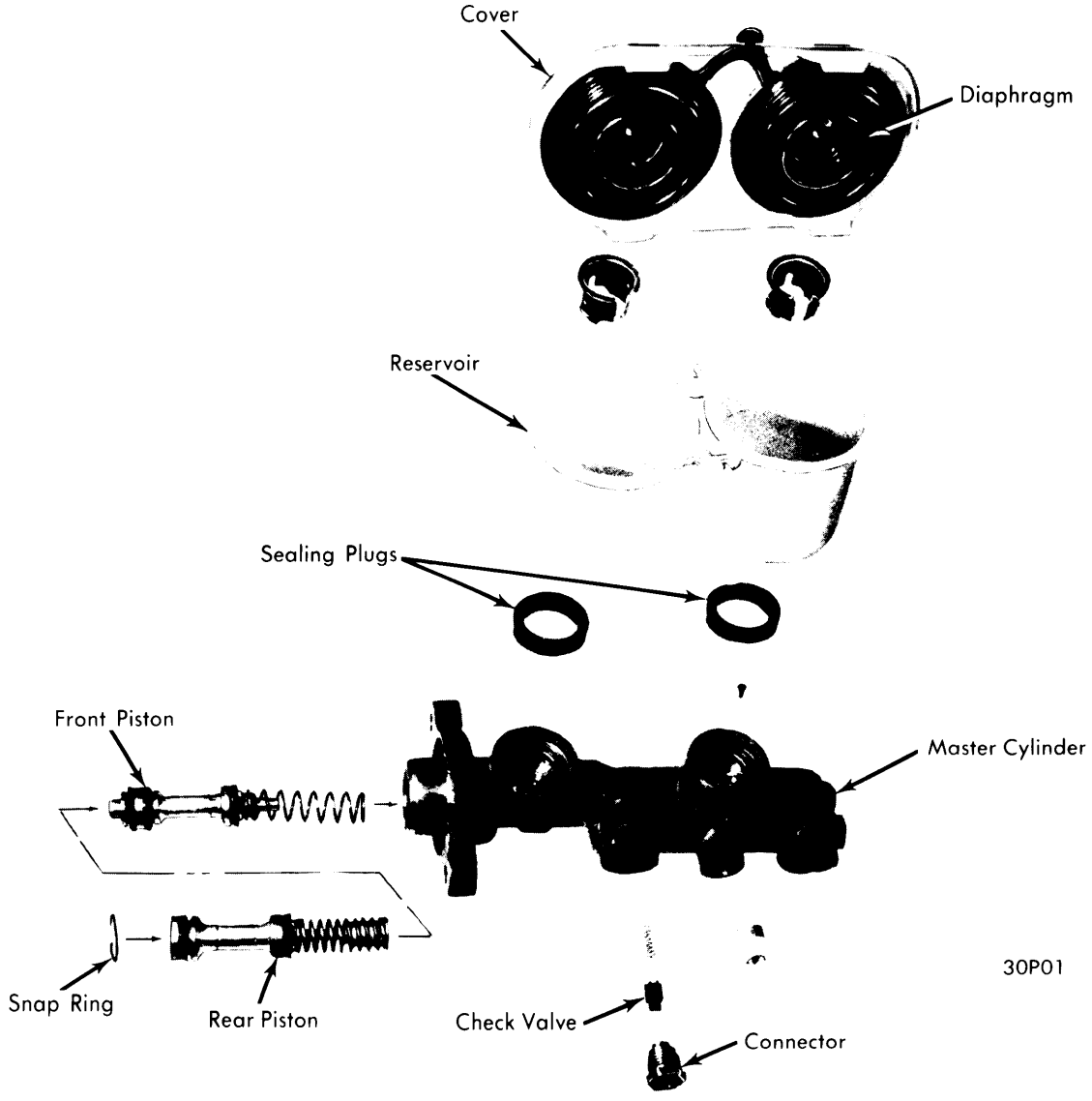
ADJUSTMENT

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.



MASTER CYLINDER ASSEMBLY (TYPICAL)

OPEL (Cont.)

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

Brake pedal height can be adjusted by removing nut and lock tab from brake pedal-to-clevis attaching bolt. Turn head of bolt and rotate eccentric until there is approximately ¼ " free play in brake pedal.

HYDRAULIC SYSTEM BLEEDING

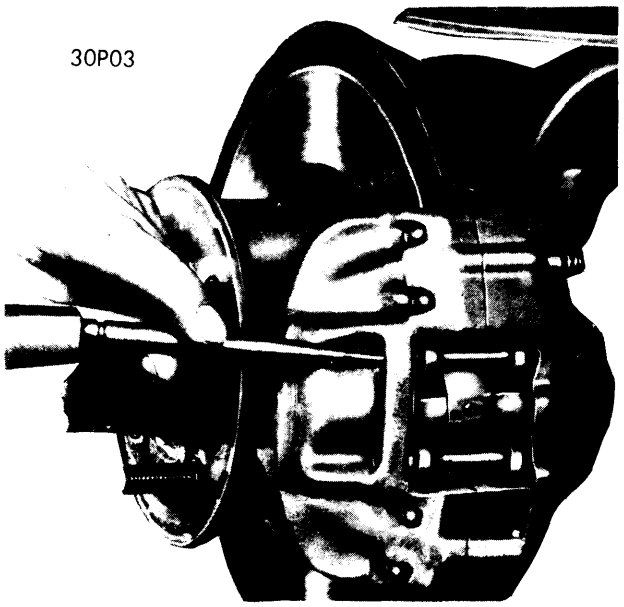
NOTE — It will be necessary to bleed both hydraulic systems if air has been allowed to enter system through master cylinder.

Begin bleeding hydraulic system at wheel cylinder (caliper) nearest master cylinder. With pressure on brake pedal, open bleeder screw, and push brake pedal through its full travel. Close bleeder screw, then allow pedal to return to fully released position. Repeat procedure until all air is expelled from cylinder. Repeat bleeding procedure at remaining cylinder (caliper) until all air is expelled from system.

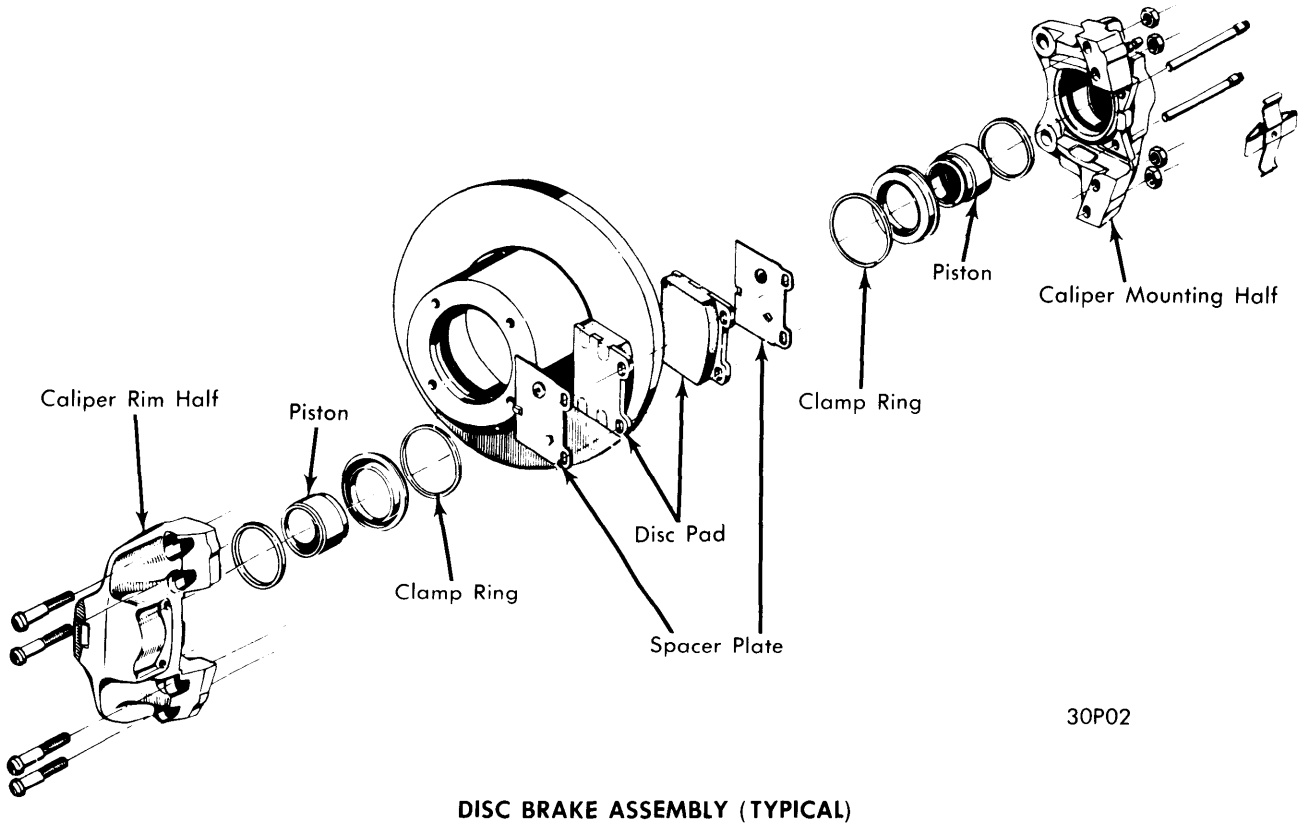
REMOVAL & INSTALLATION

FRONT DISC BRAKE PADS

Removal — Raise and support front of vehicle, and remove front wheels. Drive dowel pins inward to remove from caliper. Lift disc pads out of caliper assembly.



DOWEL PIN REMOVAL



DISC BRAKE ASSEMBLY (TYPICAL)

OPEL (Cont.)

Installation – Using suitable tool (J-22430), force both pistons to the bottom of their bores. Install friction pads in caliper assembly, ensuring pads fit freely in caliper recesses. *NOTE – If pads are not free, remove excess from pad corners and high spots.* Using a punch, install one dowel pin from inside of caliper. Install new retaining spring under dowel pin, then install second dowel pin. Depress brake pedal several times to seat pads to brake rotor.

FRONT DISC BRAKE CALIPER

Removal – Raise and support vehicle, and remove front wheels. Remove disc brake pads from brake caliper. Loosen brake line to caliper union nut several turns, then remove caliper attaching bolts, and brake hose bracket from steering knuckle. Lift caliper assembly off brake rotor, disconnect brake line at brake hose, and remove caliper assembly from vehicle.

Installation – Position brake caliper assembly on steering knuckle, and install caliper attaching bolts. Attach brake line to brake hose, and tighten all hydraulic connections. Install disc pads in caliper and bleed system.

FRONT DISC BRAKE ROTOR

Removal – Raise and support front of vehicle, and remove wheel. Remove caliper attaching bolts from steering knuckle, and support caliper out of the way to prevent damage to brake hose. Remove wheel hub, disc, and wheel bearings as an assembly. Remove wheel bearings from hub, then mount hub and disc assembly in a soft-jawed vise. Mark disc and hub for reassembly reference. Using suitable tool (J-21737), remove four star head attaching bolts, and pull disc from wheel hub.

Installation – To install, remove all burrs and foreign matter from contacting surfaces of hub and disc, and reverse removal procedure.

REAR BRAKE SHOES

Removal – Raise and support vehicle, and remove wheel to be serviced. Remove brake drum. Remove upper and lower brake shoe return springs. Remove brake shoe mounting pins and springs, disengage parking brake cable, and remove brake shoes from brake backing plate.

Installation – To install, reverse removal procedure, making sure brake shoes and parking brake are properly adjusted.

MASTER CYLINDER

Removal – Disconnect hydraulic lines at master cylinder. Remove master cylinder attaching nuts and remove master cylinder from power unit. *NOTE – Be careful not to loosen front housing seal.*

Installation – To install, reverse removal procedure, and bleed brake system.

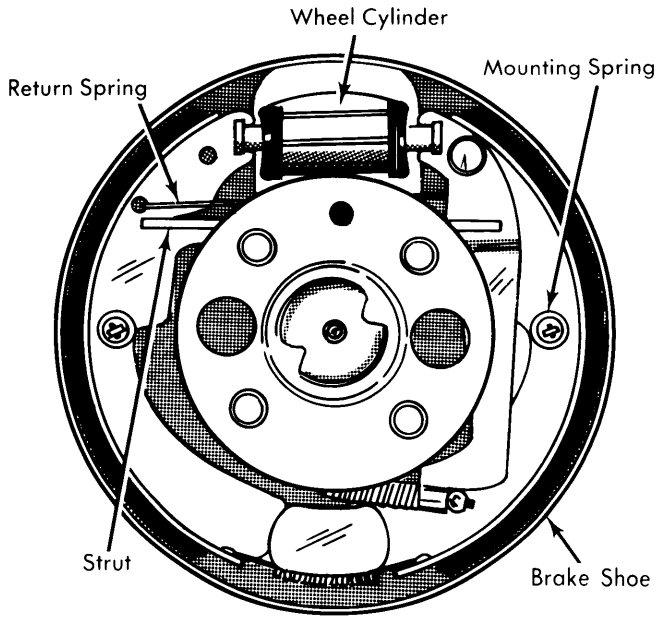
POWER BRAKE UNIT

Removal – Disconnect hydraulic lines at master cylinder and vacuum hose at brake booster. Remove brake booster-to-mounting bracket attaching nuts. Remove pedal-to-push rod attaching hardware. Remove brake booster and master cylinder assembly from vehicle, then separate master cylinder from booster.

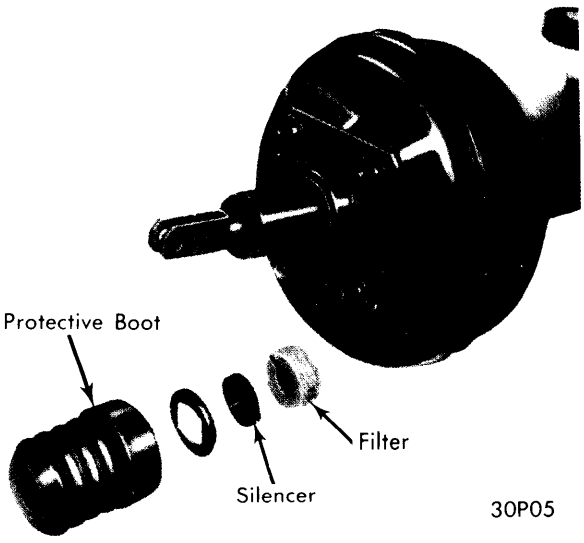
Installation – Using a new front housing seal, assemble master cylinder to brake booster. Position brake booster on mounting bracket and install attaching washers and nuts. Install nut and bolt attaching push rod to brake pedal. Connect vacuum hose to booster and hydraulic lines to master cylinder. Adjust brake pedal free play and bleed hydraulic system.

Air Filter Replacement – With brake booster removed from vehicle, remove protective boot. Using a pointed tool, pull silencer and filter out of housing, and remove them from push rod. To install, reverse removal procedure.

Vacuum Check Valve Replacement – Remove hose clamps from control valve hoses, and remove vacuum control valve from vehicle. To install, connect control valve to hoses, making sure short hose is between intake manifold and valve, arrows on valve point toward intake manifold, and all connections are air tight.



DRUM BRAKE ASSEMBLY (TYPICAL)



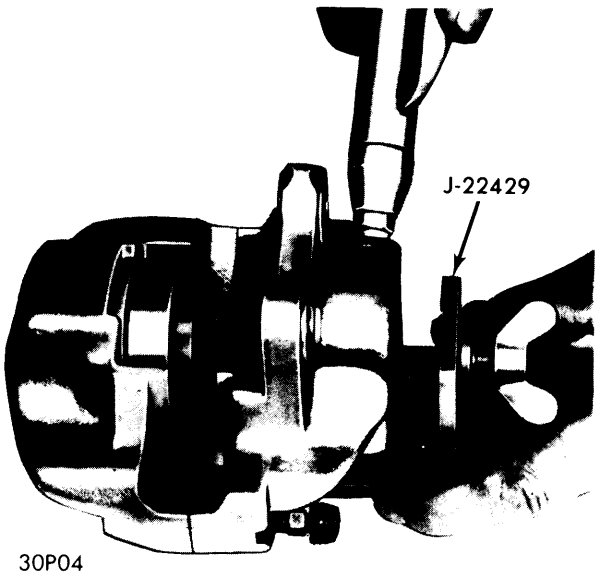
AIR FILTER REPLACEMENT

OPEL (Cont.)

OVERHAUL

FRONT DISC BRAKE CALIPER

Disassembly – *NOTE – Do not separate caliper halves while working on caliper.* Remove brake line from caliper. Pry clamp rings from rubber seals, and remove seals. Clamp caliper mounting half piston in place using suitable clamp (J-22429), and force rim half piston out of bore using compressed air. Position clamp (J-22429) over rim half piston bore until rubber gasket of clamp seals entire bore, then force mounting half piston out of bore using air pressure. *CAUTION – Use extreme caution when removing pistons to prevent injury.* Remove rubber seals from grooves in caliper bores, using care not to damage bores.



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PISTON REMOVAL (RIM HALF)

Inspection – Clean all parts with clean brake fluid or denatured alcohol. Check all components for wear. If cylinder bores are scored or rusted, replace complete caliper assembly. If pistons are damaged, replace pistons.

Reassembly – Install seals in grooves of cylinder bore. Mount caliper in a soft-jawed vise, with bore to be worked on facing up. Install piston, with hollow end towards rotor assembly, into cylinder bore. Using piston-to-disc pad spacer as a gauge, locate relieved edge of piston 20° to horizontal in a downward direction during installation. Push piston into caliper bore until bottomed. Invert caliper in vise, and install second piston in a similar manner.

MASTER CYLINDER

Disassembly – Drain master cylinder completely, and remove brake fluid reservoir from cylinder. Remove reservoir sealing plugs from cylinder housing. Remove check valve and connector from drum brake port of cylinder. Force piston into cylinder bore, and insert round rod into feed port to retain piston in forward position. Remove piston stop screw and snap ring from housing. Remove round rod, then remove pistons from cylinder bore. Disassemble piston components as necessary.

Reassembly – *NOTE – Prior to assembly, lubricate all rubber seals, cylinder bore, and pistons with clean brake fluid.* Assemble front and rear piston components. Insert front piston into cylinder bore, with small diameter of thrust spring facing piston. Push piston fully into bore, and insert round rod into feed port to retain piston. Install piston stop screw, then install second piston into bore. Remove round rod, and install check valve and connector in housing. Install piston snap ring, new reservoir sealing plugs, and install reservoir.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Brake Booster-to-Support	11 (1.5)
Master Cylinder-to-Booster	14 (1.9)
Caliper-to-Steering Knuckle	72 (10)
Brake Disc-to-Wheel Hub	36 (5)
Brake Pipe-to-Caliper	22 (3)
Backing Plate-to-Axle Housing	43 (6)

DISC BRAKE ROTOR SPECIFICATIONS

Application	Disc Diameter In. (mm)	Lateral Runout In. (mm)	Parallelism In. (mm)	Original Thickness In. (mm)	Minimum Refinish Thickness In. (mm)	Discard Thickness In. (mm)
All Models	9.370 (238)	.004 (.10)	.0006 (.015)	.430 (11)	.394 (10)	.....

BRAKE DRUM SPECIFICATIONS

Application	Drum Diameter In. (mm)	Original Diameter In. (mm)	Maximum Refinish Diameter In. (mm)	Discard Diameter In. (mm)
All Models	9.060 (230)	9.060 (230)	9.090 (231)	①

① – More than Maximum Refinish Diameter.