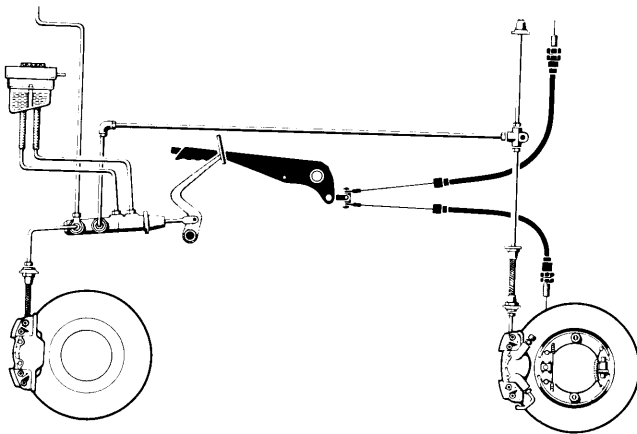


## PORSCHE

 911  
 914

### DESCRIPTION

Brake system is hydraulically operated, utilizing a tandem master cylinder. All models are equipped with four wheel disc brakes, consisting of a rotor and a dual piston fixed caliper at each wheel. The 914 models are equipped with a pressure regulator in the rear circuit brake line to maintain proportional hydraulic pressure under all braking conditions. The parking brake on 911 models is cable actuated, operating conventional brake shoes which act against a drum machined in rear disc brake rotor casting. On 914 models, the parking brake is mechanical, operated by levers and cables, and acting on disc pads of rear brake assemblies.



4PO10

### DUAL CIRCUIT BRAKE SYSTEM

### ADJUSTMENT

#### DISC BRAKES

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

#### PARKING BRAKE

**914 Models** — Parking brake is incorporated in service brake, therefore no adjustment is required.

**911 Models** — Raise and support vehicle, and remove rear wheels. Release parking brake lever and push pistons and pads into caliper to allow rotor to turn freely. Loosen parking brake cable lock nuts until cable is slack. Working through access hole in parking brake drum, turn star wheel adjuster until rotor can no longer be turned by hand. Adjust parking brake cable at rear cable end until it just begins to pull and tighten lock nuts. Back off on star wheel adjuster until rotor turns freely without drag. Repeat procedure on opposite wheel and check parking brake operation.

### BLEEDING SYSTEM

**Bleeding Sequence** — If equipped with outer and inner caliper half bleed screws, always bleed outer caliper half first and inner half second. Bleed brakes as follows: Left rear first, right rear second, right front third, and left front last.

**CAUTION** — When any fluid fitting is disconnected, fluid will drain from reservoir through master cylinder and out open fitting. To avoid this, depress brake pedal far enough so piston cup will pass the compensating (resupply) port.

**Pressure Bleeding** — Fill pressure bleeder with brake fluid and pressurize tank to 32.3 psi (2.2 atm). Connect bleeder to reservoir and connect a small bleed hose to first bleed screw. See *Bleeding Sequence*. Place other end in container partially filled with brake fluid. Open bleed screw 1/2 — 3/4 turn and allow fluid to drain until no air bubbles are apparent in fluid. Close bleed screw and repeat operation for each bleed screw in turn.

**NOTE** — If brake system was completely drained, it may be necessary to perform bleeding, in sequence, more than once.

**Manual Bleeding** — Fill reservoir with brake fluid and connect a small hose to first bleed screw. See *Bleeding Sequence*. Place other end in container partially filled with brake fluid. Have an assistant rapidly pump brake pedal until slight pressure is felt, then hold pedal depressed. Open bleed screw and allow fluid to drain. Close bleed screw before slowly releasing pedal. Repeat pedal action until fluid flows into container with no bubbles. Repeat at each bleed screw in turn.

### REMOVAL & INSTALLATION

#### DISC PADS

#### BRAKE PAD REPLACEMENT

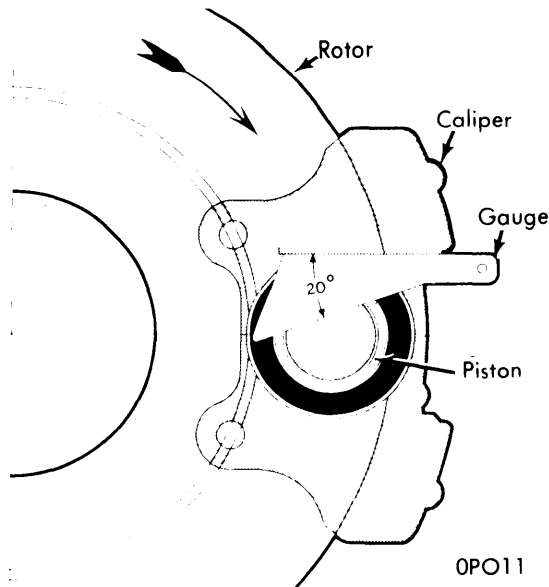
**NOTE** — Mark pads and calipers before removal. If pads are to be reused, they must be installed in original location. If only one pad on front or rear needs replacing, all four pads must be replaced.

**Removal** — Raise and support vehicle and remove wheels. Remove retaining pin clips and using a punch, drive retaining pins out of caliper (toward center of vehicle). **NOTE** — Depress spreader spring if required. Using a suitable extractor (P86) pull pads from caliper.

**CAUTION** — If fluid level is too high in reservoir, overflow will result when pistons (during installation) are pushed back into calipers.

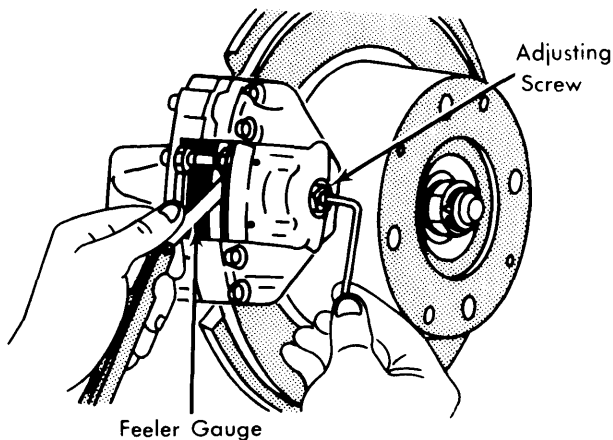
**Installation (Except 914 Rear)** — Push pistons back into caliper using suitable tool (P83), or wooden block. Remove anti-rotation locks (if equipped) and clean all parts with alcohol. Inspect all parts for damage or wear. Ensure piston 20° position is correct using suitable gauge (P84). Install remaining parts in reverse order of removal, replacing parts as necessary.

## PORSCHE (Cont.)



CALIPER &amp; PISTON 20° POSITION

**Installation (914 Rear)** — Push pistons back into caliper using suitable tool (P83) or wooden block. Remove cap screw on outer caliper half, loosen lock nut, and back off adjusting screw while maintaining a preload on piston with expander. Repeat procedure on inner caliper half, using an extension through hole in control arm. Insert disc pads into caliper and position with retaining pins. Adjust pads for .008" clearance on both sides of rotor. Tighten lock nut and install cap screw. Remove retaining pins, insert spreader spring, retaining pins, and pin clips.



ADJUSTING DISC PADS (914 MODELS)

## BRAKE CALIPER

**CAUTION** — When any fluid fitting is disconnected, fluid will drain from reservoir through master cylinder and out open fitting. To avoid this, depress brake pedal far enough so piston cup will pass the compensating (resupply) port.

**Removal (Front & Rear)** — Raise and support vehicle, and remove wheels. Remove brake pads as previously outlined. Remove splash shield (if necessary), disconnect hydraulic line, and on 914 models disconnect parking brake cable from rear caliper. Remove caliper mounting bolts and remove caliper assembly.

**Installation (Front & Rear)** — To install, reverse removal procedure and note the following: Clean and inspect all parts for wear or damage and replace as necessary. Tighten all bolts and fittings to specifications and bleed complete brake system.

## BRAKE ROTOR

**Removal (Front)** — Remove caliper assembly as previously outlined. Remove dust cap from wheel hub, loosen clamp lock screw, then remove clamp nut and thrust washer. Remove rotor and wheel bearings as a unit. On 911 models, mark rotor and hub for reassembly reference, remove attaching bolts and separate rotor from hub.

**Removal (Rear)** — Remove caliper assembly as previously outlined. Remove the two rotor attaching screws and pull rotor from hub. **NOTE** — If rotor cannot be removed by hand, insert two 8mm bolts into attaching screw holes and alternately tighten bolts to press rotor from hub.

**Installation (Front & Rear)** — To install, reverse removal procedure, bleed brakes and adjust front wheel bearing free play. See *Wheel Bearing Adjustment* in **WHEEL ALIGNMENT** Section.

## PARKING BRAKE ASSEMBLY (EXCEPT 914 MODELS)

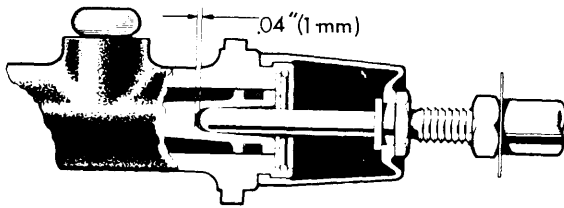
**Removal & Installation** — Remove cotter pin, castle nut and washer from cable and remove cable from brake assembly. Remove expander and springs and shoe retaining pins and springs from upper shoe. Raise upper shoe and withdraw adjuster and spring. Remove shoe retainer from lower shoe and remove both shoes from vehicle. To install, reverse removal procedure.

## MASTER CYLINDER

**Removal** — Raise and support vehicle and drain fluid from reservoir. Pull back on accelerator pedal to detach pedal from rod. Remove floor mat and floor board and withdraw boot from master cylinder. Remove underpanel, covering front axle, remove brake lines, electrical leads and reservoir tubes from cylinder and remove master cylinder from vehicle.

**Installation** — Reverse removal procedure and note the following: Be sure push rod is correctly installed and that clearance between push rod and piston is about .04" (1 mm). Use a sealing material on cylinder flange to prevent water leakage into drivers compartment. Bleed system as previously outlined.

## PORSCHE (Cont.)



OPO13

PUSH ROD-TO-PISTON CLEARANCE

### OVERHAUL

#### BRAKE CALIPER

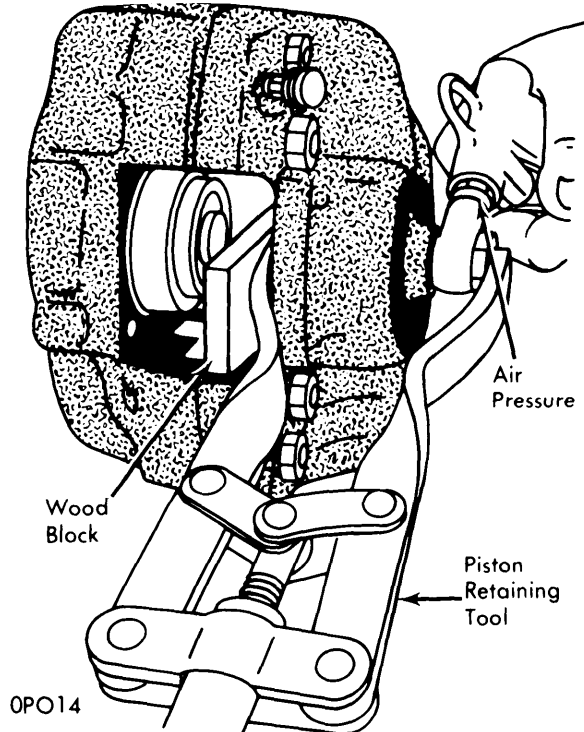
**NOTE** — Cylinders can only be overhauled one at a time, because with one piston removed air pressure is unattainable in second cylinder.

**Disassembly** — With pads and piston retaining plates removed, clamp caliper (by mounting flange) in vise. Remove dust cover retaining ring and dust cover. Install suitable piston retaining tool (P83) to one piston and place a thin wood block between tool and piston to be removed. Apply air pressure to fluid inlet hole to remove piston. Remove cylinder to piston seal using a plastic or hard rubber tool.

**Cleaning & Inspection** — Clean all parts in alcohol or clean brake fluid. Check all parts for wear or damage and replace as necessary. If caliper piston or bore show any signs of wear or damage, complete caliper assembly must be replaced.

**Separating Caliper Halves** — Caliper halves should only be separated if "O" ring seals between caliper halves show signs of leaking. To separate, remove bolts attaching caliper halves, separate caliper and discard "O" ring seals. To

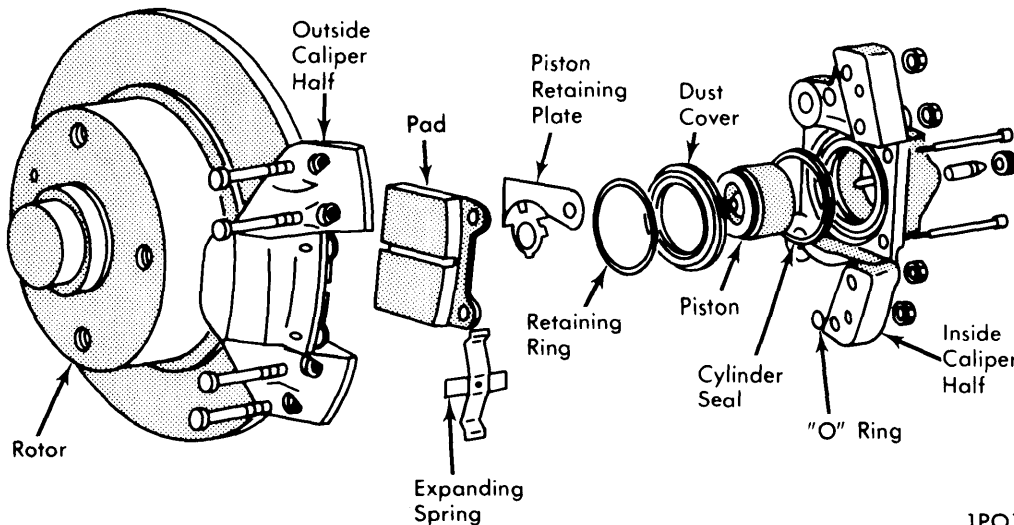
reassemble, install new "O" ring seals and reassemble caliper using new bolts, spring washers and nuts. **NOTE** — Install shorter bolts in outside holes. Tighten two inside bolts first and then tighten outside bolts. Bolts must be tightened in two stages; first to 50% of torque value, then to 100% of torque value.



OPO14

REMOVING PISTON FROM CALIPER

**Reassembly** — Reverse disassembly procedure and note the following: Use new rubber components, dust cover retaining ring and pad retaining plates. Apply brake cylinder paste to piston, and cylinder seal. Assure piston is straight with cylinder by using a suitable piston installing clamp. Check 20° position of piston with suitable gauge and correct using piston rotating pliers (if required).



1PO15

DISC BRAKE CALIPER ASSEMBLY



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## PORSCHE (Cont.)

### TIGHTENING SPECIFICATIONS

<b>Application</b>	<b>Ft. Lbs. ( mkg)</b>
Master Cylinder Mounting Bolts.....	18 (2.5)
Brake Line Connections.....	11 (1.5)
Caliper Mounting Bolts	
911 (Front & Rear).....	50 (7.0)
914 (Front) .....	61 (8.5)
914 (Rear) .....	50 (7.0)
Caliper Housing Bolts .....	① 16 (2.2)
Rotor-to-Hub .....	17 (2.3)
Brake Carrier Bolts .....	34 (4.7)
Splash Shield Bolts.....	18 (2.5)
Wheel Lug Nuts .....	94 (13.0)

① — Tighten 911 front caliper housing bolts to 25 ft. lbs.  
(3.4 mkg).