VOLKSWAGEN

Type 1
Type 2
Dasher
Rabbit
Scirocco

DESCRIPTION

Brake systems are hydraulically actuated using a tandem master cylinder and optional vacuum power brake unit. Type 1 models are equipped with 4-wheel drum brakes. All other models have front disc brakes and rear drum brakes with a pressure regulator incorporated in the rear brake circuit. All models are equipped with cable actuated parking brake which operates on rear brakes.

ADJUSTMENT

PEDAL FREE PLAY

Type 1 – Free play (measured at top of pedal pad) is the distance brake pedal travels before push rod contacts master cylinder piston. To adjust, loosen pedal stop bracket bolt and move bracket until free play is 3/16-9/32" (5-7 mm). Tighten bolt.

Rabbit & Scirocco (Exc. Power Brake) – Free play is measured from floor to pedal pad center. To adjust, turn brake pedal stop until pedal pad aligns with clutch pedal. Tighten lock nut and turn push rod until free play is 5/32" (4 mm). Tighten lock nut.

DISC BRAKES

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

DRUM BRAKES

Rear brakes are self-adjusting on Dasher, Rabbit and Scirocco models; therefore, no adjustment in service is required.

Type 1 (All Wheels) – Turn adjuster until slight drag is felt when rotating drum by hand. Back off adjuster 3-4 notches, or until drum just rotates freely.

Type 2 – Turn adjusting nut for both shoes, alternating from one nut to the other, until both shoes touch drum. Turn both nuts back alternately, until drum just rotates freely.

All Others – Raise and support vehicle and ensure rear brakes are properly adjusted. Pull back boot at base of parking brake handle and loosen cable lock nuts. Pull handle up 2-3 notches and tighten each adjusting nut until rear wheels just lock. Tighten lock nuts and refit boot. Ensure rear wheels rotate freely with parking brake fully released.

PARKING BRAKE

Type 2 & Dasher – Raise and support vehicle and ensure rear brakes are properly adjusted. From under vehicle, loosen parking brake cable lock nut(s). Pull parking brake handle up 6 notches (2 on Dasher) and tighten cable adjusting nut(s) until rear wheels can just be turned by hand. Tighten lock nut(s) and ensure rear wheels rotate freely with parking brake fully released.

All Others – Raise and support vehicle and ensure rear brakes are properly adjusted. Pull back rubber (plastic) boot at base of parking brake handle and loosen parking brake cable lock nuts. Pull handle up 3 notches and tighten each adjusting nut until rear wheels just lock. Tighten lock nuts and refit boot. Ensure rear wheels rotate freely with parking brake fully released.

HYDRAULIC SYSTEM BLEEDING

CAUTION – *Push brake pressure regulator lever in direction of rear axle on Dasher, Rabbit and Scirocco when bleeding brake system.*

Attach bleed tube to bleeder screw and submerge opposite end in a jar half full of clean brake fluid. Pump pedal several times, with pressure applied to pedal, open bleeder screw. Close bleeder screw with pedal completely depressed. Repeat procedure until no air bubbles are seen in discharged fluid. Check master cylinder reservoir often; replacing fluid as required. Repeat operation on remaining brake lines. Sequence is right rear, left rear, right front, left front.

NOTE – *Pressure bleeding can be used to bleed brake lines.*

BRAKE PRESSURE REGULATOR

Type 2 – 1) Regulator is mounted on front side member. Connect one 1500 psi gauge to left front caliper and another gauge to left rear cylinder. Bleed gauges. Remove regulator mounting bolts.

2) Apply brake pedal until both gauges read 362 psi, maintain pressure and tilt front of regulator down to a 30° angle. Increase pressure until front gauge reads 724 psi; rear gauge should read 398-470 psi.

3) Return and secure regulator to proper position. Remove gauges and bleed brakes. Replace regulator if pressure is not within specified range.

Dasher (Pressure Sensitive) – 1) One regulator for each rear wheel is mounted on corresponding side of master cylinder. Connect one 1500 psi gauge to left rear cylinder and another gauge to right front caliper. Bleed gauges. Pump pedal several times.

2) Depress pedal until front gauge reads 497 psi; rear gauge should read 356-412 psi. Depress pedal further until front reads 1400 psi; rear gauge should read 768-852 psi. Repeat test on opposite system; replace regulator(s) if specified pressures are not attained. Remove gauges and bleed brakes.

Dasher, Rabbit, Scirocco (Load Sensitive) – 1) Regulator is located on body (right rear on Dasher; left rear on other models). Empty vehicle, fill fuel tank and load driver's seat to 165 lbs. Bounce car several times and allow vehicle to settle normally.

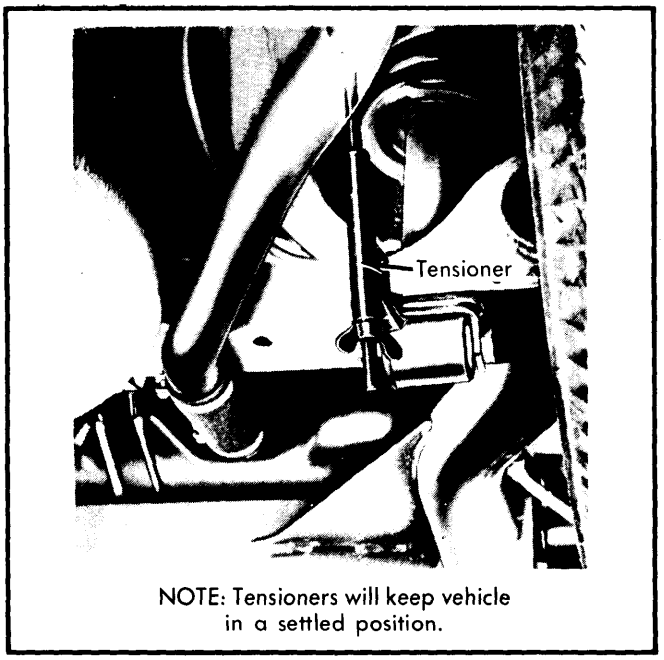
2) Measure distance from top of tire rim to lower edge of fender lip (both sides). Attach spring tensioners to hold vehicle in settled positon. See *Fig. 1*. Raise and support vehicle, check measurement and adjust tensioners if required. Connect one 1500 psi gauge to left front caliper and another gauge to right rear cylinder. Bleed gauges.

VOLKSWAGEN (Cont.)

3) Pump pedal several times. Depress pedal until front gauge reads 711 psi (710 psi, Dasher), rear gauge should read 441-498 psi (Dasher, 469-526 psi). Increase pedal pressure until front gauge reads 1422 psi (Dasher, 755-811), rear gauge should read 754-811 psi (Dasher, 782-839 psi).

4) If both pressures were high on rear wheel, loosen regulator clamp bolt and REDUCE spring tension. INCREASE spring tension if pressures were too low. Replace pressure regulator if spring adjustment does not correct pressures.

NOTE – *Do NOT adjust spring tension with brake pedal depressed.*



NOTE: Tensioners will keep vehicle in a settled position.

Fig. 1 Tensioner Position on Rabbit & Scirocco (Dasher Tensioner is Mounted With Wing Nut on Top)

REMOVAL & INSTALLATION

FRONT DISC BRAKE PADS

NOTE – *ATE or Girling calipers are used on all front discs. Rabbit and Scirocco models may be equipped with Kelsey-Hayes calipers. Disc pads are interchangeable between ATE and Girling calipers only.*

Removal (ATE) – **1)** Raise and support vehicle on safety stands; remove tire and wheel. Remove retaining clips (if equipped) and remove retaining pins and spreader spring. With a disc pad extractor, remove inner pad (both pads on Type 2). Remove outer pad with extractor tool after separating pad from notch.

2) Remove piston retaining plates. Replace linings if thickness is less than .08" (2.0 mm) on Type 2 and Dasher; .25" (6 mm) pad and lining thickness on Rabbit and Scirocco.

Installation – **1)** Siphon small amount of brake fluid from master cylinder reservoir. Seat piston in bore with suitable tool. Using a 20° gauge, check piston position and rotate if required.

2) Install piston retainers (if equipped) with lugs engaged in piston recesses and recessed point of retainer in forward direction of disc rotation. Install NEW spreader spring. Install retaining pins and clips (if equipped). Depress brake pedal to set pad-to-rotor clearance.

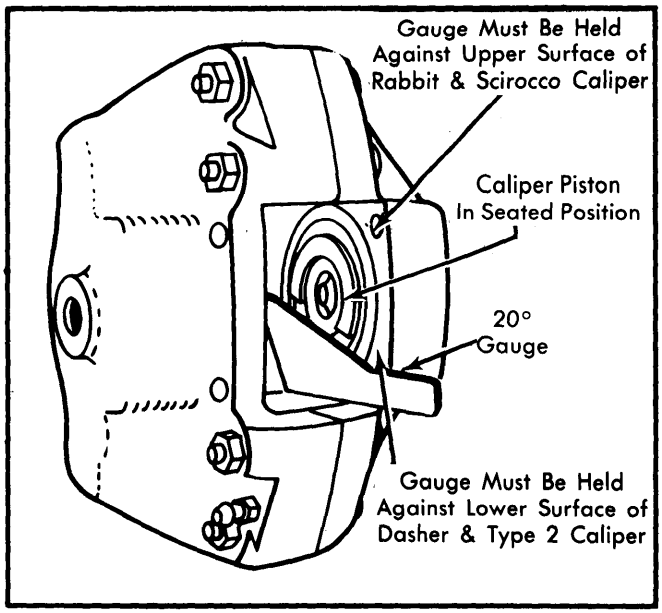


Fig. 2 Using a 20° Gauge to Position Piston in ATE Caliper Bore

Removal (Girling; Exc. Dasher) – **1)** Raise and support vehicle on safety stands; remove tire and wheel. Remove spreader spring. Remove pin retaining bolt (pin clips) and remove pad pins.

2) With disc pad extractor tool, remove pads and damping plates (if equipped). Replace pads if lining is less than .08" (2 mm) on Type 2; .25" (6 mm) on Rabbit and Scirocco.

Installation – **1)** Remove small amount of brake fluid from reservoir. Seat pistons in caliper bore with suitable tool. Install pads and damping plates (if equipped). Damping plates must be installed with arrows pointing in forward wheel rotation.

2) Attach spreader spring (if stamped with arrow, install with arrow down). Install pad pins and pin retaining bolt (pin clips). Depress brake pedal several times to adjust pad-to-rotor clearance.

Removal (Girling; Dasher) – **1)** Raise and support vehicle on safety stands; remove tire and wheel. Remove small amount of brake fluid from reservoir. Using hand pressure, seat piston in housing by pushing caliper toward outer bearing.

2) Remove lower caliper mounting bolt while holding guide pin head with open end wrench. Rotate caliper body upward. Remove pads. Replace pads if lining is less than .25" (6 mm).

Installation – To install, reverse removal procedure and install new lower mounting bolt. Depress brake pedal several times to adjust pad-to-rotor clearance.

VOLKSWAGEN (Cont.)

Removal (Kelsey-Hayes) – Raise and support vehicle on safety stands; remove tire and wheel. Remove anti-rattle springs and guide pins. Remove and suspend caliper with wire. DO NOT allow caliper to hang from hydraulic line. Remove pads.

Installation – Insert pads in caliper support (inner pad is identified by chamfered ends). Remove brake fluid from reservoir and seat piston with suitable tool. Position caliper on support. Lube guide pins with silicone grease and install (long pin on top). Install anti-rattle springs. Depress brake pedal several times to adjust pad-to-rotor clearance.

DISC BRAKE CALIPER

Removal – Raise and support vehicle and remove wheel. Disconnect brake line from caliper and plug opening to prevent entry of dirt and foreign matter. Bend back locking tabs (if equipped) on mounting bolts. Remove caliper mounting bolts and take off caliper assembly.

Installation – To install, reverse removal procedure, using new lock plates and mounting bolts.

DISC BRAKE ROTOR

Removal – Remove grease cap (if equipped), cotter pin and loosen adjusting nut. Raise and support vehicle on safety stands; remove wheel and tire. Remove wheel bearing hardware. Pull hub and rotor from spindle without dropping outer bearing. Separate hub and rotor if necessary by removing Allen head bolts and using rubber hammer.

Installation – To install hub and rotor assembly, reverse removal procedure and adjust wheel bearings. *See Wheel Bearing Adjustment in WHEEL ALIGNMENT Section.*

FRONT BRAKE DRUM

CAUTION – *Loosen and tighten spindle nut only with wheels on the ground.*

Removal – Raise and support vehicle, and remove wheel. Remove retainer from speedometer cable. Remove dust cap from hub, then remove wheel bearing adjusting nut, and outer wheel bearing. Back off brake shoe adjusters, and remove hub and drum assembly from vehicle.

Installation – To install, reverse removal procedure. Adjust and lubricate wheel bearings, and adjust brake shoes.

REAR BRAKE DRUM

CAUTION – *Loosen and tighten spindle nut only with wheels on the ground.*

Removal (Type 1 & 2) – Remove dust cap, cotter pin (if equipped) and loosen castellated nut (clamp nut). Raise and support vehicle on safety stands; remove tire and wheel. Release parking brake and back off adjuster. Remove drum retaining screws (if equipped); install puller and remove drum.

Installation – To install, reverse removal procedure and ensure drum retaining screws are tight.

CAUTION – *Before removing right drum, release spring pressure on pressure regulator (if equipped).*

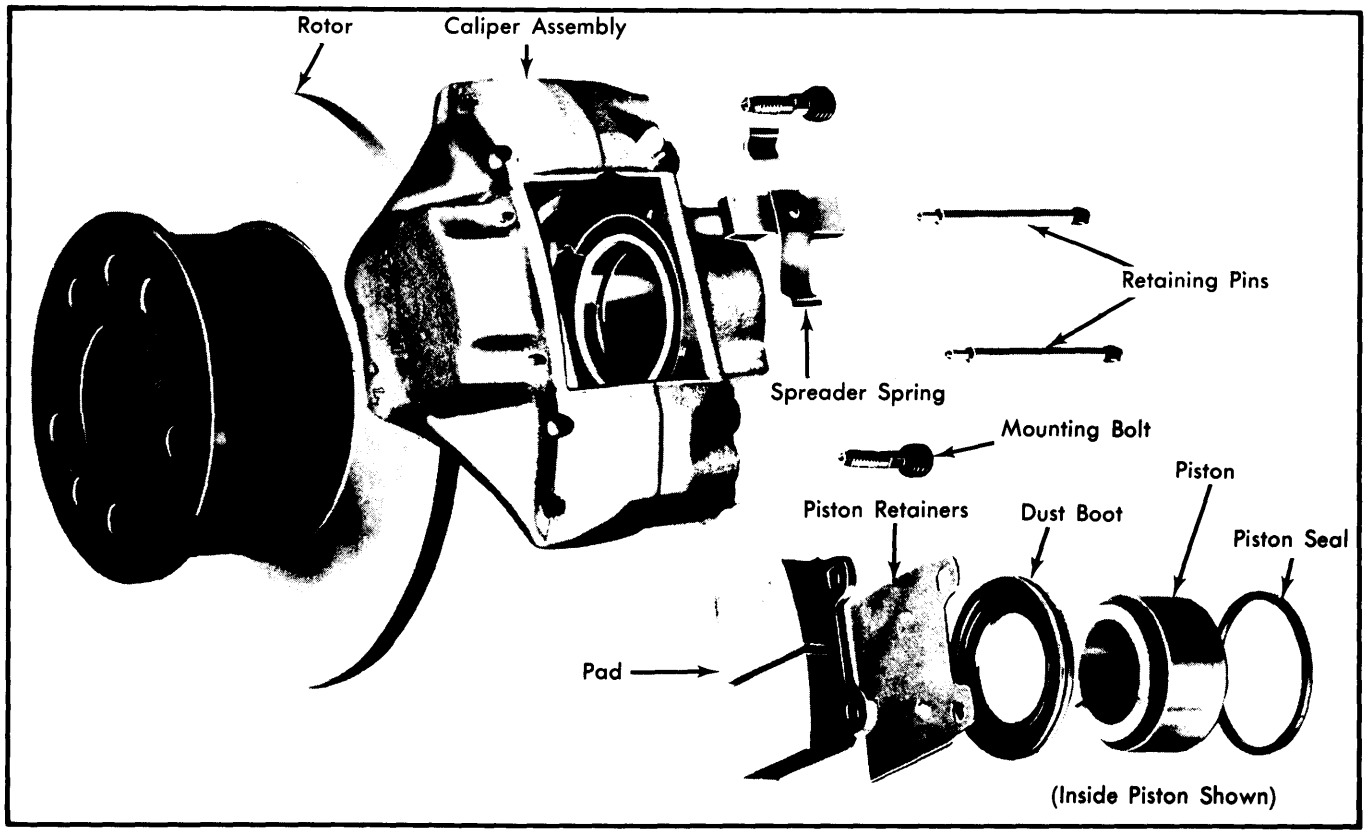


Fig. 3 Volkswagen Type 2 ATE Front Disc Assembly. Girling Caliper Has Dust Boot Retaining Ring Separate from Boot and Damping Plates Replace Retainers.

VOLKSWAGEN (Cont.)

Removal (All Others) – Raise and support vehicle. Remove one wheel bolt and push adjusting wedge upward with a screwdriver. Reinstall wheel bolt, remove wheel bearing hardware. Remove drum assembly from spindle without dropping thrust washer or outer bearing.

Installation – To install, reverse removal procedure and adjust wheel bearings. *See Wheel Bearing Adjustment in WHEEL ALIGNMENT Section.* Apply brake pedal firmly to set self-adjusting mechanism.

BRAKE SHOES

Removal (Type 1 & 2) – With wheel and drum removed, remove hold down springs and pins. Remove return springs. On rear brakes only, disconnect parking brake cable from lever. Remove brake shoes and separate shoes from attaching hardware.

Installation – To install, reverse removal procedure, adjust brakes and bleed hydraulic system if necessary.

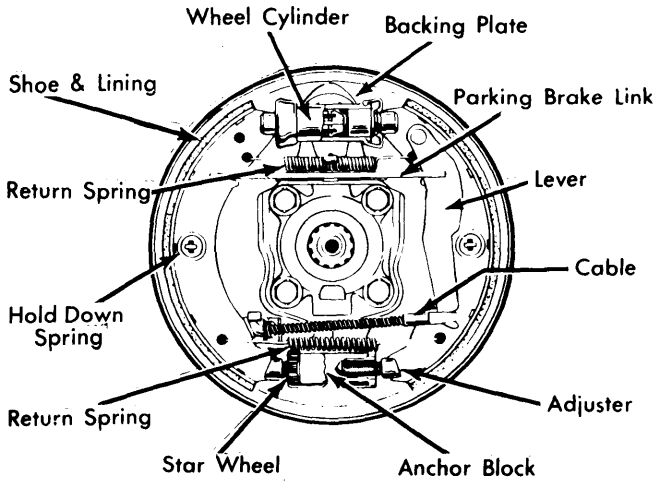


Fig. 4 Type 1 & 2 Rear Brake Assembly. Type 1 Front Brake Is Similar Except for Parking Brake.

Removal (All Others) – 1) With drum removed, remove hold down springs and pins. Remove brake shoes from anchor pins and remove return spring.

2) Disconnect parking brake cable from lever. Disconnect adjusting wedge spring and upper return spring. Remove brake shoes. Place adjuster strut and shoe in vise; remove tension spring. Separate shoe and components.

Installation – To install, reverse removal procedure and note the following: Lug on adjusting wedge faces backing plate. Adjust wheel bearings. *See Wheel Bearing Adjustment in WHEEL ALIGNMENT Section.* Apply brake firmly to set adjuster mechanism.

WHEEL CYLINDER

Removal & Installation – With brake shoes and drum removed, remove hydraulic lines and plug openings. Remove mounting bolts and remove wheel cylinder. To install, reverse removal procedure and bleed hydraulic system.

MASTER CYLINDER

NOTE – *Removal and installation of all master cylinders is basically the same. The following variations may apply: Location of cylinder, removal of wheel for accessibility, number of fluid connections, and number of electrical connections.*

Removal – Drain or siphon fluid from reservoir(s). Raise and support vehicle, and remove cover plate (if equipped). Disconnect fluid lines at master cylinder. Disconnect electrical connections at cylinder, and remove push rod at brake pedal connection. Remove master cylinder attaching bolts, and remove master cylinder from vehicle.

NOTE – *If spacers are used on attaching bolts, do not drop or lose spacers.*

Installation – To install, reverse removal procedure and note the following: On vehicles equipped with a power brake unit, install a new "O" ring seal between master cylinder and power unit. After installation, bleed hydraulic system.

POWER BRAKE BOOSTER

Function Test – Depress and release brake pedal several times (engine off) to exhaust vacuum. Depress and hold pedal; start engine. Pedal should fall slightly then hold. Replace booster assembly if check valve is operative and no defects or leaks are present in vacuum or hydraulic systems.

Removal – Remove master cylinder from power brake unit (except Type 2). Remove pin at brake pedal and disconnect operating rod. Remove mounting nuts from firewall. Disconnect vacuum lines and remove power unit.

Installation – 1) To install, reverse removal procedure and note the following: Always replace damping ring, washer, filter and "O" ring. Slots in damping washer and filter must be offset 180°. Adjust push rod clearance.

2) To adjust clearance on Rabbit and Scirocco (measured between booster mounting flange and clevis hole), loosen lock nut and rotate push rod until distance is 8 1/8" (206 mm). Tighten lock nut.

3) To adjust clearance on Dasher (measured from inside portion of steering wheel to top of pedal pad), loosen lock nut and rotate push rod until distance is 23 13/16" (605 mm). Tighten lock nut.

CHECK VALVE

Function Test – Check valve is located in vacuum line between power brake unit and intake manifold. Blowing into large diameter side must unseat valve; valve must seat when test is performed on opposite side. Replace defective valve.

VACUUM BOOSTER

Fuel Injected Rabbit & Scirocco – An adjustable or nonadjustable vacuum booster is installed to increase vacuum to power brake unit. To check booster, warm engine until oil reaches 140°F. Install "T" connector between distributor vacuum unit and intake manifold. Gauge should read 7.4" (188 mm) vacuum with engine idling. If not, check vacuum lines for leaks; if yes, check booster as follows: Remove and plug

VOLKSWAGEN (Cont.)

hose from right side of booster. Loosen locknut (if equipped) and install vacuum gauge and hose. Gauge should read 11.8" (300 mm) vacuum with engine idling. Adjust screw in or out to obtain correct reading (if equipped); replace defective booster.

VACUUM PUMP (DIESEL ONLY)

Removal & Installation – Remove vacuum lines from upper housing. Remove unit from engine block. To install, reverse removal procedure and replace "O" ring at mounting base.

OVERHAUL

DISC BRAKE CALIPER

Disassembly (ATE & Girling; Type 2) – 1) Remove disc pads and retaining plates (damping plates). Clamp mounting flange in a vise and remove dust boot retainer (if equipped) and dust boot.

2) Install piston retaining tool on one piston, insert wooden block in caliper and remove piston with compressed air. Repeat procedure for opposite piston. Remove piston seals without damaging bore.

Cleaning & Inspection – Clean all parts in brake fluid. Check piston and caliper bore for wear or damage; replace as necessary. DO NOT split caliper housings; assembly must be replaced if split. Replace all parts included in repair kit.

Reassembly – Apply light coat of brake paste to piston and seal. Fit seal in groove. Install piston and clamp at bottom of bore. Lightly coat inside of dust seal with paste and fit to piston. Using suitable tool (VW 442), press seal and piston into caliper. Fit retaining plate and position piston in bore. Repeat procedure on other half of caliper.

NOTE – *Ensure pistons are properly seated and piston retainers (damping plates) are properly installed.*

Disassembly (ATE; Dasher, Rabbit & Scirocco) – 1) Remove disc pads. Press caliper frame off floating frame. Insert wooden block in floating frame and drive cylinder and guide spring off with brass drift.

2) Remove piston retaining ring and dust seal. Protect piston with wooden block and force piston out with compressed air. Remove piston seal without damaging bore.

Cleaning & Inspection – Clean all parts in brake fluid. Check piston and caliper bore for wear or damage; replace as necessary. Replace all parts included in repair kit.

Reassembly – To reassemble, reverse disassembly procedure and note following: Coat piston with brake paste. Use a vise to seat piston. Use a brass drift to fit brake cylinder to floating frame. Make sure two grooves in mounting frame are pushed over ribs on floating frame. Ensure piston is in proper position.

Disassembly (Girling; Rabbit & Scirocco) – Press cylinder out of frame. Remove dust boot and retaining ring from each piston. Hold piston between padded jaws of vise and blow pistons out of bore with compressed air. Remove piston seals without damaging bore.

Cleaning & Inspection – Clean all parts in brake fluid. Check piston and bore for wear or damage; replace as necessary. Replace all parts included in repair kit.

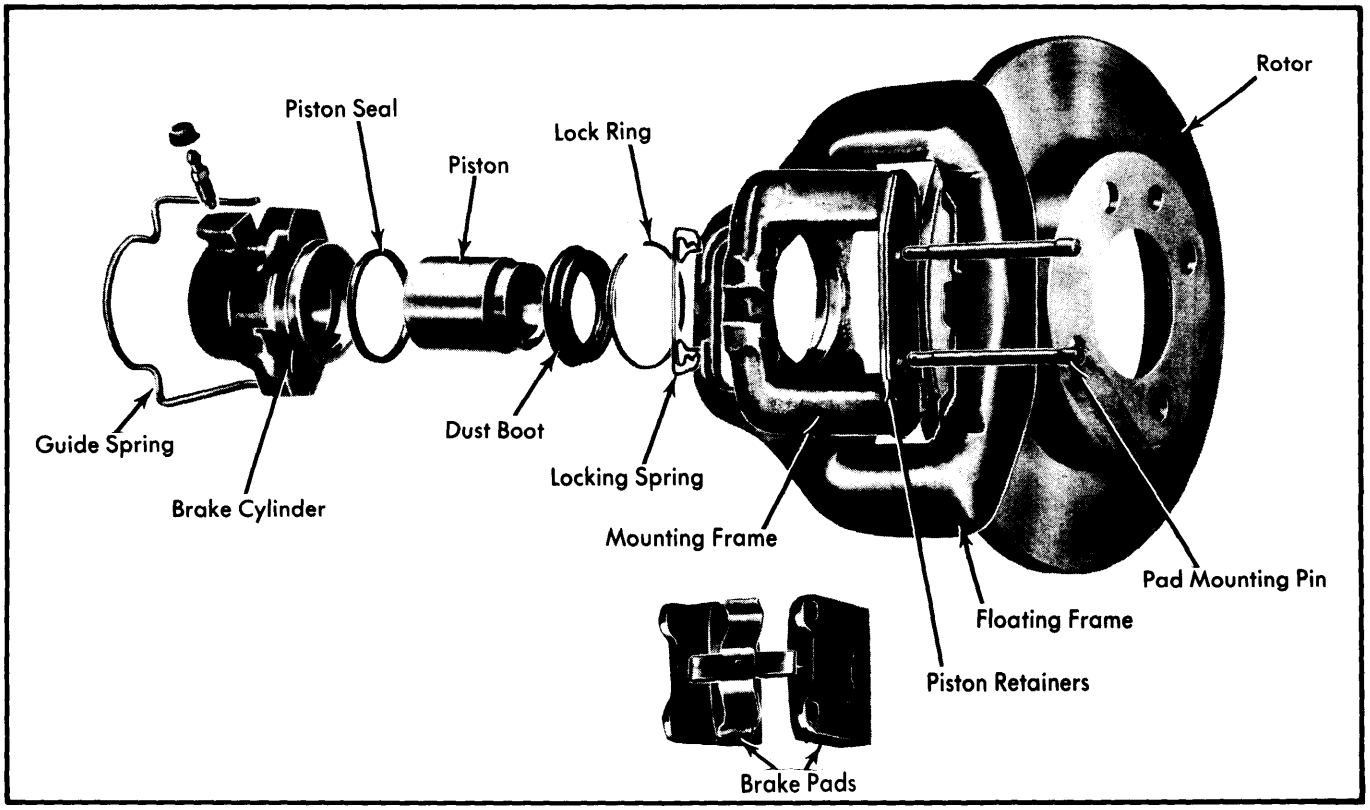


Fig. 5 ATE Disc Brake Assembly Used on Dasher, Rabbit and Scirocco

VOLKSWAGEN (Cont.)

Reassembly – To reassemble, reverse disassembly procedure and note: Coat pistons and seals with brake paste before refitting.

Disassembly (Girling; Dasher) – Separate cylinder housing from pad carrier. Remove dust cap. Insert wooden block in housing and blow out piston with compressed air. Remove piston seal without damaging bore.

Cleaning & Inspection – Clean all parts in brake fluid. Check piston and bore; if corroded, pitted or scored, replace defective part. DO NOT use abrasives. Replace all parts included in repair kit.

Reassembly – Coat piston, cylinder bore, and new seal with suitable brake paste. Fit seal into cylinder. Slide dust seal onto piston. Slowly insert piston into cylinder fitting inner lip of dust seal into cylinder housing groove. Fully seat piston into cylinder. Engage outer lip of dust seal into groove of piston.

Disassembly (Kelsey-Hayes; Rabbit & Scirocco) – 1) With caliper assembly removed from spindle, remove anti-rattle springs and guide pins. Remove brake hose from caliper and separate caliper from support.

2) Remove dust boot from piston. Place wooden block in caliper housing and blow out piston with compressed air. Remove piston seal without damaging bore. Remove guide pins and bushings, if necessary.

Cleaning & Inspection – Clean all parts in brake fluid. Check cylinder bore and piston for wear or corrosion; replace defective part. Replace all parts included in repair kit.

Reassembly – Coat seals, dust boot, cylinder bore and piston with brake paste. Coat guide pins with silicone grease. Reverse disassembly procedure and note the following: Seat dust boot with brass drift. Long guide pin is installed in top hole of caliper housing.

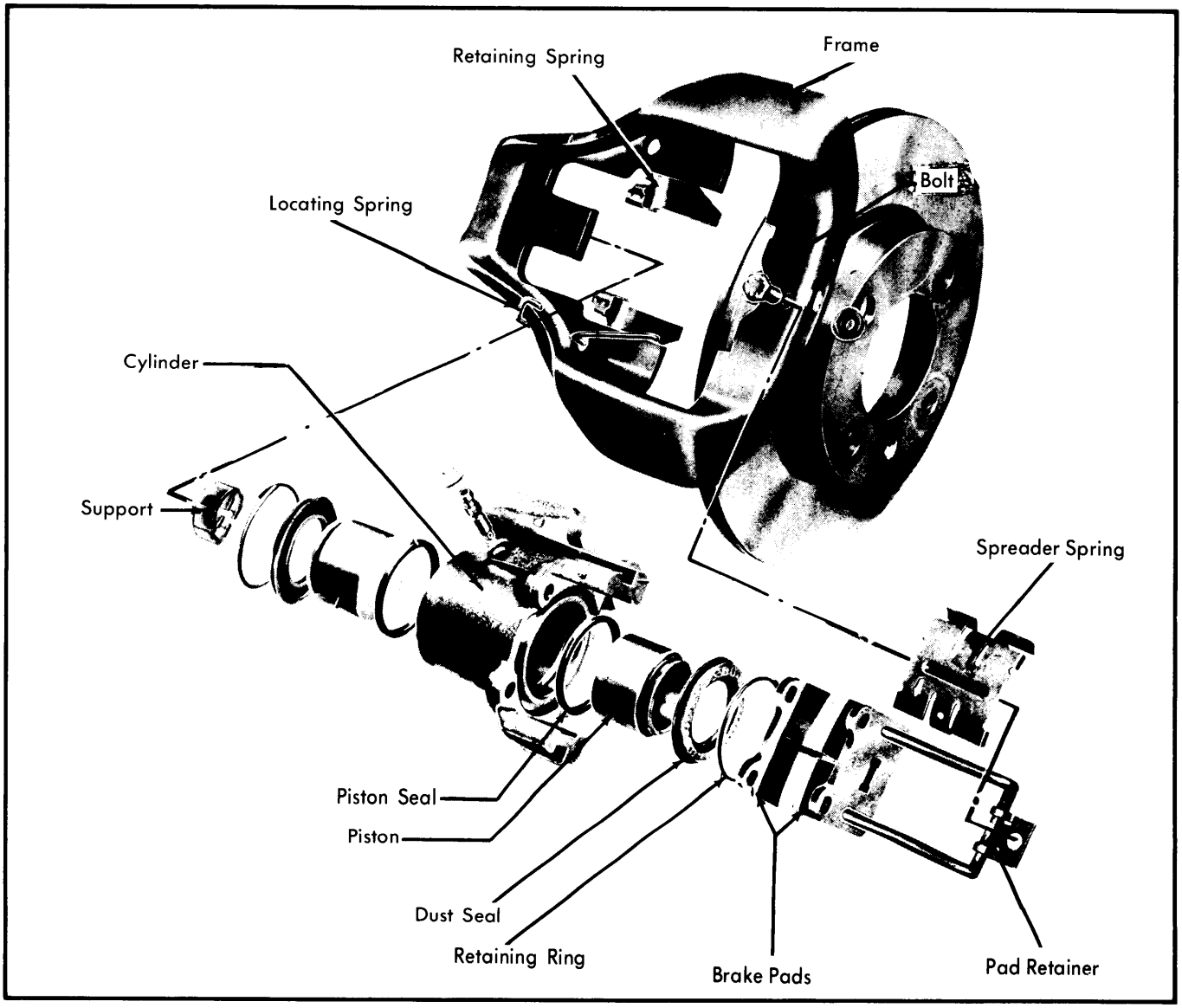


Fig. 6 Exploded View of Girling Disc Brake Assembly Used on Rabbit and Scirocco

VOLKSWAGEN (Cont.)

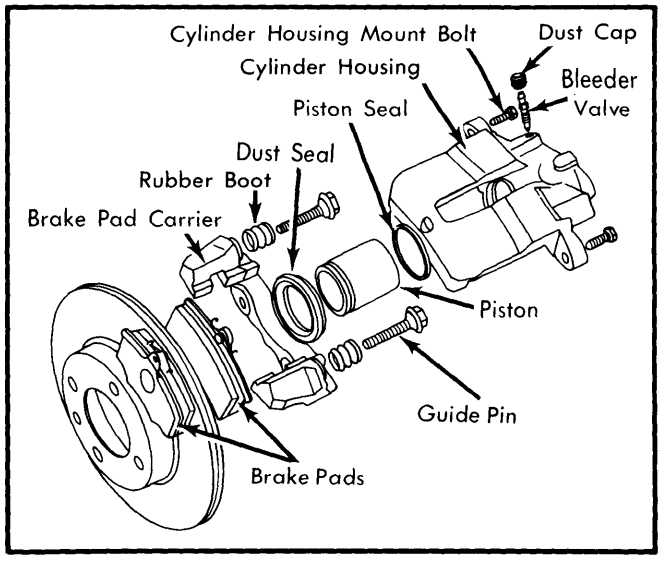


Fig. 7 Girling Disc Used on Dasher. Kelsey-Hayes Disc Used on Rabbit & Scirocco Is Similar.

WHEEL CYLINDER

Disassembly – Remove dust boots and working from one end, remove piston and push out opposite piston, cups, cup expanders (if equipped) and spring.

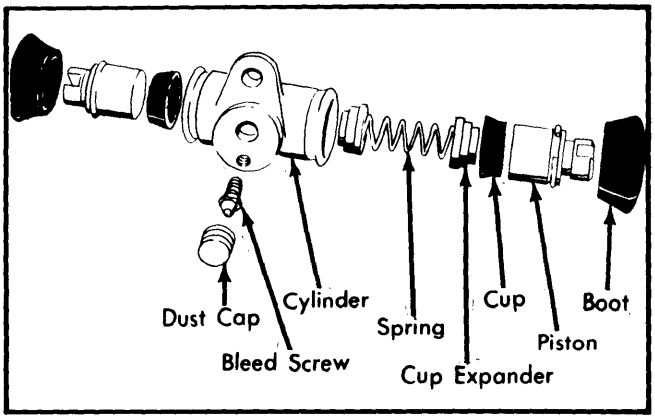


Fig. 9 Type 1 Wheel Cylinder (Others Similar)

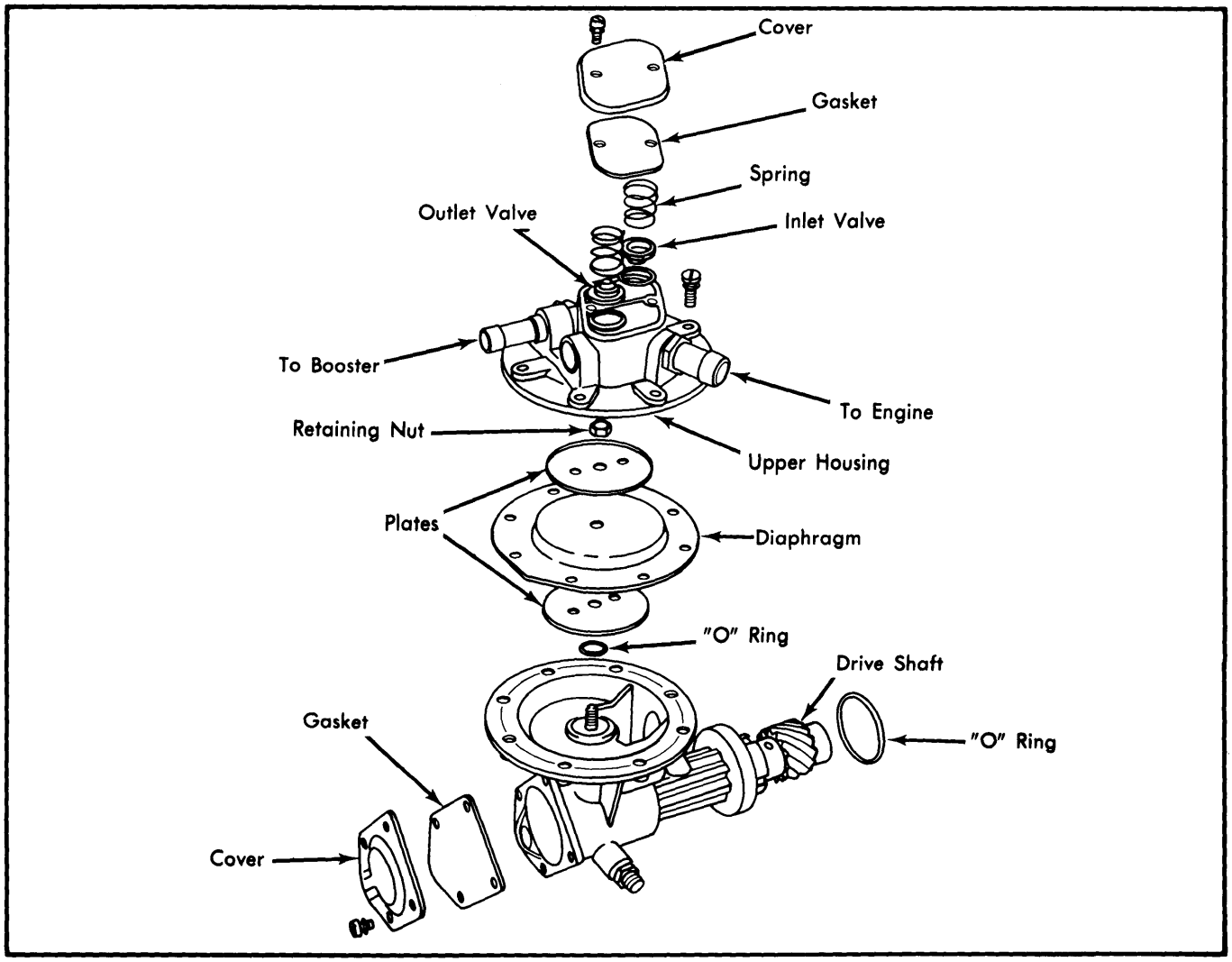


Fig. 8 Exploded View of Vacuum Pump Assembly (Diesel Engines Only)

VOLKSWAGEN (Cont.)

Cleaning & Inspection – Clean all parts in clean brake fluid or denatured alcohol. Check pistons and cylinder bore for out-of-round, wear or corrosion; replace as complete assembly.

Reassembly – To reassemble, reverse disassembly procedure, using new rubber components. Replace piston(s) and spring as necessary. Use brake cylinder paste on pistons and cups.

MASTER CYLINDER

NOTE – *Master cylinders differ in external design and primary piston configuration between power assist and non-power assist models. Disassembly procedures are the same.*

Disassembly – Remove dust boot ("O" ring) and piston stop screw. Remove lock ring (retainer) and washer. Tap open end of cylinder and remove piston assemblies. Separate primary and secondary piston assemblies. Remove all external mountings and hardware from cylinder.

Cleaning & Inspection – Clean all parts with brake fluid or denatured alcohol. Check cylinder bore and pistons for wear; replace as complete assembly if defective. Replace all rubber parts during overhaul and use all parts included in repair kit.

Reassembly – Reverse disassembly procedure and note the following: Coat primary piston shaft with lubricant supplied in repair kit. Coat pistons and cups with brake paste. DO NOT interchange return springs or piston cups. (ATE secondary cups are identified by chamfer and groove.)

POWER BRAKE UNIT & PRESSURE REGULATING VALVE

Manufacturer recommends replacing each unit as a complete assembly. DO NOT disassemble.

VACUUM PUMP (DIESEL ONLY)

Disassembly – 1) Remove cover from upper housing and separate components. Remove upper housing retaining screws and separate housings. Remove diaphragm retaining nut and separate diaphragm and plates.

2) Remove drive shaft cover and gasket. Remove retainer and washer from drive shaft. Push drive shaft back until push rod is free. Remove push rod.

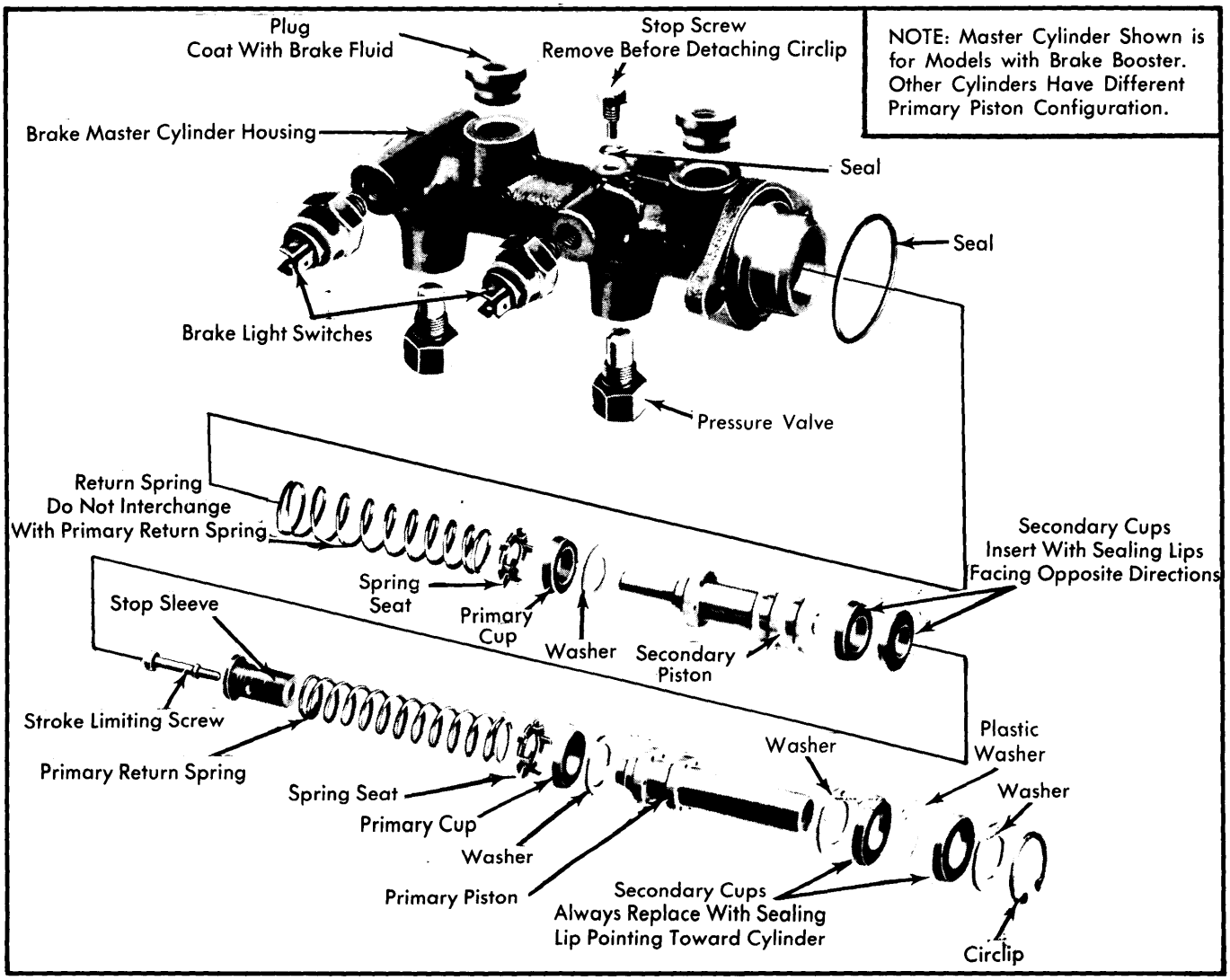


Fig. 10 Master Cylinder Component Relationship – Rabbit, Scirocco, Dasher Shown

VOLKSWAGEN (Cont.)

Cleaning & Inspection – Clean all parts in denatured alcohol and inspect body for cracks. Inspect diaphragm for cracks and deformation. Replace defective parts as required. Replace diaphragm retaining nut and all rubber parts during overhaul. Use all parts included in repair kit.

Installation – 1) Reassemble diaphragm assembly with diaphragm molded center facing up. Coat new retaining nut with sealing compound and tighten to 5 ft. lb. (0.7 mkg). Install upper housing plate with brake booster connection pointing straight up. Loosely install retaining screws.

2) Press and hold push rod into position. Tighten upper housing retaining screws. Push drive shaft into position and secure with washer and retainer. Replace spring sealing washers and install valves with spring seat toward housing. Replace gaskets and install covers.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Master Cylinder-to-Booster	9 (1.3)
Caliper Mounting Bolts	
Dasher (Support Bolt)	43 (6.0)
Dasher (Caliper-to-Support Bolt)	25 (3.5)
Type 2	123 (17.0)
Rabbit & Scirocco	36 (5.0)
Girling Caliper Pad Retainer Bolt	14 (2.0)
Kelsey-Hayes Guide Pins	30 (4.2)
Wheel Cylinder	
Type 1	
Front	18 (2.5)
Rear	14-22 (2.0-3.0)
All Others	7 (1.0)

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)
Type 2	.....	.....	.....	.512 (13)	.472 (12)	.452 (11.5)
Dasher, Rabbit & Scirocco	.....	.....	.....	.472 (12)	.413 (10.5)	.393 (10)

BRAKE DRUM SPECIFICATIONS

Application	Drum Diameter In. (mm)	Original Diameter In. (mm)	Maximum Refinish Diameter In. (mm)	Discard Thickness In. (mm)
Type 1				
Front	9.768 (248.1)	9.768① (248.1)	9.823 (249.5)	.....
Rear	9.055 (230)	9.055① (230)	9.114 (231.5)	.....
Type 2	9.921 (252)	9.921 (252)	9.980 (253)	.....
Dasher	7.87 (200)	7.87 (200)	7.89 (200.5)	7.91 (201)
Rabbit & Scirocco	7.08 (180)	7.08 (180)	7.10 (180.5)	7.125 (181)

① – Plus .008" (.20 mm).