TRIUMPH

Spitfire
TR7
TR8

DESCRIPTION

All models are equipped with front disc and rear drum brakes. A tandem master cylinder with 2 independent and complete hydraulic circuits is used on all models. A pressure differential valve is used on all models to detect low pressure in either front or rear brake circuit. When a pressure differential exists between the 2 circuits, the pressure differential valve will be positioned off-center and cause the brake failure warning lamp on instrument panel to glow. A vacuum servo unit is used on TR7 and TR8 models for power braking. Parking brake on all models is cable actuated on rear brakes.

ADJUSTMENT

DRUM BRAKES

Spitfire – Release parking brake and raise rear wheels off ground. Rotate square-ended adjuster on bottom center of backing plate clockwise until wheel locks. After wheel locks, rotate adjuster counterclockwise until wheel is just free to turn.

NOTE – *Rear brakes on TR7 and TR8 models are equipped with self-adjusting mechanism incorporated in parking brake linkage.*

PARKING BRAKE

NOTE – ***Adjustment of rear brakes will normally provide satisfactory parking brake adjustment. If cables are stretched, further adjustment is performed as follows:***

Spitfire – **1)** Raise and support vehicle. Release parking brake and lock both rear wheels. Check that front cable-to-rear cable equalizer is at a 15° angle as shown in *Fig. 1*. Adjust front and rear cables as necessary to obtain this specification.

2) To adjust front cable, remove seats, carpet, and parking brake lever cover to expose lever. Loosen cable lock nut and rotate cable clockwise to tighten or counterclockwise to loosen. Tighten lock nut and replace parking brake lever cover, carpet, and seats.

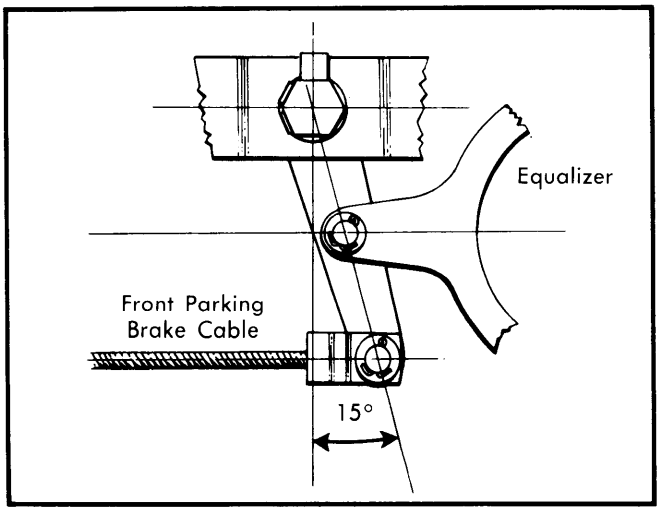

Fig. 1 Positioning Spitfire Front Parking Brake Cable and Equalizer for Parking Brake Adjustment

NOTE – *Before adjusting front cable, it may be necessary to release rear cables from rear backing plate operating levers.*

3) To adjust rear cables, disconnect parking brake cable clevis pins from operating levers on brake backing plates. Adjust each clevis equal amounts until clevis pin can be easily inserted into operating levers. Secure clevis pins and check operation.

TR7 & TR8 – **1)** Raise and support rear of vehicle; release parking brake lever. Disconnect parking brake cable clevis pins from operating levers on brake backing plates. With light finger pressure, push operating levers inward to ensure operating levers are in contact with brake shoes.

2) Align parking brake cable equalizer (located on right side of differential housing) ½" (12.5 mm) to left of vertical position. Adjust each clevis equal amounts until clevis pins can be easily inserted into operating levers. Secure clevis pins and check operation. Brakes should not drag. Parking brake lever travel should be 5-7 notches with 25 ft. lbs. (3.5 mkg) force applied to lever.

BRAKE WARNING LIGHT

NOTE – *Warning light will glow after any repair on service brake system and will not go out until manually reset by bleeding hydraulic circuit.*

A dual warning light is mounted on instrument panel. Parking brake light should glow when lever is pulled 1 notch (ignition on) and go off when lever is fully released. To check circuit warning sensor, fully release parking brake and ensure light is off (ignition on). Open 1 bleed screw and depress brake pedal; light should glow. To reset warning light, bleed hydraulic system and check operation of brakes. After bleeding brakes, turn ignition on; warning lamp should not glow. If warning lamp glows, center differential valve.

NOTE – *During bleeding process, use only short strokes to prevent differential valve from being forced off-center.*

REMOVAL & INSTALLATION

DISC BRAKE PADS

Removal – Raise and support vehicle; remove tire and wheel. Remove retaining pins and springs. Lift out brake pads, complete with damper shims.

Installation – Clean surfaces of pistons and caliper cavity. Ease caliper pistons into bores (with bleed screw slightly opened) to provide clearance. Insert new pads and shims. Arrow on Spitfire shim faces up; smaller cut-out on TR7 and TR8 faces up. Install retaining springs and pins.

DISC BRAKE CALIPER

Removal (Spitfire) – Raise and support vehicle; remove tire and wheel. Disconnect and plug hydraulic line-to-caliper flex hose. Remove nut securing flex hose to front suspension bracket and remove hose from bracket. Disconnect and plug hose at caliper. Remove 2 caliper mounting bolts and washers. Remove caliper and shield.

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

Removal (TR7 & TR8) – Raise and support vehicle; remove tire and wheel. Disconnect and plug hydraulic line at caliper. Remove 2 bolts and washers retaining steering arm and lower

TRIUMPH (Cont.)

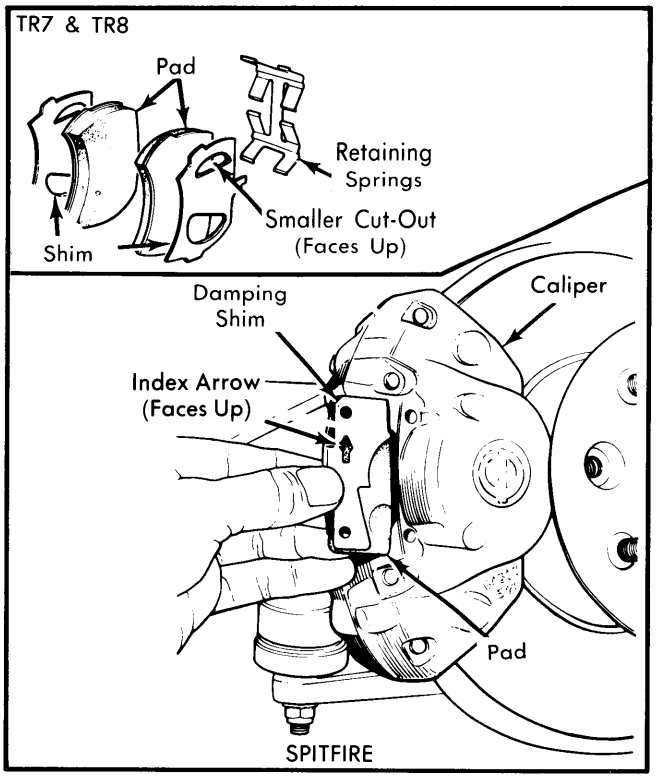

Fig. 2 Installing Disc Brake Pads

caliper mounting lug to stub axle. Push steering arm clear. Remove upper caliper mounting bolt and remove caliper.

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

DISC BRAKE ROTOR

Removal – Raise and support vehicle; remove tire and wheel. Remove caliper without disconnecting hydraulic line and hang out of way. Remove grease cap, cotter pin, castellated nut and washer. Remove hub, complete with bearings and disc. Remove 4 hub-to-rotor bolts and separate hub from rotor.

Installation – To install, reverse removal procedure and note the following: On Spitfire, adjust hub end play to .003-.005" (.076-.127 mm). On TR7 and TR8, eliminate end play, but do not tighten hub more than 5 ft. lbs. (.70 mkg). On all models, adjust wheel bearings. *See Wheel Bearing Adjustment in WHEEL ALIGNMENT section.*

REAR BRAKE DRUM

Removal – Raise and support vehicle; remove tire and wheel. Remove 2 brake drum retaining screws. Release parking brake and remove brake drum. On TR7 and TR8, if drum is difficult to remove, release self-adjuster. To release adjuster, remove dust cover on rear of backing plate, insert small screwdriver and engage slotted hole in small adjusting lever. Press lever down to release adjuster.

Installation – To install, reverse removal procedure and note the following: On TR7 and TR8, if brake adjustment was released, neutralize brakes, install brake drum and depress brake pedal to set shoe-to-drum clearance. On all models, tighten retaining screws evenly.

REAR BRAKE SHOES

Removal (Spitfire) – **1)** Remove brake drum as previously outlined. Remove parking brake lever cotter pin, shoe anchor pins, springs and cups. Release lower end of rear shoe from adjuster, then release upper end from wheel cylinder.

2) Disconnect return springs and remove brake shoe. Release lower end of front shoe from adjuster, then release parking brake lever from top of shoe. Carefully remove front shoe from wheel cylinder, without pulling piston out of wheel cylinder. Remove brake adjuster retaining nuts and brake adjuster.

Installation – To install, reverse removal procedure and adjust brakes. Return springs are installed on inboard side of shoes.

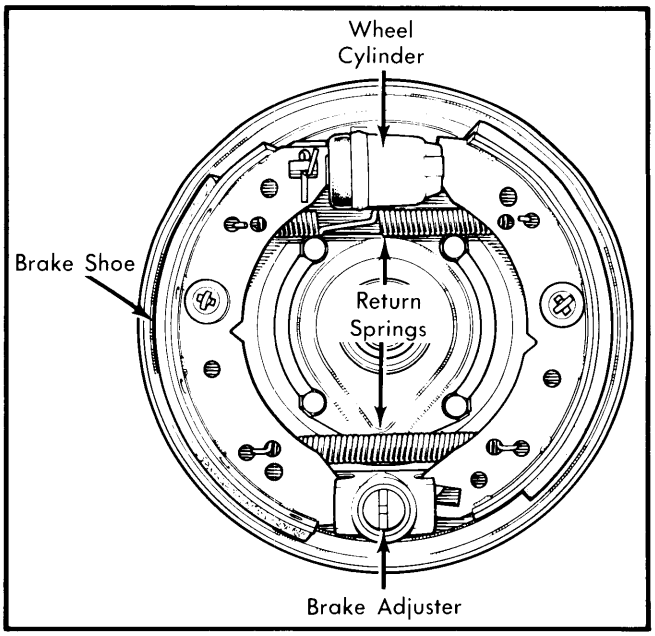

Fig. 3 Exploded View of Spitfire Rear Brake Assembly

CAUTION – *Upper and lower return springs are not interchangeable on TR7 and TR8 models. Note position of each spring prior to removal.*

Removal (TR7 & TR8) – **1)** Remove brake drum as previously outlined. Remove cotter pin from parking brake lever on rear of backing plate. Separate lever from parking brake lever. Remove rear shoe anchor pins, springs and cups. Disconnect and remove lower return spring.

2) On rear shoe, disconnect and remove parking brake lever return spring. Place a clamp on wheel cylinder to prevent pistons from popping out of wheel cylinder. Remove lower end from wheel cylinder without damaging cylinder boot. Disconnect upper return spring and remove rear shoe.

3) On front shoe, remove "E" clips from shoe retainers. Carefully withdraw lower end of shoe from wheel cylinder. Remove front shoe from backing plate with upper return spring and parking brake lever installed. Separate parking brake lever and strut from shoe. Remove upper return spring.

Installation – **1)** To install, reverse removal procedure and note the following: Upper return spring must be installed on inboard side of brake shoes. After installation, check operation

TRIUMPH (Cont.)

of adjusting mechanism by lightly applying brakes with drum removed. After shoes have expanded, adjusting ratchet should move.

2) Replace brake drum, depress brake pedal several times to set shoe-to-drum clearance. Bleed hydraulic system and road test vehicle. If parking brake and service brake operation is poor during road test, make 4 brake applications (moderate pedal effort) to decelerate vehicle from 20 to 0 MPH. This will ensure proper adjustment of rear brakes.

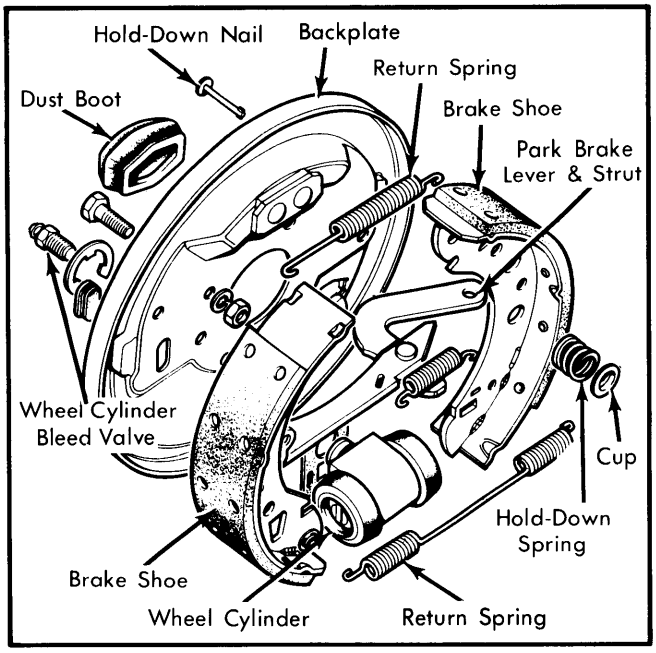

Fig. 4 Exploded View of TR7 and TR8 Rear Brake Assembly

MASTER CYLINDER

Removal – Disconnect all hydraulic lines and electrical connections (if equipped) from master cylinder. On models equipped with vacuum servo unit, remove mounting nuts and washers, then remove master cylinder. On models without vacuum servo unit, disconnect master cylinder push rod from brake pedal. Remove 4 mounting bolts securing master cylinder to firewall, then remove 2 bolts securing cylinder to front bracket. Remove master cylinder.

Installation – To install, reverse removal procedure and note the following: Bleed hydraulic system and check that pressure differential valve is centered.

VACUUM SERVO UNIT

Removal & Installation – Remove master cylinder as previously outlined. Disconnect vacuum hose from check valve. Remove clevis pin from servo operating rod and brake pedal lever. Remove 4 mounting nuts and washers, then remove servo. To install, reverse removal procedure.

PRESSURE DIFFERENTIAL VALVE

Removal & Installation – Disconnect electrical leads. Disconnect inlet and outlet lines and plug all ports to prevent loss of fluid and entry of dirt. Remove bolt securing valve and remove unit. To install, reverse removal procedure, bleed brakes and if necessary, center valve shuttle.

REAR BRAKE WHEEL CYLINDER

Removal & Installation – Remove brake shoes as previously outlined. Drain fluid and disconnect flexible hydraulic line at wheel cylinder. Remove wheel cylinder dust cover, retaining clip and spring plate. Remove wheel cylinder complete with parking brake operating lever. To install, reverse removal procedure and bleed hydraulic system.

NOTE – *TR7 and TR8 models have single bleed screw on right wheel cylinder and no bleed screw on left cylinder. Left cylinder has fluid line installed in place of screw to transfer fluid to right wheel cylinder. DO NOT interchange wheel cylinders.*

OVERHAUL

DISC BRAKE CALIPER

Disassembly – Using low air pressure, force pistons from caliper bores. If pistons are seized, the whole caliper assembly must be removed. Carefully pry dust seal retainer from groove, using a blunt instrument. Take out dust seal and then fluid seal.

Inspection – Clean caliper bores and inspect for deep scratches or pitting. Look at pistons and ensure they are not corroded or damaged. Replace components as necessary.

Reassembly – Fit new fluid seals into caliper bores, making sure they are properly located. Lightly coat bores with clean brake fluid. Insert pistons into caliper bores with approximately 5/16" (7.9 mm) of each piston protruding from mouth of each bore. Fit new dust seal into retainer, then slide assembly, seal first, into mouth of bore. Fully seat pistons, ensuring retainers are not distorted.

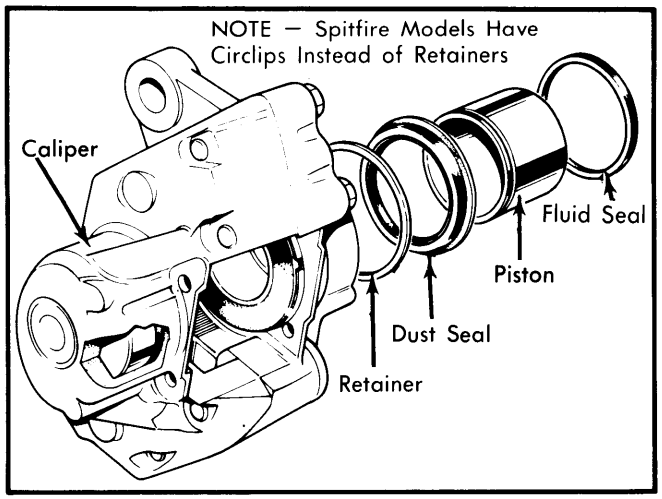

Fig. 5 Disassembled Front Disc Brake Caliper Spitfire Shown – Others Similar

REAR WHEEL CYLINDER

Disassembly – Remove wheel cylinder as previously outlined. Remove dust cover retaining ring (if equipped) and dust cover(s). On Spitfire, remove piston and separate seal from piston using fingers only. On TR7 and TR8, press on one piston to force pistons, seals and springs from cylinder.

Cleaning & Inspection – Clean all parts in alcohol or brake fluid and examine cylinder bore and piston for score marks, ridges or corrosion. If either bore or piston is damaged, replace entire cylinder assembly.

TRIUMPH (Cont.)

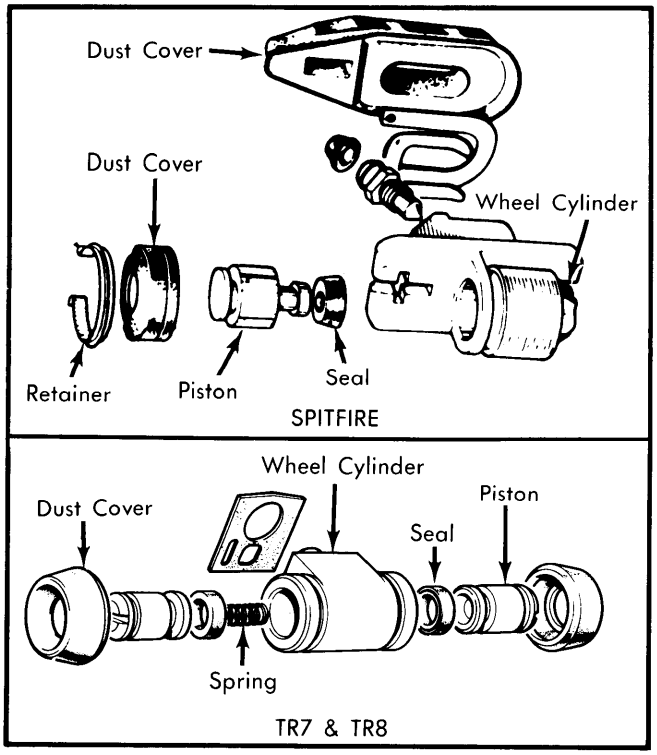

Fig. 6 Exploded View of Rear Wheel Cylinders

Reassembly – Install new seal(s) on piston(s). Lubricate seal(s), inside of cylinder and piston(s) with clean brake fluid. Reverse disassembly procedure to complete reassembly of wheel cylinder.

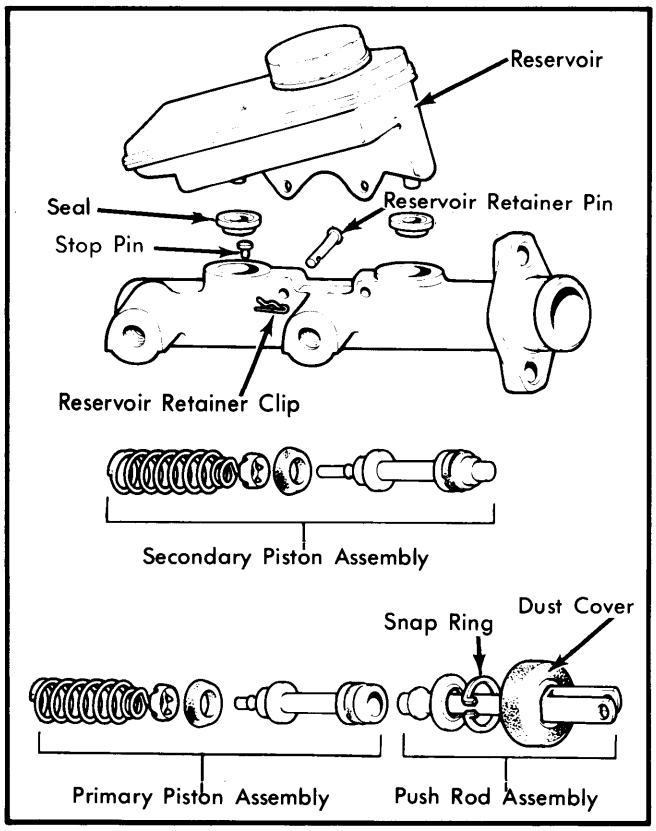

Fig. 7 Exploded View of Spitfire Master Cylinder

MASTER CYLINDER

Disassembly – 1) Drain and discard hydraulic fluid from reservoir. Remove reservoir from master cylinder. Note size and location of reservoir seals, then remove seal from master cylinder.

2) On Spitfire, slide push rod dust boot off master cylinder to expose push rod circlip. Remove circlip, withdraw push rod and separate components. Withdraw primary piston assembly.

3) On TR7 and TR8, remove metal cap and rubber boot from end of master cylinder. Remove circlip, then withdraw primary piston assembly.

4) On all models, insert a rod into bore to depress secondary piston assembly. With piston assembly depressed, remove stop pin, then extract secondary piston assembly.

5) On TR7 and TR8, unscrew pressure failure switch from cylinder body. Remove end plug and copper washer, withdraw spacer, return spring and pressure differential piston as an assembly. Remove spring retainer, then separate spring and piston. Remove and discard "O" rings.

6) On all models, note size and position of all piston seals, washers and spring retainers. Remove seals using fingers only.

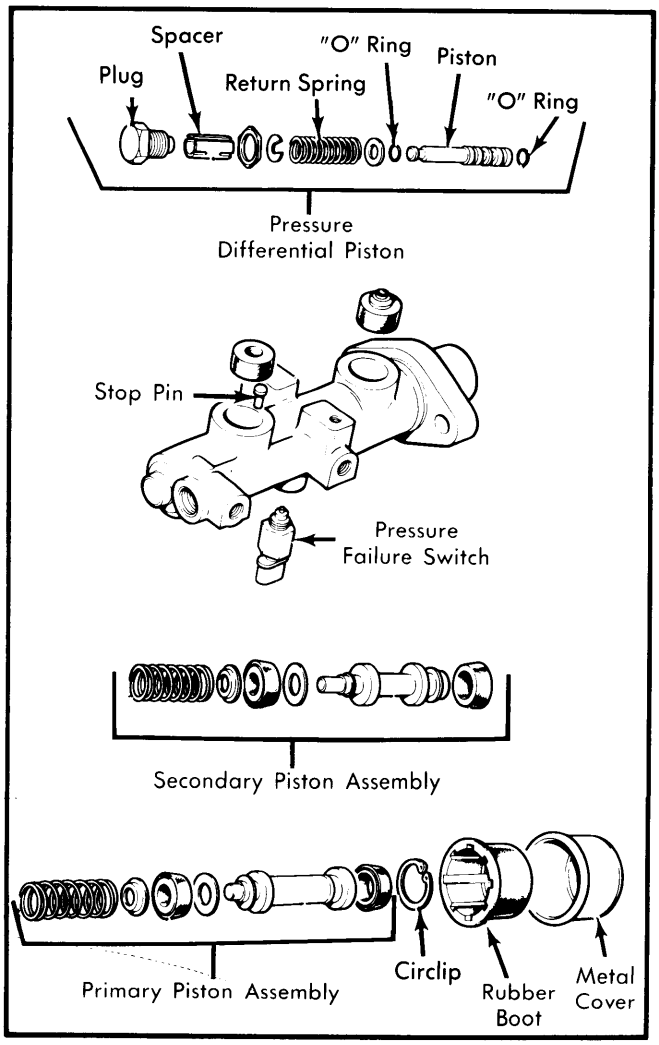

Fig. 8 Exploded View of TR7 and TR8 Master Cylinder

TRIUMPH (Cont.)

Reassembly – 1) Install seals on primary and secondary pistons, using fingers only. Ensure all seals, springs and washers are properly installed. To assemble, reverse disassembly procedure and note the following:

2) On TR7 and TR8, install new "O" rings, and assemble pressure differential piston assembly. Install pressure differential assembly using new copper washer and tighten end plug. Install reservoir with 2 new screws.

3) On all models, depress secondary piston assembly in cylinder bore and install stop pin. Install primary piston assembly and retain in position with new circlip.

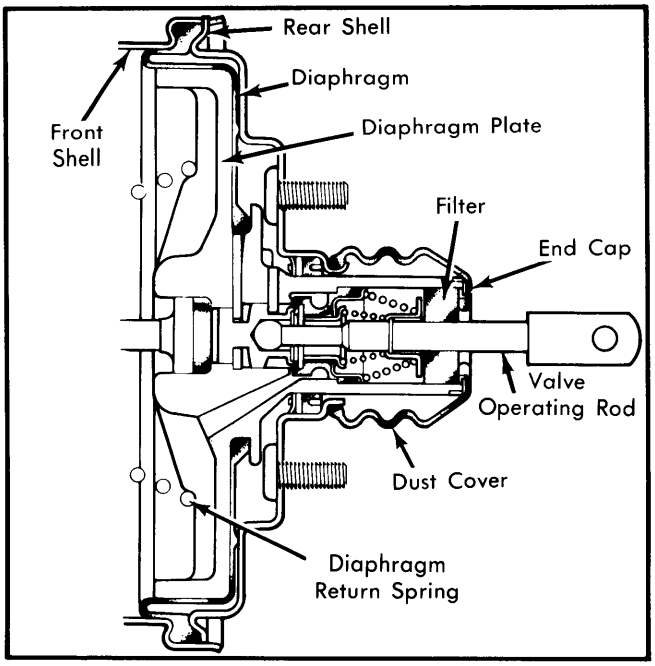

Fig. 9 Sectional View of Vacuum Servo Unit

VACUUM SERVO UNIT

NOTE – *Overhauling unit consists of changing check valve, filter dust cover, seal and plate assembly. Any other component failure requires complete unit replacement. Replacing filter is the only normal service required. A service repair kit is available for limited service.*

Disassembly – 1) Remove servo unit as previously outlined. To remove check valve, note angle of valve in relation to servo housing. Use a suitable wrench to press down on valve and rotate counterclockwise ⅓ turn.

2) Remove filter by pulling back dust cover and pulling out filter. Do not remove valve operating rod. For ease of filter installation, cut new filter diagonally.

NOTE – *Servo push rod to master cylinder clearance is set by factory and secured with Loctite. No attempt should be made to alter setting.*

Reassembly – To reassemble components of servo unit, reverse disasssembly procedure.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Rotor-to-Hub	
Spitfire	34 (4.7)
TR7 & TR8	32 (4.4)
Caliper Mounting Bolts	
Spitfire	65 (9.0)
TR7 & TR8	74 (10.2)
Reservoir-to-Master Cylinder (TR7 & TR8)	5 (.69)
Master Cylinder End Plug (TR7 & TR8)	33 (4.6)
Master Cylinder-to-Press. Reduction Valve (TR7 & TR8)	9 (1.2)

DRUM BRAKE SPECIFICATIONS

Application	Wheel Cyl. Bore Diameter In. (mm)	Drum Diameter In. (mm)	Original Diameter In. (mm)	Maximum Refinish Diameter In. (mm)	Discard Diameter In. (mm)
Spitfire	.....	7.00 (178)	7.00 (178)	.....	.....
TR7 & TR8					
5-Speed	.....	9.00 (229)	9.00 (229)	.....	9.05 (229.9)
All Others	.....	8.00 (203)	8.00 (203)	.....	8.05 (204.5)

DISC BRAKE SPECIFICATIONS

Application	Caliper Bore Diameter In. (mm)	Lateral Runout In. (mm)	Parallelism In. (mm)	Original Thickness In. (mm)	Minimum Refinish Thickness In. (mm)	Discard Thickness In. (mm)
Spitfire	.....	.....	.....	.375 (9.5)	.....	.....
TR7 & TR8	.....	.....	.....	.375 (9.5)	.....	.....