

## TOYOTA

Celica  
Corolla  
Corona  
Cressida

Land Cruiser  
Pickup  
Supra  
Tercel

### DESCRIPTION

Brake systems are hydraulically actuated using a tandem master cylinder and vacuum power brake unit. Power assist units vary among models and Land Cruiser models use a separate vacuum pump to supply vacuum to power unit. Supra is equipped with 4-wheel disc brakes. All other models are equipped with front disc brakes and rear drum brakes. A load sensing proportioning valve is installed in rear circuit of all Pickup models (except 1/2 ton). Rear brakes on Pickup and Land Cruiser models require adjustment; all others are self-adjusting. All parking brakes are cable actuated and operate on rear discs of Supra; rear of transfer case on Land Cruiser and rear drum brakes of all other models.

**NOTE** — Brake caliper applications vary among models. Check and compare calipers with those shown in this article for correct service procedures.

### ADJUSTMENTS

#### DRUM BRAKES

**Pickup & Land Cruiser** — Raise and support vehicle on safety stands. Release parking brake and ensure wheel rotates freely. Remove plug from adjusting hole. Turn adjusting screw with suitable adjusting tool until wheel can not be turned. Depress brake pedal and ensure drum is locked. On Land Cruiser, back off adjuster 4-5 notches or until wheel turns with slight drag. On Pickup models, back off adjuster 10-12 notches or until wheel turns freely.

#### BRAKE PEDAL HEIGHT

Brake pedal height is measured from center of brake pedal to asphalt sheet under carpet. To adjust clearance, loosen stop light switch and lock nut on brake pedal push rod. Adjust pedal height by turning push rod. After setting pedal height, tighten lock nut, adjust stop light switch and tighten stop light switch lock nut. See Fig. 1.

Brake Pedal Height	
Application	Height In. (mm)
Celica, Corona & Supra .....	6.5-6.9 (165-175)
Corolla .....	6.9-7.3 (175-185)
Cressida .....	6.1-6.5 (156-166)
Land Cruiser .....	8.5 (215)
Pickup .....	6.2-6.6 (157-167)
Tercel .....	6.4-6.5 (164-165)

#### BRAKE PEDAL FREE PLAY

Pedal free play is distance brake pedal travels before initial resistance of power brake push rod is contacted. To adjust pedal free play, stop engine and depress brake pedal several times to exhaust vacuum from power brake unit. Place a

straightedge beside brake pedal, then press pedal down with fingers until initial resistance is felt. See Fig. 1. Free play should be .16-.28" (4-7 mm) for Tercel and .12-.24" (3-6 mm) for all others. If pedal travel is not as specified, adjust pedal height, start engine and confirm free play measurement. Check brake pedal height.

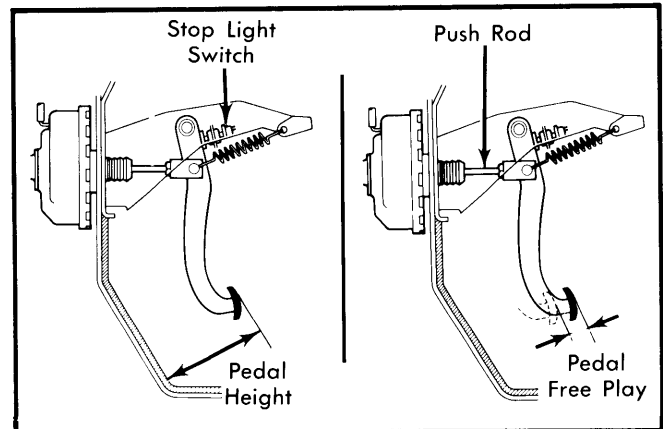


Fig. 1 Measuring Pedal Height and Free Play

#### PARKING BRAKE

**NOTE** — Before adjusting parking brake, release parking brake lever. Pull parking brake and count number of notches lever travels. If lever travel meets specifications, do not adjust parking brake. Pickup models require adjustment of service brakes before adjusting parking brake. On all other models, except Supra, if parking brake requires adjustment, first set brake shoe-to-drum clearance by depressing release knob on parking brake lever and operating lever several times. Recheck lever travel.

**Celica & Corolla** — If parking brake lever travel is not 3-6 notches, remove console (if equipped), release parking brake, loosen lock nut and turn adjusting screw on lever until lever travel is correct. Tighten lock nut and install console (if equipped). Wheels should be locked when parking brake is applied and rotate freely when lever is released.

**Corona** — If parking brake lever travel is not 3-7 notches; release parking brake, loosen lock nut on turnbuckle (under vehicle) and rotate turnbuckle until travel is correct. Tighten lock nut. Wheels should be locked when parking brake is applied and rotate freely when lever is released.

**Cressida** — If parking brake lever travel is not 5-7 notches; release parking brake and loosen lock nut on turnbuckle located under vehicle on right cable. Rotate turnbuckle until .39" (10 mm) of threaded cable end is inside turnbuckle. Tighten lock nut. Remove slack from rear cables by loosening lock nut on equalizer and turning adjusting nut. Tighten lock nut. Wheels should be locked when parking brake is applied and rotate freely when lever is released.

**Land Cruiser** — Fully release parking brake and turn adjusting cam on back of backing plate (at rear of transfer case) until brake shoes seat against drum. Back off adjusting cam 1 notch at a time until drum locks when parking brake is applied and spins freely when released. After adjusting brake shoes, adjust parking brake travel to 12 notches by turning cable adjusting nut or turnbuckle. Wheels should be locked when parking brake is applied and rotate freely when lever is released.

## TOYOTA (Cont.)

**Pickup** – 1) If parking brake lever travel is not 7-15 notches, adjust parking brake, AFTER adjusting service brakes. To adjust parking brake on 2-WD models, release parking brake and turn adjusting nut on intermediate lever (under vehicle) until lever travel is correct. Wheels should be locked when parking brake is applied and rotate freely when lever is released.

2) To adjust parking brake on 4-WD models, release parking brake and loosen lock nut stopper screw on operating lever on rear of backing plate. Turn stopper screw until no play is evident at operating lever. Tighten stopper screw lock nut, then tighten 1 adjusting nut on intermediate lever while loosening other nut until lever travel is correct. Tighten both adjusting nuts. After lever travel is correct, operating lever stopper screw MUST contact backing plate when lever is released.

**Supra** – If parking brake lever travel is not 5-8 notches; release parking brake and depress brake pedal 2-3 times. Check parking brake lever travel. If travel is not correct; release parking brake lever, loosen turnbuckle lock nut located under vehicle on right cable and rotate turnbuckle to put slack in cable. Tighten turnbuckle until parking brake operating lever on rear caliper begins to move. Tighten turnbuckle lock nut. Check parking brake operation.

**NOTE** – With either operating lever pushed away from caliper, it should not move when opposite operating lever is pushed away from caliper. If it does, cable is too tight and parking brake must be readjusted.

**Tercel** – If parking brake lever travel is not 2-5 notches; release parking brake and loosen lock nut on equalizer (under vehicle). Turn adjusting nut until lever travel is correct. Wheels should be locked when parking brake is applied and rotate freely when lever is released.

### STOP LIGHT SWITCH

Stop light switch is located under dash, above brake pedal. To adjust, loosen lock nuts and adjust switch so contact button just touches brake pedal. Tighten lock nut and check pedal height.

### BRAKE WARNING LIGHT

A dual warning light is mounted on dash of all vehicles except Pickups (single warning light). On all models, light should glow when parking brake lever is pulled 1 notch and go off when lever is fully released (ignition on). To check circuit warning on all models except Pickups, release parking brake (ignition on) and ensure light is off. Open bleed screw on 1 wheel and depress brake pedal; light should glow. Close bleed screw, replenish brake fluid and bleed hydraulic system.

### LOAD SENSING PROPORTIONING VALVE (PICKUPS, EXCEPT ½ TON)

1) Set rear axle load (including vehicle weight) to 1433 lbs. (650 kg) on 4-WD pickup and to 1323 lbs. (600 kg) on all others. Install a load sensing proportioning gauge (09705-29017) to front caliper and another to rear wheel cylinder on same side of vehicle. Depress brake pedal and raise pressure on front gauge to 711 psi (50 kg/cm<sup>2</sup>).

**NOTE** – DO NOT depress brake pedal more than 1 time and do not release pedal while setting front pressure reading.

2) After 2 seconds, rear brake pressure reading should be 398-540 psi (28-38 kg/cm<sup>2</sup>). Depress brake pedal further and raise front brake pressure reading to 1138 psi (80 kg/cm<sup>2</sup>). Rear brake pressure reading should be 526-726 psi (37-51 kg/cm<sup>2</sup>). If pressure on rear gauge does not meet specifications outlined in steps 1) and 2), adjust load sensing proportioning valve.

3) To adjust load sensing proportioning valve, adjust length of the lower shackle. See Fig. 2. If rear pressure was low, lengthen the distance "A" shown in Fig. 2. If rear pressure was high, shorten the distance. Repeat procedure and check pressure readings.

**NOTE** – Turning the lower shackle 1 turn changes pressure reading 8.5 psi (.6 kg/cm<sup>2</sup>).

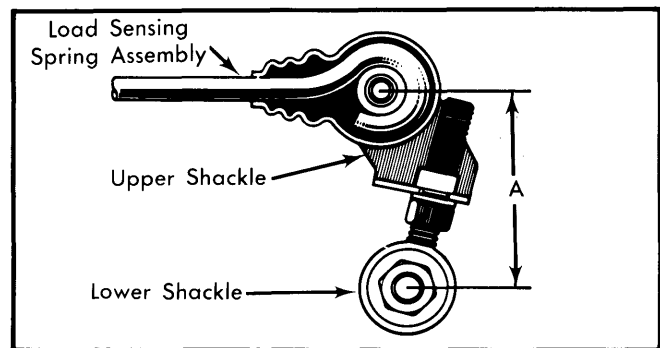


Fig. 2 Adjusting Load Sensing Proportioning Valve

4) If rear pressures do not conform to specifications shown in steps 1) and 2) after adjusting length of lower shackle, loosen valve body retaining nuts and reposition valve body. If rear pressure was low, lower valve body. If rear pressure was high, raise valve body. Tighten retaining nuts and adjust length of lower shackle to standard length. Standard length for 4-WD pickup should be 4.72" (120 mm) and 3.07" (78 mm) for all others. Repeat procedure and check brake pressure readings.

5) If pressures do not meet to those specified in step 1) and 2), position valve body in upper most position and depress brake pedal to obtain readings shown in Load Sensing Proportional Valve Specifications table. If measured value does not meet specifications shown in table, replace valve assembly.

### Load Sensing Proportioning Valve Specifications

Front Reading psi (kg/cm <sup>2</sup> )	Rear Reading psi (kg/cm <sup>2</sup> )
71 (5)	71 (5)
711 (50)	280-337 (19.7-23.7)
1138 (80)	424-509 (29.8-35.8)

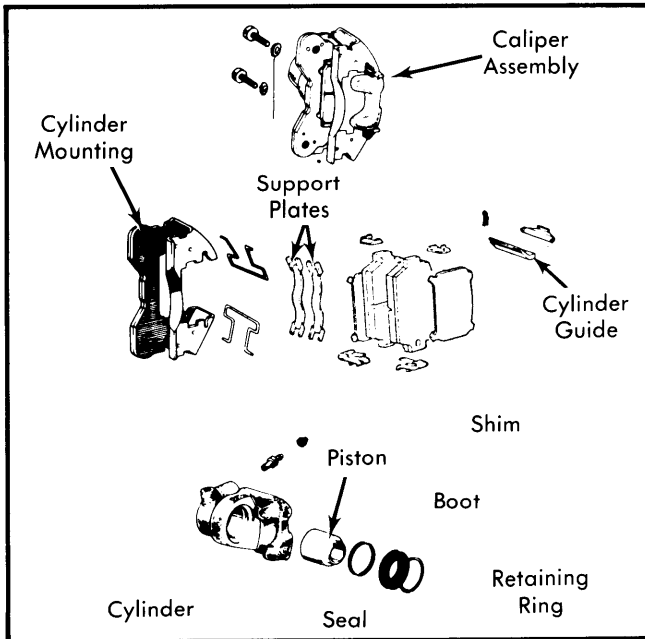
### REMOVAL & INSTALLATION

**NOTE** – Front disc calipers used on Toyota vehicles may vary between manufacturer and model. Refer to appropriate illustrations to assist in identification of caliper.

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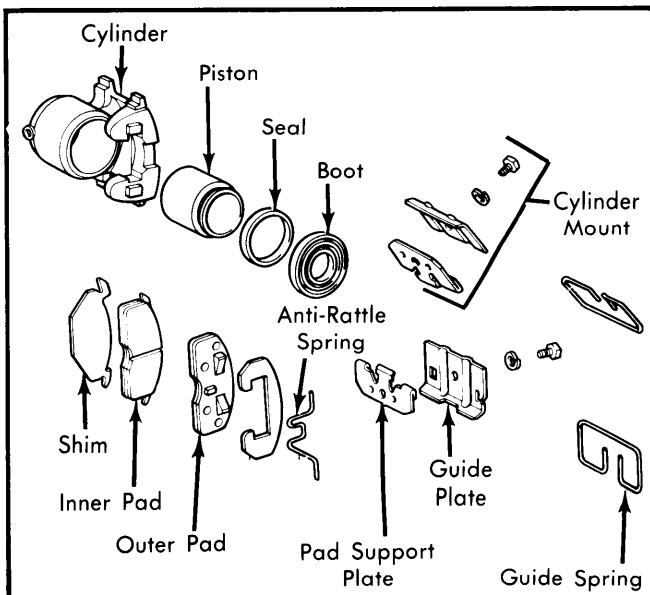
### FRONT DISC BRAKE PADS

**Removal ("F" Type)** — Raise and support vehicle; remove tire and wheel. Remove spring clips and guides. Remove cylinder and suspend out of way without disconnecting hydraulic line. Remove disc pads, shims (if equipped), guide plates, anti-rattle springs and pad support plates. See Fig. 3.



**Fig. 3 Exploded View of "F" Type Disc Brake Used on Celica and Supra**

**Installation** — Clean piston and cylinder assembly, then seat piston in cylinder bore, opening bleed screw if necessary. Install pad support plates, anti-rattle springs, guide plates, disc pads and shims (if equipped). Apply brake grease to cylinder guides. Install cylinder and retain with guides and spring clips.



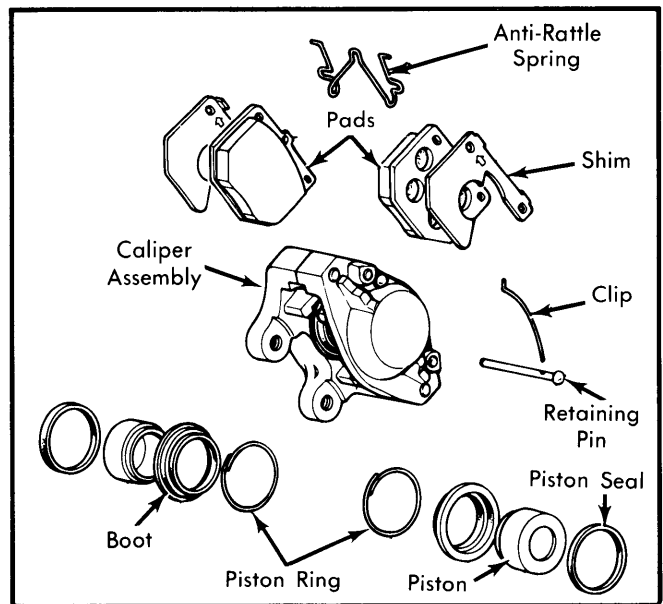
**Fig. 4 Exploded View of "K" Type Disc Brake Used on Cab and Chassis Pickup**

**Removal ("K" Type)** — Raise and support vehicle; remove tire and wheel. Remove guide plates, support springs and pad support plates. Remove cylinder with outer pad attached and suspend from frame without disconnecting hydraulic line. Remove outer pad anti-rattle spring. Remove outer pad and shim (if equipped). Remove inner pad and shim (if equipped) from cylinder mount. See Fig. 4.

**Installation** — Clean piston and cylinder assembly, then seat piston in cylinder bore, opening bleed screw if necessary. Install inner pad and shim (if equipped) to cylinder mount. Install outer pad, shim (if equipped) and anti-rattle spring on cylinder. Apply brake grease to cylinder guides. Install cylinder (with outer pad installed) over inner pad, then install pad support plates, support springs and guide plates.

**NOTE** — Larger side of support springs **MUST** face away from vehicle.

**Removal (Girling)** — Raise and support vehicle; remove tire and wheel. Remove clip, pins, anti-rattle spring, pads and shims.



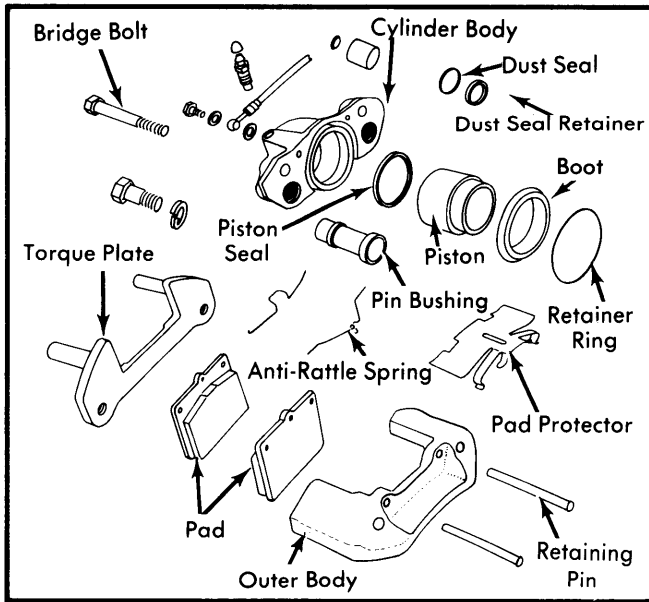
**Fig. 5 Exploded View of Girling Type Disc Brake Used on Corona, Cressida and Standard Pickups**

**Installation** — Coat both sides of shim with brake grease. Remove small amount of brake fluid from master cylinder reservoir. Push pistons into cylinder bore. Install shims with arrows pointing in forward rotation of disc. Install springs, pins and clips. Refill master cylinder reservoir.

**Removal & Installation (Corolla)** — Raise and support vehicle; remove tire and wheel. Remove pad protector, anti-rattle springs, spring pins, pad and shims (if equipped). Clean dirt from pin portion of torque plate. To install, clean piston assembly and seat piston in cylinder bore. Insert pads and shims (if equipped). Install retaining pins, anti-rattle springs and protector.

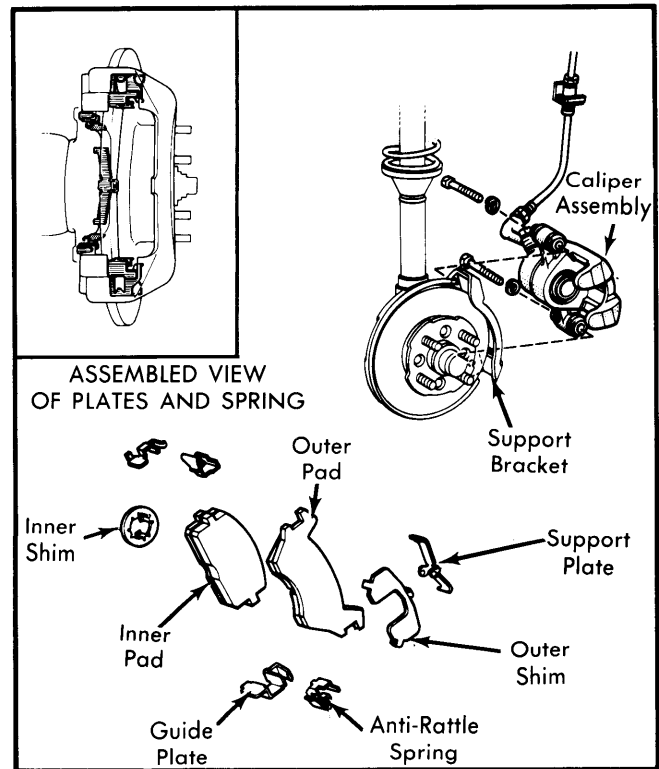
**Removal (Land Cruiser & 4-WD Pickup)** — Raise and support vehicle; remove tire and wheel. Remove clip, retaining pins and anti-rattle spring. Pull disc pads from caliper cavity.

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**Fig. 6 Exploded View of Toyota or Sumitomo Type Disc Brake Used on Corolla**

**Installation** — Siphon small amount of brake fluid from master cylinder reservoir. Seat pistons into cylinder bores. Install pads, anti-rattle spring, retaining pins and clip. Refill master cylinder reservoir.



**Fig. 8 Exploded View of Toyota Disc Brake Used on Tercel**

## FRONT DISC BRAKE CALIPER

**Removal & Installation ("F" Type)** — Raise and support vehicle; remove tire and wheel. Remove spring clips and guide plates. Disconnect hydraulic line and remove caliper. Remove brake pads as previously outlined. To install, apply brake grease to guides and reverse removal procedure. Bleed hydraulic system.

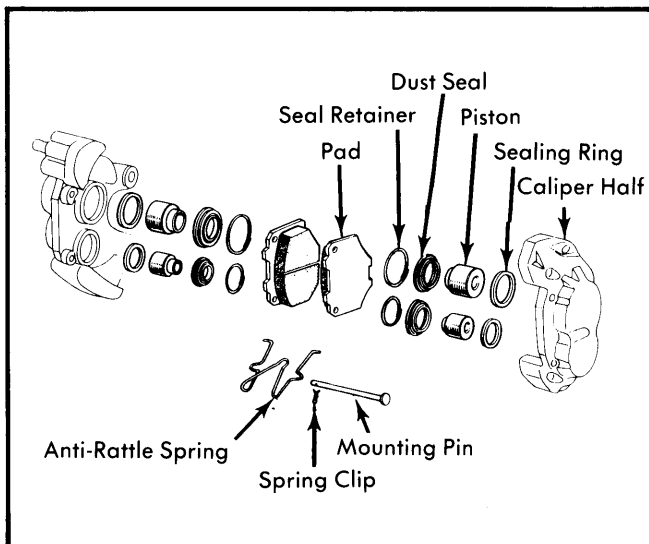
**Removal & Installation ("K" Type)** — Raise and support vehicle; remove tire and wheel. Disconnect hydraulic line and remove brake pads as previously outlined. Remove caliper. To install, reverse removal procedure and bleed hydraulic system.

**Removal & Installation (Tercel)** — Raise and support vehicle; remove tire and wheel. Disconnect hydraulic line and remove caliper mounting bolts. Slide caliper off mounting bracket. To install, apply rubber grease to retaining pin dust boots and bushings. Reverse removal procedure and install caliper with NEW pins. Bleed hydraulic system.

**Removal & Installation (All Others)** — Raise and support vehicle; remove tire and wheel. Remove brake pads as previously outlined. Disconnect hydraulic line. Remove caliper mounting bolts and lift off caliper. To install, reverse removal procedure and ensure mounting bolts are tightened. Bleed hydraulic system.

## FRONT DISC BRAKE ROTOR

**Removal (Land Cruiser & 4 x 4 Pickup)** — Raise and support vehicle; remove wheel and caliper assembly. Remove hub grease cap, snap ring, flange and gasket. Remove free wheel hub (if equipped). Remove lock nut and adjusting nut with



**Fig. 7 Exploded View of Disc Brake Assembly Used on Land Cruiser and 4-WD Pickup**

**Removal (Tercel)** — Raise and support vehicle; remove tire and wheel. Using 2 wrenches, remove cylinder mounting bolts and suspend cylinder from frame without disconnecting hydraulic line. Remove inner pad, then remove outer pad with shim attached. Remove anti-rattle springs, pad guide plates and support plates. Remove inner shim from piston and separate shim from outer pad.

## TOYOTA (Cont.)

suitable socket (09607-60020). Remove rotor and hub as an assembly. Mark hub and rotor for reassembly reference and separate.

**NOTE** — Free wheel hub control handle must be set to "FREE" position for removal.

**Installation** — To install, reverse removal procedure and note the following: Adjust wheel bearings. See *Wheel Bearing Adjustment* in WHEEL ALIGNMENT Section.

**Removal (Tercel)** — 1) Raise and support vehicle; remove tire and wheel. Remove cotter pin and castellated cap. Depress brake pedal and loosen bearing lock nut. Remove caliper assembly as previously described and suspend from frame without disconnecting hydraulic line.

2) Disconnect tie rod end using remover (09610-20011). Using a jack, raise left lower arm assembly. Remove stabilizer bar and strut bar from lower arm. Remove bolt securing lower arm to crossmember and disconnect lower arm from crossmember.

3) Remove bearing lock nut and washer. Using puller (09950-20013), pull hub from drive axle shaft. Remove shock absorber-to-steering knuckle retaining bolt. Separate shock absorber from knuckle. Remove steering knuckle and hub assembly from vehicle with lower arm attached.

**NOTE** — Before removing hub assembly, suspend drive axle shaft up so it does not fall or become damaged.

4) Separate lower arm from steering knuckle. Remove inner dust shield and remove oil seal. Using hub remover (09608-16031), force hub out of steering knuckle. Place alignment marks on hub and rotor for reassembly reference. Remove hub-to-rotor bolts and separate hub from rotor.

**Installation** — 1) Install new outer bearing if removed and adjust bearing preload. See *Wheel Bearing Adjustment* in Wheel Alignment Section. Align marks made during removal and install hub to rotor. Tighten hub-to-rotor bolts evenly. Install spacer in steering knuckle, then install inner bearing and race.

2) Using installer (09636-20010), press steering knuckle onto hub with 2205 lbs. (1000 kg) of pressure. With pressure still applied, rotate steering knuckle to settle bearings. Using a spring pull scale, measure frictional force of steering knuckle with pressure still applied. Frictional force should be 13-26 ozs. (370-750 g).

3) Increase pressure to 7716 lbs. (3500 kg), rotate steering knuckle to settle bearings and measure frictional force. Force should be 13-40 ozs. (370-1120 g). If frictional force is not to specification, insert thinner spacer to raise force or thicker spacer to lower force.

4) Tap oil seal into steering knuckle until it is recessed .16" (4 mm) from end of steering knuckle. Install dust shield and coat oil seal lip with multi-purpose grease. Attach lower arm to steering knuckle. Place steering knuckle and lower arm into position and insert drive axle shaft into hub assembly. Attach steering knuckle to shock absorber. Loosely install bearing washer and lock nut.

5) Loosely install strut bar to lower arm. Align stopper on shock absorber with steering knuckle. Raise lower arm with a

jack until steering knuckle contacts shock absorber stopper. Attach lower arm to crossmember and loosely install retaining bolt. Insert bolt to retain steering knuckle to shock absorber and tighten.

6) Connect stabilizer bar to lower arm and tighten nut. Connect and tighten tie rod to steering knuckle. Install disc brake caliper, depress brake pedal and tighten axle nut. Bounce vehicle several times to settle suspension, then tighten lower arm-to-crossmember bolt and strut bar with vehicle weight resting on suspension system. Check front alignment. See WHEEL ALIGNMENT Section.

**Removal (All Others)** — Raise and support vehicle; remove tire and wheel. Remove caliper as previously outlined. Remove hub grease cap, cotter pin, washer and castellated nut. Carefully remove outer wheel bearing. Remove rotor and hub assembly and place alignment marks on rotor and hub for reassembly reference. Remove hub-to-rotor bolts and separate hub from rotor.

### REAR DISC BRAKE PADS

**Removal** — Raise and support vehicle; remove wheel. Remove parking brake cable from brake lever. Remove cylinder guides and plates. Remove cylinder and hang out of way. DO NOT let cylinder hang by hydraulic line. Remove pad springs, shims and springs. Remove anti-rattle springs, pad guide plates and pad support plates.

**Installation** — Preset piston before installing pads by pushing and turning piston clockwise until it retracts into cylinder body. Install pad support plates, pad guide plates and anti-rattle springs. Install pads, shims and springs. Install cylinder, guides and plates. Install parking brake cable.

**NOTE** — Piston stopper groove and inner pad protrusion must be aligned.

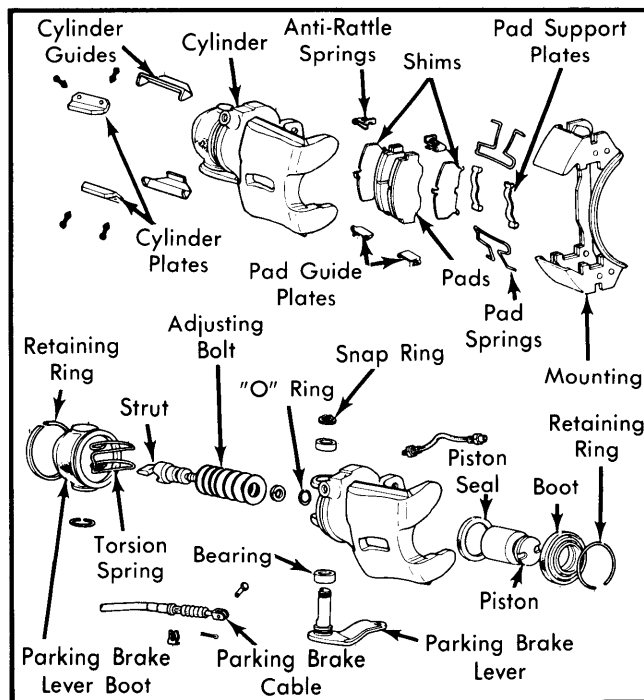


Fig. 9 Exploded View of Supra Rear Disc Brake

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## REAR DISC BRAKE CALIPER

**Removal & Installation** — Raise and support vehicle; remove wheel. Remove parking brake cable from brake lever. Remove cylinder guides and plates. Remove and plug hydraulic line at cylinder. Remove cylinder and mount. To install, reverse removal procedure and bleed brake system.

## REAR DISC BRAKE ROTOR

**Removal & Installation** — With wheel and caliper removed, slide rotor off axle flange. To install, reverse removal procedure and bleed brake system.

## REAR BRAKE DRUM

**Removal (All Models)** — Raise and support vehicle; remove wheel. Remove set screws from brake drum (if equipped). Pull drum from axle flange. It may be necessary to loosen brake adjustment before removing drum.

**Installation** — On all models (except Land Cruiser) set brake shoe-to-drum clearance by measuring inside diameter of brake drum and diameter of brake shoes. Turn brake adjuster until difference between diameters is .02" (.6 mm). Install brake drum and adjust brakes if required.

## BRAKE SHOES

**Removal (Land Cruiser)** — With brake drum removed, remove hold down pins and clips. Remove return springs and remove brake shoes.

**Installation** — Position brake shoes over wheel cylinders with front return spring hooked on inner side of shoe. Install rear return spring to outer side of shoe. Install hold down pins and clips. Adjust and bleed brakes.

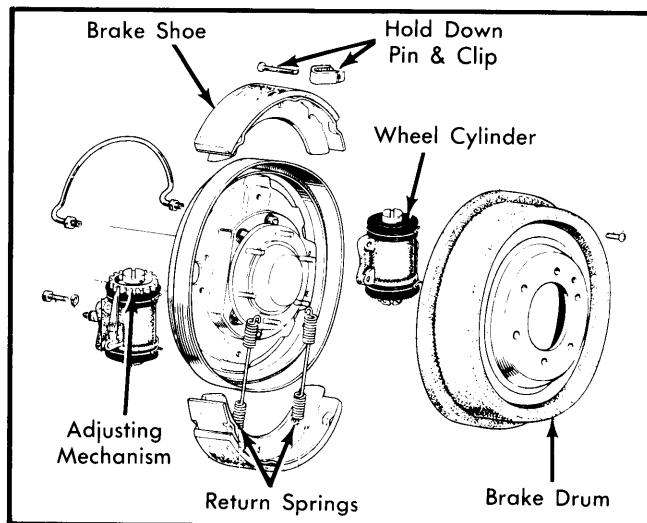


Fig. 10 Exploded View of Land Cruiser Rear Brake

**Removal (Standard Pickup)** — With brake drum removed, remove adjuster spring and adjuster. Remove front hold down spring and pin, then remove front shoe and anchor spring. Remove rear hold down spring and pin and remove rear shoe. Remove adjusting strut and spring from adjusting lever. Dis-

connect parking brake cable from lever. Using a screwdriver, remove "C" washers retaining parking brake lever and adjuster lever to rear shoe. Remove levers from shoe.

**Installation** — To install, reverse removal procedure and note the following: Install parking brake lever and adjuster lever to rear shoe with new "C" washers. After installation of brake assembly, move adjuster back and forth and ensure adjusting bolt moves. If not, check installation of brake assembly. Bleed hydraulic system.

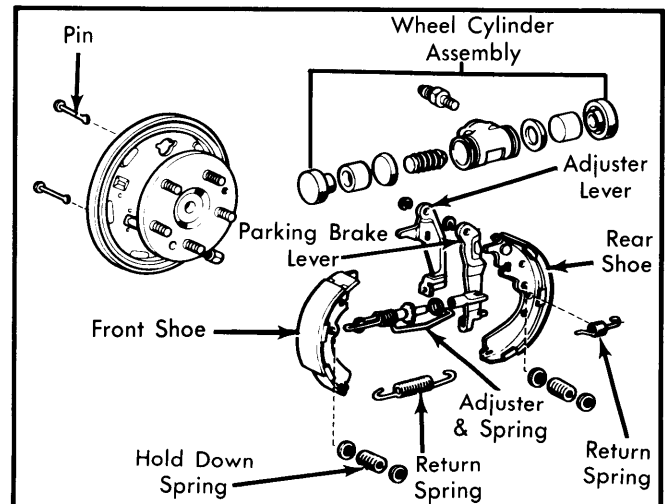


Fig. 11 Exploded View of Standard Pickup Rear Brake

**Removal (Cab & Chassis Pickup and 4-WD Pickup)** — With brake drum removed, remove upper return springs. Remove adjuster cable, cable guide, adjuster lever and anchor plate. Remove adjuster lever tension spring and strut. Remove hold down springs and pins. Pull brake shoes from backing plate and separate adjusting mechanism and return spring. Disconnect parking brake cable from lever. Mount rear shoe in a vise and remove "C" washer retaining parking brake lever to shoe. Remove parking brake lever.

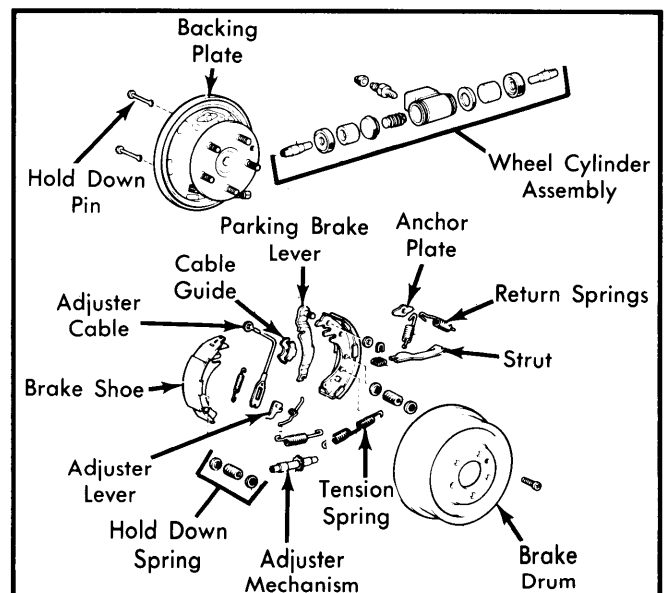


Fig. 12 Exploded View of Cab and Chassis Pickup and 4-WD Pickup Rear Brake

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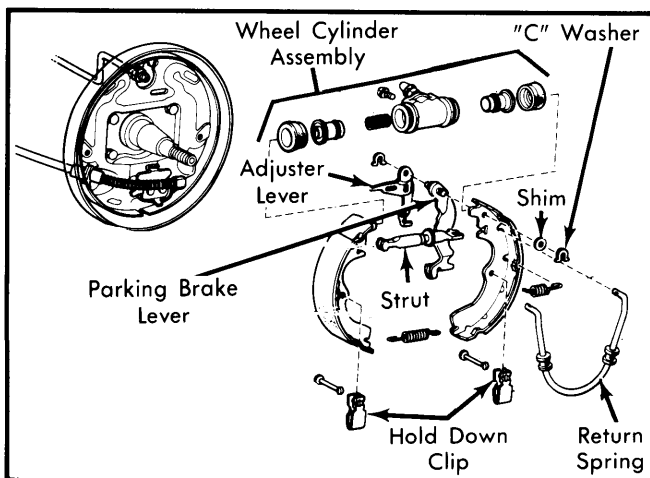
**Installation** — To install, reverse removal procedure and note the following: Adjuster mechanisms are not interchangeable. Left-hand thread — right wheel; right-hand thread — left wheel. After installation of brake assembly, pull adjusting cable backward and release; adjusting bolt should move. If not, check installation of brake assembly. Install drum and adjust brakes.

**Removal (Tercel)** — With brake drum removed, remove return spring. Remove hold down springs and pins. Disconnect front shoe from parking brake strut and disconnect lower return spring. Remove front shoe. Disconnect parking brake lever return spring. Remove rear shoe from backing plate and disconnect parking brake cable from lever. Remove "C" washer retaining parking brake lever and adjusting lever to rear shoe, then remove levers from rear shoe. Remove "C" washer retaining parking brake lever on adjusting lever and separate levers.

**Installation** — 1) Install parking brake lever onto adjusting lever with NEW "C" washer. Install lever assembly on rear shoe and retain in position temporarily with NEW "C" washer. Measure clearance between adjusting lever and rear of shoe. Remove "C" washer and install correct shim(s) which will give a clearance of 0-.014" (0-.35 mm). Install and stake "C" washer and ensure lever moves.

2) Complete installation by reversing removal procedure and note the following: Adjuster mechanisms are not interchangeable. Left-hand thread — left wheel; right-hand thread — right wheel. Install drum and bleed hydraulic system.

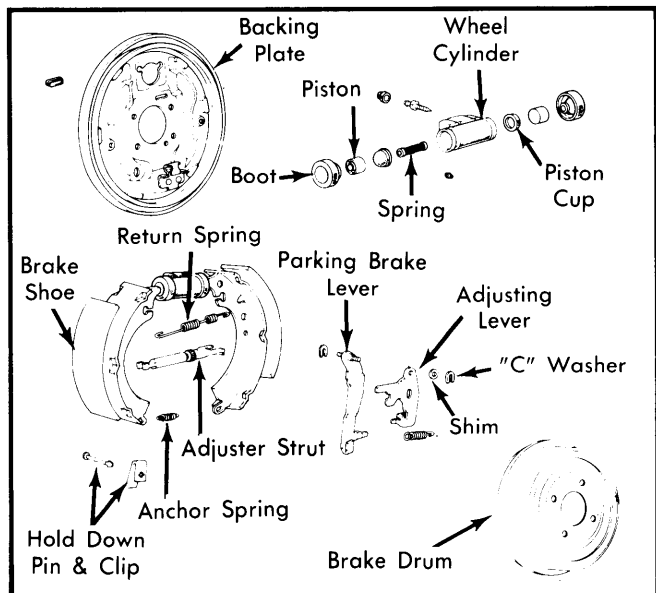
**NOTE** — Shims are available in 6 sizes: .008" (.2 mm), .012" (.3 mm), .016" (.4 mm), .020" (.5 mm), .024" (.6 mm) and .035" (.9 mm). Shims may be installed in pairs to provide proper clearance.



**Fig. 13 Exploded View of Tercel Rear Brake**

**Removal (All Others)** — With brake drum removed, remove hold down pins and clips. Remove anchor spring and return spring. Remove front shoe and adjuster strut. Remove parking brake cable from parking brake lever. Remove rear shoe, parking brake lever and adjusting lever as an assembly. Remove "C" washer retaining parking brake lever and adjusting lever to rear shoe and separate levers from shoe.

**Installation** — Install adjusting lever and parking brake lever to rear shoe with NEW "C" washer. Measure clearance between lever and shoe. Remove "C" washer and install correct shim(s) which will give a clearance of 0-.014" (0-.35 mm). Install and stake "C" washer and ensure lever moves. Complete installation by reversing removal procedure and note the following: Adjuster mechanisms are not interchangeable. Left-hand thread — right wheel; right-hand thread — left wheel. Install drum and bleed hydraulic system.



**Fig. 14 Exploded View of Rear Brake Used on Celica, Corolla, Corona and Cressida**

### REAR BRAKE WHEEL CYLINDER

**Removal (All Drum Brake Models)** — With brake drum and shoes removed, disconnect hydraulic line from wheel cylinder. Remove mounting bolts and remove wheel cylinder.

**Installation** — To install, reverse removal procedure and note the following: Wheel cylinders and adjusting mechanisms on Land Cruiser are not interchangeable. Wheel cylinders are stamped "L" for left and "R" for right; left-hand thread adjuster mounts on right wheel cylinder and right-hand thread adjuster mounts on left wheel cylinder. Leading wheel cylinder must be installed with adjuster at top of cylinder; trailing wheel cylinder must be installed with adjuster at bottom of cylinder. Bleed brake cylinder.

### PARKING BRAKE

**Removal (Land Cruiser)** — Drain oil from transfer case. Disconnect front of drive shaft and wire out-of-way. Remove drum mounting nut and slide drum off splines. Remove return springs and tension springs, then take off hold down springs and pins. Disconnect parking brake cable from shoes.

**Installation** — To install, reverse removal procedure and note: Make sure lower tension spring is installed so it lies between back plate and shoes. Refill transfer case with 1.8 quarts of SAE 90. Tighten drum mounting nut and adjust parking brake.

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## MASTER CYLINDER

**Removal & Installation** — Disconnect electrical lead (if equipped). Disconnect and plug hydraulic lines. Remove master cylinder-to-power brake unit mounting nuts. Remove master cylinder. To install, reverse removal procedures and bleed brake system.

## VACUUM PUMP

**Removal (Land Cruiser)** — Disconnect vacuum line from pump assembly. Disconnect and plug oil lines. Remove mounting nuts and gently pry pump off studs.

**Installation** — To install, reverse removal procedure and note: Run engine at idle speed. Loosen screw at vacuum pump outlet and check that oil is circulating.

## POWER BRAKE UNIT

**Removal & Installation** — Remove master cylinder assembly from vehicle. Disconnect push rod clevis at brake pedal. Remove power booster attaching hardware, and remove booster assembly from vehicle. To install, reverse removal procedure.

## LOAD SENSING PROPORTIONING VALVE

**Removal** — Raise and support vehicle. Remove load sensing spring assembly. Disconnect and plug hydraulic lines from load sensing valve. Remove brake tube bracket from valve body, then remove valve body and bracket as an assembly. Separate valve body from bracket. See Fig. 15.

**NOTE** — DO NOT disassemble valve body.

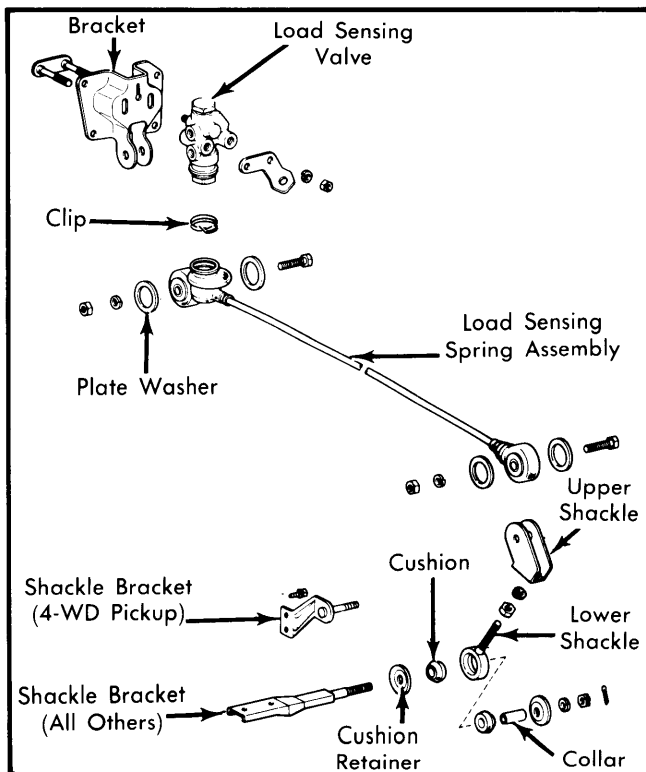


Fig. 15 Exploded View of Load Sensing Proportioning Valve

**Installation** — Wipe parts and inspect for rust or damage. Inspect valve piston pin and load sensing contact surface for wear (bottom of valve). Replace as an assembly if wear exceeds .028" (.7 mm). To install, reverse removal procedure and note the following: Apply rubber grease to all rubbing areas. Install new rubber plate on valve body side of spring. Adjust length of upper and lower shackle to original height. After installation, position valve body so valve piston lightly contacts load sensing spring. Bleed hydraulic system and check brake pressures.

**NOTE** — DO NOT mistake valve side of load sensing spring for shackle side.

## OVERHAUL

**NOTE** — When overhauling caliper, wheel cylinder, or master cylinder assemblies, all rubber components should be replaced. If cylinder bores in any part are pitted, or scored more than light honing will repair, entire assembly should be replaced.

## DISC BRAKE CALIPER

**Disassembly ("F" & "K" Types and Tercel)** — Remove retainer ring (if equipped) and boot. Apply light air pressure to fluid inlet port and expel piston from cylinder. Remove seal from cylinder without damaging bore. See Fig. 3, Fig. 4, Fig. 8 and Fig. 16.

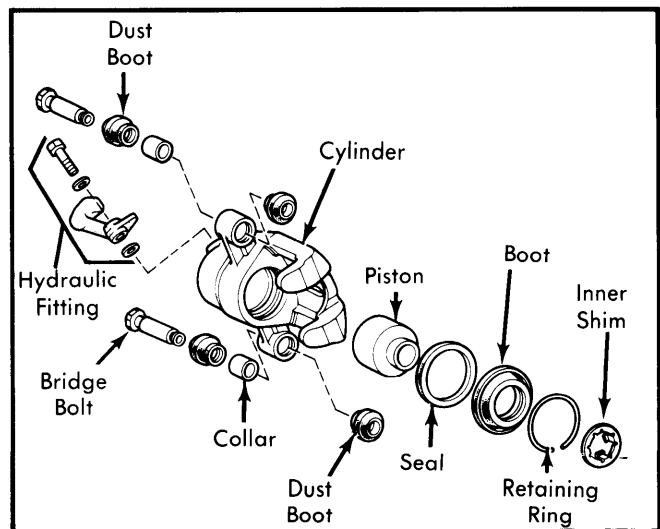


Fig. 16 Exploded View of Tercel Caliper Assembly

**Cleaning & Inspection** — Clean all parts in clean brake fluid. Inspect bore and piston for excessive wear or damage; replace defective parts.

**Reassembly** — Coat piston, seal and cylinder bore with rubber grease before reassembly. To reassemble, reverse disassembly procedure and note the following: On "K" type, install seal, fit boot to piston, then fit boot to cylinder and push piston into cylinder bore.

**Disassembly (Corolla)** — Loosen both bridge bolts (caliper half mounting bolts) and separate cylinder casting from outer body. Pull out torque plate. Remove retainer ring and boot. Force light air pressure through fluid inlet port and expel

## TOYOTA (Cont.)

piston. From caliper, remove following: Piston seal, bushings, hole plug, retainers and dust seals. See Fig. 6.

**Cleaning & Inspection** — Clean all parts in alcohol or clean brake fluid. Inspect parts for excessive wear or damage; replace defective parts. If torque plate pins are excessively worn or if pin weld parts are abnormally corroded, caliper must be replaced.

**Reassembly** — 1) Ensure torque plate pins and bushing bores are clean and coat with grease furnished in repair kit. Coat piston seals and cylinder bore with rubber grease. Fit dust seal, retainers and bushings to cylinder.

2) Fit piston seal on cylinder and push piston in by hand. Install dust boot and ring. Reassemble torque plate pins in cylinder body. Make sure torque plate is free to slide smoothly. Install bridge bolts and tighten.

**Disassembly (Land Cruiser & 4-WD Pickup)** — Remove dust seal retainer ring and seal. Insert small block of wood into cylinder cavity. Apply light air pressure to one side of cylinder to expel pistons; repeat procedure on opposite side. Remove piston seals without damaging bores. See Fig. 7.

**NOTE** — DO NOT separate caliper halves.

**Cleaning & Inspection** — Clean all parts in clean brake fluid. Inspect pistons and cylinder bores for excessive wear, damage or corrosion; replace defective parts.

**Reassembly** — Lightly coat all parts with rubber grease. Insert new piston seal, being careful that seals properly enter grooves. Fit piston and slide dust seal into position. With dust seal seated, fit retainer ring.

**Disassembly (All Others)** — Remove dust boot retainer ring and dust boot. Insert small wooden block between pistons and apply light air pressure to fluid inlet port to expel pistons. Remove seals without damaging bores. See Fig. 5.

**NOTE** — DO NOT separate caliper halves.

**Cleaning & Inspection** — Clean all parts in clean brake fluid. Inspect bores and pistons for excessive wear or damage; replace defective parts.

**Reassembly** — Coat piston seals, cylinder bores and pistons with brake grease. To reassemble, reverse disassembly procedure.

**Disassembly (Supra Rear Caliper)** — 1) Remove dust boot retaining ring and boot. Remove piston by turning it counter-clockwise with suitable remover (09719-14010). Remove piston seal from cylinder groove without damage to cylinder bore. See Fig. 6.

2) Remove retaining ring from parking brake lever boot. Pull boot back over parking brake lever and remove shaft retaining ring. Using arbor press and suitable remover (09719-14010), remove parking brake lever; separate boot from lever.

3) Remove torsion spring and strut. Mount caliper assembly in padded vise and remove bearings. Separate components and arrange for reassembly reference.

**Cleaning & Inspection** — Wash all parts in clean brake fluid. Inspect all parts for excessive wear, damage or corrosion; replace defective parts.

**Reassembly** — 1) Coat all parts with rubber grease. Install bearings. Fit new "O" ring and spring washer on adjusting bolt. Ensure "O" ring and washer do not touch. Install adjusting bolt and strut into bore with strut against raised side of bolt. Strut must be angled toward torsion spring retaining pin. Install torsion spring with formed loop seated around retaining pin.

2) Fit rubber boot to parking brake lever. Install parking brake lever with arbor press and suitable tool (09719-14010). Install shaft retaining ring. Pull boot over lever assembly and install retaining ring.

3) Install piston seal into cylinder bore. Install piston into cylinder bore by turning it clockwise with suitable installer (09719-14010J). Align piston with piston stopper groove; install dust boot and retaining ring.

## MASTER CYLINDER

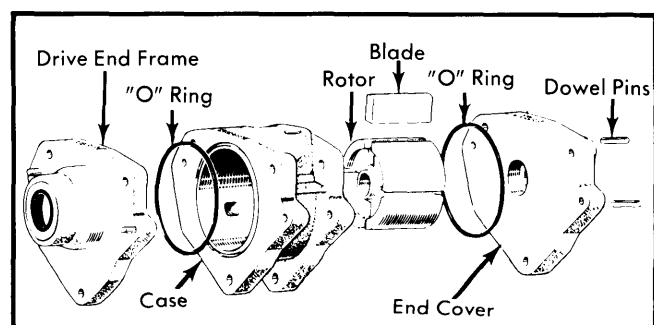
**Disassembly** — Remove reservoir(s) and switches (if equipped) and mount cylinder in soft-jawed vise. Remove dust boot and check valve(s). Push pistons into cylinder bore and remove stop bolt. Remove snap ring and withdraw piston assemblies. Remove unions, outlet plugs, and other external components. Disassemble piston assemblies by removing springs, retainers and cups. See Fig. 18.

**Cleaning & Inspection** — Wash all parts in clean brake fluid and inspect for wear, damage or corrosion. Replace defective parts as required.

**Reassembly** — To reassemble, reverse disassembly procedure using all new rubber parts and lubricating all components with clean brake fluid.

## VACUUM PUMP

**Disassembly (Land Cruiser)** — Drive dowel pins from end cover toward case. Separate end cover. Continue to drive dowels through case and stop with them flush with end frame. Remove end frame with pins still fitted. Remove both "O" rings and discard. Slide rotor and blades from case.

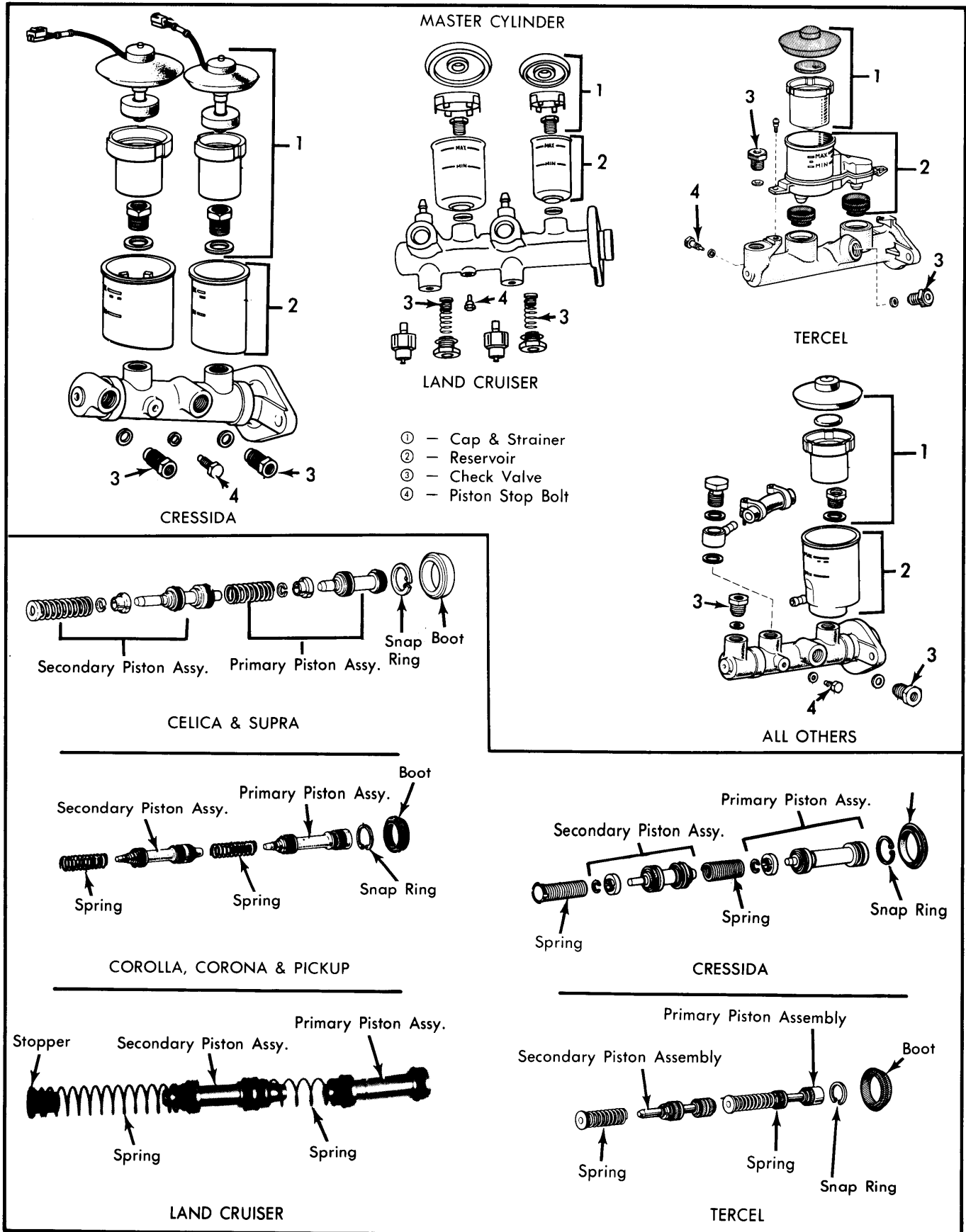


**Fig. 17 Exploded View of Land Cruiser Vacuum Pump**

**Inspection** — Inspect end cover and casing for damage or wear. Casing bore must not be worn beyond 2.29" (5.82 mm). Check rotor-to-alternator shaft spline play. Rotor wear must

# Brakes

## TOYOTA (Cont.)



**Fig. 18 Exploded View Of Master Cylinders With Detail of Each Model's Piston Assemblies Shown**

## TOYOTA (Cont.)

not exceed .095" (2.4 mm). Inspect rotor blades for following wear limits: Height .47" (12 mm); length 1.377" (34.98 mm); width .036" (.92 mm). Check end frame bushing and oil seal. Bushing bore must not exceed .635" (16.14 mm). Replace oil seal by prying out and pressing in new one.

**Reassembly** – Lightly coat new "O" rings and insert into grooves. Refit rotor and blades. Drive in dowel pins.

### POWER BRAKE UNIT

**NOTE** – Power brake units are produced by several manufacturers and may vary slightly between model application. The following overhaul procedures can be used with minor attention to detail of specific booster being repaired. Refer to Fig. 19, Fig. 20 and Fig. 21.

**Disassembly** – 1) Remove check valve and grommet from front of unit (except Corolla, Pickup and Tercel), then remove push rod (except Land Cruiser). From rear of unit, remove clevis, nut and dust boot. Using a screwdriver, pry off retainer and remove filter and silencer pack.

**NOTE** – Check valve on Corolla, Pickup and Tercel is located in vacuum line and is mounted on firewall.

2) Place an alignment mark on front and rear shells for reassembly reference. Mount unit in suitable support to prevent internal spring pressure from forcing shells apart. On units equipped with clamping band, remove bolt and nut. Remove band and separate front and rear shells. On all other units, rotate front shell counterclockwise and separate front and rear shells.

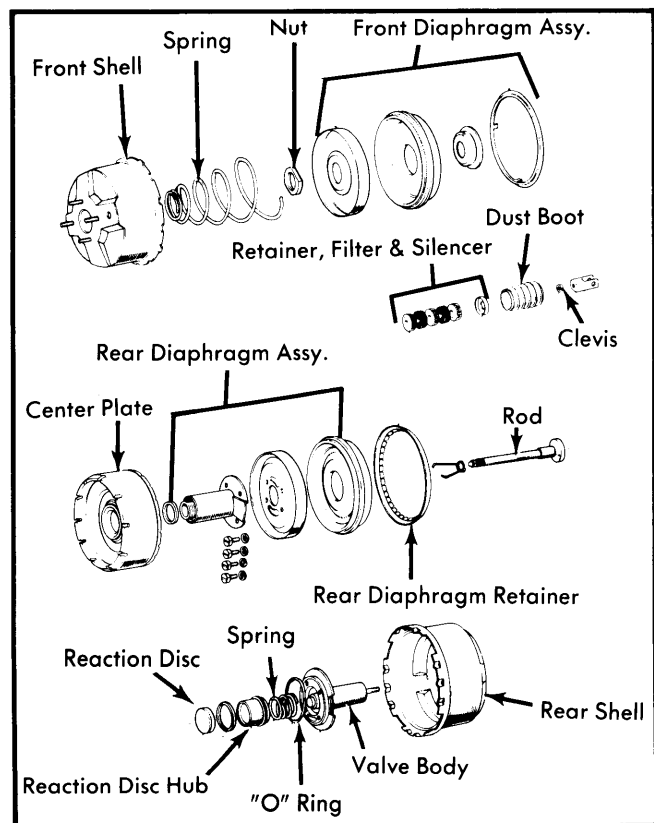


Fig. 19 Land Cruiser Power Brake Unit

3) On Land Cruiser, remove front diaphragm lock nut and separate front diaphragm assembly. Remove rear diaphragm retainer and center plate. Remove rear diaphragm lock nut and 4 hub bolts. Remove hub and separate rear diaphragm assembly. Remove push rod and spring, reaction disc, reaction disc hub and spring, valve body and "O" ring from rear shell.

4) On Aisin units, remove spring from front shell. Remove spring retainer, reaction plate and levers and "O" ring from diaphragm plate. Remove snap ring, then pull operating rod out through rear of diaphragm plate. Remove diaphragm retainer, then separate diaphragm and diaphragm plate. Remove star washer, seal and boot from rear shell.

5) On JKK units, remove push rod and spring from front shell. Remove diaphragm from diaphragm plate. Depress operating rod, remove stopper key, then pull out operating rod and reaction disc. Remove star washer, seal and bearing from rear shell.

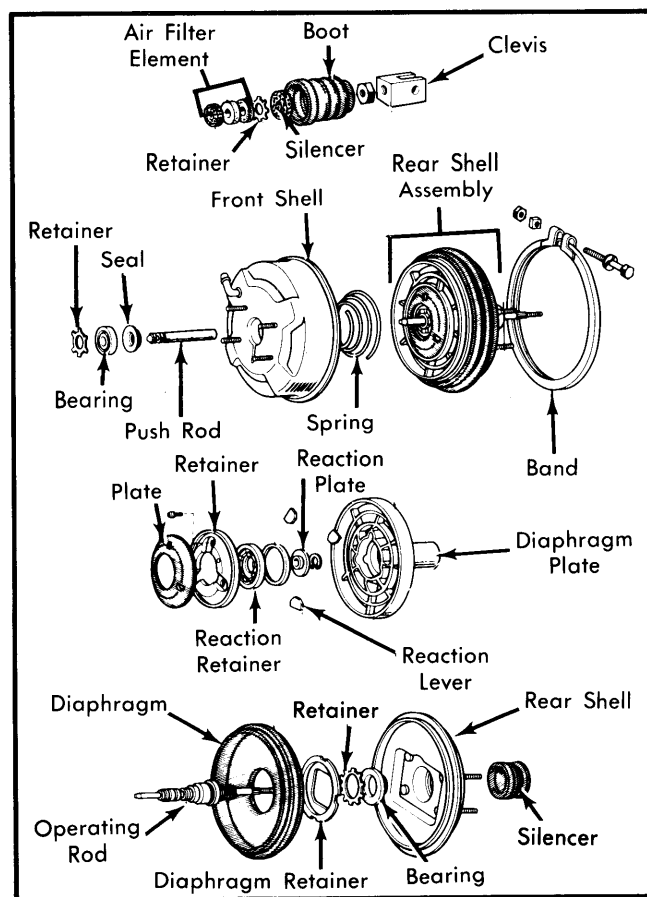


Fig. 20 Exploded View of Aisin Power Brake Unit

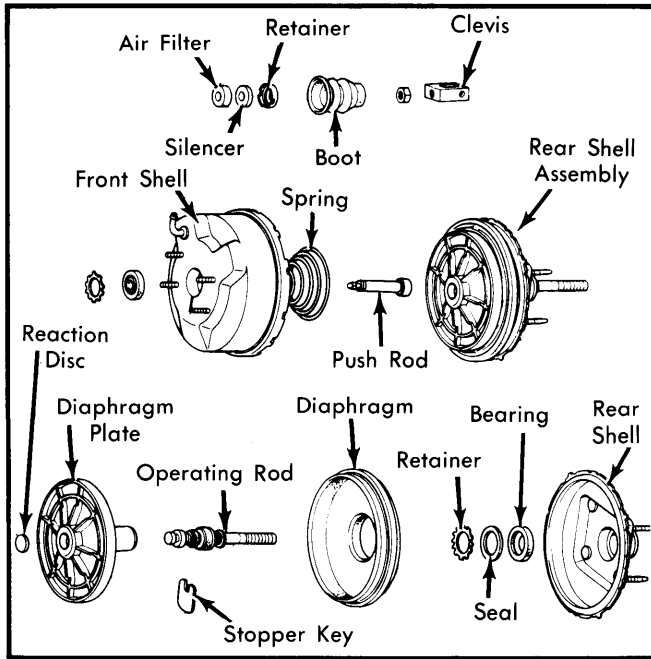
**Cleaning & Inspection** – Wash all parts in denatured alcohol. Inspect all components for wear or damage; replace defective parts. Replace all rubber parts during overhaul.

**Reassembly** – 1) Apply silicone grease to front and rear shell seals and reaction disc. Coat diaphragm edge with light coat of oil before final tightening. Shell halves must align with index marks.

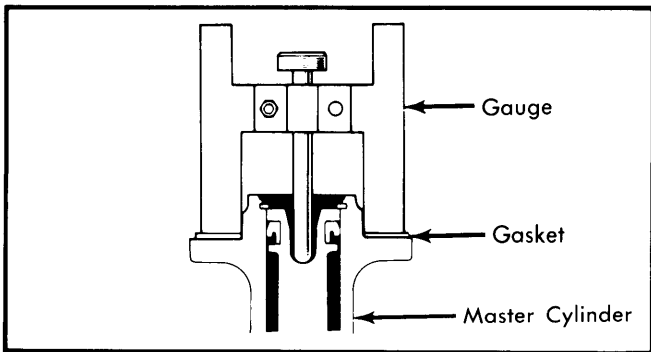
2) Reassemble power brake unit by reversing removal procedure and note the following: On Aisin units, secure

## TOYOTA (Cont.)

diaphragm to diaphragm plate by turning retainer 45°. On JKK units, rear seal must be seated .40-.43" (10-11 mm) from rear shell body. On Land Cruiser, fit reaction disc with protrusion directed toward valve body and install center plate on hub with large groove facing front side.



**Fig. 21 Exploded View of JKK Power Brake Unit**



**Fig. 22 Adjusting Push Rod Clearance With Gauge**

3) After installation, adjust push rod length. Using depth gauge (09737-00010), place gauge on master cylinder (with gasket in place, if equipped) and turn pin until tip just touches piston. See Fig. 21. Without disturbing gauge setting, turn gauge upside down on power brake unit. Adjust length of push rod by turning nut until clearance between gauge and tip of push rod is obtained as shown in Push Rod Clearance Specifications table.

### Push Rod Clearance Specifications

Application	Clearance In. (mm)
Corolla	Zero
Corona, Cressida,	
Land Cruiser & Tercel	.024-.026 (.60-.66)
All Others	.004-.020 (.10-.51)

### TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Caliper Mounting Bolts	
Celica, Corolla & Supra	40-54 (5.5-7.5)
Corona, Cressida & Pickup	68-86 (9.5-12.0)
Land Cruiser & 4-WD Pickup	54-76 (7.5-10.5)
Caliper Bracket-to-Steering Knuckle	
Cab & Chassis Pickup	80-126 (11.0-17.5)
Tercel	33-39 (4.5-5.4)
Caliper-to-Caliper Bracket (Tercel)	11-15 (1.5-2.0)
Caliper Bridge Bolts (Corolla)	58-68 (8.0-9.5)
Guide Plate-to-Caliper Bolts	
Cab & Chassis Pickup	29-39 (4.0-5.4)
Hub-to-Rotor Bolts	
Cab & Chassis Pickup	40-54 (5.5-7.5)
All Others	29-39 (4.0-5.4)
Tercel Suspension Components	
Axle Nut	73-108 (10.0-15.0)
Lower Arm-to-Crossmember	51-65 (7.1-9.0)
Lower Arm-to-Steering Knuckle	40-52 (5.5-7.2)
Stabilizer Bar	11-15 (1.5-2.0)
Steering Knuckle-to-Shock	40-52 (5.5-7.2)
Strut Bar	29-29 (4.0-5.4)
Tie Rod End	37-50 (5.1-7.0)

### 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)
Land Cruiser	.....	.....	.....	.....	11.5 (292)
Pickups	.....	10.0 (254)	10.0 (254)	.....	10.079 (256)
All Others	.....	9.0 (228.6)	9.0 (228.6)	.....	9.079 (230.6)

# Brakes

7-97

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## TOYOTA (Cont.)

DISC BRAKE SPECIFICATIONS						
Application	Disc Diameter	Lateral Runout	Parallelism	Original Thickness	Minimum Refinish Thickness	Discard Thickness
Cab & Chassis Pickup	.....	.006 (.15)	.....	.787 (20)	.....	.748 (19)
Land Cruiser	.....	.005 (.12)	.....	.790 (20.1)	.....	.740 (18.8)
Supra Front	.....	.006 (.15)	.....	.492 (12.5)	.....	.453 (11.5)
Rear	.....	.006 (.15)	.....	.394 (10)	.....	.354 (9)
All Others	.....	.006 (.15)	.....	.492 (12.5)	.....	.453 (11.5)