

# Clutches

## TOYOTA LAND CRUISER

### DESCRIPTION

Clutch is a dry single disc type using a diaphragm type pressure plate. Clutch is hydraulically operated by a firewall mounted master cylinder and a clutch housing mounted slave cylinder. A prelubricated sealed release bearing is used.

### REMOVAL & INSTALLATION

#### CLUTCH ASSEMBLY

##### Removal

1) Drain transmission and transfer case oil. Remove battery ground. Remove scuff plates. Remove cowl side trim. Remove heater duct on transmission hump. Remove front carpet or mat. Remove shift lever and transfer case levers.

2) Disconnect back-up light connector. With special spanner (09305-55010) remove transmission shift lever nut and shift lever. Remove transfer case shift lever. Remove transmission undercover. Disconnect speedometer cable. Disconnect propeller shafts.

3) Disconnect slave cylinder, leaving hydraulic line attached. Remove rear engine support member. Support transmission and transfer case assembly with jacks and a rope, and remove. Remove release bearing retaining clips, and release bearing with collar.

4) Remove clutch lever assembly. Mark pressure plate and flywheel for reassembly reference. Loosen pressure plate attaching bolts one turn at a time in a diagonal fashion until spring pressure is released, then remove bolts and clutch assembly.

##### Installation

To install, reverse removal procedure and note the following: Use aligning tool to center disc on flywheel. Tighten clutch attaching bolts alternately and evenly. After reinstallation, adjust clutch fork free play and bleed hydraulic system if necessary.

#### CLUTCH MASTER CYLINDER

##### Removal

Remove clevis pin connecting master cylinder push rod to clutch pedal. Disconnect hydraulic line from cylinder body and plug opening. Remove cylinder attaching bolts at firewall and remove master cylinder.

**NOTE:** Do not allow fluid to spill on painted surfaces.

##### Installation

To install, reverse removal procedure. Adjust pedal height and clutch pedal free play, and bleed hydraulic system. Check hydraulic system for leaks.

#### CLUTCH SLAVE CYLINDER

##### Removal

Plug master cylinder reservoir cap. Disconnect clutch return spring from hanger. Disconnect flexible hose from metal line and remove clip. Remove slave cylinder retaining bolts and remove slave cylinder.

##### Installation

To install, reverse removal procedure, adjust clutch fork free play and bleed hydraulic system.

#### CLUTCH RELEASE BEARING

##### Removal & Installation

With clutch assembly removed, remove release bearing from hub with bearing remover/installer (09315-

00021). To install bearing, lubricate with multi-purpose grease and seat bearing with the remover/installer.

#### PILOT BEARING

##### Removal & Installation

With clutch assembly removed, check pilot bearing in end of crankshaft for roughness or noise during rotation. If defective, remove using a puller (09303-55010). To install, lubricate bearing with multi-purpose grease and insert into crankshaft using driver (09304-47010).

### OVERHAUL

#### CLUTCH MASTER CYLINDER

##### Disassembly

With master cylinder removed from vehicle, drain fluid from reservoir and remove push rod, boot and snap ring as an assembly. Using a deep socket, remove reservoir retaining nut and lift reservoir from master cylinder. Pull piston assembly from master cylinder.

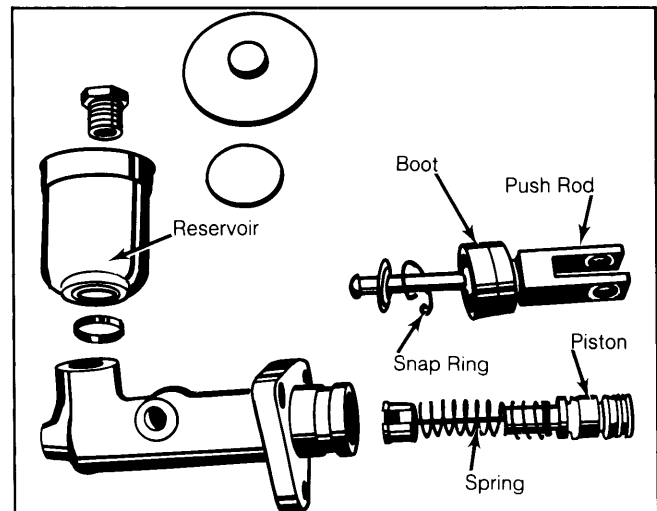
##### Cleaning & Inspection

Wash all parts in clean brake fluid and inspect for wear or damage. Replace master cylinder if scored or worn excessively.

##### Reassembly

Use cylinder overhaul kit and soak all parts in clean brake fluid. Assemble in reverse order of disassembly. Fill reservoir with fluid and bleed cylinder.

Fig. 1: Exploded View of Clutch Master Cylinder



#### CLUTCH SLAVE CYLINDER

##### Disassembly

Remove push rod assembly and rubber boot from cylinder body. Withdraw cylinder piston and cup seal. Loosen and remove bleeder screw.

##### Cleaning & Inspection

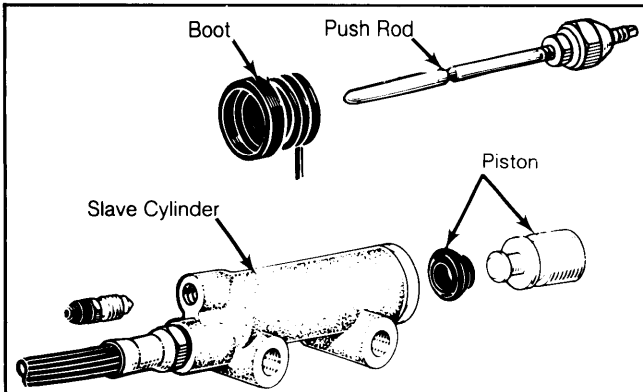
Wash all parts in clean brake fluid and inspect for wear or damage. If slave cylinder bore-to-piston clearance exceeds .006" (.15 mm), replace defective part. Replace piston cup during overhaul.

##### Reassembly

Soak all parts in clean brake fluid before reassembly. Reverse disassembly procedure and install boot with protruded part down.

## TOYOTA LAND CRUISER (Cont.)

**Fig. 2: Exploded View of Clutch Slave Cylinder**



turn push rod tip while holding push rod nut with wrench. Free play should be .16-.20" (4-5 mm). Tighten lock nut and check clutch pedal free play.

### HYDRAULIC SYSTEM BLEEDING

1) Connect a flexible tube to slave cylinder bleeder screw, and place opposite end in a container partially filled with brake fluid.

2) Pump clutch pedal several times. With pedal depressed, loosen bleeder screw 1/3 to 1/2 turn and allow air to bleed out. Tighten bleeder screw.

3) Continue operation until air bubbles are no longer seen in fluid being discharged into container. Tighten bleeder screw securely and install cap. Check fluid level in master cylinder reservoir, and check system for leaks.

## ADJUSTMENTS

### PEDAL HEIGHT

Pedal height is measured from floor to top of pedal pad. To adjust, loosen lock nut and turn stop bolt to give pedal height of 7.7" (195 mm) for FJ60 Station Wagon models with brake booster, 8.5" (215 mm) for all other models.

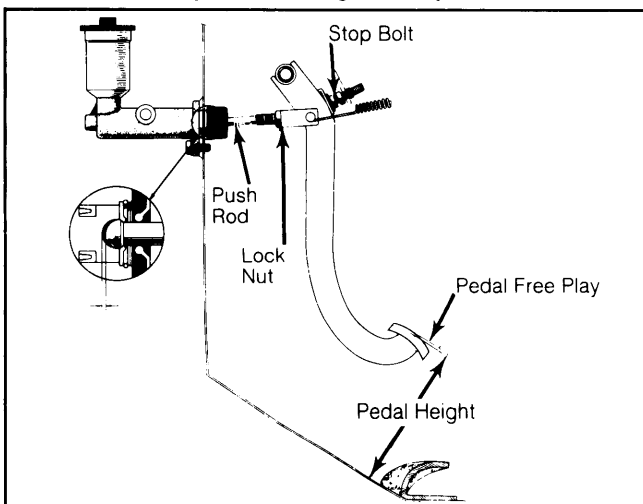
### PUSH ROD FREE PLAY

Push rod play is distance pedal moves before moving piston in master cylinder. Adjust by turning push rod. Play at pedal top should be .04-.20 (1.0-5.0 mm).

### PEDAL FREE PLAY

Clutch pedal free play is the amount of free play before clutch pedal movement causes movement of pressure plate. To adjust, loosen lock nut and turn push rod to obtain 1.9-2.0" (48-51 mm) free play. Tighten lock nut.

**Fig. 3: Pedal Height Measuring and Adjustment Points**



### CLUTCH FORK FREE PLAY

Clutch fork free play is distance slave cylinder push rod moves before moving clutch fork. To adjust clutch fork free play, loosen lock nut at slave cylinder and