

# CHAPTER 1

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## CLUTCH

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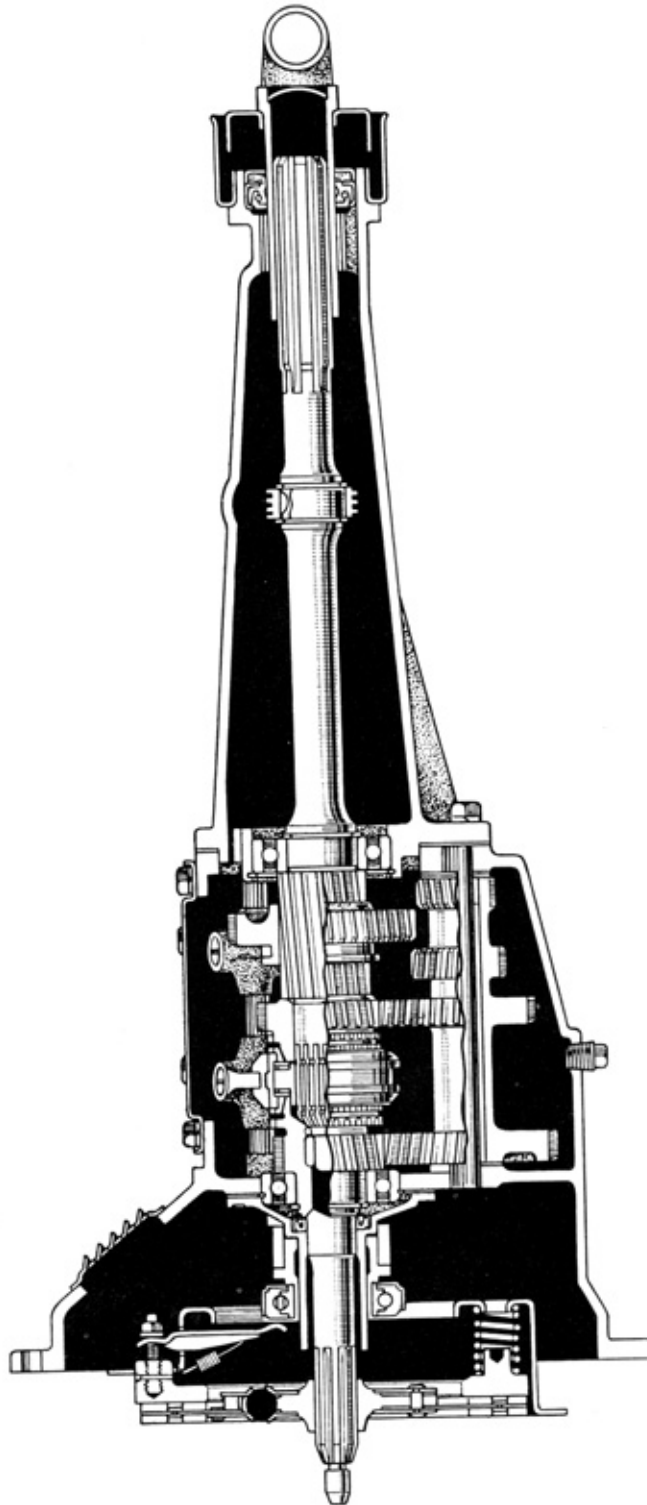


Fig. 1-1 Section of Clutch & Transmission

## CLUTCH

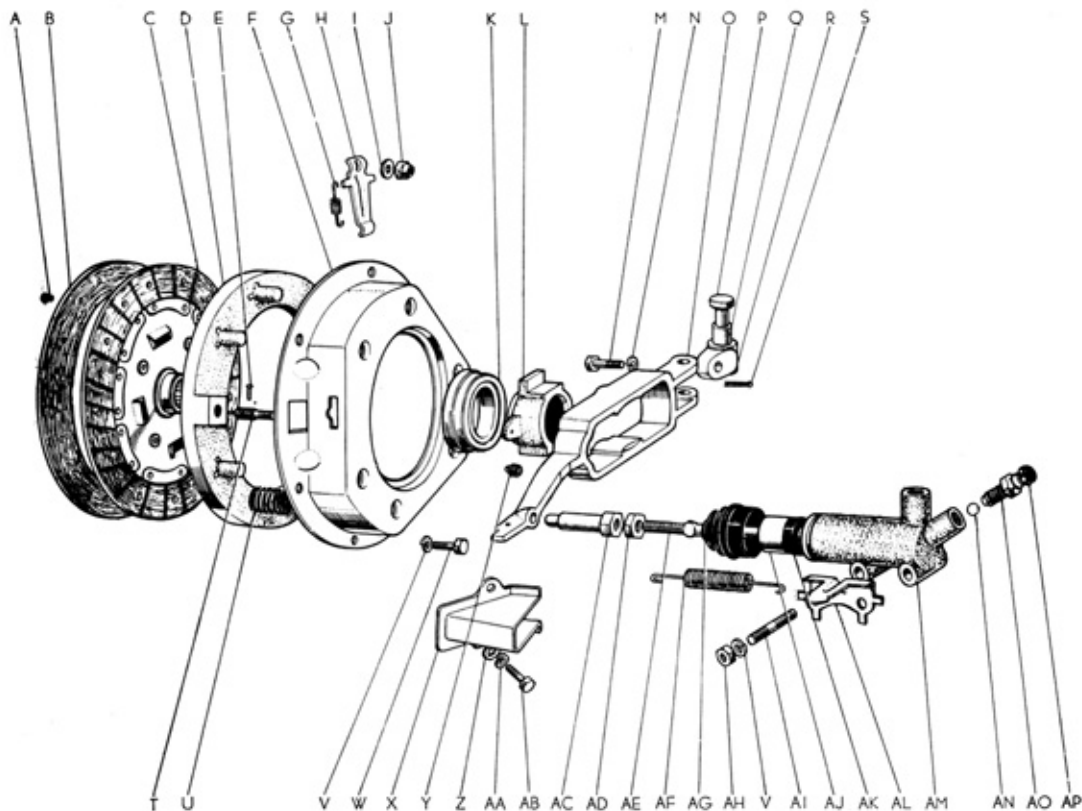


Fig. 1—2 Clutch &amp; Release Cylinder

- |  |  |
|--|--|
| A Clutch Facing Rivet                  | Q Clutch Release Fork Support Bushing          |
| B Clutch Facing                        | R Clutch Release Fork Support                  |
| C Clutch Disc Assembly                 | S Cotton pin                                   |
| D Clutch Pressure Plate                | T Clutch Pressure Plate Bolt                   |
| E Clutch Pressure Plate Bolt Pin       | U Clutch Spring                                |
| F Clutch Cover                         | V Spring Washer                                |
| G Clutch Pressure Lever Tension Spring | W Bolt   |
| H Clutch Pressure Lever                | X Clutch Release Fork Ball Cover               |
| I Clutch Pressure Plate Nut Plate      | Y Clutch Release Bearing Hub Tension Spring    |
| J Clutch Pressure Lever Adjust Nut     | Z Plate Washer                                 |
| K Clutch Release Bearing               | AA Spring Washer                               |
| L Clutch Release Bearing Hub           | AB Bolt  |
| M Bolt                                 | AC Clutch Release Cylinder Piston Rod Adjuster |
| N Spring Washer                        | AD Nut   |
| O Clutch Release Fork                  | AE Clutch Release Cylinder Piston Rod          |
| P Clutch Release Fork Support Pin      | AF Clutch Release Fork Return Spring           |

AG Clutch Release Cylinder Boot  
 AH Nut  
 AI Bolt  
 AJ Clutch Release Cylinder Piston  
 AK Clutch Release Cylinder Piston Cup

AL Clutch Release Fork Back Spring Hanger  
 AM Clutch Release Cylinder  
 AN Bolt  
 AO Clutch Release Cylinder Bleeder Plug  
 AP Bleeder Plug Rubber Cap

\* \* \*

## CLUTCH

### Removal

1. Remove hood, air cleaner and drain cooling water, engine oil and transmission oil.
2. Remove radiator hoses and radiator.
3. Disconnect wiring and pipes.
4. Remove propeller shaft. (See page 3-1 "PROPELLER SHAFT".)
5. Remove control rods and speedometer cable from transmission.
6. Place jack under the transmission.
7. Remove under floor crossmember center.
8. Remove engine front support bolts.
9. Remove engine assembly together with the transmission with hoist.
10. Remove clutch cover assembly and clutch disc.

### Installation

1. Install clutch cover assembly holding clutch disc securely so that its center may line up with the center of the crankshaft using main drive shaft.
2. Adjust the height of clutch pressure levers by using Clutch Pressure Lever Height Gauge (RS SST-1074).

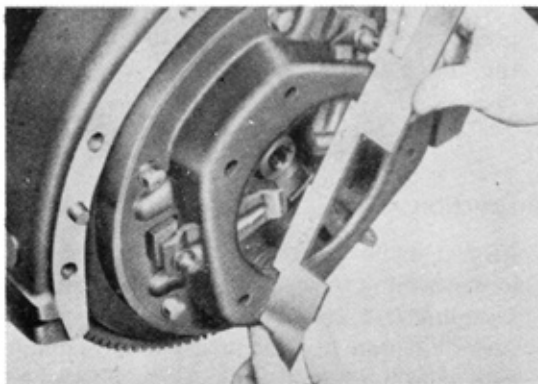


Fig. 1-3 Adjusting Pressure Lever

**Note:** The height of the clutch pressure levers is specified as 5mm (0.20") when measured from the surface of the clutch cover. The difference in height between the three pressure levers should be maintained within 0.2 mm (0.008"). After the height of pressure levers is adjusted,peen the tops of the adjusting nuts to prevent them from loosening.

3. Install transmission assembly on the engine.
4. Install engine assembly with transmission on the vehicle.

## CLUTCH COVER ASSEMBLY

### Disassembly

1. Place a flat steel plate or a piece of wood over the clutch cover, and pressed down lightly to overcome the clutch spring tension acting on the cover.

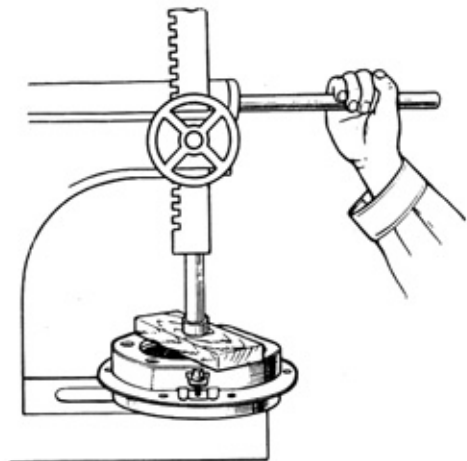


Fig. 1-4 Pressing down Clutch Cover

2. Remove pressure lever adjusting nuts.

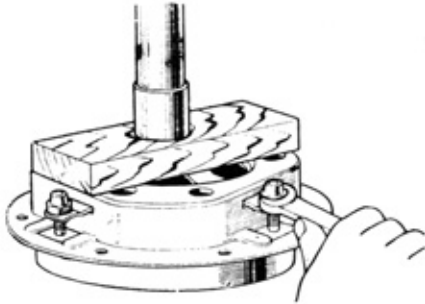


Fig. 1-5 Removing Pressure Plate

**Note:** Before removing the pressure plate from the clutch cover, marks should be punched on the plate and the cover in order to reassemble in their former positions for balancing purpose.

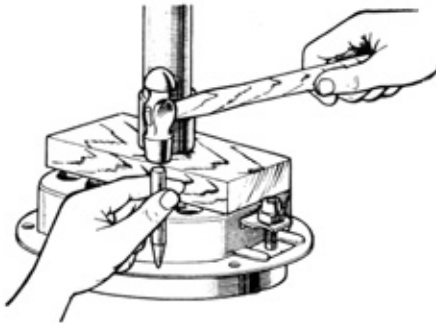


Fig. 1-6 Punching Marks on Plate

3. Release press slowly preventing the springs from flying out of clutch cover, then remove pressure plate.

### Assembly

1. Place clutch pressure plate on a press and install six clutch springs on boss.

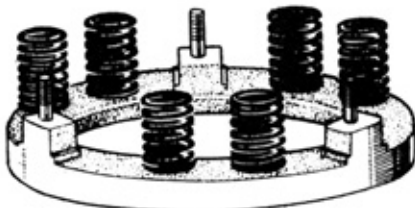


Fig. 1-7 Installing Springs

2. Insert three pressure levers into their pivot holes in the clutch cover. Place clutch cover carefully over the pressure plate.

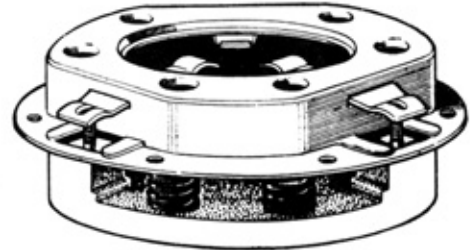


Fig. 1-8 Installing Pressure Lever

**Note:** Care should be taken to match marks punched on the cover and the plate.

3. Place a steel plate or a piece of wood on the top of the clutch cover and press down carefully. Check that pressure plate and cover are fitting properly and also all clutch springs are resting uniformly in their positions.
4. Having the clutch cover compressed, install plate washers and pressure lever adjusting nuts.

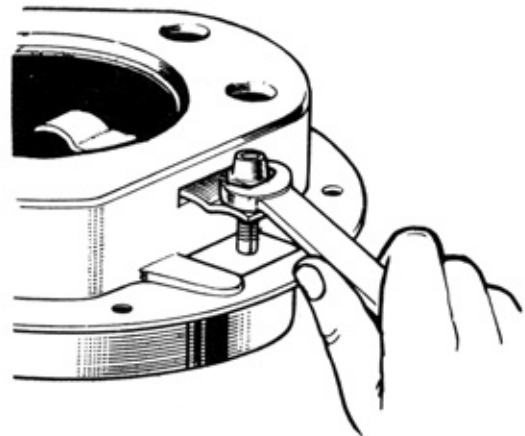


Fig. 1-9 Installing Clutch Cover

5. Place press spindle on the contact ends of pressure levers, and check the action of the clutch levers.

## CLUTCH DISC

### Inspection

1. Inspect splines of clutch plate hub for looseness due to wear. Replace clutch disc assembly if found defective in the hub.
2. Inspect clutch torsion rubbers for damage and deformation.  
If found defective, replace the clutch disc

assembly.

### 3. Inspect clutch facing

a. Clutch facing worn down to rivets, scored or in glacial condition should be replaced. The depth of the surface of clutch facing to the head of rivet should be more than 0.3 mm (0.012") and also when rivet holes are enlarged and having excessive looseness in facing, the disc assembly should be replaced.

b. If oil soaked facings are found, trace the cause of trouble and make necessary repairs.

Oil on the facings should be washed clean with gasoline and dried, or replace the disc assembly if necessary. Also make sure to clean the surfaces of fly wheel and bressure plate.

## CLUTCH RELEASE FORK & ITS RELATED PARTS

### Disassembly

1. Remove release bearing hub tension spring with nose pliers.

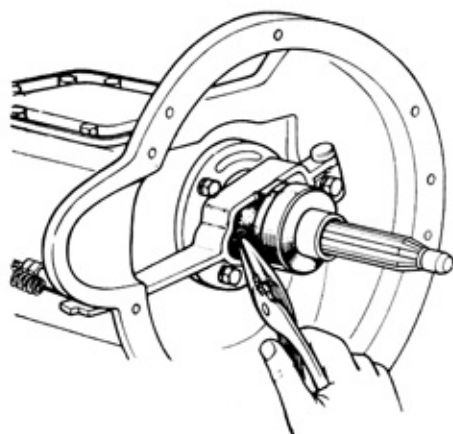


Fig. 1-10 Removing Tension Spring

2. Remove clutch release bearing together with the hub.
3. Remove release fork back spring.
4. Loosen mounting bolt from clutch release fork support and remove clutch release fork.

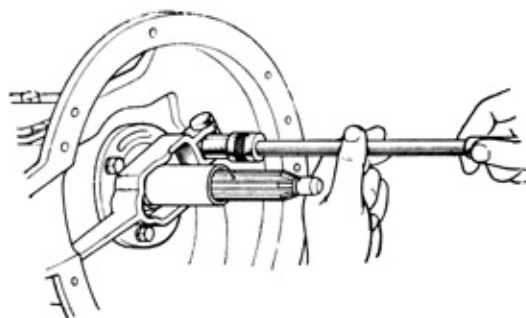


Fig. 1-11 Removing Clutch Release Fork

### Assembly

1. Install clutch release fork.
2. Install fork back spring.
3. Install clutch release bearing together with hub.

**Note:** Check that hub operates smoothly on the front bearing lock.

4. Install release bearing hub tension spring.

## PILOT BEARING

### Disassembly

To remove, use Pilot Bearing Puller (SG SST-1075)

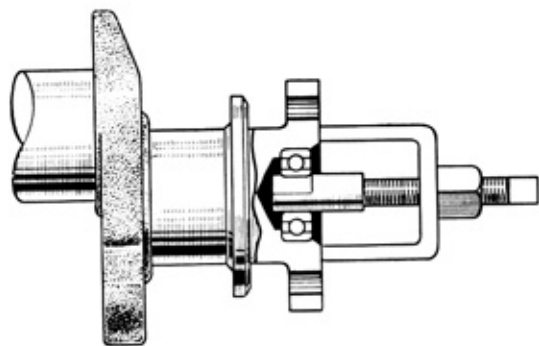


Fig. 1-12 Removing Pilot Bearing

### Inspection

Inspect bearing carefully and replace if found defective.

### Assembly

To install, use Pilot Bearing Replacer (RS SST-1076).

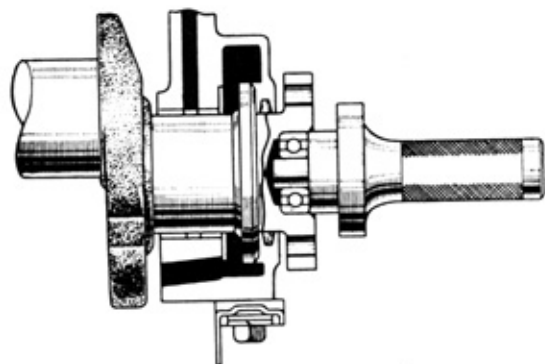


Fig. 1-13 Installing Pilot Bearing

## CLUTCH RELEASE BEARING

### Inspection

Inspect bearing for smooth rotation by pressing from both side.

If damaged, replace with new one.

**Note:** Do not soak or wash bearing with solvent or gasoline. When removing or installing bearing, never tap bearing with hammer. Use a press.

## PRESSURE LEVER

### Inspection

1. Inspect pressure lever for damage and deformation. If found defective, replace pressure lever.
2. Inspect pivot points where pressure levers contact with clutch cover. If found defective, correct these points. Levers excessively worn should be replaced. Usually clutch cover will be also worn at these contact points, so it must be repaired at the same time.

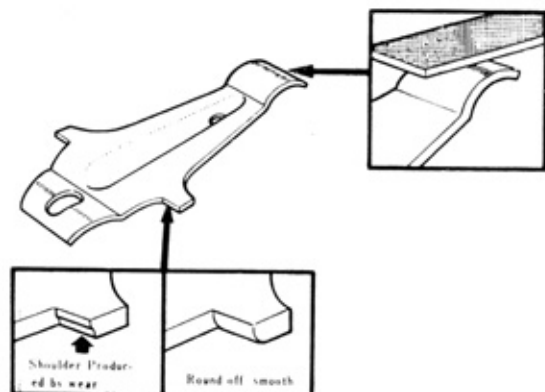


Fig. 1-14 Correcting Pressure Lever

3. Inspect the surface where the end of pressure levers contacts the release bearing. If the surface is excessively worn, round off smooth, or replace pressure lever.

## PRESSURE PLATE

### Inspection

If the surface of the clutch pressure plate contacting the clutch facing is scored or worn, the surface should be smoothed with fine emery cloth or machined on a lathe or surface grinder.

## CLUTCH SPRING

### Inspection

1. Check pressure of springs on the spring indicator.

The test readings obtained by the indicator should conform to the following specified values. If they are under these values, replace spring.

#### Spec.

Installed height 34.4 mm (1.35")  
pressure 26 kg (57.37 lbs)

2. Stand spring on a surface plate and place a steel square against it to check its perpendicularity. The allowable amount of deflection of perpendicularity is 2.52 mm (0.1") at free height of spring. If it is over this value, replace spring.

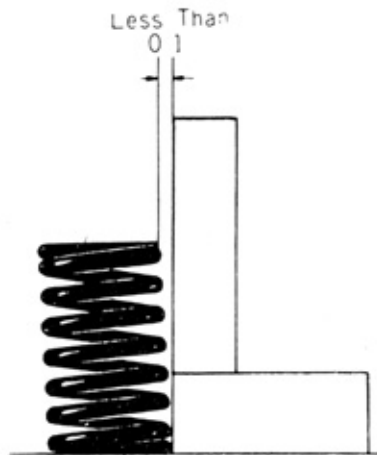


Fig. 1-15 Measuring Perpendicularity

## CLUTCH RELEASE CYLINDER

### Removal

1. Plug air vent of master cylinder oil tank to prevent air entering the tank.
2. Jack up front of vehicle.
3. Remove release pipe line from release cylinder.
4. Remove release fork back spring.
5. Remove release cylinder.

### Installation

1. Install release cylinder together with back spring hunger.
2. Adjust piston rod adjuster.  
Adjust by turning piston rod adjuster so that play of release fork is about 3.8 mm (0.15").

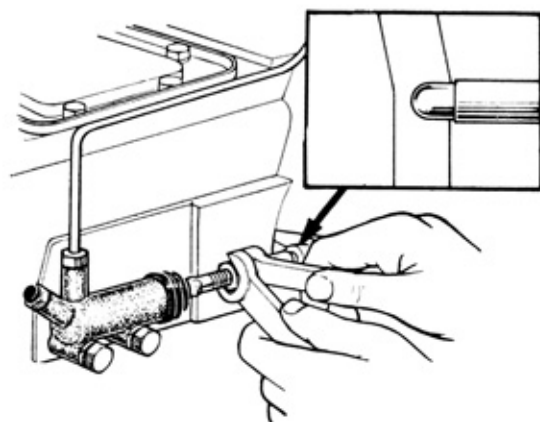


Fig. 1-16 Adjusting Piston Rod Adjuster

3. Install release fork spring.
4. Connect release pipe with rear end of release cylinder.
5. Refill reservoir with brake fluid.
6. Depress clutch pedal repeatedly and bleed air out through bleeder plug.
7. Check all connections for leakage.

### Disassembly

1. Remove piston rod adjuster together with adjuster and boot from release cylinder body.
2. Remove release cylinder piston with piston cap from the inside of release cylinder.
3. Unscrew bleeder plug from rear end of release cylinder and remove check ball.

### Inspection

Wash all parts with alcohol or brake fluid and make thorough inspection on the following points.

1. If cylinder is scored, replace cylinder.
2. If the crack or deformation of brake fluid reservoir is found, replace the reservoir.
3. If the diameter of piston is less than 14.9 mm (0.587"), replace piston.

### Assembly

Follow "REMOVAL" in reverse order.



## CLUTCH MASTER CYLINDER

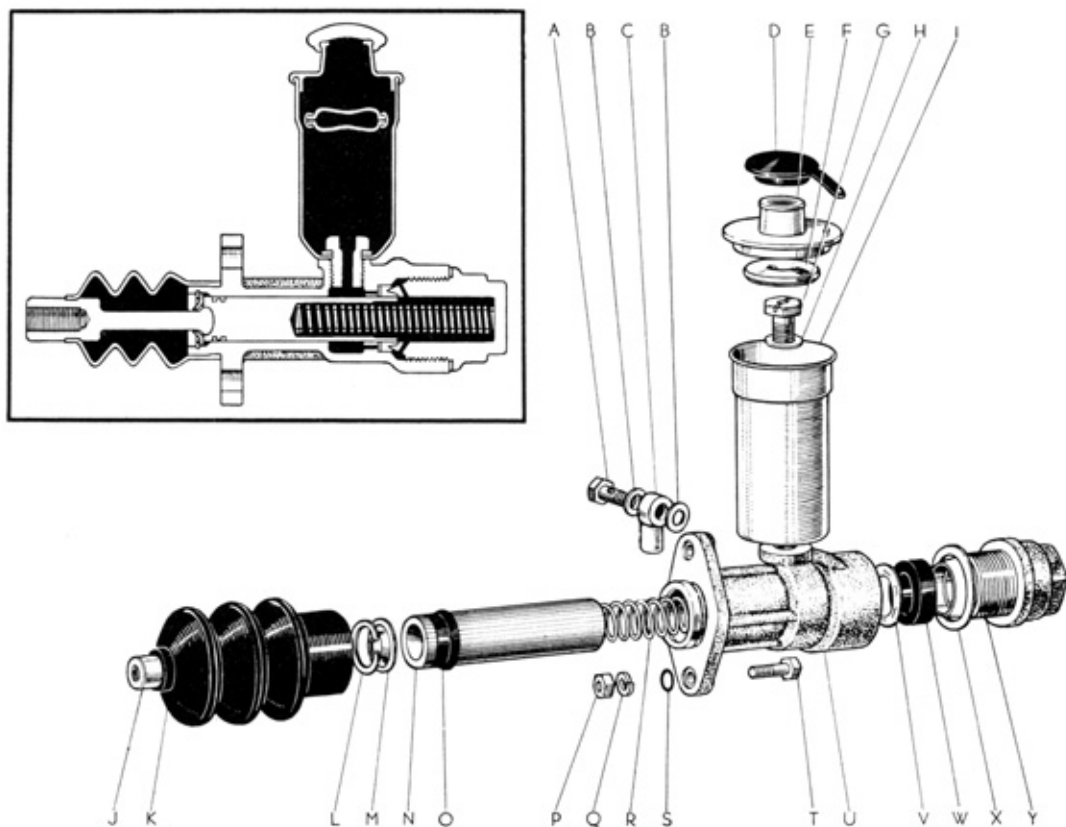


Fig. 1-17 Clutch Master Cylinder

- |  |  |
|--|--|
| A Bolt                                     | N Master Cylinder Piston               |
| B Union Packing                            | O Master Cylinder Piston Packing       |
| C Union                                    | P Nut                                  |
| D Master Cylinder Oil Tank Rubber Cap      | Q Spring Washer                        |
| E Master Cylinder Oil Tank Resin Cap       | R Master Cylinder Piston Return Spring |
| F Master Cylinder Oil Tank Float Complete  | S Master Cylinder Set Bolt Seal        |
| G Master Cylinder Oil Tank Set Bolt        | T Bolt                                 |
| H Master Cylinder Oil Tank Set Bolt Washer | U Master Cylinder                      |
| I Master Cylinder Oil Tank                 | V Master Cylinder Piston Cup Spacer    |
| J Master Cylinder Piston Rod               | W Master Cylinder Piston Cup           |
| K Master Cylinder Boot                     | X Master Cylinder Piston Cap Packing   |
| L Master Cylinder Snap Ring                | Y Master Cylinder Cap                  |
| M Master Cylinder Piston Seat              |  |

## Removal

**Note:** Care should be taken to avoid the damage of the paint of the body, caused by the brake fluid attached.

1. Plug air vent of master cylinder oil tank.
2. Disconnect flexible hose from master cylinder.
3. Remove clutch pedal return spring.
4. Remove cotter pin and pull out master cylinder push rod pin.
5. Loosen two attaching bolts that retain master cylinder to dash board.

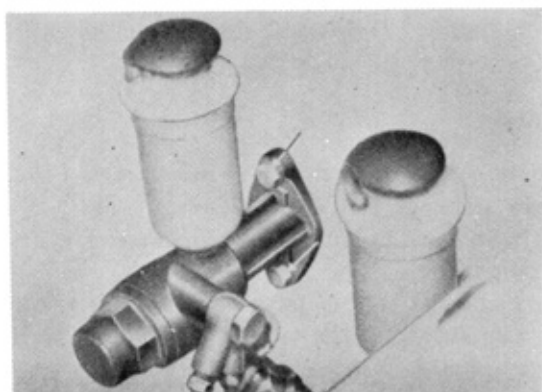


Fig. 1-18 Loosening Two Attaching Bolts

## Installation

1. Attach master cylinder to the dash board.
2. Connect push rod with clutch pedal by installing push rod pin in push rod and clutch pedal, then secure the pin in place with washers and cotter pin.
3. Install clutch pedal return spring.
4. Adjust push rod pin (See page 1-12 "CLUTCH PEDAL").
5. Connect flexible hose to master cylinder.
6. Fill reservoir with brake fluid.
7. Loosen bleeder plug of clutch release cylinder, and depress clutch pedal several times to bleed out air in the line.
8. Refill reservoir with brake fluid to  $\frac{3}{4}$  full.
9. Check the leakage of brake fluid in line and the clutch to operate smoothly.

## Disassembly

1. Remove master cylinder inlet cap and drain out brake fluid.
2. Remove cap and float.

3. Loosen oil tank set bolt and remove reservoir.

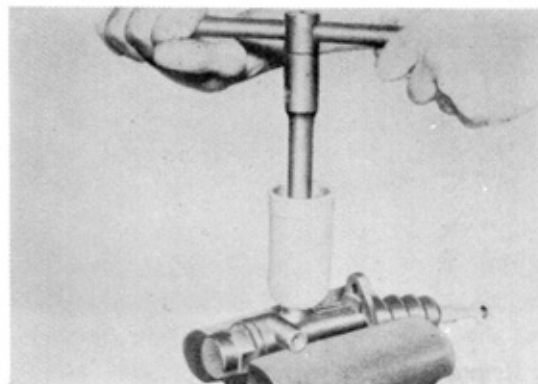


Fig. 1-19 Removing Oil Tank

4. Take off boot from master cylinder body.

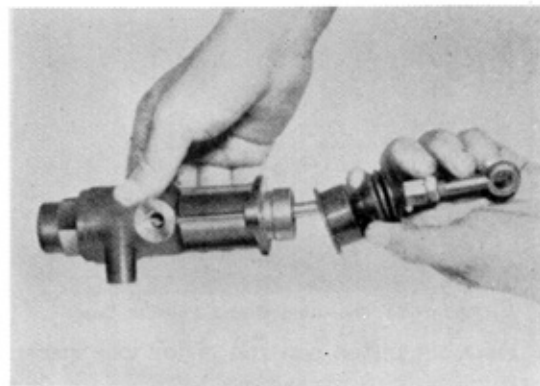


Fig. 1-20 Taking off Boot

5. Remove snap ring to take out push rod and piston rod.

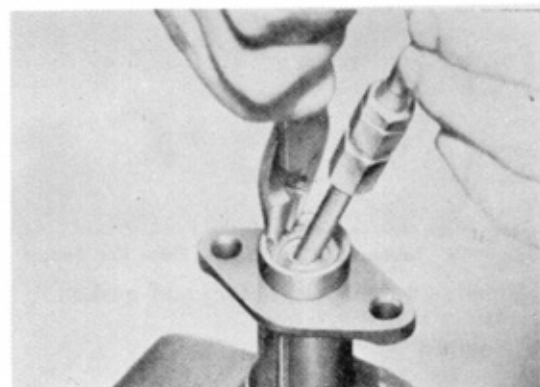


Fig. 1-21 Removing Snap Ring

6. Take out master cylinder piston and piston return spring.

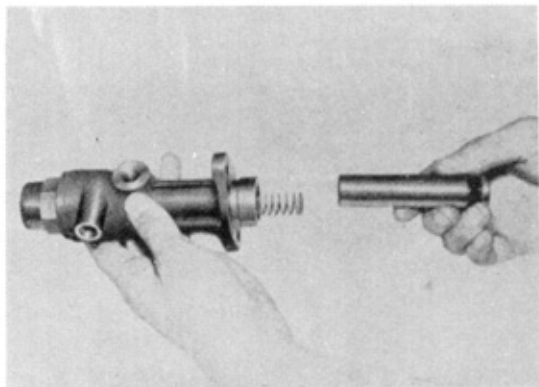


Fig. 1-22 Taking out Master Cylinder Piston

7. Remove master cylinder cap.

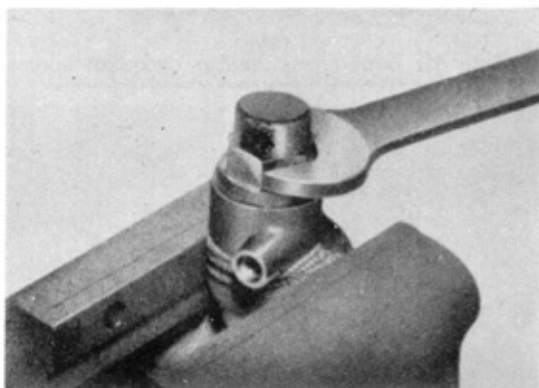


Fig. 1-23 Removing Master Cylinder Cap

8. Take out piston cap and piston cap spacer.

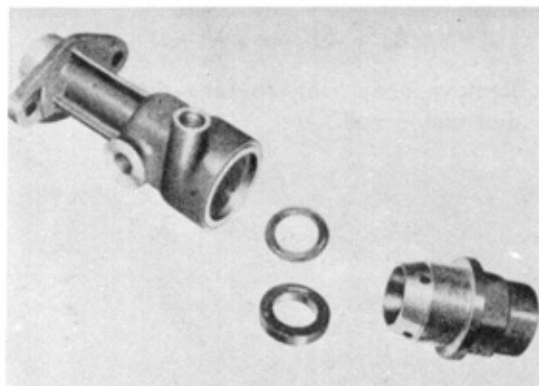


Fig. 1-24 Taking out Piston Cup & Piston Cup Spacer

9. Remove union bolt, union, and gaskets.

### Inspection

Wash all parts with alcohol or brake fluid and make thorough inspection on the following points.

1. If master cylinder is scored, replace with

new one.

2. If the wear in master cylinder is more than 0.08 mm (0.003"), replace master cylinder.
3. If master cylinder piston cup and piston packing are badly cracked, deformed or damaged, replace with new ones.
4. If the clearance between the cylinder and piston is more than 0.15 mm (0.006"), replace piston.
5. If return spring is found weak, replace with new one.

**Spec. Free length 117.5 mm (4.63")**

6. If the crack or deformation of master cylinder oil tank is found, replace with new one.

### Assembly

**Note:** Each part should be kept clean. Use new packings and new gaskets.

1. Insert piston cup spacer into master cylinder body.

Place flat side of piston cup against piston cup spacer in the cylinder.



Fig. 1-25 Inserting Piston Cup Spacer & Piston Cup

2. Screw master cylinder piston cap into the body.
3. Insert master cylinder piston return spring.
4. Insert master cylinder piston.

**Note:** Care should be taken that the lip of piston packing is placed forward and it may not be damaged when installing.

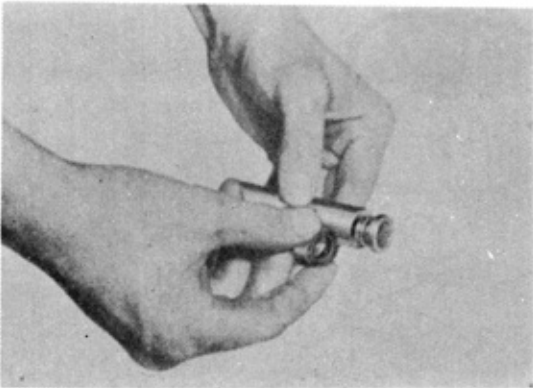


Fig. 1-26 Inserting Master Cylinder Piston

5. Place piston rod against the concaved end of piston and insert piston seat. Fix snap ring in the groove.
6. Install rubber boot.
7. Install union bolt, gasket and union to master cylinder.
8. Install oil tank on master cylinder and replace cap.

**Torque Spec.**

Set bolt 1.4~1.8 m-k<sub>g</sub> (10~13ft-lb)

**Note:** Before installing oil tank to master cylinder, check the free passage of piston by blowing master cylinder from the oil tank hole.

If passage holes in piston are open, there should be free travel of air to the union. Push in the piston rod slightly and try to blow air in again.

The air should not blow by in, because this pushing puts the piston into the sealing position with the piston cup, and will not allow air to pass through.

## CLUTCH PEDAL

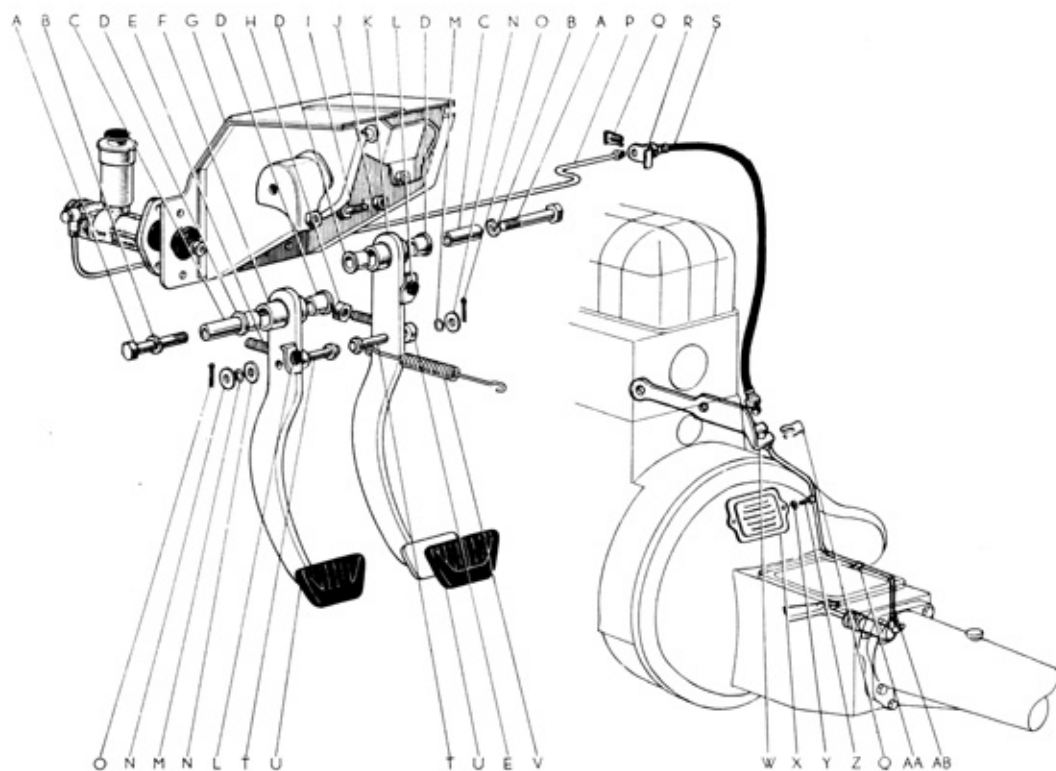


Fig. 1-27 Clutch Pedal &amp; Brake Pedal

- |                            |   |
|----------------------------|---|
| A Bolt                     | O Cotter Pin                                |
| B Spring Washer            | P Clutch Release Intermediate Pipe Complete |
| C Pedal Shaft Collar       | Q Flexible Hose Clip                        |
| D Bushing                  | R Clutch Release Flexible Hose Set Plate    |
| E Master Cylinder Push Rod | S Clutch Flexible Hose Complete             |
| F Clutch Pedal Complete    | T Master Cylinder Push Rod Pin              |
| G Pedal Bracket Complete   | U Pedal Rubber Seat                         |
| H Nut                      | V Pedal Back Spring                         |
| I Bolt                     | W Clutch Flexible Hose Bracket              |
| J Nut                      | X Clutch Inspection Hose Cover              |
| K Brake Pedal Complete     | Y Spring Washer                             |
| L Pedal Cushion Rubber     | Z Bolt                                      |
| M Washer                   | AA Clutch Release Union Pipe Clamp          |
| N Plate Washer             | AB Clutch Release Pipe Complete             |

### Removal

1. Remove pedal return spring.
2. Pull out push rod pin.
3. Remove clutch pedal.

### Installation

Follow "REMOVAL" in reverse order.

### Adjustment

1. Unhook clutch release fork return spring.
2. Screw or unscrew rod adjuster to adjust the play of release fork.

**Note :** The play of 3.8 mm (0.15") indicates the clearance of 1.5 mm (0.06") for clutch release bearing to contact clutch pressure lever.

3. Adjust free height of clutch pedal to 630 mm (24.8") when measured from steering wheel to pedal by screwing or unscrewing adjust bolt on pedal bracket.
4. Adjust piston rod by loosening lock nut and turning piston rod so that pedal may fully contact stopper on the pedal bracket and also master cylinder piston may return fully.

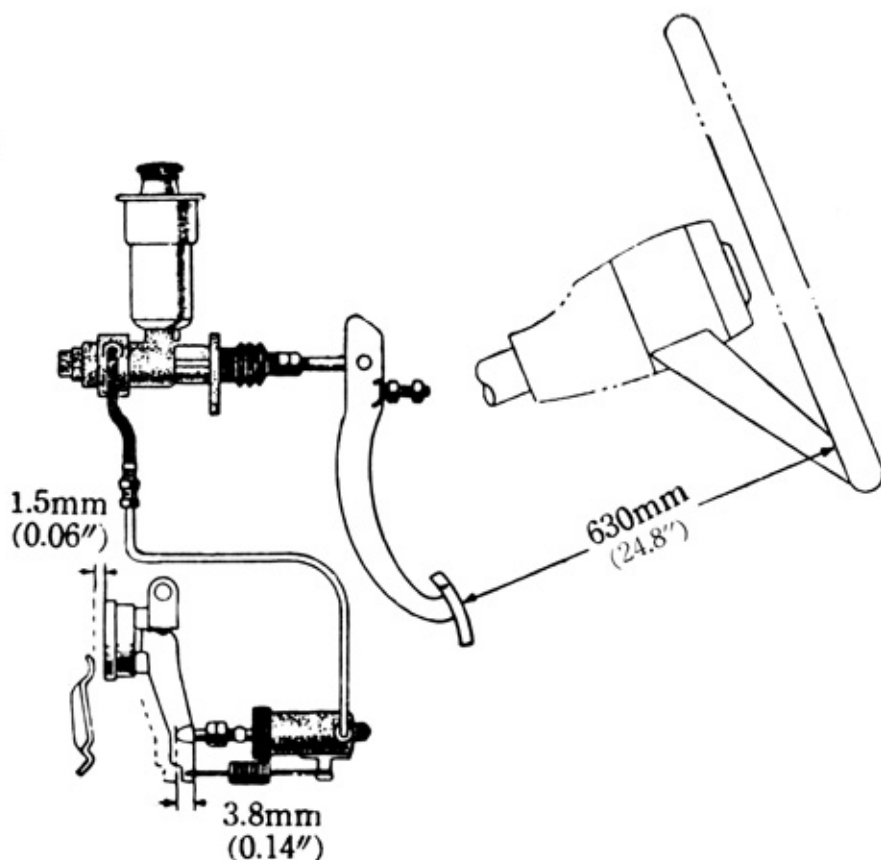


Fig. 1-28 Adjusting Clutch Pedal