

CLUTCH

6-A. CLUTCH PEDAL ADJUSTMENT	6 : 1
6-B. RELEASE FORK ADJUSTMENT	6 : 1
6-C. CLUTCH REMOVAL	6 : 1
6-D. CLUTCH INSPECTION	6 : 1
6-D-1. Checking of Release Bearing and Fork	6 : 1
6-D-2. Checking of Pressure Plate and Cover Assembly	6 : 1
6-D-3. Checking of Clutch Disk	6 : 2
6-D-4. Flywheel Inspection	6 : 2
6-D-5. Ring Gear Replacement	6 : 2
6-D-6. Checking of Pilot Bearing	6 : 2
6-E. CLUTCH ASSEMBLY	6 : 2
6-F. CLUTCH MASTER CYLINDER	6 : 3
6-F-1. Removing of Clutch Master Cylinder	6 : 3
6-F-2. Disassembling of Clutch Master Cylinder	6 : 3
6-F-3. Checking of Clutch Master Cylinder	6 : 3
6-F-4. Assembling of Clutch Master Cylinder	6 : 3
6-F-5. Installing of Clutch Master Cylinder	6 : 4
6-G. CLUTCH RELEASE CYLINDER	6 : 4
6-G-1. Removing of Clutch Release Cylinder	6 : 4
6-G-2. Checking of Clutch Release Cylinder	6 : 4
6-G-3. Assembling of Clutch Release Cylinder	6 : 4
6-G-4. Installing of Clutch Release Cylinder	6 : 4
6-H. AIR BLEEDING	6 : 4

CLUTCH

The clutch is of the single dry disk type. The clutch assembly consists of the clutch disk assembly, clutch cover and pressure plate assembly, and clutch release mechanism.

The clutch operating mechanism is a hydraulic type.

6-A. CLUTCH PEDAL ADJUSTMENT

The free travel of the clutch pedal should be between **20 to 30 mm (0.8 to 1.2 in)**. To adjust the free travel, loosen the lock nut and turn the push rod until proper adjustment is made.

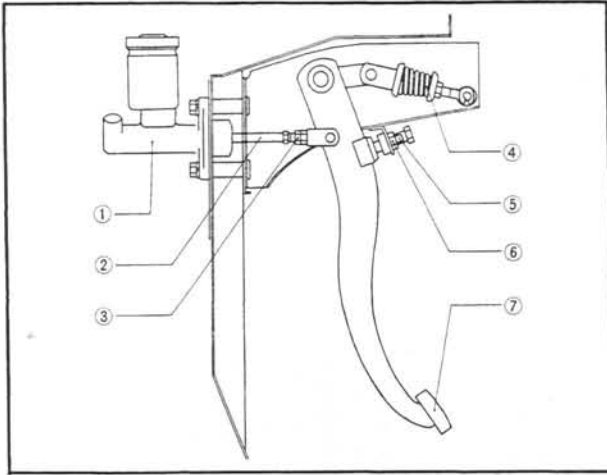


Fig. 6-1 Clutch pedal

- | | |
|---------------------------|-----------------|
| 1. Clutch master cylinder | 5. Stopper bolt |
| 2. Rod | 6. Lock nut |
| 3. Lock nut | 7. Pedal |
| 4. Return spring | |

6-B. RELEASE FORK ADJUSTMENT

There should always be a safe clearance of 1.5 mm (0.06 in) between the release bearing and the diaphragm spring. This clearance is essential to disengage the release bearing and to prevent unnecessary wear and possible slippage. This clearance is obtained when the free play of the release fork is adjusted to **3.0 mm (0.12 in)**.

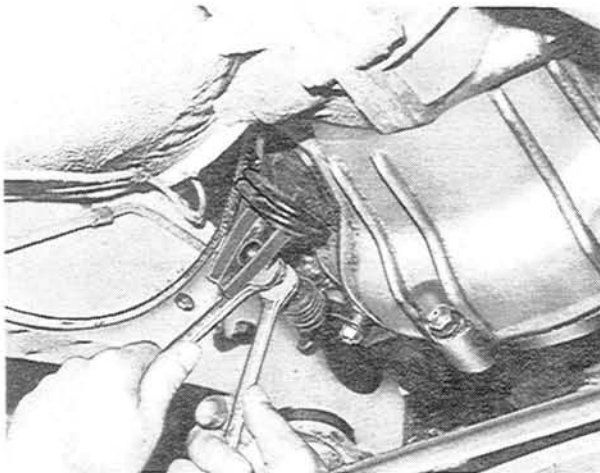


Fig. 6-2 Adjusting of release fork

To adjust remove the return spring, loosen the lock nut, and turn the adjusting nut until the correct play is obtained.

After adjusting, securely tighten the lock nut and hook the return spring.

6-C. CLUTCH REMOVAL

To remove the clutch from the vehicle, proceed as follows:

1. Remove the transmission as detailed in Par. 7-A.
2. Install the **ring gear brake** (49 0221 030A).
3. Loosen the bolts holding the clutch cover assembly to the flywheel and remove the clutch cover assembly and the clutch disk.
4. Loosen the bolts that attach the flywheel to the crankshaft. Remove the flywheel.
5. Remove the return spring for the clutch release bearing and slide off the release bearing.
6. Pull the release fork outward until the retaining spring of the fork releases itself from the pivot pin. Remove the fork from the clutch housing.

6-D. CLUTCH INSPECTION**6-D-1. Checking of Release Bearing and Fork**

Note: The release bearing is packed with lubricant which is intended to last the whole life time of the bearing. Therefore, the bearing must not be washed in gasoline or any other solvent.

Check the release bearing by turning the bearing race by hand. Replace if the bearing feels rough or seems noisy when turning.

Examine the front cover of the transmission carefully to be certain there are no burrs on the outer surface of the front cover which pilots the release bearing. Check the release fork for crack or bend.



Fig. 6-3 Release bearing

6-D-2. Checking of Pressure Plate and Cover Assembly

Check the contact surfaces of the pressure plate with the clutch facing for wear, damage or warpage. If it is slight, correct it by lapping with compound or by turning a lathe. But if severe, replace with a new one.

Check the diaphragm spring and cover and if any wear or damage is found, replace the pressure plate and cover assembly.

6-D-3. Checking of Clutch Disk

Inspect the clutch disk for warpage with a dial indicator or a feeler gauge, as shown in Fig. 6-4. If it is **more than 1.0 mm (0.0394 in)**, replace with a new one.



Fig. 6-4 Checking of clutch disk

Replace excessive worn facing as it will cause slippage, or scores the pressure plate and flywheel due to the projected heads of rivets.

If oil is evident on the facing, clean or replace the facing and eliminate the cause of oil leakage.

Make certain that the clutch disk slides easily on the main drive shaft without any excessive play.

If the play exceeds 0.3 mm (0.012 in), replace the clutch disk or the main drive shaft.

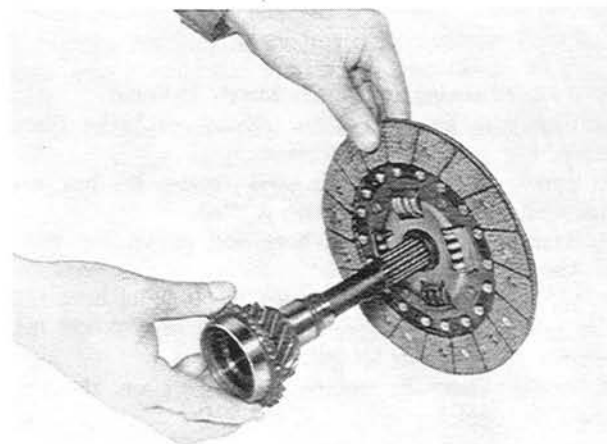


Fig. 6-5 Checking of disk spline

6-D-4. Flywheel Inspection

Inspect the contact surface of the flywheel with the clutch facing for burnt surface, scored surface or rivet grooves.

If it is slight, it can be reconditioned by grinding in a lathe. If the damage is deep, the flywheel should be replaced.

Check the ring gear teeth and replace if the ring gear teeth are broken, cracked or seriously burred.

6-D-5. Ring Gear Replacement

1. Heat the old ring gear and remove it from the flywheel.

2. Heat the new ring gear evenly 250 to 300°C (480 to 570°F).

3. Place the ring gear on the cold flywheel, making sure that the **chamfer on the teeth is faced to the engine**.

4. Allow the ring gear to cool slowly to shrink it onto the flywheel.

6-D-6. Checking of Pilot Bearing

Check the transmission main drive shaft pilot bearing which is pressed into the center of the flywheel.

If the bearing is loose or rough, it should be replaced.

6-E. CLUTCH ASSEMBLY

1. Install the flywheel onto the rear end of the crankshaft with six bolts. When doing so, **align the "O" marked hole** on the flywheel with the reamer hole on the crankshaft and install the **reamer bolt** in the "O" marked hole.

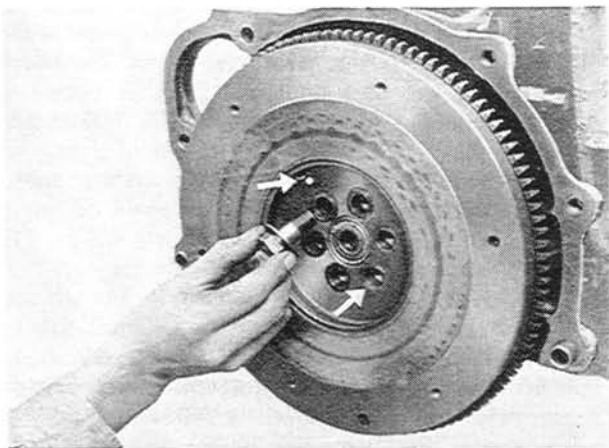


Fig. 6-6 Installing of flywheel

2. Use the **ring gear brake (49 0221 030A)** and tighten the bolts to **16.0 m-kg (120 ft-lb)**.

3. Hold the clutch disk in its mounting position with the **clutch disk centering tool (49 0223 391)**.

If the tool is not available, use a spare main drive shaft.

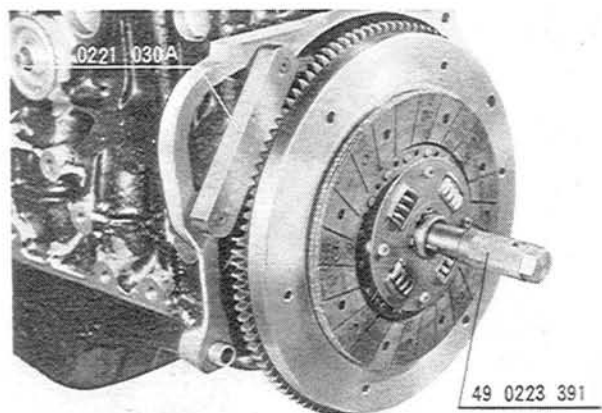


Fig. 6-7 Installing of clutch disk

4. Install the clutch cover and pressure plate assembly, aligning the "O" marks of the clutch cover and flywheel and install the attaching bolts. Use the reamer bolts in the "O" marked holes. Tighten the bolts to 2.0 m-kg (15 ft-lb).

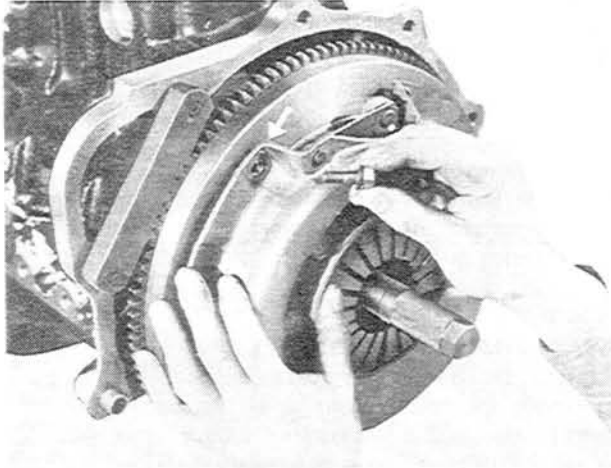


Fig. 6-8 Installing of clutch cover

5. Remove the disk centering tool and ring gear brake.
6. Apply grease to the pivot pin. Insert the release fork through the dust boot and press it inward so that the retaining spring of the release fork fits to the pivot pin.
7. Install the release bearing and the return spring.
8. Install the transmission.

6-F. CLUTCH MASTER CYLINDER

6-F-1. Removing of Clutch Master Cylinder

If it becomes necessary to remove the master cylinder for repair or overhaul, proceed as follows:

1. Disconnect the fluid pipe at the master cylinder outlet.
2. Loosen the nuts that attach the master cylinder to the dash panel.
3. Pull the master cylinder straight out and away from the dash panel.

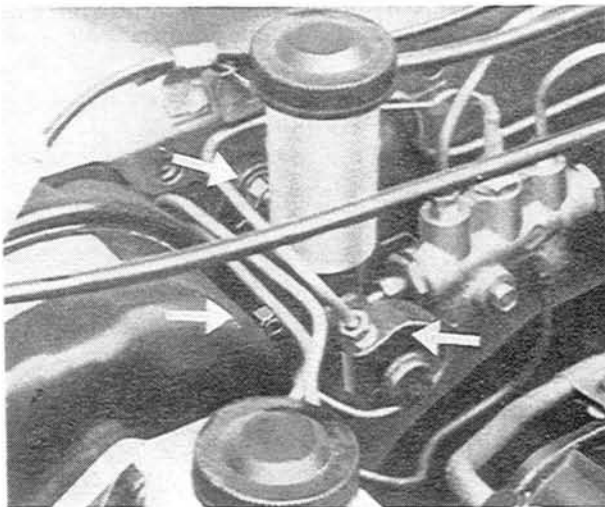


Fig. 6-9 Removing of master cylinder

6-F-2. Disassembling of Clutch Master Cylinder

The procedures for disassembling the master cylinder after removing the master cylinder are as follows:

1. Clean the outside of the master cylinder thoroughly and drain the brake fluid.
2. Remove the dust boot from the cylinder.
3. Remove the piston stop wire with a screwdriver and remove the stop washer.
4. Remove the piston assembly, primary cup and return spring from the cylinder.
5. Remove the reservoir from the cylinder.

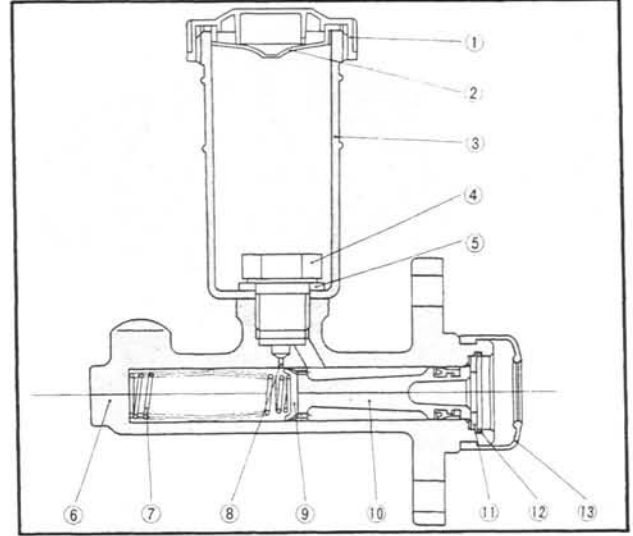


Fig. 6-10 Clutch master cylinder

- | | |
|------------------|----------------------|
| 1. Cap | 8. Compensating port |
| 2. Baffle | 9. Primary cup |
| 3. Reservoir | 10. Piston assembly |
| 4. Bolt | 11. Stop washer |
| 5. Washer | 12. Stop wire |
| 6. Cylinder | 13. Boot |
| 7. Return spring | |

6-F-3. Checking of Clutch Master Cylinder

1. Wash the parts in clean alcohol or brake fluid. **Never** use gasoline or kerosene.
2. Check the piston cups and replace if they are damaged, worn, softened, or swelled.
3. Examine the cylinder bore and piston for wear, roughness or scoring.
4. Check the clearance between the cylinder bore and the piston. If it is **more than 0.15 mm (0.006 in)**, replace the cylinder or piston.
5. Ensure that the compensating port on the cylinder is open.

6-F-4. Assembling of Clutch Master Cylinder

1. Before assembling, dip the piston and cups in clean brake fluid.
2. Install the reservoir.
3. Insert the return spring into the cylinder.
4. Install the primary cup so that the flat side of the cup goes toward the piston.
5. Fit the secondary cup onto the piston and install them into the cylinder.
6. Install the stop washer and stop wire.
7. Fill with brake fluid and operate the piston with a

screwdriver until the fluid is ejected at the outlet.
8. Install the rubber boot to the cylinder.

6-F-5. Installing of Clutch Master Cylinder

1. Install the clutch master cylinder assembly onto the dash panel and tighten the nuts.
2. Connect the fluid pipe to the cylinder.
3. Fill with brake fluid.
4. Bleed the clutch hydraulic system, as described in Par. 6-H.

6-G. CLUTCH RELEASE CYLINDER

6-G-1. Removing of Clutch Release Cylinder

1. Disconnect the fluid pipe at the clutch release cylinder.
2. Unhook the release fork return spring.
3. Loosen the nuts attaching the cylinder to the clutch housing. Remove the release cylinder.

6-G-2. Checking of Clutch Release Cylinder

Refer to Par. 6-F-3 and inspect the clutch release cylinder.

6-G-3. Assembling of Clutch Release Cylinder

1. Fit the cups to the piston and install them into the cylinder.
2. Install the rubber boot on the end of the cylinder.
3. Install the valve (steel ball) and bleeder screw into the bleeder hole. Fit the cap.
4. Install the clutch release rod.

6-G-4. Installing of Clutch Release Cylinder

1. Install the clutch release cylinder assembly to the clutch housing with two nuts.
2. Connect the fluid pipe.
3. Fill the reservoir of the master cylinder with brake fluid and bleed the system, as described in Par. 6-H.
4. Adjust the free play of the release fork, as instructed in Par. 6-B.
5. Hook the return spring.

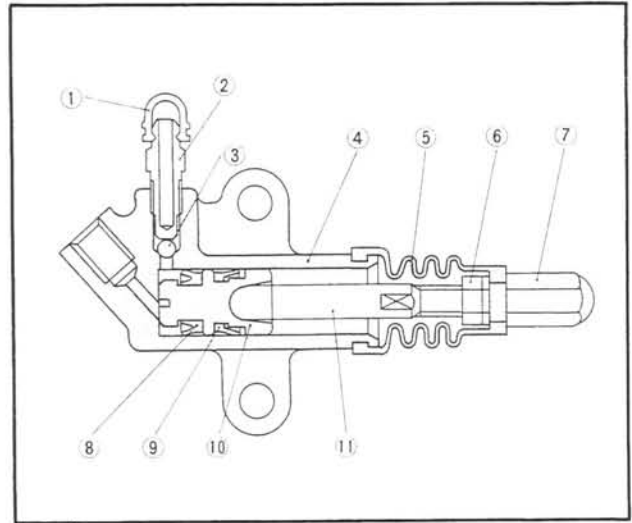


Fig. 6-11 Clutch release cylinder.

- | | |
|-------------|------------------|
| 1. Cap | 7. Adjusting nut |
| 2. Bleeder | 8. Primary cup |
| 3. Valve | 9. Secondary cup |
| 4. Cylinder | 10. Piston |
| 5. Boot | 11. Push rod |
| 6. Lock nut | |

6-H. AIR BLEEDING

The clutch hydraulic system must be bled whenever a fluid line has been disconnected or air enters the system. To bleed the clutch system, remove the rubber cap from the bleeder screw and attach the bleeder tube and fixture of the bleeder screw.

Place the end of the tube in the glass jar and submerge in brake fluid. Open the bleeder valve.

Depress the clutch pedal and allow it to return slowly. Continue this pumping action and watch the flow of fluid in the jar. When air bubbles cease to appear, close the bleeder valve. During bleeding the reservoir of the master cylinder must be kept at least 3/4 full of the brake fluid. After the bleeding operation, remove the tube, fit the cap to the bleeder valve, fill the reservoir and fit the cap.

SPECIAL TOOLS

49 0221 030A	Ring gear brake
49 0223 391	Clutch disk centering tool

