CLUTCH

TROUBLE SHOOTING

Symptoms & Probable Causes	Remedies
1. Slippage	
The clutch slipping will appear gradually with the followings.	
(a) No speed gains	
(b) Fuel consumption increases	
(c) Engine overheats	
(d) Not enough acceleration relative to engine rpm when the accelerating pedal is depressed suddenly.	
(e) Loses in power is evident when climbing a slope.	
The clutch slippage can be detected immediately in case of "d", and "e", but as for the symptoms of "a", "b", and "c", they are sometimes taken for engine troubles. Thus, diagnosis must be carefully made. Try not to operate the car with a slipping clutch which may lead to excessive wear or burning of clutch facing.	
a. No play at clutch release fork end	Adjust release cylinder push rod
b. No cl utch pedal free-play	Adjust master cylinder push rod
c. Oil adhering to clutch facing	Replace clutch disc
d. Clutch facing worn out	Replace clutch disc
e. Weak clutch diaphragm spring	Replace diaphragm spring
f. Deformed pressure plate and/or flywheel	Repair or replace
2. Improper disengagement	
This symptom causes unpleasant noise (clutch or gear clash) when shifting the transmission gears into mesh, and makes the gear shift difficult. Especially this appears when shifting into reverse gear.	
a. Excessive clutch pedal free-play	Adjust master cylinder push rod
b. Excessive free-play at release fork end	Adjust release cylinder push rod
c. Defective clutch retracting spring/s	Replace spring/s
d. Defective input shaft front bearing	Replace bearing
e. Worn splines of clutch disc hub	Replace clutch disc
f. Excessive clutch disc run-out	Replace clutch disc
g. Weak or deformed master cylinder and/or release cylinder cup	Replace cup
h. Fluid leakage from master cylinder and/or release cylinder	Check and repair
i. Air in clutch hydraulic system	Bleed Air

Symptoms & Probable Causes	Remedies
3. Chattering Upon starting out the car with the clutch engaged half-way, entire body may vibrate.	
a. Clutch facing glazed	Recondition the facing or replace clutch disc
b. Oil or grease on facing	Replace clutch disc
c. Weak or damaged clutch disc torsion rubbers	Replace clutch disc
d. Poor facing contact or excessive clutch disc run-out	Replace clutch disc
e. Warped pressure plate or flywheel	Correct or replace
f. Loose or worn engine mounting	Tighten or replace
g. Loose rivets in clutch disc	Replace clutch disc
4. Noisy Find the origin of the noisy clutch by disengaging the clutch for "a", and "b" or engaging clutch for "c", "d", and "e".	
a. Worn or damage clutch release bearing	Replace bearing
b. Worn or damaged input shaft front bearing	Replace bearing
c. Loose clutch disc hub	Replace clutch disc
d. Cracked clutch disc plate	Replace clutch disc
e. Weak or damage clutch disc torsion rubbers	Replace clutch disc
5. Jerking Upon starting out the car with the clutch engaged half-way, the car jerks, and is not accelerated smoothly.	
a. Oil or grease on facing	Recondition or replace clutch disc
b. Worn facing or loose rivets	Replace clutch disc
c. Damaged or weak clutch disc torsion rubbers	Replace clutch disc

ADJUSTMENT

1. Clutch pedal.

a. Adjust the clutch pedal height with the pedal stopper bolt to specified height which should be 195 mm (7.7") from the dash panel.

b. Adjust the clutch pedal free-play with the master cylinder push rod. The specified free-play is 0.5 to 3.0 mm (0.02 ~ 0.12") at the top center of the pedal pad. Make this adjustment with the tension spring.

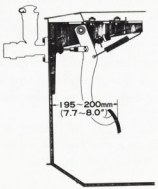


Fig.8-1 Clutch Pedal Height Y5049

c. Check the small hole in the master cylinder boot if it is at the underneath side.

2. Clutch release fork.

a. Jack the front end of the car, and support it on stands.

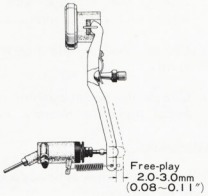


Fig.8-2 Clutch Release Fork Free-play X4228

b. In order to obtain the specified clearance between the clutch release bearing in operation, and the clutch diaphragm spring, the adjustment should be made with the release cylinder push rod.
The specified free-play at the clutch release fork end should be 2 to 3 mm (0.08 ~ 0.11").

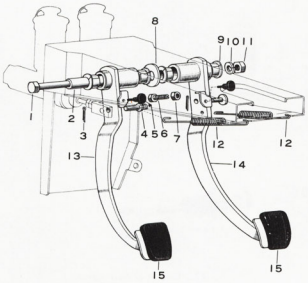
3. Air bleeding.
Be sure that the reservoir does not run short of brak fluid during the air bleeding operation, and brake fluid does not drip on any painted surface.

a. Connect the vinyl pipe to the release cylinder bleeder plug, and put the other end of the pipe into a jar half filled with brake fluid.

b. Pump the clutch pedal to bleed the air from the system.

c. After air bleeding, check if the oil leakage is not present.

CLUTCH & BRAKE PEDALS



1. Bolt
2. Collar
3. Cotter pin
4. Pin
5. Cushion
6. Pedal adjusting bolt
7. Lock nut
8. Washer
9. Bushing
10. Lock washer
11. Nut
12. Return spring
13. Clutch pedal
14. Brake pedal
15. Pedal pad

Fig.8-3 Clutch & Brake Pedals Components Y5050

Removal

1. Remove both pedal return spring (1) of the clutch pedal, and the brake pedal.
Disconnect the stop lamp switch wires.

2. With the cotter pins removed, remove the pins (2) from the clutch and brake master cylinder push rods.

3. Remove the bolt (3) holding the pedals, then remove the clutch, and brake pedals (4) from the pedal bracket.
Remove the collars, bushings, and the washers from the pedals.

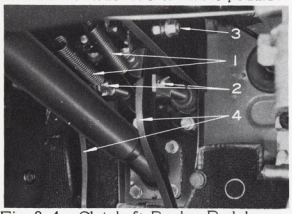


Fig.8-4 Clutch & Brake Pedals Removal V1265

Inspection

Inspect the followings, and repair or replace the part/s if necessary.

1. Check the bushings for wear, scores, and damage.

2. Check the collars and pins for wear and rough surface.

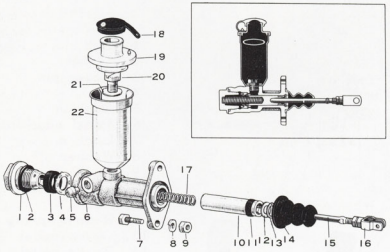
3. Check the pedals for twist, and bend.

4. Check the pedal bushing eyes, and pedal pads for wear.

Installation

Follow the removal procedures in the reverse order.
When bushings and collars are assembled, apply a coat of multipurpose grease on these items.
Adjust the pedal, refer to clutch pedal adjustment.

CLUTCH MASTER CYLINDER



1. Master cylinder cap
2. "O" ring
3. Cylinder cap
4. Cup spacer
5. Union seat
6. Master cylinder body
7. Bolt
8. Lock washer
9. Nut
10. Master cylinder piston
11. Cylinder cup
12. Washer
13. Hole snap ring
14. Boot
15. Push rod
16. Push rod clevise
17. Compression spring
18. Reservoir filler cap
19. Reservoir cap
20. Reservoir set bolt
21. Washer
22. Reservoir

Fig.8-5 Clutch Master Cylinder Components C1278

Removal

1. Plug the master cylinder reservoir inlet.
2. Disconnect the clutch tube from the master cylinder.
3. Remove the clutch pedal return spring.
   Next, with the cotter pin removed, remove the pin to disconnect the push rod, and the pedal.
4. Remove the bolts mounting the master cylinder onto the dash panel, and remove the master cylinder.
   Do not spill any brake fluid on the paint surfaces.

Disassembly

1. Remove the reservoir filler cap, and drain the fluid.
   Remove the reservoir cap, and the float.
2. Unscrew the bolt attaching the reservoir onto the master cylinder body, and remove the reservoir.
3. Remove the push rod, and the boot from the master cylinder body.
4. Clamp the master cylinder body in a vise, and with a pipe wrench remove the master cylinder cap from the master cylinder body.
5. Remove the cylinder cup, cup spacer, spring, and the piston towards the front end of the master cylinder body.
6. Remove the hole snap ring, and the washer.

Inspection

Wash all disassembled parts thoroughly in brake fluid, and inspect for wear and scores.

1. Inspect the master cylinder bore for wear or scores.
2. Inspect the piston exterior for abnormal wear or scores.
3. Inspect the cylinder to piston clearance.
   If the clearance exceeds the limit, replace the piston and/or the cylinder.

   Cylinder inner diameter:
   15.87 ~ 15.913 mm
   (0.625 ~ 0.626")

   Piston diameter:
   15.811-15.838mm(0.622-0.623")

   Specified clearance:
   0.032 ~ 0.102 mm
   (0.001 ~ 0.004")

   Clearance limit:
   0.15 mm (0.006")
4. Inspect the cylinder cups, and the cup spacer for scores, distortion or wear.
5. Inspect the piston return spring for proper spring tension. If too weak, replace the spring.

   Free length:
   85.0 mm (3.346")

   Installed length:
   63.4 mm (2.496")

   Installed load:
   1.5 kg (3.3 lb)
6. Inspect the reservoir for scores, and deformation at the base.

Assembly

Follow the disassembly procedures in reverse order.

1. Before assembly, soak the components in brake fluid.

2. It is recommended that the cylinder cups, cup spacer, and the gasket should be replaced at the time of assembly.

3. Secure the reservoir with the bolt and washer to the cylinder body. Tighten the bolt to 1.7 m-kg or 12 ft-lb torque.

4. Install the master cylinder cap with the gasket, and tighten the cap to 18.5 m-kg (134 ft-lb) torque.

CLUTCH RELEASE CYLINDER

1. Nut
2. Lock washer
3. Stud bolt
4. Clutch release cylinder
5. Cylinder cup
6. Retracting spring
7. Plug cap
8. Bleeder plug
9. Cylinder cup
10. Release cylinder piston
11. Boot
12. Push rod No.1
13. Lock nut
14. Push rod No.2

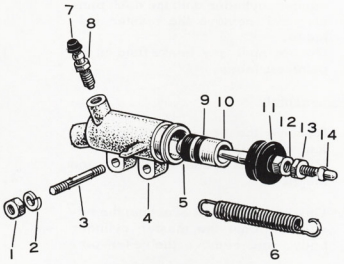


Fig.8-6 Clutch Release Cylinder Components G0066

Removal

1. Plug the master cylinder reservoir filler cap.

2. Disconnect the flexible hose from the release cylinder.

3. Disconnect the release fork retracting spring from the release cylinder.

4. Loosen the lock nut, and screw in the push rod No.2 into the push rod No.1.
Remove the nuts securing the release cylinder to the clutch housing, then remove the clutch release cylinder.

Installation

Follow the removal procedures in the reverse order.

1. Bleed the air from the hydraulic system.

2. Adjust the clutch pedal free-play.

Disassembly

1. Remove the push rod No.1 together with the push rod No.2, and the boot.

2. Pull out the piston together with the cylinder cups.

3. Remove the bleeder plug.

Inspection

Wash all disassembled parts thoroughly in brake fluid, and inspect for wear and scores.
Replace any defective part/s.

1. Inspect the release cylinder bore

for abnormal wear, and scores.

2. Inspect the piston surface for abnormal wear, and scores.

3. Inspect the cylinder to piston clearance.
   If the clearance exceeds the limit, replace the piston and/or the cylinder.

   Cylinder bore diameter:
   19.050 ~ 19.102 mm
   (0.750 ~ 0.752")

   Piston diameter:
   18.995 ~ 19.020 mm
   (0.748 ~ 0.749")

   Specified clearance:
   0.030 ~ 0.107 mm
   (0.001 ~ 0.004")

   Clearance limit:
   0.15 mm (0.006")

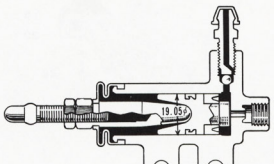


Fig.8-7 Cross Sectional View of Release Cylinder X4073

4. Inspect the cylinder cups for wear, scores, and deformation.

Assembly

Follow the disassembly procedures in the reverse order.

1. Before assembly, soak the components in brake fluid.

2. It is recommended that cylinder cups should be replaced at the time of assembly.

Installation

Follow the removal procedures in the reverse order.

1. Bleed the air from the hydraulic line.

2. Adjust the clutch release fork free play to 2 ~ 3 mm (0.08 ~ 0.11").

CLUTCH

Removal

1. Remove the engine together with the transmission from the car. Refer to ENGINE Removal.

2. Remove the transmission and clutch housing from the cylinder block.

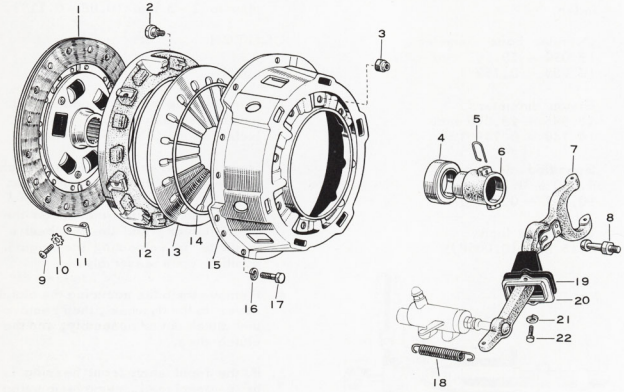
3. Punch the mating marks on the clutch cover, and the flywheel to facilitate in relocating the original position upon assembly.

4. Remove the bolts securing the clutch cover to the flywheel, then remove the clutch cover assembly, and the clutch disc.

5. If the input shaft front bearing is to be replaced, remove it using the Input Shaft Front Bearing Puller 09303-35010.
   To install the bearing, use the Input Shaft Front Bearing Replacer 09304-30012.

Disassembly

1. Before disassembly, inspect the clutch pressure plate installed load with a tester.
   Many types of tester are available for use. Therefore, it is recommended that the gauge manufacturer's instructions be followed when performing the test.
   The specified load is 422 ~ 458 kg (928.4 ~ 1,007.6 lb) and the limit is 365 kg (803 lb).



1. Clutch disc
2. Diaphragm spring set bolt
3. Lock nut
4. Release bearing
5. Bearing clip
6. Release bearing hub
7. Clutch release fork
8. Release fork ball
9. Screw
10. Lock washer
11. Retracting spring
12. Clutch pressure plate
13. Clutch diaphragm spring
14. Clutch pivot ring
15. Clutch cover
16. Lock washer
17. Bolt
18. Retracting spring
19. Boot
20. Boot plate
21. Lock washer
22. Bolt

Fig.8-8 Clutch Cover Assembly & Fork Components Y5051

2. Punch the mating marks on the clutch cover, and the pressure plate to facilitate in relocating the original position upon assembly.

Fig.8-9 Removing Retracting Spring W0371

3. Remove the retracting springs, and separate the clutch cover, and the pressure plate.

4. Loosen and remove the clutch diaphragm spring set bolt nuts, and remove the diaphragm spring, and the clutch pivot rings.

5. Unhook the release bearing hub clips, and remove the release bearing together with the bearing hub.

6. Remove the bolts mounting the release fork boot to the clutch housing, and remove the release fork.

Inspection & Repair

Wash all parts, and inspect for wear, scores, and other defects. Repair or replace if necessary.
Never wash the clutch disc in cleaning solvent.
The release bearing is impregnated with lubricant, and should not be immersed in solvent.

1. Clutch disc.

a. Inspect the facing for wear, glazed surfaces, oil soaked condition or warpage.

If the depth from the facing surface to the rivet head is less than 0.3 mm (0.012") or if the rivet holes are enlarged or the rivets are loose, replace the clutch disc assembly.
If the glazed surface is slight, the facing surface may be dressed with an emery cloth to remove the glaze.
If the facing is oil soaked slightly, the facing surface may be washed with gasoline.

b. Check the clutch disc facing run-out with a dial gauge.
If the run-out exceeds 0.5 mm or 0.02", replace the clutch disc assembly.

c. Check the spline in the disc hub, and assure that the hub will slide freely on the input shaft spline.
If worn, replace the clutch disc assembly.

d. Check the torsion rubbers for damage or deformation.

2. Clutch cover & pressure plate.

a. Inspect the contacting portions with the clutch cover, and pressure plate for abnormal wear.

b. Inspect for perfect uniform contact with the clutch disc facing.
If the contacting surface is scored or worn, the surface may be dressed with a fine emery cloth, or finished on a surface grinder if necessary.

c. Inspect the retracting springs for break, damage or weakness.

d. Check the pivot rings for abnormal wear on the contact surface with the diaphragm spring, and the diaphragm spring set bolts.

e. Check the diaphragm spring set bolts for abnormal wear at the pivot ring contacting point.

3. Diaphragm spring.

   a. Inspect the diaphragm spring for abnormal wear on the release bearing contact furface, and the pivot ring contact surface.

   b. Inspect the diaphragm spring for cracks.

4. Release bearing, hub & release fork.

   a. Inspect the release bearing for abnormal wear, and roughness on the diaphragm spring contact surface or noise.

   b. Check the release bearing hub for wear on the release fork contact surface.

   c. Check the release fork for wear, and roughness on the bearing hub contact surface, and the release fork ball.

Assembly

1. Place the clutch cover with inside out, and position the pivot ring in the clutch cover, aligning the recess in the pivot ring with one of the set bolt holes.
   Place the diaphragm spring over the pivot ring, then put the other pivot ring on the diaphragm spring, lining up the recess in the ring as done previously.

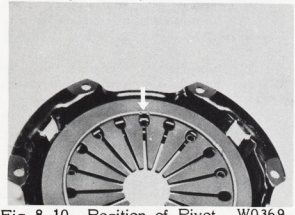


Fig. 8-10 Position of Pivot Rings W0369

2. Install the diaphragm spring set bolts, then tighten the nuts to 0.8 to 1.0 m-kg (6 ~ 7 ft-lb) torque. The nuts should be tightened symmetrically.

3. Assemble the pressure plate, and the clutch cover aligning the mating marks carefully, then install the diaphragm spring to the pressure plate so that there is no clearance between the retracting springs, and the diaphragm spring.

4. Assemble the release fork, boot, release bearing with hub, and the two hub clips.

Installation

Follow the removal procedures in the reverse order.

1. When assembling the clutch cover assembly, and the clutch disc, use the Clutch Guide Tool 09301-36010.

2. Line up the mating marks carefully on the flywheel, and the clutch cover when assembling.

3. Tighten the bolts securing the clutch cover to the flywheel to 0.8 ~ 1.3 m-kg (6 ~ 9 ft-lb) torque.