SERVICE MANUAL

DATSUN 240Z
MODEL S30 SERIES



NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION CL

CLUTCH

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CLUTCH

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DESCRIPTION

The clutch is a single dry disc diaphragm spring type clutch. The major components are clutch cover, pressure plate, diaphragm spring, and wire rings. The clutch disc is provided with riveted plates on both surfaces and coil springs arranged in a link. The coil springs absorb shock while engaging the clutch, softening the smoothing clutch engagement.

Release bearing, sleeve, and withdrawal lever are used to control clutch engagement and disengagement.

Each part of the clutch assembly is secured with rivets. Therefore, when a trouble is uncorrectable, replace the clutch assembly with a new assembly.

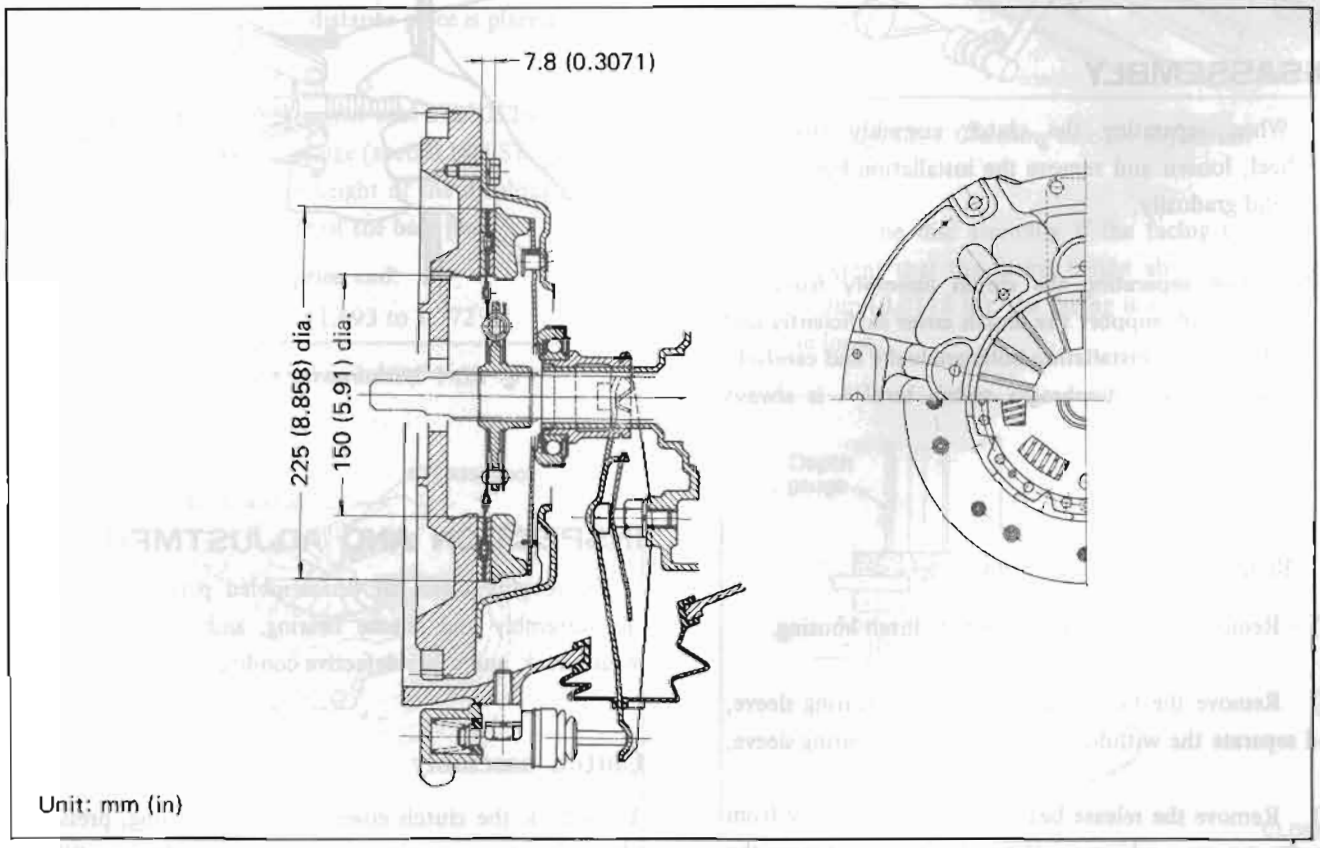
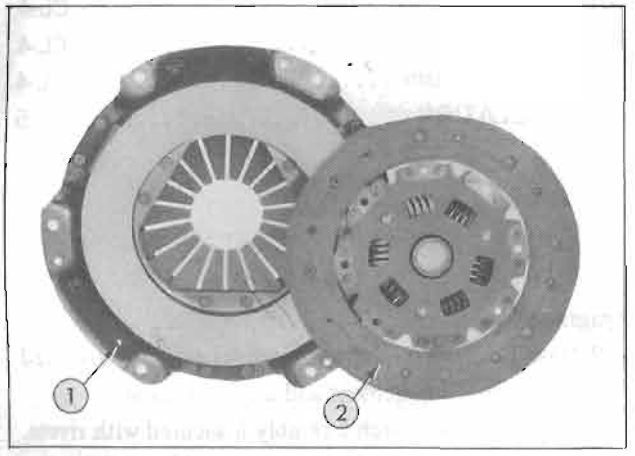


Fig. CL-1 Construction of clutch

REMOVAL

The clutch assembly is dismounted primarily in the same manner as the engine assembly. Thus, when dismounting the clutch assembly, refer to the Section ER (Engine Removal) and other relative sections.



1	Clutch assembly	2	Clutch disc assembly

Fig. CL-2 Clutch assembly and disc assembly

DISASSEMBLY

1. When separating the clutch assembly from the flywheel, loosen and remove the installation bolts diagonally and gradually.

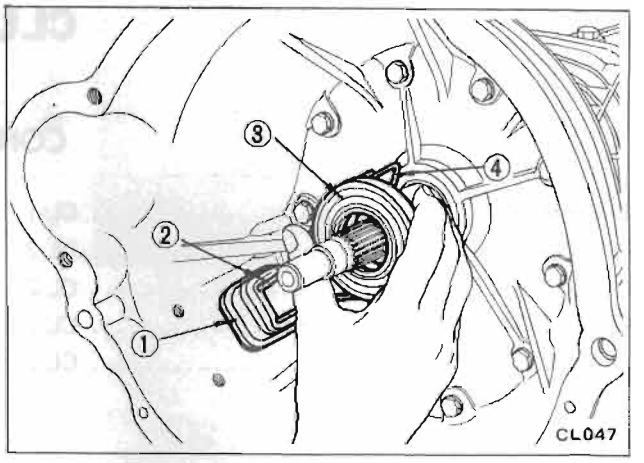
Note: When separating the clutch assembly from the flywheel, support the clutch cover sufficiently and loosen the installation bolts gradually and carefully because the diaphragm spring tension is always applied.

2. Removing release mechanism

(1) Remove the dust cover from the clutch housing.

(2) Remove the holder spring from the bearing sleeve, and separate the withdrawal lever from the bearing sleeve.

(3) Remove the release bearing and bearing sleeve from the front cover, and remove the withdrawal lever from the withdrawal lever ball pin.



1	Dust cover	3	Release bearing
2	Withdrawal lever	4	Holder spring

Fig. CL-3 Disassembling release mechanism

3. Withdraw the release bearing from the bearing sleeve by the use of a bearing puller.

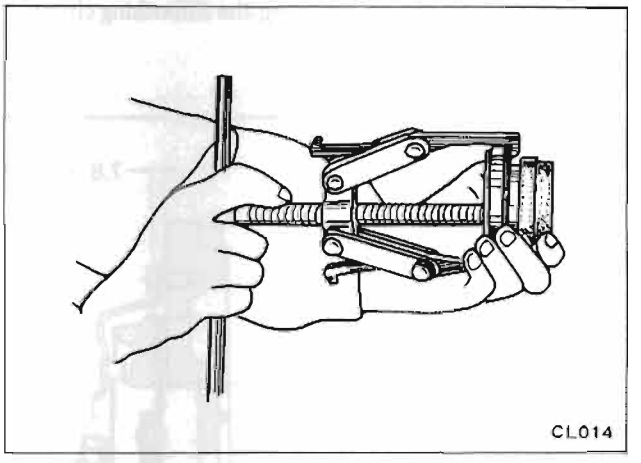


Fig. CL-4 Withdrawing release bearing

INSPECTION AND ADJUSTMENT

Thoroughly clean all disassembled parts, except for disc assembly and release bearing, and check them for wear, crack, and other defective conditions.

Clutch assembly

1. Check the clutch cover, diaphragm spring, pressure plate, etc. for excessive wear, crack and damage. When noise occurs on the clutch assembly, replace.

2. Measuring and adjusting height of diaphragm spring

(1) Line up distance piece (special tool ST20058001) on clutch assembly base plate (special tool ST20051000).

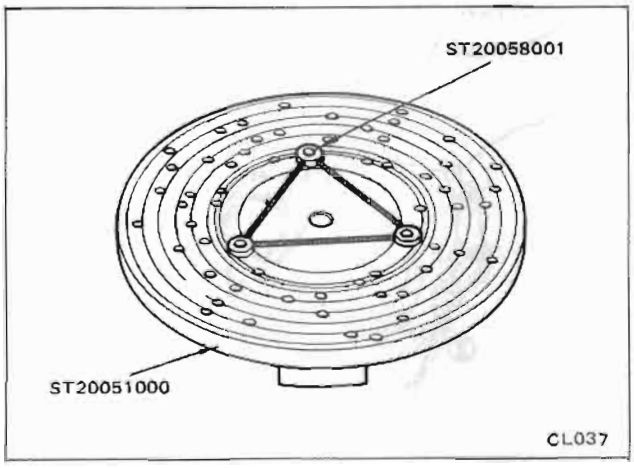


Fig. CL-5 Base plate and distance piece

(2) Place the clutch assembly on the distance piece, and set the clutch assembly on the base plate stationarily. (Under this condition, the distance piece is placed beneath the pressure plate.)

(3) Raise center pole (special tool ST20052000) on the base plate. Install height gauge (special tool ST20240000) on the pole, and measure height of the diaphragm spring end from the upper surface of the base plate.

Height of diaphragm spring end:

43.0 to 45.0 mm (1.693 to 1.772 in)

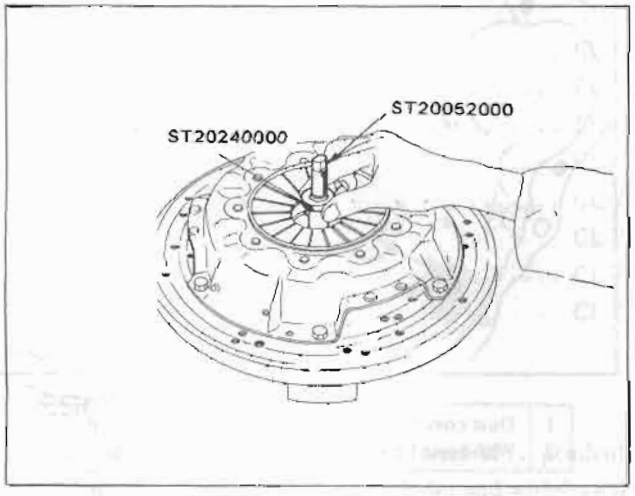


Fig. CL-6 Measuring height of diaphragm spring

Disc assembly

1. If the facing is soiled with grease or oil, clean off with gasoline tetrachloride and dress the facing with a wire brush. Replace the facing, if required.

2. Check the disc for deflection, and repair or replace if the deflection at the outer circumference of the facing exceeds the following value:

Upper limit of the deflection:

0.5 mm (0.0197 in) at

112 mm (4.40 in) radius (R)

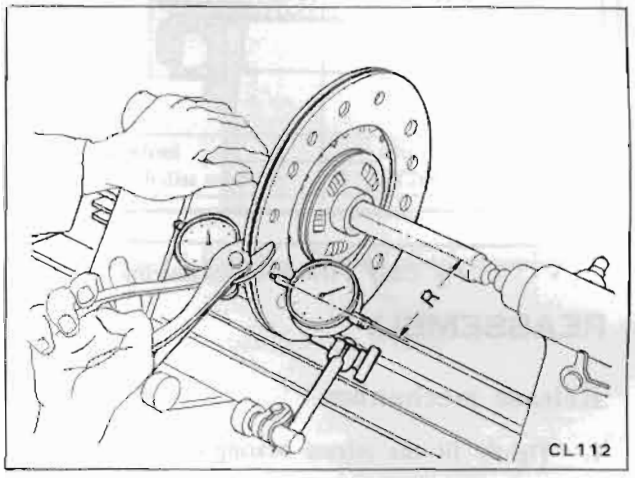


Fig. CL-7 Checking disc for deflection

3. Replace the disc assembly if the facing is worn to such an extent that the facing height above rivet is less than 0.3 mm (0.0118 in), the facing is worn unevenly, or rivets are loose.

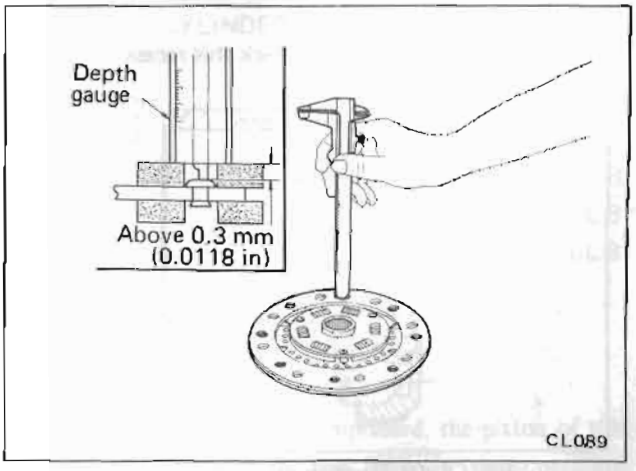


Fig. CL-8 Checking clutch facing for wear

Release bearing and sleeve

1. When withdrawal lever and bearing sleeve contact point is worn in step, replace the sleeve.

2. When grease leaks from the release bearing, or noise occurs on the release bearing, replace the release bearing.

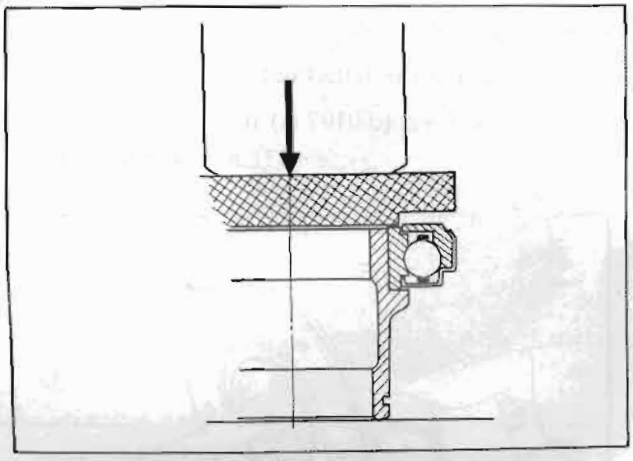


Fig. CL-9 Fitting release bearing

REASSEMBLY

Release mechanism

1. Tightly fit the release bearing to the place on the bearing sleeve as shown in Figure CL-9. When the bearing is installed completely, turn the bearing with a finger, and make sure that the bearing operates smoothly.

2. Apply multi-purpose grease (MIL G-2108 or 10924) to the following places:

- Bearing sleeve inside groove

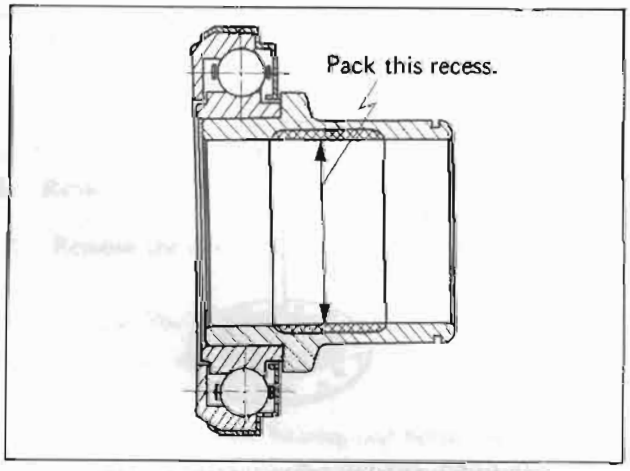
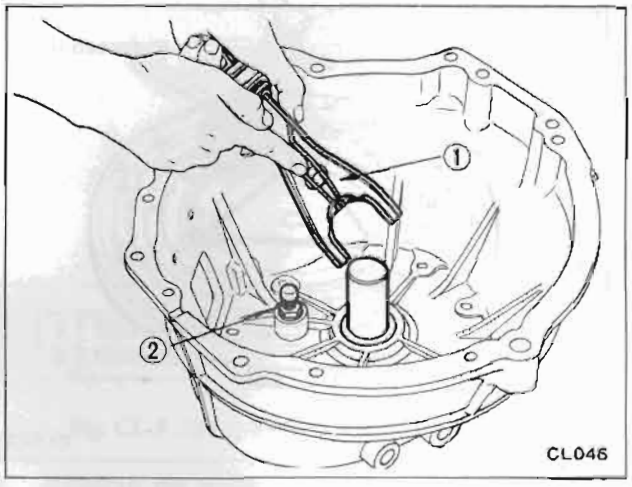


Fig. CL-10 Position on the bearing sleeve to which grease is applied

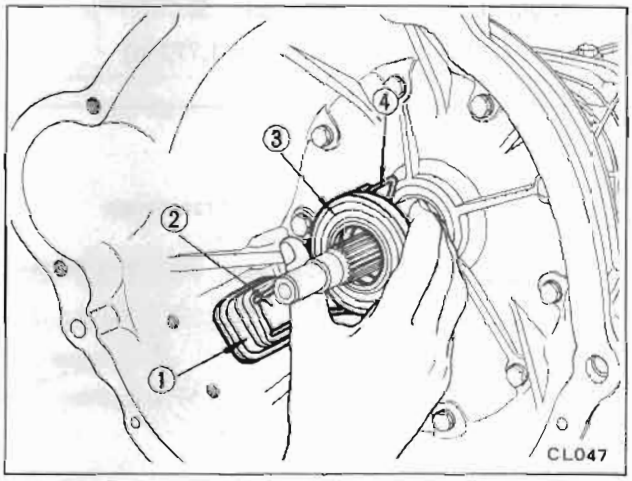
- Withdrawal lever and bearing sleeve contact point
- Withdrawal lever ball pin and withdrawal lever contact surface.



1	Withdrawal lever	2	Withdrawal lever ball pin

Fig. CL-11 Position on the withdrawal lever to which grease is applied.

3. When grease is applied to the necessary places, install the withdrawal lever, release bearing, and bearing sleeve on the clutch housing, connect them with holder spring, and install the dust cover on the clutch housing.



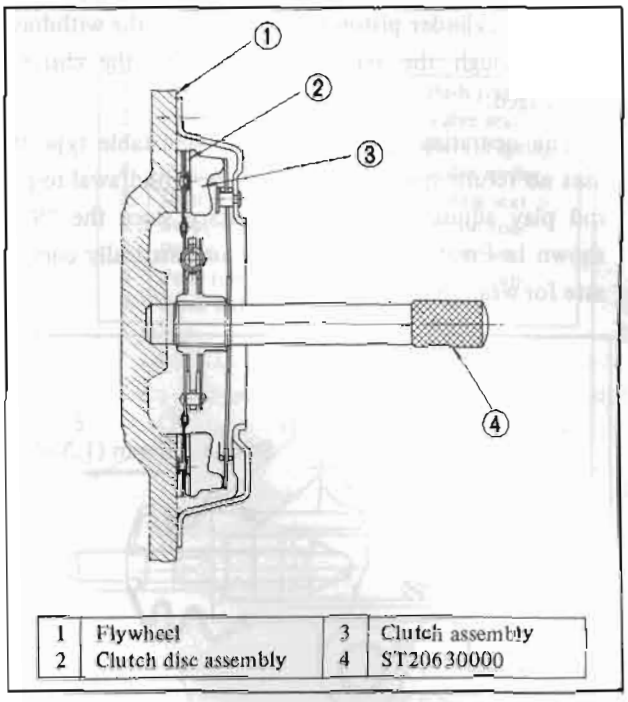
1	Dust cover	3	Release bearing
2	Withdrawal lever	4	Holder spring

Fig. CL-12 Installing release mechanism

REINSTALLATION

1. Clean the clutch pilot bushing, and fill it with recommended multi-purpose grease.

2. Install the disc assembly and clutch assembly on the flywheel by the use of a clutch aligning bar (special tool ST20630000).



1	Flywheel	3	Clutch assembly
2	Clutch disc assembly	4	ST20630000

Fig. CL-13 Installing disc and clutch assembly

CLUTCH CONTROL

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DESCRIPTION

The hydraulic clutch control consists of a pendent pedal, master cylinder, operating cylinder and withdrawal lever.

When the clutch pedal is depressed, the piston of the master cylinder forwards the fluid to the operating cylinder through a pipe line. The movement of the

operating cylinder piston is transmitted to the withdrawal lever through the push rod, and thus, the clutch is disengaged.

The operating cylinder is a non-adjustable type that uses no return spring. In this unit, the withdrawal-to-push rod play adjustment is not necessary since the "S" as shown in Figure CL-14 serves to automatically compensate for wear on clutch disc.

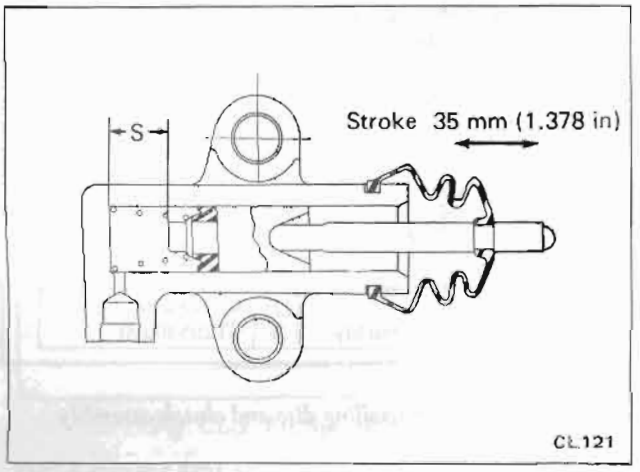


Fig. CL-14 Non-adjustable operating cylinder

CLUTCH PEDAL

Removal

1. Remove the return spring.

2. Loosen the lock nut of the master cylinder push rod, and disconnect the push rod end.

3. Remove the cotter pin and washer of the pedal shaft, and remove the pedal lever.

Note: Before removing the pedal, measure the pedal head height from toe board without fail.

Inspection

Thoroughly clean all disassembled parts (indicated below) and carefully check them for wear, damage and other abnormal conditions. Repair or replace them with new ones, if required.

1. Pedal head rubber
2. Return spring
3. Pedal lever boss
4. Clevis pin
5. Nylon bushing
6. Pedal shaft, etc.

Reinstallation

Reinstall the clutch pedal in reverse sequence of removal.

Adjustment

1. Adjust the pedal head height to 226 mm (8.9 in) for both right-hand and left-hand drive by adjusting the master cylinder push rod length.

Note: The pedal stopper should be free.

2. Adjust the pedal height to 223 mm (8.8 in) by screwing the pedal stopper and lock up the lock nut.

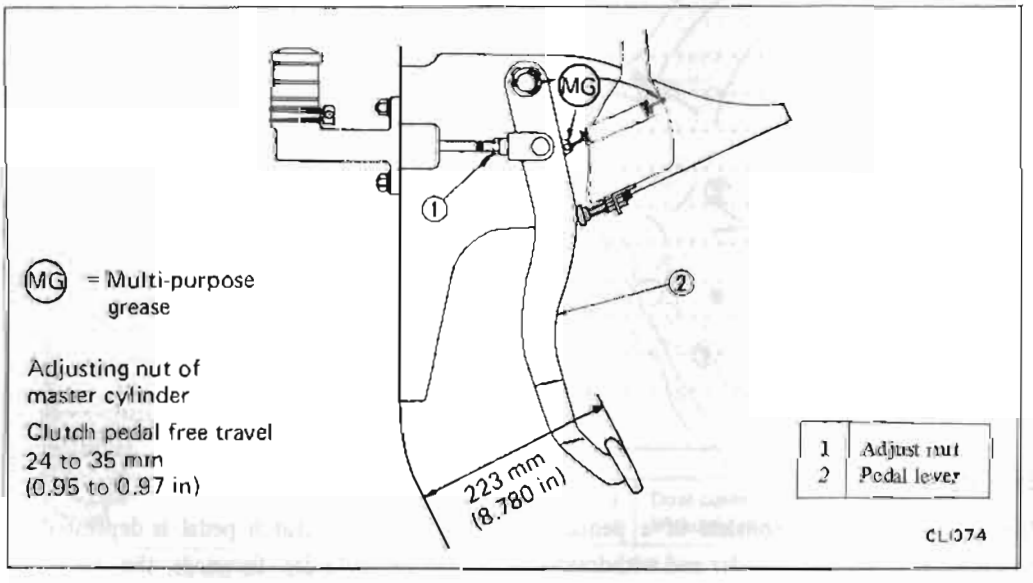


Fig. CL-15 Pedal height adjustment

CLUTCH MASTER CYLINDER

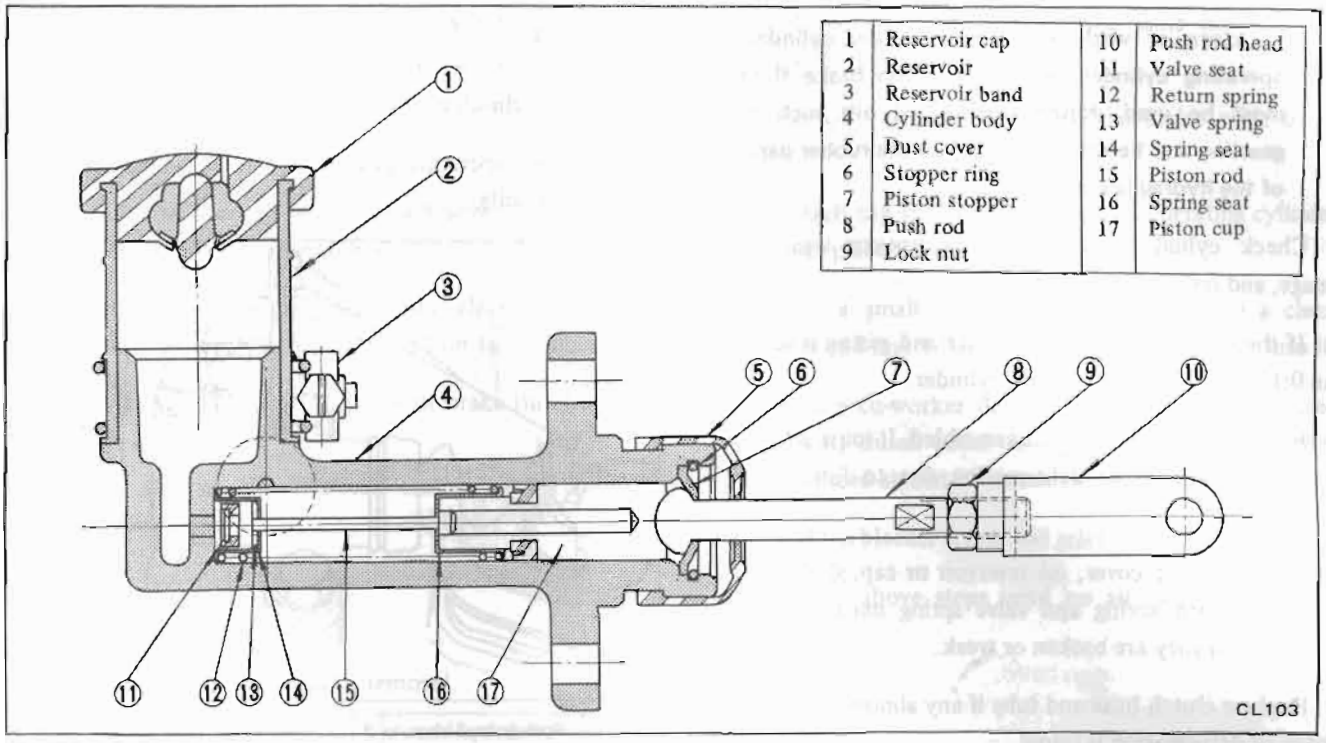


Fig. CL-16 Clutch master cylinder

Removal

1. Remove snap ring on clevis pin.
2. Remove clevis pin at push rod.
3. Disconnect clutch tube from master cylinder and drain clutch fluid.
4. Remove master cylinder to the dash panel securing bolts and dismount master cylinder.

Note: Remove dust cover from master cylinder body on the side of driver's seat.

Disassembly

1. Remove dust cover and take off stopper ring from body.
2. Remove push rod and piston assembly.
3. When replacing piston cup, disassemble piston assembly by straightening the tooth of spring seat, if necessary. See Figure CL-18.

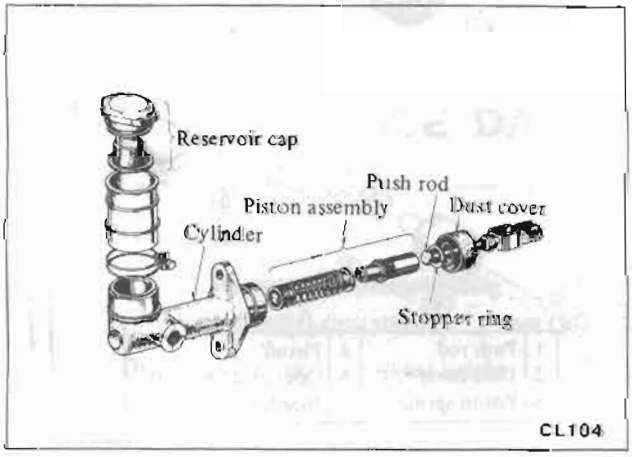


Fig. CL-17 Exploded view of master cylinder

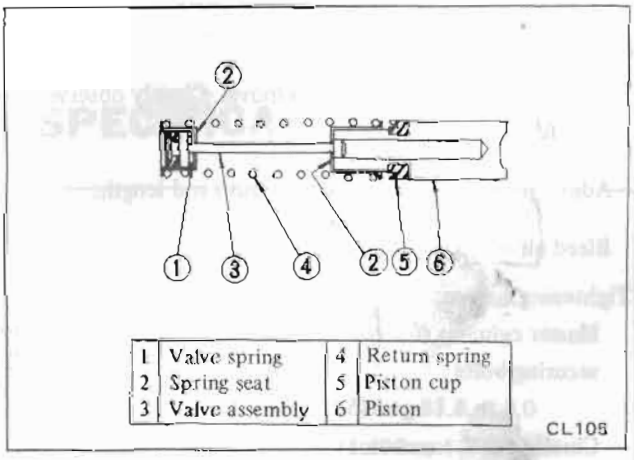


Fig. CL-18 Piston assembly

Inspection

Note: To clean or wash all parts of master cylinder, operating cylinder and piping, clean brake fluid must be used. Never use mineral oils such as gasoline and kerosene. It will ruin the rubber parts of the hydraulic system.

1. Check cylinder and piston for uneven wear or damage, and replace if necessary.

2. If the clearance between cylinder and piston is more than 0.15 mm (0.006 in), replace cylinder.

3. Renew piston cup when disassembled. It must also be replaced when wear or deformation due to fatigue or damage is found.

4. Damaged dust cover, oil reservoir or cap, should be replaced. Return spring and valve spring must also be replaced when they are broken or weak.

5. Replace clutch hose and tube if any abnormal sign of damage or deformation is found.

Assembly

To assemble, reverse the order of disassembly. Closely observe the following instructions.

1. Dip piston cup in brake fluid before installing. Make sure that it is correctly faced in position.

2. Apply a coating of brake fluid to cylinder and piston when assembling.

Installation

To install, reverse the order of removal. Closely observe the following instructions.

1. Adjust pedal height by changing push rod length.

2. Bleed air out of hydraulic system.

Tightening torque:

Master cylinder to dash panel securing bolts
0.8 to 1.1 kg-m (5.8 to 8.0 ft-lb)

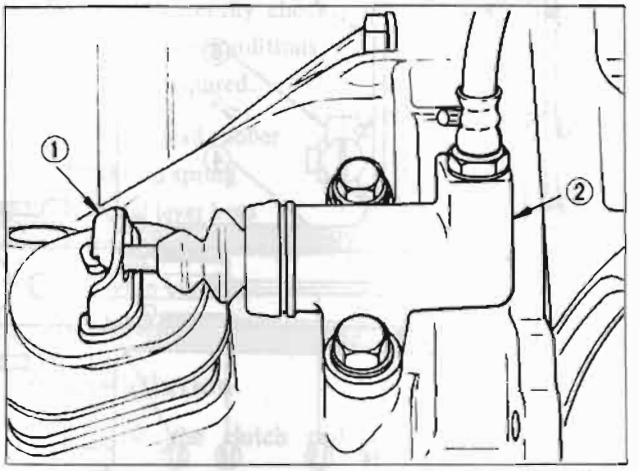
Clutch tube connector
1.5 to 1.8 kg-m (11 to 13 ft-lb)

OPERATING CYLINDER

Removal

1. Detach clutch hose from operating cylinder.

2. Remove operating cylinder to clutch houisng securing two (2) bolts.



1	Withdrawal lever	2	Clutch operating cylinder

Fig. CL-19 Operating cylinder

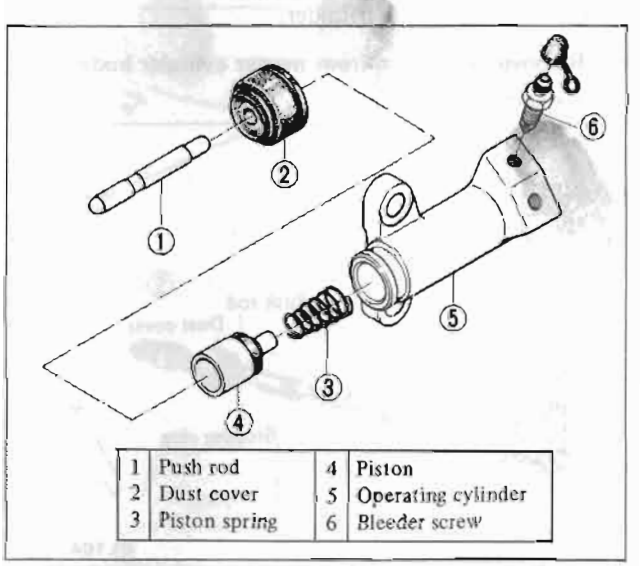
Disassembly

See Figure CL-20.

1. Remove push rod with dust cover.

2. Remove piston assembly and piston spring.

3. Remove bleeder screw.



1	Push rod	4	Piston
2	Dust cover	5	Operating cylinder
3	Piston spring	6	Bleeder screw

Fig. CL-20 Exploded view of operating cylinder

Inspection

Visually inspect all disassembled parts, replacing those found worn or damaged too badly beyond specifications.

Assembly

Assemble in the reverse order of disassembly. Closely observe the following instructions.

1. Prior to assembly, dip piston cup in clean brake fluid. In installing cup, pay particular attention to its direction.

2. Dip cylinder and piston in clean brake fluid before assembly.

Note: Be sure to install piston assembly with piston spring in place.

Installation

Install in the reverse order of removal.

Note: Bleed air thoroughly from clutch hydraulic system.

Tightening torque:

Operating cylinder to clutch housing securing bolts:
2.5 to 3.0 kg-m (18 to 22 ft-lb)

Bleeder screw:
0.7 to 0.9 kg-m (5.1 to 6.5 ft-lb)

Clutch hose connector:
1.7 to 2.0 kg-m (12 to 14 ft-lb)

BLEEDING CLUTCH SYSTEM

To bleed clutch system, use the same procedure as described in Brake System.

1. Fill oil reservoir of operating cylinder with brake fluid.

2. Detach cap from bleeder screw on operating cylinder and, in its place, connect a vinyl tube.

3. Pour a small amount of brake fluid into a clean container and insert the open end of the vinyl tube into it.

4. Have a co-worker depress clutch pedal two or three times. With clutch pedal depressed fully, loosen bleeder screw to bleed air out of clutch system.

5. Tighten bleeder screw and release the pedal.

6. Repeat above steps until no air bubbles appear in vinyl tube.

Notes: a. Always keep brake fluid in oil reservoir so that it flows into the line continuously.

b. Use care not to allow brake fluid coming into contact with painted surfaces.

c. Make sure that no leak occurs at connections.

d. Pour brake fluid into oil reservoir up to the specified level.

SERVICE DATA AND SPECIFICATIONS

Clutch release lever		
Release bearing-to-diaphragm spring (withdrawal lever) clearance	mm (in)	0 (0)
Diaphragm spring-to-flywheel height	mm (in)	43.0 to 45.0 (1.693 to 1.772)

Clutch disc		
Facing size		
Outer dia. x inside dia. x thickness	mm (in)	225 x 150 x 3.5 (8.86 x 5.90 x 0.140)
Total friction area	cm² (sq in)	442 (68.51)
Thickness of disc assembly		
Free	mm (in)	8.3 to 8.9 (0.327 to 0.350)
Compressed	mm (in)	7.6 to 8.0 (0.300 to 0.315)
Number of torsion springs		6
Allowable minimum depth of rivet head from facing surface	mm (in)	0.3 (0.0118)
Allowable facing run-out	mm (in)	0.5 (0.0197)
Allowable free play of spline	mm (in)	0.4 (0.0157)
Clutch pedal		
Pedal height when not depressed	mm (in)	223 (8.8)
Free travel of pedal head	mm (in)	10 to 15 (0.394 to 0.590)
Pressing strength at full stroke	kg (lb)	10 to 15 (22 to 33)
Master cylinder – clutch		
Master cylinder diameter	mm (in)	15.87 (5/8)
Allowable maximum clearance between cylinder and piston	mm (in)	0.15 (0.0059)
Operating cylinder – clutch		
Operating cylinder diameter	mm (in)	19.05 (3/4 in)

Tightening torque	kg-m (ft-lb)
Clutch assembly securing bolt	1.5 to 2.2 (11 to 16)
Push rod adjusting screw	0.8 to 1.1 (5.8 to 8.0)
Master cylinder to dash panel securing bolts	0.8 to 1.1 (5.8 to 8.0)
Clutch tube connector	1.5 to 1.8 (11 to 13 ft-lb)
Operating cylinder to clutch housing securing bolts	2.5 to 3.0 (18 to 22)
Clutch hose connector	1.7 to 2.0 (12 to 14)
Bleeder screw	0.7 to 0.9 (5.1 to 6.5)

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Corrective action
Noises audible on pedal depression	Excessively worn, damaged or poorly lubricated release bearing	Replace the bearing which, being cased, cannot be greased inside.
	Seized release bearing and diaphragm spring fingers	Replace the release bearing. Clean diaphragm spring fingers with metal brush and smooth out bearing contact faces with felt polishers.
	Insufficient pedal free travel	Readjust pedal free travel correctly.
	Weakened, unhooked or broken clutch pedal return and control springs	Set springs in position, or replace them if weakened or snapped.
	Weakened, unhooked or broken clutch yoke lever return spring	Replace the spring or hook it up, as required.
	Excessive play between clutch disc hub and drive shaft spline	Replace the clutch disc and ensure that clearance between hub of new clutch and drive shaft is within 0.50 mm (0.0197 in) endwise and 0.20 to 0.0079 in) crosswise. When clearances exceed above limits, replace the drive shaft also.
Noises audible on pedal release	Misalignment of clutch disc to flywheel causes slight movement of disc hub in respect of facings. This noise is especially audible with engine idling or at low speed.	Set level of clutch disc with clutch disc in place on drive shaft, set it under slight rotation and check for no run-out, using a scriber.
	Broken or weakened clutch disc cushion springs	Replace the clutch disc.
	Insufficient pedal free travel	Set pedal free travel correctly.
	Weakened, unhooked or broken clutch controlled pedal return springs	Replace the spring or hook it up, as required.
	Weakened, broken or unhooked clutch yoke lever return spring	Replace the spring or hook it up, as required.
	Distorted or worn drive shaft	Replace the drive shaft and clutch disc if necessary.
	Excessive play of release bearing on slip sleeve	Replace the worn parts.

The clutch drags.	Insufficient push rod length	Adjust the push rod length correctly.
	Warped clutch disc	Repair or replace. Maximum plate run-out; 0.25 mm (0.0098 in)
	Roughened linings	Repolish linings with a metal brush or replace them, if necessary.
	Improperly fitted, loose or broken lining	Replace linings. Lining rivets should be clenched with no protrusion, to avoid damaging pressure plate and flywheel.
	Incorrect release bearing-to-diaphragm spring finger clearance	Adjust correctly.
	Clutch disc hub forcing on drive shaft	Locate cause of trouble and remove it, if possible. Otherwise replace the clutch disc.
	Damaged drive shaft splines prevent the clutch disc from sliding	Replace the drive shaft; also the clutch disc, if required.
	Oil or grease on linings	Locate the cause of oil or grease leakage and correct it as required. Clean or replace linings.
	Warped or damaged pressure plate or clutch cover	Replace defective parts.
	Air pockets in the hydraulic system (not bled correctly)	Bleed out completely.
	Dirt or foreign matter on sealing faces of master cylinder piston cup	Clean, replace piston cup, if damaged, and bleed the system.
	Air pockets in master cylinder due to loose piston	Replace piston cup and bleed the system.
	Fluid leakage from cylinder	Replace piston cup, if damaged; bleed the system.
	Low fluid level in reservoir	Top up with brake fluid and bleed the system, if necessary.
	Clogged vent hole in reservoir cap promotes vacuum in master cylinder allowing air to infiltrate past the seal	Clean reservoir cap, unclog the vent hole and bleed the system.

Abnormal lining wear	Driver steps unnecessarily on pedal; this causes lining wear and damage to release bearing	Advise driver to discontinue wrong practice and step on clutch pedal only when necessary.
	Weakened or snapped pressure springs	Check pressure springs for tension as specified, and replace springs, if they are unserviceable.
	Incorrectly installed linings	Replace linings with new ones and install them correctly. Check clutch disc for center alignment.
The clutch grabs.	Oil or grease on flywheel, pressure plate and linings	Remove cause of leakage, clean flywheel and pressure plate thoroughly, replace linings.
	Loose disc linings due to poor rivet tightness	If linings are not worn, replace defective rivets. Otherwise, replace linings and clench rivets securely.
	Clutch disc hub does not slide freely on drive shaft spline	Remove any foreign matter or dirt deposits from shaft splines. When trouble is still present, replace damaged part.
	Warped or cracked pressure plate	Replace pressure plate.
	Misalignment	Locate the defective point, and if possible, adjust alignment or replace distorted parts.
	Stiffened hydraulic control mechanism	Check spring tension: If necessary, take down pedal and lubricate components.
	Worn out lining	Install new linings and make sure that the clutch disc, pressure plate and flywheel are not damaged.
The clutch slips.	Insufficient clutch pedal return travel, due to the control and pedal return springs being weak or misadjusted	Locate cause of failure and replace defective springs.
	Weakened or broken diaphragm spring	Overhaul clutch and replace spring.
	Oil or grease on linings	Remove cause of leakage and replace linings if cleaning is ineffective.
	Worn or burned disc linings	Replace linings.
	Overloaded master cylinder due to a restricted transfer port	Overhaul the master cylinder, replace the piston cup if swollen or damaged, and clean the transfer port; bleed the system.

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT