

CLUTCH

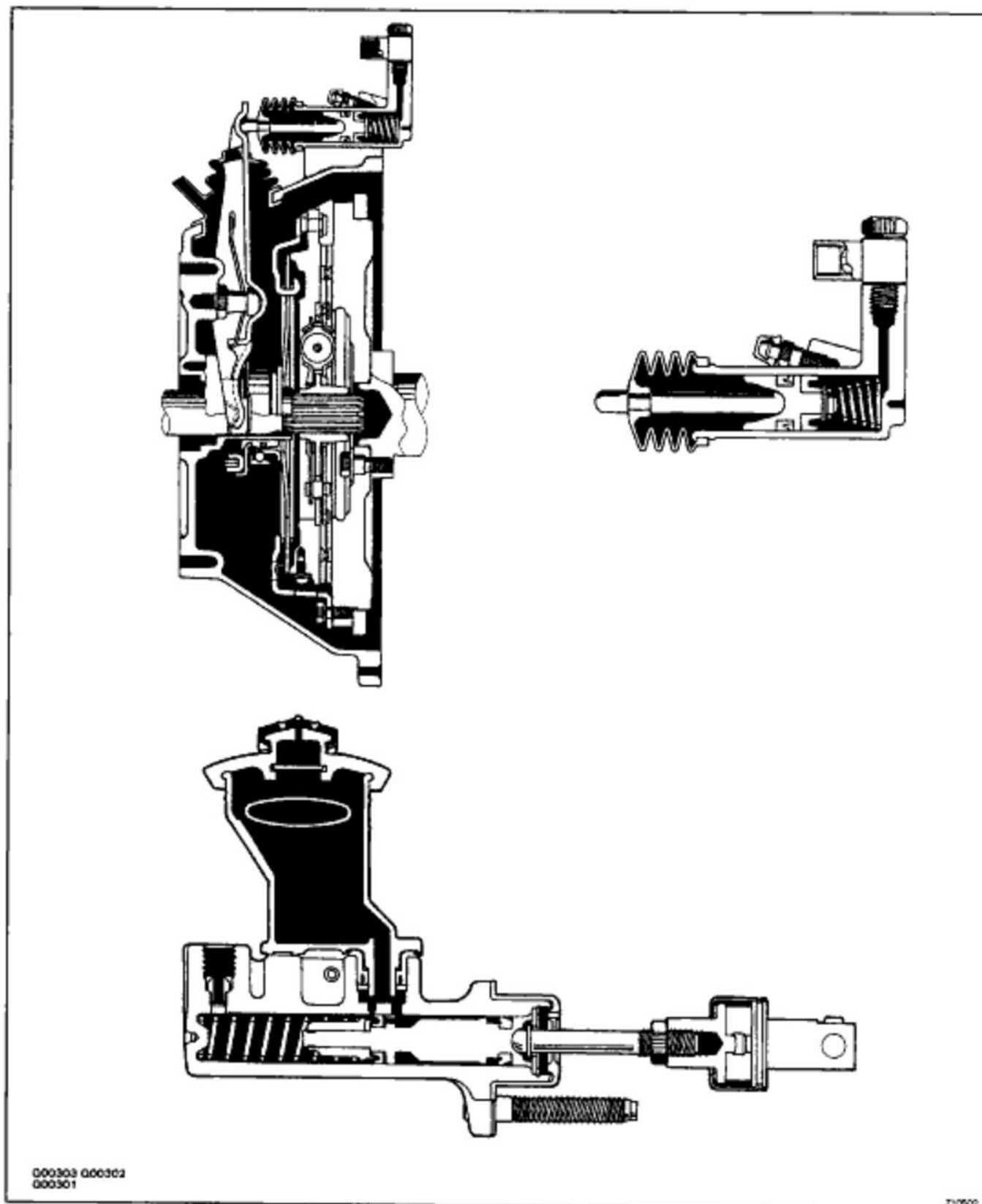
CL-2

CLUTCH – DESCRIPTION

DESCRIPTION

The diaphragm spring turnover type clutch providing lighter release performance.

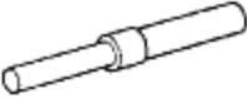
CLWA-21



PREPARATION

SST(SPECIAL SERVICE TOOLS)

CLASE-94

	09023-00100 Union Nut Wrench 10 mm	Clutch line tube
	09301-00210 Clutch Guide Tool	
	09333-00013 Clutch Diaphragm Spring Aligner	

RECOMMENDED TOOLS

CLUSE-01

	09082-00050 TOYOTA Electrical Tester Set	
	09905-00013 Snap Ring Pliers	

EQUIPMENT

CLUSE-01

Calipers	
Dial indicator	
Torque wrench	

CL-4

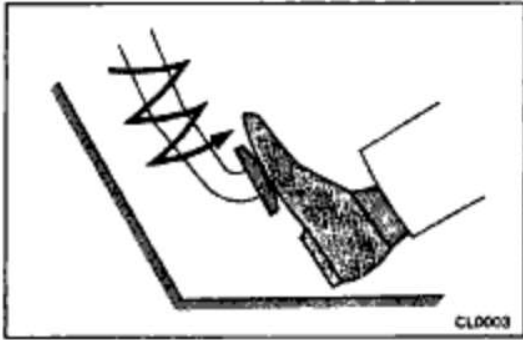
CLUTCH – TROUBLESHOOTING

TROUBLESHOOTING

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

See Page	CL-6	CL-5	CL-8	CL-11	-	CL-14	MX-33	CL-14	CL-14	CL-14	CL-14	CL-14	CL-14	CL-14	CL-14	CL-16	CL-14	CL-16	CL-14	-
Parts Name	Clutch pedal (Freeplay out of adjustment)	Clutch line (Air in line)	Master cylinder cup (Damaged)	Release cylinder cup (Damaged)	Engine mounting (Loosen)	Release bearing (Worn, dirty or damaged)	Input shaft bearing (Worn or damaged)	Clutch disc (Out of true)	Clutch disc (Runout is excessive)	Clutch disc (Lining broken)	Clutch disc (Dirty or burred)	Clutch disc (Oily)	Clutch disc (Worn out)	Clutch disc torsion rubber (Damaged)	Clutch disc (Harden)	Clutch disc (Lack of spline grease)	Diaphragm spring (Damaged)	Diaphragm spring (Out of tip alignment)	Pressure plate (Distortion)	Flywheel (Distortion)
Trouble																				
Clutch grabs/chatters				1				2				2	2	2	2			2		
Clutch pedal spongy		1	2	2																
Clutch noisy						1	2							3						
Clutch slips	1											2	2				3		4	5
Clutch does not disengage	1	2	3	4			5	6	6	6	6	6				6	7	7	8	

W00004



CLUTCH SYSTEM BLEEDING

HINT: If any work is done on the clutch system or if air is suspected in the clutch lines, bleed the system of air.

NOTICE: Do not let brake fluid remain on a painted surface. Wash it off immediately.

1. FILL CLUTCH RESERVOIR WITH BRAKE FLUID

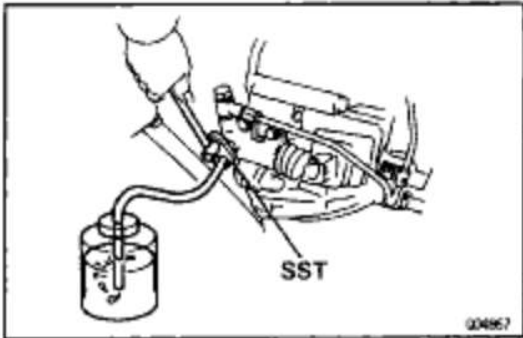
2. CONNECT VINYL TUBE TO BLEEDER PLUG

Insert the other end of the tube in a half-full container of brake fluid.

HINT: Check the reservoir frequently. Add fluid if necessary.

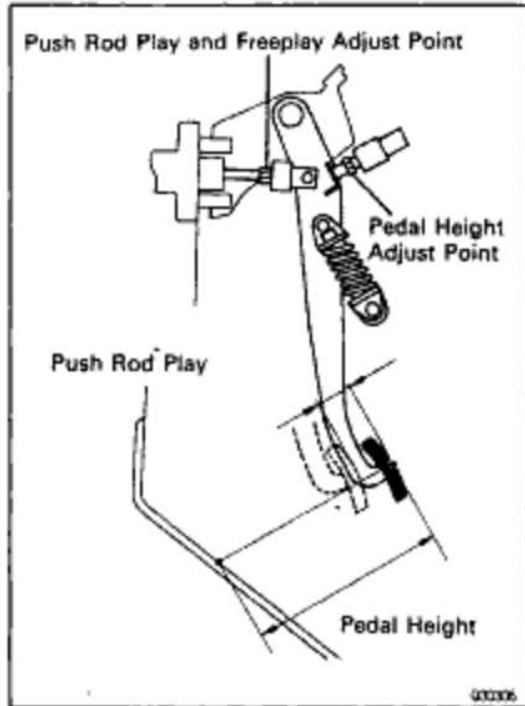
3. BLEED CLUTCH LINE

- (a) Slowly pump the clutch pedal several times.
- (b) While pressing on the pedal, loosen the bleeder plug until the fluid starts to run out. Then close the bleeder plug.
SST 09023-00100
- (c) Repeat this procedure until there are no more air bubbles in the fluid.



CL-6

CLUTCH – CLUTCH PEDAL



CLUTCH PEDAL

CLUTCH PEDAL CHECK AND ADJUSTMENT

CL070-91

1. CHECK THAT PEDAL HEIGHT IS CORRECT

Pedal height from asphalt sheet:

160.8–170.8 mm (6.33–6.72 in.)

2. IF NECESSARY, ADJUST PEDAL HEIGHT

Loosen the lock nut and turn the stopper bolt until the height is correct. Tighten the lock nut.

3. CHECK THAT PEDAL FREEPLAY AND PUSH ROD PLAY ARE CORRECT

Pedal freeplay:

Push in on the pedal until the beginning of clutch resistance is felt.

Pedal freeplay:

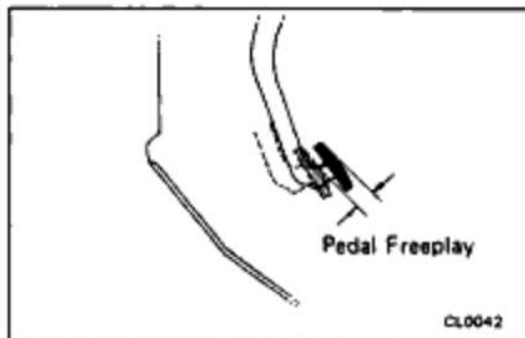
5.0–15.0 mm (0.197–0.591 in.)

Push rod play:

Push in on the pedal with a finger softly until the resistance begins to increase a little.

Push rod play at pedal top:

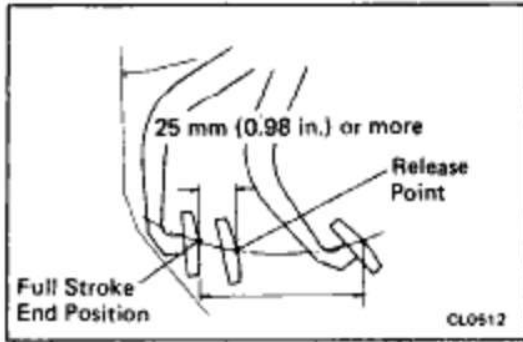
1.0–5.0 mm (0.039–0.197 in.)



4. IF NECESSARY, ADJUST PEDAL FREEPLAY AND PUSH ROD PLAY

- Loosen the lock nut and turn the push rod until the freeplay and push rod play are correct.
- Tighten the lock nut.
- After adjusting the pedal freeplay, check the pedal height.
- Connect the air duct and install the lower finish panel.

CLUTCH - CLUTCH PEDAL

**5. INSPECT CLUTCH RELEASE POINT**

- Pull the parking brake lever and install wheel stopper.
- Start the engine and idle the engine.
- Without depressing the clutch pedal, slowly shift the shift lever into reverse position until the gears contact.
- Gradually depress the clutch pedal and measure the stroke distance from the point the gear noise stops (release point) up to the full stroke end position.

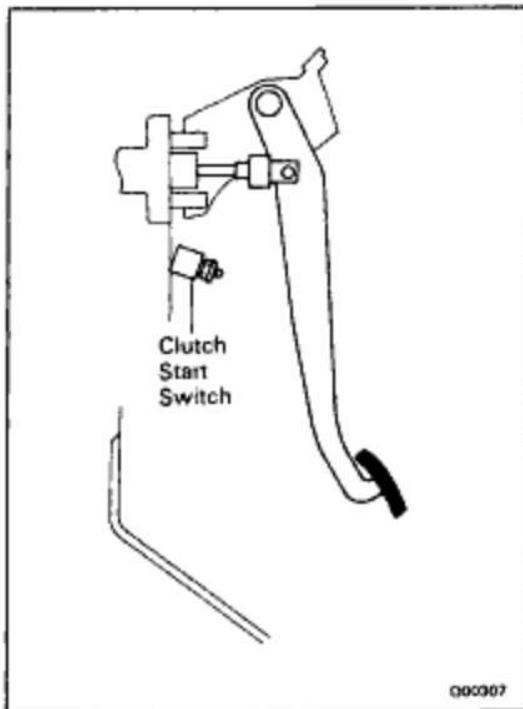
Standard distance:

25 mm (0.98 in.) or more

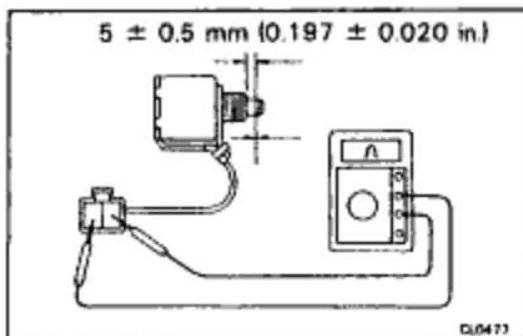
(From pedal stroke end position to release point)

If the distance not as specified, perform the following operation.

- Inspect pedal height.
- Inspect push rod play and pedal freeplay.
- Bleed the clutch line.
- Inspect the clutch cover and disc.

**6. CHECK CLUTCH START SYSTEM**

- Check that the engine does not start when the clutch pedal is released.
 - Check that the engine starts when the clutch pedal is fully depressed.
- If necessary, adjust or replace the clutch start switch.

**7. CHECK CONTINUITY OF CLUTCH START SWITCH**

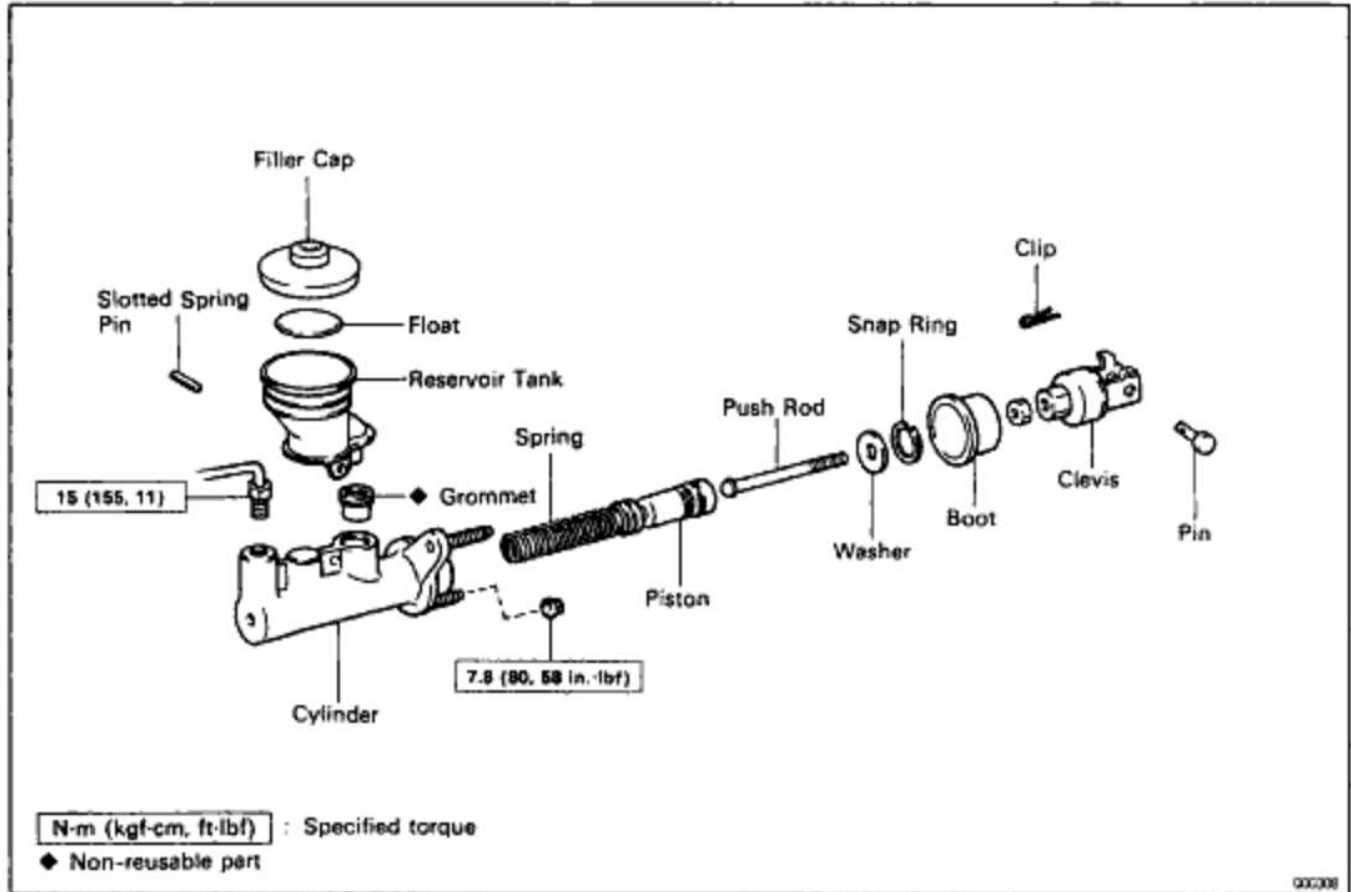
- Check that there is continuity between terminals when the switch is ON (pushed).
 - Check that there is no continuity between terminals when the switch is OFF (free).
- If continuity is not as specified, replace the switch.

CL-8

CLUTCH - CLUTCH MASTER CYLINDER

CLUTCH MASTER CYLINDER COMPONENTS

CLUTCH-01



CLUTCH-01



MASTER CYLINDER REMOVAL

1. DRAW OUT FLUID WITH SYRINGE
2. DISCONNECT CLUTCH LINE TUBE

Using SST, disconnect the clutch line tube. Use a container to catch the brake fluid.

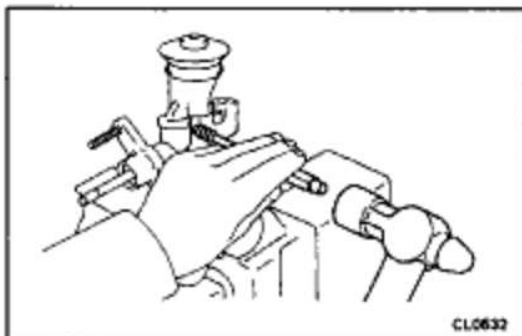
SST 09023-00100

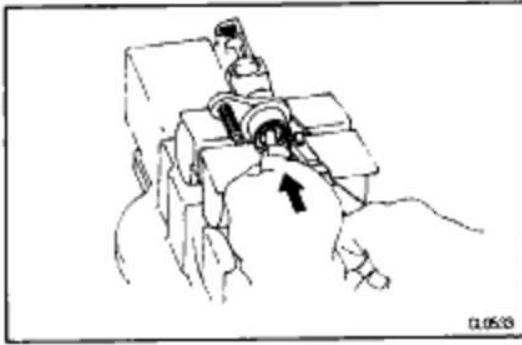
3. REMOVE CLIP AND CLEVIS PIN
4. REMOVE 2 MOUNTING NUTS AND PULL OUT MASTER CYLINDER

MASTER CYLINDER DISASSEMBLY

1. REMOVE RESERVOIR TANK

- (a) Using a pin punch and a hammer, drive out the slotted spring pin.
- (b) Remove the reservoir tank and grommet.



**2. REMOVE PUSH ROD**

Pull back the boot, and using snap ring pliers, remove the snap ring.

3. REMOVE PISTON**MASTER CYLINDER INSPECTION**

CLUTCH-91

HINT: Clean the disassembled parts with compressed air.

1. INSPECT MASTER CYLINDER BORE FOR SCORING OR CORROSION

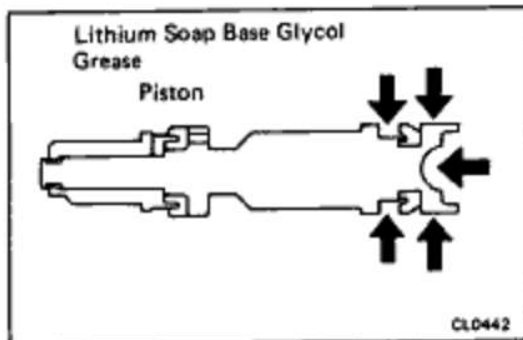
If a problem is found, clean or replace the cylinder.

2. INSPECT PISTON AND CUPS FOR WEAR, SCORING, CRACKS OR SWELLING

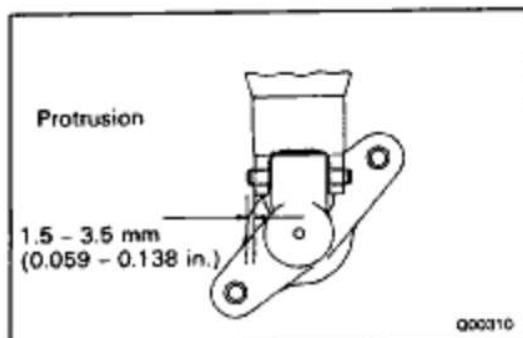
If either one requires replacement, use the parts from the cylinder kit.

3. INSPECT PUSH ROD FOR WEAR OR DAMAGE

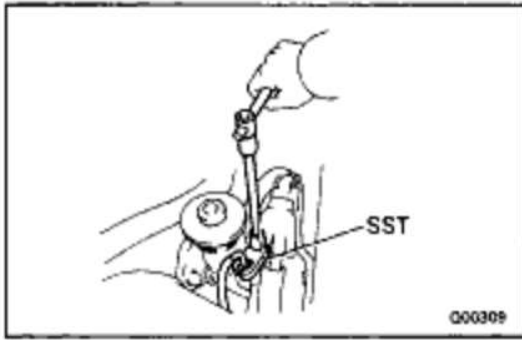
If necessary, replace the push rod.

**MASTER CYLINDER ASSEMBLY**

CLUTCH-91

1. COAT PARTS WITH LITHIUM SOAP BASE GLYCOL GREASE. AS SHOWN**2. INSERT PISTON INTO CYLINDER****3. INSTALL PUSH ROD ASSEMBLY WITH SNAP RING****4. INSTALL RESERVOIR TANK**

- Install the reservoir tank and new grommet.
- Using a pin punch and a hammer, drive in the slotted spring pin.

CL-10**CLUTCH - CLUTCH MASTER CYLINDER****MASTER CYLINDER INSTALLATION****1. INSTALL MASTER CYLINDER**

Install the 2 mounting nuts, and torque them.

Torque: 7.8 N-m (80 kgf-cm, 58 in.,lbf)

2. CONNECT CLUTCH LINE TUBE

Using SST, connect the clutch line tube.

SST 09023-00100

Torque: 15 N-m (155 kgf-cm, 11 ft-lbf)

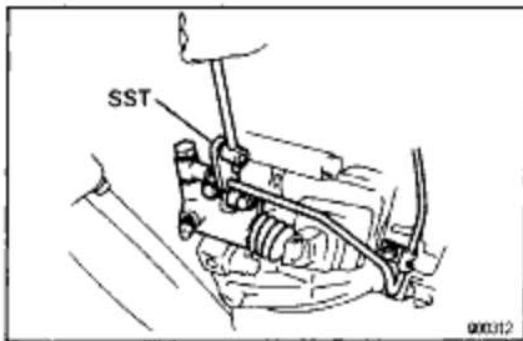
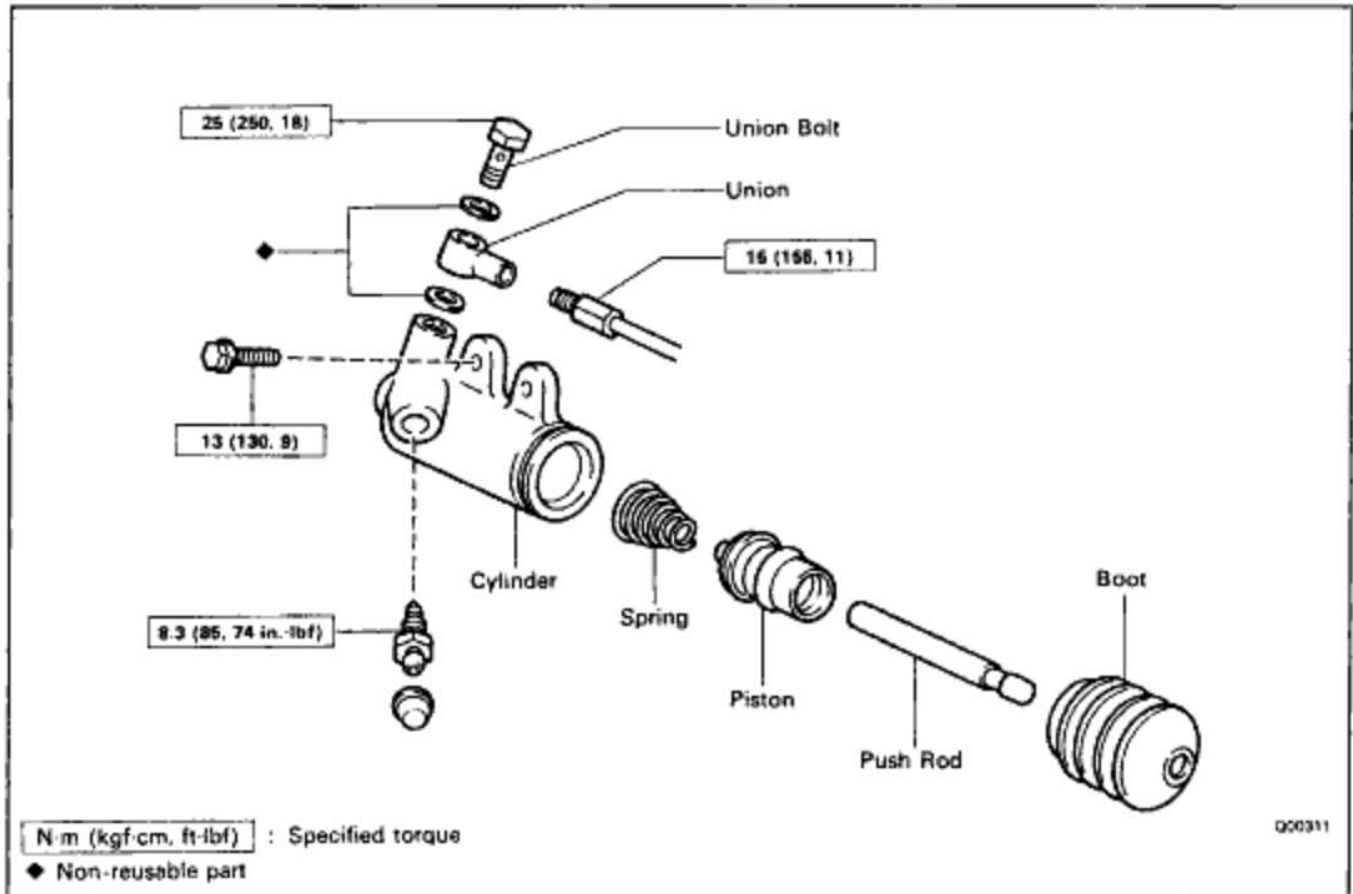
3. CONNECT PUSH ROD AND INSTALL PIN

Install the clip in the push rod pin.

4. BLEED SYSTEM AND ADJUST CLUTCH PEDAL

(See page [CL-5,6](#))

CLUTCH RELEASE CYLINDER COMPONENTS



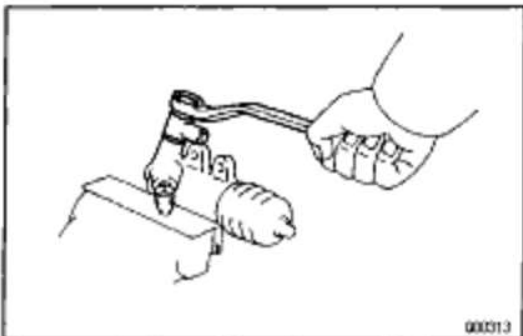
RELEASE CYLINDER REMOVAL

1. DISCONNECT CLUTCH LINE TUBE

Using SST, disconnect the tube. Use a container to catch the brake fluid.

SST 09023-00100

2. REMOVE 2 BOLTS AND PULL OUT RELEASE CYLINDER



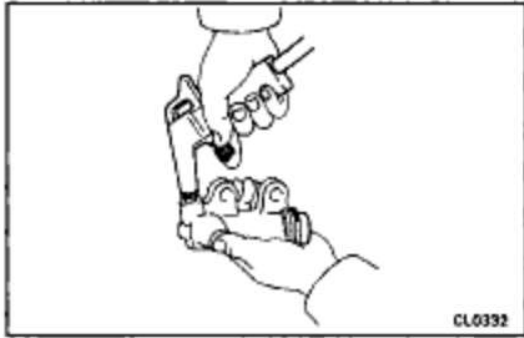
RELEASE CYLINDER DISASSEMBLY

1. REMOVE UNION FROM RELEASE CYLINDER

Remove the union bolt, 2 gaskets and union from the release cylinder.

CL-12

CLUTCH – CLUTCH RELEASE CYLINDER



2. PULL OUT BOOT WITH PUSH ROD
3. REMOVE PISTON

Using compressed air, remove the piston with the spring from the cylinder.

RELEASE CYLINDER INSPECTION

HINT: Clean the disassembled parts with compressed air.

1. INSPECT RELEASE CYLINDER BORE FOR SCORING OR CORROSION

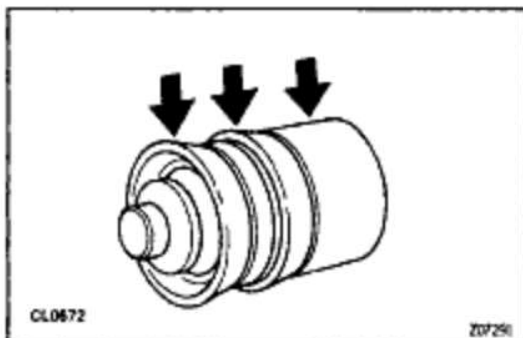
If a problem is found, clean or replace the cylinder.

2. INSPECT PISTON AND CUPS FOR WEAR, SCORING, CRACKS OR SWELLING

If either one requires replacement, use the parts from the cylinder kit.

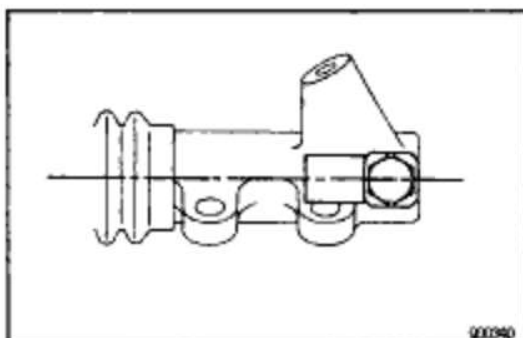
3. INSPECT PUSH ROD FOR WEAR OR DAMAGE

If necessary, replace the push rod.



RELEASE CYLINDER ASSEMBLY

1. COAT PISTON WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN
2. INSTALL PISTON WITH SPRING INTO CYLINDER
3. INSTALL BOOT WITH PUSH ROD TO CYLINDER

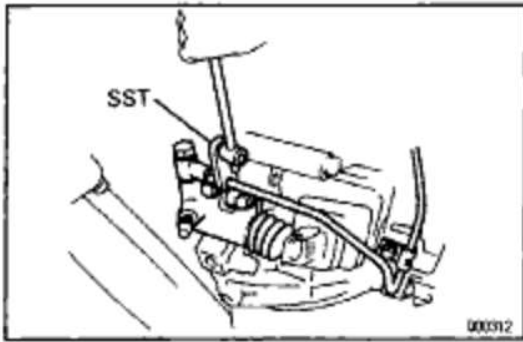


4. INSTALL UNION TO RELEASE CYLINDER

(a) Adjust the center line of the union is in parallel with the release cylinder.

(b) Install the union bolt.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



RELEASE CYLINDER INSTALLATION

1. INSTALL RELEASE CYLINDER WITH 2 BOLTS

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

2. CONNECT CLUTCH LINE TUBE

Using SST, connect the tube.

SST 09023-00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

3. FILL CLUTCH RESERVOIR WITH BRAKE FLUID AND BLEED CLUTCH SYSTEM

(See page [CL-5](#))

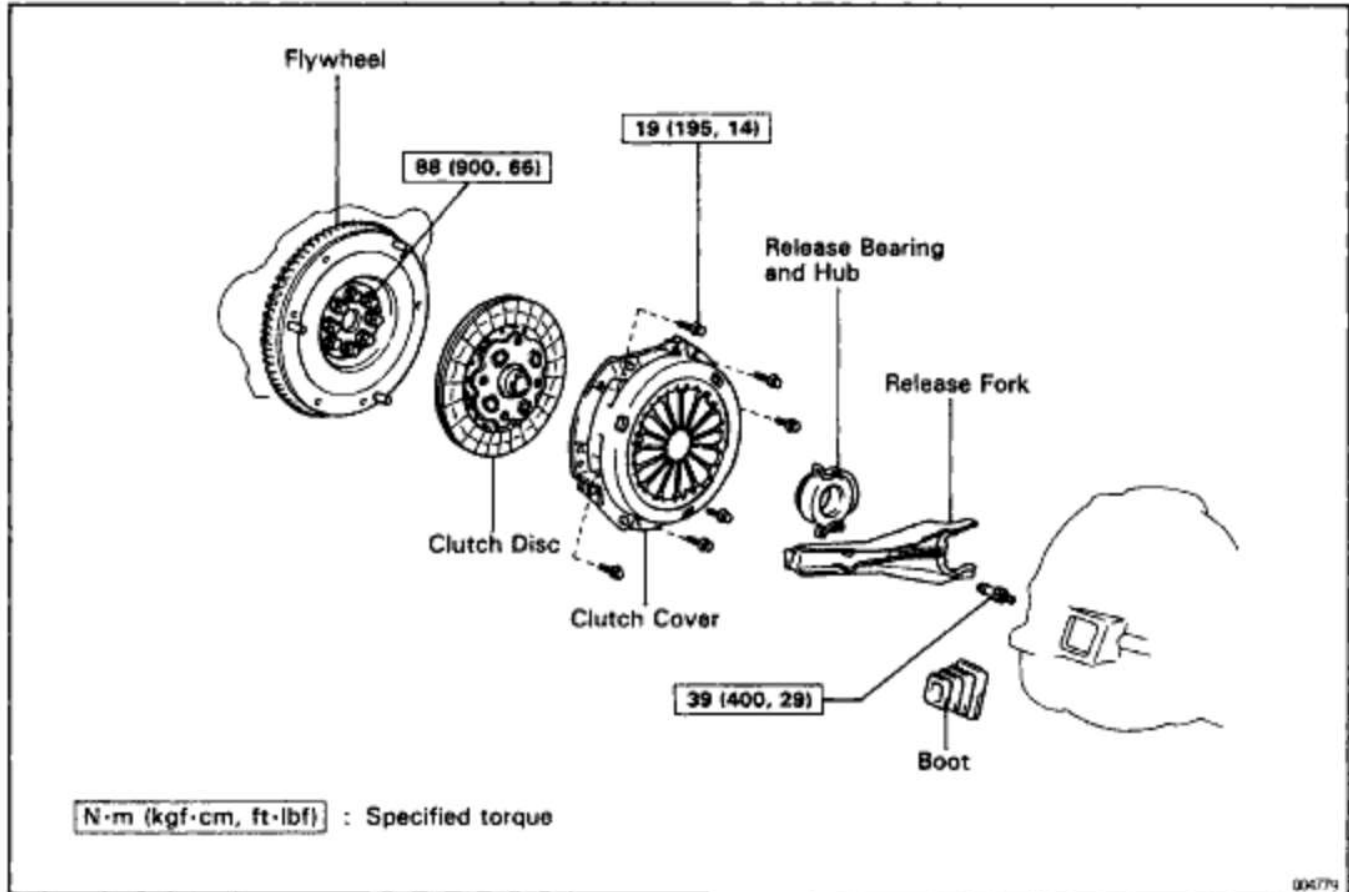
4. CHECK FOR LEAKS

CL-14

CLUTCH - CLUTCH UNIT

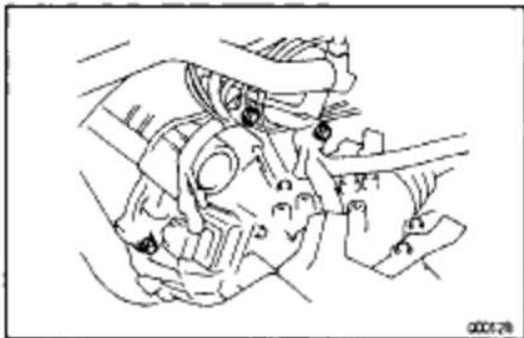
CLUTCH UNIT COMPONENTS

CLUTCH-01



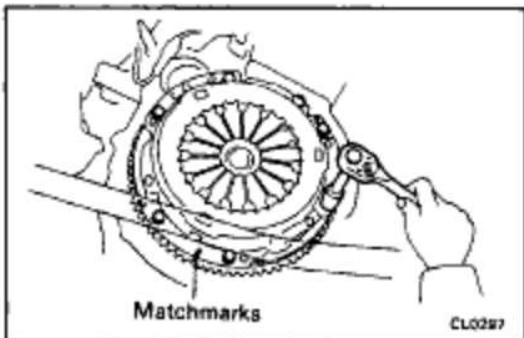
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CLUTCH-01



CLUTCH UNIT REMOVAL

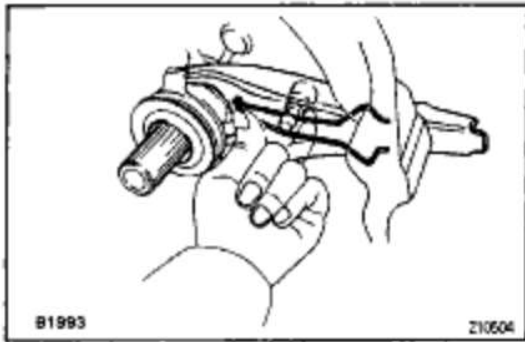
1. REMOVE TRANSAXLE FROM ENGINE
(See page [MX-10](#))



2. REMOVE CLUTCH COVER AND DISC

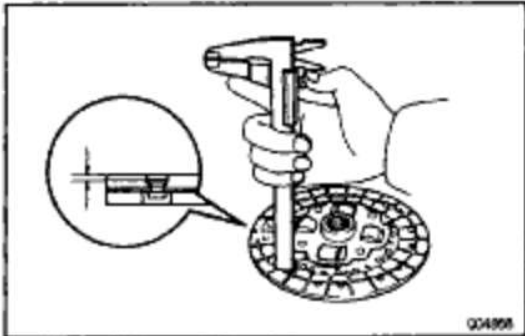
- (a) Place matchmarks on the flywheel and clutch cover.
- (b) Loosen each set bolt one turn at a time until spring tension is released.
- (c) Remove the set bolts, and pull off the clutch cover with the clutch disc.

NOTICE: Do not drop the clutch disc.



3. REMOVE RELEASE BEARING AND FORK FROM TRANS-AXLE

- Remove the release bearing together with the fork and then separate them.
- Remove the boot.



CLUTCH PARTS INSPECTION

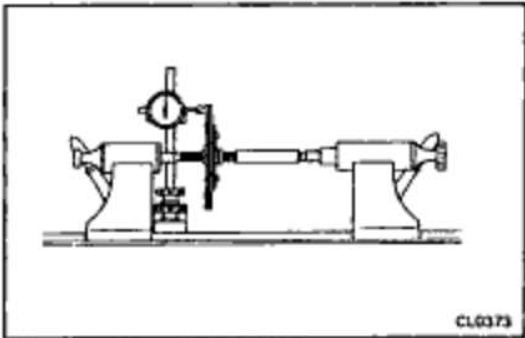
1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using calipers, measure the rivet head depth.

Minimum rivet depth:

0.3 mm (0.0121 in.)

If a problem is found, replace the clutch disc.



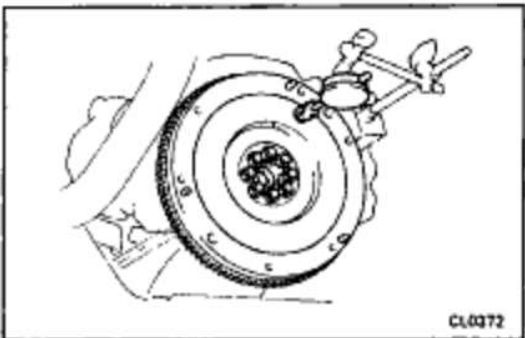
2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator, check the disc runout.

Maximum runout:

0.8 mm (0.031 in.)

If runout is excessive, replace the clutch disc.



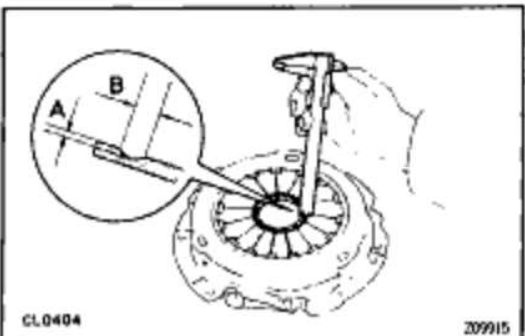
3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator, check the flywheel runout.

Maximum runout:

0.1 mm (0.004 in.)

If runout is excessive, replace the flywheel.



4. INSPECT DIAPHRAGM SPRING FOR WEAR

Using calipers, measure the diaphragm spring for depth and width of wear.

Maximum:

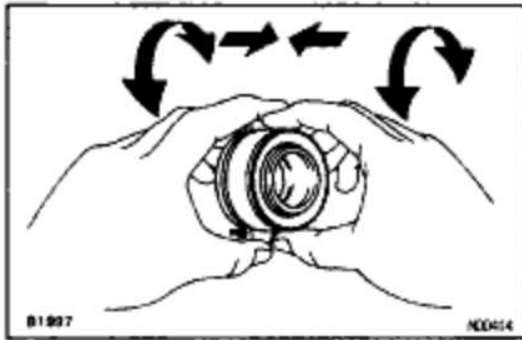
A: Depth 0.6 mm (0.024 in.)

B: Width 5.0 mm 0.197 in.)

If necessary, replace the clutch cover.

CL-16

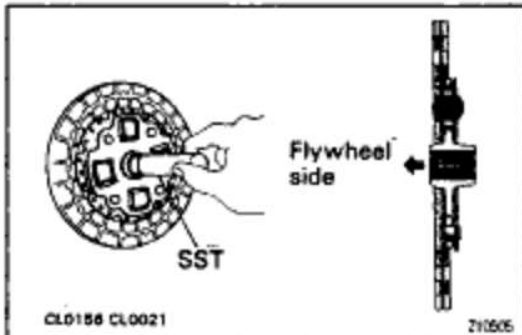
CLUTCH - CLUTCH UNIT

**5. INSPECT RELEASE BEARING**

Turn the bearing by hand while applying force in the axial direction.

HINT: The bearing is permanently lubricated and requires no cleaning or lubrication.

If a problem is found, replace the bearing.

**CLUTCH UNIT INSTALLATION****1. INSTALL CLUTCH DISC AND CLUTCH COVER ON FLYWHEEL**

- (a) Insert the SST in the clutch disc, and then set them and the clutch cover in position.
SST 09301-00210

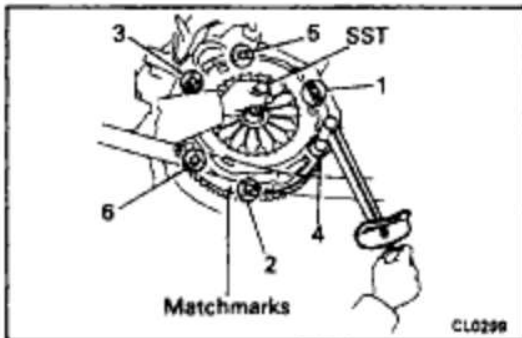
- (b) Align the matchmarks on the clutch cover and flywheel.

- (c) Temporarily tighten the topmost bolt from the 3 near the knock pins.

HINT: Temporarily tighten the No.3 bolt.

- (d) Torque the bolts on the clutch cover in the order shown.

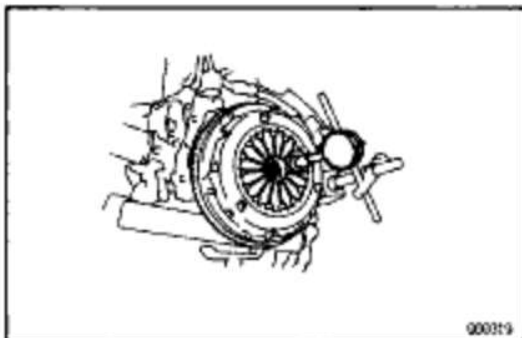
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

**2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT**

Using a dial indicator with roller instrument, check the diaphragm spring tip alignment.

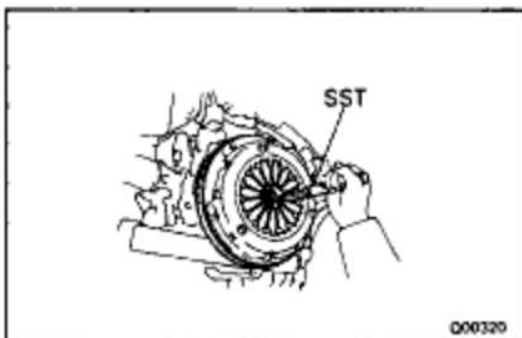
Maximum non-alignment:

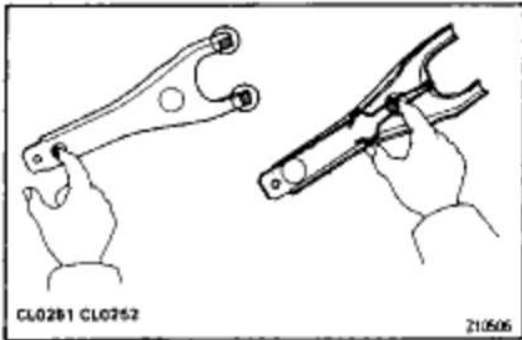
0.5 mm (0.020 in.)



If alignment is not as specified, using SST, adjust the diaphragm spring tip alignment.

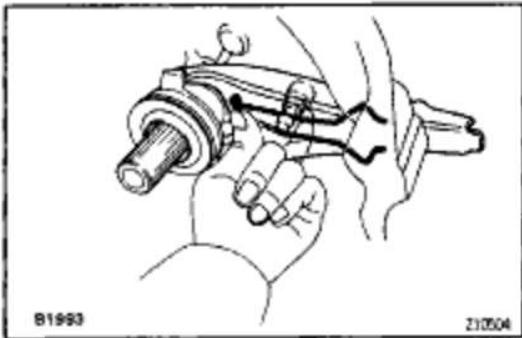
SST 09333-00013





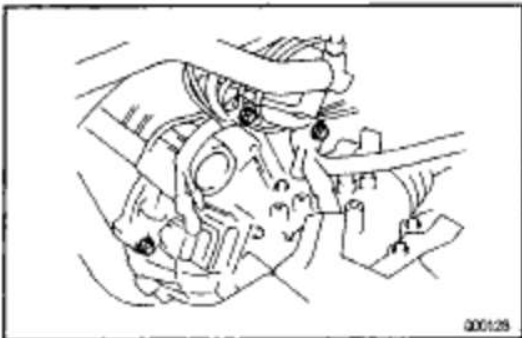
3. APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO.2) TO FOLLOWING PARTS

- Release fork and hub contact point
- Release fork and push rod contact point
- Release fork pivot point
- Clutch disc spline



4. INSTALL RELEASE BEARING AND FORK TO TRANSAXLE

Install the bearing to the release fork, and then install them to the transaxle.



5. INSTALL TRANSAXLE TO ENGINE

(See page [MX-15](#))

CL-18

CLUTCH – SERVICE SPECIFICATIONS

SERVICE SPECIFICATIONS

CL18W - 01

SERVICE DATA

Pedal height from asphalt sheet	160.8–170.8mm (6.33–6.72in.)
Push rod play at pedal top	1.0–5.0mm (0.039–0.197in.)
Pedal freeplay	5.0–15.0mm (0.197–0.591in.)
Clutch release point from pedal full stroke end position	25 mm (0.98in.) or more
Disc rivet head depth (Minimum)	0.3mm (0.012in.)
Disc runout (Maximum)	0.8mm (0.031in.)
Diaphragm spring tip non-alignment (Maximum)	0.5mm (0.020in.)
Diaphragm spring finger wear (Maximum depth)	0.6mm (0.024in.)
Diaphragm spring finger wear (Maximum width)	5.0mm (0.197in.)
Flywheel runout (Maximum)	0.1mm (0.004in.)

TORQUE SPECIFICATIONS

CL18W - 01

Part tightened	N·m	kgf·cm	ft·lbf
Master cylinder installation nut	7.8	80	58 in.-lbf
Release cylinder installation nut	13	130	9
Union bolt	25	250	18
Clutch line union	15	155	11
Bleeder plug	8.3	85	74 in.-lbf
Release fork support	39	400	29
Clutch cover x Flywheel	19	195	14
Flywheel set bolt	88	900	65