

# CLUTCH

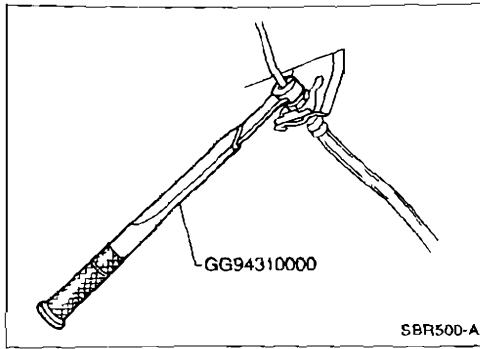
## SECTION **CL**

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# PRECAUTIONS AND PREPARATION



## Precautions

- Recommended fluid is brake fluid "DOT 3".
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- When removing and installing clutch piping, use Tool.
- Use new brake fluid to clean or wash all parts of master cylinder, operating cylinder and clutch damper.
- Never use mineral oils such as gasoline or kerosene. It will ruin the rubber parts of the hydraulic system.

### WARNING:

After cleaning the clutch disc, wipe it with a dust collector. Do not use compressed air.

## Special Service Tools

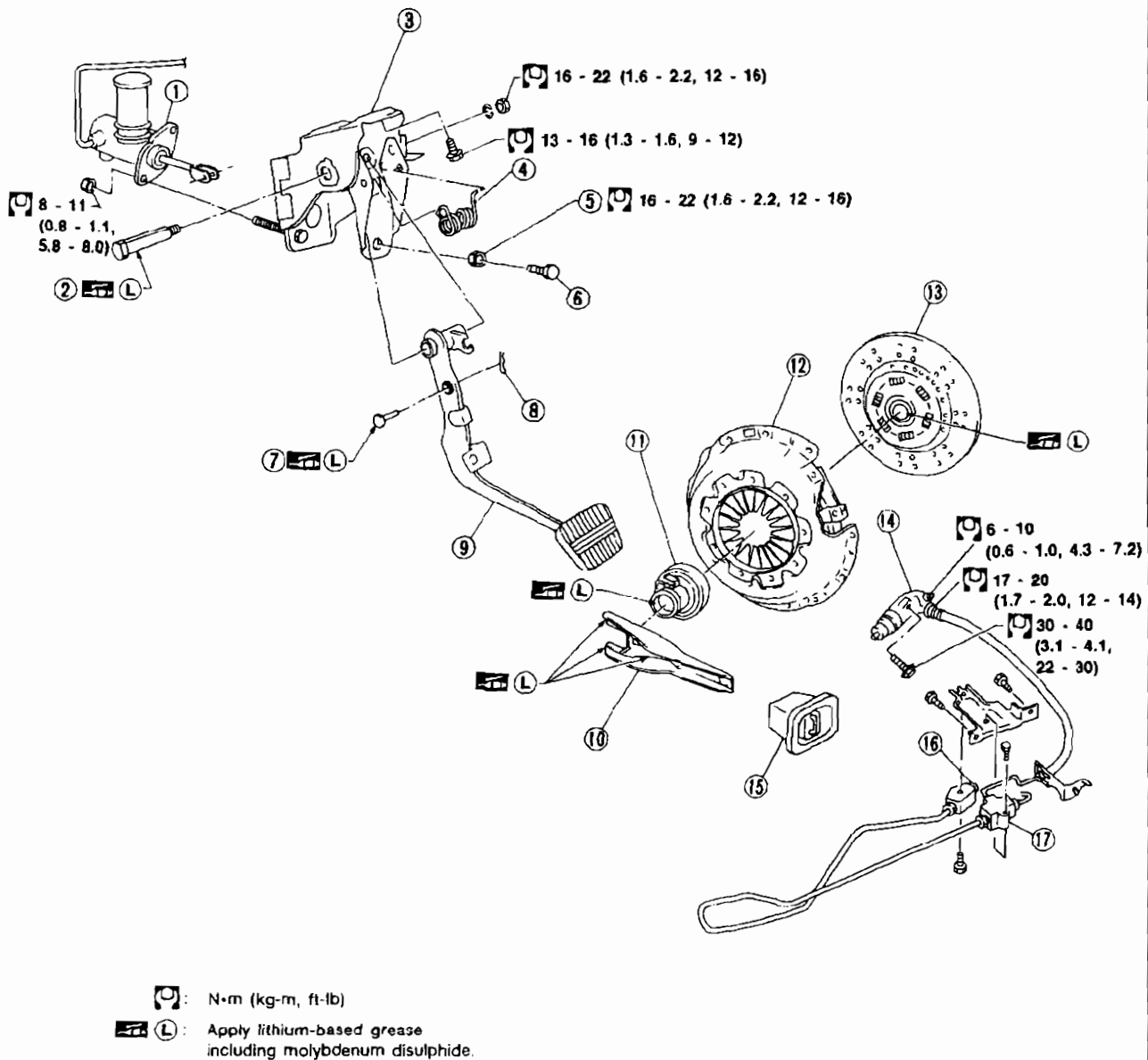
Tool number Tool name	Description
GG94310000 Flare nut torque wrench	<p>NT406</p> <p>a: 10 mm (0.39 in)</p>
ST20600000 Clutch aligning bar	<p>NT405</p> <p>a: 15.9 mm (0.626 in) dia. b: 22.8 mm (0.898 in) dia. c: 55 mm (2.17 in)</p>
ST20050240 Diaphragm spring adjusting wrench	<p>NT404</p> <p>a: 150 mm (5.91 in) b: 25 mm (0.98 in)</p>

## Commercial Service Tools

Tool name	Description
Bearing puller	<p>NT077</p> <p>Removing release bearing</p>
Bearing drift	<p>NT063</p> <p>a: 50 mm (1.97 in) dia.</p> <p>Installing release bearing</p>

# CLUTCH SYSTEM

SEC. 300-305-465



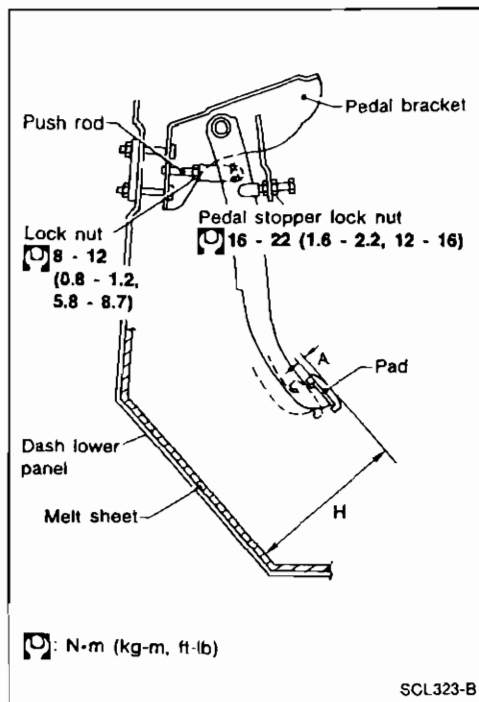
- ① Clutch master cylinder
- ② Fulcrum pin
- ③ Pedal bracket
- ④ Return spring
- ⑤ Lock nut
- ⑥ Lock nut

- ⑦ Clevis pin
- ⑧ Snap pin
- ⑨ Clutch pedal
- ⑩ Withdrawal lever
- ⑪ Release bearing
- ⑫ Clutch cover

- ⑬ Clutch disc
- ⑭ Operating cylinder
- ⑮ Dust cover
- ⑯ Bleeder screw
- ⑰ Clutch connector

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## INSPECTION AND ADJUSTMENT



### Adjusting Clutch Pedal

1. Adjust pedal height with pedal stopper.

**Pedal height "H":**

**LHD 192 - 202 mm (7.56 - 7.95 in)**

**RHD 188 - 198 mm (7.40 - 7.80 in)**

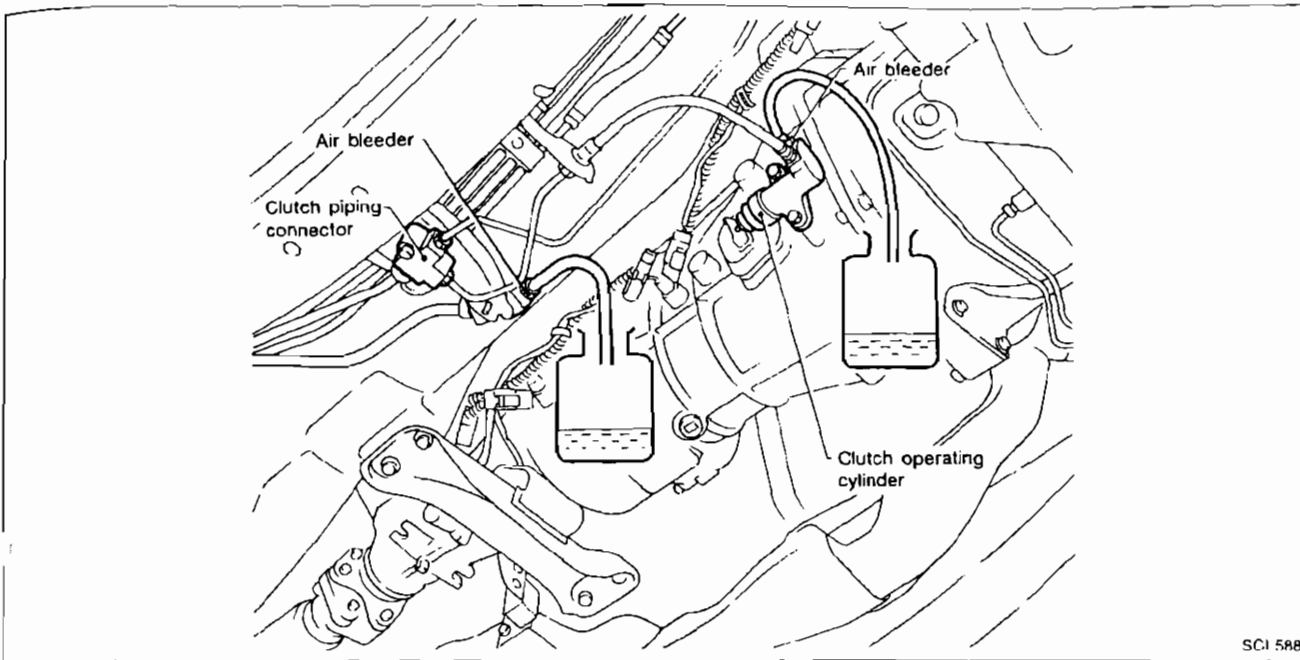
2. Adjust pedal free play with master cylinder push rod. Then tighten lock nut.

**Pedal free play "A":**

**9 - 16 mm (0.35 - 0.63 in)**

**Pedal free play means the following total measured at position of pedal pad:**

- **Play due to clevis pin and clevis pin hole in clutch pedal.**
3. Make sure that clevis pin can be rotated smoothly. If not, readjust pedal free play with master cylinder push rod.



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## Bleeding Procedure

1. Bleed air from clutch master cylinder (RHD model only) according to the following procedure.

**Carefully monitor fluid level at master cylinder during bleeding operation.**

- a. Top up reservoir with recommended brake fluid.
- b. Connect a transparent vinyl tube to air bleeder valve.
- c. Fully depress clutch pedal several times.
- d. With clutch pedal depressed, open bleeder valve to release air.
- e. Close bleeder valve.
- f. Repeat steps c through e above until brake fluid flows from air bleeder valve without air bubbles.

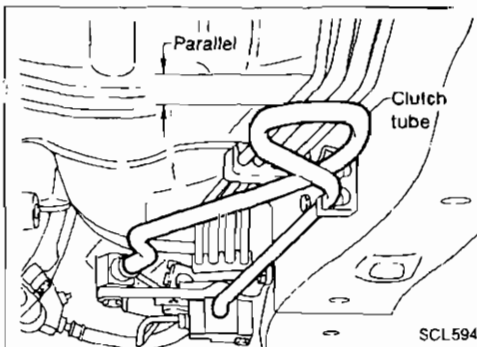
2. Bleed air from clutch operating cylinder according to the above same procedure.

3. Bleed air from clutch piping connector according to the above same procedure.

4. Repeat the above bleeding procedures 1 through 3 several times.

### Remarks

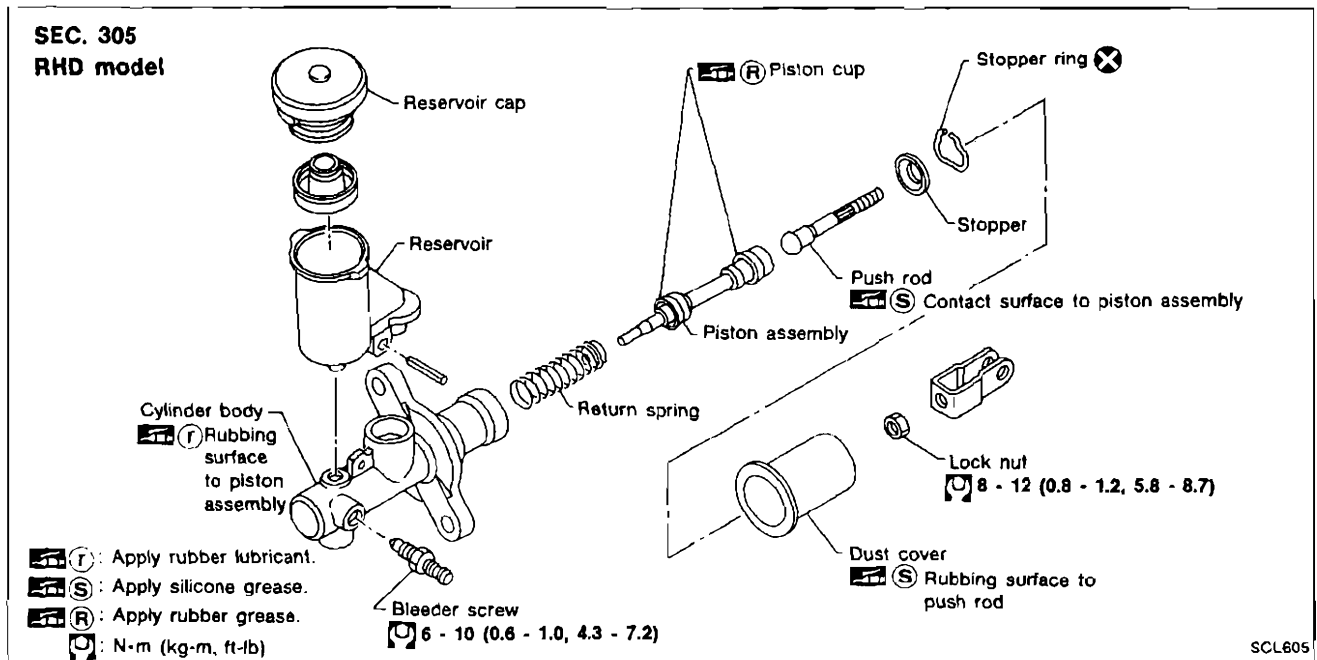
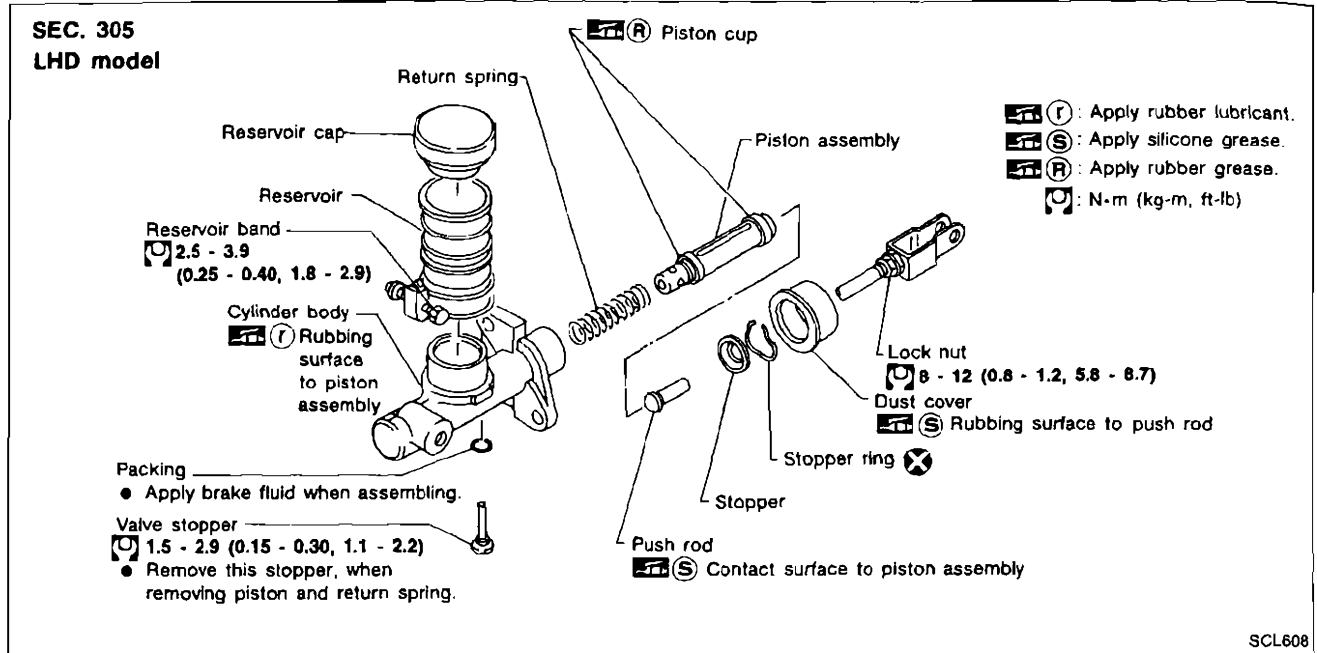
When replacing clutch tube, install new one parallel to body floor panel. If not, air bleeding might be difficult.



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# HYDRAULIC CLUTCH CONTROL

## Clutch Master Cylinder

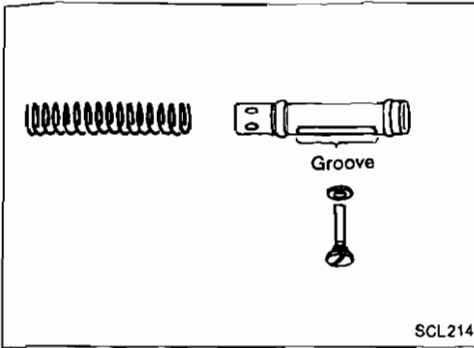


### DISASSEMBLY AND ASSEMBLY

- Push piston into cylinder body with screwdriver when removing and installing valve stopper.

# HYDRAULIC CLUTCH CONTROL

## Clutch Master Cylinder (Cont'd)



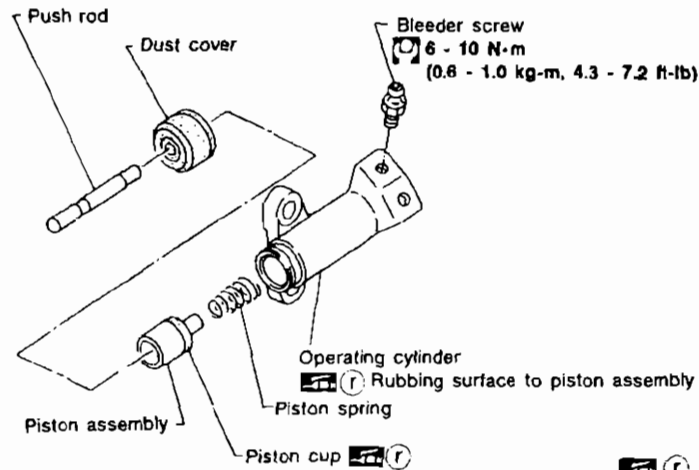
- Align groove of piston assembly and valve stopper when installing valve stopper.
- Check direction of piston cups.

## INSPECTION

- Check cylinder and piston rubbing surface for uneven wear, rust or damage. Replace if necessary.
- Check piston with piston cup for wear or damage. Replace if necessary.
- Check return spring for wear or damage. Replace if necessary.
- Check reservoir for deformation or damage. Replace if necessary.
- Check dust cover for cracks, deformation or damage. Replace if necessary.

## Operating Cylinder

SEC. 306



SCL590

## INSPECTION

- Check rubbing surface of cylinder for wear, rust or damage. Replace if necessary.
- Check piston with piston cup for wear or damage. Replace if necessary.
- Check piston spring for wear or damage. Replace if necessary.
- Check dust cover for cracks, deformation or damage. Replace if necessary.

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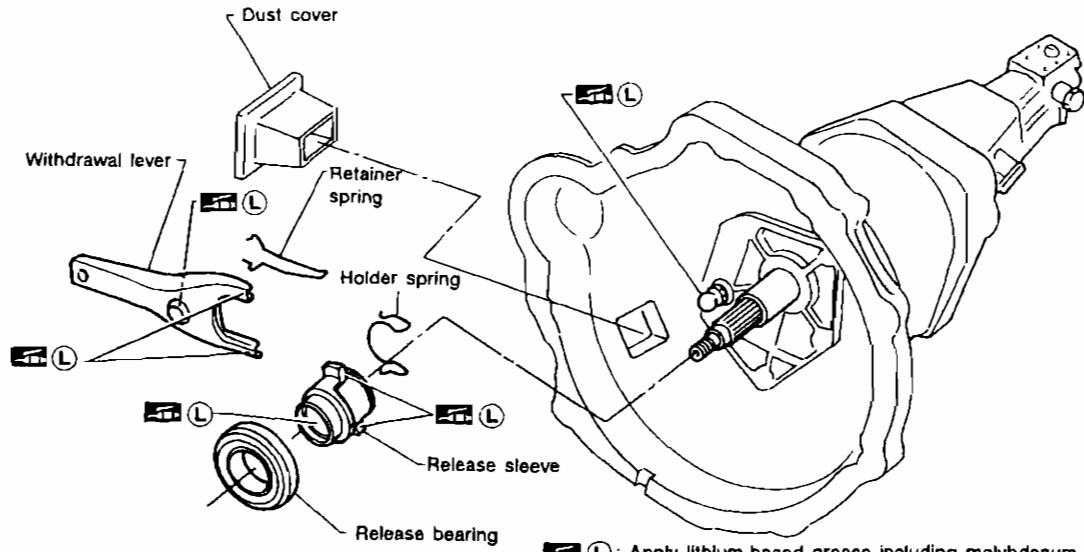
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# CLUTCH RELEASE MECHANISM

SEC. 321

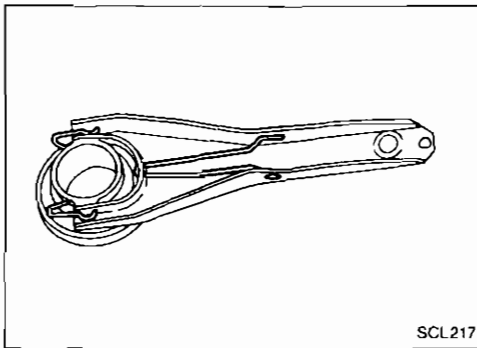


(L) : Apply lithium-based grease including molybdenum disulphide.

SCL617

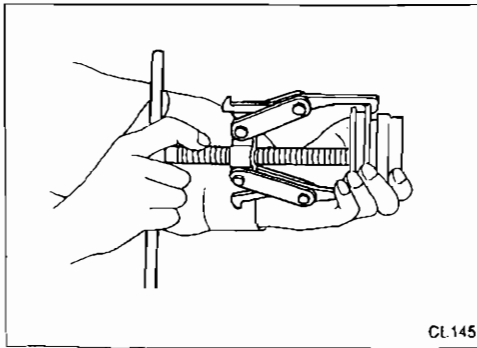
## REMOVAL AND INSTALLATION

- Install retainer spring and holder spring.



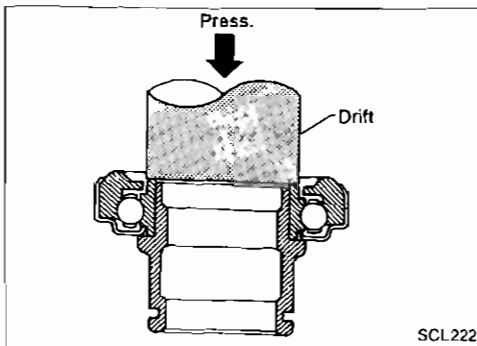
SCL217

- Remove release bearing



CL145

- Install release bearing with suitable drift.



SCL222



# CLUTCH RELEASE MECHANISM

## INSPECTION

- Check release bearing to see that it rolls freely and is free from noise, cracks, pitting or wear. Replace if necessary.
- Check release sleeve and withdrawal lever rubbing surface for wear, rust or damage. Replace if necessary.

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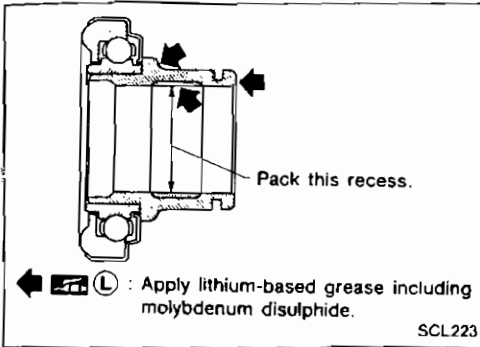
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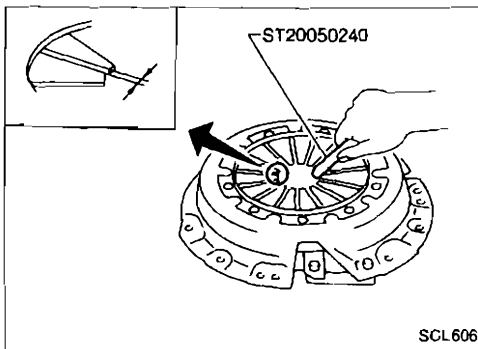
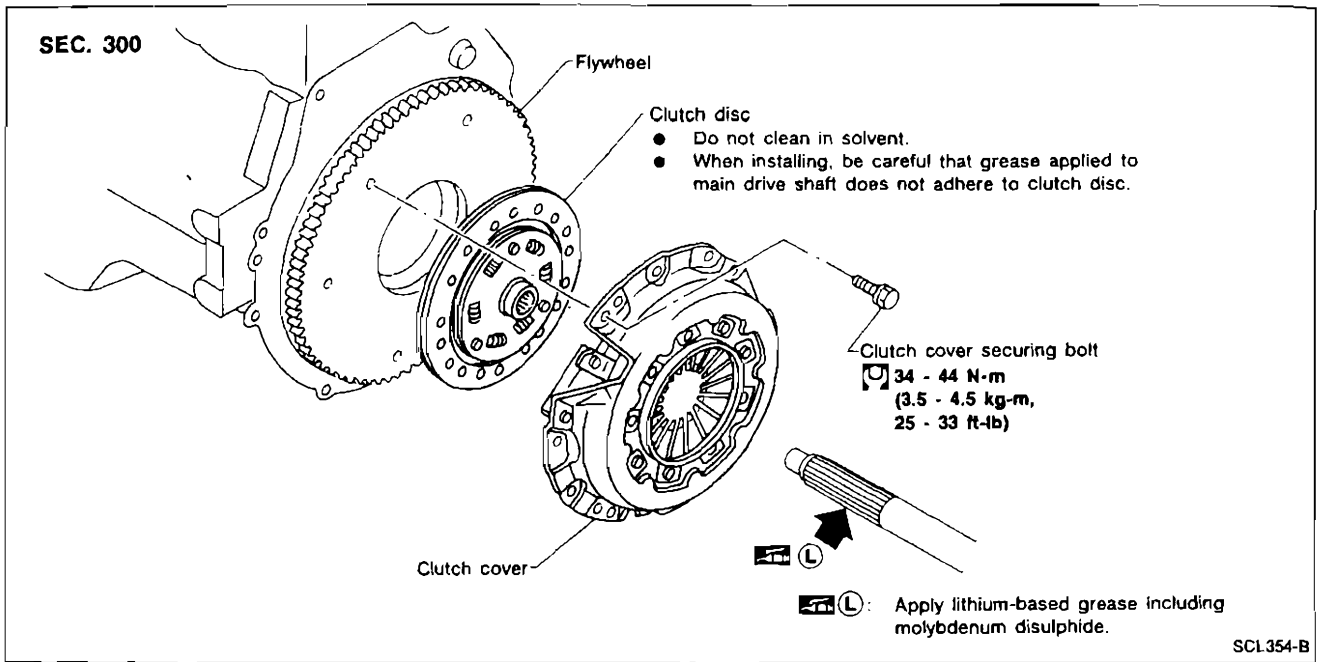


## LUBRICATION

- Apply recommended grease to contact surface and rubbing surface.

**Too much lubricant might damage clutch disc facing.**

# CLUTCH DISC AND CLUTCH COVER



## Clutch Cover and Flywheel

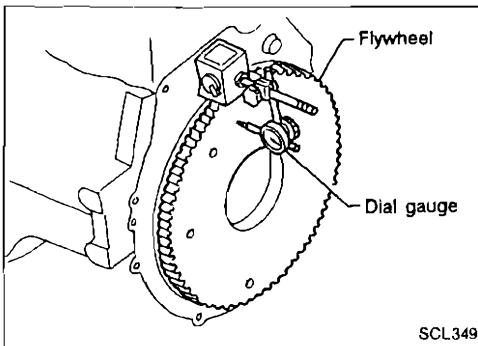
### INSPECTION AND ADJUSTMENT

- Check clutch cover installed on vehicle for unevenness of diaphragm spring toe height.

**Uneven limit:**

**0.5 mm (0.020 in)**

- If out of limit, adjust the height with Tool.

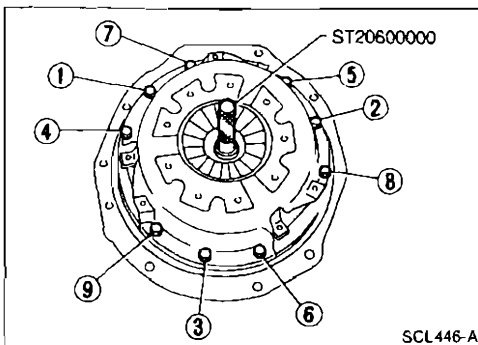


### FLYWHEEL INSPECTION

- Check contact surface of flywheel for slight burns or discoloration. Repair flywheel with emery paper.
- Check flywheel runout.

**Maximum allowable runout:**

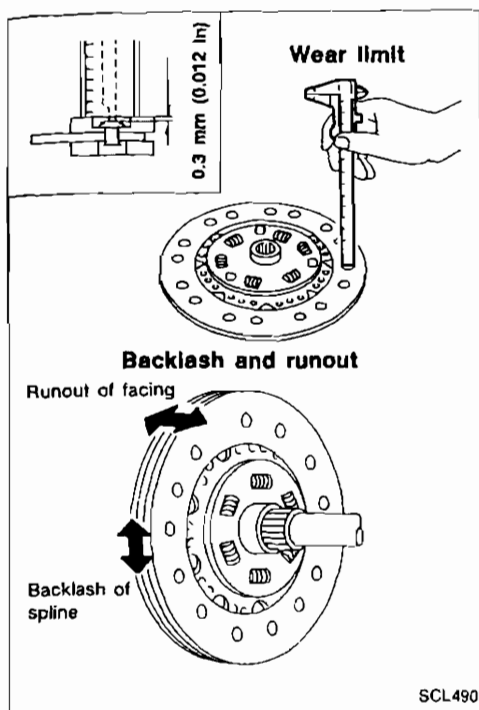
**Refer to EM section ("Inspection", "CYLINDER BLOCK").**



### INSTALLATION

- Insert Tool into clutch disc hub when installing clutch cover and disc.
- Tighten bolts in numerical order.
- **Be careful not to allow grease to contaminate clutch facing.**

# CLUTCH DISC AND CLUTCH COVER



## Clutch Disc

### INSPECTION

- Check clutch disc for wear of facing.  
**Wear limit of facing surface to rivet head:**  
0.3 mm (0.012 in)
- Check for backlash of spline and runout of facing.  
**Maximum backlash of spline (at outer edge of disc):**  
1.0 mm (0.039 in)  
**Runout limit:**  
1.0 mm (0.039 in)  
**Distance of runout check point (from hub center):**  
115 mm (4.53 in)
- Check clutch disc for burns, discoloration or oil or grease leakage. Replace if necessary.

### INSTALLATION

- Apply recommended grease to contact surface of spring portion.  
**Too much lubricant might damage clutch disc facing.**

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# SERVICE DATA AND SPECIFICATIONS (SDS)

## General Specifications

### CLUTCH CONTROL SYSTEM

Type of clutch control	Hydraulic
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### CLUTCH MASTER CYLINDER

Inner diameter	mm (in)	15.87 (5/8)
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### CLUTCH OPERATING CYLINDER

Inner diameter	mm (in)	19.05 (3/4)
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### CLUTCH DISC

Unit: mm (in)

Model	240
Facing size (Outer dia. x inner dia. x thickness)	240 x 160 x 3.5 (9.45 x 6.30 x 0.138)
Thickness of disc assembly With load	7.9 - 8.3 (0.311 - 0.327) with 4,903 N (500 kg, 1,103 lb)

### CLUTCH COVER

Model	240
Full load	N (kg, lb) 5,688 (580, 1,279)

## Inspection and Adjustment

### CLUTCH PEDAL

Unit: mm (in)

Model	LHD	RHD
Pedal height "H"	192 - 202 (7.56 - 7.95)	188 - 198 (7.40 - 7.80)
Pedal free play "A" (At pedal pad)	9 - 16 (0.35 - 0.63)	

\*: Measured from surface of melt sheet to pedal pad

### CLUTCH COVER

Unit: mm (in)

Model	240
Uneven limit of diaphragm spring toe height	0.5 (0.020)

### CLUTCH DISC

Unit: mm (in)

Model	240
Wear limit of facing surface to rivet head	0.3 (0.012)
Runout limit of facing	1.0 (0.039)
Distance of runout check point (from the hub center)	115 (4.53)
Maximum backlash of spline (at outer edge of disc)	1.0 (0.039)