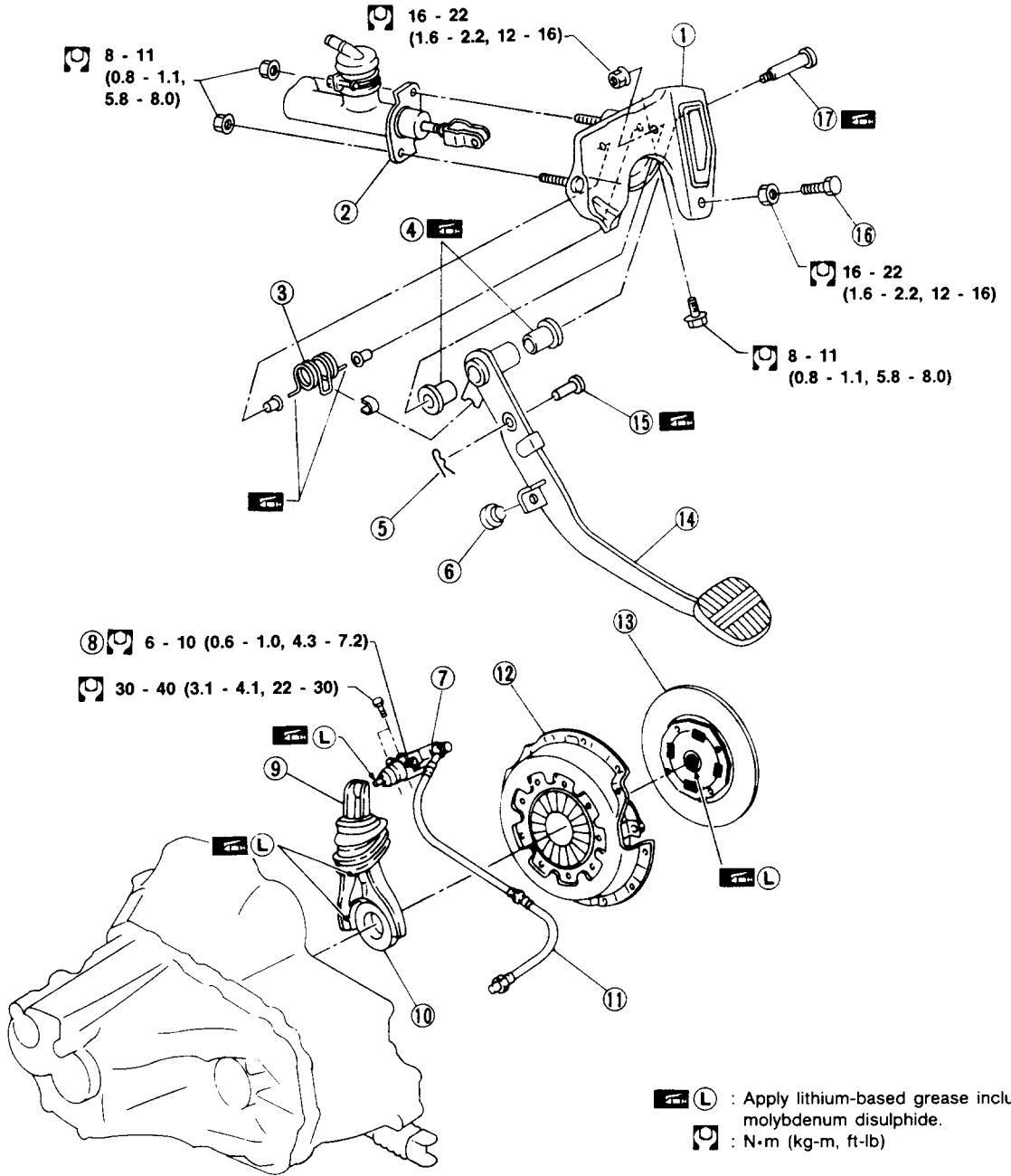


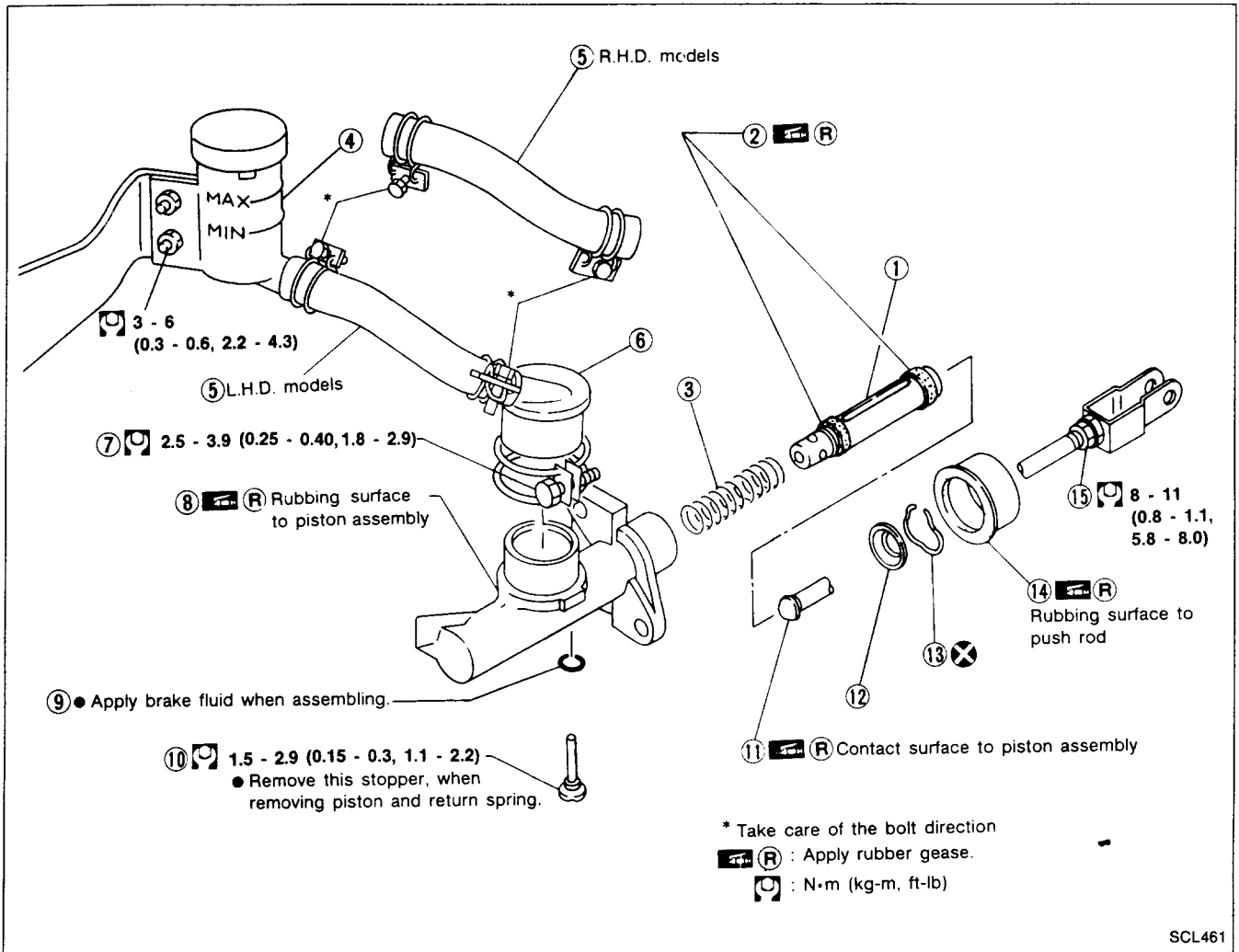
# CLUTCH SYSTEM — Hydraulic Type



SCL458

- |                          |                      |                 |
|--------------------------|----------------------|-----------------|
| ① Clutch pedal bracket   | ⑦ Operating cylinder | ⑬ Clutch disc   |
| ② Clutch master cylinder | ⑧ Air bleeder screw  | ⑭ Clutch pedal  |
| ③ Assist spring          | ⑨ Withdrawal lever   | ⑮ Clevis pin    |
| ④ Bushing                | ⑩ Release bearing    | ⑯ Pedal stopper |
| ⑤ Pin                    | ⑪ Clutch hose        | ⑰ Fulcrum pin   |
| ⑥ Stopper rubber         | ⑫ Clutch cover       |                 |

## Clutch Master Cylinder



SCL461

- ① Piston assembly
- ② Piston cup
- ③ Return spring
- ④ Reservoir tank
- ⑤ Reservoir hose

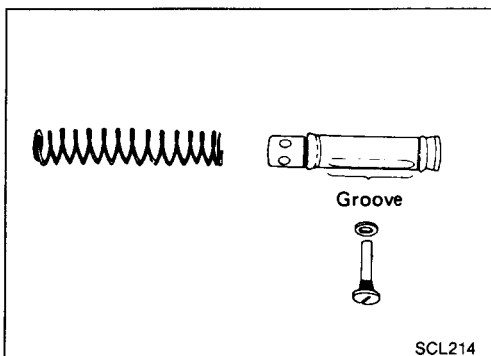
- ⑥ Reservoir cap
- ⑦ Reservoir band
- ⑧ Cylinder body
- ⑨ Packing
- ⑩ Valve stopper

- ⑪ Push rod
- ⑫ Stopper
- ⑬ Stopper ring
- ⑭ Dust cover
- ⑮ Lock nut

### DISASSEMBLY AND ASSEMBLY

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

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



# HYDRAULIC CLUTCH CONTROL — Hydraulic Type

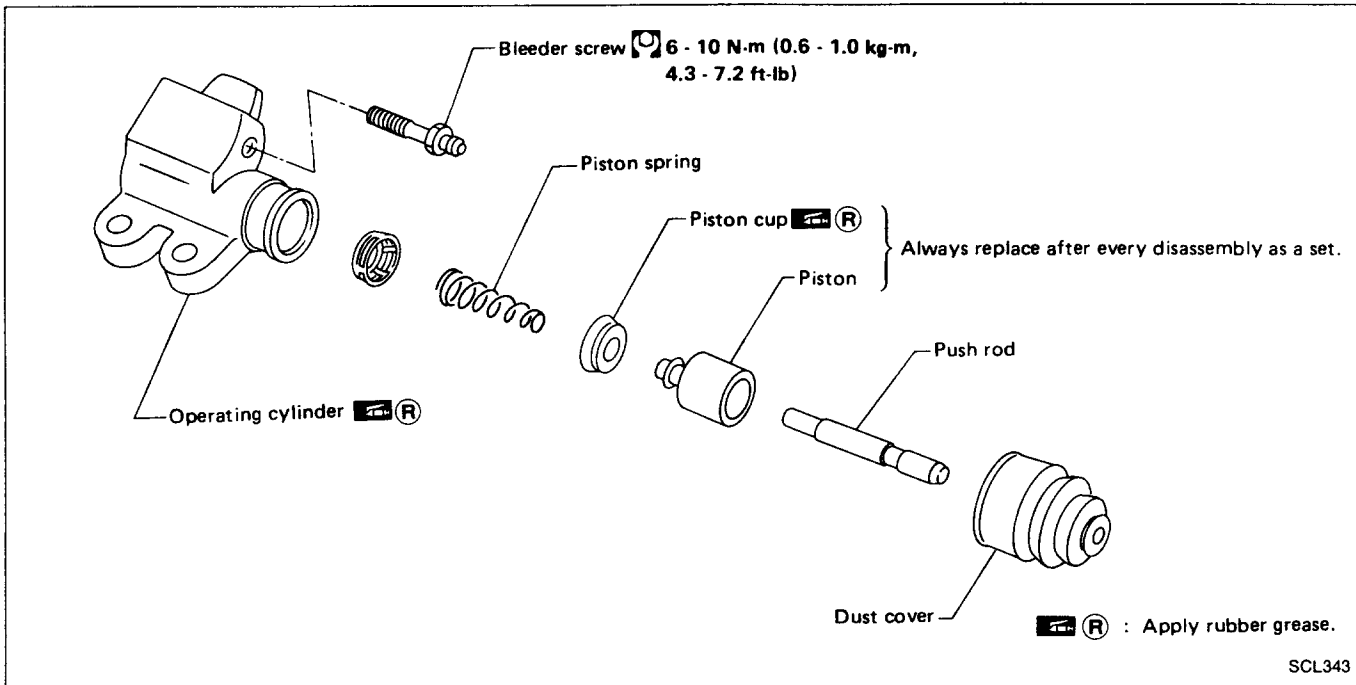
## Clutch Master Cylinder (Cont'd)

### INSPECTION

Check the following items, and replace if necessary.

- Rubbing surface of cylinder and piston, for uneven wear, rust or damage
- Piston with piston cup, for wear or damage
- Return spring, for wear or damage
- Dust cover, for cracks, deformation or damage
- Reservoir, for deformation or damage

### Operating Cylinder



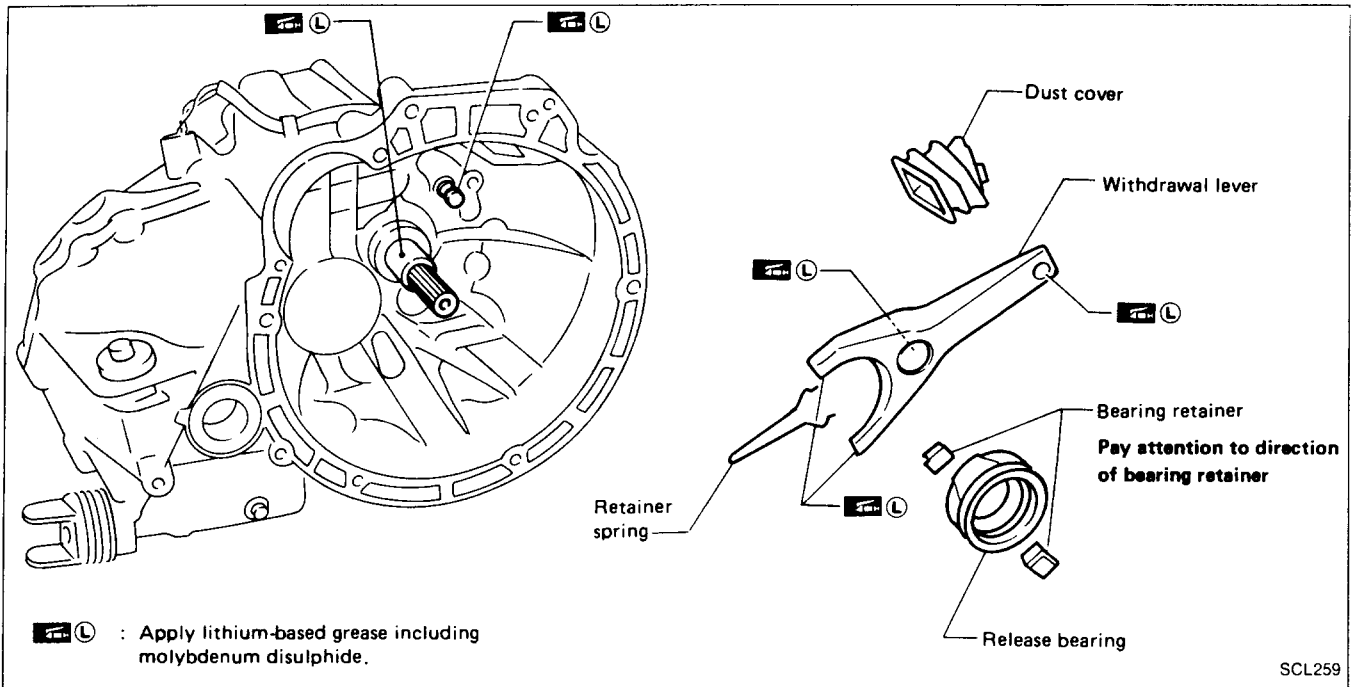
### INSPECTION

Check the following items, and replace if necessary.

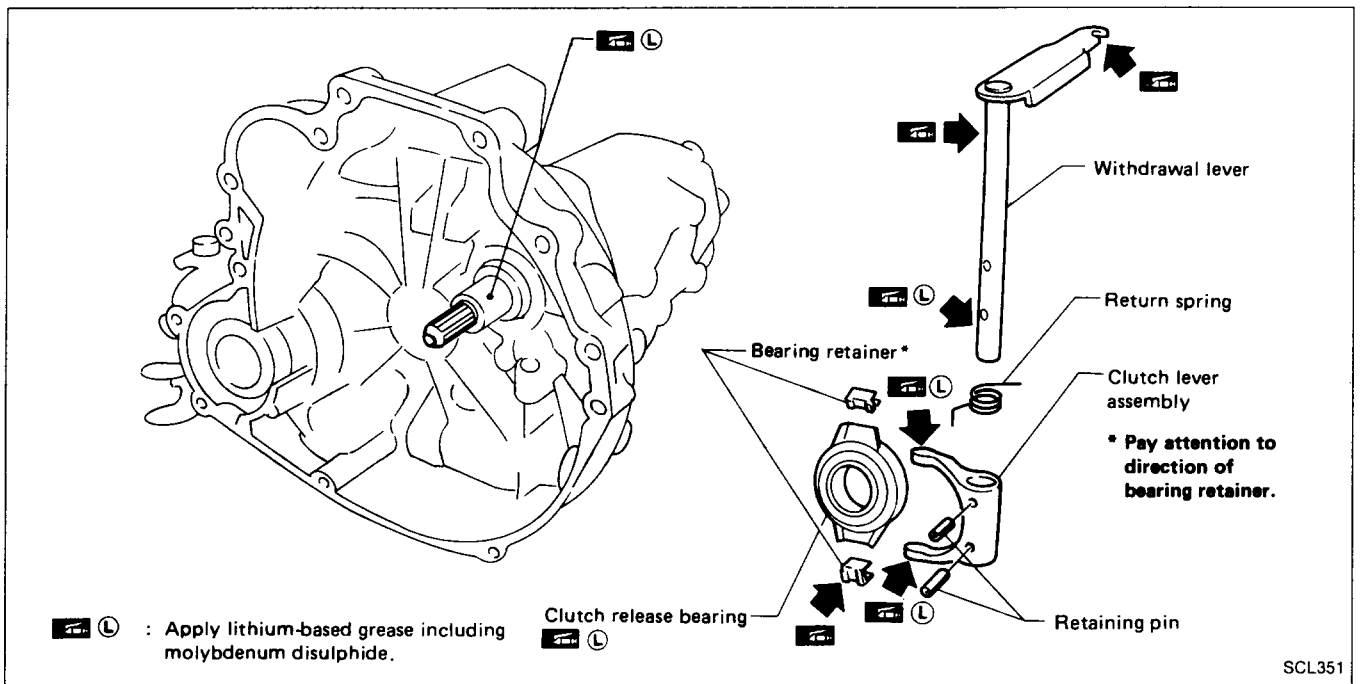
- Rubbing surface of cylinder and piston, for uneven wear, rust or damage
- Piston with piston cup, for wear or damage
- Piston spring, for wear or damage
- Dust cover, for cracks, deformation or damage

# CLUTCH RELEASE MECHANISM

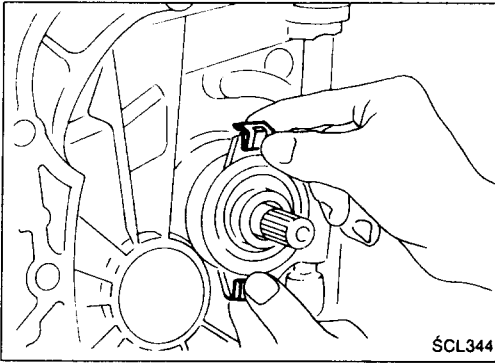
## HYDRAULIC TYPE



## MECHANICAL TYPE

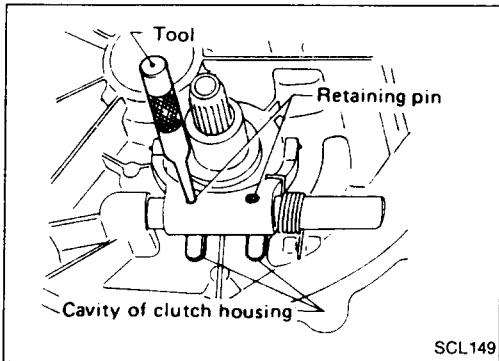


# CLUTCH RELEASE MECHANISM



## REMOVAL AND INSTALLATION

- Remove release bearing by pulling bearing retainers outward.



- Align retaining pin with cavity of clutch housing and tap out retaining pin.

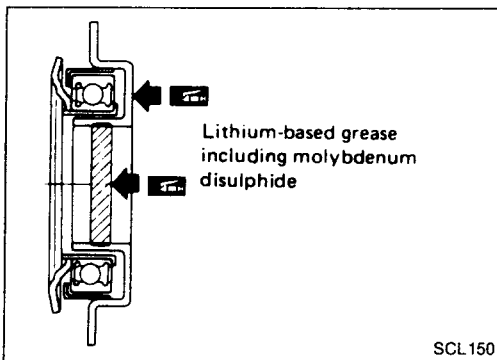
## INSPECTION

Check the following items, and replace if necessary.

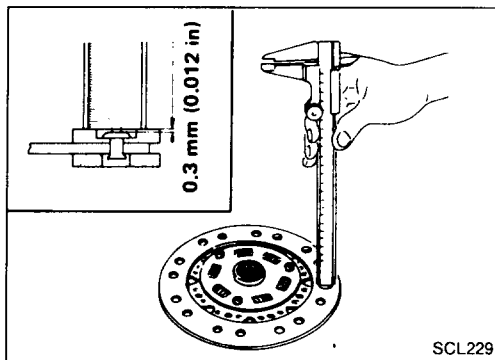
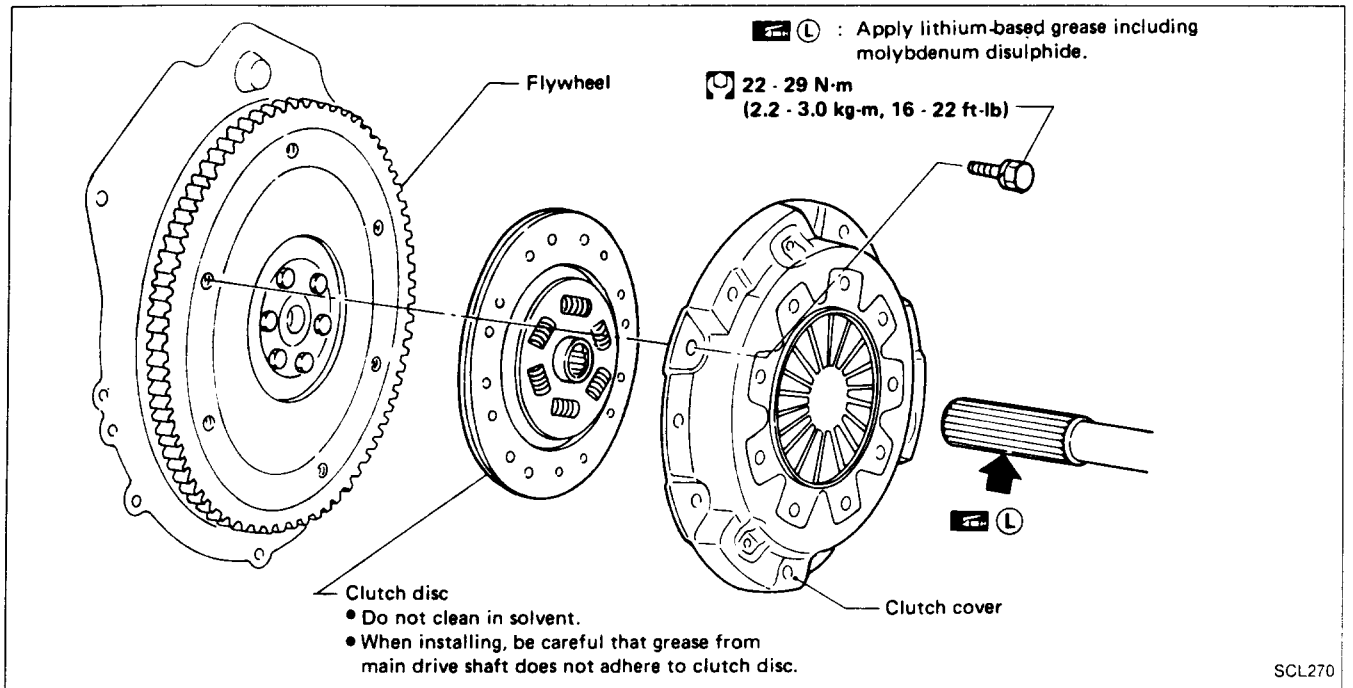
- Release bearing, to see that it rolls freely and is free from noise, cracks, pitting or wear
- Release sleeve and withdrawal lever rubbing surface, for wear, rust or damage

## LUBRICATION

- Apply recommended grease to contact surface and rubbing surface.
- **Too much lubricant might damage clutch disc facing.**



# CLUTCH DISC AND CLUTCH COVER

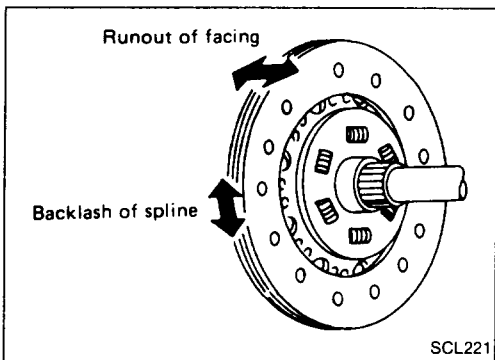


## Clutch Disc

### INSPECTION

Check clutch disc for wear of facing.

**Wear limit of facing surface to rivet head:  
0.3 mm (0.012 in)**



- Check clutch disc for backlash of spline and runout of facing.

**Maximum backlash of spline (at outer edge of disc):**

|                |                   |
|----------------|-------------------|
| 180CBL         | 0.7 mm (0.028 in) |
| 190TBL, 200TBL | 0.8 mm (0.031 in) |
| 215TBL         | 0.9 mm (0.035 in) |
| 240LTD         | 1.0 mm (0.039 in) |

**Runout limit:**

1.0 mm (0.039 in)

**Distance of runout check point (from hub center):**

|        |                    |
|--------|--------------------|
| 180CBL | 85 mm (3.35 in)    |
| 190TBL | 90 mm (3.54 in)    |
| 200TBL | 95 mm (3.74 in)    |
| 215TBL | 102.5 mm (4.04 in) |
| 240LTD | 115 mm (4.53 in)   |

- Check clutch disc for burns, discoloration or oil or grease leakage. Replace if necessary.

# CLUTCH DISC AND CLUTCH COVER

## Clutch Cover and Flywheel

### INSPECTION AND ADJUSTMENT

- Set Tools and check height and unevenness of diaphragm spring.

Set specified feeler gauges on distance pieces (ST20050100) to obtain the same thickness as clutch disc.

#### Thickness of feeler gauges:

**C180S, C190S and C200S (CD20 engine models)**  
0.4 mm (0.016 in)

**C200S (4WD models with GA16DS engine)**  
0.1 mm (0.004 in)

**C215S** Not required

**C240S** 0.3 mm (0.012 in)

#### Diaphragm spring height "A":

**C180S** 29 - 31 mm (1.14 - 1.22 in)

**C190S**

Except for models with CD17 engine

29 - 31 mm (1.14 - 1.22 in)

For models with CD17 engine

31 - 33 mm (1.22 - 1.30 in)

**C200S** 31 - 33 mm (1.22 - 1.30 in)

**C215S** 30.5 - 32.5 mm (1.201 - 1.280 in)

**C240S** 37.5 - 39.5 mm (1.476 - 1.555 in)

- Check thrust rings for wear or damage by shaking cover assembly and listening for chattering noise, or lightly hammering on rivets for a slightly cracked noise. Replace clutch cover assembly if necessary.
- Check pressure plate and clutch disc contact surface for slight burns or discoloration. Repair pressure plate with emery paper.
- Check pressure plate and clutch disc contact surface for deformation or damage. Replace if necessary.

- Adjust unevenness of diaphragm spring with Tool.

#### Uneven limit:

**C180S** 1.0 mm (0.039 in)

**C190S, C200S and C215S** 0.7 mm (0.028 in)

**C240S** 0.5 mm (0.020 in)

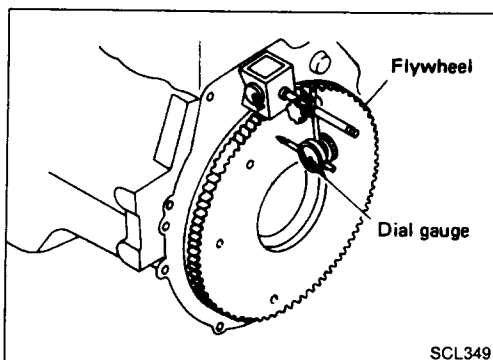
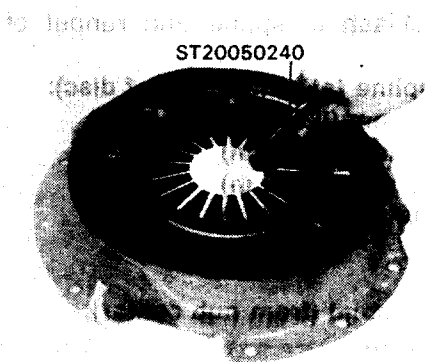
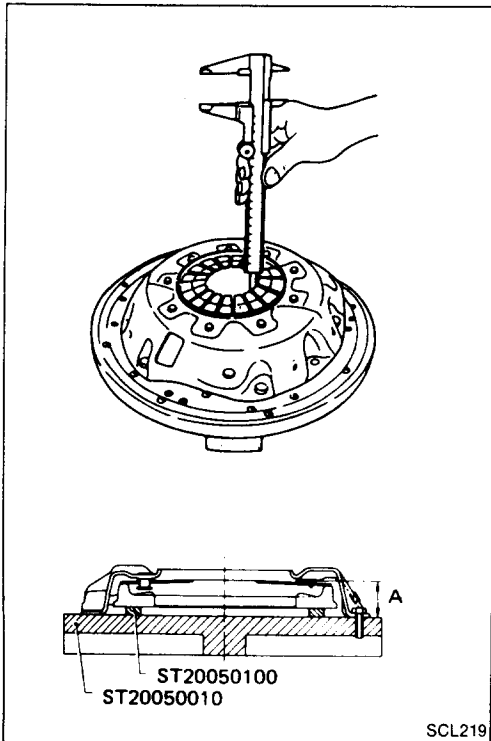
### FLYWHEEL INSPECTION

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

#### Runout (Total indicator reading):

##### Flywheel

Less than 0.15 mm (0.0059 in)

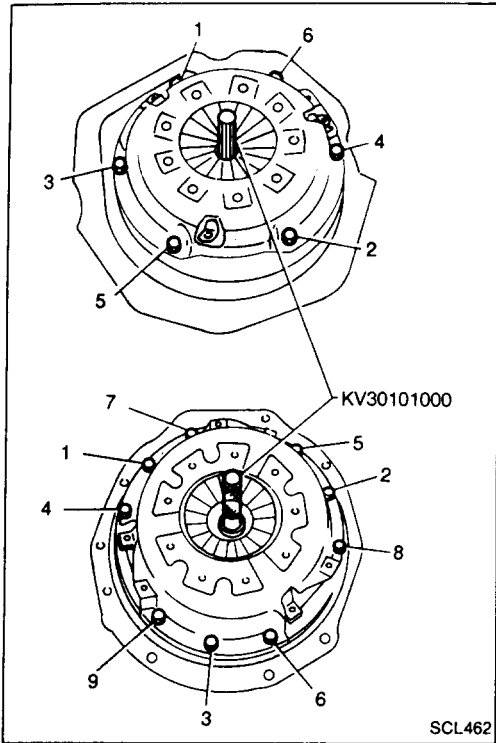


# CLUTCH DISC AND CLUTCH COVER

## Clutch Cover and Flywheel (Cont'd)

### 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.**





# SERVICE DATA AND SPECIFICATIONS (S.D.S.)

## General Specifications

### CLUTCH CONTROL SYSTEM

|                        |                    |           |
|------------------------|--------------------|-----------|
| Engine                 | Except for SR20DET | SR20DET   |
| Type of clutch control | Mechanical         | Hydraulic |

### CLUTCH MASTER CYLINDER

|                |         |             |
|----------------|---------|-------------|
| Inner diameter | mm (in) | 15.87 (5/8) |
|----------------|---------|-------------|

### CLUTCH OPERATING CYLINDER

|                |         |             |
|----------------|---------|-------------|
| Inner diameter | mm (in) | 19.05 (3/4) |
|----------------|---------|-------------|

### CLUTCH DISC

Unit: mm (in)

| Engine  | E10S, GA13DS, GA14DS                                       | GA16DS (2WD), GA16DE, CD17               | CD20                                     | GA16DS (4WD)   | SR20DE   | SR20DET  |
|---|--|--|--|--|--|--|
| Model   | 180CBL   | 190TBL                                   | 200TBL                                   |  | 215TBL   | 240LTD   |
| Facing size (Outer dia. x inner dia. x thickness) | 180 x 125 x 3.5<br>(7.09 x 4.92 x 0.138)                   | 190 x 132 x 3.5<br>(7.48 x 5.20 x 0.138) | 200 x 130 x 3.5<br>(7.87 x 5.12 x 0.138) |  | 215 x 140 x 3.5<br>(8.46 x 5.51 x 0.138)                   | 240 x 160 x 3.5<br>(9.45 x 6.30 x 0.138)                     |
| Thickness of disc assembly with load              | 8.0 - 8.4 (0.315 - 0.331)<br>with 3,923 N (400 kg, 882 lb) |  |  | 7.7 - 8.1<br>(0.303 - 0.319)<br>with 3,923 N<br>(400 kg, 882 lb) | 7.6 - 8.0 (0.299 - 0.315)<br>with 3,923 N (400 kg, 882 lb) | 7.9 - 8.3 (0.311 - 0.327)<br>with 4,904 N (500 kg, 1,103 lb) |

### CLUTCH COVER

| Engine               | E10S                | GA13DS, GA14DS      | GA16DS (2WD)        | GA16DE              | CD17                | CD20, GA16DS (4WD)  | SR20DE              | SR20DET               |
|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------------|
| Model                | C180S               |                     | C190S               |                     |                     | C200S               | C215S               | C240S                 |
| Full-load N (kg, lb) | 2,746<br>(280, 617) | 3,236<br>(330, 728) | 3,432<br>(350, 772) | 3,825<br>(390, 860) | 2,844<br>(290, 639) | 3,481<br>(355, 783) | 4,413<br>(450, 992) | 5,688<br>(580, 1,279) |

# SERVICE DATA AND SPECIFICATIONS (S.D.S.)

## Inspection and Adjustment

### CLUTCH PEDAL

Unit: mm (in)

| Applied model   | 2WD                         |                            | 4WD                        |                            |
|---|-----------------------------|----------------------------|----------------------------|----------------------------|
|   | R.H.D.                      | L.H.D.                     | GA16DS engine models       | SR20DET engine models      |
| Pedal height*   | 159 - 169<br>(6.26 - 6.65)  | 150 - 160<br>(5.91 - 6.30) | 162 - 172<br>(6.38 - 6.77) | 159 - 169<br>(6.26 - 6.65) |
| Pedal free play "A <sub>1</sub> "<br>(Backlash at clevis) | —                           |                            |                            | 1 - 3 (0.04 - 0.12)        |
| Pedal free travel "A <sub>2</sub> "                       | 10.8 - 15.1 (0.425 - 0.594) |                            |                            | —                          |
| Withdrawal lever play "B"                                 | 2.5 - 3.5 (0.098 - 0.138)   |                            |                            | —                          |

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

### CLUTCH DISC

Unit: mm (in)

| Disc model  | 180CBL      | 190TBL      | 200TBL      | 215TBL       | 240LTD      |
|---|-------------|-------------|-------------|--------------|-------------|
| Wear limit of facing<br>surface to rivet head         | 0.3 (0.012) |             |             |              |             |
| Runout limit of facing                                | 1.0 (0.039) |             |             |              |             |
| Distance of runout check point (from<br>hub center)   | 85 (3.35)   | 90 (3.54)   | 95 (3.74)   | 102.5 (4.04) | 115 (4.53)  |
| Maximum backlash of spline (at outer<br>edge of disc) | 0.7 (0.028) | 0.8 (0.031) | 0.8 (0.031) | 0.9 (0.035)  | 1.0 (0.039) |

### CLUTCH COVER

Unit: mm (in)

| Cover model  | C180S                    | C190S                    |                           | C200S                    | C215S                          | C240S                          |
|--|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------------|--------------------------------|
| Diaphragm spring height                            | 29 - 31<br>(1.14 - 1.22) | 29 - 31<br>(1.14 - 1.22) | 31 - 33<br>(1.22 - 1.30)* | 31 - 33<br>(1.22 - 1.30) | 30.5 - 32.5<br>(1.201 - 1.280) | 37.5 - 39.5<br>(1.476 - 1.555) |
| Uneven limit of diaphragm<br>spring toe height "A" | 1.0 (0.039)              | 0.7 (0.028)              |                           |                          |                                | 0.5 (0.020)                    |

\*: For models with CD17 engine