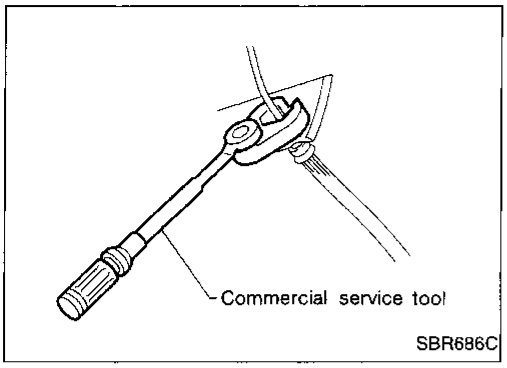
SECTION CL

CONTENTS

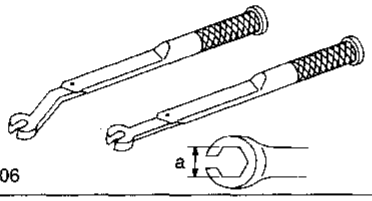
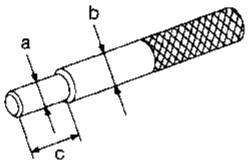
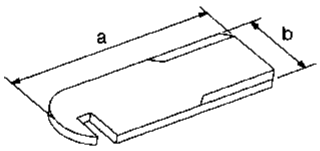


Precautions

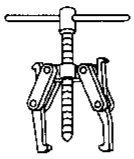
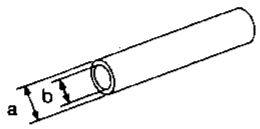
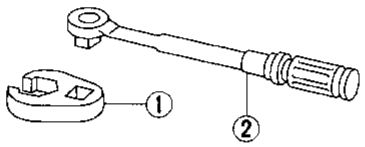
- **Recommended fluid is brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**
- **Be careful not to splash brake fluid on painted areas.**
- **When removing and installing clutch piping, use Tool.**
- **Use new brake fluid to clean or wash all parts of master cylinder, operating cylinder and 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.

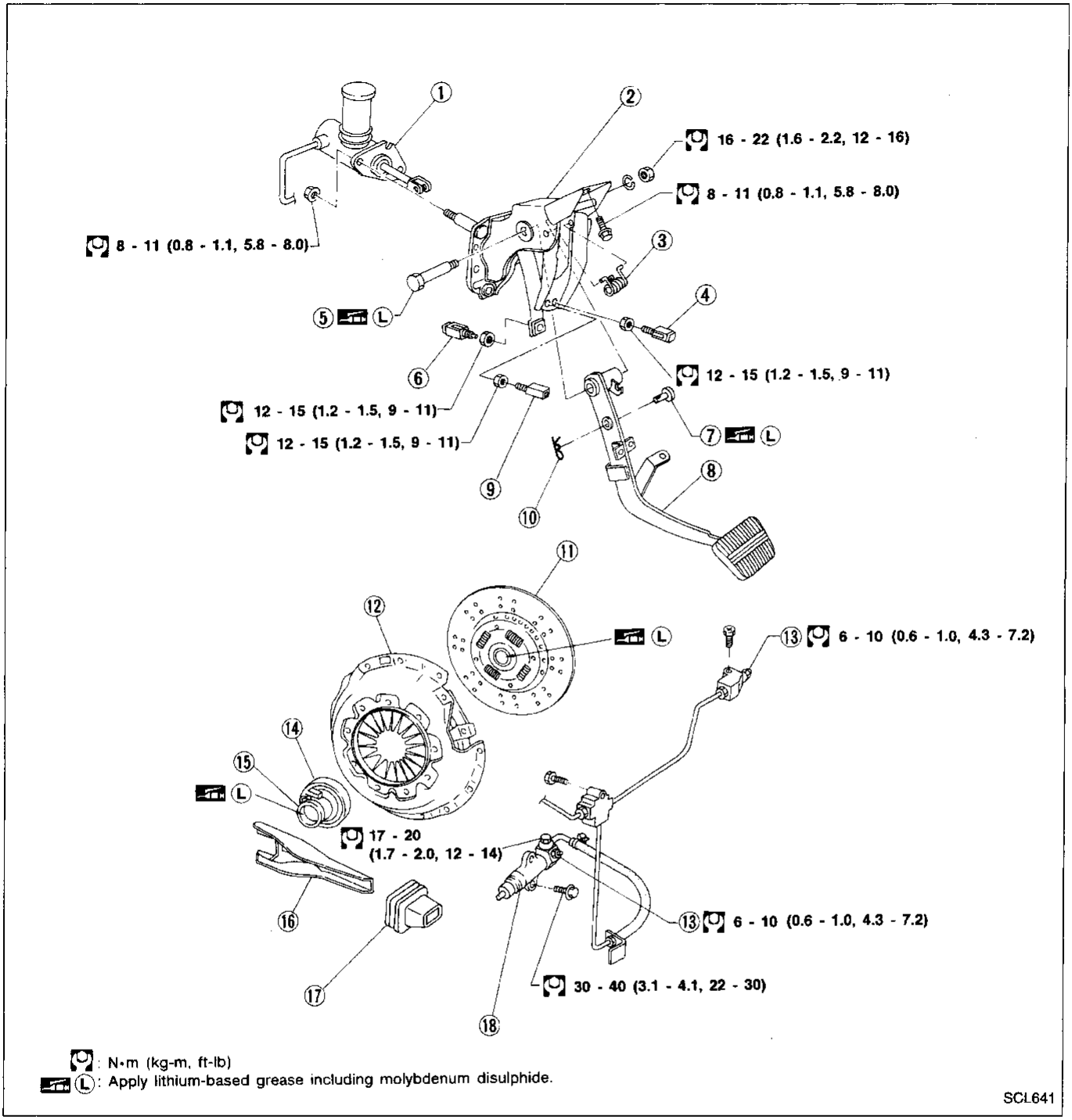
Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description	
GG94310000 (—) Flare nut torque wrench	 NT406	Removing and installing each clutch piping **a: 10 mm (0.39 in)**
ST20600000 (J26366) Clutch aligning bar	 NT405	Installing clutch cover and clutch disc **a: 15.9 mm (0.626 in) dia.** **b: 22.8 mm (0.898 in) dia.** **c: 55 mm (2.17 in)**
ST20050240 (—) Diaphragm spring adjusting wrench	 NT404	Adjusting unevenness of diaphragm spring of clutch cover **a: 150 mm (5.91 in)** **b: 25 mm (0.98 in)**

Commercial Service Tools

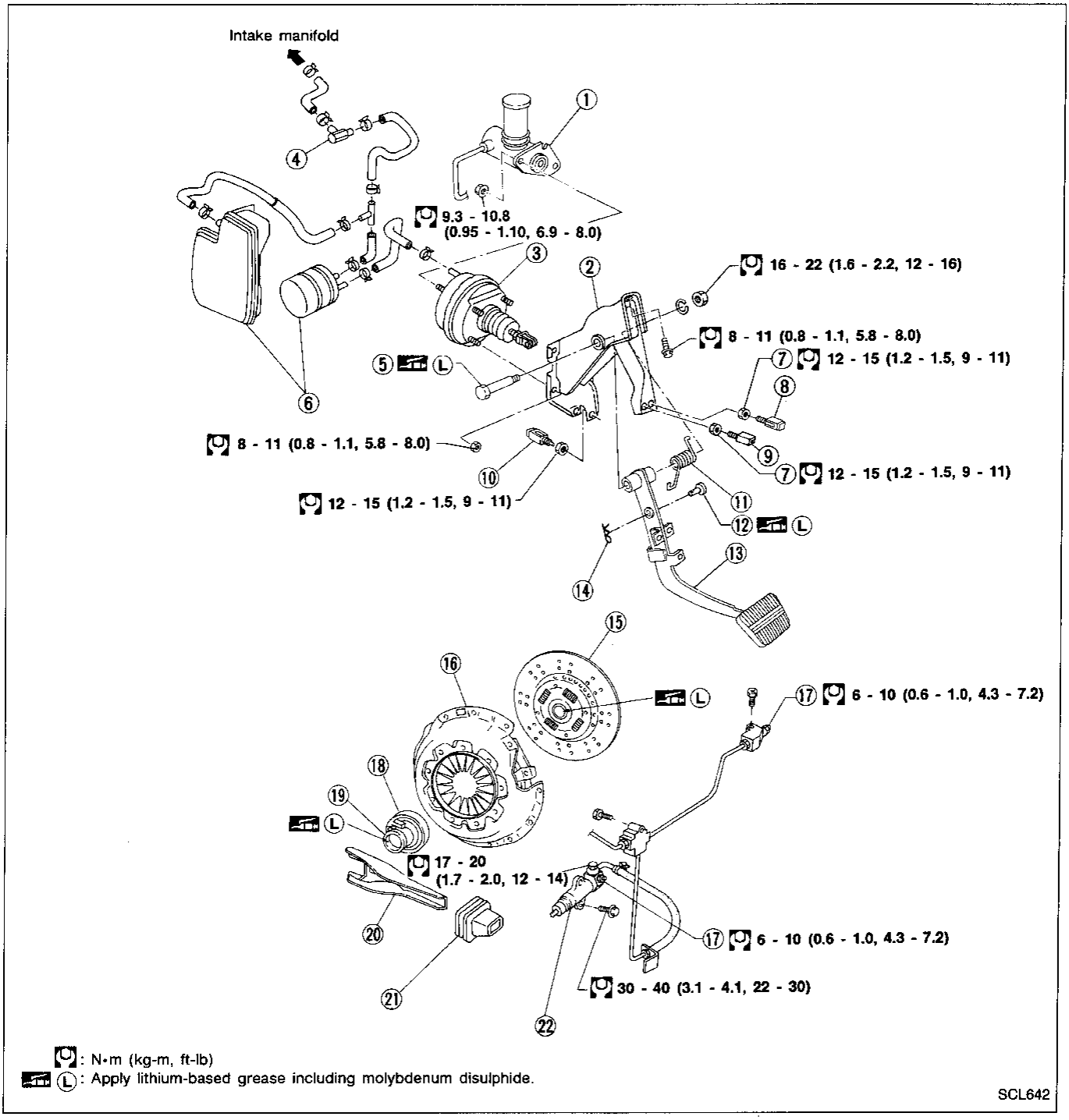
Tool name	Description	
Bearing puller	 NT077	Removing release bearing
Bearing drift	 NT065	Installing release bearing **a: 50 mm (1.97 in) dia.** **b: 45 mm (1.77 in) dia.**
① Flare nut crows foot ② Torque wrench	 NT223	

VG30DE engine model



① Clutch master cylinder
② Pedal bracket
③ Assist spring
④ ASCD cancel switch
⑤ Fulcrum pin
⑥ Clutch interlock switch
⑦ Clevis pin
⑧ Clutch pedal
⑨ Clutch switch
⑩ Snap pin
⑪ Clutch disc
⑫ Clutch cover
⑬ Air bleeder screw
⑭ Release bearing
⑮ Release bearing sleeve
⑯ Withdrawal lever
⑰ Dust cover
⑱ Operating cylinder

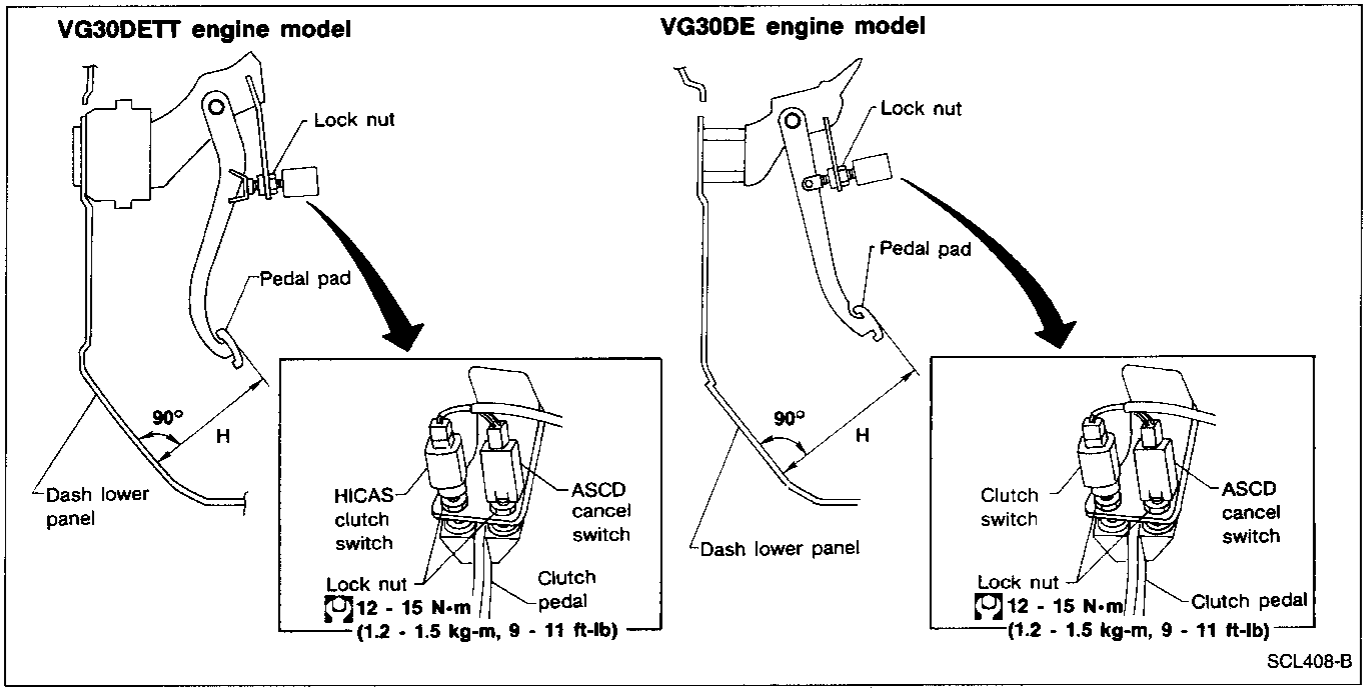
VG30DETT engine model

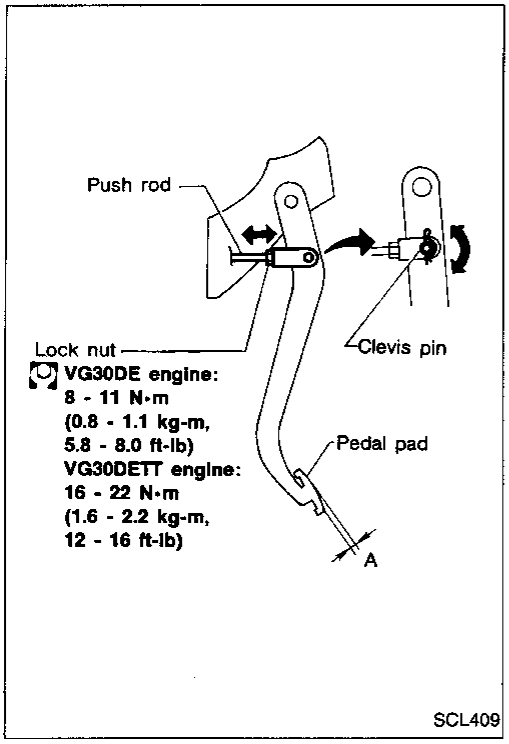


① Clutch master cylinder
② Pedal bracket
③ Clutch booster
④ Check valve
⑤ Fulcrum pin
⑥ Vacuum tank
⑦ Lock nut
⑧ ASCD cancel switch
⑨ HICAS clutch switch
⑩ Clutch interlock switch
⑪ Return spring
⑫ Clevis pin
⑬ Clutch pedal
⑭ Snap pin
⑮ Clutch disc
⑯ Clutch cover
⑰ Air bleeder screw
⑱ Release bearing
⑲ Release bearing sleeve
⑳ Withdrawal lever
㉑ Dust cover
㉒ Operating cylinder

Adjusting Clutch Pedal

1. Adjust pedal height with ASCD cancel switch and HICAS clutch switch or clutch switch.
   Pedal height "H":
   VG30DE engine
   197 - 207 mm (7.76 - 8.15 in)
   VG30DETT engine
   183 - 193 mm (7.20 - 7.60 in)





2. Adjust pedal free play with master cylinder push rod. Then tighten lock nut.
   Pedal free play "A":
   1.0 - 3.0 mm (0.039 - 0.118 in)

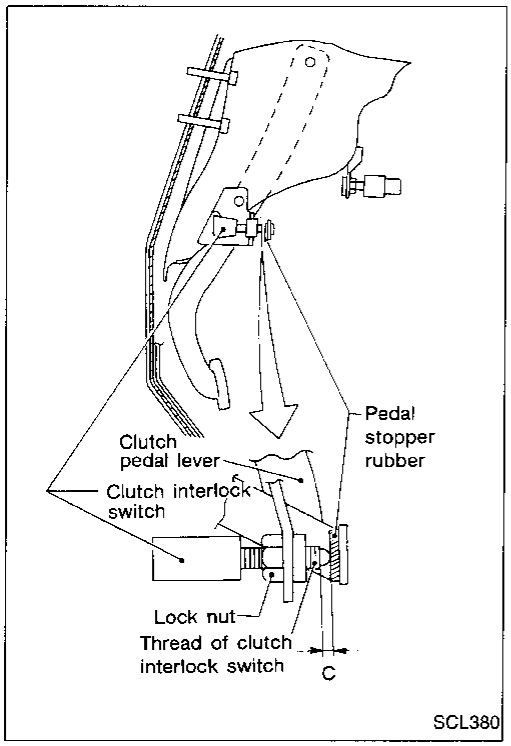
Pedal free play means the following measured at position of pedal pad:

- **Play due to clevis pin and clevis pin hole in clutch pedal.**

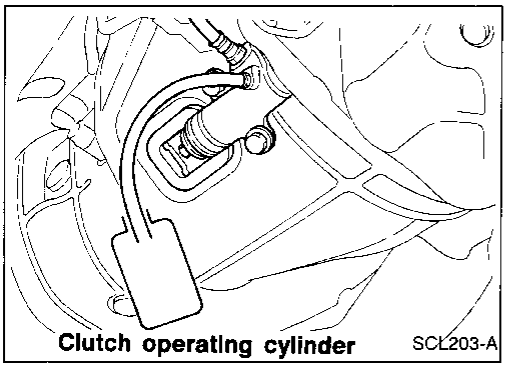
3. Make sure that clevis pin can be rotated smoothly.
   If not, readjust pedal free play with master cylinder push rod.

Adjusting Clutch Pedal (Cont'd)

— U.S.A. model only —



4. Adjust clearance "C" shown in the figure while fully depressing clutch pedal.
   Clearance C:
   1.0 - 2.0 mm (0.039 - 0.079 in)



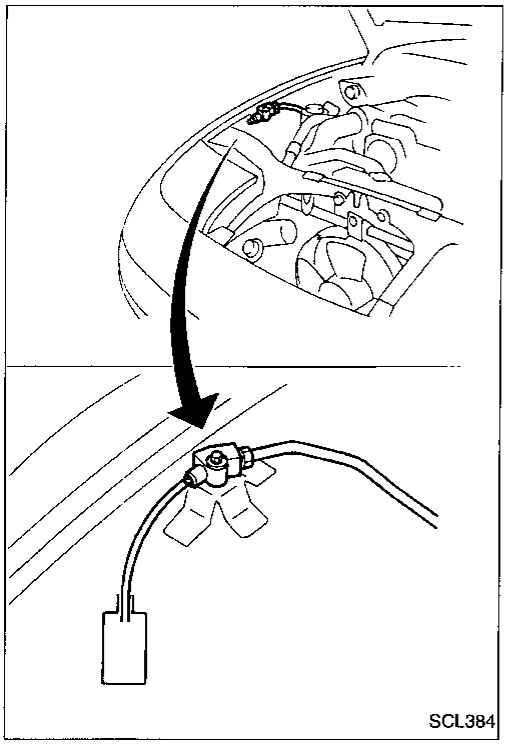
Bleeding Procedure

1. Bleed air from clutch operating cylinder according to the following procedure.

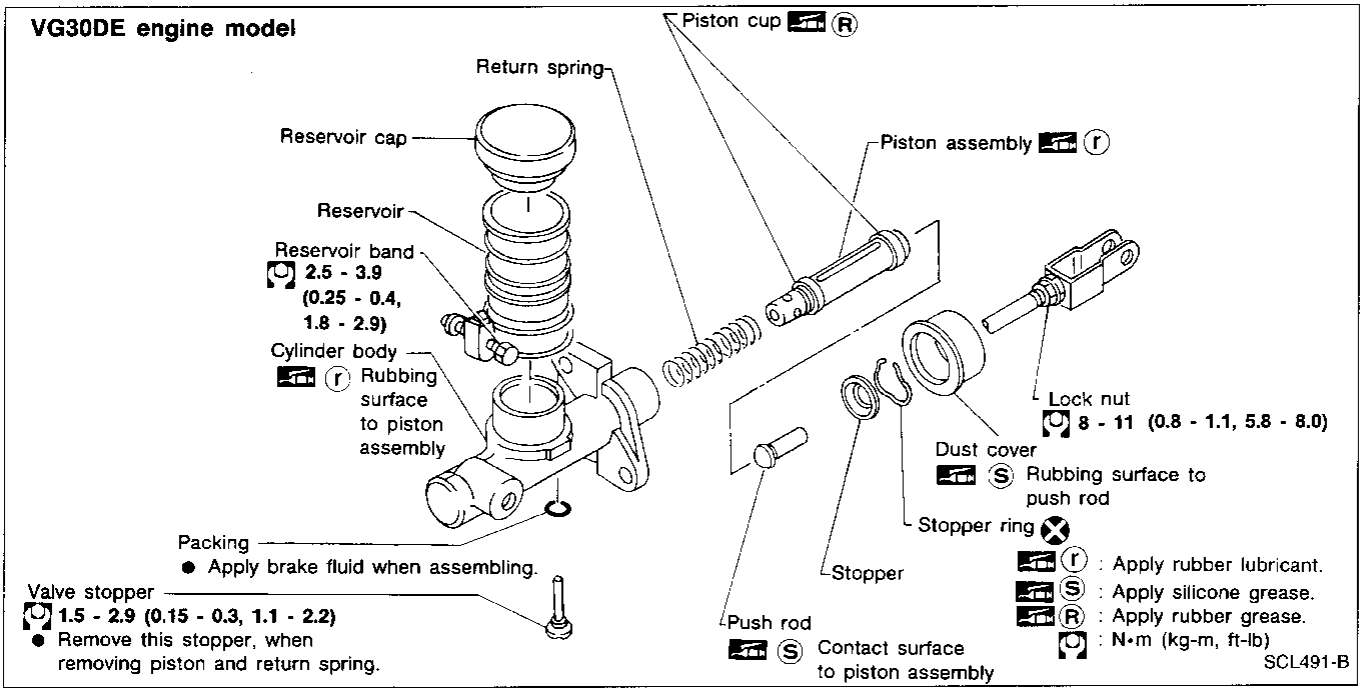
Carefully monitor fluid level at master cylinder during bleeding operation.

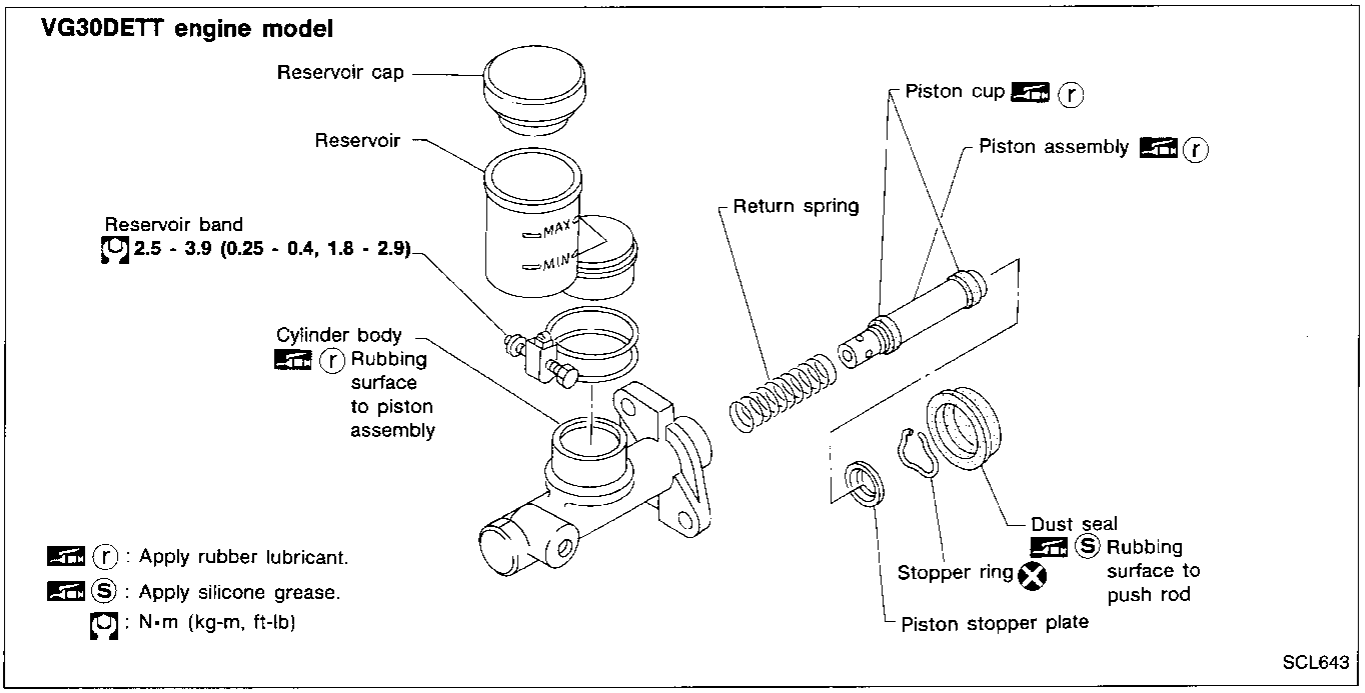
a. Top up reservoir with recommended brake fluid.
b. Connect a transparent vinyl tube to air bleeder valve.
c. Fully depress clutch pedal several times.
d. With clutch pedal depressed, open bleeder valve to release air.
e. Close bleeder valve.
f. Repeat steps c through e above until brake fluid flows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

2. Bleed air from clutch piping connector according to the above same procedure.
3. Repeat the above bleeding procedures 1 and 2 several times.



Clutch Master Cylinder

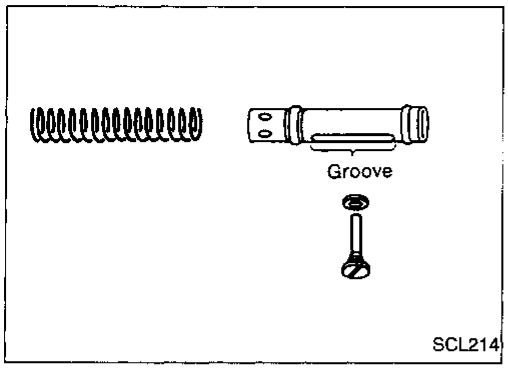




DISASSEMBLY AND ASSEMBLY

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

Clutch Master Cylinder (Cont'd)

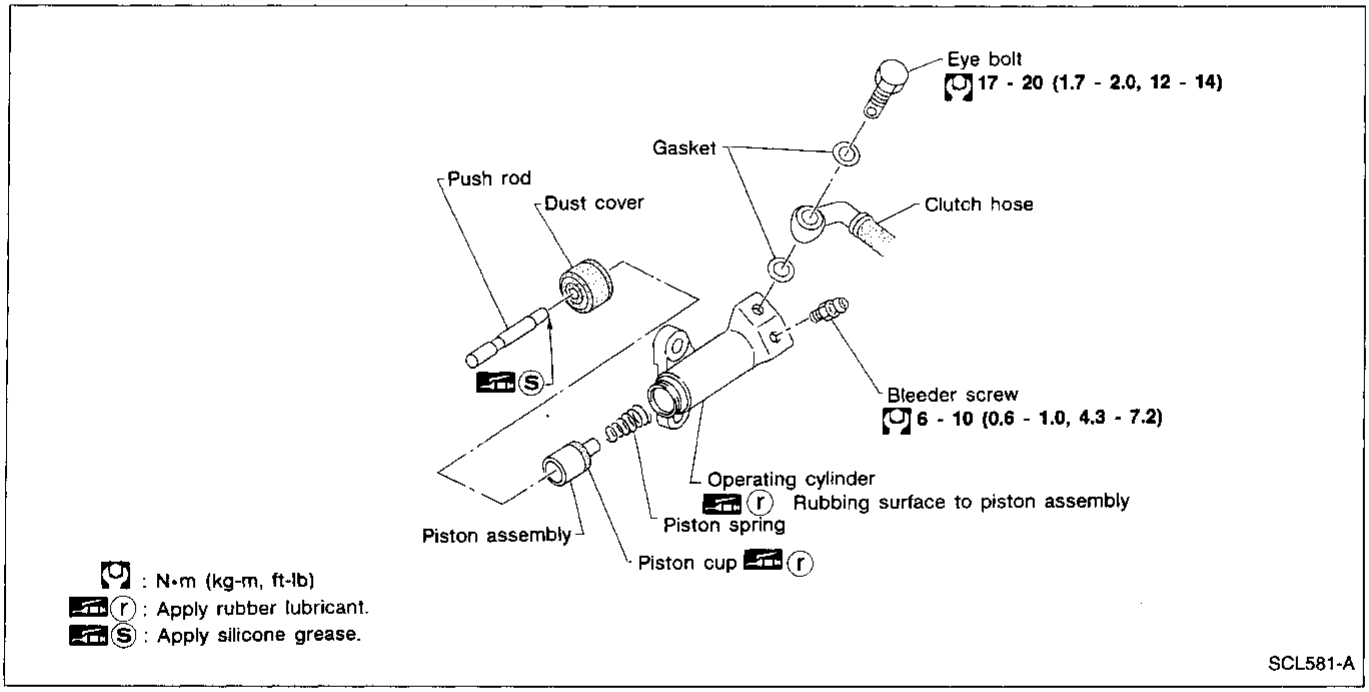


- Align groove of piston assembly and valve stopper when installing valve stopper.
- Check direction of piston cups.

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.

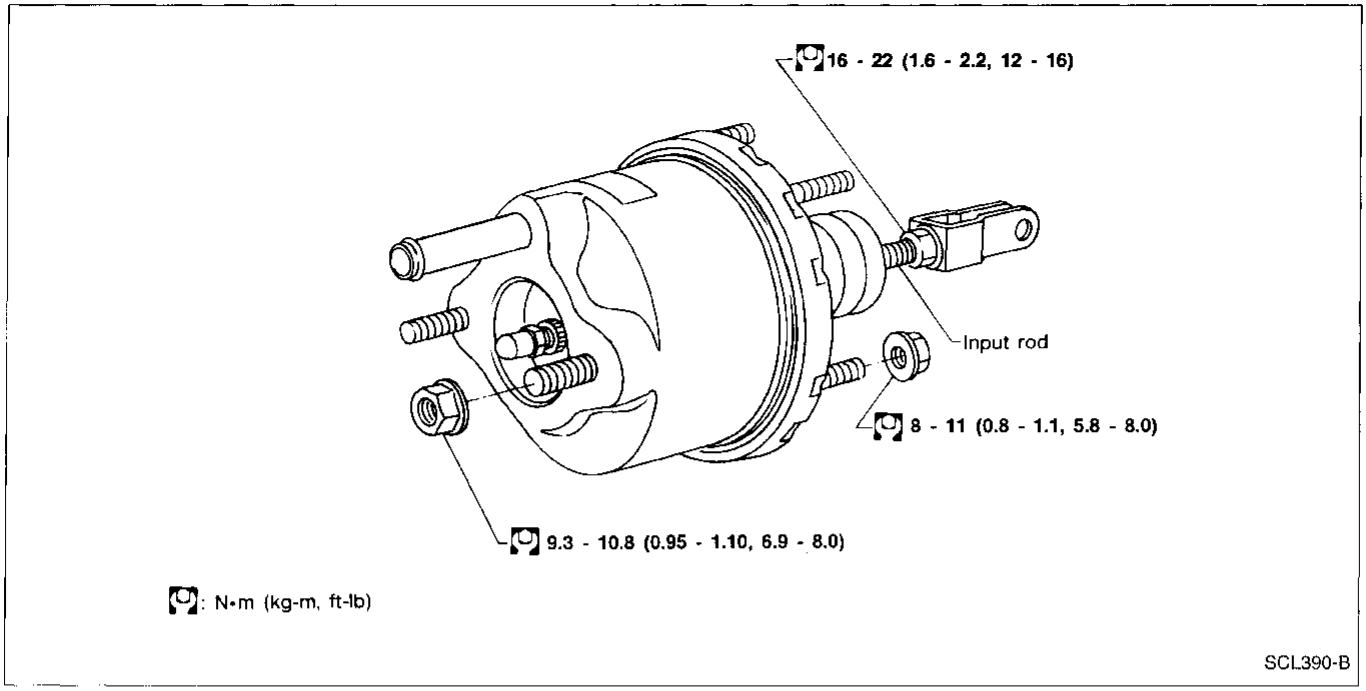
Operating Cylinder



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.

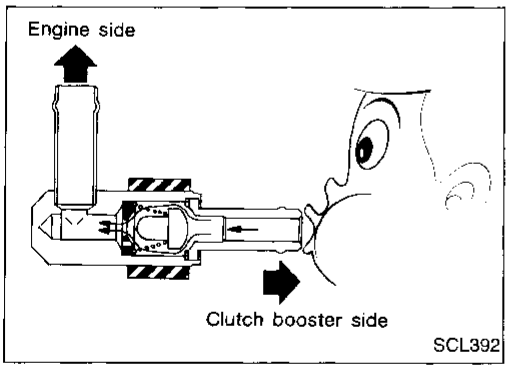
Clutch Booster



INSPECTION

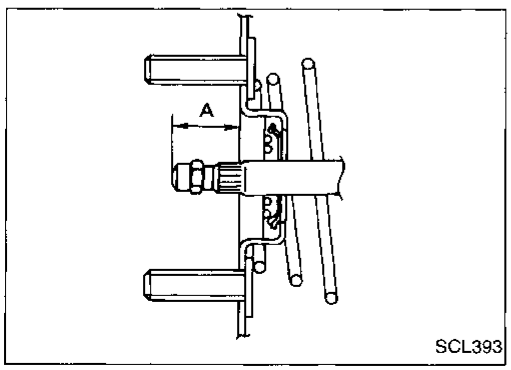
Hoses and connectors

- Check condition of vacuum hoses and connections.
- Check vacuum hoses and check valve for air tightness.



Check valve

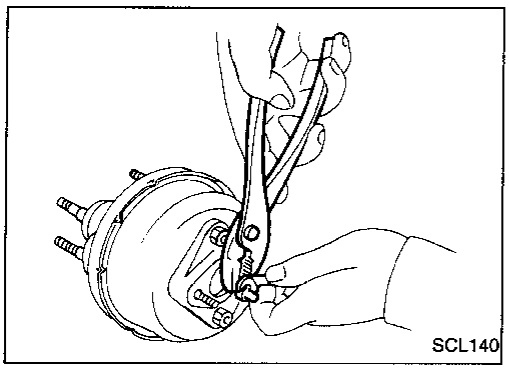
- Install check valve properly paying attention to its direction.
- When pressure is applied to the clutch booster side of check valve and valve does not open, replace check valve with a new one.



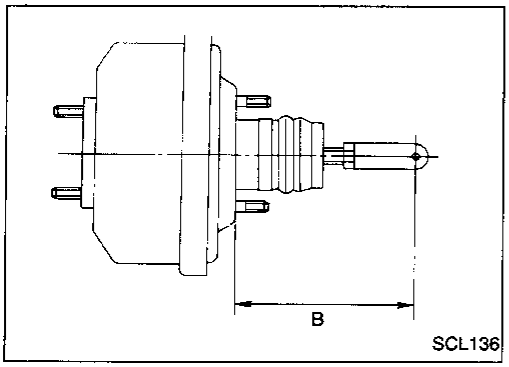
ADJUSTMENT

Output rod length "A":
13.35 - 13.60 mm (0.5256 - 0.5354 in)

Clutch Booster (Cont'd)

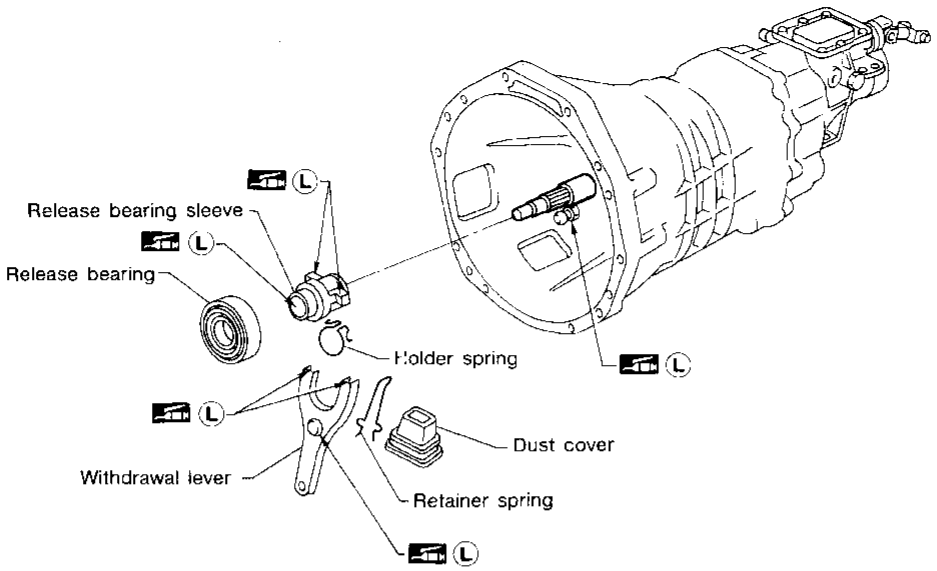

SCL140

If amount of adjustment required exceeds 0.5 mm (0.020 in), reaction disc may have either been dislocated or fallen off. Replace clutch booster assembly.



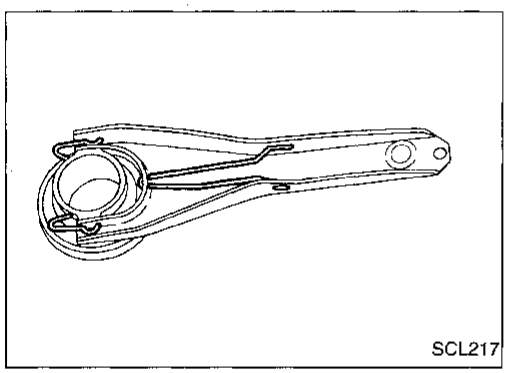
SCL136

Input rod length "B":
113 mm (4.45 in)



Ⓛ: Apply lithium-based grease including molybdenum disulphide.

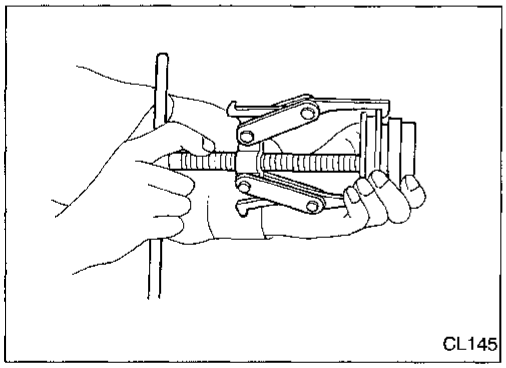
SCL644



SCL217

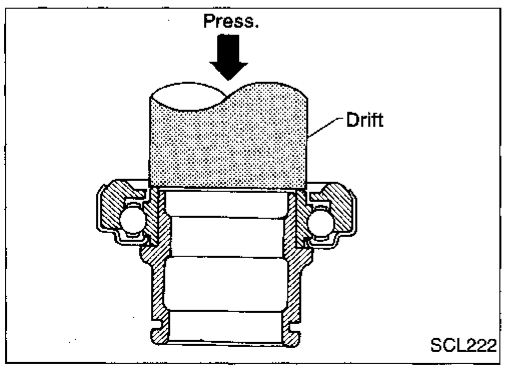
REMOVAL AND INSTALLATION

- Install retainer spring and holder spring.



CL145

- Remove release bearing.

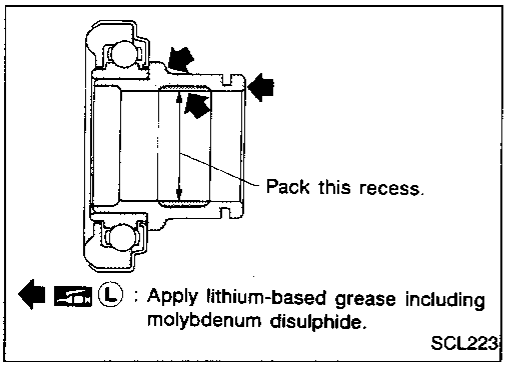


SCL222

- Install release bearing with suitable drift.

INSPECTION

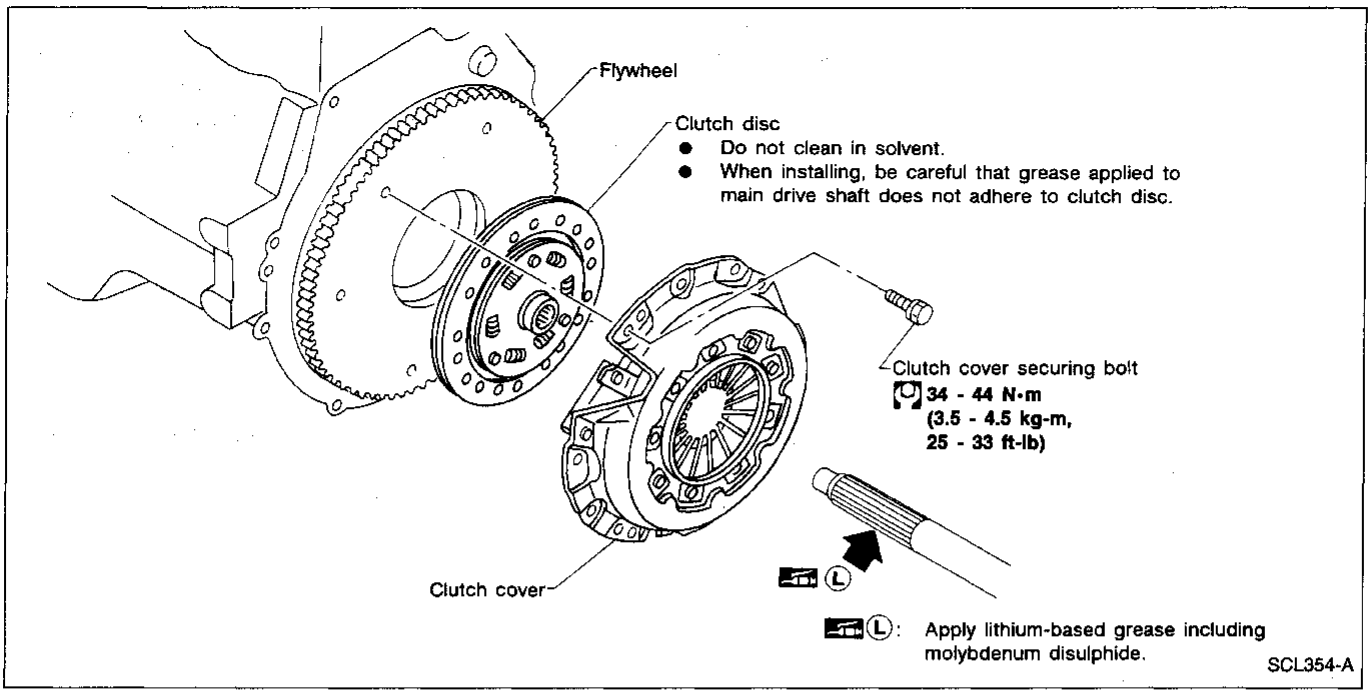
- Check release bearing to see that it rolls freely and is free from noise, cracks, pitting or wear. Replace if necessary.
- Check release bearing sleeve and withdrawal lever rubbing surface for wear, rust or damage. Replace if necessary.

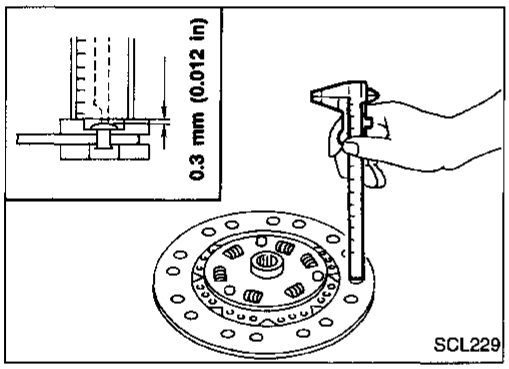


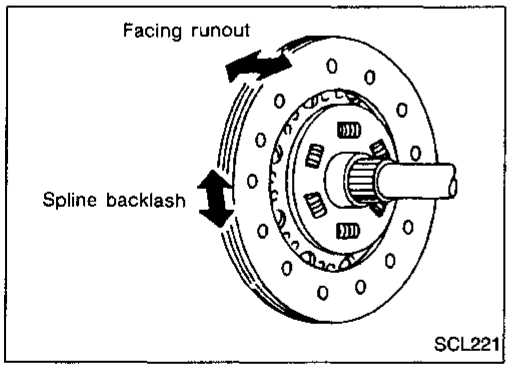
LUBRICATION

- Apply recommended grease to contact surface and rubbing surface.

Too much lubricant might damage clutch disc facing.







Clutch Disc

INSPECTION

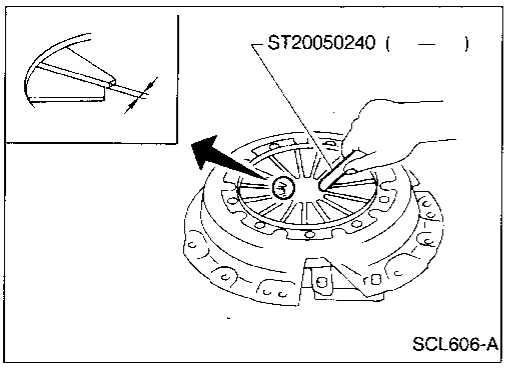
- Check clutch disc for wear of facing.
  Wear limit of facing surface to rivet head:
  Model 240 and 250
  0.3 mm (0.012 in)

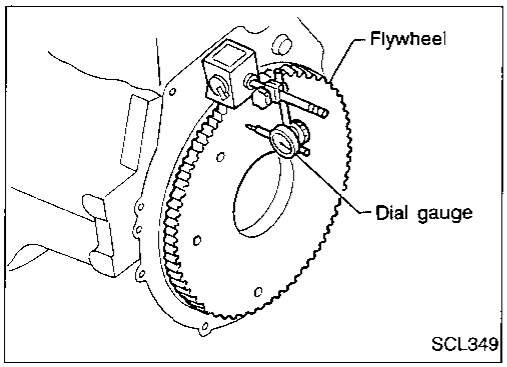
- Check clutch disc for spline backlash and facing runout.
  Maximum spline backlash (at outer edge of disc):
  Model 240 and 250
  1.0 mm (0.039 in)
  Runout limit:
  Model 240 and 250
  1.0 mm (0.039 in)
  Distance of runout check point (from hub center):
  Model 240
  115 mm (4.53 in)
  Model 250
  120 mm (4.72 in)
- Check clutch disc for burns, discoloration or oil or grease leakage. Replace if necessary.

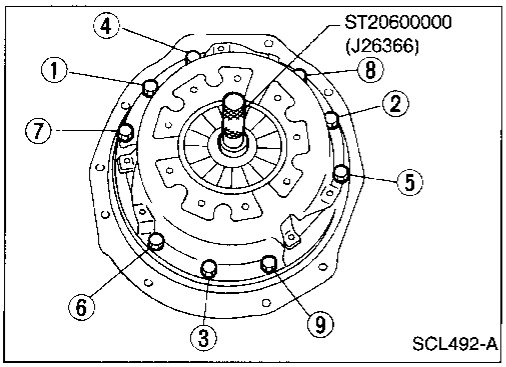
INSTALLATION

- Apply recommended grease to contact surface of spring portion.

Too much lubricant might damage clutch disc facing.







Clutch Cover and Flywheel

INSPECTION AND ADJUSTMENT

- Check clutch cover installed on vehicle for unevenness of diaphragm spring toe height.
  Uneven limit:
  Model 240
  0.5 mm (0.020 in)
  Model 250
  0.7 mm (0.028 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.

General Specifications

CLUTCH CONTROL SYSTEM

Type of clutch control	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

Model	240	250
Engine	VG30DE	VG30DETT
Facing size (Outer dia. x inner dia. x thickness) mm (in)	240 x 160 x 3.5 (9.45 x 6.30 x 0.138)	250 x 160 x 3.5 (9.84 x 6.30 x 0.138)
Thickness of disc assembly With load mm (in)	8.1 - 8.5 (0.319 - 0.335) with 4,904 N (500 kg, 1,103 lb)	

CLUTCH COVER

Model	240	250
Engine	VG30DE	VG30DETT
Full-load N (kg, lb)	5,688 (580, 1,279)	7,846 (800, 1,764)

CLUTCH BOOSTER (VG30DETT engine model)

Model	M45
Diaphragm diameter mm (in)	114.3 (4.50)

Inspection and Adjustment

CLUTCH PEDAL

Unit: mm (in)

Engine	VG30DE	VG30DETT
Pedal height "H*"	197 - 207 (7.76 - 8.15)	183 - 193 (7.20 - 7.60)
Pedal free play "A" (at pedal pad)	1.0 - 3.0 (0.039 - 0.118)	
Clearance "C" (between pedal stopper rubber and threaded end of clutch interlock)	1.0 - 2.0 (0.039 - 0.079)	

*: Measured from surface of dash lower panel to pedal pad

CLUTCH DISC

Unit: mm (in)

Model	240	250
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)	120 (4.72)
Maximum backlash of spline (at outer edge of disc)	1.0 (0.039)	

CLUTCH COVER

Unit: mm (in)

Model	240	250
Uneven limit of diaphragm spring toe height	0.5 (0.020)	0.7 (0.028)

CLUTCH BOOSTER

Unit: mm (in)

Output rod length "A"	13.35 - 13.60 (0.5256 - 0.5354)
Input rod length "B"	113 (4.45)