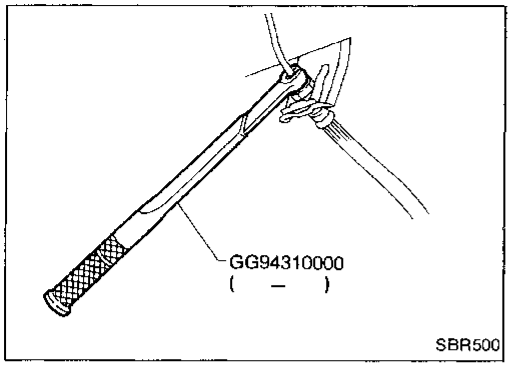
SECTION CL

CONTENTS

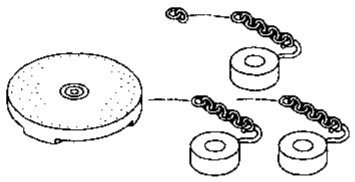
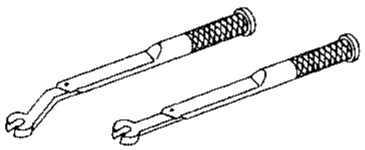
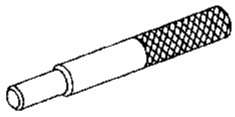
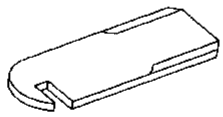


Precautions

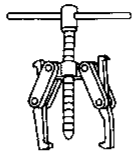
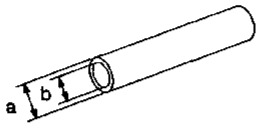
- **Recommended fluid is brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**
- **Be careful not to splash brake fluid on painted areas.**
- **When removing and installing clutch piping, use Tool.**
- **Use new brake fluid to clean or wash all parts of master cylinder, operating cylinder and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

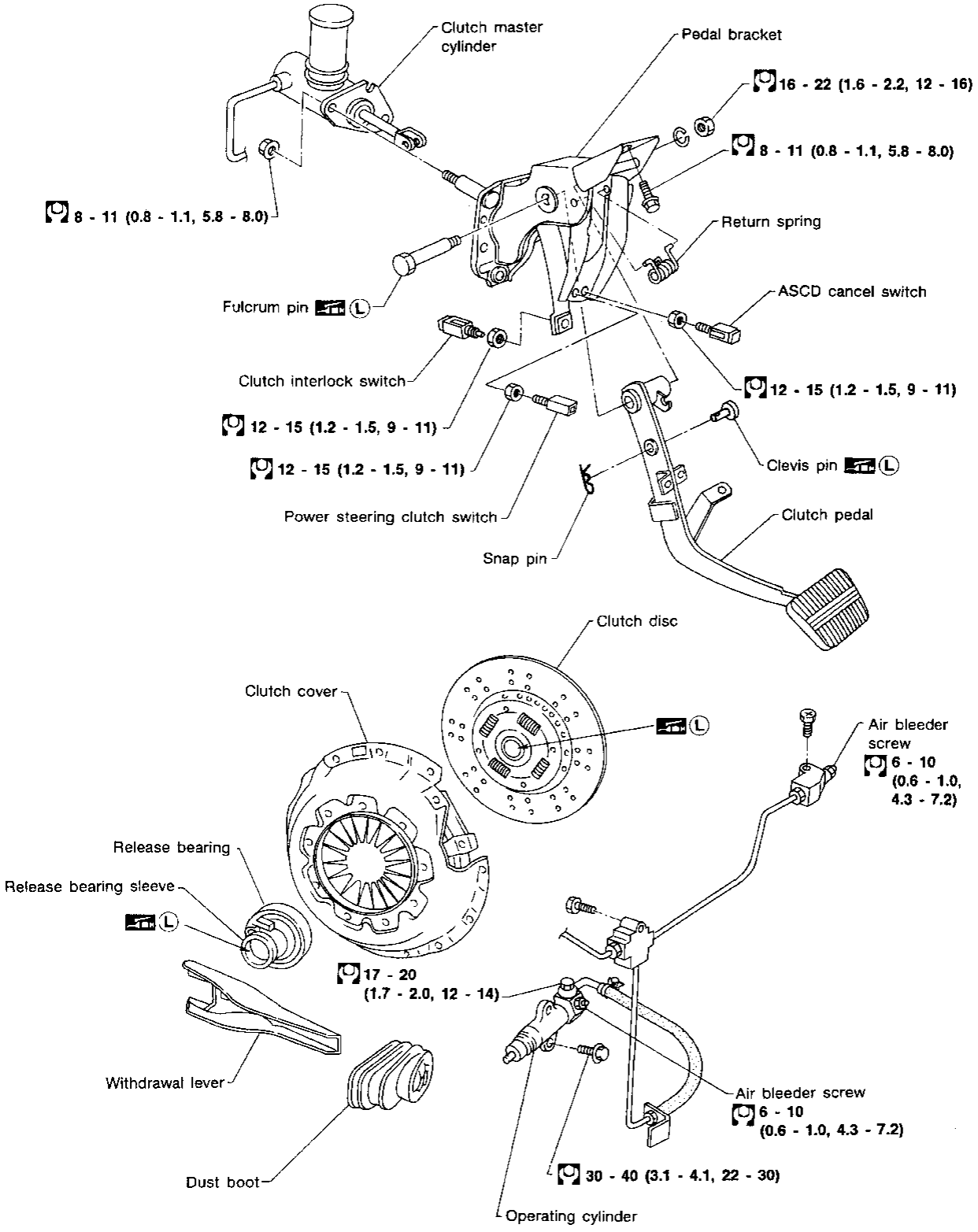
Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description	
ST20050010 (—) Base plate ST20050100 (—) Distance piece	 NT058	Inspecting diaphragm spring of clutch cover
GG94310000 (—) Flare nut torque wrench	 NT064	Removing and installing each clutch piping
ST20600000 (J26366) Clutch aligning bar	 NT062	Installing clutch cover and clutch disc
ST20050240 (—) Diaphragm spring adjusting wrench	 NT060	Adjusting unevenness of diaphragm spring of clutch cover

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.**

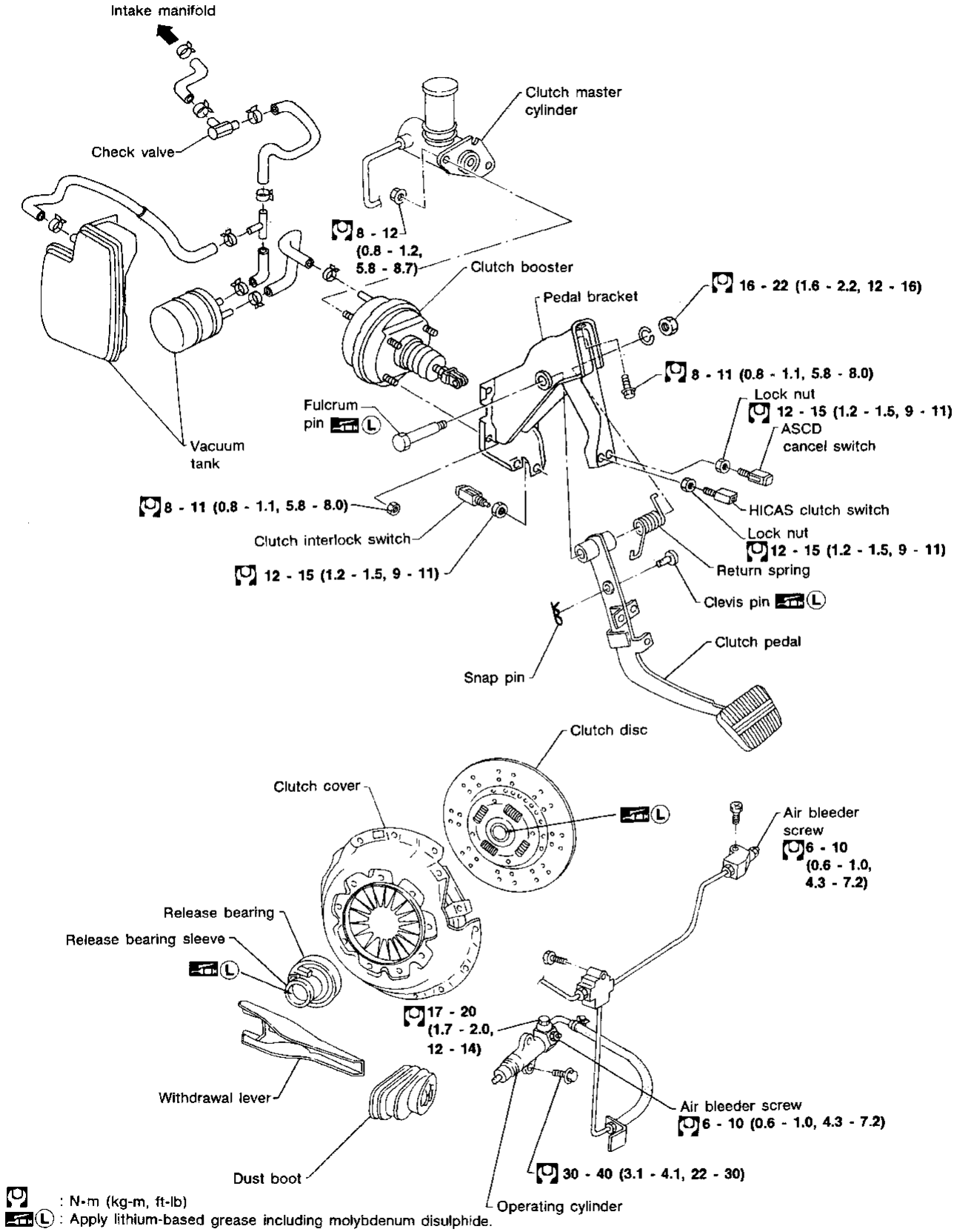
VG30DE engine model



: N•m (kg-m, ft-lb)
: Apply lithium-based grease including molybdenum disulphide.

SCL579

VG30DETT engine model



SCL580

Adjusting Clutch Pedal

1. Adjust pedal height with ASCD cancel switch and HICAS clutch switch or power steering clutch switch.

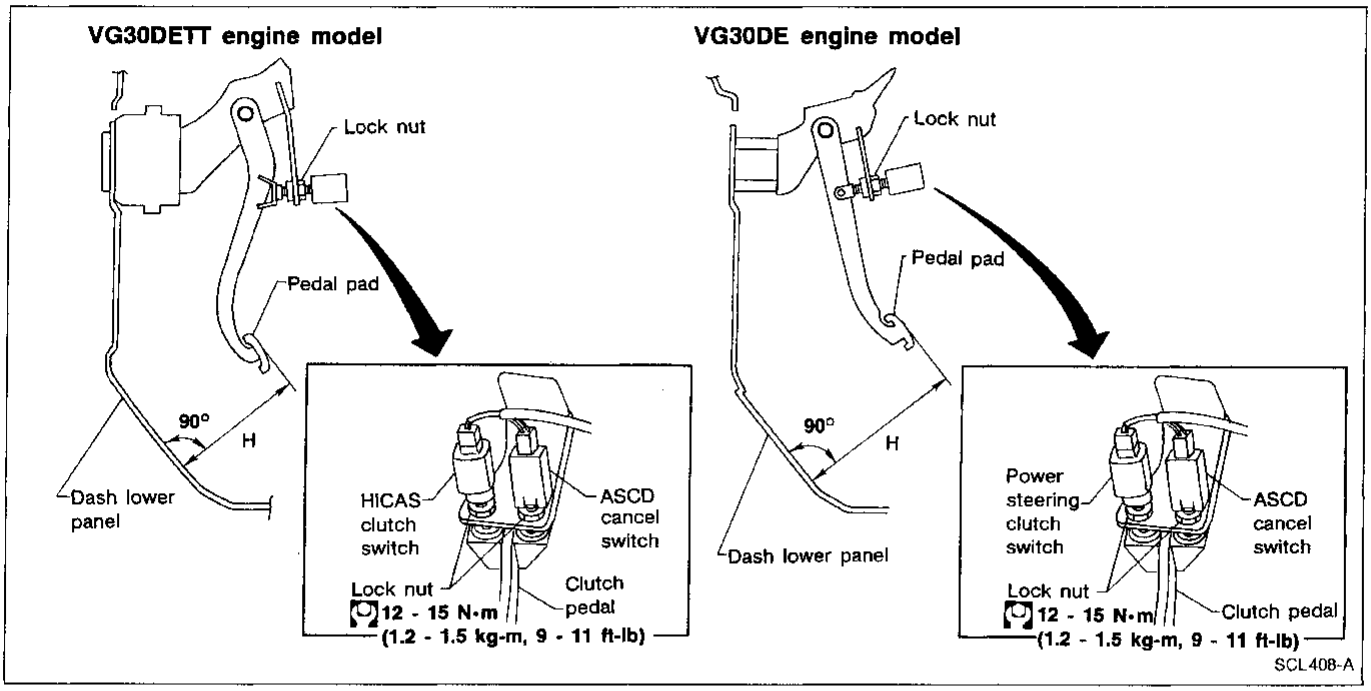
Pedal height "H":

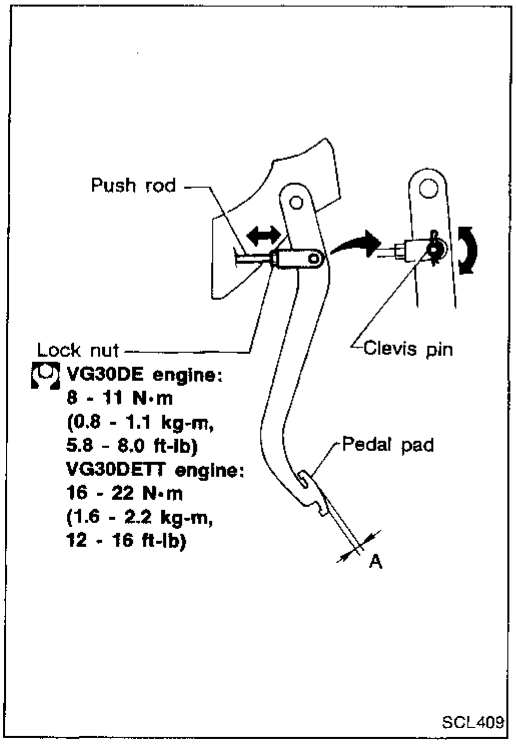
VG30DE engine

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":

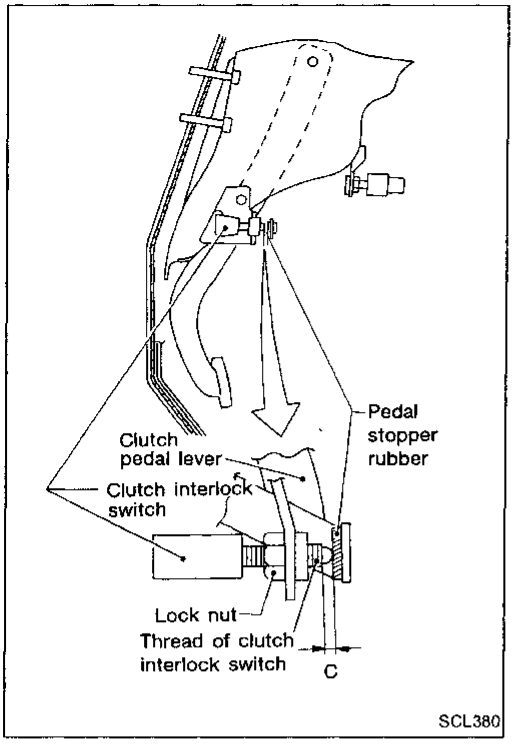
1.0 - 3.0 mm (0.039 - 0.118 in)

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

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

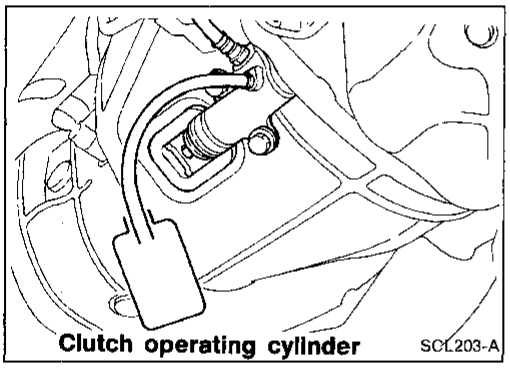
3. Make sure that clevis pin can be rotated smoothly.
   If not, readjust pedal free play with master cylinder push rod.

Adjusting Clutch Pedal (Cont'd)



— U.S.A. model only —

4. Adjust clearance "C" between pedal stopper rubber and threaded end of clutch interlock switch while depressing clutch pedal fully.
   Clearance C:
   1.0 - 2.0 mm (0.039 - 0.079 in)



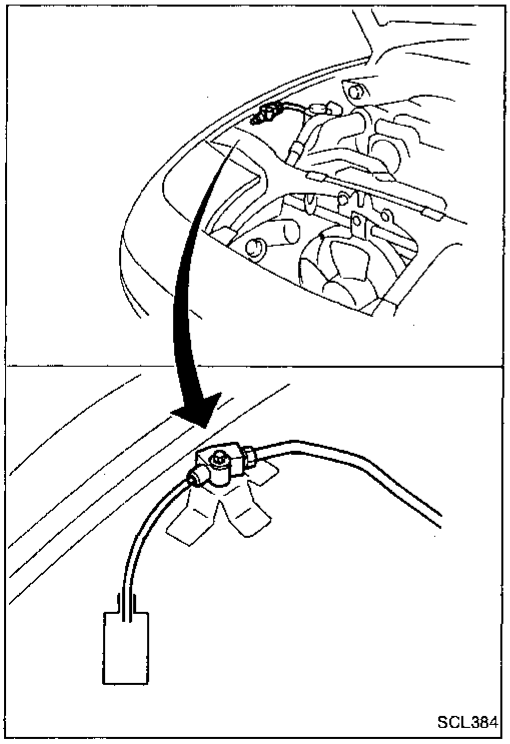
Bleeding Procedure

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

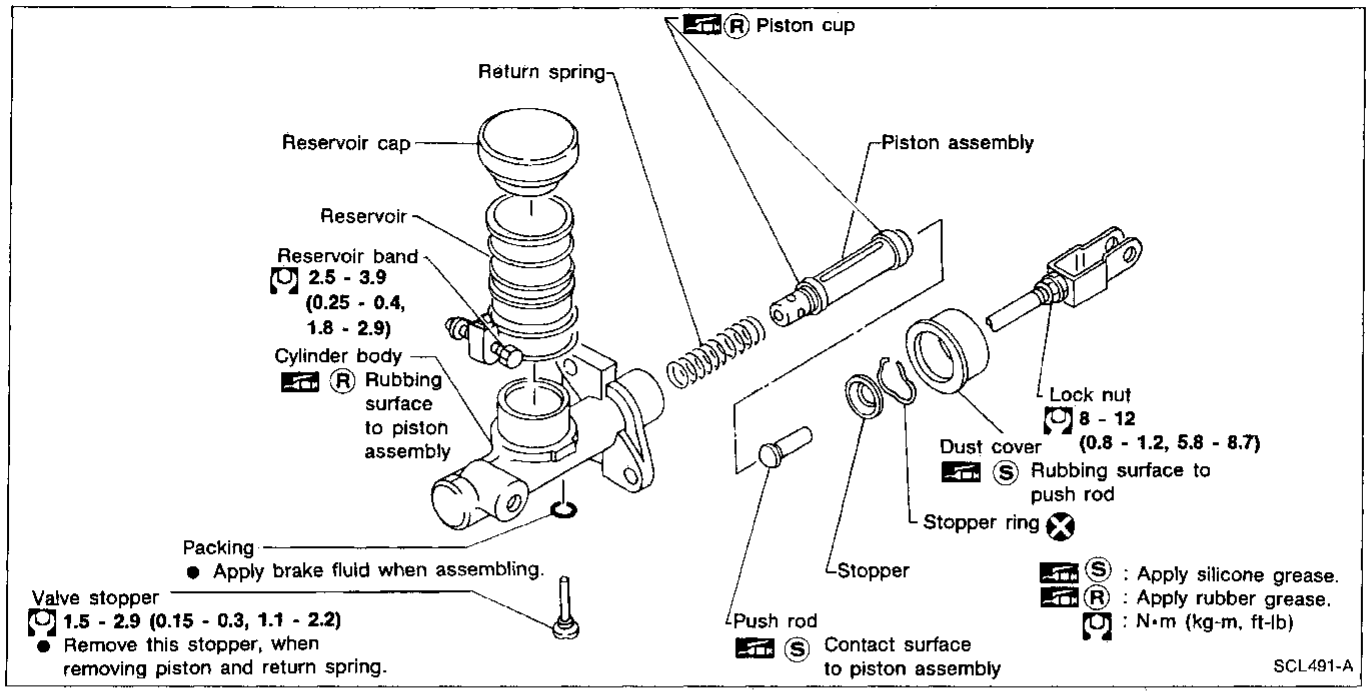
Carefully monitor fluid level at master cylinder during bleeding operation.

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.

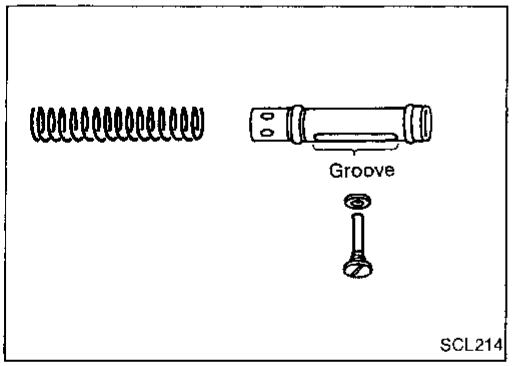


Clutch Master Cylinder



DISASSEMBLY AND ASSEMBLY

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

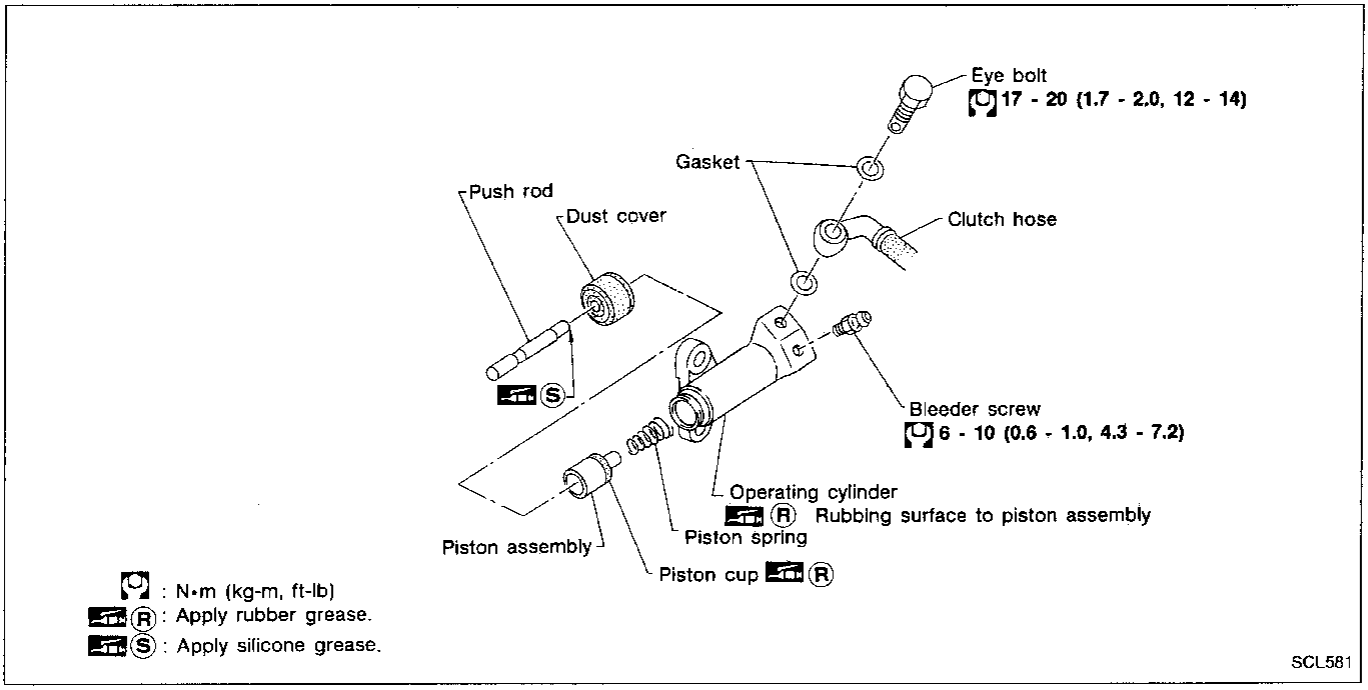


- Align groove of piston assembly and valve stopper when installing valve stopper.
- Check direction of piston cups.

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.

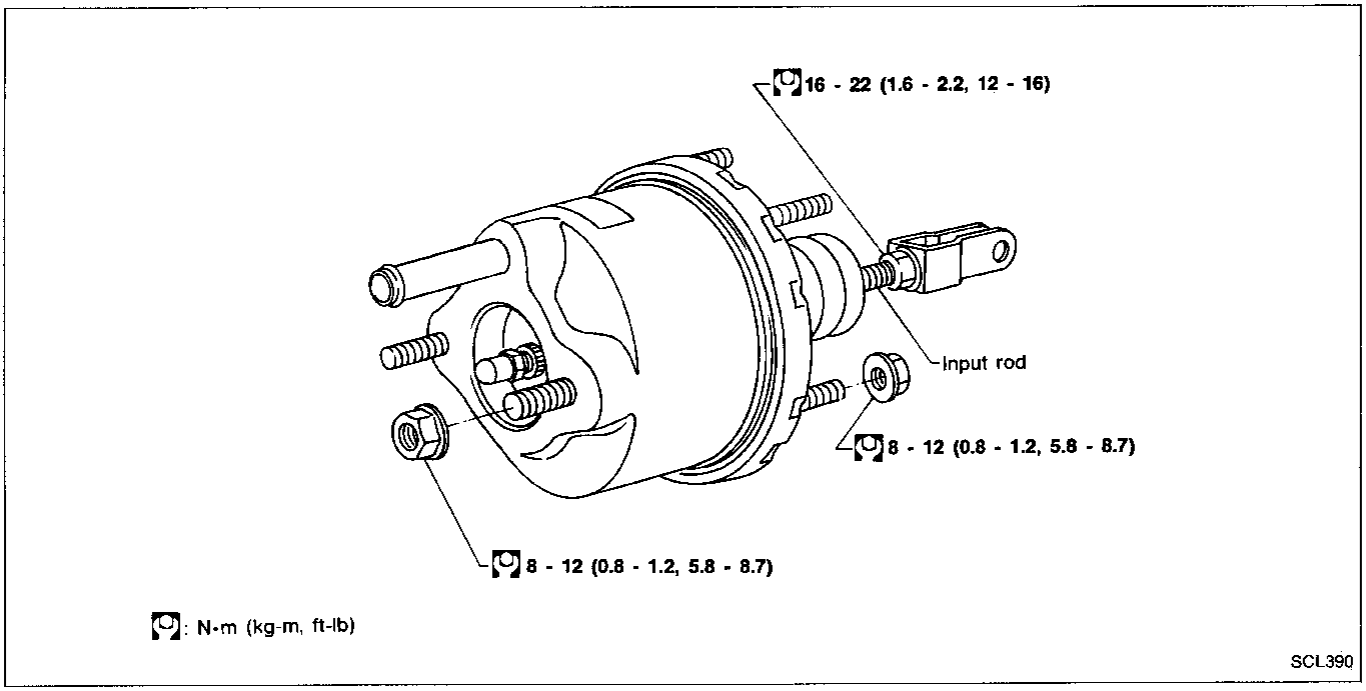
Operating Cylinder



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

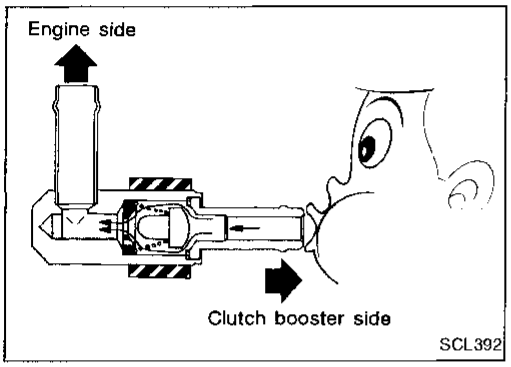


Clutch Booster (Cont'd)

INSPECTION

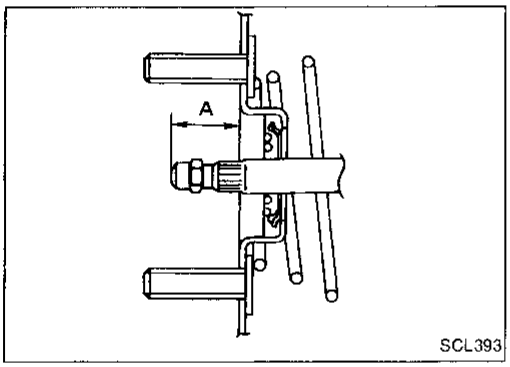
Hoses and connectors

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



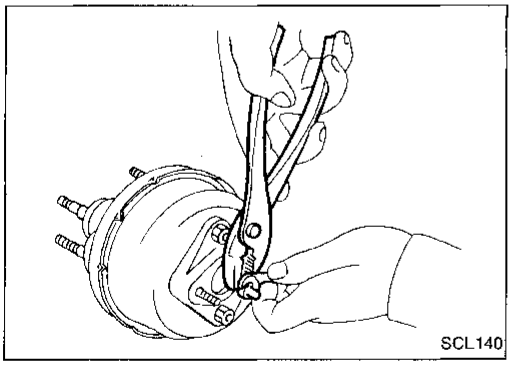
Check valve

- 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.

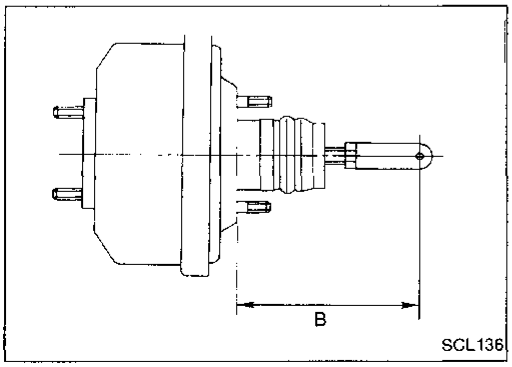


ADJUSTMENT

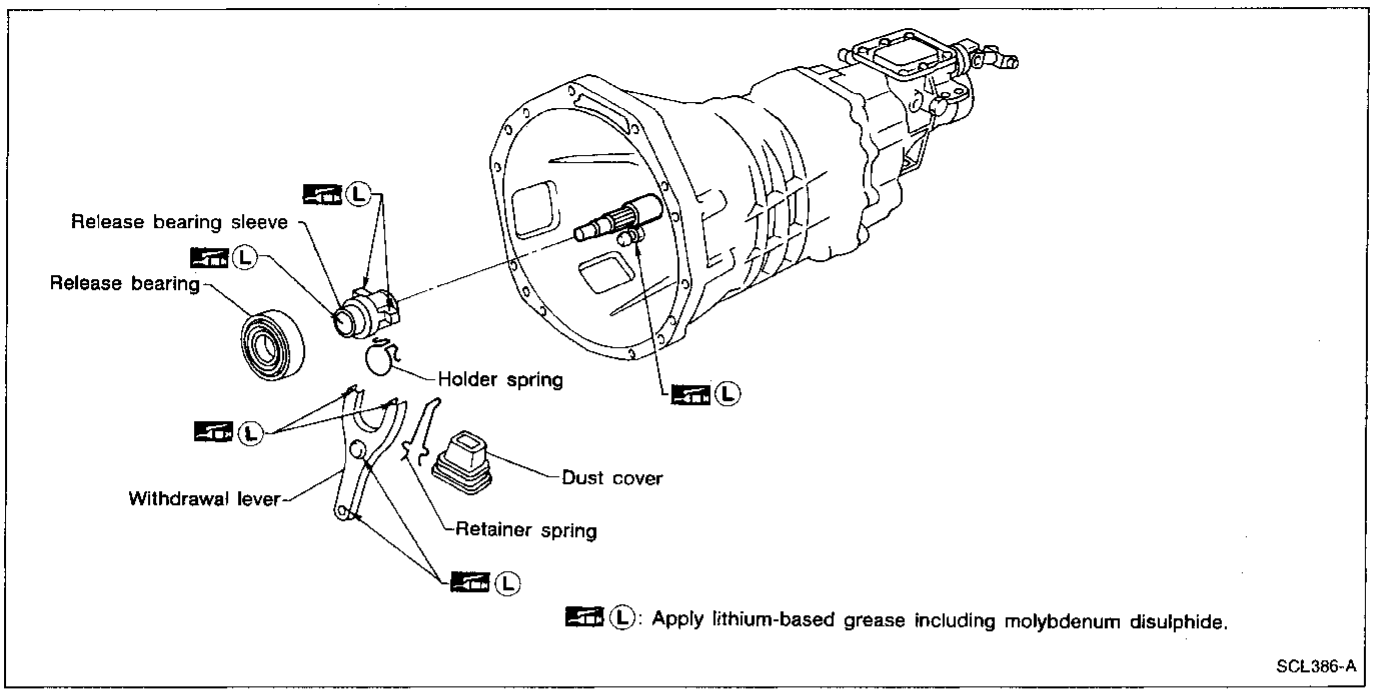
Output rod length "A":
13.35 - 13.60 mm (0.5256 - 0.5354 in)

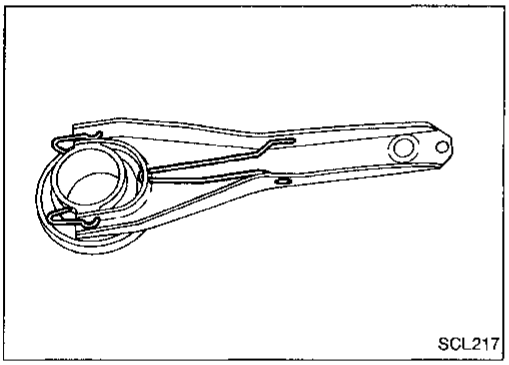


If amount of adjustment required exceeds 0.5 mm (0.020 in), reaction disc may have either been dislocated or fallen off. Replace clutch booster assembly.



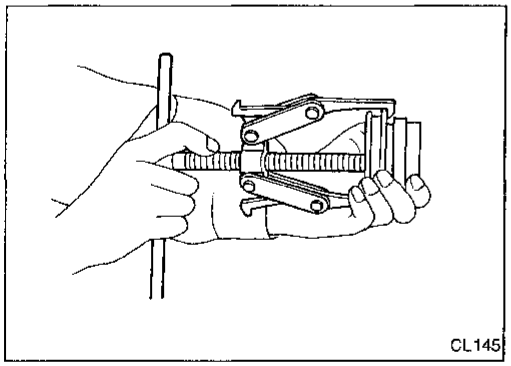
Input rod length "B":
113 mm (4.45 in)



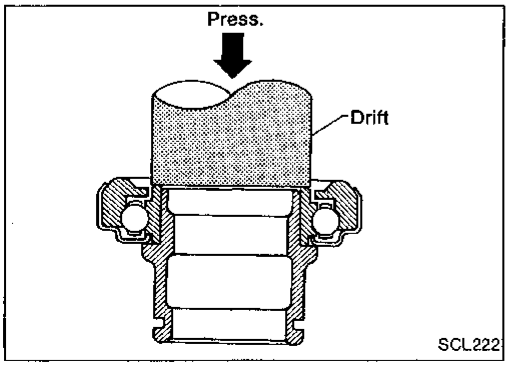


REMOVAL AND INSTALLATION

- Install retainer spring and holder spring.



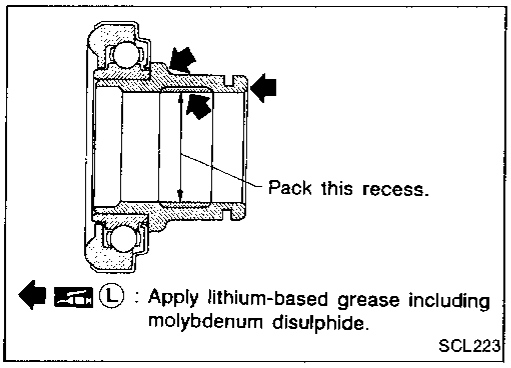
- Remove release bearing.



- Install release bearing with suitable drift.

INSPECTION

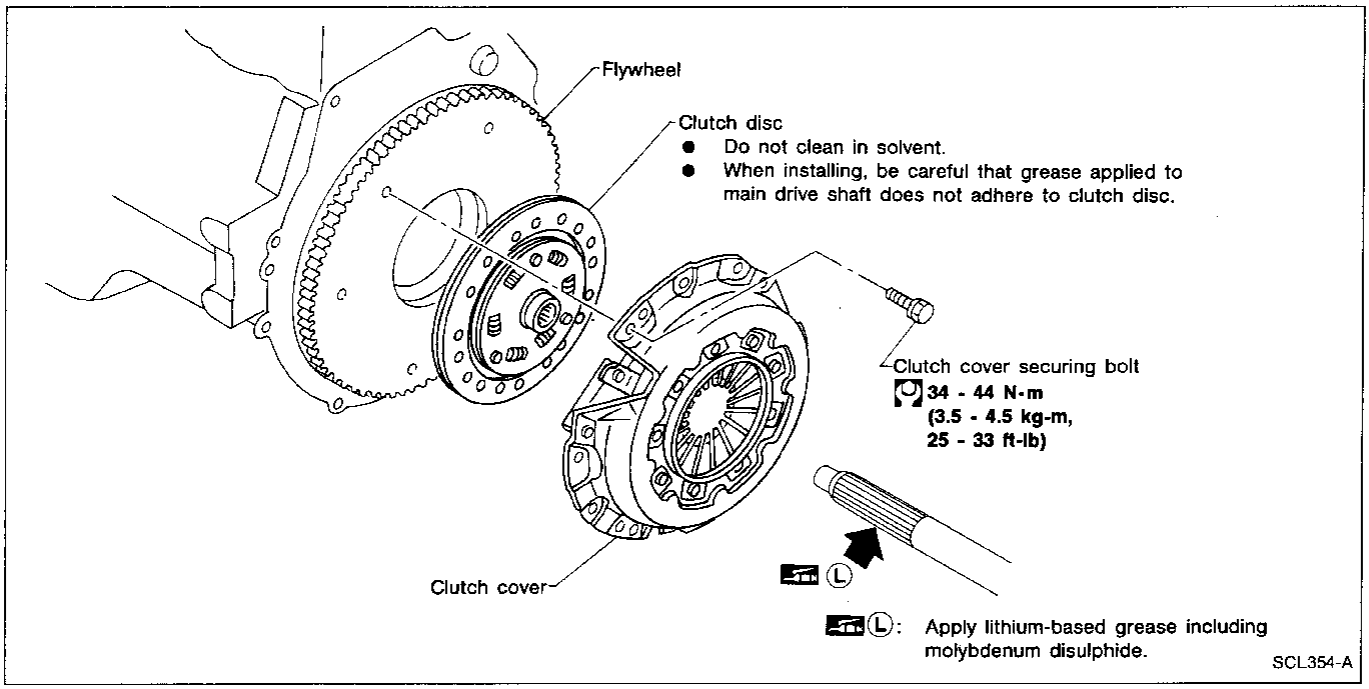
- Check release bearing to see that it rolls freely and is free from noise, cracks, pitting or wear. Replace if necessary.
- Check release bearing sleeve and withdrawal lever rubbing surface for wear, rust or damage. Replace if necessary.

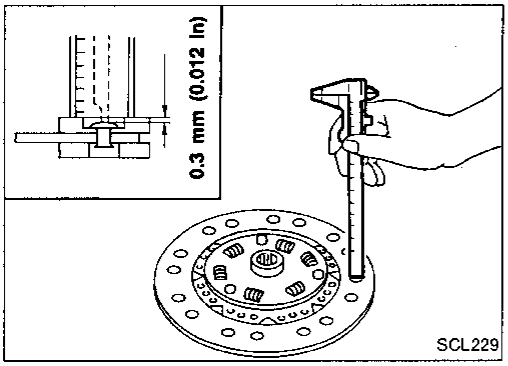


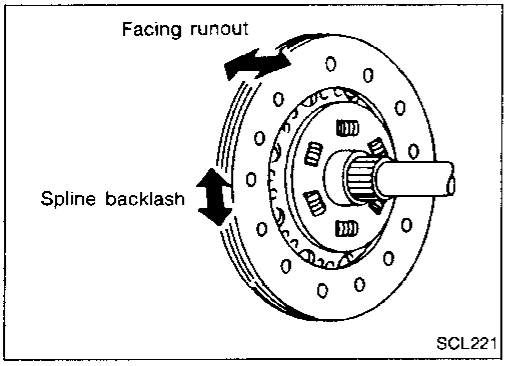
LUBRICATION

- Apply recommended grease to contact surface and rubbing surface.

Too much lubricant might damage clutch disc facing.







Clutch Disc

INSPECTION

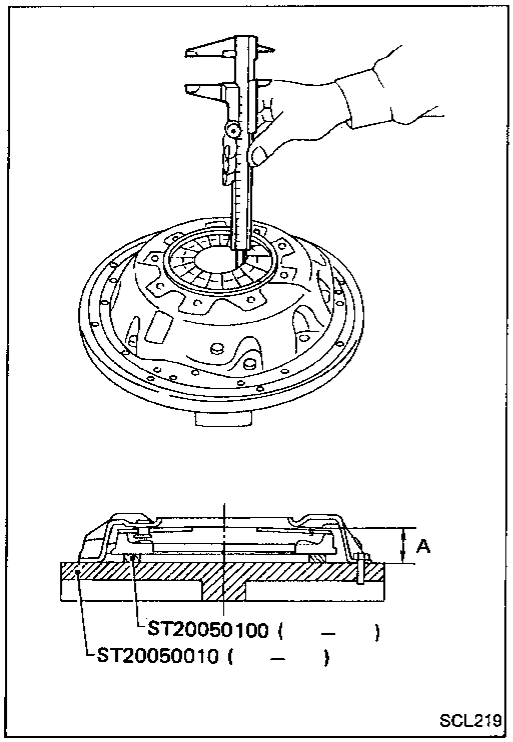
- Check clutch disc for wear of facing.
  Wear limit of facing surface to rivet head:
  0.3 mm (0.012 in)

- Check clutch disc for spline backlash and facing runout.
  Maximum spline backlash (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):
  VG30DE engine
  115 mm (4.53 in)
  VG30DETT engine
  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.

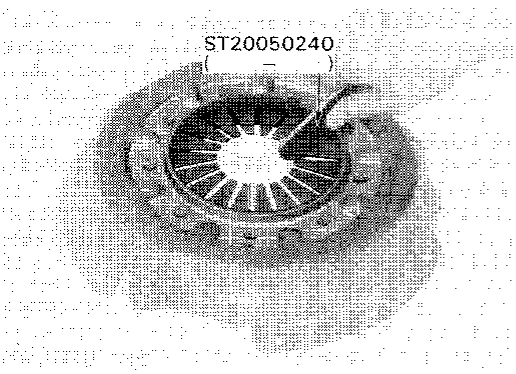
Too much lubricant might damage clutch disc facing.



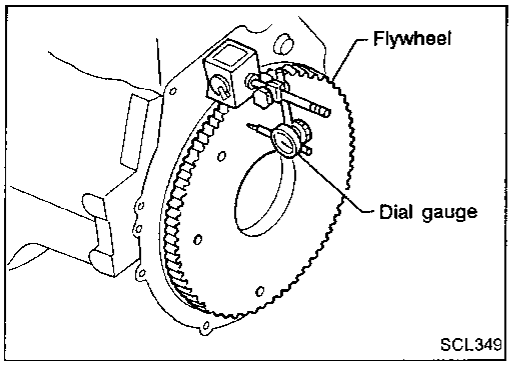
Clutch Cover and Flywheel

INSPECTION AND ADJUSTMENT

- Set Tool and check height and unevenness of diaphragm spring.
  Diaphragm spring height "A":
  VG30DE engine
  37.5 - 39.5 mm (1.476 - 1.555 in)
  VG30DETT engine
  36.5 - 38.5 mm (1.437 - 1.516 in)
- **Set 0.5 mm (0.020 in) feeler gauges on distance pieces (ST20050100) when checking diaphragm spring height.**
- 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.

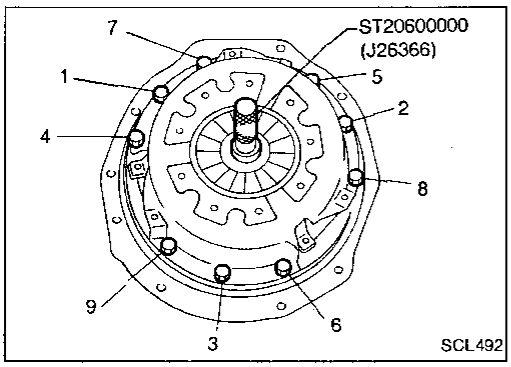


- Adjust unevenness of diaphragm spring with Tool.
  Uneven limit:
  0.5 mm (0.020 in)



FLYWHEEL INSPECTION

- Check contact surface of flywheel for slight burns or discoloration. Repair flywheel with emery paper.
- Check flywheel runout.
  Runout (Total indicator reading):
  Less than 0.15 mm (0.0059 in)



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 (Backlash at clevis)	1.0 - 3.0 (0.039 - 0.118)	
Clearance 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
Diaphragm spring height	37.5 - 39.5 (1.476 - 1.555)	36.5 - 38.5 (1.437 - 1.516)
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)