

CLUTCH

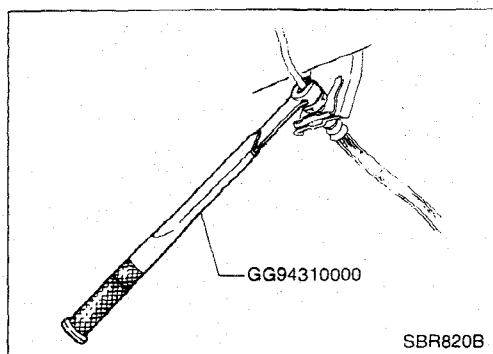
SECTION **CL**

CONTENTS

PRECAUTIONS AND PREPARATION	2	Clutch Operating Cylinder	7
Precautions	2	Clutch Damper (LHD models)	8
Preparation	2	CLUTCH RELEASE MECHANISM	9
CLUTCH SYSTEM	3	CLUTCH DISC AND CLUTCH COVER	11
Clutch Pedal	4	Clutch Disc	11
INSPECTION AND ADJUSTMENT	5	Clutch Cover and Flywheel	12
Adjusting Clutch Pedal	5	SERVICE DATA AND SPECIFICATIONS	
Bleeding Procedure	5	(S.D.S.)	14
HYDRAULIC CLUTCH CONTROL	6	General Specifications	14
Clutch Master Cylinder	6	Inspection and Adjustment	14

CL

PRECAUTIONS AND PREPARATION



Precautions

- Recommended fluid is brake fluid "DOT 4".
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- When removing and installing clutch piping, use Tool.
- To clean or wash all parts of master cylinder, operating cylinder and clutch damper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. It will ruin the rubber parts of the hydraulic system.

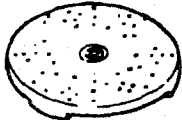
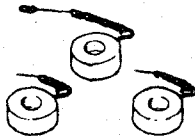
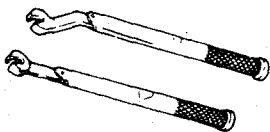
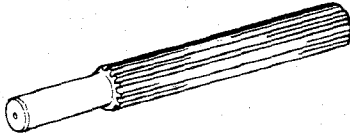

WARNING:

Remove all dust from clutch disc with a dust collector after cleaning with waste cloth.

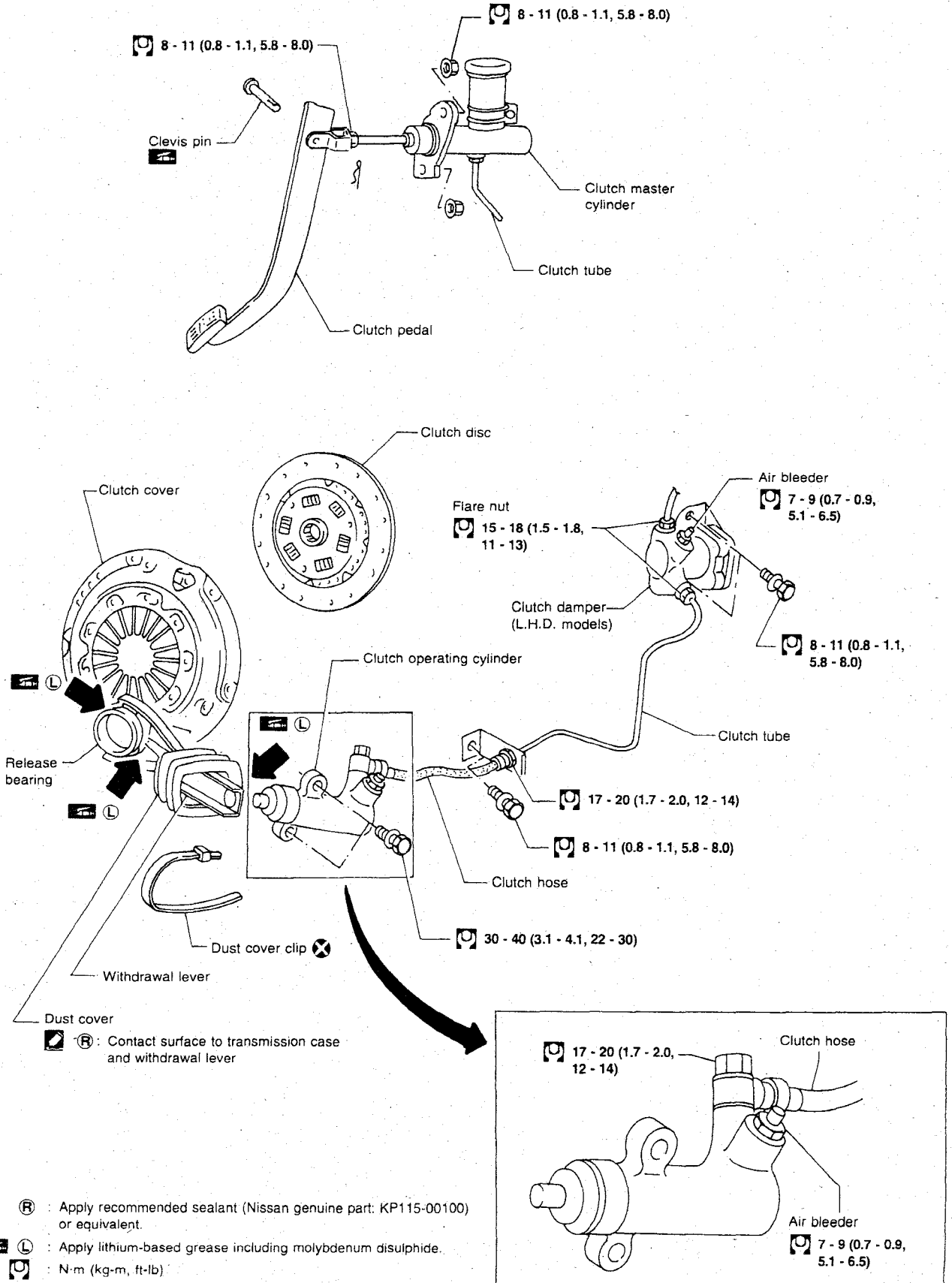
Preparation

SPECIAL SERVICE TOOLS

*: Special tool or commercial equivalent

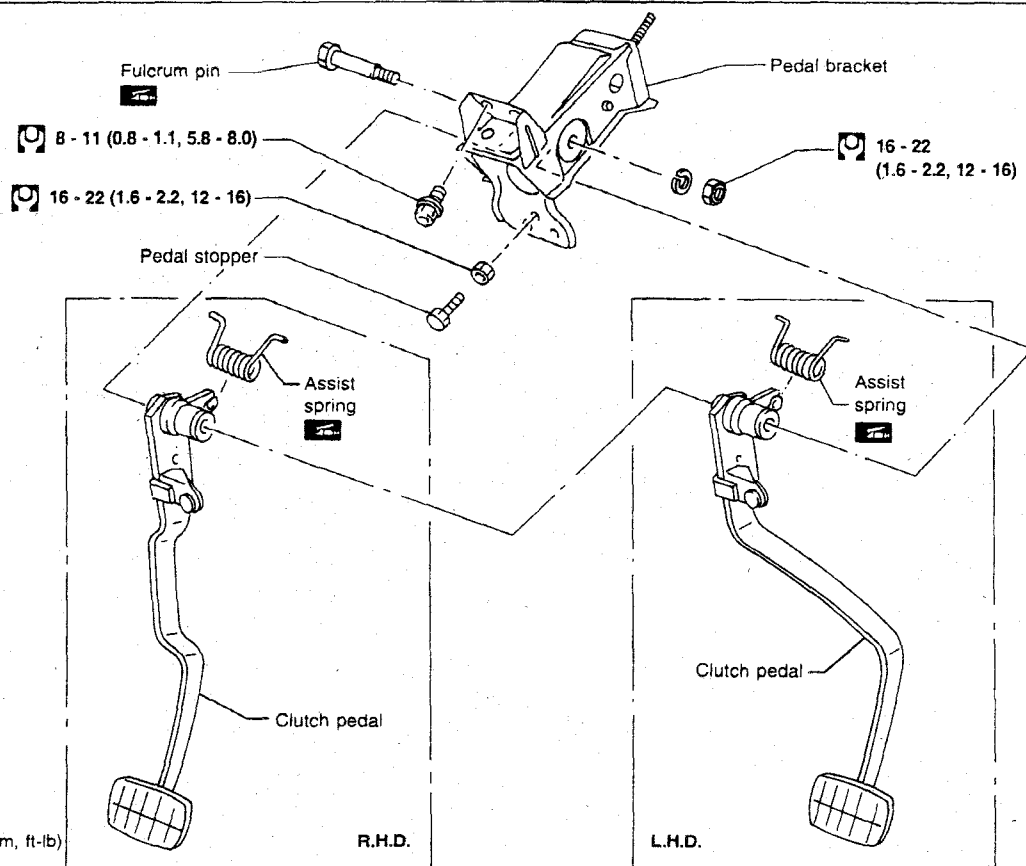
Tool number Tool name	Description
ST20050010 Base plate	Inspecting diaphragm spring of clutch cover 
ST20050100 Distance piece	Inspecting diaphragm spring of clutch cover 
GG94310000 Flare nut torque wrench	Removing and installing each clutch piping 
KV30100100* Clutch aligning bar	Installing clutch cover and clutch disc 
ST20050240* Diaphragm spring adjusting wrench	Adjusting unevenness of diaphragm spring of clutch cover 

CLUTCH SYSTEM



CLUTCH SYSTEM

Clutch Pedal



ECL003

Adjusting Clutch Pedal

1. Adjust pedal height with pedal stopper.

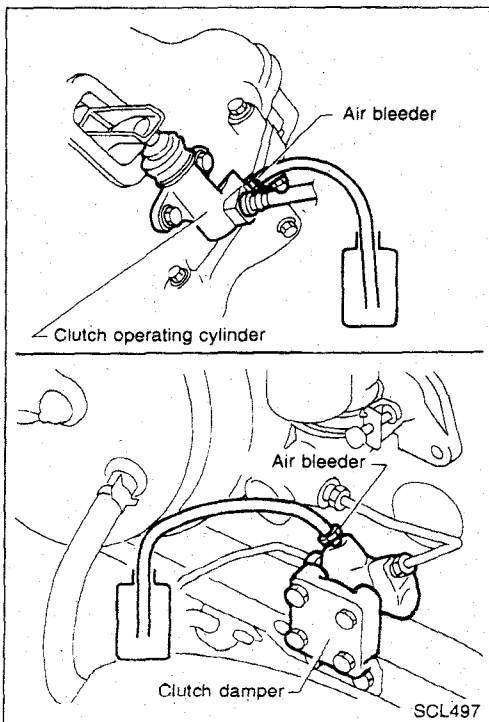
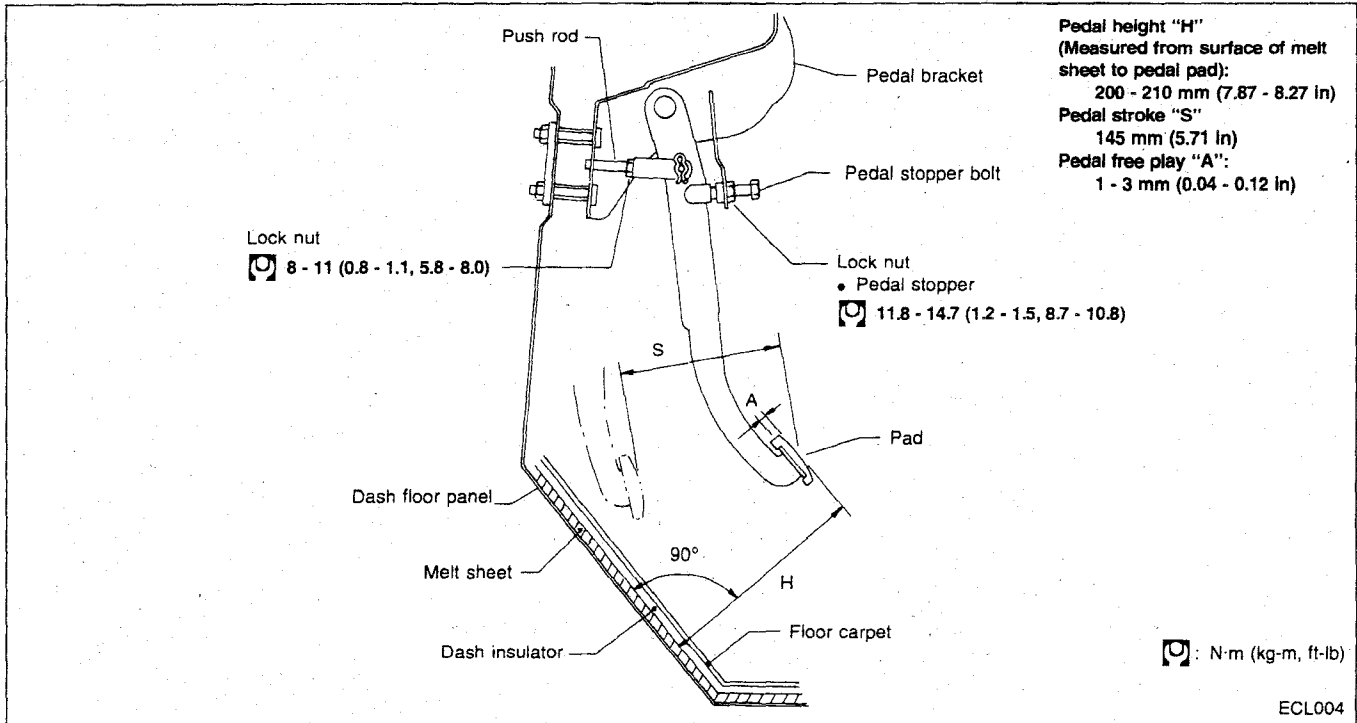
Pedal height "H":

217 - 227 mm (8.54 - 8.94 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)



Bleeding Procedure

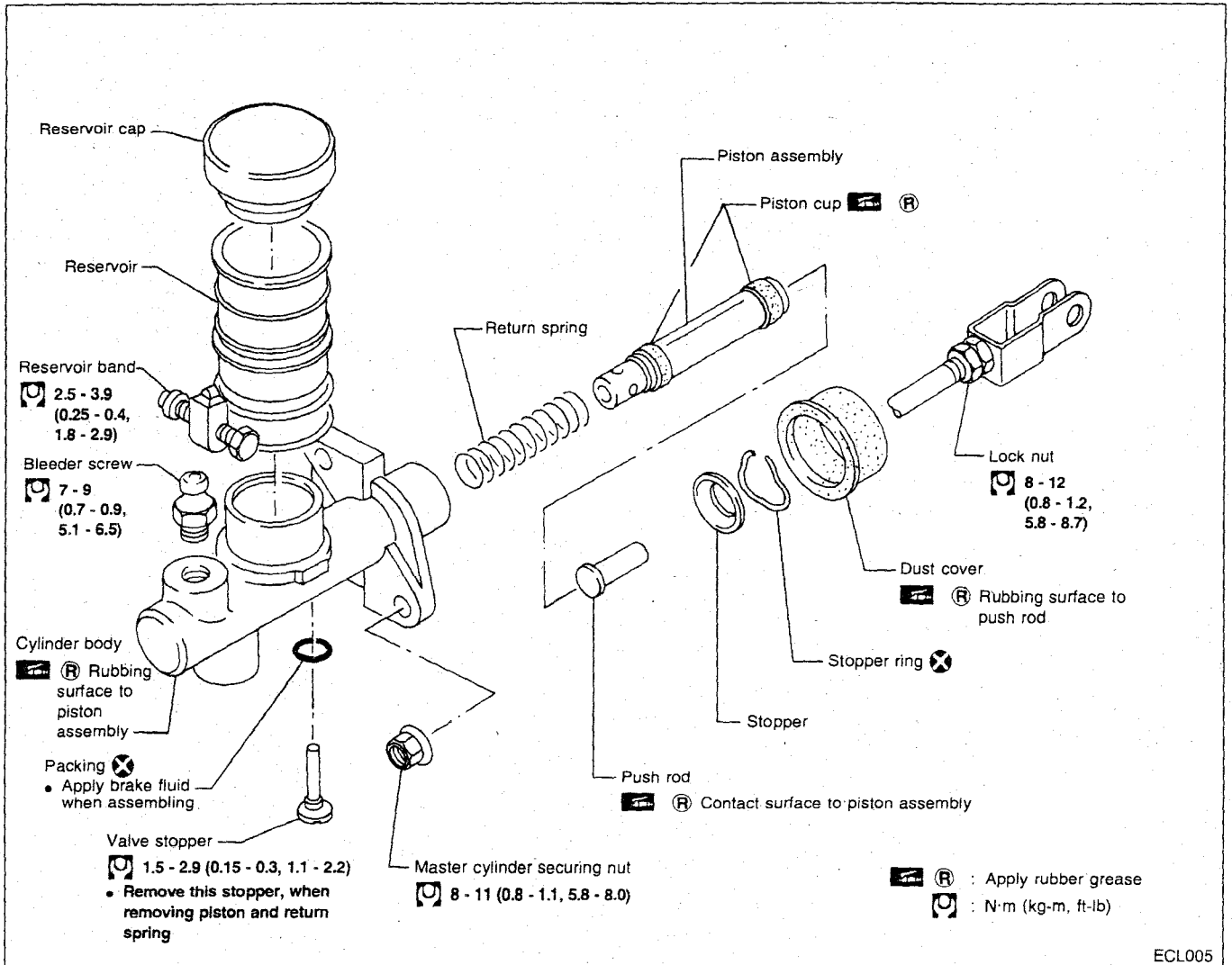
1. Bleed air from clutch operating cylinder according to the following procedure.

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 of clutch operating cylinder.
 - 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 damper according to the above procedure.
 3. Repeat the above bleeding procedures 1 and 2 several times.

HYDRAULIC CLUTCH CONTROL

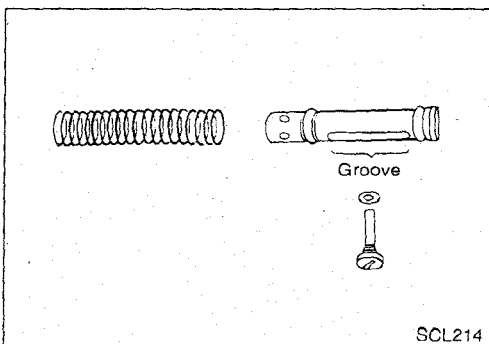
Clutch Master Cylinder



ECL005

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.

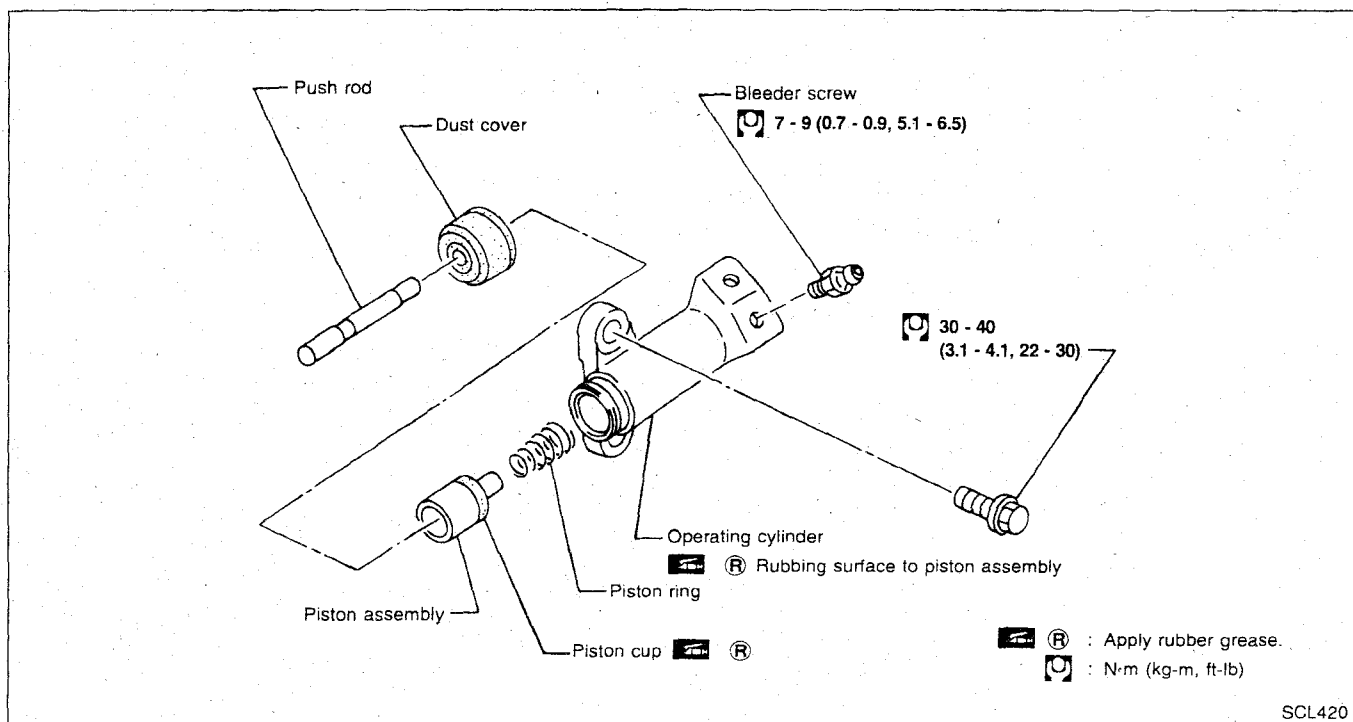
HYDRAULIC CLUTCH CONTROL

Clutch Master Cylinder (Cont'd)

INSPECTION

- Check cylinder and piston rubbing surface for uneven wear, rust or damage. Replace if necessary.
- Check piston and 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.

Clutch Operating Cylinder

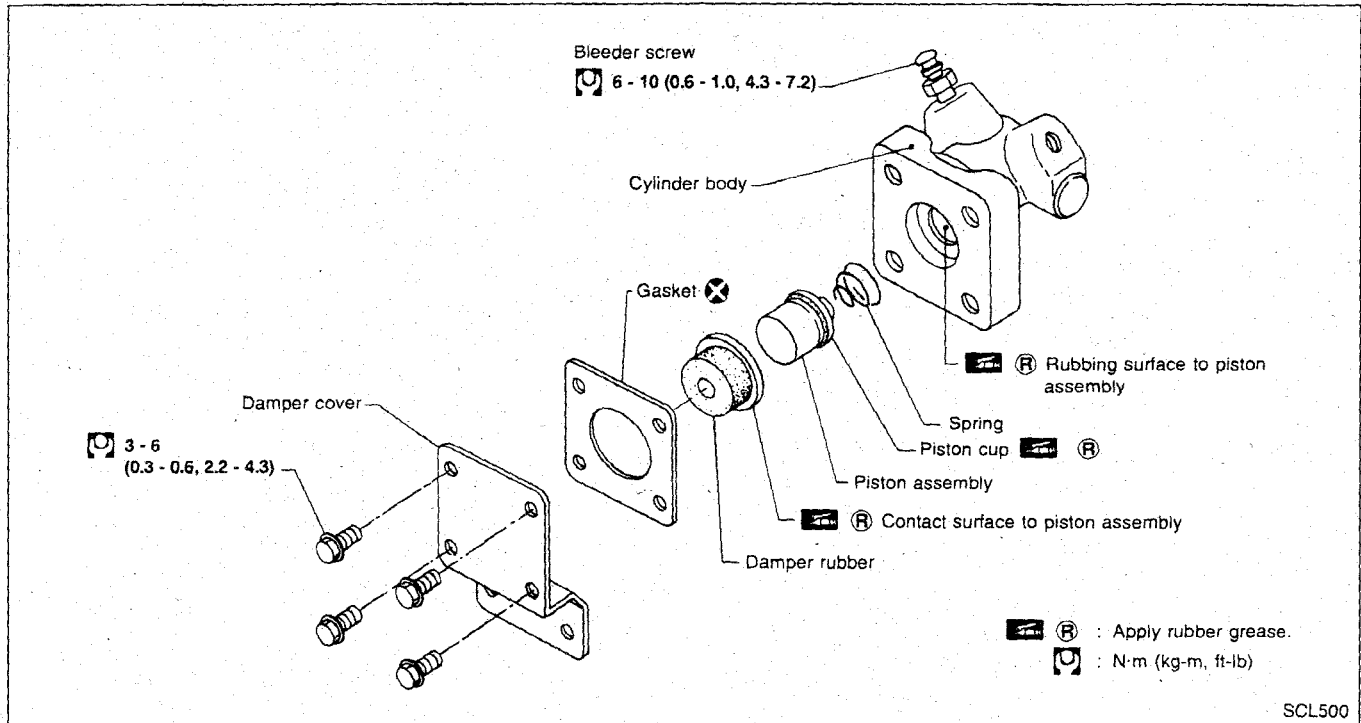


INSPECTION

- Check rubbing surface of cylinder for wear, rust or damage. Replace if necessary.
- Check piston and 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.

HYDRAULIC CLUTCH CONTROL

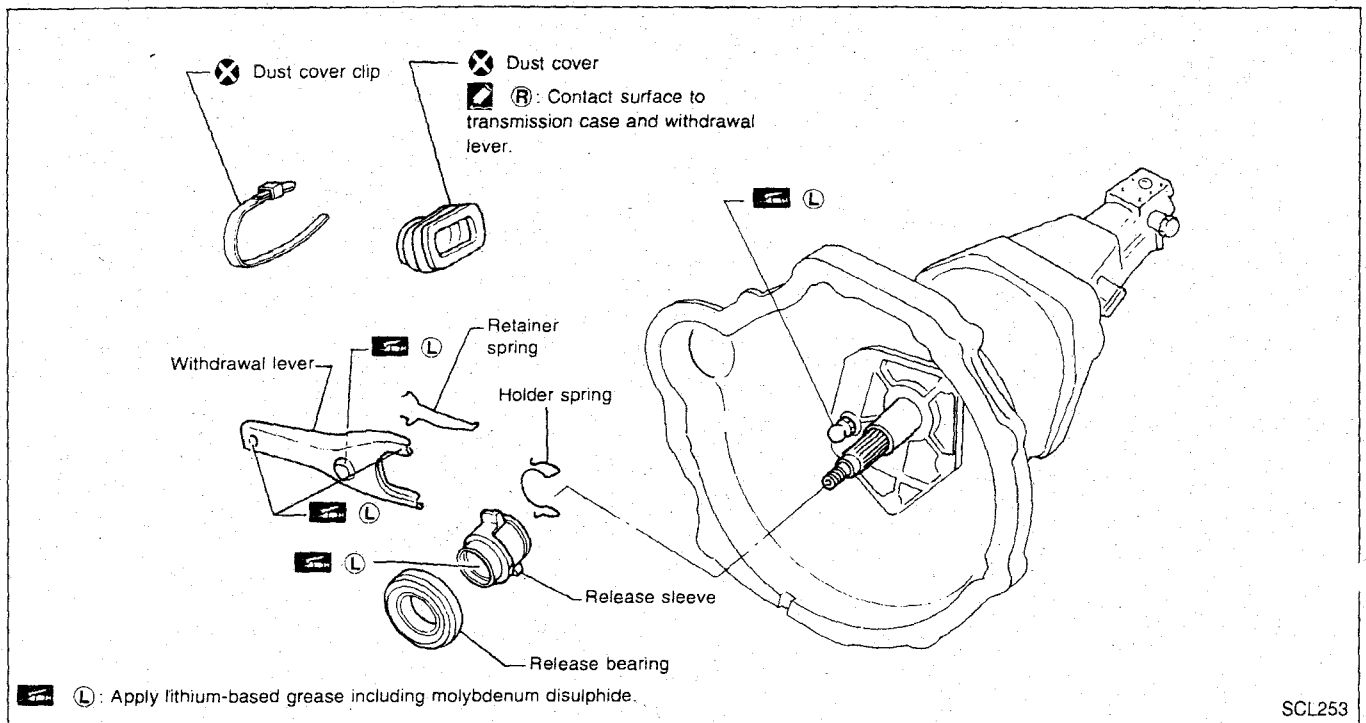
Clutch Damper (L.H.D. models)



INSPECTION

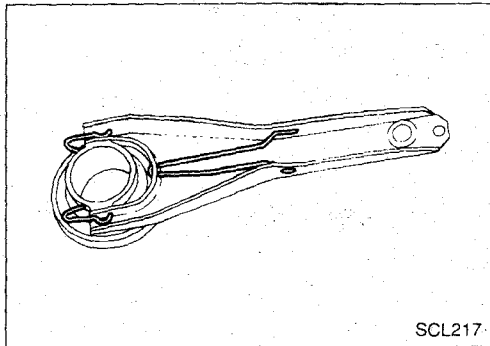
- Check cylinder and piston rubbing surface for uneven wear, rust or damage. Replace if necessary.
- Check damper rubber and piston cup for cracks, deformation or damage. Replace if necessary.

CLUTCH RELEASE MECHANISM

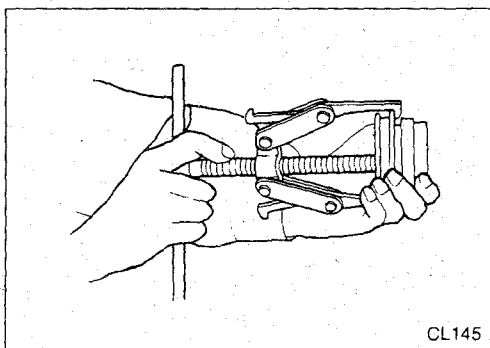


REMOVAL AND INSTALLATION

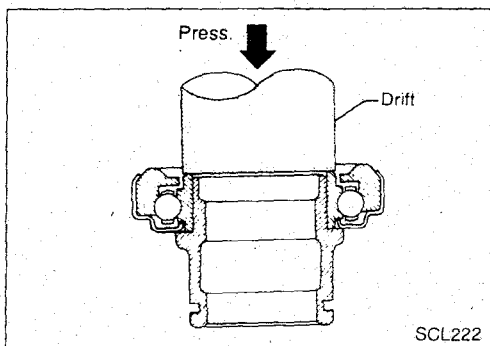
- Install retainer spring and holder spring.



- Remove release bearing.



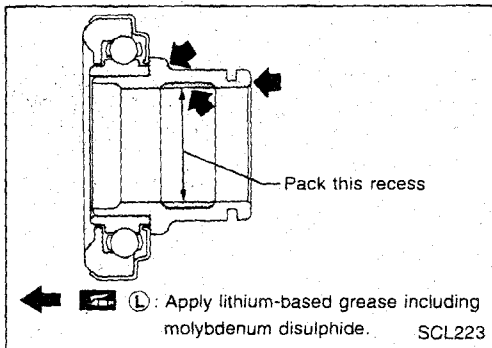
- Install release bearing with suitable drift.



CLUTCH RELEASE MECHANISM

INSPECTION

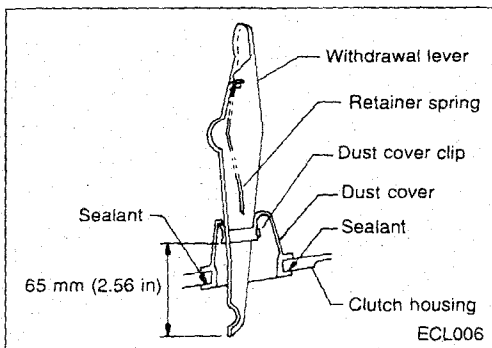
- Check release bearing to see that it rolls freely and is free from noise, cracks, pitting or wear. Replace if necessary.
- Check release sleeve and withdrawal lever rubbing surface for wear, rust or damage. Replace if necessary.



LUBRICATION

- Apply recommended grease to contact surface and rubbing surface.

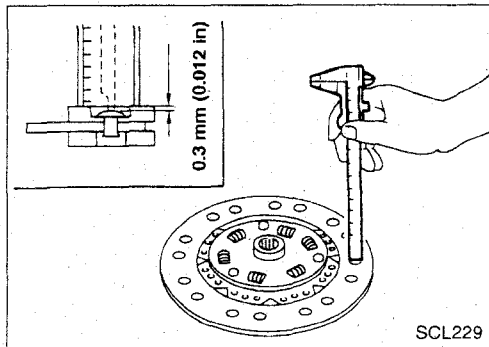
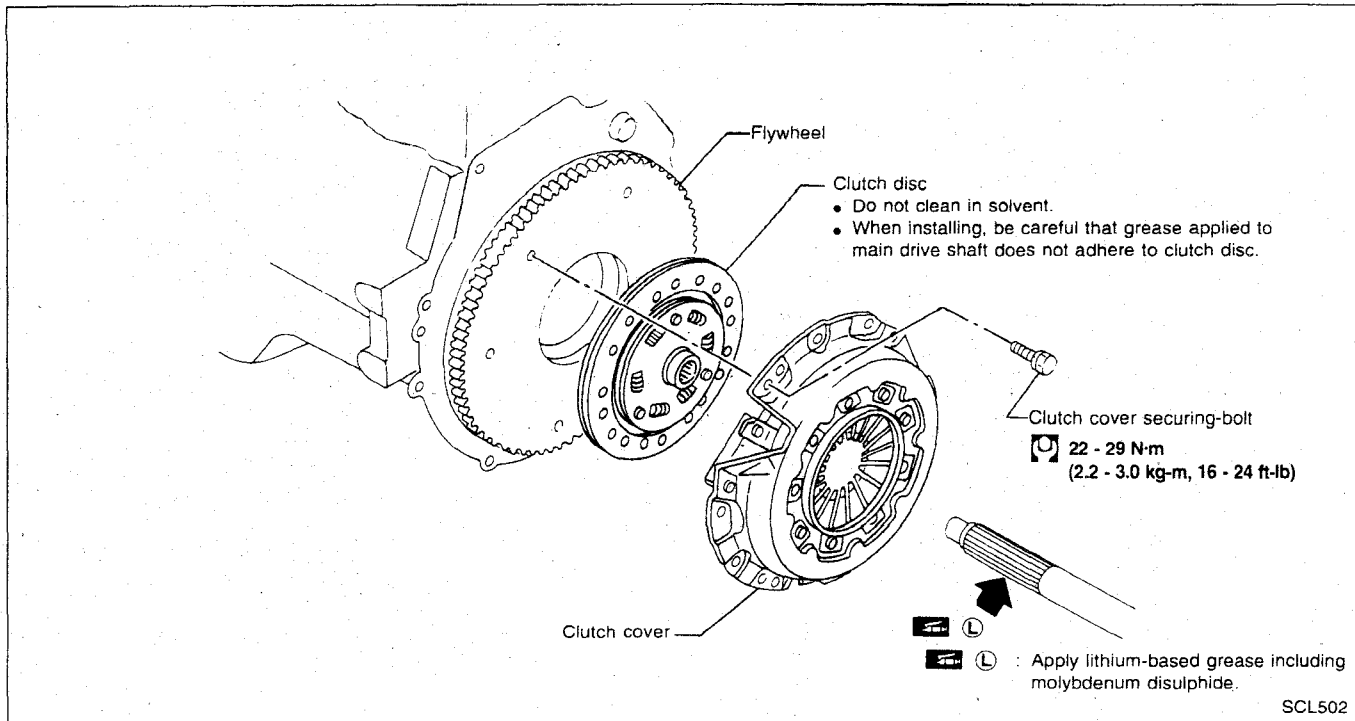
Too much lubricant might cause clutch disc facing damage.



DUST COVER SEALING

- Apply recommended sealant to contact surface of dust cover to transmission case and withdrawal lever and then install dust cover clip.

CLUTCH DISC AND CLUTCH COVER

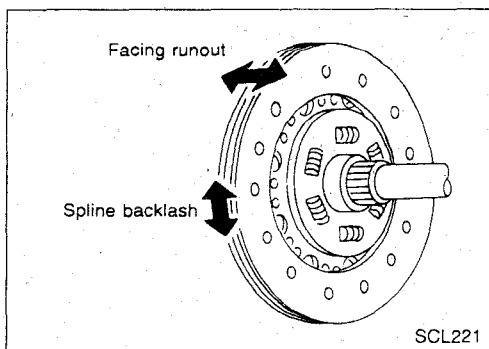


Clutch Disc

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 spline backlash and facing runout.

Maximum spline backlash (at outer edge of disc):
1.0 mm (0.039 in)

Runout limit:
0.9 mm (0.035 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 splines to clutch disc hub.

Too much lubricant might damage clutch disc facing.

CLUTCH DISC AND CLUTCH COVER

Clutch Cover and Flywheel

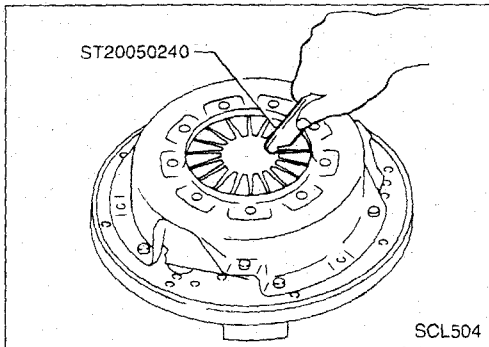
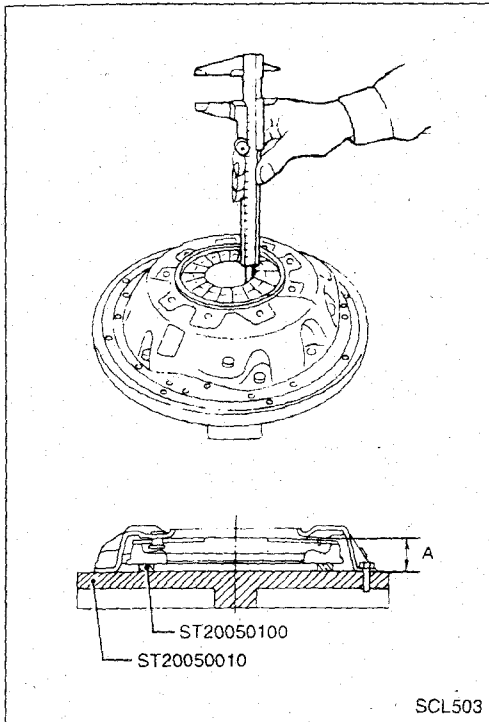
INSPECTION AND ADJUSTMENT

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

Diaphragm spring height "A":

37 - 40 mm (1.46 - 1.58 in)

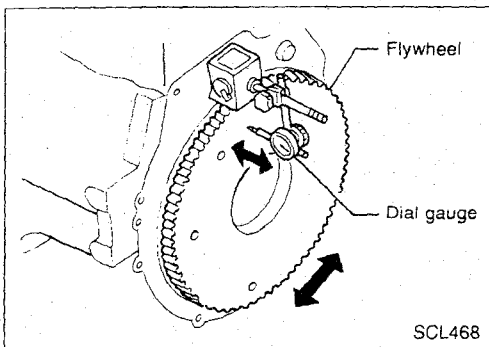
- Check thrust rings for wear or damage by shaking cover assembly and listening for chattering noise, or lightly hammering on rivets for a slight cracking noise. Replace clutch cover assembly if necessary.
- Check pressure plate and clutch disc contact surface for slight burns or discoloration. Repair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

0.7 mm (0.028 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):

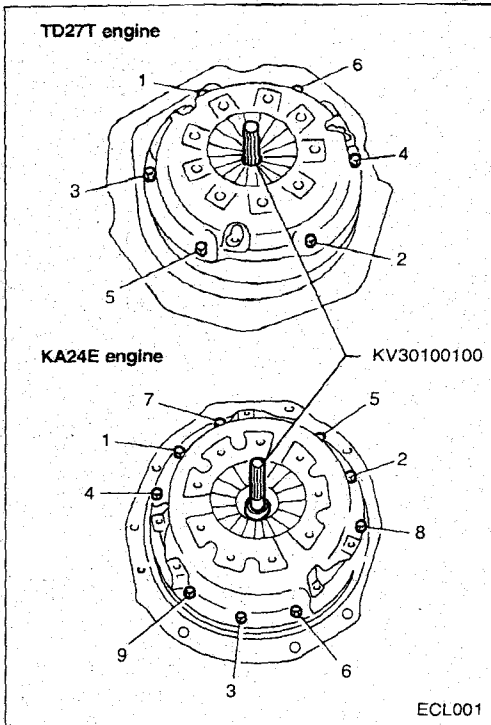
Refer to EM section. (Inspection — CYLINDER BLOCK)

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

Type of clutch control	Hydraulic
------------------------	-----------

CLUTCH MASTER CYLINDER

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

CLUTCH OPERATING CYLINDER

Inner diameter	mm (in)	
L.H.D.		17.46 (11/16)
R.H.D.		19.05 (3/4)

CLUTCH DAMPER

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

CLUTCH DISC

Unit: mm (in)

Engine	KA24E	TD27T *
Model	242	
Facing size (Outer dia. x inner dia. x thickness)	242 x 162 x 3.5 (9.53 x 6.38 x 0.0138)	
Thickness of disc assembly under load	7.6 - 8.2 Under a load of 4750 N (484.3 kg, 1068 lb)	

* TD27T models are equipped with a clutch disc with pre-damper system.

CLUTCH COVER

Engine	KA24E	TD27T
Model	242	
Full load N (kg, lb)	4750 (484.3, 1068)	

Inspection and Adjustment

CLUTCH PEDAL

Unit: mm (in)

Applied model	All
Pedal height*	217 - 227 (8.54 - 8.94)
Pedal stroke	145 (5.71)
Pedal free play	1.0 - 3.0 (0.039 - 0.118)

*: Measured from surface of metal sheet to surface of pedal pad

CLUTCH DISC

Unit: mm (in)

Disc model	242
Wear limit of facing surface to rivet head	0.3 (0.012)
Runout limit of facing	0.9 (0.035)
Distance of runout check point (from the hub center)	115 (4.53)
Maximum of spline backlash of spline (at outer edge of disc)	1.0 (0.039)

CLUTCH COVER

Unit: mm (in)

Cover model	All
Engine	242
Diaphragm spring height	37 - 40 (1.46 - 1.58)
Uneven limit of dia- phragm spring toe height "A"	0.7 (0.028)