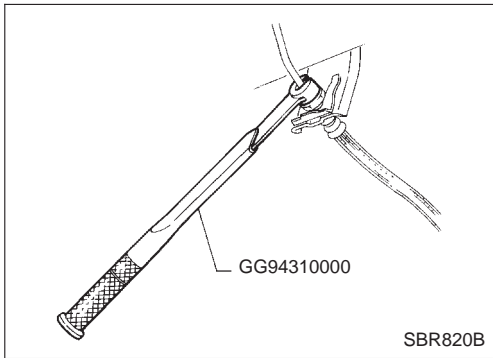


SECTION **CL**

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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.
- 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 clutch disc, wipe it with a dust collector. Do not use compressed air.

Preparation

SPECIAL SERVICE TOOLS

Tool number Tool name	Description	
GG94310000 Flare nut torque wrench	<p style="text-align: center;">NT406</p>	Removing and installing clutch piping a: 10 mm (0.39 in)
KV30101600 (New) KV30101000 (Former) Clutch aligning bar	<p style="text-align: center;">NT645</p>	Installing clutch cover and clutch disc a: 15.9 mm (0.626 in) dia. b: 17.9 mm (0.705 in) dia. c: 40 mm (1.57 in)
ST20050240 Diaphragm spring adjusting wrench	<p style="text-align: center;">NT404</p>	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	
Equivalent to GG94310000 ① Flare nut crows foot ② Torque wrench	<p style="text-align: center;">NT360</p>	Removing and installing clutch piping a: 10 mm (0.39 in)

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

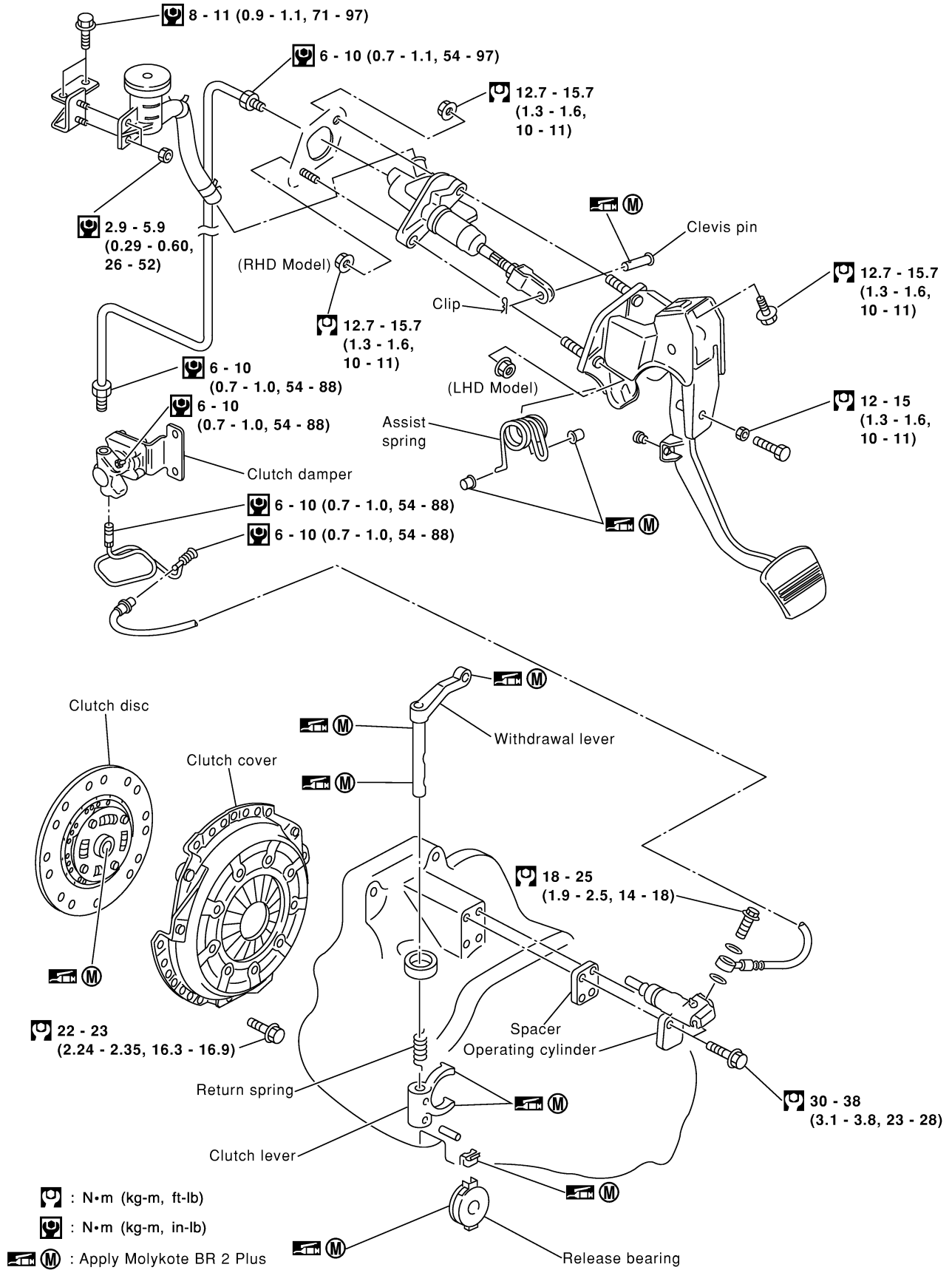
NVH Troubleshooting Chart

Use the chart below to help you to find the cause of the symptom. The numbers indicate the order of inspection.
Check each part in order. If necessary, repair or replace these parts.

Reference page		
CL-5		CLUTCH PEDAL (Free play out of adjustment)
CL-7		CLUTCH LINE (Air in line)
CL-8		MASTER CYLINDER PISTON CUP (Damaged)
CL-9		OPERATING CYLINDER PISTON CUP (Damaged)
Refer to EM section	1	ENGINE MOUNTING (Loose)
CL-11	1	RELEASE BEARING (Worn, dirty or damaged)
CL-13		CLUTCH DISC (Out of true)
CL-13	2	CLUTCH DISC (Runout is excessive)
CL-13		CLUTCH DISC (Lining broken)
CL-13		CLUTCH DISC (Dirty or burned)
CL-13	2	CLUTCH DISC (Oily)
CL-13	2	CLUTCH DISC (Worn out)
CL-13	2	CLUTCH DISC (Hardened)
CL-13		CLUTCH DISC (Lack of spline grease)
CL-14	3	DIAPHRAGM SPRING (Damaged)
CL-14	2	DIAPHRAGM SPRING (Out of tip alignment)
CL-14	4	CLUTCH COVER (Distortion)
CL-14	5	FLYWHEEL (Discoloration)
SUSPECTED PARTS (Possible cause)		
		Clutch grabs/chatters
	1	Clutch pedal spongy
	2	MASTER CYLINDER PISTON CUP (Damaged)
	2	OPERATING CYLINDER PISTON CUP (Damaged)
	1	ENGINE MOUNTING (Loose)
	1	RELEASE BEARING (Worn, dirty or damaged)
		Clutch does not disengage
	1	CLUTCH PEDAL (Free play out of adjustment)
	2	CLUTCH LINE (Air in line)
	3	MASTER CYLINDER PISTON CUP (Damaged)
	4	OPERATING CYLINDER PISTON CUP (Damaged)
		Clutch noisy
	1	RELEASE BEARING (Worn, dirty or damaged)
	1	Clutch slips
	2	CLUTCH DISC (Oily)
	2	CLUTCH DISC (Worn out)
	2	CLUTCH DISC (Hardened)
	3	DIAPHRAGM SPRING (Damaged)
	4	CLUTCH COVER (Distortion)
	5	FLYWHEEL (Discoloration)

CLUTCH SYSTEM

SEC. 300-305-306-465



CL-4

YCL007

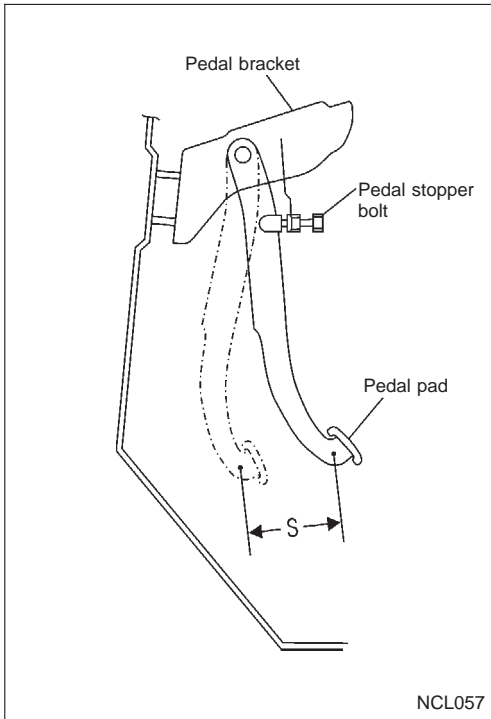
INSPECTION AND ADJUSTMENT

Inspecting and Adjusting Clutch Pedal

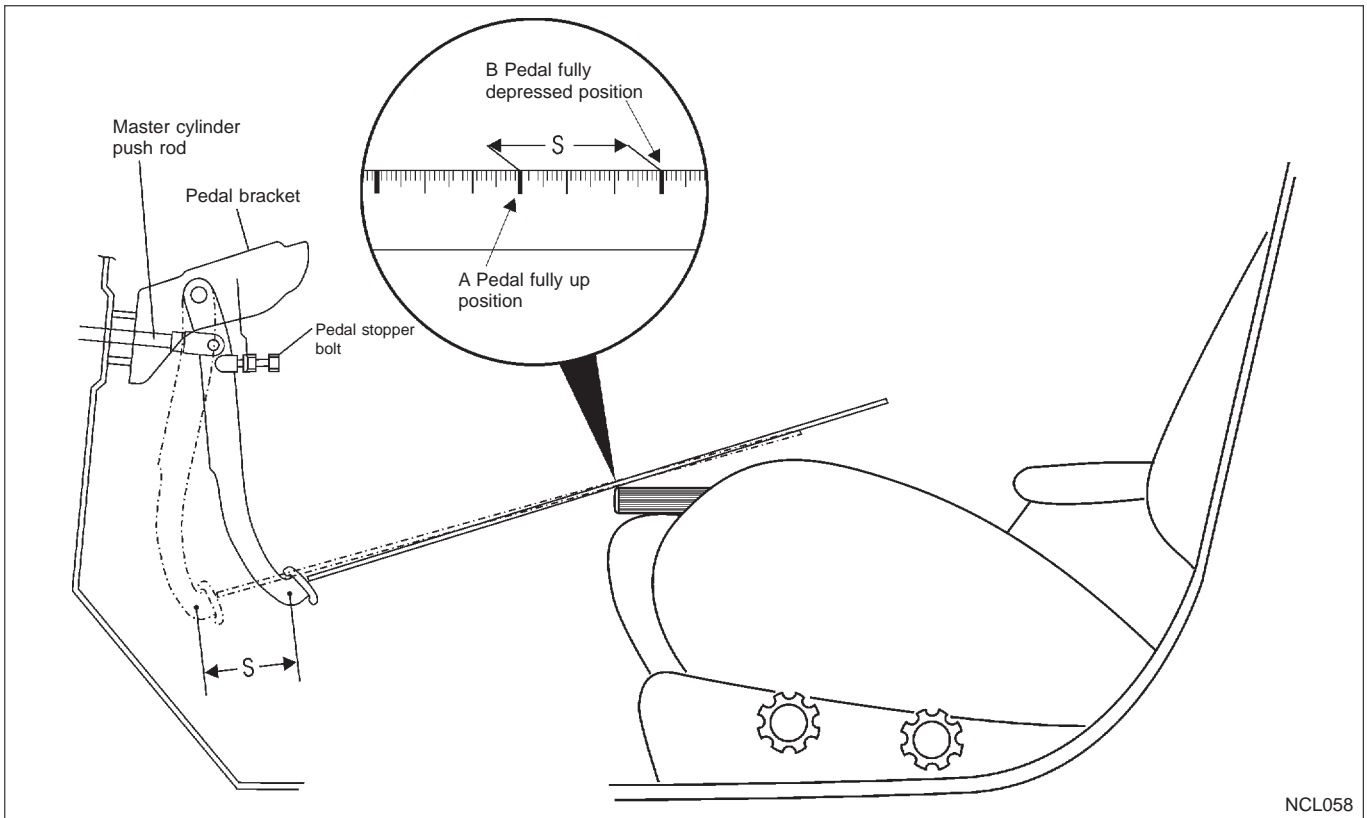
Inspect and adjust clutch pedal stroke.

Pedal stroke "S":

Refer to SDS, CL-16.



NCL057



NCL058

INSPECTION AND ADJUSTMENT

Inspecting and Adjusting Clutch Pedal (Cont'd)

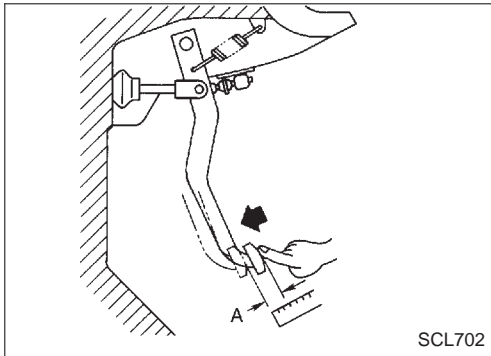
INSPECTION

Pedal stroke

Check clutch pedal stroke using a 1-meter rule to measure the total pedal stroke. Place end of rule onto the middle of the clutch pedal pad. Place a book/clipboard on the driver's seat to set a reference point, ensure the book/clipboard does not move during pedal depression. Mark (A) the pedal fully up position on the rule. Depress the clutch pedal and mark (B) the rule again next to the reference point on the book/clipboard. Measure the distance between the marks (A and B), this is the actual pedal stroke (S). Check the specified pedal stroke in the table, adjust actual pedal stroke if necessary (refer to "ADJUSTMENT").

Note:

- Do not use steering wheel as a reference point, angle gives incorrect reading.
- Ensure there is no interference between the floor carpet and clutch pedal when fully depressed.



Pedal free play

Check pedal free play. If out of specification, refer to "ADJUSTMENT".

- Push on the clutch pedal until resistance is felt, and check the distance the pedal moves.

ADJUSTMENT

Pedal stroke

1. Loosen the pedal stopper bolt completely (so there is no contact between pedal and stopper bolt).
2. Adjust pedal stroke to the specified value with the master cylinder push rod.
3. Adjust the pedal stopper bolt until it is just in contact with the pedal, then tighten the lock nut.
4. Once stroke is set to specification, adjust clutch pedal free play.

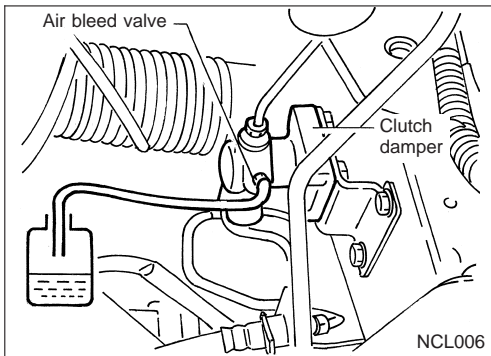
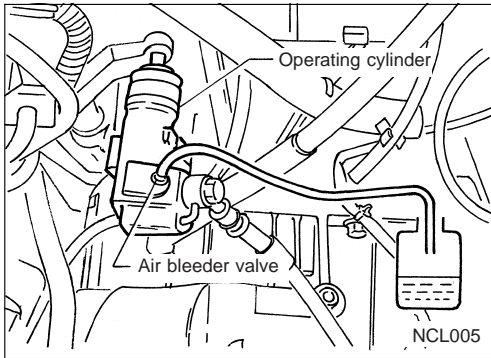
Pedal free play

1. Adjust pedal free play to the specified value with the master cylinder push rod.
2. Tighten lock nut of the master cylinder push rod.
- Push on the clutch pedal until resistance is felt, and check the distance the pedal moves.

Pedal free play "A":

Refer to SDS, CL-16.

INSPECTION AND ADJUSTMENT



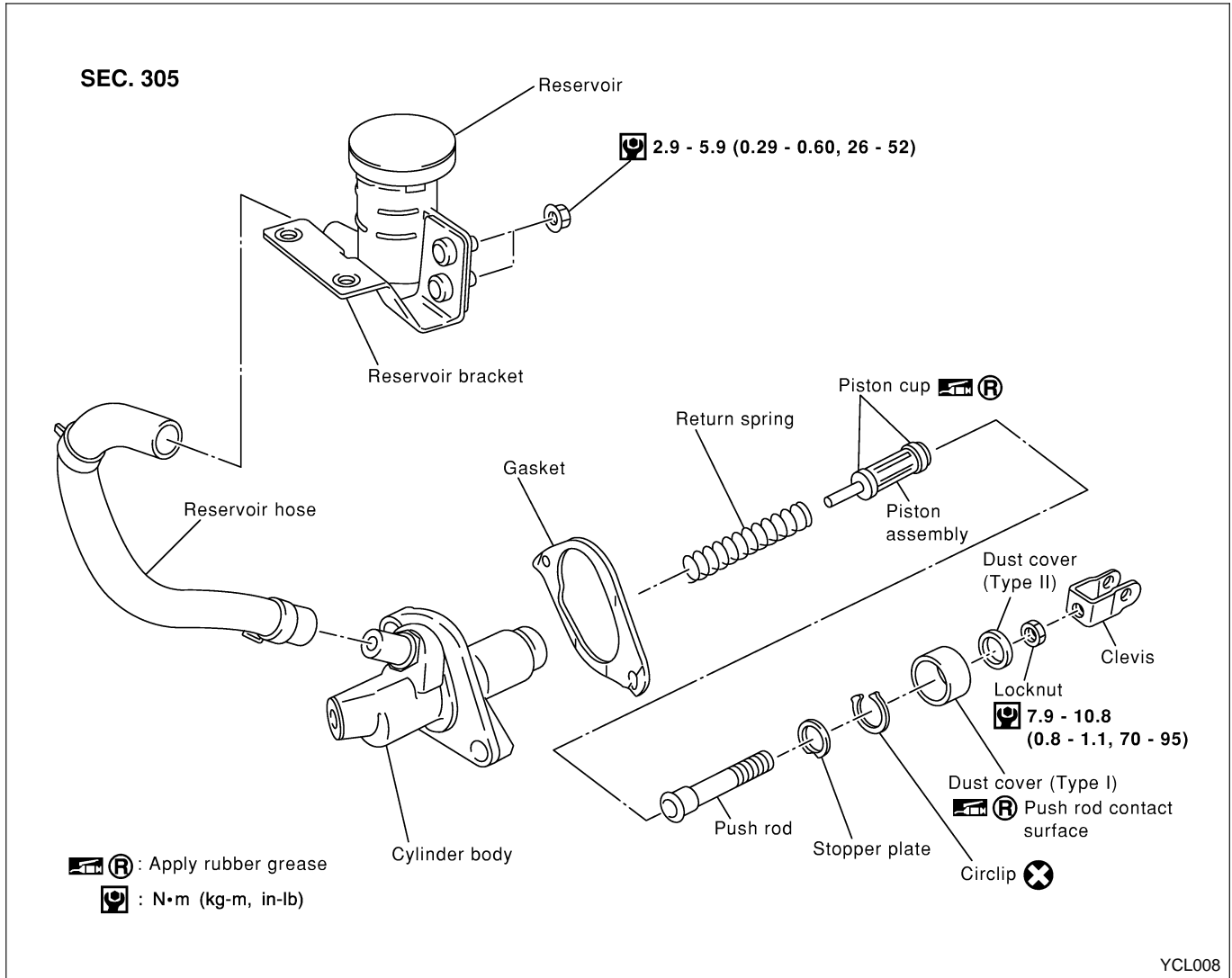
Bleeding Procedure

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

Carefully monitor fluid level at master cylinder during bleeding operation.

- Top up reservoir with recommended brake fluid.
 - Connect a transparent vinyl tube to air bleeder valve of clutch operating cylinder.
 - Fully depress clutch pedal several times.
 - With clutch pedal depressed, open bleeder valve to release air.
 - Close bleeder valve.
 - 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.

Clutch Master Cylinder



DISASSEMBLY AND ASSEMBLY

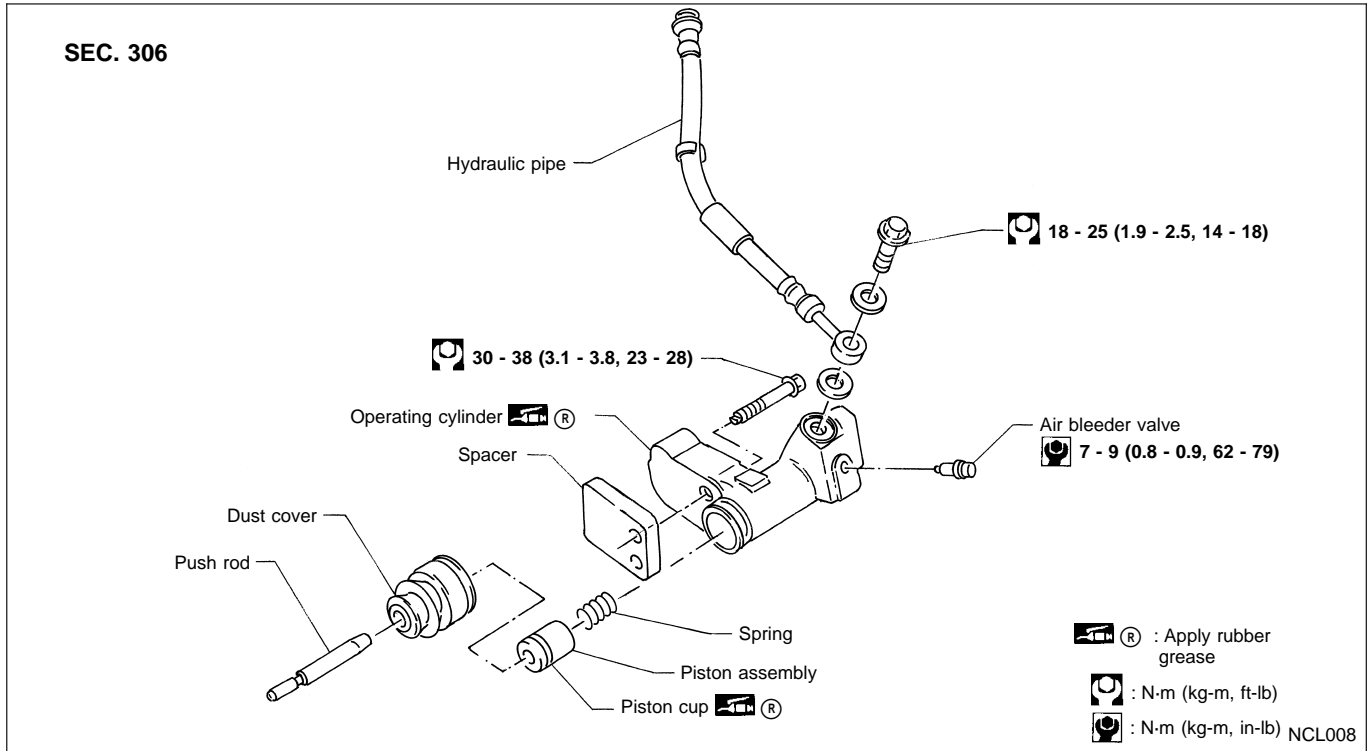
- Push piston into cylinder body with screwdriver when removing and installing valve stopper.
- Check direction of piston cups.

INSPECTION

- Check cylinder and piston contact surfaces 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.

HYDRAULIC CLUTCH CONTROL

Clutch Operating Cylinder

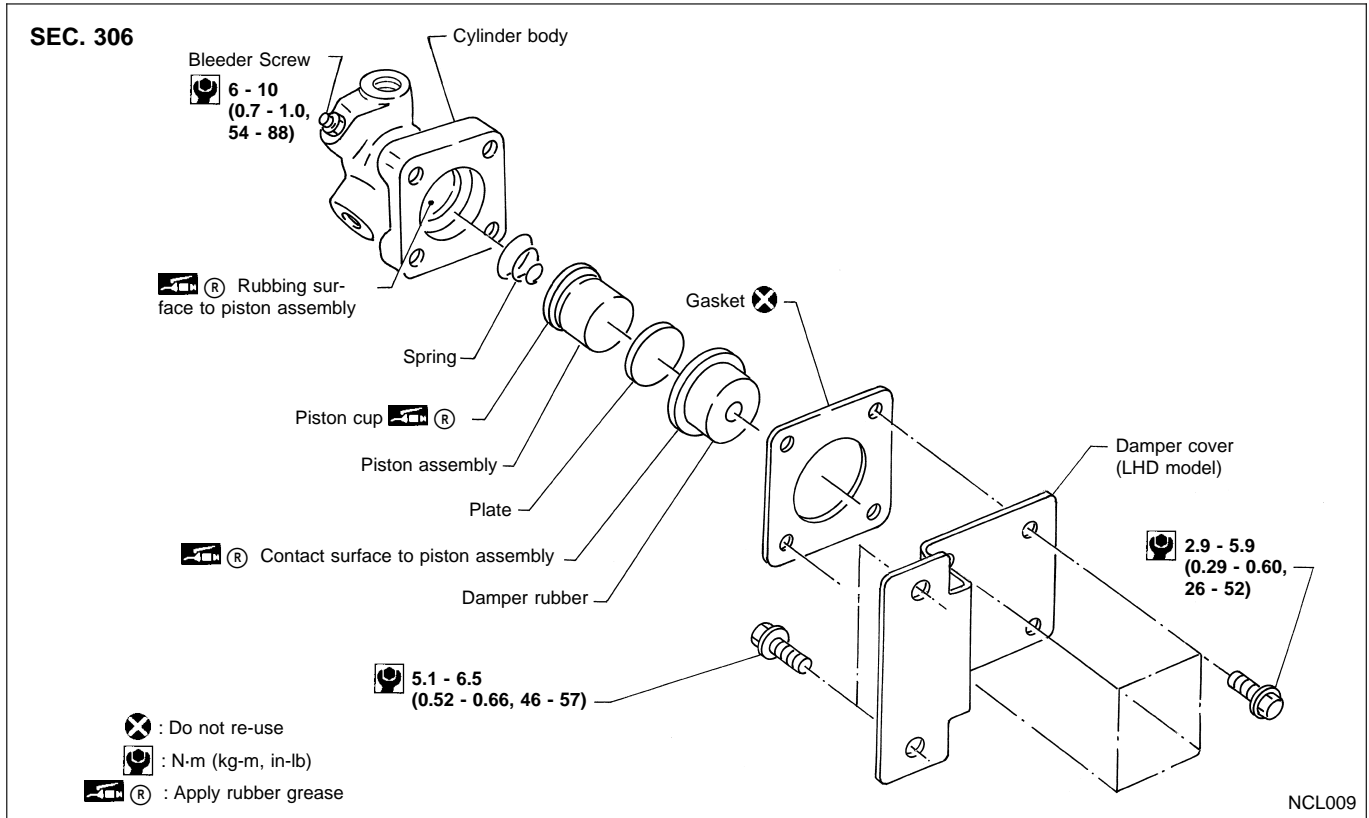


INSPECTION

- Check contact surfaces 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



DISASSEMBLY AND ASSEMBLY

1. Remove damper assembly mounting bolts.
2. Remove gasket, damper rubber, plate, piston assembly, and piston spring from cylinder body.
3. Clean gasket contact surface on cylinder body and damper bracket with scrapers.

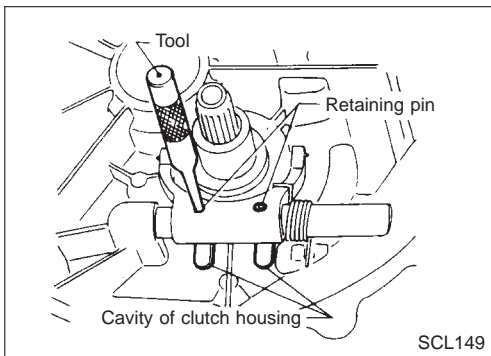
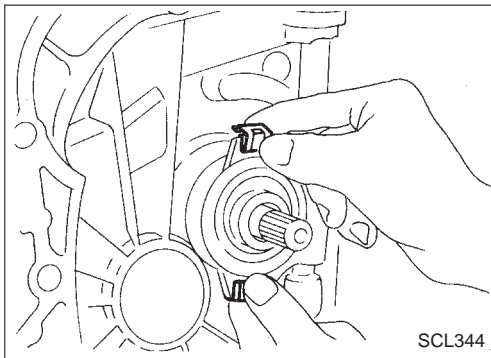
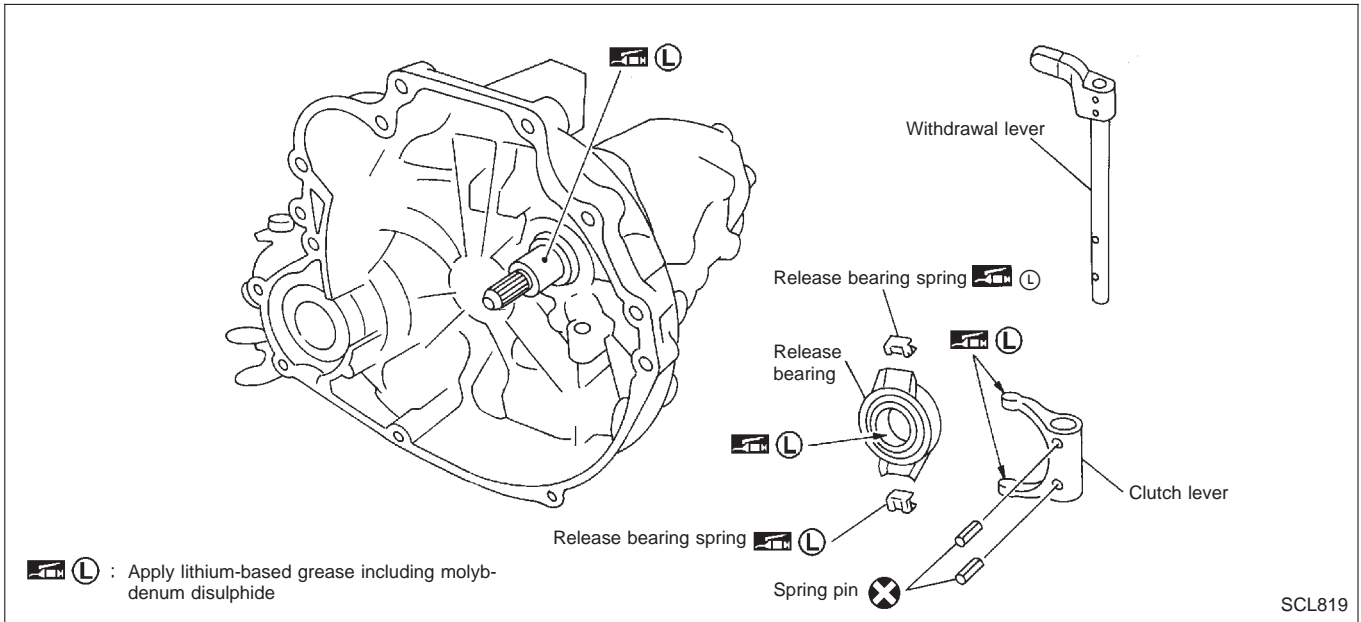
CAUTION:

Be careful not to scratch the contact surface.

INSPECTION

- Check cylinder and piston contact surfaces 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

1. Remove manual transaxle from vehicle. Refer to MT section "REMOVAL AND INSTALLATION".
2. Remove release bearing by pulling bearing retainers outward.

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

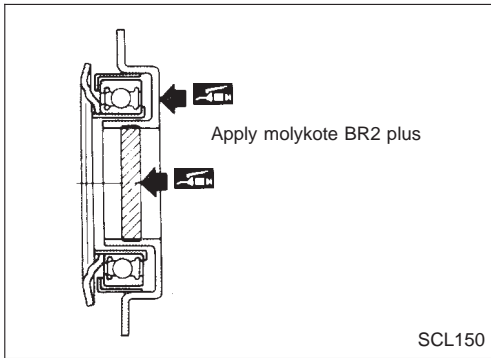
CAUTION:

- Be sure to apply grease to the clutch components. Otherwise, abnormal noise, poor clutch disengagement, or clutch damage may occur. Wipe the excess grease off completely, because it may cause the clutch components to slip and shudder.
- Keep the clutch disc facing, pressure plate, and flywheel free of oil and grease.

INSPECTION

- Replace the release bearing if it is seized, damaged, faulty in rotation direction, or has poor aligning function.
- Replace the withdrawal lever if its contact surface is worn abnormally.
- Replace the clutch lever if its contact surface is worn abnormally.
- Replace the dust seal if it is deformed or cracked.

CLUTCH RELEASE MECHANISM

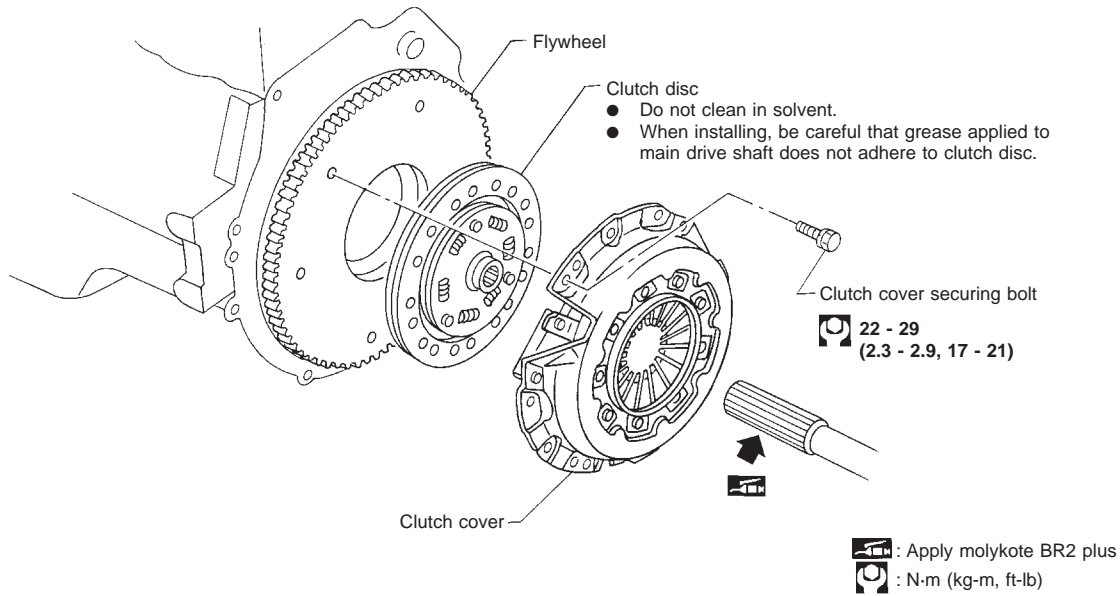


LUBRICATION

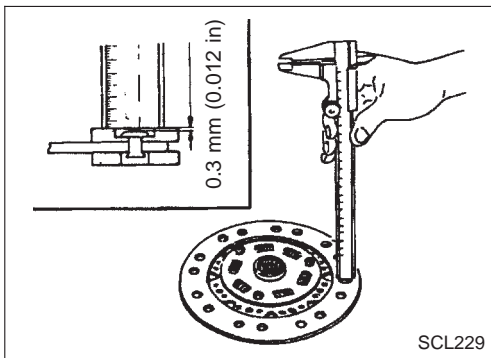
- Apply recommended grease to contact surface and rubbing surface.
- **Too much lubricant might damage clutch disc facing.**

CLUTCH DISC AND CLUTCH COVER

SEC. 300



SCL206

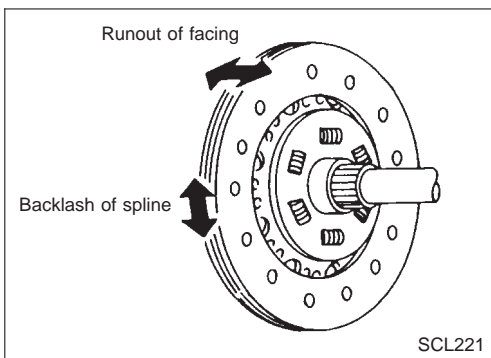


Clutch Disc

INSPECTION

Check clutch disc for wear of facing.

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

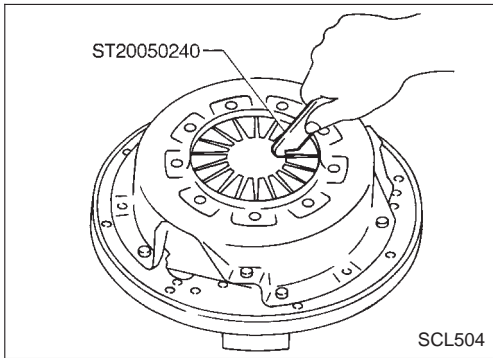


- Check clutch disc for backlash of spline and runout of facing.
**Maximum backlash of spline (at outer edge of disc):
Model 215/225 0.9 mm (0.035 in)**
**Runout limit:
1.0 mm (0.039 in)**
**Distance of runout check point (from hub center):
Model 215 102.5 mm (4.04 in)
Model 225 107.5 mm (4.23 in)**
- Check clutch disc for burns, discoloration or oil or grease contamination. Replace if necessary.

INSTALLATION

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

CLUTCH DISC AND CLUTCH COVER



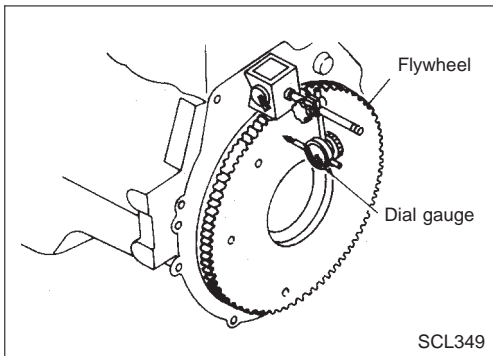
Clutch Cover and Flywheel

INSPECTION AND ADJUSTMENT

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

Uneven limit:

Model 225	0.7 mm (0.028 in)
Model 215	0.8 mm (0.031 in)

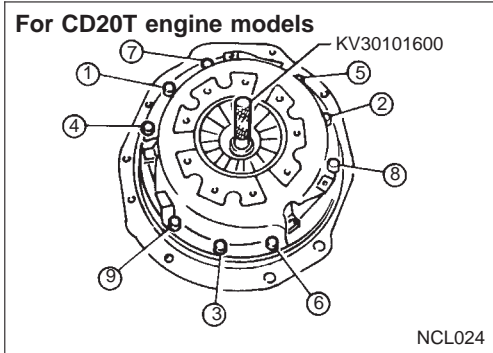
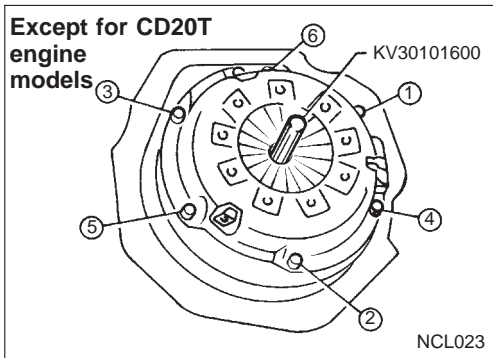


FLYWHEEL INSPECTION

- 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 to specified torque.
Tightening procedure
 - a. Tighten all bolts, in numerical order, to 10 - 20 N·m (1.1 - 2.0 kg·m, 8 - 14 ft·lb).
 - b. Tighten all bolts, in numerical order, to 22 - 29 N·m (2.3 - 2.9 kg·m, 17 - 21 ft·lb).
- Do not allow grease to contaminate clutch facing.

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 DAMPER

Inner diameter mm (in)	19.05 (3/4)
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CLUTCH OPERATING CYLINDER

Inner diameter	mm (in)	17.46 (11/16)
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CLUTCH DISC

Unit: mm (in)

Engine	QG16DE, QG18DE, SR20DE	CD20T
Model	215	225
Facing size (Outer dia. x inner dia. x thickness)	216 x 153 x 3.5 (8.50 x 6.02 x 0.138)	225 x 150 x 3.5 (8.86 x 5.91 x 0.138)
Thickness of disc assembly with load	7.3 - 7.9 (0.287 - 0.311) with 4,900 N (499.8 kg, 1,101.5 lb)	7.6 - 8.0 (0.299 - 0.315) with 3,923 N (400 kg, 882 lb)

CLUTCH COVER

Engine	QG16DE, QG18DE, SR20DE	CD20T
Model	L215K	L225K
Full-load	N (kg, lb)	4,413 (450, 992)

SERVICE DATA AND SPECIFICATIONS (SDS)

Inspection and Adjustment

CLUTCH PEDAL

Unit: mm (in)

Applied model		RHD	LHD
Pedal stroke "S"	CD20T	145 - 150 (5.71 - 5.91)	140 - 145 (5.51 - 5.71)
	QG16DE	153 - 158 (6.02 - 6.22)	140 - 145 (5.51 - 5.71)
	QG18DE		
	SR20DE		
Pedal free play "A" (at pedal pad)		1 - 3 (0.04 - 0.12)	

* : Measured from surface of dash reinforcement panel to surface of pedal pad.

CLUTCH DISC

Unit: mm (in)

Disc model	215	225
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 hub center)	102.5 (4.04)	107.5 (4.23)
Maximum backlash of spline (at outer edge of disc)	0.9 (0.035)	

CLUTCH COVER

Unit: mm (in)

Cover model	L215K	L225K
Uneven limit of diaphragm spring toe height	0.8 (0.031)	0.7 (0.028)