

SECTION **CL**
CLUTCH

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PRECAUTIONS

PRECAUTIONS

PFP:00001

Precautions for Battery Service

NCS00001

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

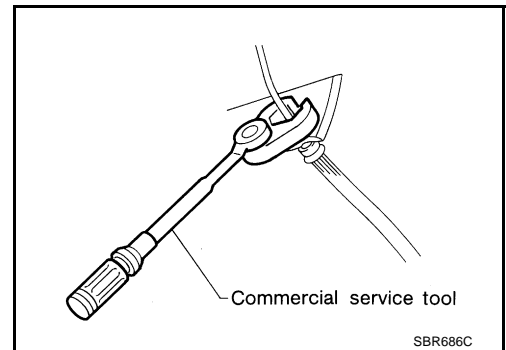
Service Notice or Precaution

NCS00002

- Recommended fluid is brake fluid "DOT 3". Refer to [MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).
- 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 and operating cylinder.
- 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

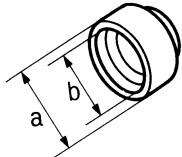

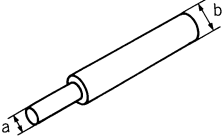
PREPARATION

PFP:00002

Special Service Tools


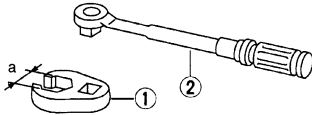
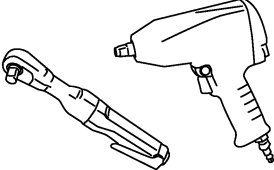
NCS00003

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

| Tool number (Kent-Moore No.) Tool name | Description |
|--|--|
| KV30101400 (—) Drift a: 51 mm (2.01 in) dia. b: 44 mm (1.73 in) dia. | Installing release bearing |
|  ZZA0838D | |
| ST20050240 (—) Diaphragm adjusting wrench | Adjusting unevenness of diaphragm spring of clutch cover |
|  ZZA0508D | |
| ST20670000 (—) Clutch aligning bar a: 15 mm (0.59 in) dia. b: 23 mm (0.91 in) dia. | Installing clutch disc |
|  ZZA1178D | |

Commercial Service Tools

NCS00004

| Tool name | Description |
|--|--|
| Pin punch Tip diameter: 4.5 mm (0.177 in) dia. | Removing and installing master cylinder spring pin |
|  ZZA0515D | |
| 1. Flare nut crowfoot a: 10 mm (0.39 in) 2. Torque wrench | Removing and installing clutch piping |
|  S-NT360 | |
| Power tool | Loosening bolts and nuts |
|  PBIC0190E | |

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PPF:00003

NVH Troubleshooting Chart

NCS00005

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

| Reference page | | CL-5 | CL-7 | CL-9 | CL-11 | EM-131 | CL-14 | CL-16 | | | | | | | | | | EM-165 | |
|----------------------------------|---------------------------|--|---------------------------|--------------------------------------|---|-------------------------|--|---------------------------|-----------------------------------|-----------------------------|-------------------------------|--------------------|------------------------|------------------------|-------------------------------------|----------------------------|---|-----------------------------|-----------------------|
| SUSPECTED PARTS (Possible cause) | | CLUTCH PEDAL (Free play out of adjustment) | CLUTCH LINE (Air in line) | MASTER CYLINDER PISTON CUP (Damaged) | OPERATING CYLINDER PISTON CUP (Damaged) | ENGINE MOUNTING (Loose) | RELEASE BEARING (Worn, dirty or damaged) | CLUTCH DISC (Out of true) | CLUTCH DISC (Runout is excessive) | CLUTCH DISC (Lining broken) | CLUTCH DISC (Dirty or burned) | CLUTCH DISC (Oily) | CLUTCH DISC (Worn out) | CLUTCH DISC (Hardened) | CLUTCH DISC (Lack of spline grease) | DIAPHRAGM SPRING (Damaged) | DIAPHRAGM SPRING (Out of tip alignment) | PRESSURE PLATE (Distortion) | FLYWHEEL (Distortion) |
| Symptom | Clutch grabs/chatters | | | | | 1 | | | 2 | | | 2 | 2 | 2 | | | 2 | | |
| | Clutch pedal spongy | | 1 | 2 | 2 | | | | | | | | | | | | | | |
| | Clutch noisy | | | | | | 1 | | | | | | | | | | | | |
| | Clutch slips | 1 | | | | | | | | | | 2 | 2 | | | 3 | | 4 | 5 |
| | Clutch does not disengage | 1 | 2 | 3 | 4 | | | 5 | 5 | 5 | 5 | 5 | | | 5 | 6 | 6 | 7 | |

CLUTCH PEDAL

CLUTCH PEDAL

PFP:46540

On-Vehicle Inspection and Adjustment

NCS00006

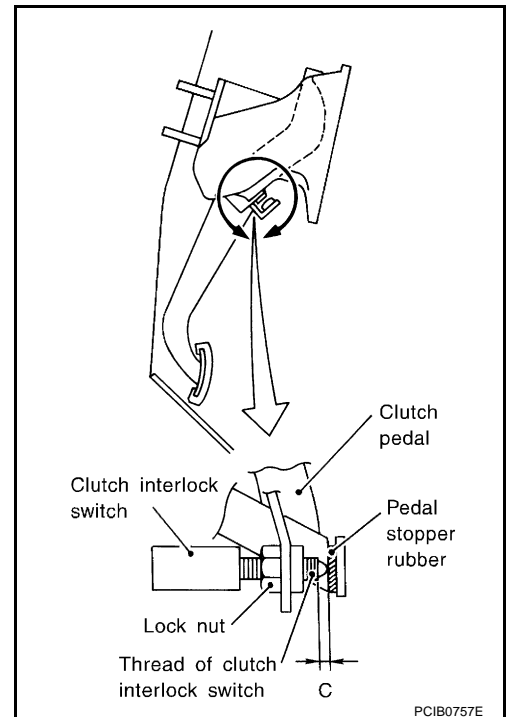
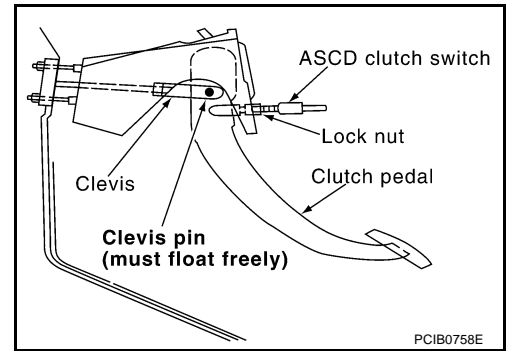
1. Check to see if the clevis pin floats freely in the bore of the clutch pedal. It should not be bound by the clevis or clutch pedal.
 - a. If the clevis pin is not free, check that the ASCD clutch switch is not applying pressure to the clutch pedal causing the clevis pin to bind. To adjust, loosen lock nut and turn ASCD clutch switch.
 - b. Tighten the lock nut.
 - c. Verify that the clevis pin floats in the bore of the clutch pedal. It should not be bound by the clutch pedal.
 - d. If the clevis pin is still not free, remove the clevis pin and check for deformation or damage. Replace clevis pin if necessary. Leave pin removed for step 2.
2. Check clutch pedal stroke for free range of movement.
 - a. With the clevis pin removed, manually move the clutch pedal up and down to determine if it moves freely.
 - b. If any sticking is noted, replace the related parts (clutch pedal bracket, assist spring, bushing etc.). Re-assemble the clutch pedal and re-verify that the clevis pin floats freely in the bore of the clutch pedal.
3. Adjust clearance "C" while depressing clutch pedal fully. (With clutch interlock switch)

Clearance C : 0.1 - 1.0 mm (0.004 - 0.039 in)

4. Check clutch hydraulic and system components (clutch master cylinder, clutch operating cylinder, clutch withdrawal lever, clutch release bearing, etc.) for sticking or binding.
 - a. If any sticking or binding noted, repair or replace related parts as necessary.
 - b. If hydraulic system repair was necessary, bleed the clutch hydraulic system. Refer to [CL-7, "Bleeding"](#).

NOTE:

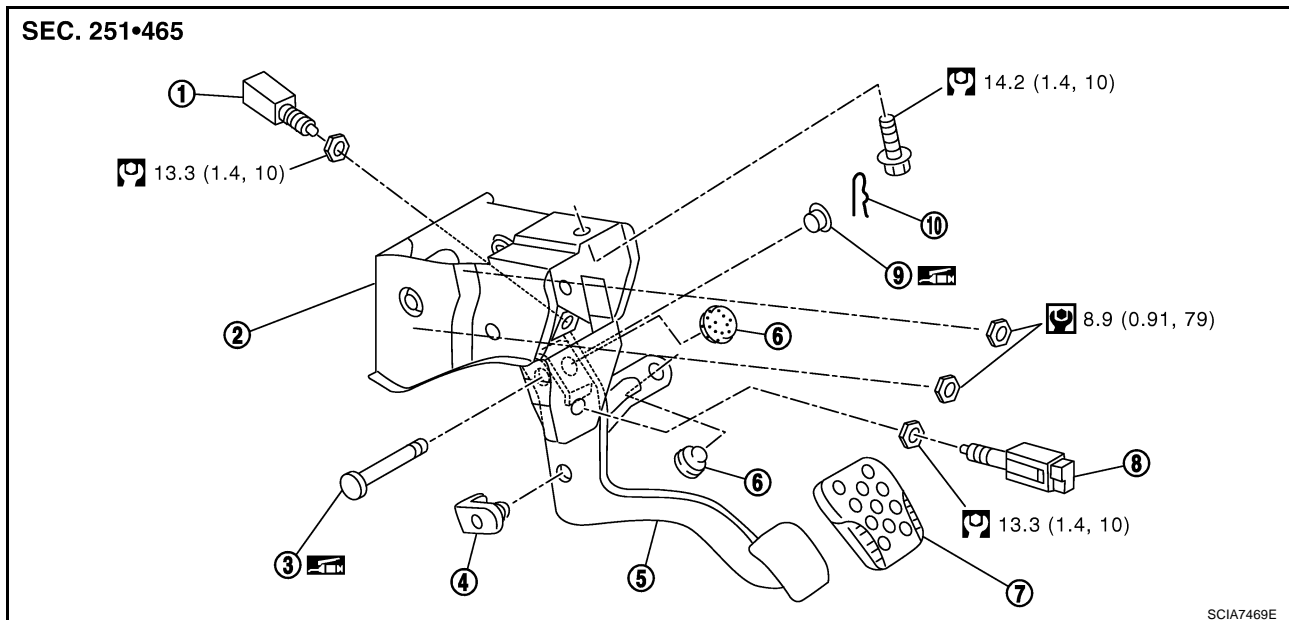
Do not use a vacuum assist or any other type of power bleeder on this system. Use of a vacuum assist or power bleeder will not purge all the air from the system.



CLUTCH PEDAL

Removal and Installation COMPONENTS

NCS00007



REMOVAL

1. Remove kicking plate. Refer to [EI-35, "Removal and Installation \(for Coupe Models\)"](#) or [EI-37, "Removal and Installation \(for Roadster Models\)"](#).
2. Remove footrest. Refer to [EI-43, "Removal and Installation"](#).
3. Remove dash side finisher (LH). Refer to [IP-11, "Removal and Installation"](#).
4. Remove instrument driver panel lower. Refer to [IP-11, "Removal and Installation"](#).
5. Remove VDC/TCS/ABS control unit. (VDC/TCS/ABS models) Refer to [BRC-135, "Removal and Installation"](#).
6. Remove the clutch interlock switch and ASCD clutch switch connectors and harness.
7. Remove the snap pin and clevis pin.
8. Remove the pedal bracket mounting bolt and nuts and then remove the clutch pedal assembly.

INSPECTION AFTER REMOVAL

- Check clutch pedal for bend, damage, or a cracked weld. If bend, damage, or a cracked weld is found, replace the clutch pedal assembly.

INSTALLATION

To install, reverse the removal procedure, following the cautions below:

- Install clutch pedal assembly and adjust the pedal height. Tighten ASCD clutch switch lock nut to the specified torque.
- After installing the clutch interlock switch, adjust the switch position.

NOTE:

Tighten the ASCD clutch switch lock nut to the specified torque after installing the clutch pedal assembly in the vehicle and adjusting the pedal free play.

CLUTCH FLUID

CLUTCH FLUID

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Bleeding

NCS00008

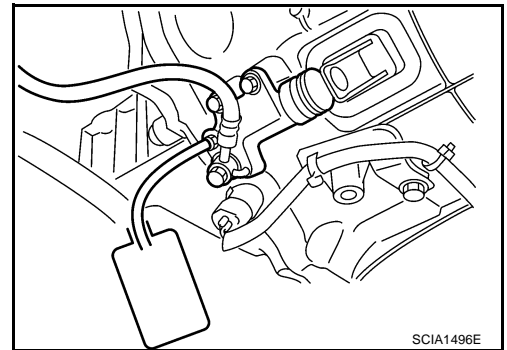
CAUTION:

- Monitor fluid level in the reservoir tank to make sure it does not empty.
- Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.

NOTE:

Do not use a vacuum assist or any other type of power bleeder on this system. Use of a vacuum assist or power bleeder will not purge all the air from the system.

1. Fill the master cylinder reservoir tank with new clutch fluid.
2. Connect a transparent vinyl hose to the air bleeder.
3. Depress the clutch pedal quickly and fully a few times and hold it.
4. With clutch pedal depressed, open air bleeder to release air.
5. Close air bleeder.
6. Release clutch pedal and wait for 5 seconds.
7. Repeat steps 3 to 6 until no bubbles can be observed in the brake fluid.
8. Tighten air bleeder to the specified torque. Refer to [CL-11, "Components"](#).



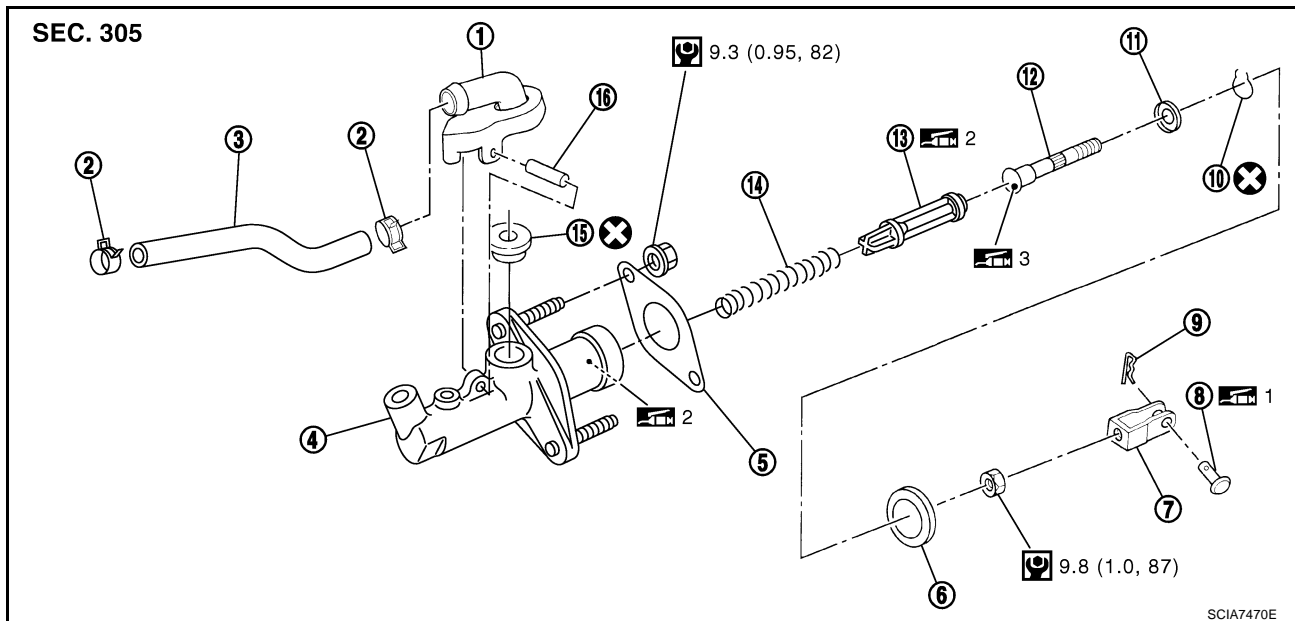
CLUTCH MASTER CYLINDER

CLUTCH MASTER CYLINDER

PFP:30610

Components

NCS001A1



- | | | |
|---------------------|-------------------|--------------------|
| 1. Nipple | 2. Clamp | 3. Reservoir hose |
| 4. Cylinder body | 5. Packing | 6. Seat |
| 7. Clevis | 8. Clevis pin | 9. Snap pin |
| 10. Stopper ring | 11. Stopper | 12. Push rod |
| 13. Piston assembly | 14. Return spring | 15. Reservoir seal |
| 16. Spring pin | | |

Refer to [GI-10, "Components"](#), and the followings for the symbols in the figure.

1: Apply lithium-based grease including molybdenum disulphide.

2: Apply rubber lubricant.

3: Apply silicone grease

Removal and Installation

NCS00009

REMOVAL

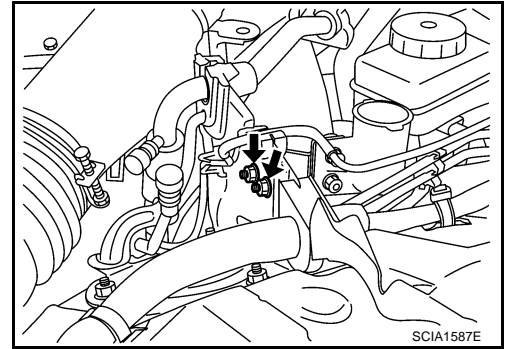
1. Remove kicking plate. Refer to [EI-35, "Removal and Installation \(for Coupe Models\)"](#) or [EI-37, "Removal and Installation \(for Roadster Models\)"](#).
2. Remove footrest. Refer to [EI-43, "Removal and Installation"](#).
3. Remove dash side finisher. Refer to [IP-11, "Removal and Installation"](#).
4. Remove instrument driver panel lower. Refer to [IP-11, "Removal and Installation"](#).
5. Remove VDC/TCS/ABS control unit. (VDC/TCS/ABS models) Refer to [BRC-135, "Removal and Installation"](#).
6. Remove snap pin and clevis pin from the clevis, and separate it from clutch pedal.
7. Remove hoodedge cover.
8. Drain clutch fluid in reservoir tank and remove reservoir hose.

CAUTION:

Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.

CLUTCH MASTER CYLINDER

9. Remove reservoir tank.
10. Remove clutch tube using a flare nut wrench.
11. Remove master cylinder assembly.



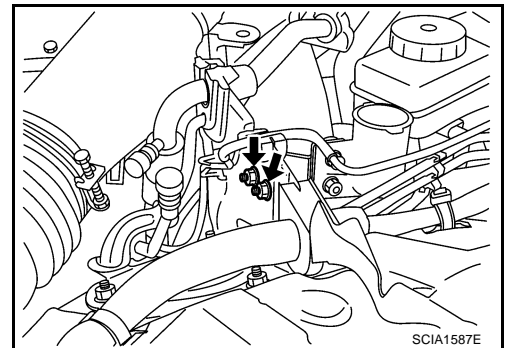
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INSTALLATION

1. Connect clutch tube to master cylinder assembly and temporarily tighten flare nut.
2. Install master cylinder assembly and tighten mounting nuts to the specified torque.
3. Tighten clutch tube flare nut to the specified torque using a flare nut torque wrench. Refer to [CL-13, "Removal and Installation"](#).
4. Install clevis to the clutch pedal, and fix clevis with clevis pin.
5. Install snap pin to the clevis pin.
6. Install reservoir hose to the nipple. Install the reservoir tank to the vehicle, and then tighten mounting nuts to the specified torque.

: **5.8 N·m (0.59 Kg-m, 51 in-lb)**

7. After completing this procedure, inspect and adjust for clutch pedal and then bleed the clutch hydraulic system. Refer to [CL-5, "On-Vehicle Inspection and Adjustment"](#) and [CL-7, "Bleeding"](#).
8. Install hoodledge cover.
9. Install VDC/TCS/ABS control unit. (VDC/TCS/ABS models) Refer to [BRC-135, "Removal and Installation"](#).
10. Install instrument driver panel lower. Refer to [IP-11, "Removal and Installation"](#).
11. Install dash side finisher. Refer to [IP-11, "Removal and Installation"](#).
12. Install footrest. Refer to [EI-43, "FLOOR TRIM"](#).
13. Install kicking plate. Refer to [EI-35, "Removal and Installation \(for Coupe Models\)"](#) or [EI-37, "Removal and Installation \(for Roadster Models\)"](#).



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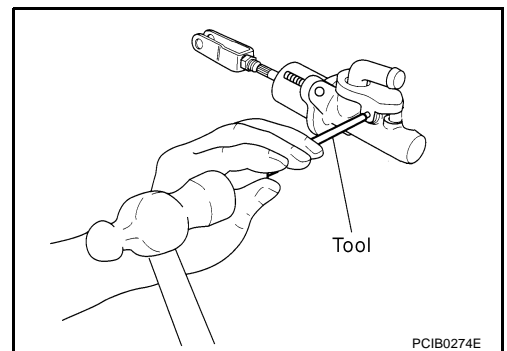
Disassembly and Assembly

DISASSEMBLY

1. Remove spring pin, nipple and reservoir seal from cylinder body using a pin punch.
2. Loosen push rod lock nut. Remove clevis and lock nut.
3. Remove the seat from the cylinder body.
4. Remove the stopper ring and stopper, and then remove the push rod, piston assembly and return spring from the cylinder body.

CAUTION:

Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the cylinder body.



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M

CLUTCH MASTER CYLINDER

INSPECTION AFTER DISASSEMBLY

Check for any of the conditions shown below. If any malfunction is found, replace the part concerned.

- Damaged cylinder internal wall, foreign matter, wear, corrosion, or pin hole
- Damaged or deformed nipple or reservoir tank
- Settling of the spring
- Cracked and deformed seat

ASSEMBLY

1. Apply rubber lubricant to internal surface of the cylinder body, sliding surface of piston assembly, and the piston cup. Insert return spring and piston assembly to the cylinder body.
2. Apply silicone grease to the push rod and install the stopper before installing the stopper ring.

CAUTION:

Restrain the push rod while doing this because there is a danger the piston assembly will fly out of the master cylinder.

3. Install seat to the cylinder body.
4. Install clevis to the push rod and tighten lock nut to the specified torque. Refer to [CL-8, "Removal and Installation"](#).
5. Install reservoir seal and nipple to cylinder body. Install spring pin using a pin punch.

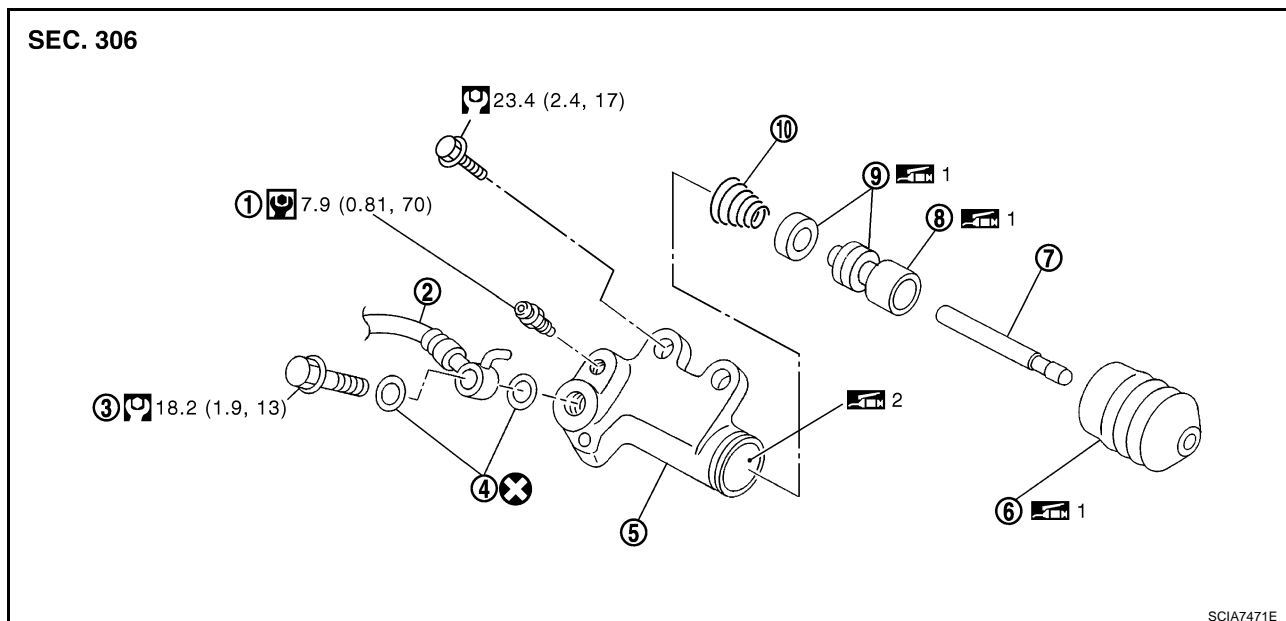
OPERATING CYLINDER

OPERATING CYLINDER

PFP:30620

Components

NCS0000B



- | | | |
|-------------------|------------------|---------------|
| 1. Air bleeder | 2. Clutch hose | 3. Union bolt |
| 4. Copper washer | 5. Cylinder body | 6. Dust cover |
| 7. Push rod | 8. Piston | 9. Piston cup |
| 10. Piston spring | | |

Refer to [GI-10, "Components"](#), and the followings for the symbols in the figure.

1: Apply rubber grease.

2: Apply rubber lubricant.

Removal and Installation

NCS001A2

REMOVAL

1. Drain clutch fluid.

CAUTION:

Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.

2. Remove clutch hose from the operating cylinder.
3. Remove operating cylinder mounting bolts and then remove operating cylinder from the vehicle.

INSTALLATION

To install, reverse the removal procedure, following the cautions below:

- Install hose with care so that it will not be bent or twisted. Refer to [CL-13, "Removal and Installation"](#).
- After completing the procedure, bleed the clutch hydraulic system. Refer to [CL-7, "Bleeding"](#).

Disassembly and Assembly

NCS0000C

DISASSEMBLY

- Remove dust cover and push rod. Remove piston, piston cup, and piston spring from inside the cylinder body.

INSPECTION AFTER DISASSEMBLY

Check for any of the conditions shown below. If any malfunction is found, replace the part concerned.

- Damage to cylinder inner surface or piston sliding surface. Foreign matter, wear, corrosion, or pin hole
- Settling of the spring
- Cracked or deformed dust cover

OPERATING CYLINDER

ASSEMBLY

1. Apply rubber lubricant to cylinder body inner surface and rubber grease to the piston cup and piston. Insert piston assembly and piston spring into the cylinder body.
2. Apply rubber grease to dust cover and install push rod and dust cover.

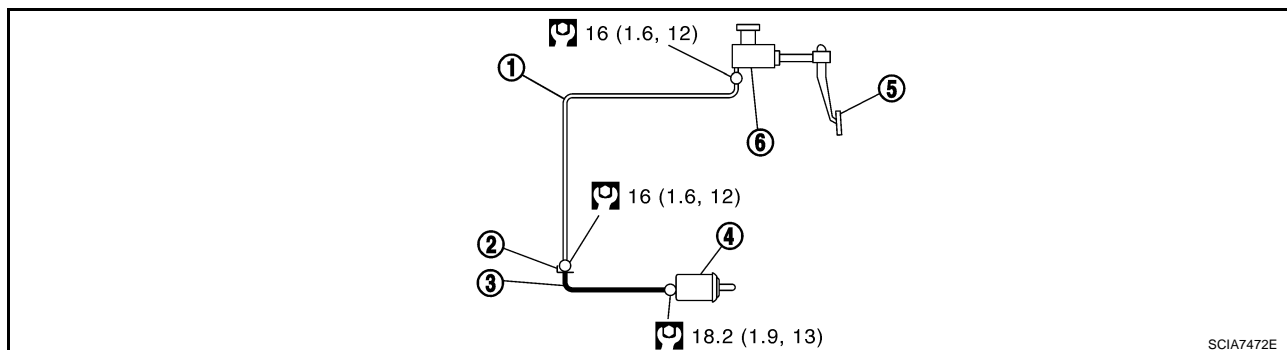
CLUTCH PIPING

CLUTCH PIPING

PFP:30650

Removal and Installation

NCS0000D

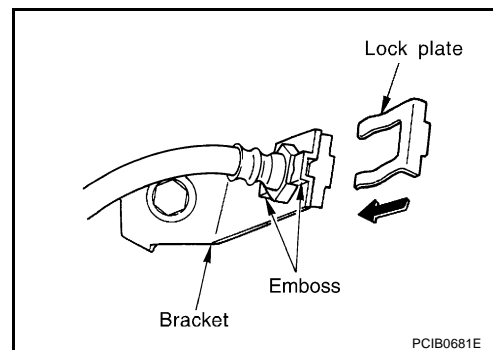


- | | | |
|-----------------------|-----------------|--------------------|
| 1. Clutch tube | 2. Lock plate | 3. Clutch hose |
| 4. Operating cylinder | 5. Clutch pedal | 6. Master cylinder |

Refer to [GI-10. "Components"](#), for the symbol in the figure.

Carefully observe the following steps during clutch tube removal and installation.

- Do not spill clutch fluid onto painted surfaces. If it spills, wipe up immediately and wash the affected area with water.
- When fixing clutch hose to bracket, align clutch hose metal fittings with bracket positioning emboss and lock plate to secure. At this time, prevent twisting or damage of clutch hose. In addition, be careful not to damage clutch hose.
- Tighten clutch tube flare nut to the specified torque.
CAUTION:
Be careful not to damage flare nut and clutch tube.
- Tighten the union bolt to the specified torque. Refer to [CL-11. "Components"](#).
CAUTION:
Do not reuse the copper washer.
- After installation, bleed the clutch hydraulic system. Refer to [CL-7. "Bleeding"](#).



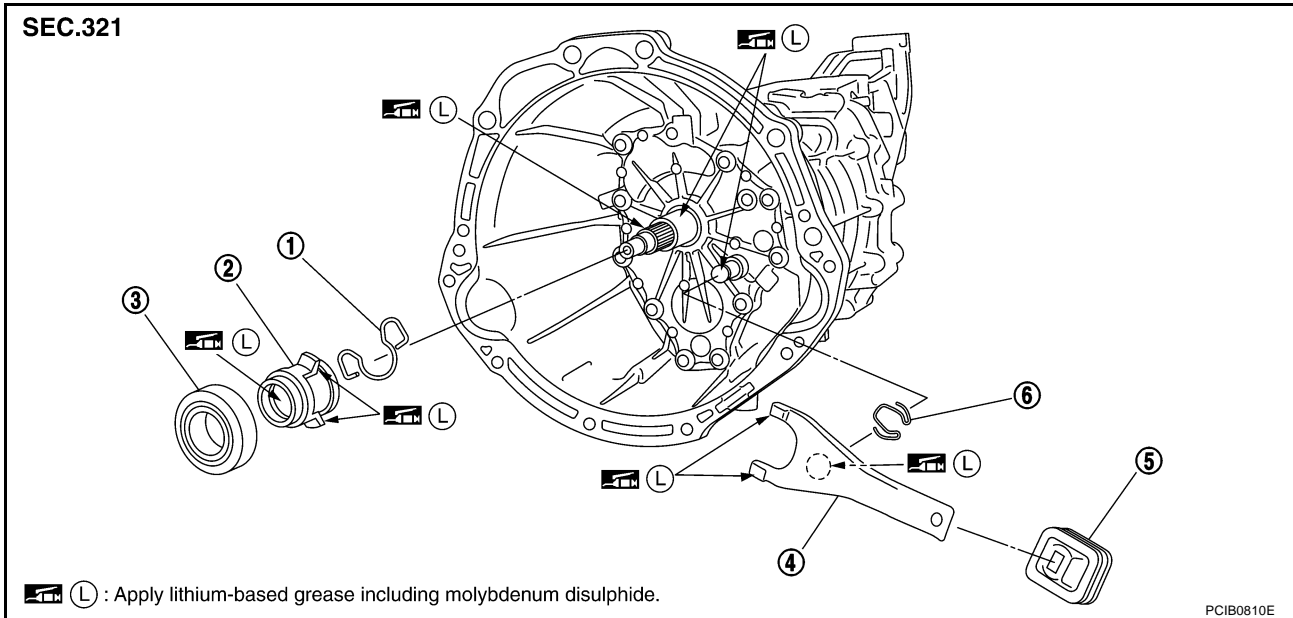
CLUTCH RELEASE MECHANISM

CLUTCH RELEASE MECHANISM

PFP:30502

Removal and Installation COMPONENTS

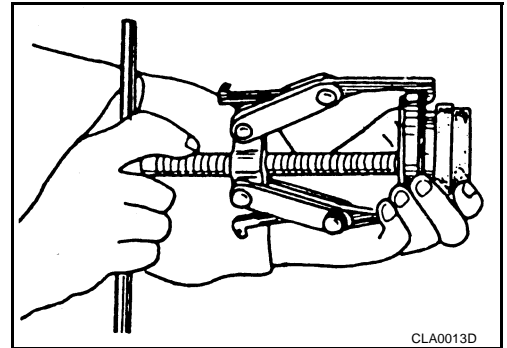
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- | | | |
|---------------------|---------------------------|--------------------|
| 1. Holder spring | 2. Release bearing sleeve | 3. Release bearing |
| 4. Withdrawal lever | 5. Dust cover | 6. Snap spring |

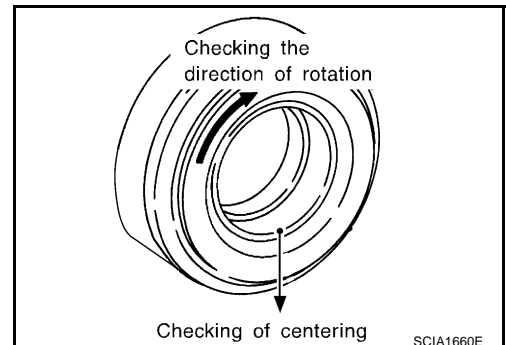
REMOVAL

1. Remove manual transmission from the vehicle. Refer to [MT-18, "Removal and Installation"](#).
2. Remove release bearing sleeve assembly, holder spring and withdrawal lever from inside the clutch housing.
3. Remove dust cover.
4. Remove snap spring from withdrawal lever.
5. Remove release bearing from release bearing sleeve using a puller.



INSPECTION AFTER REMOVAL

- If release bearing is seized, damaged, not properly centered or does not rotate smoothly, replace it.
- If contact surface of withdrawal lever is excessively worn out, replace it.
- If dust cover is cracked or deformed, replace it.



CLUTCH RELEASE MECHANISM

INSTALLATION

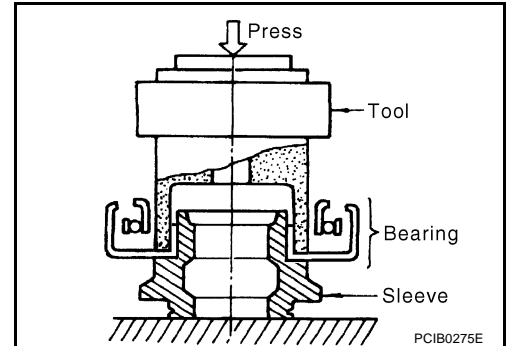
CAUTION:

- Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or quiver. Wipe off any grease oozing from the parts.
 - Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface and flywheel surface.
1. Install release bearing to release bearing sleeve using the drift.

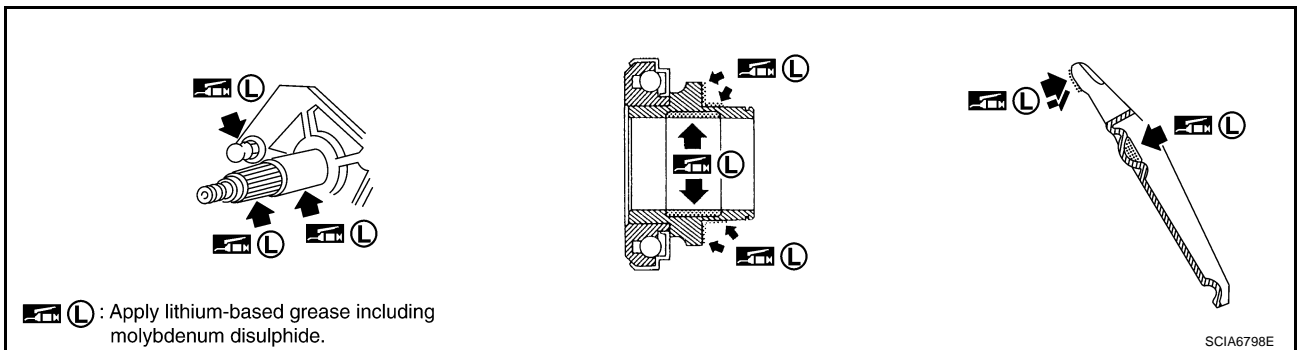
Tool number : KV30101400 (—)

CAUTION:

Press bearing inner race by pushing with the drift.



2. Following the instructions below, apply grease to the specified points.



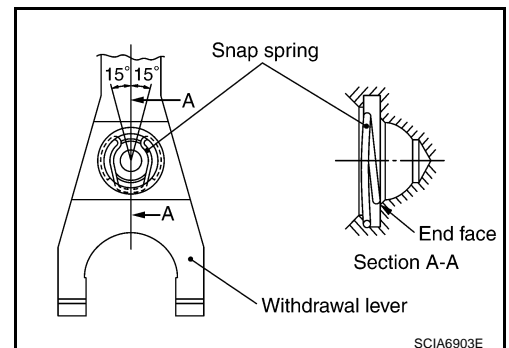
CAUTION:

Wipe off any old grease, debris, or powdery residue left on the surfaces.

- Evenly apply a 1 mm (0.04 in) thick coating of recommended grease to withdrawal lever and release bearing sleeve or holder spring sliding surface.
 - Apply recommended grease to ball pin contact surface of withdrawal lever and inner slots of release bearing. The grease surface should be level with the surrounding area.
 - Evenly apply a thin coat of recommended grease to release bearing sliding surface. Install release bearing. Wipe off any excess grease that oozes from the parts and then remove release bearing.
3. To install, reverse the removal procedure, following the cautions below.

CAUTION:

- Before installing manual transmission to the vehicle, check that each sliding surface slides smoothly by operating withdrawal lever.
- When assembling, make sure that both ends of snap spring touch the end face of withdrawal lever.
- Be careful with the orientation of installation.



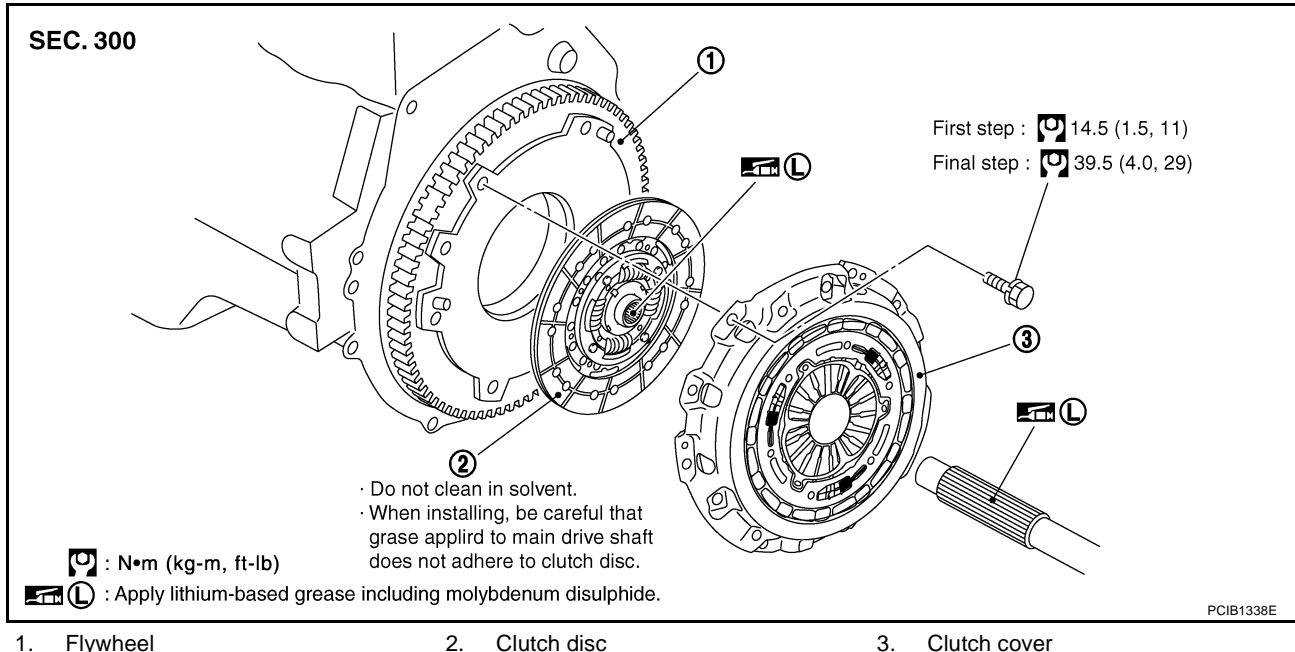
CLUTCH DISC, CLUTCH COVER

CLUTCH DISC, CLUTCH COVER

PFP:30100

Removal and Installation COMPONENTS

NCS0000G



CAUTION:

- Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface and flywheel surface.
- If flywheel is removed, align dowel pin with the smallest hole of flywheel. Refer to [EM-143, "ASSEMBLY"](#).
- Replace clutch disc and clutch cover as a set.

REMOVAL

1. Remove manual transmission from the vehicle. Refer to [MT-18, "Removal and Installation"](#).
2. Loosen clutch cover mounting bolts with power tool. Remove clutch cover and clutch disc.

INSPECTION AND ADJUSTMENT AFTER REMOVAL

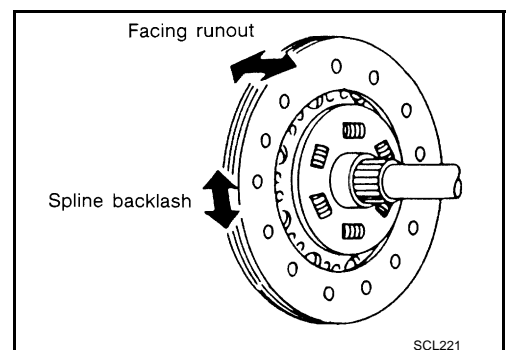
Clutch Disc

- Measure circumference runout relative to the clutch disc center spline. If it is outside the specification, replace clutch disc and clutch cover as a set.

Runout limit/diameter of the area to be measured
: 1.0 mm (0.039 in) or less/230 mm (9.06 in) dia.

- Measure backlash for clutch disc spline and main drive shaft spline at the circumference of the clutch disc. If it is outside the specified range, replace clutch disc and clutch cover as a set.

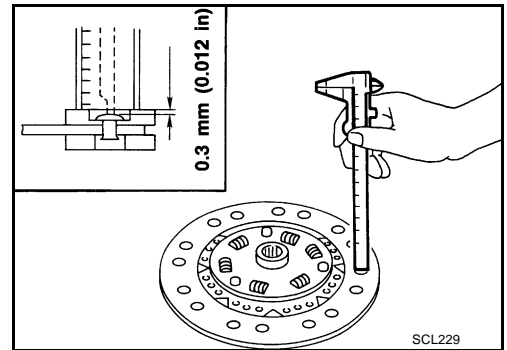
Maximum backlash of spline
: 1.0 mm (0.039 in)



CLUTCH DISC, CLUTCH COVER

- Using calipers, measure the depth to the clutch disc facing rivet heads. If it exceeds the allowable wear limit, replace clutch disc and clutch cover as a set.

Facing wear limit (depth to the rivet head)
: 0.3 mm (0.012 in)



Clutch Cover

Check diaphragm spring lever claws for unevenness with the lever still on the vehicle. If they exceed the tolerance, adjust lever height using the diaphragm adjusting wrench.

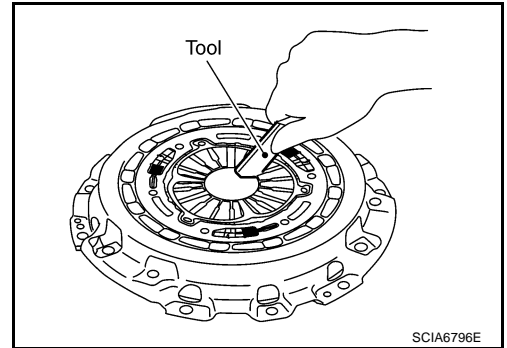
Tolerance for diaphragm spring lever unevenness
: 0.8 mm (0.031 in)

Tool number : ST20050240 (—)

- Check clutch cover thrust ring for wear or breakage. If wear or breakage is found, replace clutch disc and clutch cover as a set.

NOTE:

- Worn thrust ring will generate a beating noise when tapped at the rivet with a hammer.
- Broken thrust ring will make a clinking sound when cover is shaken up and down.
- If a trace of burn or discoloration is found on the clutch cover pressure plate to clutch disc contact surface, repair the surface with sandpaper. If surface is damaged or distorted, replace clutch disc and clutch cover as a set.



INSTALLATION

- Apply recommended grease to clutch disc and main drive shaft spline.

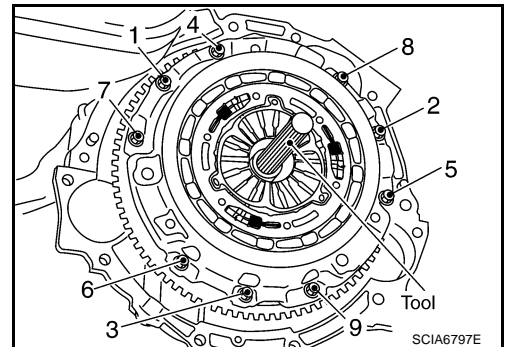
CAUTION:

Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or quiver. Wipe off any grease oozing from the parts.

- Install clutch disc and clutch cover. Pre-tighten mounting bolts and install clutch aligning bar.

Tool number : ST20670000 (—)

- Tighten clutch cover mounting bolts evenly in two steps in the order shown in the figure. Refer to [CL-16, "Removal and Installation"](#).
- Install manual transmission. Refer to [MT-18, "Removal and Installation"](#).



SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Clutch Control System

NCS0000H

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

Clutch Master Cylinder

NCS0000I

Unit: mm (in)

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

Clutch Operating Cylinder

NCS0000J

Unit: mm (in)

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

Clutch Disc

NCS0000K

Unit: mm (in)

| | |
|---|---------------------------------------|
| Model | 240 |
| Facing size (Outer dia. × inner dia. × thickness) | 240 × 160 × 3.8 (9.45 × 6.30 × 0.150) |
| Wear limit (depth to the rivet head) | 0.3 (0.012) |
| Runout limit/diameter of the area to be measured | 1.0 (0.039) or less/230 (9.06) dia. |
| Maximum backlash of spline (at outer edge disc) | 1.0 (0.039) |

Clutch Cover

NCS0000L

Unit: mm (in)

| | |
|---|-----------------------------|
| Set-load | 9,900 N (1,009.8 kg) |
| Diaphragm spring lever height | 41.9 - 44.1 (1.650 - 1.736) |
| Uneven limit of diaphragm spring toe height | 0.8 (0.031) |

Clutch Pedal

NCS0000M

Unit: mm (in)

| | |
|--|---------------------------|
| Clearance "C" between pedal stopper rubber and clutch interlock switch threaded while clutch pedal is fully depressed. | 0.1 - 1.0 (0.004 - 0.039) |
|--|---------------------------|