

SECTION

CL

CLUTCH

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PRECAUTIONS

PRECAUTIONS

PFP:00001

Caution

ECS008JC

- Recommended fluid is brake fluid “DOT 3”.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- 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.
- If manual transaxle is removed from the vehicle, always replace CSC (concentric slave cylinder). CSC insert is returned to original position to remove transaxle. Dust on clutch disc sliding parts may damage CSC seal and may cause clutch fluid leak.
- Do not disassemble master cylinder and CSC.

WARNING:

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

PREPARATION

PREPARATION

PFP:00002

Special Service Tools

ECS008JD

A

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D

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H



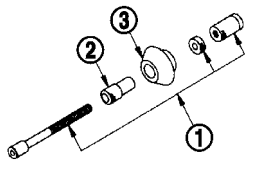
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K

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M

Tool number Tool name	Description
KV10110910 Ring gear stopper	Removing and Installing clutch cover
 ZZA1005D	
ST20050240 Diaphragm spring adjusting wrench	Inspecting clutch cover
 ZZA0508D	
EM07020000 Clutch aligner	Installing clutch cover and disc
 PCIB0017E	

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS008SM

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.

CLUTCH

Reference page		CL-5.	CL-7.	CL-8.	EM-65.	CL-9	CL-10.	CL-10.	CL-10.	CL-10.	CL-10.	CL-10.	CL-10.	CL-10.	CL-11.	CL-11.	CL-11.	CL-10
SUSPECTED PARTS (Possible cause)		CLUTCH PEDAL (Free play out of adjustment)	CLUTCH LINE (Air in line)	MASTER 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														
	Clutch noisy					1												
	Clutch slips	1									2	2			3		4	5
	Clutch does not disengage	1	2	3			5	5	5	5	5			5	6	6	7	

CLUTCH PEDAL

CLUTCH PEDAL

PFP:46540

On Board Inspection HEIGHT INSPECTION

ECS008JE

1. Make sure clutch pedal height H1 from upper surface of the dash panel is within the specified range.

Pedal height H1

: 164 - 174 mm (6.46 - 6.85 in)

2. If pedal height H1 is outside the specification, replace pedal assembly.
3. Make sure free play A at pedal pad top surface and pedal height H2 when clutch is disengaged are within the ranges specified below.

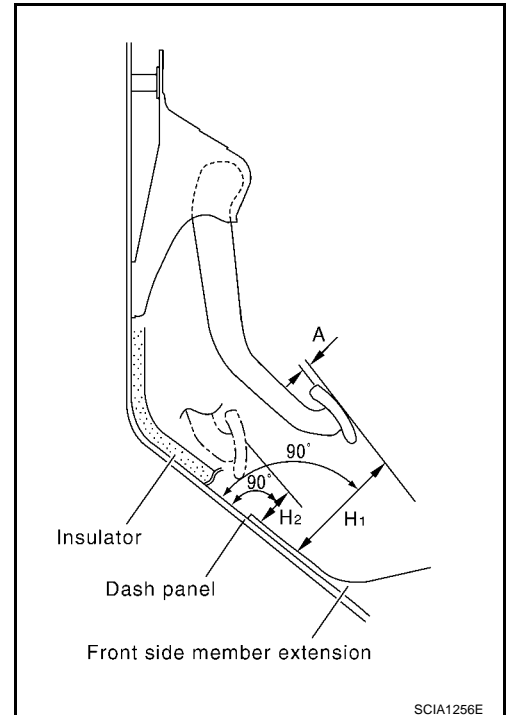
A: Pedal free play at the pedal pad

: 2 - 8 mm (0.08 - 0.31 in)

Pedal height H2 when clutch is disengaged

: 100 mm (3.94 in) or more

4. If free play A at pedal pad top surface and pedal height H2 when clutch is disengaged are outside the specification, replace clutch pedal assembly.

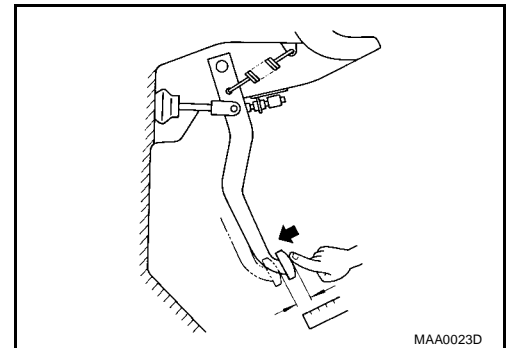


PLAY INSPECTION

- Press the clutch pedal by hand until certain resistance can be felt. Using a scale, Make sure the free play is within the specified range.

Pedal free play

: 2 - 8 mm (0.08 - 0.31 in)

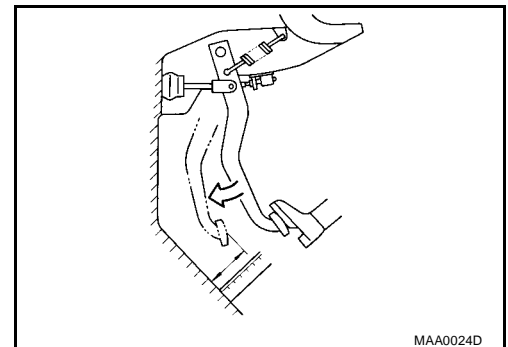


CLEARANCE CHECK

1. Start the engine and let it idle.
2. Apply parking brake.
3. Depress the brake pedal.
4. Fully depress clutch pedal and shift to 1st gear.
5. Release clutch pedal gradually. Using a scale, check the clearance between the clutch pedal and floor panel to see if it is within the specified range.

Pedal height when the clutch disengages

: 100 mm (3.94 in) or more



NOTE:

Pedal height at clutch disengagement varies slightly from the clutch engagement point. Despite this, pedal height at clutch engagement is commonly used for both cases in order to simplify the inspection.

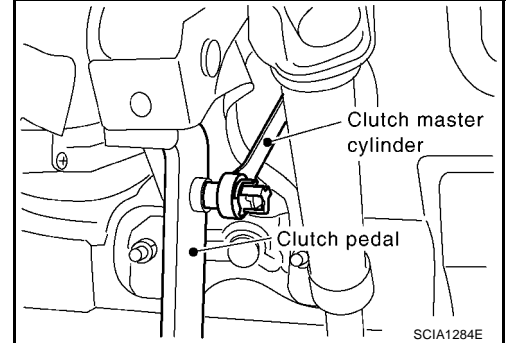
CLUTCH PEDAL

Removal and Installation

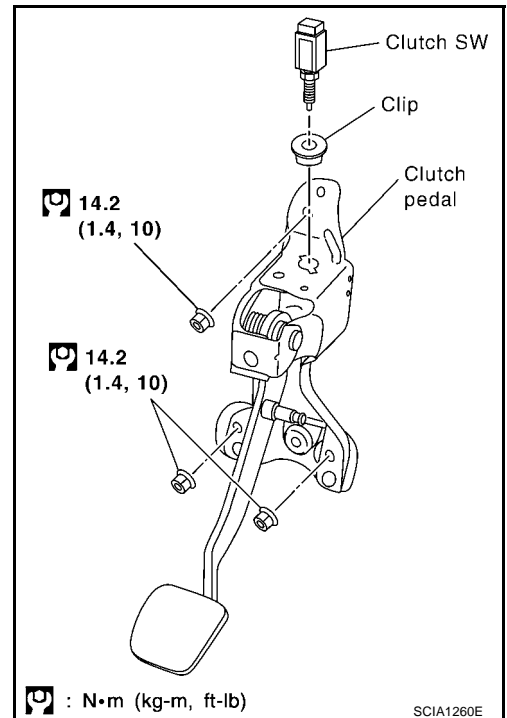
REMOVAL

ECS008JF

1. Remove instrument panel under tray. Refer to [IP-4, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Unlock master cylinder rod end and separate master cylinder from clutch pedal.
3. Remove clutch switch harness clamp from pedal bracket.
4. Disconnect clutch switch connector.



5. Remove nuts (3), and remove clutch pedal assembly.



INSPECTION AFTER REMOVAL

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

INSTALLATION

- Install in the reverse order of removal.

CLUTCH FLUID

CLUTCH FLUID

PFP:00017

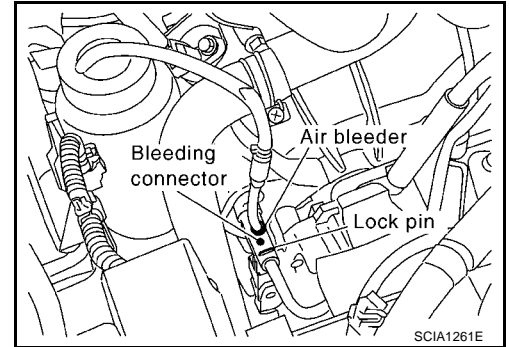
Air Bleeding Procedure

ECS008JG

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.
- Bleed the bleeding connector.

1. Fill the master cylinder reservoir tank with new clutch fluid.
2. Remove rubber cap and connect a transparent vinyl hose to air bleeder of bleeding connector.



3. Lift tube side lock pin of bleeding connector up one step.

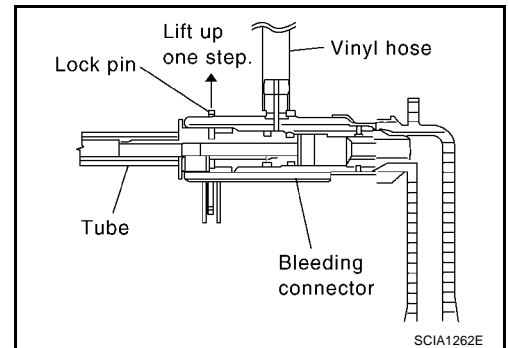
CAUTION:

Do not remove lock pin.

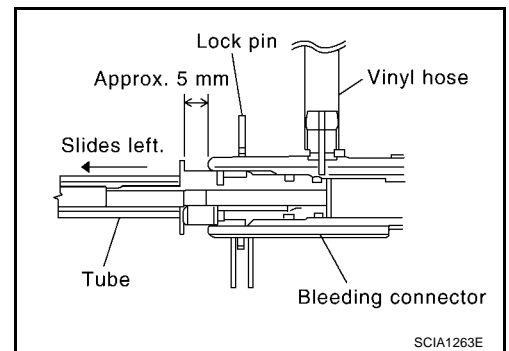
4. "Depress" and "release" the clutch pedal slowly and fully 15 times at an interval of 2 to 3 seconds and hold it.

CAUTION:

Hold it to prevent releasing tube from bleeding connector when fluid pressure is applied in the tube.



5. Slide tube 5 mm (0.20 in) to the direction shown by the arrow and drain clutch fluid.
6. Return tube to its original position.
7. Release clutch pedal and wait for 5 seconds.
8. Repeat steps 4 to 7 until no bubbles can be observed in the brake fluid.



CLUTCH MASTER CYLINDER

CLUTCH MASTER CYLINDER

PFP:30610

Removal and Installation

ECS008JH

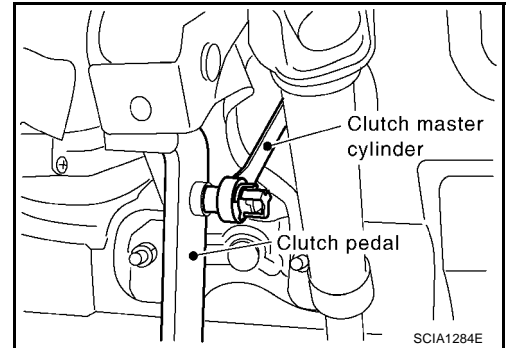
REMOVAL

1. Drain clutch fluid from reservoir tank and remove hose from the nipple.

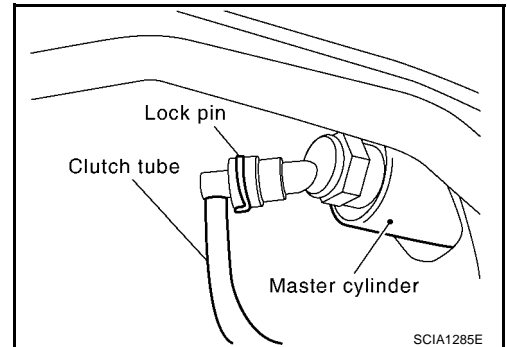
CAUTION:

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

2. Unlock master cylinder rod end in the passenger room and separate master cylinder from clutch pedal.

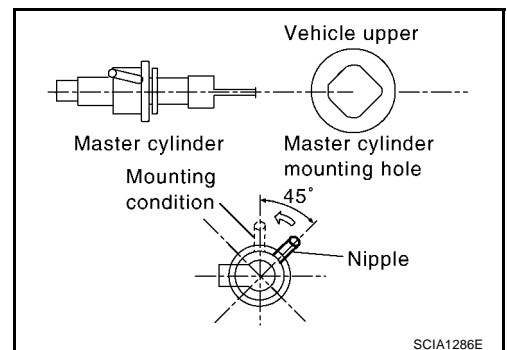


3. Remove lock pin from master cylinder and separate clutch tube.
4. Rotate master cylinder clockwise by 45° and remove from the vehicle.



INSTALLATION

1. Tilt master cylinder clockwise by 45° and insert to the mounting hole. Rotate counter clockwise and secure it. At this time, nipple is upward of the vehicle.
2. After finishing work, perform clutch pedal height inspection and clutch piping air bleeding.
 - Refer to [CL-5, "On Board Inspection"](#) , [CL-7, "Air Bleeding Procedure"](#)



CSC (CONCENTRIC SLAVE CYLINDER)

CSC (CONCENTRIC SLAVE CYLINDER)

PFP:30500

Removal and Installation

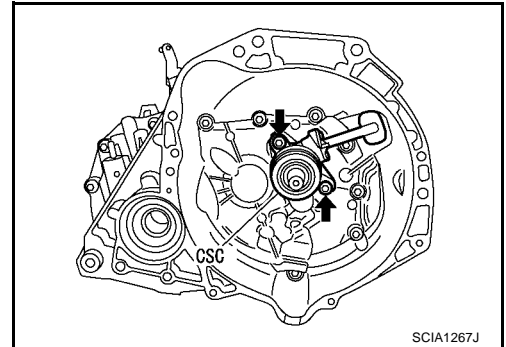
ECS008/JI

CAUTION:

If manual transaxle is removed from the vehicle, always replace CSC (concentric slave cylinder). CSC insert is returned to original position to remove transaxle. Dust on clutch disc sliding parts may damage CSC seal and may cause clutch fluid leak.

REMOVAL

1. Remove manual transaxle. Refer to [MT-12, "Removal and Installation From Vehicle"](#).
2. Remove bolts and CSC from manual transaxle.



INSTALLATION

1. Install new CSC to manual transaxle. Tighten to the specified torque.

Tightening torque

: 9.0 N·m (0.9 kg-m, 7 ft-lb)

CAUTION:

Do not insert and operate CSC because piston and stopper of CSC components may fall off.

2. Install manual transaxle to the vehicle. Refer to [MT-12, "Removal and Installation From Vehicle"](#).
3. Bleed air from the clutch piping. Refer to [CL-7, "Air Bleeding Procedure"](#).

CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

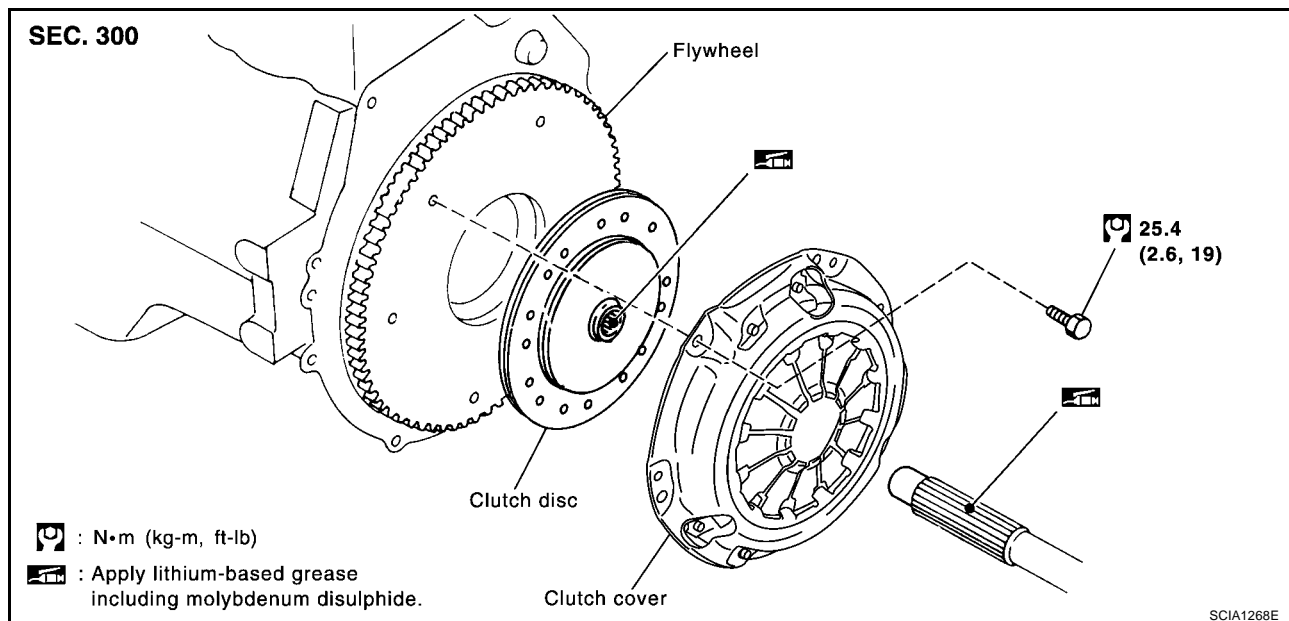
PFP:30100

Removal and Installation

ECS008JJ

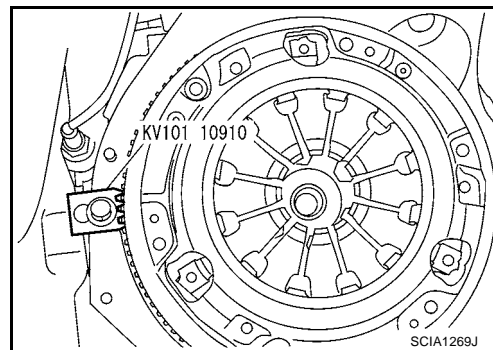
CAUTION:

- If manual transaxle is removed from the vehicle, always replace CSC (concentric slave cylinder). CSC insert is returned to original position to remove transaxle. Dust on clutch disc sliding parts may damage CSC seal and may cause clutch fluid leak.
- Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface, or flywheel surface.



REMOVAL

1. Remove manual transaxle from the vehicle. Refer to [MT-12, "Removal and Installation From Vehicle"](#).
2. Install a rear gear stopper adapter (SST).
3. Loosen clutch cover mounting bolts evenly. Remove clutch cover and clutch disc.

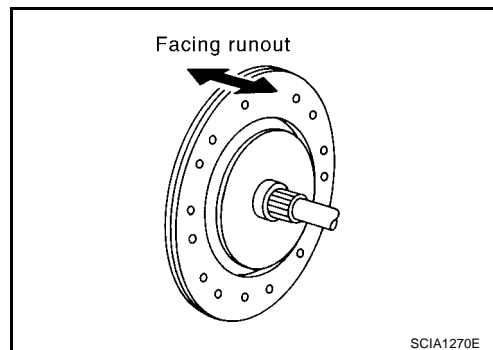


INSPECTION AND ADJUSTMENT AFTER REMOVAL

Clutch Disc

- Measure circumferential runout relative to the clutch disc center spline. If it is outside the specification, replace the clutch disc.

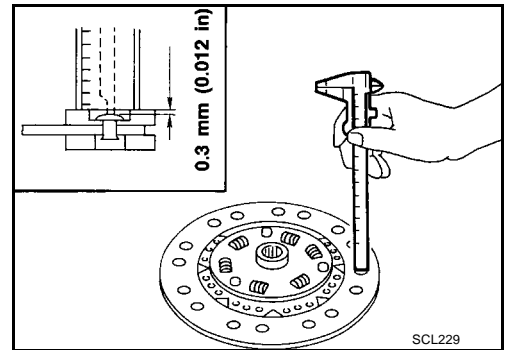
Runout limit/diameter of the area to be measured:
: 0.7 mm (0.028 in) or less/170
(6.69 in) mm dia.



CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

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

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



Clutch Cover

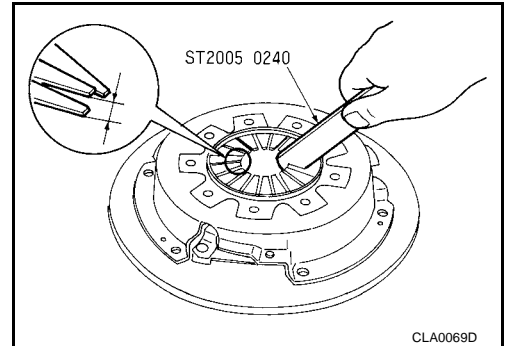
Check diaphragm spring lever claws for unevenness with the lever still on the vehicle. If they exceed the tolerance, adjust lever height using a diaphragm adjusting wrench (SST).

Tolerance for diaphragm spring lever unevenness
: 0.7 mm (0.028 in)

- Check clutch cover thrust ring for wear or breakage. If wear or breakage is found, replace clutch cover assembly.

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 the assembly.



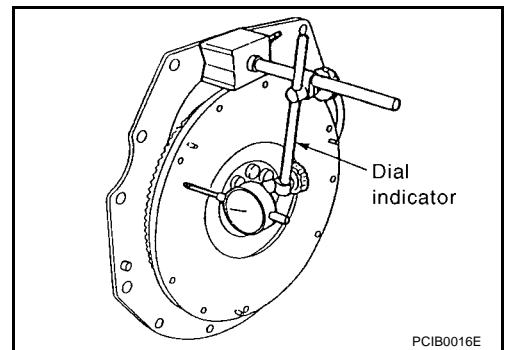
Flywheel Runout

Using a dial gauge, measure runout at the flywheel clutch contact surface. If runout is outside the specification, replace the flywheel. If a trace of burn or discoloration is found on the surface, repair it with sandpaper.

Flywheel surface runout
: EM-88, "FLYWHEEL RUNOUT"

CAUTION:

Measure it at flywheel outer face (not on knock pin and clutch cover mounting hole).



INSTALLATION

- Clean input shaft spline by removing grease and dust from wear.
- Apply recommended Grease to clutch disk and input shaft spline.

NOTE:

Applied amount of grease is 0.4 g. Film pressure is 1 mm (0.04 in) or less.

- Insert clutch disc to input shaft. Wipe off any grease oozing from the parts.

CAUTION:

- Excessive grease may cause slip or judder. And if it adheres to CSC seal, it cause clutch fluid leak. Wipe off excess grease.
- If grease is not applied, it may cause noise, poor disengagement, or damage to the clutch. Be sure to apply grease.

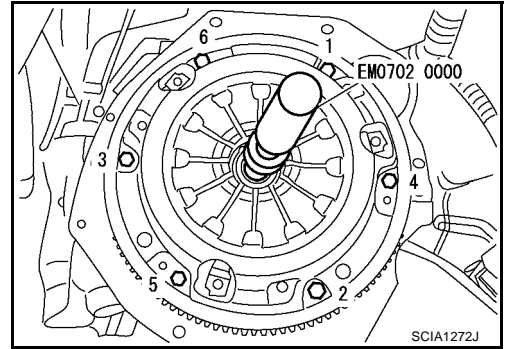
CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

4. Install clutch disc and clutch cover. Pre-tighten mounting bolts and install a clutch aligner (SST).
5. Tighten clutch cover attaching bolts evenly in two steps in the order shown in the figure.

Tightening torque

First step	: 9.9 - 19 N·m (1.0 - 2.0 kg-m, 8 - 14 ft-lb)
Final step	: 22 - 29 N·m (2.2 - 3.0 kg-m, 17 - 21 ft-lb)

6. Install manual transaxle. Refer to [MT-12, "Removal and Installation From Vehicle"](#).



SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Clutch Pedal

ECS008JK

Unit: mm (in)

Pedal height	164 - 174 (6.46 - 6.85)
Pedal height at clutch disengagement	100 (3.94) or more
Pedal free play	2 - 8 (0.08 - 0.31 in)

Clutch Disc

ECS008JL

Unit: mm (in)

Size	180 (7.09) dia.
Wear limit (depth to rivet head)	0.3 (0.012 in)
Runout limit/diameter of the area to be measured	0.7 (0.028 in) or less / 170 (6.69 in) dia.

Clutch Cover

ECS008JM

Unit: mm (in)

Size	190 (7.48 in) dia.
Diaphragm spring lever height	32.0 - 34.0 (1.26 - 1.34 in)
Uneven limit diaphragm spring toe height	0.7 (0.028 in) or less

Clutch Control System

ECS008SO

Type of clutch control	Hydraulic
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Clutch Master Cylinder

ECS008SP

Unit: mm (in)

Inner diameter	15.87 (5/8)
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SERVICE DATA AND SPECIFICATIONS (SDS)
