

SECTION **CL**
CLUTCH

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PRECAUTIONS

< SERVICE INFORMATION >

SERVICE INFORMATION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000004802358

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

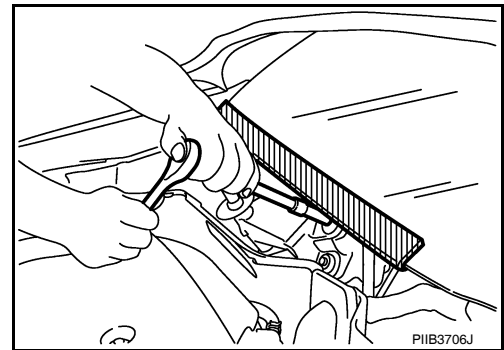
WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.
- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:000000004305163

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Service Notice or Precaution

INFOID:000000004305164

- Use recommended brake fluid when adding fluid to the clutch reservoir tank. Refer to [MA-14](#).
- Never reuse fluid drained from clutch system.
- 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 transaxle assembly is removed from the vehicle, always replace CSC (Concentric slave cylinder). Return CSC to original position to remove transaxle assembly. Dust on clutch disc sliding parts may damage CSC seal and may cause clutch fluid leakage.
- Do not disassemble clutch master cylinder and CSC.

WARNING:

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

PREPARATION


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PREPARATION

Special Service Tool

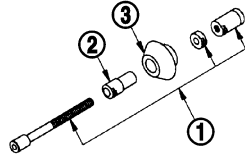
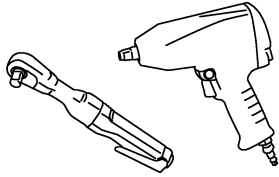
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The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST20050240 (—) Diaphragm spring adjusting wrench <div style="text-align: center;">  <p>ZZA0508D</p> </div>	Adjusting unevenness of diaphragm spring of clutch cover

Commercial Service Tool

INFOID:000000004305166

Tool name	Description
Clutch aligning bar <div style="text-align: center;">  <p>PCIB0017E</p> </div>	Installing clutch cover and clutch disc 1: Assembly 2: Sleeve 3: Adapter
Power tool <div style="text-align: center;">  <p>PBIC0190E</p> </div>	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000004305167

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-8	EM-195	CL-12	CL-15										EM-216	
Symptom		CLUTCH PEDAL (Inspection and adjustment)	CLUTCH LINE (Air in line)	ENGINE MOUNTING (Loose)	CSC (Concentric slave cylinder) (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)
SUSPECTED PARTS (Possible cause)	Clutch grabs/chatters			1			2			2	2	2			2		
	Clutch pedal spongy		1														
	Clutch noisy				1												
	Clutch slips	1								2	2			3		4	5
	Clutch does not disengage	1	2			5	5	5	5	5			5	6	6	7	

CLUTCH PEDAL

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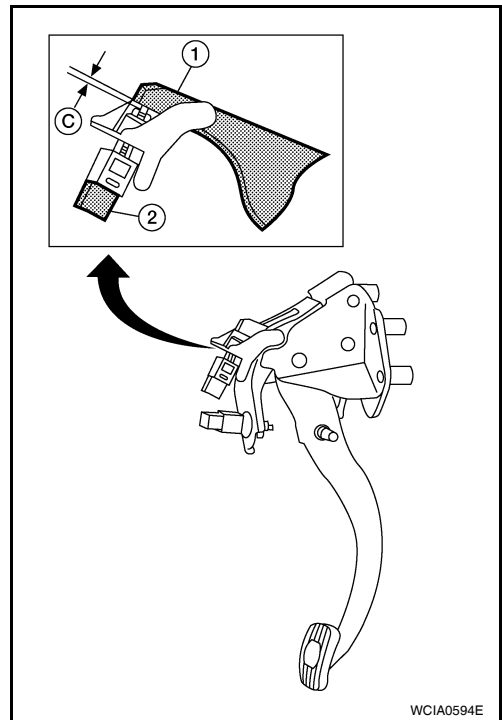
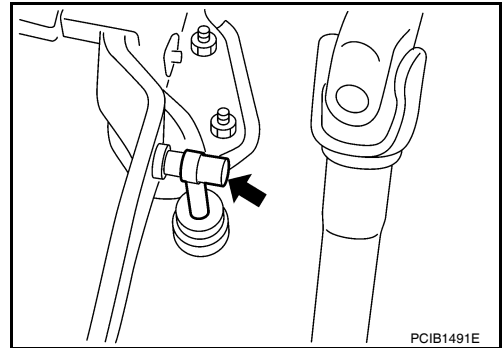
CLUTCH PEDAL

On-vehicle Inspection and Adjustment

INFOID:000000004305168

1. Check to see if the master cylinder rod end moves freely. It should not be bound by the clutch pedal.
 - a. If the rod end does not move freely, check that the ASCD switch, if equipped, is not applying pressure to the clutch pedal causing the rod end to bind. To adjust, disconnect the ASCD switch electrical connector and turn the ASCD switch.
 - b. Connect the ASCD switch electrical connector, if equipped.
 - c. Verify that the master cylinder rod end moves freely. It should not be bound by the clutch pedal.
 - d. If the rod end does not move freely, remove the rod end and check for deformation or damage on the rod end. Leave the rod end removed for step 2.
2. Check the clutch pedal stroke for free range of movement.
 - a. With the master cylinder rod end removed, manually move the pedal up and down to determine if it moves freely.
 - b. If any sticking is noted, replace the clutch pedal assembly. Re-verify that the master cylinder rod end moves freely.
3. Adjust clutch interlock switch (2) position so that clearance between clutch pedal (1) and thread end of clutch interlock switch (2), with clutch pedal fully depressed, is within specification (C).

Clearance C : 0.74 - 1.96 mm (0.0291 - 0.0772 in)



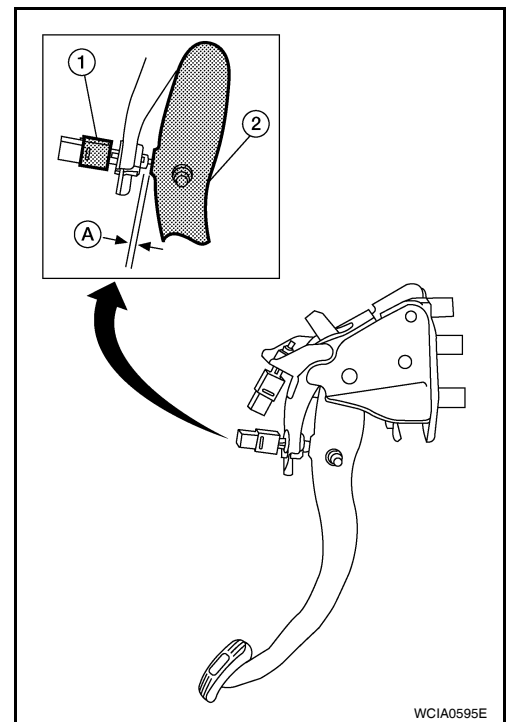
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CLUTCH PEDAL

< SERVICE INFORMATION >

4. Adjust ASCD clutch switch (1), if equipped. Position so that clearance between clutch pedal (2) and thread end of ASCD clutch switch (1), with clutch pedal fully released, is within specification (A).

Clearance A : 0.74 - 1.96 mm (0.0291 - 0.0772 in)



5. Check the clutch hydraulic system components (clutch master cylinder, clutch operating cylinder, clutch withdrawal lever and clutch release bearing) for sticking or binding.
 - a. If any sticking or binding is noted, repair or replace the related parts as necessary.
 - b. If any hydraulic system repair was necessary, bleed the clutch hydraulic system. Refer to [CL-8. "Air Bleeding Procedure"](#).

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 of the air from the system.

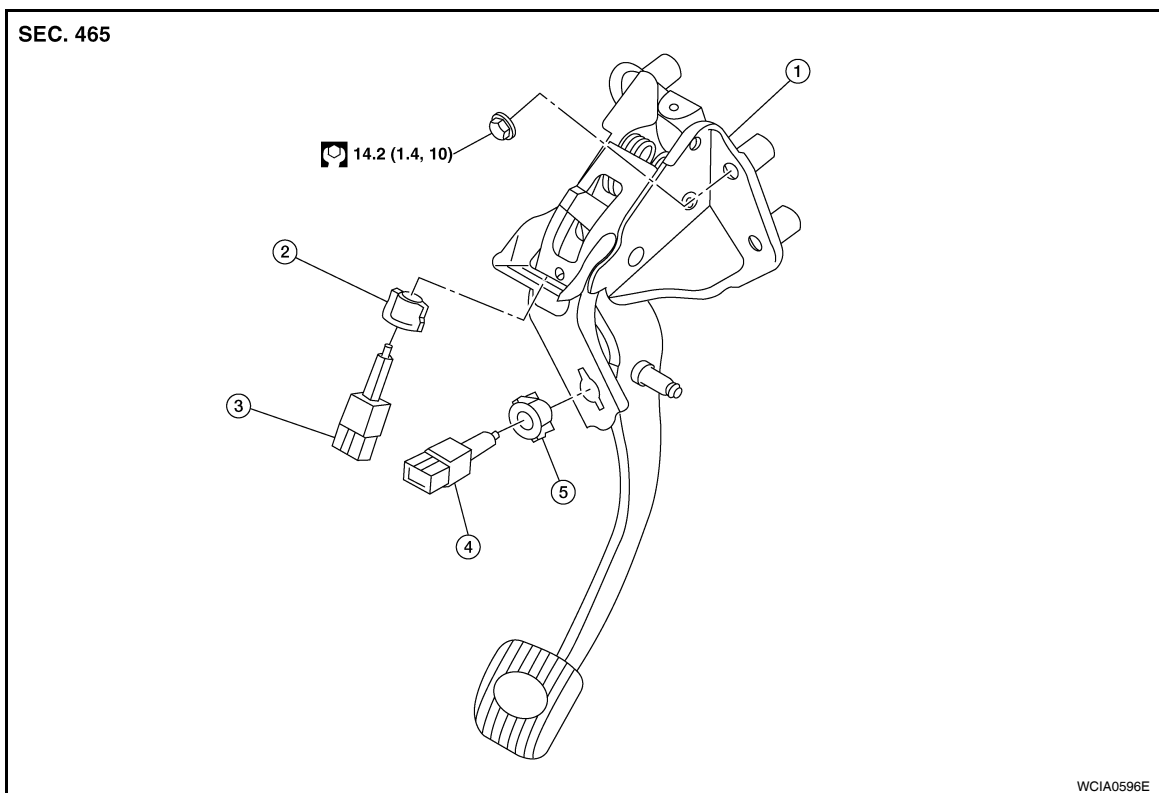
Removal and Installation

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COMPONENTS

CLUTCH PEDAL

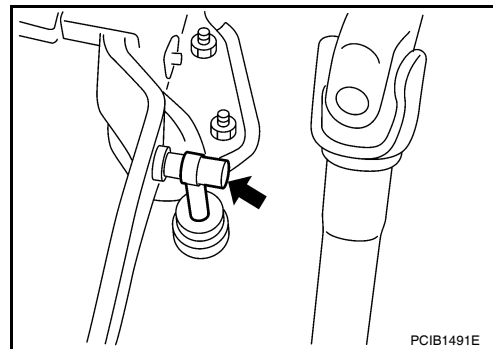
< SERVICE INFORMATION >



- | | | |
|--------------------------|-------------|----------------------------|
| 1. Clutch pedal assembly | 2. Lock nut | 3. Clutch interlock switch |
| 4. ASCD clutch switch | 5. Lock nut | |

REMOVAL

1. Remove instrument lower finisher. Refer to [IP-12, "Removal and Installation"](#).
2. Disconnect clutch interlock switch and ASCD clutch switch harness connectors, if equipped.
3. Remove clutch switch harness clamp from clutch pedal assembly.
4. Disconnect master cylinder rod end from clutch pedal lever.
5. Remove clutch pedal assembly nuts, and then remove 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 clutch pedal assembly.

INSTALLATION

Installation is in the reverse order of removal.

- After installing the clutch switches, adjust the switch positions. Refer to [CL-5, "On-vehicle Inspection and Adjustment"](#).

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CLUTCH FLUID

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CLUTCH FLUID

Air Bleeding Procedure

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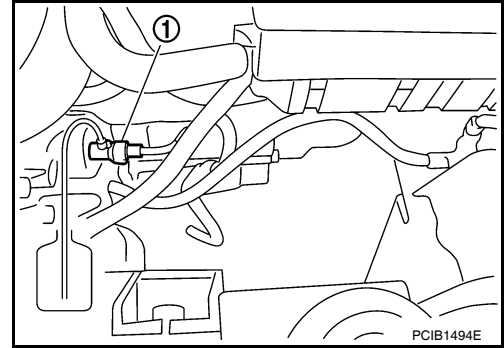
CAUTION:

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.
- Carefully monitor fluid level in reservoir tank during bleeding operation.

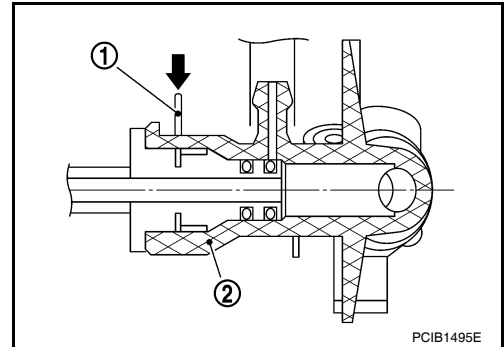
1. Fill master cylinder reservoir tank with new clutch fluid.
2. Connect a transparent vinyl tube and container to the bleeding connector (1) on the CSC.
3. Depress and release the clutch pedal slowly and fully 15 times at an interval of two to three seconds and release the clutch pedal.



4. Push in the lock pin (1) of the bleeding connector (2), and maintain the position.
 - RS5F91R transaxle models

CAUTION:

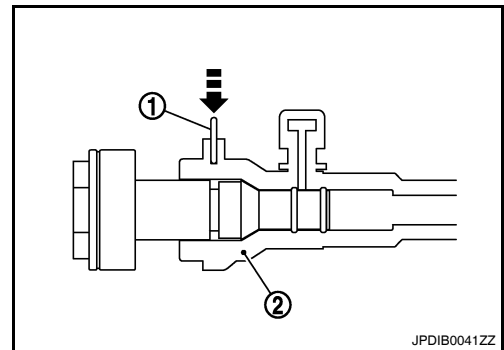
Hold the lock pin in to prevent the bleeding connector from separating when fluid pressure is applied.



- RS6F94R transaxle models

CAUTION:

Hold the lock pin in to prevent the bleeding connector from separating when fluid pressure is applied.

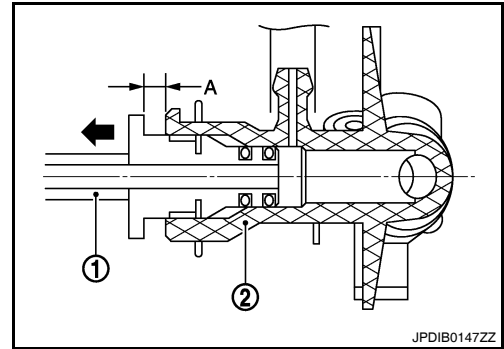


CLUTCH FLUID

< SERVICE INFORMATION >

- Slide the clutch tube (1) in the direction of the arrow as shown to the dimension (A). (For RS5F91R transaxle models)
2: bleeding connector

Dimension (A) : 5 mm (0.20 in)



- Slide bleeding connector (1) in the direction of the arrow as shown to the dimension (A). (For RS6F94R transaxle models)
2: clutch housing

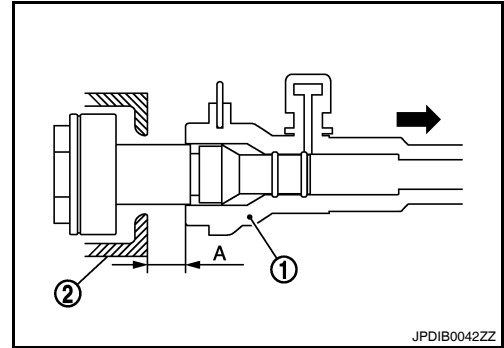
Dimension (A) : 10 mm (0.39 in)

- Depress the clutch pedal soon and hold it, and then bleed air from the piping. wait for 5 seconds.

CAUTION:

Hold the clutch pedal down to prevent air from getting back into the clutch system.

- Return the clutch tube and lock pin to their original positions.
- Release clutch pedal and wait for 5 seconds.
- Repeat steps 3 to 8 until no bubbles are observed in the clutch fluid.



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CLUTCH MASTER CYLINDER

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CLUTCH MASTER CYLINDER

Removal and Installation

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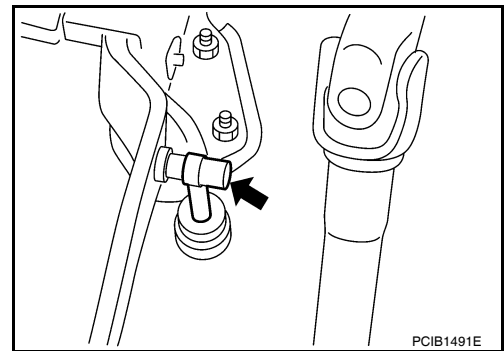
REMOVAL

1. Remove the battery, battery tray and brackets. Refer to [SC-5](#).
2. Remove the air cleaner and air duct. Refer to [EM-26, "Removal and Installation"](#) (HR16DE models), [EM-139, "Removal and Installation"](#) (MR18DE models).
3. Use one of the following methods to remove hose from master cylinder.
 - Drain clutch fluid from reservoir tank and remove hose.
 - Remove hose from master cylinder. Immediately plug hose and reservoir tank to prevent clutch fluid from dripping.

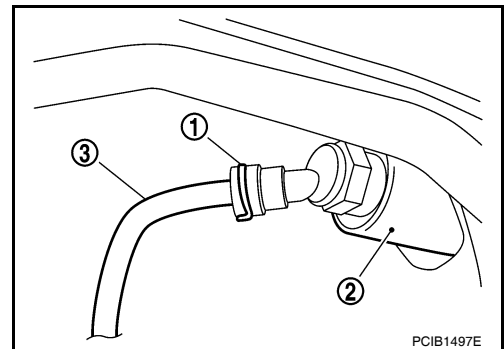
CAUTION:

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

4. Remove master cylinder rod end from clutch pedal assembly.



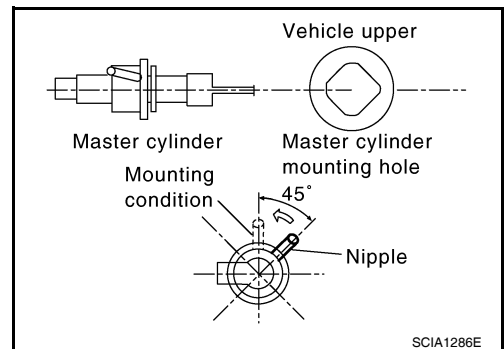
5. Remove lock pin (1) from connector of master cylinder (2) and separate clutch tube (3).



6. Rotate master cylinder clockwise by 45° and remove from the vehicle.

INSTALLATION

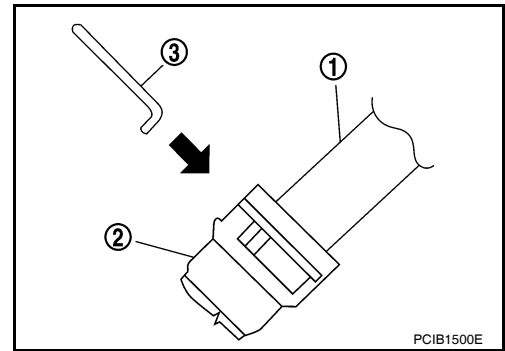
1. Tilt master cylinder clockwise by 45° and insert it in the mounting hole. Rotate counterclockwise to secure it. At this time, nipple is in the up position.
2. Install master cylinder rod end to clutch pedal.



CLUTCH MASTER CYLINDER

< SERVICE INFORMATION >

3. Install clutch tube (1) fully into connector of master cylinder (2).
4. Install lock pin (3) fully into connector of master cylinder (2).
5. Fill with new clutch fluid and bleed air from the system. Refer to [CL-8](#).
6. After completing this procedure, inspect clutch pedal operation. Refer to [CL-5, "On-vehicle Inspection and Adjustment"](#).
7. Install the air cleaner and air duct. Refer to [EM-26, "Removal and Installation"](#) (HR16DE models), [EM-139, "Removal and Installation"](#) (MR18DE models).
8. Install the battery. Refer to [SC-5](#).



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CSC (CONCENTRIC SLAVE CYLINDER)

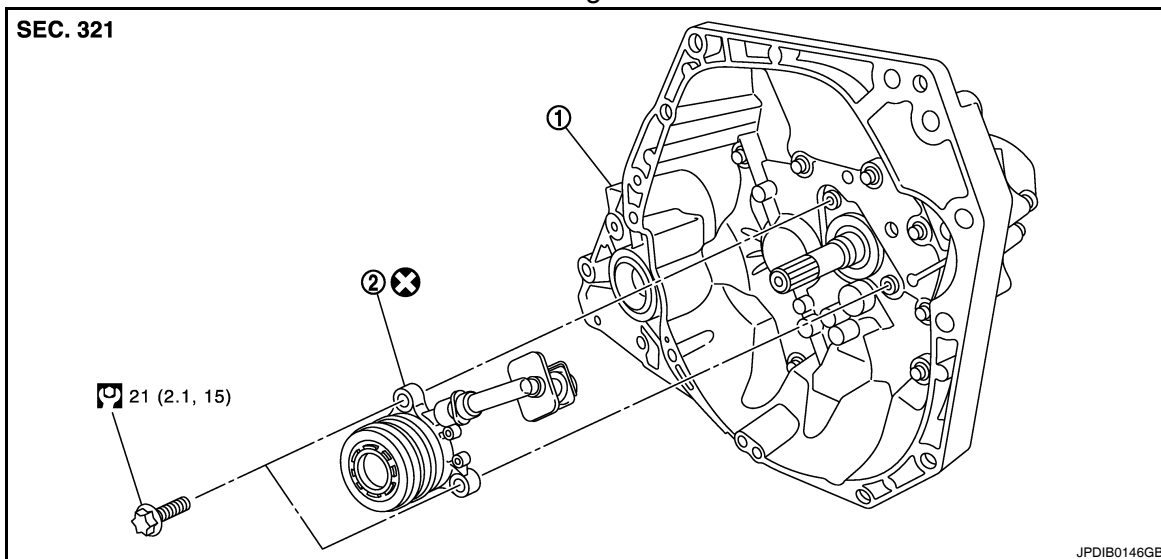
< SERVICE INFORMATION >

CSC (CONCENTRIC SLAVE CYLINDER)

Exploded View

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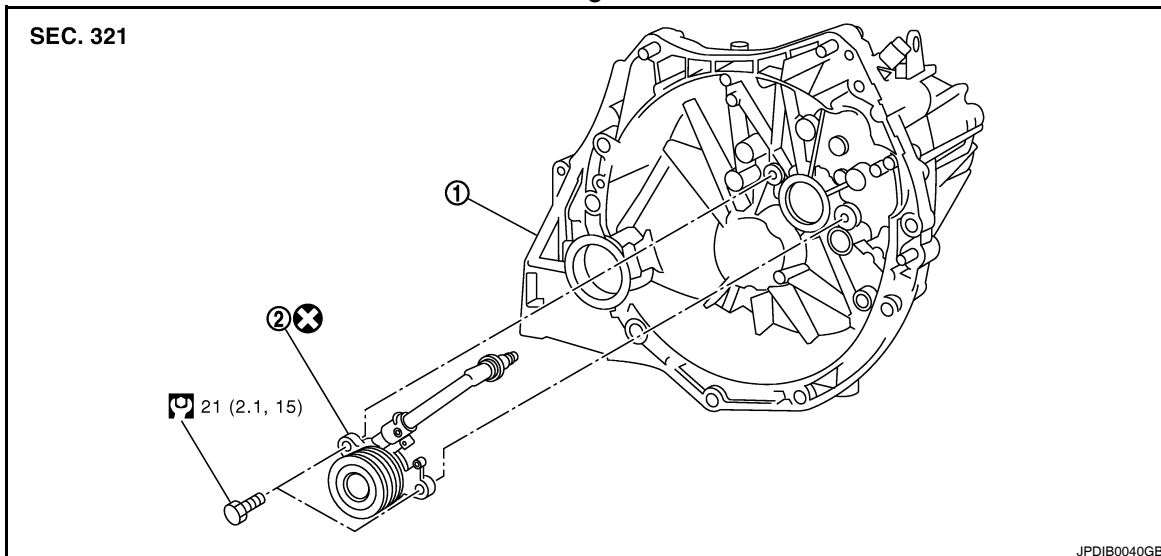
HR16DE engine models



1. Transaxle assembly

2. CSC (Concentric Slave Cylinder)

MR18DE engine models



1. Transaxle assembly

2. CSC (Concentric Slave Cylinder)

CAUTION:

- Never reuse CSC (Concentric Slave Cylinder). Because CSC slides back to the original position every time when removing transaxle assembly. At this timing, dust on the sliding parts may damage a seal of CSC and may cause clutch fluid leakage.
- Never disassemble CSC.
- Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.

Removal and Installation

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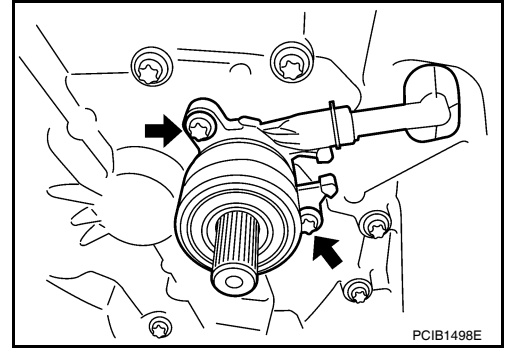
REMOVAL

1. Remove transaxle assembly. Refer to [EM-88. "Removal and Installation"](#) (HR16DE models), [EM-195. "Removal and Installation"](#) (MR18DE models).

CSC (CONCENTRIC SLAVE CYLINDER)

< SERVICE INFORMATION >

2. Remove CSC bolts and the CSC from clutch housing.



INSTALLATION

1. Install CSC to clutch housing and then tighten bolts to specification. Refer to [MT-59, "Disassembly and Assembly"](#).
CAUTION:
 - Do not reuse CSC.
 - Do not insert and operate CSC because piston and stopper of CSC components may fall off.
2. Install transaxle assembly. Refer to [EM-88, "Removal and Installation"](#) (HR16DE models), [EM-195, "Removal and Installation"](#) (MR18DE models).
3. Bleed the air from the clutch hydraulic system. Refer to [CL-8, "Air Bleeding Procedure"](#).

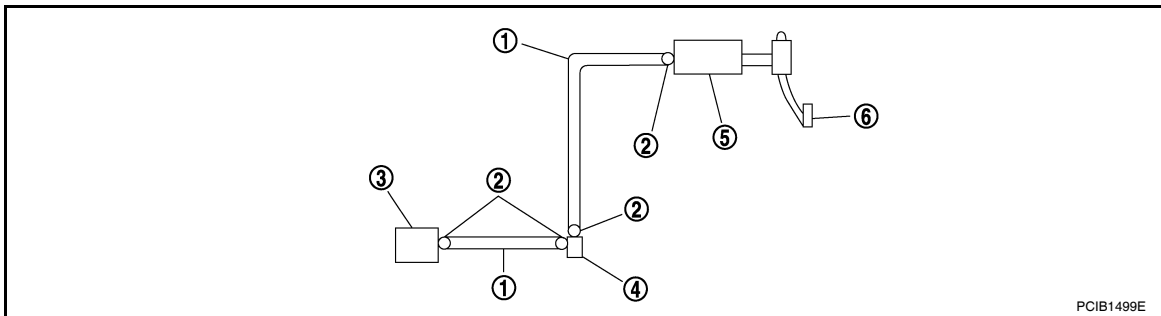
CLUTCH PIPING

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CLUTCH PIPING

Removal and Installation

INFOID:000000004305173



- | | | |
|------------------|---------------------------|-----------------|
| 1. Clutch tube | 2. Clutch tube lock pin | 3. CSC |
| 4. Clutch damper | 5. Clutch master cylinder | 6. Clutch pedal |

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

CAUTION:

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

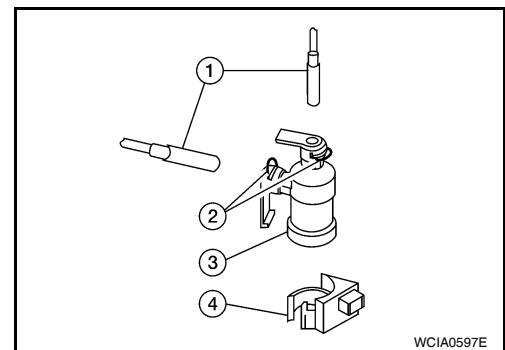
REMOVAL

1. Remove the battery, battery tray and brackets. Refer to [SC-5](#).
2. Remove the air cleaner and air duct. Refer to [EM-26, "Removal and Installation"](#) (HR16DE models), [EM-139, "Removal and Installation"](#) (MR18DE models).
3. Use one of the following methods to remove hose from clutch master cylinder.
 - Drain clutch fluid from reservoir tank and remove hose.
 - Remove hose from clutch master cylinder. Immediately plug hose and reservoir tank to prevent clutch fluid from dripping.

CAUTION:

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

4. Remove clutch tube lock pin from clutch master cylinder.
5. Remove clutch tube lock pin at clutch housing.
6. Remove clutch tube lock pins (2) from clutch damper (3).
7. Remove clutch tube (1) from clutch damper (3).
8. Remove clutch damper (3) from bracket (4).



INSTALLATION

Installation is in the reverse order of removal.

- **Make sure that all tubes are fully installed into connectors.**
- **Make sure that all connector lock pins are fully installed.**
- After installation, bleed the air from the clutch hydraulic system. Refer to [CL-8, "Air Bleeding Procedure"](#).

CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

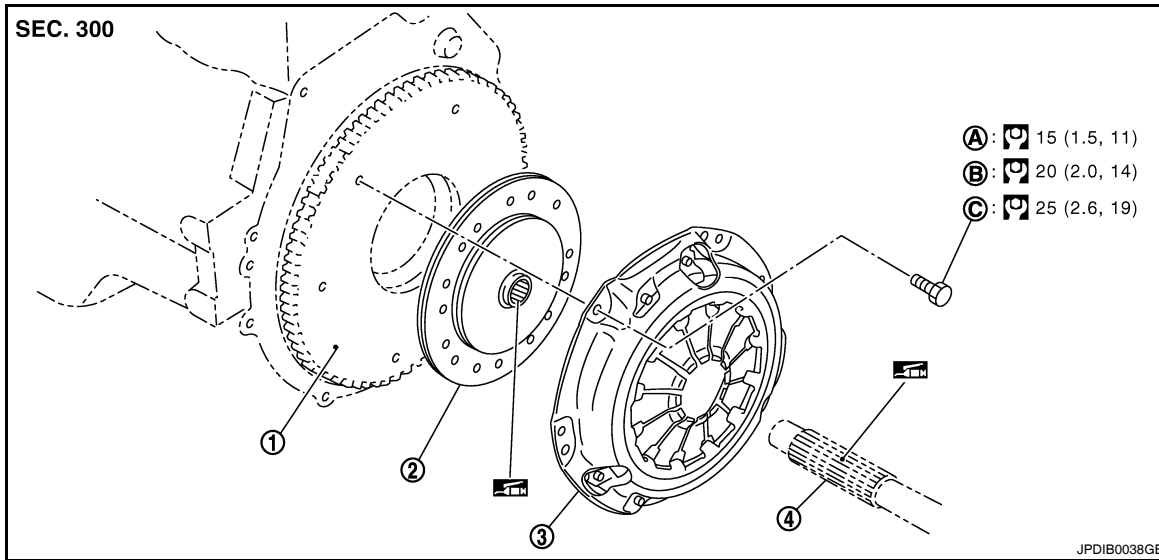
< SERVICE INFORMATION >

CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

Removal and Installation

INFOID:000000004305174

COMPONENTS



- | | | |
|----------------|--|--------------------------------------|
| 1. Flywheel | 2. Clutch disc | 3. Clutch cover |
| 4. Input shaft | A. First step (MR18DE engine models) | B. First step (HR16DE engine models) |
| C. Final step | ■ Apply lithium-based grease including molybdenum disulphide | |

CAUTION:

- Never reuse CSC (Concentric Slave Cylinder). Because CSC slides back to the original position every time when removing transaxle assembly. At this timing, dust on the sliding parts may damage a seal of CSC and may cause clutch fluid leakage. Refer to [CL-12, "Removal and Installation"](#).
- Never bring any grease to the clutch disc facing, pressure plate surface and flywheel surface.
- When installing, be careful that grease applied to input shaft does not adhere to clutch disc.
- Never clean clutch disc using solvent.

REMOVAL

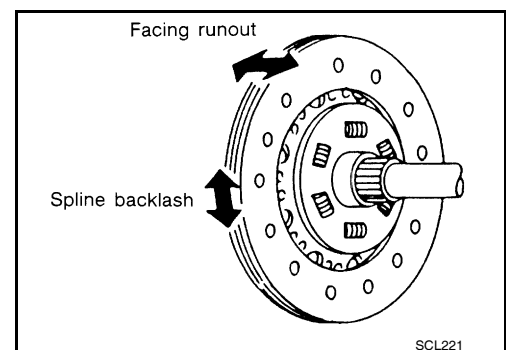
1. Remove transaxle assembly from the vehicle. Refer to [MT-16, "Removal and Installation"](#) (RS5F91R models), [MT-58, "Removal and Installation"](#) (RS6F94R models).
2. Loosen clutch cover bolts evenly. Then remove clutch cover and clutch disc.

INSPECTION AND ADJUSTMENT AFTER REMOVAL

Clutch Disc

- Measure clutch disc runout and spline backlash. If either measurement exceeds the specification, replace clutch disc.

Runout and backlash : Refer to [CL-18, "Clutch Disc"](#).



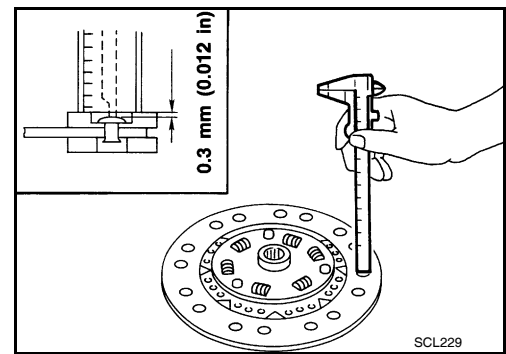
- Check clutch disc for burns, discoloration or oil or grease leakage. Replace if necessary.

CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

< SERVICE INFORMATION >

- Determine the wear limit of clutch facing (depth to the rivet head). If measurement exceeds specifications, replace clutch disc.

Clutch facing wear : Refer to [CL-18, "Clutch Disc"](#).



Clutch Cover

- Check clutch cover installed on vehicle for unevenness of diaphragm spring toe height. If unevenness exceeds specifications, adjust the height using Tool (A).

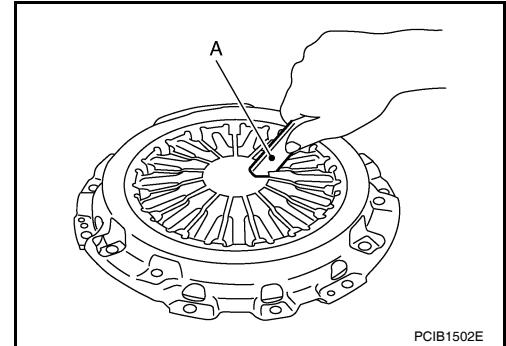
Uneven limit of diaphragm spring toe height : Refer to [CL-18, "Clutch Cover"](#).

Tool number A : ST20050240 (—)

- 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 using suitable tool.
- 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 clutch cover pressure plate to clutch disc contact surface, repair the surface with sandpaper. If surface is damaged or distorted, replace the assembly.

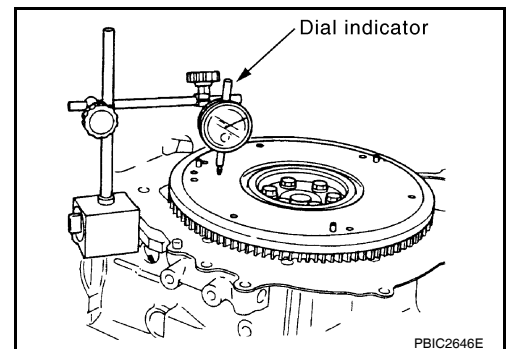


Flywheel Runout

- Check contact surface of flywheel for slight burns or discoloration. Repair flywheel with emery paper.
- Check the flywheel runout. Refer to [EM-103, "Inspection"](#) (HR16DE models), [EM-216, "Inspection After Disassembly"](#) (MR18DE models).

CAUTION:

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



INSTALLATION

1. Clean clutch disc and input shaft splines to remove grease and dust caused by abrasion.
2. Apply recommended grease to clutch disc and input shaft splines.

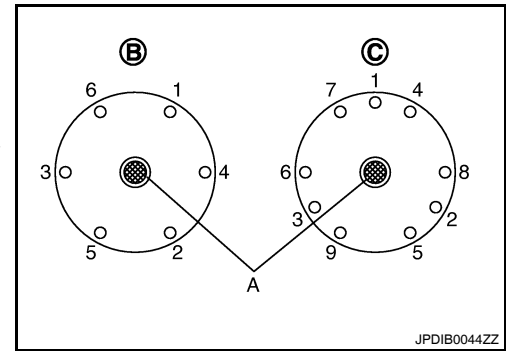
CAUTION:

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 shudder. If it adheres to CSC seal, it will cause clutch fluid leakage. Wipe off excess grease.

CLUTCH DISC, CLUTCH COVER AND FLYWHEEL

< SERVICE INFORMATION >

3. Install clutch disc using suitable clutch aligner (A).
 - B: HR16DE
 - C: MR18DE
4. Install clutch cover. Pre-tighten clutch cover bolts.
5. Tighten clutch cover bolts evenly in two steps in the order shown.
6. Install transaxle assembly. Refer to [MT-58. "Removal and Installation"](#).



A

B

CL

D

E

F

G

H

I

J

K

L

M

N

O

P

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE INFORMATION >

SERVICE DATA AND SPECIFICATIONS (SDS)

Clutch Control System

INFOID:000000004305175

Type of clutch control	Hydraulic
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Clutch Pedal

INFOID:000000004305176

Clearance (A) between clutch pedal and ASCD switch threaded end while clutch pedal is fully released (if equipped).	0.74 - 1.96 mm (0.0291 - 0.0772 in)
Clearance (C) between clutch pedal and clutch interlock switch threaded end while clutch pedal is fully depressed.	0.74 - 1.96 mm (0.0291 - 0.0772 in)

Clutch Disc

INFOID:000000004305177

Engine type	HR16DE	MR18DE
Model	200	225
Facing size (outer dia. × inner dia. × thickness)	200 mm × 140 mm × 3.1 mm (7.87 in × 5.51 in × 0.122 in)	225 mm × 160 mm × 3.2 mm (8.86 in × 6.30 in × 0.126 in)
Thickness of disc assembly with load	7.1 - 7.5 mm (0.280 - 0.295 in) with 4,658 N (475 kg, 1,047 lb)	7.2 - 7.6 mm (0.283 - 0.299 in) with 5,394 N (550 kg, 1,213 lb)
Runout limit/diameter of the area to be measured	1.0 mm (0.039 in) / 190 mm (7.48 in) dia	1.0 mm (0.039 in) / 215 mm (8.46 in) dia.
Maximum spline backlash (at outer edge of disc)	0.8 mm (0.031 in)	0.9 mm (0.035 in)
Wear limit of facing (depth to the rivet head)	0.3 mm (0.012 in)	0.3 mm (0.012 in)

Clutch Cover

INFOID:000000004305178

Engine type	HR16DE	MR18DE
Set-load	4,658 N (475.1 kg, 1,047.1 lb)	5,394 N (550 kg, 1,213 lb)
Diaphragm spring lever height	29 - 31 mm (1.14 - 1.22 in)	20 - 22 mm (0.79 - 0.87 in)
Uneven limit of diaphragm spring toe height	0.7 mm (0.028 in) or less	0.7 mm (0.028 in) or less