SECTION CL
CLUTCH

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000010745311

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. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never 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.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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 Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000010745312

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Before removing and installing any control units, first turn the ignition power source and accessory power source to the OFF, then disconnect both battery cables.**
- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**
- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Open driver door.
3. Turn the ignition switch to the ON position.
   (At this time, the steering lock will be released.)
4. Turn the ignition switch to OFF position with driver door open.
5. Wait for 3 minutes or longer with driver door open.
   NOTE:
   - Do not close driver door because the steering wheel locks when driver door is closed.

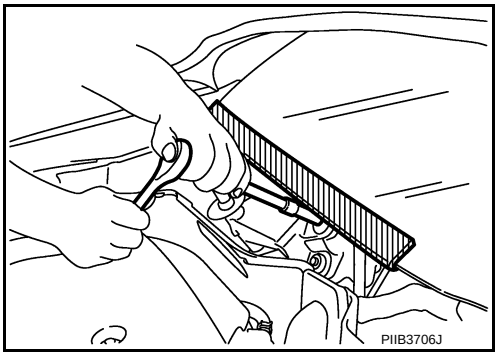
- The auto acc function is adapted to this vehicle. For this reason, even when the ignition switch is turned to OFF position, the accessory power source does not turned OFF and continues to be supplied for a certain amount of time.

6. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
7. Perform the necessary repair operation.
8. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from OFF position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
9. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000010745313

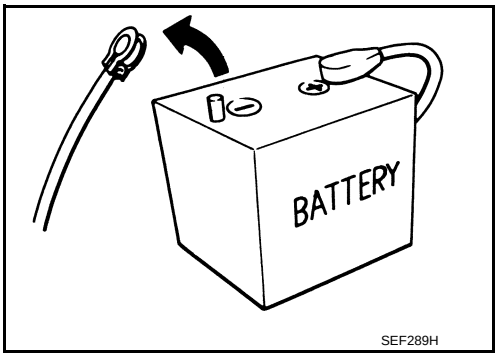
When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precautions for Removing Battery Terminal

INFOID:0000000010745361

- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the intelligent key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.



HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to Instruction 1 or Instruction 2 described below.
For vehicles parked by ignition switch OFF, refer to Instruction 2.

INSTRUCTION 1

1. Open the hood.
2. Turn key switch to the OFF position with the driver side door opened.
3. Get out of the vehicle and close the driver side door.
4. Wait at least 3 minutes. For vehicle with the engine listed below, remove the battery terminal after a lapse of the specified time.

D4D engine	: 20 minutes
HRA2DDT	: 12 minutes

K9K engine : 4 minutes
M9R engine : 4 minutes
R9M engine : 4 minutes
V9X engine : 4 minutes

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

5. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

INSTRUCTION 2 (FOR VEHICLES PARKED BY IGNITION SWITCH OFF)

1. Unlock the door with intelligent key or remote keyless entry.
NOTE:
At this moment, ACC power is supplied.
2. Open the driver side door.
3. Open the hood.
4. Close the driver side door.
5. Wait at least 3 minutes.
CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.
6. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

Precaution for Stop/Start System Service

INFOID:0000000011045986

CAUTION:
When performing an inspection and its related work with the engine at idle, always turn the stop/start OFF switch ON or open the hood to release the stop/start system.

Service Notice or Precautions for Clutch

INFOID:0000000010745315

WARNING:
After cleaning clutch disc, wipe it with a dust collector. Never use compressed air.
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-30, "Removal and Installation".

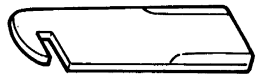
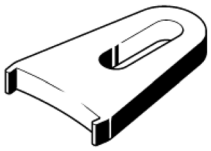
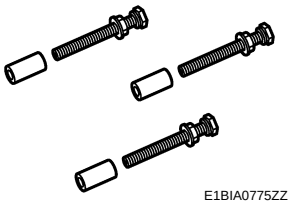
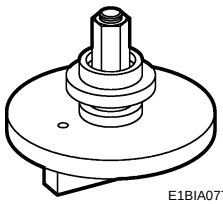
- Use recommended clutch fluid only, refer to MA-23, "Fluids and Lubricants".
- Never reuse drained clutch fluid.
- Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.
- Never use mineral oils such as gasoline or kerosene. It will ruin the rubber parts of the hydraulic system.
- Never disassemble clutch master cylinder and CSC.

PREPARATION

PREPARATION

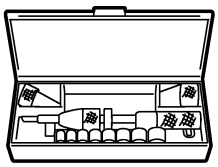
Special Service Tools

INFOID:0000000010745316

Tool number (RENAULT tool No.) Tool name	Description
ST20050240 (—) Diaphragm adjusting wrench  ZZA0508D	Adjusting unevenness of diaphragm spring lever
— (Mot.1431) Flywheel locking tool  JMAIA0431ZZ	Locking flywheel
— (Emb.1761) Tool kit for clutch cover removal and installation  E1BIA0775ZZ	Holding clutch cover
— (Emb.1604) Clutch compression tool  E1BIA0778ZZ	Rearming clutch cover compensation system

Commercial Service Tools

INFOID:0000000010745317

Tool name	Description
Clutch aligner  MCIB0404E	Installing clutch disc

Lubricant or/and Sealant

INFOID:0000000010745318

Item	Use
Lithium-based grease including molybdenum disulphide	Application to clutch disc and input shaft splines area

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000010745319

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

SUSPECTED PARTS (Possible cause)		CLUTCH PEDAL (Inspection and adjustment)	CLUTCH LINE (Air in line)	MASTER CYLINDER PISTON CUP (Damaged)	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)
Reference		CL-9, "Inspection and Adjustment"	CL-13, "Air Bleeding"	CL-22, "LHD : Exploded View" (LHD), CL-24, "RHD : Exploded View" (RHD)	EM-56, "Exploded View" (MR20DD), EM-365, "Exploded View" (R9M)	CL-30, "Exploded View"	CL-33, "MR20DD : Inspection" (MR20DD), CL-39, "R9M : Inspection" (R9M)												EM-63, "Inspection" (MR20DD), EM-401, "Inspection" (R9M)
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	4	4	4	4	4			4	5	5	6	

PERIODIC MAINTENANCE

CLUTCH PEDAL

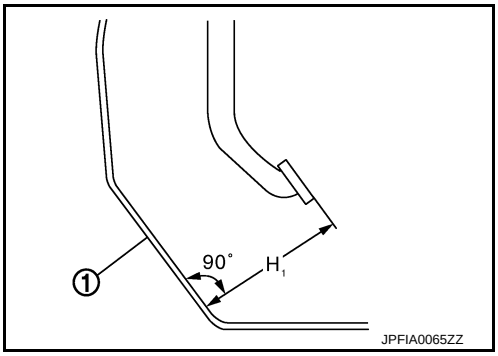
Inspection and Adjustment

INFOID:0000000010745320

INSPECTION

Clutch Pedal Height

1. Turn the floor carpet.
2. Check that the clutch pedal height (H_1) from the surface ① for measurement is within the reference value.



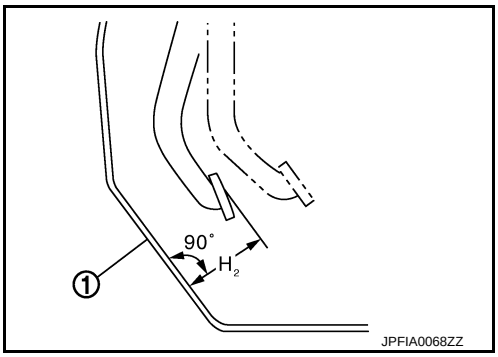
Measurement surface : Top surface of floor panel

Clutch pedal height : Refer to CL-41, "Clutch Pedal".

- Replace clutch pedal if the height is outside the reference value.

Clutch Pedal Height when Disengaging the Clutch

1. Securely engage the parking brake.
2. Turn the floor carpet.
3. Start the engine and run at idle.
4. Fully depress clutch pedal and shift to the 1st gear.
   CAUTION:
   Securely depress the brake pedal with shift lever in 1st gear.
5. Gradually release the clutch pedal and check that the clutch pedal height (H_2) from the surface ① for measurement is within the reference value with a scale immediately before the clutch is engaged.



Measurement surface : Top surface of floor panel

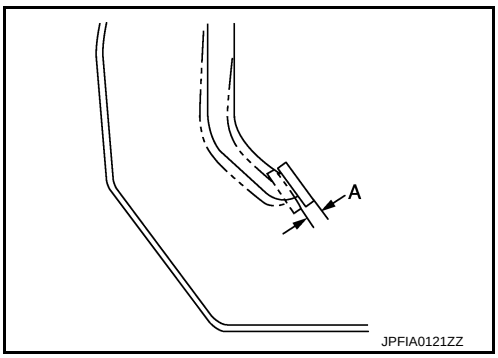
Clutch pedal height at clutch disengagement : Refer to CL-41, "Clutch Pedal".

- Replace clutch pedal if the height is outside the reference value.

NOTE:
Although the clutch pedal height differs according to whether the clutch gets disengaged or engaged, clutch-engaged case is regarded as clutch-disengaged case for easier inspection.

Clutch Pedal Play

Push the pedal pad by hand until a resistance can be felt and check that the play (A) on the upper surface of the pedal pad is within the reference value.



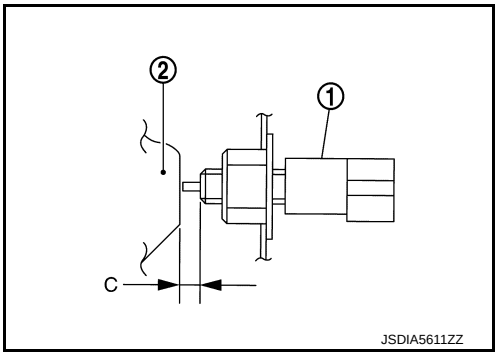
Clutch pedal play : Refer to CL-41, "Clutch Pedal".

- Replace clutch pedal if the play is outside the reference value.

Position of Clutch Interlock Switch

Check that the clearance (C) between the thread end of clutch interlock switch ① and clutch pedal lever ② is within the specified value while clutch pedal is fully depressed.

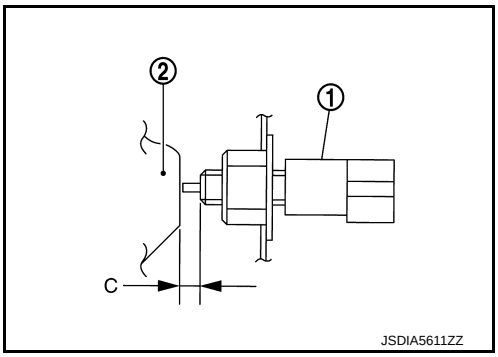
Clearance : Refer to CL-41, "Clutch Pedal".



Position of Clutch Pedal Position Switch

Check that the clearance (C) between the thread end of clutch pedal position switch ① and clutch pedal lever ② is within the specified value while clutch pedal is fully released.

Clearance : Refer to CL-41, "Clutch Pedal".



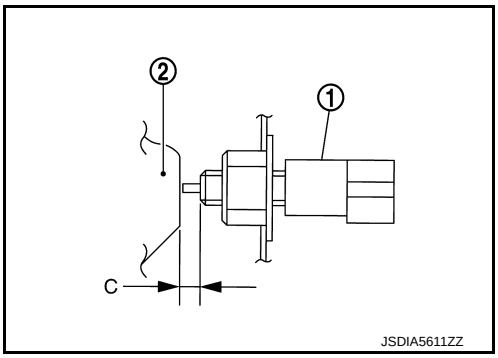
ADJUSTMENT

Position of Clutch Interlock Switch

1. Disconnect the clutch interlock switch connector.
2. Loosen the clutch interlock switch 45 degrees counterclockwise.
3. With the clutch pedal fully depressed, press into the clutch interlock switch ① until it reaches the clutch pedal lever ② and turn the switch clockwise by 45 degrees to secure it.
   CAUTION:
   The clearance (C) show in the figure must be within the specified value.

   Clearance : Refer to CL-41, "Clutch Pedal".

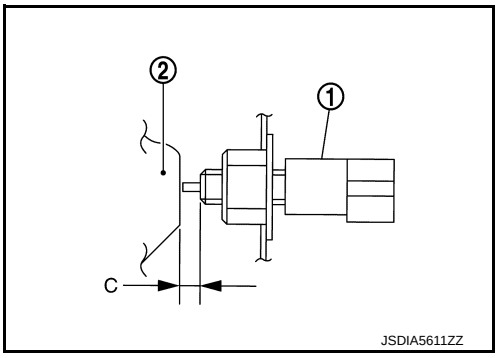
   NOTE:
   Fully depressed clutch pedal means a clutch pedal condition that the clutch pedal lever contacts the pedal stopper rubber.



Position of Clutch Pedal Position Switch

1. Disconnect the clutch pedal position switch connector.
2. Loosen the clutch pedal position switch 45 degrees counterclockwise.
3. Press-fit the clutch pedal position switch ① until the clutch pedal position switch hits the clutch pedal lever ② 45 degrees clockwise while pulling the pedal pad slightly.
   CAUTION:
   The clearance (C) show in the figure must be within the specified value.

   Clearance : Refer to CL-41, "Clutch Pedal".



CLUTCH FLUID

Inspection

INFOID:0000000010745321

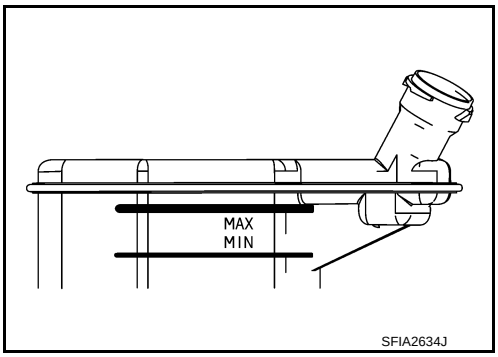
FLUID LEAKAGE

- Check clutch line for cracks, deterioration or other damage. Replace any damaged parts.
- Check for fluid leakage by fully depressing clutch pedal while engine is running.

CAUTION:
If leakage occurs around joints, reinstall the joints or, if necessary, replace damaged parts.

FLUID LEVEL

- Check that the fluid level in the reservoir tank is within the specified range (MAX – MIN lines).
- Visually check for any clutch fluid leakage around the reservoir tank.
- Check the clutch system for any leakage if the fluid level is extremely low (lower than MIN).

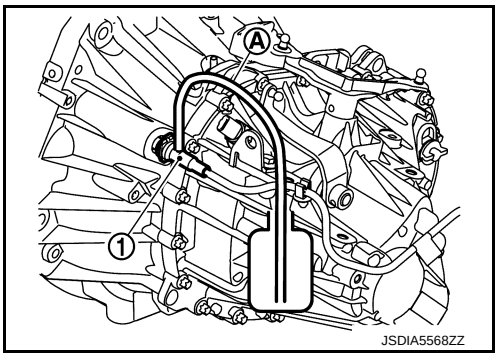


Draining

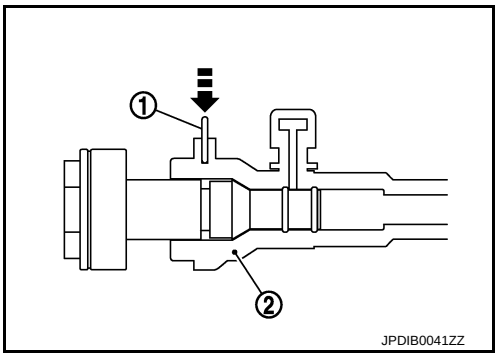
INFOID:0000000010745322

CAUTION:
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.

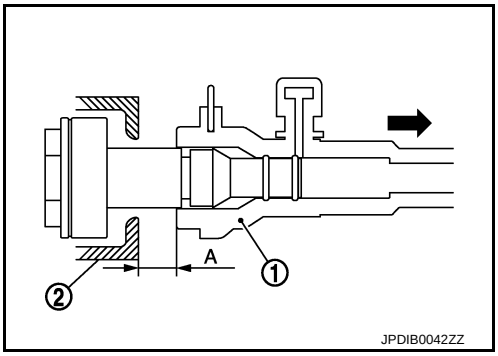
1. Connect a transparent vinyl hose Ⓐ to air bleeder of bleeding connector ①.



2. Press the lock pin ① into the bleeding connector ②, and maintain the position.



3. Slide bleeding connector ① in the direction of the arrow as shown in the figure.



② : Clutch housing

Dimension (A) : 10 mm (0.39 in)

4. Depress clutch pedal to gradually discharge clutch fluid.
CAUTION:
Since the inside of clutch tube is under hydraulic pressure, hold the tube to prevent it from getting disconnected.

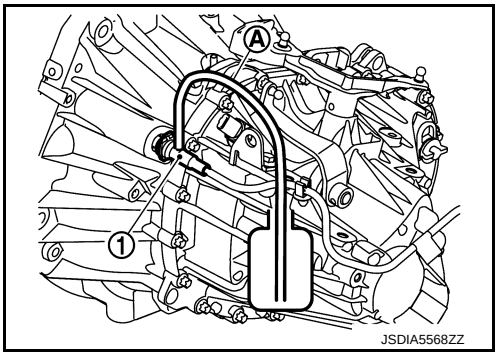
Refilling

INFOID:0000000010745323

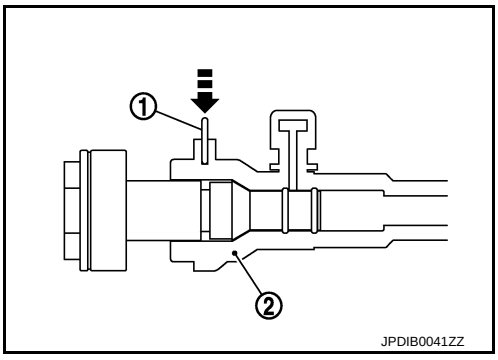
CAUTION:
Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.

1. Check that there is no foreign material in reservoir tank, and then fill with new clutch fluid.
CAUTION:
Never reuse drained clutch fluid.

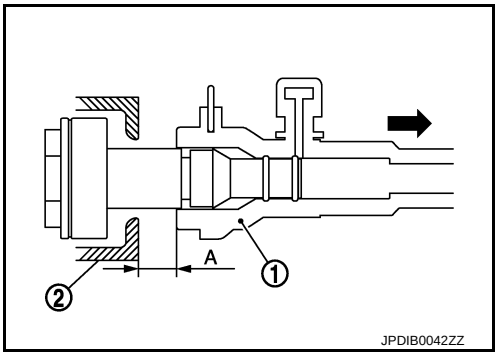
2. Connect a transparent vinyl hose Ⓐ to air bleeder of bleeding connector ①.



3. Press the lock pin ① into the bleeding connector ②, and maintain the position.



4. Slide bleeding connector ① in the direction of the arrow as shown in the figure.



② : Clutch housing

Dimension (A) : 10 mm (0.39 in)

5. Slowly depress clutch pedal to the full stroke position, and then release the pedal.
CAUTION:
Since the inside of clutch tube is under hydraulic pressure, hold the tube to prevent it from getting disconnected.

6. Repeat step 5 at intervals of 2 or 3 seconds until new clutch fluid is discharged.
CAUTION:
Monitor clutch fluid level in reservoir tank so as not to empty the tank.

7. Return clutch tube and lock pin in their original positions while clutch pedal is depressed.
8. Perform the air bleeding. Refer to CL-13, "Air Bleeding".

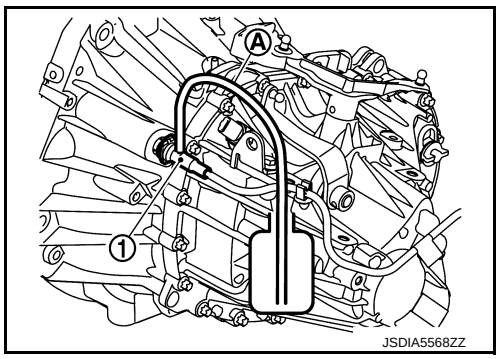
Air Bleeding

INFOID:0000000010745324

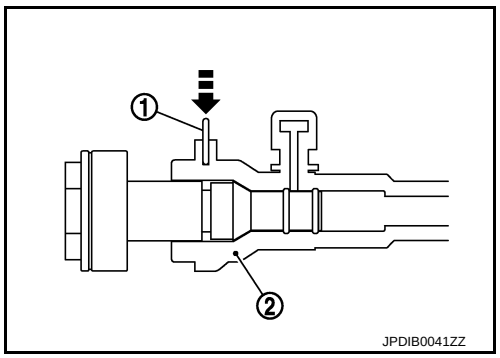
CAUTION:
- **Monitor clutch fluid level in reservoir tank so as not to empty the tank.**
- **Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.**

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 reservoir tank with new clutch fluid.
   CAUTION:
   Never reuse drained clutch fluid.
2. Connect a transparent vinyl hose Ⓐ to air bleeder of bleeding connector ①.
3. "Depress" and "Release" the clutch pedal slowly and fully 15 times at an interval of 2 to 3 seconds and release the clutch pedal.



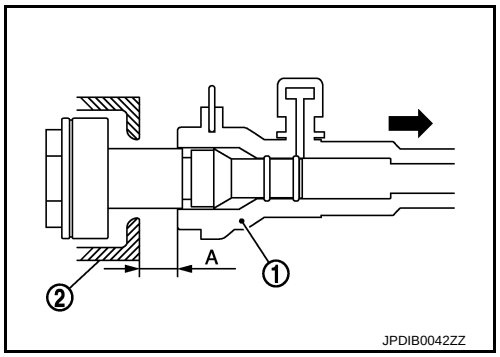
4. Press the lock pin ① into the bleeding connector ②, and maintain the position.
   CAUTION:
   Since the inside of clutch tube is under hydraulic pressure, hold the tube to prevent it from getting disconnected.



5. Slide bleeding connector ① in the direction of the arrow as shown in the figure.

   ② : Clutch housing

   Dimension (A) : 10 mm (0.39 in)



6. Depress the clutch pedal soon and hold it, and then bleed the air from the piping.
   CAUTION:
   Since the inside of clutch tube is under hydraulic pressure, hold the tube to prevent it from getting disconnected.
7. Return clutch tube and lock pin in their original positions.
8. Release clutch pedal and wait for 5 seconds.
9. Repeat steps 3 to 8 until no bubbles are observed in the clutch fluid.
10. Check that the fluid level in the reservoir tank is within the specified range after air bleeding. Refer to CL-11, "Inspection".

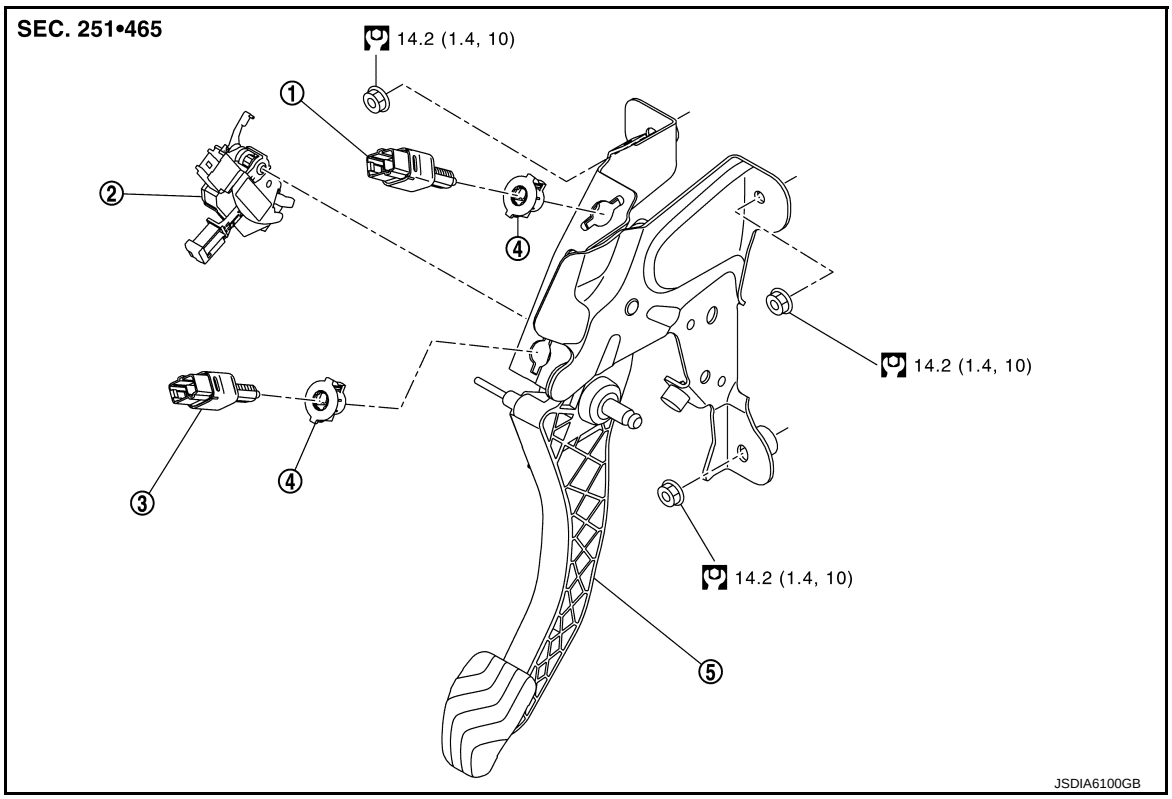
REMOVAL AND INSTALLATION

CLUTCH PEDAL

LHD

LHD : Exploded View

INFOID:0000000010745325



① Clutch interlock switch ② Clutch pedal stroke sensor ③ Clutch pedal position switch

④ Clip ⑤ Clutch pedal assembly

: N·m (kg-m, ft-lb)

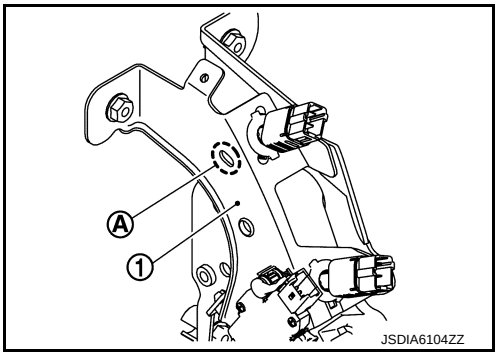
LHD : Removal and Installation

INFOID:0000000010745326

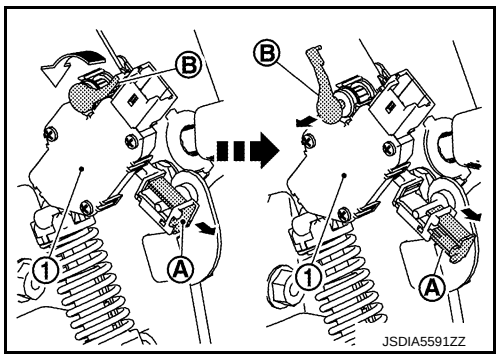
REMOVAL

1. Remove instrument lower panel LH. Refer to IP-14, "Removal and Installation".
2. Disconnect clutch pedal position switch harness connector.
3. Disconnect clutch interlock switch harness connector.
4. Disconnect clutch pedal stroke sensor harness connector.
5. Disconnect harness clip from clutch pedal bracket ①.

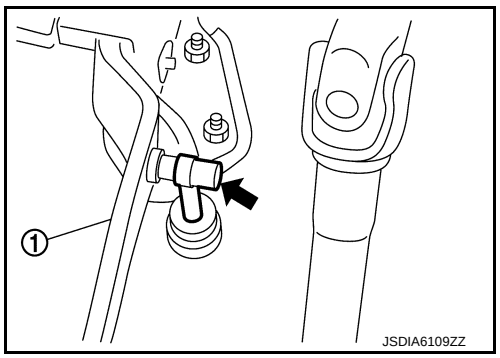
Ⓐ : Hole for harness clip



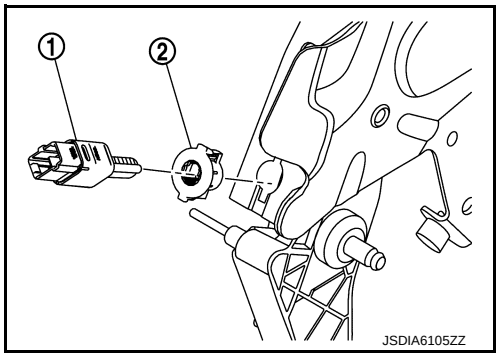
6. Remove clutch pedal stroke sensor ①.
a. Pull sensor lever cover Ⓐ
b. While turn lever pin Ⓑ and pull it.
c. Remove clutch pedal stroke sensor.



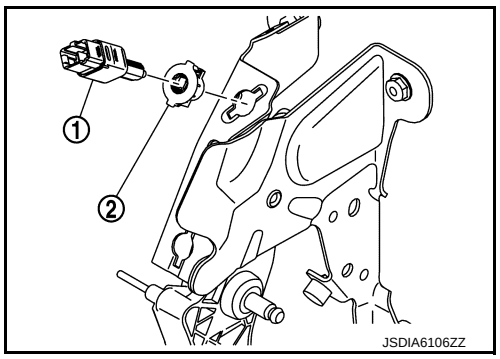
7. Remove master cylinder rod end from clutch pedal lever ①.



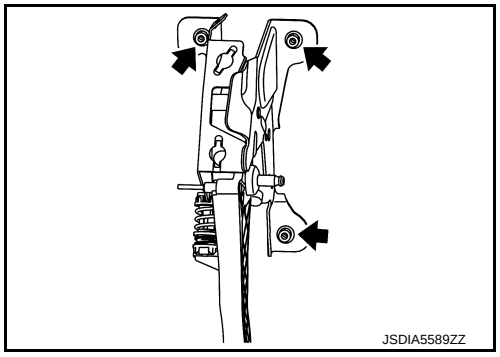
8. Remove clutch pedal position switch ① and clip ② from clutch pedal bracket.



9. Remove clutch interlock switch ① and clip ② from clutch pedal bracket.



10. Remove clutch pedal assembly.
11. Perform inspection after removal. Refer to CL-16, "LHD : Inspection and Adjustment".



INSTALLATION

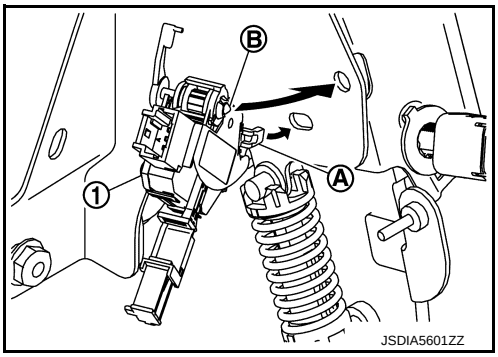
Note the following, and install in the reverse order of removal.

- Push clip until it clicks.
- Press master cylinder rod end to pin of clutch pedal until it stops.
- Perform inspection and adjustment after installation. Refer to CL-16, "LHD : Inspection and Adjustment".
- Install clutch pedal stroke sensor, according to the following procedure.

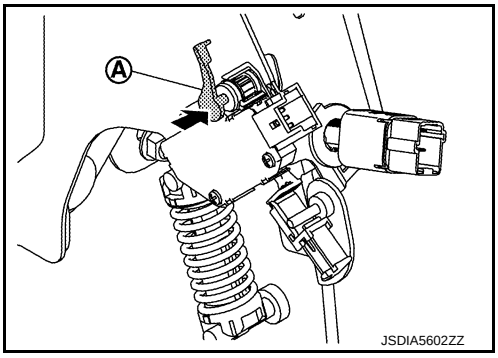
CAUTION:

Install clutch pedal position switch before installing clutch pedal stroke sensor.

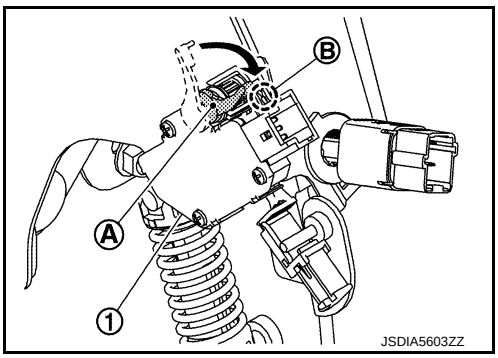
1. Insert pawl Ⓐ into the hole and hook it, and fit lever pin Ⓑ into the hole. And then clutch pedal stroke sensor ① is installed temporary.



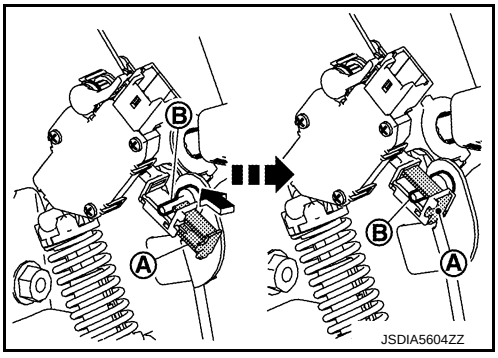
2. Push lever pin Ⓐ and insert it into the hole deeply.



3. Turn lever pin Ⓐ as shown in the figure and fix lever pin to stopper Ⓑ. And then clutch pedal stroke sensor ① is installed completely.



4. Push sensor lever cover Ⓐ, then hold on pin Ⓑ of clutch pedal.

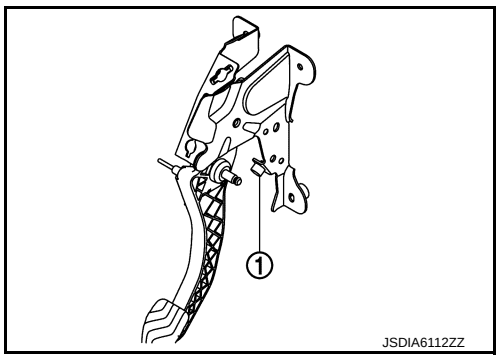


LHD : Inspection and Adjustment

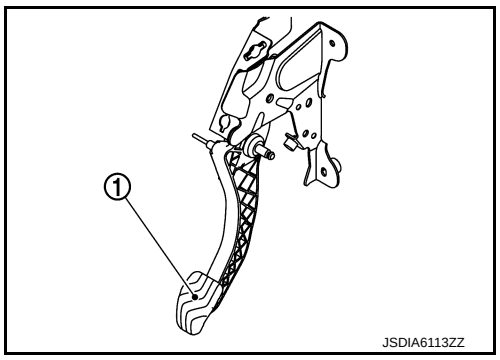
INFOID:0000000010745327

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.
- Check pedal stopper rubber ①. If damage or deformation is found, replace clutch pedal assembly.



- Check pedal pad ①. If wear or damage is found, replace clutch pedal assembly.



INSPECTION AFTER INSTALLATION

- Check the clutch pedal height, clutch pedal height at clutch disengagement, and clutch pedal play. Refer to CL-9, "Inspection and Adjustment".
- Check the clutch pedal position switch position. Refer to CL-9, "Inspection and Adjustment".
- Check the clutch interlock switch position. Refer to CL-9, "Inspection and Adjustment".

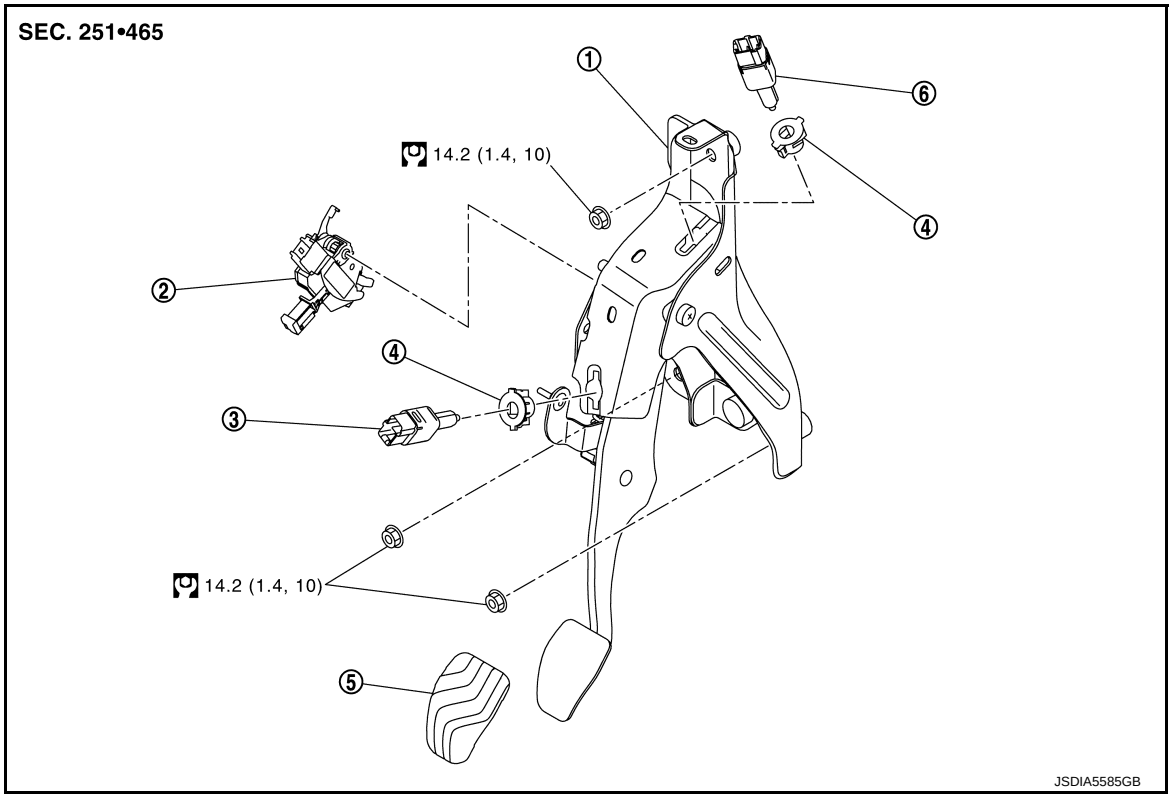
ADJUSTMENT AFTER INSTALLATION

- Adjust the clutch pedal position switch position. Refer to CL-9, "Inspection and Adjustment".
- Adjust the clutch interlock switch position. Refer to CL-9, "Inspection and Adjustment".
- Perform reset of clutch pedal stroke sensor, after installation clutch pedal or clutch pedal stroke sensor. Refer to PB-59, "Work Procedure".

RHD

RHD : Exploded View

INFOID:0000000010745328



① Clutch pedal assembly ② Clutch pedal stroke sensor ③ Clutch pedal position switch
④ Clip ⑤ Pedal pad ⑥ Clutch interlock switch

: N·m (kg-m, ft-lb)

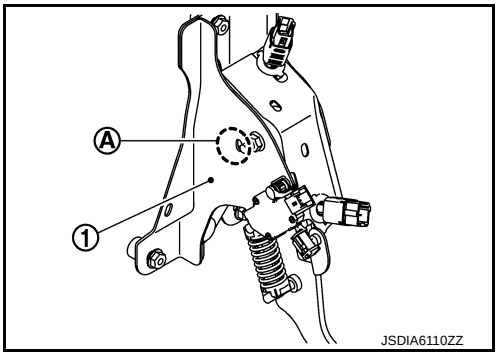
RHD : Removal and Installation

INFOID:0000000010745329

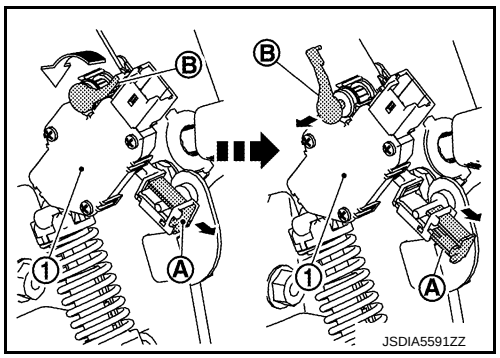
REMOVAL

1. Remove instrument lower panel RH. Refer to IP-41, "Removal and Installation".
2. Disconnect clutch pedal position switch harness connector.
3. Disconnect clutch interlock switch harness connector.
4. Disconnect clutch pedal stroke sensor harness connector.
5. Disconnect harness clip from clutch pedal bracket ①.

Ⓐ : Hole for harness clip

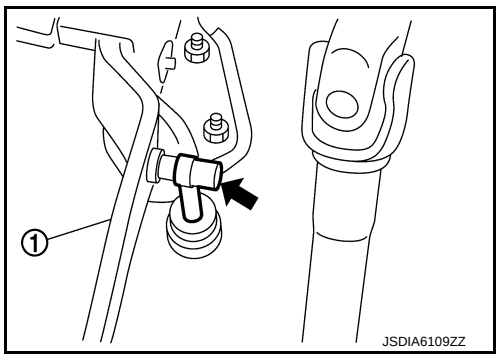


6. Remove clutch pedal stroke sensor ①.
a. Pull sensor lever cover Ⓐ
b. While turn lever pin Ⓑ and pull it.
c. Remove clutch pedal stroke sensor.



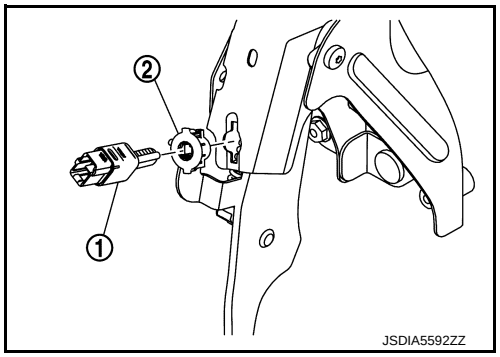
JSDIA5591ZZ

7. Remove master cylinder rod end from clutch pedal lever ①.



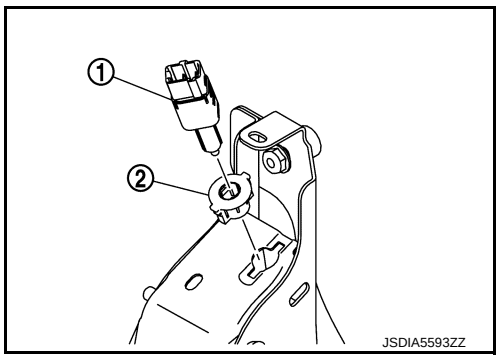
JSDIA6109ZZ

8. Remove clutch pedal position switch ① and clip ② from clutch pedal bracket.



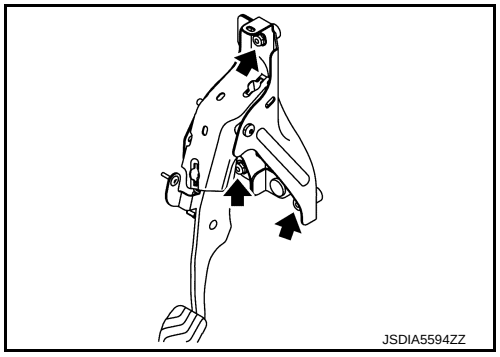
JSDIA5592ZZ

9. Remove clutch interlock switch ① and clip ② from clutch pedal bracket.



JSDIA5593ZZ

10. Remove clutch pedal assembly.
11. Remove pedal pad from clutch pedal.
12. Perform inspection after removal. Refer to CL-20, "RHD : Inspection and Adjustment".


JSDIA5594ZZ

INSTALLATION

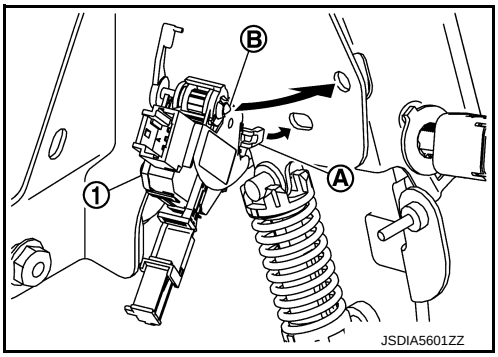
Note the following, and install in the reverse order of removal.

- Push clip until it clicks.
- Press master cylinder rod end to pin of clutch pedal until it stops.
- Perform inspection and adjustment after installation. Refer to CL-20, "RHD : Inspection and Adjustment".
- Install clutch pedal stroke sensor, according to the following procedure.

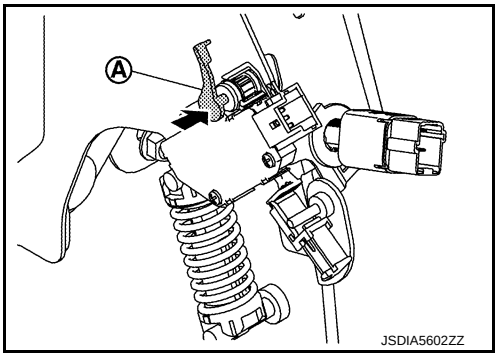
CAUTION:

Install clutch pedal position switch before installing clutch pedal stroke sensor.

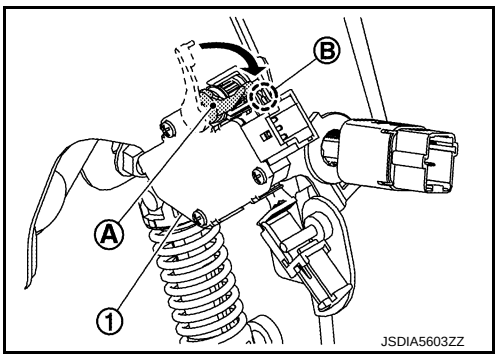
1. Insert pawl Ⓐ into the hole and hook it, and fit lever pin Ⓑ into the hole. And then clutch pedal stroke sensor ① is installed temporary.



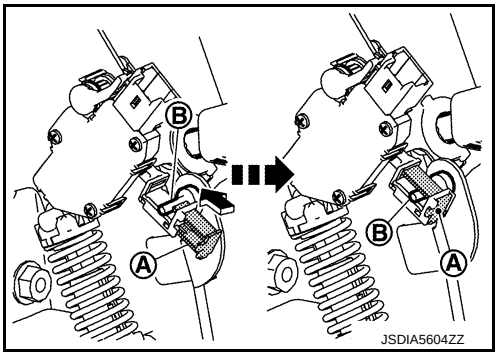
2. Push lever pin Ⓐ and insert it into the hole deeply.



3. Turn lever pin Ⓐ as shown in the figure and fix lever pin to stopper Ⓑ. And then clutch pedal stroke sensor ① is installed completely.



4. Push sensor lever cover Ⓐ, then hold on pin Ⓑ of clutch pedal.

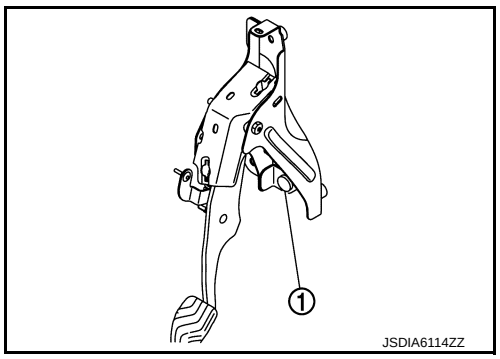


RHD : Inspection and Adjustment

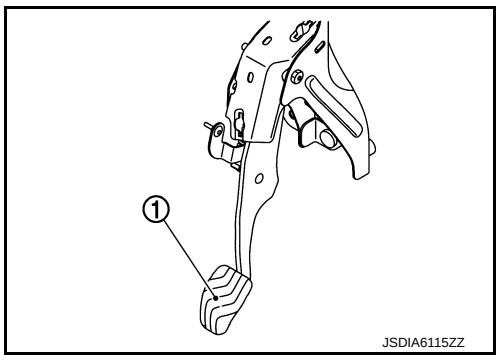
INFOID:0000000010745330

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.
- Check pedal stopper rubber ①. If damage or deformation is found, replace clutch pedal assembly.



- Check pedal pad ①. If wear or damage is found, replace pedal pad.



INSPECTION AFTER INSTALLATION

- Check the clutch pedal height, clutch pedal height at clutch disengagement, and clutch pedal play. Refer to CL-9, "Inspection and Adjustment".
- Check the clutch pedal position switch position. Refer to CL-9, "Inspection and Adjustment".
- Check the clutch interlock switch position. Refer to CL-9, "Inspection and Adjustment".

ADJUSTMENT AFTER INSTALLATION

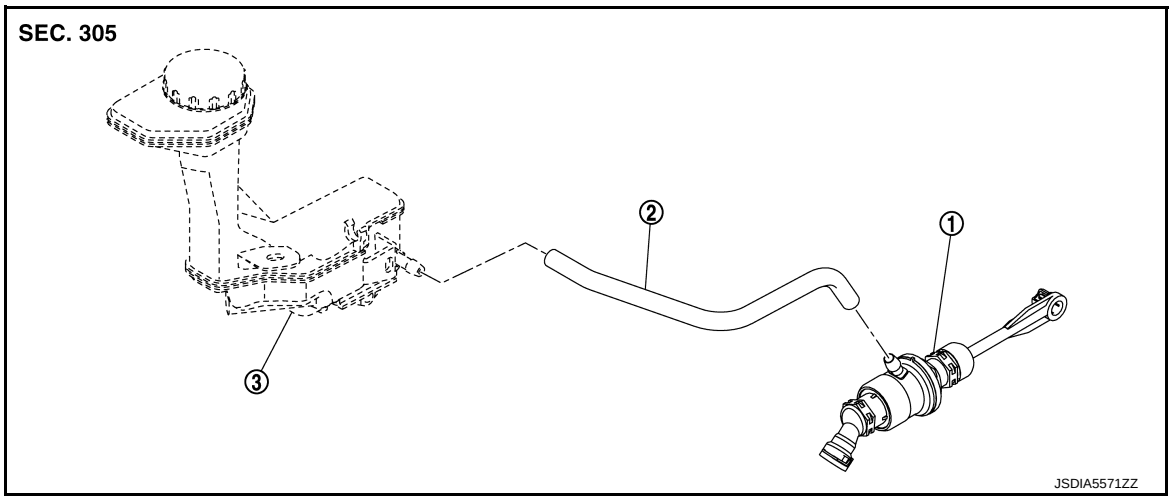
- Adjust the clutch pedal position switch position. Refer to CL-9, "Inspection and Adjustment".
- Adjust the clutch interlock switch position. Refer to CL-9, "Inspection and Adjustment".
- Perform reset of clutch pedal stroke sensor, after installation clutch pedal or clutch pedal stroke sensor. Refer to PB-59, "Work Procedure".

CLUTCH MASTER CYLINDER

LHD

LHD : Exploded View

INFOID:0000000010745331



① Master cylinder ② Reservoir hose ③ Reservoir tank

LHD : Removal and Installation

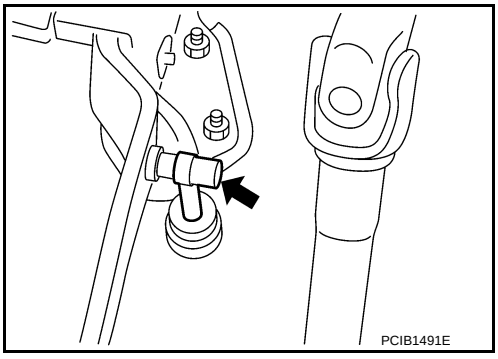
INFOID:0000000010745332

REMOVAL

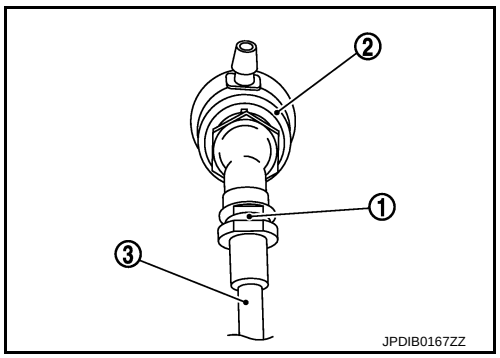
CAUTION:

- **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.**
- **Never disassemble clutch master cylinder.**

1. Remove the air cleaner case and air duct (inlet). Refer to EM-31, "Removal and Installation" (MR20DD), EM-308, "Removal and Installation" (R9M)
2. Drain clutch fluid. Refer to CL-11, "Draining".
3. Remove reservoir hose from reservoir tank and master cylinder.
4. Remove master cylinder rod end from clutch pedal.



5. Pull up the lock pin ① from connector of master cylinder ② and separate clutch tube ③.
6. Rotate master cylinder clockwise by 45 degrees, and then remove master cylinder.

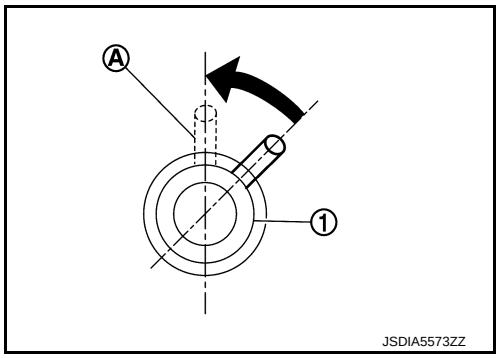


INSTALLATION

CAUTION:

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.

1. Tilt master cylinder ① clockwise by 45 degrees and insert it to the mounting hole. Rotate counterclockwise and secure it. At this time, nipple Ⓐ is upward of the vehicle.
2. Install master cylinder rod end to clutch pedal.
   CAUTION:
   Press master cylinder rod end to clutch pedal until it stops.
3. Install reservoir hose to reservoir tank and master cylinder.
   CAUTION:
   Set reservoir hose with painted mark facing upward.
4. Press down the lock pin into connector of master cylinder until it stops.



5. Install clutch tube into connector of master cylinder until it stops.
6. Fill with clutch fluid. Refer to CL-12, "Refilling".
7. Perform inspection and adjustment after installation. Refer to CL-23, "LHD : Inspection and Adjustment".
8. For the next step and after, install in the reverse order of removal.

LHD : Inspection and Adjustment

INFOID:0000000010745333

INSPECTION AFTER INSTALLATION

- Check the fluid leakage and the fluid level. Refer to CL-11, "Inspection".
- Check for the clutch pedal condition. Refer to CL-9, "Inspection and Adjustment".

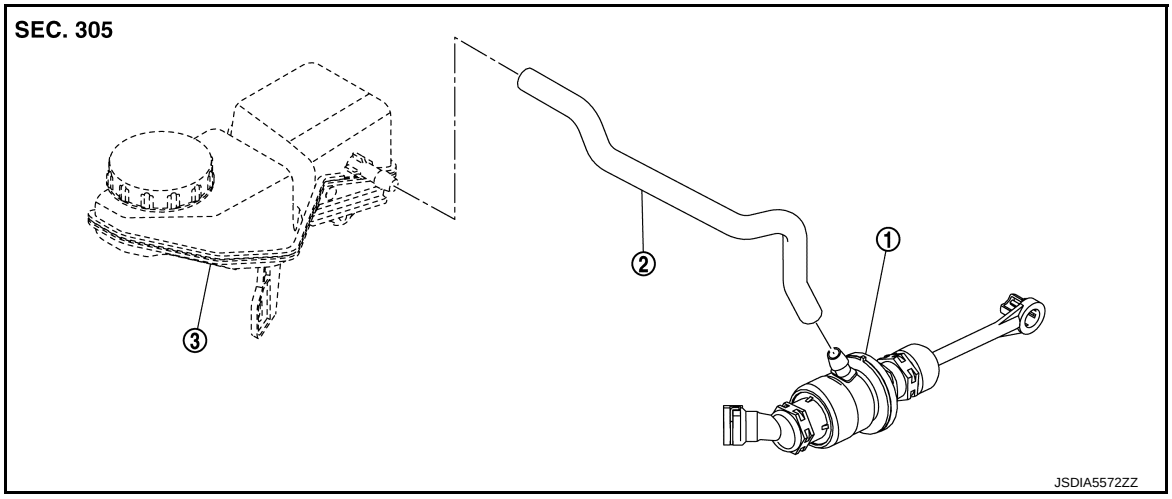
ADJUSTMENT AFTER INSTALLATION

Perform the air bleeding. Refer to CL-13, "Air Bleeding".

RHD

RHD : Exploded View

INFOID:0000000010745334



① Master cylinder ② Reservoir hose ③ Reservoir tank

RHD : Removal and Installation

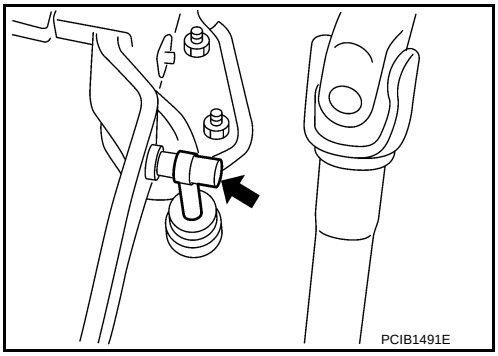
INFOID:0000000010745335

REMOVAL

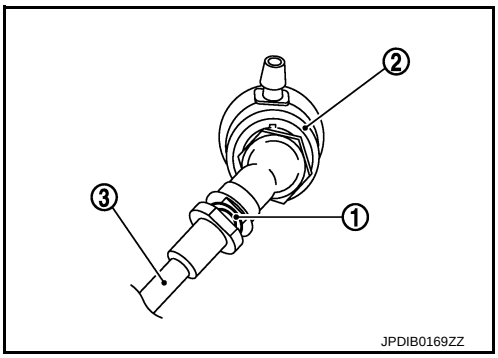
CAUTION:

- **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.**
- **Never disassemble clutch master cylinder.**

1. Drain clutch fluid. Refer to CL-11, "Draining".
2. Remove reservoir hose from reservoir tank and master cylinder.
3. Remove master cylinder rod end from clutch pedal.



4. Pull up the lock pin ① from connector of master cylinder ② and separate clutch tube ③.
5. Rotate master cylinder clockwise by 45 degrees, and then remove master cylinder from the vehicle.

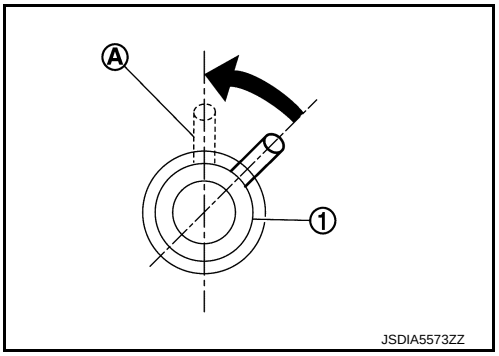


INSTALLATION

CAUTION:

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.

1. Tilt master cylinder ① clockwise by 45 degrees and insert it to the mounting hole. Rotate counterclockwise and secure it. At this time, nipple Ⓐ is upward of the vehicle.
2. Install master cylinder rod end to clutch pedal.
   CAUTION:
   Press master cylinder rod end to clutch pedal until it stops.
3. Install reservoir hose to reservoir tank and master cylinder.
4. Press down the lock pin into connector of master cylinder until it stops.
5. Install clutch tube into connector of master cylinder until it stops.
6. Fill with clutch fluid. Refer to CL-12, "Refilling".
7. Perform inspection and adjustment after installation. Refer to CL-25, "RHD : Inspection and Adjustment".
8. For the next step and after, install in the reverse order of removal.



RHD : Inspection and Adjustment

INFOID:0000000010745336

INSPECTION AFTER INSTALLATION

- Check the fluid leakage and the fluid level. Refer to CL-11, "Inspection".
- Check for the clutch pedal condition. Refer to CL-9, "Inspection and Adjustment".

ADJUSTMENT AFTER INSTALLATION

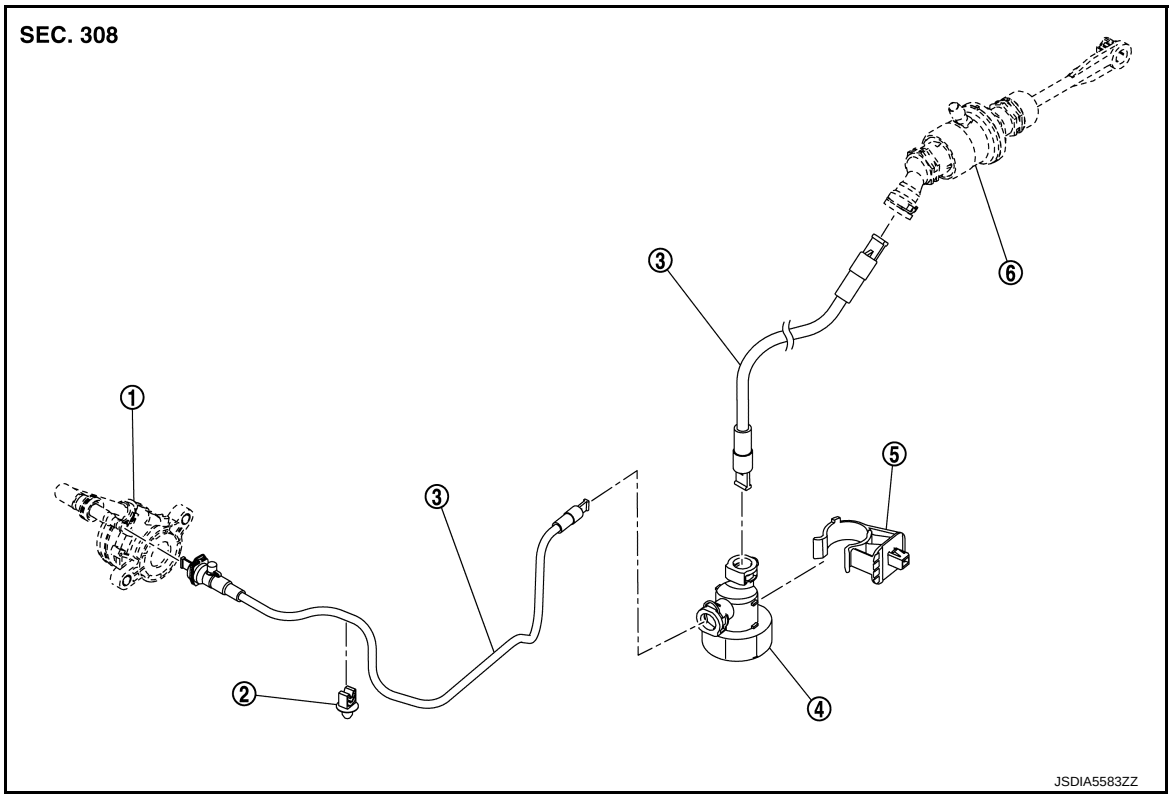
Perform the air bleeding. Refer to CL-13, "Air Bleeding".

CLUTCH PIPING

Exploded View

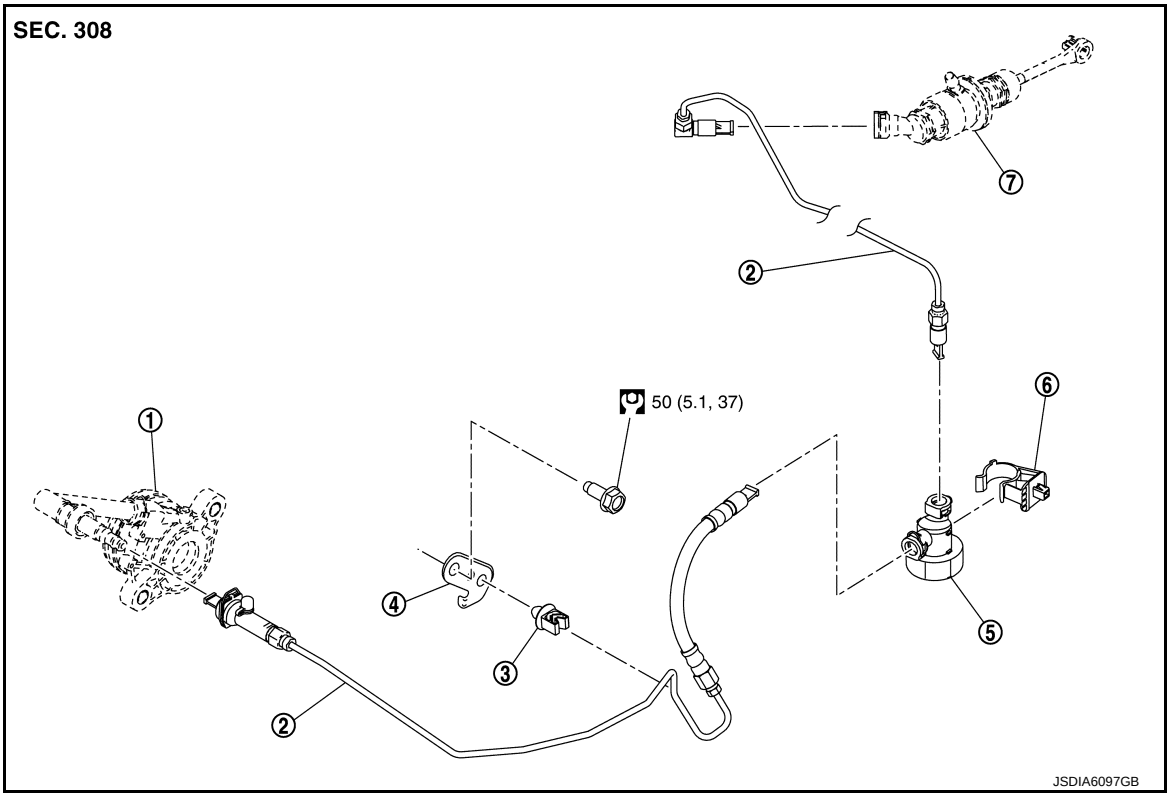
INFOID:0000000010745337

MR20DD



① CSC (Concentric Slave Cylinder) ② Clip ③ Clutch tube
④ Clutch damper ⑤ Bracket ⑥ Master cylinder

R9M

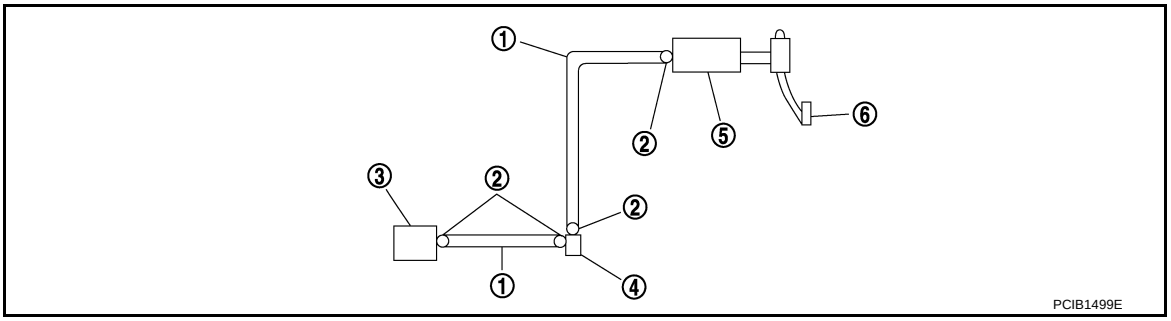


① CSC (Concentric Slave Cylinder) ② Clutch tube ③ Clip
④ Bracket ⑤ Clutch damper ⑥ Bracket
⑦ Master cylinder

: N·m (kg-m, ft-lb)

Hydraulic Piping

INFOID:0000000010745338



① Clutch tube ② Lock pin ③ CSC (Concentric Slave Cylinder)
④ Clutch damper ⑤ Master cylinder ⑥ Clutch pedal

Removal and Installation

INFOID:0000000010745339

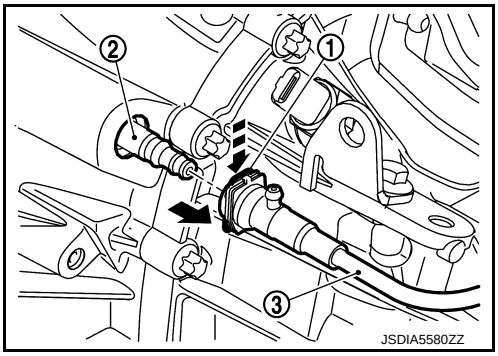
CAUTION:
Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.

REMOVAL

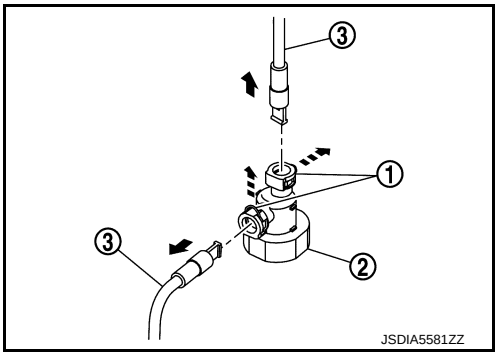
Note the following, and refer to CL-26, "Exploded View" for removal procedure.

- Drain clutch fluid. Refer to CL-11, "Draining".

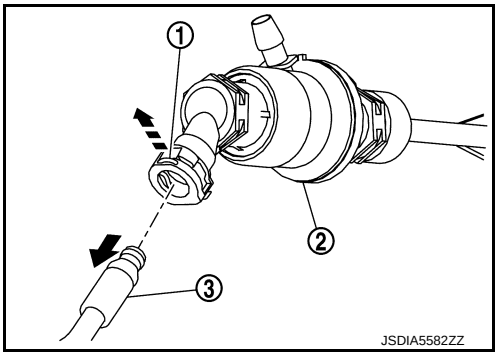
- Press the lock pin ① into the bleeding connector of the CSC ②, and then remove clutch tube ③ from CSC.



- Pull the lock pins ① from the connectors of the clutch damper ② until the pins stop, and then remove clutch tubes ③ from clutch damper.



- Pull the lock pin ① from the connector of the clutch master cylinder ② until the pin stop, and then remove clutch tube ③ from clutch master cylinder.
- Perform inspection after removal. Refer to CL-28, "Inspection and Adjustment".



INSTALLATION

Note the following, and refer to CL-26, "Exploded View" for installation procedure.

CAUTION:

Never damage clutch tube.

- Insert each clutch tube into the CSC bleeding connector, the clutch damper connector, and the clutch master cylinder connector until it contacts the end of each connector.
- Install each lock pin into the clutch damper connector and the clutch master cylinder connector until it contacts the end of each connector.
- Perform inspection and adjustment after installation. Refer to CL-28, "Inspection and Adjustment".

Inspection and Adjustment

INFOID:0000000010745340

INSPECTION AFTER REMOVAL

- Check the clutch tube for cracks and damage. If the clutch tube has cracks or damage, replace it with a new one.
- Check the O-ring of the clutch tube for cracks and damage. If the O-ring of the clutch tube has cracks or damage, replace clutch tube with a new one.
- Check the clutch damper for cracks and damage. If the clutch damper has cracks or damage, replace it with a new one.

INSPECTION AFTER INSTALLATION

- Check the fluid leakage and the fluid level. Refer to CL-11, "Inspection".
- Check for the clutch pedal condition. Refer to CL-9, "Inspection and Adjustment".

ADJUSTMENT AFTER INSTALLATION

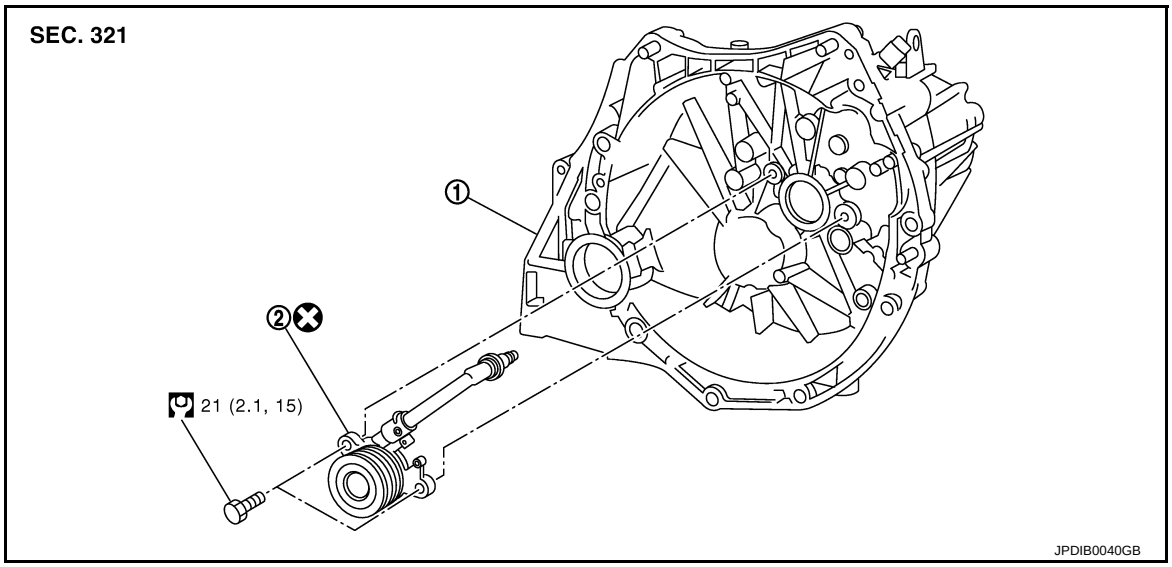
Perform the air bleeding. Refer to CL-13, "Air Bleeding".

CSC (CONCENTRIC SLAVE CYLINDER)

Exploded View

INFOID:0000000010745341

MR20DD

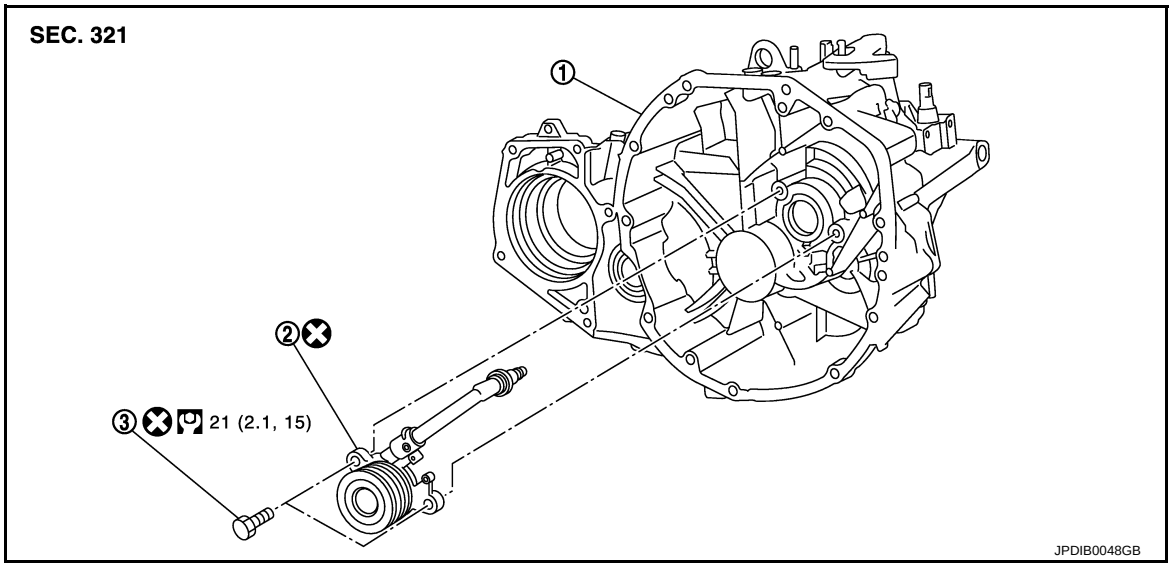


① Transaxle assembly ② CSC (Concentric Slave Cylinder)

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

R9M



① Transaxle assembly ② CSC (Concentric Slave Cylinder) ③ Sealing bolt

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

Removal and Installation

INFOID:0000000010745342

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

1. Remove transaxle assembly. Refer to TM-41, "Removal and Installation" (RS6F94R), TM-122, "Removal and Installation" (RS6F52A).
2. Remove CSC from clutch housing.

INSTALLATION

1. Install CSC to clutch housing, and then tighten CSC mounting bolts to the specified torque.
   - For tightening torque, refer to CL-30, "Exploded View".

   CAUTION:
   - **Never reuse CSC.**
   - **Never reuse sealing bolt. (R9M only)**
   - **Never insert and operate CSC because piston and stopper of CSC components may fall off.**
2. Install transaxle assembly. Refer to TM-41, "Removal and Installation" (RS6F94R), TM-122, "Removal and Installation" (RS6F52A).
3. Perform inspection and adjustment after installation. Refer to CL-31, "Inspection and Adjustment".

Inspection and Adjustment

INFOID:0000000010745343

INSPECTION AFTER INSTALLATION

Check the fluid leakage and the fluid level. Refer to CL-11, "Inspection".

ADJUSTMENT AFTER INSTALLATION

Perform the air bleeding. Refer to CL-13, "Air Bleeding".

CLUTCH DISC AND CLUTCH COVER

MR20DD

MR20DD : Exploded View

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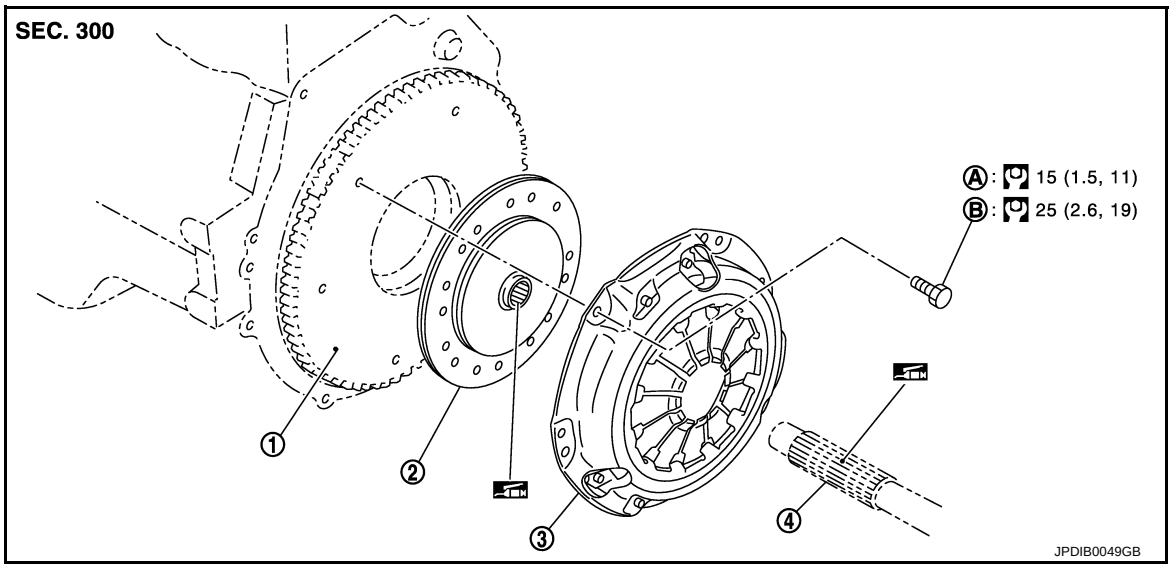

① Flywheel ② Clutch disc ③ Clutch cover

④ Input shaft

Ⓐ First step Ⓑ Final step

: N·m (kg-m, ft-lb)

: Apply lithium-based grease including molybdenum disulphide.

MR20DD : Removal and Installation

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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-30, "Removal and Installation".**
- **Never bring any grease to the clutch disc facing, pressure plate surface and flywheel surface.**
- **Never clean clutch disc using solvent.**

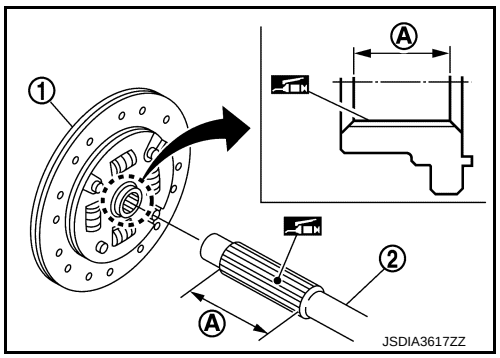
REMOVAL

1. Remove transaxle assembly. Refer to TM-41, "Removal and Installation".
2. Remove clutch cover mounting bolts while holding clutch cover.
   CAUTION:
   Never drop clutch disc.
3. Remove clutch cover and clutch disc.
   CAUTION:
   Never drop clutch disc.
4. Perform inspection after removal. Refer to CL-33, "MR20DD : Inspection".

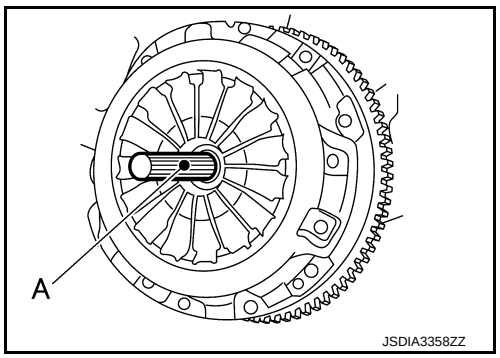
INSTALLATION

1. Clean clutch disc and input shaft splines to remove grease and powder arisen from abrasion.

2. Apply recommended grease to clutch disc ① and input shaft ② splines area Ⓐ. For recommended grease, refer to CL-32, "MR20DD : Exploded View".
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 judder. And if it adheres to seal of CSC, it cause clutch fluid leakage. Wipe out excess grease. Wipe out any grease oozing from the parts.

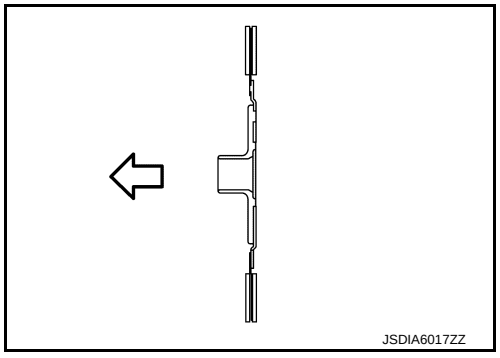


3. Install clutch disc using clutch aligner (A) (commercial service tool), and temporarily install clutch cover.
CAUTION:
- **Never drop clutch disc and clutch cover.**



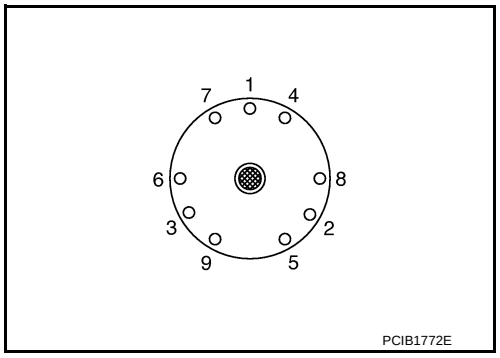
- **Be careful with the orientation of the clutch disc.**

⇦ : Engine side



4. Tighten clutch cover mounting bolts to the specified torque evenly in two steps in the numerical order as shown in the figure.
- For tightening torque, refer to CL-32, "MR20DD : Exploded View".
- After installation, perform inspection. Refer to CL-33, "MR20DD : Inspection".

5. Install transaxle assembly. Refer to TM-41, "Removal and Installation".



MR20DD : Inspection

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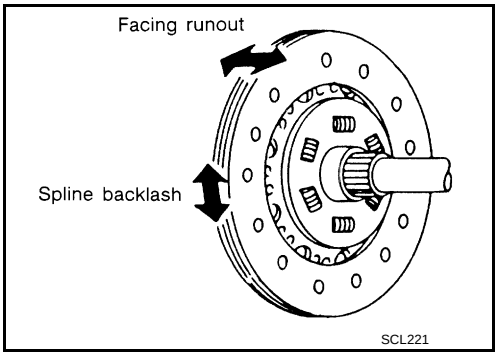
INSPECTION AFTER REMOVAL

Clutch Disc

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

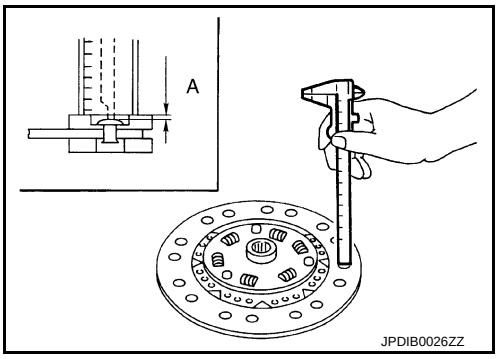


Runout limit/diameter of the area to be measured	**: Refer to CL-41, "Clutch Disc".**

- Measure backlash to clutch disc spline and input shaft spline at the circumference of clutch disc. If it is outside the specification, replace clutch disc.

Maximum allowable spline backlash (at outer edge of disc)	**: Refer to CL-41, "Clutch Disc".**

- Measure the depth (A) to clutch disc facing rivet heads, using a calipers. If it exceeds the allowable wear limit, replace clutch disc.



Facing wear limit (depth to the rivet head)	**: Refer to CL-41, "Clutch Disc".**

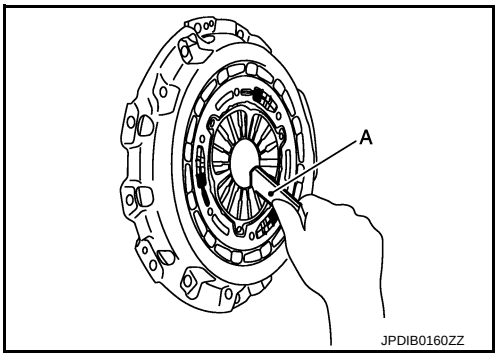
Clutch Cover

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

INSPECTION AFTER INSTALLATION

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 (A) (SST: ST20050240).

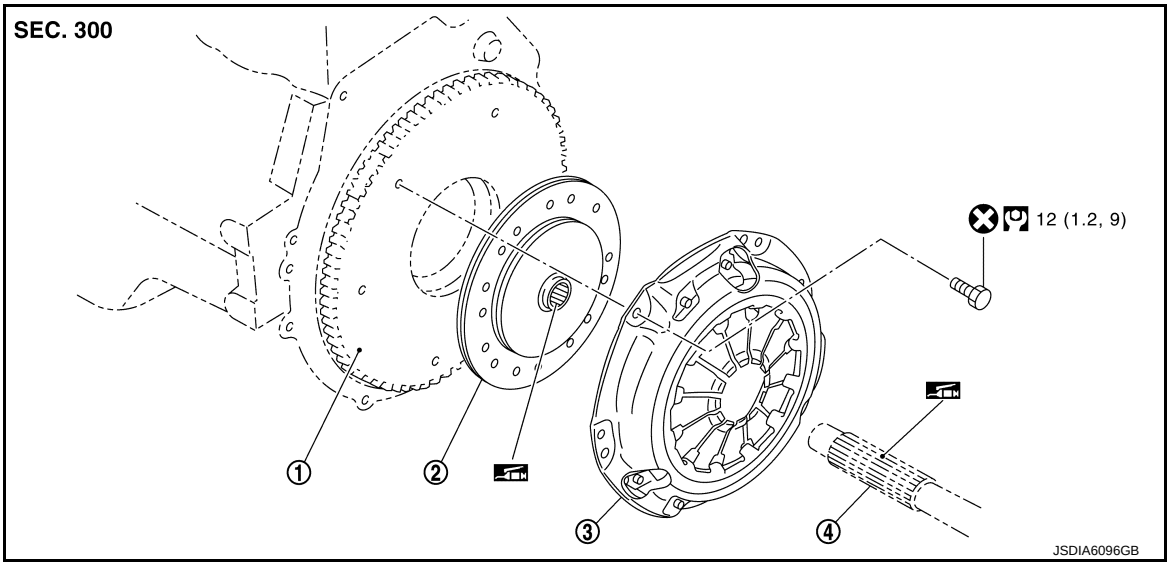


Tolerance for diaphragm spring lever unevenness	**: Refer to CL-42, "Clutch Cover".**

R9M

R9M : Exploded View

INFOID:0000000010752997



① Flywheel ② Clutch disc ③ Clutch cover

④ Input shaft

: N·m (kg-m, ft-lb)

: Apply lithium-based grease including molybdenum disulphide.

R9M : Removal and Installation

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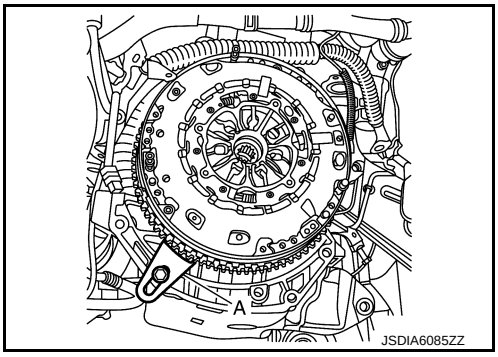
CAUTION:

- **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-30, "Removal and Installation".**
- **Never bring any grease to the clutch disc facing, pressure plate surface and flywheel surface.**
- **Never clean clutch disc using solvent.**

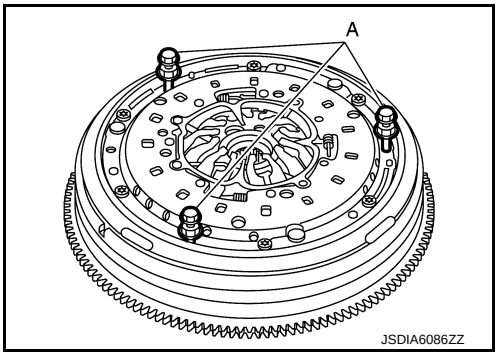
REMOVAL

1. Remove transaxle assembly. Refer to TM-122, "Removal and Installation".
2. Lock the flywheel using the flywheel locking tool (A) [SST: — (Mot.1431)].
3. Remove clutch cover and clutch disc according to the following procedure.
   NOTE:
   These instructions must be respected to prevent twisting the clutch cover.

a. Remove three clutch cover mounting bolts at 120° intervals.



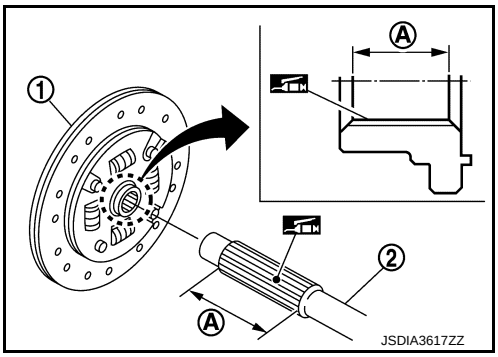
b. Replace these three bolts to the bolts of the tool kit (A) [SST: — (Emb.1761)].
c. Place the three spacers of the tool kit [SST: — (Emb.1761)] in contact with the nuts.
d. Gradually remove the remaining bolts.
e. Unscrew and gradually remove by quarter turns the three nuts of the tool kit [SST: — (Emb.1761)] one by one.
f. Remove clutch cover and clutch disc.
CAUTION:
Never drop clutch disc.
g. Perform inspection after removal. Refer to CL-39, "R9M : Inspection".



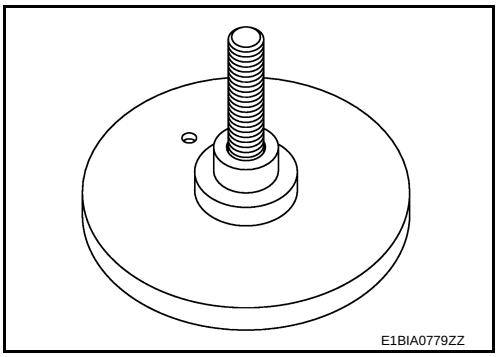
INSTALLATION

In Case of Clutch Cover Reused:
NOTE:
The automatic compensation must be repositioned at its first point.

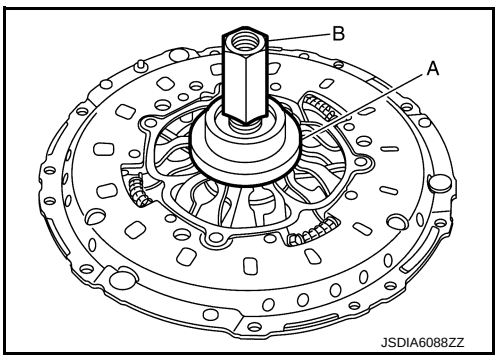
1. Clean clutch disc and input shaft splines to remove grease and powder arisen from abrasion.
2. Apply recommended grease to clutch disc ① and input shaft ② splines area Ⓐ. For recommended grease, refer to CL-35, "R9M : Exploded View".
CAUTION:
Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or judder. And if it adheres to seal of CSC, it cause clutch fluid leakage. Wipe out excess grease. Wipe out any grease oozing from the parts.



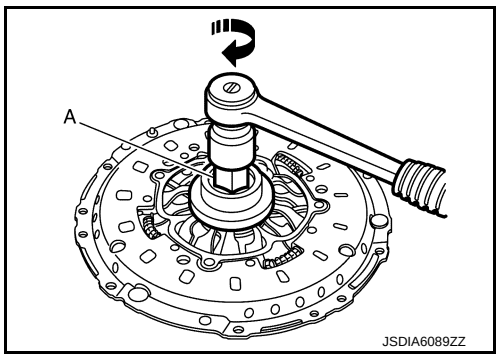
3. Place the base plate of clutch compression tool [SST: — (Emb.1604)] in a vice jaw.



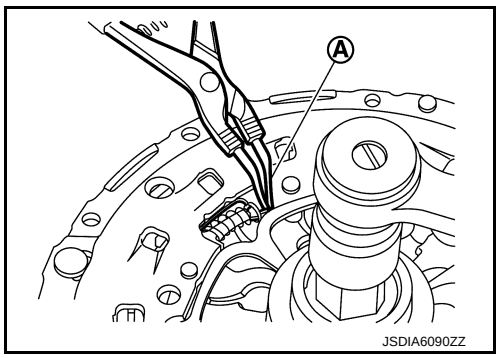
4. Install clutch cover onto the base plate then install the ball bearing or bronze ring (A) and the nut (B) of clutch compression tool [SST: — (Emb.1604)].



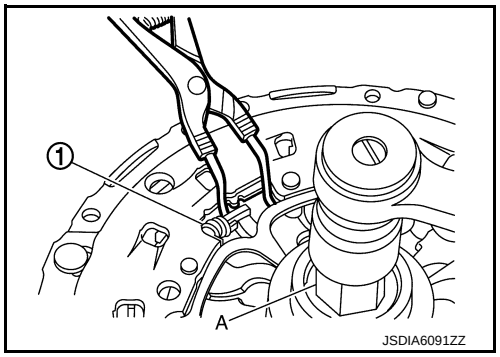
5. Tighten the nut (A) fully.



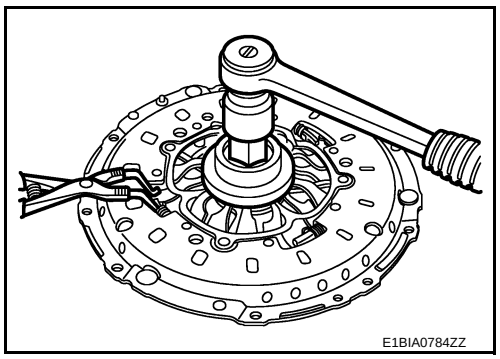
6. Fit a circlip and clamp it at Ⓐ.



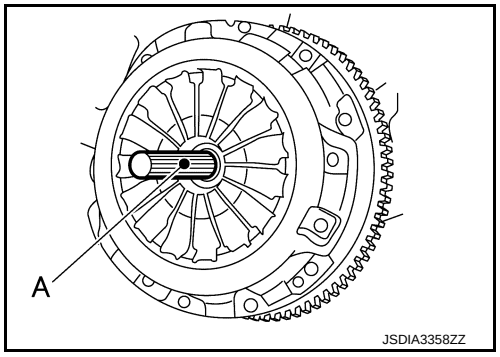
7. Compress the spring ① to reprime the automatic compensation. Then slacken off the nut (A) completely. (Spring is compressed.)
8. Release clutch cover.



9. Remove clutch cover from the base plate of clutch compression tool [SST: — (Emb.1604)].
CAUTION:
Be sure that the springs are correctly compressed.

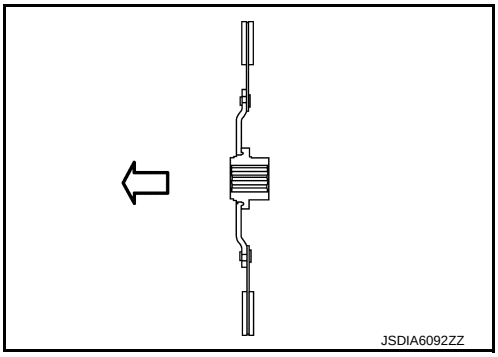


10. Install clutch disc using clutch aligner (A) (commercial service tool), and temporarily install clutch cover.
CAUTION:
- **Never drop clutch disc and clutch cover.**

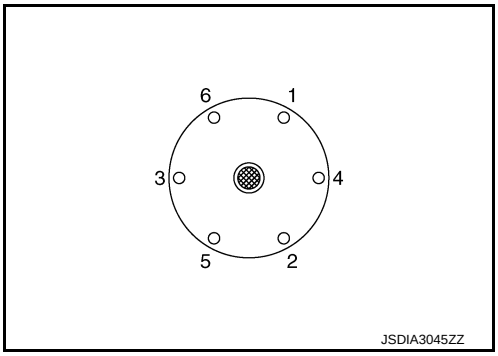


- **Be careful with the orientation of the clutch disc.**

⇦ : Engine side

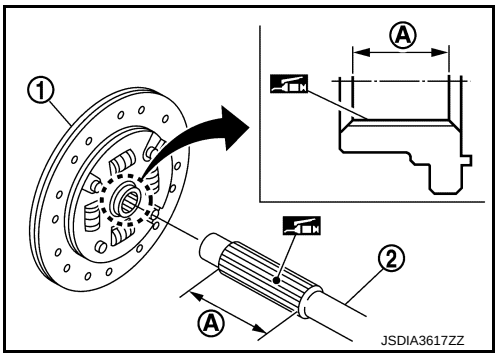


11. Tighten clutch cover mounting bolts to the specified torque evenly in the numerical order as shown in the figure.
    - For tightening torque, refer to CL-35, "R9M : Exploded View".
    - After installation, perform inspection. Refer to CL-39, "R9M : Inspection".
12. Install transaxle assembly. Refer to TM-122, "Removal and Installation".

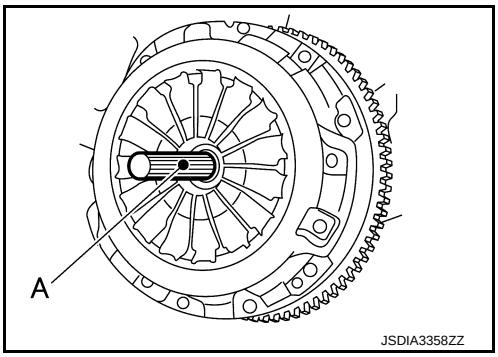


In Case of New Clutch Cover Installation:

1. Clean clutch disc and input shaft splines to remove grease and powder arisen from abrasion.
2. Apply recommended grease to clutch disc ① and input shaft ② splines area Ⓐ. For recommended grease, refer to CL-35, "R9M : Exploded View".
   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 judder. And if it adheres to seal of CSC, it cause clutch fluid leakage. Wipe out excess grease. Wipe out any grease oozing from the parts.

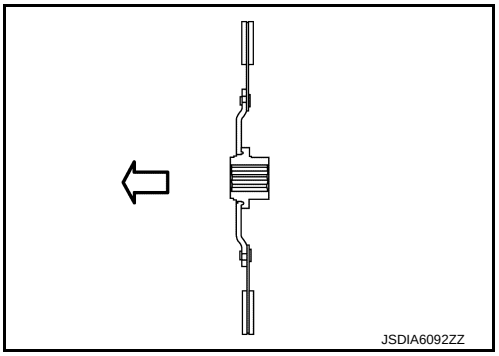


3. Install clutch disc using clutch aligner (A) (commercial service tool), and temporarily install clutch cover.
   CAUTION:
   - **Never drop clutch disc and clutch cover.**

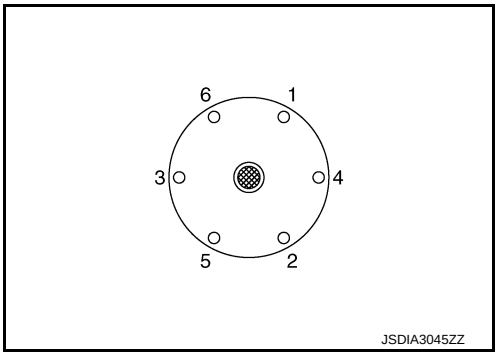


- **Be careful with the orientation of the clutch disc.**

⇦ : Engine side



4. Tighten clutch cover mounting bolts to the specified torque evenly in the numerical order as shown in the figure.
   - For tightening torque, refer to CL-35, "R9M : Exploded View".
   - After installation, perform inspection. Refer to CL-39, "R9M : Inspection".
5. Install transaxle assembly. Refer to TM-122, "Removal and Installation".



R9M : Inspection

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INSPECTION AFTER REMOVAL

Clutch Disc

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

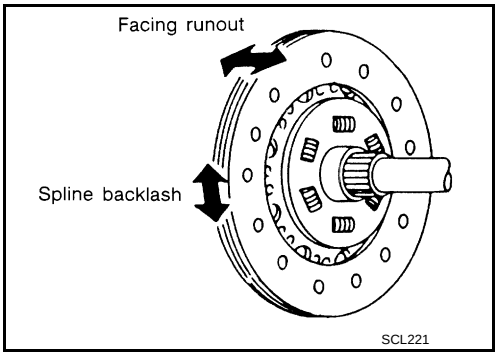
Runout limit/diameter of the area to be measured	**: Refer to CL-41, "Clutch Disc".**

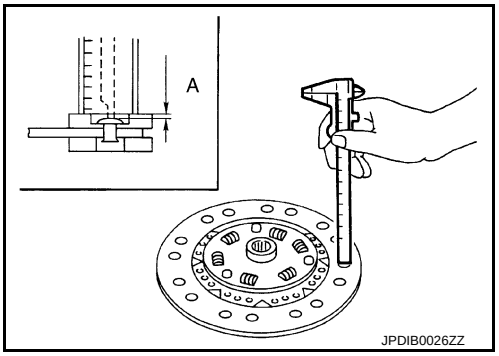
- Measure backlash to clutch disc spline and input shaft spline at the circumference of clutch disc. If it is outside the specification, replace clutch disc.

Maximum allowable spline backlash (at outer edge of disc)	**: Refer to CL-41, "Clutch Disc".**

- Measure the depth (A) to clutch disc facing rivet heads, using a calipers. If it exceeds the allowable wear limit, replace clutch disc.

Facing wear limit (depth to the rivet head)	**: Refer to CL-41, "Clutch Disc".**





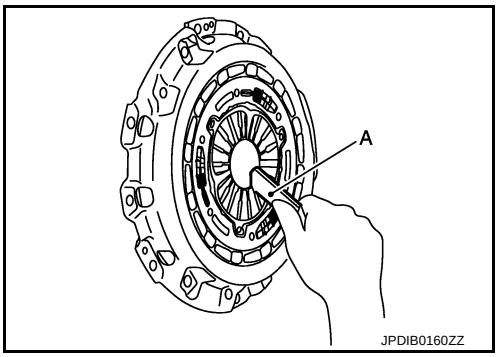
Clutch Cover

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

INSPECTION AFTER INSTALLATION

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 (A) (SST: ST20050240).



Tolerance for diaphragm spring lever unevenness	**: Refer to CL-42, "Clutch Cover".**

SERVICE DATA AND SPECIFICATIONS (SDS)

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General Specifications

INFOID:0000000010745347

Unit: mm (in)

Engine		MR20DD	R9M
Type of clutch control		Hydraulic	
Clutch disc	Facing size (Outer dia. × Inner dia. × Thickness)	230 × 155 × 3.2 (9.06 × 6.10 × 0.126)	239 × 170 × 3.45 (9.41 × 6.69 × 0.1358)
Recommended clutch fluid		Refer to MA-23, "Fluids and Lubricants".	

Clutch Pedal

INFOID:0000000010745348

LHD MODELS

Unit: mm (in)

Item			Standard
Clutch pedal height			193.6 – 203.6 (7.62 – 8.02)
Clutch pedal height at clutch disengagement		MR20DD	111.7 (4.40) or more
		R9M	96.0 (3.780) or more
Clutch pedal play			2 – 8 (0.08 – 0.31)
Clearance	Between the thread end of clutch interlock switch and clutch pedal lever		0.2 – 1.96 (0.008 – 0.077)
	Between the thread end of clutch pedal position switch and clutch pedal lever		0.2 – 1.96 (0.008 – 0.077)

RHD MODELS

Unit: mm (in)

Item			Standard
Clutch pedal height			188.5 – 198.5 (7.42 – 7.81)
Clutch pedal height at clutch disengagement		MR20DD	—
		R9M	93.4 (3.677) or more
Clutch pedal play			2 – 8 (0.08 – 0.31)
Clearance	Between the thread end of clutch interlock switch and clutch pedal lever		0.2 – 1.96 (0.008 – 0.077)
	Between the thread end of clutch pedal position switch and clutch pedal lever		0.2 – 1.96 (0.008 – 0.077)

Clutch Disc

INFOID:0000000010745349

Unit: mm (in)

Item		Standard
Runout limit/diameter of the area to be measured	MR20DD	1.0 (0.039) / 220 (8.66) dia.
	R9M	1.0 (0.039) / 229 (9.02) dia.
Maximum allowable spline backlash (at outer edge of disc)	MR20DD	0.9 (0.035)
	R9M	1.0 (0.039)
Facing wear limit (depth to the rivet head)	MR20DD	0.3 (0.012)
	R9M	

Clutch Cover

INFOID:0000000010745350

Unit: mm (in)

Item		Standard
Tolerance for diaphragm spring lever unevenness	MR20DD	0.7 (0.028) or less
	R9M	0.8 (0.031) or less