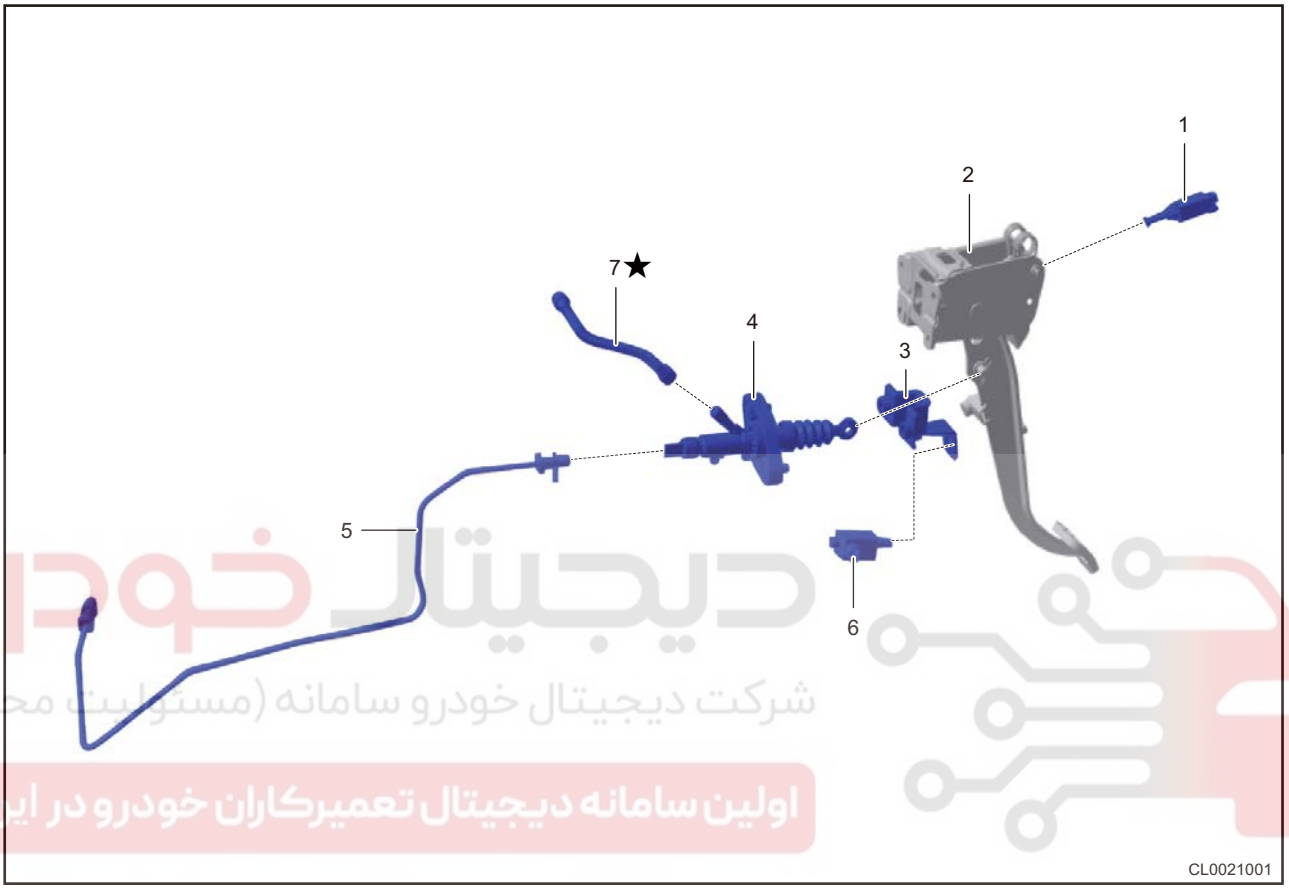
CLUTCH

GENERAL INFORMATION

Overview

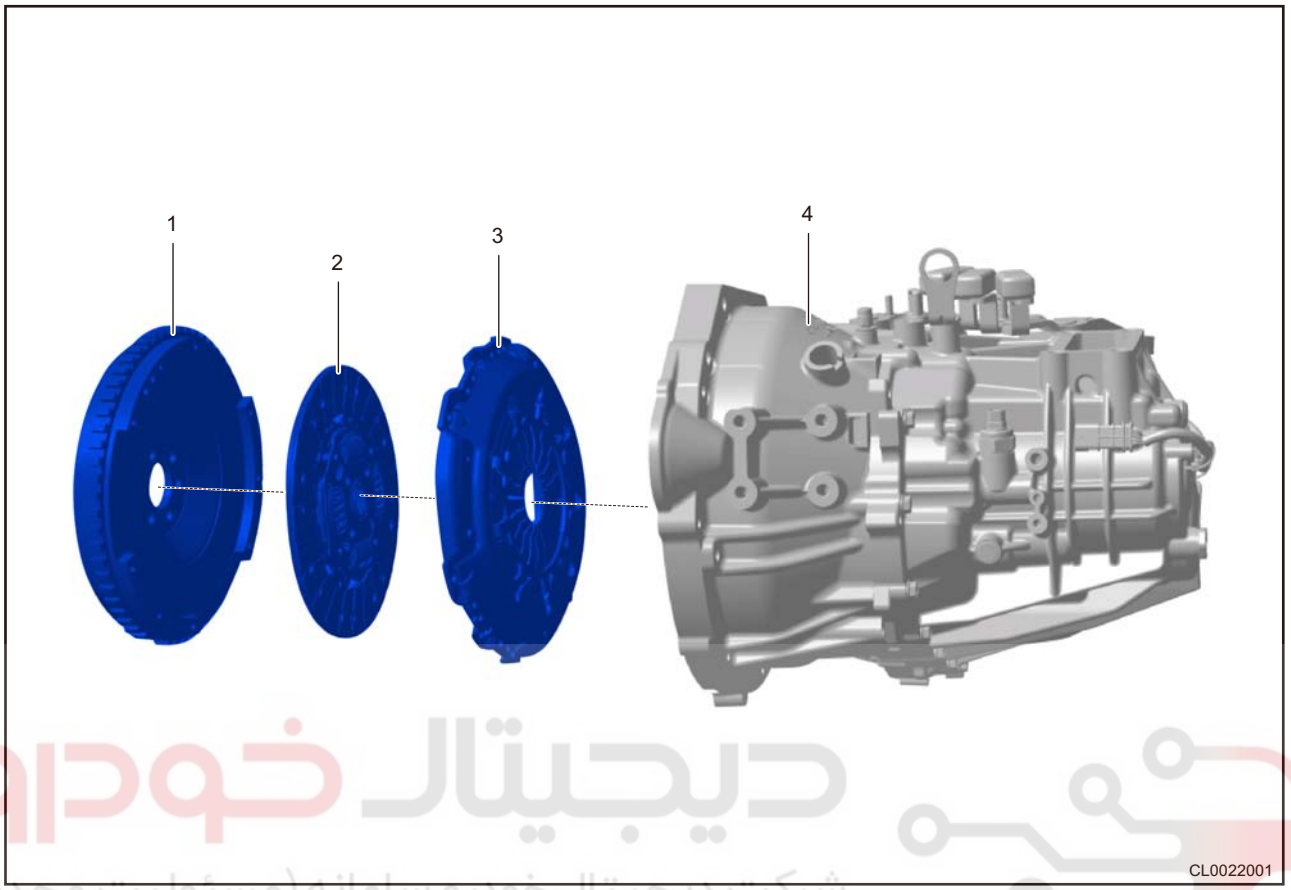
Description

Clutch Pedal Assembly



1 - Clutch Upper Switch	2 - Clutch Pedal Assembly
3 - Clutch Bottom Switch Bracket	4 - Clutch Master Cylinder Assembly
5 - Clutch Pipe	6 - Clutch Bottom Switch
7 - Clutch Master Cylinder Inlet Hose	★ - Indicates that it is a non-reusable part

Clutch Sub-assembly



1 - Flywheel	2 - Clutch Driven Disc
3 - Clutch Pressure Plate	4 - Transmission Assembly

Operation

Hydraulic clutch system: Hydraulic clutch system mainly consists of clutch pedal, clutch master cylinder, clutch release cylinder, clutch hydraulic line, etc. When depressing clutch pedal, clutch master cylinder generates pressure, and transmits it to the release bearing which is fitted with pressure plate diaphragm spring. As external force is applied, release bearing presses in diaphragm spring release finger until it reaches fulcrum. This operation moves pressure plate backward, thus releasing the clamping force of clutch driven disc. Clutch master cylinder assembly: Clutch master cylinder consists of piston, cylinder block, push rod and hydraulic line. When depressing pedal, push rod pushes the piston in master cylinder and fluid in the hydraulic line is drained into release cylinder.

Specifications

Torque Specifications

Description	Torque (N·m)
Clutch Pedal Fixing Nut	23 ± 2
Clutch Pressure Plate	23 ± 2
Release Bearing Fixing Bolt	12 ± 1.8
Clutch Master Cylinder Fixing Nut	25 ± 3

Clutch Driven Disc Specifications

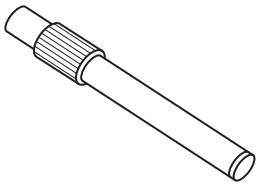
Measurement Item	Specification (mm)
Clutch Driven Disc Standard Thickness	6.5 ± 0.2
Minimum rivet depth	1

Distance Between Clutch Master Cylinder and Clutch Pedal

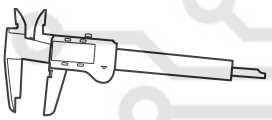
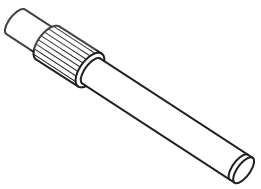
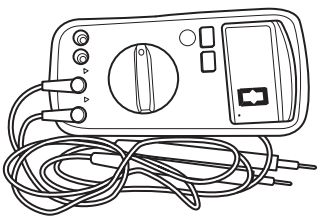
Measurement Item	Specification (mm)
Distance Between Clutch Master Cylinder and Clutch Pedal	125

Tools

General Tool

Tool Name	Part No.	Tool Drawing
Clutch Pressure Plate Alignment Tool	CH-20014-A	 RCH0018006

General Tools

Tool Name	Tool Drawing
Vernier Caliper	 RCH0071006
Clutch Pressure Plate Alignment Tool	 RCH0018006
Digital Multimeter	 RCH0002006

DIAGNOSIS & TESTING

Problem Symptoms Table

Hint:

- Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

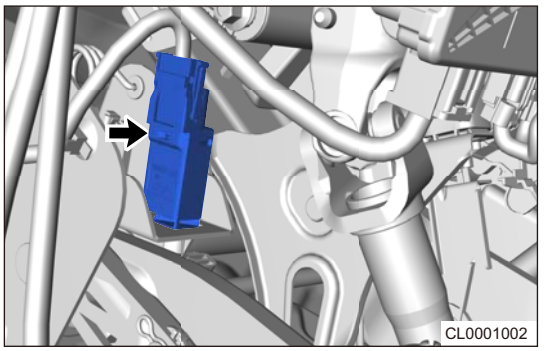
Symptom	Possible Cause
Clutch chatters	Oil level (too low)
	Engine bracket (loose)
	Clutch driven disc assembly runout (excessive)
	Clutch driven disc (oily)
	Clutch driven disc (worn)
	Clutch driven disc torsion spring (damaged)
	Clutch driven disc (glazed)
	Diaphragm spring tip (out of alignment)
Clutch is noisy	Clutch release bearing (worn, dirty or damaged)
	Clutch driven disc torsion spring (damaged)
Clutch slips	Clutch pedal free play (out of adjustment)
	Oil level (too low)
	Clutch driven disc (oily)
	Clutch driven disc (worn)
	Diaphragm spring (damaged)
	Pressure plate (distorted)
	Flywheel (distorted)
Clutch disengages incompletely	Clutch driven disc (improperly installed)
	Oil level (too low)
	Clutch line (blocked)
	Master cylinder cup (damaged)
	Release cylinder cup (damaged)
	Clutch driven disc runout (excessive)
	Clutch driven disc lining (broken)
	Clutch driven disc (dirty or burned)
	Clutch driven disc (oily)
	Clutch pedal free play (out of adjustment)

ON-VEHICLE SERVICE

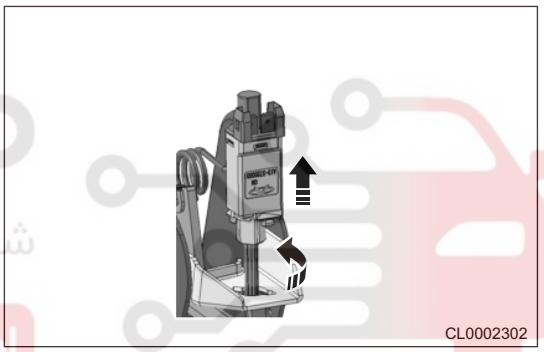
Clutch Upper Switch

Removal

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the clutch switch.
   (a) Disconnect the clutch upper switch connector (arrow).



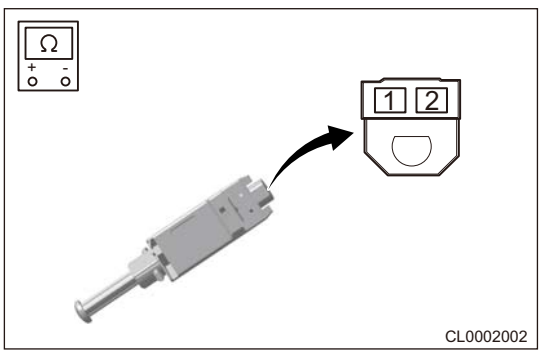
   (b) Press clutch upper switch by hand and turn it 90° counterclockwise, align the switch body with lengthwise direction of pedal installation hole, and pull out clutch switch assembly along opening of pedal.



Inspection

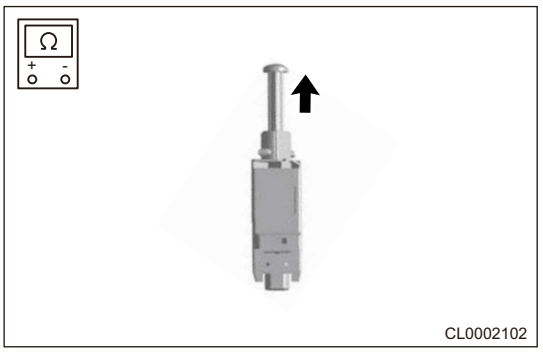
1. Check the status between terminals when the removed clutch switch is turned on or off.

Switch Position	Specified Condition
ON (not pressed)	Resistance ⩽ 1 Ω
OFF (pressed)	Resistance ∞



Installation

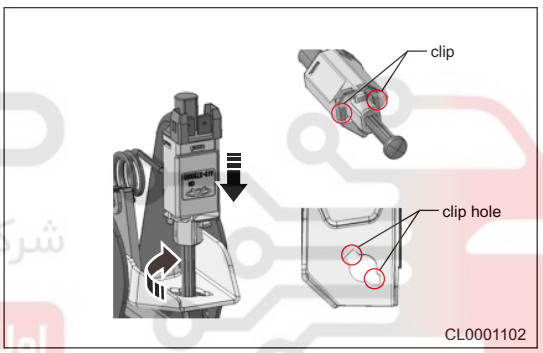
1. Pull out the clutch switch lever completely.



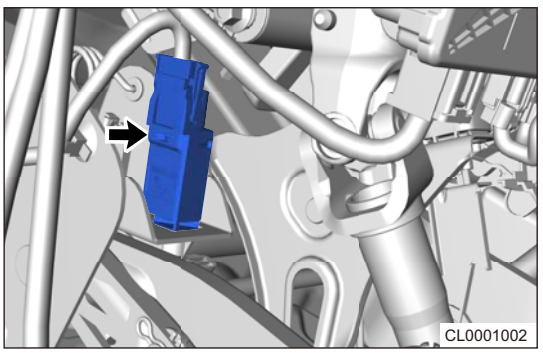
Warning:

- Before assembling clutch switch to vehicle, the lever must be pulled out completely. If the switch lever cannot be pulled out in the direction of axis, the lever has been pulled to the longest (a "click" sound can be heard when pulling lever).

2. Install clutch switch to clutch pedal.
   (a) Fully depress the clutch pedal.
   (b) Align clutch switch body with installation hole of pedal, and then install clutch switch to installation hole of pedal.



   (c) Press clutch switch and turn it 90° clockwise to clamp switch clip into clip hole of pedal.
   (d) Release clutch pedal slowly to return clutch pedal to initial position automatically under the action of return spring, and automatically adjust clutch switch lever to appropriate gear position simultaneously (a "click" sound can be heard during adjustment).
   Warning:
   - After completing installation, clutch pedal should fully contact with clutch switch lever (lever is compressed).
   - After clutch pedal is fully depressed, the hand do not release pedal during auto return of pedal and make pedal return to original position slowly. Avoid releasing pedal suddenly, large impact may lead clutch switch to jump.
   (e) Connect the clutch upper switch connector.



3. Connect the negative battery cable.

Clutch Bottom Switch

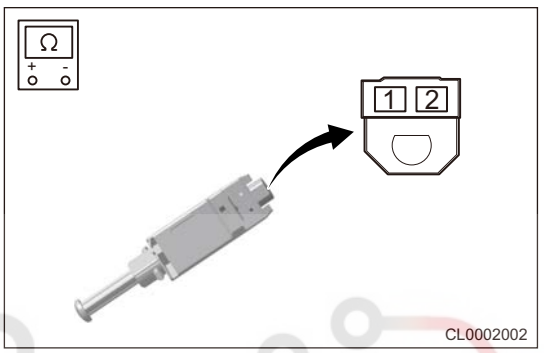
Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the clutch bottom switch.
   (a) Disconnect the clutch bottom switch connector.
   (b) Turn switch clockwise by hand, align the switch body with lengthwise direction of pedal installation hole, and pull out clutch bottom switch assembly along opening of pedal.

Inspection

1. Check the status between terminals when the removed clutch switch is turned on or off.

Switch Position	Specified Condition
ON (not pressed)	Resistance ⩽ 1 Ω
OFF (pressed)	Resistance ∞

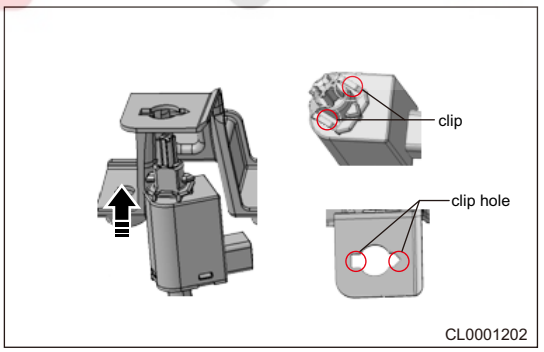


Installation

1. Connect the clutch bottom switch connector.
2. Install clutch bottom switch to clutch pedal.
   (a) Align clutch bottom switch body with installation hole of clutch pedal mounting bracket.
   (b) Press clutch bottom switch into installation hole.
   (c) Press switch and turn it counterclockwise to clamp clutch bottom switch clip into clip hole on bracket.

Warning:

- Before assembly, make sure that clutch bottom switch bracket has been installed to body and clutch pedal has been installed to master cylinder.



Clutch Master Cylinder Assembly

Removal

Warning/Caution/Hint:

Warning:

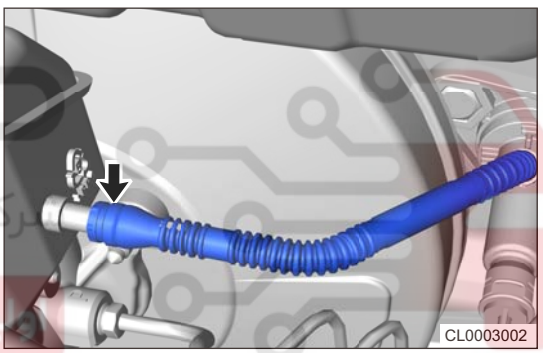
- Brake fluid in master cylinder is harmful to your skin, so be sure to wear protective gloves before operation.
- Once brake fluid contacts with your skin, wash it off with water immediately.
- Be careful when removing the clutch master cylinder from engine compartment. Incorrect operation may damage hydraulic line, also cause clutch to disengage improperly.
- DO NOT allow brake fluid to spray onto body surface. Brake fluid may damage paint surface. If any brake fluid is get onto the paint surfaces, wash it off with water immediately.

1. Disconnect the negative battery cable.
2. Drain the brake fluid.

   Hint:

   - Drained brake fluid should be well kept in a container. Never discard it at will.
3. Remove the battery.
4. Remove the battery tray.
5. Remove the clutch master cylinder.

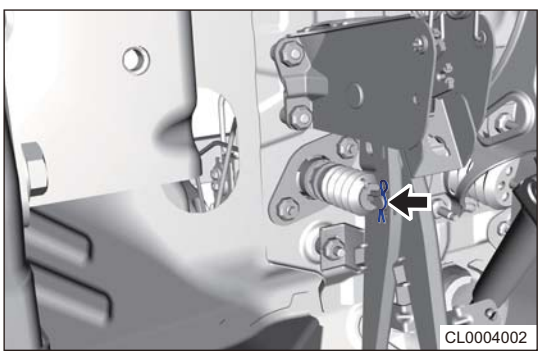
   (a) Disconnect the clutch master cylinder inlet hose (arrow).



   Caution:

   - Master cylinder inlet hose is a non-reusable component, and replace it after removal.
   - Insert the end with "small straight mark without corrugation" of clutch master cylinder inlet hose into outlet port joint of brake fluid reservoir, and insert the end without mark into clutch master cylinder inlet port.
   - DO NOT turn and pull back and forth when inserting into master cylinder inlet hose, to prevent damaging the seal ring.
   - After hose is bent, it is normal that some material between two corrugations is "whitish".

   (b) Remove cotter lock pin (arrow), and separate connection between clutch master pedal and clutch master cylinder push rod.

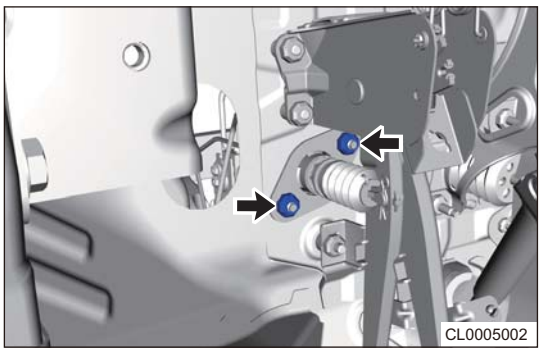


   Caution:

   - When removing and installing cotter lock pin, detaching or installing pin between clutch master cylinder push rod and clutch pedal assembly, the right and left pendulum angle of clutch master cylinder push rod relative to master cylinder axis is less than 10°.

(c) Remove 2 fixing nuts (arrows) from clutch master cylinder, and pull out clutch master cylinder assembly from outside.

Tightening torque
23 ± 2 N·m



Installation

1. Installation is in the reverse order of removal.

Caution:
- Make sure that brake fluid level remains between "MIN" and "MAX" mark.
- Perform bleeding procedure for hydraulic clutch and check brake fluid for leakage after installation.

Warning:
- After installing clutch pedal and clutch master cylinder, it is necessary to check and adjust position of clutch upper switch, otherwise, it may cause problems such as cruise failure, vehicle rushing, etc.

Clutch Pipe Assembly

Removal

Warning/Caution/Hint:

Warning:

- Brake fluid in master cylinder is harmful to your skin, so be sure to wear protective gloves before operation.
- Once brake fluid contacts with your skin, wash it off with water immediately.

Caution:

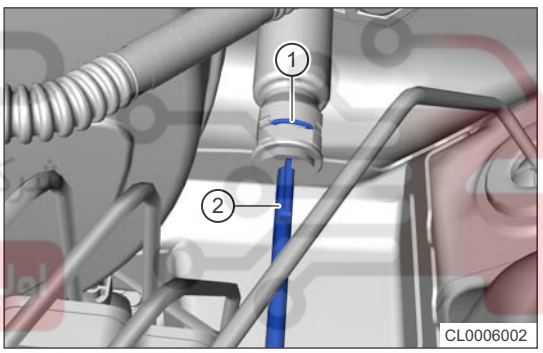
- Be careful when removing the clutch master cylinder from engine compartment. Incorrect operation may damage hydraulic line, also cause clutch to disengage improperly.
- DO NOT allow brake fluid to spray onto body surface. Brake fluid may damage paint surface. If any brake fluid is get onto the paint surfaces, wash it off with water immediately.

1. Disconnect the negative battery cable.
2. Drain the brake fluid.

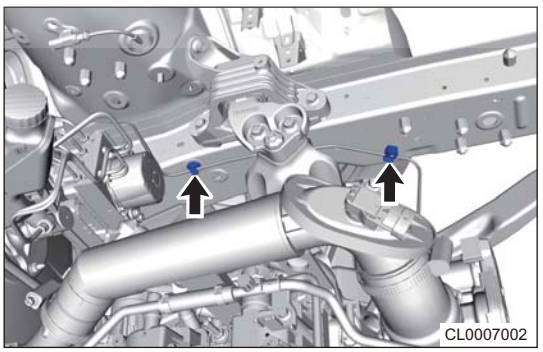
   Hint:

   - Drained brake fluid should be well kept in a container. Never discard it at will.
3. Remove the battery.
4. Remove the battery tray.
5. Remove the clutch pipe assembly.

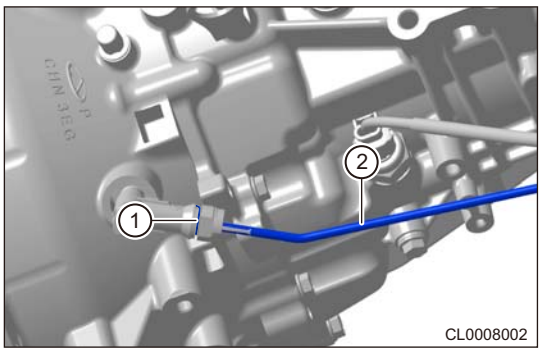
   (a) Loose fixing clip (1) between clutch pipe and clutch master cylinder, and disconnect connection (2) between clutch pipe and clutch master cylinder.



   (b) Remove clutch pipe from single opening pipe clamps (arrow).



6. Remove fixing clip (1) between clutch pipe assembly (2) and clutch release bearing joint.



7. Remove the clutch pipe assembly.

Installation

1. Installation is in the reverse order of removal.
   Caution:
   - Perform bleeding procedure for hydraulic clutch and check system line for leakage after installation.
   - After installing battery tray, check clearance between clutch pipe and battery tray and other surrounding parts, make sure that clearance is not less than 5 mm. If clearance is less than 5 mm, adjust relative position between clutch pipe and pipe clamp to make sure clearance is appropriate.

Clutch Release Bearing

Removal

Warning/Caution/Hint:

Warning:

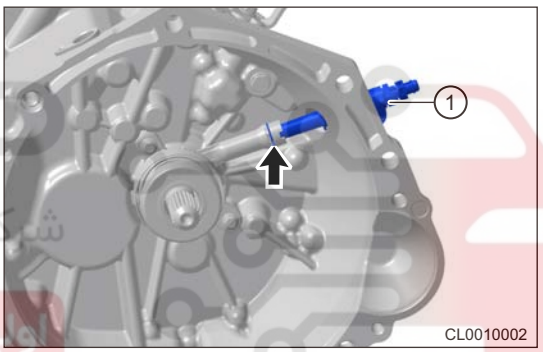
- Brake fluid in master cylinder is harmful to your skin, so be sure to wear protective gloves before operation.
- Once brake fluid contacts with your skin, wash it off with water immediately.

Caution:

- Collect brake fluid with a container when repairing.
- After replacing release cylinder, make sure that brake fluid level remains between "MIN" and "MAX" mark.
- DO NOT allow brake fluid to spray onto body surface. Brake fluid may damage the paint surfaces; If any brake fluid is get onto the paint surfaces, wash it off with water immediately.
- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing bottom of vehicle.

1. Raise the vehicle with a lift.
2. Remove the transmission assembly.
3. Remove the clutch release bearing.

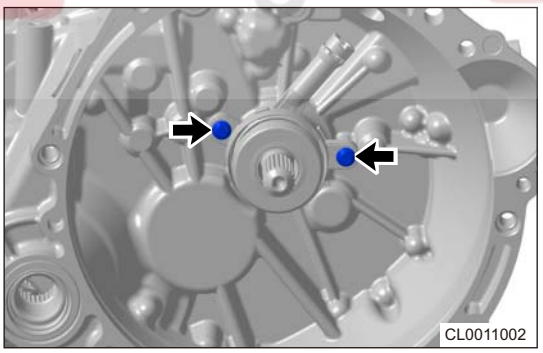
(a) Pry off clutch release bearing fixing clip (arrow), and remove clutch release bearing joint (1).



(b) Using a tool, remove 2 fixing bolts (arrow) from clutch release bearing, and remove clutch release bearing.

Tightening torque

12 ± 1.8 N·m



Installation

1. Installation is in the reverse order of removal.

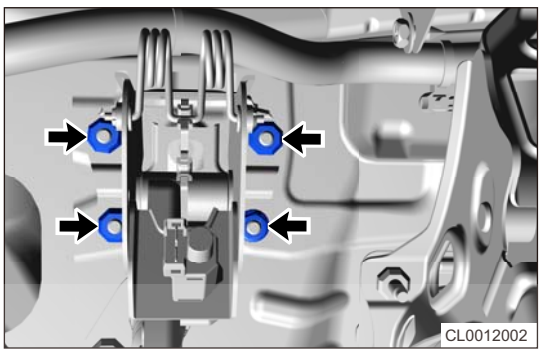
Caution:

- Make sure that securely connect clutch release bearing joint and release bearing. Perform bleeding procedure for hydraulic clutch and check system line for leakage after installation.

Clutch Pedal

Removal

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel left lower protector.
4. Remove the clutch pedal.
   (a) Disconnect connection between clutch pedal and clutch master cylinder push rod
   (b) Press switch by hand and turn it 90° counterclockwise, align the switch body with lengthwise direction of pedal installation hole, and pull out clutch switch assembly along opening of pedal.
   (c) Remove 4 fixing nuts (arrow) from clutch pedal.
   Tightening torque
   23 ± 2 N·m



5. Remove the clutch pedal.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to tighten bolts and nuts to specified value.
- Check fluid level in reservoir after installation.

Warning:

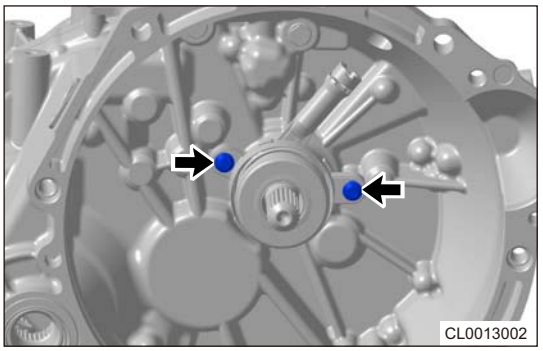
- When installing clutch upper switch, it is necessary to follow removal and installation procedures of clutch switch closely (Refer to Removal and Installation of Clutch Upper Switch), otherwise, it may cause problems such as cruise failure, vehicle rushing, etc.
- Clutch pedal should have been installed to clutch master cylinder before installing the clutch switch.

Clutch Unit

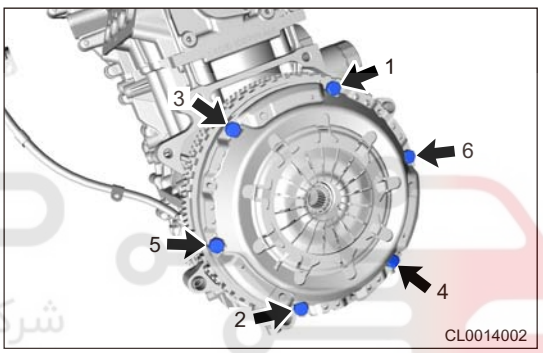
Removal

1. Remove the transmission assembly.
2. Remove fixing bolts (arrow) and clutch release bearing.

Tightening torque
12 ± 1.8 N·m



3. Remove fixing bolts (arrow) from clutch pressure plate in order shown in illustration

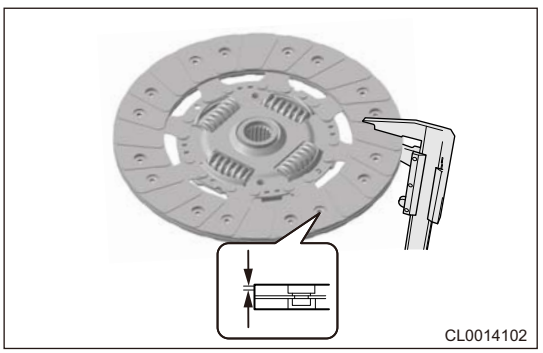


4. Remove clutch pressure plate and clutch driven disc.

Inspection

1. Check the clutch driven disc.
   (a) Visually check clutch driven disc for dirt or glazing. Clean or replace the clutch driven disc as necessary.
   (b) Use a vernier caliper to measure the thickness of clutch driven disc.

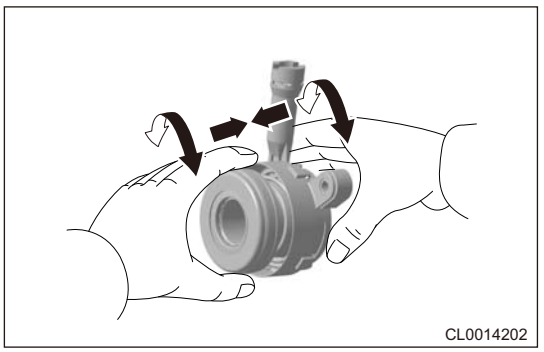
Standard thickness
6.5 ± 0.2 mm
Minimum rivet depth
1 mm
If result is not as specified, replace the clutch driven disc.



2. Check the clutch release bearing assembly.
   (a) Visually check surface of release bearing for dirt, glazing or damage. Clean or replace the release bearing assembly as necessary.

(b) Check that bearing operates smoothly by rotating the sliding part of bearing (the side contacting with clutch).

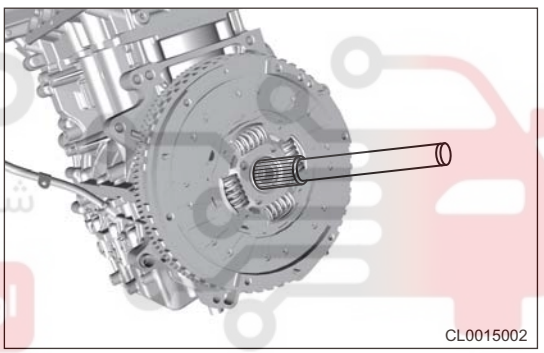
Hint:
Replace the release bearing assembly if necessary.


CL0014202

3. Check the clutch pressure plate.
   (a) Check clutch pressure plate for warping, rupture, or excessive wear.
   (b) Press pressure plate with a straight steel ruler and check if the planeness of pressure plate is too flat using a feeler gauge.
   (c) Check diaphragm spring of clutch pressure plate.
      (1) Check if contacting area between diaphragm spring and release bearing is excessive worn.
      (2) Check diaphragm spring for elasticity deformation.

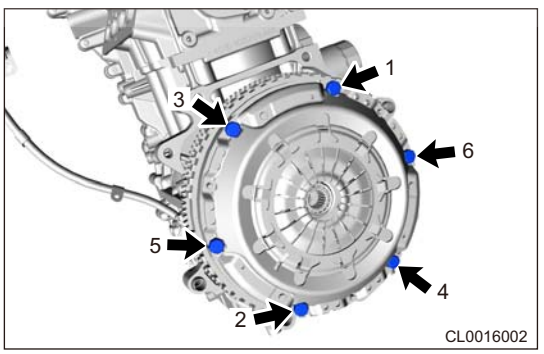
Installation

1. Use a special tool to install flywheel and clutch driven disc to engine.


CL0015002

2. Install clutch pressure plate and tighten 6 fixing bolts (arrow) in order shown in illustration.

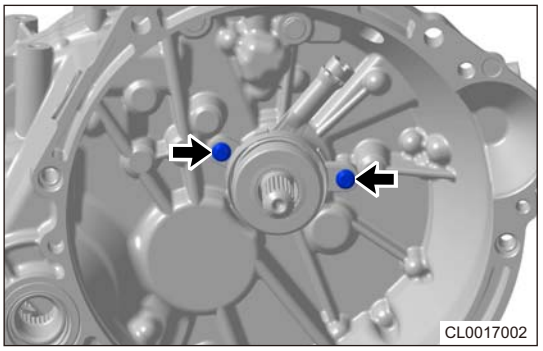
Tightening torque
23 ± 2 N·m



CL0016002

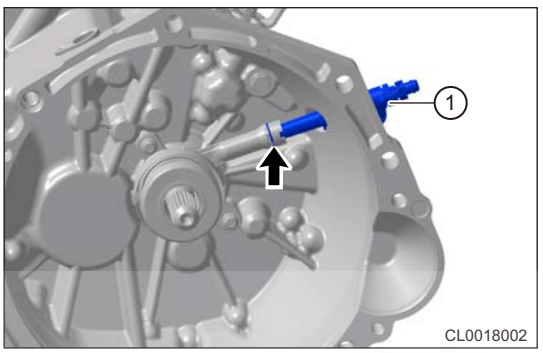
3. Install the clutch release bearing.

(a) Install clutch release bearing and clutch release bearing fixing bolts (arrow).



(b) Install clutch release bearing joint (1) and press the clip (arrow).

Caution:
- Secure clutch fork in place, without being reversed.
- During installation, apply appropriate amount of grease to release bearing inner race.



Bleeding Hydraulic Clutch

Operation Step

Warning/Caution/Hint:

Warning:

- Brake fluid in master cylinder is harmful to your skin, so be sure to wear protective gloves before operation.
- Once brake fluid contacts with your skin, wash it off with water immediately.

Caution:

- Collect brake fluid with a container when repairing.
- Only use brake fluid recommended by Chery Automobile Co., Ltd, otherwise the lines may be subjected to a severe corrosion.
- DO NOT allow brake fluid to spray onto body surface. Brake fluid may damage the paint surfaces; If any brake fluid is get onto the paint surfaces, wash it off with water immediately.
- Brake fluid type should be DOT4.

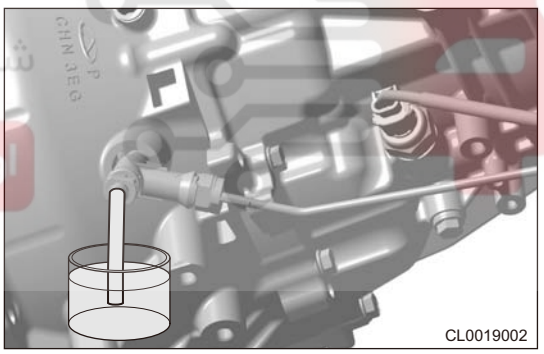
Hint:

- An assistant will be required to assist when bleeding hydraulic clutch.

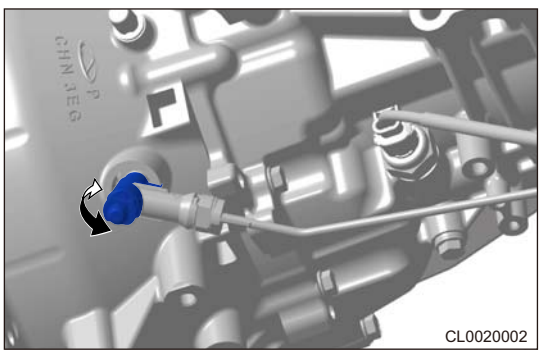
1. Turn off all electrical equipment and the ignition switch.
2. Check the fluid level in brake master cylinder, add DOT4 brake fluid as necessary, and keep the cap open.

   Caution:

   - Make sure that there is sufficient brake fluid in reservoir before bleeding.
3. Remove the discharge port protective cap and connect a clear plastic hose to the bleeder screw, and submerge the end of hose into container.



4. Turn discharge port (arrow) and open it.



5. Depress the clutch pedal until brake fluid is drained from discharge port.
   Caution:
   - Collect brake fluid with a container.
   - DO NOT allow brake fluid to spray onto body surface. Brake fluid may damage paint surface. If any brake fluid is get onto the paint surfaces, wash it off with water immediately.
   - Only use brake fluid recommended by Chery Automobile Co., Ltd, otherwise the lines may be subjected to a severe corrosion.
   - Brake fluid type should be DOT4.
6. Depress the clutch pedal and tighten the discharge port.
7. Depress the clutch pedal until there is pressure in the clutch system.
8. Depress the clutch pedal, then loosen the discharge port and bleed the air from fluid in brake master cylinder.
9. Repeat steps from 5 to 8 for several times, until there is no air in the hydraulic clutch system any more.
   Caution:
   - Never drain brake fluid while bleeding hydraulic clutch.
   - During bleeding, make sure that brake fluid level remains between "MIN" and "MAX" mark.
10. Tighten the discharge port, then remove the discharge hose and replace the discharge port dust cover.
11. Check the brake fluid, and add DOT4 brake fluid to "MAX" as necessary, then tighten the reservoir cap.
12. Check the clutch pedal travel. If clutch pedal travel is excessive, or the condition does not improve, it indicates that some air is still kept in the system. Bleed the clutch again as necessary.
13. Test the vehicle and make sure the clutch operates normally and depressing feel is good.