VELOSTER(FS) > 2013 > G 1.6 T-GDI > Clutch System

Clutch System > General Information > Specifications

Specifications

Items		Specifications
Clutch operation method		Hydraulic type
Clutch cover	Type	Diaphragm spring strap
Clutch disc Type	Type	Single dry with diaphragm
	Faling diameter (Outer × inner)	Ø210 × Ø145 (Ø8.2677 × Ø5.7087)
Clutch release cylinder	inner diameter	20.64 mm (0.8126 in.)
Clutch master cylinder	inner diameter	15.87 mm (0.6248 in.)

Service Standard

Item	Specification
Clutch disc thickness [When free]	8.3 ± 0.3 mm (0.3268 ± 0.0118 in.)
Clutch pedal height [With carpet]	194.5 mm (7.6575 in.)
Clutch pedal free play	7 ~ 10 mm (0.2756 ~ 0.3937 in.)
Clutch pedal stroke	130 ± 0.3 mm (5.1181 ± 0.0118 in.)
Clutch disc rivet depth	1.1 mm (0.0433 in.)
Diaphragm spring end height difference	0.5 mm (0.0197 in.)
Clutch master cylinder clearance to piston	1.6 mm (0.0630 in.)

Tightening Torques

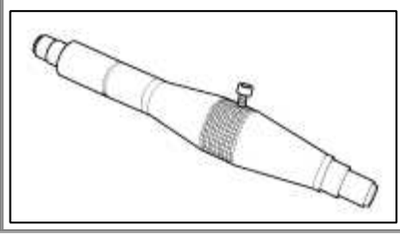
Item	N.m	kgf.m	lb-ft
Clutch pedal mounting bolts & nuts	18.6 ~ 23.5	1.9 ~ 2.4	13.7 ~ 17.4
Clutch release cylinder installation nut	14.7 ~ 21.6	1.5 ~ 2.2	10.8 ~ 15.9
Clutch release cylinder union bolt	24.5 ~ 34.3	2.5 ~ 3.5	18.1 ~ 25.3
Clutch release cylinder bleed plug	6.8 ~ 9.8	0.7 ~ 1.0	9.2 ~ 13.3
Clutch cover mounting bolt	14.7 ~ 21.6	1.5 ~ 2.2	10.8 ~ 15.9

Lubricants

Items	Specified lubricants	Quantity
Input shaft spline	CASMOLY L9508	0.2g
clutch release cylinder assembly	Brake fluid DOT 3 or DOT	As required
Clutch pedal shaft and bushings	Chassis grease SAE J310a, NLGI No.1	

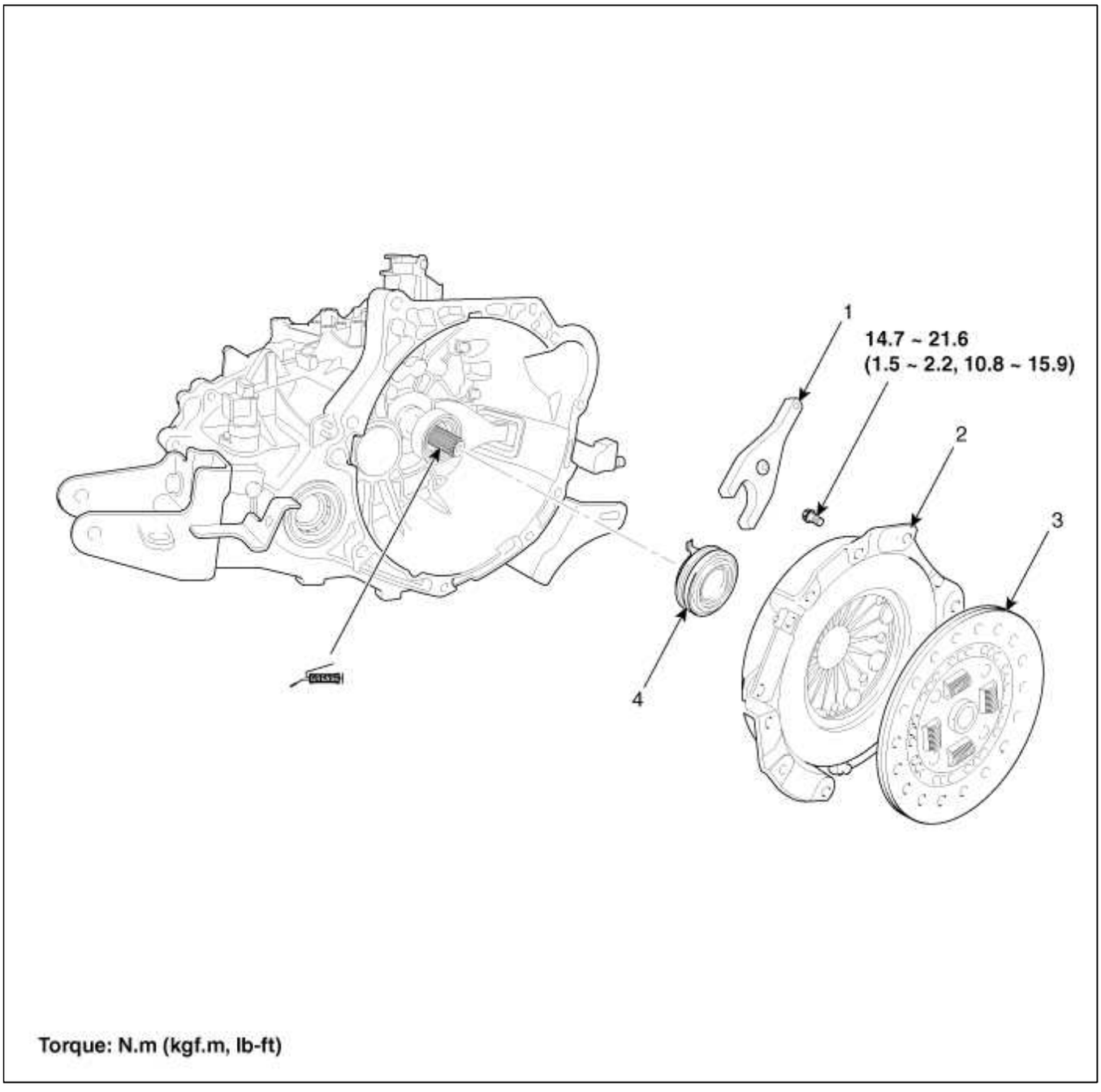
Clutch System > General Information > Special Service Tools

Special Service Tools

Tool (Number and name)	Illustration	Use
09411-1P000 Clutch disc guide		Installation of the clutch disc.

Clutch System > Clutch System > Clutch Cover And Disc > Components and Components Location

Components

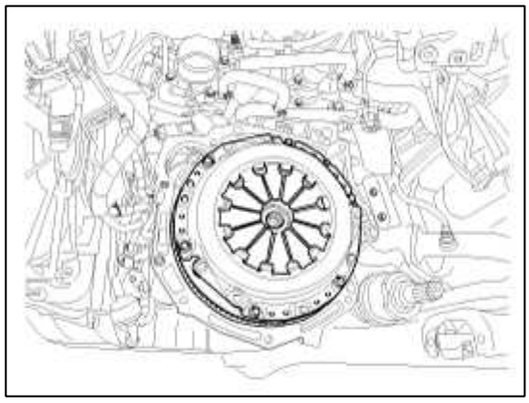


1. Clutch release fork 2. Clutch cover assembly	3. Clutch disk assembly 4. Clutch release bearing

Clutch System > Clutch System > Clutch Cover And Disc > Repair procedures

Removal

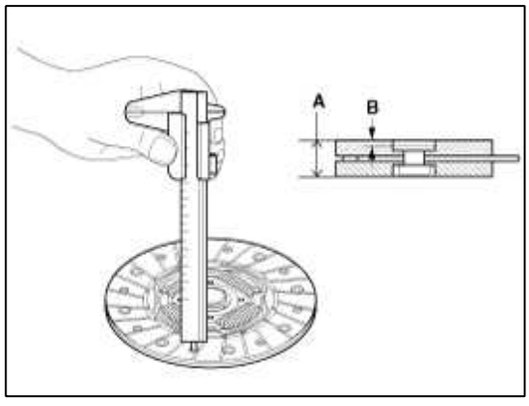
1. Remove the transaxle assembly.
   (Refer to "Manual transaxle system" in MT group)
2. Remove the clutch cover bolts. Be careful not to be bent ortwist bolts. Loosen bolts in diagonal directions.



Inspection

1. Inspect diaphragm spring wear which is in contact with a concentric slave cylinder bearing.
2. Check the clutch cover and disc surface for wear or cracks.
3. Check the clutch disc lining for slipping or oil marks.
4. Measure the depth from a clutch lining surface to a rivet. If the measured value is less than the specification below, replace it.

Standard value
Clutch disc thickness(A)[when free] :
8.3 ± 0.3 mm (0.3268 ± 0.0118 in.)
Clutch disc rivet depth(B) : 1.1 mm (0.0433 in.)



Installation

NOTE

If reinstalling used cover, the cover should be installed with its clutch disc as a set.

1. Replace a clutch cover and disc as a set.

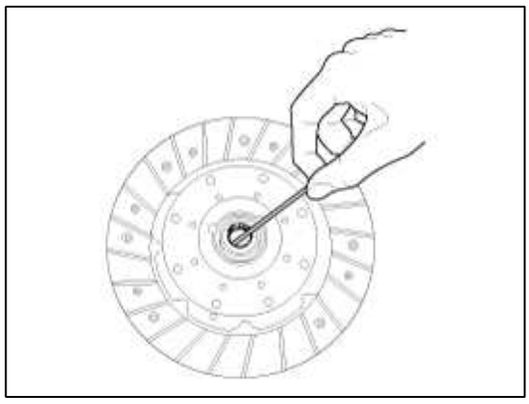
NOTE

- When replacing only a disc, a slip problem can occur because of the load loss due to uneven surface wear.
- When replacing only a disc, it can be difficult to cut power because the thickness of the disc won't permit it.

2. Apply grease on a disc spline part and transmission input shaft spline part as required.

NOTE

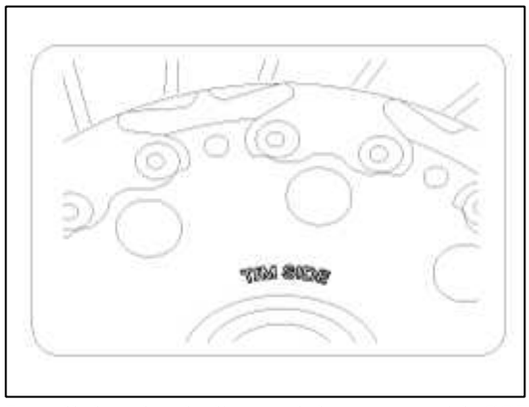
* Possible problems when not following
  - When not applying: Excessive wear of splines and bad clutch operation can occur.
  - When excessively applying: Grease can be scattered bycentrifugal force which can conteminate the clutch disc. This can cause a loss of friction force causing a slip.



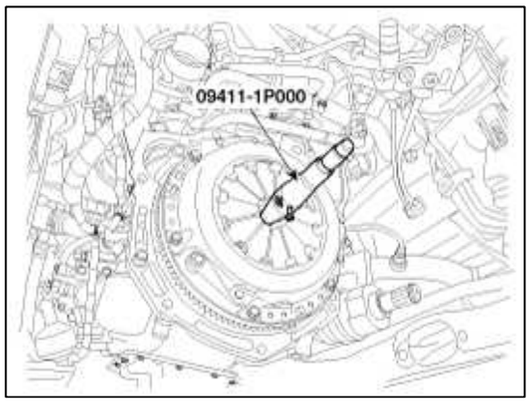
3. The 'T/M SIDE' marked surface should face the transmission .

CAUTION

* Possible problems when the disc is installed in the opposite direction.
  • There can be an interference between the concentric slave cylinder on the TM side and a engine flywheel surface.
  • Transaxle shift errror or a strangesound can occur due to clutch separation.



4. Install the clutch disc and the cover with SST(A : 09411-1P000).

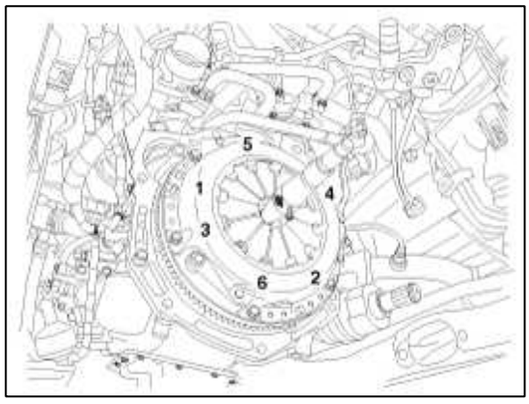


5. Install the clutch cover bolts. Not to be bent or twisted, Tighten them in diagonal directions.

Tightening torque:
14.7 ~ 21.6 N.m (1.5 ~ 2.2 kgf.m, 10.8 ~ 15.9 lb-ft)

CAUTION

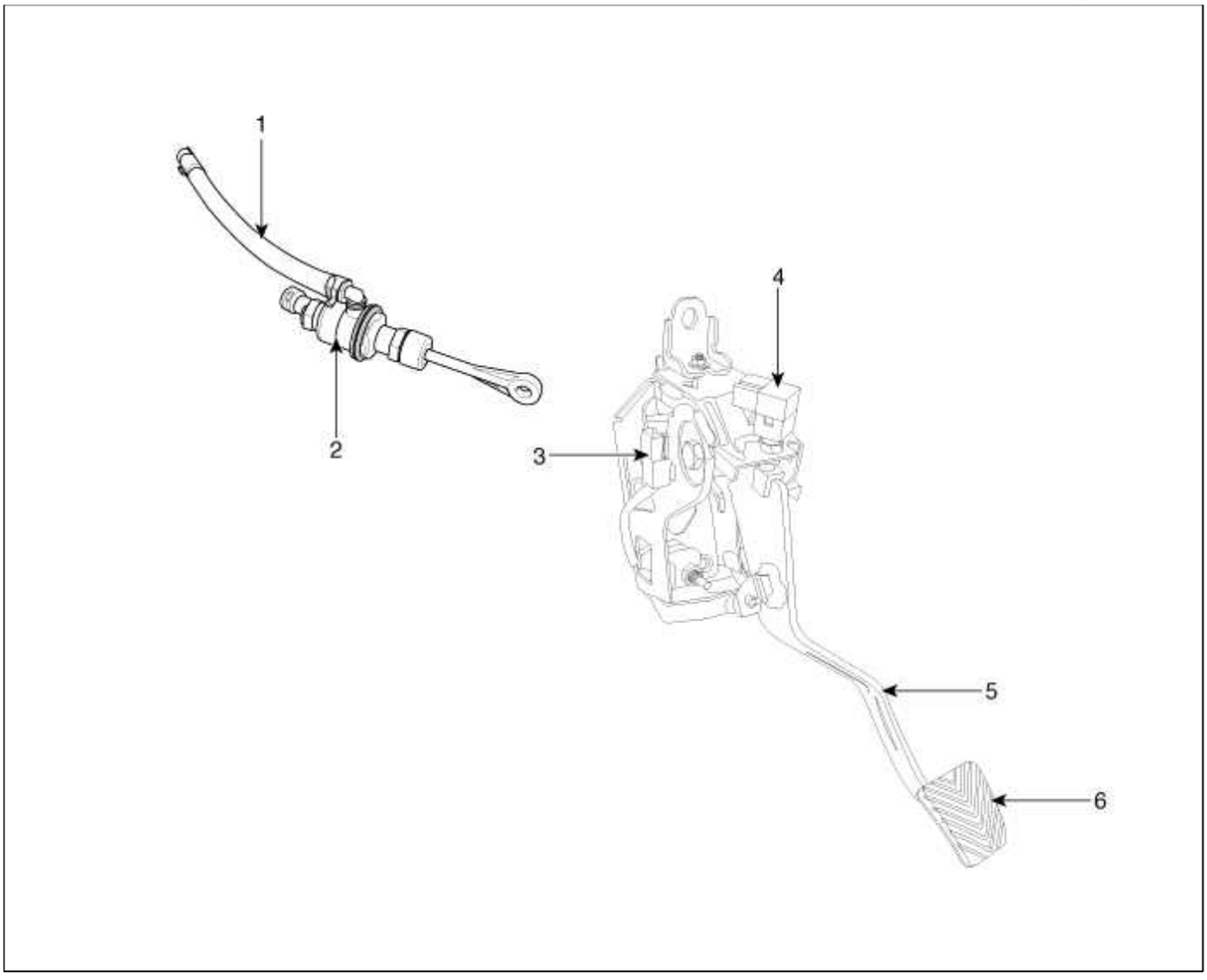
- Loosely tighten every clutch cover bolts, then torque to specifications in a diagonal direction. This can prevent twisting, vibration of the cover, and the lifting of the pressure plate.
- Install the all the components with the specified torques. If not, the clutch torque transmission may have concerns or the mounting bolt can loosen.



6. Install the transaxle assembly.
(Refer to "Manual transaxle system" in MT group)

Clutch System > Clutch System > Clutch Master Cylinder > Components and Components Location

Components



1. Reverse hose 2. Master cylinder 3. Ignition lock switch	4. Clutch switch 5. Clutch arm assembly 6. Pedal pad

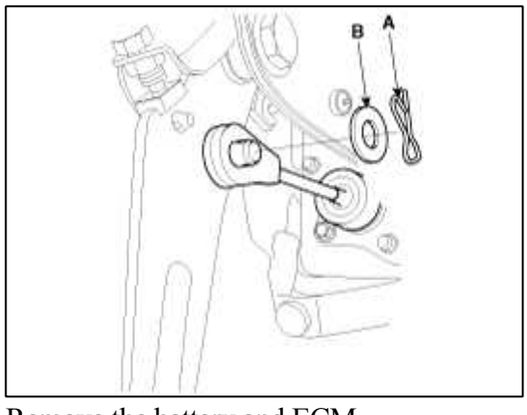
Clutch System > Clutch System > Clutch Master Cylinder > Repair procedures

Removal

NOTE

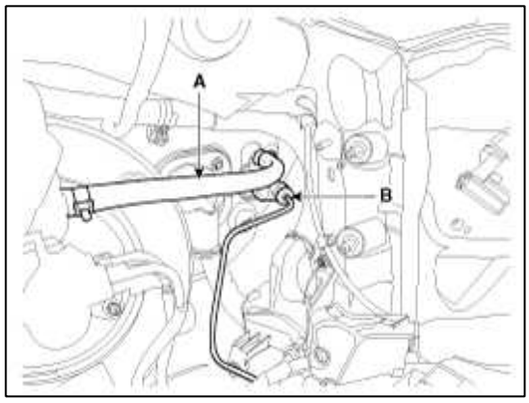
- Do not spill brake fluid on the vehicle; it may damage the paint if brake fluid does contact the paint, wash it off immediately with water.

1. Disconnect the push rod from the master cylinder by removing the snap pin (A) and washer (B).

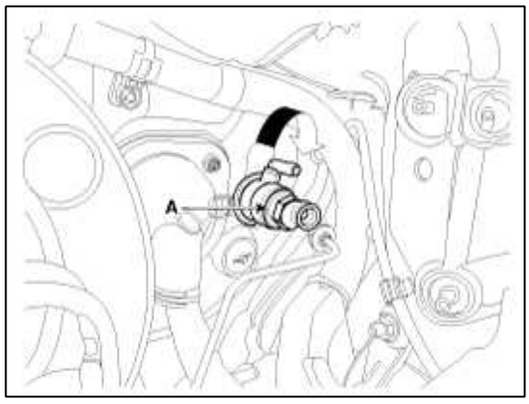


2. Remove the battery and ECM.
   (Refer to "Manual transaxle system" in MT group)

3. Disconnect the clutch tube (B) and reservoir hose (A) from the clutch master cylinder.



4. Remove the clutch master cylinder assembly (A) by turning it clockwise.



Installation

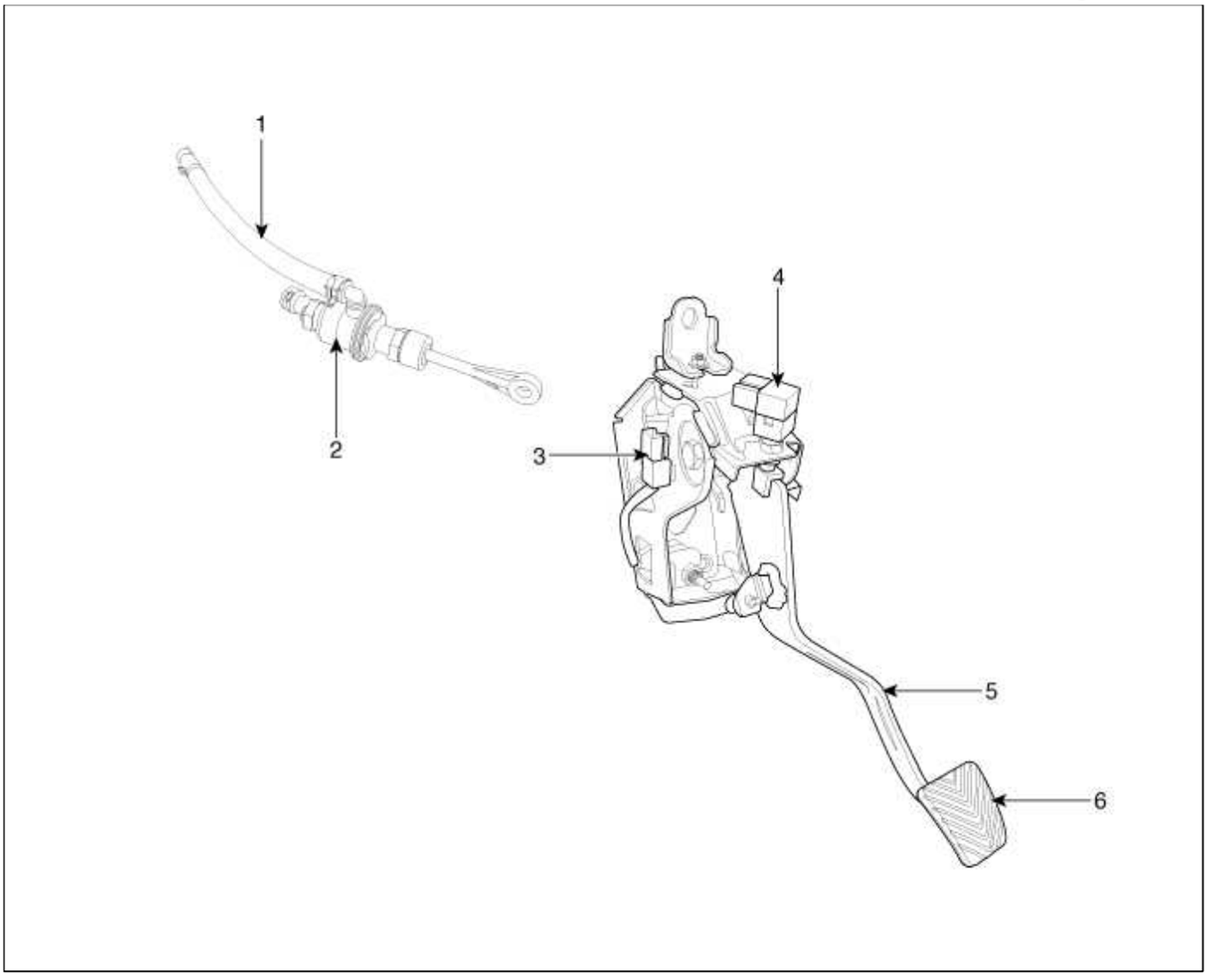
1. Installation is in reverse order of removal.

NOTE

- GDI: Perform bleeding air procedure in clutch release cylinder after pouring the brake fluid. (Refer to Clutch Release Cylinder - "Adjustment")
- T-GDI: Perform bleeding air procedure in concentric slave cylinder after pouring the brake fluid. (Refer to Concentric Slave Cylinder Assembly - "Adjustment")

Clutch System > Clutch System > Clutch Pedal > Components and Components Location

Components



1. Reverse hose 2. Master cylinder 3. Ignition lock switch	4. Clutch switch 5. Clutch arm assembly 6. Pedal pad

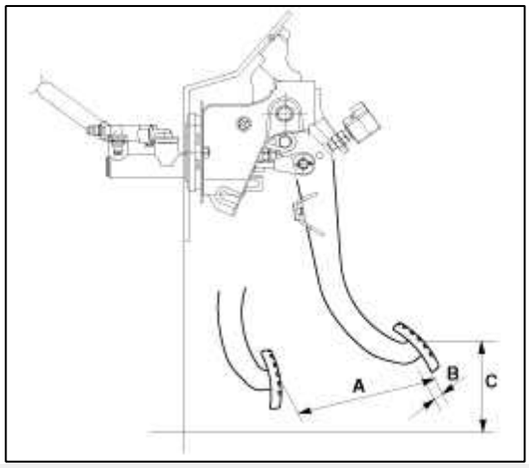
Clutch System > Clutch System > Clutch Pedal > Repair procedures

Inspection

Clutch Pedal Inspection

1. Measure the clutch pedal height (from the face of the pedal pad to the floor board) and the clutch pedal clevis pin play (measured at the face of the pedal pad.)

Standard value
Stroke (A): 130 ± 0.3 mm (5.1181 ± 0.0118 in.)
Free play (B): 7 ~ 10 mm (0.2756 ~ 0.3937 in.)
Height (C): 194.5 mm (7.6575 in.)



Ignition Lock Switch Inspection

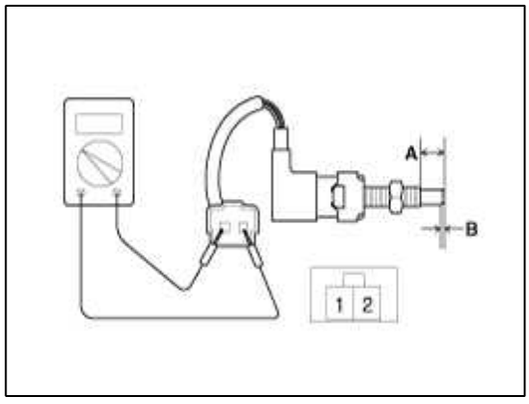
1. Disconnect 2P-connector from a ignition lock switch.
2. Disconnect the ignition lock switch. (if you can install a tester with the switch fixed, this step can be omissible)
3. Check for continuity between terminals. (refer to the table below)

NOTE

- If there is difference between what tested and the table above, replace the ignition lock switch with a new one.

Pedal position	Clutch switch	Ignition lock switch
Released	Pressed (Continuity)	Released (Open)
Fully pressed	Released (Open)	Pressed (Continuity)

Standard value
Full stroke (A): 12.0 ± 0.3mm (0.4724 ± 0.0118 in.)
ON-OFF point (B): 2.0 ± 0.3mm (0.0787 ± 0.0118 in)

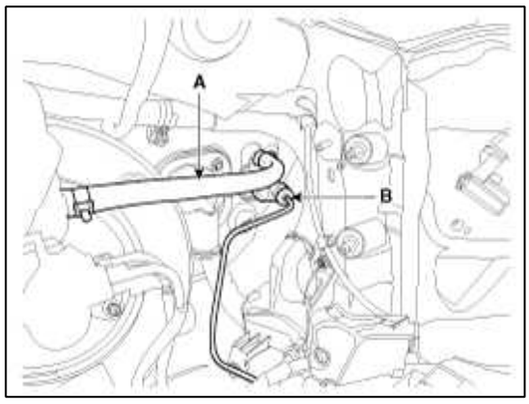


Removal

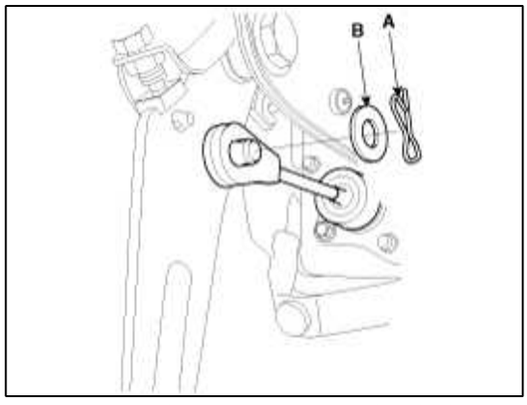
NOTE

- Do not spill brake fluid on the vehicle; it may damage the paint if brake fluid does contact the paint, wash it off immediately with water.

1. Remove the battery and ECM.
   (Refer to "Manual transaxle system" in MT group)
2. Disconnect the clutch tube (B) and reservoir hose (A) from the clutch master cylinder.



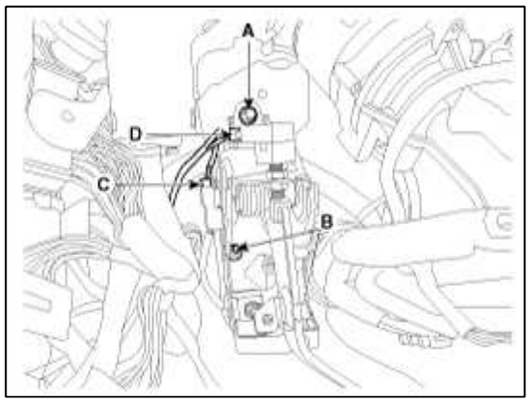
3. Disconnect the push rod from the master cylinder by removing the snap pin (A) and washer (B).



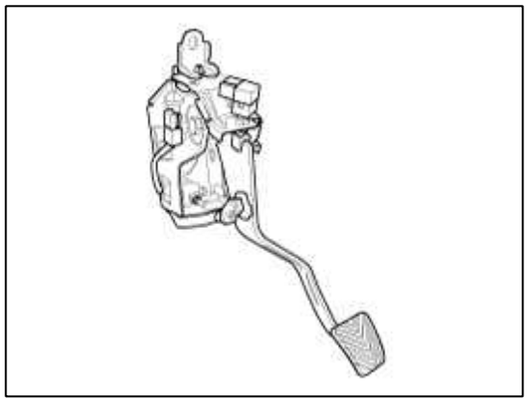
4. Remove the clutch pedal mounting bolt (A) and nuts (B-2ea).

Tightening torque:
(A) 16.7 ~ 25.5 N.m (1.7 ~ 2.6 kgf.m, 12.3 ~ 18.8 lb-ft)
(B) 18.6 ~ 23.5 Nm (1.9 ~ 2.4 kgf.m, 13.7 ~ 17.4 lb-ft)

5. Disconnect the ignition lock switch connector (C) and clutch switch connector (B).



6. Remove the clutch pedal and the master cylinder assembly together.



Installation

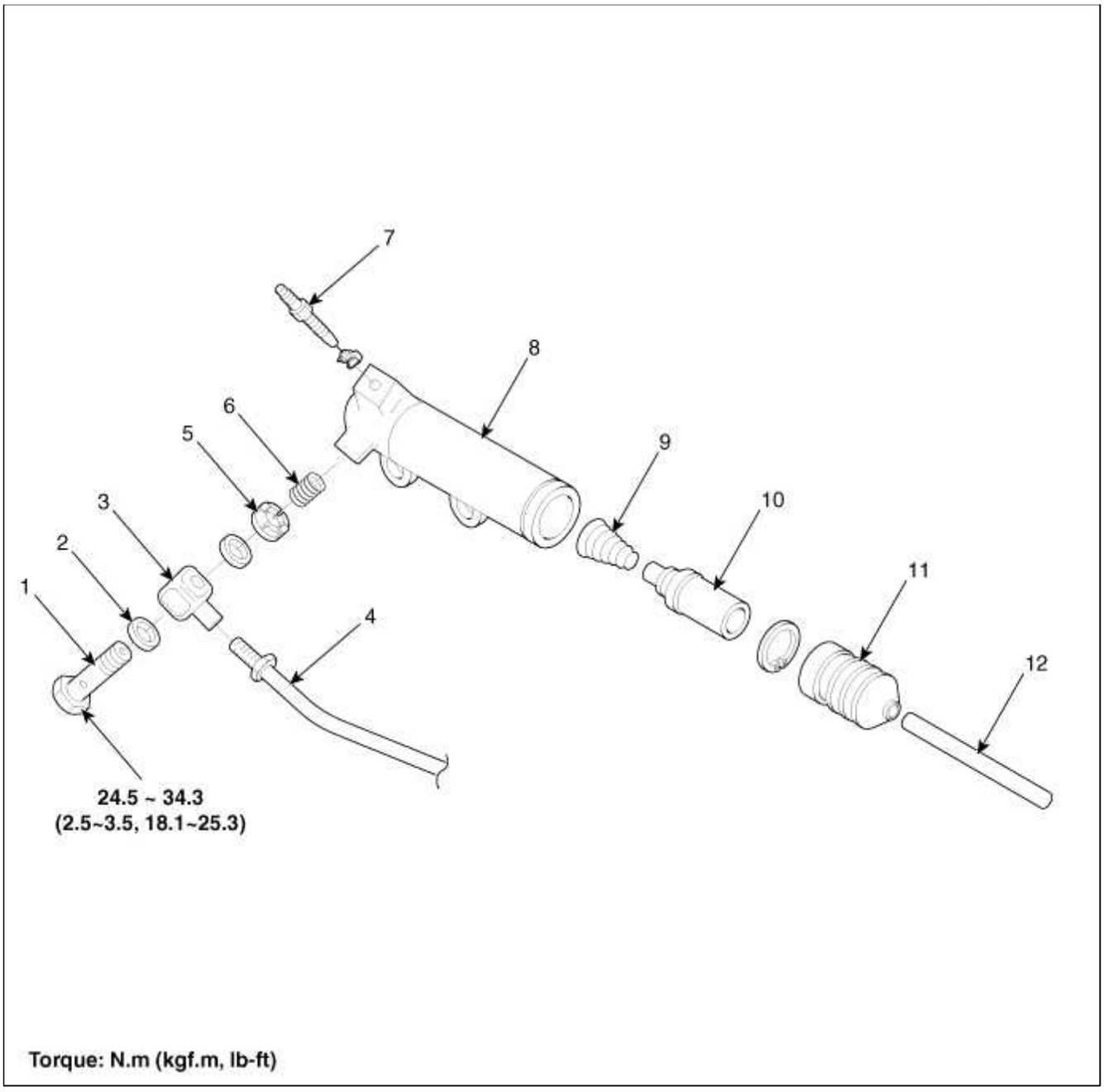
1. Installation is in reverse order of removal.

NOTE

- GDI: Perform bleeding air procedure in clutch release cylinder after pouring the brake fluid. (Refer to Clutch Release Cylinder - "Adjustment")
- T-GDI: Perform bleeding air procedure in concentric slave cylinder after pouring the brake fluid. (Refer to Concentric Slave Cylinder Assembly - "Adjustment")

Clutch System > Clutch System > Clutch Release Cylinder > Components and Components Location

Components

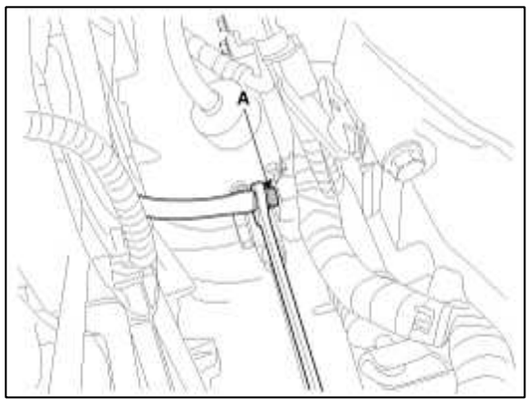


1. Union bolt 2. Gasket 3. Tube joint 4. Clutch tube 5. Valve plate 6. Valve spring	7. Bleeder screw 8. Release cylinder 9. Return spring 10. Piston 11. Boot 12. Push rod

Clutch System > Clutch System > Clutch Release Cylinder > Repair procedures

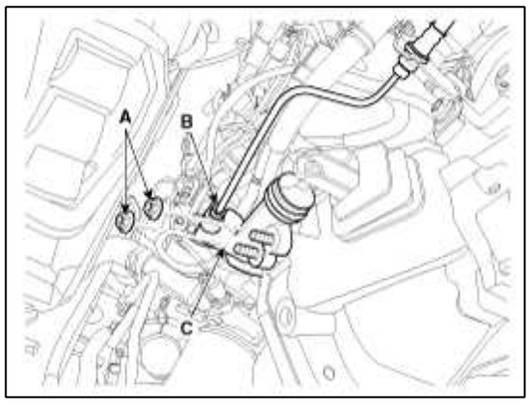
Removal

1. Drain the brake fluid through the bleed plug (A).



2. Remove the clutch release cylinder assembly (C) after removing thd tube (B) and nuts (A-2ea).

Tightening torque:
14.7 ~ 21.6 N.m (1.5 ~ 2.2 kgf.m, 10.9 ~ 15.9 lb-ft)



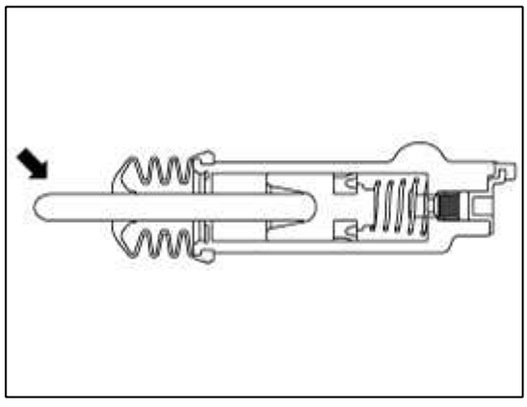
Installation

1. Installation is the reverse of removal.

NOTE

Coat the clutch clevis push rod specified grease.

Specified grease: CASMOLY L9508



Adjustment

Clutch Release Cylinder Air Bleeding Procedure

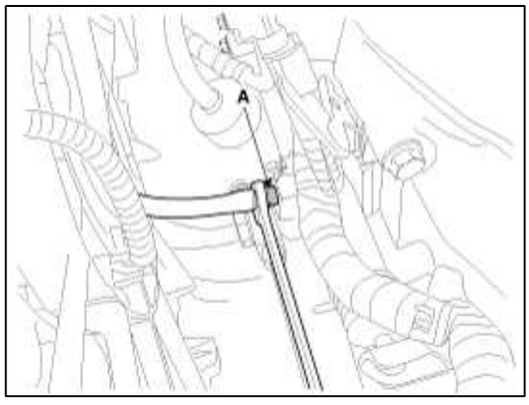
CAUTION

Use the specified fluid. Avoid mixing different brands of fluid.

Specified fluid: SAE J1703 (DOT 3 or DOT 4)

1. After disconnecting a cap from the clutch release cylinder air bleeder, insert a vinyl hose in the plug.
2. Loosening the plug screw, press and release the clutch pedal about 10 times.
3. Tighten the plug (A) during the clutch pedal pressed. Afterwards, raise the pedal with a hand.
4. After pressing the clutch pedal 3 times more, loosen the plug (A) and retighten it with the pedal pressed. Raise it again, then.
5. Repeat the step 4 two or three times. (until there is no bubble in the fluid)

Tightening torque:
6.8 ~ 9.8 N.m (0.7 ~ 1.0 kgf.m, 9.2 ~ 13.3 lb-ft)

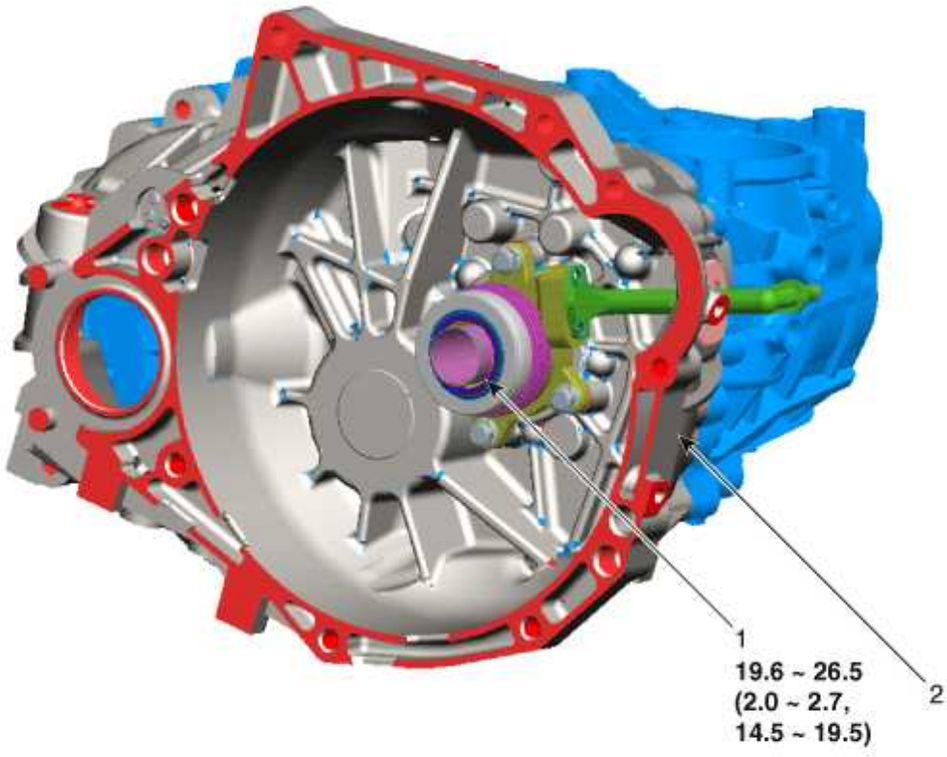


6. Refill the clutch master cylinder with the specified fluid.

Clutch System > Clutch System > Concentric Slave Cylinder Assembly > Components and Components Location

Component

[T-GDI]



Torque: N.m (kgf.m, lb-ft)

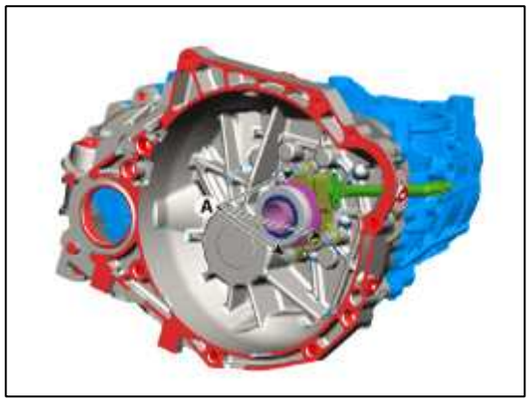
1. Concentric slave cylinder assembly	2. Manual transaxle

Clutch System > Clutch System > Concentric Slave Cylinder Assembly > Repair procedures

Removal

1. Remove the transaxle assembly.
   (Refer to Manual Transaxle System - " Manual Transaxle")
2. Remove the concentric slave cylinder assembly from the transaxle case by removing bolts (A).

Tightening torque:
19.6 ~ 26.5 N.m (2.0 ~ 2.7 kgf.m, 14.5 ~ 19.5 lb-ft)



Installation

NOTE

- Install the concentric slave cylinder bolts. Not to be bent or twisted, Tighten them in diagonal directions.
- When it is assembled, it must be free from invasive foreign matters and oil leakage.

1. Installation is in reverse order of removal.
2. Perform bleeding air procedure in concentric slave cylinder after pouring the brake fluid.
   (Refer to Concentric Slave Cylinder Assembly - "Adjustment")

Adjustment

Concentric Slave Cylinder Air Bleeding Procedure

1. After disconnecting a cap from the concentric slave cylinder air bleeder, insert a vinyl hose in the plug.
2. Refill the reservoir tank with the specified fluid.

NOTE

Use the specified fluid. Avoid mixing different brands of fluid.

Specified fluid: SAE J1703 (DOT 3 or DOT 4)

3. Pump the clutch pedal about 10 times.
4. Loosen the air bleed screw (A) at hold down the clutch pedal to allow air to escape from the clutch system. Then tighten the air bleed screw.

5. Repeat the step 2 ~ 4 until there is no bubble in the fluid.