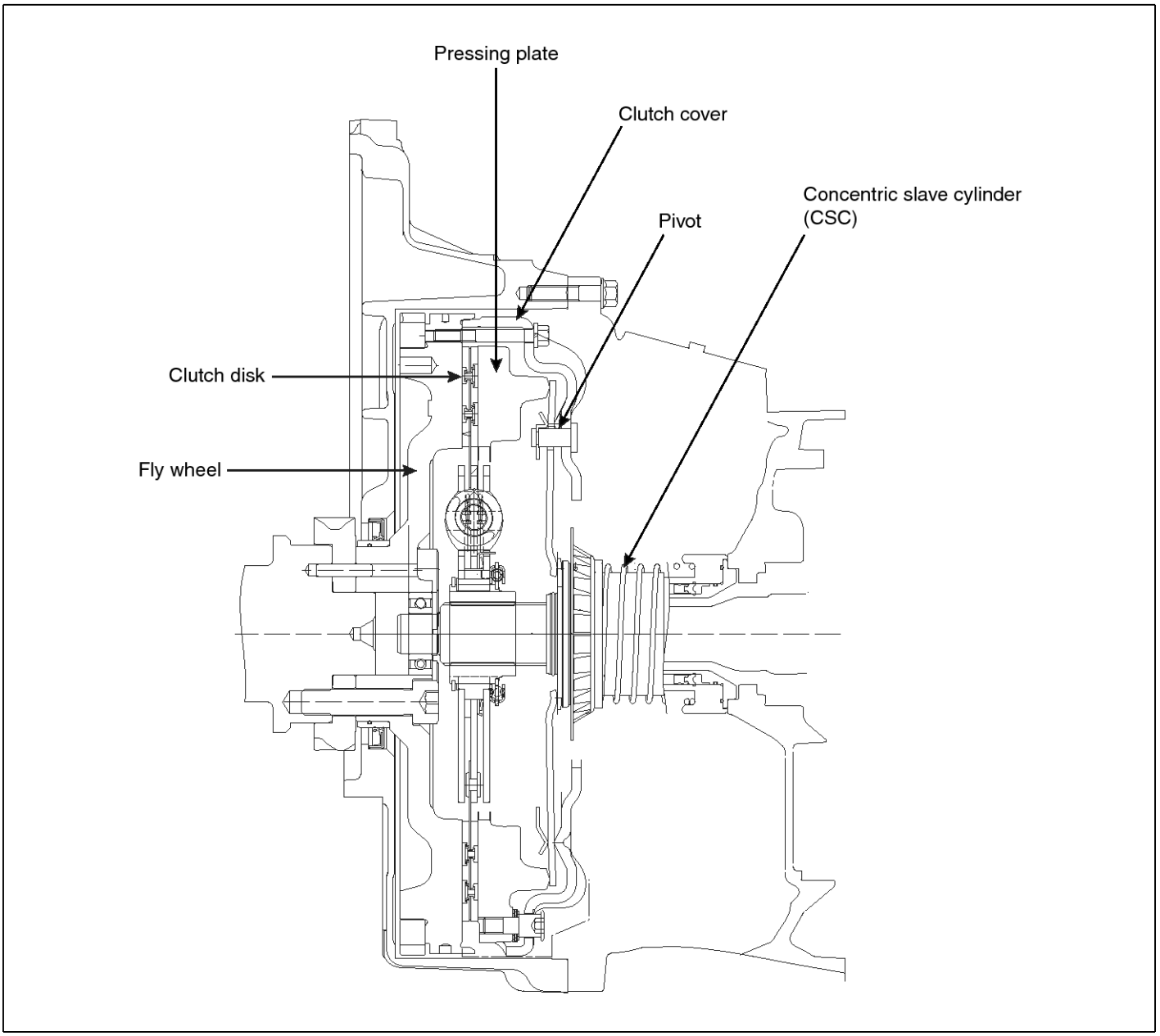
Clutch System

General

Generals

T60S5, T60S6 transmission



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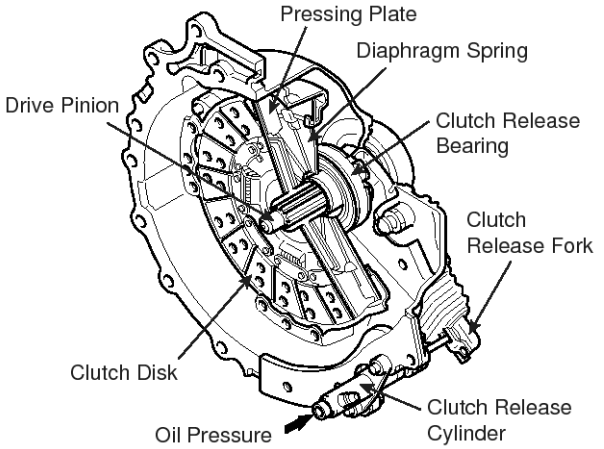
[Other tansmissions]



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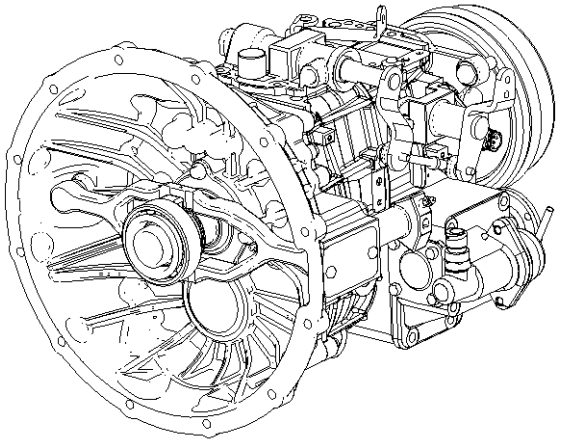
M035S5 transmission - D4GA engine



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The clutch device comprises of the clutch body and the clutch controller.

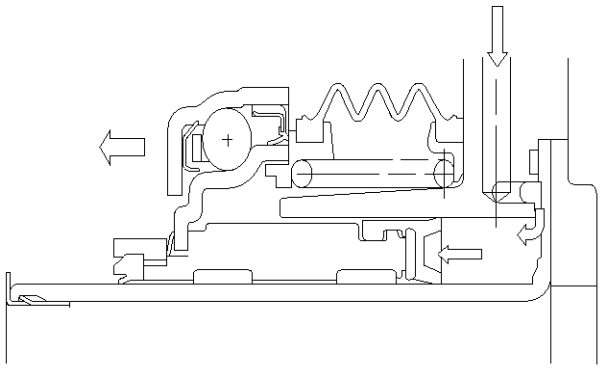
The clutch body generally transmits the driving force from the engine to the transmission. As the clutch pedal is operated, the following functions are worked.

1. When the vehicle starts to move, the clutch transmits the driving force of the engine to the transmission.
2. The clutch can link or cut the driving force of the engine according to the movement of the transmission gear.

Concentric slave cylinder(CSC) - T60S5, T60S6

The clutch release control parts(release bearing and release cylinder) are simplified as CSC. The functioning efficient improves and the number of parts diminish. And the weight of parts lose.

If pushing the clutch pedal, the hydraulic pressure is transferred to the CSC in the direction of an arrow. The CSC moves the diaphragm spring of clutch cover.



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Operating Principle

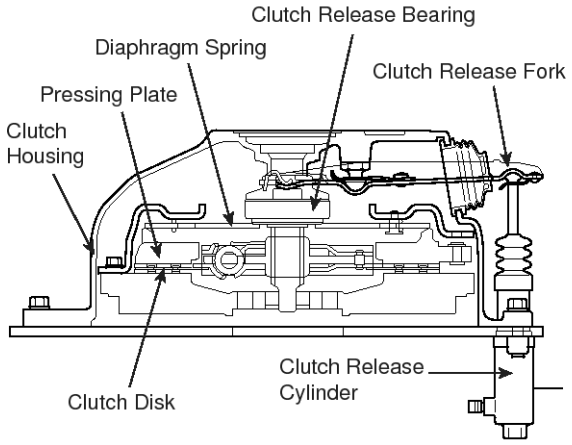
[Clutch Body]

The clutch comprises of the clutch disk transmitting the driving force of the engine to the transmission and the pressing plate pushing the clutch disk to the engine fly wheel.

As the clutch pedal is released, the outward spring force of the diaphragm spring pushes the clutch disk to the fly wheel using the pivot ring as a pivoting point.

Rotating with the fly wheel, the clutch disk transmits the driving force to the drive pinion of the transmission supporting the clutch disk.

As the clutch pedal is pressed, the oil pressure from the master cylinder moves the clutch release cylinder.



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The driving force generated by the release cylinder pushes the release bearing to outward through the release fork and then pushes the diaphragm spring.

At that time, the outside of the diaphragm spring is pulled to backward using the pivot as a pivoting point.

As a result, the pressing plate will be pulled back by the sharp plate connected to the one end of the clutch cover.

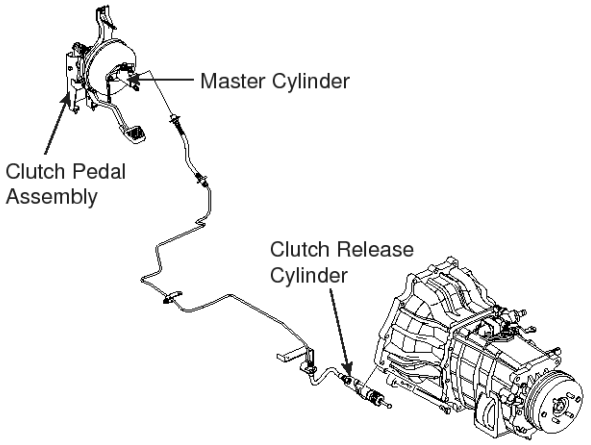
Therefore, there is a clearance between the clutch disk and the fly wheel (engine), so that the driving force of the engine is not transmitted.

[Clutch Control]

As the clutch pedal is pressed, the pressure of the pedal is transmitted to the master cylinder generating the oil pressure so that the release cylinder is operated.

The oil pressure of the release cylinder is converted to the pushing force of the push rod, and then the clutch is disconnected. So, the connecting live of driving force is cut off.

[Except D4GA engine]



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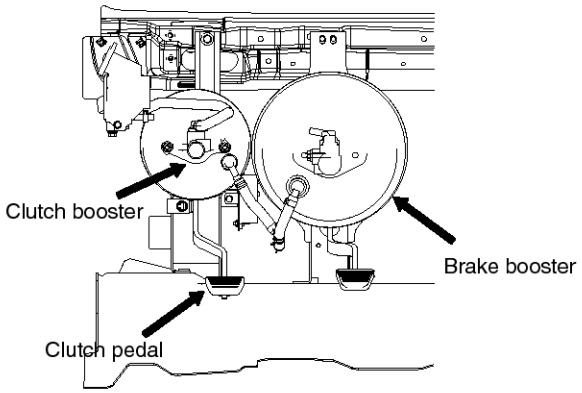
[D4GA engine - LHD]



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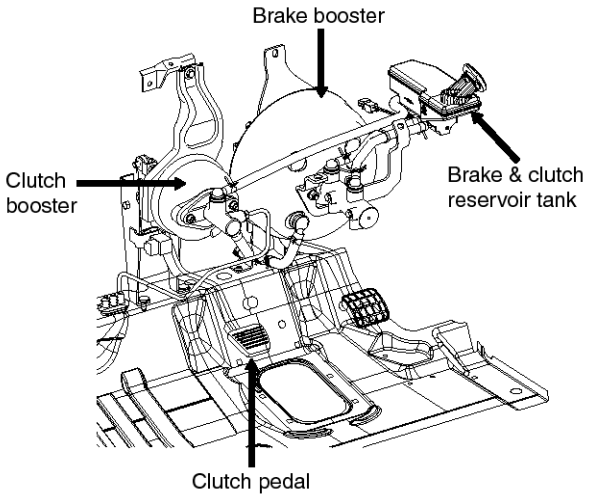
[D4GA engine - RHD]



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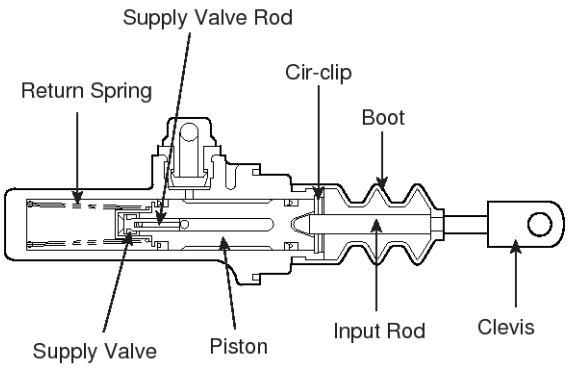
[Clutch Master Cylinder]



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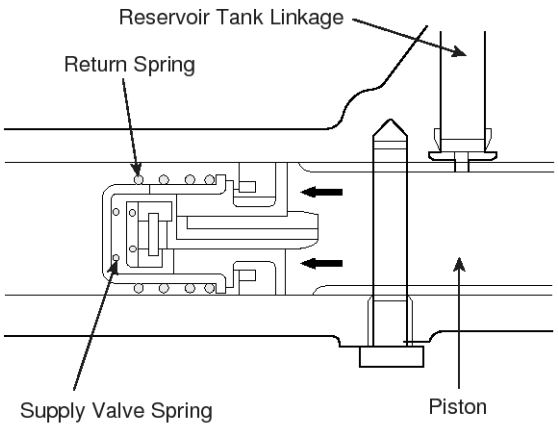
1. When the clutch pedal is pressed.

   As the return spring having the tensioning force applying at the valve seal portion when the piston is pushed is pressed, the valve spring closes the linkage of the brake oil, reservoir tank.

   As the piston is pushed more and more, the oil pressure in the cylinder is increased. So, the brake oil will be sent to the release cylinder.



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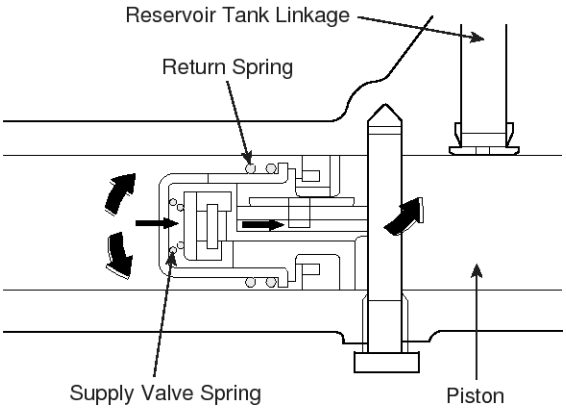
2. When the clutch pedal is release.

   As the pedal is released, the oil pressure of the release cylinder and the return spring push the piston to backward. At the same time, as the spring seat pulls the valve stem, the linkage of the reservoir tank is opened so as the oil pressure in the cylinder to be discharged.



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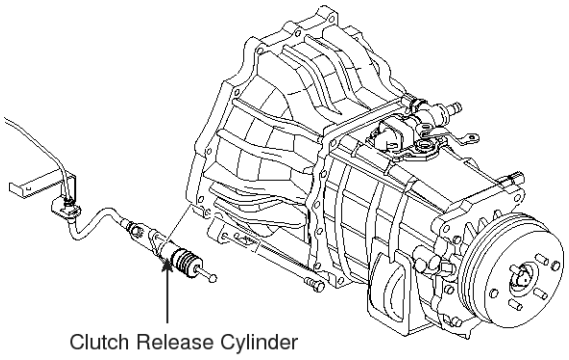
[Clutch Release Cylinder]

As the clutch pedal is pressed, the clutch release cylinder connects or disconnects the clutch in accordance with the increasing or decreasing of the oil pressure generated by the master cylinder.



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Specification

[Except D4GA engine]

Item		Specifications
Driving device		Strap drive
Type of clutch disk		Dry single plate
Material of disk surface		Non-Asbestos
Facing outer Diameter x I.D x Thickness (mm)		HD65 275X180X3.7 (D4AF, D4DC, D4DBD, D4AL) 300X190X4.4 (D4DA, D4DB) HD72 275X180X3.7 (D4DC, D4AL) 300X190X4.4 (D4DA, D4DB) HD78 300X190X4.5(D4DD)
Type of pressing plate		Diaphragm spring type
Control device		Oil pressure type by the release cylinder
Clutch pedal stroke (mm)		155~160, 165~170(D4AF ONLY)-without Booster 165~170-with booster
Master cylinder	Diameter (mm)	22.22
	Stroke (mm)	Max.31
Release cylinder	Diameter (mm)	22.22
	Stroke (mm)	Max.32

[D4GA engine]

Item		Specifications
Driving device		Strap drive
Type of clutch disk		Dry single plate
Material of disk surface		Non-Asbestos
Facing outer Diameter x I.D x Thickness(mm)		Ø362 x Ø236 x 4.1(T60S5, T60S6) Ø300 x Ø190 x 4.4(M035S5)
Type of pressing plate		Diaphragm spring type
Control device		Vacuum assisted hydraulic type
Clutch pedal stroke(mm)		145 ± 3(T60S5, T60S6) 140 ± 3(M035S5)
Clutch pedal clearance(mm)		8~11
Master cylinder	Diameter (mm)	23.81(T60S5, T60S6) 22.22(M035S5)
	Stroke (mm)	Max 31
Concentric slave cylinder	Surface area (mm^2)	1,137
	Stroke (mm)	Max 34.5

Item	Specifications
Clutch oil	Brake oil DOT 3, DOT 4

Service Standard

[Except D4GA engine]

Item		Reference(mm) ([ ] is STD Dia.)	Limit (mm)	Remedy & Remark
Clutch disk	Facing assemble thickness (When is apart from the disk)	10.3~10.9(OD : Ø300) 8.3~8.9(OD : Ø275)	-	-
	Depth from the facing surface to the rivet head	1.6~2.1	0.2	Replace
	Flatness	0.4 or less	-	Repair & Replace
	Side run out	1.0 or less	1.5	Repair & Replace
	Horizontal run out	1.0 or less	1.5	Repair & Replace
	Clearance of rotational radius of boss spline	0.07~0.16	0.4	Replace
Pressure plate	Flatness of frictional surface	0.5 or less	0.5	Repair & Replace
	Thickness	18.2~18.7	17.7	Replace
Diaphragm spring	Unevenness of finger height	1.0 or less	1.3	Modify
	Wear of release bearing contacting surface	-	Wear groove depth 1.2	Replace
	Gap between diaphragm spring and pivot ring	-	Too long gap	Replace

Item				Reference(mm) ([ ] is STD Dia.)	Limit (mm)	Remedy & Remark
Clutch control	Clutch pedal	Pedal clearance		14~20	-	Adjust
		Inner diameter after fit-in bushing		10~10.068	-	-
		Outer diameter of pedal shaft		16~16.063	-	-
		Gap between bushing and collar		0.02~0.26	0.3	Replace
		Length of pedal arm (from pedal shaft center to pedal pad center)		124.6~130.6	-	Adjust
		Return spring	Free field	43	-	Replace
			Load(kg)/Installation length	18.7/37, 35.5/31.6	-	Replace
	Master cylinder	Gap between cylinder and piston		[22.22] 0.02~0.08	0.2	Adjust
		Return spring	Free field	81	-	-
			Load(kg)/Installation length	1.84~2.16/63.45	1.7/63.45	-
		Valve spring	Free field	9.2	-	-
			Load(kg)/Installation length	0.15~0.17/2.5	1.2(0.12)/2.5	-
	Release cylinder	Gap between cylinder and piston		[22.22] 0.02~0.1	0.2	Replace
		Return spring	Free field	79.6	-	Replace
			Load(kg)/Installation length	6.9~8.8/48	-	Replace

Tightening Torque

Item		Tightening Torque		
		Nm	kgf.m	lb-ft
Clutch cover bolt		16.7~22.5	1.7 ~ 2.6	12.3~18.8
Clutch control	Clutch pedal shaft bolt	16.7~25.5	1.7 ~ 2.6	12.3~18.8
	Clutch pedal bracket bolt	8.8~13.7	0.9 ~ 1.4	6.5~10.1
	Clutch master cylinder bolt	9.8~14.7	1.0 ~ 1.5	7.2~10.8
	Clutch master cylinder union tight	12.7~16.7	1.3 ~ 1.7	9.4~12.3
	Release cylinder air breather screw	3.9~6.9	0.4 ~ 0.7	2.9~5.1
	Release cylinder bolt	33.3	3.4	24.6

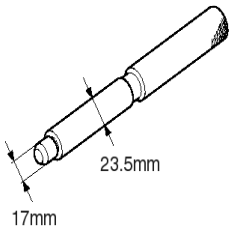
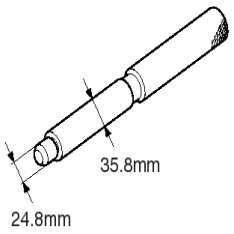
Lubricant

Item	Recommended Lubricant
Clutch oil	Brake oil DOT3, DOT4

Grease

Item	Recommended grease
Clutch disk spline tooth surface	MOLY KOTE BR-2 PLUS
Clutch release cylinder inner surface, piston cup	Rubber grease for car (RG-306)
Clutch pedal arm assembly inner surface	Grease chassis grease (NLGI No.2)

Special Tools

Name of Tool	Name of Tool	Shape	Usage
Clutch Arbor	09411-45100		Installation of the clutch disk (For M2S5 and M3S5 Transmission)
Clutch Arbor	09411-5A000		Installation of the clutch (For M035S5 Transmission)
Clutch Arbor	09411-5L000	 SUECH8007D	Installation of the clutch (For T60S5, T60S6 Transmission)

Trouble Diagnosis

Symptom		Causes	Remedy
When releasing clutch, drawing symptom is occurred.	Defective on operating device	Oil leakage on oil line	Repair or replace defective parts
		Air inflow into oil line	Air bleeding
		Improper clutch pedal clearance	Adjust clearance
		Defective on operating of clutch master cylinder	Repair or replace
	Defective on clutch body (Inspect by disassembling clutch assembly)	Damages on pilot bearing or oil supply	Replace or oiling lubricant
		Improper or damages on release lever height	Height adjust or replace
		Damages or deformations on clutch disk	Replace
		Wear or rust on transmission drive pinion and clutch Hub spline	Repair or replace (Drive pinion or input axis)
		Damages or twist on pressing plate	Replace
Clutch is slipping.	Defective on operating device	Improper clearance on clutch pedal	Adjust
		Weakness on tension of clutch pedal return spring	Replace
	Defective on clutch master cylinder	Adhesion on piston or piston cup	Replace
		Clog on oil Inlet path or outlet path	Disassemble to clear
		Weakness on tension of return spring	Replace
	Defective on clutch booster	Weakness on tension of return spring	Replace
		Adhesion on piston or piston cup	Replace
		Clog on oil Inlet path or outlet path	Disassemble to clear
	Defective on clutch body (Inspect by disassembling clutch assembly)	Improper height of release lever	Adjust
		Weakness on tension of pressing spring	Replace
	Defective on clutch disk	Facing wear	Replace clutch disk
		Cracks	Remove hardened part or replace
		Facing hardened	Remove oil or replace
	Pressing plate or flywheel	Damages on oil	Modify or replace

Symptom		Causes	Remedy
Clutch does not connected smoothly	Defective on clutch pedal	Damages or twist	Oiling or replace
		Weakness on tension of clutch pedal return spring	Replace
	Defective on clutch master cylinder	Adhesion on piston or piston cup	Replace
		Clog on oil Inlet path or outlet path	Disassemble to clear
		Weakness on tension of return spring	Replace
	Defective on clutch booster	Weakness on tension of return spring	Replace
		Adhesion on piston or piston cup	Replace
		Clog on oil Inlet path or outlet path	Disassemble to clear
	Defective on clutch disk	Facing is twisted	Replace clutch disk
		Facing is hardened	Remove hardened part or replace
		Rivet is loosened	Replace clutch disk
		Oil is contaminated	Remove oil or replace
		Disk spline is adhesive	Modify or oiling at spline
		Torsion spring is weakened or damaged	Replace clutch disk
	Defective on clutch body	Improper height of release lever	Adjust
		Weakness on tension of return spring	Replace
		Damages or twist on pressing plate	Modify or replace
	Flywheel	Damages or twist	Modify or replace
When clutch is released, there is a noise.	Bearing	Lubricant deficiency or wear on pilot bearing	Oiling or replace
		Lubricant deficiency or wear on release bearing	
	Clutch disk	Wear on spline disk	Replace clutch disk
		Weakness or damages on tension of torsion spring	
	Strap Plate	Bent	Replace clutch cover

Symptom		Causes	Remedy
At starting the vehicle, vibration is occurred.		Lubricant deficiency on clutch control device	Oiling grease at clutch shifter
		Weakness on rubber installing engine	Replace
	Defective on clutch housing (Removing the transmission assembly)	Defective on clutch release bearing	Replace or oiling
		Damages or adhesion on clutch shifter	Replace or oiling
		Wear or damage on clutch release fork	Replace
	Defective on clutch body	Improper height of release lever or damages thereon	Height adjust or replace
		Strap plate locking bolt is loosened	Tighten modified torque
		Flatness exceeds the limit	Modify or replace
	Defective on clutch disk	Oil contamination on facing surface	Clear or replace
		Flatness or run-out exceeds the limit	Modify or replace
		Spline wear	Coat grease on spline or replace
	Flywheel	Flatness exceeds the nominal value	Modify or replace

Inspection On-Vehicle

Checking and Adjusting of the Clutch Pedal.

1. Check the Clutch Pedal

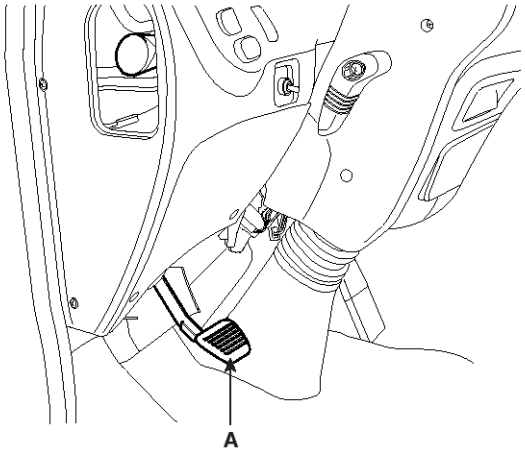
   Check the displacement of the clutch pedal (A) by pressing it with hand softly.

   [Except D4GA engine]

Clutch Pedal Free Play: 14~20mm
Clutch Pedal Stroke: 155mm (with booster)
170mm (with booster)

[D4GA engine]

Clutch Pedal Free Play: 8~11mm
Clutch Pedal Stroke: 140±3mm (M035S5)
145±3mm (T60S5, T60S6)



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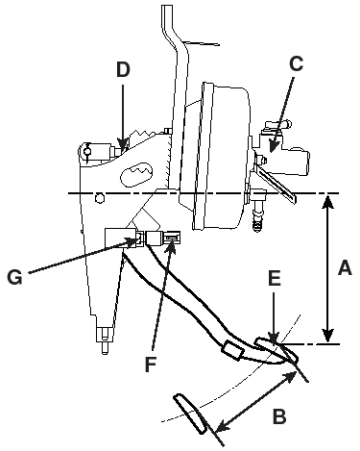
2. Adjust the Clutch Pedal
   1) Adjust the adjuster nut (D) of the clutch master cylinder (C) so as the clutch pedal position to be "A" or "B".
   2) Adjust the clutch pedal switch (F) and nut (G) so as the clearance of the pedal (E) to be (H)mm.

      ⚠CAUTION
      For adjusting, the clutch pedal switch (F) should be pressed fully.

   3) Check if it works properly after assembling.



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	A(mm)	B(mm)	H(mm)
D4AF/L , D4DA/B/C (NO VAC)	207(-4,0)	165(0,5)	7~9
D4AF/L , D4DA/B/C (VAC)	215(-4,0)	155(0,5)	10~12
D4DD	193(-4,0)	140(0,5)	7~9
D4GA+T60S5, T60S6	189±3	145±3	8~11
D4GA+M035S5	200±3	140±3	8~11

*VAC : Vacuum assisted clutch system

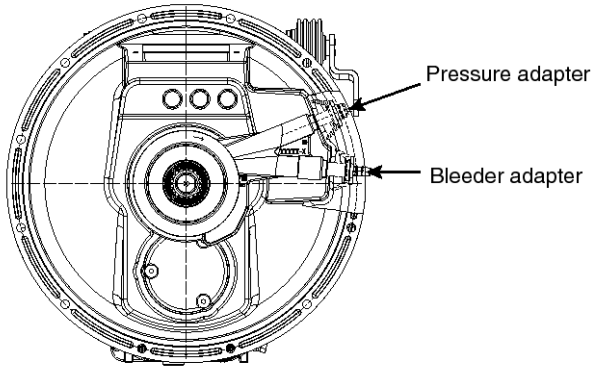
Air bleeding of the Clutch System.

⚠CAUTION
When the clutch tube, the clutch hose or the clutch master cylinder is removed or the clutch pedal has a sponge symptom, the air discharging service should be performed.

Clutch Oil: Brake Oil DOT3, DOT4

NOTICE
For the air discharging of the clutch system, refer to the "procedure for adjusting the clutch release cylinder".

Air bleeding of the clutch system (T60S5, T60S6)



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If replacing the concentric slave cylinder in the clutch housing, do air bleeding of the clutch system.

1. Disassemble the concentric slave cylinder. Stop the clutch line with a plug for being enough clutch oil in the concentric slave cylinder.
2. Assemble the new concentric slave cylinder with a pressure adapter.
3. Install the clutch assembly to the engine and fill the clutch oil.
4. Fill the clutch oil into the concentric slave cylinder through the bleeder adapter till the clutch oil flows out from the pressure adapter.

   Fill the clutch oil into the concentric slave cylinder slowly to prevent an indraft of air.
5. Connect the clutch line to the pressure adapter.
6. Fill the clutch oil into the clutch system.(bleeder adapter ~ master cylinder)

   It is easy to fill the clutch oil using about 500 ml bottle. All tools which are used to do air bleeding should not be contaminated with the mineral oil.
7. If the rubber part of the concentric slave cylinder is contaminated with the mineral oil, the rubber part of the clutch master cylinder may expand and the clutch system may be out of order.
8. In a state filled with the clutch oil in the master cylinder reservoir, if the clutch oil arrive in the master cylinder reservoir with no air bubbles, the clutch oil injection and pumping operations are completed.
9. If the air remain in the clutch line, do air bleeding of the clutch system as below.
   1) Step on the clutch pedal about 10 times.
   2) Stepping on the pedal, loosen the screw of the air bleeder to discharge the brake oil intruded by the air.
   3) Step on the clutch pedal about 5 times.
   4) Stepping on the pedal, loosen the screw of the air bleeder to discharge the brake oil intruded by the air.

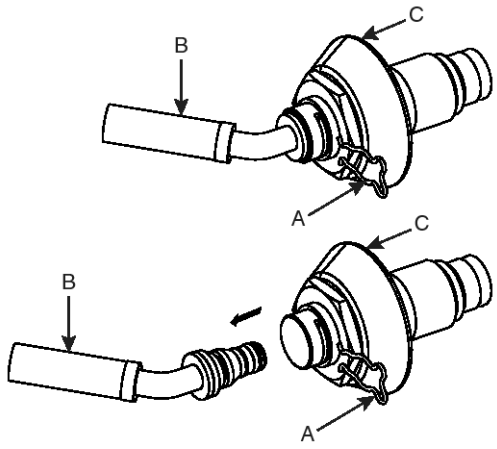
      Pressing the pedal, tighten the screw of the air bleeder screw.
   5) Repeat the above-step until the air bubble is fully removed in the brake oil.
   6) Check the clearance of clutch pedal.

Model	Clearance(mm)
D4AF/L , D4DA/B/C (NO VAC)	7~9
D4AF/L , D4DA/B/C (VAC)	10~12
D4DD	7~9
D4GA+T60S5, T60S6	8~11
D4GA+M035S5	8~11

   7) If the clearance is not satisfied with the specified value, do the air bleeding again.

Disconnecting the oil hose

Remove the joint pin(A). Remove the oil hose(B) from the pressure adapter(C).



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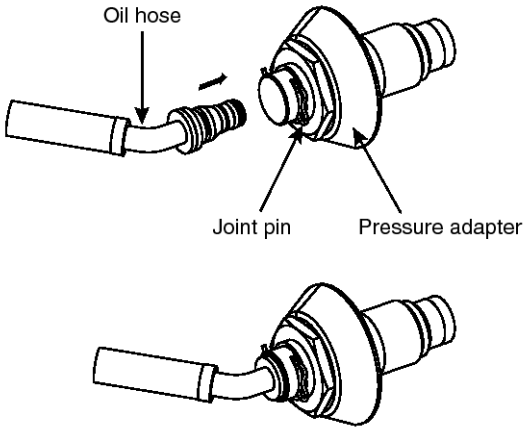
connecting the oil hose

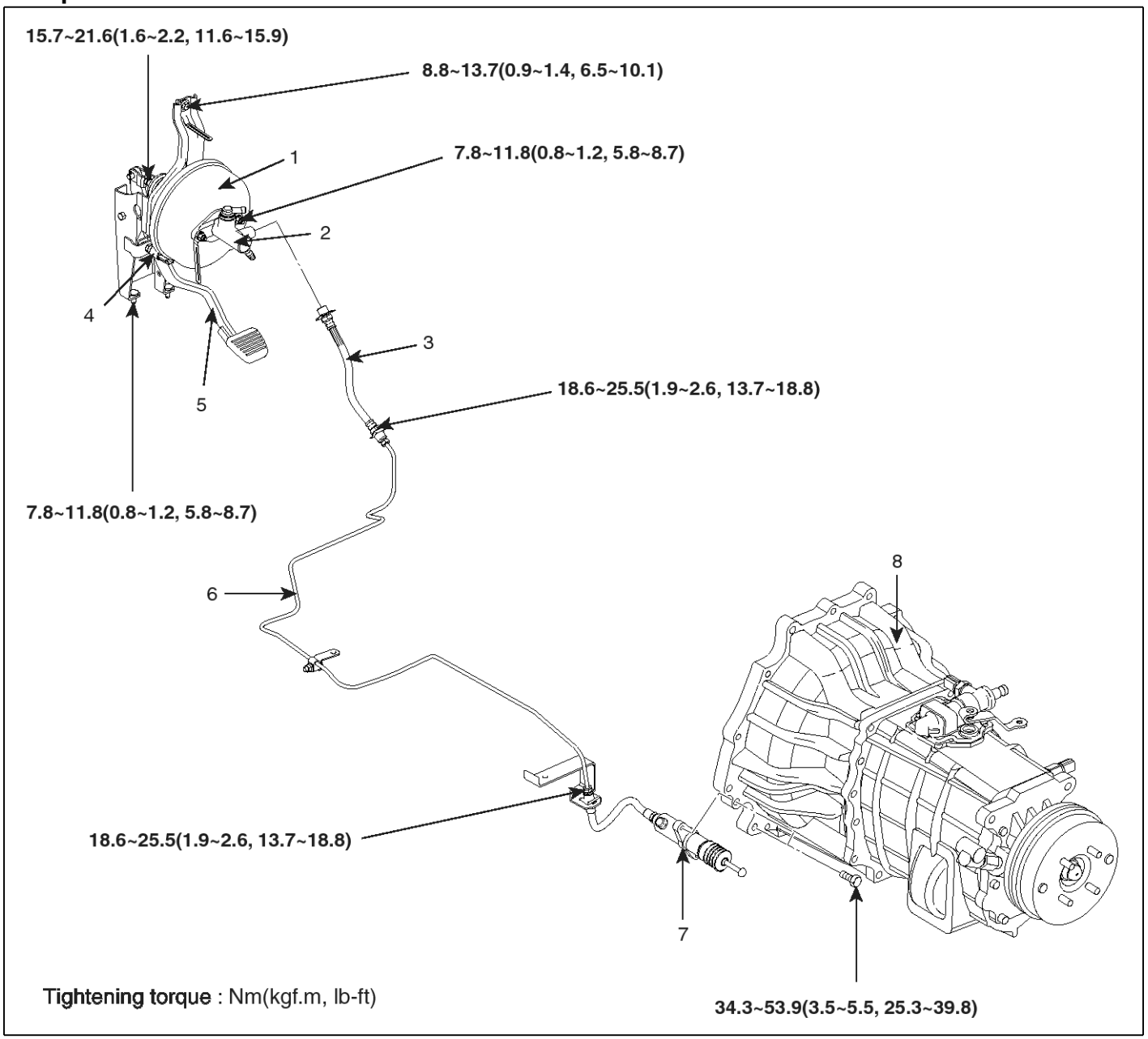
Install the oil hose to the pressure adapter as below picture.



SUDCHA0005L

Clutch Control System

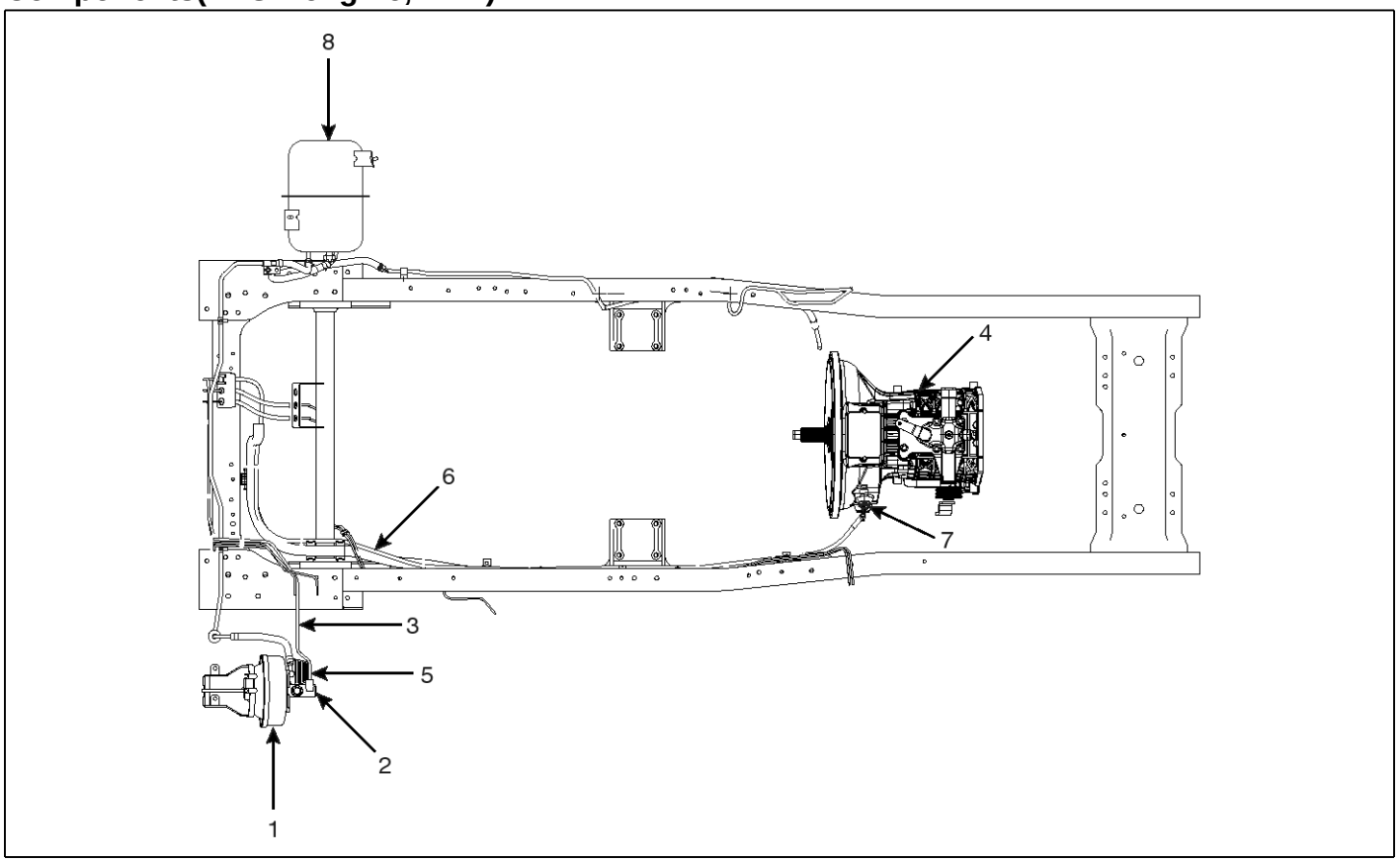
Components



SUDCHA0009L

1. Clutch Booster Assembly
2. Clutch Master Cylinder
3. Clutch Flexible Hose
4. Clutch Switch
5. Clutch Pedal
6. Clutch Oil Tube
7. Clutch Release Cylinder
8. Transmission Assembly

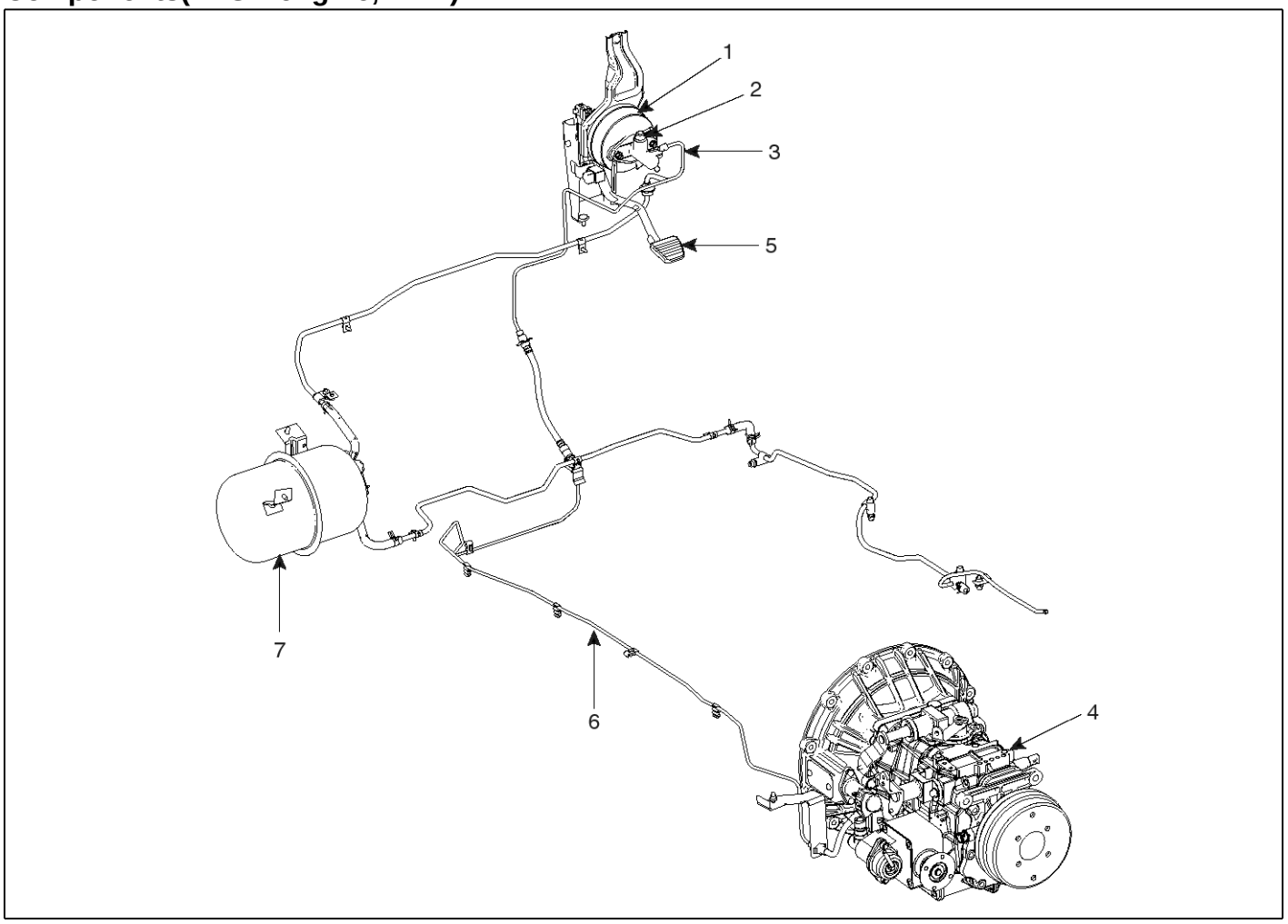
Components(D4GA engine, LHD)



SUDCHA0006L

1. Clutch booster assembly
2. Clutch master cylinder
3. Clutch flexible hose
4. Manual transmission
5. Clutch pedal
6. Clutch oil tube
7. Pressure adapter
8. Vacuum tank

Components(D4GA engine, RHD)

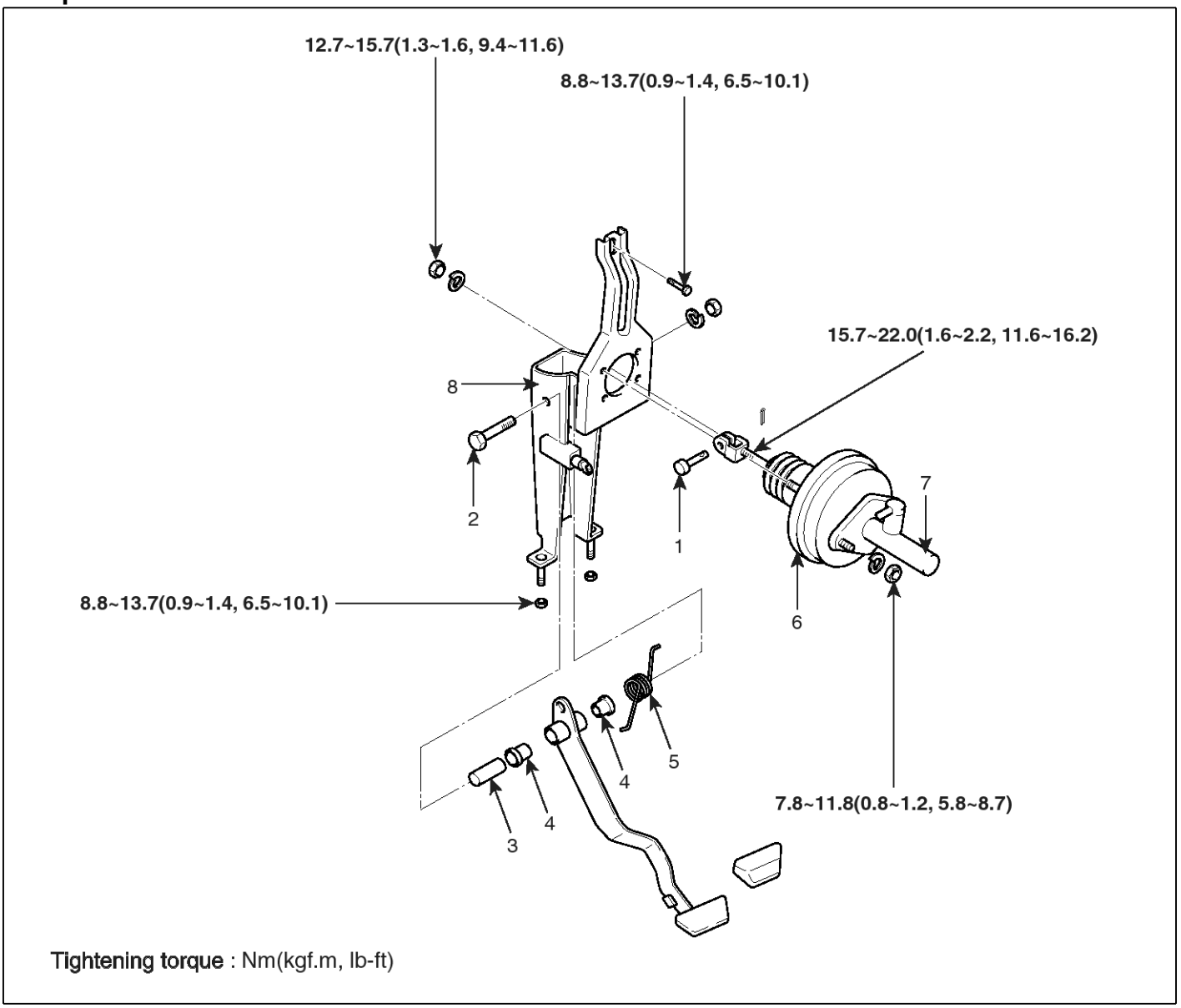


SUDCHA0007L

1. Clutch booster assembly
2. Clutch master cylinder
3. Clutch flexible hose
4. Manual transmission
5. Clutch padal
6. Clutch oil tube
7. Vacuum tank

Clutch Pedal

Components

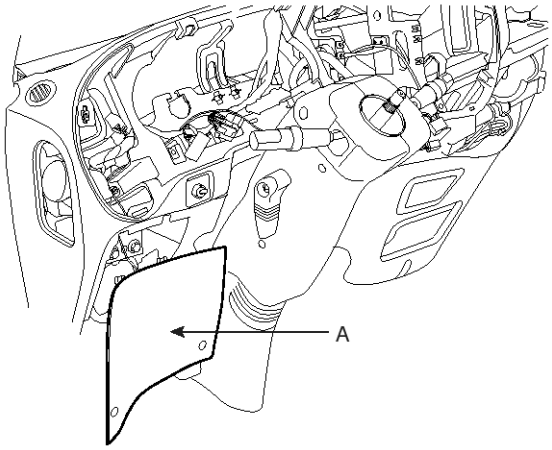


SUDCHA0010L

1. Clevis Pin
2. Pedal Support Mounting Bolt
3. Collar
4. Bushing
5. Return Spring
6. Booster
7. Master Cylinder
8. Pedal Support

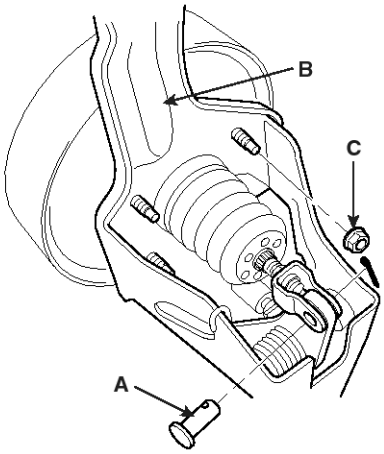
Removal

1. Remove the crash pad lower Panel (A).



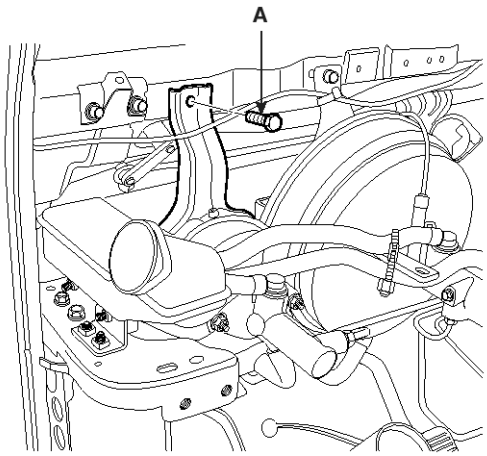
KBD1008A

2. Disassemble the clutch booster assembly from the pedal support member.
   1) Take off the clutch booster clevis pin (A) installed at the clutch pedal assembly.
   2) Remove the clutch booster mounting nut (C) from the pedal support member (B).



KCH1016D

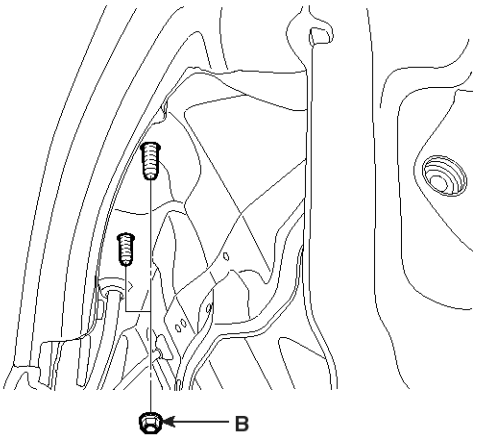
3) After taking off the pedal support member mounting bolt (A) and nut (B), remove the clutch pedal assembly.



KCH1013B

NOTICE

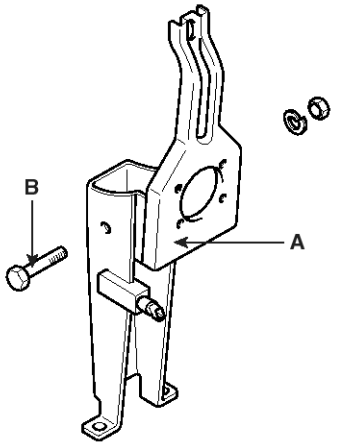
When taking off the pedal support mounting nut (B), at first, remove the head lamp before removing the pedal support mounting nut (B).



KCH1013C

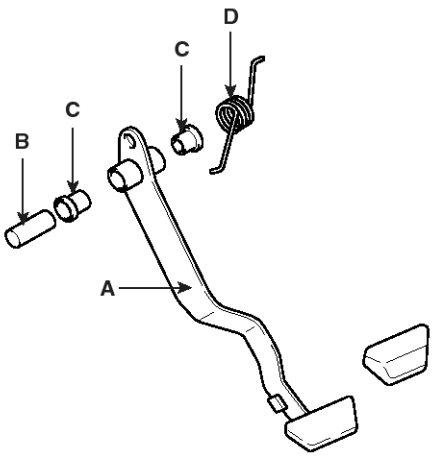
Disassembly

1. Remove the pedal support member (A) and the mounting bolt (B).



KCH1014A

2. Remove the bushing (B), the collar (C) and the return spring (D) from the clutch pedal (A).



KCH1014E

Inspection

1. Check the clearances of the bushing and the collar.

Clearance of the bushing and the collar.
Reference: 0.02~0.26mm
Limit : 0.3mm

2. Check the bending amount and twisting amount of the clutch pedal.
3. Check if the return spring is damaged or weakened.
4. Check if the pedal pad is damaged or worn.

Reassembly

1. Install the clutch pedal bushing and collar.

   Tighten the pedal support member mounting bolt.

Tightening Torque:
15.7~25.5Nm(1.7~2.6kgf.m,12.3~18.8lb-ft)

NOTICE

Apply the chassis grease (NLGI No.2) at the inner surface of the arm assembly on which the collar contacts.

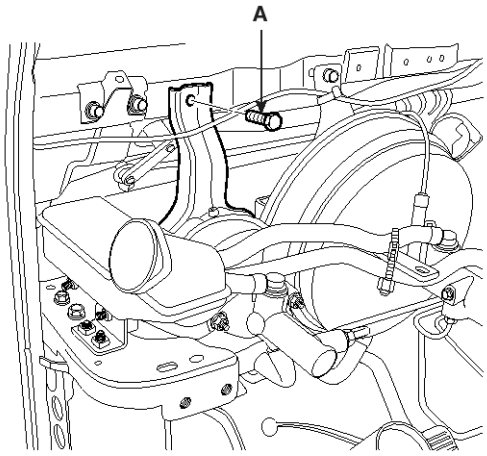
2. Install the return spring.

Installation

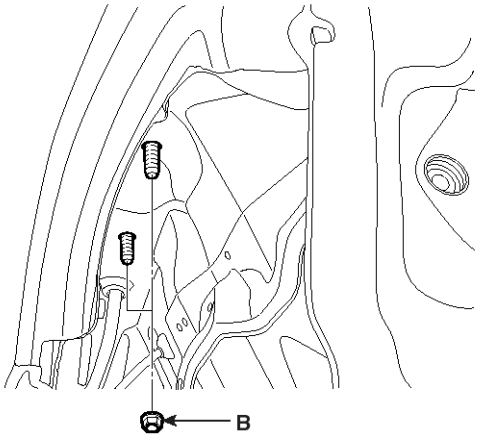
The installation is performed in the reverse order of removal.

1. Tighten the pedal support member mounting bolt (A) and nut (B) at the vehicle's body.

Tightening Torque: 8.8~13.7 Nm(0.9~1.4 kgf.m, 6.5~10.1 lb-ft)



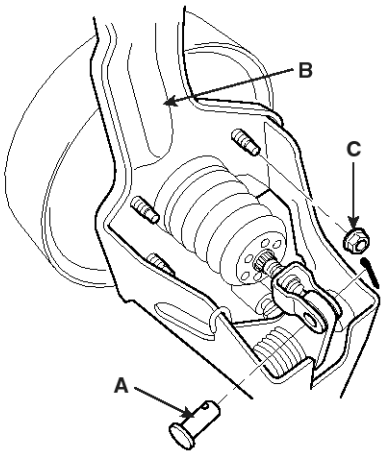
KCH1013B



KCH1013C

2. Tighten the clutch booster mounting nut (C) at the pedal support member (B).

Tightening Torque: 12.7~15.7 Nm(1.3~1.6 kgf.m, 9.4~11.6 lb-ft)



KCH1016D

3. Install the clevis pin (A) at the pedal, and then fix the split pin firmly.

   Tighten the adjuster nut.

Tightening Torque: 15.7~21.6 Nm(1.6~2.2 kgf.m, 11.6~15.9 lb-ft)

NOTICE

a. After assembling, check that the stroke of clutch pedal satisfies (F)mm.

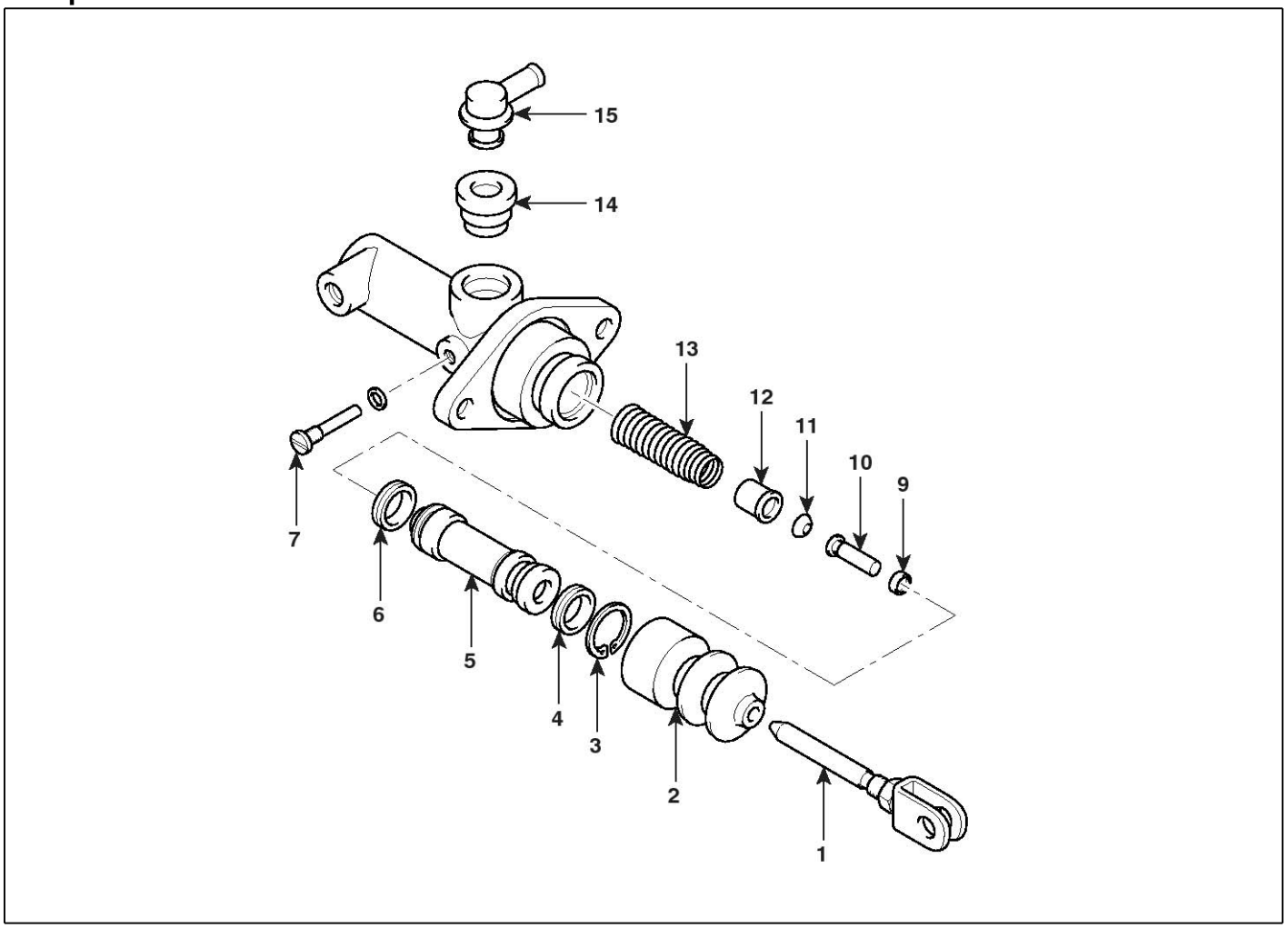
b. After assembling, check that the distance between the center of the clutch pedal pad and the center of the pedal support member mounting bolt satisfies (G)mm.

c. For adjusting the clearance of the clutch pedal, refer to the clutch pedal Inspection, Adjustment of the "On-Vehicle Inspection".

	F(mm)	G(mm)
D4AF/L , *D4DA/B/C (NO VAC)*	165(0,5)	207(-4,0)
D4AF/L , *D4DA/B/C (VAC)*	155(0,5)	215(-4,0)
D4DD	140(0,5)	193(-4,0)
D4GA+T60S5,6	145±3	189±3
D4GA+M035S5	140±3	200±3

Clutch Master Cylinder

Components

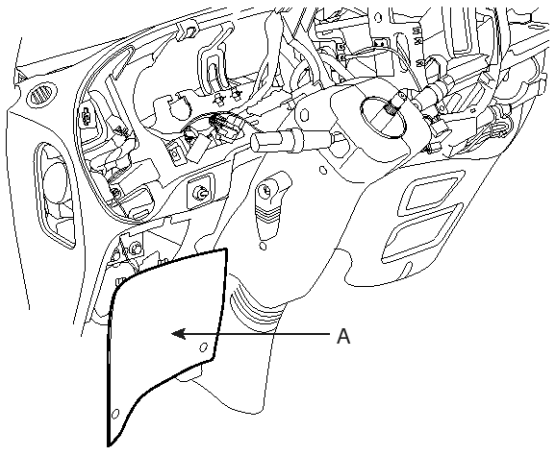


SUDCHA0011L

1. Input Rod
2. Boot
3. Cir-clip
4. Seal
5. Piston
6. Seal
7. Stopper
8. O-Ring
9. Supply Valve
10. Supply Valve Rod
11. Valve Spring
12. Spring Seat
13. Return Spring
14. Glow Mat
15. Adaptor

Removal

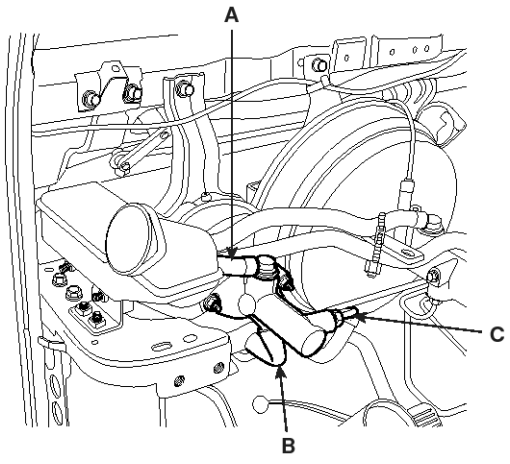
1. Remove the crash pad lower panel (A).



KBD1008A

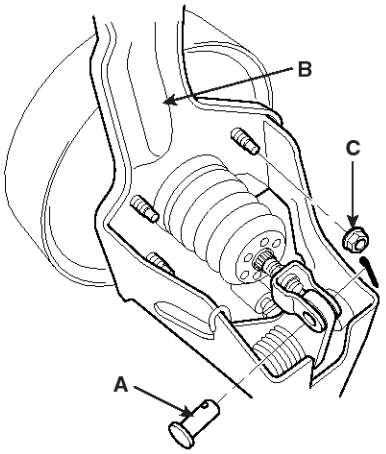
2. After disassembling the clutch oil hose (A) and the vacuum hose (B), remove the oil tube (C) connecting to the release cylinder.

⚠CAUTION
When removing the clutch oil hose and the oil tube, the oil could flow out. Therefore, prepare an appropriate container to serve the oil.



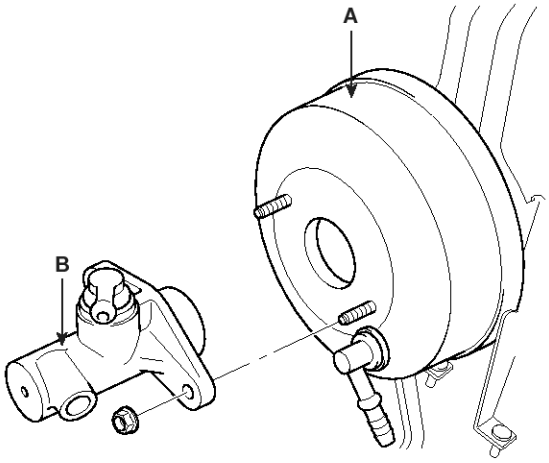
KCH1013F

3. Disassemble the clutch booster assembly from the pedal support member (B).
   1) Disassemble the clutch booster clevis pin (A) from the pedal assembly.
   2) Remove the clutch booster mounting nut (C).



KCH1016D

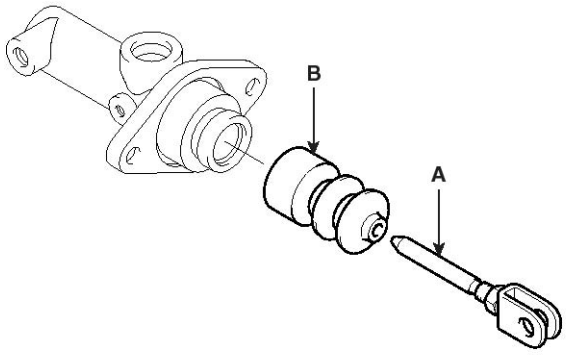
4. Remove the master cylinder assembly (B) from the clutch booster (A).



KCH1015A

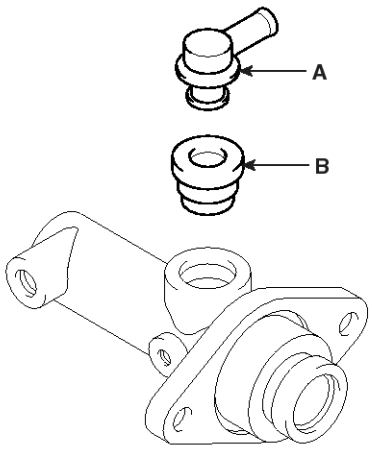
Disassembly

1. Take off the input rod (A) and boot(B) from the master cylinder body.



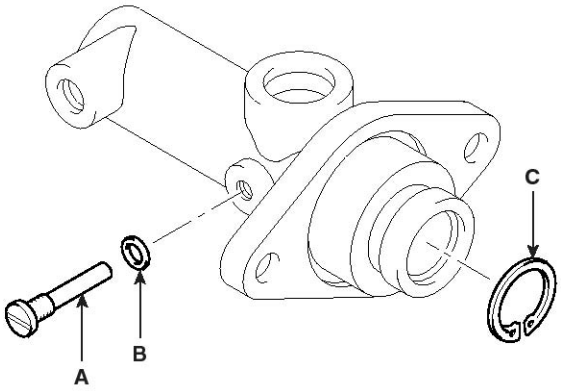
KCH1018A

2. Remove the piping adaptor (A) and the glow mat (B).



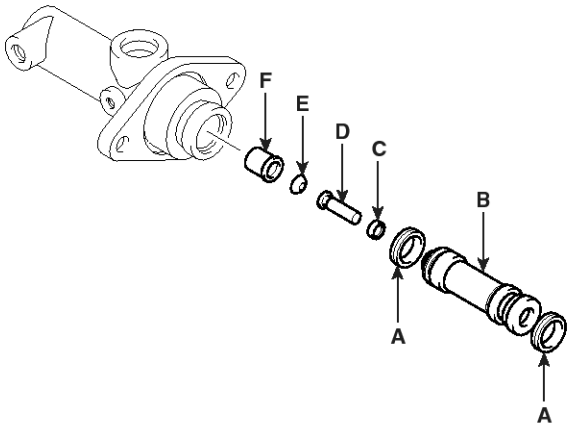
KCH1019A

3. Using a snap ring plier, remove the cir-clip (C). Remove the stopper(A) and washer(B).



KCH1020A

4. Remove the piston assembly(B), seal(A), supply valve(C), supply valve load(D), valve spring(E) and spring seat(F).



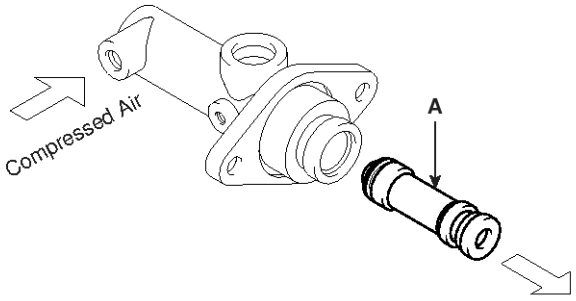
KCH1021A

NOTICE

For removing the piston from the body, use the compressed air.

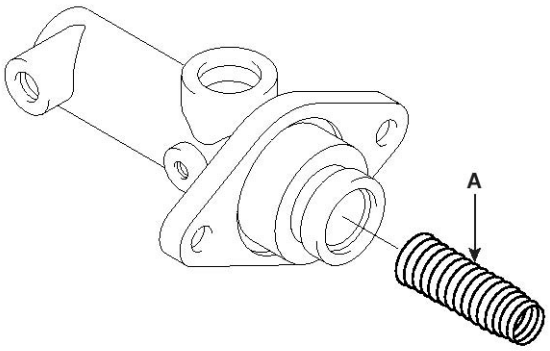
CAUTION

When removing the oil seal from the piston, be careful that the piston (A) groove is not damaged.



EMTCH5011A

5. Remove the return spring(A) from the master cylinder.



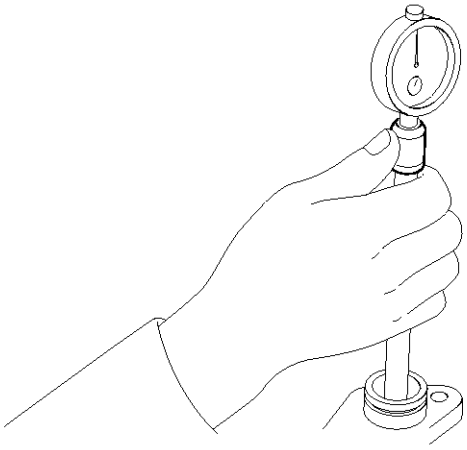
KCH1022A

Inspection

1. Check if there are rusts or furs inside of the cylinder body.
2. Check the wear and deformation of the piston cup.
3. Check the clearances of the master cylinder's inner diameter and the piston's outer diameter.

   If they exceed the limit value, replace the piston and the cylinder.

Standard Diameter: 22.22mm (General)
: 23.81mm (T60S5, T60S6)
Reference Clearance: 0.02~0.08mm
Limit Value: 0.2mm



KCH1023A

CAUTION

Measure the inner diameter at the three position (upper, center, lower) of the master cylinder vertically.

4. Check the free lengths of the return spring and the valve spring. If needed, replace them.

Free Length of the Return Spring: 81mm
Free Length of the Valve Spring: 9.2mm

Reassembly

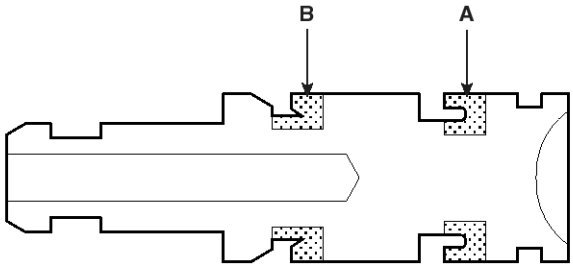
The assembly is performed in the reverse order of disassembly.

⚠CAUTION

a. Before assembling, apply the brake oil at the cylinder inner surface and the piston seal.

b. Before assembling, check if there are any damages on the piston cup and body or there are any foreign materials in the cylinder.

c. Check that the assembling direction of the 2nd piston cup (A) and the pressure cup (B).



KCH1024A

Installation

The installation is performed in the reverse order of the removal.

1. Install the master cylinder to the booster.

Tightening Torque: 7.8~11.8Nm(0.8~1.2kgf.m, 5.8~8.7lb-ft)

2. Tighten the clutch booster mounting nut at the pedal support member.

Tightening Torque: 12.7~15.7Nm(1.3~1.6kgf.m, 9.4~11.6lb-ft)

3. Installing the clevis pin at the pedal and fixing the split pin firmly, tighten the adjuster nut.

Tightening Torque: 15.7~22.0Nm(1.6~2.2kgf.m, 11.6~16.2lb-ft)

NOTICE

a. After assembling, check that the stroke of clutch pedal satisfies (F)mm.

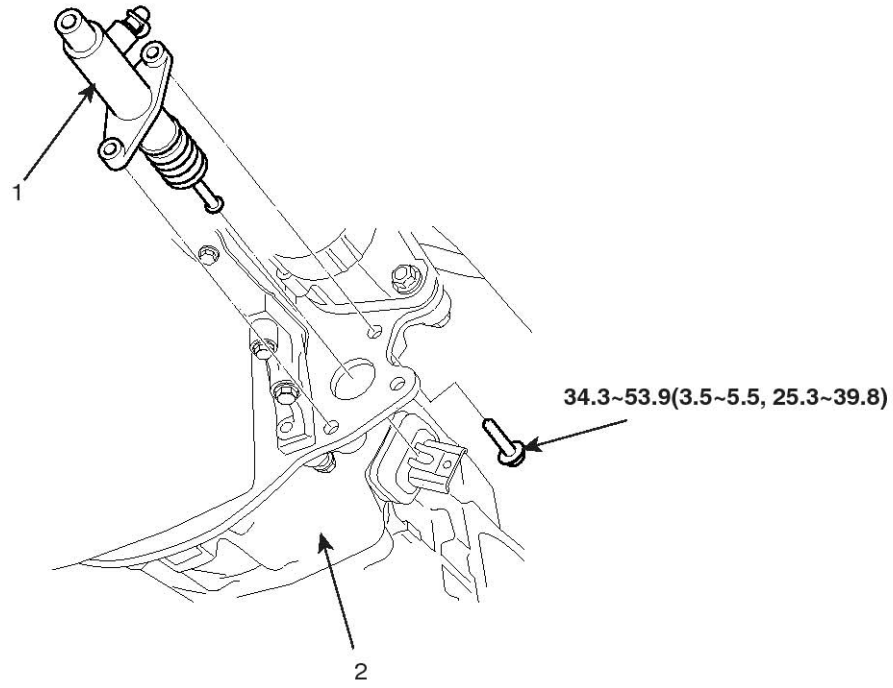
b. After assembling, check that the distance between the center of the clutch pedal pad and the center of the pedal support member mounting bolt satisfies (G)mm.

c. For adjusting the clearance of the clutch pedal, refer to the clutch pedal Inspection, Adjustment of the "On-Vehicle Inspection".

	F(mm)	G(mm)
D4AF/L , D4DA/B/C (NO VAC)	165(0,5)	207(-4,0)
D4AF/L , D4DA/B/C (VAC)	155(0,5)	215(-4,0)
D4DD	140(0,5)	193(-4,0)
D4GA+T60S5, 6	145±3	189±3
D4GA+M035S5	140±3	200±3

Clutch Release Cylinder

Component Location

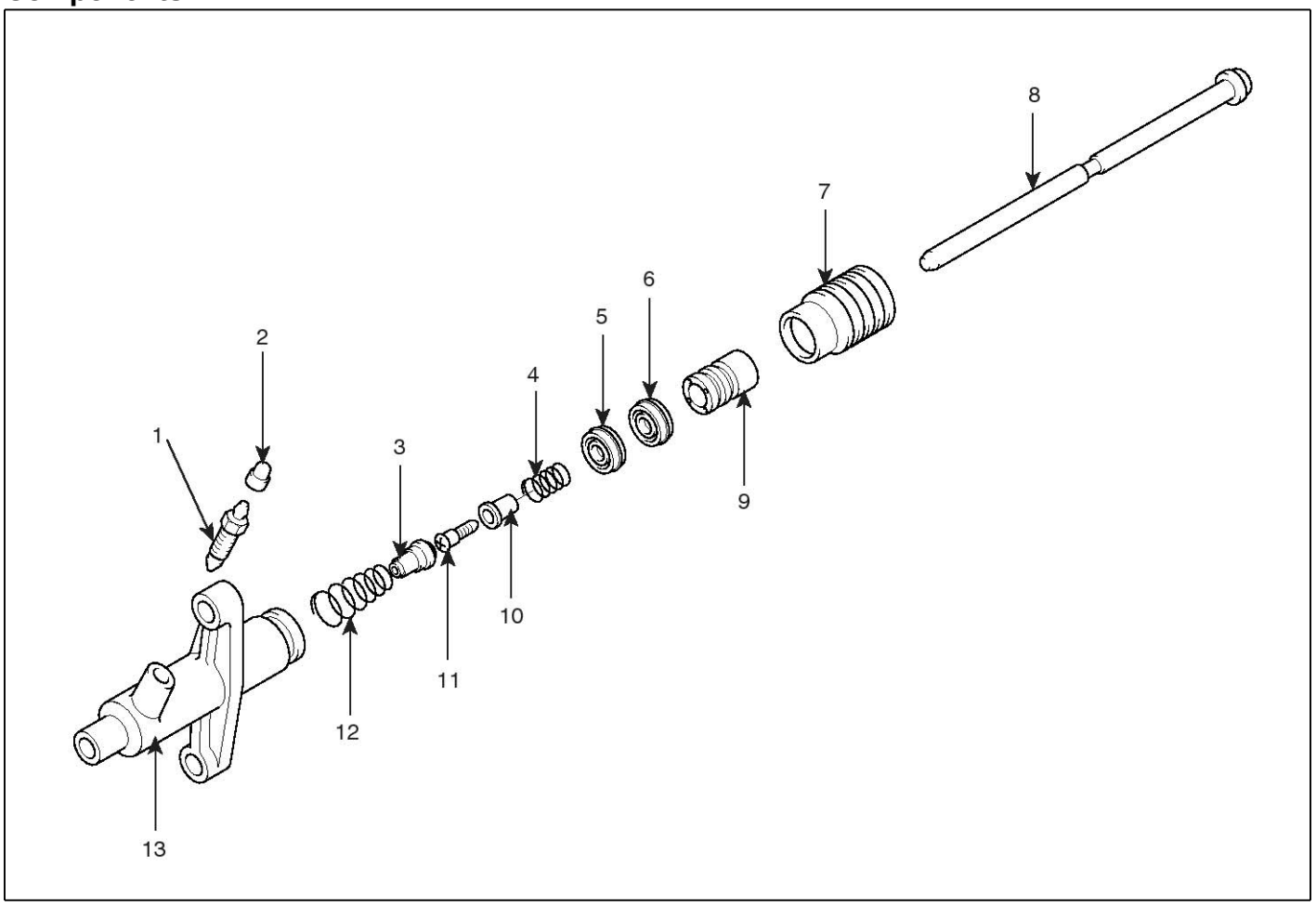


Tightening torque : Nm(kgf.m, lb-ft)

SUDCHA0012L

1. Clutch Release Cylinder
2. Transmission Assembly

Components



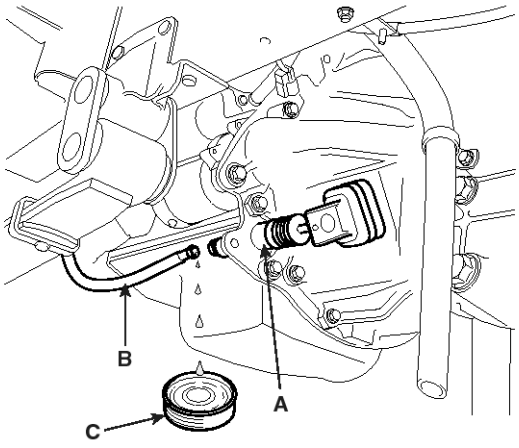
SUDCHA0013L

1. Breath Screw
2. Breath Screw Cap
3. Choke Valve Assembly
4. Piston Spring
5. 1st Cup
6. 2nd Cup
7. Boot
8. Push Rod
9. Piston Assembly
10. Piston Cup
11. Spring Seat Screw
12. Return Spring
13. Cylinder Body

Removal

1. Remove the flexible hose (B) of the release cylinder (A).

   ⚠CAUTION
   When removing the flexible hose, the brake oil may flow out so it is prefer to prepare a transparent container (C).

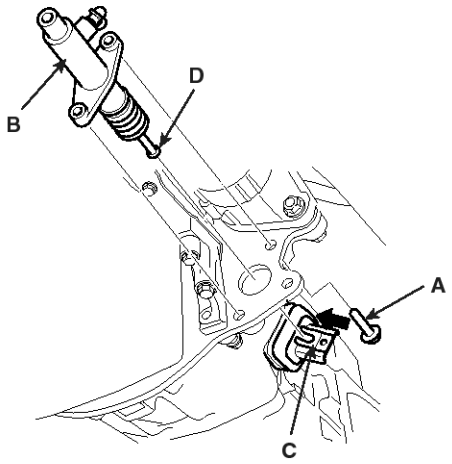


KCH1027A

2. Take off the release cylinder mounting bolt (A).

   Remove the release cylinder(B).

   NOTICE
   For removing the release cylinder, push the end portion (D) of the release cylinder push rod assembled in the release fork spring groove (C) to the arrow marking direction, in the figure.



KCH1028A

Installation

The installation is performed in the reverse order of removal.

1. After inserting the release cylinder into the spring groove of the release fork, tighten the release cylinder mounting bolt.

Tightening Torque: 34.3~53.9Nm(3.5~5.5kgf.m, 25.3~39.8lb-ft)

   NOTICE
   Apply the grease at the end portion of the release cylinder push rod and the release fork spring groove.

2. Tighten the release cylinder flexible hose.

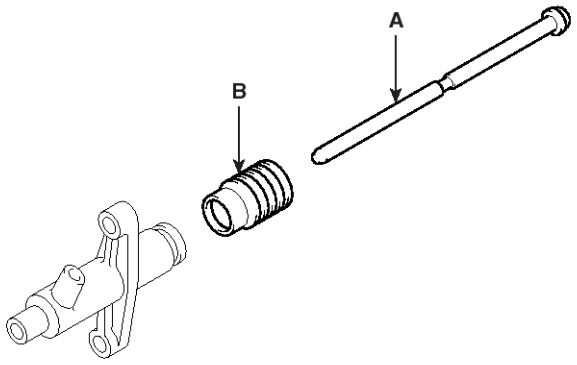
Tightening Torque: 18.6~25.5Nm(1.9~2.6kgf.m, 18.8~lb-ft)

   ⚠CAUTION
   Be careful that the hose does not bent or twisted.

3. Evacuating the air from the clutch system, check any oil leakage at each jointing part.

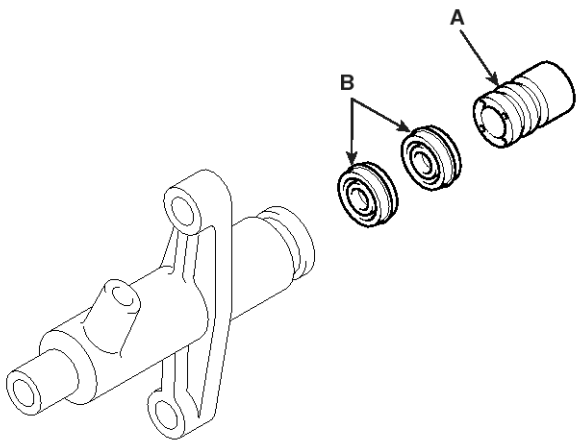
Disassembly

1. Remove the push rod (A) and Boot (B) from the release cylinder.



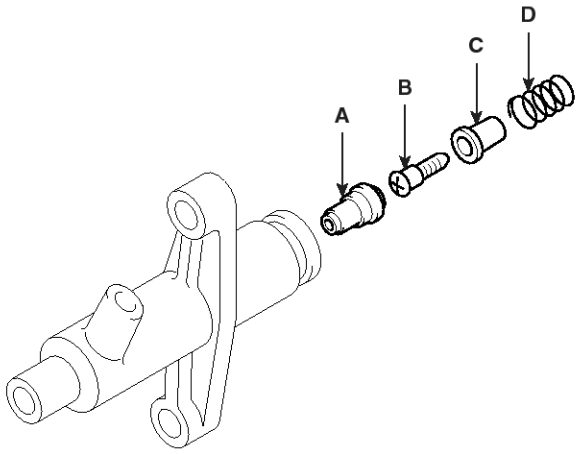
KCH1029A

2. Remove the piston (A) and the piston cup (B) assembly.



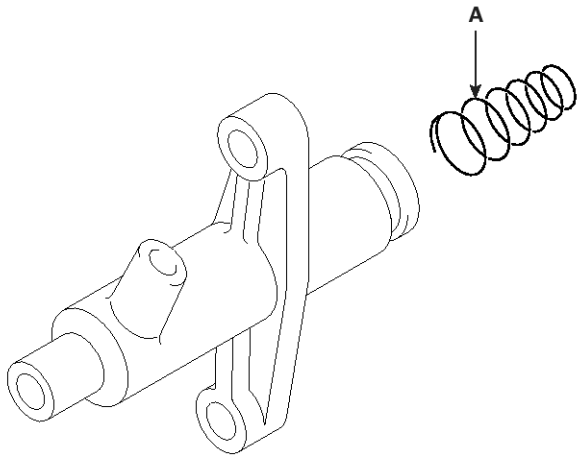
KCH1030A

3. Remove the choke valve assembly (A), the spring seat screw (B), the spring seat (C), and the piston spring (D).



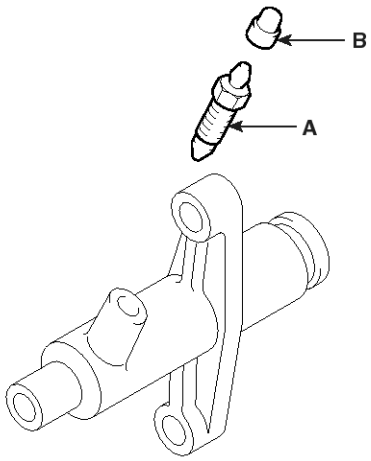
KCH1031A

4. Remove the return spring (A).



KCH1032A

5. Remove the bleeder screw (A) and the screw cap (B) from the cylinder body.

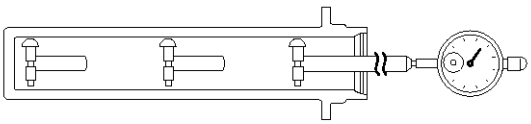


KCH1033A

Inspection

1. Check the clearance between the release cylinder inner diameter and the piston outer diameter.

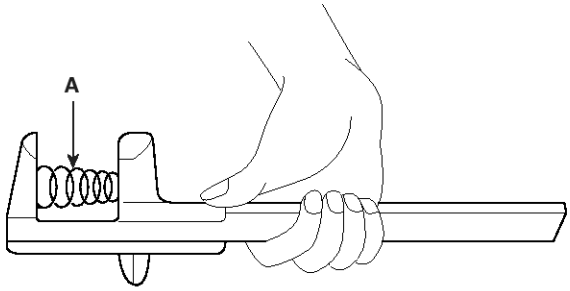
Standard Diameter : 22.22mm
Reference Clearance: 0.02~0.1mm
Limit Value : 0.2mm



KCH1034B

2. Check the free play distance of the return spring (A).

Reference Value: 79.6mm



KCH1034A

Reassembly

The assembly is performed in the reverse order of the disassembly.

NOTICE

a. Apply the rubber grease (RG-306) at all inner surface of the cylinder and piston cup.

b. On the piston cup and the inner surface of the cylinder, there is no damage and there is no foreign materials, and leakage.

c. Check the assembling direction for the 1st cup and 2nd cup. The brake oil (DOT3, DOT4) should be applied before assembling.

CAUTION

The recommended brake oil should be used.

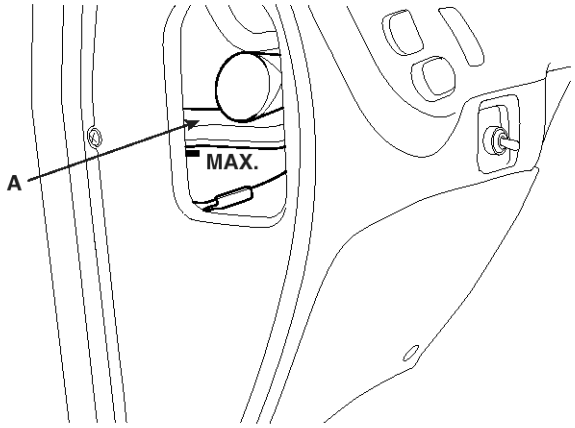
Do not mix with the other kind of oil.

Adjustment

Air bleeding of Clutch System

1. Check the oil amount of the reservoir tank.

   Fill up the brake oil into the reservoir tank at maximum level.

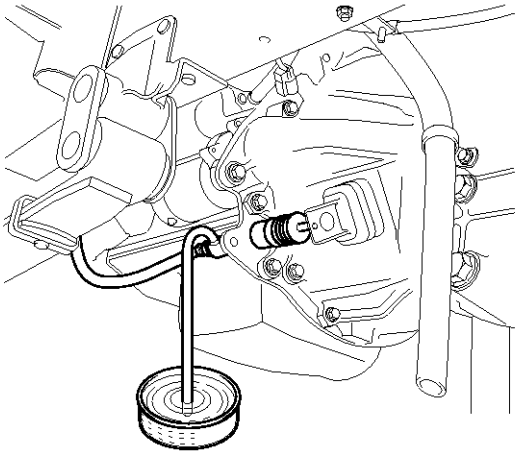


KCH1035A

NOTICE

If the level of the reservoir tank (A) is decreased during the air bleeding, refill the brake oil.

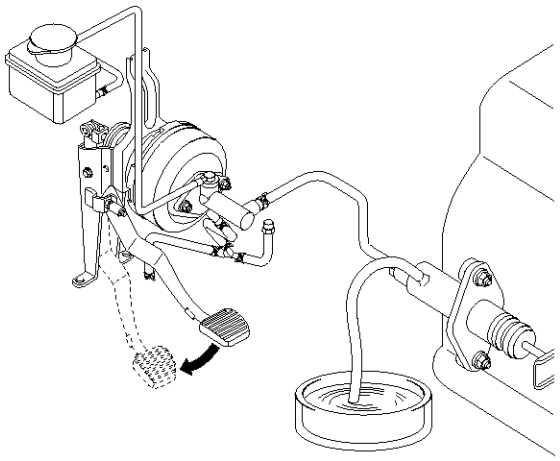
2. Installing a vinyl pipe to the air bleeder screw of the release cylinder, put the other end of the vinyl pipe into the transparent container having the brake oil.



KCH1036A

3. Air bleeding
   a. Step on the clutch pedal several times.

      Stepping on the pedal, loosen the screw of the air bleeder to discharge the brake oil intruded by the air.
   b. Pressing the pedal, tighten the screw of the air bleeder screw. After that, release the pedal.
   c. Repeat the above-step until the air bubble is fully removed in the brake oil.



KCH1037A

CAUTION

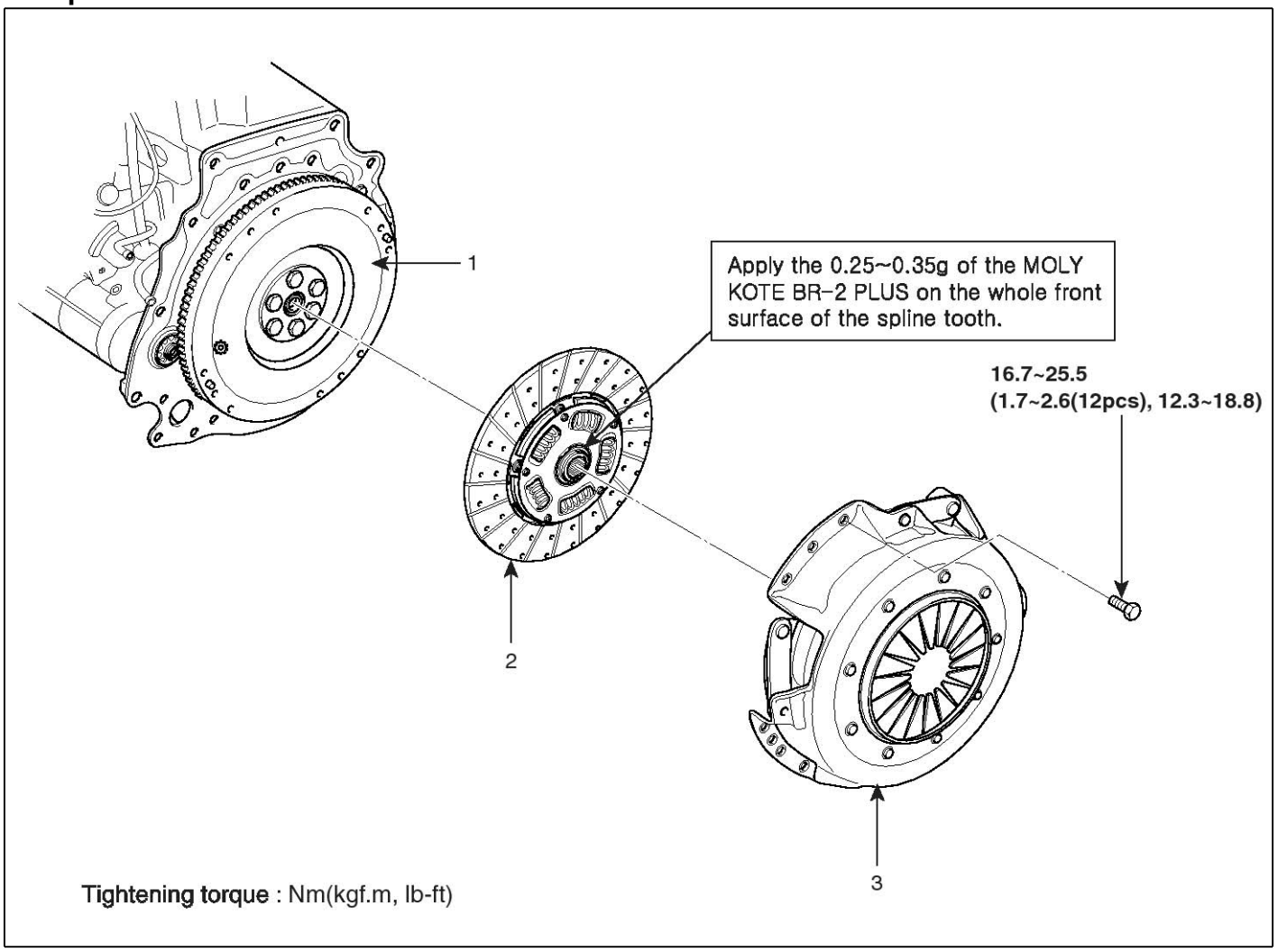
During the air bleeding, the brake oil in the reservoir tank should be filled with maximum level.

NOTICE

As the pedal stays in the pressed position due to the operation of the toggle spring, set the pedal brake to the original position with hand.

Clutch Cover And Disc

Component Location

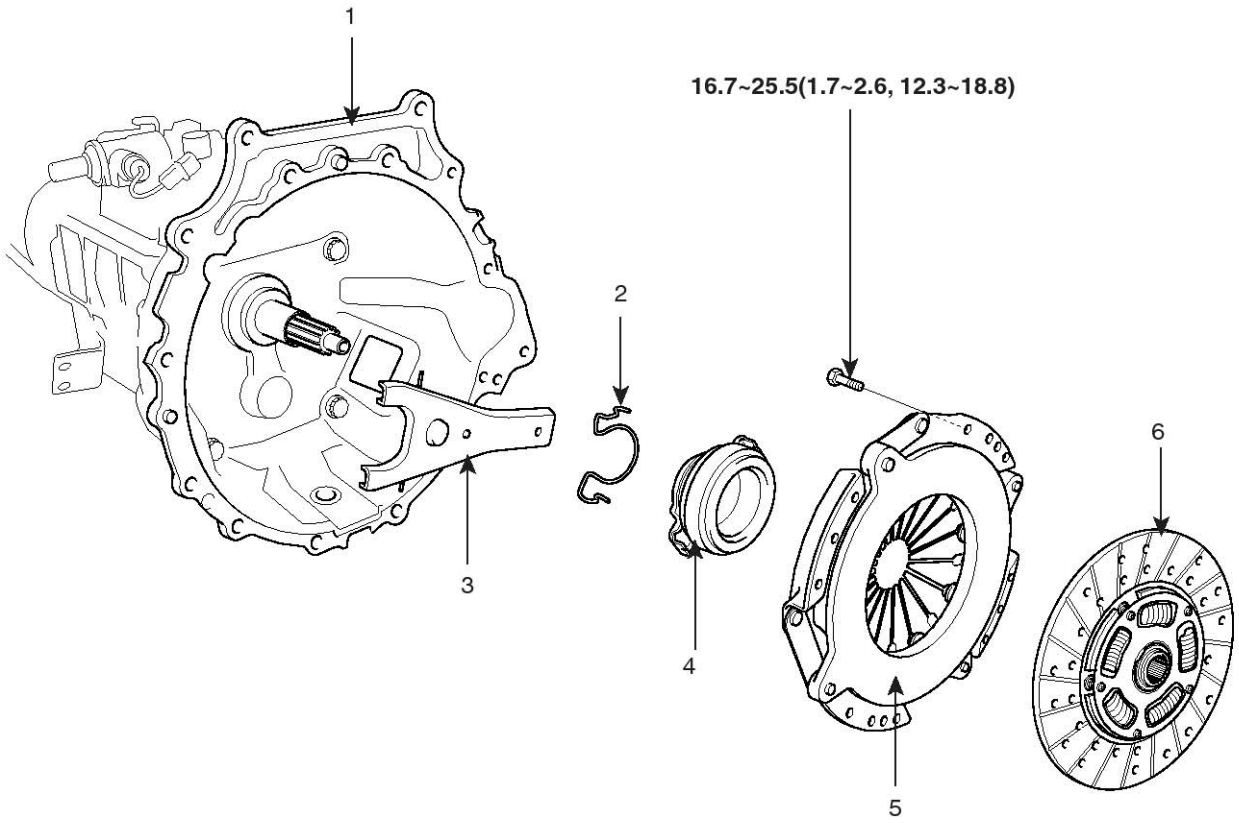


SUDCHA0014L

1. Fly Wheel Assembly
2. Clutch Disk
3. Clutch Cover Assembly

Component

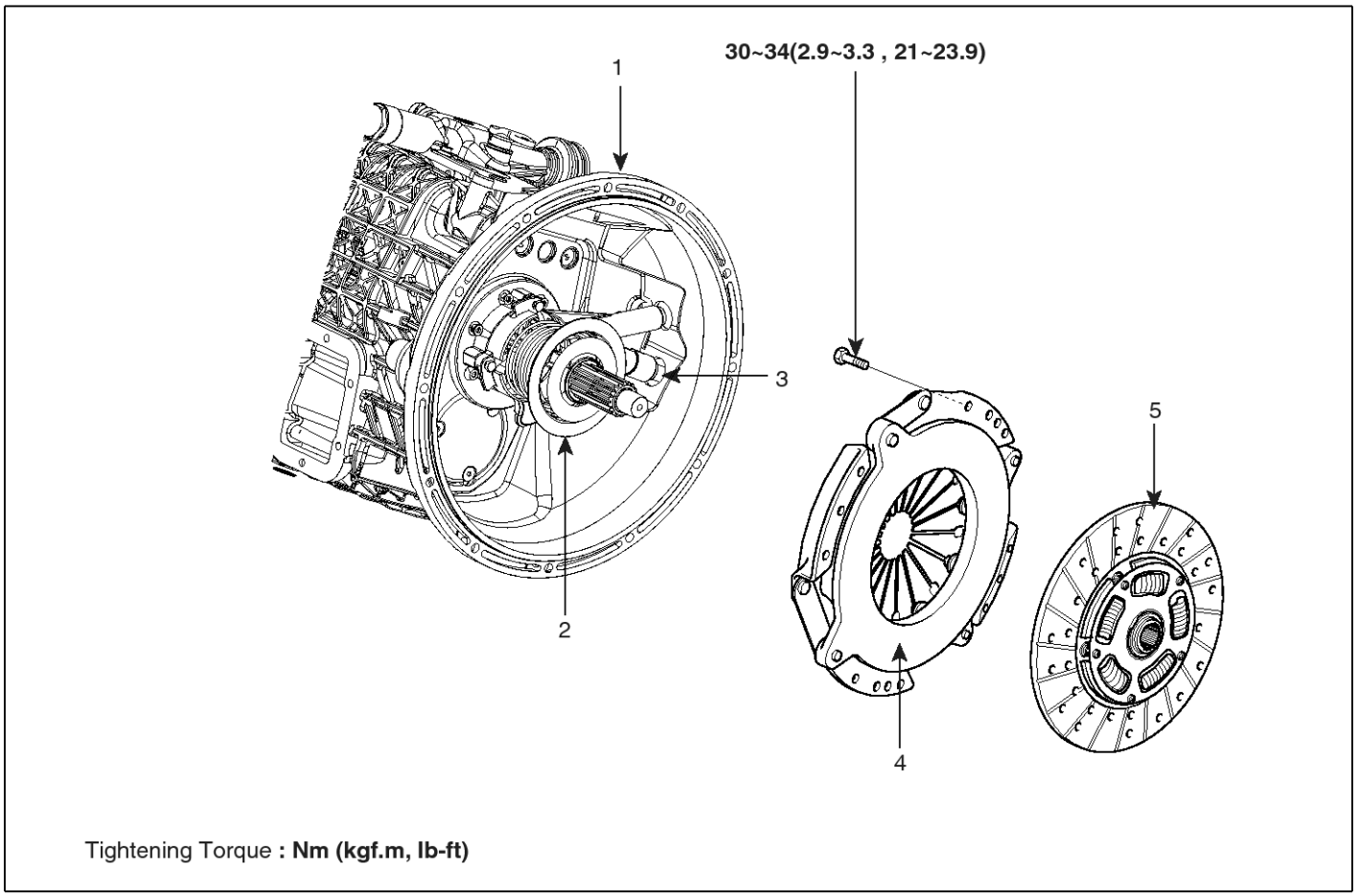
[Except D4GA engine]



SUDCHA0015L

1. Transmission Assembly
2. Return Spring
3. Clutch Release Fork
4. Clutch Release Bearing
5. Clutch Cover Assembly
6. Clutch Disk

[D4GA engine]



SUDCHA0008L

1. Transmission assembly
2. Concentric slave cylinder(CSC)
3. Pressure adapter
4. Clutch cover assembly
5. Clutch disc

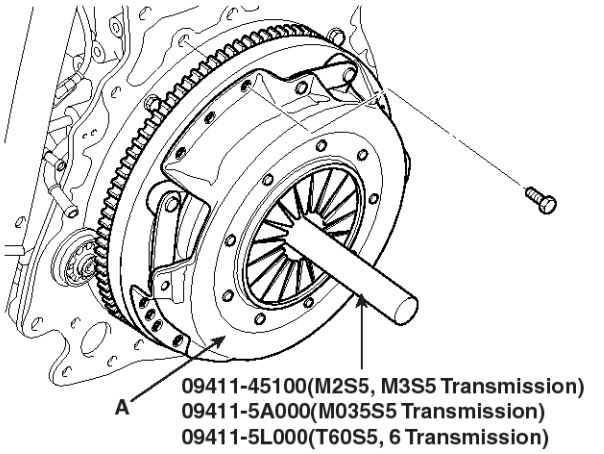
Disassembly

1. For the removal and installation of the manual transmission, refer to the "Manual Transmission (MT)" Group.
2. Using the special tools (09411-45100, 09411-5A000, 09411-5L000), support the clutch disk. Remove the clutch cover assembly (A).

NOTICE

When removing the clutch cover and fly wheel tightening bolt, observe the sequence for removing.

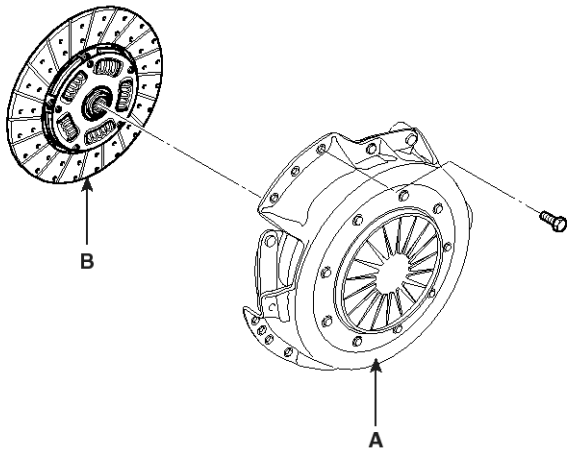
When loosen the bolt, perform it over 1~2 times not at one time because the cover flange may be bent.



SUDCHA0016L

3. Disassemble the clutch disk (B) from the clutch cover assembly.

   ⚠CAUTION
   Do not clean the clutch disk (B) with the solvent.

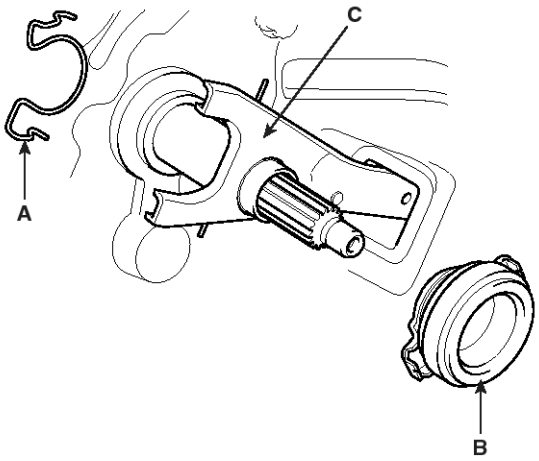


KCH1038C

4. [Except T60S5, T60S6]

   Remove the release fork return spring (A).

   Remove the release bearing (B) and the release fork (C).

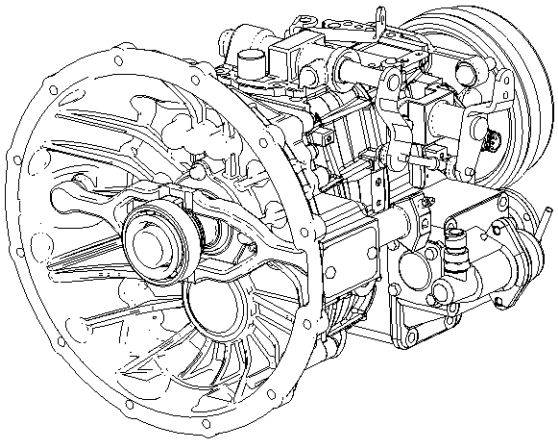


KCH1041A

   [T60S5, T60S6]

   Remove the CSC assembly.

   [M035S5 - D4GA engine]



SUDCHA0017L

   Remove the release bearing and the release fork together.

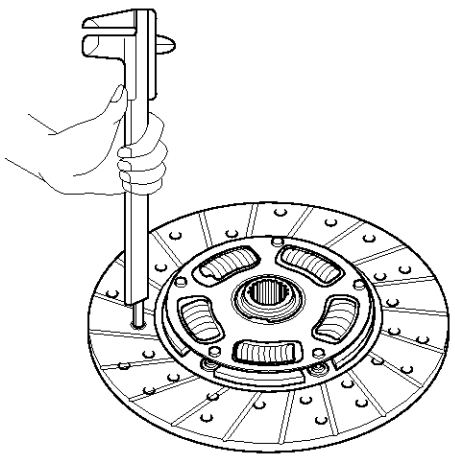
   Remove the springs(2 EA) and remove the release bearing from the release fork.

Inspection

1. Wear of Facing

   Measure the depth from the facing surface to the rivet head. If it excesses the limit value, replace the clutch disk assembly.

Depth From the facing surface to the rivet head
Reference Value: 1.6~2.1mm
Limit Value : 0.2mm

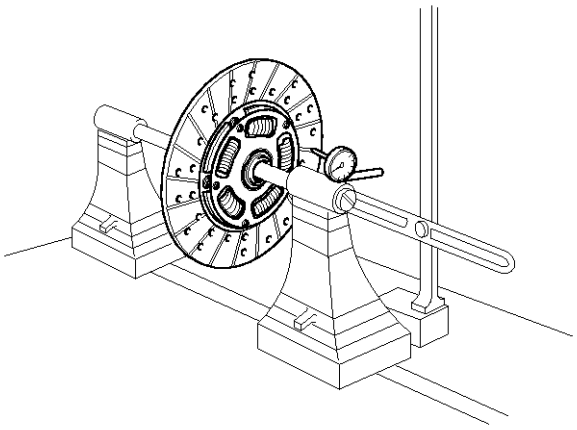


KCH1042A

2. Clutch Disk Run Out

   Using a dial gauge, measure the run out of the clutch disk. If it excesses the limit value, replace or repair it.

Clutch Disk Run Out
Reference Value: 1.0mm
Limit Value : 1.5mm



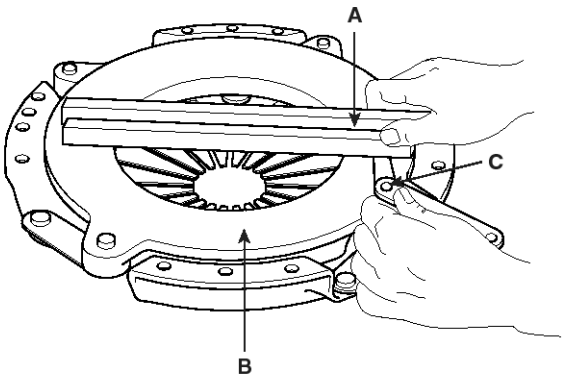
KCH1043A

3. Clutch Cover Assembly

   Laying a square (A) on the frictional surface of the pressing plate (B), measure the flatness using a thickness gauge (C).

   If the measurement excesses the limit value, repair it by grinding or replace it.

Flatness of the frictional surface of the pressing plate.
Reference Value: 0.05mm or less
Limit Value : 0.5mm



KCH1044A

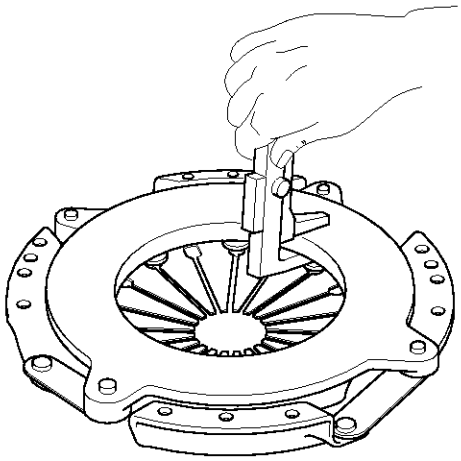
⚠CAUTION

As the clutch cover, the pressing plate, the strap plate and the diaphragm are riveted in one body, if one of them has been defective, then replace the whole clutch cover assembly.

4. Measure the thickness of the pressing plate.

   If needed, replace it.

Thickness of the pressing plate
Reference Value: 23~24mm
Limit Value : 22.5mm



KCH1045A

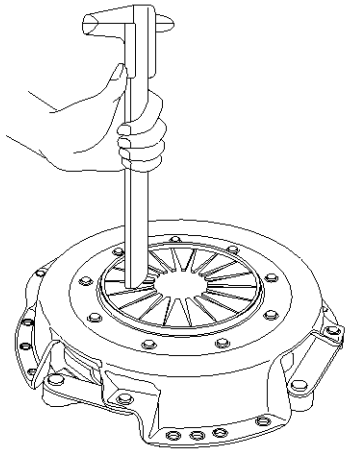
5. Check if the diaphragm has been cracked or damaged.

   If needed, replace it.

   Measure the wear thickness of the diaphragm spring finger (a part pushing the release bearing).

   If it reaches to the limit value, replace it.

Height Difference of the Diaphragm Finger
Reference Value: 1.0mm or less
Limit Value : 1.3mm



KCH1046A

6. Using a thickness gauge, measure the clearance between the diagram spring lock pin and the pivot ring. If the clearance excesses the limit value, replace it.

Clearance between the Pivot ring and the Diaphragm Spring
Limit Value: Too long clearance

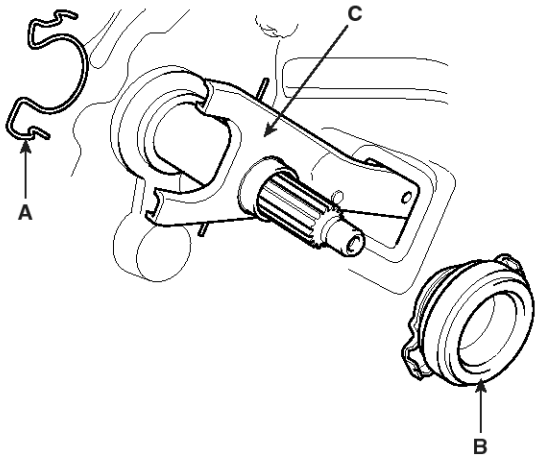
7. Check the release bearing for adhesion, damage and abnormal noise. Check the wear of the contacting portion of the diaphragm spring.

   ⚠CAUTION
   As the release bearing is filled with the grease, do not clear it with solvent or oil.

Reassembly

1. [Except T60S5, T60S6]

   Install the release bearing (B), and the release fork (C). Install the return spring (A).

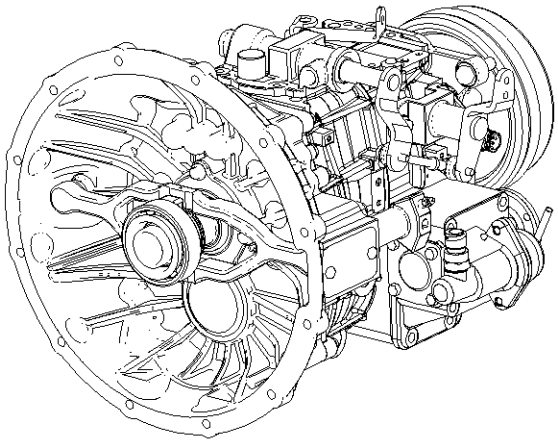


KCH1041A

[T60S5, T60S6]

Install the CSC assembly.

[M035S5 - D4GA engine]



SUDCHA0017L

Install the release fork.

Install the release bearing with installing springs(2 EA).

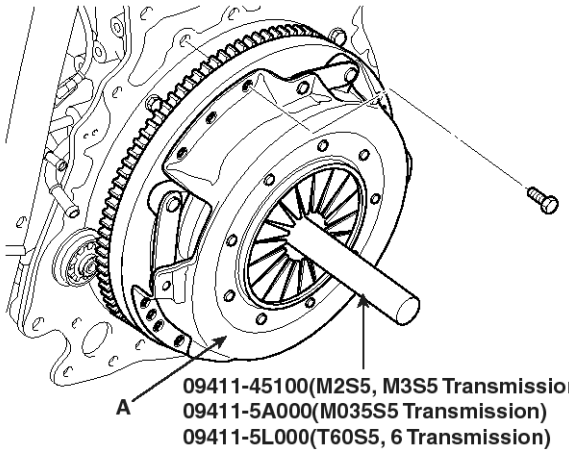
2. Using the special tool (09411-45100, 09411-5A000, 09411-5L000), fix the clutch disk. Install the clutch cover assembly (A).

Tightening Torque: 16.7~25.5Nm (1.7~2.6kgf.m, 12.3~18.8 lb-ft)

NOTICE

a. When assembling the clutch cover assembly (A), it should be aligned with the lock pin of the fly wheel.

b. Apply evenly the 0.25~0.35g of the MOLY KOTE BR-2 PLUS on the whole surface of the spline tooth.



SUDCHA0016L

CAUTION

a. When tightening the clutch cover mounting bolt, evenly tight the bolts in the order of diagonal direction turn.

b. After tightening with the specified torque, the height difference of the diaphragm spring finger should be less than 1mm.