Clutch System

General Information

Specifications

Item				Specification	
Clutch operation method				Hydraulic type	
Clutch cover assembly	Туре			Diaphragm spring strap	
Clutch disc	Туре			Single dry with diaphragm	
	Facing diameter (outside × outside)	Diesel 2.0	Low power	Ø240 × Ø155mm (Ø9.4488 × Ø6.1024in.)	
			High power	Ø239 × Ø170mm (Ø9.4094 × Ø6.6929in.)	
		Diesel 1.7		Ø235 × Ø155mm (Ø9.2520 × Ø6.1024in.)	
		Gasoline 1.6		Ø210 × Ø145mm (Ø8.2677 × Ø5.7087in.)	
Concentric slave cylinder	Cylinder diameter (inside x outside)		outside)	Ø32.2 x Ø44mm (Ø1.2677 × Ø1.7323in.)	
Clutch release cylinder	Inside diameter			20.64mm(0.8126in.)	
Clutch master cylinder	Insid	Inside diameter		15.87mm(0.6248in.)	

Service Standard

Item	Specification	
	Diesel 2.0: 8.5 \pm 0.3 mm (0.3347 \pm 0.012 in.)	
Clutch disc thickness [When free]	Diesel 1.7: 8.3 ± 0.3 mm (0.3268 ± 0.012 in.)	
/	Gasoline 1.6 : 8.3 \pm 0.3 mm (0.3268 \pm 0.012 in.)	
Clutch pedal height	167 mm (6.5748 in.)	
Clutch pedal free play	6 ~ 13 mm (0.2362 ~ 0.5118 in.)	
Clutch pedal stroke	Diesel: 150 ± 3mm (5.9055 ± 0.1181 in.)	
	Gasoline :140 \pm 3mm (5.5118 \pm 0.1181 in.)	
	Diesel 2.0 :Min1.3 mm (0.0512 in.)	
Clutch disc rivet depth	Diesel 1.7 :Min1.1 mm (0.0433 in.)	
	Gasoline 1.6 :Min1.1 mm (0.0433 in.)	
Diaphragm spring end height difference	0.5 mm (0.0197 in.)	
	Diesel : 0.15 mm (0.0059 in.)	
Clutch master cylinder clearance to piston	Gasoline : 0.16 mm (0.0063 in.)	

General Information

CH-3

Tightening Torques

Item		N.m	kgf.m	lb-ft
	Diesel 2.0	24.5 ~ 34.3	2.5 ~ 3.6	18.1 ~ 26.0
Clutch cover assembly	Diesel 1.7	11.8 ~ 14.7	1.2 ~ 1.5	8.7 ~ 10.8
	Gasoline 1.6	14.7 ~ 21.6	1.5 ~ 2.2	10.8 ~ 15.9
Concentric slave cylinder Installation bolt		11.8 ~ 14.7	1.2 ~ 1.5	8.7 ~ 10.8
Ignition lock switch		7.8 ~ 9.8	0.8 ~ 1.0	5.8 ~ 7.2
Clutch pedal mounting nut		16.7 ~ 25.5	1.7 ~ 2.6	12.3 ~ 18.8
Clutch release cylinder ins	tallation bolt	14.7 ~ 21.6	1.5 ~ 2.2	10.8 ~ 15.9

Lubricants

Item	Specified lubricants	Quantity
Input spline	CASMOLY L9508	0.2g
Concentric slave cylinder assembly	KLUBER 9R100	An required
Clutch pedal shaft and bushings	Chassis grease SAE J310, NGLI NO.1	As required

Special Service Tools

Tools (Number and Name)	Illustration	Use
09411-1P000 Clutch disc guide		Installation of the clutch disc.
	SRBCH1012L	

Clutch System

Troubleshooting

٦	Frouble symptom	Suspect area	Remedy
Clutch slipping Car will not respond to engine speed during acceleration Insufficient vehicle speed		Insufficient pedal free play	Adjust
		Clogged hydraulic system	Correct or replace parts
		Excessive wear of clutch disc facing	Replace
Lack of portions	ower during uphill driving	Hardened clutch disc facing, or oil on surface	Replace
		Damaged pressure plate or flywheel	Replace
		Weak or broken pressure spring	Replace
_	shifting (gear noise during	Excessive pedal free play	Adjust
shifting)		Hydraulic system fluid leaks, air trapping or clogging	Repair or replace parts
		Unusual wear or corrosion of the clutch disc spline	Replace
		Excessive vibration (distortion) of the clutch disc	Replace
Clutch noisy	When the clutch is not	Insufficient play of the clutch pedal	Adjust
	used	Excessive wear of the clutch disc facing	Replace
محدود)	A noise is heard after the clutch is disengaged	Unusual wear and/ or damage of the release bearing	Replace
	A noise is heard when the clutch is disengaged	Insufficient grease on the sliding surface of the bearing sleeve	Repair
		Improperly installed clutch assembly or bearing	Repair
ایران	A noise is heard when the car suddenly rolled up with the clutch partially engaged	Damaged pilot bushing	Replace
Hard pedal e	ffort	Insufficient lubrication of the clutch pedal	Repair
		Insufficient lubrication of the spline part of clutch disc	Repair
		Insufficient lubrication of the clutch release lever shaft	Repair
Hard to shift	or will not shift	Excessive clutch pedal free play	Adjust the pedal free play
		Faulty of the clutch release cylinder	Repair the release cylinder
		Clutch disc out of place, runout is excessive or lining broken	Inspect the clutch disc
		Spline on the input shaft or clutch disc dirty or burned	Repair as necessary
		Faulty of the clutch pressure plate	Replace the clutch cover

General Information

CH-5

Trouble symptom	Suspect area	Remedy
Clutch slips	Insufficient clutch pedal free play	Adjust the pedal free play
	Clogged of the hydraulic system	Repair or replace parts
	Clutch disc lining oily or worn out	Inspect the clutch disc
	Faulty pressure plate	Replace the clutch cover
	Binding of the release fork	Inspect the release fork
Clutch grabs/chatters	Clutch disc lining oily or worn out	Inspect the clutch disc
	Faulty the pressure plate	Replace the clutch cover
	Bent clutch diaphragm spring	Replace the clutch cover
	Worn or broken torsion spring	Replace the clutch disc
	Engine mounts loose	Repair as necessary
Clutch noisy	Damaged the clutch pedal bushing	Replace the clutch pedal bushing
	Loose part inside housing	Repair as necessary
	Worn or dirty release bearing	Replace the replease bearing
	Sticking release fork or linkage	Repair as necessary

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

Clutch System

Clutch System

Service Adjustment Procedure

Bleeding

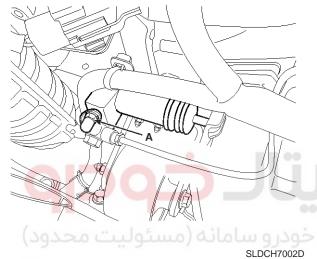
Gasoline 1.6 [M6CF1], Diesel 1.7 [M6CF3-1]

⚠CAUTION

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

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

1. Loosen the bleeder screw (A) at the clutch release cylinder.

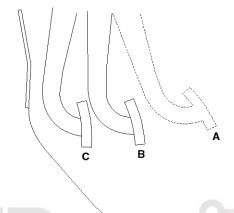


- 2. Depress the clutch pedal slowly until all air is expelled.
- 3. Hold the clutch pedal down until the bleeder is retightened.

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

ACAUTION

The rapidly-repeated operation of the clutch pedal in B-C range may disrupt the release During cylinder's position. the operation, press the clutch pedal to the floor after it returns to the "A" point.



EOKD006A

CH-7

Diesel 2.0 [M6GF2]

Concentric Slave Cylinder (C.S.C) Air Bleeding Procedure

ACAUTION

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 concentric slave cylinder air bleeder, insert a vinyl hose in the plug.
- 2. Loosening the plug screw, press and release the clutch pedal about 10 times.

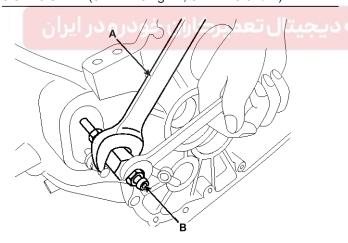
MOTICE

Using a flare nut wrench, hold the air bleeder body, being careful not to rotate it (A). Then use a second flare nut wrench on the plug screw to bleed the clutch master cylinder.

- 3. Tighten the plug (B) during the clutch pedal pressed. Afterwards, raise the pedal with a hand.
- 4. After pressing the clutch pedal 3 times more, loosen the plug (B) 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)

خودر و سامانه (مسئول:Tightening torque

 $6.8 \sim 9.8 \text{ N.m} (0.7 \sim 1.0 \text{ kgf.m}, 9.2 \sim 13.3 \text{ lb-ft})$



SXMCH0015L

Refill the clutch master cylinder with the specified fluid.

ACAUTION

- Do not clamp the pipe of a concentric slave cylinder.
- Be careful not to damage O-rings.

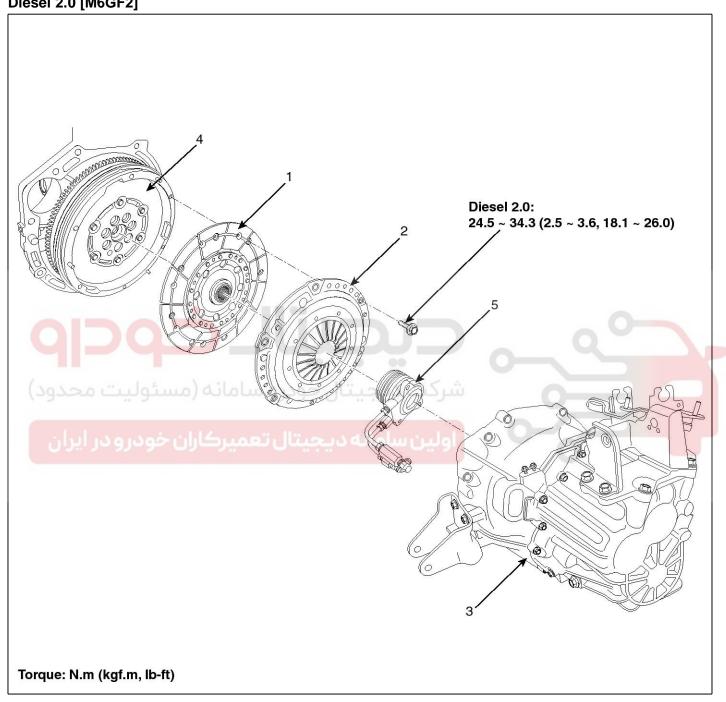


Clutch System

Clutch Cover And Disc

Components

Diesel 2.0 [M6GF2]



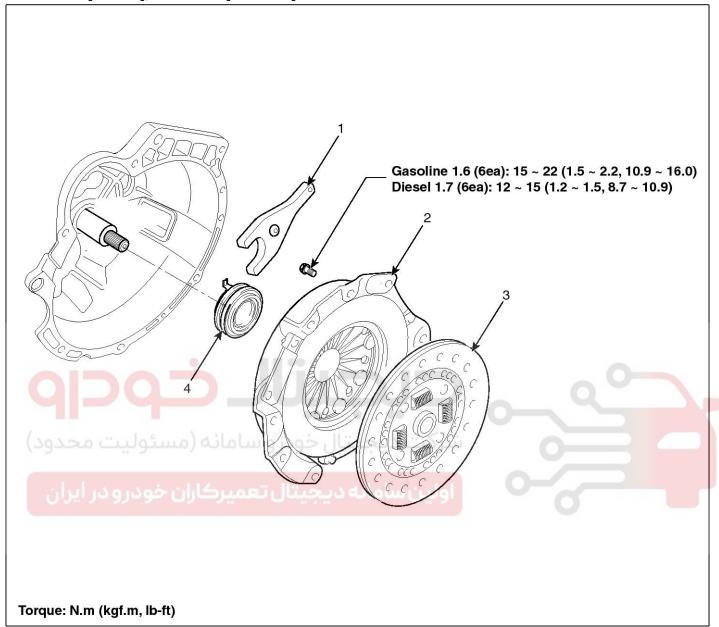
SELCH1010L

- 1. Clutch disc
- 2. Clutch cover
- 3. Manual transaxle

- 4. Engine flywheel
- 5. Concentric slave cylinder

CH-9

Gasline 1.6 [M6CF1], Diesel 1.7 [M6CF3-1]



SELCH1011L

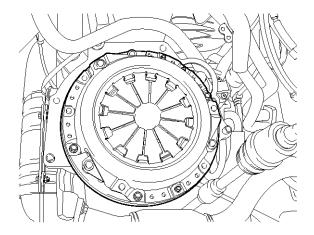
- 1. Clutch release fork
- 2. Clutch disc cover

- 3. Clutch disc
- 4. Clutch release bearing (Gasoline 1.6 & Diesel U1.7)

Clutch System

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 or twist bolts. Loosen bolts in diagonal directions.



SSLCH1003D

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

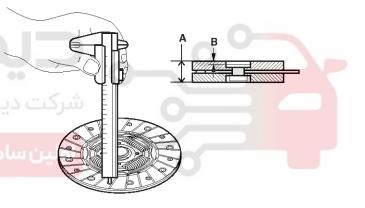
Clutch disc thickness (A) [when free]:

Diesel 2.0: 8.5 \pm 0.3 mm (0.3347 \pm 0.012 in.) Diesel 1.7: 8.3 \pm 0.3 mm (0.3268 \pm 0.012 in.) Gasoline 1.6: 8.3 ± 0.3 mm (0.3268 ± 0.012 in.)

Clutch disc rivet depth (B):

Diesel 2.0: Min1.3 mm (0.0512 in.) Diesel 1.7: Min1.1 mm (0.0433 in.) Gasoline 1.6: Min1.1 mm (0.0433 in.)





SCMCH0006D

CH-11

Installation

Self Adjusting Clutch (S.A.C.) Cover

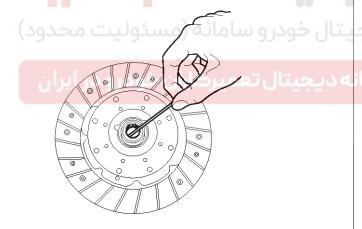
MNOTICE

- If reinstalling used cover, the cover should be installed with its clutch disc as a set.
- 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.
- 1. Apply grease on a disc spline part and transmission input shaft spline part as required.

MNOTICE

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.



FOKD011A

2. The 'T/M SIDE' marked surface should face the engineer.

⚠CAUTION

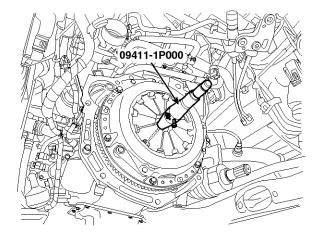
Possible problems when the disc is installed in the opposite direction.

- 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.
- The concentric slave cylinder can break. If it does, the concentric slave cylinder should be replaced new one.



SCMCH0007D

3. Install the clutch disc and the cover with SST (09411-1P000).



SRBCH1002L

Clutch System

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

Tightening torque:

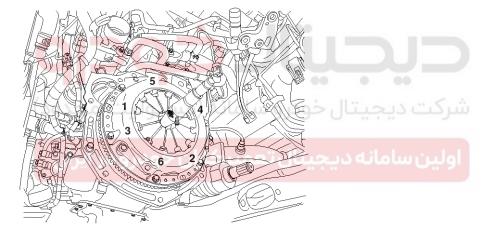
Diesel 2.0: 24.5 \sim 35.3 N.m (2.5 \sim 3.6 kgf.m, 18.1 \sim 26.0 lb-ft)

Diesel 1.7: 11.8 \sim 14.7 N.m (1.2 \sim 1.5 kgf.m, 8.7 \sim 10.8 lb-ft)

Gasoline 1.6: 14.7 \sim 21.6 N.m (1.5 \sim 2.2 kgf.m, 10.8 \sim 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.





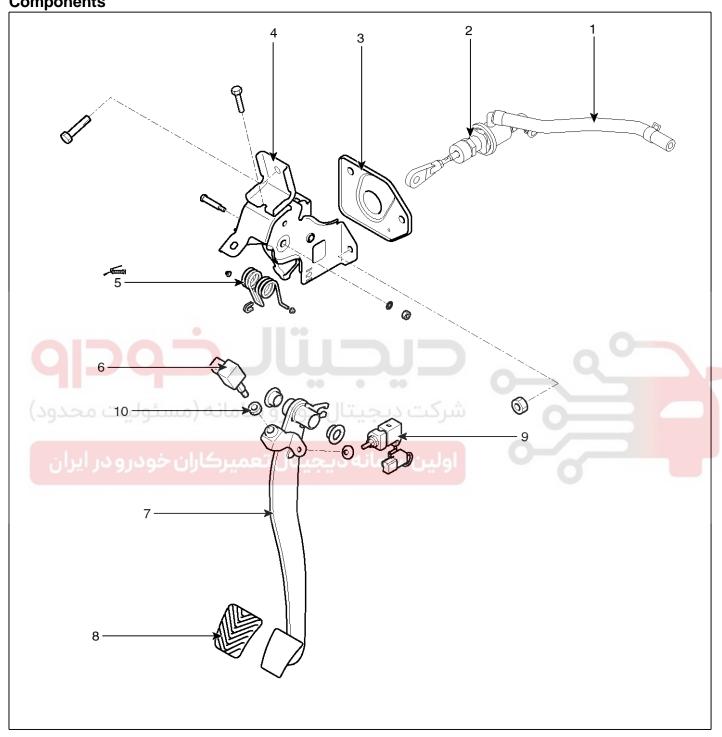
SMDCH1017D

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

CH-13

Clutch Pedal

Components



SLMCH0003D

- 1. Reverse hose
- 2. Master cylinder
- 3. Siller
- 4. Member assembly
- 5. Turn over spring

- 6. Clutch switch
- 7. Clutch arm
- 8. Pedal pad
- 9. Ignition lock switch
- 10. Stopper

Clutch System

Inspection

Clutch Pedal Inspection

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

Standard value:

Stroke (A):

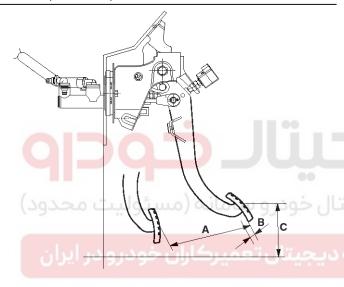
Diesel: 150 \pm 3mm (5.9055 \pm 0.1181 in.) Gasoline: 140 \pm 3mm (5.5118 \pm 0.1181 in.)

Free play (B):

 $6 \sim 13 \text{ mm} (0.2362 \sim 0.5118 \text{ in.})$

Height (C):

167mm (6.5748 in.)



SXMCH0008L

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)

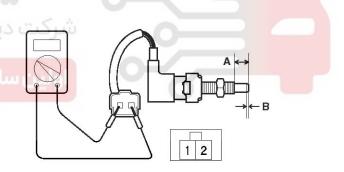
MNOTICE

 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 ± 0.3 mm (0.4724 ± 0.0118 in.) ON-OFF point (B): 2.0 ± 0.3 mm (0.0787 ± 0.0118 in)



LOJF002B

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

CH-15

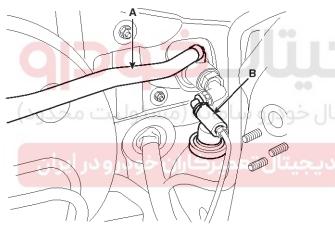
Removal

MNOTICE

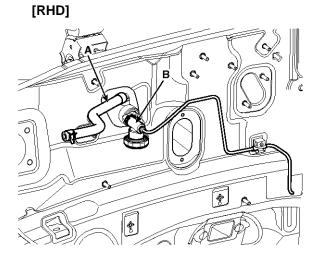
Do not spill brake fluid on the vehicle; it may damage the paint if brake fluid does contact the paint, wash it off immediately with water.

- 1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
- 2. Remove the ECM. (Refer to "Engine Control Module" in FL group).
- 3. Remove the fuel filter. (Refer to "Fuel Delivery Sustem" in FL group)
- 4. Clamp the clutch master cylinder hose (A). If there is not enough room for clamping, you can also clamp the hose from the brake master cylinder side.
- 5. Disconnect the clutch master tube line (B) after removing the nut on the clutch master cylinder.

Diesel 2.0 [M6GF2], Diesel 1.7 [M6CF3-1] [LHD]

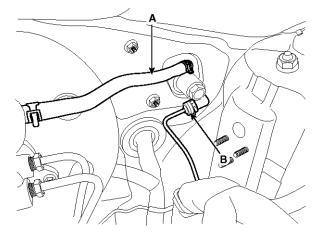


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SSLCH1002L

Gasline 1.6 [M6CF1]



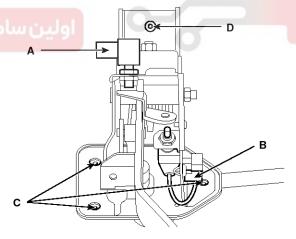
SELCH1001L

- 6. Remove the crash pad lower panel. (Refer to "Interior (Crash pad)" in BD group).
- 7. Disconnect the ignition lock switch connector (B) and clutch switch (A).
- 8. Remove the clutch pedal assembly mounting nut (C-3ea) and bolts (D-1ea).

Tightening torque:

16.7 ~ 25.5 N.m (1.7 ~ 2.6 kgf.m, 12.3 ~ 18.8 lb-ft)

Remove the clutch pedal and the master cylinder assembly together.



SLMCH0002L

Clutch System

Installation

1. Installation is in reverse order of removal.

MNOTICE

- Inspect the continuity of the ignition lock switch and clutch pedal. (Refer to "Clutch pedal(Inspection)" in CH group.)
- Perform bleeding air procedure in clutch system after pouring the brake fluid. (Refer to "Repair procedures" in CH group.)

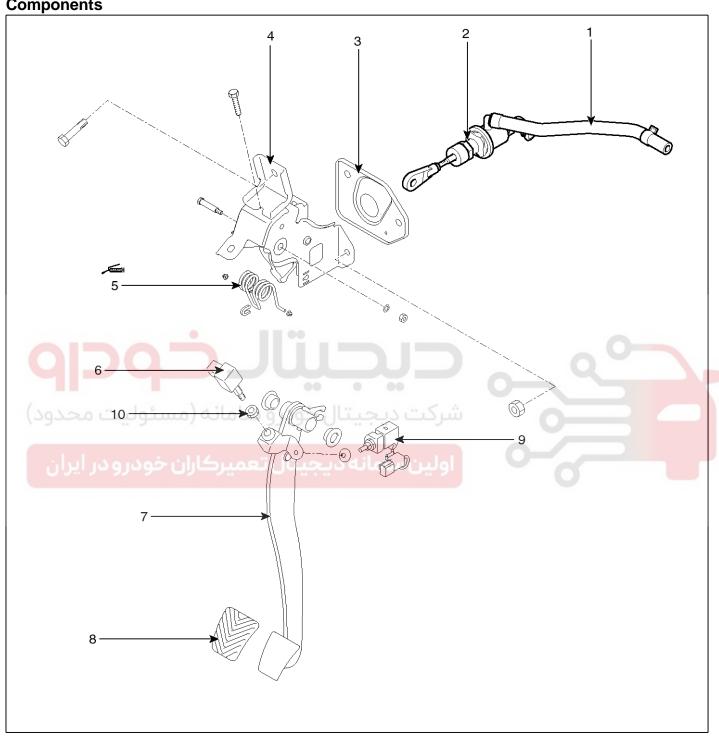




CH-17

Clutch Master Cylinder

Components



SLMCH0002C

- 1. Reverse hose
- 2. Master cylinder
- 3. Siller
- 4. Member assembly
- 5. Turn over spring

- 6. Clutch switch
- 7. Clutch arm
- 8. Pedal pad
- 9. Ignition lock switch
- 10. Stopper

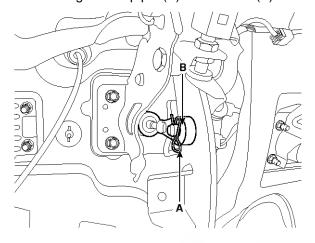
Clutch System

Removal

MOTICE

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 clutch pedal by removing the snap pin (A) and washer (B).



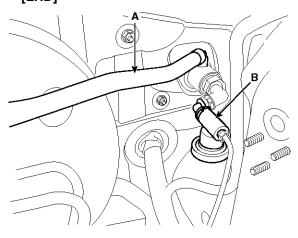
SSLCH1001D

- Remove the ECM. (Refer to "Engine Control Module" in FL group).
- 3. Remove the fuel filter. (Refer to "Fuel Delivery Sustem" in FL group)

ه دیجیتال تعمیرکاران خودرو در ایران

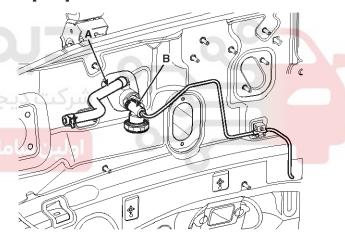
4. Disconnect the clutch tube (B) and reverse hose (A) from the clutch master cylinder.

Diesel 2.0 [M6GF2], Diesel 1.7 [M6CF3-1] [LHD]



SLMCH0001D

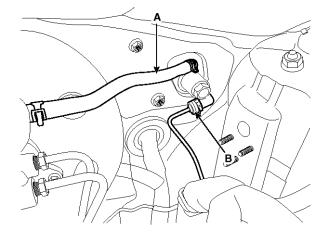
[RHD]



SSLCH1002L

CH-19

Gasline 1.6 [M6CF1]



SELCH1001L

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

[LHD]

Installation

1. Installation is in reverse order of removal.

MOTICE

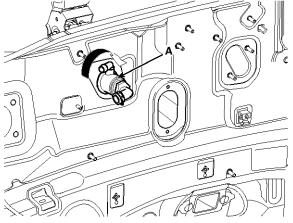
 Perform bleeding air procedure in clutch system after pouring the brake fluid. (Refer to "Repair procedures" in CH group.)





SLMCH0003C



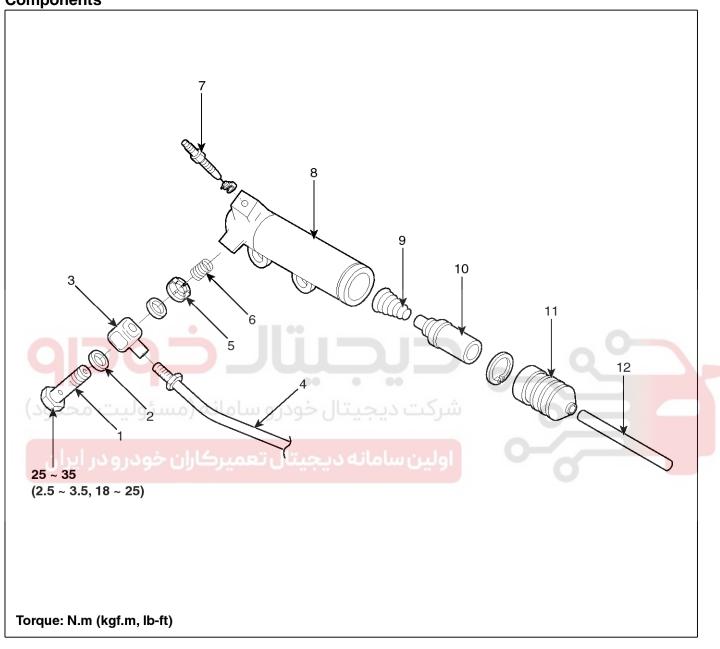


SSLCH1003L

Clutch System

Clutch Release Cylinder

Components



SEDCH1006L

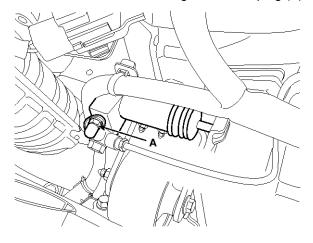
- 1. Union bolt
- 2. Gasket
- 3. Tube joint
- 4. Clutch tube
- 5. Valve plate
- 6. Valve spring

- 7. Bleeder screw
- 8. Release cylinder
- 9. Return spring
- 10. Piston
- 11. Boot
- 12. Push rod

CH-21

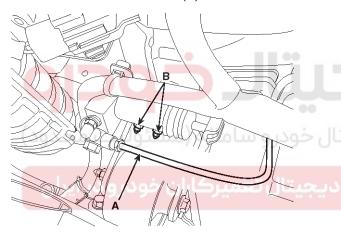
Removal

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



SLDCH7002D

2. Disconnect the clutch tube (A).



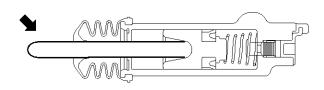
SEDCH7010L

3. Remove the two clutch release cylinder mounting nuts (B-2ea).

Installation

1. Coat the clutch clevis push rod specified grease.

Specified grease: CASMOLY L9508

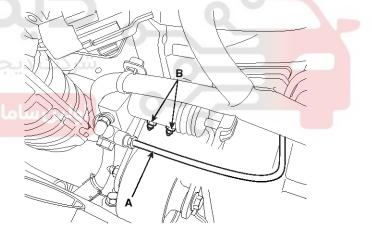


LOGF006B

2. Install the release cylinder mounting nuts (B-2ea).

Tightening torque:

15 \simeq 22 N.m (150 \sim 220 kgf.cm, 11 \sim 16 lb-ft)



SEDCH7010L

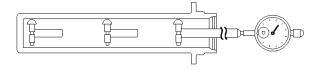
- 3. Install the clutch tube (A).
- 4. Refill the brake fluid.
- 5. Bleed the air in the clutch system.(Refer to Bleeding in Service Adjustment Procedure)

Clutch System

Inspection

- 1. Check the release cylinder bore for rust and damage.
- Measure the release cylinder bore at three locations (bottom, middle, and top) with a cylinder gauge and replace the release cylinder assembly if the bore-to-piston clearance exceeds the limit.

Limit clearance to piston: 0.25mm (0.0098 in)



EOKD025A

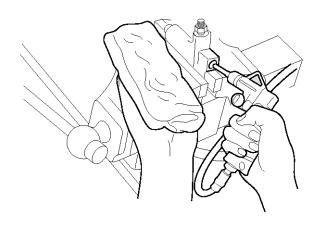
- 3. Check the clutch release cylinder for fluid leakage.
- 4. Check the clutch release cylinder boots for damage.

Disassembly

- 1. Remove the clutch hose, valve plate, spring, push rod, and boot.
- 2. Remove any dirt from the piston bore opening of the release cylinder.
- 3. Remove the piston from the release cylinder using compressed air.

⚠CAUTION

- Use rags to prevent the piston from popping out and causing injury.
- Apply compressed air slowly. Keep the fluid from splashing in your eyes or on your skin.



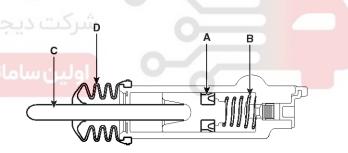
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Reassembly

 Apply specified brake fluid to the release cylinder bore and the outer surface of the piston and piston cup, and push the piston cup assembly into the cylinder.

Specified fluid: Brake fluid DOT 3 or DOT 4

2. Install the valve plate (A), Spring (B), push rod (C) and boot (D).

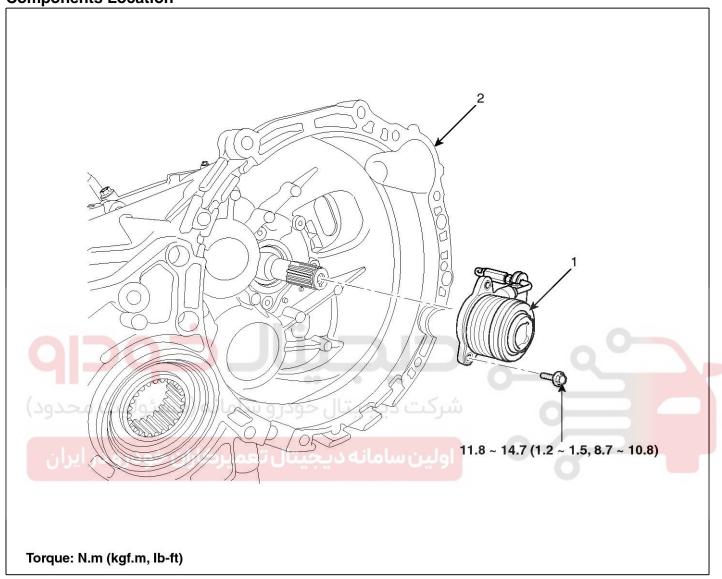


LOJF003B

CH-23

Concentric Slave Cylinder Assembly

Components Location



SSLCH1054N

- 1. Concentric Slave Cylinder assembly
- 2. Manual transaxle case

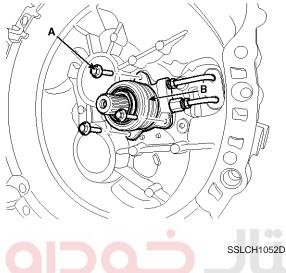
Clutch System

Removal

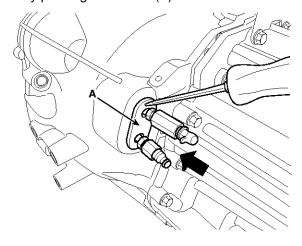
- 1. Remove the transaxle assembly. (Refer to "Manual transaxle" in MT group)
- 2. Remove the concentric slave cylinder assembly (B) from the transaxle case by removing bolts (A-3ea).

Tightening torque:

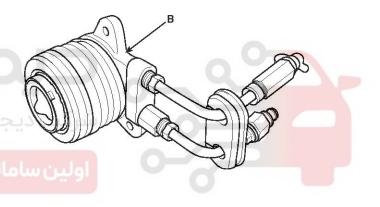
11.8 \sim 14.7 N.m (1.2 \sim 1.5 kgf.m, 8.7 \sim 10.8 lb-ft)



3. Remove the concentric slave cylinder assembly (B) by pushing the rubber (A) to forward.



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Installation

1. Installation is in reverse order of removal.

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- Install the concentric slave cylinder bolts. Not to be bent or twisted, Tighten them in diagonal directions.
- Cup, Inner surface of body and outer surface of tube guide must be free from flaws.
- When it is assembled, it must be free from invasive foreign matters and oil leakage.