

CH-2

Clutch System

General Information

Specifications

Items	Specifications
Engine type	θ 2.0
Clutch operation method	Hydraulic type
Clutch disc Type	Single dry with diaphragm
Faling diameter(Outer × inner)	235 × 155mm(9.25×6.10 in)
Clutch cover assembly Type	Diaphragm spring strap
Clutch release cylinder inner diameter	20.64mm(0.81 in)
Clutch master cylinder inner diameter	15.87mm(0.62 in)

Service Standard

Standard value	
Clutch disc thickness [When free]	8.4~9.0 mm (0.33~0.35 in)
Distance between inner pad and clutch pedal	242~246 mm (9.52~9.68 in)
Clutch pedal free play	6~13 mm (0.24~0.51 in)
Clutch pedal stroke	145 mm (5.7 in)
Clutch pedal end play	Max. 2.5 mm (0.095 in)
Clutch pedal height	193 mm (7.6 in)
Limit	
Clutch disc rivet sink	0.3 mm (0.011 in)
Diaphragm spring end height difference	0.5 mm (0.02 in)
Clutch replease cylinder clearance to piston	0.15 mm (0.006 in)
Clutch master cylinder clearance to piston	0.15 mm (0.006 in)

Tightening Torque

Item	Nm	kgf.m	lb-ft
Clutch tube to clutch oil regulator	13 ~ 17	1.3 ~ 1.7	9.6 ~ 12.5
Clutch tube to clutch hose	13 ~ 17	1.3 ~ 1.7	9.6 ~ 12.5
Clutch release cylinder to clutch hose	25 ~ 35	2.5 ~ 3.5	18.4 ~ 25.8
Clutch release cylinder bleeder screw	12 ~ 20	1.2 ~ 2.0	8.9 ~ 14.5
Clutch cover	25 ~ 36	2.5 ~ 3.6	18 ~ 26
Clutch mounting	43 ~ 55 8 ~ 10	4.3 ~ 5.5 (3EA) 0.8 ~ 1.0 (2EA)	31.1 ~ 39.8 5.8 ~ 7.2
Ignition lock switch	8 ~ 10	0.8 ~ 1.0	5.9 ~ 7.4
Clutch pedal mounting	13 ~ 16	1.3 ~ 1.6	9.6 ~ 11.6

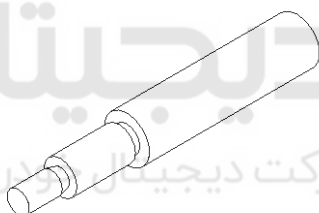
General Information

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Lubricants

Items	Specified lubricants	Quantity
Contact surface of release bearing and fulcrum of clutch release fork	CASMOLY L 9508	0.3~0.5g
Inner surface of clutch release cylinder and outer circumference of piston and cup	Brake fluid DOT 3 or DOT 4	As required
Inner surface of clutch disc spline	CASMOLY L 9508	0.2g
Inner surface of clutch master cylinder and outer circumference of piston assembly	Brake fluid DOT 3 or DOT 4	As required
Clutch master cylinder push rod, clevis pin and washer	Wheel bearing grease SAE J310, NLGI No.2	As required
Clutch pedal shaft and bushings	Chassis grease SAE J310a, NLGI No.1	As required
Contact portion of release fork to release cylinder push rod	CASMOLY L 9508	As required

Special Service Tools

Tool (Number and name)	Illustration	Use
09411-11000 Clutch disc guide	 شرکت دیجیتال خودرو سامانه (مسئولیت محدود) ایران سامانه دیجیتال تعمیرکاران خودرو در ایران EOKD001A	Installation of the clutch disc.

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Clutch System

Troubleshooting

Trouble symptom		Suspect area	Remedy
Clutch slipping • Car will not respond to engine speed during acceleration • Insufficient vehicle speed • Lack of power during uphill driving		Insufficient pedal free play	Adjust
		Clogged hydraulic system	Correct or replace parts
		Excessive wear of clutch disc facing	Replace
		Hardened clutch disc facing, or oil on surface	Replace
		Damaged pressure plate or flywheel	Replace
		Weak or broken pressure spring	Replace
Difficult gear shifting (gear noise during shifting)		Excessive pedal free play	Adjust
		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 noise	When the clutch is not used	Insufficient play of the clutch pedal	Adjust
		Excessive wear of the clutch disc facing	Replace
	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 the clutch assembly or bearing	Repair
	A noise is heard when the car suddenly rolled up with the clutch partially engaged	Damaged pilot bushing	Replace
Hard pedal effort		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
		Insufficient lubrication of the front bearing retainer	Repair

General Information

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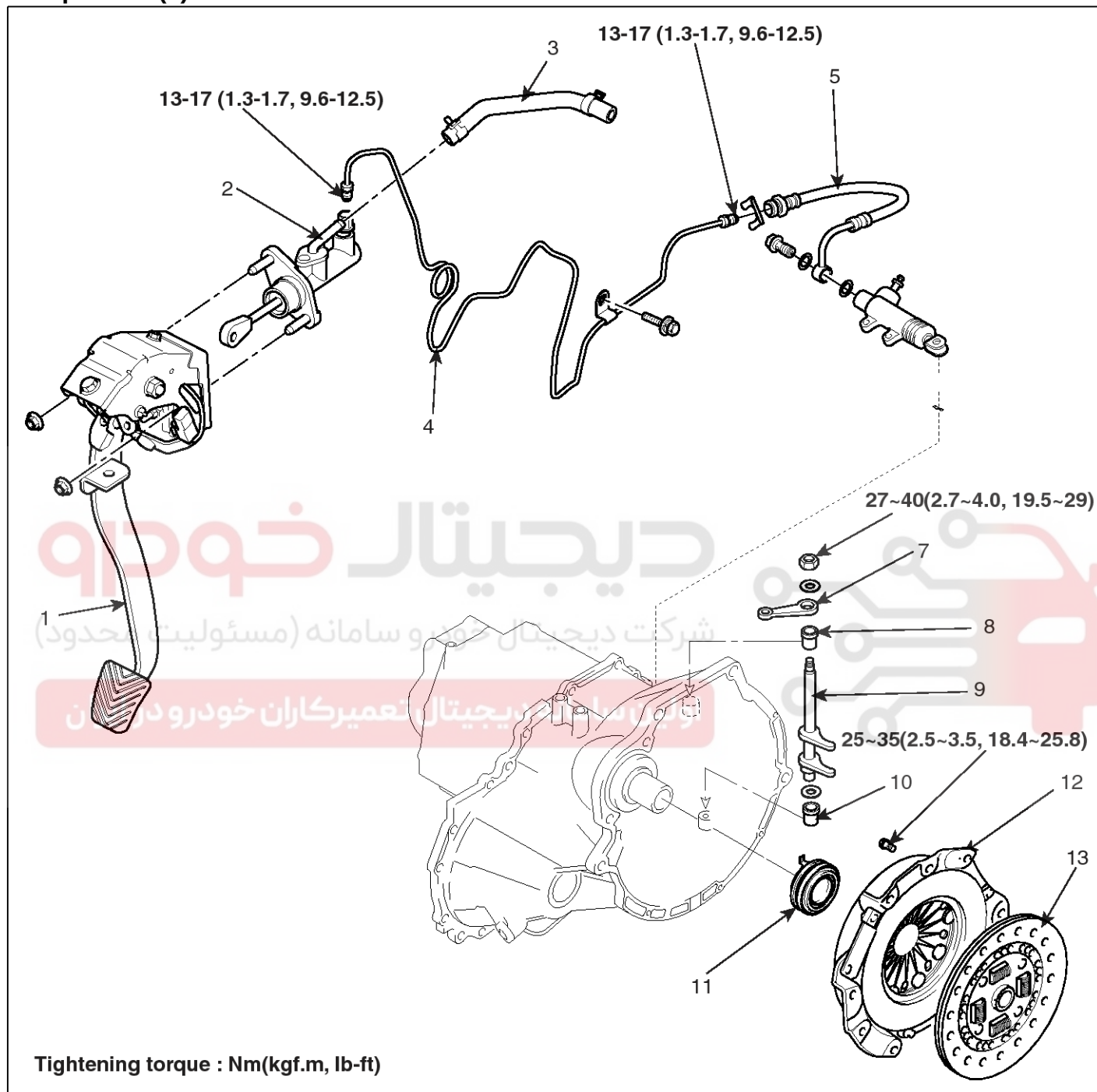
Trouble symptom	Suspect area	Remedy
Hard to shift or will not shift	Excessive clutch pedal free play	Adjust the pedal free play
	Faulty of the clutch release cylinder	Repair the release cylinder
	Clutch disc out of place, runout is excessive or lining broken	Inspect the clutch disc
	Spline on the input shaft or clutch disc dirty or burred	Repair as necessary
	Faulty of the clutch pressure plate	Replace the clutch cover
Clutch slips	Insufficient of the clutch pedal free play	Adjust the pdal free play
	Clogged of the hydraulic system	Repair or replace parts
	Clutch disc lining oily or worn out	Inspect the clutch disc
	Faulty of the 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 the clutch diaphragm spring	Replace the clutch cover
	Worn or broken torsion spring	Replace the clutch disc
	Loose the engine mounts	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

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Clutch System

Clutch System

Components(1)



SMGCH9001L

1. Clutch pedal
2. Master cylinder
3. Flexible hose
4. Clutch tube
5. Clutch hose

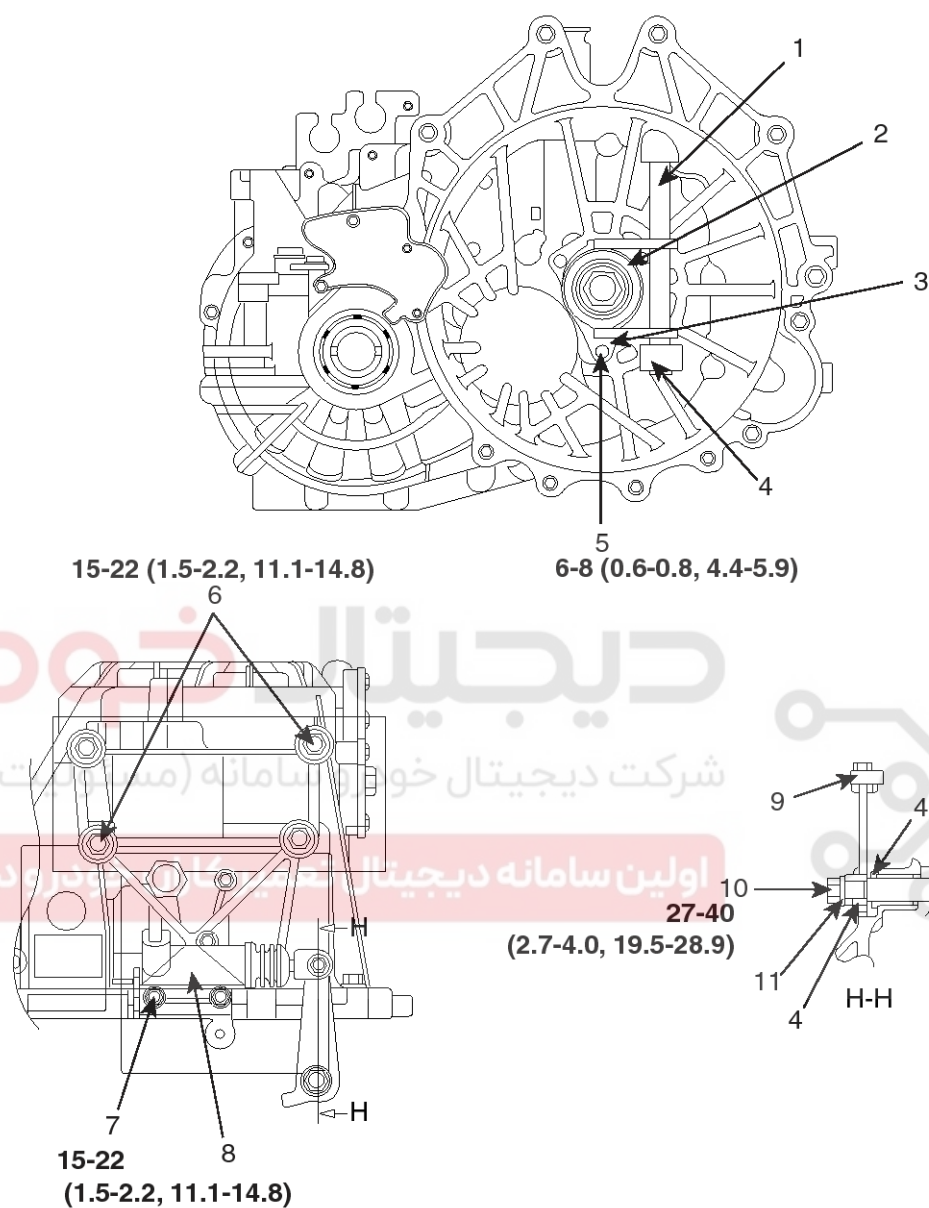
6. Release cylinder
7. Release lever
8. Bushing
9. Release fork shaft
10. Bushing

11. Release bearing
12. Clutch disc cover assembly
13. Clutch disc assembly

Clutch System

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Components(2)



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

SMGCH9002L

- | | |
|------------------------------|---------------------------------|
| 1. Clutch release fork shaft | 7. Clutch release cylinder bolt |
| 2. Clutch release bearing | 8. Clutch release cylinder |
| 3. Release bearing sleeve | 9. Clevis pin |
| 4. Bushing | 10. Nut |
| 5. Bolt | 11. Spring washer |
| 6. Stud | |

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Clutch System

Service Adjustment Procedure

Clutch Pedal Inspection And Adjustment

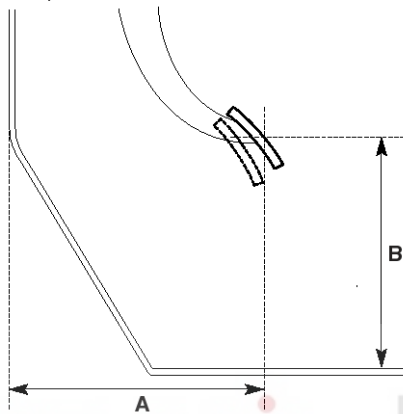
1. Measure the clutch pedal height (from the face of the pedal pad to the floorboard) and the distance between inner pad and clutch pedal.

Standard value:

(A) 242~246mm (9.52~9.68in)

(B) 193mm (7.6in)

Clutch pedal



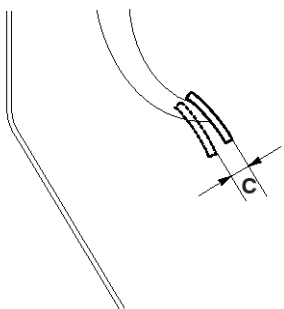
LOLG001C

2. Confirm that the measuring values of the free play of the clutch pedal and the distance between the clutch pedal which is disconnected from the master cylinder and the floor board, are within the standard values.

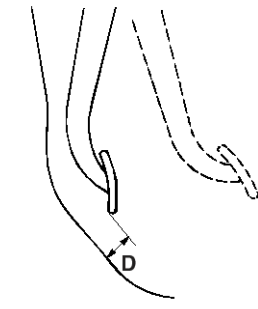
Free play of clutch pedal (C): 6~13 mm (0.23~0.51 in)

Distance between clutch pedal and toe board (D): 36 mm (1.41 in)

Clutch pedal free play



Distance between clutch pedal and toe board



LOLG001D

3. If the clutch pedal's free play and the distance between the clutch pedal which is disconnected from the master cylinder and the floor board, do not meet with the standard values, it may be the cause, either air in the hydraulic system or a faulty the clutch master cylinder. Bleed the air or disassemble and inspect the master cylinder or clutch.

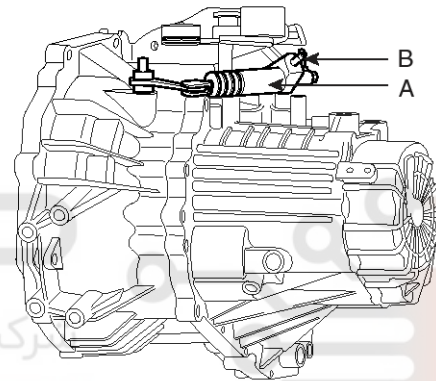
Bleeding

⚠ 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(B) at the clutch release cylinder(A).



LOIF001G

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

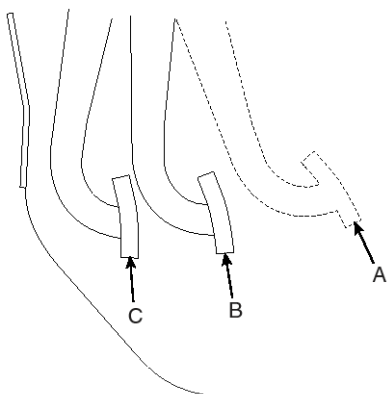
Clutch System

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

⚠ CAUTION

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



دیجیتال خودرو

AOIE007A

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

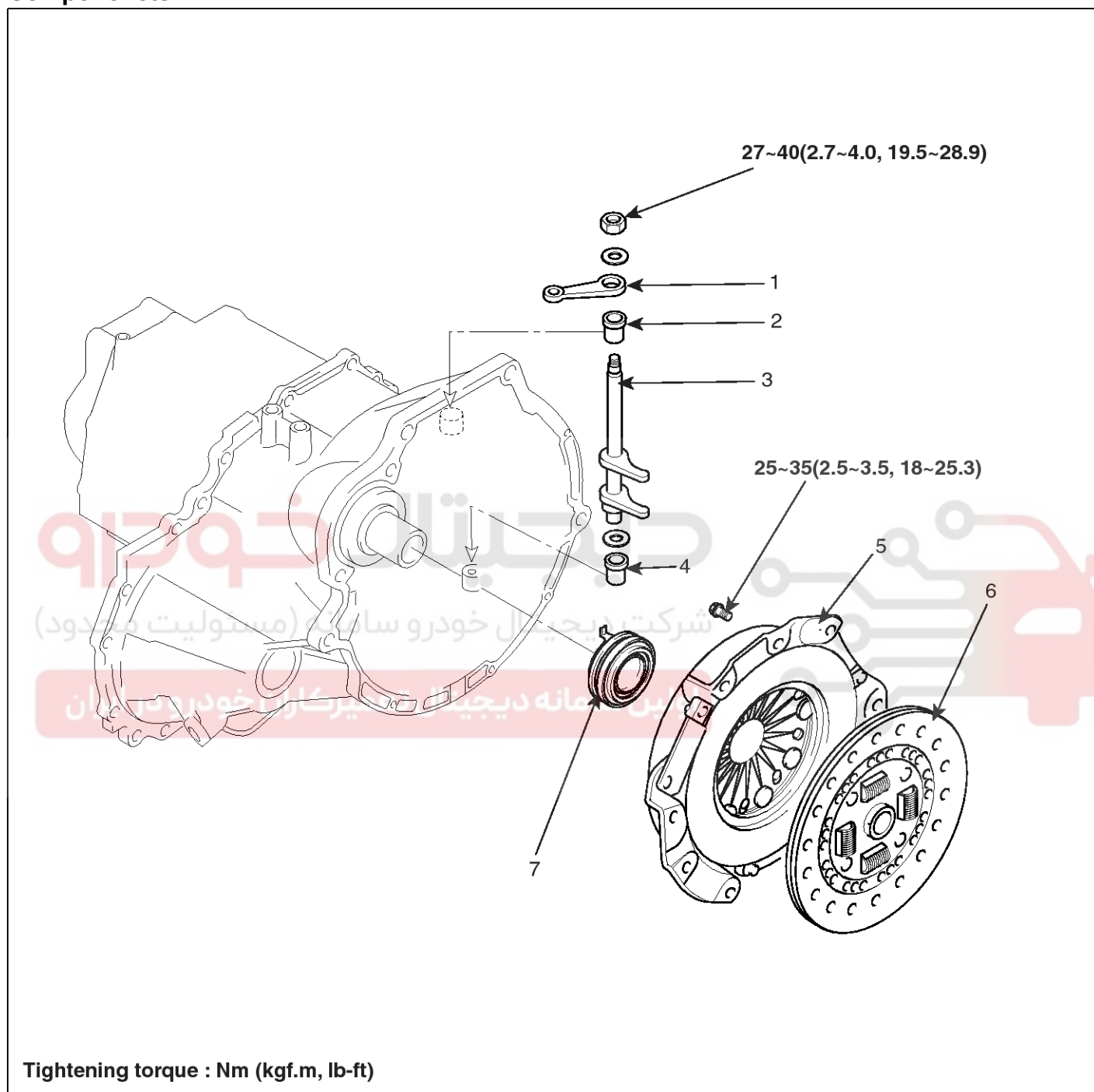


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Clutch System

Clutch Cover And Disc

Componenets



SMGCH9003L

1. Clutch release lever
2. Bushing
3. Clutch release fork
4. Bushing

5. Clutch cover assembly
6. Clutch disc
7. Clutch release bearing

Clutch System

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Inspection

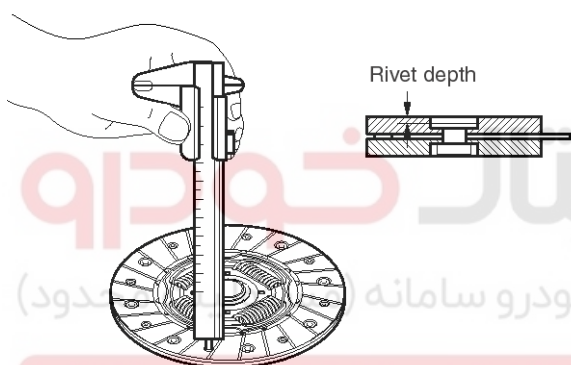
Clutch cover assembly

1. Check the diaphragm spring end for wear and uneven height.
2. Check the pressure plate surface for wear, cracks and color change.
3. Check the rivets for looseness and replace the clutch cover assembly if necessary.

Clutch disc

1. Check the clutch facing for loose rivets, uneven contact, deterioration due to seizure, adhesion of oil, or grease, and replace the clutch disc if defective.
2. Measure the thickness of the disc when free.

Limit : 0.3 mm (0.012 in)



LOIF001I

3. Check for the torsion spring play and damage and if defective, replace the clutch disc.
4. Clean the splines on the input shaft and install the clutch disc.

If the disc does not slide smoothly or if play is excessive, replace the clutch disc and/or the input shaft.

Clutch release bearing

⚠ CAUTION

The release bearing is packed with grease. Do not use cleaning solvent or oil.

1. Check the bearing for seizure, damage or abnormal noise. Also check the diaphragm spring contacting points for wear.
2. Replace the bearing if the release fork contacting points are worn abnormally.

Clutch release fork

Removal

1. Remove the transaxle assembly. (See 'MT' group - 'Manual Transaxle')
2. Remove the release bearing.
3. Remove the clutch cover and the disk from the engine.

📌 NOTICE

- Insert the special tool (09411-11000) into the spline hole to support the clutch disk when removing the clutch cover.
 - Do not use solvent to clean the clutch disk and the release bearing.
4. Remove the bushing and the release fork assembly.

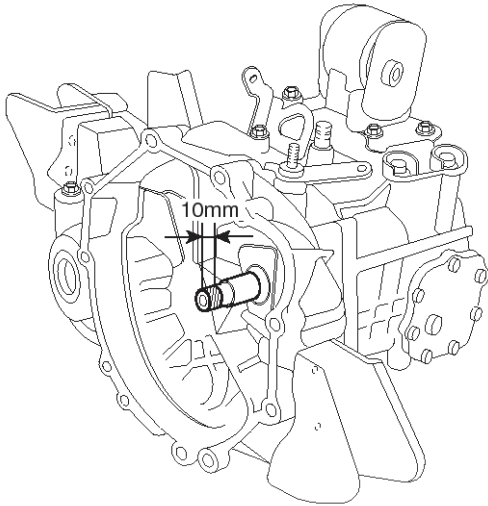
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Clutch System

Installation

1. Grease where is 10mm from the end of the transaxle's input shaft, before installing the clutch disk and cover assembly.

Grease: CASMOLY L9508



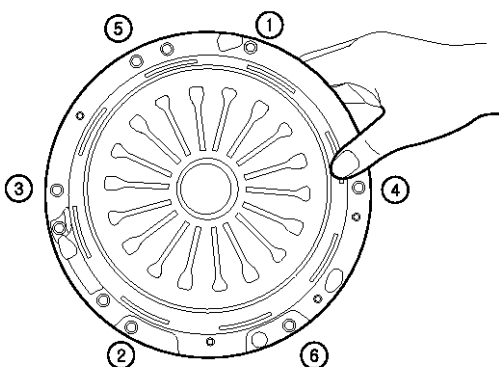
AOLG003A

2. Install the clutch disc assembly to the flywheel using the special tool (09411-11000).
3. Install the clutch cover assembly to the flywheel and temporarily tighten the bolts one or two steps at a time in a star pattern.

Tightening torque :

Clutch cover bolt:

25~36 Nm(2.5~3.6 kgf.m, 18~26 lb-ft)



AOIE013A

4. Align the bearing (A) to the release fork (B) and then install it to the sleeve of the housing.

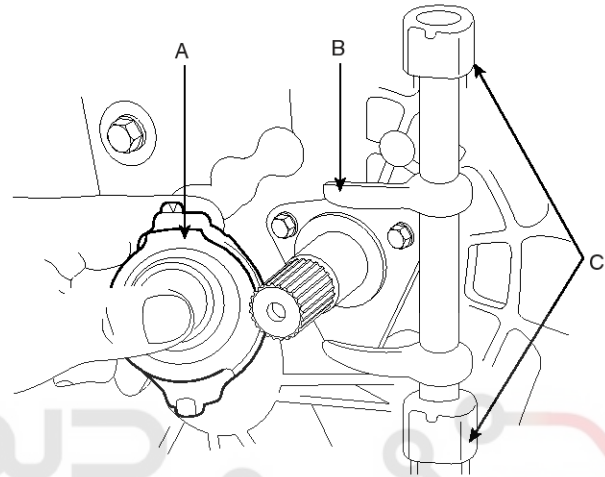
⚠ CAUTION

Apply multipurpose grease (CASMOLY L9508) to the bearing sleeve, contact point of the release fork (B) and the bushing inner surface (C).

Groove of bearing sleeve : 0.5~1.0g

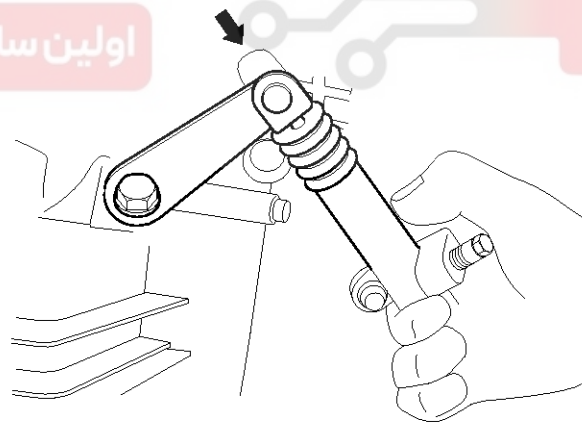
Contacting part of release fork : 0.3~0.5g

Bushing's neck : 0.8~1.2g



EOQE502A

5. Install the release lever to the release fork.



EOQE502B

6. Install the transaxle assembly to the engine.

⚠ CAUTION

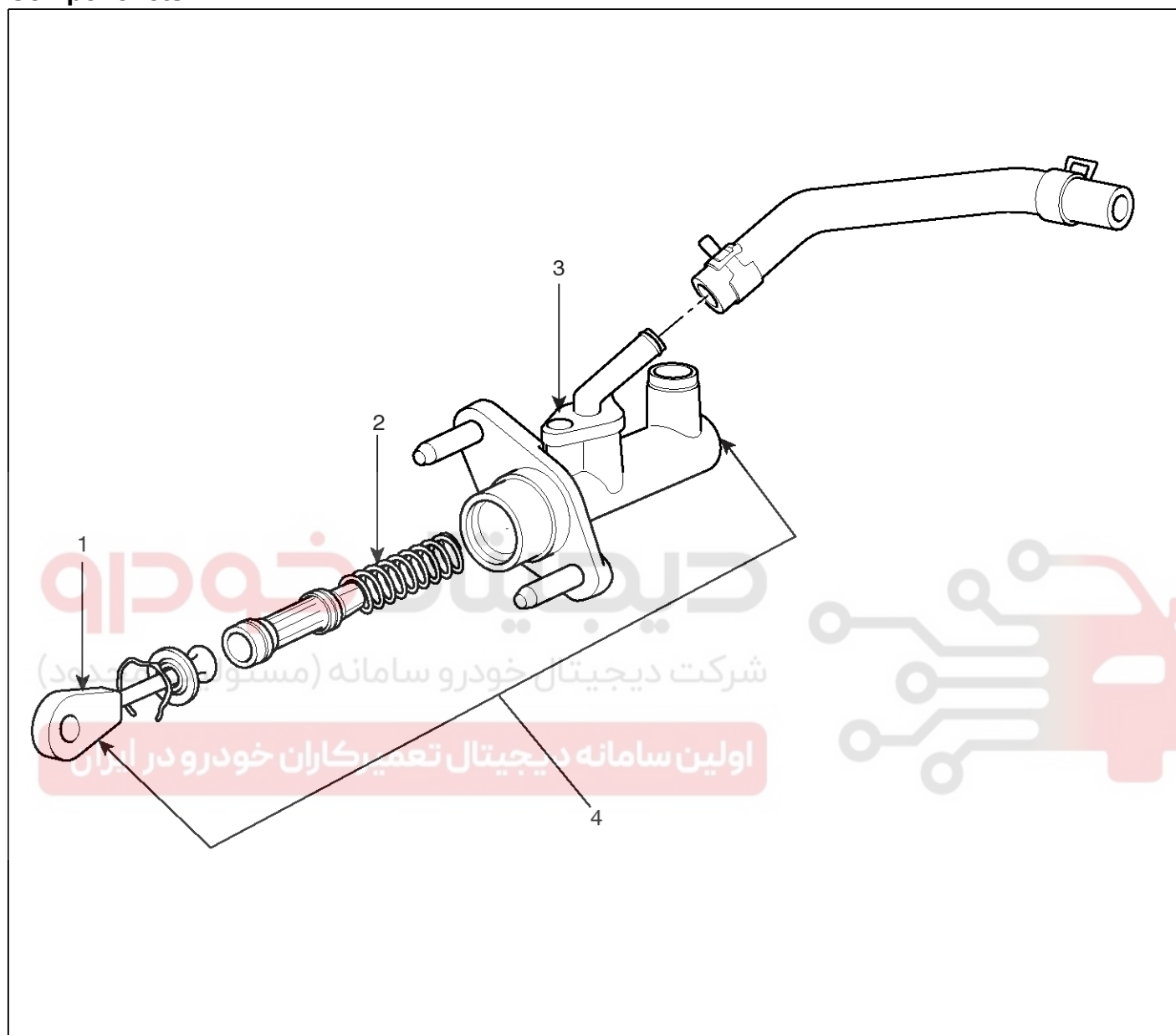
If the transaxle assembly is installed to the engine without performing this step, the release bearing can be separated, as the release fork rotates freely.

Clutch System

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Clutch Master Cylinder

Componenets



SMGCH9004L

- 1. Push rod
- 2. Return spring

- 3. Master cylinder body
- 4. Clutch master cylinder

CH-14

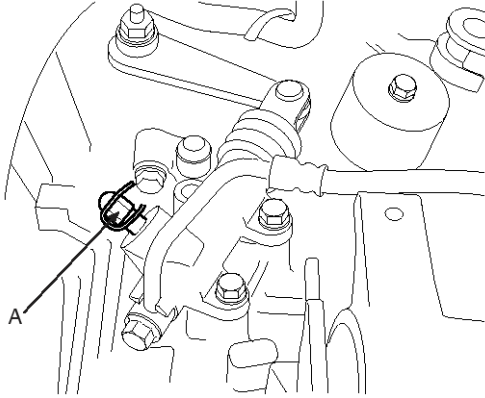
Clutch System

Replacement

 NOTICE

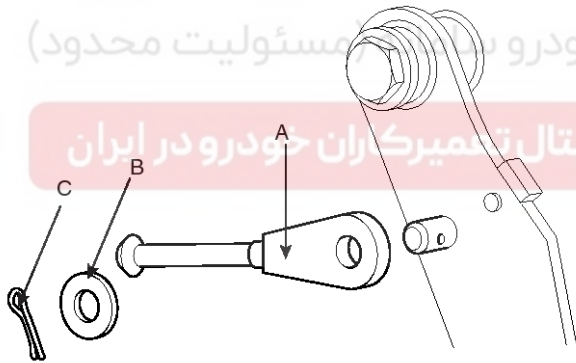
Do not spill brake fluid on the vehicle it may damage the paint, if brake fluid does contact the paint, wash it off immediately with water.

1. Drain the clutch fluid through the bleeding plug (A).



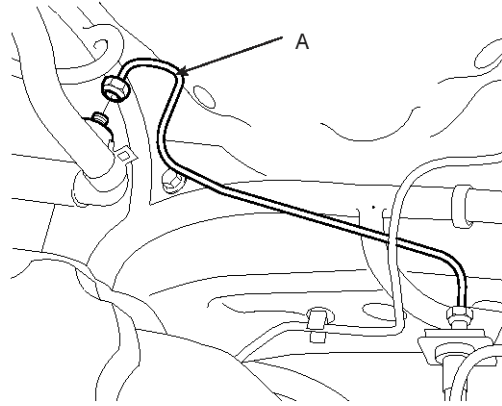
AOIE018A

2. Remove clutch master cylinder connecting rod (A), split pin (cotter pin) (C) and washer (B).



LOIF001R

3. Disconnect the clutch tube (A) (master cylinder side).



AOIE020A

4. Remove the master cylinder mounting nuts.
5. Install the master cylinder.
6. Apply the specified grease to the clevis pin and washer.

Wheel bearing grease: SAE J310a, NLGI NO. 2

7. Install the push rod to the clutch pedal.
8. Pour the clutch fluid into the clutch master cylinder.
9. Bleed the clutch system.

Clutch System

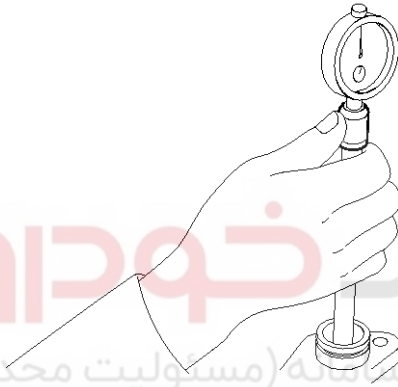
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Inspection

1. Check the inside of the cylinder body for rust, pitting or scoring.
2. Check the piston cup for wear or distortion.
3. Check the piston for rust, pitting or scoring.
4. Check the clutch tube line for clogged.
5. Measure the master cylinder inside diameter and the piston outside diameter with a cylinder gauge micrometer.

NOTICE

Measure the inside diameter of the master cylinder at three places (bottom, middle, and top) in a perpendicular direction.



6. If the master cylinder-to-piston clearance exceeds the limit, replace the master cylinder and/or piston assembly.

Limit: 0.15 mm (0.006 in)



دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

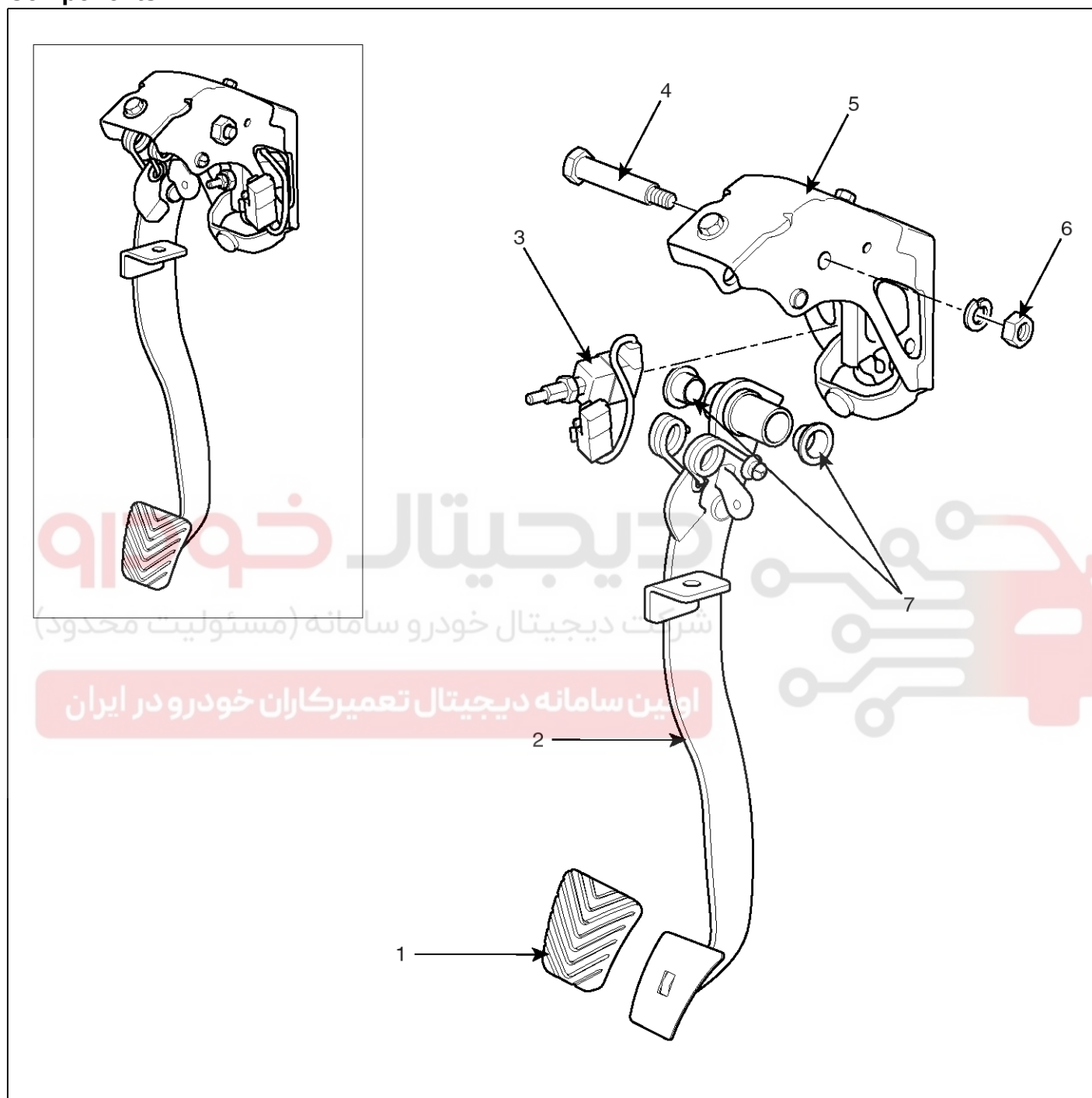
AOIE021A

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Clutch System

Clutch Pedal

Components



SMGCH9005L

Clutch System

CH-17

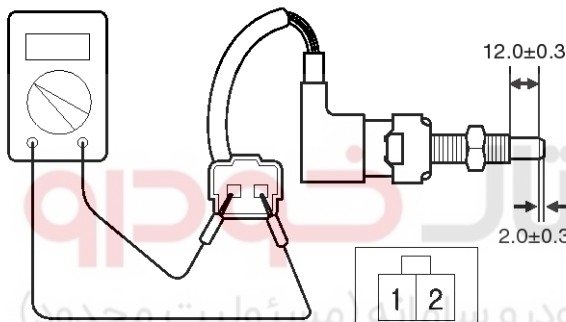
Inspection

1. Check the pedal shaft and bushing for wear.
2. Check the clutch pedal for bending or torsion.
3. Check the return spring for damage or deterioration.
4. Check the pedal pad for damage or wear.

Ignition lock switch inspection

Terminal	1	2
Condition		
Pushed		
Free		

LOIF002C



LOIF002D

Returning Test Of Clutch Pedal

Deformation of pedal pad must be MAX. 5mm after repeating the test 20 times (sudden return from full stroke).

Adjustment

NOTICE

- Check for the ignition lock switch.
In case of clutch lock system vehicle, there is an additional switch.
 - Before adjusting, remove the driver's floor seat.
1. After loosening the ignition lock switch nut, move it back until it has no contact with the clutch pedal arm. (In case of clutch lock system vehicle, repeat this step with its additional ignition lock switch).
 2. Check for the specification below.

Clutch pedal stroke : 150 mm (5.9 in)

Clutch pedal free play : 6~13 mm (0.24~0.51 in)

Distance between the inner pad and clutch pedal : 250~254 mm (9.84~10.00 in)

3. (Clutch lock system vehicle)

Fix the additional ignition lock switch when its signal is ON pressing the pedal slowly 112~118 mm (4.4~4.6 in).

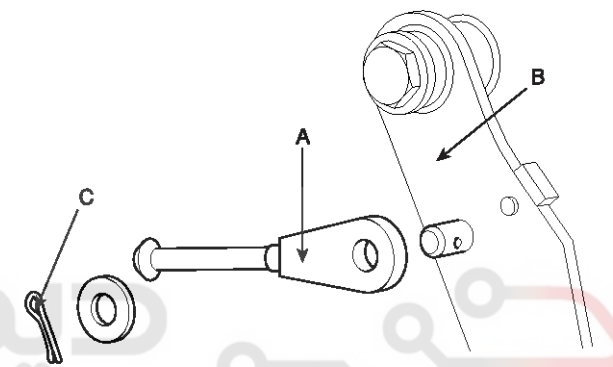
Tighten the fixing nut with specification.

Tightening torque :

8~10Nm (0.8~1.0kgf.m, 5.9~7.4lb-ft)

Replacement

1. Disconnect the connector of the ignition lock switch.
2. Remove the split pin (C) connecting the master cylinder's push rod (A) and the clutch pedal's arm (B).



AOIE028A

3. Remove the clutch pedal mounting bolts.
4. Remove the clutch pedal.
5. Install a new clutch pedal.
6. Install the clutch pedal mounting bolt and nut.

Tightening torque :

25~35 Nm (2.5~3.5 kgf.m, 18~25.3lb-ft)

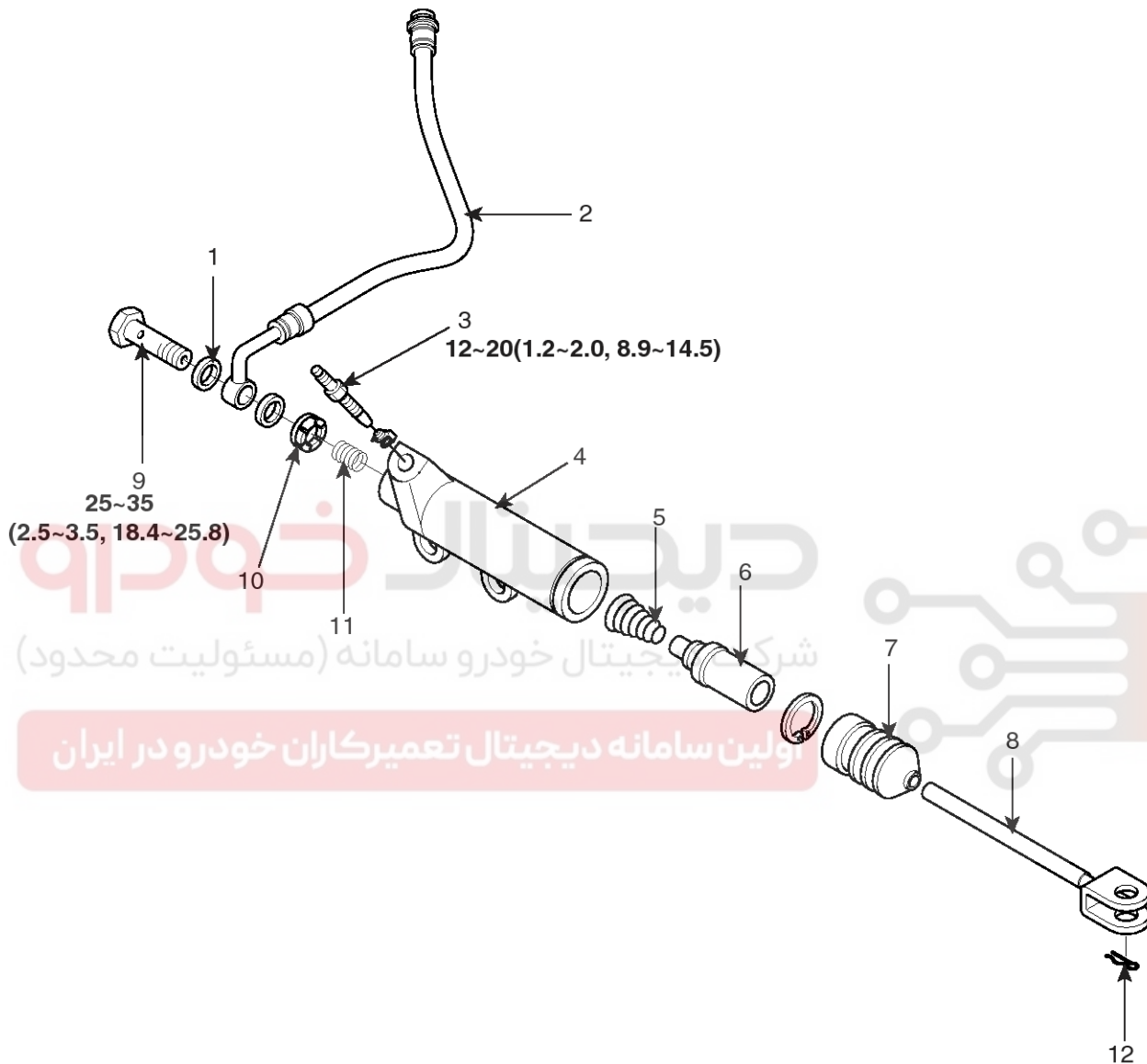
7. Grease the clutch pedal mounting bolt and bushing of the turn-over spring.
8. Connect the connector of the ignition lock switch.
9. Adjust the clutch pedal and the ignition lock switch.

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Clutch System

Clutch Release Cylinder

Components



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

SMGCH9006L

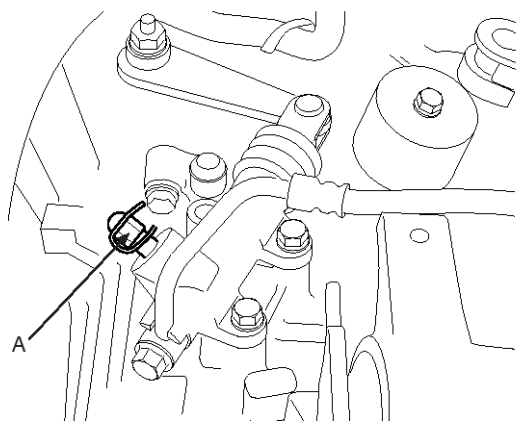
- | | |
|---------------------|------------------|
| 1. Gasket | 7. Boot |
| 2. Clutch hose | 8. Push rod |
| 3. Bleeder screw | 9. Union bolt |
| 4. Release cylinder | 10. Valve plate |
| 5. Return spring | 11. Valve spring |
| 6. Piston | 12. Cotter pin |

Clutch System

CH-19

Removal

1. Drain the fluid from the bleeding plug(A).



AOIE033A

2. Clamp the clutch hose between the clutch release cylinder and the clutch tube.
3. Remove the clutch release cylinder loosening the mounting bolt.
4. Install a new clutch release cylinder.

دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

