

## CH -2

## CLUTCH SYSTEM

## GENERAL

SPECIFICATIONS EE5F2FA3

Clutch operation method	Hydraulic type
Clutch disc Type	Single dry with diaphragm
Faling diameter(Outter x innter)	235 x 155mm(9.25x6.10 in)
Clutch cover assembly Type	Diaphragm spring strap
Clutch release cylinder inner diameter	20.64mm(0.81in)
Clutch master cylinder inner diameter	15.87mm(0.62 in)

## SERVICE STANDARD

<b>Standard value</b>	
Clutch disc thickness [When free]	8.5 ± 0.3 mm (0.326 ~ 0.350 in)
Distance between inner pad and clutch pedal	252 ± 2mm(9.84 ~ 10.00 in)
Clutch pedal free play	6 ~ 13 mm (0.24 ~ 0.51 in)
Clutch pedal stroke	150 mm (5.9 in)
Clutch pedal height	189.5 mm (7.46 in)
<b>Limit</b>	
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-cm	lbf-ft
Ignition lock switch	8 ~ 10	80 ~ 100	5.9 ~ 7.4
Clutch pedal mounting	25 ~ 35	250 ~ 350	18.4 ~ 25.8
Clutch tube to clutch oil regulator	13 ~ 17	130 ~ 170	9.6 ~ 12.5
Clutch tube to clutch master cylinder	12 ~ 16	120 ~ 160	8.9 ~ 11.8
Clutch tube to clutch hose	13 ~ 17	130 ~ 170	9.6 ~ 12.5
Clutch release cylinder to clutch hose	25 ~ 35	250 ~ 350	18.4 ~ 25.8
Clutch oil regulator mounting	6 ~ 8	60 ~ 80	4.4 ~ 5.9
Clutch release cylinder bledder screw	12 ~ 20	120 ~ 220	8.9 ~ 14.8
Clutch cover	15 ~ 22	150 ~ 220	11.1 ~ 14.8
Clutch mounting	43 ~ 55 8 ~ 10	430 ~ 550 (3EA) 80 ~ 100 (2EA)	5.9 ~ 7.4
Clutch release lever fork nut	27 ~ 40	270 ~ 400	19.5 ~ 28.9

## GENERAL

CH -3

## LUBRICANTS

Items	Specified lubricants	Quantity
Contact surface of release bearing and fulcrum of clutch release fork	CASMOLY L 9508	As required
Inner surface of clutch release bearing	CASMOLY L 9508	As required
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	0.29 g
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
Input shaft spline	CASMOLY L 9508	As required

## TROUBLESHOOTING

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Trouble symptom	Suspect area	Remedy (See page)
Clutch slipping <ul style="list-style-type: none"> <li>Car will not respond to engine speed during acceleration</li> <li>Insufficient vehicle speed</li> <li>Lack of power during uphill driving</li> </ul>	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

## CH -4

## CLUTCH SYSTEM

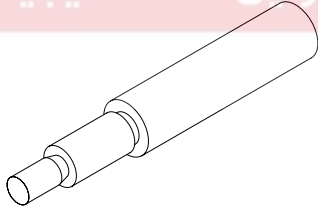
Trouble symptom		Suspect area	Remedy (See page)
Clutch noisy	When the clutch is not used	Insufficient play of the clutch pedal	Adjust
		Excessive wear of the clutch disc facing	Replace
	A noise is heard after the clutch is disengaged	Unusual wear and/ or damage of the release bearing	Replace
	A noise 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
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

## GENERAL

## CH -5

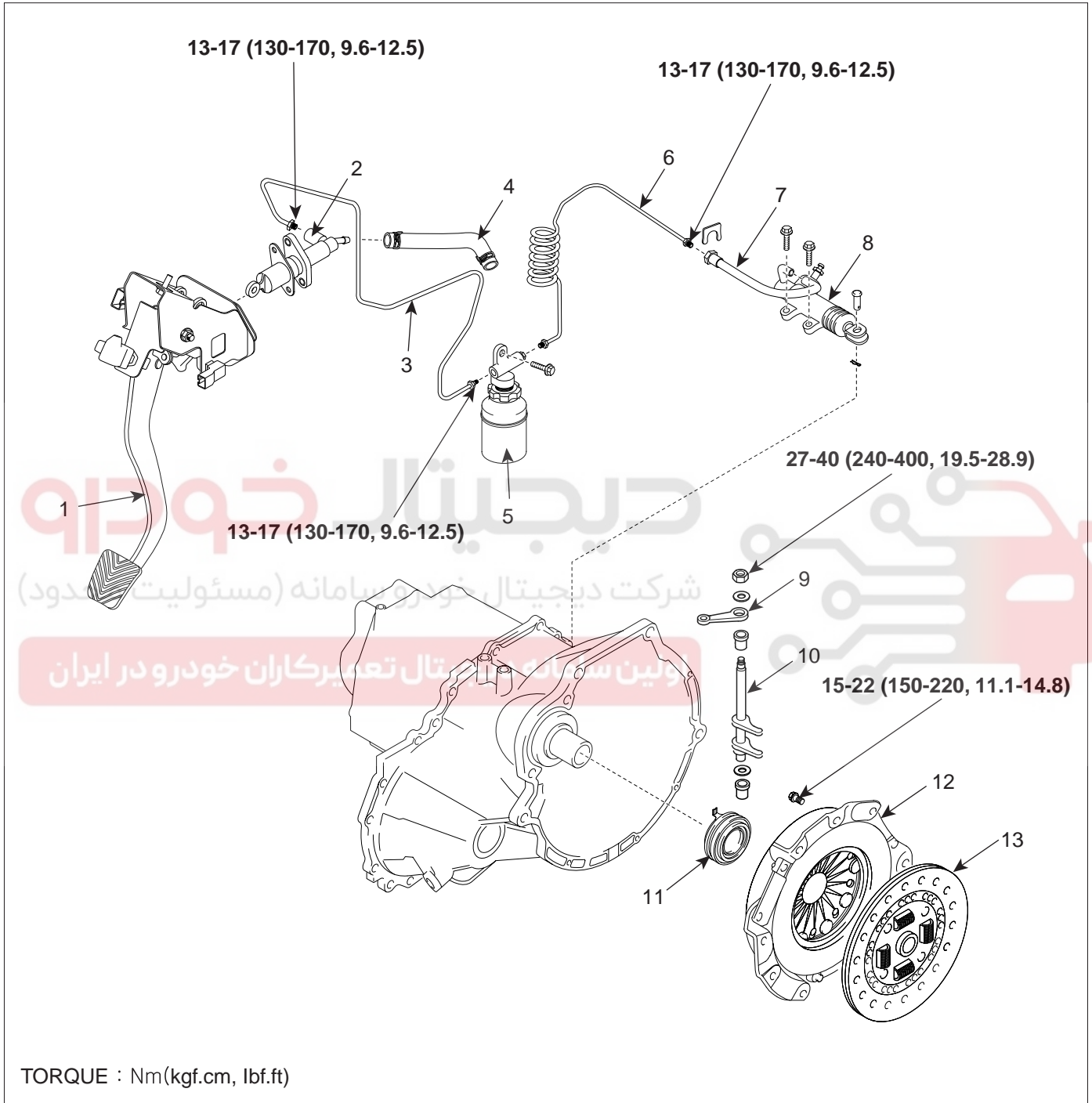
Trouble symptom	Suspect area	Remedy (See page)
Clutch grabs/chatters	Clutch disc lining oily or worn out	Inspect the clutch disc
	Faulty the pressure plate	Replace the clutch cover
	Bent the clutch diaphragm spring	Replace the clutch cover
	Worn or broken torsion spring	Replace the clutch disc
	Loose 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 release bearing
	Sticking release fork or linkage	Repair as necessary

SPECIAL TOOLS E64C4063

Tool (Number and name)	Illustration	Use
09411-11000 Clutch disc guide	 EOKD001A	Installation of the clutch disc.

# CLUTCH SYSTEM

## COMPONENTS(1) E2801931



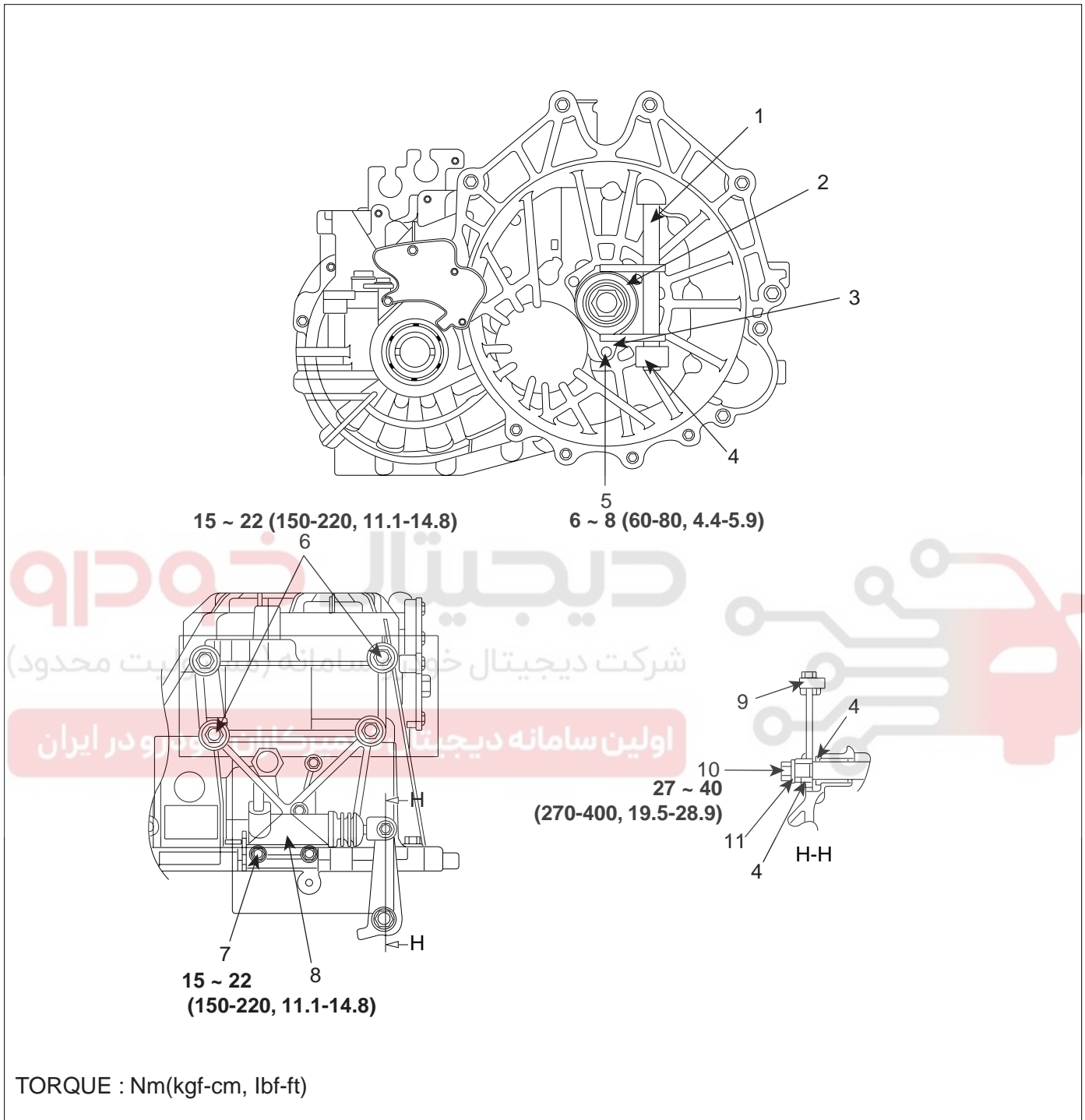
- |                          |                       |
|--------------------------|-----------------------|
| 1. Clutch pedal          | 8. Release cylinder   |
| 2. Master cylinder       | 9. Release lever      |
| 3. Master cylinder hose  | 10. Release fork      |
| 4. Flexible hose         | 11. Release bearing   |
| 5. Regulator(for diesel) | 12. Clutch disc cover |
| 6. Clutch tube           | 13. Clutch disc       |
| 7. Clutch tube hose      |                       |

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CLUTCH SYSTEM

CH -7

COMPONENTS(2)



TORQUE : Nm(kgf-cm, lbf-ft)

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

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CH -8

CLUTCH SYSTEM

SERVICE ADJUSTMENT

PROCEDURE E3291C97

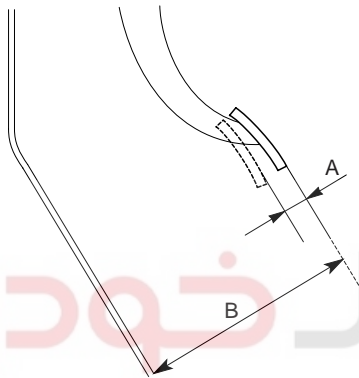
CLUTCH PEDAL INSPECTION AND ADJUSTMENT

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) 252 ± 2 mm (9.84 ~ 10.00 in.)

(B) 189.5 mm (7.46 in.)



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2. If the clutch pedal height and distance is not within the standard value range, adjust as follows:

- 1) Turn and adjust the bolt, then secure by tightening the lock nut.

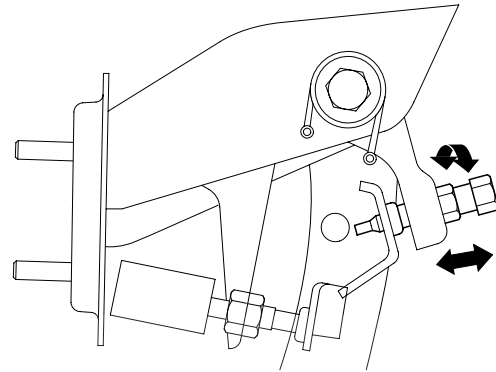
**NOTE**

After the adjustment, tighten the bolt until it reaches the pedal stopper, and then tighten the lock nut.

- 2) Turn the push rod to agree with the standard value and then secure the push rod with the lock nut.

**CAUTION**

When adjusting the clutch pedal height or the clutch pedal clevis pin play, be careful not to push the push rod toward the master cylinder.



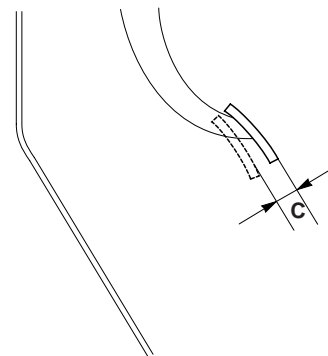
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3. After completing the adjustments, check that the clutch pedal free play (measured at the face of the pedal pad) is within the standard value ranges.

Standard value: (C) 6 ~ 13 mm (0.24~0.52 in.)

4. If the clutch pedal free play and the distance between the clutch pedal and the floor board when the clutch is disengaged, do not meet with the standard values, it may be the result of 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.

Clutch pedal free play



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## CLUTCH SYSTEM

CH -9

## BLEEDING

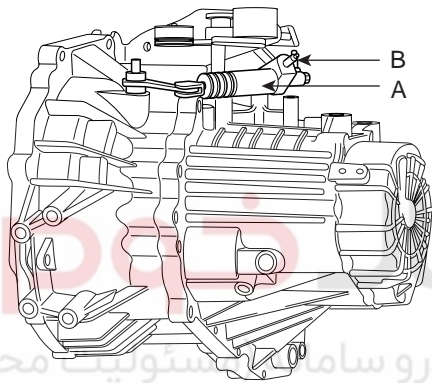
Whenever the clutch tube, the clutch hose, and/or the clutch master cylinder have been removed, or if the clutch pedal is spongy, bleed the system.

 **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).

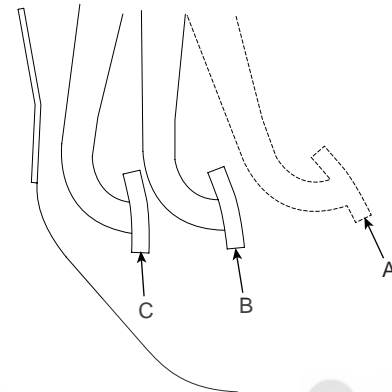


2. Pump the clutch pedal slowly until all air is expelled.
3. Hold the clutch pedal down until the bleeder is retightened.

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

 **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.**



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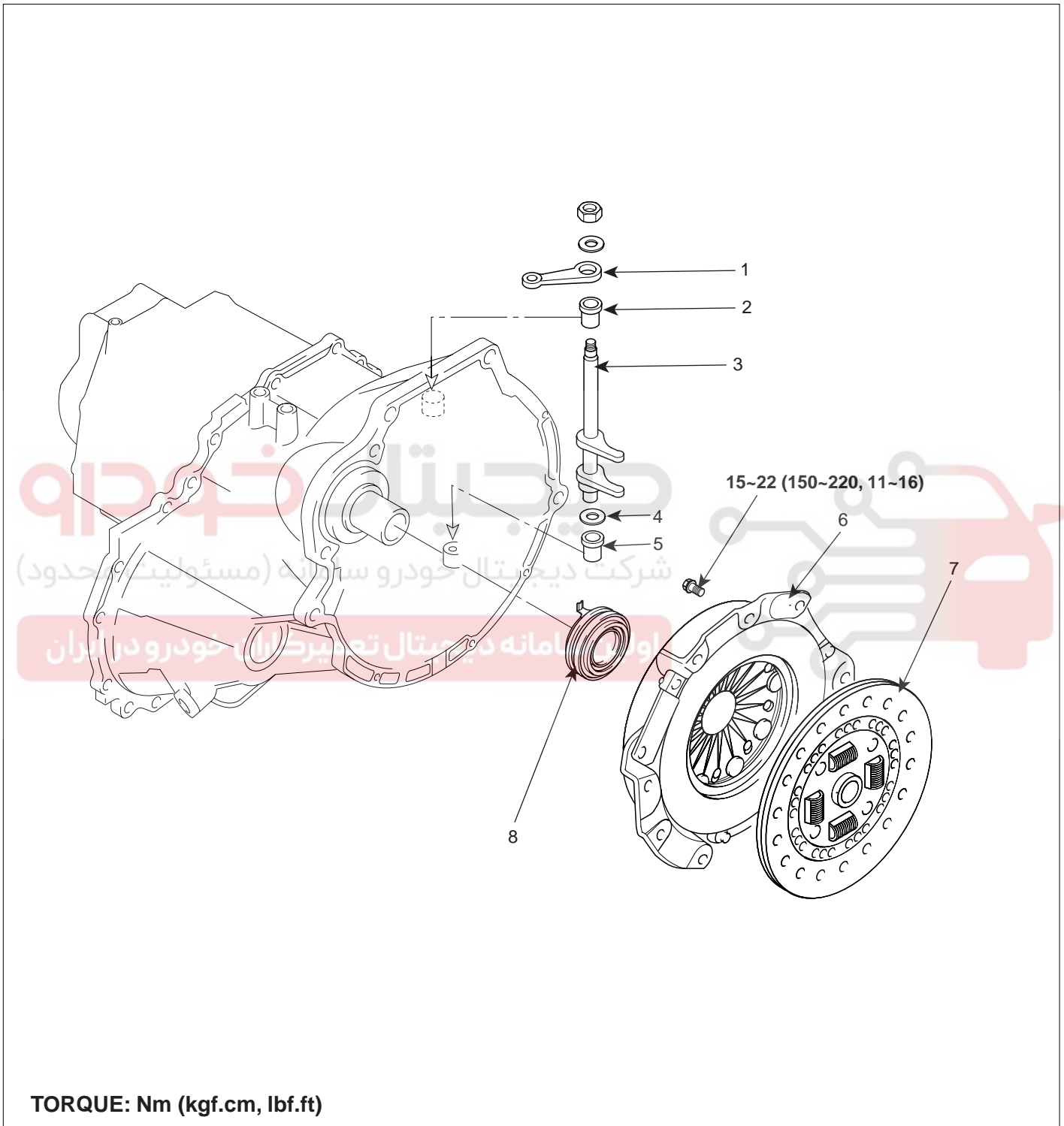


CH -10

CLUTCH SYSTEM

CLUTCH COVER AND DISC

COMPONENETS E05E6EDE



- |                         |                           |
|-------------------------|---------------------------|
| 1. Clutch Release lever | 5. Bushing                |
| 2. Bushing              | 6. Clutch cover assembly  |
| 3. Clutch Release fork  | 7. Clutch disc            |
| 4. Packing              | 8. Clutch Release bearing |

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## CLUTCH SYSTEM

CH -11

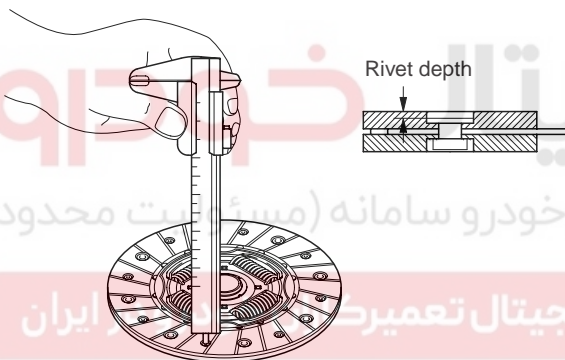
## INSPECTION EDC2FFDA

## 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.



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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.**

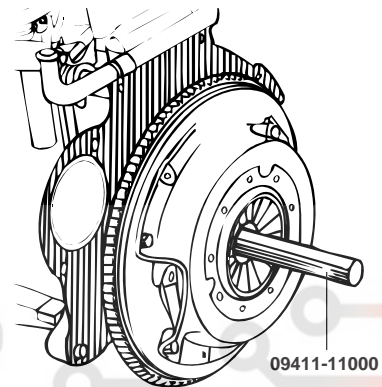
1. Check the bearing for seizure, damage or abnormal noise. Also check the diaphragm spring contacting points for wear.
2. Replace the bearing if the release fork contacting points are worn abnormally.

## CLUTCH RELEASE FORK

If there is abnormal wear at the point of contact with the bearing, replace the release fork assembly.

## REPLACEMENT E6DD46A6

1. Remove the transaxle assembly. (See 'TR' group - 'Manual Transaxle')
2. Insert the special tool (09411-11000) in the clutch disc to prevent the disc from falling.

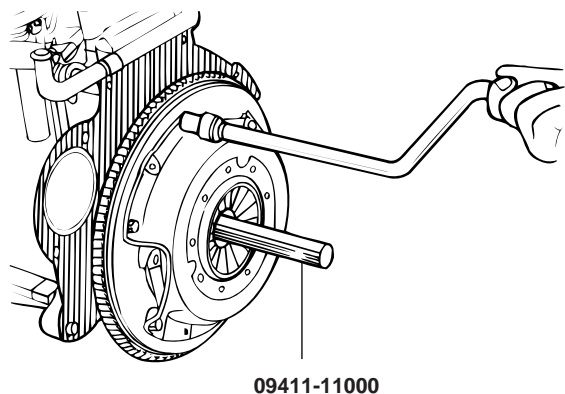


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3. Loosen the bolts which attach the clutch cover to the flywheel in a star pattern. Loosen the bolts in succession, one or two turns at a time, to avoid bending the cover flange.

 **NOTE**

*Do not clean the clutch disc or the release bearing with cleaning solvent.*



09411-11000

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4. Remove the release fork shaft and bushing.

CH -12

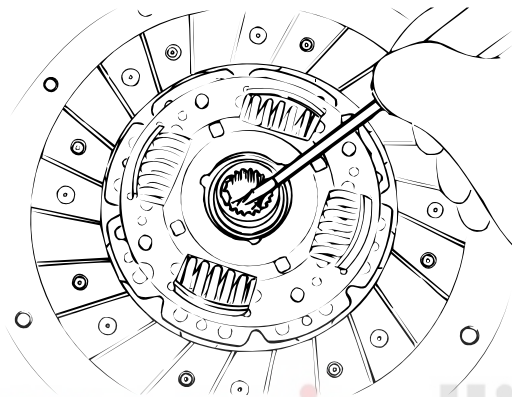
CLUTCH SYSTEM

- Apply multipurpose grease to the spline of the disc.

Grease: CASMOLY L 9508 0.2gr

**CAUTION**

When installing the clutch, apply grease to each part, but be careful not to apply excessive grease. It can cause clutch slippage and judder.

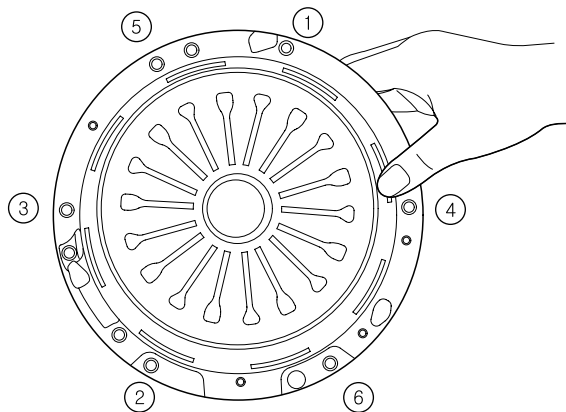


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- Install the clutch disc assembly to the flywheel using the special tool (09411-11000).
- Install the clutch cover assembly to the flywheel and temporarily tighten the bolts one or two steps at a time in a star pattern.

**Tightening torque**

Clutch cover bolt:  
15 ~ 22 Nm (150~220 kgf.cm, 11~16 lbf.ft)

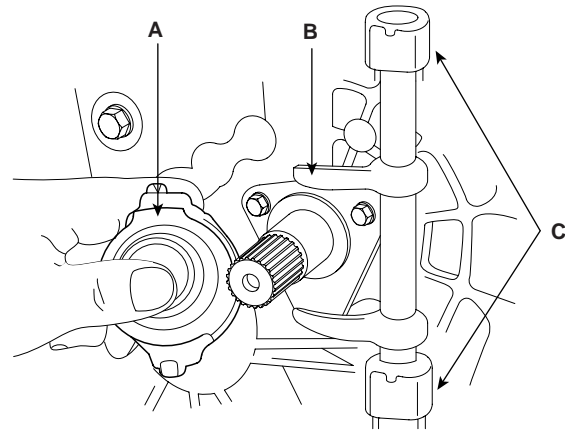


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- Align the bearing (A) to the release fork (B) and then install it to the sleeve of the housing.

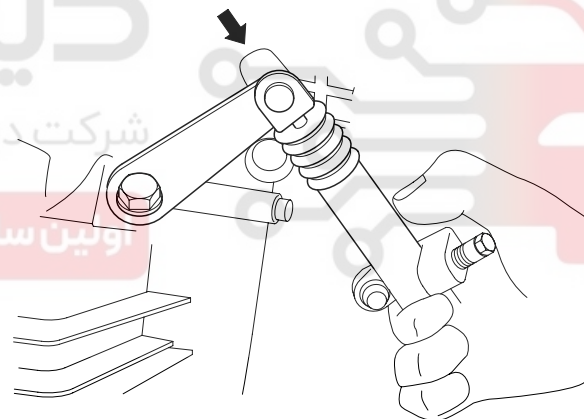
**CAUTION**

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



LKIF001N

- Install the release lever to the release fork.



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- Install the transaxle assembly to the engine.

**CAUTION**

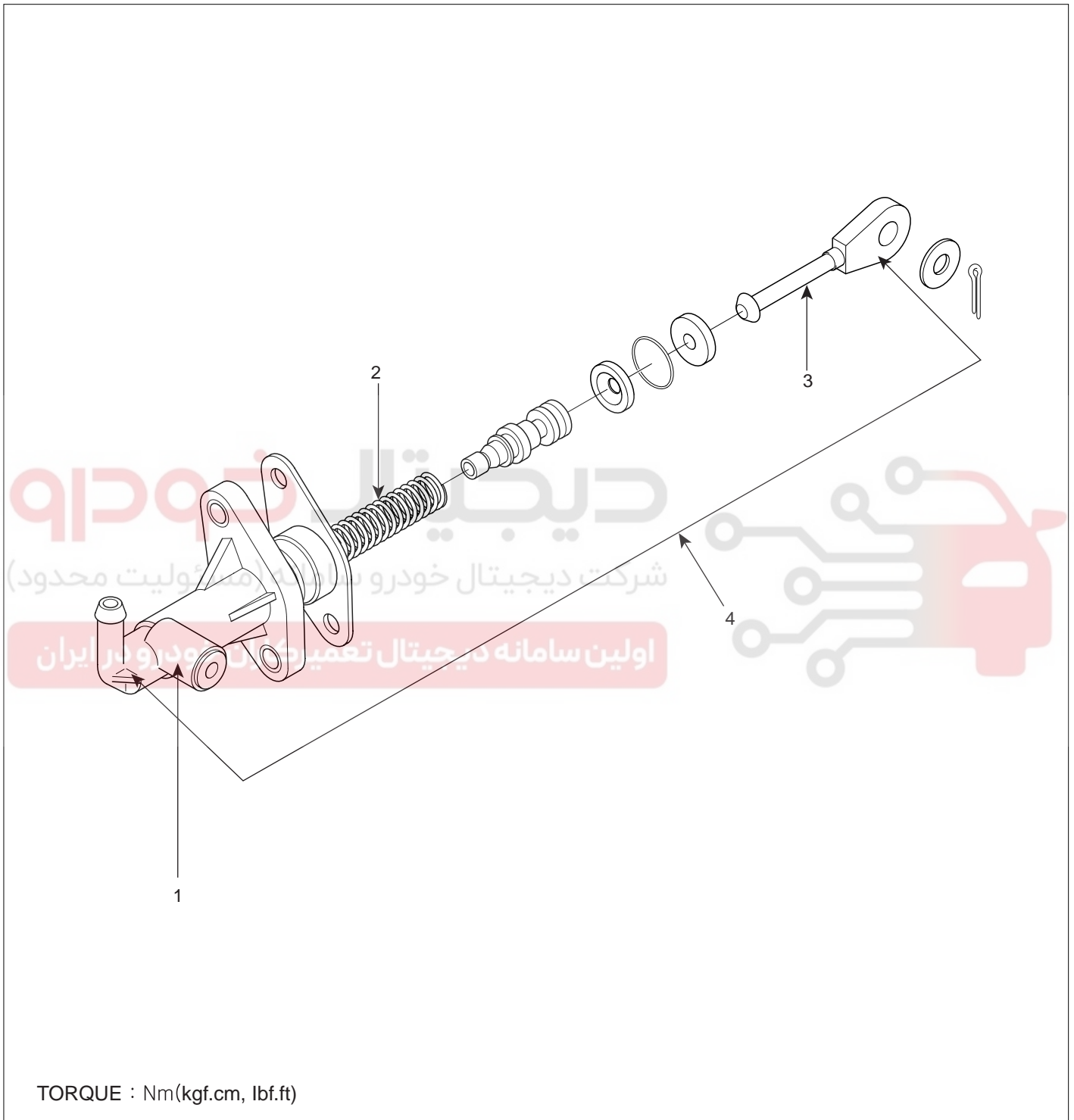
If the transaxle assembly is installed to the engine without performing this step, the release bearing can be separated, as the release fork rotates freely.

CLUTCH SYSTEM

CH -13

CLUTCH MASTER CYLINDER

COMPONENETS EAB004C9



- 1. Return spring
- 2. Master cylinder body
- 3. Clutch master cylinder
- 4. Master cylinder body

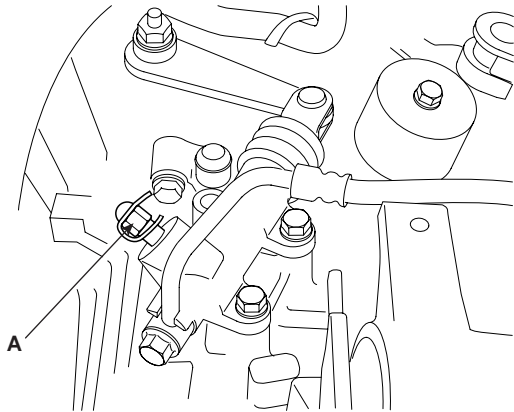
LKIF001P

CH -14

CLUTCH SYSTEM

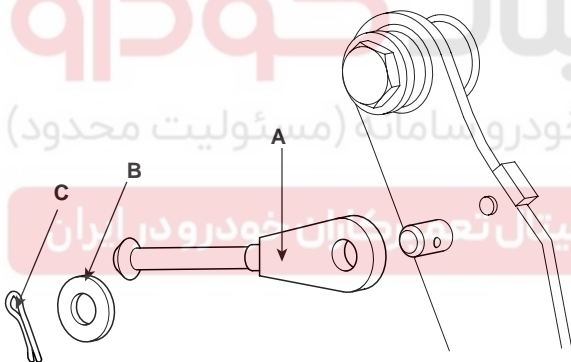
REMOVAL EF63C371

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



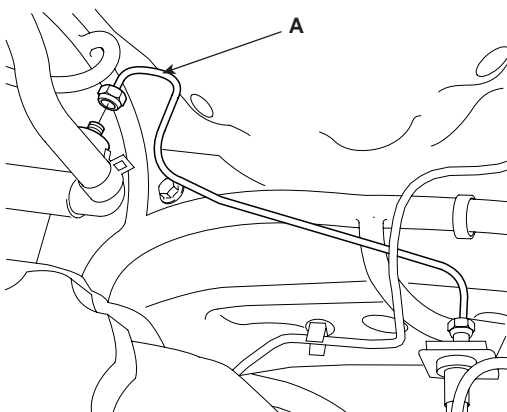
LKIF001Q

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



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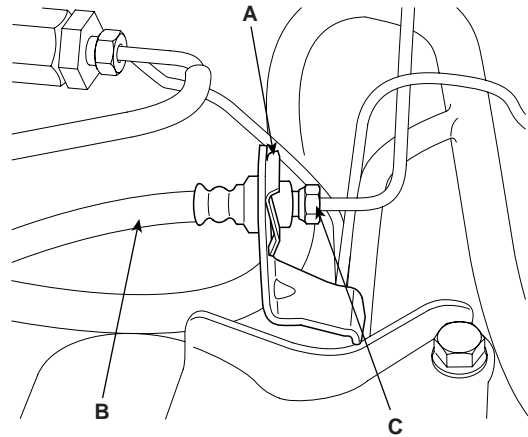
3. Disconnect the clutch tube (A) (master cylinder side).



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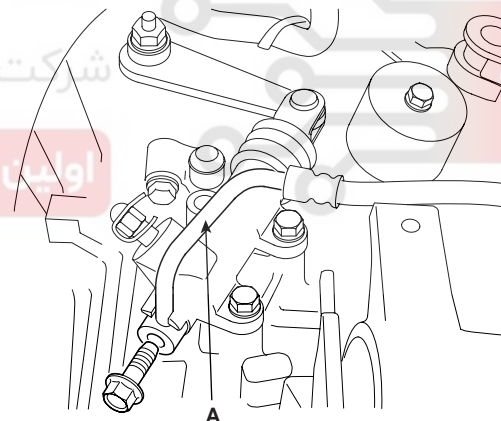
4. Remove the master cylinder mounting nuts.

5. Remove the clutch line clips (A).
6. Hold the nut on the clutch hose (B) and loosen the flare nut (C) on the clutch tube.



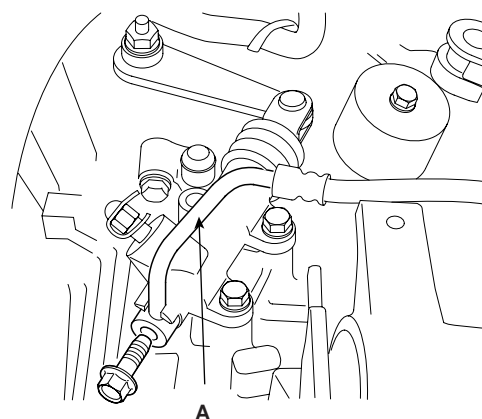
LKIF001T

7. Remove the clutch tube.
8. Disconnect the clutch hose (A) (release cylinder side).



LKIF001U

9. Connect the clutch tube (A) (release cylinder side).

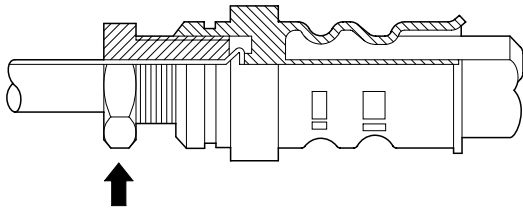


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**CLUTCH SYSTEM**

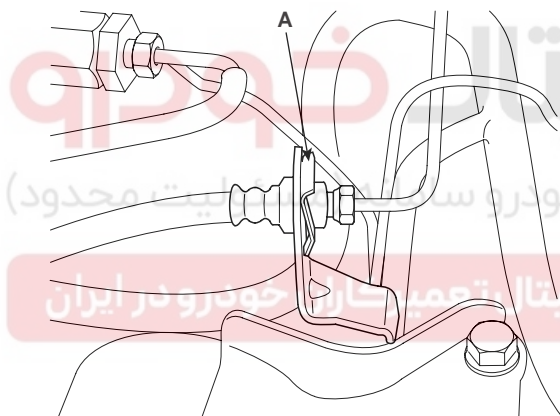
**CH -15**

- 10. Temporarily tighten the flare nut by hand, then tighten it to the specified torque, being careful that the clutch hose does not become twisted.



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- 11. Install the clutch tube and clips (A).

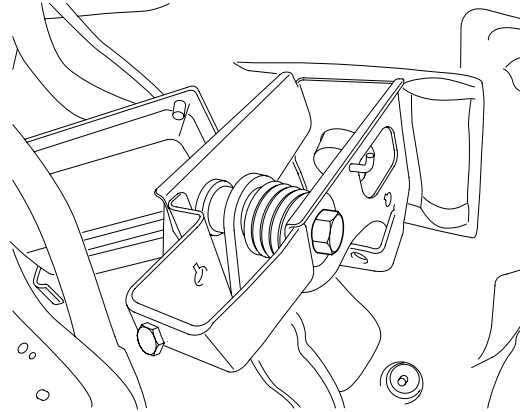


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- 12. Install the master cylinder.

- 13. Apply the specified grease to the clevis pin and washer.

Wheel bearing grease: SAE J310a, NLGI NO. 2



LKIF001Y

- 14. Install the push rod to the clutch pedal.
- 15. Pour the clutch fluid into the clutch master cylinder.
- 16. Bleed the clutch system.

## CH -16

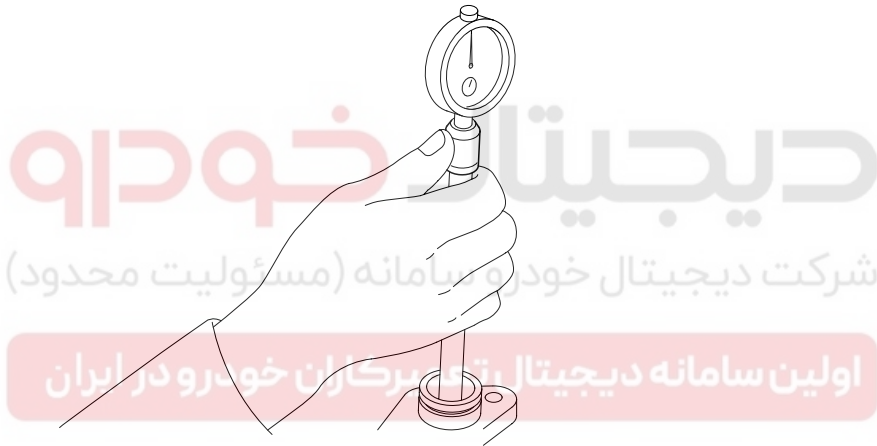
## CLUTCH SYSTEM

**INSPECTION** EC0AED19

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.

 **NOTE**

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



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

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Limit: 0.15 mm (0.006 in.)

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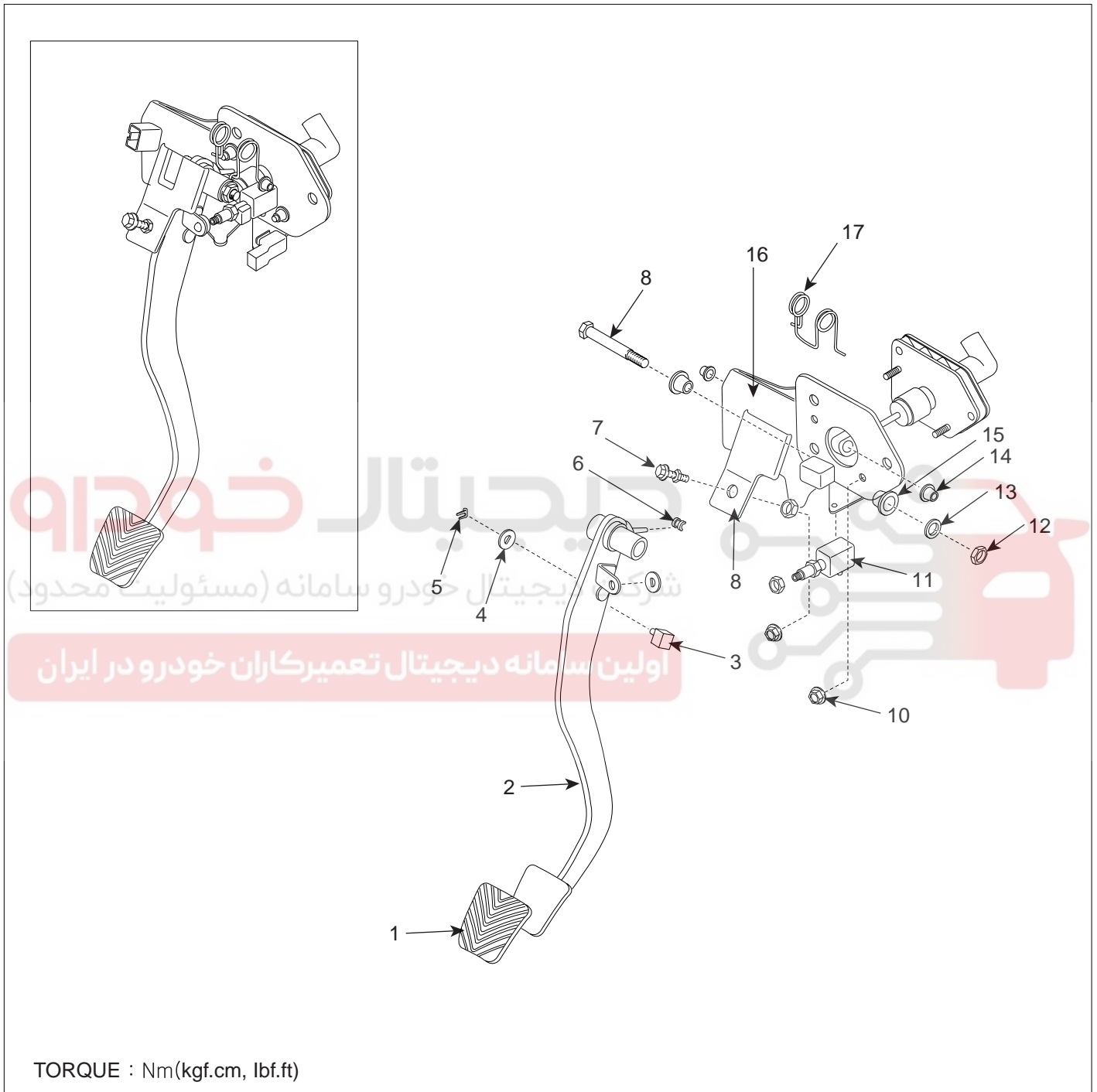


CLUTCH SYSTEM

CH -17

CLUTCH PEDAL

COMPONENTS E498E4A5



- |                  |                          |                   |
|------------------|--------------------------|-------------------|
| 1. Pedal pad     | 7. Bolt                  | 13. Spring washer |
| 2. Clutch pedal  | 8. Hinge bolt            | 14. Bushing       |
| 3. Pedal stopper | 9. Stopper bracket       | 15. Pedal bushing |
| 4. Washer        | 10. Locking nut          | 16. Clutch plate  |
| 5. Split pin     | 11. Ignition lock switch | 17. Return spring |
| 6. Bushing       | 12. Nut                  |                   |

LKIF002A



CH -18

CLUTCH SYSTEM

**INSPECTION** EA2E0ED4

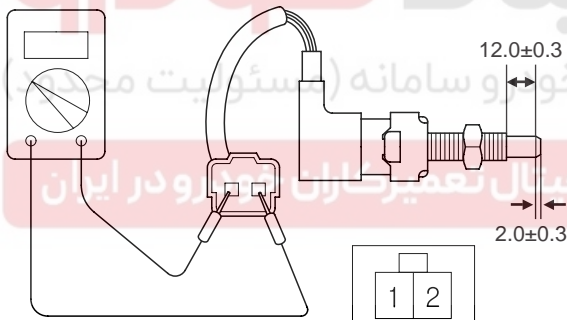
1. Check the pedal shaft and bushing for wear.
2. Check the clutch pedal for bending or torsion.
3. Check the return spring for damage or deterioration.
4. Check the pedal pad for damage or wear.

**IGNITION LOCK SWITCH INSPECTION**

Remove the ignition lock switch and check for continuity between the terminals. If the continuity is not as specified, replace the switch.

Condition \ Terminal	1	2
Pushed	●—————●	
Free		

LKIF002C



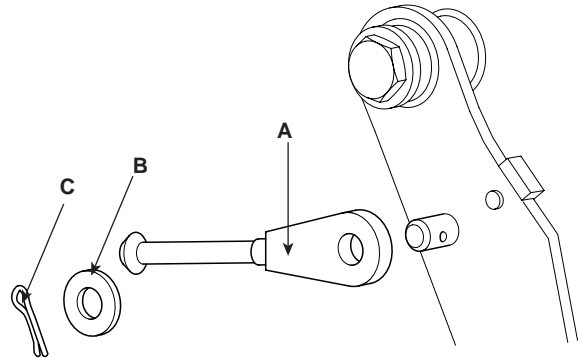
LKIF002D

**RETURNING TEST OF CLUTCH PEDAL.**

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

**REPLACEMENT** E3A8D716

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

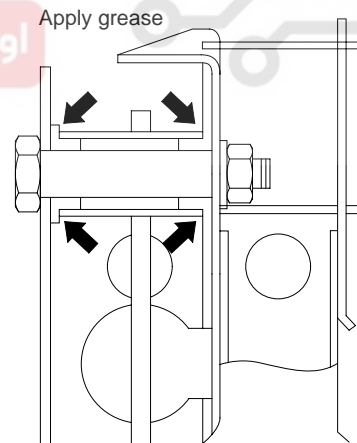


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2. Remove the clutch pedal mounting bolts.
3. Apply the specified grease to the clutch pedal and bushings.

Chassis grease: SAE J310a, NLGI No.1

4. Install the clutch pedal mounting bolt.



LKIF002F

5. Apply the specified grease to the clevis pin and washer.

Wheel bearing grease: SAE J310, NLGI No.2

6. Install the push rod to the clutch pedal.

## CLUTCH SYSTEM

CH -19

ADJUSTMENT EBD96AE2 NOTE

- 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)

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3. Fix the ignition switch when its signal is OFF pressing the pedal slowly 52 ~ 58 mm (2.0 ~ 2.3 in).  
Tighten the fixing nut with specification

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TORQUE : 8~ 10 Nm (80 ~ 100 kgf·cm, 5.9 ~ 7.4 lbf·ft)

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4. (Clutch lock system vehicle)  
Fix the additional ignition lock switch when its signal is ON pressing the pedal slowly 117 ~ 123 mm (4.6~4.8 in).  
Tighten the fixing nut with specification.

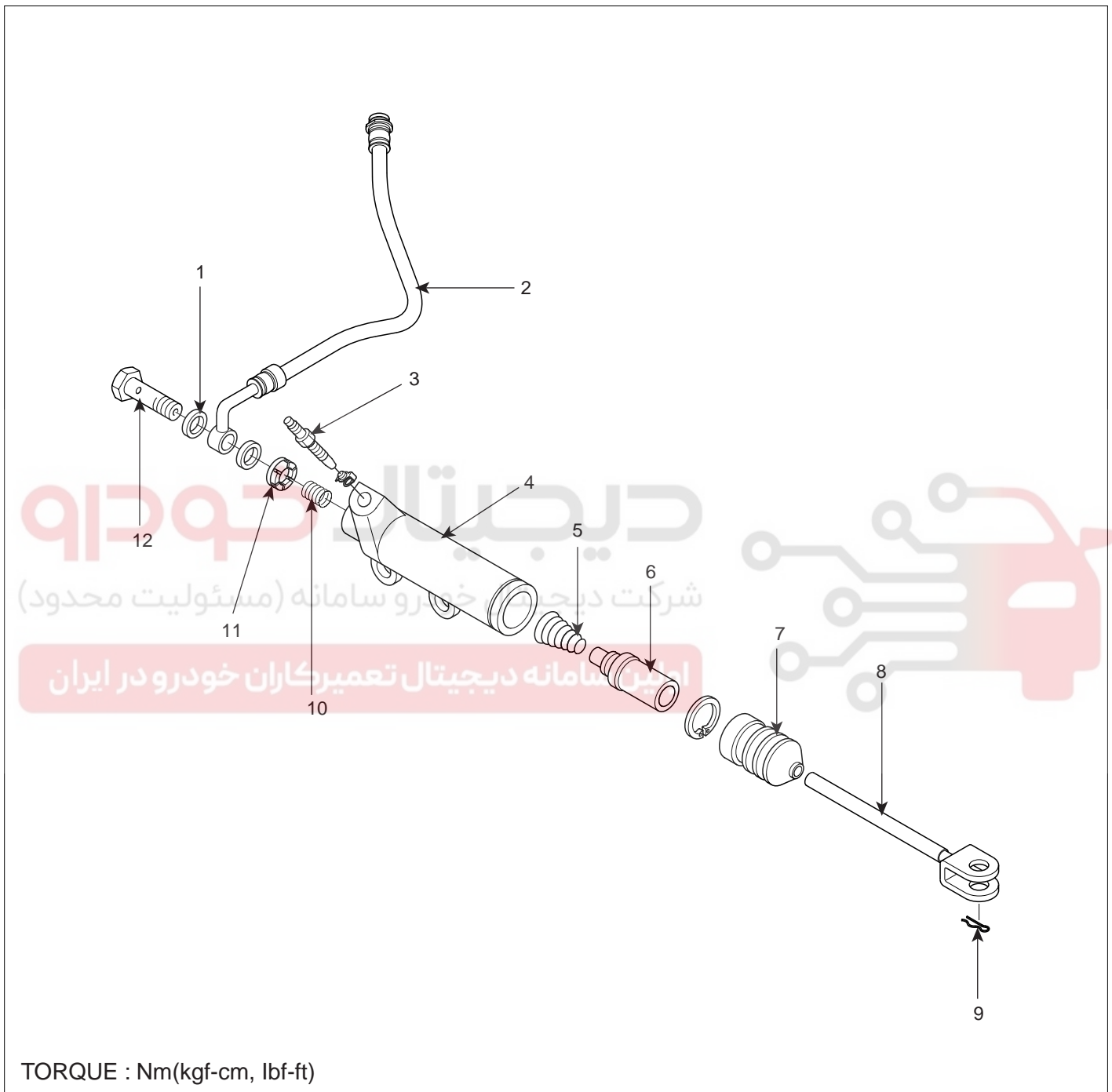


CH -20

CLUTCH SYSTEM

CLUTCH RELEASE BEARING

COMPONENTS EED22ADE



TORQUE : Nm(kgf-cm, lbf-ft)

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

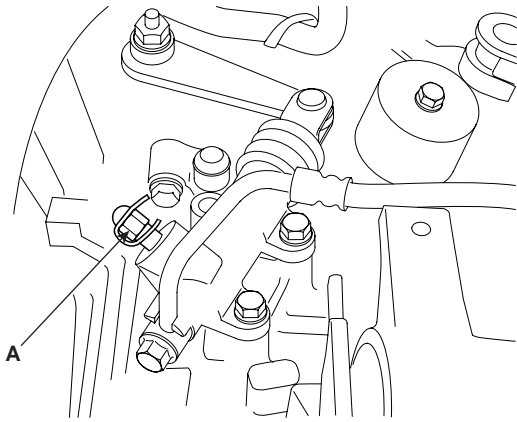
LKIF002G

**CLUTCH SYSTEM**

CH -21

**REPLACEMENT** E25A6940

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



LK1F002H

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 the new clutch release cylinder.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

