

Clutch System

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GENERAL

SPECIFICATIONS

E09FBD2F

Engine type	Diesel U1.5 (M5CF2)
Clutch operation method	Hydraulic type
Clutch disc Type	Single dry with diaphragm
Facing diameter (outside x inside)mm (in)	240 x 150 (9.4 x 5.9)
Clutch cover assembly Type	Diaphragm spring strap
Clutch release cylinder * I.D. mm (in)	20.64 (0.81)
Clutch master cylinder * I.D. mm(in)	15.87 (0.62)

* I.D: Inside diameter

SERVICE STANDARD

Standard value Clutch disc thickness [When free] Clutch pedal height Clutch pedal free play Clutch pedal stroke Lateral play at pad center	8.7 ± 0.3 mm (0.331 ~ 0.354 in) 160.7 mm (6.33 in) 6 ~ 12 mm (0.24 ~ 0.47 in) 140 mm (5.5 in) 2.5 mm (0.098 in)
Limit Clutch disc rivet sink Diaphragm spring end height difference Clutch release cylinder clearance to piston Clutch master cylinder clearance to piston	1.1 mm (0.043 in) 0.5 mm (0.02 in) 0.15 mm (0.006 in) 0.15 mm (0.006 in)

TIGHTENING TORQUE

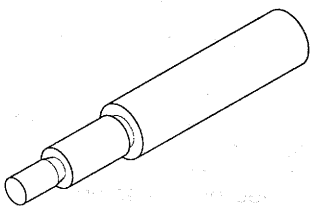
Item	Nm	kgf.cm	lb.ft
Clutch pedal to pedal support member (Clutch pedal bracket)	15 ~ 22	150 ~ 220	11 ~ 16
Clutch pedal support member to master cylinder	10 ~ 17	100 ~ 170	6 ~ 13
Clutch tube flare nut	13 ~ 17	130 ~ 170	10 ~ 13
Clutch tube bracket	9 ~ 14	90 ~ 140	6.5 ~ 10
Clutch release cylinder	15 ~ 22	150 ~ 220	11 ~ 16
Clutch release cylinder union bolt	25 ~ 40	250 ~ 400	18 ~ 29
Clutch cover assembly	12 ~ 15	120 ~ 150	9 ~ 11
Roll rod support bracket washer bolt	60 ~ 80	600 ~ 800	43 ~ 60
Release bearing washer bolt	6 ~ 8	60 ~ 80	4 ~ 6
Master cylinder push rod nut	10 ~ 15	100~150	6~11
Ignition lock switch nut	8 ~ 10	80 ~ 100	6 ~ 7

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	As required
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.2V	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

SPECIAL TOOLS

EC8AF8B6

Tool (Number and name)	Illustration	Use
09411-25000 Clutch disc guide	 EOKD001A	Installation of the clutch disc.

TROUBLESHOOTING

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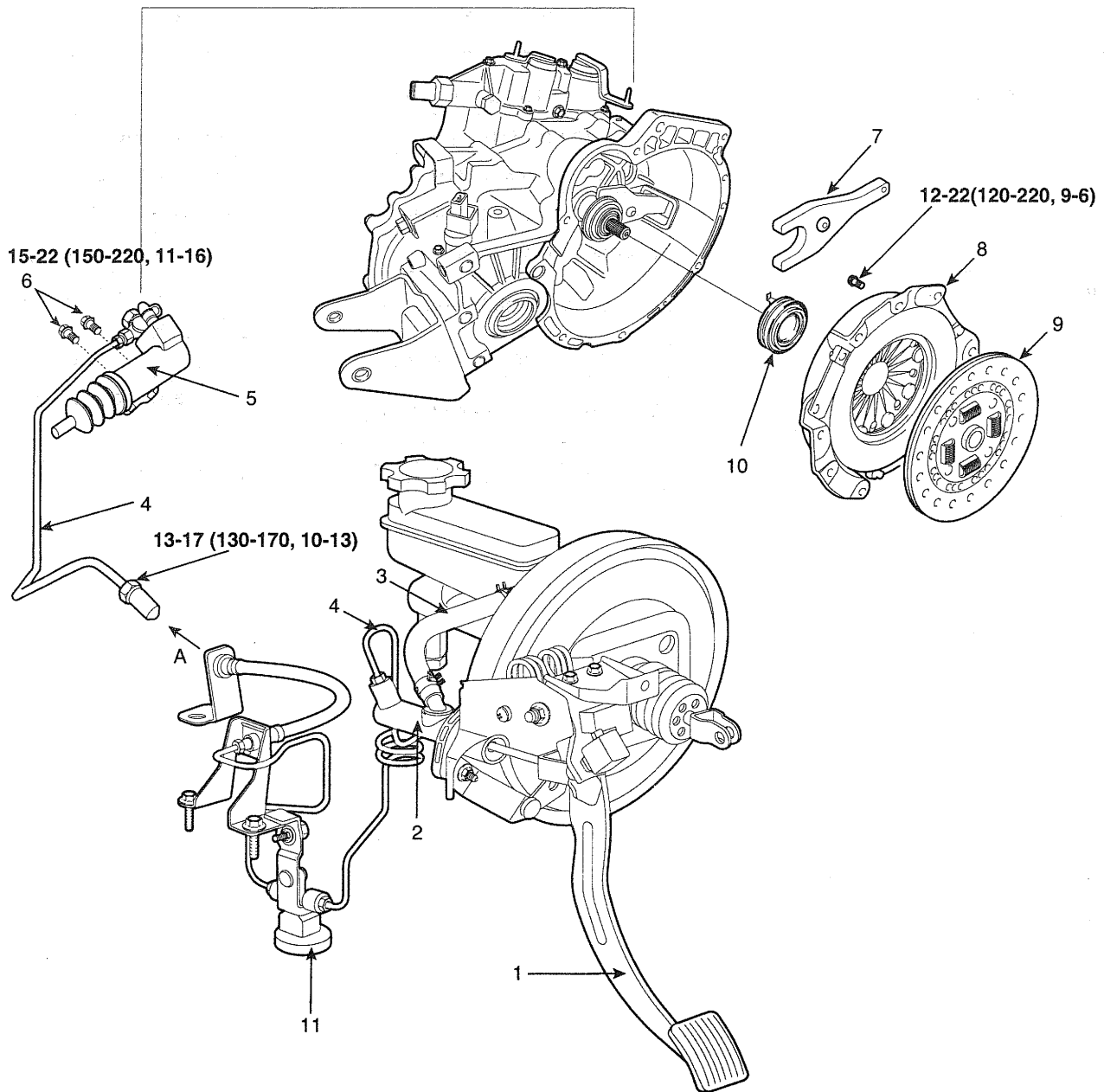
Trouble symptom		Suspect area	Remedy (See page)
Clutch slipping <ul style="list-style-type: none"> Car will not respond to engine speed during acceleration Insufficient vehicle speed Lack of power during uphill driving 		Insufficient pedal free play	Adjust
		Clogged hydraulic system	Correct or replace 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 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 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 burned	Repair as necessary
		Faulty of the clutch pressure plate	Replace the clutch cover

Trouble symptom	Suspect area	Remedy (See page)
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

CLUTCH SYSTEM

COMPONENTS

E09C3452



TORQUE : Nm (kgf.m, lb-ft)

- | | |
|----------------------------|----------------------------|
| 1. Clutch pedal | 7. Clutch release fork |
| 2. Master cylinder | 8. Clutch cover |
| 3. Reserve hose | 9. Clutch disc |
| 4. Clutch tube | 10. Clutch release bearing |
| 5. Clutch release cylinder | 11. Damper |
| 6. Bolt | |

SERVICE ADJUSTMENT PROCEDURE

ECC4FC2C

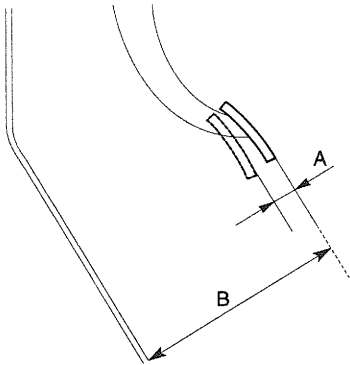
CLUTCH PEDAL INSPECTION AND ADJUSTMENT

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

Standard value:

(A) 6 ~ 12 mm (0.24 ~ 0.47 in)

(B) 160.7 mm (6.33 in)



LOJF100B

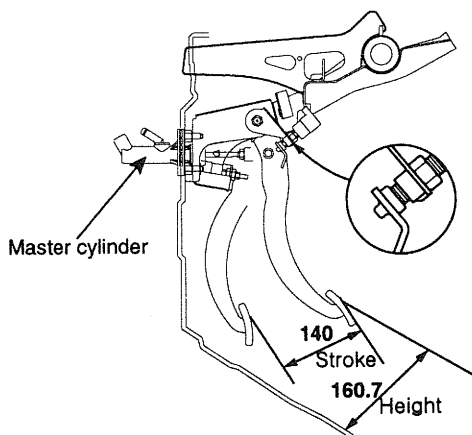
2. If the clutch pedal freeplay is not within the standard value range, adjust as follows:

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



NOTE

If the clutch pedal height is lower than the standard value, loosen the bolt and adjust the push rod. After adjustment, tighten the bolt until it reaches the pedal stopper, and then tighten the lock nut.



EOPG001C

- 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.

3. 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.

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.

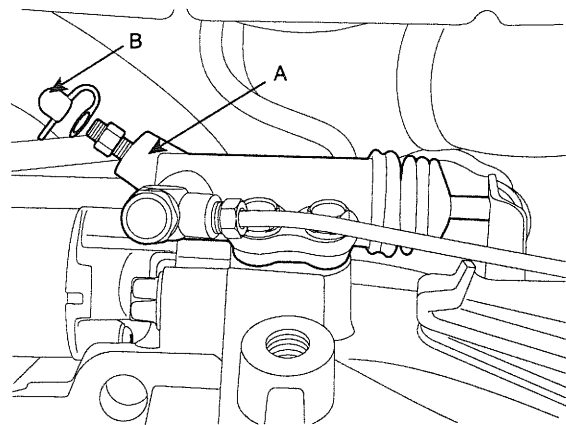


CAUTION

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

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

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

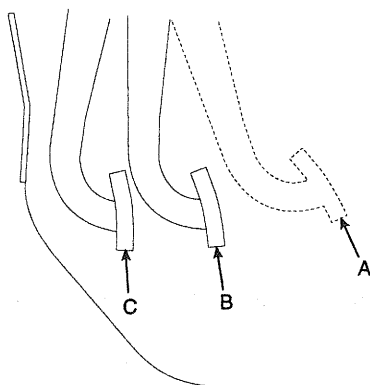


EOPG001B

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.

**CAUTION**

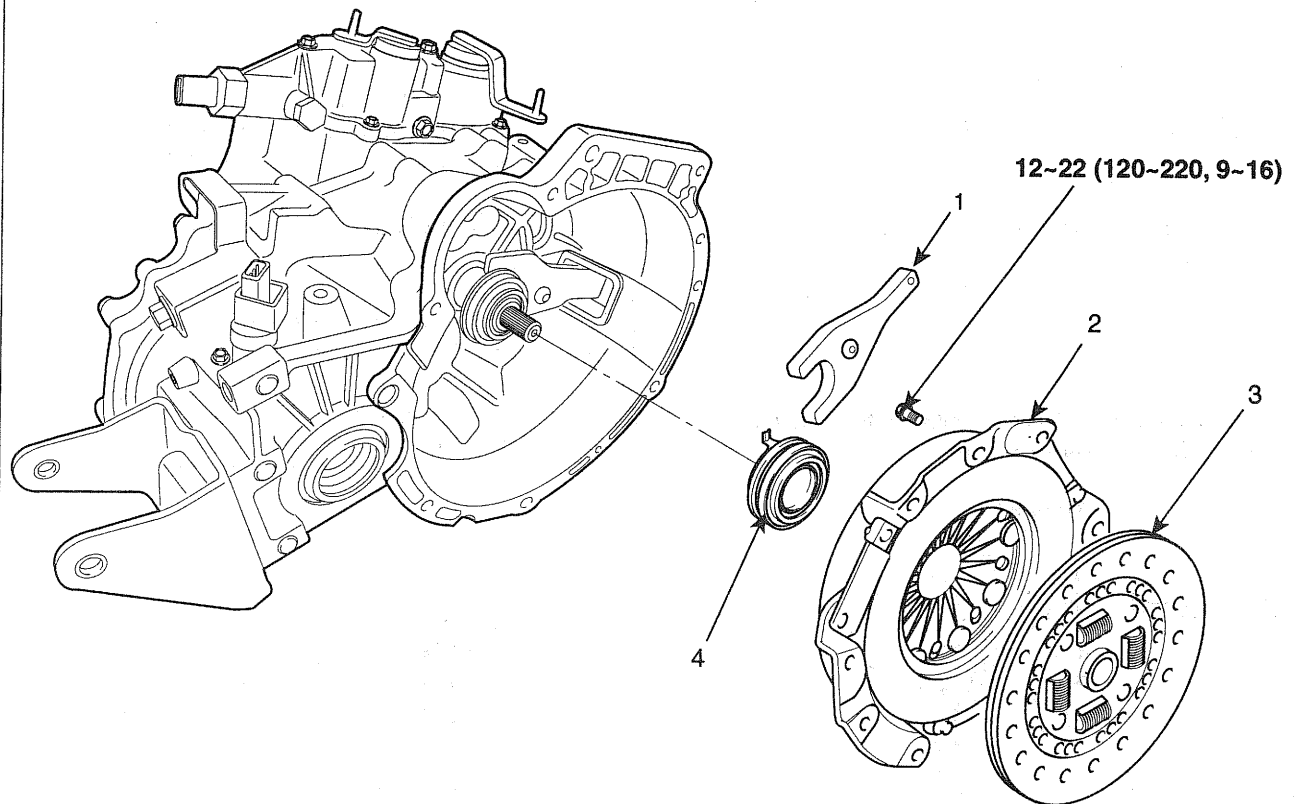
The rapidly-repeated operation of the clutch pedal in B-C range may disrupt the release cylinder's position. During the bleeding operation, press the clutch pedal to the floor after it returns to the "A" point.



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CLUTCH COVER AND DISC

COMPONENTS E8BC23C3



TORQUE: Nm (kgf.cm, lb.ft)

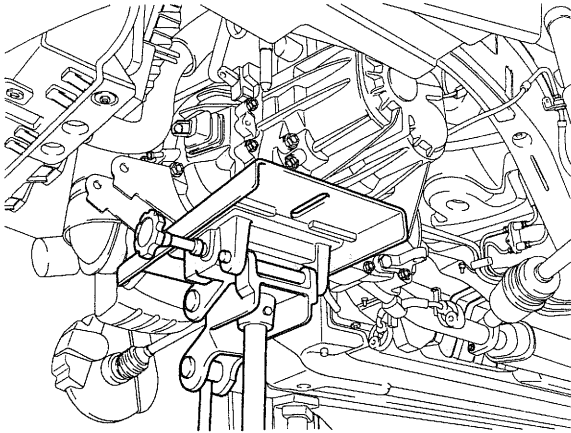
- 1. Clutch release fork
- 2. Clutch release cover

- 3. Clutch disc
- 4. Clutch release bearing

REMOVAL

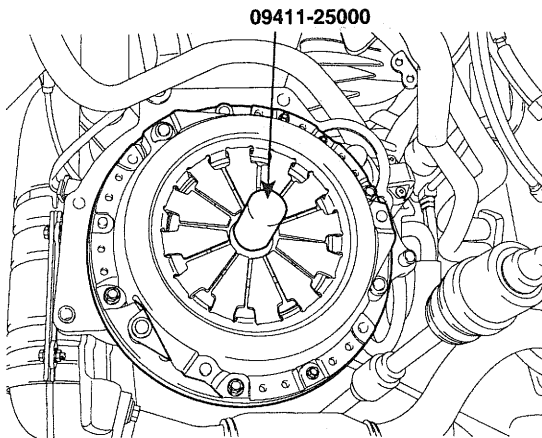
EFBBBFDF

1. To remove the transaxle assembly, first drain the clutch fluid and transaxle gear oil, then remove the air cleaner joint and the mounting bracket etc.
2. Remove the transaxle assembly, after removing each bolt which connects the transaxle assembly and engine (Refer to "MT" Gr).



KKNF002B

3. Insert the special tool (09411-25000) in the clutch disc to prevent the disc from shifting.



KKNF002C

4. 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.

**NOTE**

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

INSPECTION

E4CFDBD7

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

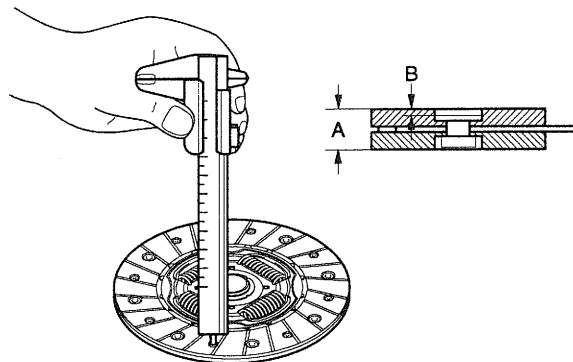
1. Check the clutch facing for loose rivets, uneven contact, deterioration due to seizure, adhesion of oil, or grease, and replace the clutch disc if defective.
2. Measure the thickness of the disc when free.

Standard value

Clutch disc thickness(A) [when free] :
8.7 ± 0.3 mm (0.331-0.364in)

Limit

Clutch disc rivrt depth(B) :
0.3 mm (0.012in)



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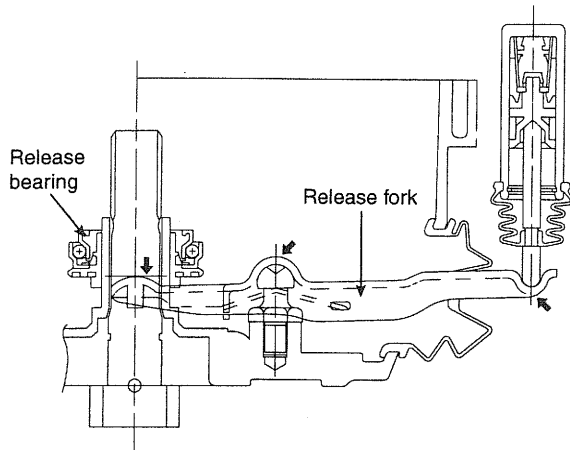
3. Check for the torsion spring play and damage and if defective, replace the clutch disc.
4. Clean the splines on the input shaft and install the clutch disc.
If the disc does not slide smoothly or if play is excessive, replace the clutch disc and/or the input shaft.

CLUTCH RELEASE BEARING

CAUTION

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

Standard grease : CASMOLY L9508



LOGF003D

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.

INSTALLATION

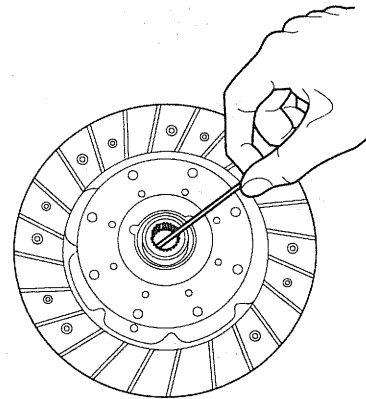
EA778EBD

1. Apply multipurpose grease to the spline of the disc.

Grease: CASMOLY L 9508

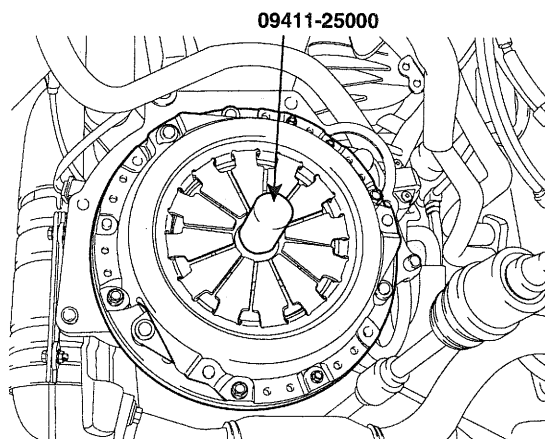
CAUTION

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



EOKD011A

2. Install the clutch disc assembly to the flywheel using the special tool (09411-25000).



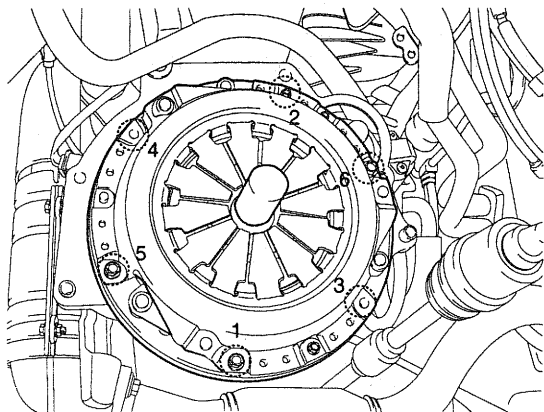
KKNF002D

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.

TORQUE

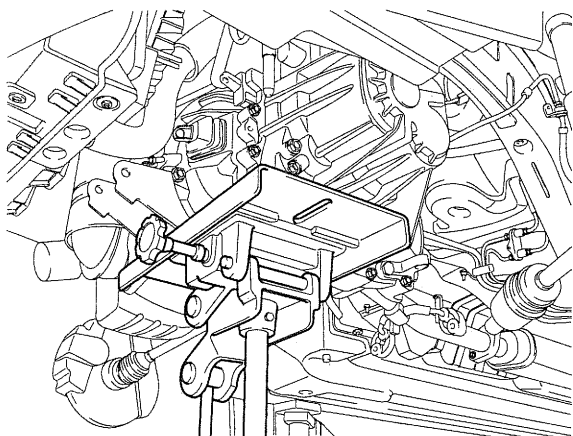
Clutch cover bolt :

12 ~ 15 Nm (120 ~ 150 kgf.cm, 9 ~ 11 lb.ft)



KKNF002E

4. Remove the special tool(09411-25000) from the clutch disc assembly.
5. Tighten each bolt to connect the transaxle assembly and engine.
6. Install the transaxle assembly to the engine and drain the clutch fluid and transaxle gear oil.

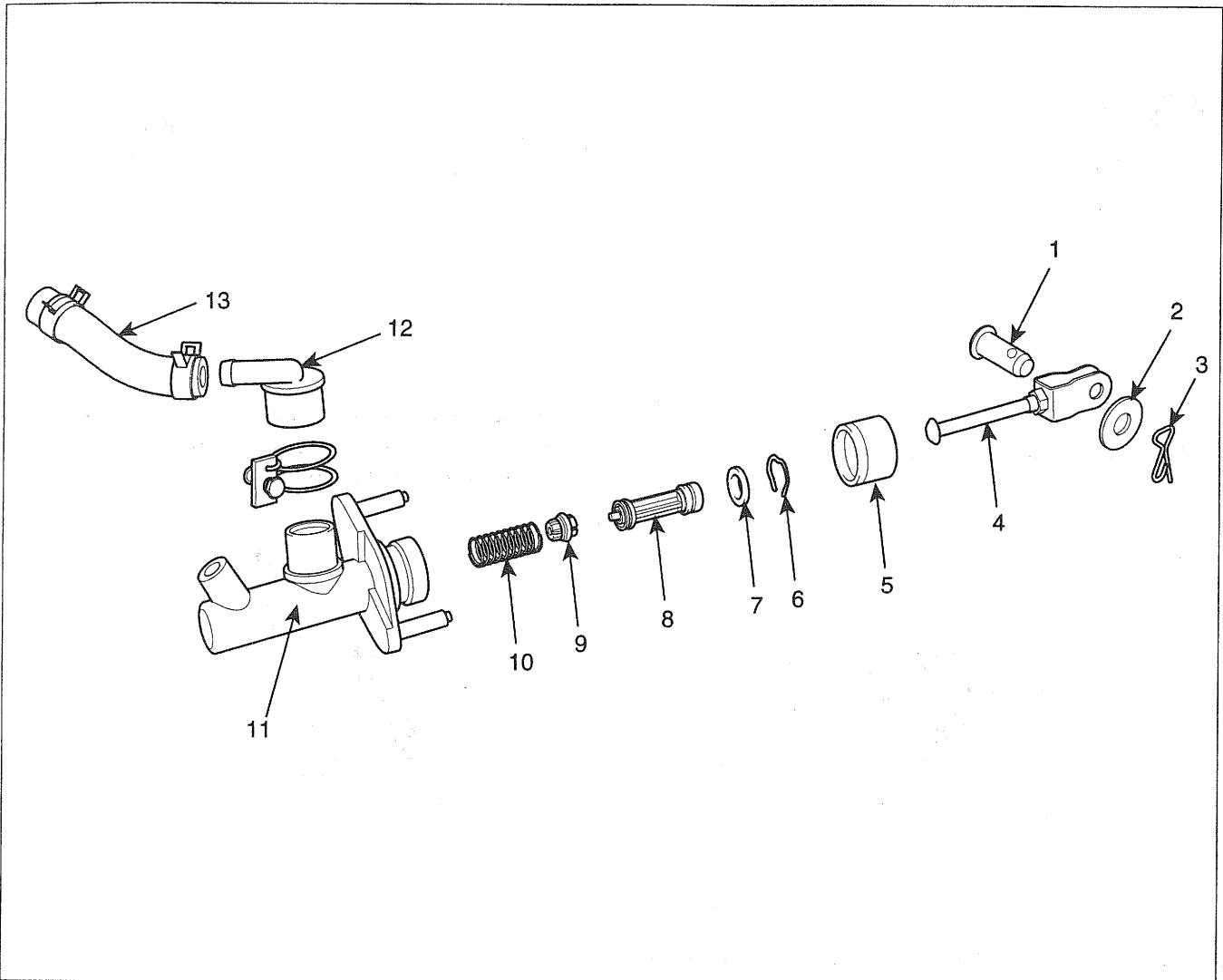


KKNF002F

7. Bleed the clutch system.

CLUTCH MASTER CYLINDER

COMPONENTS E430AEB8

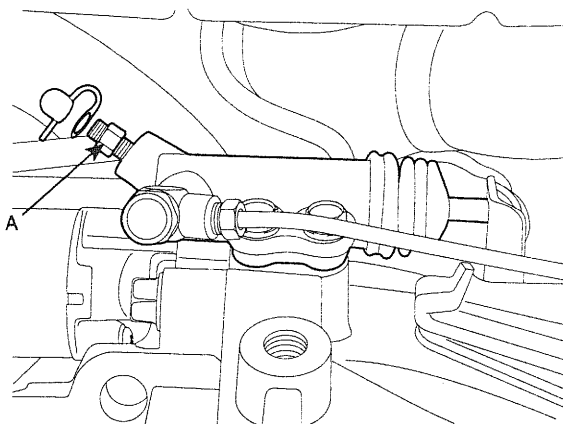


1. Clevis pin
2. Washer
3. Cotter pin
4. Rod assembly
5. Boot
6. Key
7. Plate

8. Piston assembly
9. Spring seat
10. Spring
11. Body assembly
12. Nipple
13. Flexible hose

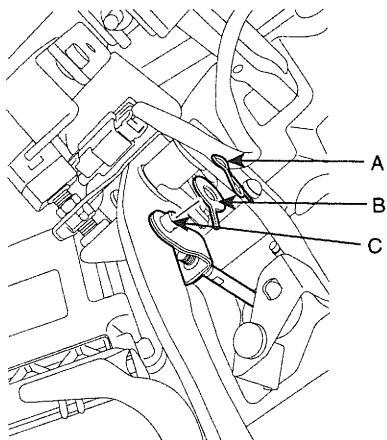
REMOVAL ECFBF9F2

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



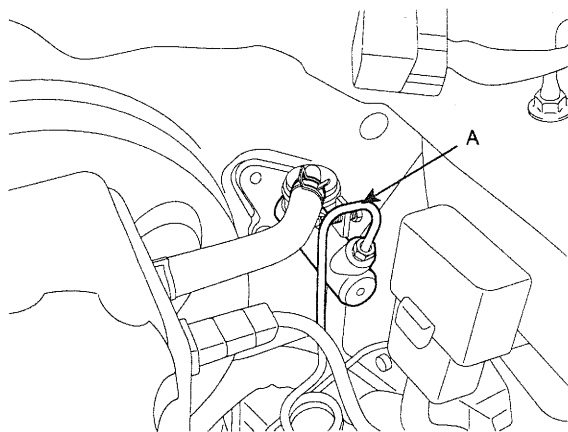
EOPG002B

2. Remove clevis pin (A), cotter pin (C) and washer (B).



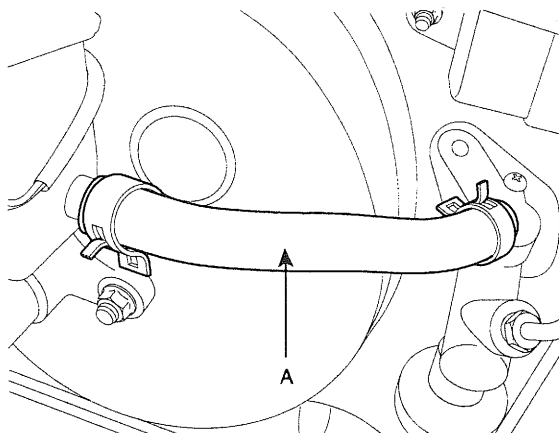
EOPG002C

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



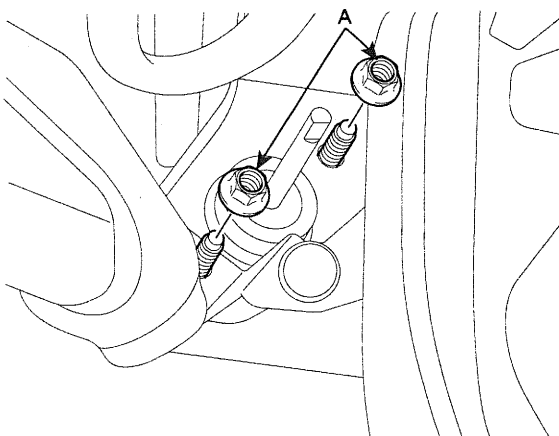
EOPG002D

4. Remove the flexible hose(A) connected to brake reserve tank.



LOJF102B

5. Remove the master cylinder mounting nuts(A) under the instrument panel and also remove the support nut in the engine room if necessary.



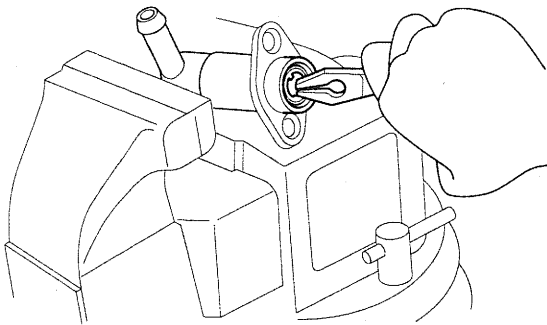
EOPG002E

DISASSEMBLY ED727549

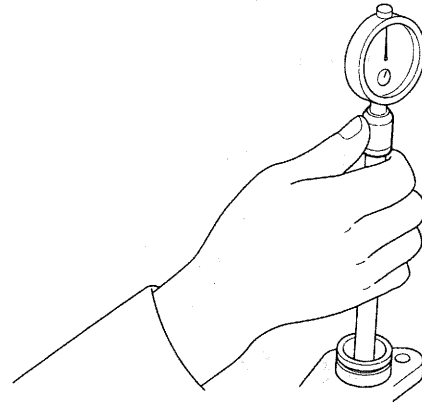
1. Remove the piston stop ring.
2. Pull out the push rod and piston assembly.
3. Remove the reserve tank band, reserve tank cap, and reserve tank.

**NOTE**

- Use care not to damage the master cylinder body and piston assembly.
- Do not disassemble the piston assembly.



EOKD019A



EOKD100A

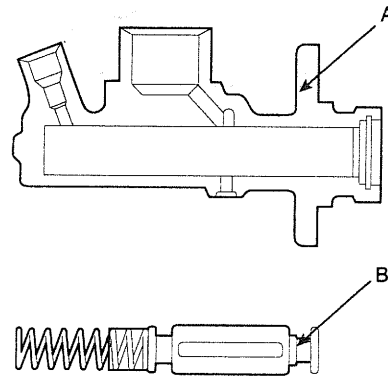
6. If the master cylinder-to-piston clearance exceeds the limit, replace the master cylinder and/or piston assembly.

 Limit : 0.15 mm (0.006 in)

REASSEMBLY E0EC7EA7

1. Apply the specified fluid to the inner surface of the master cylinder body (A) and to the entire periphery of the piston assembly (B).

 Specified fluid: Brake fluid DOT 3 or DOT 4



EOPG002H

INSPECTION EAFB43CE

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 to make sure the clutch line tube is not clogged or restricted in any way.
5. Measure the master cylinder inside diameter and the piston outside diameter with a cylinder gauge micrometer.

**NOTE**

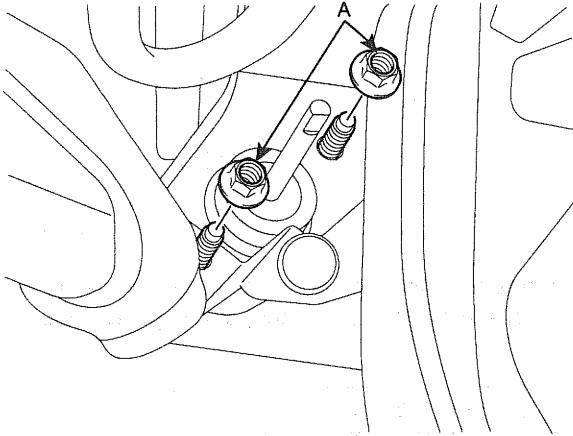
Measure the inside diameter of the master cylinder at three places (bottom, middle, and top) in a perpendicular direction.

2. Install the piston assembly.
3. Install the piston snap ring.
4. Install the push rod assembly.

INSTALLATION E921A93B

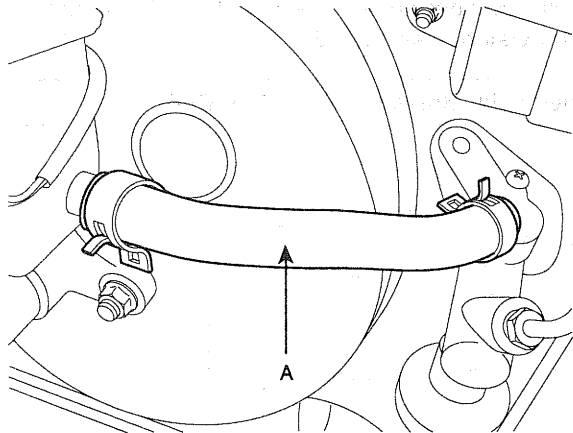
1. Install the master cylinder (A).

TORQUE :
9-14 Nm (90-140 kgf.cm, 7-10 lb-ft)



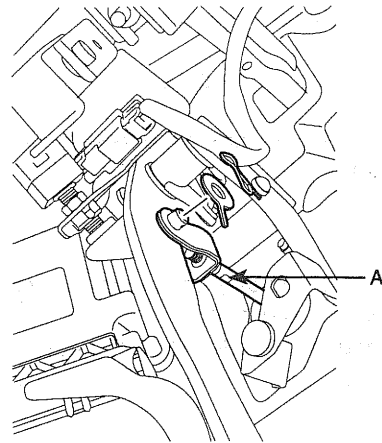
EOPG002E

2. Connect the flexible hose(A) of the brake reserve tank to the master cylinder.



LOJF102B

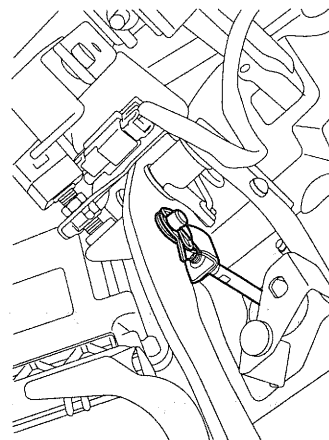
3. Install the push rod(A) to the clutch pedal.



EOPG002F

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

Wheel bearing grease: SAE J310, NLGI NO. 2



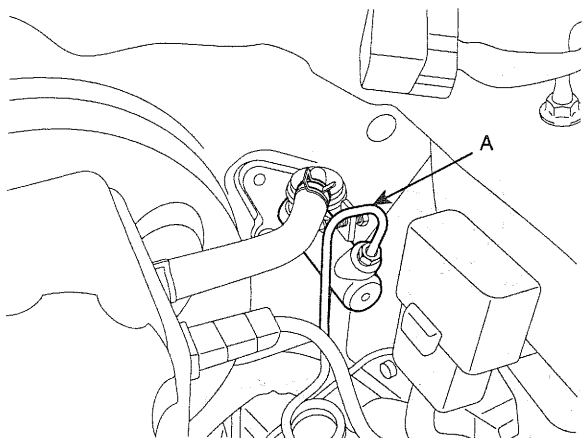
EOPG002G

5. Pour the clutch fluid into the clutch master cylinder.

6. Connect the clutch tube(A) to the master cylinder.

TORQUE :

13-17 Nm (130-170 kgf.cm, 10-13 lb-ft)



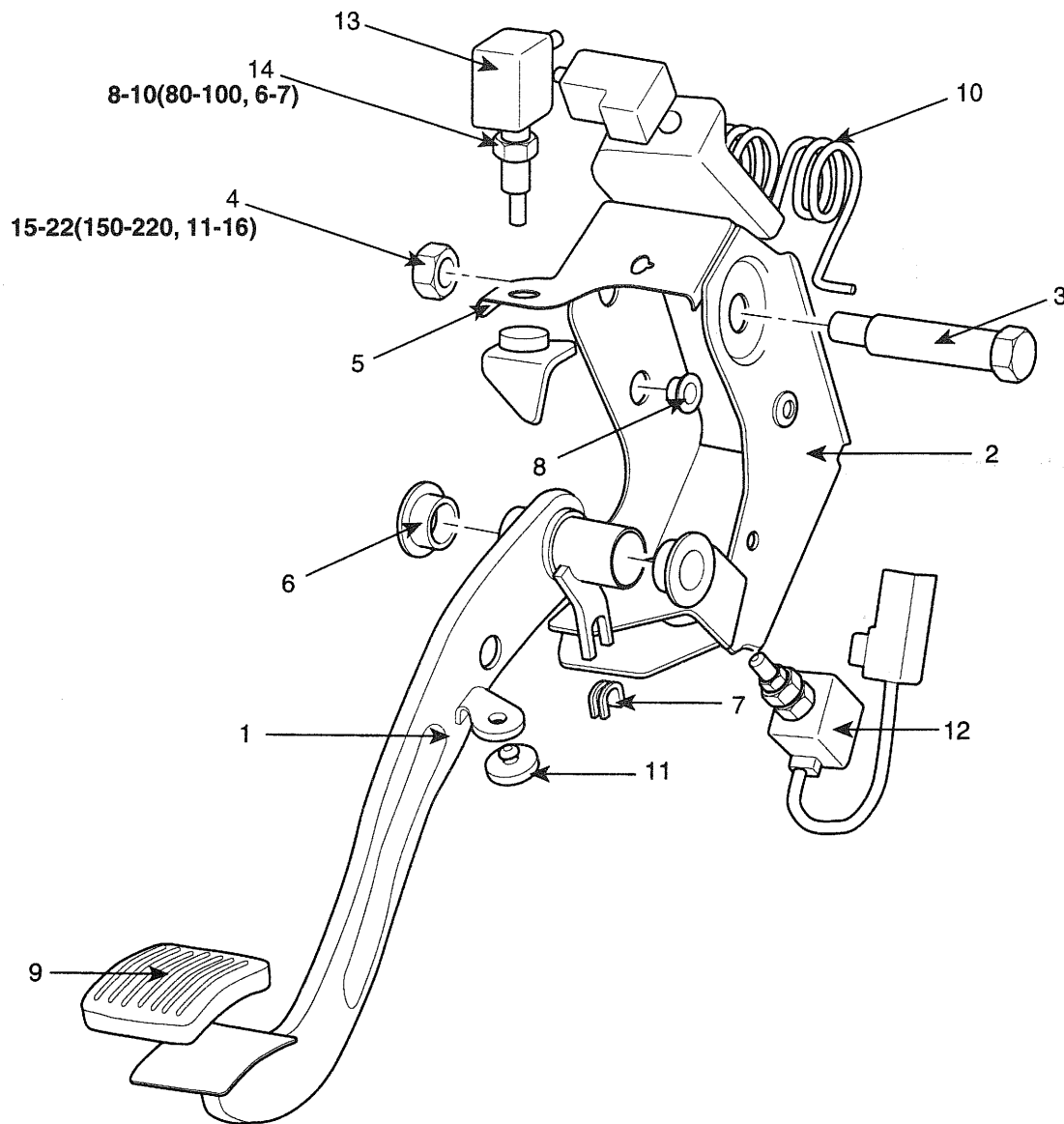
EOPG0021

7. Bleed the clutch system.



CLUTCH PEDAL

COMPONENTS E69D734A

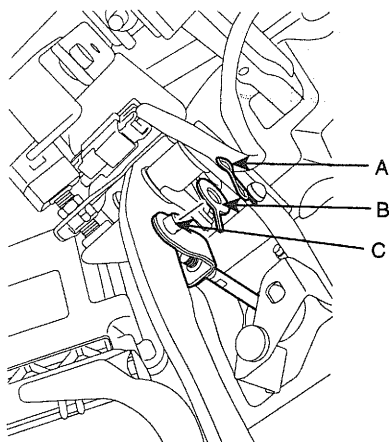


TORQUE : Nm (kgf.cm, lb-ft)

- | | |
|--------------------------|--------------------------|
| 1. Clutch pedal assembly | 8. Member bush |
| 2. Member assembly | 9. Pad |
| 3. Bolt | 10. Turn over spring |
| 4. Nut | 11. Stopper |
| 5. Spring washer | 12. Ignition lock switch |
| 6. Bush | 13. Ignition lock switch |
| 7. Arm bush | 14. Nut |

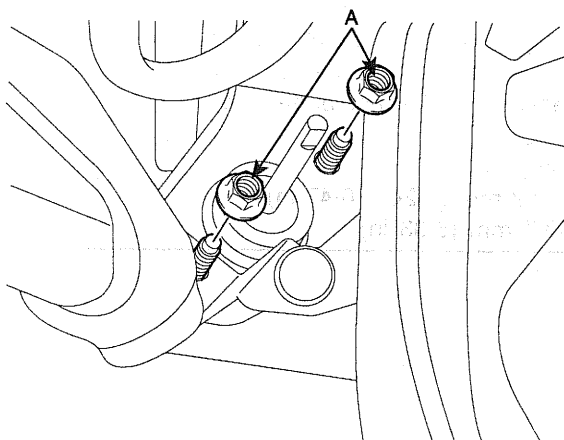
REMOVAL EEF0FC94

1. Remove the cotter pin (C), washer (B), and clevis pin (A).



EOPG002C

2. Remove the clutch pedal mounting nuts(A).



EOPG003C

INSPECTION EB0A7E6E

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.

Terminal	1	2
Condition		
Pushed	○	○
Free		

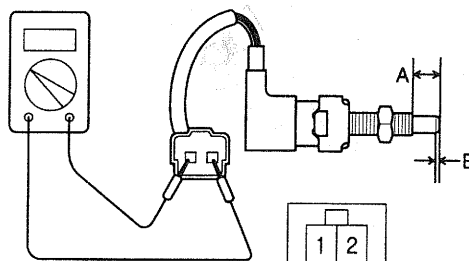
EOKD021B

Standard value

Full stroke(A) : $12.0 \pm 0.3\text{mm}$ (0.4724 ± 0.0118 in)

On Off turning point(B) :

$2.0 \pm 0.3\text{mm}$ (0.0787 ± 0.0118 in)



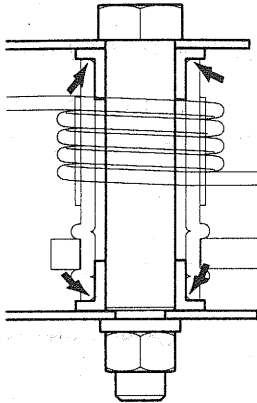
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INSTALLATION

E0BCEF84

1. Apply the specified grease to the clutch pedal and bushings.

Chassis grease: SAE J310a, NLGI No.1

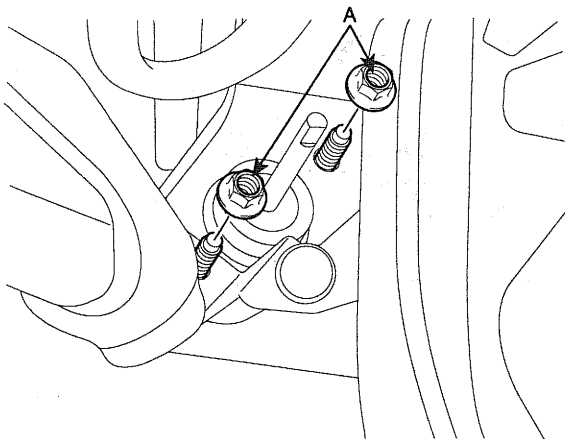


EOPG003B

2. Install the clutch pedal mounting nut(A).

TORQUE

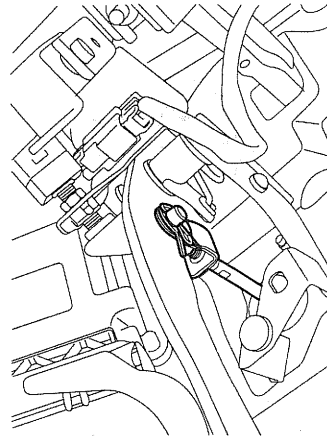
- 1) Pedal support member :
15-22Nm (150-220kgf.cm, 11-16lb-ft)
 - 2) Master cylinder :
10-17Nm (100-170kgf.cm, 6-13lb-ft)
-



EOPG003C

3. Install the push rod to the clutch pedal.
4. Apply the specified grease to the clevis pin and washer.

Wheel bearing grease: SAE J310, NLGI No.2

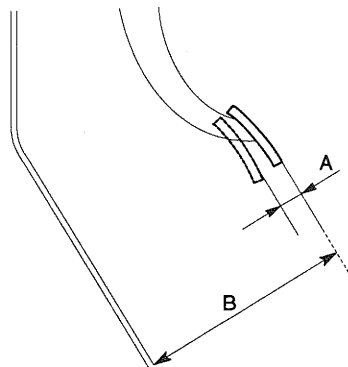


EOPG002G

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

Standard value

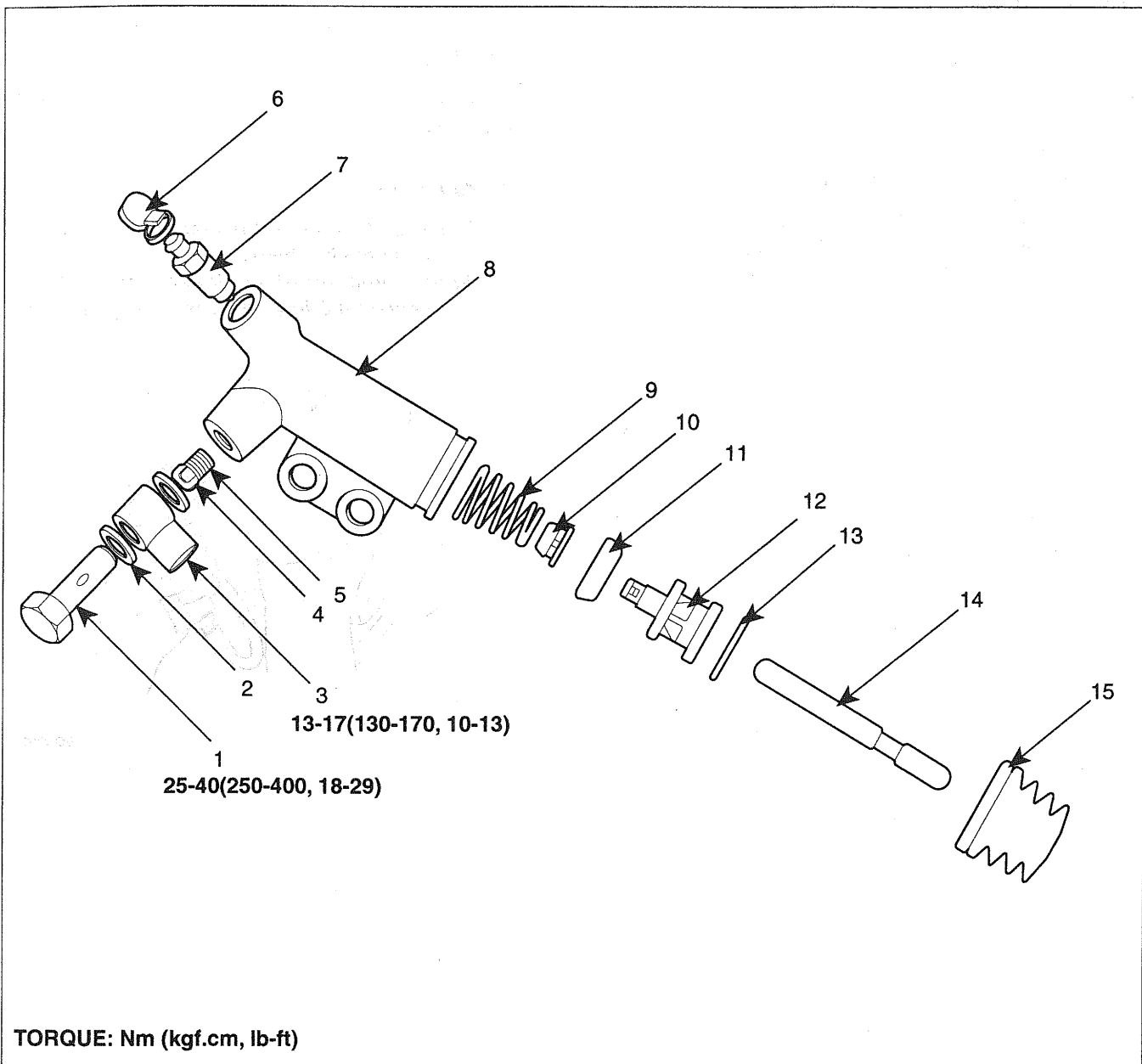
- (A) 6 ~ 12 mm (0.24 ~ 0.47 in)
 - (B) 160.7 mm (6.33 in)
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LOJF100B

CLUTCH RELEASE CYLINDER

COMPONENTS E9C5B469

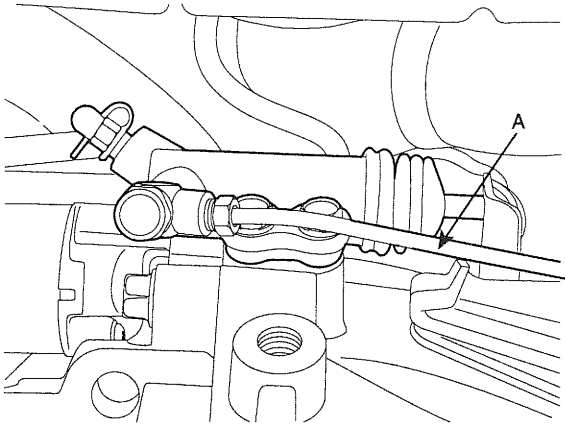


1. Union bolt
2. Gasket
3. Connector
4. Chock valve
5. Chock valve spring
6. Bleeder screw cap
7. Bleeder screw
8. Cylinder body

9. Return spring
10. Seat stopper
11. Cup
12. Piston
13. Retainer ring
14. Push rod
15. Boot

REMOVAL EEDC37D9

1. Disconnect the clutch tube(A).
2. Remove the clutch release cylinder mounting bolt.



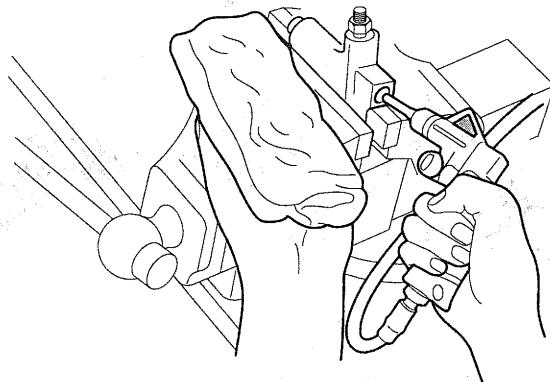
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DISASSEMBLY EC2216DA

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.

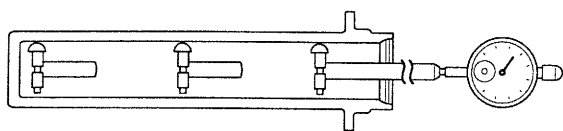


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INSPECTION

1. Check the clutch release cylinder for fluid leakage.
2. Check the clutch release cylinder boots for damage.
3. Check the release cylinder bore for rust and damage.
4. 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: 0.15 mm (0.006 in)



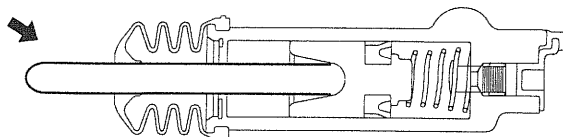
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INSTALLATION

ECE19DBD

1. Coat the push rod with specified grease.

Specified grease: CASMOLY L9508



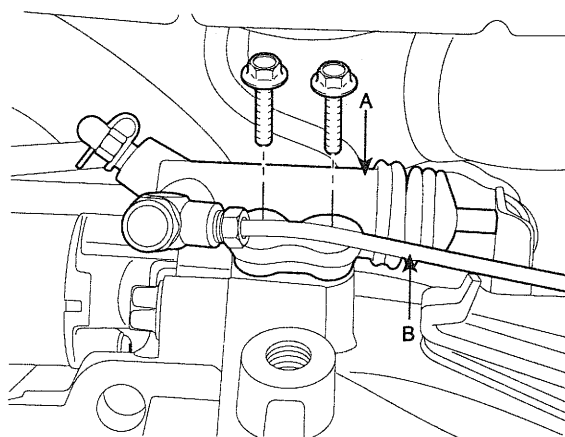
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2. Install the clutch release cylinder(A) and the clutch tube(B).

TORQUE

A : 25-40 Nm(250-400 kgf.cm, 18-29 lb-ft)

B : 13-17 Nm(130-170 kgf.cm, 10-13 lb-ft)



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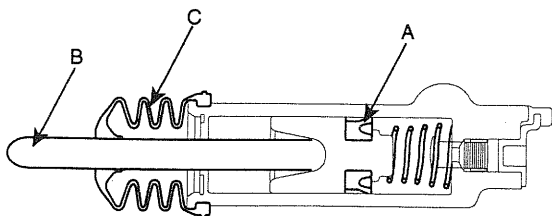
REASSEMBLY

E609CA09

1. 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), push rod(B) and boot(C).



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