

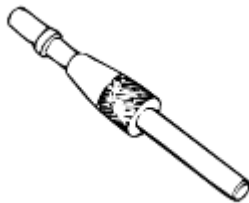
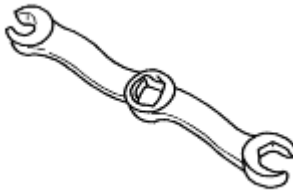




Clutch System

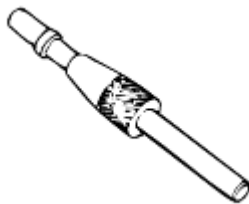
General Information

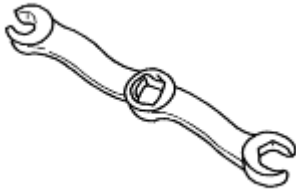

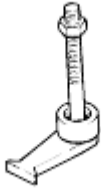


Special service tools

Tool (Number and Name)	Illustration	Use
OK130 160 010 Clutch Disc Centering Tool		Used to install clutch disc to the center of flywheel
OK130 430 019 Flare Nut Wrench		Used to remove clutch line
OK410 111 012 Bearing Puller		Used to remove pilot bearing in flywheel
OK590 111 001 Ring Gear Brake		Used to remove clutch cover and flywheel

Special service tools

Tool (Number and Name)	Illustration	Use
OK130 160 010 Clutch Disc Centering Tool		Used to install clutch disc to the center of flywheel

<p>OK130 430 019 Flare Nut Wrench</p>		<p>Used to remove clutch line</p>
<p>OK410 111 012 Bearing Puller</p>		<p>Used to remove pilot bearing in flywheel</p>
<p>OK590 111 001 Ring Gear Brake</p>		<p>Used to remove clutch cover and flywheel</p>



SYMPTOM-RELATED DIAGNOSTIC PROCEDURE

Problem	Possible Cause	Action
Clutch slips	Clutch disc facing worn excessively Clutch disc facing is oil contaminated Pressure plate damaged Diaphragm spring damaged or weakened Insufficient clutch pedal play Clutch pedal sticking Flywheel damaged	Replace Repair or replace Repair or replace Replace Adjust Repair or replace Repair or replace
Clutch does not disengage smoothly	Excessive runout or damaged clutch disc Clutch disc splines rusted or worn Oil on facing Diaphragm spring weakened Excessive clutch pedal play Insufficient clutch fluid Leakage of clutch fluid	Replace Remove rust or replace Repair or replace Replace Adjust Add fluid and check for leaks Locate and repair or replace
Clutch vibrates when accelerating	Oil on facing Torsion dampers weakened Clutch disc facing damaged Clutch disc facing rivets loose Pressure plate damaged or excessive runout Flywheel surface damaged Loose or worn engine mount	Repair or replace Replace Repair or replace Replace Replace Repair or replace Tighten or replace
Clutch pedal sticking	Pedal shaft not properly lubricated	Lubricate or replace
Abnormal noise from clutch	Clutch release bearing damaged Poor lubrication of release bearing sleeve Torsion dampers weakened Excessive crankshaft end play Pilot bearing worn or damaged Worn pivot point of release fork	Replace Lubricate or replace Replace Repair Replace Replace



SPECIFICATIONS

Item \ Engine		Diesel (J3 TCI)	Gasoline (GV6 DOHC)
Clutch control		Hydraulic	
Clutch cover	Type	Diaphragm Spring	
	Set load lb (kg)	7161 (730)	5592 (570)
Clutch disc	Outer diameter in(mm)	10.23 (260)	9.45 (240)
	Inner diameter in(mm)	6.69 (170)	6.30 (160)
	Thickness	Pressure plate side in(mm)	0.138 (3.5)
		Flywheel side in(mm)	0.138 (3.5)
Clutch pedal	Type	Suspended	
	Pedal ratio	6.6:1	
	Full stroke in(mm)	6.10 (155)	
Master cylinder inner diameter in(mm)		0.625 (15.87)	
Release cylinder inner diameter in(mm)		0.813 (20.64)	0.750 (19.05)
Hydraulic fluid		SAE J1703 or FMVSS 116 DOT-3 Brake Fluid	

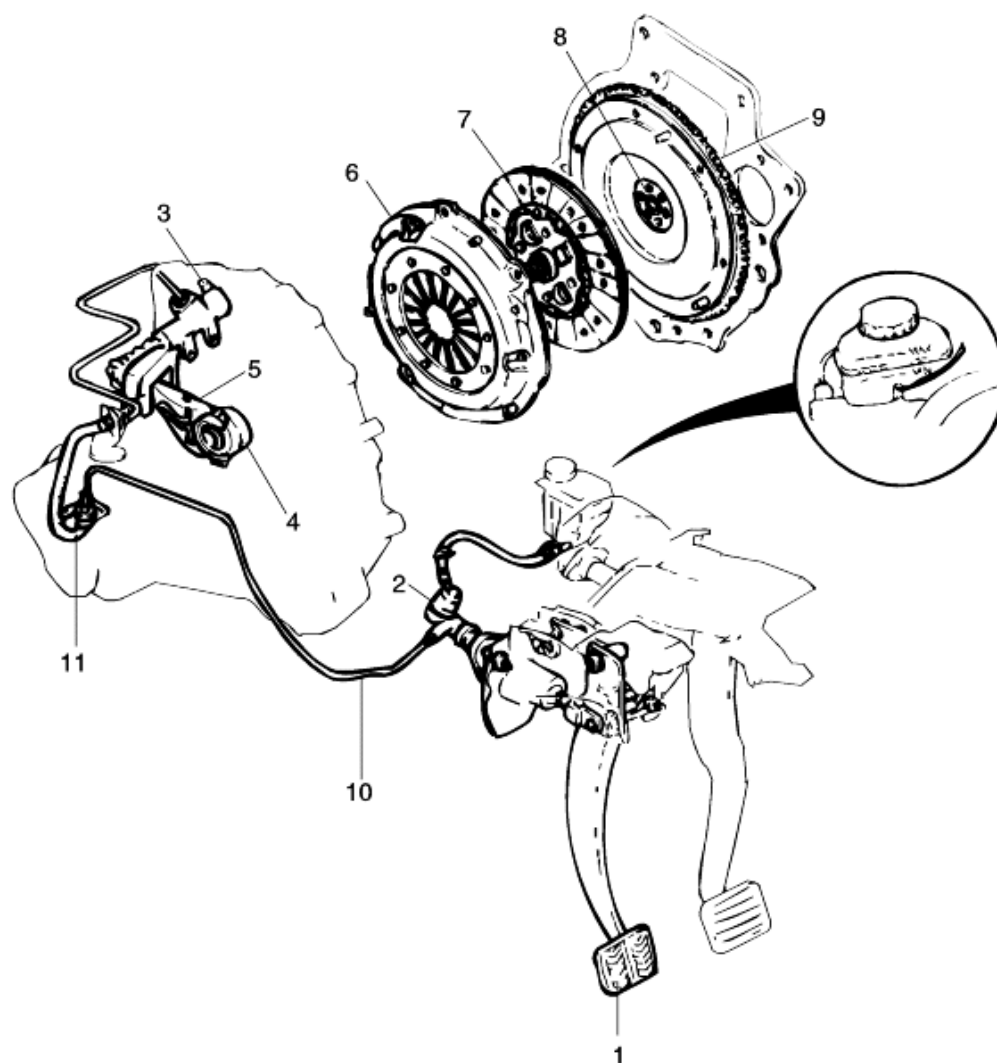


Clutch System

Clutch System



COMPONENTS



- 1. Clutch pedal
- 2. Clutch master cylinder
- 3. Clutch release cylinder
- 4. Release bearing

- 5. Clutch release fork
- 6. Clutch cover
- 7. Clutch disc
- 8. Pilot bearing

- 9. Flywheel
- 10. Clutch pipe
- 11. Flexible hose



Clutch System

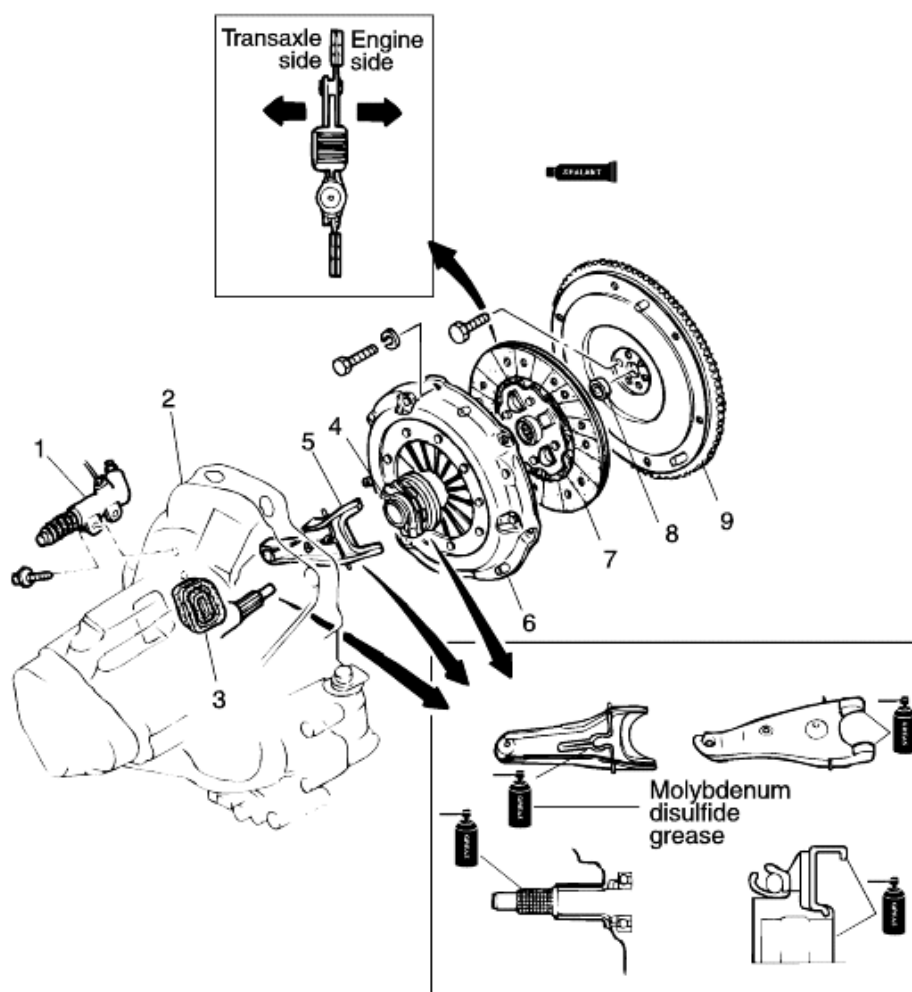
Clutch System - Clutch Cover and Dinode



COMPONENTS

NOTICE

- 1) Remove clutch release cylinder with clutch line connected.
- 2) Do not remove pilot bearing unless necessary.



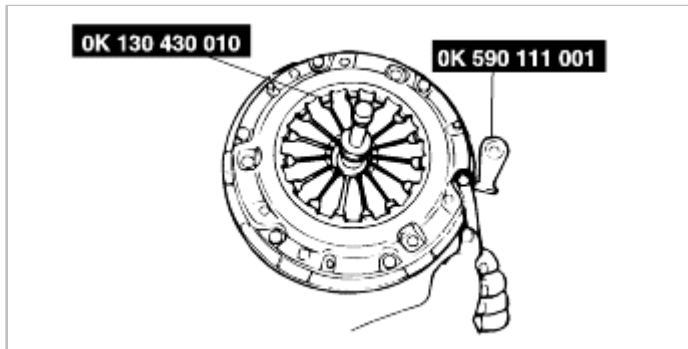
1. Clutch release cylinder
2. Transaxle housing
3. Boot
4. Release bearing
5. Clutch release fork

6. Clutch cover and pressure plate assembly
7. Clutch disc
8. Pilot bearing
9. Flywheel



REMOVAL

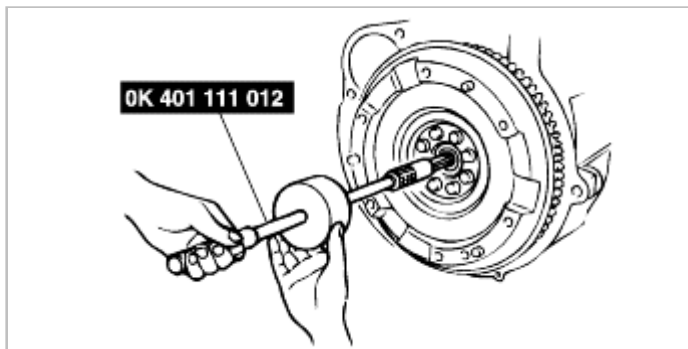
1. Remove transaxle and engine assembly.
(Refer to MT, manual transaxle)
2. Install **SST(0K130 430 010/0K590 111 001)**.
3. Loosen each bolt one turn at a time, in a crisscross pattern, until spring tension is released. Proceed to remove clutch cover assembly and disc.



NOTICE

Do not remove pilot bearing unless necessary.

4. , if necessary.

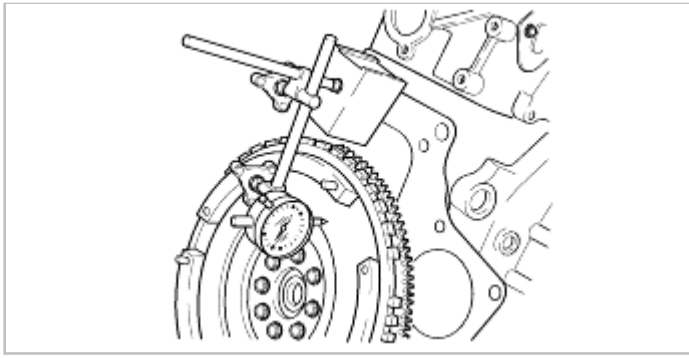


NOTICE

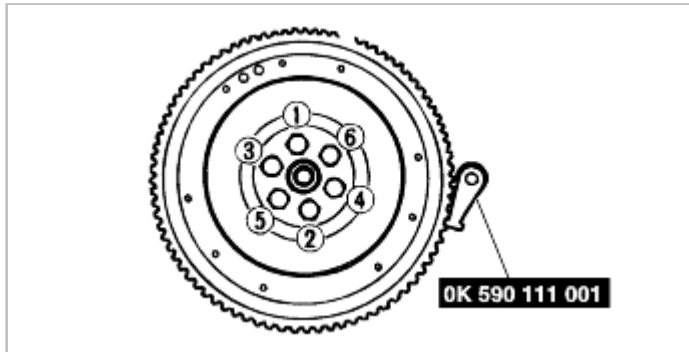
After removing flywheel, inspect for oil leakage past crankshaft rear oil seal. If necessary, replace oil seal (Refer to section EM, engine).

5. Measure flywheel runout with a dial indicator. Replace flywheel if runout is excessive.

Runout: 0.008 in (0.2 mm) maximum



6. .
7. Remove six bolts and then remove flywheel.



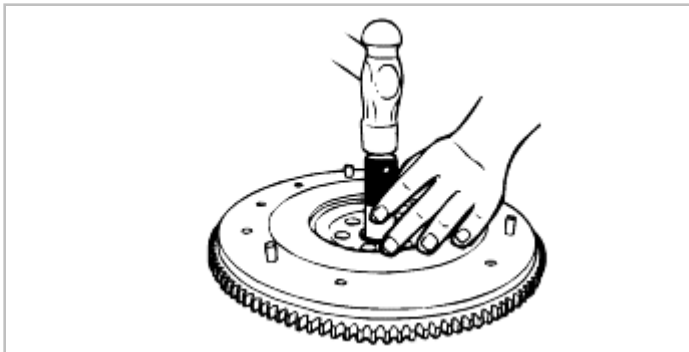
Replacement

NOTICE

Install pilot bearing flush with flywheel.

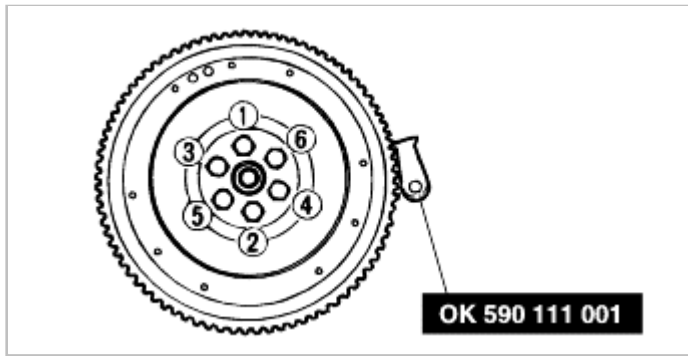
1. Install new bearing with a suitable tool.

Bearing outer diameter: 1.378 in (35 mm)



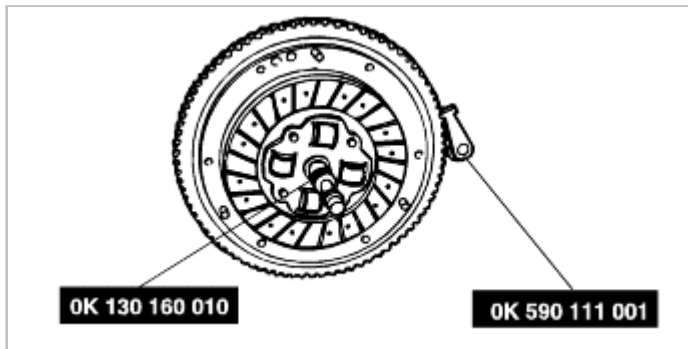
2. Wipe bolts clean and apply sealant to bolt threads.
3. .
4. Tighten bolts in pattern shown below.

Tightening torque:
70.8~75.9 lb·ft (96.1~103.0 N·m, 9.8~10.5 kg·m)



5. Clean clutch disc internal splines; then apply a thin coat of molybdenum disulfide grease to the splines.

6. .

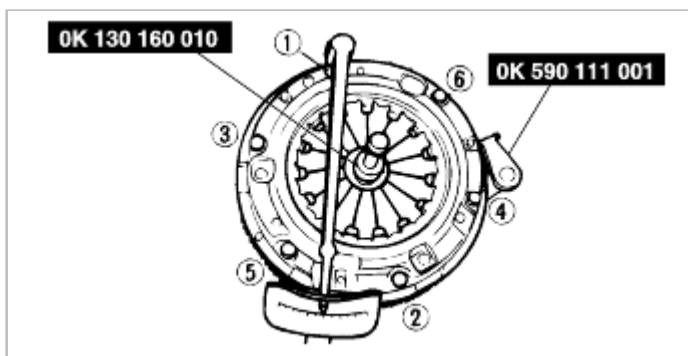


7. Align dowel holes of clutch cover assembly with flywheel dowels.

8. Tighten bolts evenly and gradually in pattern shown below.

Tightening torque:

13.0~19.5 lb·ft (17.6~26.5 N·m, 1.8~2.7 kg·m)



9. Install transaxle assembly.

(Refer to section MT, manual transaxle)

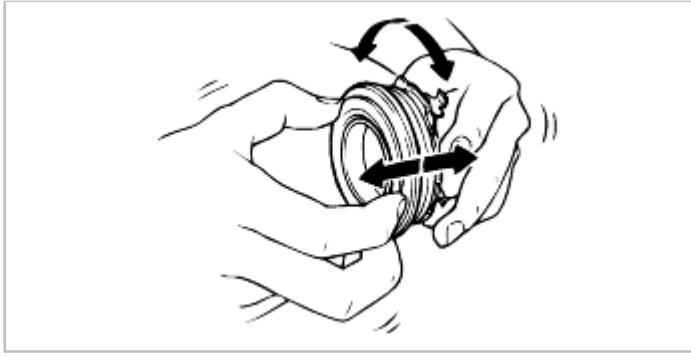
INSPECTION

Release bearing

NOTICE

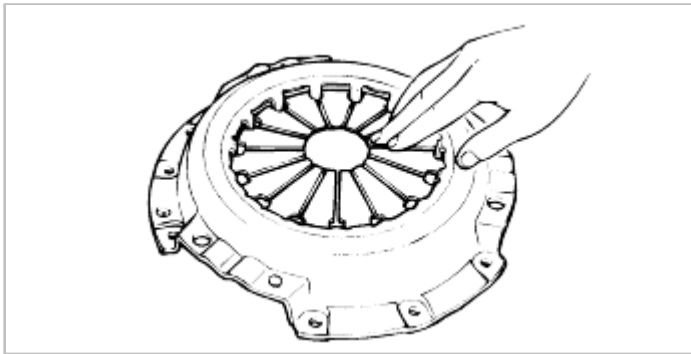
The clutch release bearing is sealed, and should not be washed in solvent.

1. Turn bearing while applying force in axial direction.
If bearing sticks or has excessive resistance, replace it.



Clutch cover

1. Inspect contact surface of pressure plate for scoring, cracks, and burning. Resurface or replace as necessary.
2. Inspect release bearing contact surface (on the diaphragm spring fingers) for wear and cracks. If there is wear or cracks on diaphragm fingers, replace clutch cover assembly.

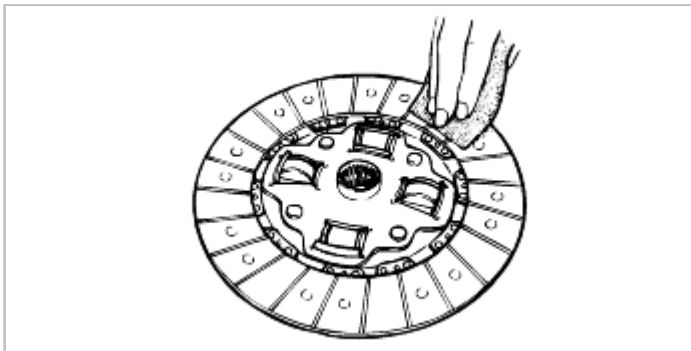


Clutch disc

NOTICE

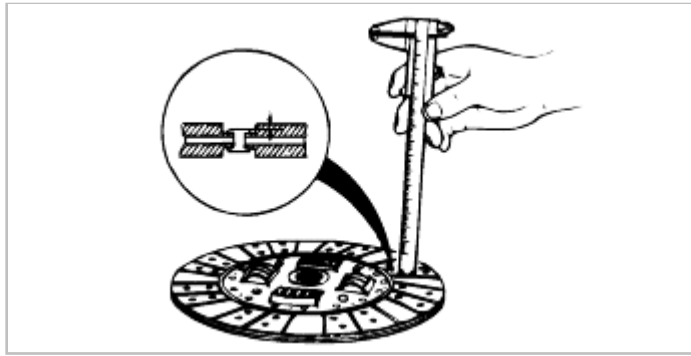
Use sandpaper if the trouble is minor.

1. Inspect lining surface for burning oil contamination or other damage. Replace clutch disc if it is burned, oil soaked or other damaged.
2. Inspect for loose clutch facing rivets and damaged torsional dampers. Replace clutch disc if either is faulty.



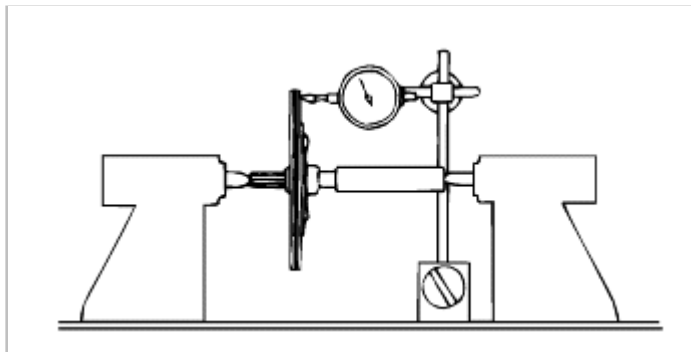
3. Measure depth of lining from clutch face to head of a rivet with calipers. Replace clutch disc if thickness on either side is less than minimum.

Thickness: 0.012 in (0.3 mm) minimum



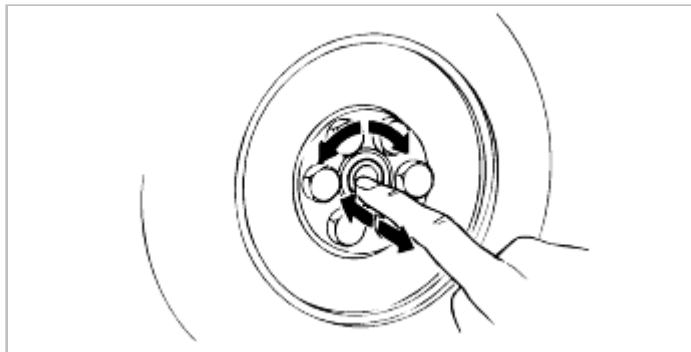
4. Measure clutch disc runout with a dial indicator.
Replace clutch disc if runout is excessive.

Runout: 0.027 in (0.7 mm) maximum



Pilot bearing

1. Turn bearing while applying force in axial direction. If bearing sticks or has excessive resistance, replace it.

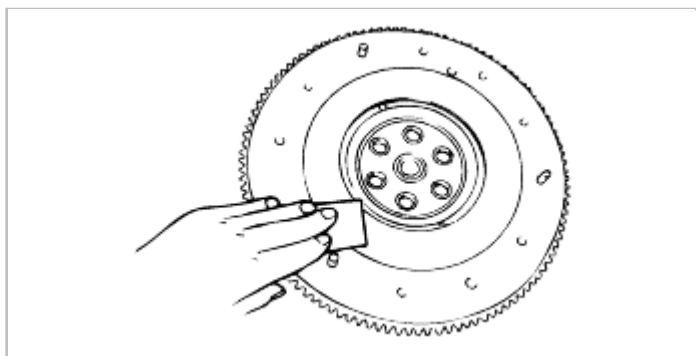


Flywheel

NOTICE

Minor scoring or burning should be removed with emery cloth.

1. Inspect contact surface of flywheel for scoring, cracks, and burning; resurface or replace as necessary.



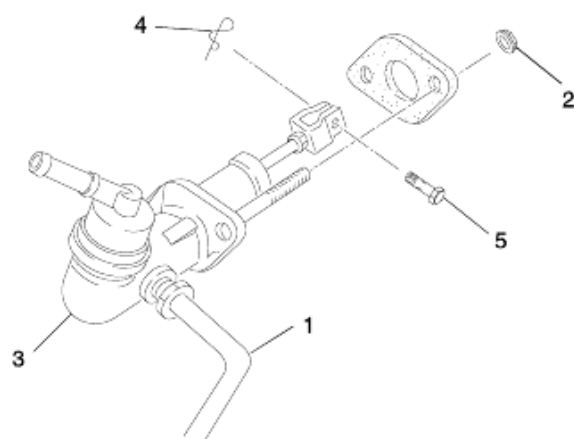
2. Inspect starter ring gear teeth for wear or damage.
If necessary, replace ring gear.

Clutch System

Clutch System - Clutch Master Cylinder



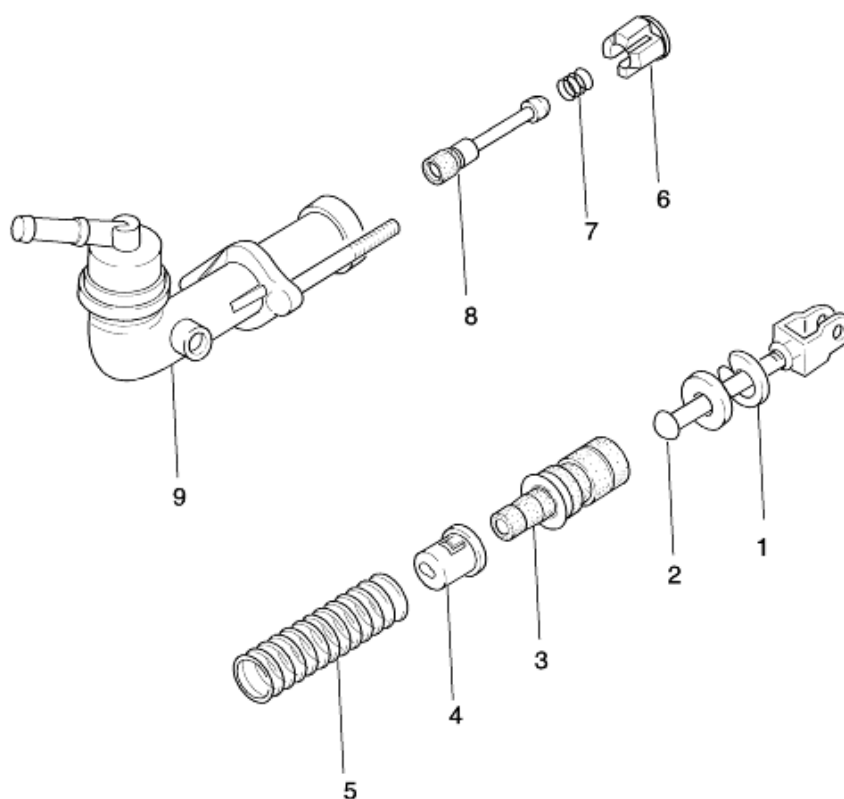
COMPONENTS



- 1. Clutch hydraulic line
- 2. Nut
- 3. Master cylinder

- 4. Snap pin
- 5. Joint pin

COMPONENTS(CONTINUED)



- 1. Snap ring (replace)
- 2. Push rod
- 3. Piston
- 4. Piston stopper (replace)

- 5. Spring
- 6. Valve stopper
- 7. Spring
- 8. Valve assembly
- 9. Body



REMOVAL

1. Remove spring clip and pin from master cylinder push rod.
2. Remove master cylinder mounting nuts.

NOTICE

Clutch brake fluid will damage painted surfaces so use a container or shop towels for fluid collection. If fluid gets on a painted surface, rinse immediately with clear water to prevent damage.

3. Disconnect clutch master cylinder hose.
4. .
5. Remove clutch master cylinder.



REPLACEMENT

1. Install clutch master cylinder.
2. Tighten master cylinder mounting nuts.
3. Insert spring clip and pin into master cylinder push rod.
4. .

Tightening torque:

9.4~15.9 lb·ft (12.7~21.5 N·m, 1.3~2.2 kg·m)

5. Connect clutch master cylinder hose.



6. Perform clutch hydraulic line bleeding. (Refer to hydraulic line bleeding)
7. Verify that there is no leakage.
8. Perform a road test.

DISASSEMBLY

NOTICE

Do not damage push rod contact surface of piston.

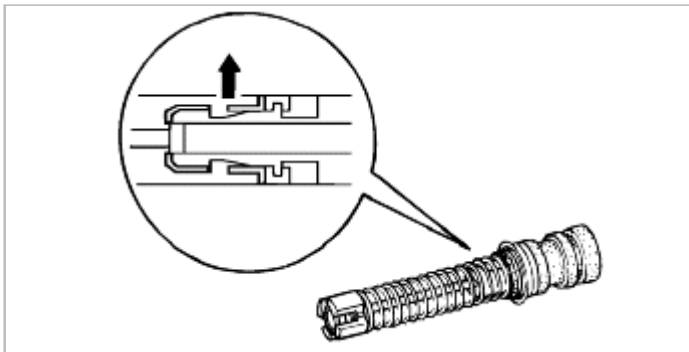
1. Press push rod down and remove internal snap ring with snap ring pliers.
2. Remove push rod, piston assembly, piston stopper, spring, valve stopper, spring and valve assembly.



CAUTION

Hold piston assembly to prevent it from flying apart.

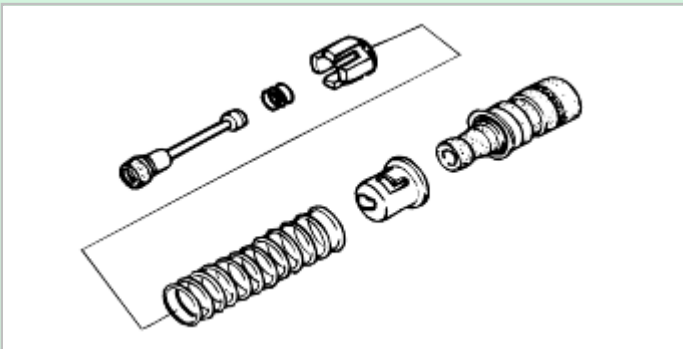
3. Release returning tabs of piston stopper with a suitable tool.



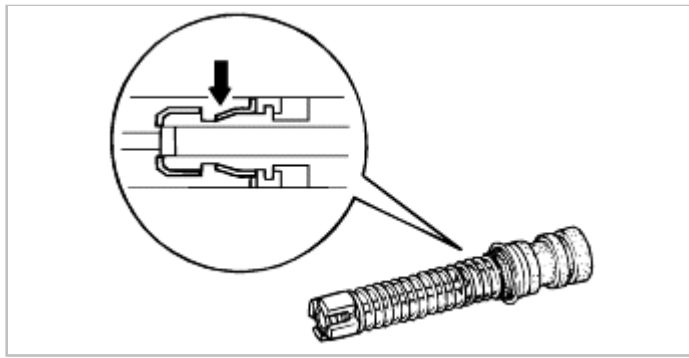
RE-ASSEMBLY

NOTICE

- 1) Clean disassembled parts in solvent and blow through all parts and passages with compressed air.
- 2) Do not mix different brands of clutch fluid.
- 3) Apply specified clutch fluid to part of piston assembly and cylinder bore before assembly.
- 4) Replace parts with new ones whenever directed to do so.



1. Depress retaining tabs.



NOTICE

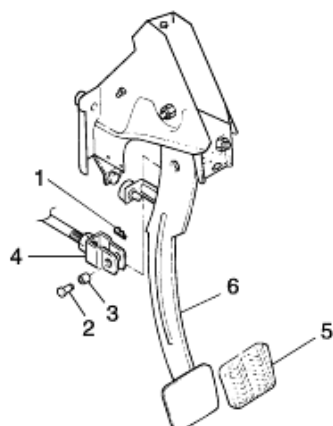
Do not damage push rod contact surface of piston.

2. Install valve assembly to master cylinder body.
3. Install snap ring while pushing in push rod.



Clutch System

Clutch System - Clutch Pedal

**COMPONENTS**

1. Snap pin

2. Joint pin

3. Bushing

4. Push rod

5. Clutch pedal pad

6. Clutch pedal



REMOVAL/REPLACEMENT

1. Remove parts in order shown in figure below.
2. Inspect all parts and repair or replace as necessary.

NOTICE

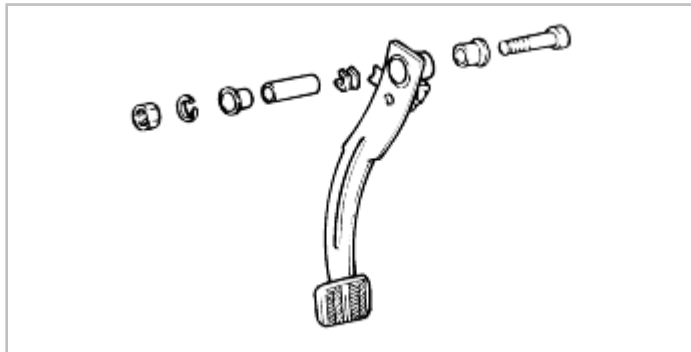
Apply a thin coat of lithium grease to bushing and pins before installation.

3. Apply a thin coat of lithium grease to bushing and pins before installation.

INSPECTION

Check the following parts, replace if necessary.

1. Worn or damaged bushings.
2. Twisted or bent clutch pedal.
3. Worn or damaged pedal pad.
4. Weakened assist spring.



Clutch System

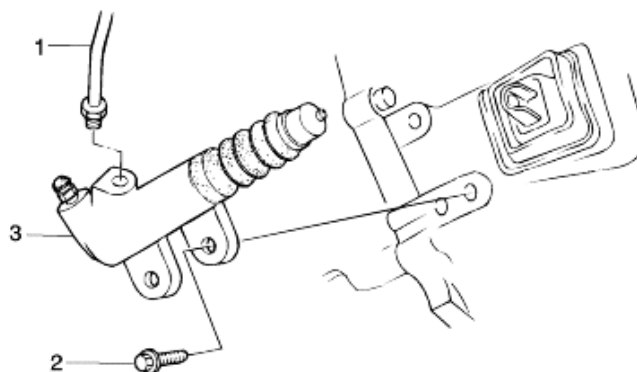
Clutch System - Clutch Release Cylinder



COMPONENTS

NOTICE

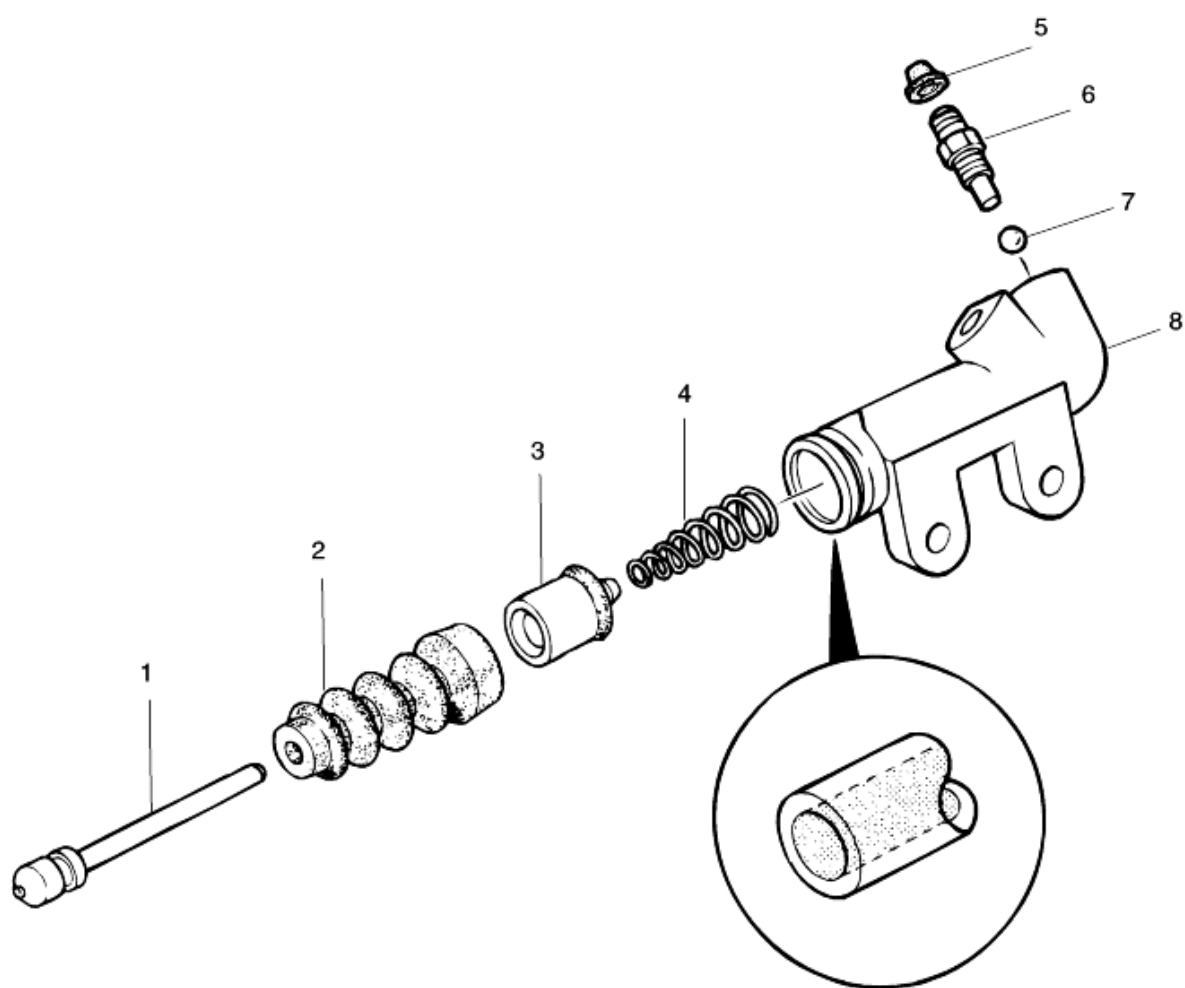
- 1) Clutch fluid will damage painted surfaces. Be sure to use a container or shop towels to collect it.
- 2) If fluid contacts a painted surface, rinse immediately with clear water to prevent damage.



1. Clutch hydraulic line
2. Bolt

3. Clutch release cylinder

COMPONENTS



- 1. Push rod
- 2. Clutch release cylinder boot
- 3. Clutch release cylinder piston
- 4. Spring

- 5. Bleeder screw cap
- 6. Bleeder screw
- 7. Steel ball
- 8. Clutch release cylinder body

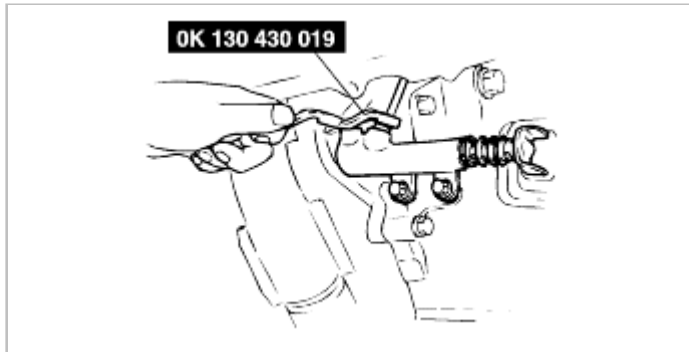


REMOVAL

CAUTION

After removing the clutch line, plug the clutch line to avoid fluid leakage.

1. Raise and properly support vehicle.
2. .
3. Remove two release cylinder bolts then remove release cylinder.



REPLACEMENT

1. Install clutch release cylinder.
2. Tighten two release cylinder bolts.

Tightening torque:

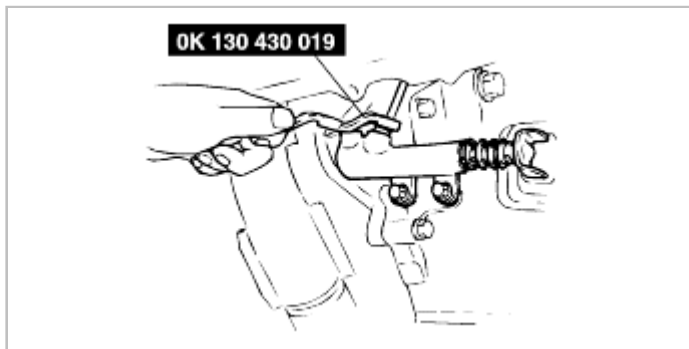
11.5~16.6 lb·ft (15.6~22.5 N·m, 1.6~2.3 kg·m)

3. .

Tightening torque:

9.4~15.9 lb·ft (12.7~21.5 N·m, 1.3~2.2 kg·m)

4. After installation, bleed the clutch system.
(Refer to hydraulic line bleeding)
5. Verify that there is no leakage.



6. Perform a road test.

DISASSEMBLY

1. Remove clutch cylinder boot and push rod.

2. Remove piston and cup assembly by applying compressed air through the clutch hydraulic line installation hole.

CAUTION

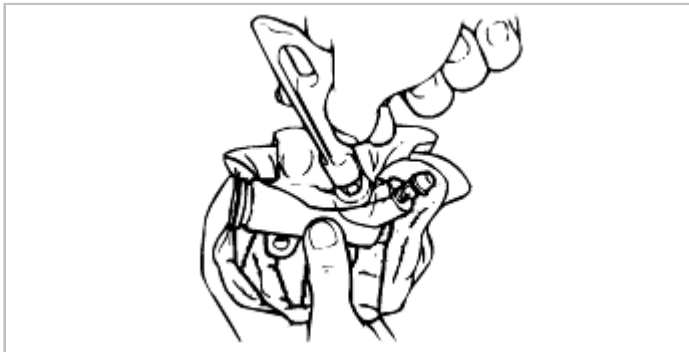
Hold a rag over the opening of release cylinder piston bore to prevent piston assembly from flying out.

RE-ASSEMBLY

NOTICE

- 1) Clean disassembled parts in solvent and blow through all parts and passages with compressed air.
- 2) Before assembly, make sure all parts are completely clean.
- 3) Apply specified clutch fluid to piston and cup assembly and cylinder bore before assembly.

1. Install spring, cylinder piston and clutch cylinder boot in release cylinder body bore.
2. Install push rod.



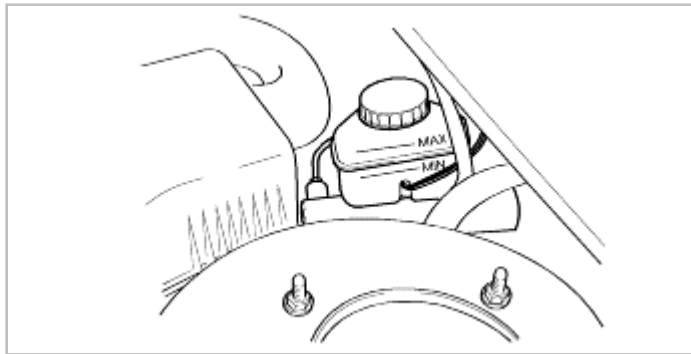


SERVICE ADJUSTMENT PROCEDURE

FLUID LEVEL

1. Clean the area around the reservoir and reservoir cap.
2. Check the fluid level. If the level is near or below the "MIN" mark, add brake fluid to the "MAX" mark.

Fluid specification:
DOT-3 (FMVSS 116, or SAE J1703)

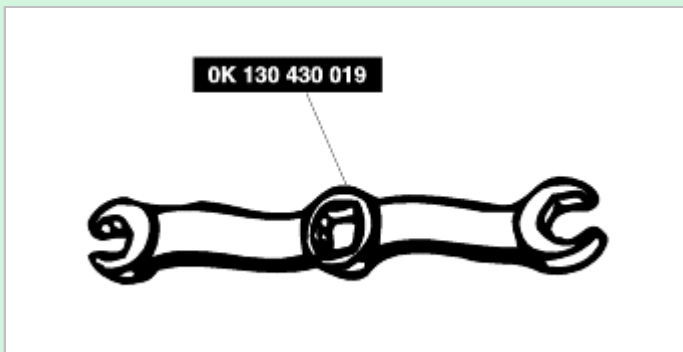


HYDRAULIC FLUID BLEEDING

The clutch hydraulic system must be bled to remove air when ever the lines are disconnected.

NOTICE

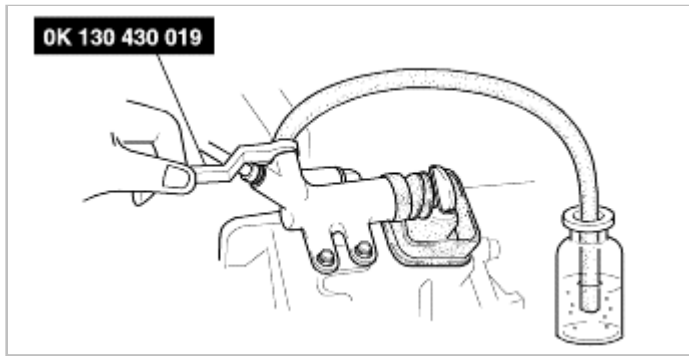
- 1) The fluid in the brake reserve tank must be maintained at the 3/4 level or higher during air bleeding.
- 2) Use only the specified fluid type.



- 3) Be careful not to spill clutch brake fluid onto a painted surface.

1. Raise vehicle and support it with safety stands.
2. Remove bleeder screw cap and attach a hose to bleeder screw.
3. Place the other end of hose in a glass container of sufficient capacity.
4. Slowly pump clutch pedal several times.
5. While clutch pedal is depressed, loosen bleeder screw and let fluid and air escape.
6. Close bleeder screw before raising clutch pedal.
7. Repeat steps 4 through 5 until no more air bubbles are in the escaping fluid.

Tightening torque:
52.0~78.1 lb·in (5.8~8.8 N·m, 60~90 kg·cm)



8. Check for correct clutch operation.
9. Install bleeder cap.
10. Lower vehicle.

Clutch pedal adjustment

Clutch pedal height

Inspection

1. Measure distance from front surface of pedal to vehicle carpet.

Pedal height:

7.16~7.40 in (182~188 mm)

2. If necessary, adjust pedal height.

Adjustment

1. Loosen locknut ⑤ and turn adjust bolt ③ until height is correct.
2. Tighten locknut ⑤.

Tightening torque:

10.1~13.0 lb·ft (13.7~17.6 N·m, 1.4~1.8 kg·m)

3. After adjustment, measure pedal free play.

Clutch pedal free play

Inspection

1. Lightly depress clutch pedal by hand until clutch resistance is felt.
2. If necessary, adjust pedal free play.

Total pedal free play: 0.29~0.55 in (7.3~13.9 mm)

Adjustment

1. Loosen locknut ⑥ and turn push rod ④ until pedal free play is correct.
2. Check that the minimum clutch pedal reserve (from front surface of pedal to carpet) is met when pedal is fully depressed.

Minimum clutch pedal reserve: 2.0 in (51 mm)

3. Tighten locknut ⑥.

Tightening torque:

8.6~12.2 lb·ft (11.7~16.6 N·m, 1.2~1.7 kg·m)

4. After adjustment, inspect pedal height.

