

SECTION 5C

CLUTCH

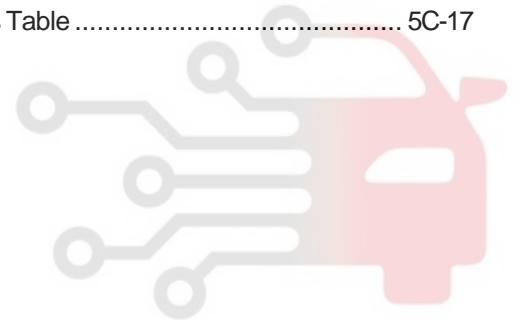
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دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



GENERAL DESCRIPTION AND OPERATION

GENERAL DESCRIPTION

Driving members

The driving members consist of two flat surfaces machined to a smooth finish. One of these is the rear face of the engine flywheel and the other is the pressure plate. The pressure plate is fitted into a steel cover, which is bolted to the flywheel.

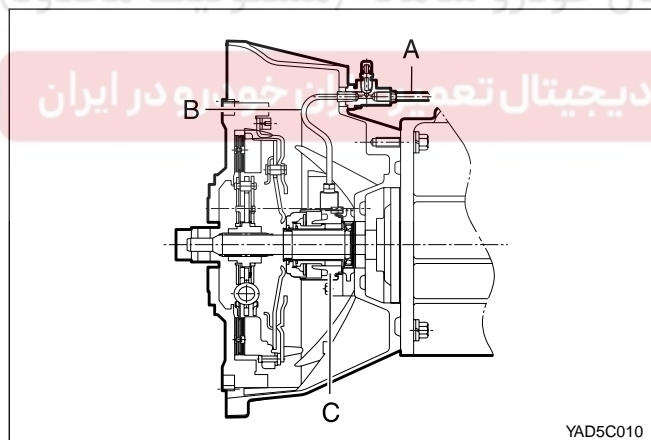
Driven members

The driven member is the clutch disc with a splined hub which is free to slide lengthwise along the splines of the input shaft, but which drives the input shaft through these same splines.

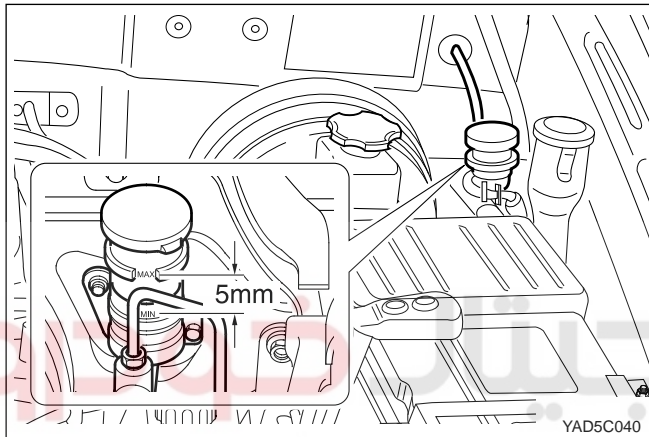
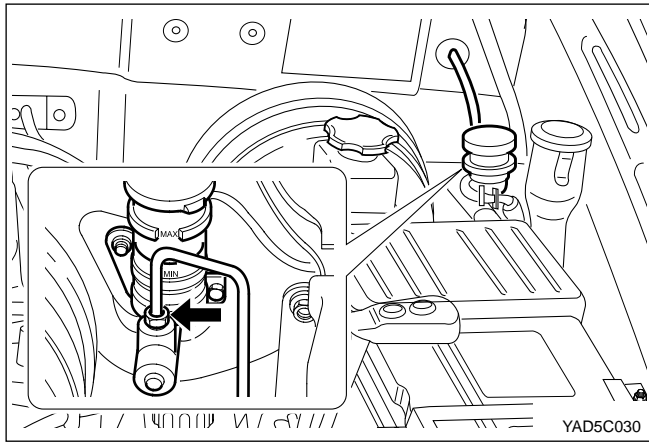
The driving and driven members are held in contact by spring pressure. This pressure is exerted by a diaphragm spring in the pressure plate assembly.

Operating members

The clutch release system consists of the clutch pedal, the clutch release shaft, the clutch cable, the release arm and the release bearing. When pressure is applied to the clutch pedal, the clutch release shaft pushes against the release bearing by rotating. The bearing then pushes against the diaphragm spring in the pressure plate assembly, thereby releasing the clutch.



- A. Clutch Release Cylinder Pipe (W/ transmission case)
- B. Clutch Release Cylinder Pipe (W/ transmission case)
- C. Concentric Slave Cylinder



BLEEDING OF CLUTCH SYSTEM

Notice: Keep the fluid level over MAX in reservoir during bleeding operation.

Do not let fluid contact a painted surface.

1. Remove the air bolt cap of the release cylinder. Connect a vinyl tube to the bolt.
2. Insert the other end of the tube in a vacant container.
3. Slowly depress the clutch pedal several times.
4. With clutch pedal fully depressed, open the air bolt and release air and fluid in the fluid line,
5. Repeat this procedure until there are no more air bubbles in the fluid flows.



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SPECIFICATIONS

Type		Hydraulic	
Clutch Pedal	Type	Suspended	
	Max. Pedal Stroke	DSL	148 mm
		GSL	150 mm
	Pedal Free Play	5 - 10 mm	
Clutch Disc	Type	Single Dry Diaphragm	
	Facing O.D. × I.D. × Thickness	240 × 155 mm	
	Facing and Quantity	22 cm² × 1	
	Thickness of Disc	Free	9.85 - 10.2 mm
		With Load	9.2 mm
Clutch Cover Assembly Setting Weight		610 kg	
Clutch Master Cylinder	Stroke	28.4 mm	
	Inner Diameter	Ø15.87 mm	
Clutch Fluid		DOT3 or DOT4	

دیجیتال خودرو

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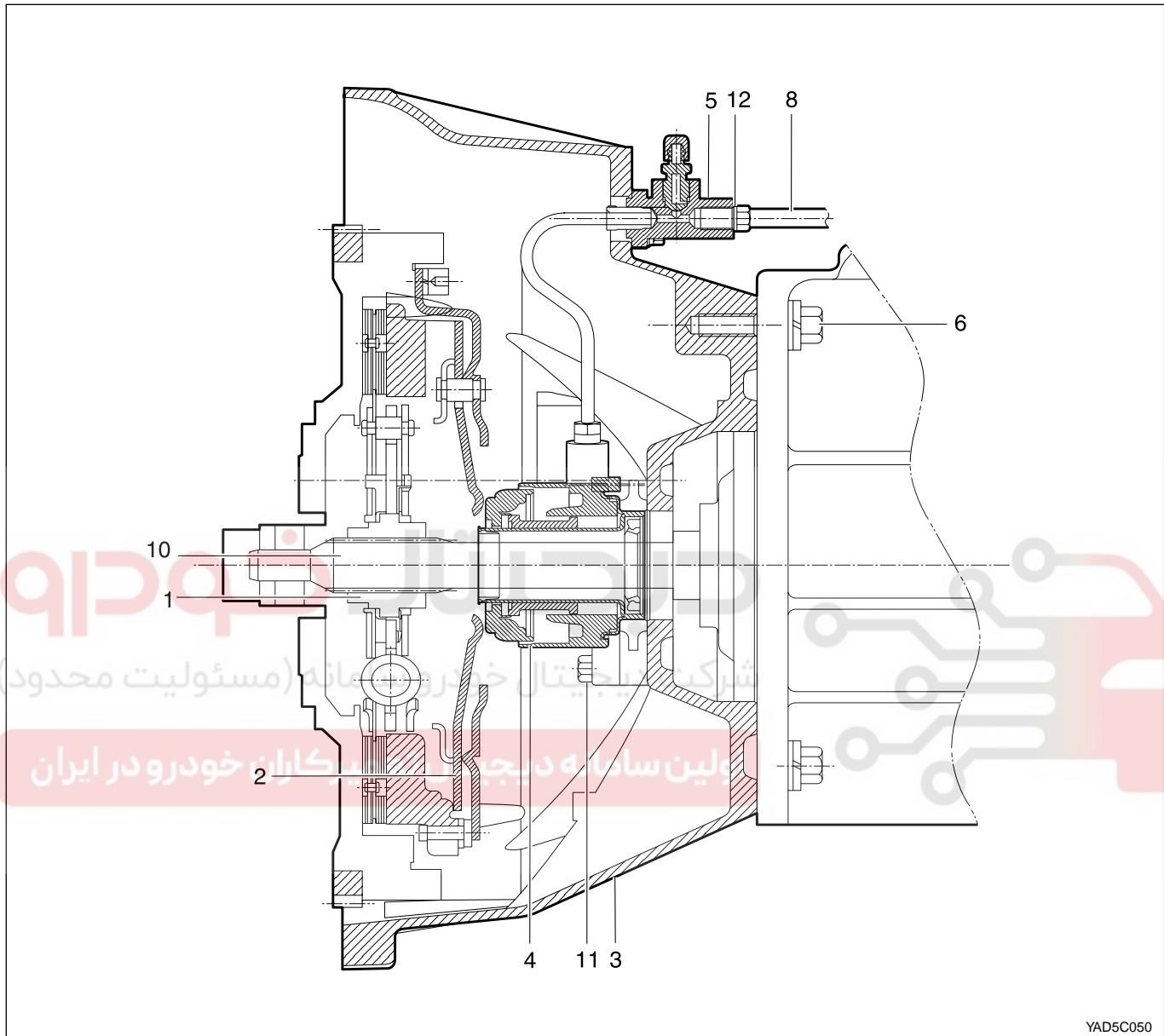


DIAGNOSTIC INFORMATION AND PROCEDURES

Check		Possible Cause	Action
Clutch slips		Excessive Wear of Facing	Replace
		Hard or Oily Facing	Repair or Replace
		Damaged Pressure Plate or Flywheel	Replace
		Damaged or Burnt Diaphragm Spring	Replace
		Clutch Pedal Free play Insufficient	Adjust
		Faulty Operation of Clutch Pedal	Repair or Replace
		Worn or Damaged Clutch Disc	Replace
Poor disengagement		Vibration or Excessive Run-out of Disc	Replace
		Rust or Wear of Disc Spline	Repair or Replace
		Oily Facing	Repair or Replace
		Damaged Diaphragm Spring	Replace
		Excessive Clutch Pedal Free play	Adjust
Hard to shift or will not shift		Excessive Clutch Pedal Free play	Adjust Pedal Freeplay
		Faulty Clutch Release Cylinder	Repair Release Cylinder
		Worn Disc, Excessive Run-out, Damaged Lining	Repair or Replace
		Dirty or Burred Splines on Input Shaft or Clutch Disc	Repair as Necessary
		Damaged Clutch Pressure Plate	Replace
Clutch chatters when starting		Oily Facing	Repair or Replace
		Hard or Faulty Facing	Replace
		Burnt Torsion Spring	Replace
		Faulty Pressure Plate	Replace
		Bent Clutch Diaphragm Spring	Replace
		Hard or Bent Flywheel	Repair or Replace
		Engine Mounts Loose or Burnt Lever	Tighten or Replace
Difficult pedal operation		Poor Lubrication on Clutch Cable	Lubricate or Replace
		Poor Lubrication on Pedal Shaft	Lubricate or Replace
		Poor Lubrication on Clutch Pedal	Repair
Clutch Noisy	Not Using the Clutch	Insufficient Clutch Pedal Free play	Adjust
		Excessive Wear of Facing	Replace
	After Disengagement	Worn or Damaged Release Bearing	Replace
		Poor Lubrication Contact Surface of Bearing	Replace
	When Disengaging	Faulty Installation of Clutch Assembly or Bearing	Repair
	Clutch Pedal is Partially Depressed and Vehicle Speed is Reduced	Damaged Pilot Bushing	Replace

COMPONENT LOCATOR

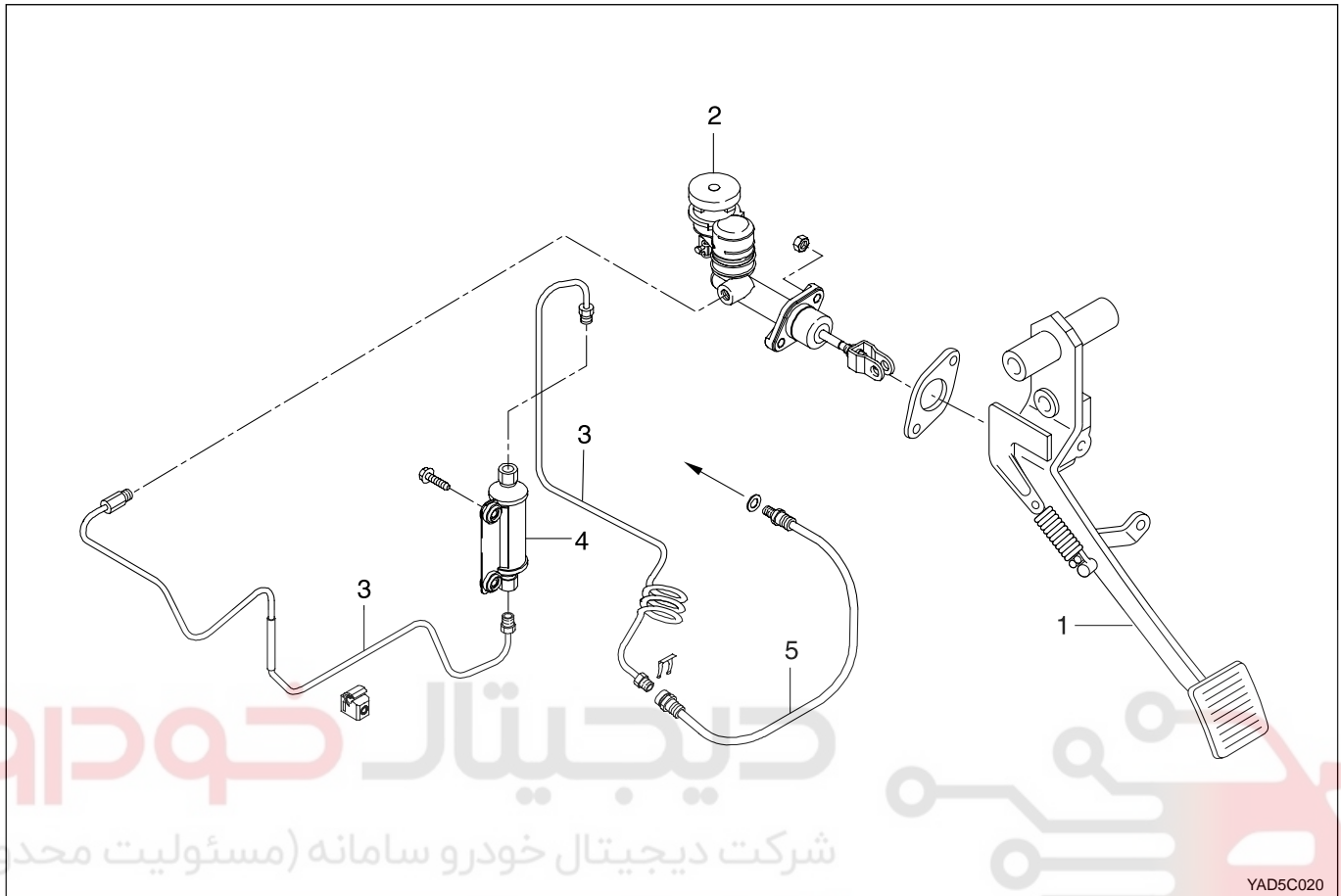
CROSS SECTIONAL VIEW



- 1 Clutch Disc
- 2 Clutch Cover
- 3 Clutch Housing
- 4 Concentric Slave Cylinder
- 5 Adapter
- 6 Bolt

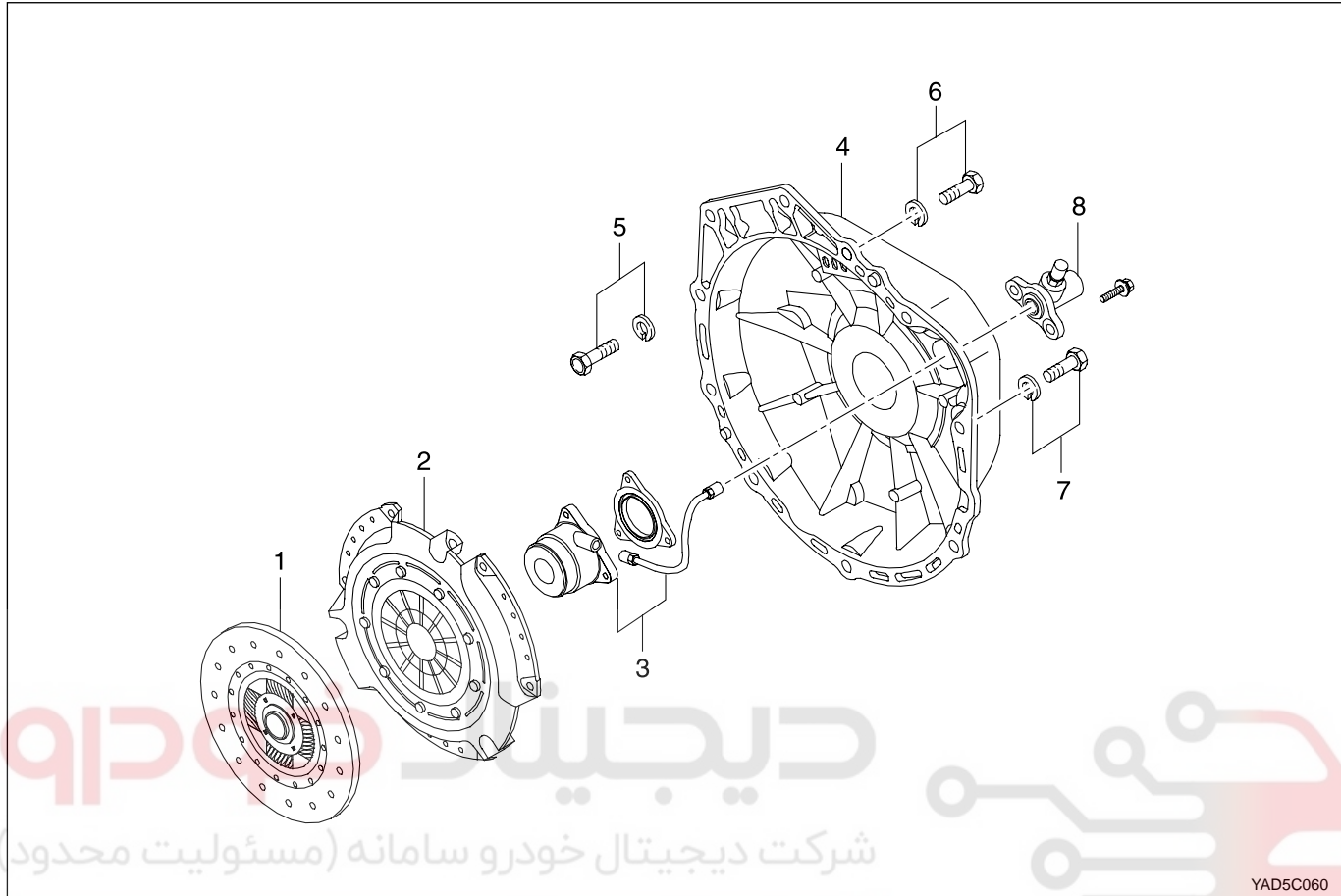
- 7 Bolt
- 8 Hose
- 9 Spring Lock Washer
- 10 Transmission Input Spline
- 11 Bolt
- 12 Gasket

CLUTCH HYDRAULIC LINES



- | | |
|--------------------------|-------------------------|
| 1 Clutch Pedal | 4 Clutch Oil Chamber |
| 2 Clutch Master Cylinder | 5 Clutch Hydraulic Hose |
| 3 Clutch Hydraulic Line | |

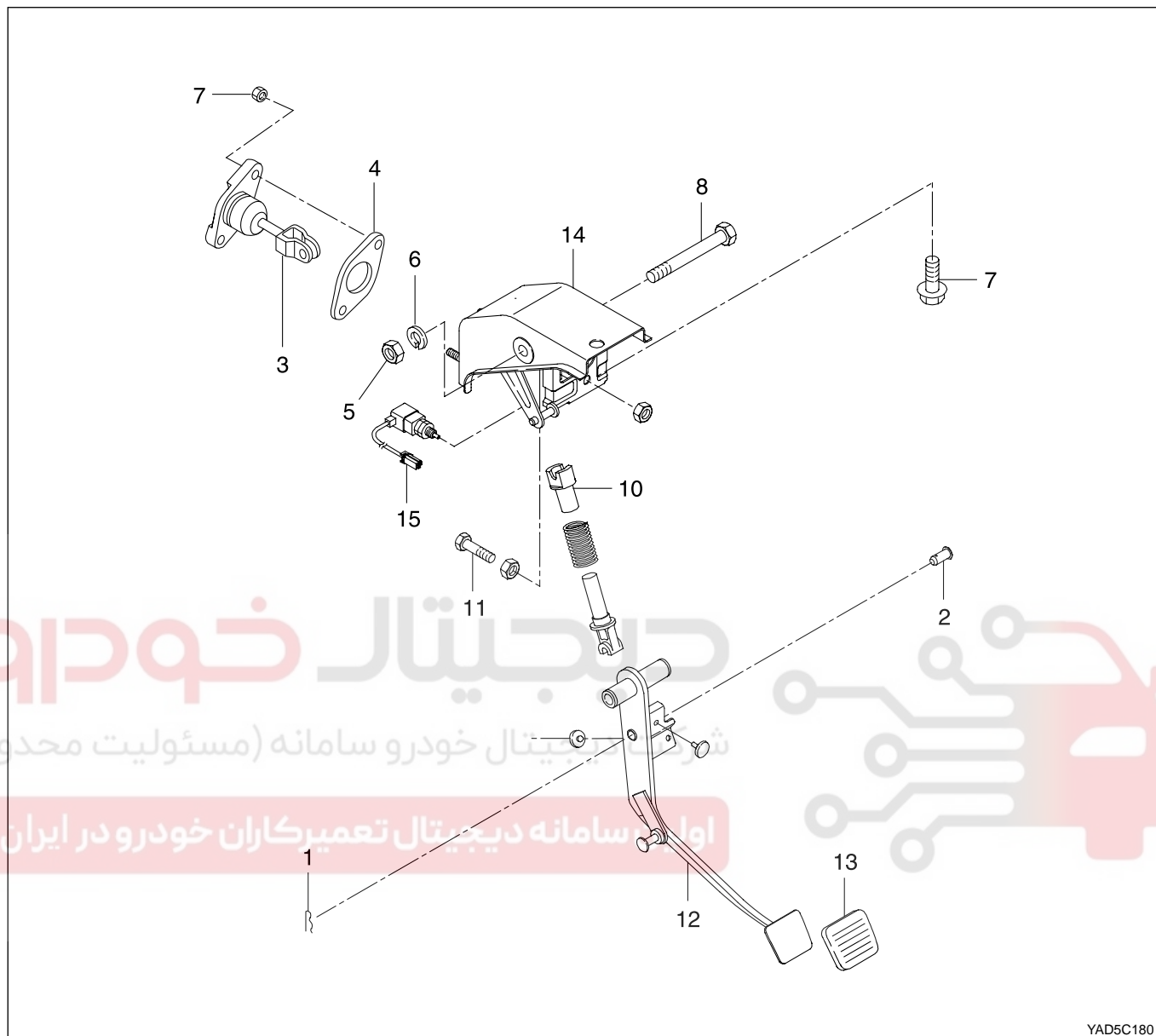
CLUTCH DISC ASSEMBLY



YAD5C060

- | | |
|-----------------------------|---|
| 1 Clutch Disc | 5 Bolt and Washer 35 N•m (26 lb-ft) |
| 2 Clutch Cover | 6 Bolt and Washer 47 N•m (35 lb-ft) |
| 3 Concentric Slave Cylinder | 7 Bolt and Washer 47 N•m (35 lb-ft) |
| 4 Clutch Housing | 8 Adapter |

CLUTCH PEDAL ASSEMBLY



YAD5C180

- | | |
|-------------------------------------|---|
| 1 Snap Pin..... Replace | 9 Turn Over Spring Apply Grease |
| 2 Clevis Pin Apply Grease | 10 Bushing Replace, Apply Grease |
| 3 Master Cylinder Push Rod | 11 Full Stroke Stopper Contact Pad |
| 4 Gasket | 12 Interlock Switch Stopper Pad |
| 5 Nut 16-22 N•m (12-16 lb-ft) | 13 Clutch Pedal |
| 6 Spring washer | 14 Pedal Pad |
| 7 Nut 8-18 N•m | 15 Pedal Mounting Bracket |
| 8 Fulcrum Pin | 16 Stopper Bolt 16-22 N•m (12-16 lb-ft) |

Notice: Assembly should follow the disassembly procedure in the reverse order.

- Grease specification : Long - term grease (T/Mn DBL6611.00)

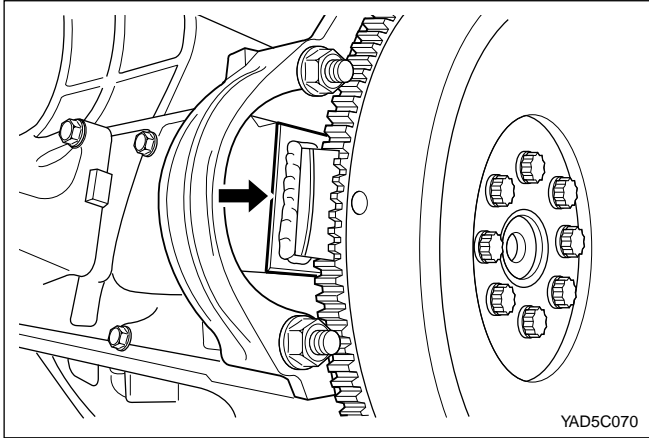
MAINTENANCE AND REPAIR

ON-VEHICLE SERVICE

CLUTCH DISC

Removal & Installation Procedure

1. Remove the starter motor. Install the special tool to the flywheel through the starter motor mounting holes.



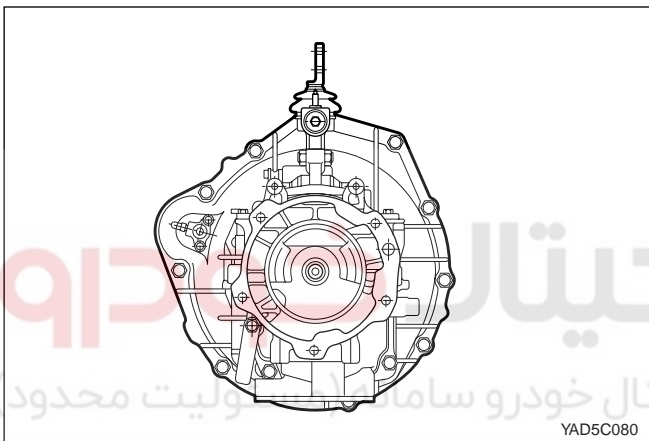
2. Unscrew the release cylinder mounting bolts and remove the release cylinder.

Installation Notice

Tightening Torque

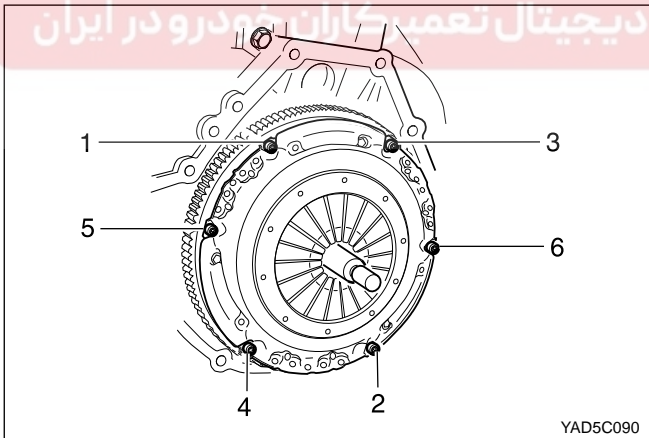
30 - 40 N•m
(22 - 30 lb-ft)

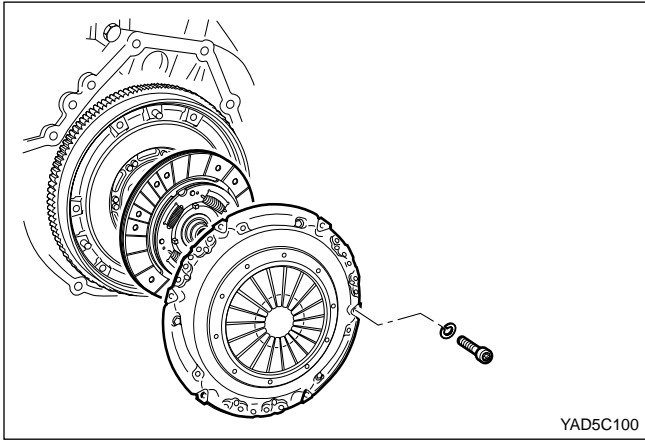
Notice: When the clutch housing and the transmission is removed, it may be possible any damage in the concentric slave cylinder.



3. Unscrew the clutch housing bolts and remove the clutch housing, release fork and release bearing. Insert the centering pin into the clutch spline. Loosen the clutch cover bolts 1/2 turn in crisscross sequence until the spring tension is released.

Notice: Do not remove the bolts at a time, or clutch cover can be damaged or deformed.



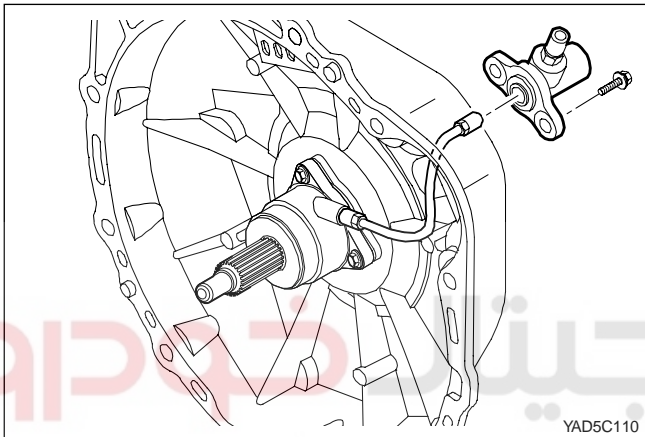


4. Unscrew the bolts and remove the clutch cover, pressure plate and clutch disc.

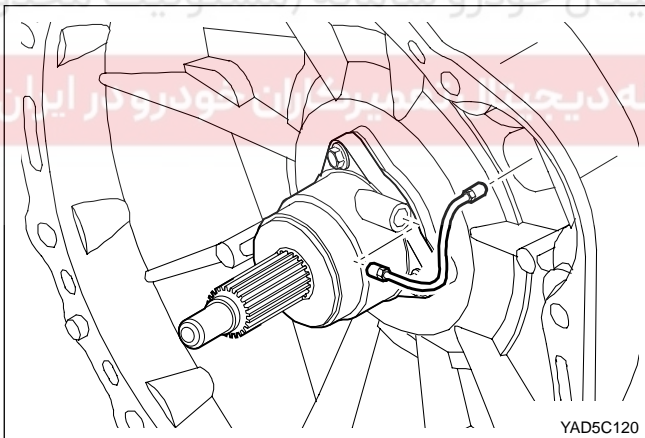
Notice: Be careful not to drop the pressure plate and clutch disc.

Installation Notice

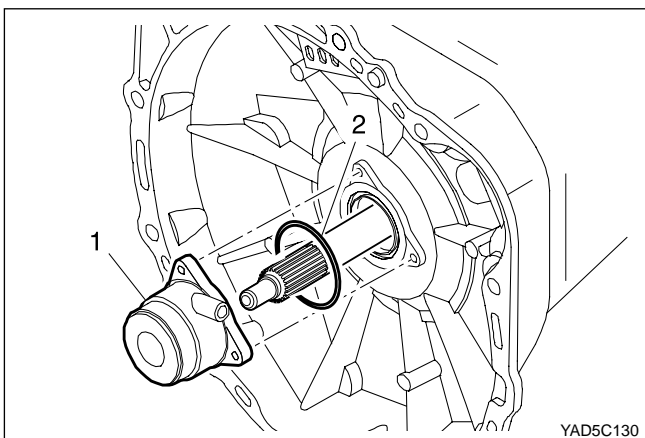
Tightening Torque	21 - 27 N•m (15 - 20 lb-ft)
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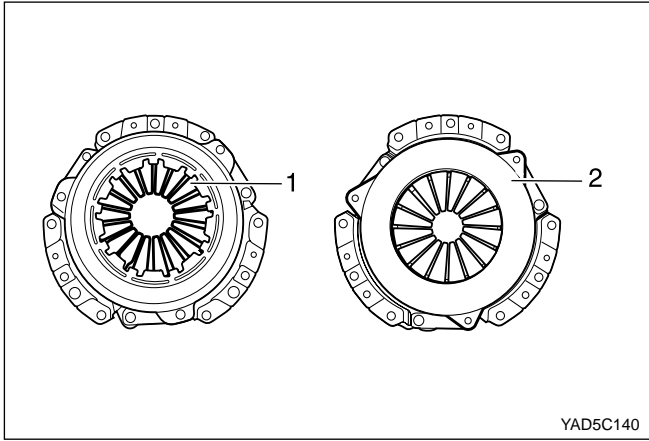
5. Remove the oil pipe and the adapter from the clutch housing.



6. Remove the oil pipe nut at the clutch housing inside.



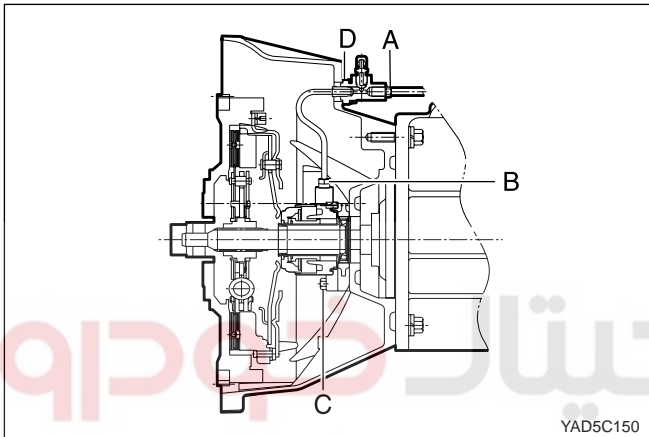
7. Remove the concentric slave cylinder mounting bolt and remove the concentric slave cylinder from the input shaft.
8. Remove the spacer from the input shaft.



9. Installation should follow the removal procedure in the reverse order.

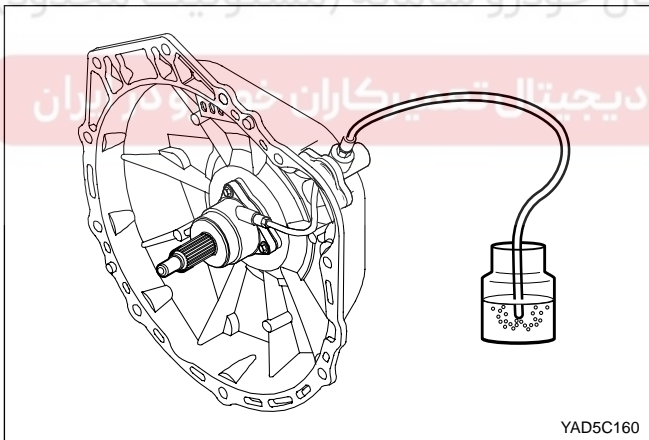
Notice:

- Before installation, clean oil and grease on the flywheel surface.
- Do not clean the clutch disc and release bearing in solvent.



10. Tighten the pipe nut and the cylinder mounting bolt as the specified torque.

Hose Nut	A: 1.5 ~ 1.8 kgf.m
Pipe Nut	B: 1.5 ~ 1.8 kgf.m
Cylinder mounting bolt	C: 1.5 ~ 1.8 kgf.m
Adapter Nut	D: 1.5 ~ 1.8 kgf.m



MASTER CYLINDER

Removal & Installation Procedure

1. Draw out the fluid.
2. Pull out the snap pin and clevis pin from the clutch pedal connection.
3. Remove the clutch tube.

Installation Notice

Tightening Torque	15 - 18 N•m (11 - 13 lb-ft)
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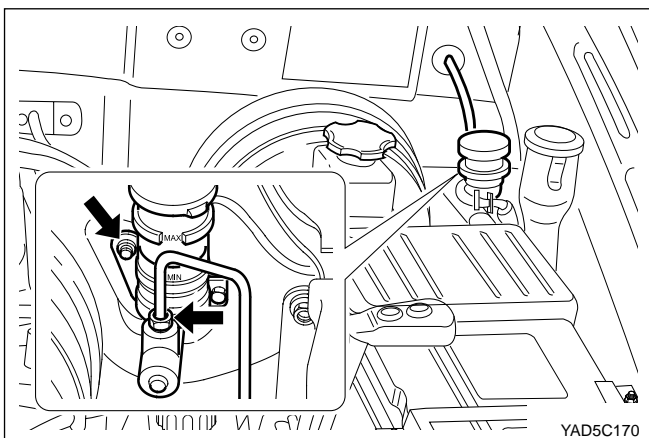
Notice: Be careful not the fluid contact a painted surface.

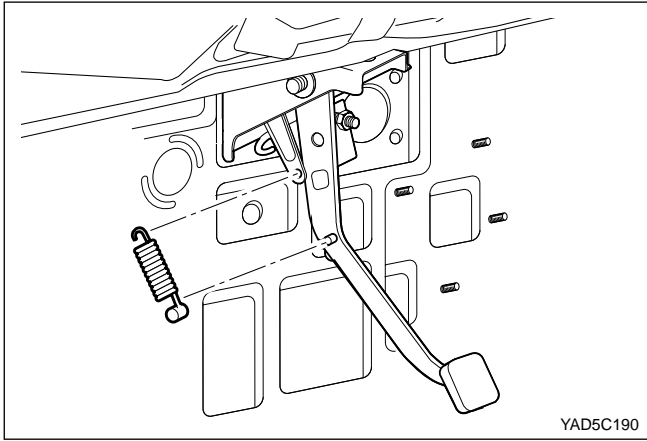
4. Remove the master cylinder mounting nuts and pull off the master cylinder.

Installation Notice

Tightening Torque	15 - 18 N•m (11 - 13 lb-ft)
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5. Check the clutch pedal operation.
6. Bleed the clutch system.
7. Installation should follow the removal procedure in the reverse order.

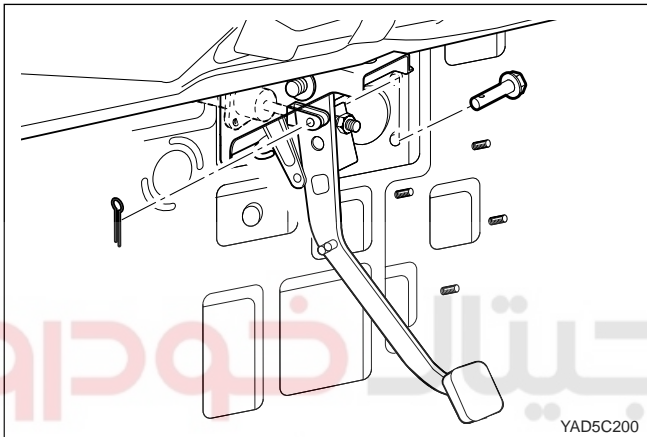




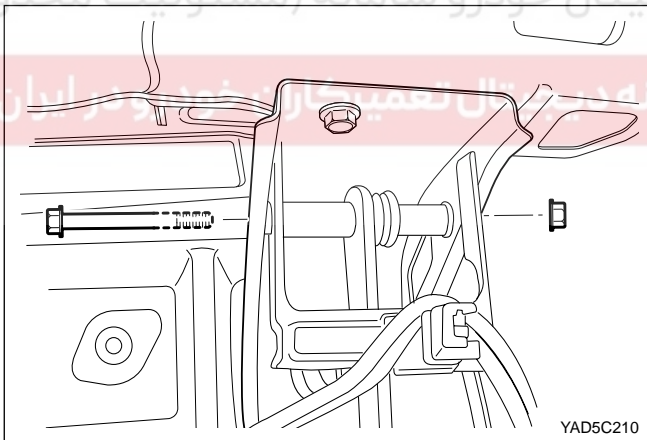
CLUTCH PEDAL

Removal & Installation Procedure

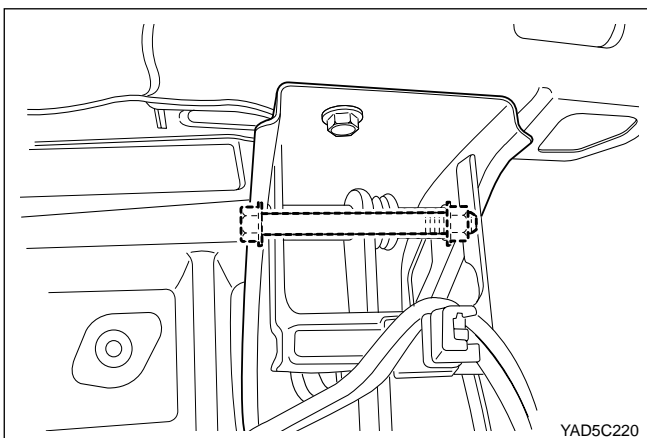
1. Remove the turn over spring from the clutch pedal.



2. Remove the snap pin and the clevis pin from the clutch master cylinder push rod and separate the push rod and the clutch pedal.



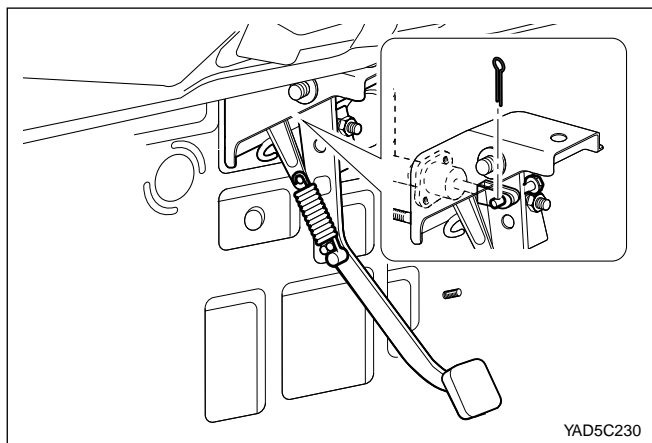
3. Remove the pedal mounting and nut from the clutch pedal bracket and remove the pedal from the bracket.



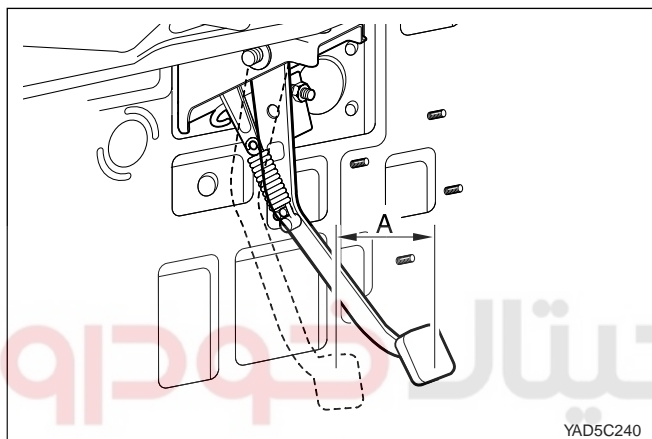
4. Installation should follow the removal procedure in the reverse order.

Perform the following procedure for installation.

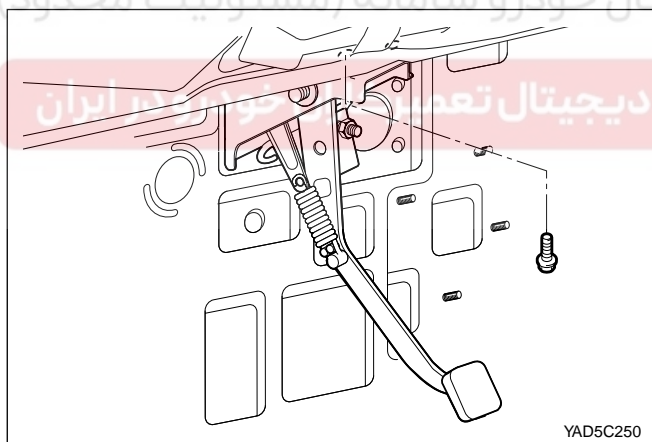
- Apply the grease to the clutch pedal clevis pin and pedal bushing.



- Apply the grease to the connecting portion between the clevis pin and the turnover spring.



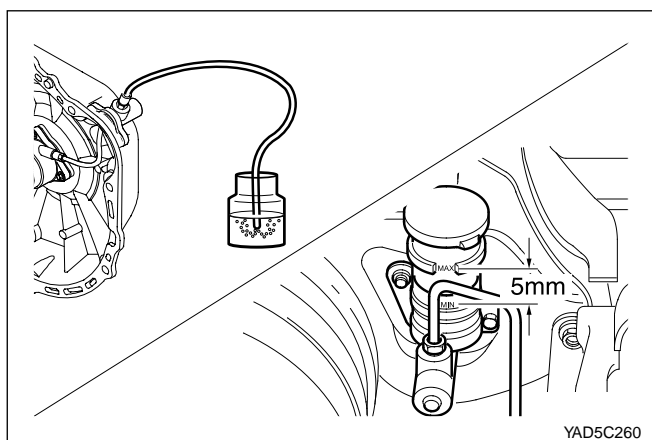
- Check the clutch pedal height after connecting the pedal and the push rod. Align the height according to the "A" free play of the push rod.



CLUTCH PEDAL BOX

Removal & Installation Procedure

1. Remove the clutch master cylinder.
2. Remove the upper bolt from the clutch pedal box and remove the clutch pedal assembly.



3. Installation should follow the removal procedure in the reverse order.

Notice: Charge the clutch oil as specified and then bleed the system.

INSPECTION PROCEDURE

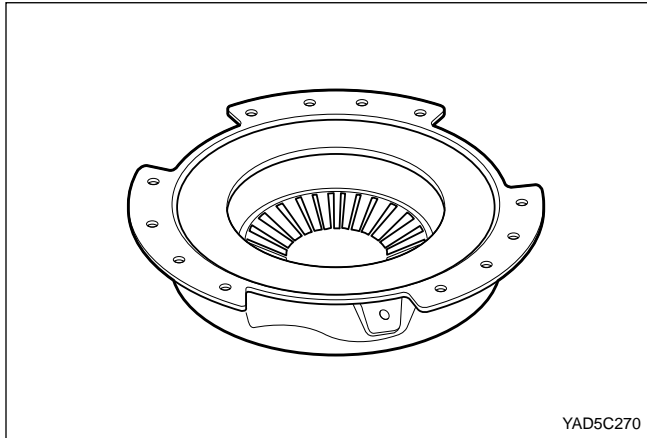
CLUTCH DISC

1. Clutch Cover

- Check the diaphragm spring tip for wear and height unevenness.

Unevenness Limit	0.8 mm
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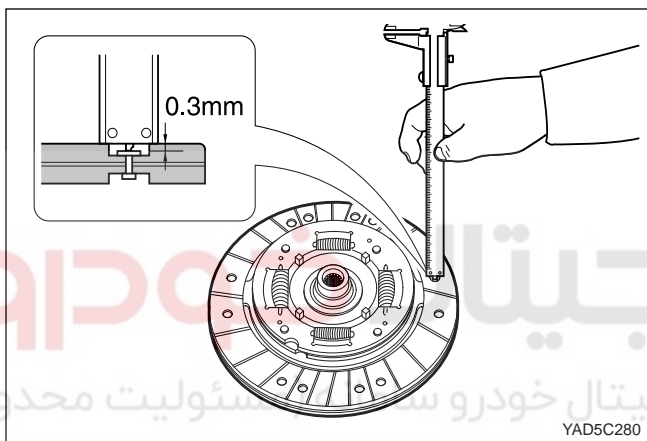
- Check the pressure plate surface for wear, crack and discoloration.
- Check the strap plate rivet for looseness and replace the clutch cover if loosened.



2. Clutch Disc

- Check the facing for rivet looseness, excessive runout, sticks, oil and grease.
- Measure the rivet head depth. If out limit, replace the disc.

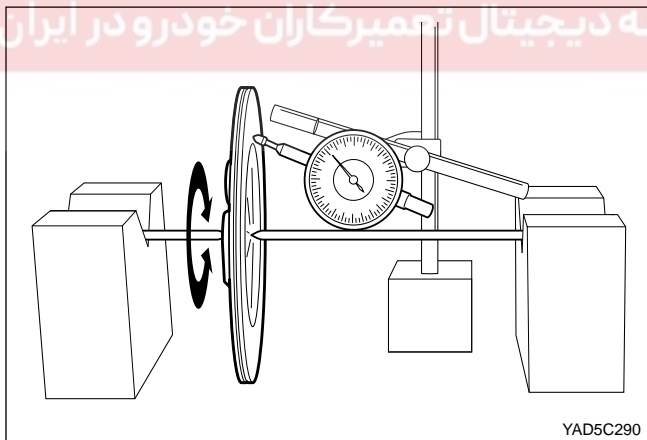
Wear Limit	0.3 mm
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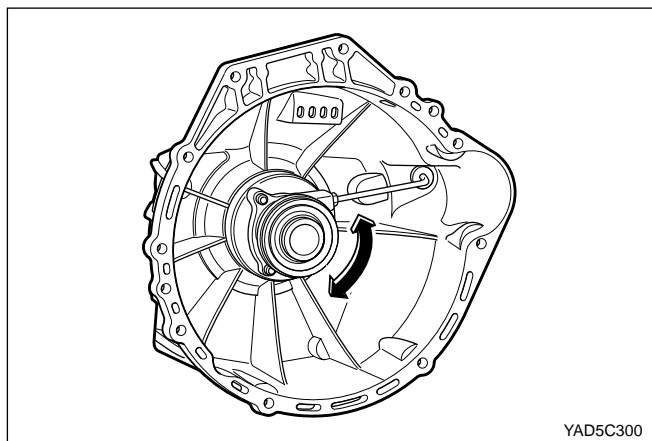


3. Clutch Disc Plane Rate

- Measure the clutch disc plane rate and replace the disc as needed.

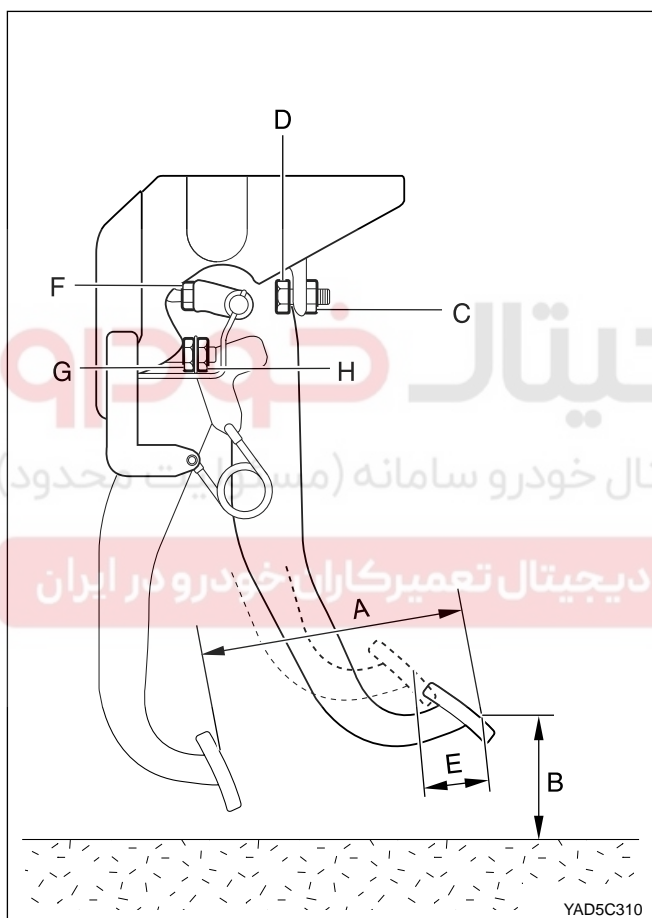
Limit Value	0.7 mm
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4. Concentric Slave Cylinder

- Check any heat damage, abnormal noise, poor rotation and wear of the concentric slave cylinder bearing.



CLUTCH PEDAL

1. Pedal Stroke (A).

Max. Stroke	GSL	158 mm
	DSL	148 mm

Notice: To adjust the pedal stroke, loosen the lock nut (H) of the interlock switch (G) and turn the two lock auto until the stroke is correct.

2. Pedal Height (B).

Height (From the Floor Carpet)	182 ± 5 mm
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Notice: To adjust the pedal height, loosen the lock nut (C) of the stopper bolt (D) and turn the stopper bolt until the height is correct.

3. Pedal Free Play (E).

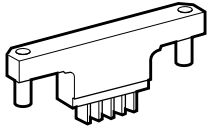
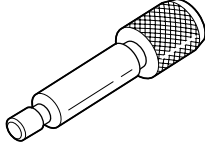
Free Play	5 - 10 N•m
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Notice: To adjust the pedal free play, loosen the lock nut (F) of the master cylinder and turn the push rod until the free play is correct.

4. Check the fulcrum pin and the bushing for wear, the pedal for bending and the spring for damage.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS TABLE

 YAD5C320	602 589 00 40 00 Engine Lock	 YAD5C330	661 589 00 15 00 Centering Pin
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