

SECTION 5B

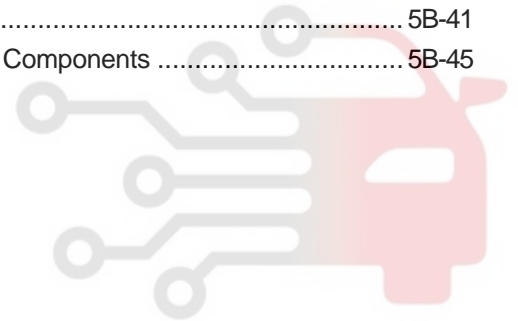
MANUAL TRANSMISSION

TABLE OF CONTENTS

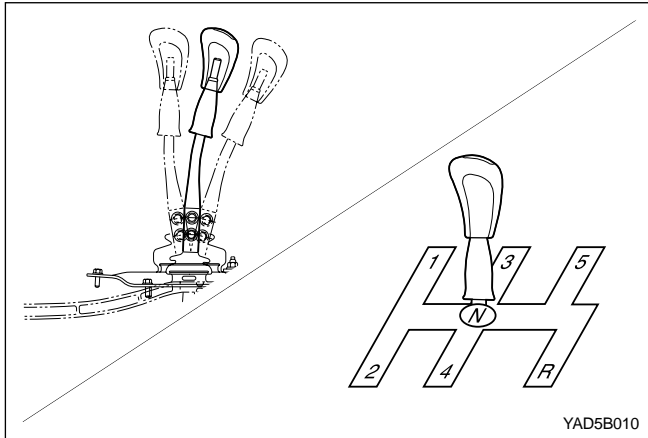
General Description and Operation	5B-2	Maintenance and Repair	5B-14
Shift Lever	5B-2	On-Vehicle Service	5B-14
Transmission Assembly	5B-2	Semi-Remote Kit	5B-14
Specifications	5B-3	Transmission	5B-19
Diagnostic Information and Procedures	5B-4	Unit Repair	5B-24
Diagnosis Table	5B-6	Major Unit	5B-24
Component Locator	5B-7	Main Shaft	5B-34
Cross-Sectional View	5B-7	Input Shaft	5B-38
Power Flow	5B-8	Counter Shaft	5B-40
Seni-Remote Kit Disassembly and Assembly	5B-9	Extension Housing	5B-40
Transmission Assembly	5B-10	Shift Cover	5B-41
Transmission Assembly Disassembled View	5B-11	Inspection of Components	5B-45

شرکت دیجیتال خودرو (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

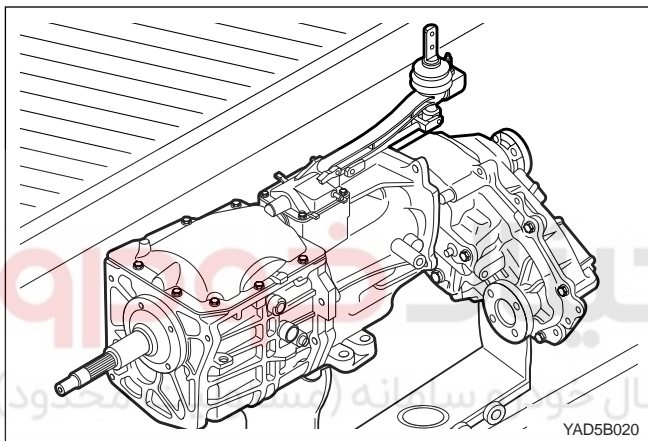


GENERAL DESCRIPTION AND OPERATION

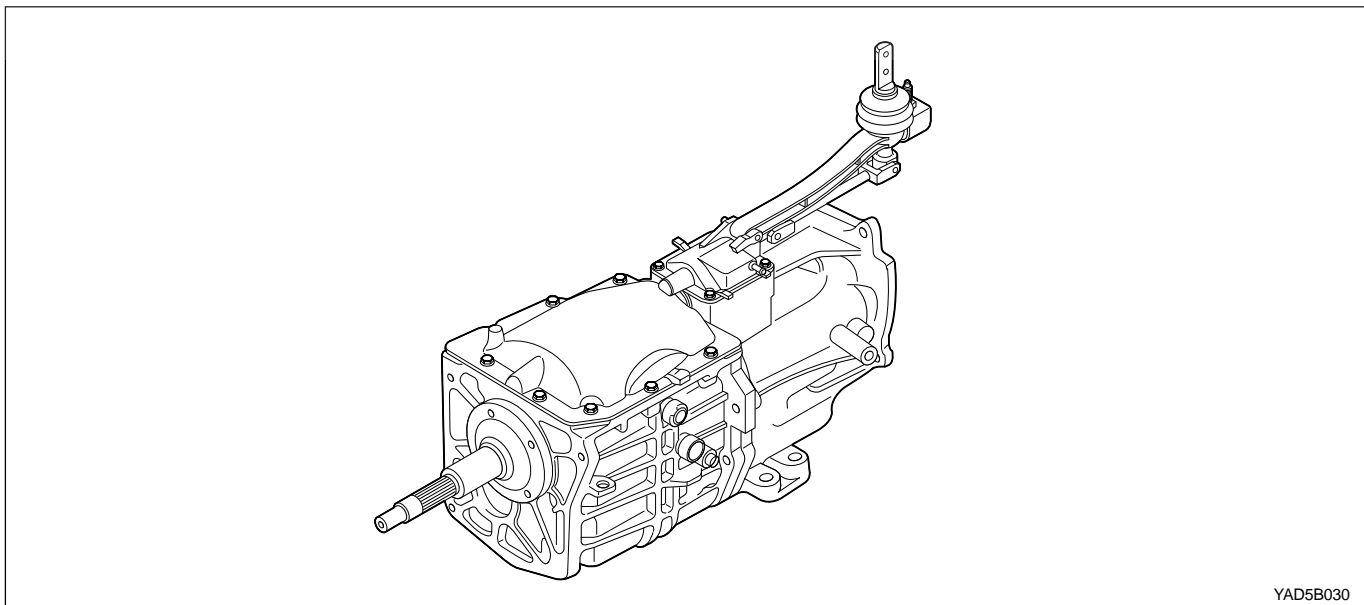


SHIFT LEVER

The shift lever is a type of linkage connected directly and lock shifting from 5th to reverse. This unit decreases the possibility of any blown, wear etc.



TRANSMISSION ASSEMBLY



SPECIFICATIONS

Application		Description
Model		T5WC
Type		Floor Change
Gear Ratio	1st	3.969 : 1
	2nd	2.341 : 1
	3rd	1.457 : 1
	4th	1.000 : 1
	5th	0.851 : 1
	Reverse	3.710 : 1
Oil	Specification	ATF DEXRON II / III
	Capacity(litre)	3.4 L
	Change Interval	Check : Every 15,000 km, Replace : Every 50,000 km
Weight (Dry)		33kg

Notice: Add LUBRIZOL (280cc) in oil after overhauling.

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DIAGNOSTIC INFORMATION AND PROCEDURES

Applicatio	Check	Action
Will not shift (control lever moves)	Control lever assembly broken or damaged.	Replace control lever and housing assembly.
	Damaged offset lever, shift fork, selector place or selector arm.	Remove extension, adapter or case cover. Check or replace damaged parts.
Hard shift or control lever will not move into gear	Clutch not releasing.	Adjust or replace clutch.
	Improper or low transmission oil.	Add or replace with specified oil.
	Shift or shift rail binding.	Remove extension, adapter or case cover. Check or replace damaged parts.
	Binding of sliding synchronizers or gears.	Remove extension, adapter or case cover. Check synchronizers and gears and replace damaged parts.
	If reverse only, faulty backup switch.	Check or replace backup switch.
	Worn or damaged flywheel pilot bushing.	Replace pilot bushing.
Gears crash when shifting	Engine idle speed too high.	Adjust idle speed to specified speed.
	Damaged or faulty clutch.	Adjust or replace clutch.
	Pilot bearing between input shaft and output shaft binding.	Replace or check roller bearings.
	Damaged synchronizer.	Check or replace synchronizer parts.
	Bell housing misaligned.	Align bell housing and bore.
	Damaged gear(s).	Check or replace gear(s).
	Worn or damaged flywheel pilot bushing.	Replace pilot bushing.
Transmission jumps out	Loosened transmission or flywheel housing bolts, improper alignment.	Tighten bolts to specified value. Realign if necessary.
	Synchronizer damaged or excessively worn.	Check or replace synchronizer parts.
	Blocking ring damaged, worn index slots or friction surfaces worn or damaged.	Check or replace blocking ring.
	Excessive countershaft end play.	Check worn or damaged parts. Adjust shim thickness using roller bearings if necessary.
	Worn or damaged fork due to loosened shaft, rail or shifting fork.	Check for wear or damaged. Replace worn or damaged parts.
Transmission locked in one gear	Fork or offset lever loose on shaft or rail.	Replace extension, adapter or case cover. Check or replace loose parts on shaft or rail. Replace roll pin(s).
	Worn or damaged forks, offset lever, shaft or rail.	Remove extension, adapter or case cover. Check for wear or damaged. Replace damaged parts.

Applicatio	Check	Action
Transmission locked in one gear	Worn or damaged synchronizer.	Check worn or damaged synchronizer parts and replace if necessary.
	Worn or damaged gears.	Check worn or damaged gears and replace if necessary.
Transmission noise	Improper or low transmission oil.	Add or drain and replace with proper oil.
	Loose bolts or other attaching parts.	Tighten as specified.
	Improper flywheel housing to engine crankshaft alignment.	Realign correctly.
	Noisy transmission bearing.	Check bearings, bearing rollers and parts for wear or damage. Replace if necessary.
	Noisy gears.	Check for worn or damaged gears(including speedometer gear). Replace if necessary.
Transmission leakage	Leakage from transmission.	Clean all exposed surfaces, then check for leaks.
	Vent or breather clogged.	Clean or replace vent or breather.
	Too much oil.	Check oil level.
	Loose bolts at sealing faces.	Tighten as specified.
	Improperly applied sealant.	Clean leaking surfaces. Reapply sealant.
	Worn or damaged oil seal.	Replace oil seal.

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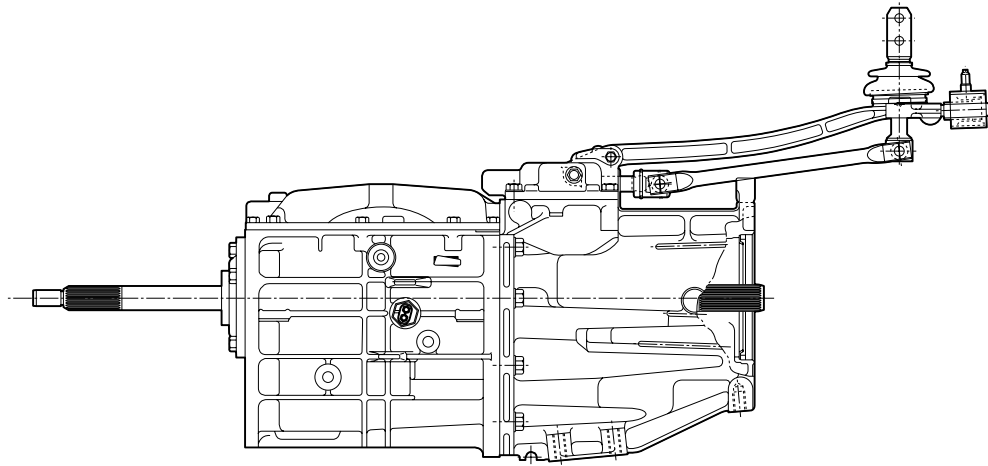
DIAGNOSIS TABLE

Applicatio													
1	Shift Hop-out												
2	Shift Gear Crash												
3	Shift Block-out												
4	Hard Shift												
5	Noise in Reverse Gear												
6	Noise in 5th Gear												
7	Noise in 4th Gear												
8	Noise in 3rd Gear												
9	Noise in 2nd Gear												
10	Noise in 1st Gear												
11	Noise in All Speeds												
12	Leak at Transmission Rear Part												
13	Leak at Transmission Center Part												
14	Leak at Transmission Front												
Possible Faulty Part													
												● ●	Transmission Case
												● ●	Extension Housing
●		●										● ●	Shift Cover / Shift Shaft
●		●										●	Shift Control Lever
		●										●	Input Bearing Retainer
												●	Input Gear Set
●												●	3rd Speed Gear Set
●												●	2nd Speed Gear Set
												●	Reverse Speed Gear Set
●												●	1st Speed Gear Set
●												●	5th Speed Gear Set
		●										●	Clutch Housing and Release Drive
		●										●	Crankshaft Pilot Bushing and Release Bearing
												●	Input Bearing
												●	Main Shaft Input Bearing
●												●	Main Shaft Thrust Bearing
												●	3rd Speed Gear Bearing
												●	2nd Speed Gear Bearing
												● ●	1st Speed Gear Bearing
												●	Reverse Idler Gear Bushing
												●	Counter Shaft Front Bearing
												●	Counter Shaft Rear Bearing
●	●											●	Counter Shaft Thrust Bearing
												●	5th Speed Drive Gear Bearing
												●	Slip Yoke Bushing
												●	Slip Yoke Seal
												●	Speedometer Drive / Driven Gears
												●	Speedometer Driven Gear Housing
												●	Input Shaft Seal
● ● ●												● ● ●	1 - 2 Synchronizer Assembly
● ● ●												●	3 - 4 Synchronizer Assembly
● ● ●												●	5th Synchronizer Assembly

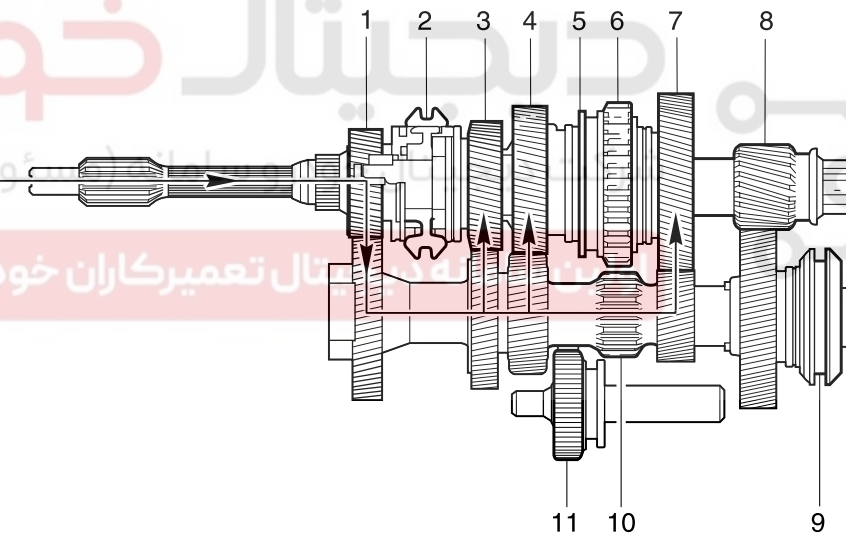
COMPONENT LOCATOR

CROSS-SECTIONAL VIEW

External View



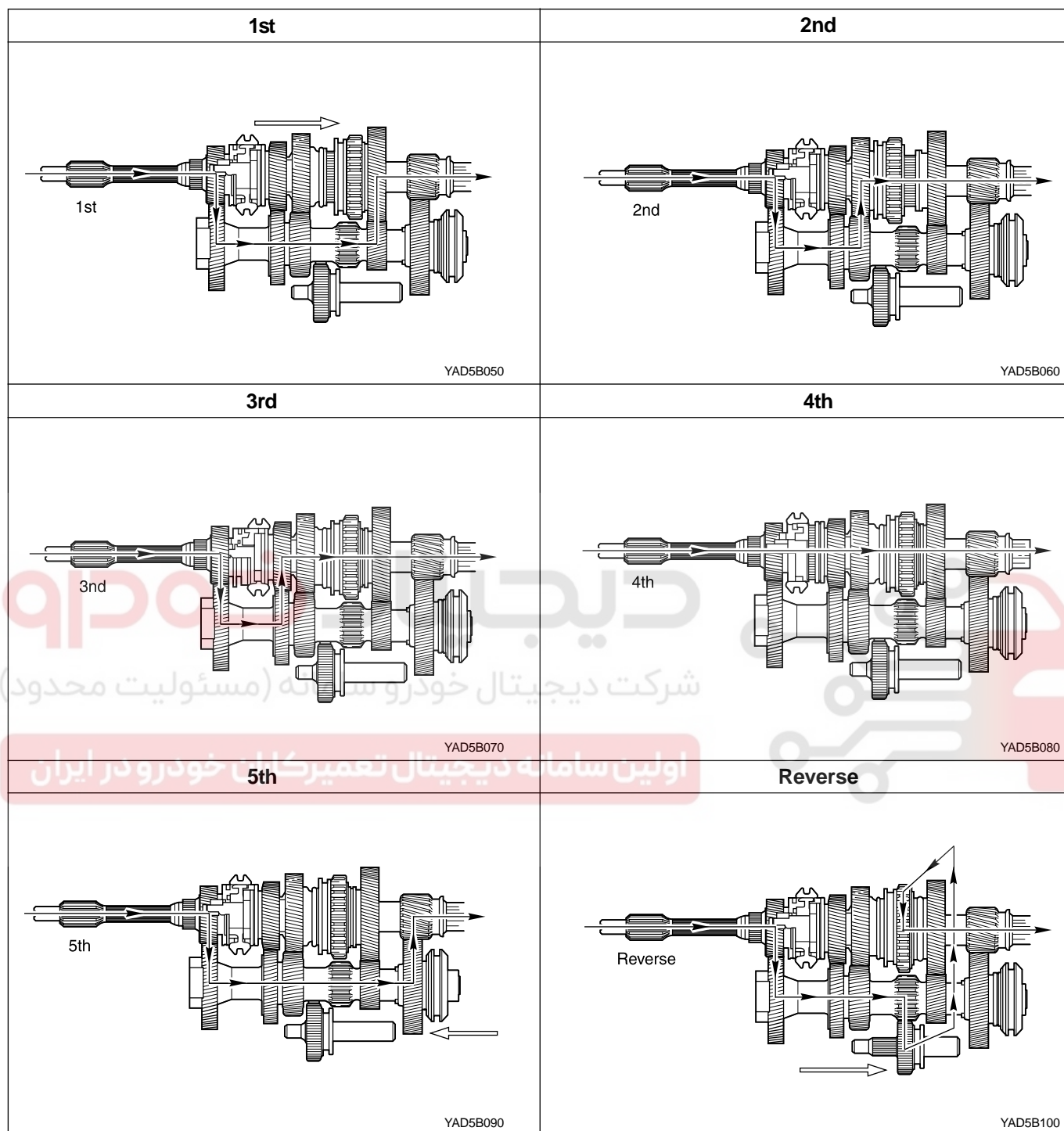
Internal View



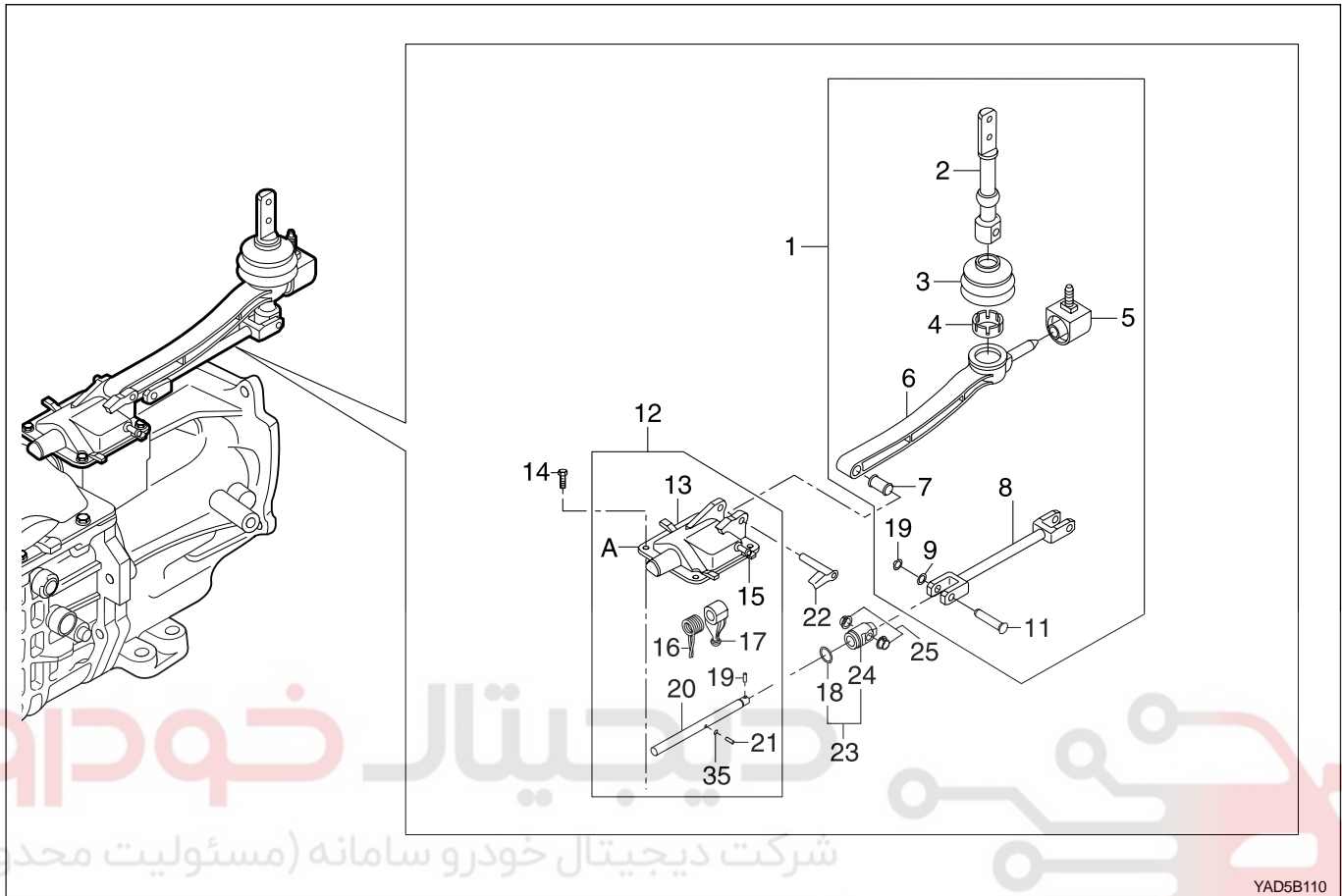
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- | | |
|------------------------|--------------------|
| 1 4th Gear | 7 1st Gear |
| 2 3rd-4th Synchronizer | 8 5th Gear |
| 3 3rd Gear | 9 5th Synchronizer |
| 4 2nd Gear | 10 Counter Shaft |
| 5 1st-2nd Synchronizer | 11 Reverse Idler |
| 6 Reverse Gear | |

POWER FLOW

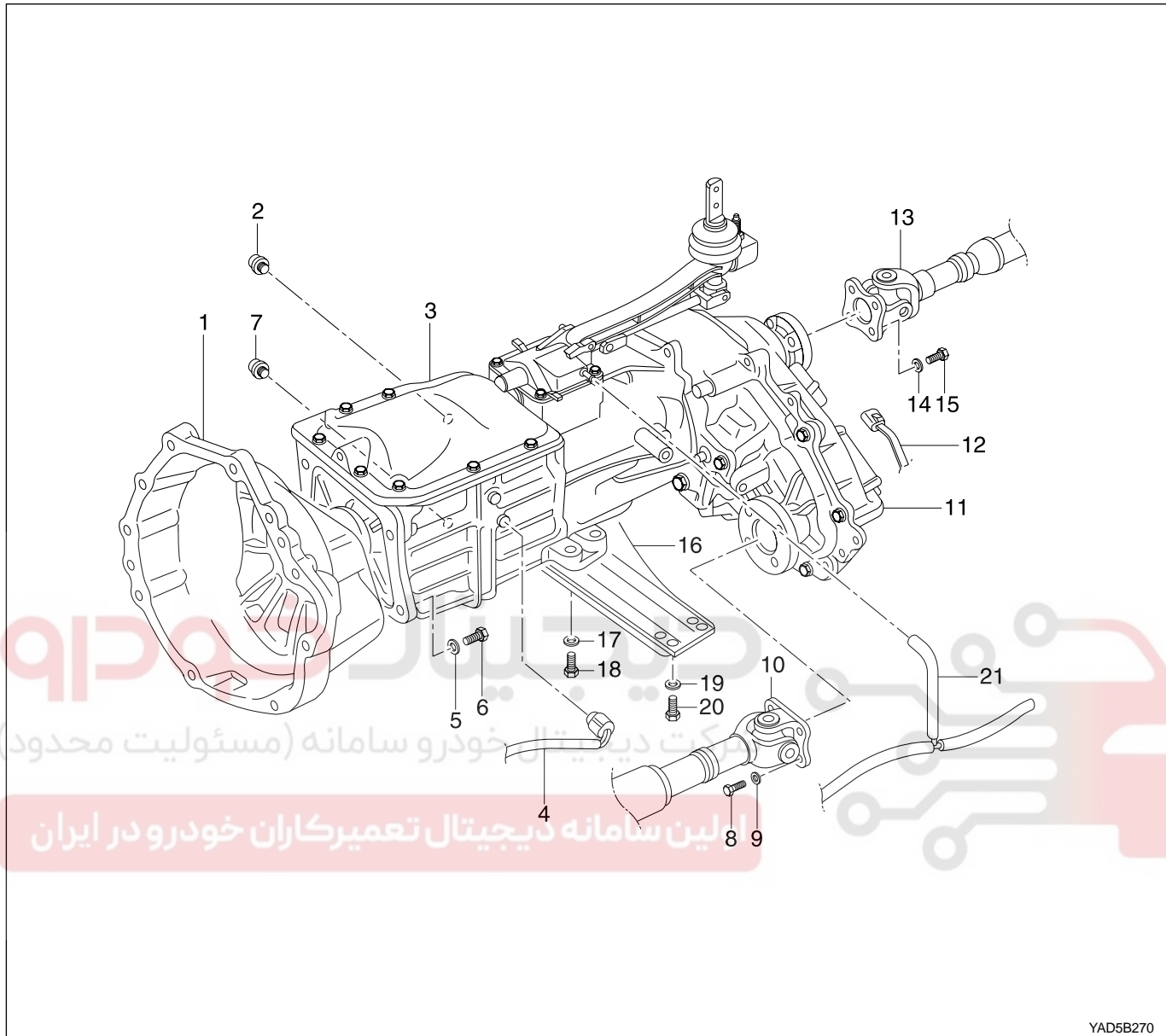


SEMI-REMOTE KIT DISASSEMBLY AND ASSEMBLY



- | | |
|---------------------------------|-------------------------|
| 1 Remote Shift | 14 Bolt |
| 2 Shift Lever | 15 Breather Hose Bar |
| 3 Shift Inner Boot | 16 Control Shift Spring |
| 4 Lining Shift Socket | 17 Offset Control Lever |
| 5 Control Housing Arm Insulator | 18 Retainer Ring |
| 6 Control Housing Arm | 19 Pin |
| 7 Bushing | 20 Shift Rail |
| 8 Shift Rod Link | 21 Grove Pin |
| 9 Washer | 22 Pin & Clip |
| 10 Clip | 23 Joint Assembly |
| 11 Shift Rod Pin | 24 Joint Housing |
| 12 Cover Assembly | 25 Bushing |
| 13 Shift Tower Cover | |

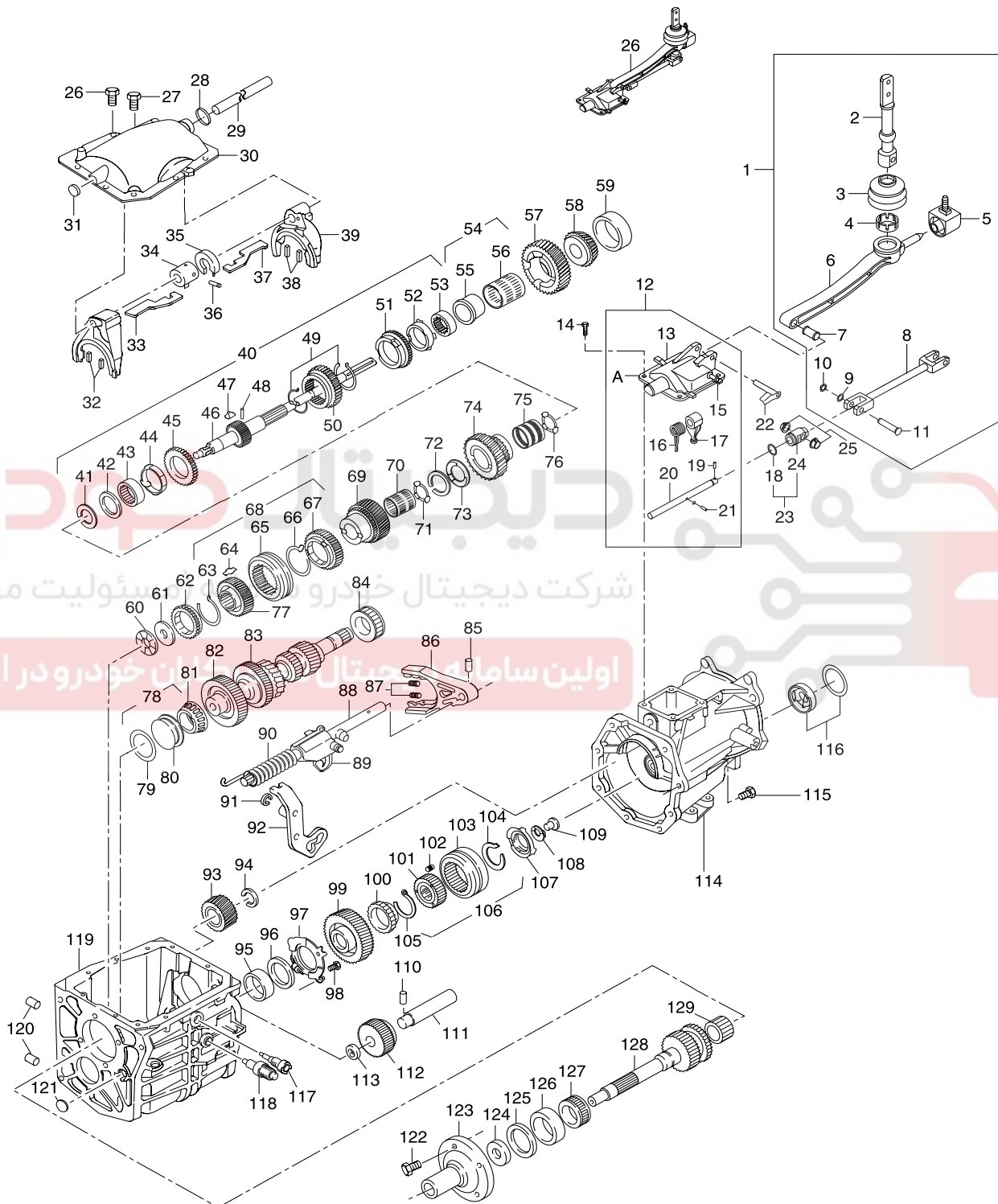
TRANSMISSION ASSEMBLY



YAD5B270

- | | |
|--------------------------------|-------------------------|
| 1 Clutch Housing | 51 Speedometer Cable |
| 2 Oil Filler Plug 25 N•m | 52 Rear Propeller Shaft |
| 3 Transmission Assembly | 53 Washer |
| 4 Back-up Switch | 54 Bolt 70-80 N•m |
| 5 Washer | 55 Cross Member |
| 6 Bolt 77-87 N•m | 56 Washer |
| 7 Oil Drain Plug 25 N•m | 57 Bolt 21-35 N•m |
| 8 Bolt 81-89 N•m | 58 Washer |
| 9 Washer | 59 Bolt 62-93 N•m |
| 10 Front Propeller Shaft | 60 Breather Hose |
| 11 Transfer Case Assembly | |

TRANSMISSION ASSEMBLY DISASSEMBLED VIEW



YAD5B460

- | | |
|---------------------------------|--------------------------------|
| 1 Remote Shift | 58 Bearing Corn |
| 2 Shift Lever | 59 Bearing Cup |
| 3 Shift Inner Boot | 60 Thrust Bearing |
| 4 Lining Shift Socket | 61 Thrust Race |
| 5 Control Housing Arm Insulator | 62 Blocking-Ring |
| 6 Control Housing Arm | 63 Spring |
| 7 Bushing | 64 Insert |
| 8 Shift Rod Link | 65 Synchronizer Sleeve |
| 9 Washer | 66 Spring |
| 10 Clip | 67 Blocking-Ring |
| 11 Shift Rod Pin | 68 Synchronizer |
| 12 Cover Assembly | 69 3rd Speed Gear |
| 13 Shift Tower Cover | 70 Needle Bearing |
| 14 Bolt | 71 Spacer |
| 15 Bleeder Hose Barb | 72 Snap Ring |
| 16 Control Shift Spring | 73 Washer |
| 17 Offset Control Lever | 74 2nd Speed Gear |
| 18 Retainer Ring | 75 Needle Bearing |
| 19 Pin | 76 Spacer |
| 20 Shift Rail | 77 Synchronizer Sleeve |
| 21 Groove Pin | 78 Bearing |
| 22 Pin and Clip | 79 O-Ring |
| 23 Joint Assembly | 80 Bearing |
| 24 Joint Housing | 81 Corn Bearing |
| 25 Bushing | 82 Shaft Gear |
| 26 Bolt | 83 Counter Shaft Gear |
| 27 Bolt | 84 Corn Bearing |
| 28 O-ring | 85 Roll Pin |
| 29 Shaft Rail | 86 Shift 5th Fork |
| 30 Case Cover | 87 Insert |
| 31 Cap Plug | 88 Shift Rail |
| 32 Insert | 89 Reverse Fork |
| 33 Selector Plate | 90 Spring |
| 34 Selector Arm | 91 Retainer Ring |
| 35 Inlockter Plate | 92 Shift Lever |
| 36 Selector Arm Pin | 93 5th Speed Driven Gear |
| 37 Selector Plate | 94 Snap Ring |
| 38 Insert | 95 Bearing Cap |
| 39 Shift Fork | 96 Shim |
| 40 Output Shaft | 97 Rear Retainer |
| 41 Retainer Ring | 98 Bolt |
| 42 Washer | 99 5th Speed Driven Gear |
| 43 Inner Corn | 100 Blocking 5th-Ring |
| 44 Outer-Race | 101 Hub Bearing |
| 45 1-2nd Blocking-Ring | 102 Insert |
| 46 Output Shaft Assembly | 103 Sleeve |
| 47 Insert | 104 Spring |
| 48 Ball | 105 Spring |
| 49 Spring | 106 Synchronizer |
| 50 Reverse Sliding Gear | 107 5th Synchronizer Retainer |
| 51 1-2nd Blocking-Ring | 108 Snap Ring |
| 52 Outer Corn Race | 109 Oil Ring Funnel |
| 53 Inner Corn | 110 Roll Pin |
| 54 Sleeve Bearing | 111 Reverse Idler Shaft |
| 55 Sleeve | 112 Reverse Idler Gear |
| 56 Needle Bearing | 113 O-Ring |
| 57 1st Speed Driven Gear | 114 Cross member Mounting Hole |

115 Bolt	123 Input Bearing Retainer
116 Spacer Seal and O-ring	124 Oil Seal
117 Pivot Pin	125 Shim
118 Back-up Switch	126 Bearing Cap
119 Transmission Case	127 Bearing Corn
120 Filler/Drain Plug	128 Input Drive Shaft
121 Plug	129 Roller Bearing
122 Bolt	

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



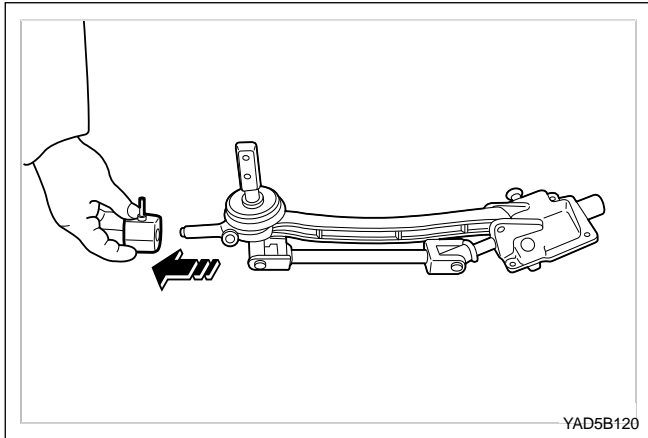
MAINTENANCE AND REPAIR

ON-VEHICLE SERVICE

SEMI-REMOTE KIT

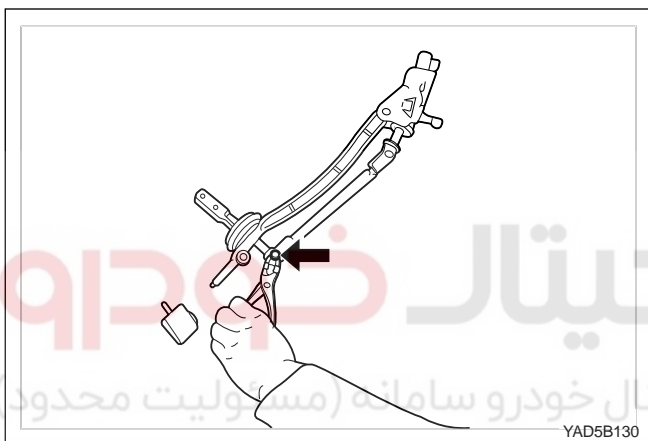
Removal Procedure

1. Remove the control housing arm insulator from the semi-remote kit.

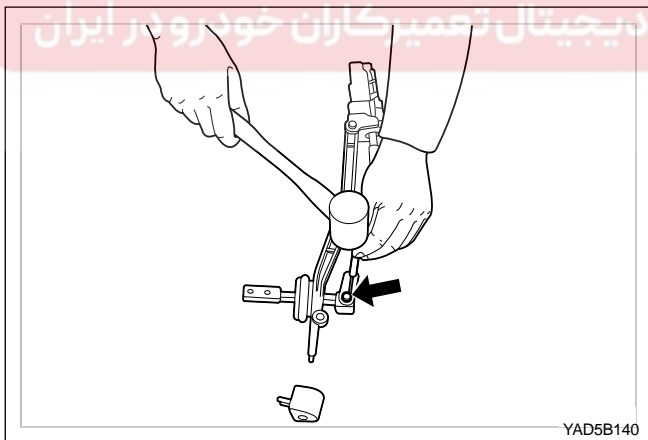


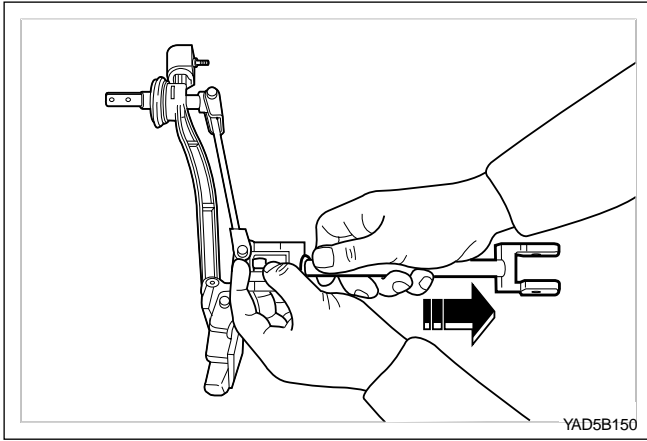
2. Remove two snap rings and two screws using the snap ring plier.

Notice: Do not reuse the damaged snap ring.

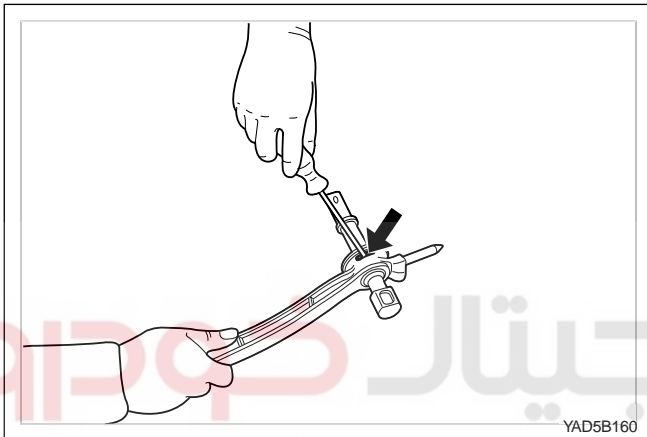


3. Disconnect the shift rod pin using the punch.

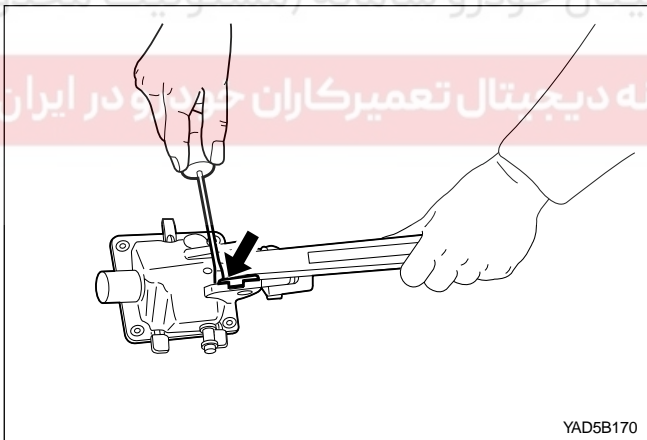




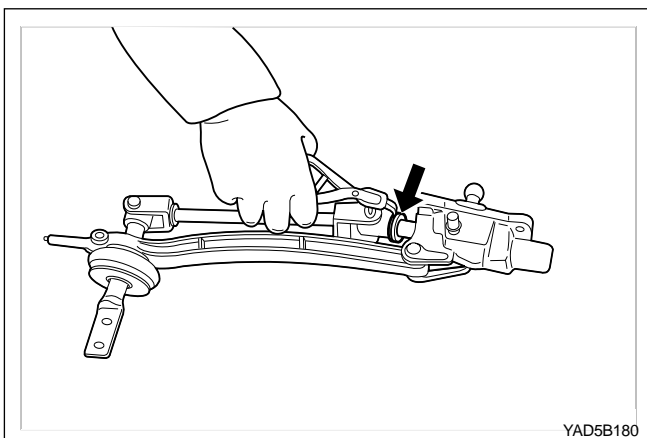
4. Remove the shift rod link from the semi-remote kit.
5. Remove four metal bushing from the shift rod.



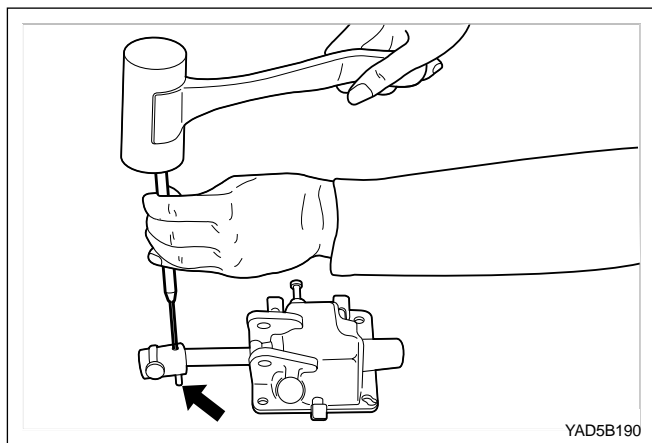
6. Push down the socket lining's wing from the control housing arm and disconnect the socket lining and shift lever from the semi-remote kit.



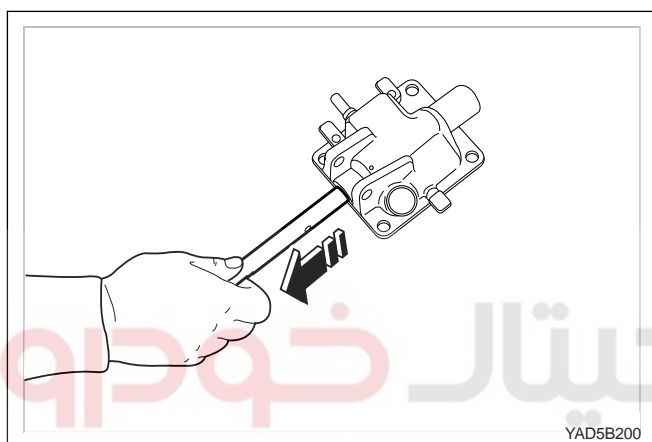
7. Remove the control housing arm by rotating the clip pin.



8. Remove the retainer-ring from the U-joint assembly using the snap ring plier.



9. Remove the pin from the U-joint assembly using the punch.
10. Remove the U-joint assembly from the cover assembly.

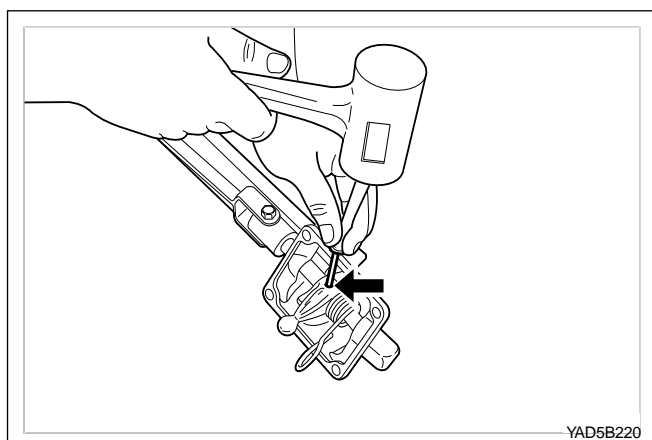


11. Remove the shift rail from the cover assembly using the punch.
12. Pull out the shift rail from the cover assembly.
13. Inspect and clean all of the disassembled parts and replace as needed.

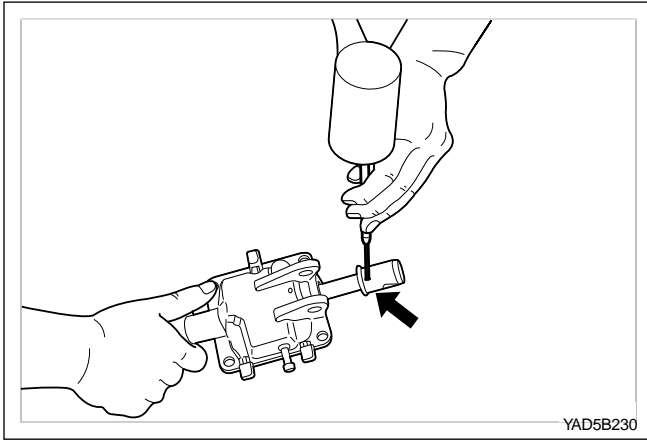


Installation Procedure

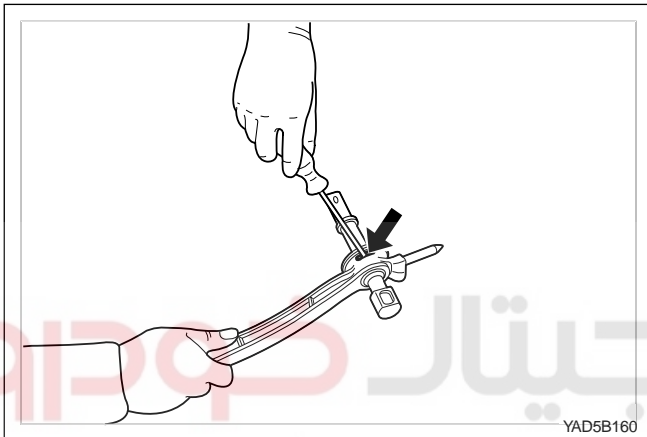
1. Insert the shift rail to the cover.



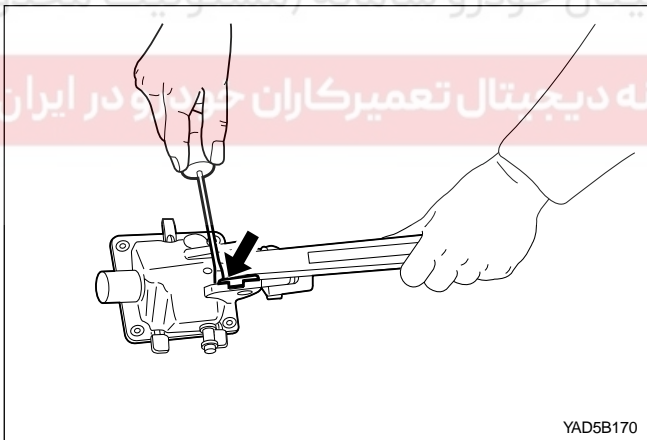
2. Pull the shift rail to the offset lever using the punch and assemble them.



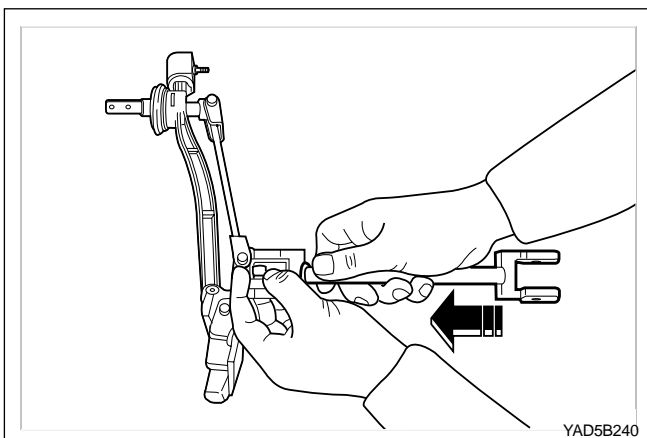
3. Insert the rail to U-joint assembly and assemble the retainer ring using the snap ring plier.



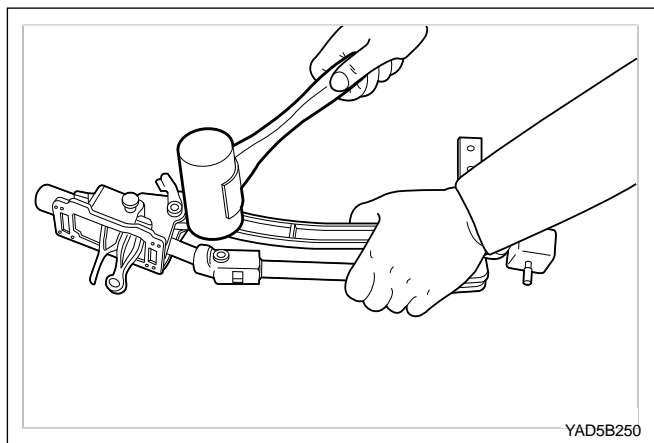
4. Push down the shift lever and the lining shift socket from the control housing arm.



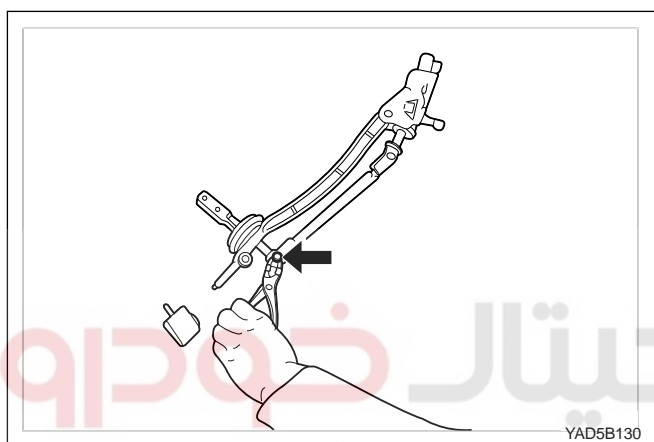
5. Insert the clip pin to fix the cover assembly and the control housing arm.



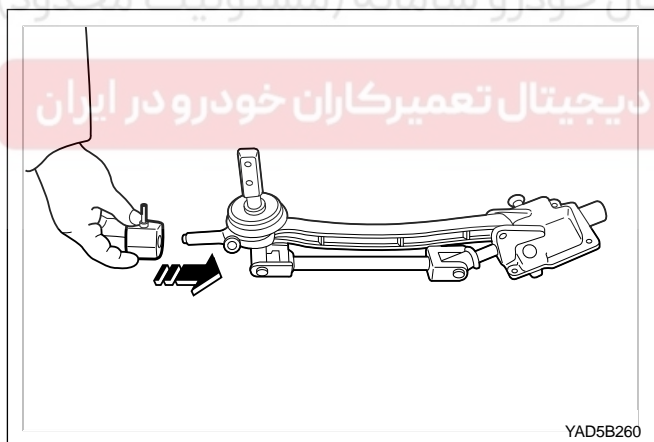
6. Insert the metal bushing to the shift rod.



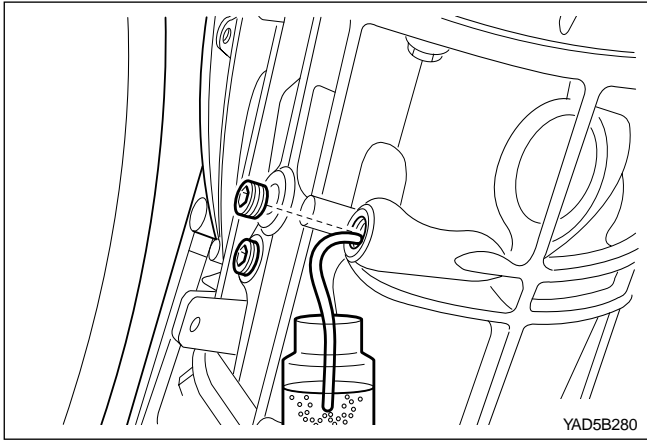
7. Assemble the shift rod, the shift rail and U-joint using the pin.



8. Insert the washer and assemble the snap ring.



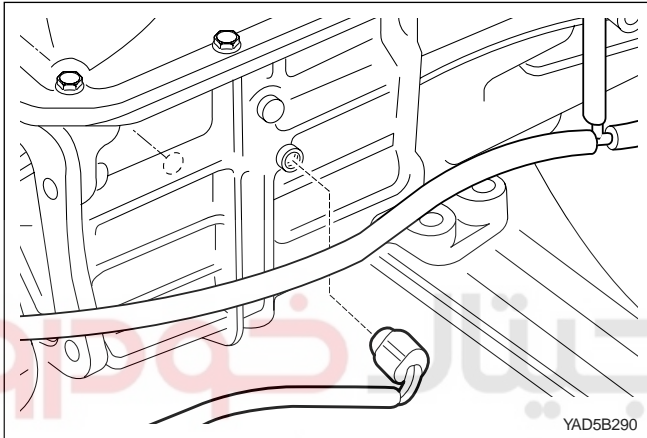
9. Insert the control housing arm insulator to the semi-remote kit.



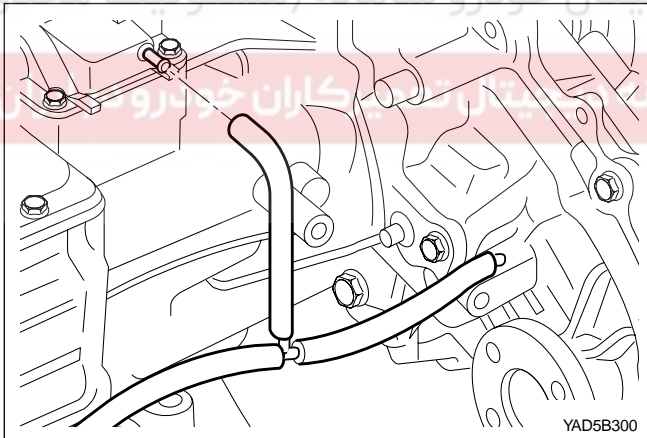
TRANSMISSION

Removal Procedure

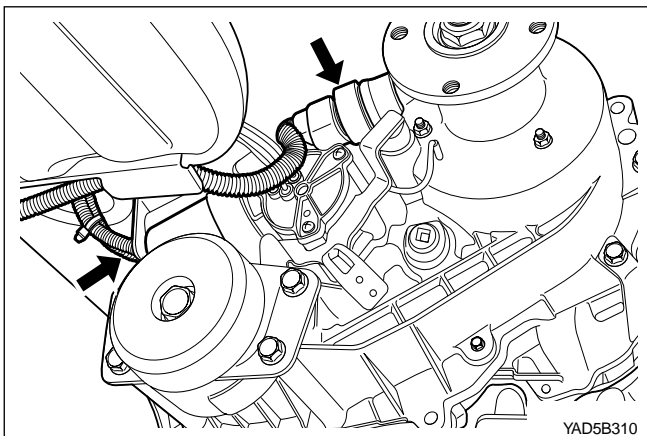
1. Disconnect the negative terminal from the battery.
2. Lift up the vehicle and fix it safely.



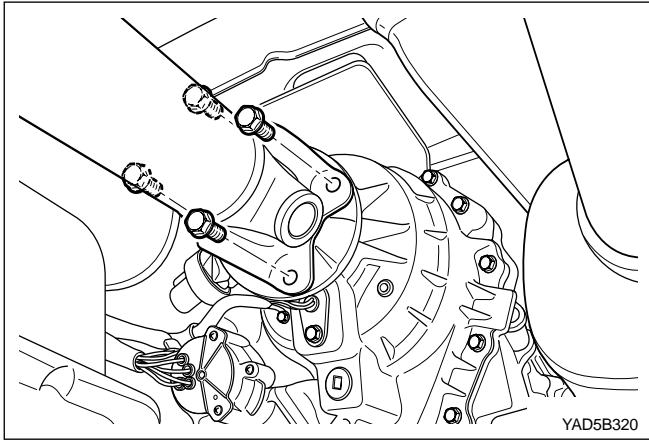
3. Remove the drain plug from the transmission housing and drain the oil. Reinstall the drain plug.
4. Disconnect the back-up switch connector.



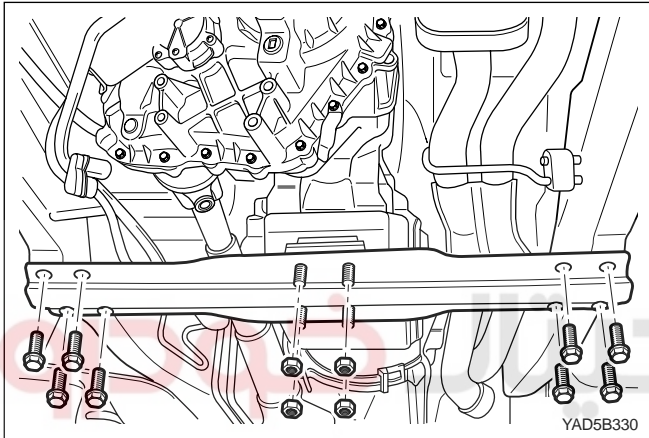
5. Remove the breather hose.



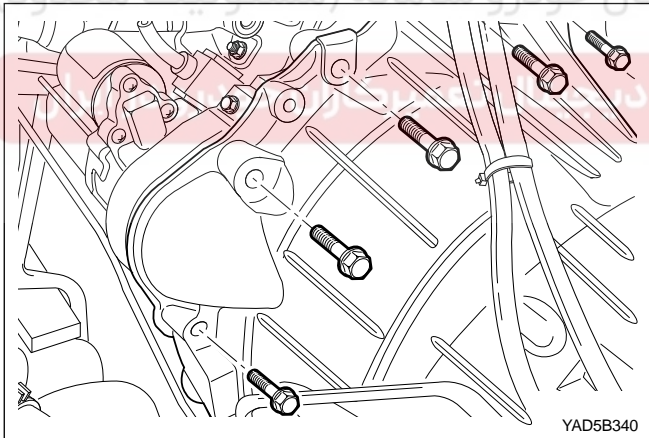
6. Remove the speedometer connector and other wiring harnesses and connectors.



7. Remove the front and rear propeller shafts from the transfercase.

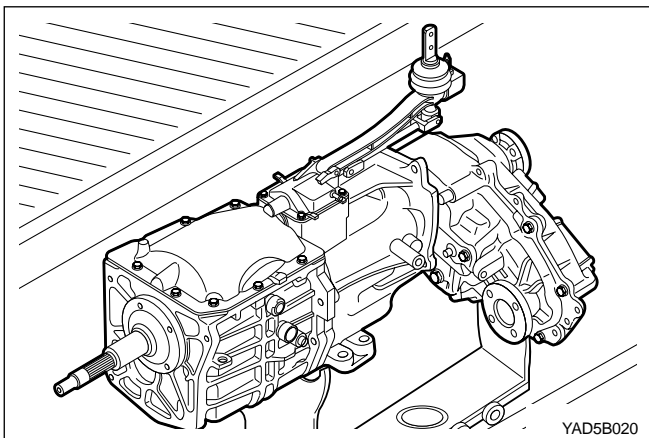


8. Support the transmission on an suitable jack.
Unscrew the center mounting nuts and each sides mounting bolts and remove the cross member.

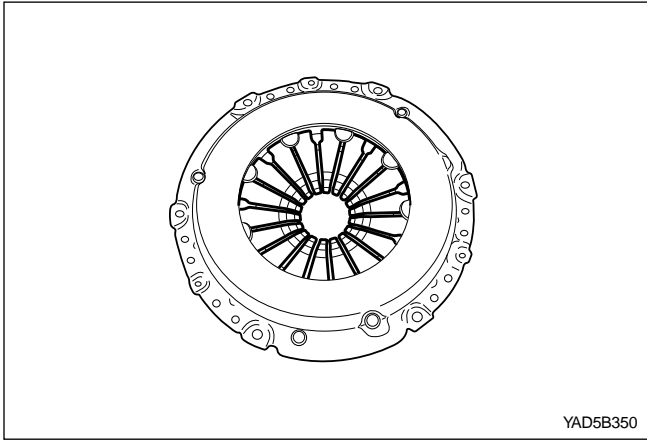


9. Remove the transmission mounting bolts.

Notice: For removing the transmission, there may be any damage in the clutch housing inside CSC. Thus remove the transmission with the clutch housing.

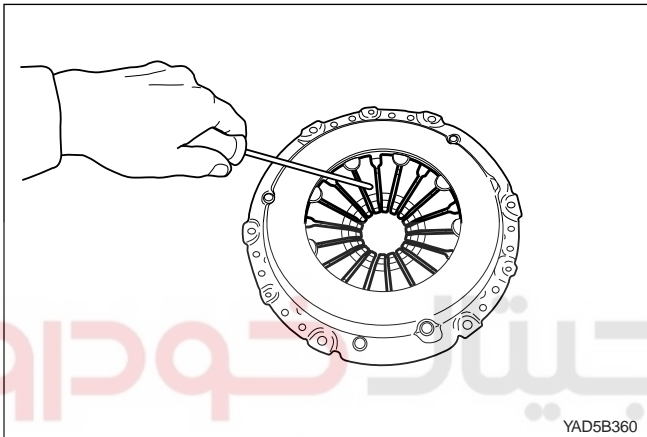


10. Move the transmission jack backward careful and disengage the transmission input shaft from the engine.
Remove the transmission.



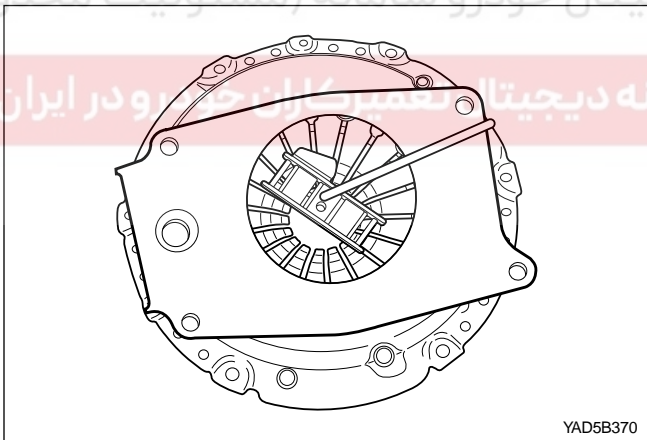
Pre-Installation Checks Checking Procedure

1. Separate the clutch release fork from the pivot and remove the pivot from the clutch housing.
2. Check the pivot. Fork and release bearing.
3. Check the pressure plate spring.

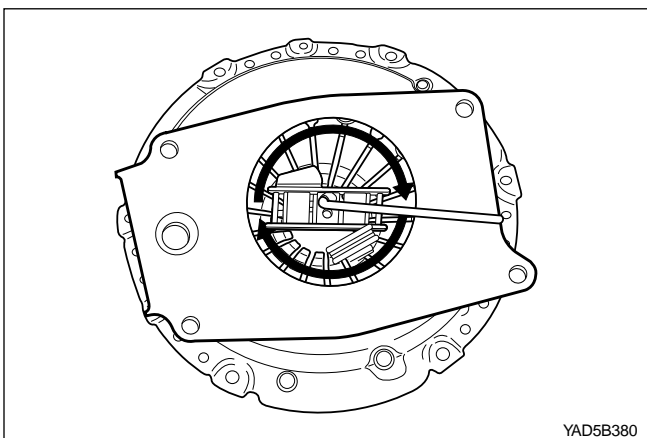


Notice: Inspect each parts and replace the excessively worn parts.

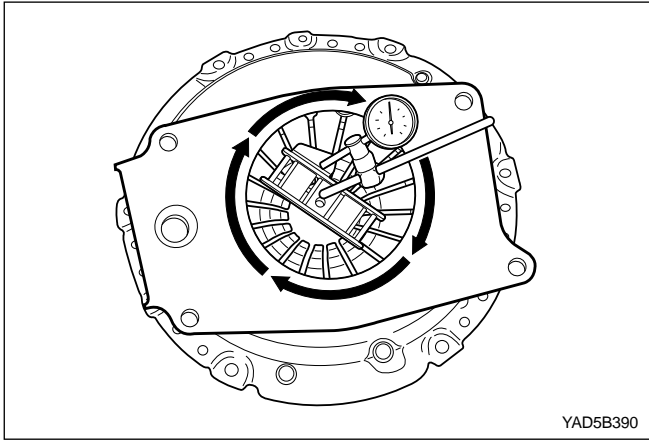
4. Check the clutch housing alignment as follows :



- Place the magnetic base on the pressure plate spring.
- Check the housing bore alignment.

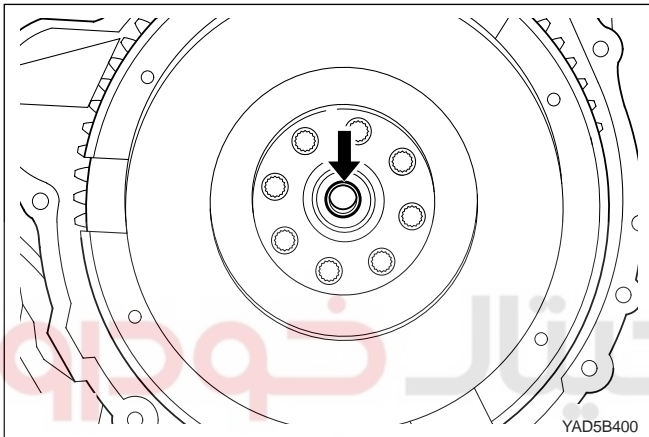


- Place the dial indicator on the bore.
- By rotating the crankshaft one revolution, record the dial indicator reading.



- Check the housing face alignment.
 - Place the dial indicator on the housing face.
 - By rotating the crankshaft one revolution, record the dial indicator reading.

Notice: If the reading is greater than 0.010 inch, insert the shim between the engine and clutch housing and adjust the alignment.

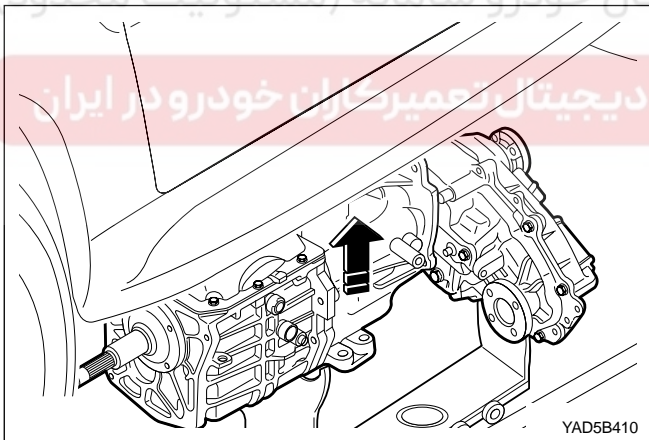


5. Check the following parts :

- Pressure plate spring assembly
- Disc
- Flywheel
- Input shaft pilot bearing

Notice: Replace the excessively worn parts.

6. Lubricate the clutch release bearing bore, fork pivot head during assembly.



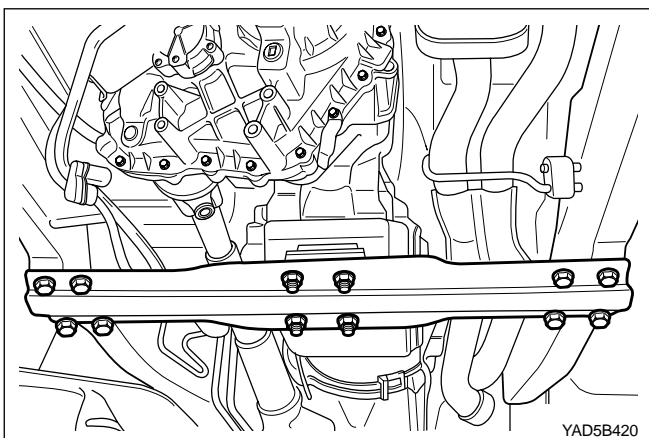
Installation Procedure

1. Install the transmission to the vehicle. At this time, seat correctly the input shaft of the transmission on the pilot bearing of the flywheel.

2. Tighten the transmission mounting bolts as the specified torque on the vehicle.

Installation Notice

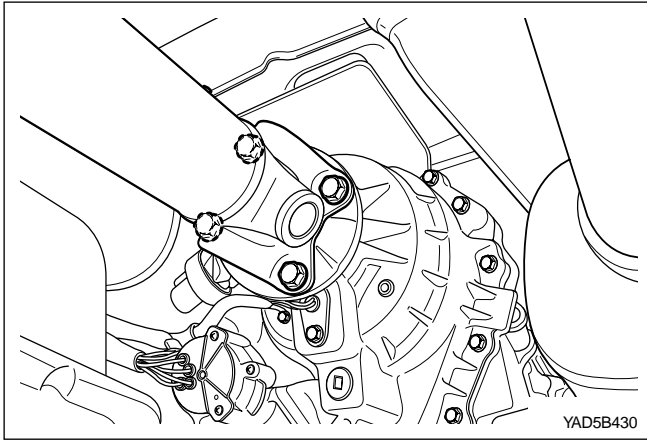
Tightening Torque	77 - 87 N•m (57 - 64 lb-ft)
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3. Install the cross member and tighten as the specified torque by supporting the suitable jack.

Installation Notice

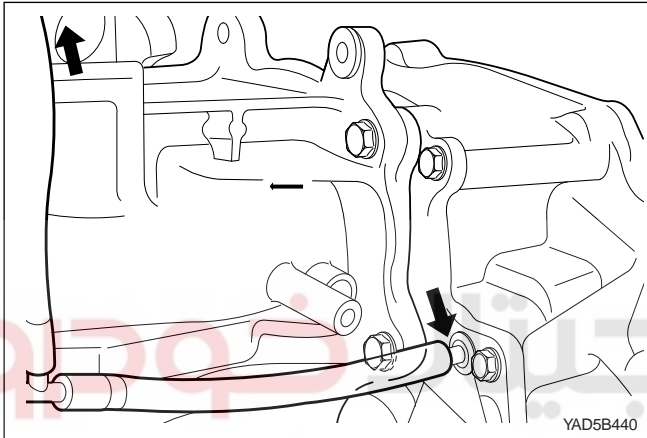
Tightening Torque	Left/Right	62 - 93 N•m (45 - 69 lb-ft)
	Center	21 - 35 N•m (15 - 26 lb-ft)



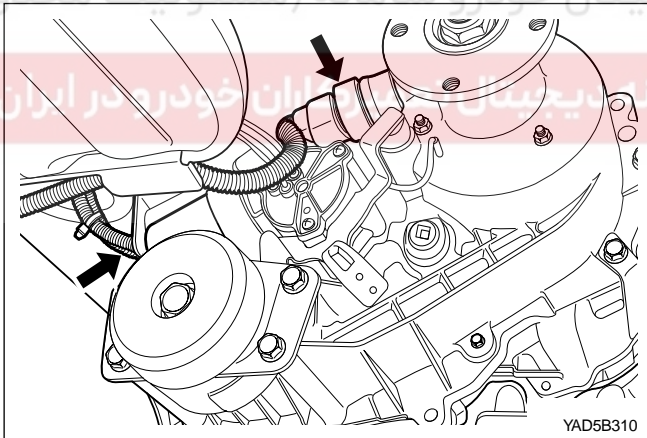
4. Install the front and rear propeller shafts to the transmission.

Installation Notice

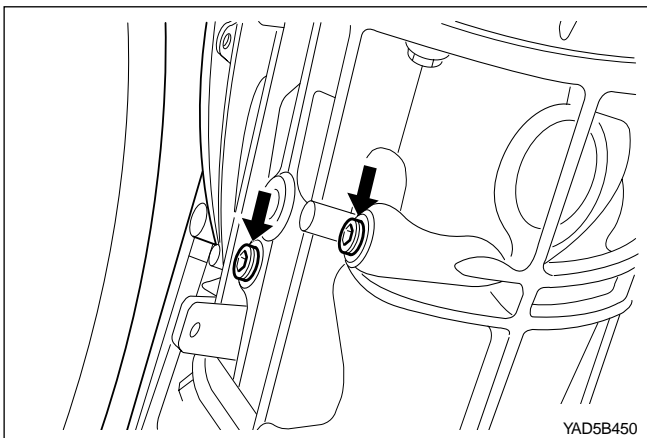
Tightening Torque	Front	81 - 89 N•m (60 - 66 lb-ft)
	Rear	70 - 90 N•m (52 - 66 lb-ft)



5. Connect the cable, the harness and the bleeder.
6. Install the back lamp switch.



7. Install the speedometer cable.



8. Charge the approved oil in the transmission housing and tighten the drain plug and the filler plug.

Installation Notice

Tightening Torque	Filler Plug	25 N•m (18 lb-ft)
	Drain Plug	25 N•m (18 lb-ft)

• Oil

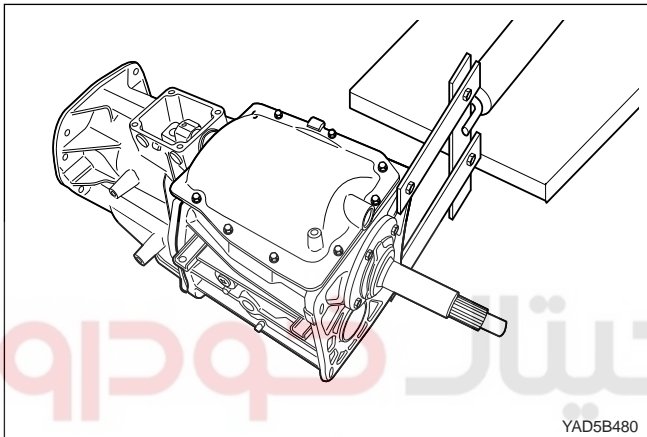
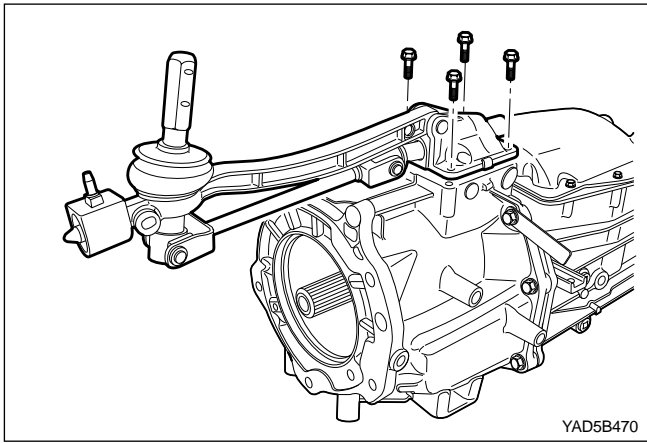
Spec.	ATF Dexron II	
Capacity	4WD	3.4L
	2WD	2.0L

UNIT REPAIR

MAJOR UNIT

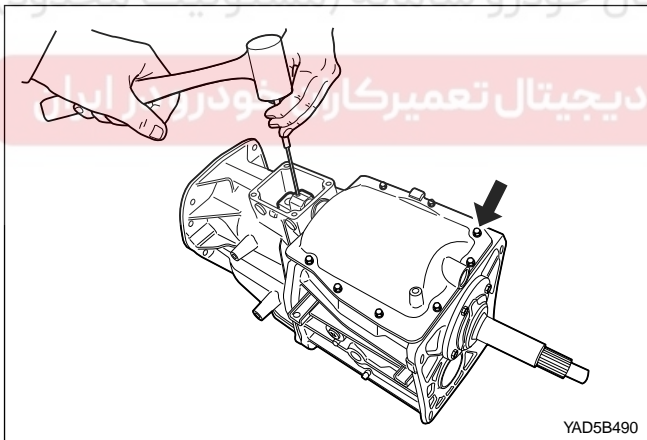
Disassembly Procedure

1. Remove the shift lever from the extension housing.

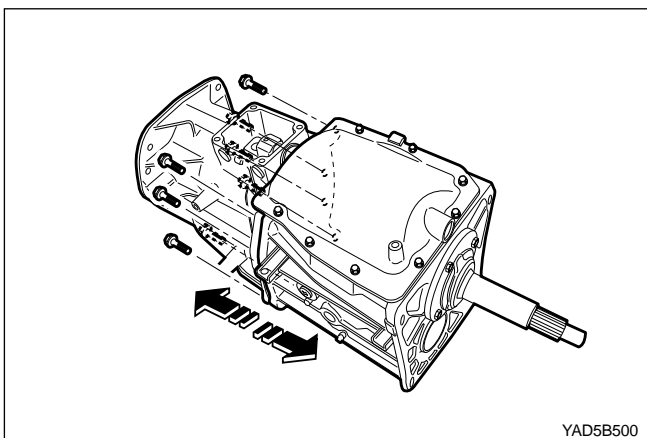


2. Install the removed transmission into a fixture.
3. Remove the drain plug and drain the oil. Using a 10 mm wrench, remove the clamp bolt and position the offset lever in the 3-4 position of neutral.

Notice: Removal of the offset lever in a position other than 3-4 of neutral will be difficult.



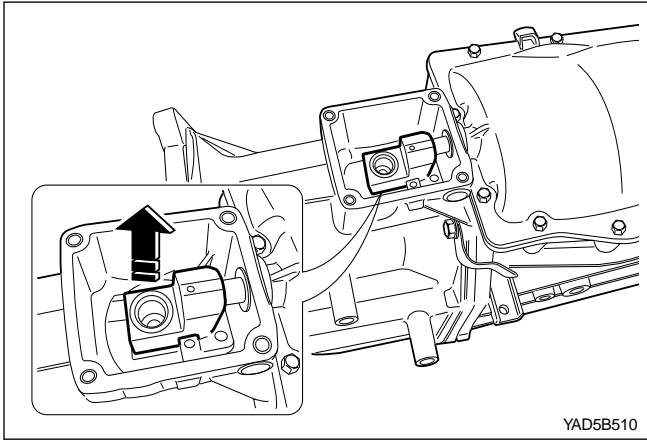
4. Using a pin punch and a hammer, remove the roll pin to remove the shift lever from the offset lever.
5. Using a 15 mm wrench, remove the 8 bolts from the extension housing.



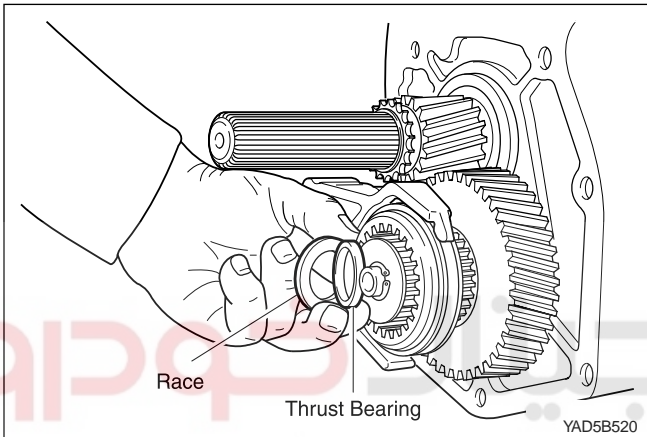
6. Separate the extension housing from the case and shift cover.

Separate the offset lever from the shift.

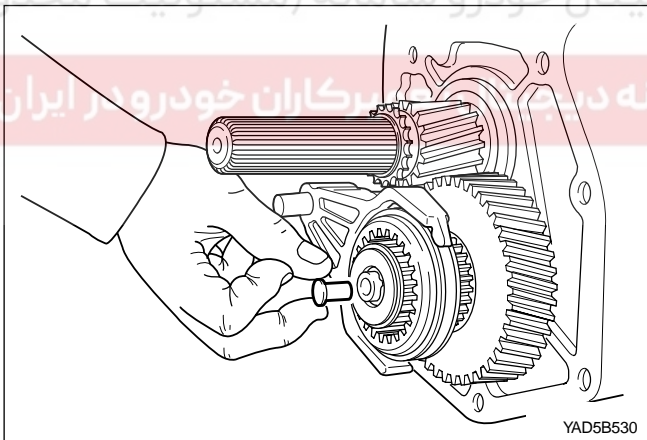
Notice: Do not remove the offset lever while the extension housing is still assembled to the case.



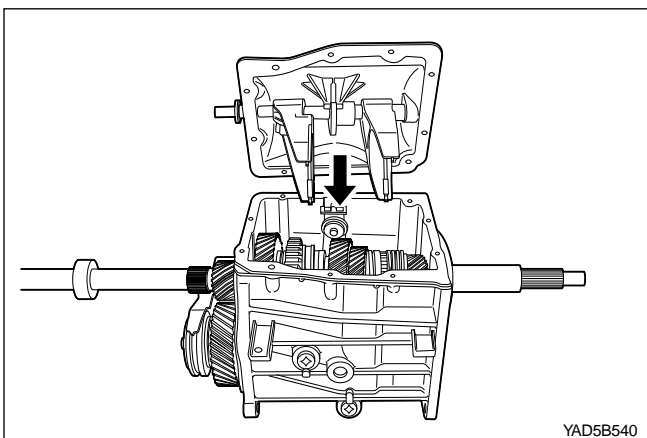
7. Remove the offset lever from the extension housing with the detent ball and spring.
8. Remove the roll pin from either the offset lever or extension housing.



9. Remove the counter shaft thrust race and bearing.



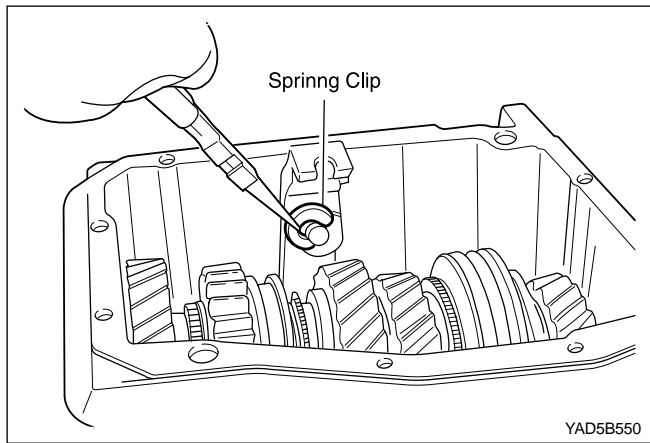
10. Carefully remove the oiling funnel from the end of the counter shaft.



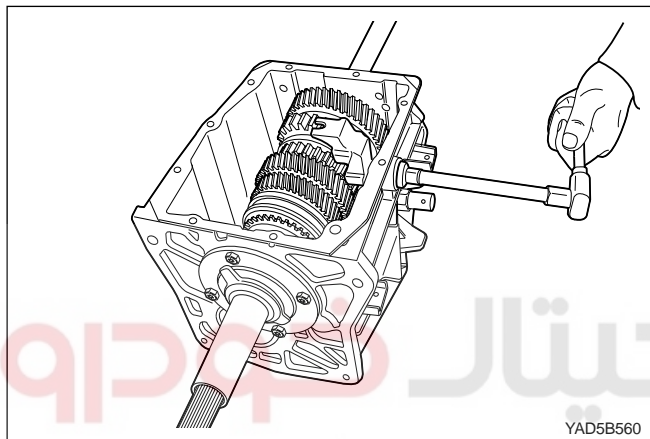
11. Using a 10 mm wrench, remove the 10 bolts from the shift cover.

Notice: For assembly, note the location of the two bolts.

12. Lift up the shift cover after sliding it toward the drain plug about 3 cm. At this time remove sealer bond.

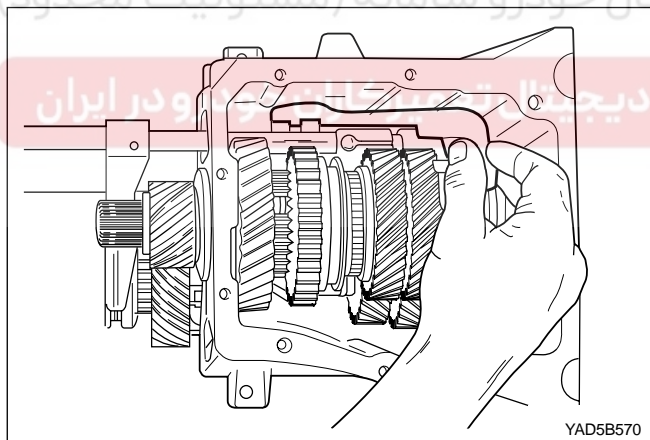


13. Using a needle nose pliers, remove the 5th-R lever clip.



14. Using a 21 mm wrench or a T-50 bit, remove the 5th-R lever pivot bolt.

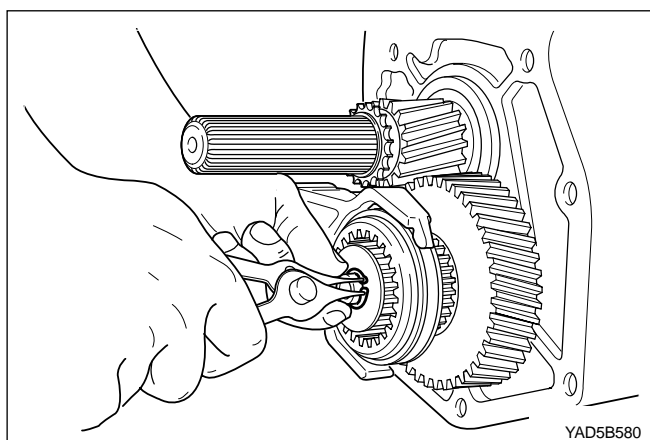
Notice: Apply sealer bond to this bolt during assembly.



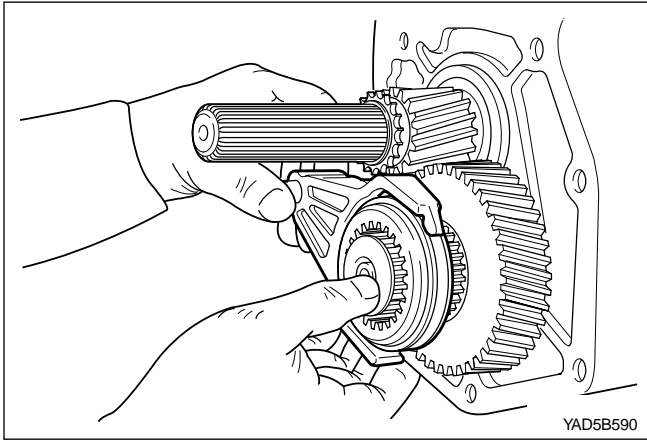
15. Using a 22 mm wrench, remove the back-up lamp switch from the 5-R lever side.

Notice: Apply sealer to the threads.

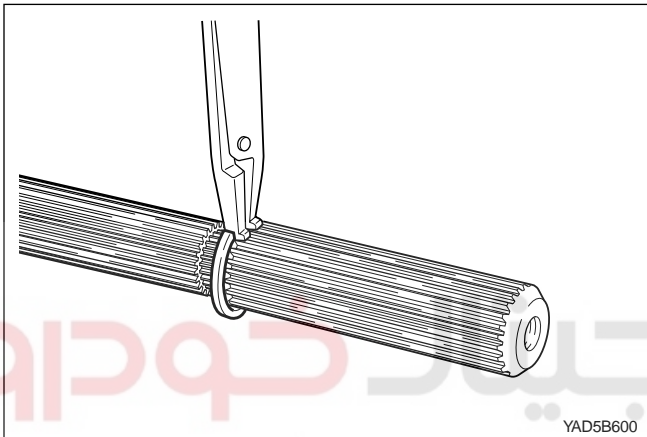
16. Pull out the 5th-R lever out of the transmission.



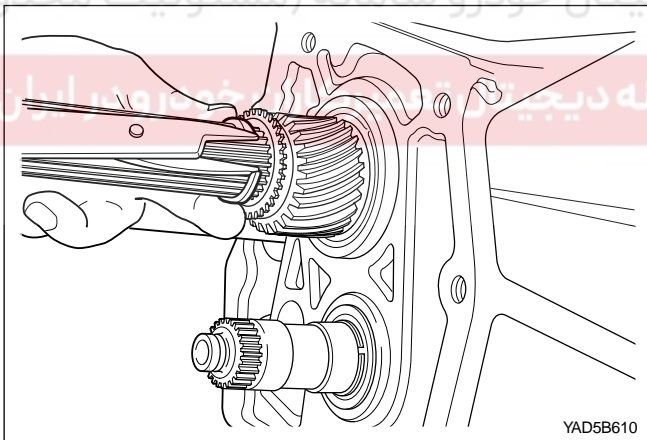
17. Using a snap ring pliers, remove the 5th synchronizer snap ring from the end of the counter shaft.



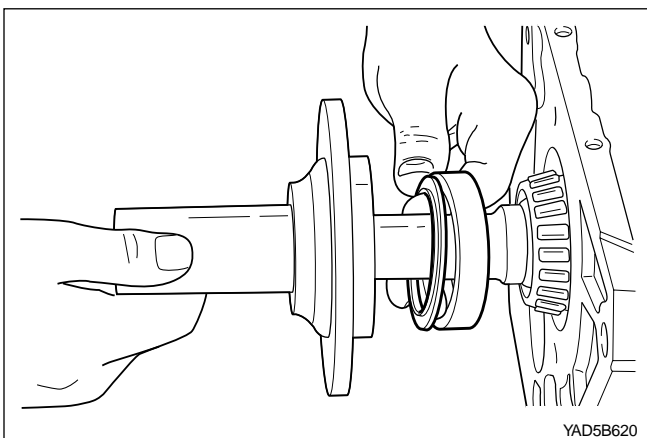
18. Remove the 5th synchronizer assembly with its fork and rail assembly from the counter shaft.



19. Remove the slip yoke snap ring from the main shaft.



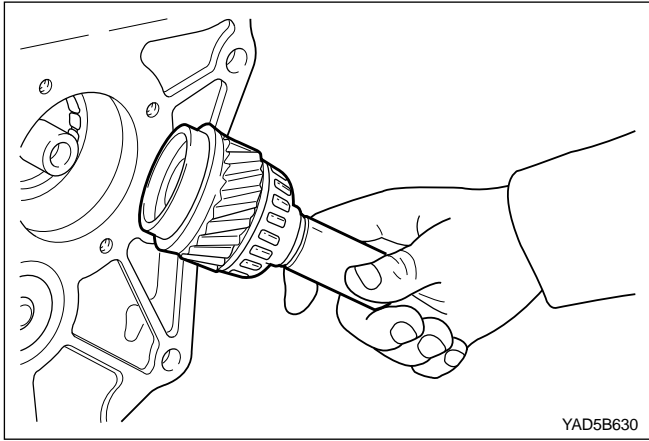
20. Remove the 5th speed drive gear snap ring from the main shaft.



21. Make alignment marks on the case and input bearing retainer and remove the 4 input shaft bearing retainer bolts, using a 13 mm wrench.

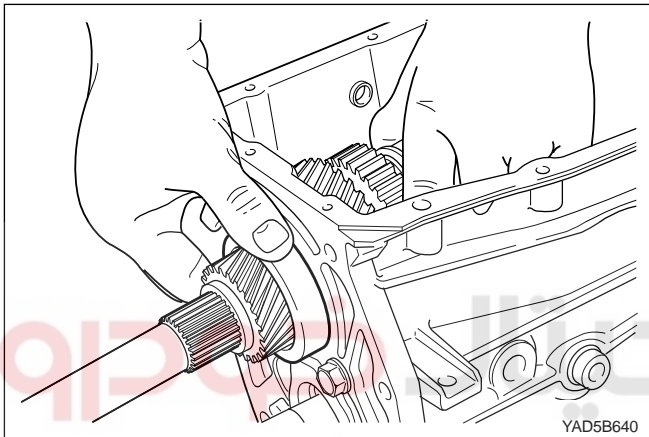
Remove the input bearing retainer with the bearing outer race and shim.

Notice: Apply sealer on these bolts during assembly.



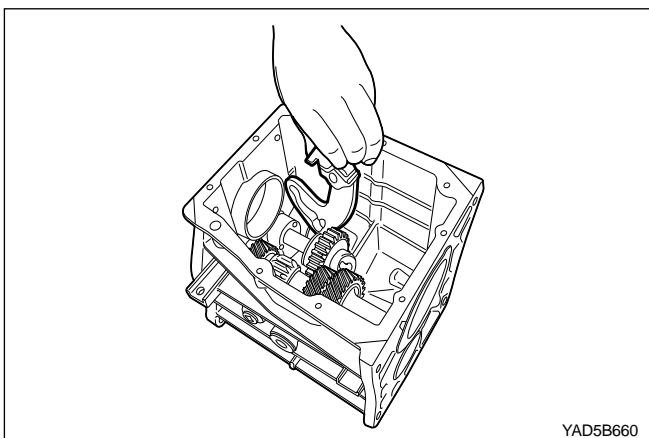
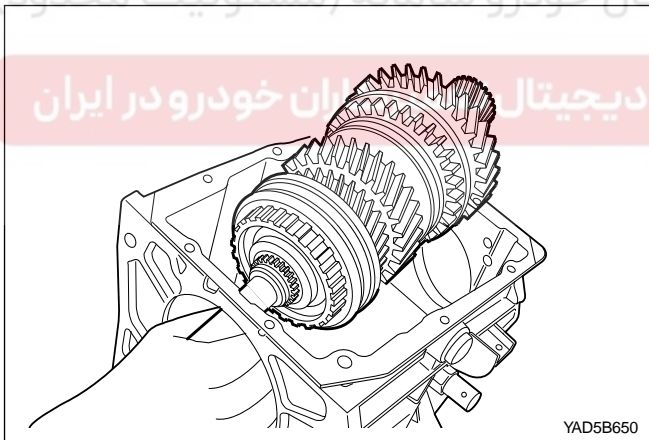
22. Remove the input shaft from the case by rotating it until the flat surface appears.
23. Remove the following parts from the input shaft.
 - 4th speed gear blocking ring.
 - Main shaft thrust race and bearing.
 - Main shaft pilot bearing rollers (15 rollers).

Notice: Be careful not to dissipate the pilot bearing rollers.

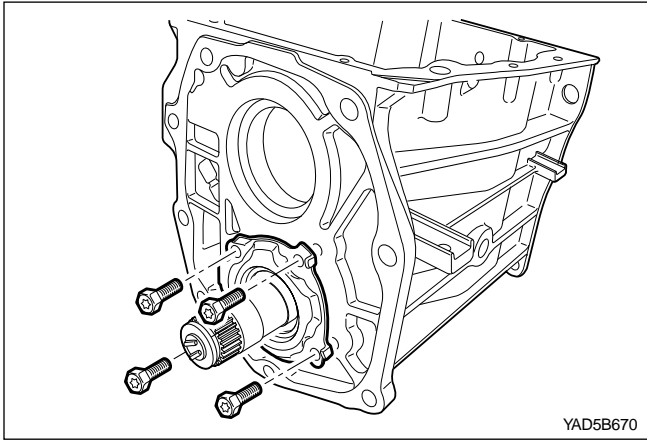


24. Remove the main shaft in 2 steps.
 - To remove the rear bearing outer race, push the main shaft rearward.

- Tilt and lift the main shaft from the case.

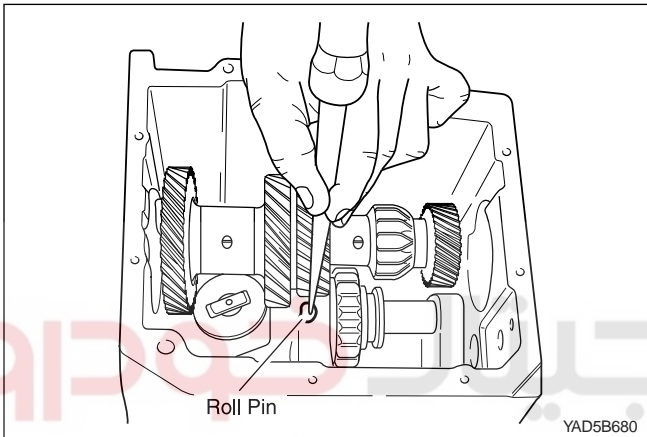


25. Remove the reverse fork and spring from the case.

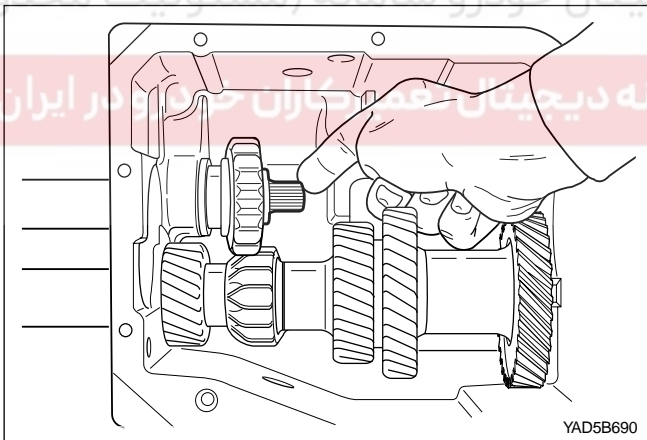


26. Remove the counter shaft as follows:

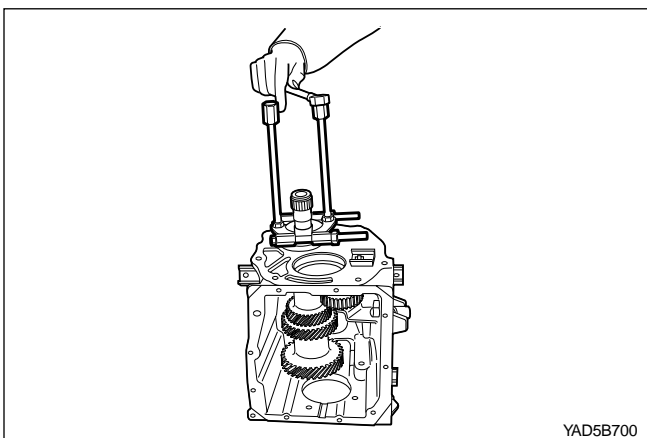
- Using a punch and hammer, pry up the lock tabs.
- Using a 13 mm wrench or T-40 bit, remove the 4 bolts.
- Remove the retainer and shim from the case.
- Push the counter shaft rearward to remove the rear bearing outer race.



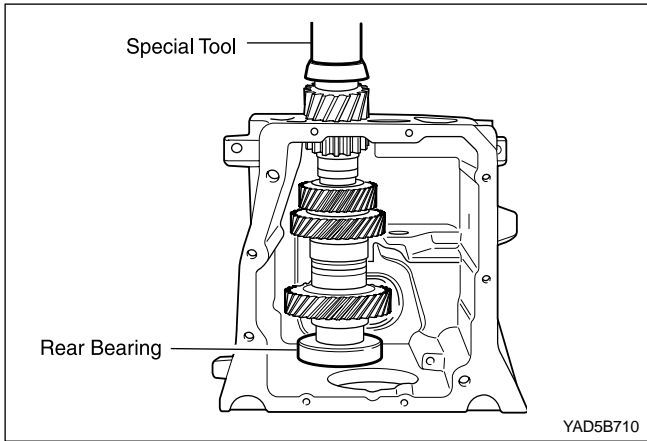
27. Using a pin punch and a hammer, remove the roll pin fixed on the reverse idler shaft.



28. By pushing the reverse idler shaft rearward and out of the case, remove the reverse idler gear and O-ring.

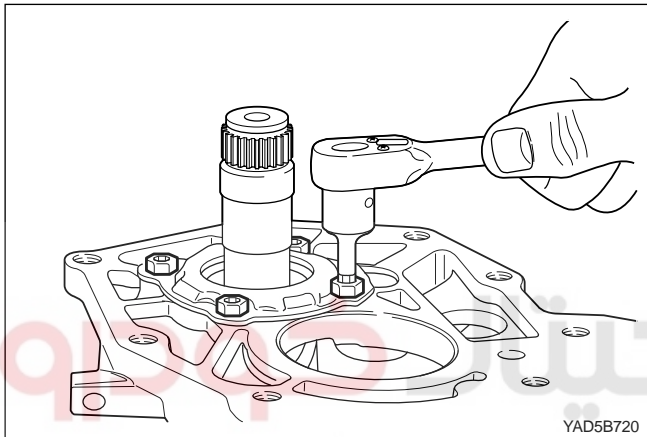


29. Using a puller, remove the rear bearing assembly from the counter shaft.



Assembly Procedure

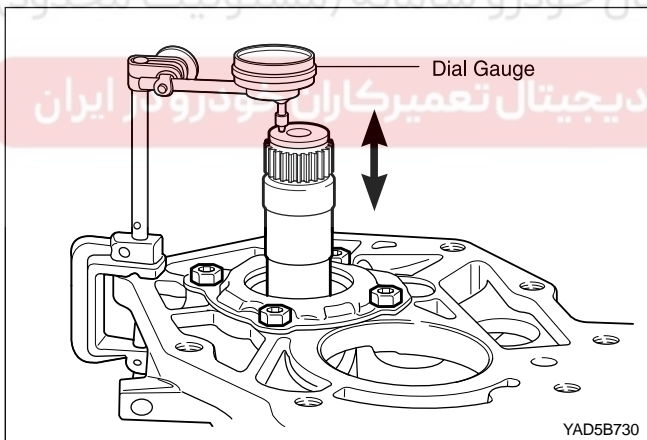
1. Using a hydraulic press and a supporting tool, press the counter shaft rear bearing into the case. Be sure that the supporting tool inside of the case should support the counter shaft.



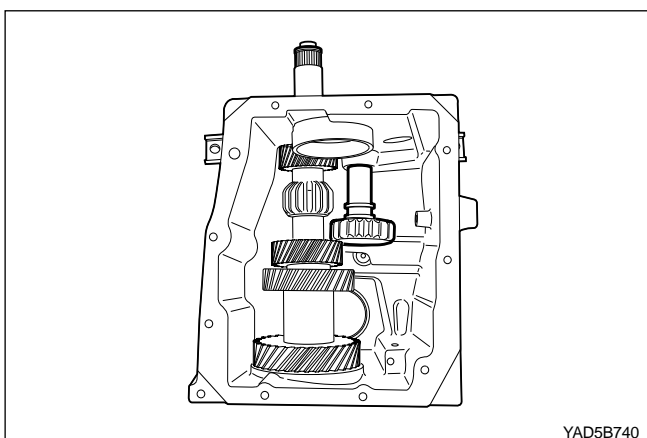
2. Without the shim, install the retainer and counter shaft rear bearing outer race. Tighten the 4 retainer bolts.

Installation Notice

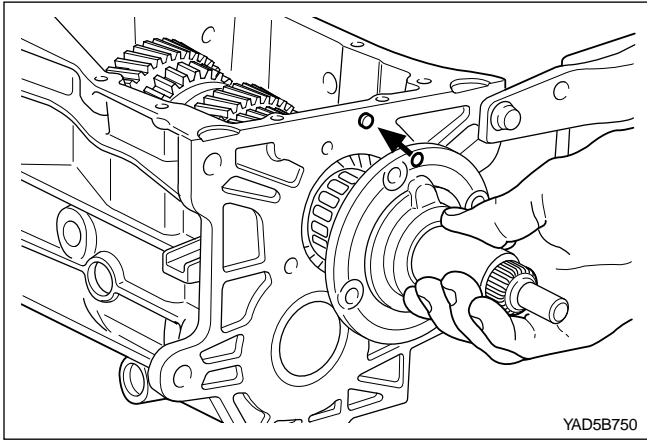
Tightening Torque	20 N•m (15 lb-ft)
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3. Place a dial indicator on the case and measure counter shaft end play by moving up and down.



4. Select a shim which is the same thickness as the indicator rearing (up to 0.004 inch) and assemble it.
5. When the end play is correctly adjusted, remove the counter shaft rear bearing retainer and outer race.
6. Using a pin punch and rubber hammer, install the reverse idler shaft, gear and O-ring.

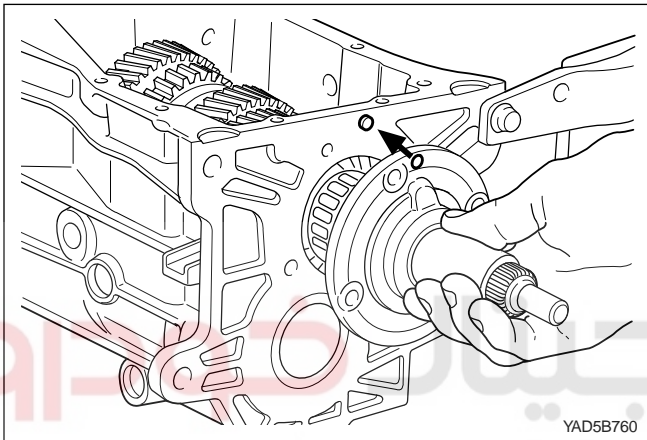


7. Install the counter shaft rear bearing outer race, shim and retainer.

Installation Notice

Tightening Torque	20 N•m (15 lb-ft)
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Notice: Using a punch and hammer, bend the lock tabs on the retainer.



8. Install the following parts :

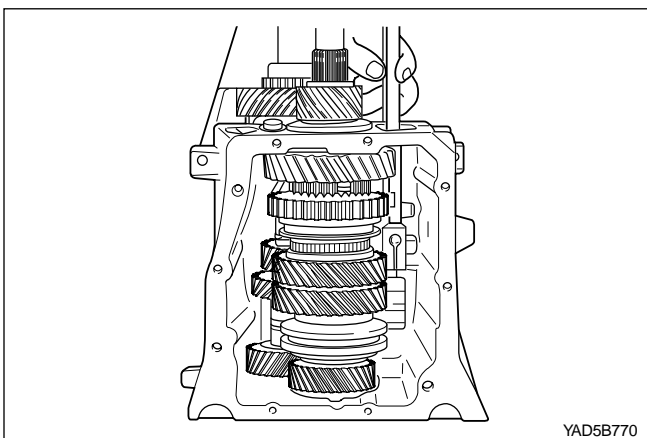
- Install the main shaft into case.
- Install the main shaft rear bearing outer race into the rear of the case.
- Install the 4th speed blocking ring onto the front of the main shaft.
- Install the input shaft onto the front of the main shaft.
- Install the input bearing retainer without shim onto the front of the case.
- Using a torque wrench, tighten the 4 bolts.

Installation Notice

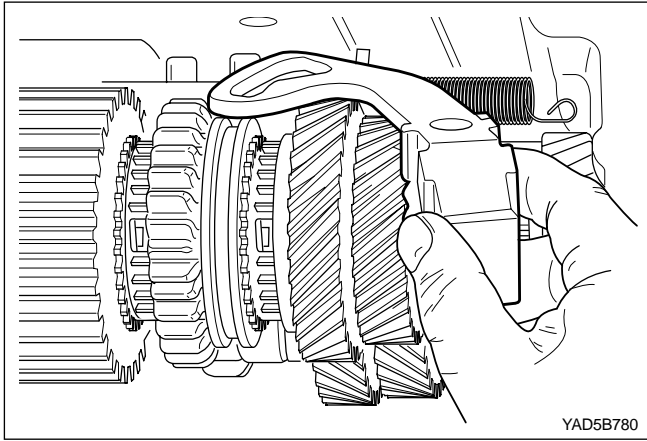
Tightening Torque	20 N•m (15 lb-ft)
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اولین سامانه دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



9. Install the 5th speed drive gear and blocking ring on the counter shaft.
10. Install the 5th synchronizer and rail/fork.
11. Install the 5th synchronizer snap ring and oiling funnel.

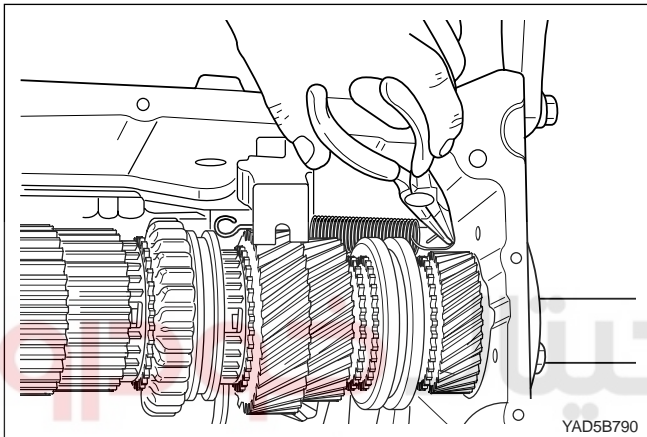


12. Align the slots of the lever with the rollers of the reverse fork and 5th shift rail. Apply sealer on the 5-R lever pivot bolt and install it into the case.

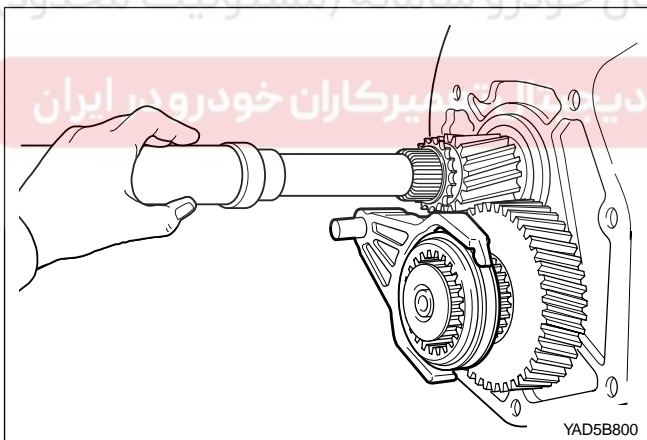
Installation Notice

Tightening Torque	28 N•m (21 lb-ft)
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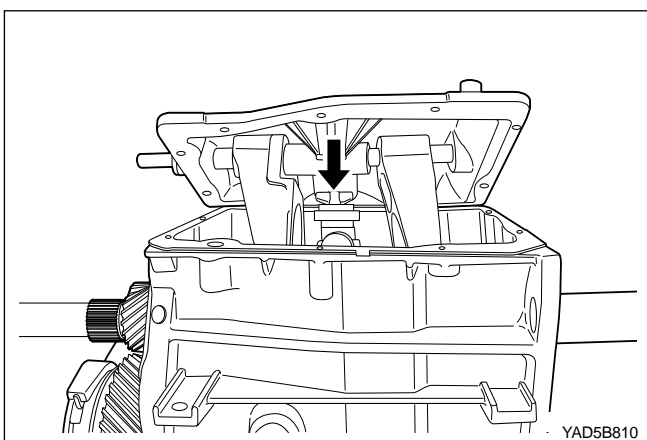
13. Using a needle nose pliers, install the 5-R lever clip.



14. Using a needle nose pliers, install the reverse fork spring to its pin inside the case. Check the operation of the 5-R shift mechanism at this time.



15. Using a snap ring pliers, install the slip yoke snap ring onto the end of the main shaft.
16. Make sure that the 1-2 and 3-4 synchronizer sleeves and 5-R shift lever are in neutral position.

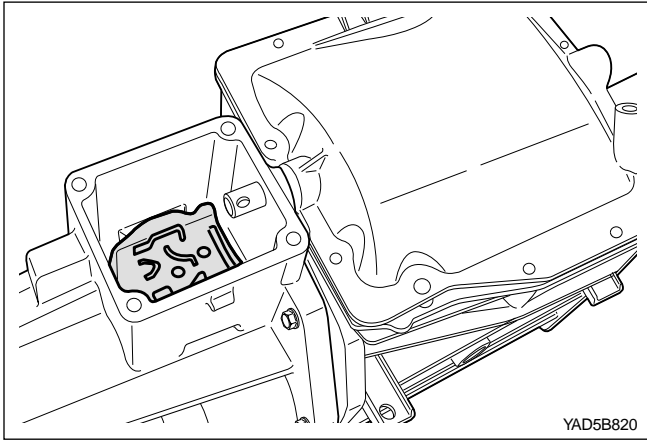


17. Align the holes the case and cover with alignment-type bolts. Tighten the 10 bolts.

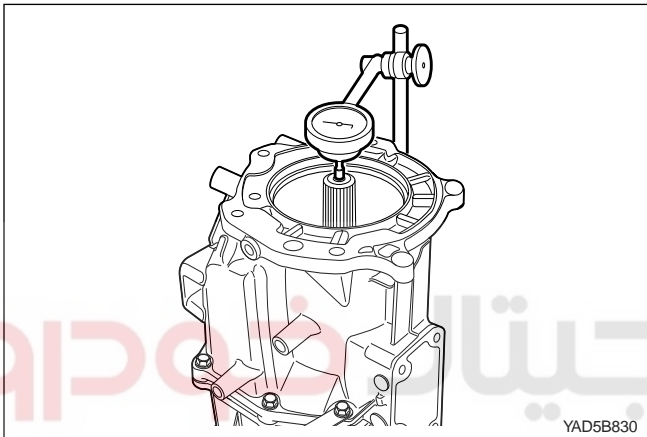
Installation Notice

Tightening Torque	15 N•m (11 lb-ft)
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18. Apply RTV sealant on the sealing surface of the extension housing.
19. Apply grease on the detent/guide plate in the extension housing. Install the detent ball in the 3-4 position.



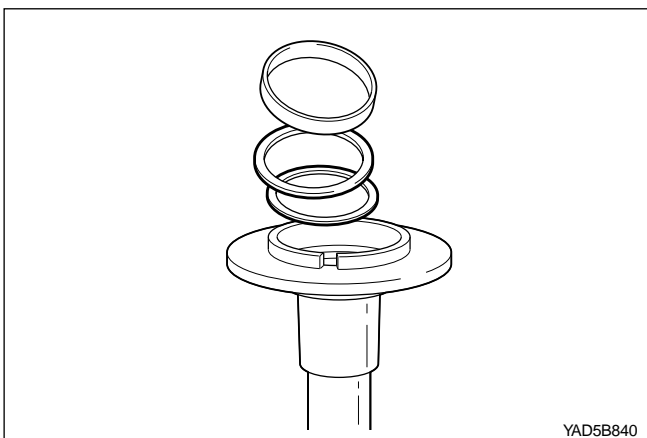
20. Place the detent spring and offset lever in the extension housing and push the extension against the case and shift cover.



21. Completely compress the detent spring.
 22. To install the extension housing to the case, apply sealer to the top two bolts and tighten them and tighten the 6 bolts.
 23. Apply sealer to the back-up lamp switch and drain plug and tighten them.
 24. Using a hammer, install the offset lever-to-shift roll pin.
 25. Turn the transmission case reversely and place a dial indicator on the extension housing. Move the input and main shift up and down and measure end play. Select a shim which is the same thickness as the measurement (0.001 inch). After shim installation, the end play should be "0".

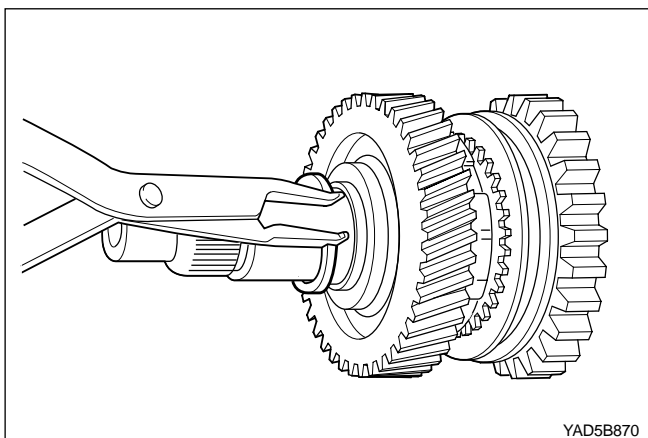
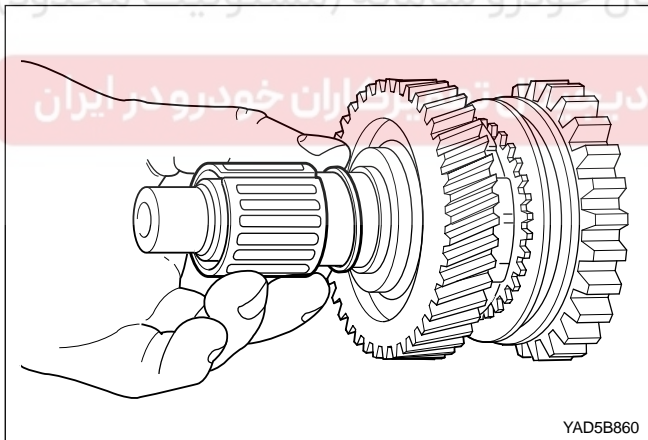
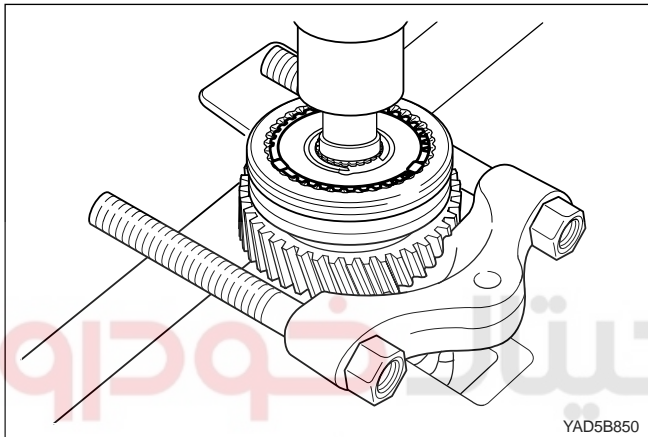
اولین سامانه دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



26. Remove the input bearing retainer and do the following :
- Install the adjusting shim behind the input bearing outer race in the retainer and if 2 shims are used, install the thinner one in first.
 - Install the retainer to the case and tighten the bolts.
 - If end play is not 0 change the shim again.
 - Apply RTV sealant to the sealing surface of the retainer.
 - Apply sealer to the 4 retainer bolts and tighten them.

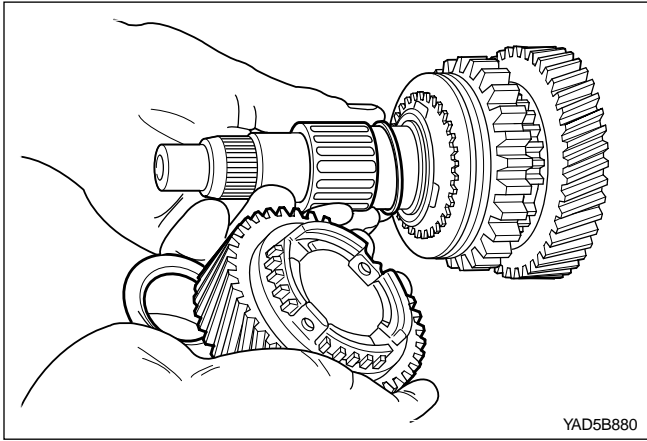
27. Remove the fill plug.
28. Remove the transmission from the holding fixture and install it to the vehicle.
29. Clean the sealing surface of the shift control lever.
30. Install the control cables to the shift lever.



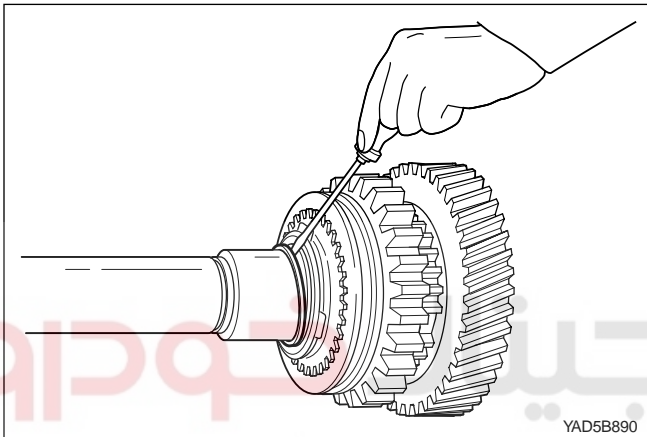
MAIN SHAFT

Disassembly Procedure

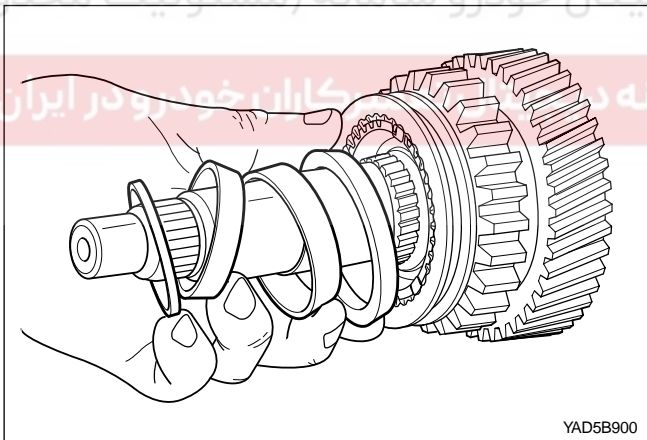
1. For correct reassemble, place an alignment mark on the 3-4 Synchronizer hub and sleeve.
2. Using a hydraulic press and puller plate, remove the 3-4 Synchronizer assembly and the 3rd speed gear.
3. Remove the 3rd speed gear bearing and spacer.
4. Using a snap ring pliers, remove the 2nd speed gear snap ring.
5. Remove the 2nd speed gear thrust washer.



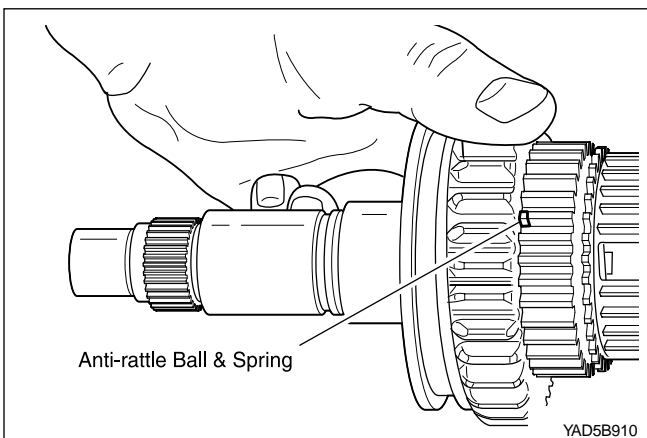
6. Remove the 2nd speed gear, bearing and spacer.



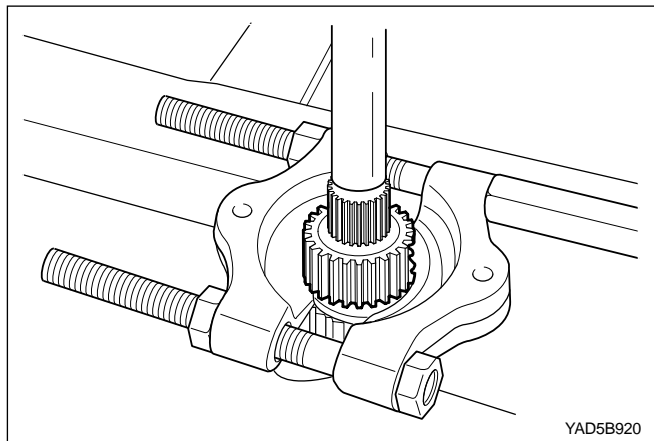
7. Using a screwdriver, remove the spiral retaining ring.



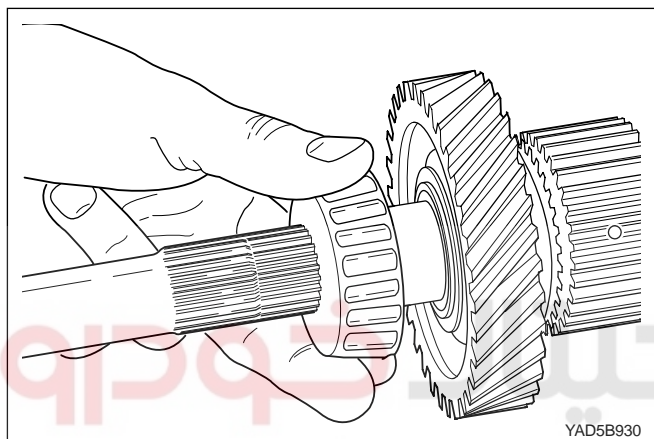
8. Remove the thrust washer and three-piece 2nd speed blocking ring assembly.



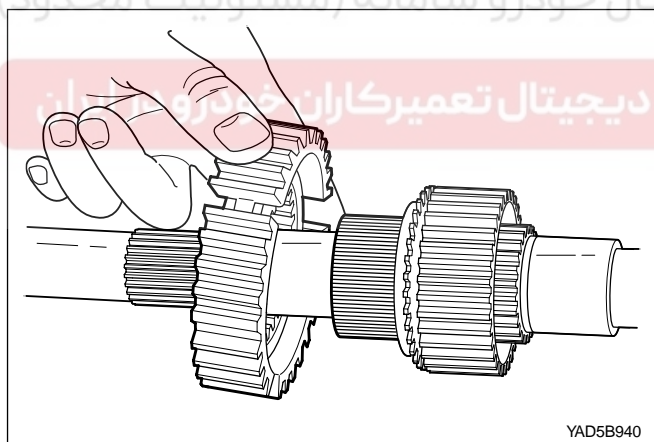
9. For correct reassembly, place an alignment mark on the 1-2 synchronizer hub and sleeve.
10. Remove the 1-2 synchronizer sleeve from the hub with following parts :
- The anti-rattle ball and spring.
 - The three keys.
 - One of the 3 springs.



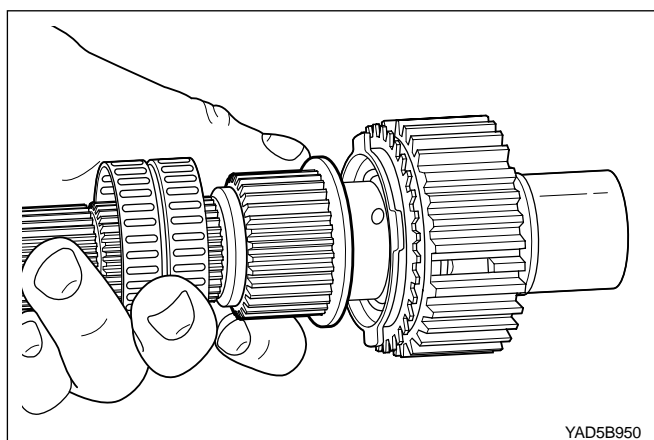
11. Using a hydraulic press and puller plate, remove the 5th speed driven gear from the main shaft.



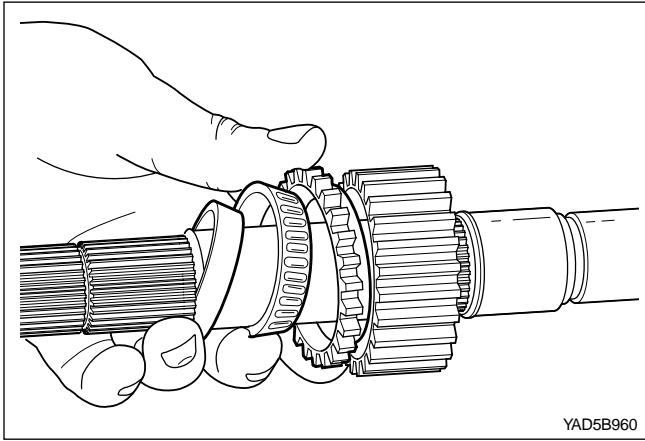
12. Remove the main shaft rear bearing assembly from the shaft.



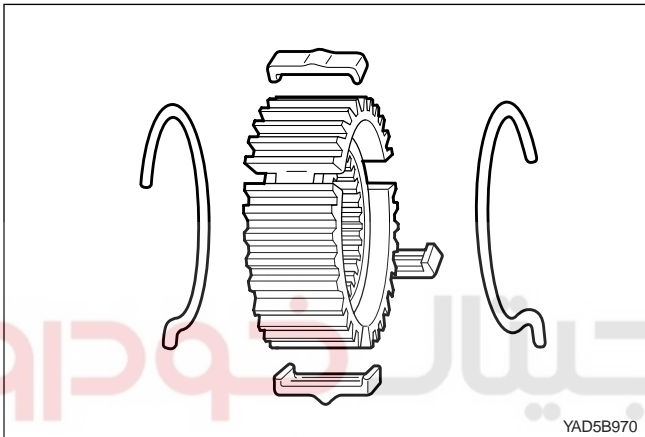
13. Remove the 1st speed gear and bearing.



14. Remove the inner race.



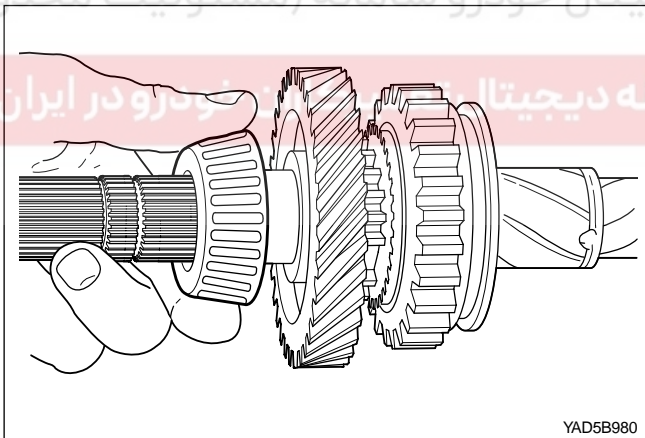
15. Remove the tree-piece 1st speed blocking ring assembly and remaining synchronizer spring.
16. Check and clean all removed parts and replace if necessary.



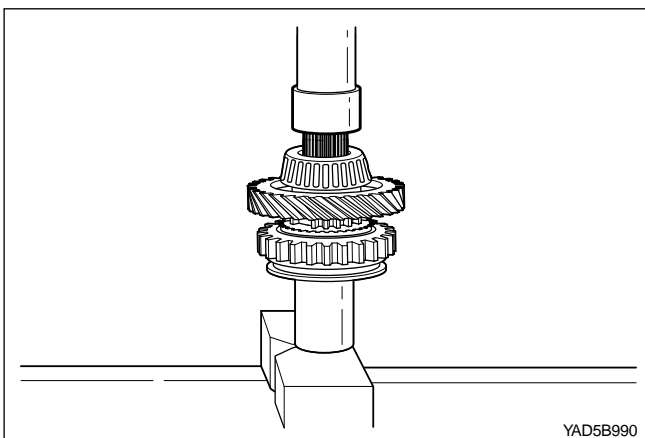
Assembly Procedure

1. When assemble the synchronizer, make sure that the hubs and sleeves are matched and the 3 keys are installed properly. Also align blocking rings with keys during installation.

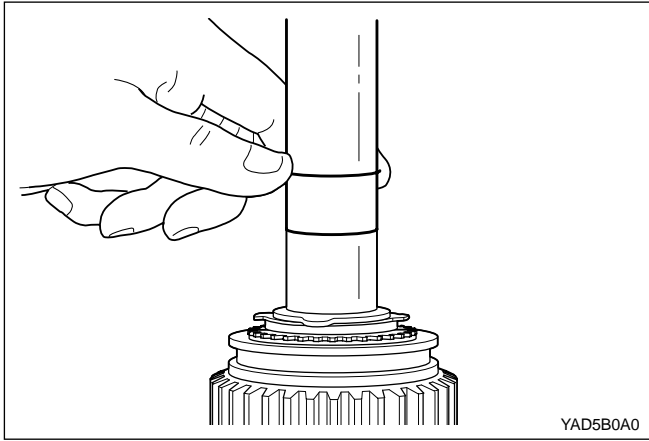
Notice: Before assembly, coat all parts with lubricant. In case of the paper-lined blocking rings, soak them in DexronII/III before installation.



2. Assemble the following parts :
 - 1st speed blocking ring.
 - Alignment pin and 1st speed gear bearing race.
 - 1st speed gear and its bearing.
3. Install the rear bearing assembly to the main shaft.

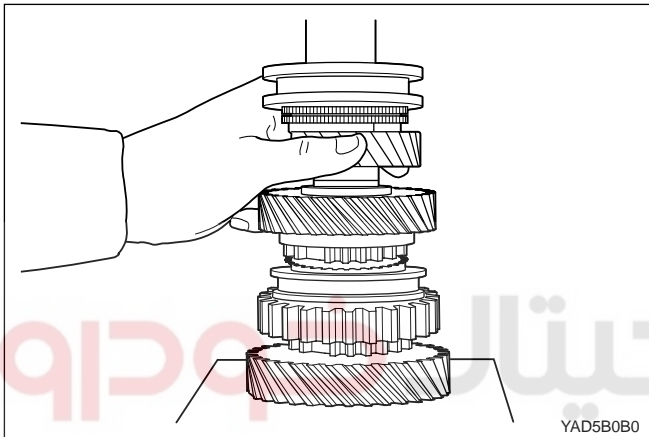


4. Using a hydraulic press and installer, press the 5th driven gear onto the main shaft. While the main shaft is still on the press bed, install the 5th driven gear snap ring. If the snap ring does not fit completely, continue pressing the 5th driven gear.



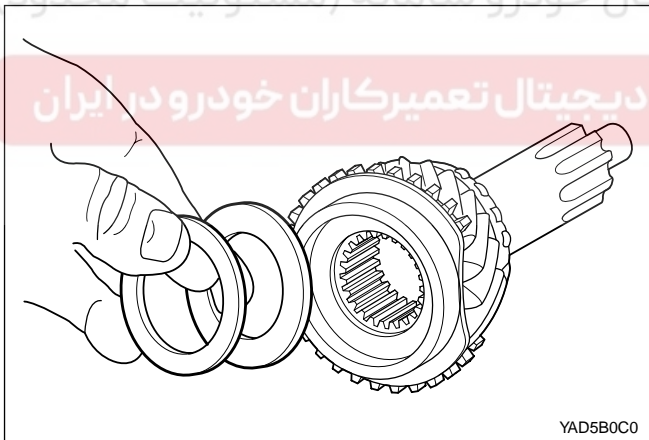
5. Install the following parts :

- 2nd speed blocking ring assembly.
- Thrust washer for the blocking ring inner cone.
- Spiral retaining ring (Use special tools).
- 2nd speed gear spacer, bearing and gear.
- 2nd gear thrust washer and snap ring.
- 3rd speed gear spacer, bearing and gear.
- 3rd speed blocking ring.



6. Using a hydraulic press and installer, install the 3-4 synchronizer hub onto the main shaft.

Notice: Align the blocking ring with the synchronizer keys while installing the hub.

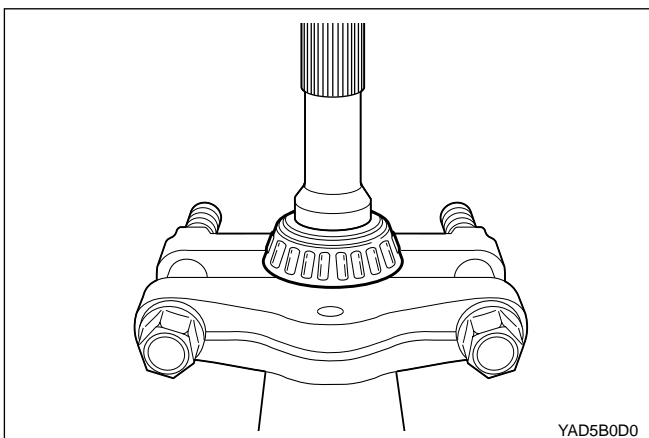


INPUT SHAFT

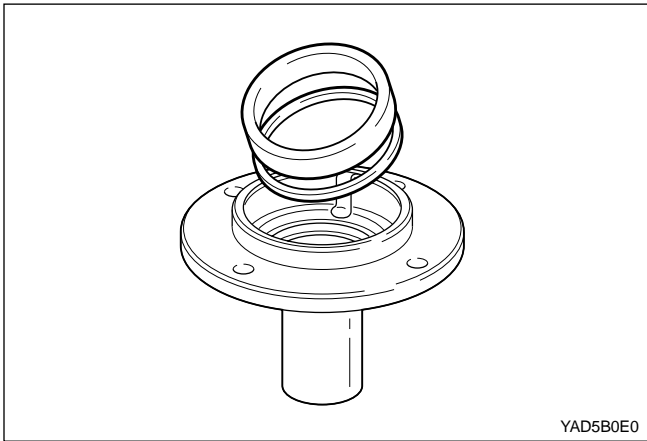
Disassembly Procedure

1. Remove the following parts from the input shaft :

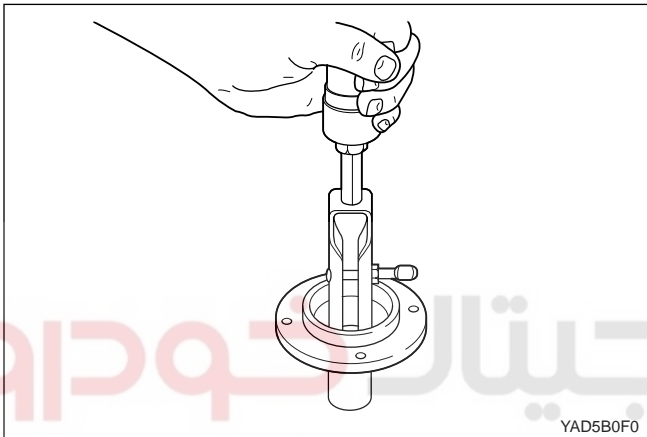
- Main shaft thrust race and bearing.
- Main shaft pilot bearing rollers (15 rollers).



2. Using a hydraulic press and puller plate, remove the input shaft bearing assembly from the shaft.

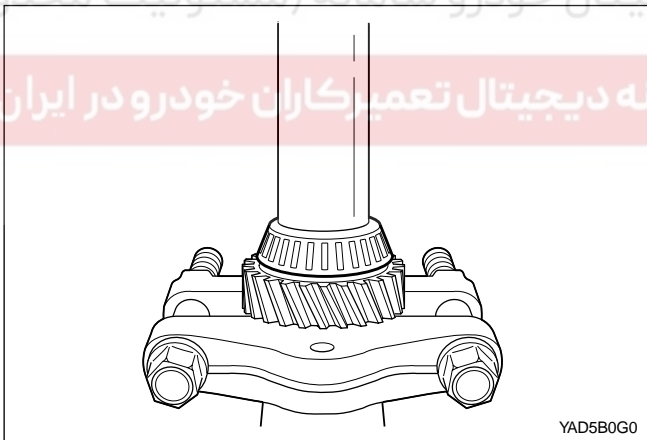


3. Remove the input bearing.



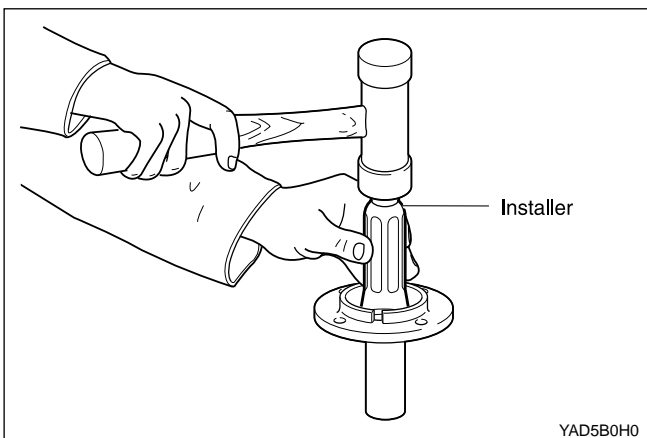
4. Remove the input shaft seal.

5. Check and clean all removed parts and replace if necessary.



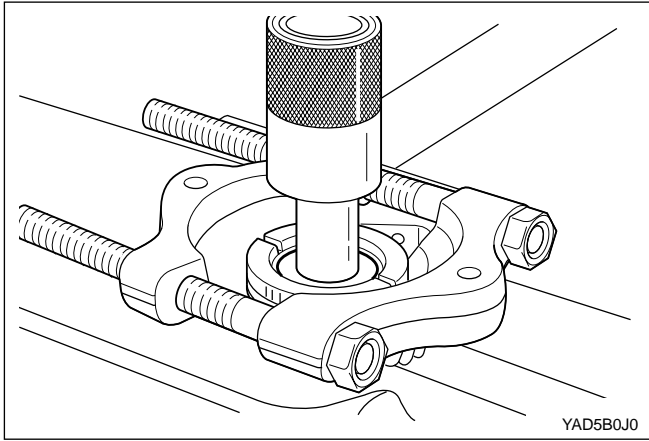
Assembly Procedure

1. Using a hydraulic press and installer, press the input shaft bearing onto the input shaft.
2. Apply grease to the thrust bearing inner roller (15 rollers) and install the main shaft thrust bearing and its race in the rear of the input shaft.



3. Using a rubber hammer and installer, install the input bearing retainer and input shaft seal after applying grease.

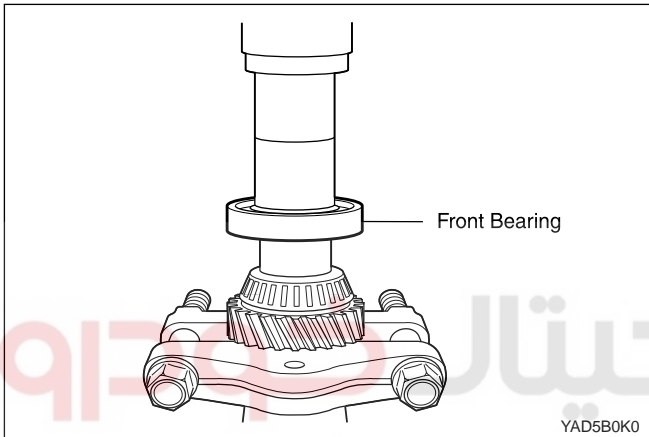
4. Install the bearing outer race to the retainer without end play adjusting shim.



COUNTER SHAFT

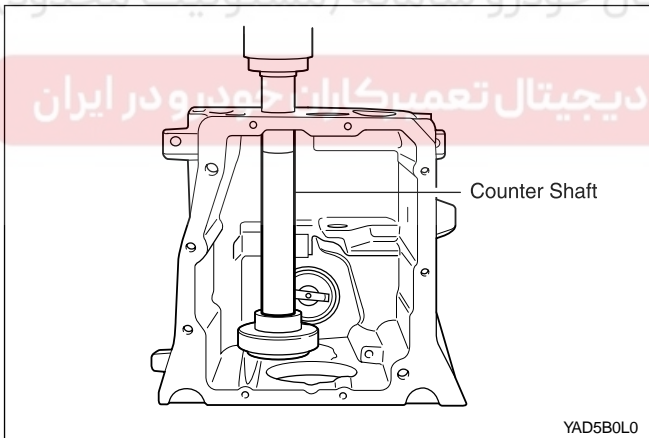
Disassembly Procedure

1. Using a hydraulic press and special tool, remove the front bearing assembly from the counter shaft.
2. Check and clean all removed parts and replace if necessary.



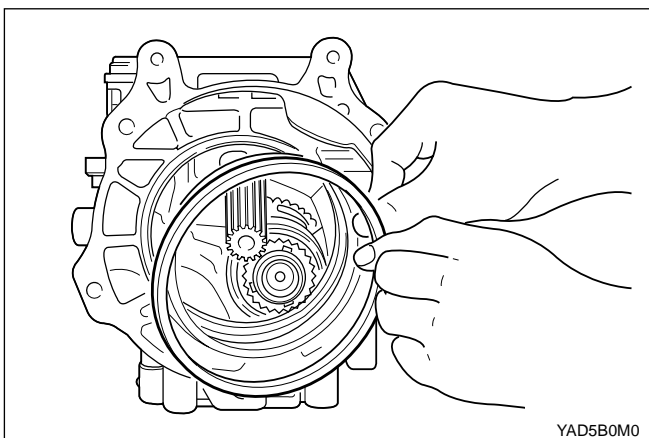
Assembly Procedure

1. Using a hydraulic press and installer, press the front bearing assembly onto the counter shaft.



2. Install is as follows :

- Install a new O-ring on the counter shaft outer race and lubricate it.
- Using a installer, lightly tap the race into its bore until the O-ring is compressed.
- Install the race to be fully seated on the inside of the case.



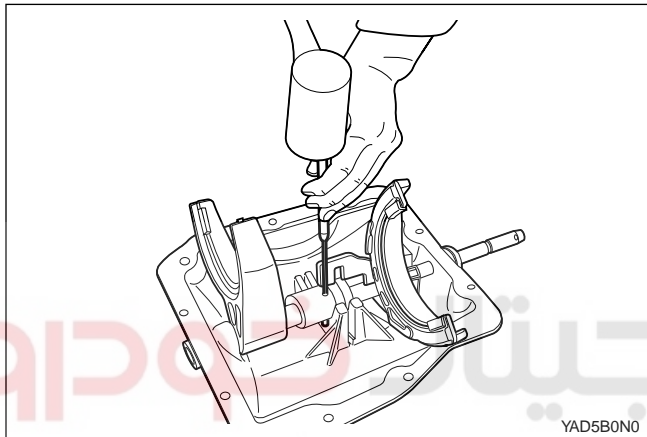
EXTENSION HOUSING

Disassembly Procedure

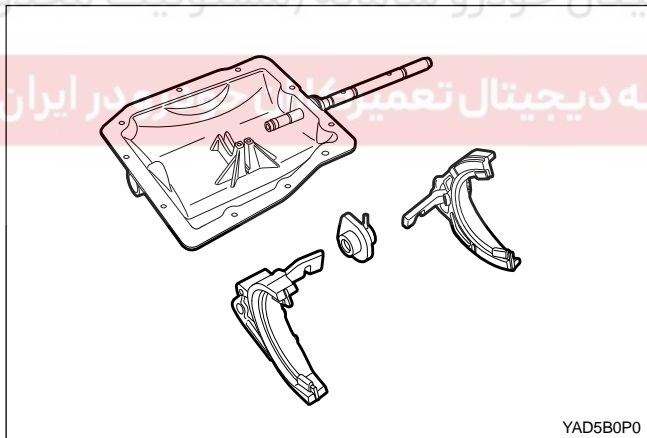
1. Remove the vent from the extension housing.
2. Remove the O-ring and steel ring from the rear of the extension housing.
3. Check and clean all removed parts and replace if necessary.

Assembly Procedure

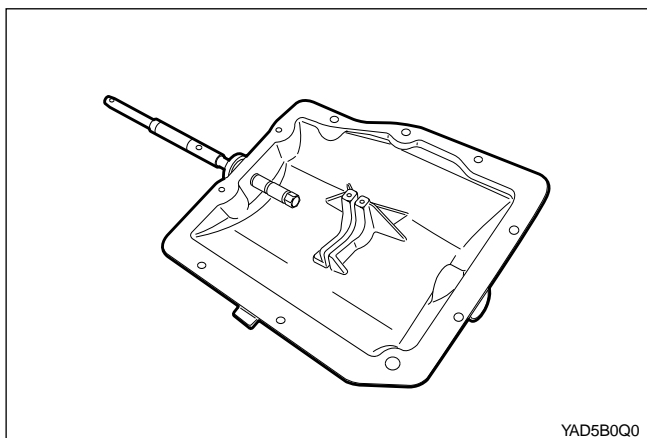
1. Install the O-ring and steel ring to the rear of the extension housing.
2. Install the vent to the extension housing.

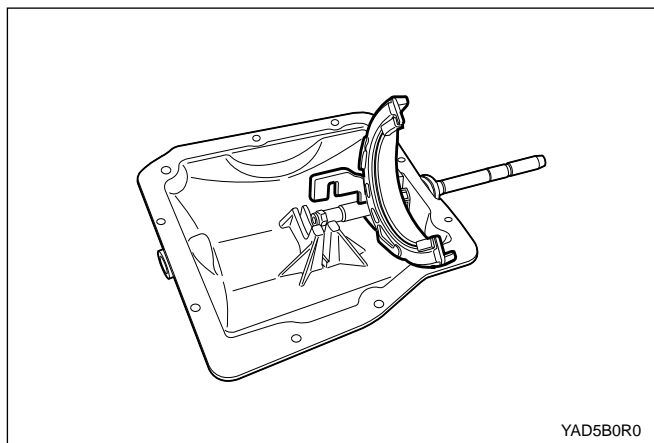
**SHIFT COVER****Disassembly Procedure**

1. Using a hammer and a pin punch (3/16) remove the selector arm roll pin.
2. Before removal, note the correct position of the interlock plate and selector arm and remove the shift shaft.
3. Check and clean all removed parts and replace if necessary.

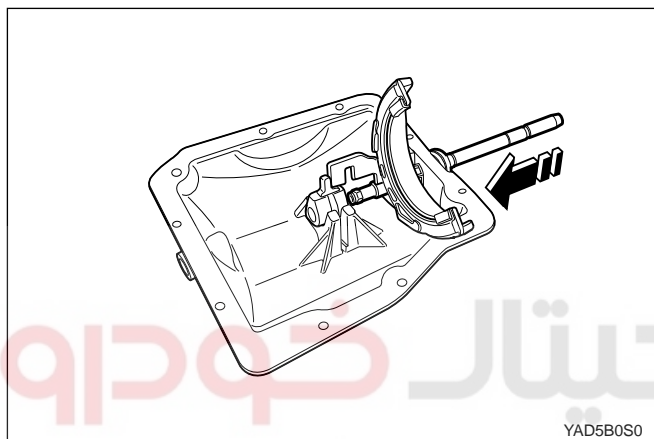
**Assembly Procedure**

1. If the shaft cup plug was removed, apply plug outer surface with sealer and install it into the cover.
2. Install the fork pads and selector plates onto the 1-2 and 3-4 shift forks.
3. Assemble the shift cover parts as follows :
 - Push the shift shaft into the cover until the front of the shaft is at the inside of the cover.





- Install the 1-2 shift fork and its selector plate.

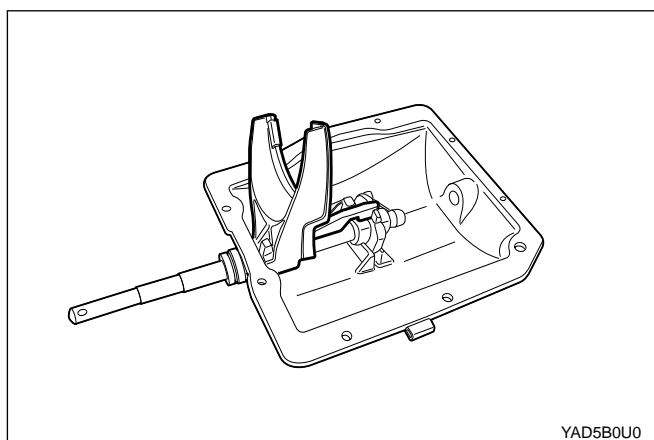


- Push the shift shaft through the 1-2 shift fork.

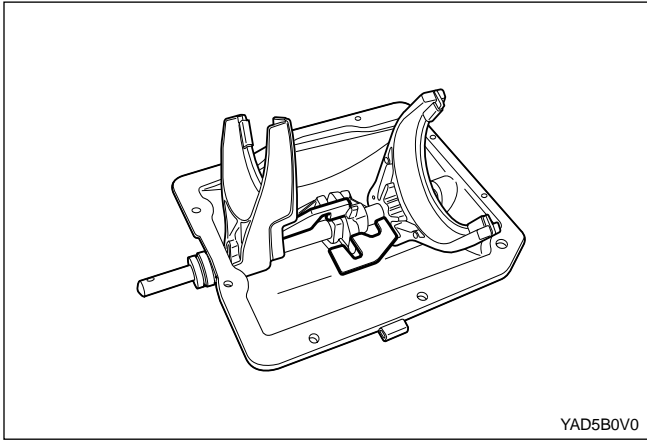


- Place the selector arm and interlock plate in the cover.

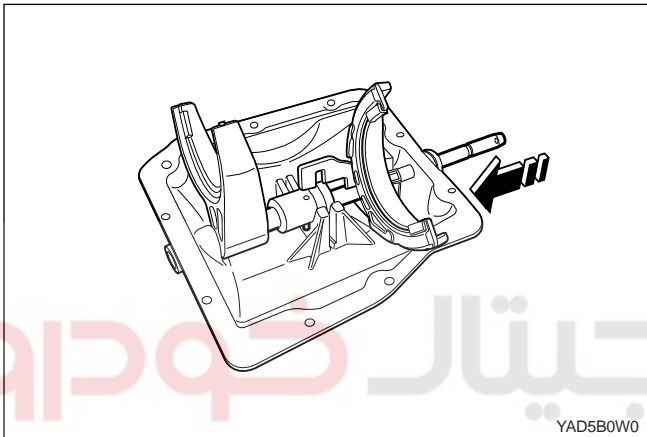
Note the position of the interlock plate and selector arm.



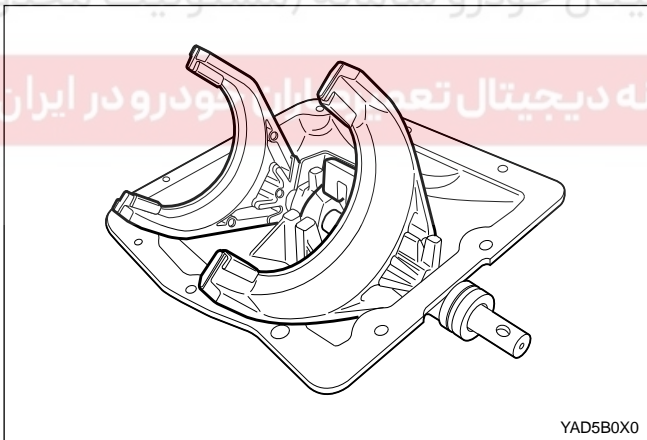
- Push the shift shaft through the 3-4 shift fork.



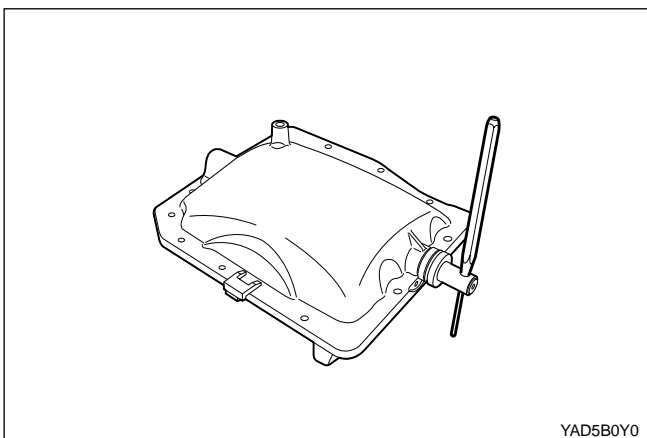
- Install the 3-4 shift fork and its selector plate.



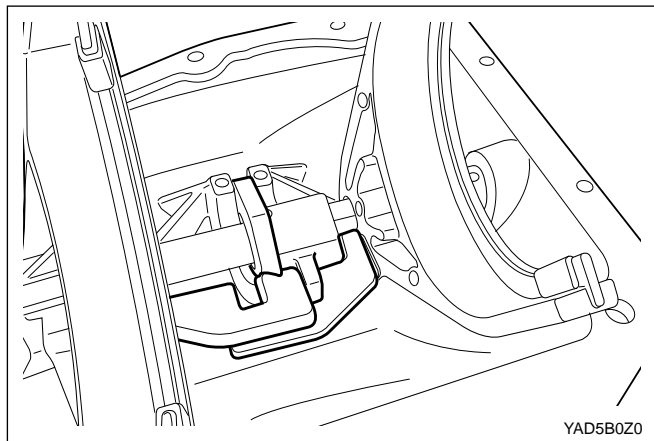
- Push the shift shaft through the 3-4 shift fork.



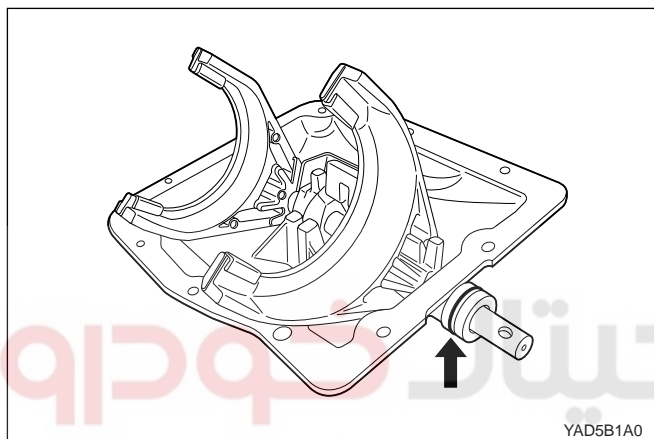
- Install the roll pin that fixes the selector arm to the shift shaft.



4. Check the shift cover parts for proper assembly as follows :
 - Insert a pin punch (3/16) into the offset lever hole of the shift shaft.
 - Place the shift cover to the flat ground and rotate the shift shaft so that the punch is vertical.



- Selector arm should be aligned with the 3/4 shift fork selector plate.

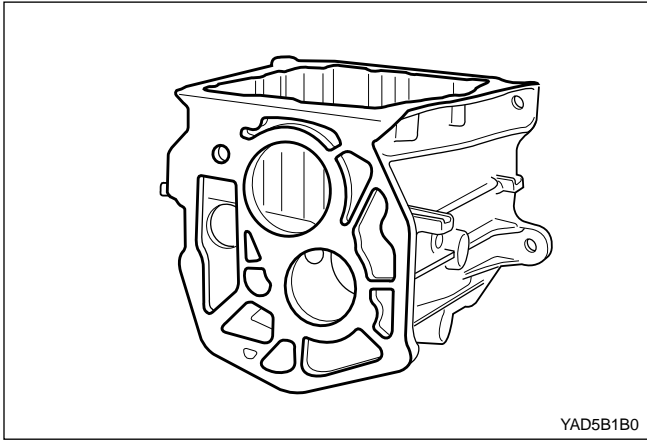


5. Lubricate and install the O-ring on the rear of the shift cover.



شرکت دیجیتال خودرو (مسئولیت محدود)

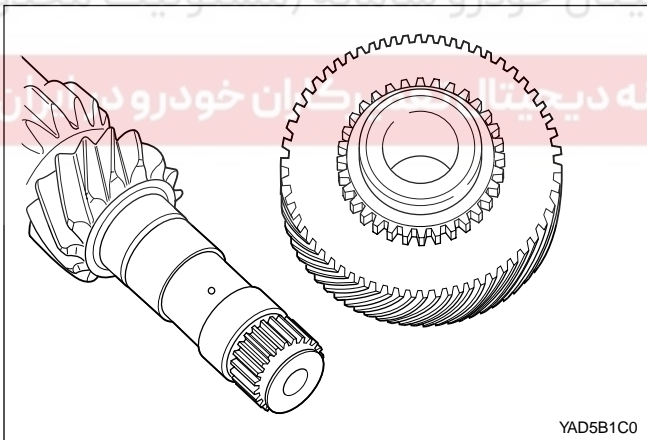
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



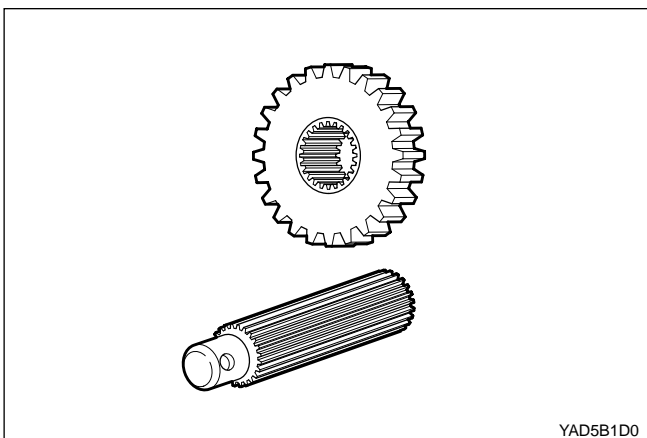
INSPECTION OF COMPONENTS

Inspection Procedure

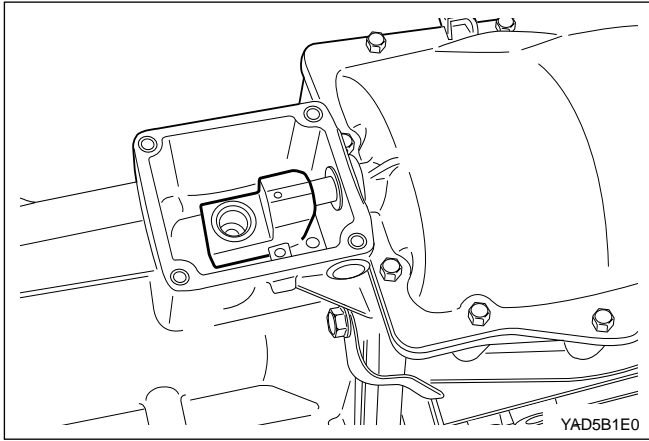
1. Clean all parts with solvent and dry them with compressed air. Check the following parts for cracks and damaged sealing surfaces.
 - Case
 - Extension housing
 - Shift Cover
 - Input bearing retainer
 - Counter shaft rear bearing retainer
2. Check the parts which support bearings and shafts for excessive wear and replace them if necessary.



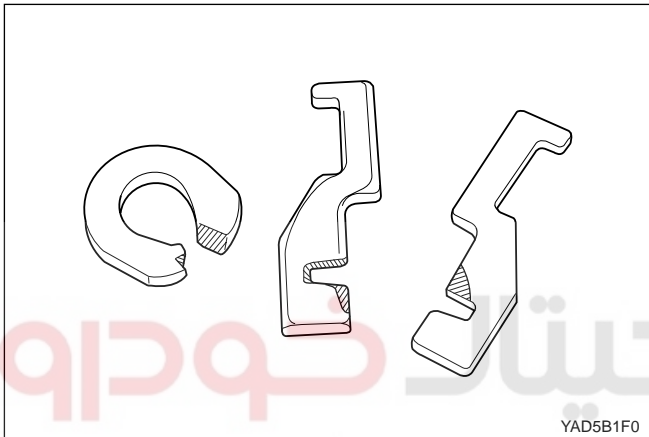
3. Check the bearing surfaces of the following parts ;
 - Input shaft
 - Main shaft and its gears
 - Counter shaft and 5th drive gear
4. Check the reverse idler shaft and its gears.



Notice: Replace excessive wear parts and do not file on the hardened surface and precision ground.



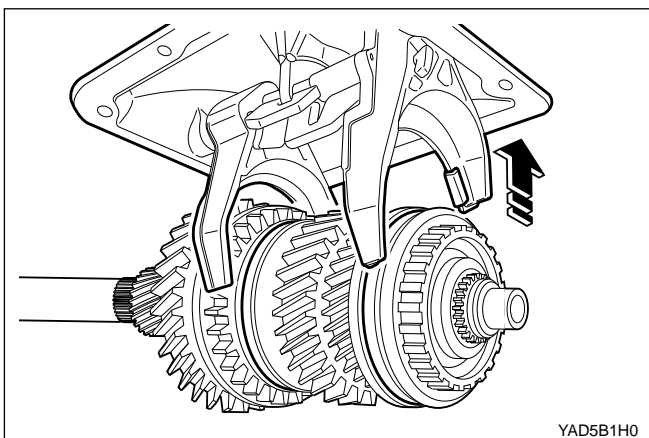
5. Check the shift mechanism parts as follows :
- Wear of the shift shaft.
 - Wear of the detent/guide plate and offset lever.



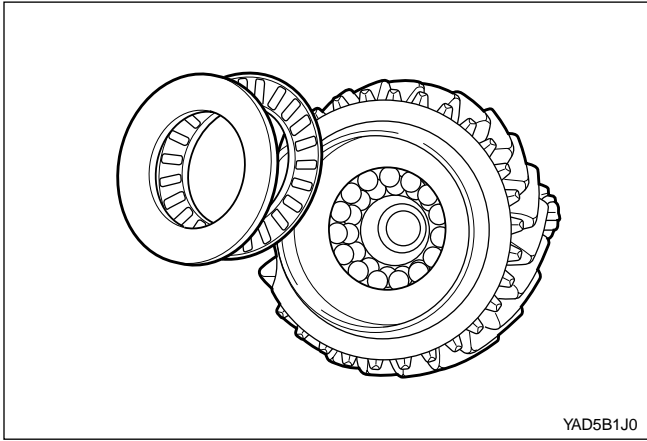
6. Check worn edges on the following parts :
- Selector arm.
 - Interlock plate.
 - Selector plates for the 1-2 and 3-4 shift forks.



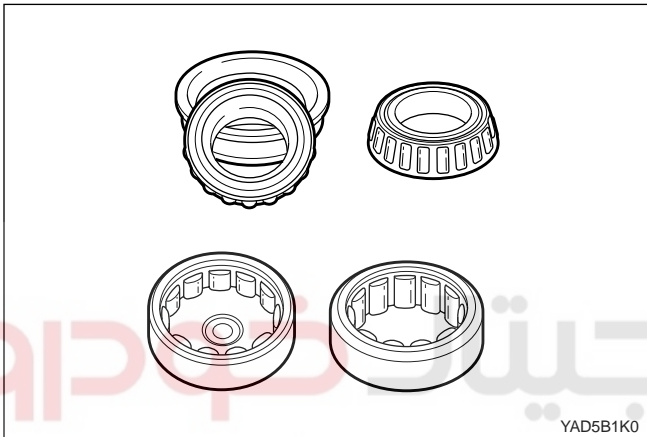
- 5-R shift lever and the rollers on the reverse fork and the 5th shift rail/fork.



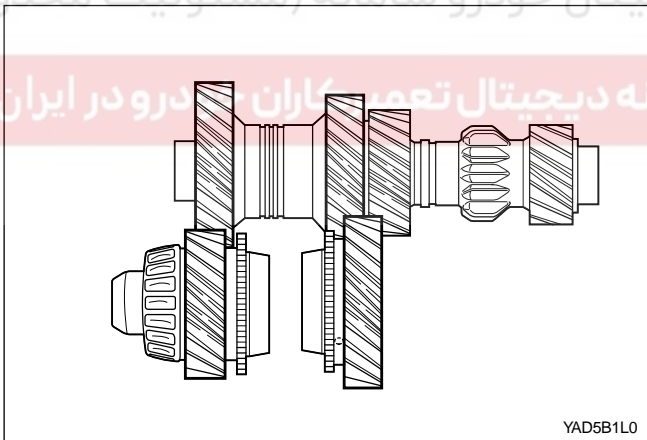
7. Check worn mating surfaces on the following parts :
- 1-2 shift fork, pads and synchronizer sleeve.
 - 3-4 shift fork, pads and synchronizer sleeve.
 - 5th shift rail/fork pads and synchronizer sleeve.
 - Reverse fork and reverse idler gear sleeve.



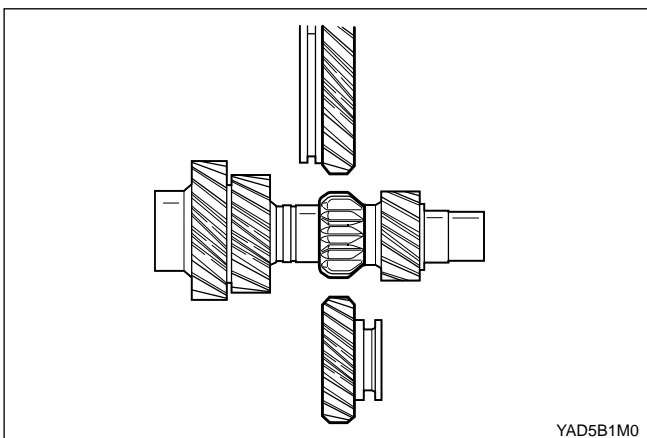
8. Check the following Bearing for excessive wear:
- Crankshaft pilot bushing for the front of the input shaft.
 - Clutch release bearing.
 - Input shaft bearing.
 - Main shaft pilot bearing rollers.
 - Main shaft thrust Bearing and its surfaces.



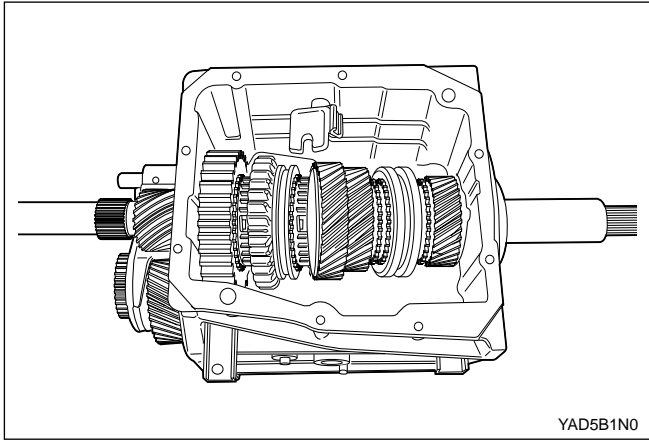
- Speed gear roller bearing on the main shaft.
- Main shaft rear bearing.
- Counter shaft front and rear bearings.



9. Check the gear tooth surfaces of all gear sets.

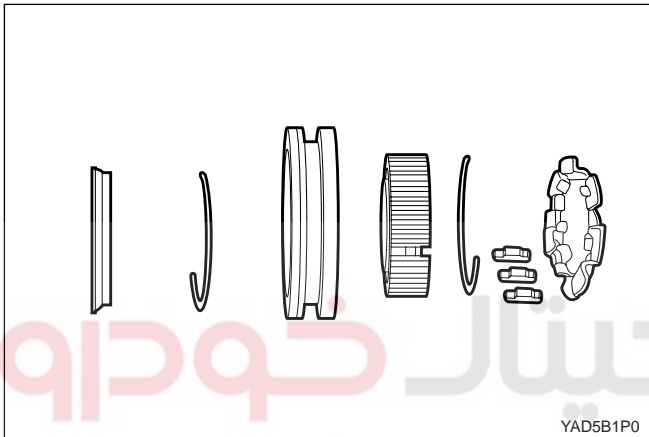


10. Check the reverse gear set surfaces. Check the surfaces of gear teeth for excessive wear, pitting, scoring and spalling and replace if necessary.

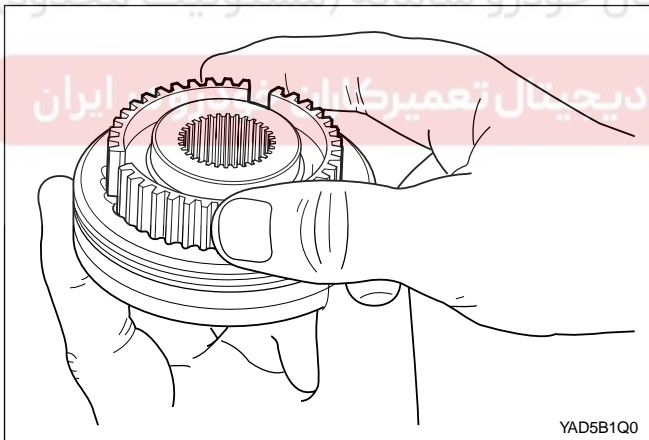


11. Take apart the three synchronizer assemblies and check :

- The 1-2 synchronizer.

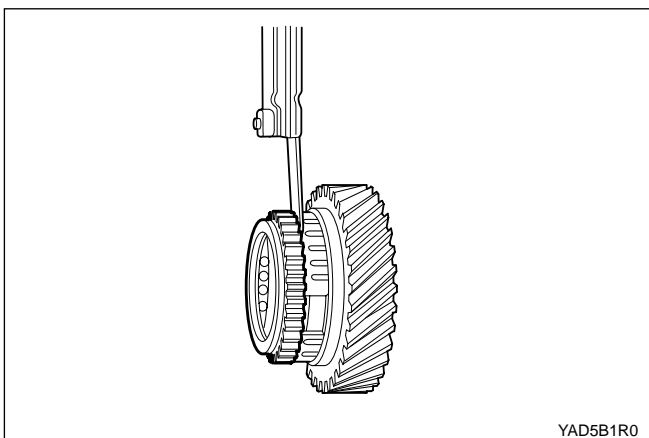


- The 5th blocking ring.



12. Check the fit between the hub and sleeve of each synchronizer

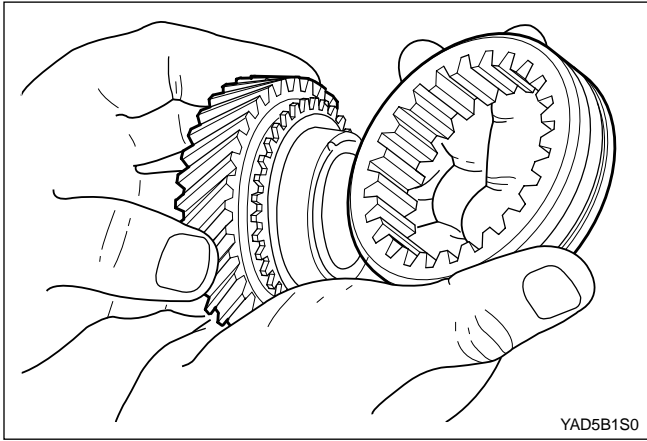
- Excessively tight or loose hub-to-sleeve fit.
- Wear of the cone clutch surfaces of brass blocking rings and gears.



13. Measure the clearance between the blocking ring and the speed gear

- New 1-2 blocking ring : 0.87 - 1.4mm
- New 3-4 blocking ring : 0.88 - 1.5mm

Notice: Excessive wear of the blocking ring or the speed gear cone surface will cause shift block-out gear clash.



14. Check for gear clash on the synchronizer sleeve teeth or the clutch teeth on the speed gear.
15. Check the synchronizer sleeve and gear clutch tooth for hop-out.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

