

SECTION 3C

PROPELLER SHAFT

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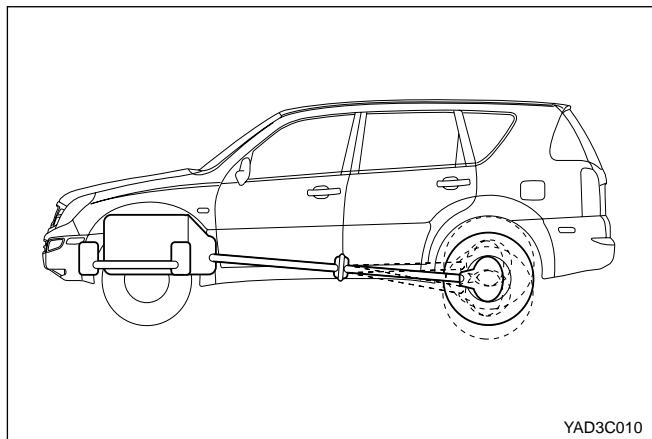
دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



GENERAL DESCRIPTION AND OPERATION



The propeller shaft transfers the power through the transmission and transfer case to the front/rear axle differential carrier (final reduction gear). It is manufactured by a thin rounded steel pipe to have the strong resisting force against the torsion and bending. Both ends of propeller shaft is connected with the spider and the center of propeller shaft is connected with the spline because the height/length of transmission and axle is not constant. The rubber bushing which wraps the center bearing is installed in rear propeller shaft. So the vibration and balance is maintained constantly.

SPECIFICATIONS

Structure	Yoke & Spider Typed Universal Joint		
Joint Type	Spider (Needle Roller Bearing)		
Number of Spider	Front Shaft	Full Time T/C	2
		Part Time T/C	2
	Rear Shaft		3
Outer Diameter of Spider (mm)	Ø16.668		
Tube Run-out (After Installation)	Within 0.4 mm		
Front Shaft Dimension (LXI.DXO.D)	Diesel + M/T•A/T + 4408 T/C		607.1 × Ø59.5 × Ø63.5
	Gasoline + M/T•A/T + 4421 T/C		591.1 × Ø59.5 × Ø63.5
Rear Shaft Dimension (LXI.DXO.D)	Diesel + M/T•A/T + 4408 T/C		(585.2+569.5) × Ø59.5 × Ø63.5
	Gasoline + M/T•A/T + 4421 T/C		(566.1+569.5) × Ø59.5 × Ø63.5
Unbalance Quantity (at 4,500 RPM)	within 30 g·cm		

DIAGNOSTIC INFORMATION AND PROCEDURES

Phenomena	Checks	Action
Vibration	Incorrect Assembly of Sliding Joint	Adjust
	Bending of Propeller Shaft	Replace
	Poor Symmetry (Left/Right) of Universal Joint Snap Ring	Adjust
	Loosened Yoke connection bolt	Tightening
Noise	Worn or Damaged Universal Joint Bearing	Replace
	Separation of Universal Joint Snap Ring	Adjust/Replace
	Loosened Yoke connection part	Tightening
	Worn sliding Joint Spline part	Replace
	Insufficient Grease	Replenish

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

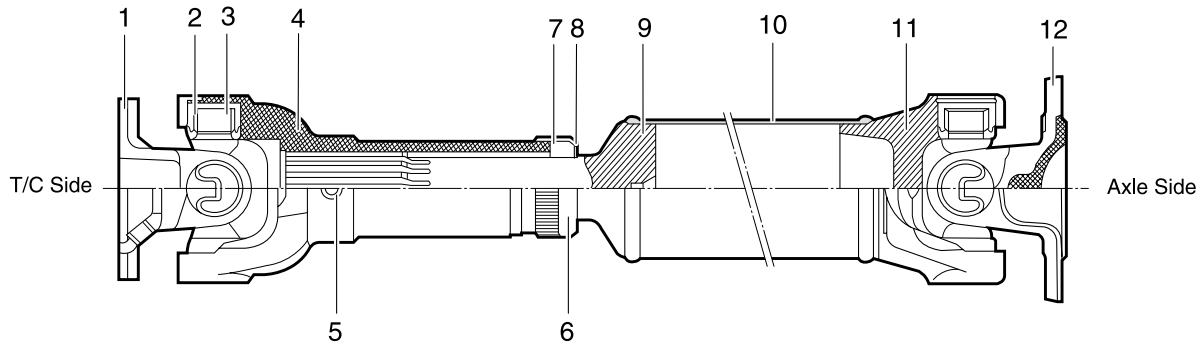
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



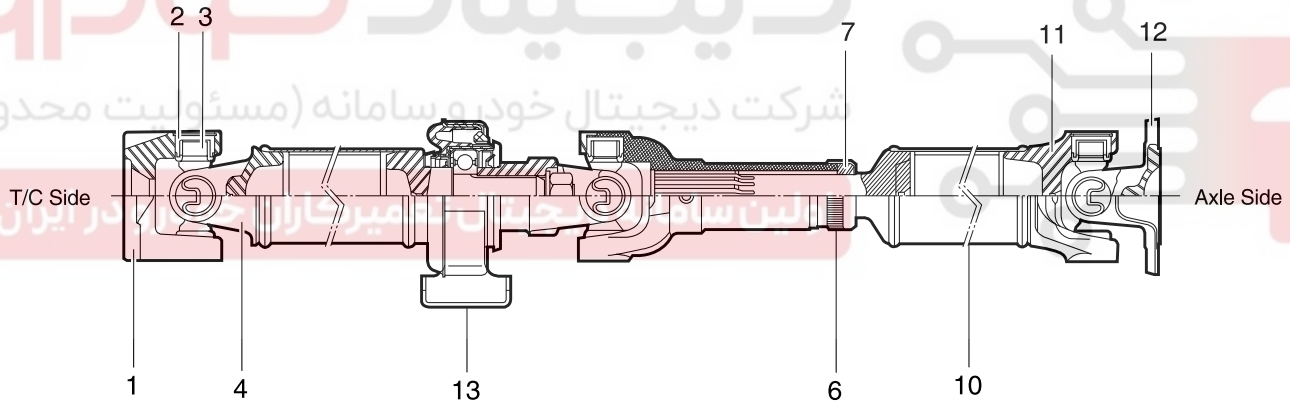
COMPONENT LOCATOR

CROSS SECTIONAL VIEW

Rear Propeller Shaft



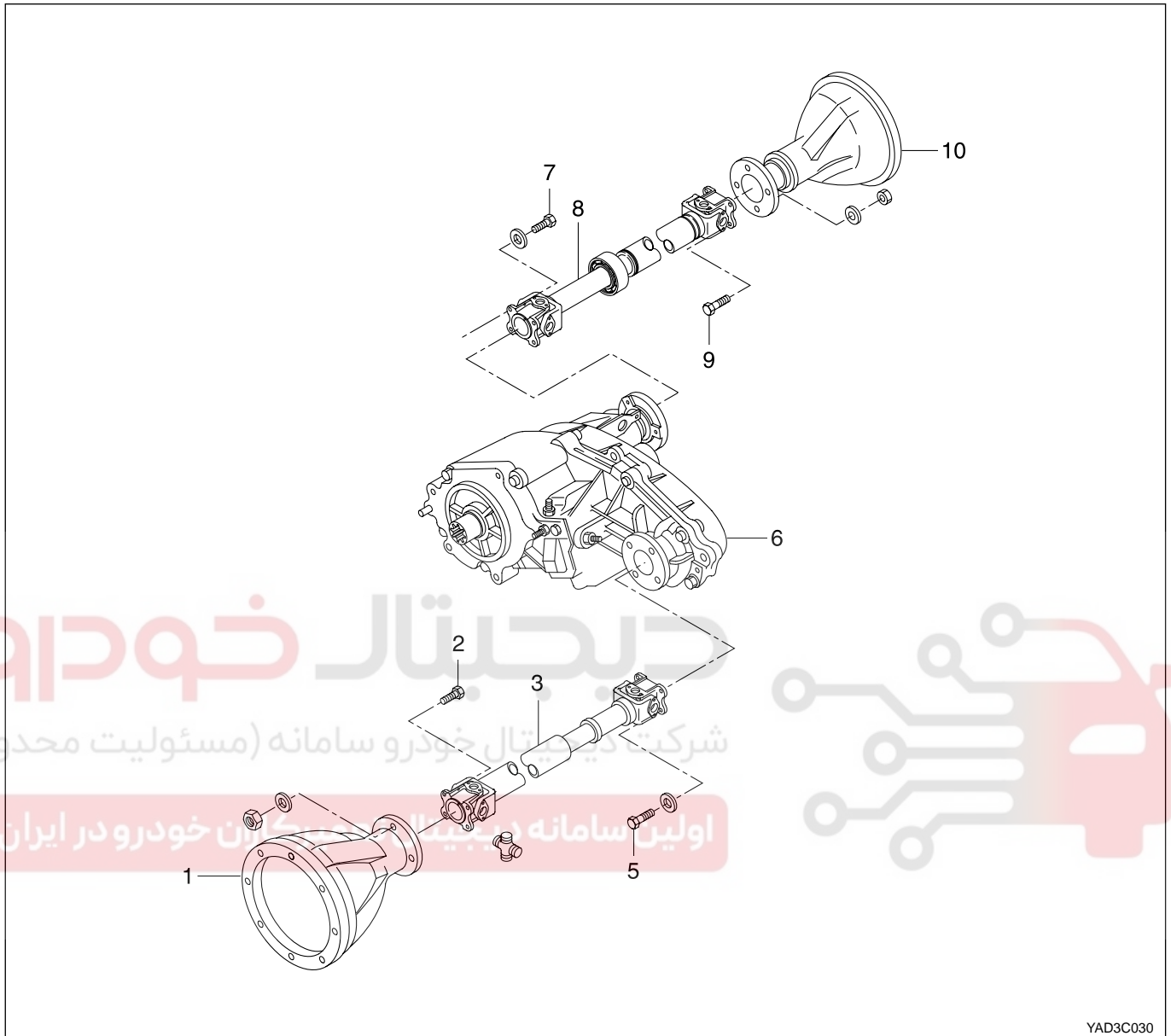
Rear Propeller Shaft



YAD3C020

- | | |
|-----------------------|-------------------|
| 1 Flange Yoke | 8 Split Washer |
| 2 Journal Bearing Cap | 9 Slip Tube Shaft |
| 3 Cross Shaft Journal | 10 Tube |
| 4 Slip Yoke Assembly | 11 Tube Yoke |
| 5 Grease Nipple | 12 Flange Yoke |
| 6 Dust Cap | 13 Center Bearing |
| 7 Oil Seal | |

PROPELLER SHAFT ASSEMBLY



- 1 Front Axle
- 2 Bolt
- 3 Front Propeller Shaft
- 4 Bolt
- 5 Transfer Case

- 6 Bolt
- 7 Rear Propeller Shaft
- 8 Bolt
- 9 Rear Axle

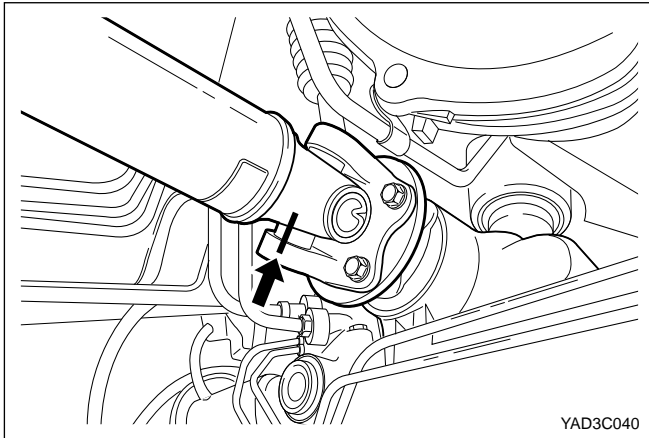
MAINTENANCE AND REPAIR

ON-VEHICLE SERVICE

PROPELLER SHAFT ASSEMBLY

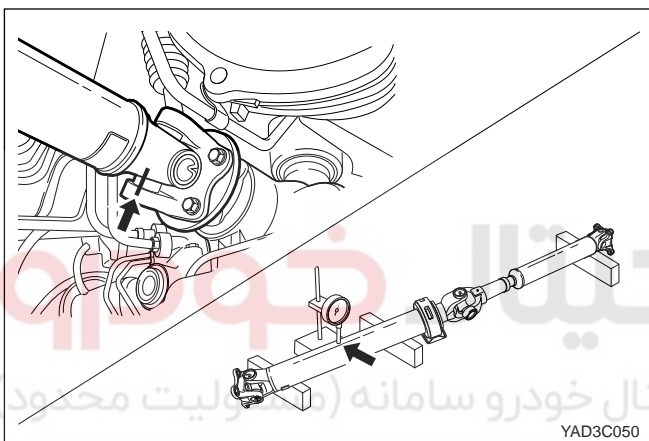
Removal

1. Do alignment marks before removing the propeller shaft.

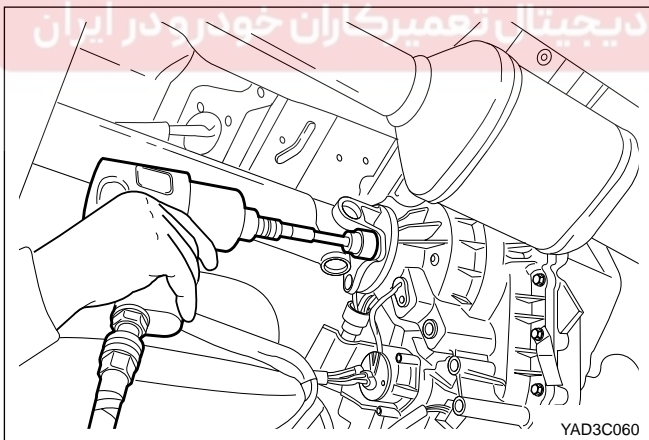


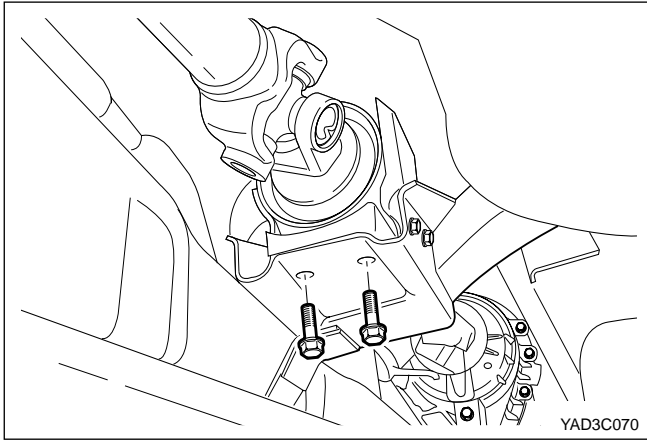
2. Remove the flange yoke fixing bolt/nut that connects the front propeller shaft axle side with transfer case.

Pull out the front propeller shaft assembly.

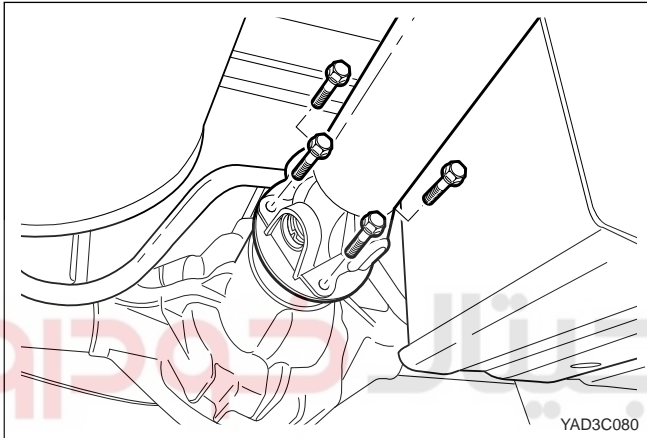


3. Remove the flange yoke bolt/nut of transfer case side in rear propeller shaft.



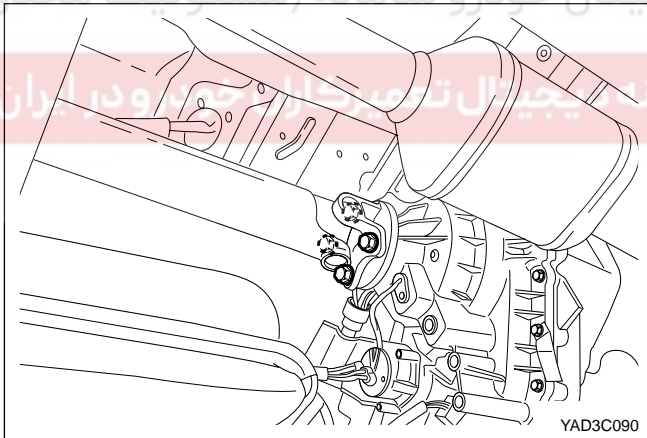


4. Remove the fixing bolt of middle bearing (center).



5. Remove the rear axle housing flange yoke bolts/nuts of rear propeller shaft.

Pull out the rear propeller shaft assembly.

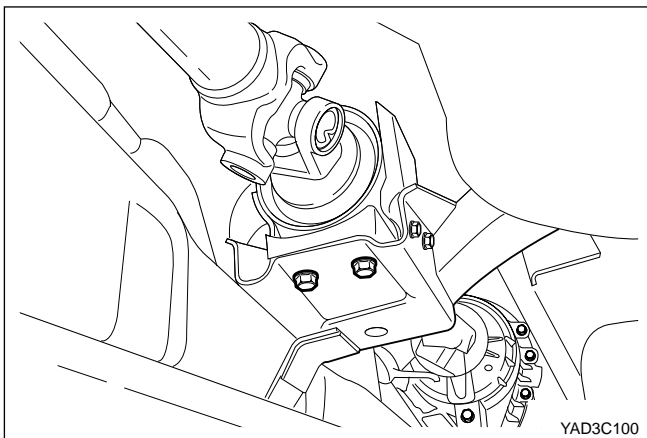


Installation

1. Check the disassembled parts visually.
2. Align the assembly mark of each propeller shaft.
3. Install the front propeller shaft.

Installation Notice

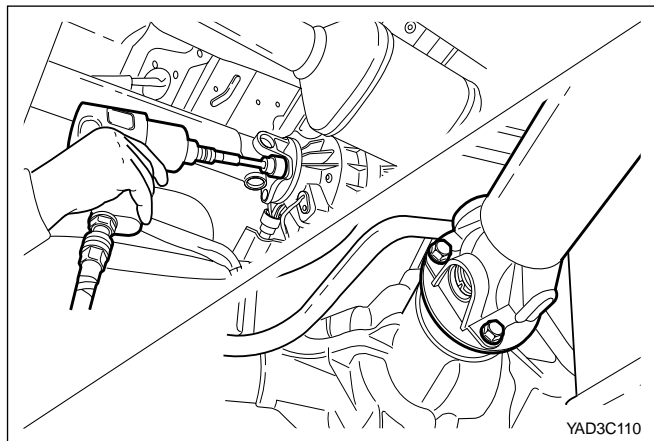
Tightening Torque	81 - 89 N•m (60 - 66 lb-ft)
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4. Set up the rear propeller shaft between the transmission and axle housing. Tighten the center bearing manually.

Installation Notice

Tightening Torque	80 - 95 N•m (59 - 70 lb-ft)
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5. Align the rear propeller shaft to the assembly mark. Tighten the bolts/nuts and then the center bearing bolts.

Installation Notice

Tightening Torque	70 - 80 N•m (52 - 59 lb-ft)
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دیجیتال خودرو

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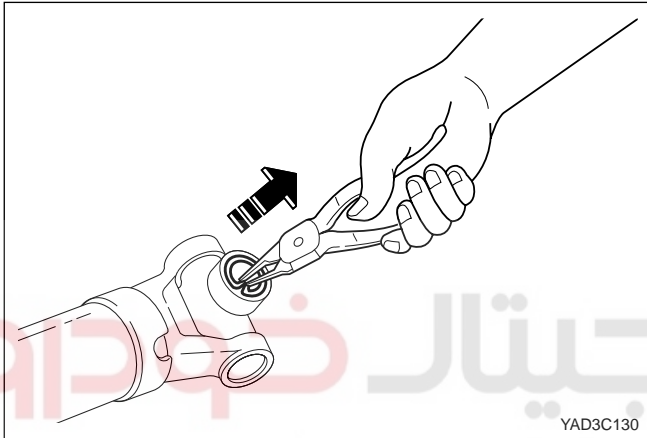
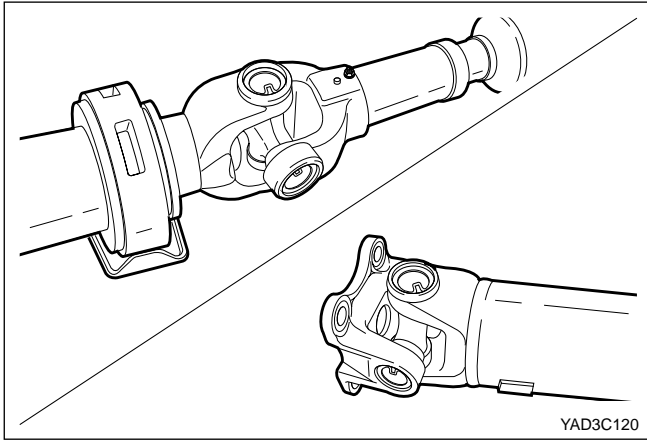


UNIT REPAIR

PROPELLER SHAFT

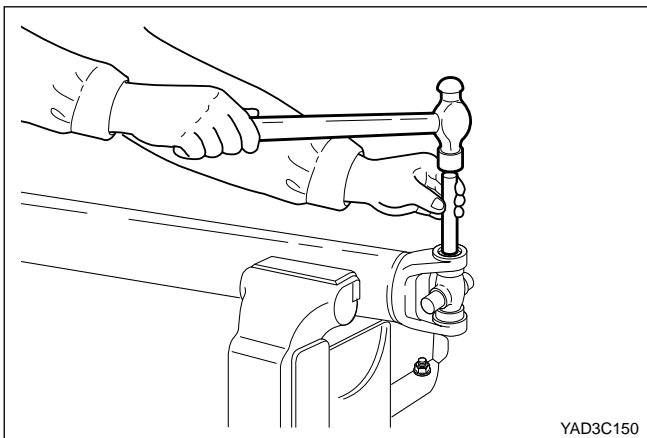
Disassembly

1. Mark the assembly mark and remove the propeller shaft.
2. Do alignment mark before separating the spider.

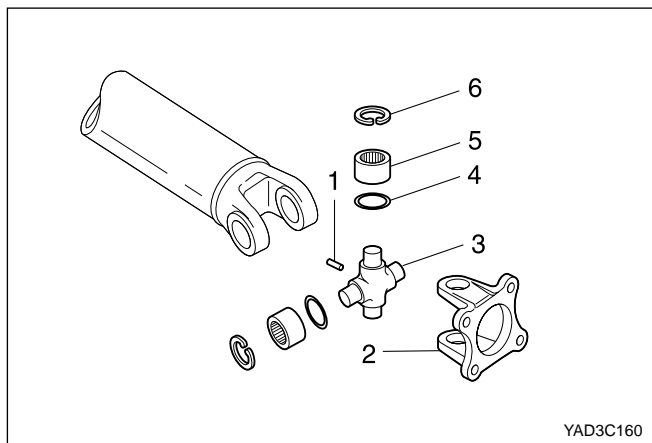


3. Remove the snap ring using the snap ring plier.

4. Slightly tapping the yoke shoulder using a brass hammer, remove the bearing.
Remove the remaining bearing in the same way.

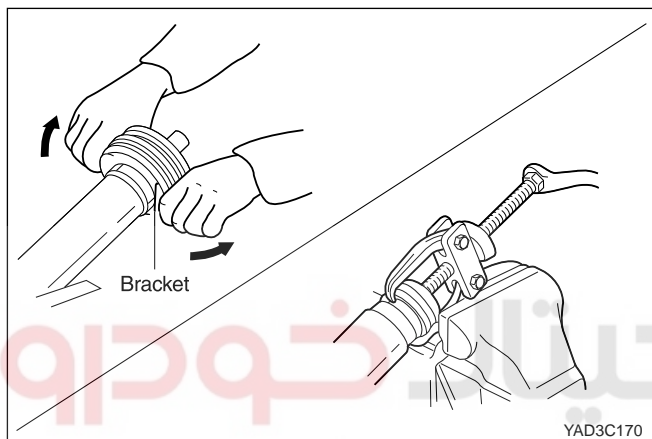


5. If it is not removed, clamp the welding part of yoke in the vise.

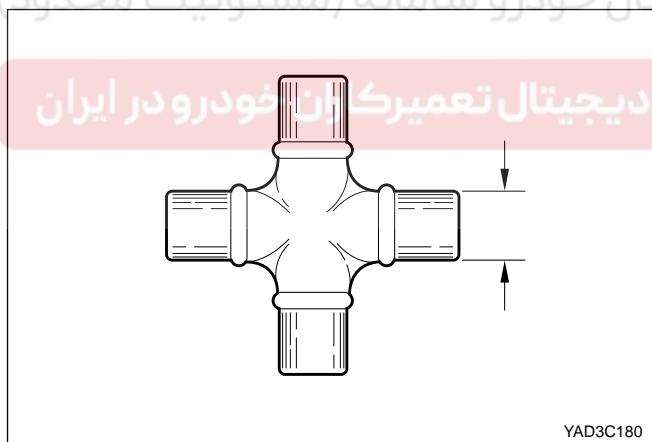


6. Disassemble the universal joint parts.

As axes move up and down, universal joints allow drive angle to change without bending of propeller shaft.



7. Remove the center bearing bracket and center bearing using the special tool.



Inspection

1. Visual Check

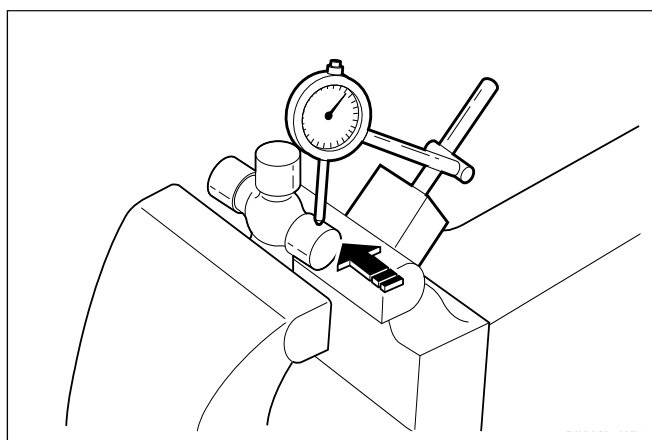
Check the disassembled parts for wear and crack. Replace them if necessary.

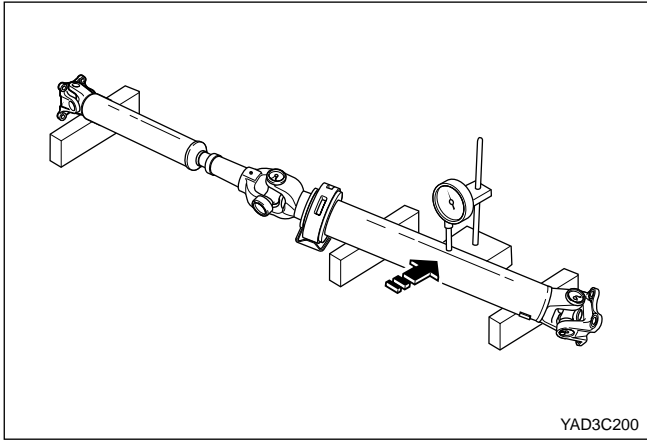
2. Spider outer diameter

standard	16.647 mm
Limit	16.668 mm

3. Clearance between the spider and bearing

standard	0.03 ~ 0.098 mm
Limit	0.25 mm

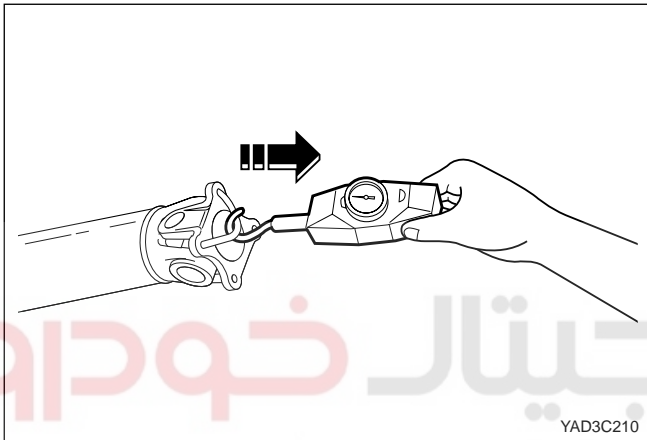




4. Propeller Shaft runout

Using a dial gauge, measure propeller shaft runout by turning the shaft. If runout exceeds limit, adjust the propeller shaft using a press or replace it.

Limit	0.4 mm
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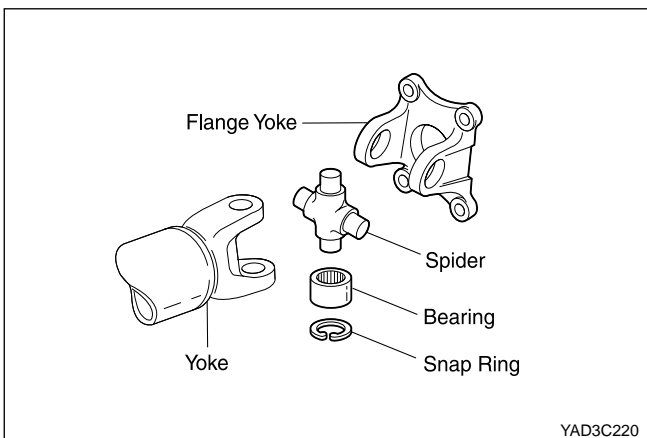


5. Universal joint starting torque

Specified Value	3 ~ 8 kg•cm
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6. Major cause of vibration

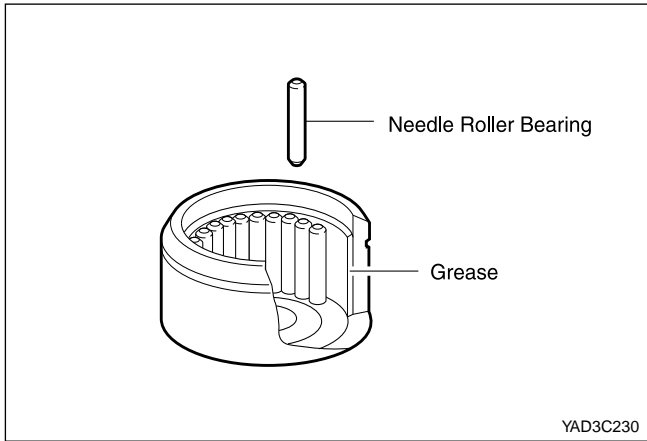
- Separation of balance weights
- Excessive runout of the propeller shaft
- Using the general bolts
- Excessive wear of universal joint
- Sticks in sleeve joint
- Vibration is caused by front & rear universal joint, pinion angle change and is generally broke out when the vehicle speed is around 60 ~ 100km/h.



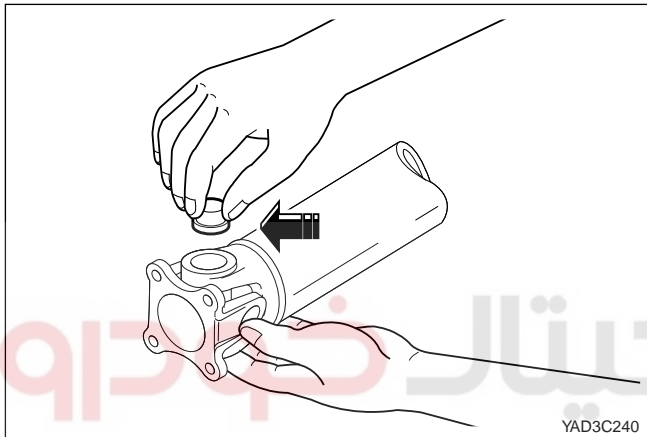
Assembly

Clean the disassembled parts and replace then if damaged.

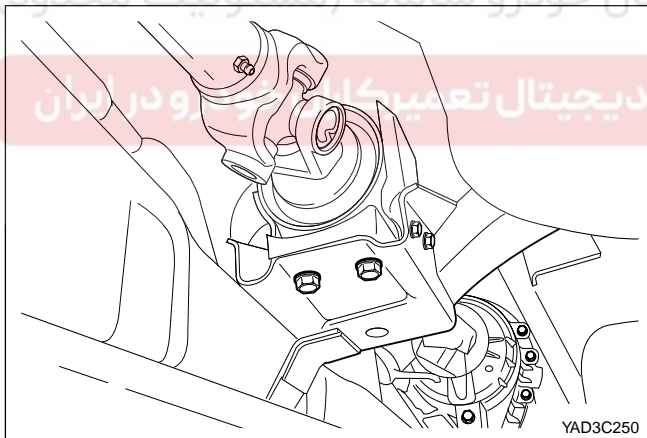
1. Align the alignment marks of the yoke and assemble the spider, bearing and snap ring.



2. Apply the grease to the inner of bearing cap of needle roller bearing and assemble the needle roller.



3. Install the bearing cap to the yoke and insert the spider. Install the opposite cap by tapping with a plastic hammer.



4. Assembly the center bearing to the rear propeller shaft.