

Driveline System

2.2 Driveline System

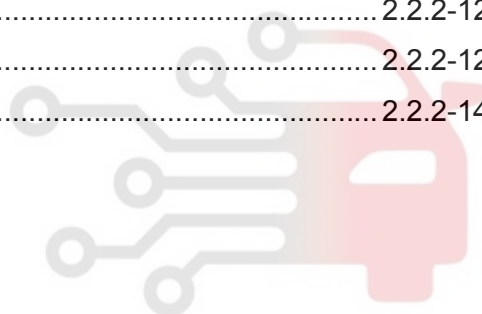
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2.2.2 Half Shaft

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شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Specifications**Material Specifications****Lubricating oil, liquid, sealant and adhesive**

Description	Model
High-performance grease (color: black), CV joint (1.6 MT)	G-3/G-2
High-performance grease (color: black), CV joint (1.6 AT)	G-3/5389

Capacity

Item	Weight
High-performance grease, outer CV joint (1.6 MT)	100 g
High-performance grease, outer CV joint (1.6 AT)	100 g
High-performance grease, inner CV joint (1.6 MT)	115 g
High-performance grease, inner CV joint (1.6 AT)	156 g

Torque Specifications

Item	Nm	lb-ft	lb-in
Lock nut of tie rod ball joint	47	35	-
Front arm ball joint to knuckle pin nut	60	44	-
Half shaft locking nut	270	200	-
Wheel nut	110	81	-
Front strut to the steering knuckle connecting bolt and nut	130	96	-

Description and Operation

System Overview

The half shafts have constant velocity (CV) joints at both.

- Inner CV joints (composed of constant velocity ball, tripod joint, roller, steel ball and universal joint housing) are installed on the drive axle.
- Outer CV joint (composed of steel ball, ball retainer and universal joint housing) is installed in the wheel side.
- Inner CV joint is set on the differential through differential spring ring.
- Outer CV joints are fixed on the wheel hub bearing.

The half shafts transmit torque from the engine to the wheels. In order to allow vertical movement of the wheels and engine. The CV joints allow for changes in half shaft length during axial movements.

Cautions for Half Shaft Maintenance

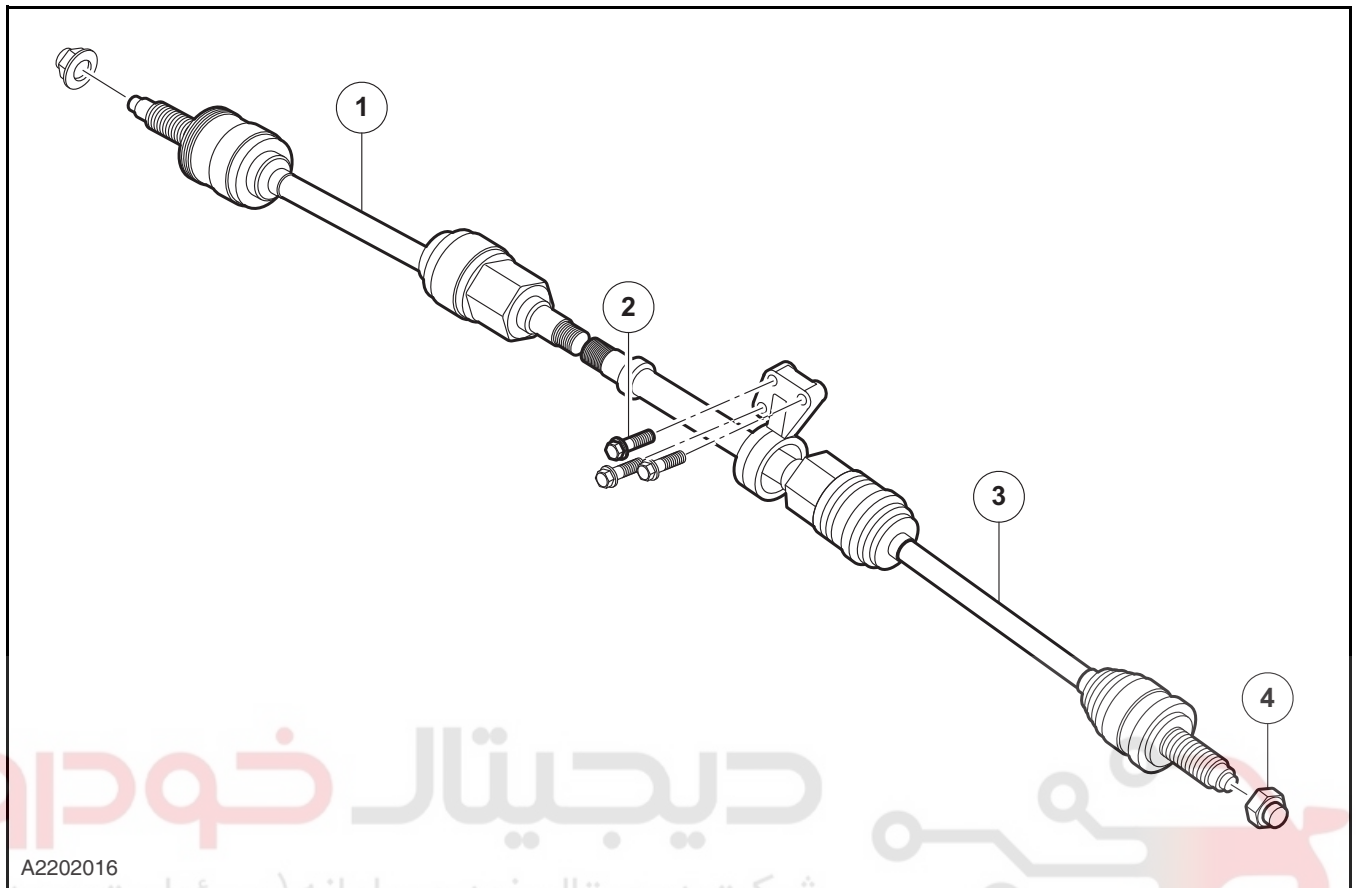
⚠ CAUTION: Special attention shall be paid when removing, installing, disassembling and assembling the half shaft. Follow the instructions below:

- Do not push and pull the CV joint when removing the half shaft.
- The operating angle of the CV joint must not be more than 22.5 degree.
- Inspect if the polished surface and the spline are damaged.
- The rubber boot is prohibited to contact with sharp edge and a hot engine or exhaust system.
- Do not drop the half shaft, since it may cause inner damage to the dust boot with no visual evidence.
- Do not use the half shaft as pry tool during the installation of other components. Do not hang the half shaft randomly.

- Knocking on the housing will cause damage to the CV joint.



Exploded View



A2202016

Item	Description	Item	Description
1	Half shaft assembly (left)	3	Half shaft assembly (right)
2	Hex flange bolt - M10×1.25×45	4	Retaining nut M22×1.5

Symptom Diagnosis and Testing

Refer to: Symptom Chart (2.2.1 Driveline System - General Information, Symptom Diagnosis and Testing).

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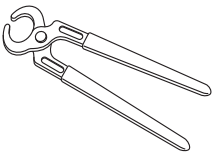



Disassembly and Assembly

Inner Tripod Universal Joint and Rubber Boot

Removal

Special Tool

 <p>CA201-002</p>	<p>Half Shaft Rubber Boot Clamp Remover CA201-002</p>
 <p>CA201-008</p>	<p>Half Shaft Rubber Boot Clamp Installer CA201-008</p>

Materials

Name	Model
High Performance Grease	2LN584 / L0 (fixed end) (GL-3) K575 GS (telescopic end) (GL-3)

1. Remove the half shaft.

Refer to: Left-Hand Half Shaft (2.2.2 Half Shaft, Removal and Installation).

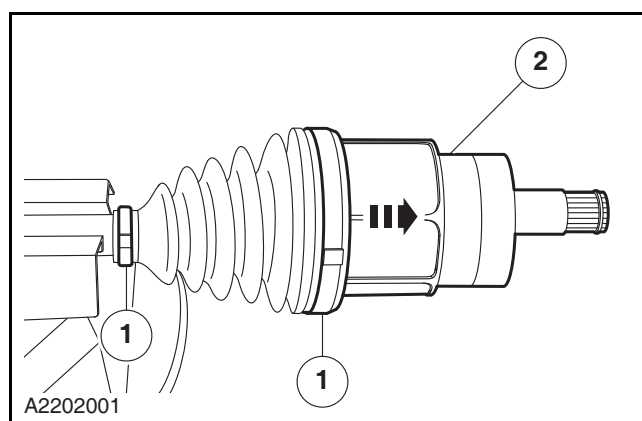
2. Remove the ball joint assembly.

1. Remove the two dust boot clamps with a special tool.

Special Tool: CA201-002

2. Disassemble the ball joint assembly.

3. Clear the grease in the tripod universal joint.

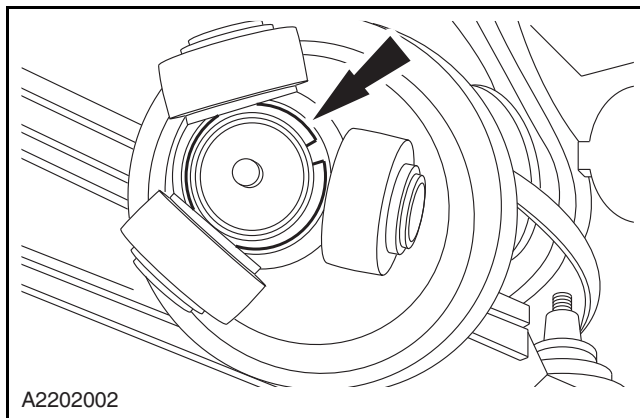


2.2.2-6

Driveshaft

2.2.2-6

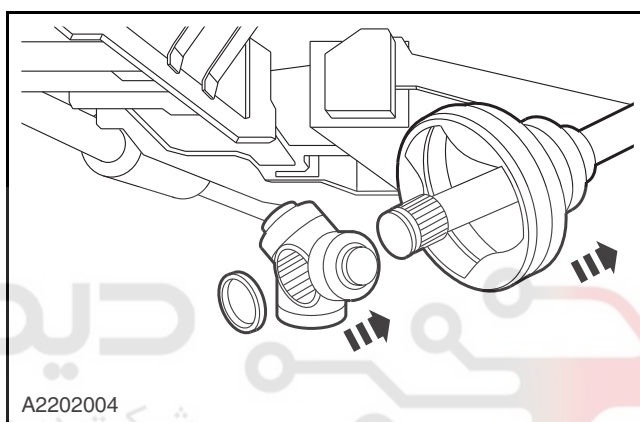
3. Use a suitable tool to remove the tripod universal joint snap ring.
4. Remove the inner tripod universal joint and rubber boot, clear the grease.



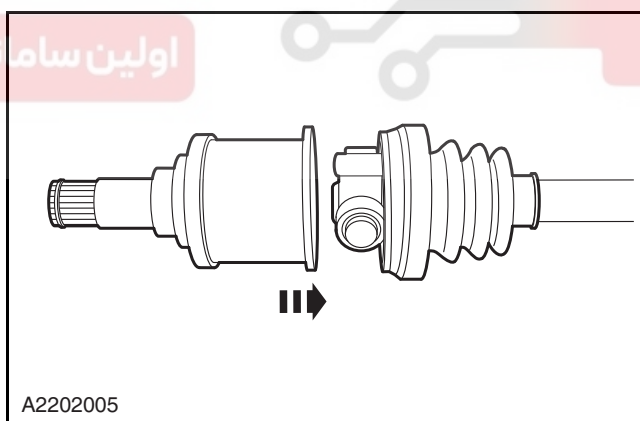
Installation

⚠ CAUTION: All the snap ring and clamps should be replaced.

1. Install the rubber boot/tripod universal joint.
 1. Install the rubber boot.
 2. Install the tripod universal joint.
 3. Install the tripod universal joint snap ring.



2. Fill the ball joint with grease.
3. Install the ball joint assembly.



4. Install the rubber boot.
 1. Install the rubber boot.
 2. Install the rubber boot clamp with a special tool.

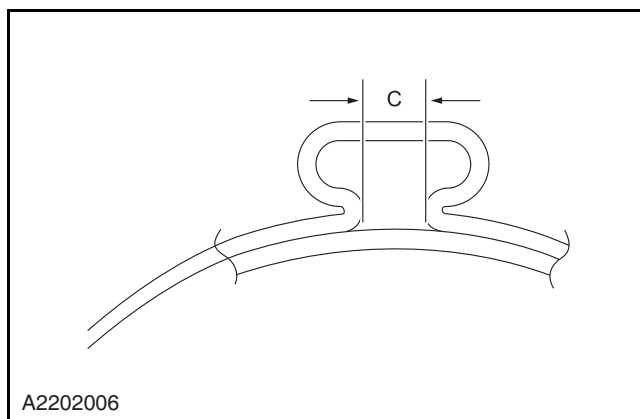
Special Tool: Half Shaft Rubber Boot Clamp Installer

⚠ CAUTION: The clamp size of the mouth should not be more than 1.5 mm after tightening the big and the small loop.

⚠ CAUTION: The tightening torque for 0.8 mm thick clamp is 12 Nm, the tightening torque for 1.1 mm thick clamp is 20 Nm.

5. Install the half shaft.

Refer to: Left-Hand Half Shaft (2.2.2 Half Shaft, Removal and Installation).



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Outer Constant Velocity (CV) Joint and Rubber Boot

Removal

Special Tool

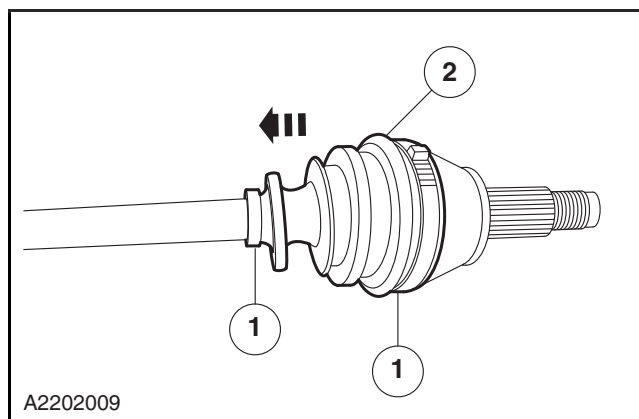
 <p>CA201-002</p>	<p>Half Shaft Rubber Boot Clamp Remover CA201-002</p>
 <p>CA201-008</p>	<p>Half Shaft Rubber Boot Clamp Installer CA201-008</p>

Name	Model
High Performance Grease	2LN584 / L0 (fixed end) (GL-3) K575 GS (telescopic end) (GL-3)

1. Remove the half shaft.
Refer to: Left-Hand Half Shaft (2.2.2 Half Shaft, Removal and Installation).
2. Remove the rubber boot clamp.
 1. Remove the rubber boot clamp with a special tool.

Special Tool: CA201-002

 2. Detach the rubber boot.
 3. Clean the grease.



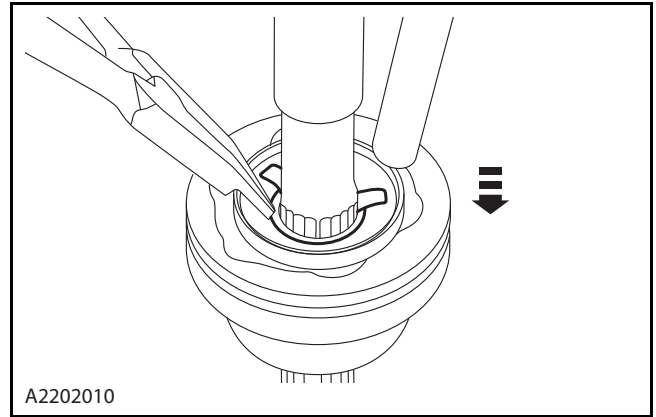
2.2.2-9

Driveshaft

2.2.2-9

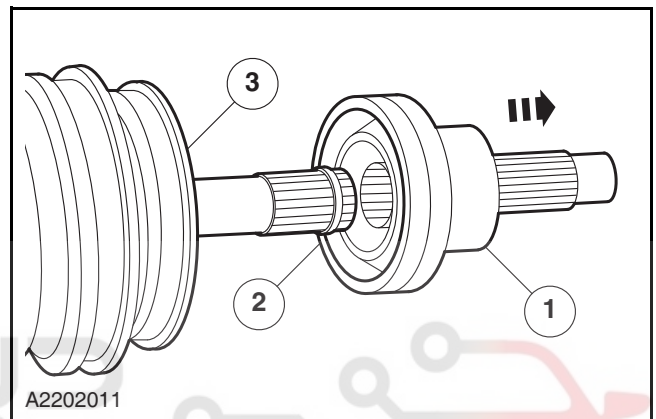
3. Take out the ball cage and the supporter from the case.

1. Use needle nose pliers to shove off the snap ring.
2. Remove the constant velocity joint with copper bar.



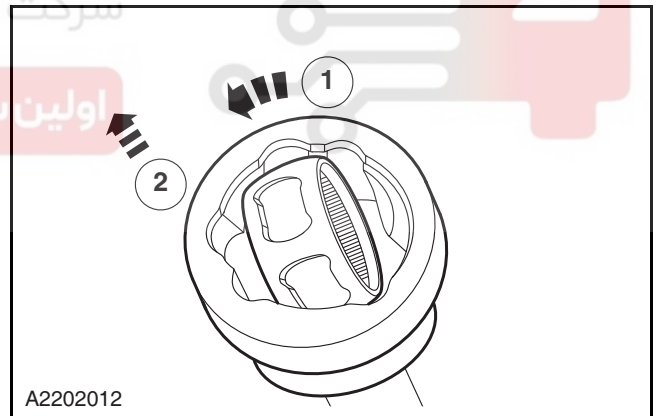
4. Remove the universal joint rubber boot.

1. Take out the half shaft from the universal joint.
2. Take out the circlip from the universal joint.
3. Take out the rubber boot .



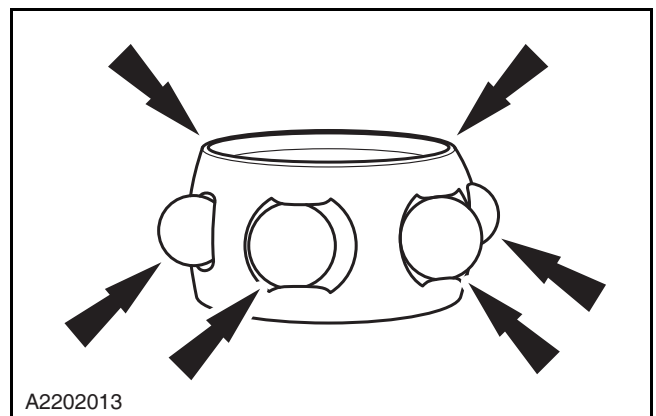
5. Remove the retainer ball cage.

1. Rotate the retainer ball cage.
2. Take out the retainer ball cage .



6. Take out the steel ball from the ball cage.
7. Inspect the wear on the moving surface .

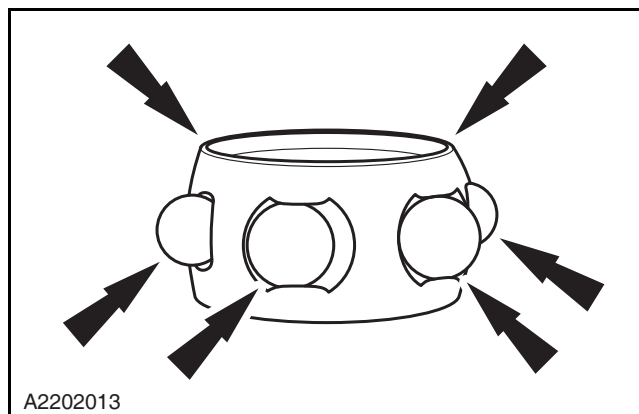
⚠ CAUTION: Make sure the ball cage, enclosure, ball and supporter are free from grease and oil.



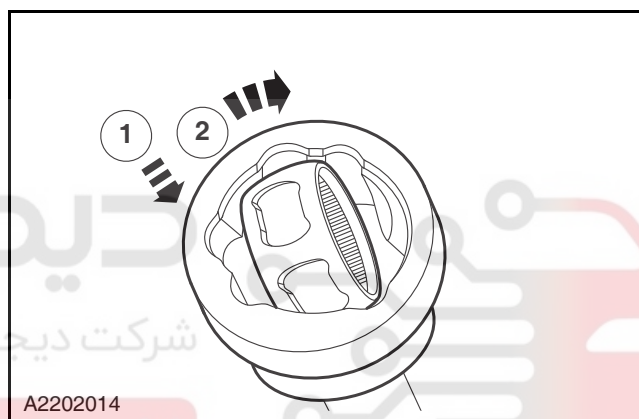
Installation

⚠ CAUTION: All the circlip and clamps shall be replaced.

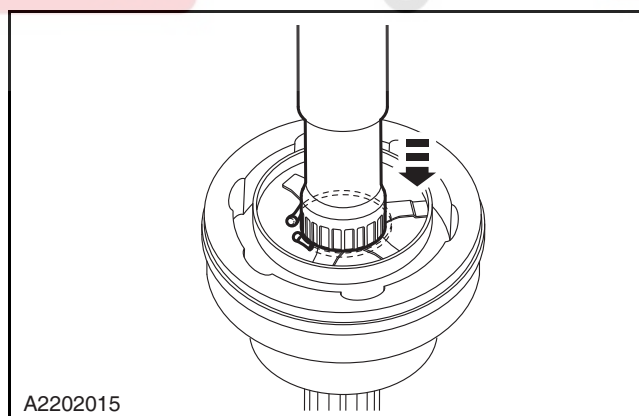
1. Install the steel ball on the ball cage supporter.



2. Install the retainer ball cage.
 1. Install the retainer ball cage into the case.
 2. Rotate the retainer ball cage.



3. Put the half shaft in the universal joint.
 1. Install the rubber boot and inner clamp.
 2. Insert a new circlip in the half shaft universal joint groove.
 3. Insert the half shaft into the half shaft universal joint until it meshes the circlip.
4. Fill the half shaft outer universal joint with high-performance grease.



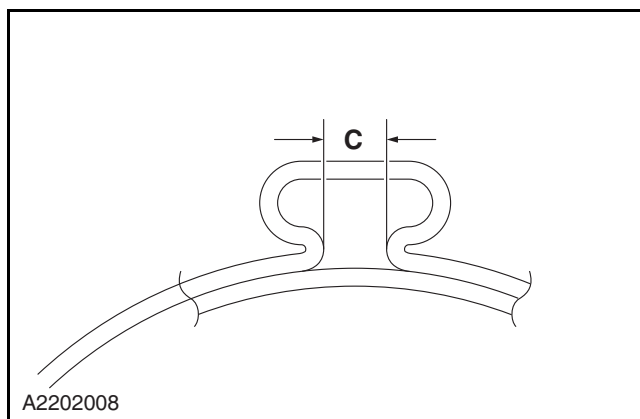
5. Install the rubber boot.
6. Install the rubber boot clamp with a special tool.

Special Tool: CA201-008

- ⚠ CAUTION:** The clamp size of the mouth should not be more than 1.5 mm after tightening the big and the small loop.
- ⚠ CAUTION:** The tightening torque for 0.8 mm thick clamp is 12 Nm, the tightening torque for 1.1 mm thick clamp is 20 Nm.

7. Install the half shaft.

Refer to: [Left-Hand Half Shaft \(2.2.2 Half Shaft, Removal and Installation\)](#).



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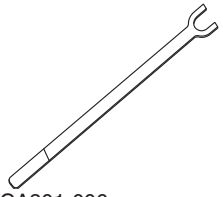


Removal and Installation

Left - Hand Half Shaft

Removal

Special Tool

 <p>CA201-006</p>	<p>Half Shaft Remover (Puller) CA201-006</p>
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1. Remove the wheel.

Refer to: [Wheels and Tires \(2.1.4 Wheels and Tires, Removal and Installation\)](#).

2. Lift the vehicle.

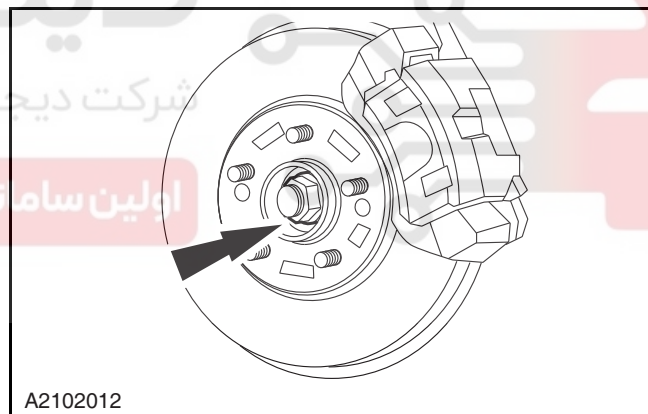
Refer to: [Lifting \(1.1.3 Traction and Lifting, Description and Operation\)](#).

3. Remove the half shaft nut.

Torque: 270 Nm

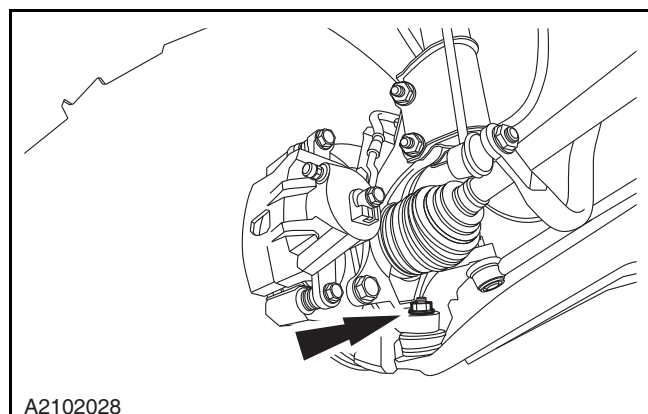
4. Remove the steering tie rod ball joint.

Refer to: [Tie Rod Ball Joint \(2.4.3 Steering Gear, Removal and Installation\)](#).



5. Remove the front arm ball joint fastening nut.

Torque: 60 Nm



2.2.2-13

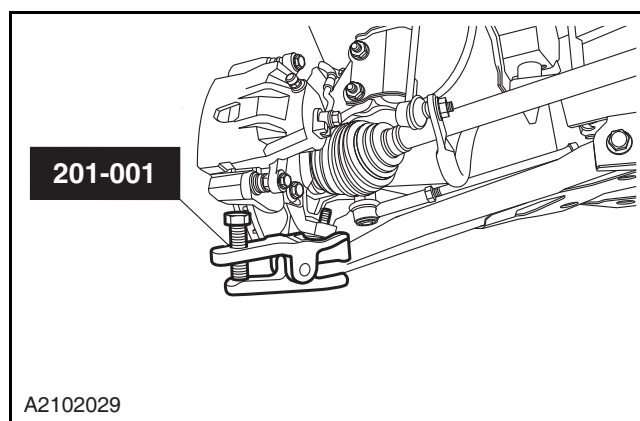
Driveshaft

2.2.2-13

6. Remove the front arm ball joint with a special tool.

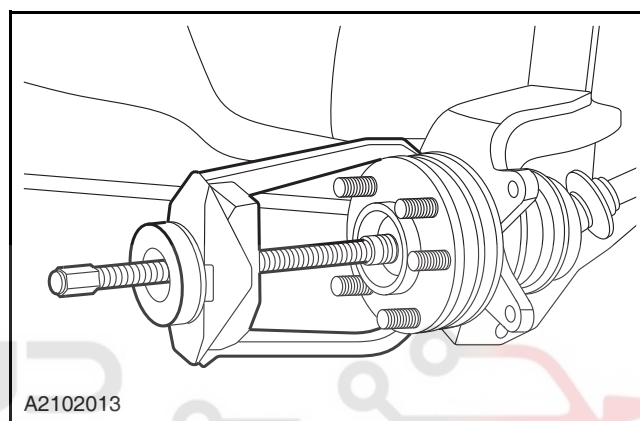
Special Tool: Ball joint remover CA201-001

CAUTION: Use a cotton, protect the ball joint to avoid damage.



7. Pull out the half shaft from the steering knuckle by the puller.

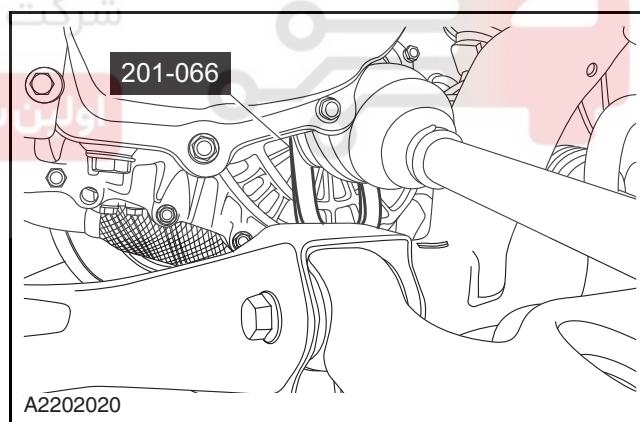
CAUTION: Make sure the inner CV joint not separate from the half shaft.



8. Remove the left-hand half shaft with a special tool.

Special Tool: CA201-066

9. Put oil collector under the vehicle.



Installation

1. Install the half shaft to the transaxle.

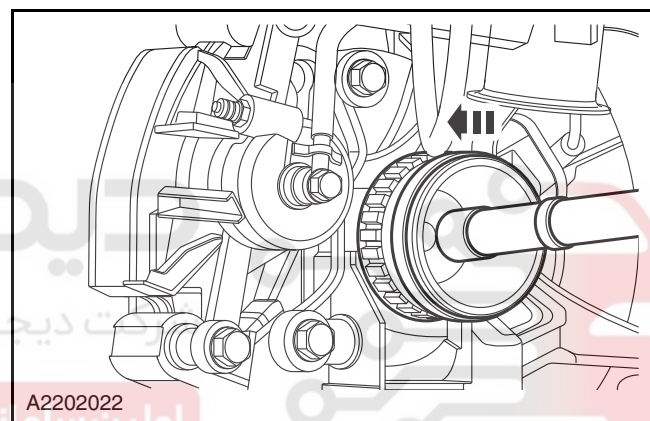
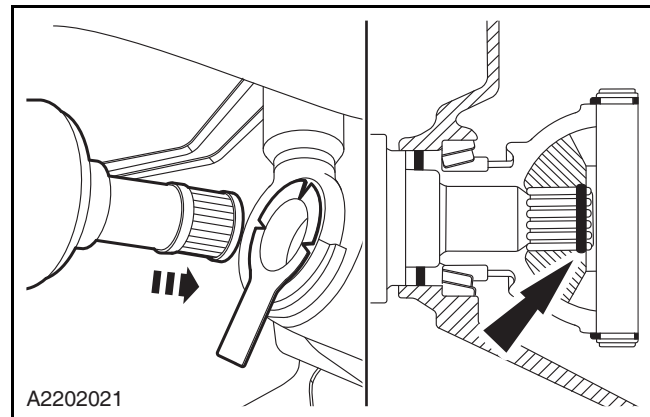
⚠ CAUTION: Protect the half shaft to prevent damage to the CV joint. The inner CV joint operating angle must not be bent more than 22.5 degrees. The outer CV joint operating angle must not be bent more than 45 degrees.

⚠ CAUTION: When inserting the half shaft, use the oil seal installer (provided with oil seal) to protect drive axle oil seal.

⚠ CAUTION: Make sure the retainer ring is installed in the groove already.

2. Install the half shaft to the wheel hub bearing.
3. Install the arm ball joint.
4. Install the half shaft nut.
5. Install the steering tie rod ball joint.
6. Install the wheel.

Refer to: [Wheels and Tires \(2.1.4 Wheels and Tires, Removal and Installation\)](#).



Right - Hand Half Shaft

Refer to: [Left-Hand Half shaft \(2.2.2 Half shaft, Removal and Installation\)](#).

⚠ CAUTION: When removing the left-hand half shaft, the half shaft middle support retaining bolt shall be removed firstly. See chart:

