

AXLE

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دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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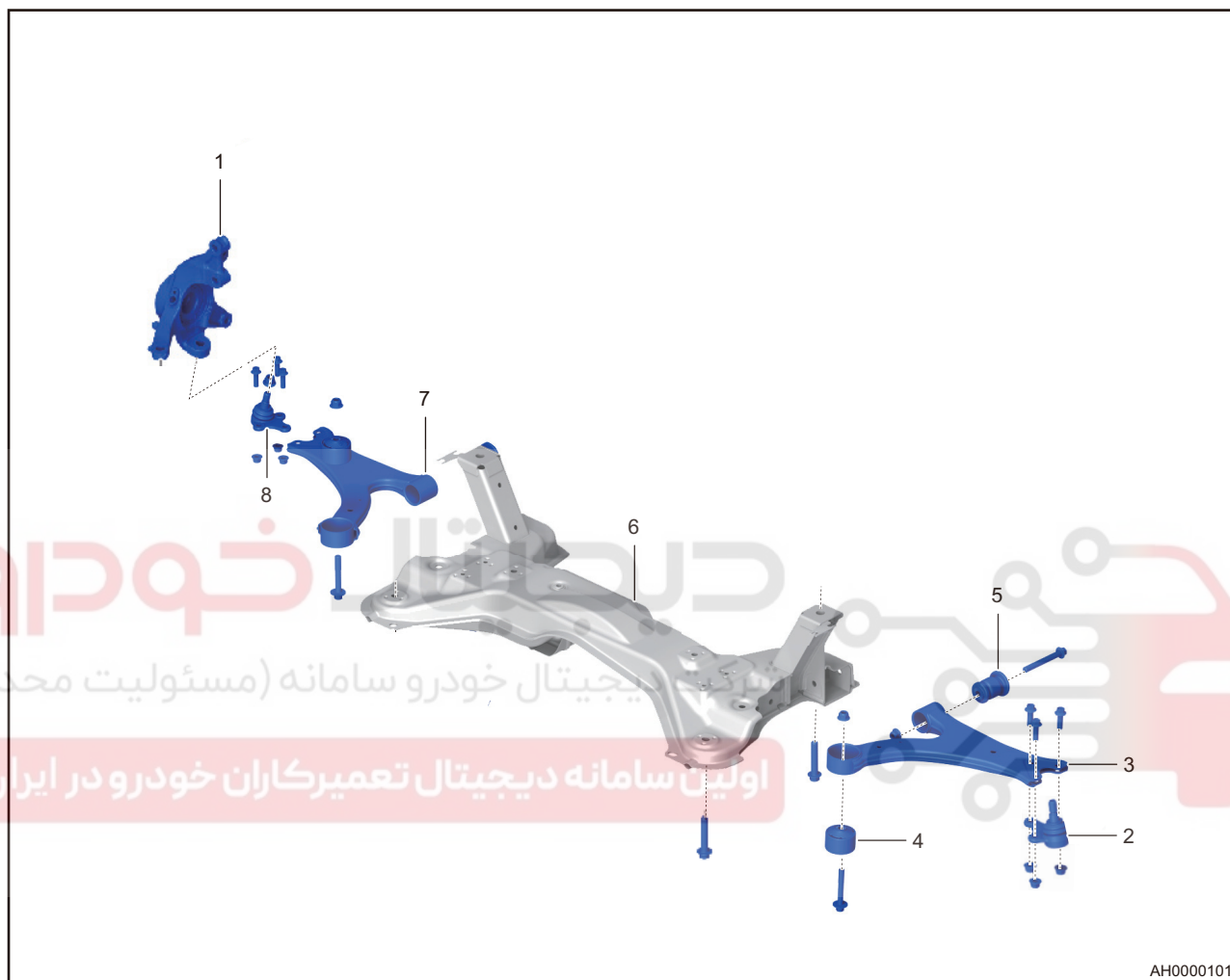


GENERAL INFORMATION

Overview

Description

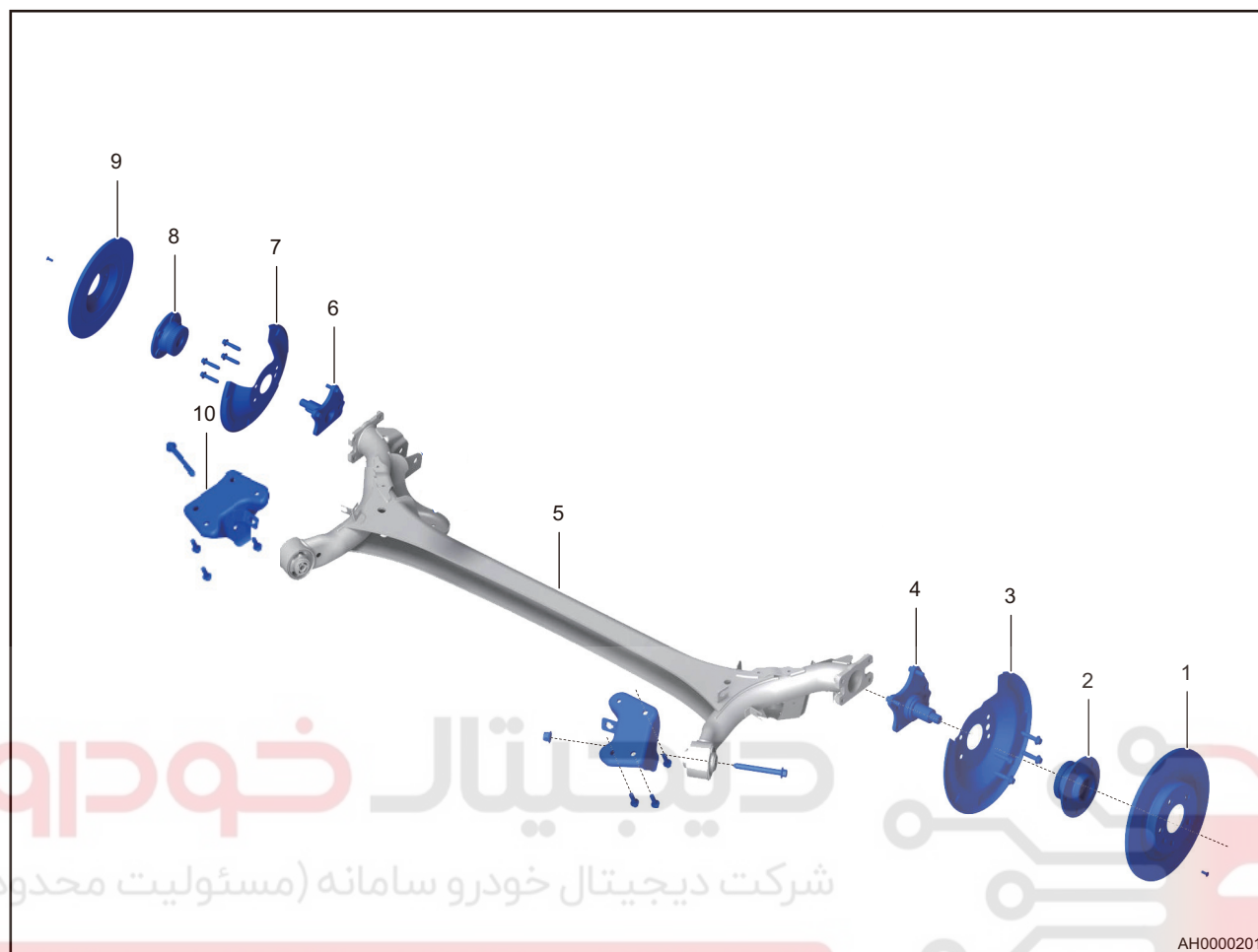
Front Axle



AH0000101

1 - Front Steering Knuckle	2 - Front Right Control Arm Ball Pin Assembly
3 - Front Right Control Arm Assembly	4 - Rubber Bushing
5 - Rubber Bushing	6 - Front Sub Frame Welding Assembly
7 - Front Left Control Arm Assembly	8 - Front Left Control Arm Ball Pin Assembly

Rear Axle



AH0000201

1 - Rear Left Brake Disc	2 - Rear Left Hub Bearing
3 - Rear Left Brake Plate Assembly	4 - Rear Left Hub Shaft
5 - Rear Shaft Assembly	6 - Rear Right Hub Shaft
7 - Rear Right Brake Plate Assembly	8 - Rear Right Hub Bearing
9 - Rear Right Brake Disc	10 - Rear Right Shaft Bracket Assembly

Axles are connected to the integral body through suspensions, and wheels are installed at both ends. Its function is to transmit force in all directions between integral body and wheels.

Specifications

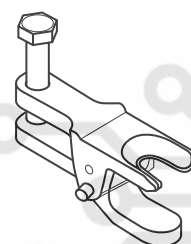
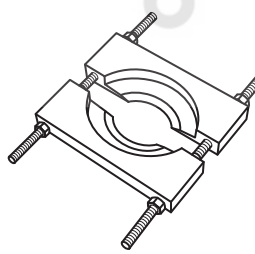
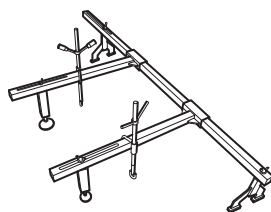
Torque Specifications

Description	Torque (N·m)
Front Drive Shaft Assembly Locking Nut	320 ± 20
Self-locking Nut Between Steering Tie Rod Assembly Ball Pin and Front Steering Knuckle Assembly	35 ± 3
Coupling Nut Between Front Control Arm Assembly Ball Pin and Front Steering Knuckle Assembly	80 ± 8
Coupling Bolt Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	180 ± 18
Locking Nut Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	180 ± 18
Coupling Bolt Between Front Stabilizer Bar Assembly and Front Sub Frame Welding Assembly	20 ± 3
Coupling Bolt Between Front Sub Frame Welding Assembly and Body	180 ± 18

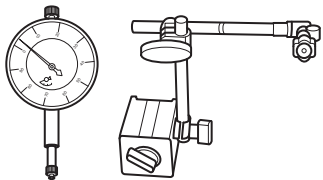
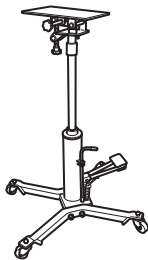
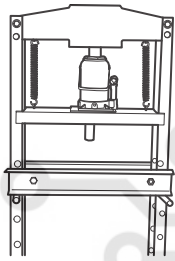
Description	Torque (N·m)
Fixing Bolt Between Dust Guard and Front Left Steering Knuckle Assembly	9 ± 11
Fixing Bolt Between Front Wheel Speed Sensor and Front Left Steering Knuckle Assembly	10 ± 1
Fixing Bolt Between Front Stabilizer Bar Assembly and Front Sub Frame Welding Assembly	20 ± 3
Steering Knuckle Fixing Bolt	110 ± 10
Rear Hub Shaft Coupling Bolt	70 ± 7
Rear Bearing Assembly Locking Nut	315 ± 15
Coupling Bolt Between Rear Shock Absorber Assembly and Rear Shaft Assembly	160 ± 16
Coupling Bolt Between Rear Shock Absorber and Body	60 ± 6
Through-bolt Between Rear Shaft Holder and Rear Shaft Assembly	120 ± 12
Coupling Bolt Between Rear Shaft Holder and Body	70 ± 7
Rear Brake Caliper Fixing Bolt	70 ± 7
Rear Brake Disc Fixing Screw	4.5 ± 0.5

Tools

Special Tools

Tie Rod Ball Pin Remover	 024
Bearing Remover Special Tool	 011
Engine Equalizer	 026

General Tools

Dial Indicator and Magnetic Holder	 023
Transmission Carrier	 005
Hydraulic Press	 012

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DIAGNOSIS & TESTING

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Suspected Area
Running deviation	Tire (worn or improperly inflated)
	Front wheel alignment (incorrect)
	Rear wheel alignment (incorrect)
	Front hub bearing (loose or worn)
	Rear hub bearing (loose or worn)
	Steering gear (misaligned or damaged)
	Suspension component (worn)
Front wheel shimmy	Tire (worn or improperly inflated)
	Wheel (imbalanced)
	Front shock absorber assembly (stuck or damaged)
	Front wheel alignment (incorrect)
	Control arm ball pin assembly (stuck or damaged)
	Front hub bearing (loose or worn)
	Steering gear (misaligned or damaged)
Rear wheel shimmy	Tire (worn or improperly inflated)
	Wheel (imbalanced)
	Rear shock absorber assembly (stuck or damaged)
	Rear hub bearing (loose or worn)
	Rear wheel alignment (incorrect)

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ON-VEHICLE SERVICE

Front Steering Knuckle

Removal

Warning/Caution/Hint

Hint:

- Use same procedures for right and left sides.
- Procedures listed below are for left side.

Caution:

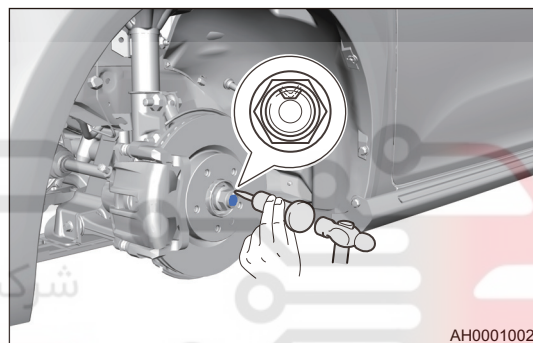
- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis parts.
- It is not permitted to weld or modify bearing parts of wheel suspension and guide parts of wheel.
- When removing chassis parts, replace self-locking nuts and rusted nuts for safety.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Remove the front left wheel (See page 24-8).
3. Remove the front drive shaft assembly locking nut

- (a) Using a nut punch and a hammer, loosen the staked part of nut.

Caution:

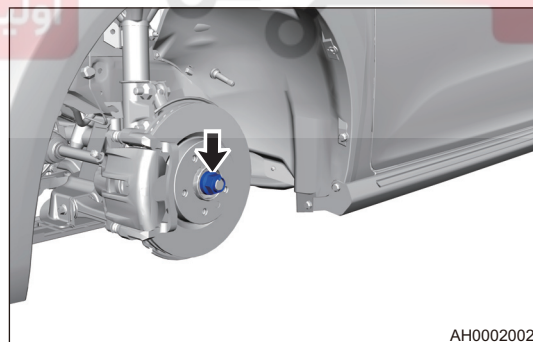
- Loosen staked part of nut completely, otherwise it will damage threads of drive shaft assembly.



- (b) Remove the front drive shaft assembly locking nut and washer (arrow) while applying brake securely.

Tightening torque

320 ± 20 N·m

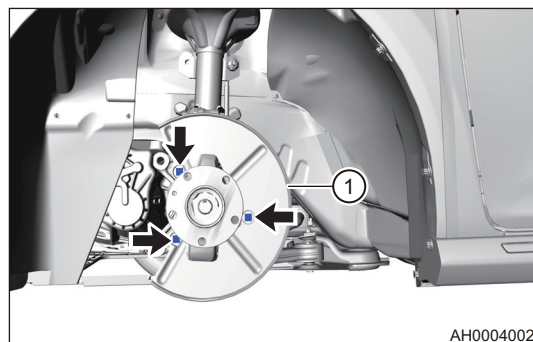


4. Remove the front left brake caliper assembly (See page 26-26).
5. Remove the front left brake disc (See page 26-26).
6. Remove the front left steering knuckle assembly.

- (a) Remove 3 fixing bolts (arrow) between front left dust guard and front left steering knuckle assembly, and remove the front left dust guard (1).

Tightening torque

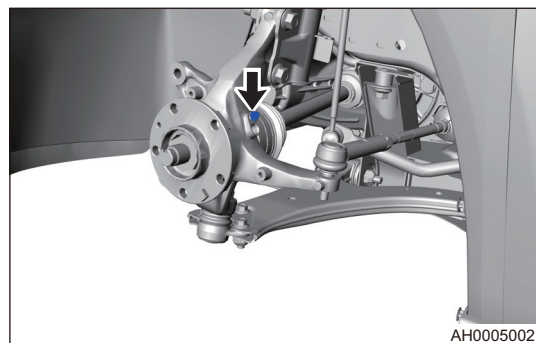
9 ~ 11 N·m



- (b) Remove coupling bolt (arrow) between front left wheel speed sensor and front left steering knuckle assembly, and disengage front left wheel speed sensor carefully.

Tightening torque

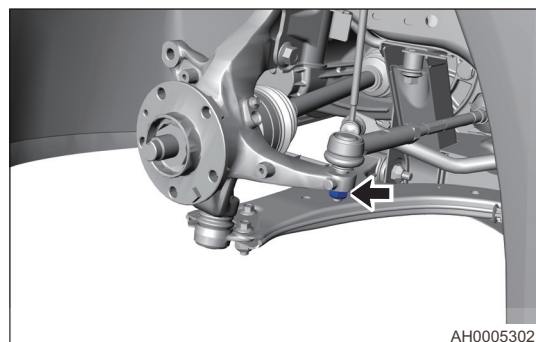
$10 \pm 1 \text{ N}\cdot\text{m}$



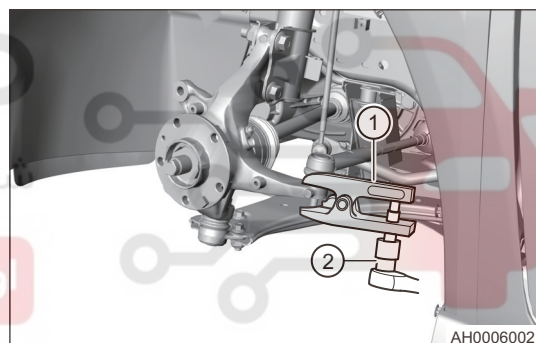
- (c) Remove self-locking nut (arrow) between left steering tie rod assembly ball pin and front left steering knuckle assembly.

Tightening torque

$35 \pm 3 \text{ N}\cdot\text{m}$



- (d) Install ball pin separator (1), and tighten ball pin separator bolt with a wrench (2) to separate steering tie rod ball pin from steering knuckle assembly.



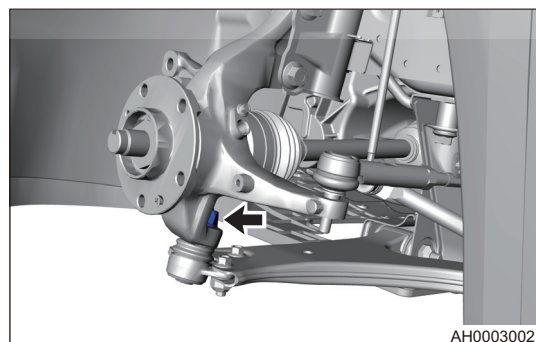
- (e) Remove the coupling nut (arrow) between front left control arm ball pin assembly and front left steering knuckle assembly.

Tightening torque

$80 \pm 8 \text{ N}\cdot\text{m}$

Warning:

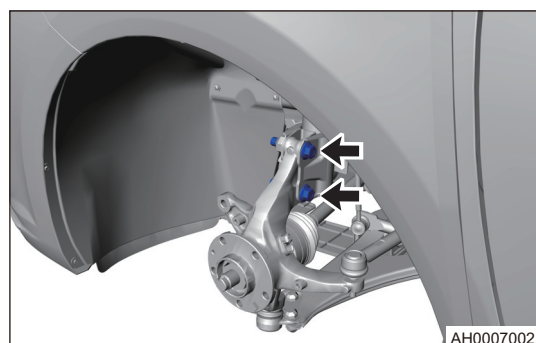
If it is difficult to remove control arm ball pin tip from steering knuckle, use a hammer or equivalent, tap the steering knuckle uniformly to detach the ball pin.



- (f) Remove 2 coupling bolts and nuts (arrow) between front left shock absorber assembly and front left steering knuckle assembly.

Tightening torque

$180 \pm 18 \text{ N}\cdot\text{m}$



(g) Disengage the left drive shaft and remove the front left steering knuckle assembly.

Disassembly

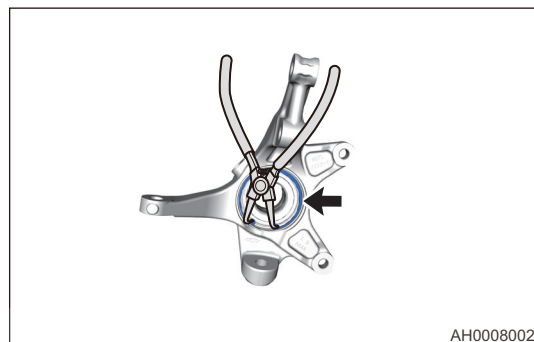
Warning/Caution/Hint

Caution:

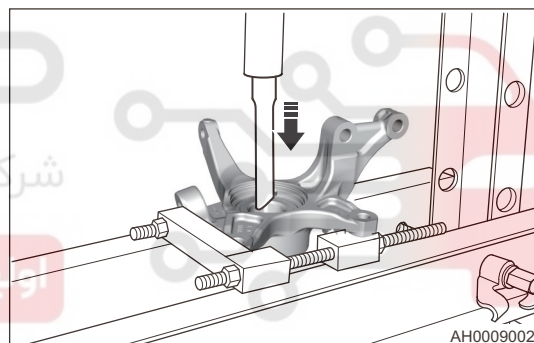
- Be sure to wear necessary safety equipment to prevent accidents, when disassembling the front steering knuckle assembly, front hub, front hub bearing.
- Appropriate force should be applied, when disassembling the front steering knuckle assembly, front hub, front hub bearing. Be careful not to operate roughly.

1. Remove the front steering knuckle assembly, front hub and front hub bearing.

(a) Remove the front hub bearing retainer (arrow) with snap spring pliers.



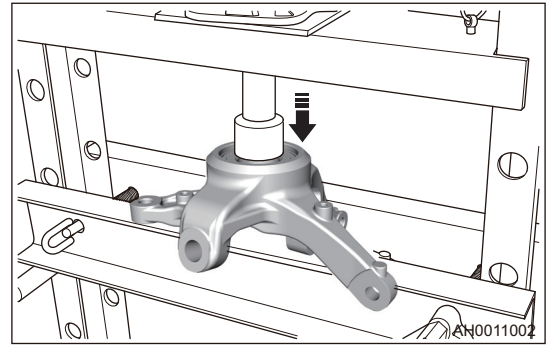
(b) Place the front steering knuckle assembly on a hydraulic press, install the bearing remover and adapter, and press out the front hub with hydraulic press.



(c) Remove the front hub carefully.



- (d) Place steering knuckle assembly on a hydraulic press, install bearing remover and adapter, and press out front hub bearing with hydraulic press.



- (e) Remove the front hub bearing carefully.



Inspection

After installing front steering knuckle assembly, front hub and front hub bearing, check front steering knuckle and dust guard.

1. Check front steering knuckle for wear, cracks, deformation or damage. Replace as necessary.
2. Check dust guard for dirt, wear, cracks, deformation or damage. Replace as necessary.

Assembly

1. Assembly is in the reverse order of disassembly.

Caution:

- Please note that opening of retainer must face opening of front wheel speed sensor, when installing front hub bearing retainer.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to tighten coupling bolts and nuts to specified torques.
- Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

Front Hub Bearing

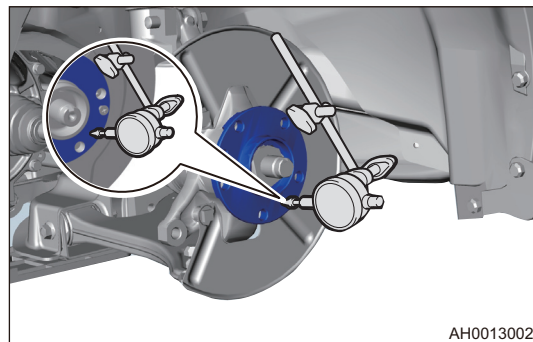
On-vehicle Inspection

1. Remove the front wheel (See page 24-8).
2. Remove the front brake caliper assembly (See page 26-26).
3. Remove the front brake disc (See page 26-26).
4. Check the front hub bearing looseness.

- (a) Check looseness near center of the front hub assembly with a dial indicator.

Caution:

- Ensure that dial indicator is perpendicular to measurement surface.
- If looseness exceeds maximum value, replace the front hub bearing.



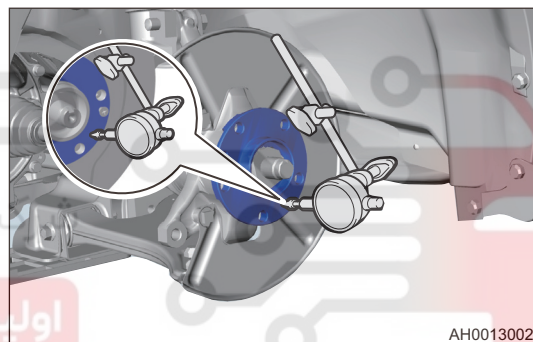
AH0013002

5. Check the front hub bearing runout.

- (a) Check runout on the bearing surface of the front hub assembly with a dial indicator.

Caution:

- Ensure that dial indicator is perpendicular to measurement surface.
- If runout exceeds maximum value, replace front hub bearing.



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Removal

Warning/Caution/Hint

Caution:

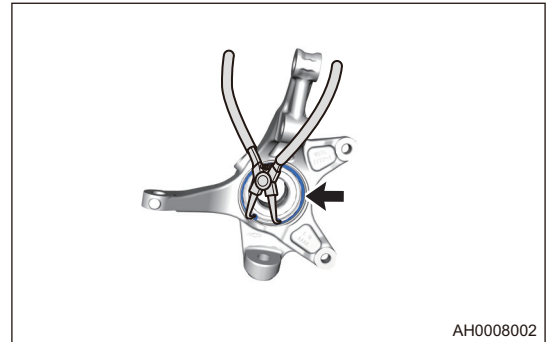
- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis parts.
- It is not permitted to weld or modify bearing parts of wheel suspension and guide parts of wheel.
- When removing chassis parts, replace self-locking nuts and rusted nuts for safety.

Hint:

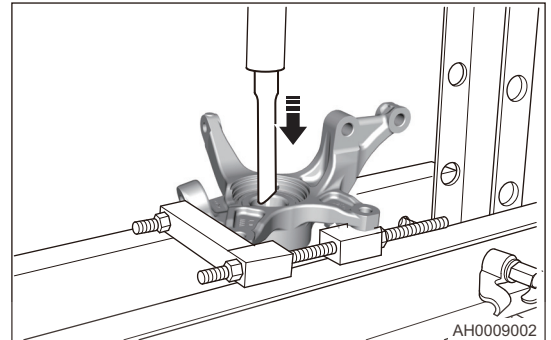
- Use same procedures for right and left sides.
- Procedures listed below are for left side.

1. Remove the front left wheel (See page 24-8).
2. Remove the front drive shaft assembly locking nut (See page 22-8).
3. Remove the front left brake caliper assembly (See page 26-26).
4. Remove the front left brake disc (See page 26-26).
5. Remove the front left steering knuckle assembly (See page 22-8).
6. Remove the front hub assembly.

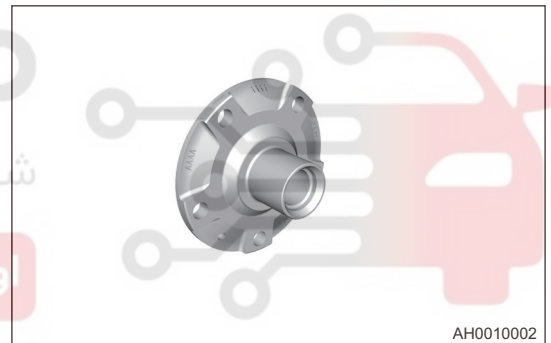
- (a) Remove the front hub bearing retainer (arrow) with snap spring pliers.



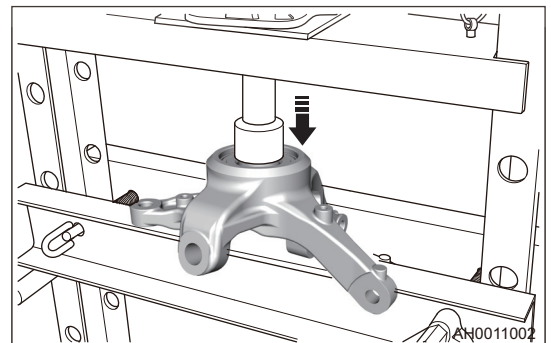
- (b) Place the front steering knuckle assembly on a hydraulic press, install the bearing remover and adapter, and press out the front hub with hydraulic press.



- (c) Remove the front hub carefully.



- (d) Place steering knuckle assembly on a hydraulic press, install bearing remover and adapter, and press out front hub bearing with hydraulic press.



(e) Remove the front hub bearing carefully.



Installation

1. Installation is in the reverse order of removal.

Caution:

- Please note that opening of retainer must face opening of front wheel speed sensor, when installing front hub bearing retainer.
- Be sure to tighten coupling bolts and nuts to specified torques.
- Check that hub assembly rotates smoothly and there is no seizing after installation.
- Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

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Front Sub Frame Welding Assembly

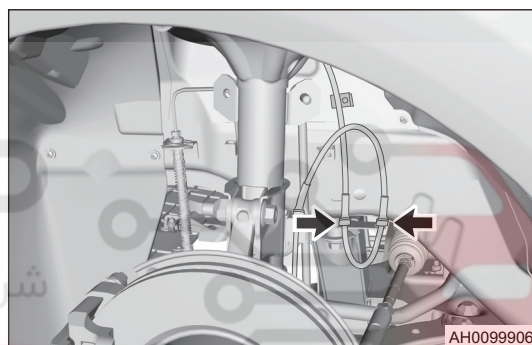
Removal

Warning/Caution/Hint

Caution:

- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis parts.
- It is not permitted to weld or modify bearing parts of wheel suspension and guide parts of wheel.
- When removing chassis parts, replace self-locking nuts and rusted nuts for safety.
- When removing front sub frame welding assembly, an engine equalizer needs to be used to support engine and transmission assembly securely to prevent them from being damaged.

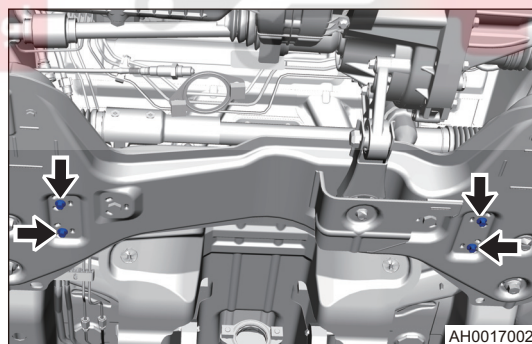
1. Remove the front wheel (See page 24-8).
2. Remove the engine lower protector assembly (See page 51-21).
3. Remove the main catalytic converter assembly (See page 11-20).
4. Remove the front control arm assembly (See page 23-15).
5. Remove the front sub frame welding assembly.
 - (a) Using an engine equalizer, support the engine and transmission assembly securely.
 - (b) Detach fixed parts (arrow) of front wheel speed sensor from front sub frame welding assembly (use same removal procedure for right side).



- (c) Remove 4 coupling bolts (arrow) between front stabilizer bar assembly and front sub frame welding assembly.

Tightening torque

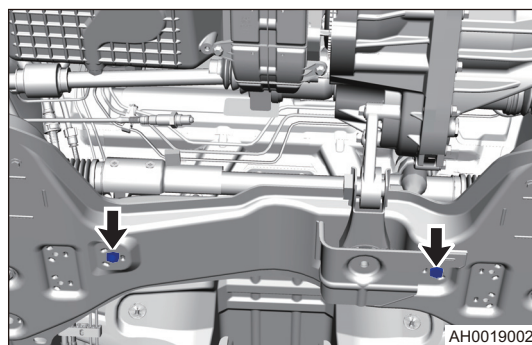
$20 \pm 3 \text{ N}\cdot\text{m}$



- (d) Remove 2 coupling bolts (arrow) between front sub frame welding assembly and steering gear assembly.

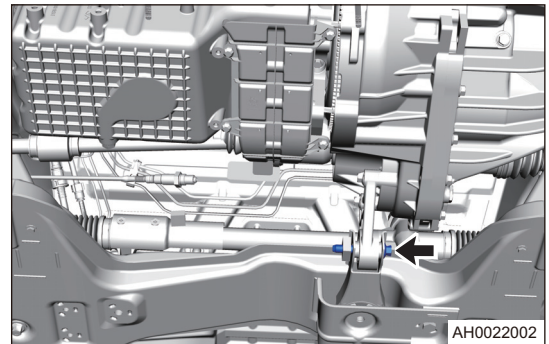
Tightening torque

$110 \pm 10 \text{ N}\cdot\text{m}$



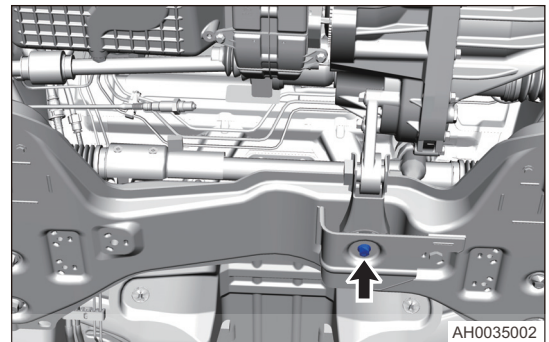
- (e) Remove coupling bolt and nut (arrow) between upper body and lower body of rear mounting cushion assembly.

Tightening torque
 $80 \pm 5 \text{ N}\cdot\text{m}$



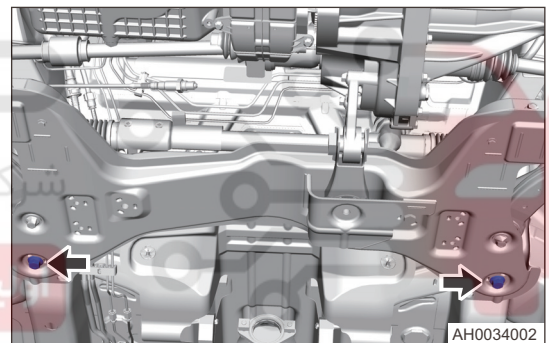
- (f) Remove the coupling bolt (arrow) between lower body of rear mounting cushion assembly and front sub frame welding assembly.

Tightening torque
 $105 \pm 5 \text{ N}\cdot\text{m}$

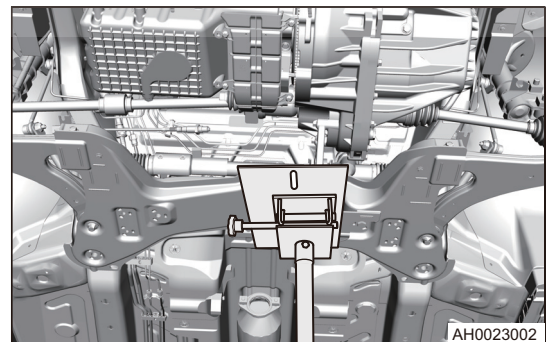


- (g) Remove 2 coupling bolts (arrow) between rear part of front sub frame welding assembly and body.

Tightening torque
 $180 \pm 18 \text{ N}\cdot\text{m}$

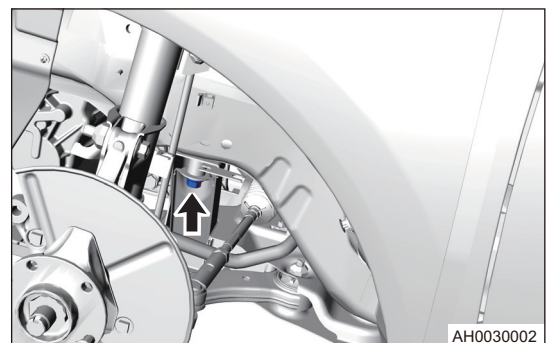


- (h) Using a transmission carrier, support front sub frame welding assembly.



- (i) Remove coupling bolt (arrow) between upper left part of front sub frame welding assembly and body. Use same removal procedure for right side.

Tightening torque
 $180 \pm 18 \text{ N}\cdot\text{m}$



- (j) Lower transmission carrier slowly, and remove the front sub frame welding assembly.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to tighten coupling bolts and nuts to specified torques.
- Check wheel alignment after installation. Adjust wheel alignment to standard range as necessary.

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Rear Hub Bearing Assembly

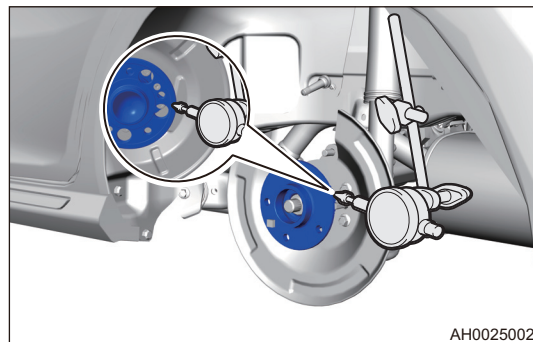
On-vehicle Inspection

1. Remove the rear wheel (See page 24-8).
2. Remove the rear brake caliper assembly (See page 26-35).
3. Remove the rear brake disc (See page 26-35).
4. Check the rear hub bearing looseness.

- (a) Check looseness near center of the rear hub bearing with a dial indicator.

Caution:

- Ensure that dial indicator is perpendicular to measurement surface.
- If looseness exceeds maximum value, replace the rear hub bearing assembly.

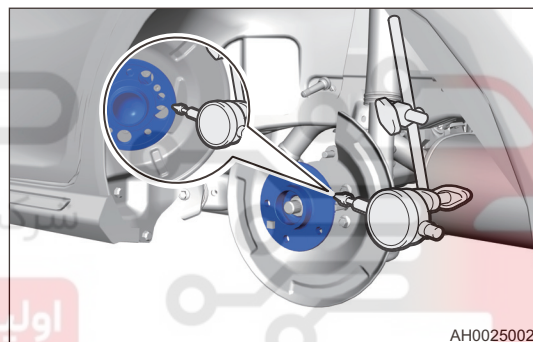


5. Check the rear hub bearing runout.

- (a) Check runout on surface of the rear hub bearing assembly with a dial indicator.

Caution:

- Ensure that dial indicator is perpendicular to measurement surface.
- If runout exceeds maximum value, replace the rear hub bearing assembly.

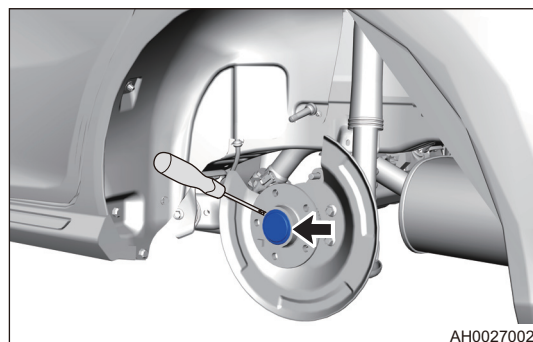


Removal

Warning/Caution/Hint

Hint:

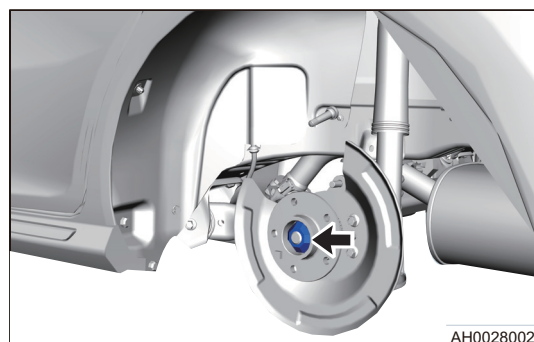
- Use same procedures for right and left sides.
 - Procedures listed below are for left side.
1. Remove the rear left wheel (See page 24-8).
 2. Remove the rear left brake caliper assembly (See page 26-35).
 3. Remove the rear left brake disc (See page 26-35).
 4. Remove the rear left hub bearing assembly.
- (a) Using a flat tip screwdriver wrapped with protective tape, pry off rear left bearing end cover (arrow) carefully.



- (b) Remove rear shaft assembly left locking nut (arrow).

Tightening torque

$315 \pm 15 \text{ N}\cdot\text{m}$



- (c) Slightly jiggle rear left hub bearing assembly, and take it out.



Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to tighten bolt to specified torque.

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Rear Hub Shaft

Removal

Warning/Caution/Hint

Caution:

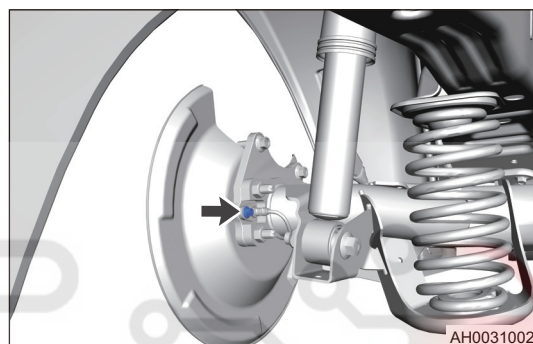
- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis.
- It is not permitted to weld or modify bearing parts of wheel suspension and guide parts of wheel.
- When removing chassis parts, replace self-locking nuts and rusted nuts for safety.

1. Remove the rear wheel (See page 24-8).
2. Remove the rear brake caliper assembly (See page 26-35).
3. Remove the brake disc assembly (See page 26-35).
4. Remove the rear hub bearing assembly (See page 22-18).
5. Remove the rear hub assembly.

- (a) Remove coupling bolt (arrow) between rear wheel speed sensor and rear steering knuckle assembly, and disengage rear wheel speed sensor.

Tightening torque

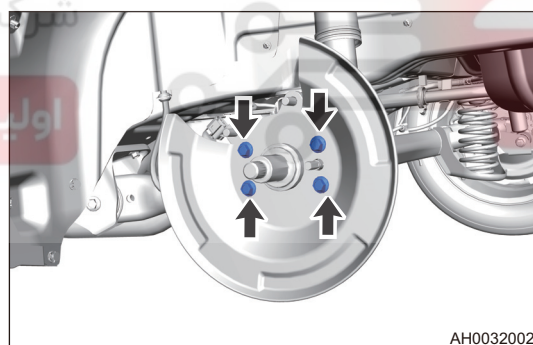
$10 \pm 1 \text{ N}\cdot\text{m}$



- (b) Remove 4 fixing bolts (arrow) between rear hub shaft and brake plate assembly.

Tightening torque

$70 \pm 7 \text{ N}\cdot\text{m}$



- (c) Disengage and remove the rear hub shaft.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to tighten bolt to specified torque.

Rear Shaft Assembly

Removal

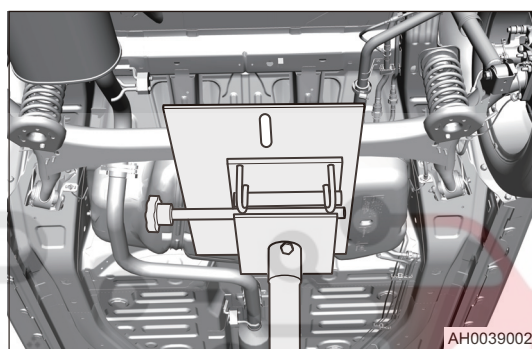
Warning/Caution/Hint

Caution:

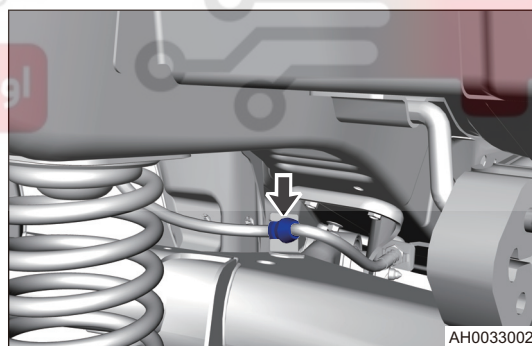
- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis.
- It is not permitted to weld or modify bearing parts of wheel suspension and guide parts of wheel.
- When removing chassis parts, replace self-locking nuts and rusted nuts for safety.

1. Remove the rear wheel (See page 24-8).
2. Remove the rear brake caliper assembly (See page 26-35).
3. Remove the brake disc assembly (See page 26-35).
4. Remove the wheel speed sensor (See page 25-89).
5. Remove the rear hub bearing assembly (See page 22-20).
6. Remove the rear shaft assembly.

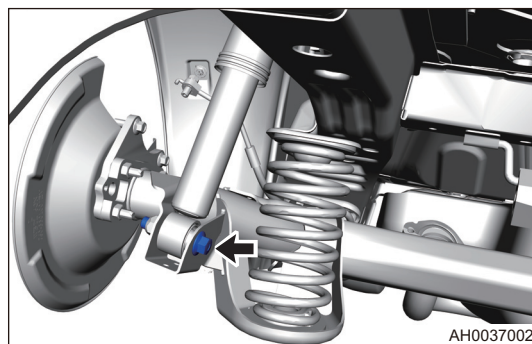
(a) Install transmission carrier and support rear shaft.



(b) Detach the pipe (arrow) and secure the rear brake caliper assembly.



(c) Remove the coupling bolt and nut (arrow) between rear left shock absorber assembly and rear shaft assembly. Use same removal procedure for right side.



Tightening torque

160 ± 16 N·m

- (d) Remove the coupling bolt (arrow) between left of rear shaft assembly and body. Use same removal procedure for right side.

Tightening torque
 $120 \pm 12 \text{ N}\cdot\text{m}$



- (e) Lower transmission carrier slowly, and remove rear coil spring and rear coil spring gasket.
 (f) Remove the rear shaft assembly.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to tighten bolt to specified torque.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

