AXLE

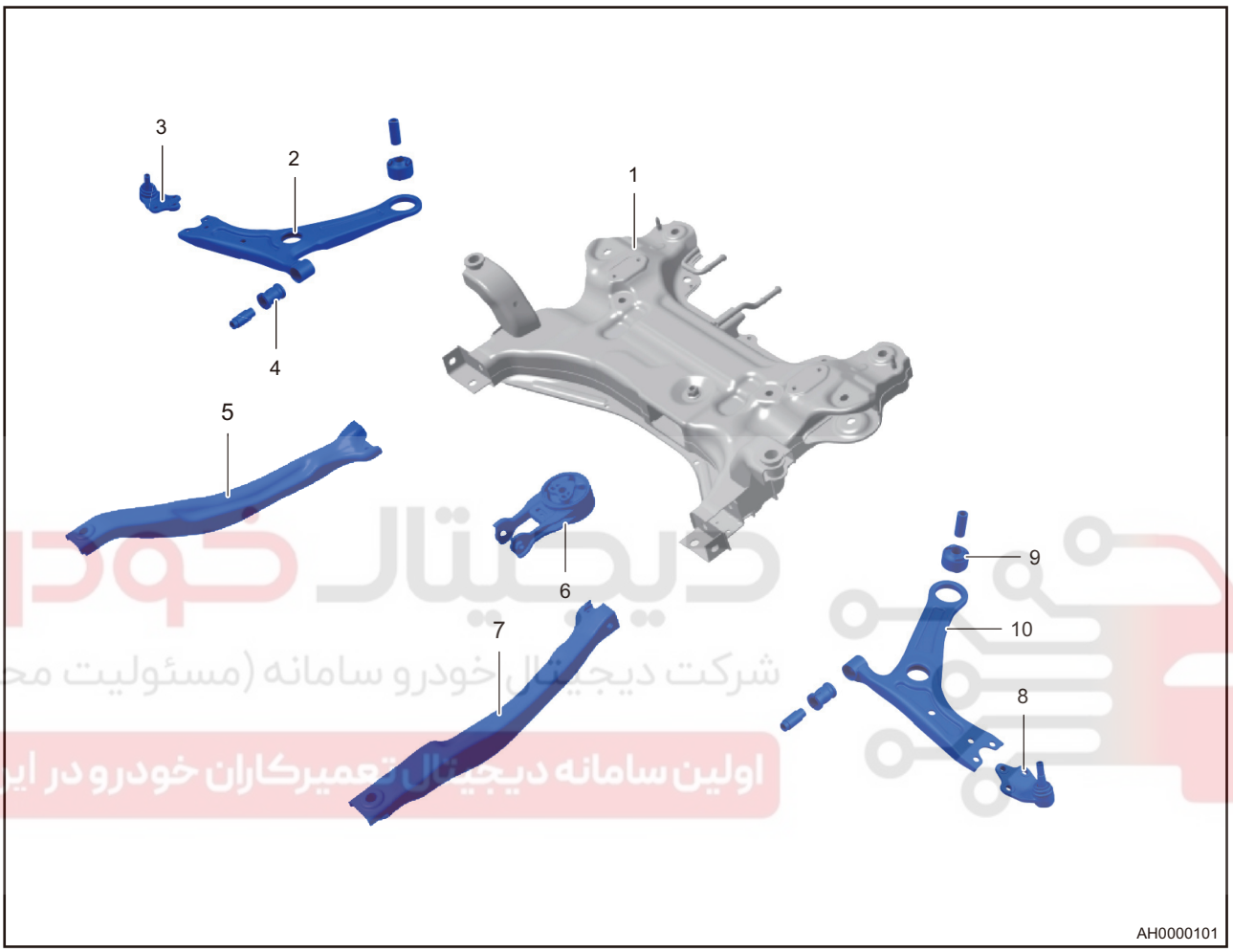
WWW.DIGITALKHODRO.COM 021 62 99 92 92

GENERAL INFORMATION

Overview

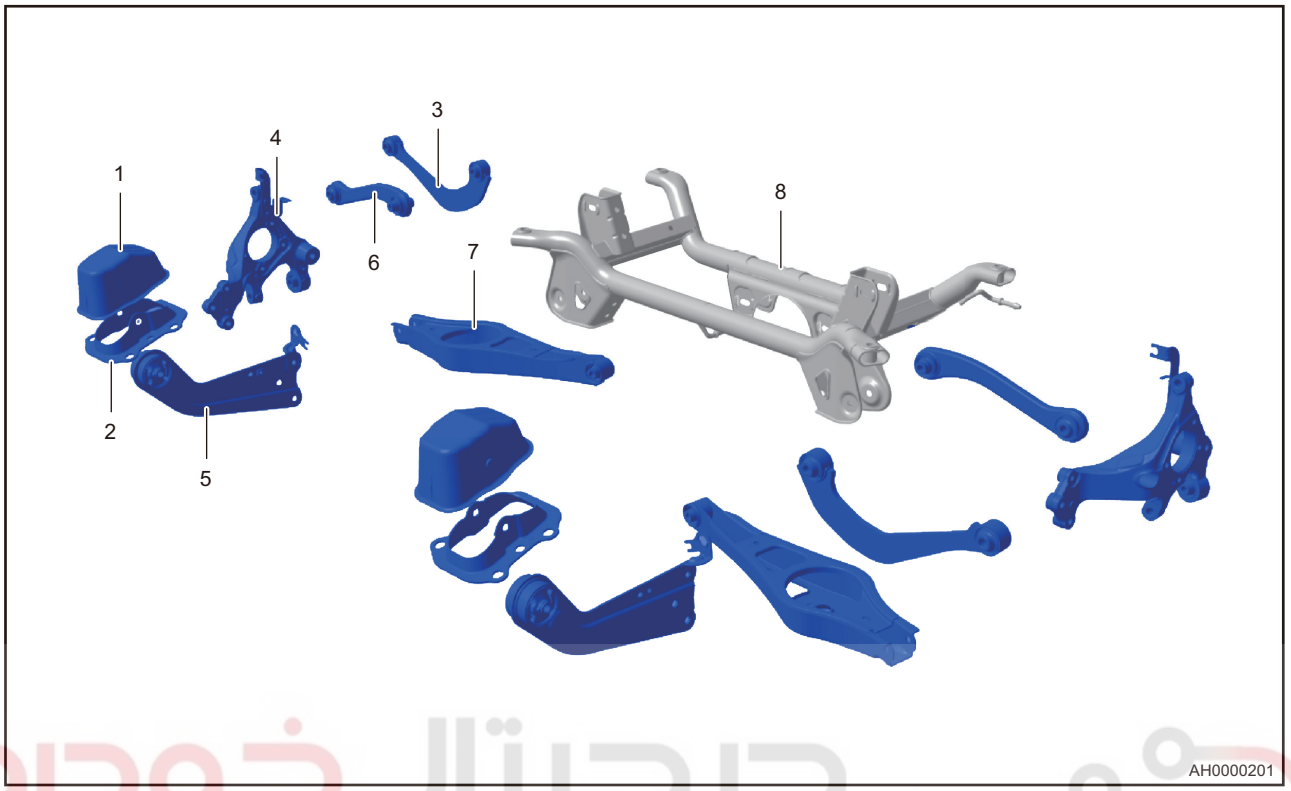
Description

Front Axle



1 - Front Sub Frame Assembly	2 - Front Right Control Arm Assembly
3 - Front Right Control Arm Ball Pin Assembly	4 - Front Right Control Arm Rubber Bushing Assembly
5 - Right Side Rail Welding Assembly	6 - Rear Mounting Lower Body
7 - Left Side Rail Welding Assembly	8 - Front Left Control Arm Ball Pin Assembly
9 - Front Left Control Arm Rear Rubber Bushing Assembly	10 - Front Left Control Arm Assembly

Rear Axle



1 - Right Trailing Arm Mounting Bracket Dust Cover	2 - Trailing Arm Mounting Bracket Assembly
3 - Rear Upper Control Arm Assembly	4 - Rear Right Steering Knuckle
5 - Rear Right Trailing Arm Assembly	6 - Right Connecting Rod Assembly
7 - Rear Lower Control Arm Assembly	8 - Rear Sub Frame Welding 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

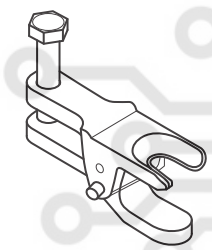
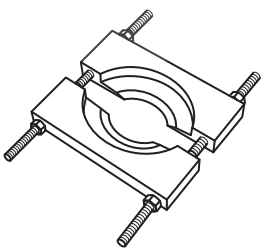
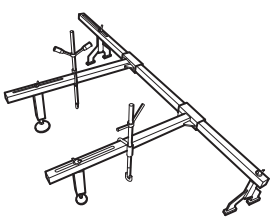
Torque Specifications

Description	Torque (N·m)
Front Drive Shaft Assembly Locking Nut	270 ± 20
Self-locking Nut Between Steering Tie Rod Assembly Ball Pin and Front Steering Knuckle Assembly	45 ± 5
Coupling Nut Between Front Control Arm Assembly Ball Pin and Front Steering Knuckle Assembly	95 ± 9
Coupling Bolt Between Control Arm and Control Arm Ball Pin	150 ± 10
Coupling Bolt Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	240 ± 24
Locking Nut Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	240 ± 24
Coupling Bolt Between Front Stabilizer Bar Assembly and Front Sub Frame Welding Assembly	25 ± 3
Coupling Bolt Between Rear Part of Front Sub Frame Bracket and Body	120 ± 12
Coupling Bolt Between Front Sub Frame Welding Assembly and Body	180 ± 18
Coupling Bolt Between Rear Lower Control Arm and Rear Steering Knuckle	110 ± 11
Coupling Bolt Between Rear Lower Control Arm and Rear Sub Frame	110 ± 11

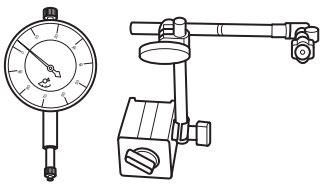
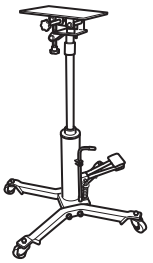
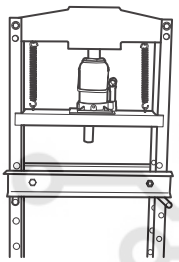
Description	Torque (N·m)
Coupling Bolt Between Rear Upper Control Arm and Rear Steering Knuckle	160 ± 16
Coupling Nut Between Rear Upper Control Arm and Rear Sub Frame	110 ± 11
Coupling Nut Between Connecting Rod Assembly and Rear Sub Frame Assembly	110 ± 11
Coupling Bolt Between Connecting Rod Assembly and Rear Steering Knuckle	160 ± 16
Coupling Nut Between Rear Stabilizer Bar and Rear Steering Knuckle	60 ± 6
Rear Stabilizer Bar Fixing Bolt	25 ± 4
Coupling Bolt Between Rear Trailing Arm Assembly and Rear Steering Knuckle	110 ± 11
Coupling Bolt Between Rear Trailing Arm and Mounting Bracket	120 ± 12
Coupling Bolt Between Rear Trailing Arm Bracket and Body Side Member	60 ± 6
Coupling Bolt Between Rear shock absorber and Body	60 ± 6
Coupling Bolt Between Rear Shock Absorber Assembly and Rear Steering Knuckle Assembly	160 ± 16
Coupling Bolt Between Rear Sub Frame and Body	120 ± 12

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

DIAGNOSIS & TESTING

Problem Symptoms Table

Hint:

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

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:

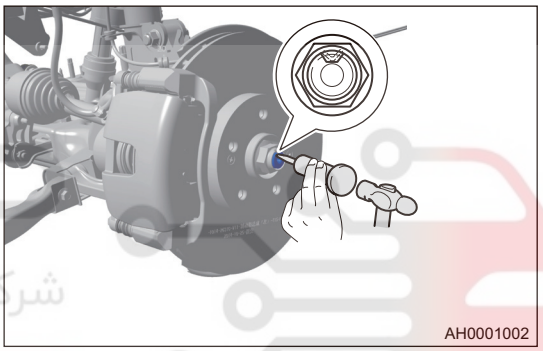
- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis parts.
- It is not permitted to weld or modify bearing parts of wheel suspension and guide parts of wheel.
- When removing chassis parts, replace self-locking nuts and rusted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

1. Turn off all electrical equipment and the ignition switch.
2. Remove the front left wheel (See page 20-8).
3. Remove the front drive shaft assembly locking nut

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

   Caution:

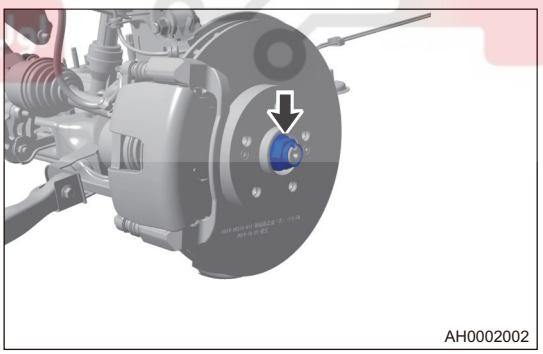
   - Loosen staked part of nut completely, otherwise it will damage threads of drive shaft assembly.



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

   Tightening torque

   270 ± 20 N·m

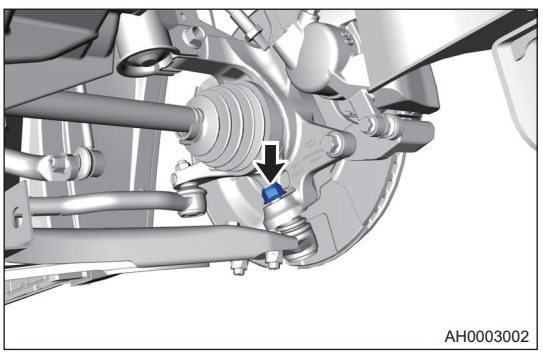


4. Remove the front left steering knuckle assembly.

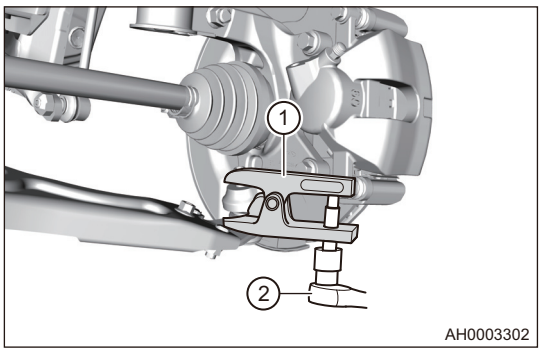
   (a) Remove coupling nut (1) between front left control arm assembly ball pin and front left steering knuckle assembly.

   Tightening torque

   95 ± 10 N·m



(b) Install ball pin separator (1), and tighten ball pin separator bolt with a wrench (2) to separate lower control arm ball pin from steering knuckle assembly.



(c) Remove the front left brake caliper assembly.

Caution:

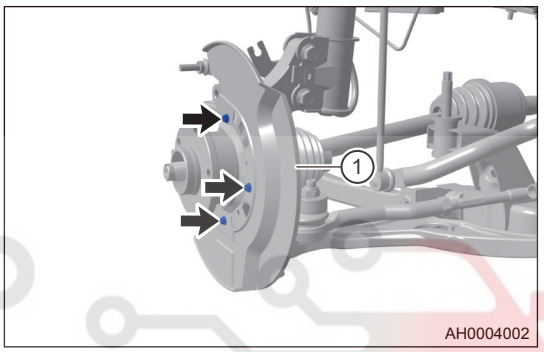
- Place front brake caliper assembly to a proper position after removal, and be careful not to extend front brake hose excessively.

(d) Remove the front left brake disc.

(e) Remove 3 fixing bolts (arrow) between front left dust guard and front left steering knuckle assembly.

Tightening torque

10 ± 1.0 N·m

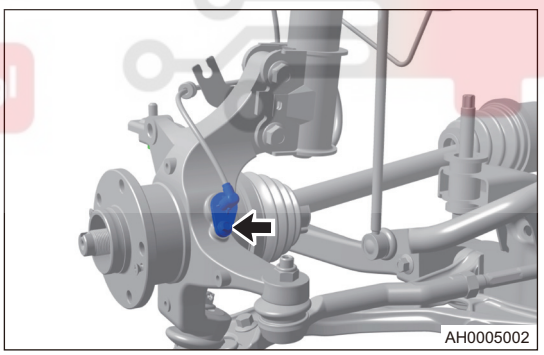


(f) Remove the front left dust guard (1).

(g) 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

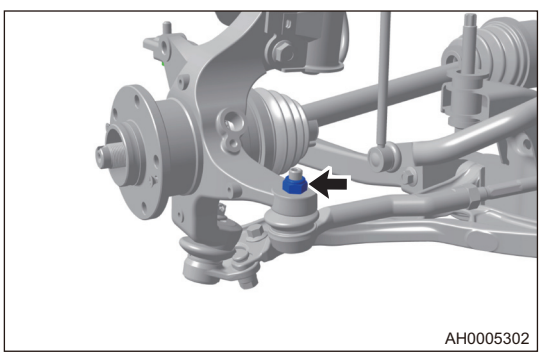
10 ± 1.0 N·m



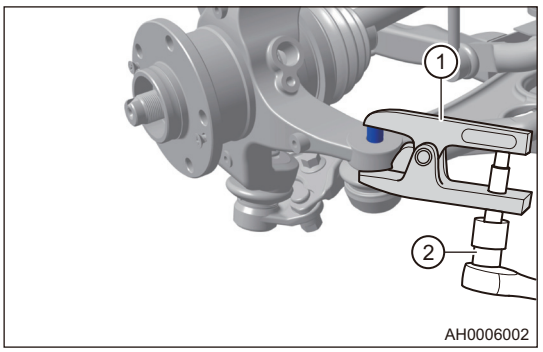
(h) Remove self-locking nut (arrow) between left steering tie rod assembly ball and front left steering knuckle assembly.

Tightening torque

45 ± 5.0 N·m

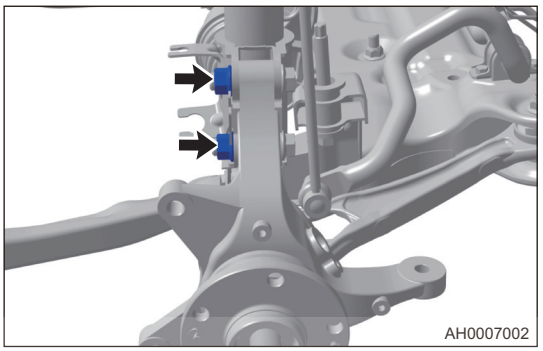


(i) Install ball pin separator (1), and tighten ball pin separator bolt with a wrench (2) to separate steering tie rod ball pin from steering knuckle assembly.



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

Tightening torque
240 ± 24 N·m



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

Disassembly

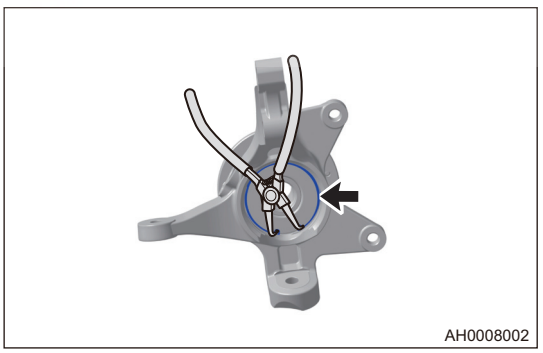
Warning/Caution/Hint

Caution:

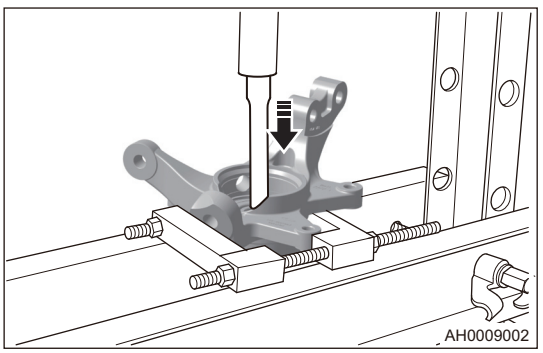
- Be sure to wear necessary safety equipment to prevent accidents, when disassembling the front steering knuckle assembly, front hub, front hub bearing.
- Appropriate force should be applied, when disassembling the front steering knuckle assembly, front hub, front hub bearing. Be careful not to operate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

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

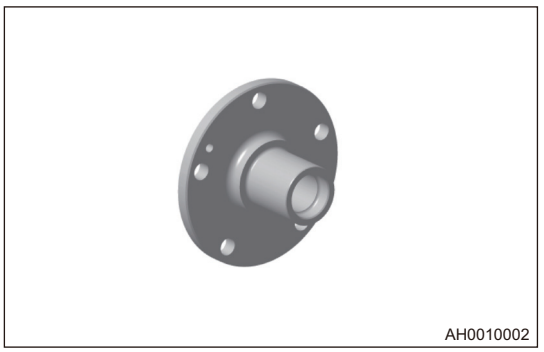
(a) Remove the front hub bearing retainer (arrow) with snap spring pliers.



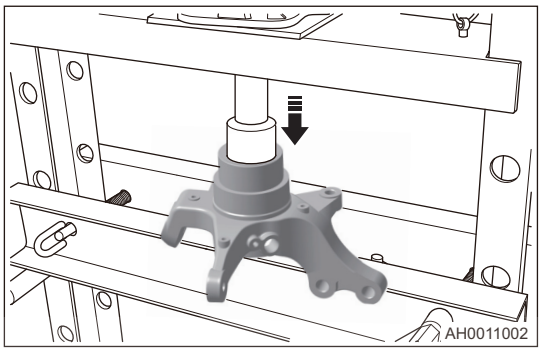
(b) Place the front steering knuckle assembly on a hydraulic press, install the bearing remover and adapter, and press out the front hub with hydraulic press.



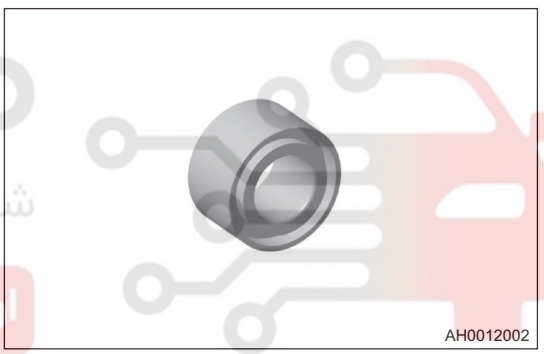
(c) Remove the front hub carefully.



(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:

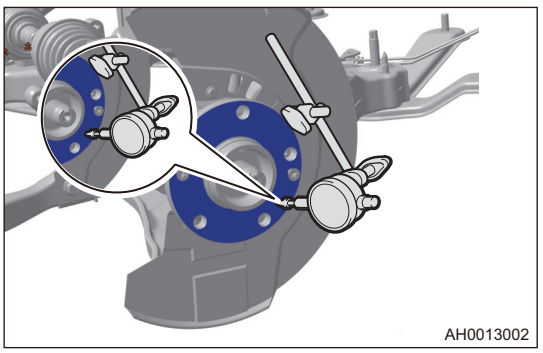
   - Be sure to tighten coupling bolts and nuts to specified torques.
   - Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

Front Hub Bearing

On-vehicle Inspection

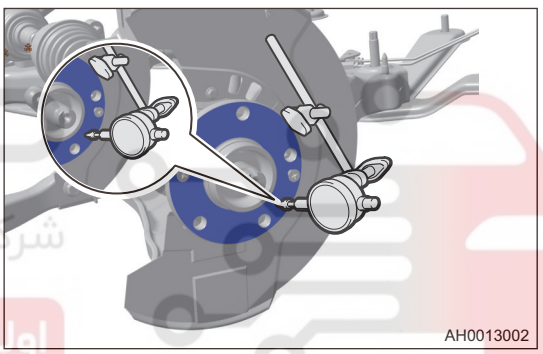
1. Remove the front wheel (See page 20-8).
2. Remove the front brake caliper assembly (See page 18-8).
3. Remove the front brake disc (See page 18-8).
4. Check the front hub bearing looseness.
   (a) Check looseness near center of the front hub assembly with a dial indicator. Maximum looseness: — mm

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



5. Check the front hub bearing runout.
   (a) Check runout on the surface of the front hub assembly with a dial indicator. Maximum runout: — mm

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



Removal

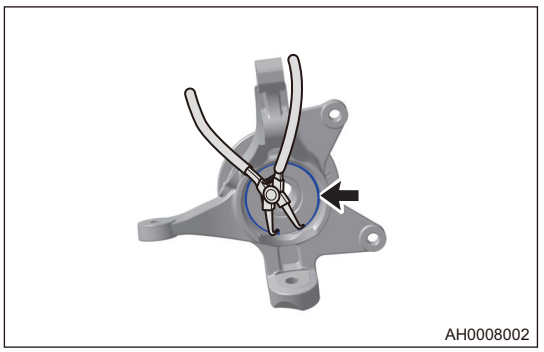
Warning/Caution/Hint

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.

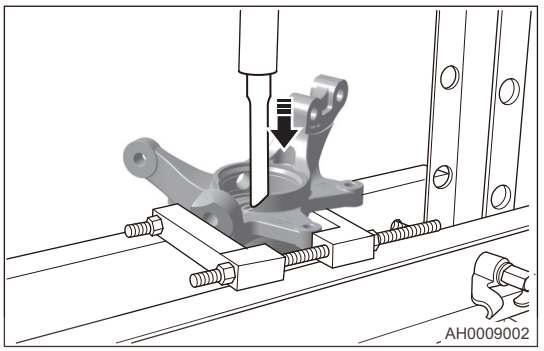
Hint:
- Use same procedures for right and left sides.
- Procedures listed below are for left side.

1. Remove the front left wheel (See page 20-8).
2. Remove the drive shaft assembly locking nut.
3. Remove the front left brake caliper assembly (See page 18-8).
4. Remove the front left brake disc (See page 18-8).
5. Remove the front left steering knuckle assembly (See page 18-8).
6. Remove the front hub assembly.
7. Remove the front hub bearing retainer (arrow) with snap spring pliers.

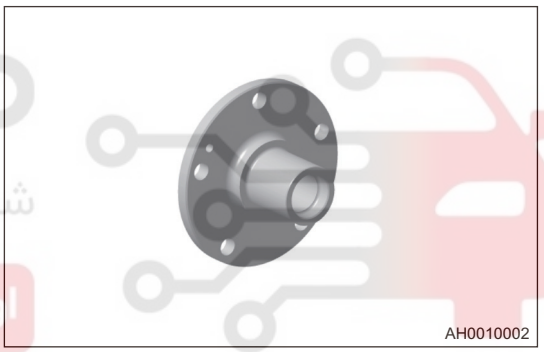
(a) Remove the front hub bearing retainer (arrow) with snap spring pliers.



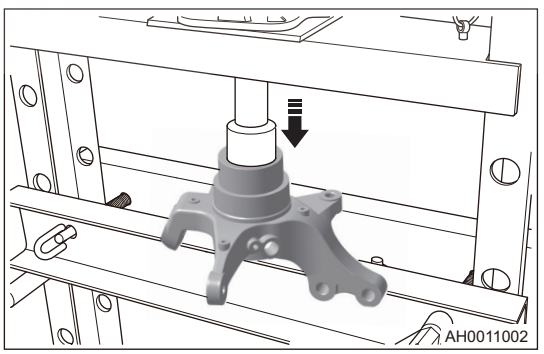
(b) Place the front steering knuckle assembly on a hydraulic press, install the bearing remover and adapter, and press out the front hub with hydraulic press.



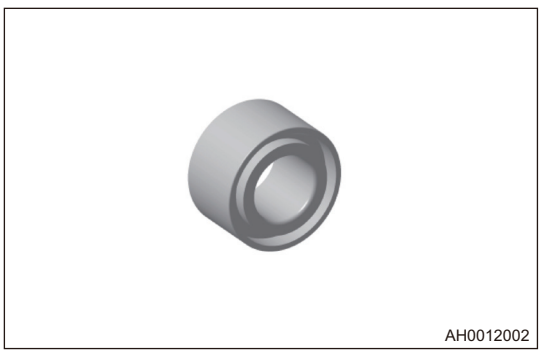
(c) Remove the front hub carefully.



(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 seizuring after installation.
   - Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

Front Sub Frame Welding Assembly

Removal

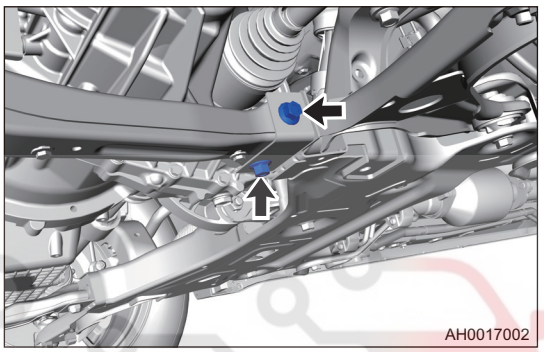
Warning/Caution/Hint

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.

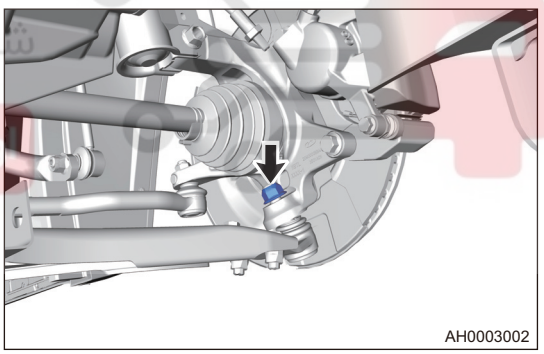
1. Remove the front wheel (See page 20-8)
2. Remove the front sub frame welding assembly.
   (a) Using an engine equalizer, support the engine and transmission assembly securely.
   (b) Remove 2 fixing bolts (arrow) between front left side rail and front sub frame. Remove 2 fixing bolts between front right side rail and front sub frame with same procedures.

   Tightening torque
   120 ± 12 N·m

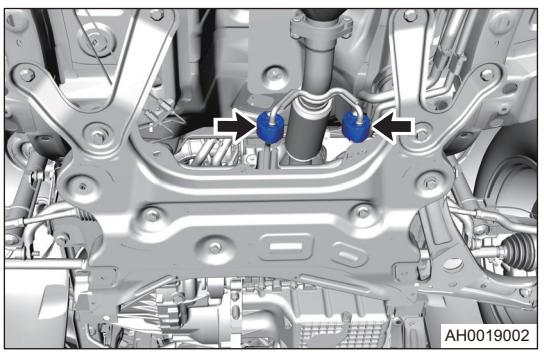


   (c) Remove coupling nut (arrow) between front left control arm assembly ball pin and front left steering knuckle assembly. Remove coupling nut between right control arm assembly ball pin and front left steering knuckle assembly with same procedures.

   Tightening torque
   95 ± 10 N·m

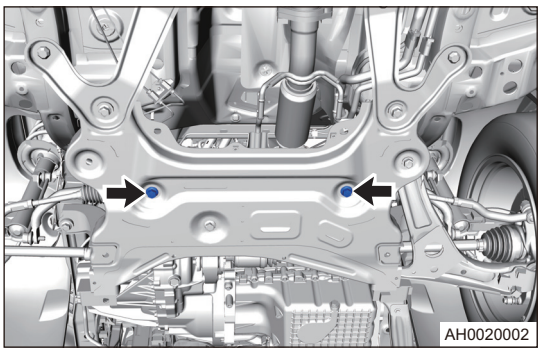


   (d) Detach exhaust pipe fixing rubber lugs (arrow) from front sub frame welding assembly.



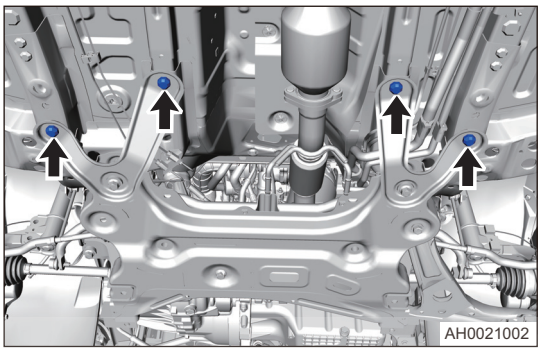
(e) Remove 2 through bolts (arrow) between power steering gear with tie rod assembly and sub frame.

Tightening torque
180 ± 18 N·m



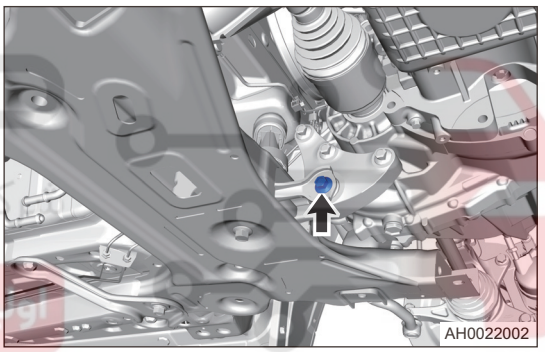
(f) Remove 4 coupling bolts between sub frame bracket rear end and body.

Tightening torque
25 ± 3.0 N·m



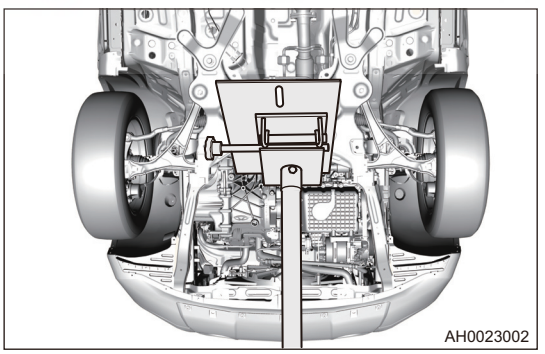
(g) Remove coupling bolt (arrow) between rear mounting upper body and transmission lower body.

Tightening torque
120 ± 12 N·m



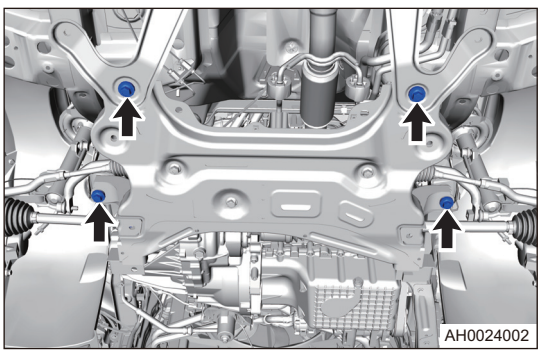
(h) Using a transmission carrier, support front sub frame welding assembly.

Tightening torque
105 ± 10 N·m



(i) Remove 4 fixing bolts (arrow) between sub frame and body.

Tightening torque
180 ± 18 N·m



3. Remove the front sub frame welding assembly.

Installation

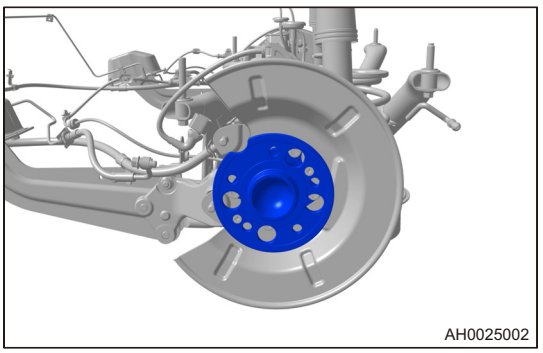
1. Installation is in the reverse order of removal.
   Caution:
   - Be sure to tighten coupling bolts and nuts to specified torques.
   - Check wheel alignment after installation. Adjust wheel alignment to standard range as necessary.

Rear Hub Bearing Assembly

On-vehicle Inspection

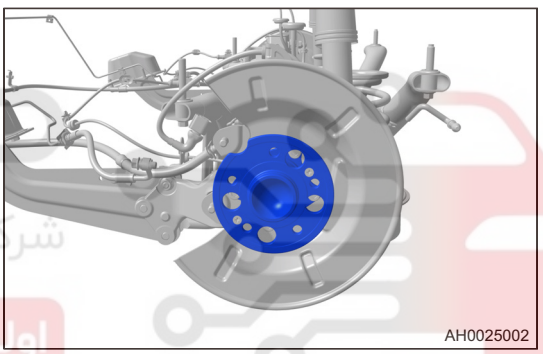
1. Remove the rear wheel (See page 20-8).
2. Remove the rear brake caliper assembly (See page 18-8).
3. Remove the rear brake disc (See page 18-8).
4. Check the rear hub bearing looseness.
   (a) Check looseness of the rear hub bearing.

   Caution:
   - If looseness, replace the rear hub bearing assembly.



5. Check the rear hub bearing abnormal noise.
   (a) Check abnormal noise of the rear hub bearing assembly.

   Caution:
   - If there is any abnormal noise, replace the rear hub bearing assembly.



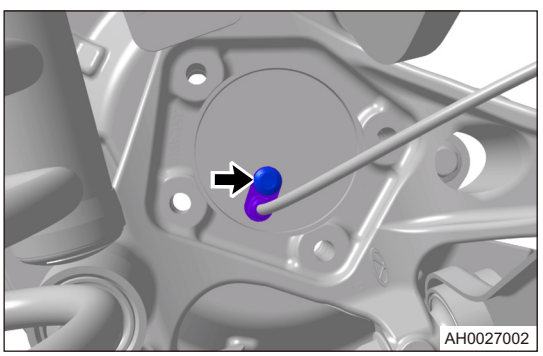
Removal

Warning/Caution/Hint

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

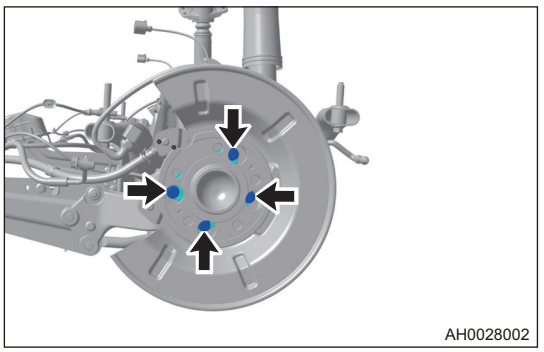
1. Remove the rear left wheel (See page 20-8).
2. Remove the rear left brake caliper assembly (See page 22-23).
3. Remove the rear left brake disc (See page 18-18).
4. Remove the rear left hub bearing assembly.
   (a) Remove fixing bolt (arrow) between rear left wheel speed sensor and remove the wheel speed sensor.

   Tightening torque
   10 ± 1.0 N·m



(b) Remove 4 fixing bolts (arrow) from rear left hub bearing.

Tightening torque
120 ± 12 N·m



(c) Remove the rear left hub bearing assembly.

Installation

1. Installation is in the reverse order of removal.

Caution:
- Be sure to tighten bolt to specified torque.
- Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

Rear Steering Knuckle Assembly

Removal

Warning/Caution/Hint

Hint:

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

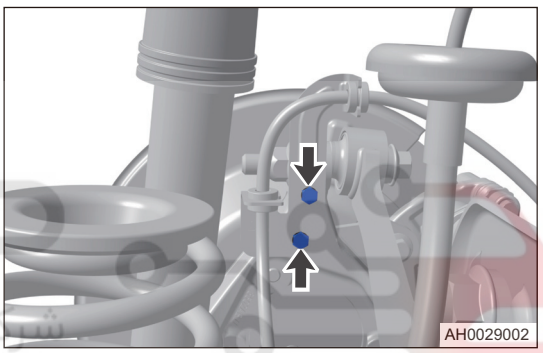
Caution:

- 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. Remove the rear wheel (See page 20-8).
2. Remove the rear brake caliper assembly (See page 22-33).
3. Remove the rear brake disc (See page 18-18).
4. Remove the rear steering knuckle assembly.

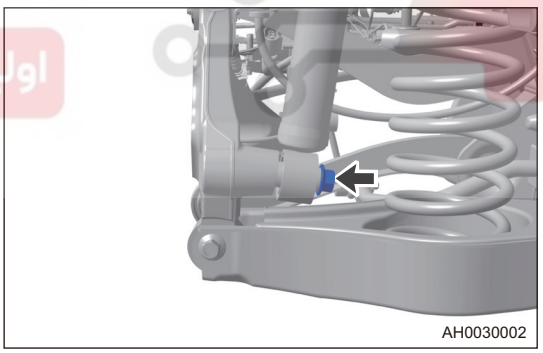
(a) Remove 2 coupling bolts (arrow) between EPB wire harness fixing bracket and rear steering knuckle assembly.

Tightening torque
15 ± 5 N·m



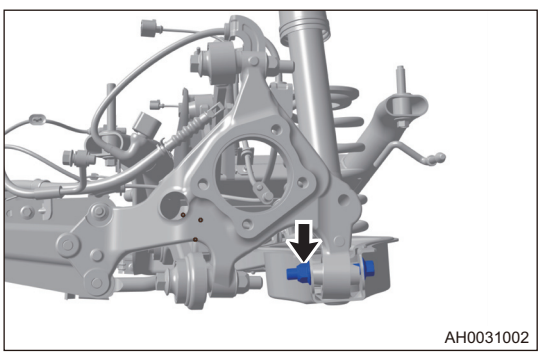
(b) Remove the coupling bolt (arrow) between rear shock absorber assembly and rear steering knuckle assembly.

Tightening torque
160 ± 16 N·m



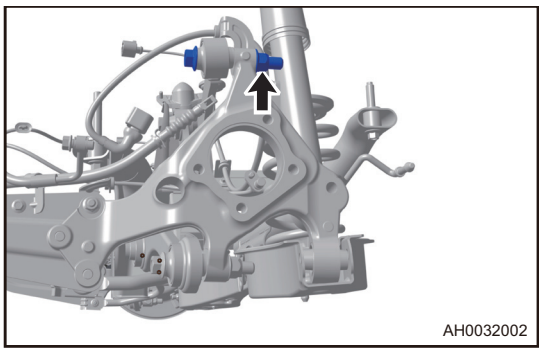
(c) Remove the coupling bolt and nut (arrow) between rear lower control arm assembly and rear steering knuckle assembly.

Tightening torque
110 ± 11 N·m



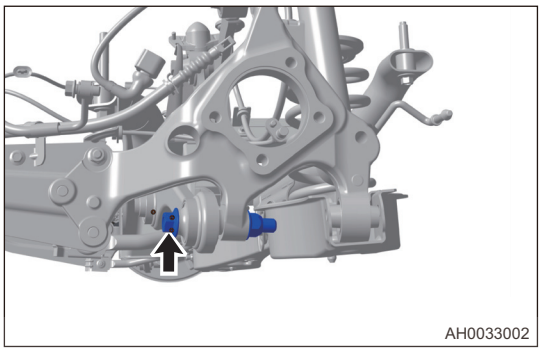
(d) Remove the coupling bolt and nut (arrow) between rear upper control arm assembly and rear steering knuckle assembly.

Tightening torque
160 ± 16 N·m



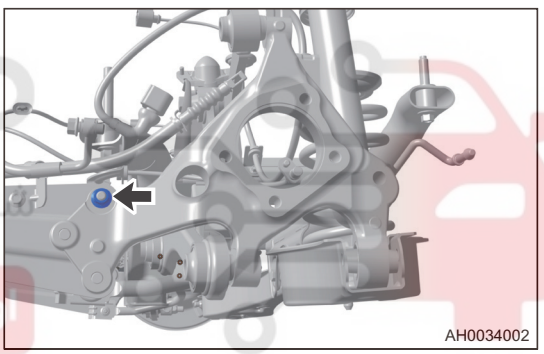
(e) Remove the coupling bolt and nut (arrow) between rear connecting rod assembly and rear steering knuckle assembly.

Tightening torque
160 ± 16 N·m



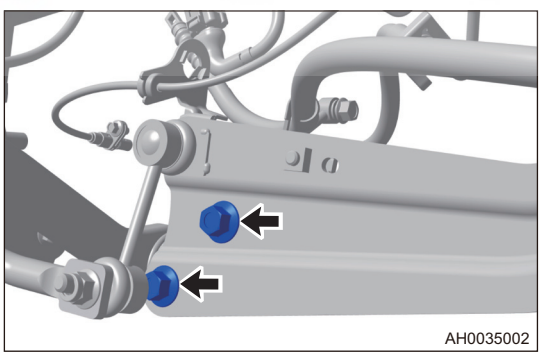
(f) Remove fixing nut (arrow) between rear small connecting rod and rear steering knuckle assembly.

Tightening torque
60 ± 6.0 N·m



(g) Remove 2 coupling bolts (arrow) between rear steering knuckle assembly and rear trailing arm assembly.

Tightening torque
110 ± 11 N·m



(h) Remove the rear steering knuckle assembly.

Installation

1. Installation is in the reverse order of removal.

Caution:
- Be sure to tighten bolt to specified torque.
- Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

Rear Sub Frame Assembly

Removal

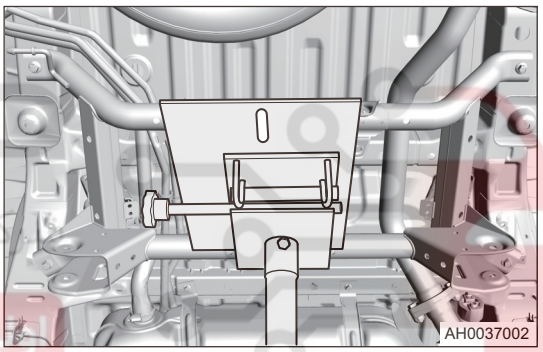
Warning/Caution/Hint

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 20-8).
2. Remove the rear brake assembly (See page 18-18).
3. Remove the rear brake disc (See page 18-18).
4. Remove rear hub bearing assembly and parking brake assembly (See page 18-18).
5. Remove the rear steering knuckle (See page 18-18).
6. Remove the rear lower control arm assembly.
7. Remove the rear connecting rod assembly.
8. Remove the rear stabilizer bar assembly.
9. Remove the rear sub frame assembly.

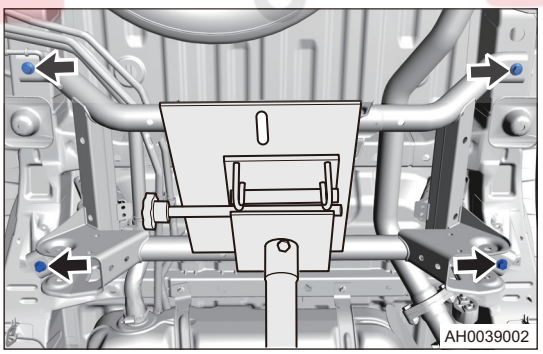
(a) Install transmission carrier and support rear shaft.



(b) Remove 4 coupling bolts (arrow) between rear sub frame assembly and body.

Tightening torque

96 ± 12 N·m



(c) Remove the rear sub frame assembly.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to tighten bolt to specified torque.
- Bounce vehicle up and down several times to stabilize rear suspension after installation.
- Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.