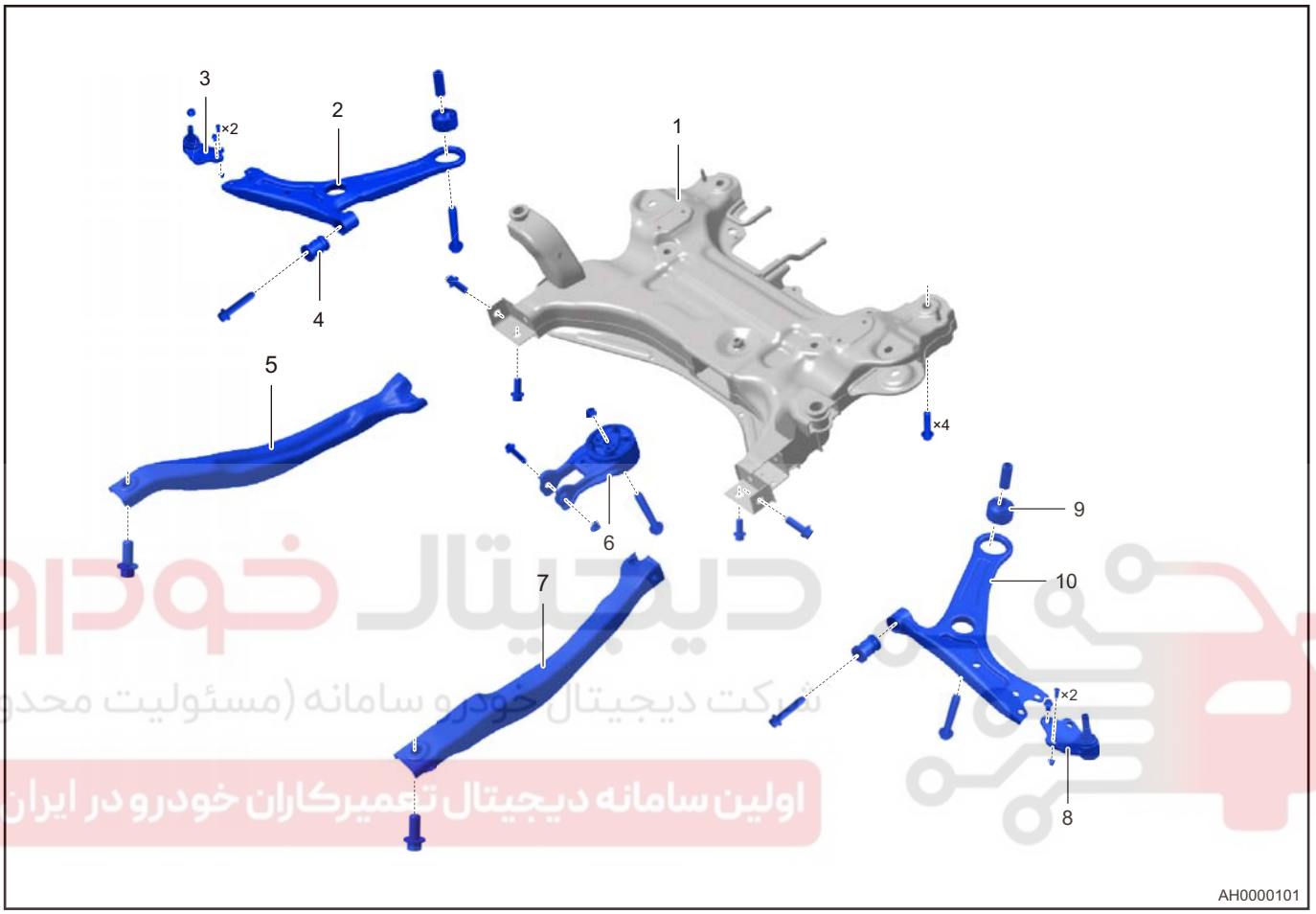
AXLE

AXLE

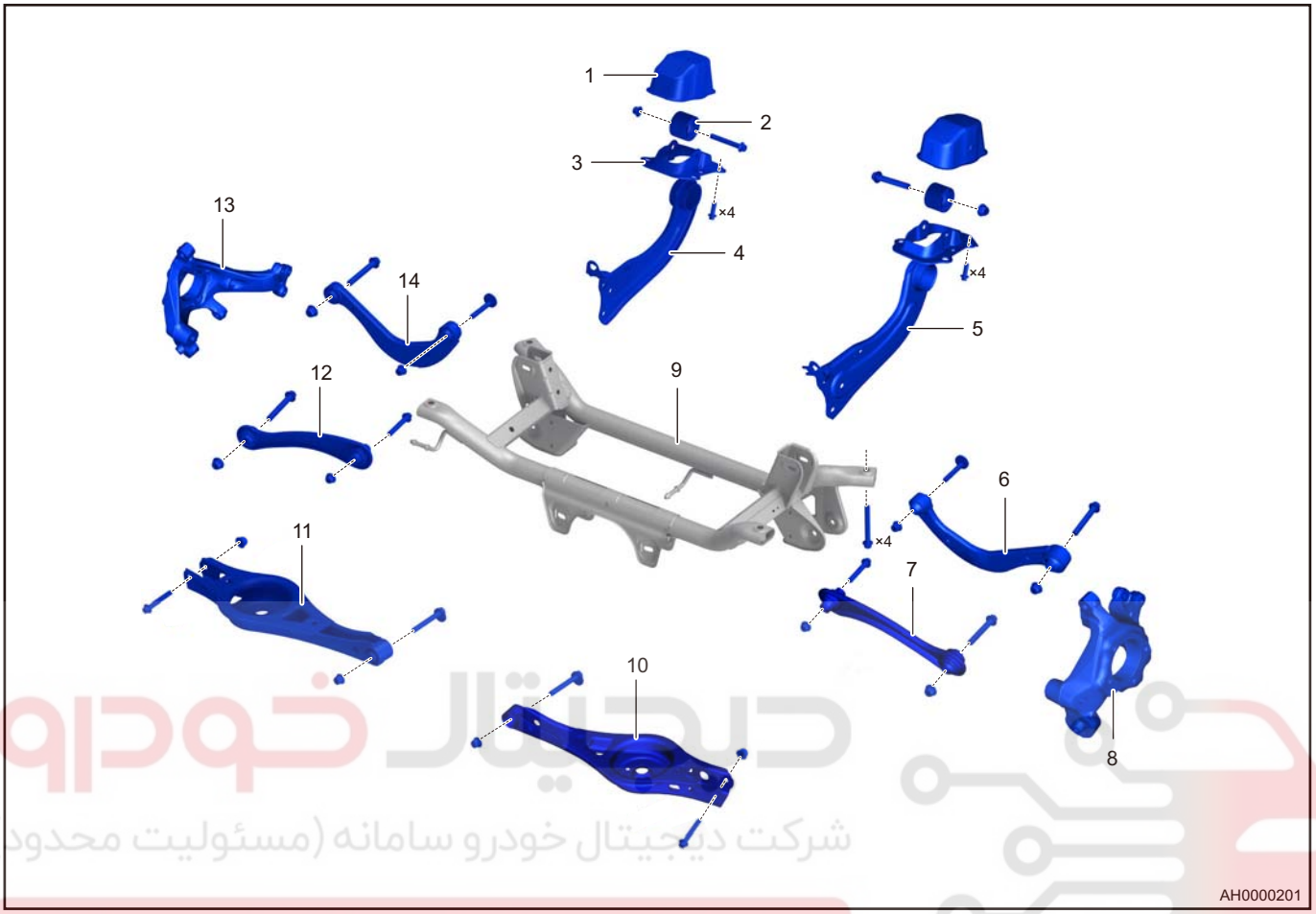
System Overview

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	Left Trailing Arm Mounting Bracket Dust Boot	2	Trailing Arm Bushing Assembly
3	Trailing Arm Bracket Assembly	4	Rear Left Trailing Arm Welding Assembly
5	Rear Right Trailing Arm Welding Assembly	6	Rear Upper Control Arm Welding Assembly
7	Right Pull Rod Body	8	Rear Right Steering Knuckle
9	Rear Sub Frame Welding Assembly	10	Right Rear Lower Control Arm Welding Assembly
11	Left Rear Lower Control Arm Welding Assembly	12	Left Pull Rod Body
13	Rear Left Steering Knuckle	14	Rear Upper Control Arm 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.

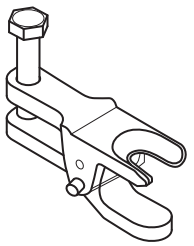
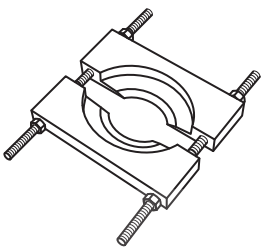
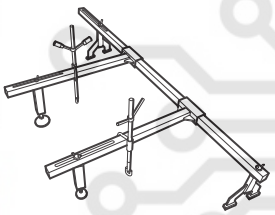
Specifications

Torque Specifications

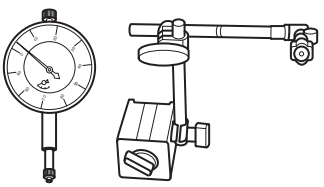
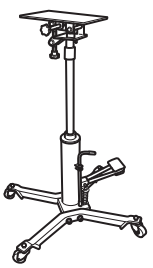
Item	Torque (N•m)
Front Drive Shaft Assembly Locking Nut	270 ± 20
Front Control Arm Assembly Ball Pin Coupling Nut	95 ± 9
Front Dust Guard Fixing Bolt	10 ± 1.0
Front Wheel Speed Sensor Coupling Bolt	10 ± 1.0
Steering Tie Rod Assembly Ball Fixing Nut	45 ± 5.0
Fixing Bolt and Nut Between Front Shock Absorber Assembly and Steering Knuckle Assembly	240 ± 24
Coupling Nut Between Front Connecting Rod Assembly and Front Stabilizer Bar Assembly	60 ± 6
Through Bolt and Nut Between Power Steering Gear and Sub Frame	110 N•m + 240°
Coupling Bolt Between Rear Sub Frame Bracket and Body	120 ± 12
Coupling Bolt Between Rear Mounting Upper Body and Transmission Lower Body	105 ± 10
Fixing Bolt Between Sub Frame and Body	140 N•m + (45 ± 2) Deg (Rear Left, Rear Right, Front Right); 140 N•m + (39 ± 2) Deg (Front Left)
Stabilizer Bar Fixing Bolt	25 ± 3
Rear Mounting Lower Body Coupling Bolt and Nut	150 ± 10
Rear Wheel Speed Sensor Fixing Bolt	10 ± 1.0
Rear Hub Bearing Fixing Bolt	120 ± 12
Coupling Bolt Between Rear Shock Absorber Assembly and Rear Steering Knuckle Assembly	160 ± 16
Coupling Bolt and Nut Between Rear Lower Control Arm Assembly and Rear Steering Knuckle Assembly	110 ± 11
Coupling Bolt and Nut Between Rear Upper Control Arm Assembly and Rear Steering Knuckle Assembly	160 ± 16
Coupling Bolt and Nut Between Pull Rod Assembly and Rear Steering Knuckle Assembly	160 ± 16
Fixing Nut Between Connecting Rod Small End and Rear Steering Knuckle Assembly	60 ± 6.0
Coupling Bolt Between Rear Sub Frame Assembly and Body	120 ± 12

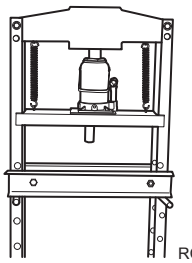
Special Tools and Equipment

Special Tools

Tool Name	Tool Drawing
Tie Rod Ball Pin Remover	 RCH0024006
Bearing Remover Special Tool	 RCH0011006
Engine Equalizer	 RCH0026006

General Tools

Tool Name	Tool Drawing
Dial Indicator and Magnetic Holder	 RCH0023006
Transmission Carrier	 RCH0005006

Tool Name	Tool Drawing
Hydraulic Press	 RCH0012006

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)

ON-VEHICLE SERVICE

Front Steering Knuckle

Removal

Hint:

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

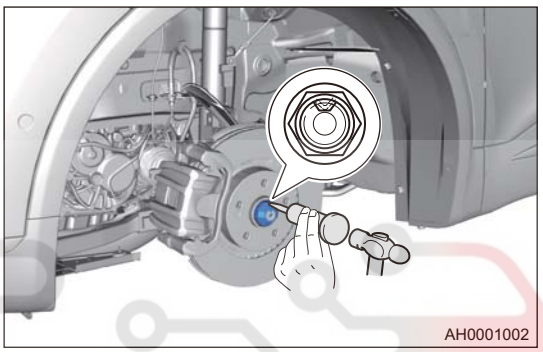
Warning:

- 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. Disconnect the negative battery cable.
3. Remove the front left wheel.
4. Using a nut punch and a hammer, loosen the staked part of nut.

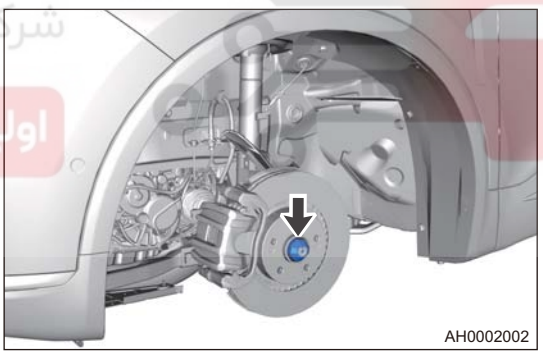
   Caution:

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


AH0001002

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

   Tightening torque: 270 ± 20 N•m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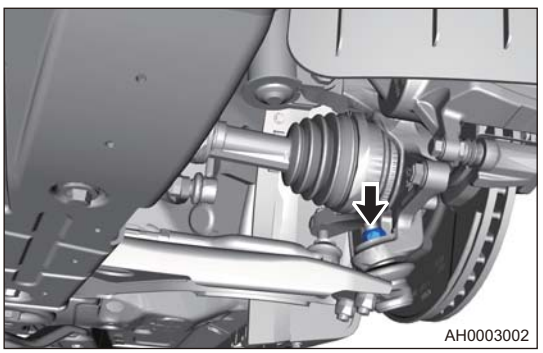
6. Remove coupling nut (arrow) between front left control arm assembly ball pin and front left steering knuckle assembly.

   Tightening torque: 95 ± 10 N•m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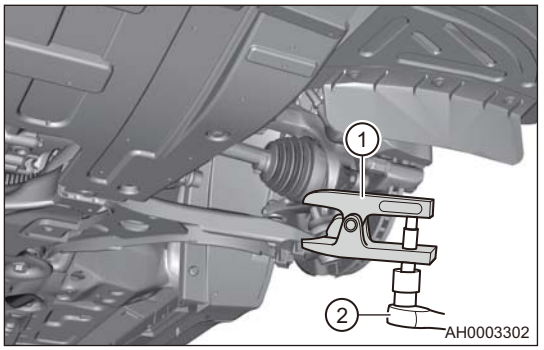
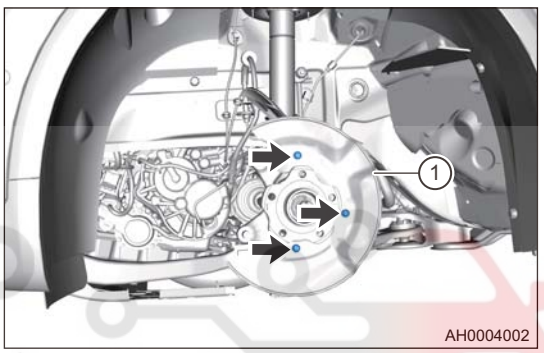
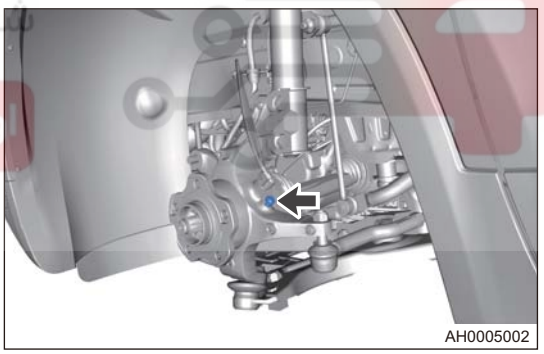
7. Install ball pin separator (1), and tighten ball pin separator bolt with a wrench (2) to separate lower control arm ball pin from steering knuckle assembly.



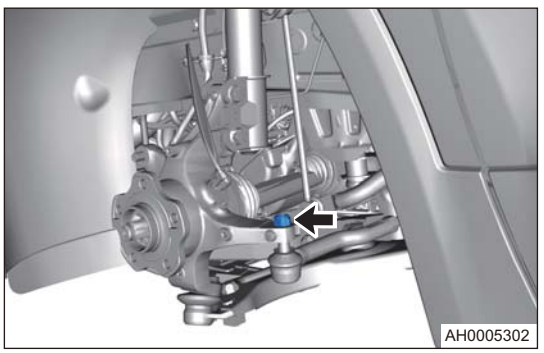
8. Remove the front left brake caliper assembly.
   Caution:
   - Place front brake caliper assembly to a proper position after removal, and be careful not to extend front brake hose excessively.
9. Remove the front left brake disc.
10. Remove 3 fixing bolts (arrow) between front left dust guard and front left steering knuckle assembly, and remove the front left dust guard (1).
    Tightening torque: 10 ± 1.0 N•m



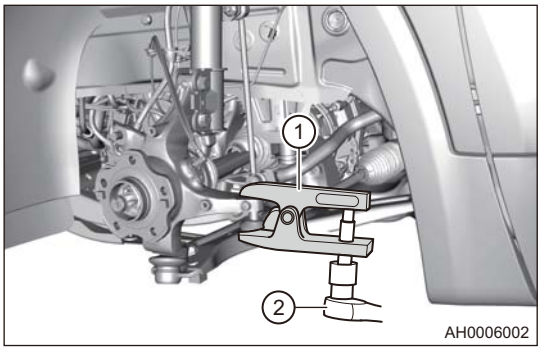
11. Remove coupling bolt (arrow) between front left wheel speed sensor and front left steering knuckle assembly, and disengage front left wheel speed sensor carefully.
    Tightening torque: 10 ± 1.0 N•m



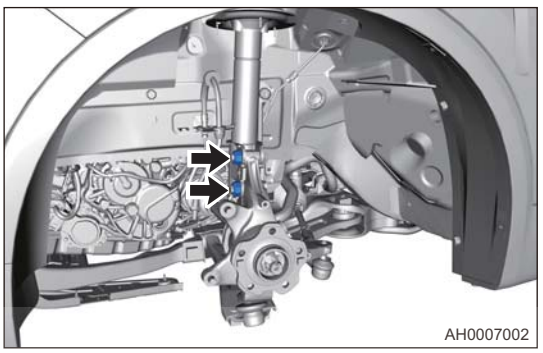
12. Remove locking nut (arrow) between left steering tie rod assembly ball and front left steering knuckle assembly.
    Tightening torque: 45 ± 5.0 N•m



13. 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.



14. 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



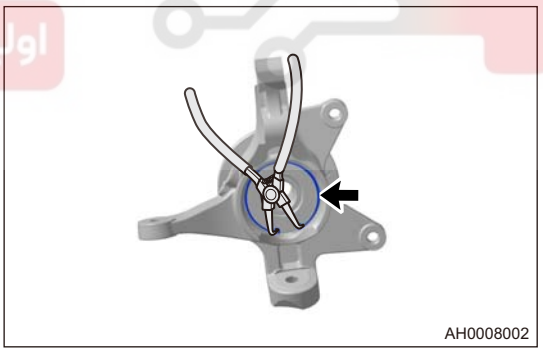
15. Disengage the left drive shaft and remove the front left steering knuckle assembly.

Disassembly

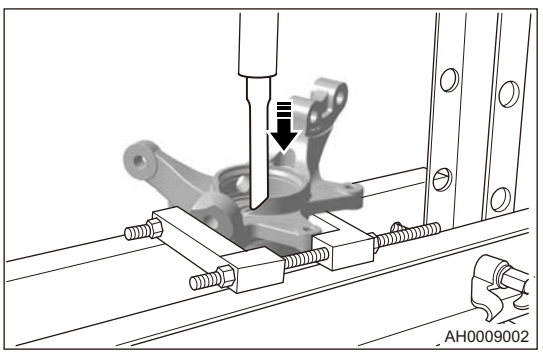
Caution:

- 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.

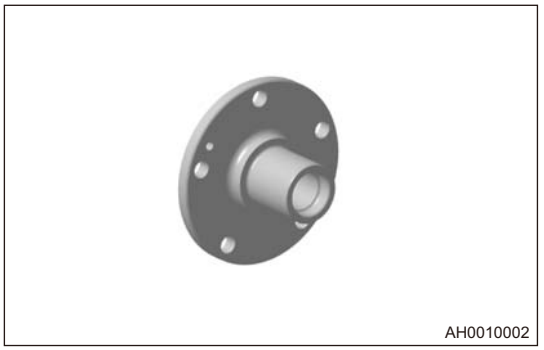
1. Remove the front hub bearing retainer (arrow) with snap spring pliers.



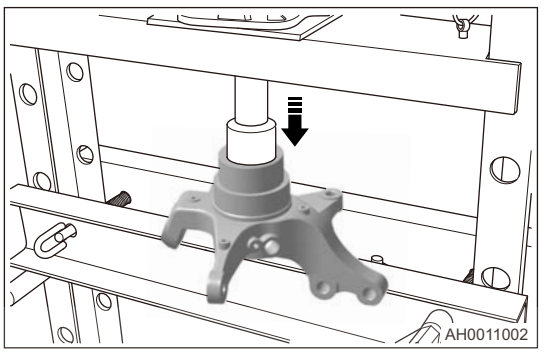
2. Place the front steering knuckle assembly on a hydraulic press, install the bearing remover and adapter, and press out the front hub with hydraulic press.



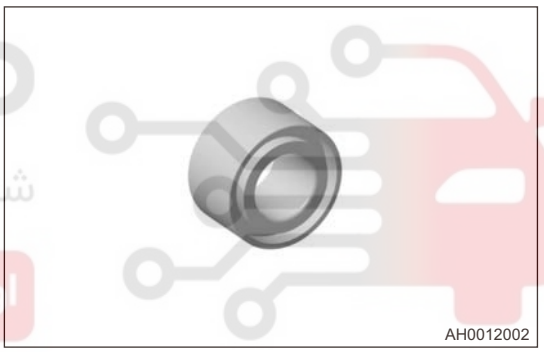
3. Remove the front hub carefully.



4. Place steering knuckle assembly on a hydraulic press, install bearing remover and adapter, and press out front hub bearing with hydraulic press.



5. Remove the front hub bearing carefully.



Inspection

1. After installing front steering knuckle assembly, front hub and front hub bearing, check front steering knuckle and dust guard.
   - Check front steering knuckle for wear, cracks, deformation or damage. Replace as necessary.
   - 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.

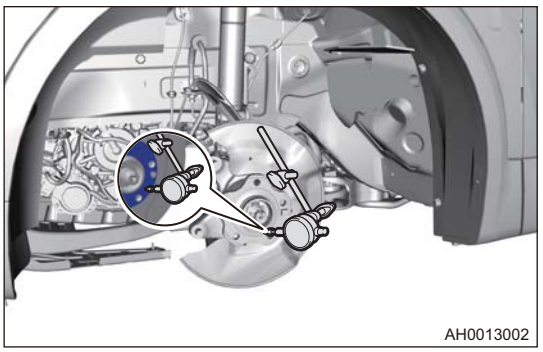
Front Hub Bearing

On-vehicle Inspection

1. Remove the front wheel.
2. Remove the front brake caliper assembly.
3. Remove the front brake disc.
4. Check the front hub bearing looseness.
5. Check looseness near center of the front hub assembly with a dial indicator.

   Caution:

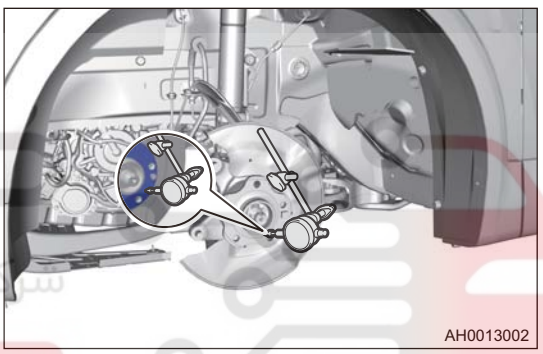
   - Ensure that dial indicator is perpendicular to measurement surface.
   - If looseness exceeds maximum value, replace the front hub bearing.



6. Check the front hub bearing runout.
7. Check runout of the front hub assembly surface with a dial indicator.

   Caution:

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



Removal

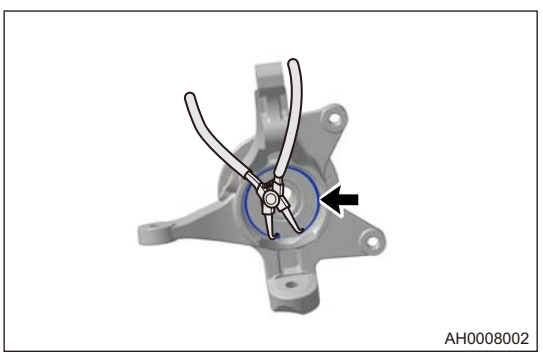
Caution:

- 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.

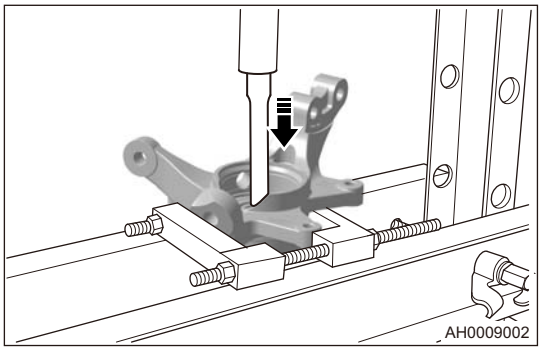
Hint:

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

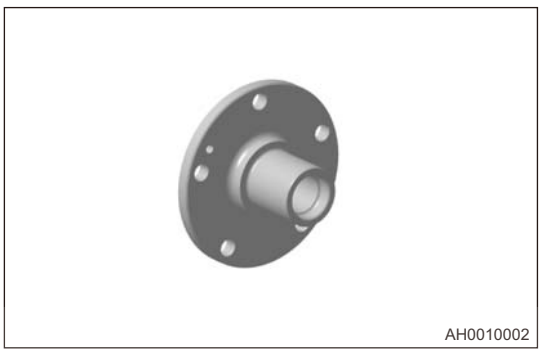
1. Remove the front left wheel.
2. Remove the drive shaft assembly locking nut.
3. Remove the front left brake caliper assembly.
4. Remove the front left brake disc.
5. Remove the front left steering knuckle assembly.
6. Remove the front hub bearing retainer (arrow) with snap spring pliers.



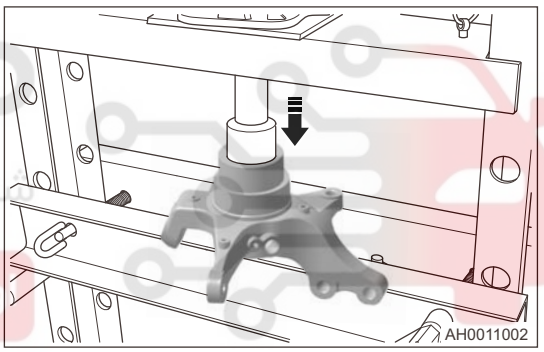
7. Place the front steering knuckle assembly on a hydraulic press, install the bearing remover and adapter, and press out the front hub with hydraulic press in direction of arrow.



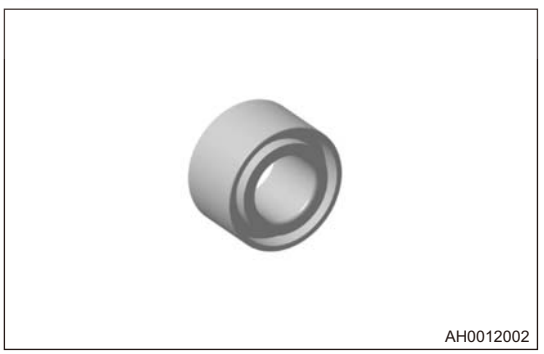
8. Remove the front hub carefully.



9. Place steering knuckle assembly on a hydraulic press, install bearing remover and adapter, and press out front hub bearing with hydraulic press in direction of arrow.



10. 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.

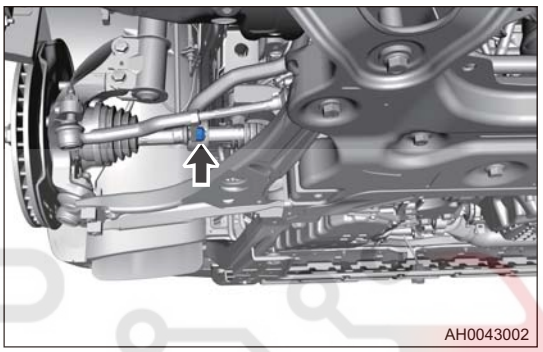
Front Sub Frame Welding Assembly

Removal

Warning:

- 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.
2. Remove the engine lower protector assembly .
3. Remove the left/right side rail welding assembly.
4. Remove the front left/right control arm assembly.
5. Using an engine equalizer, support the engine and transmission assembly securely.
6. Remove the coupling nut (arrow) between front left stabilizer bar assembly and front left connecting rod assembly. Use same removal procedure for right side.
   Tightening torque: 60 ± 6 N•m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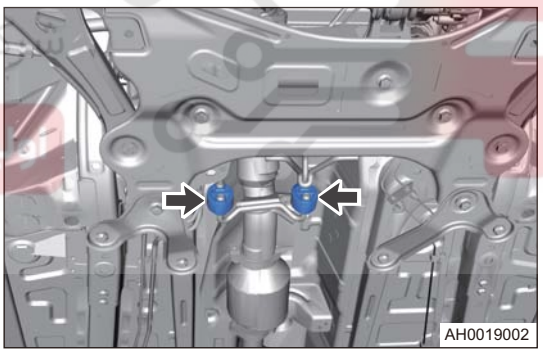
7. Detach exhaust pipe fixing rubber lugs (arrow) from front sub frame welding assembly.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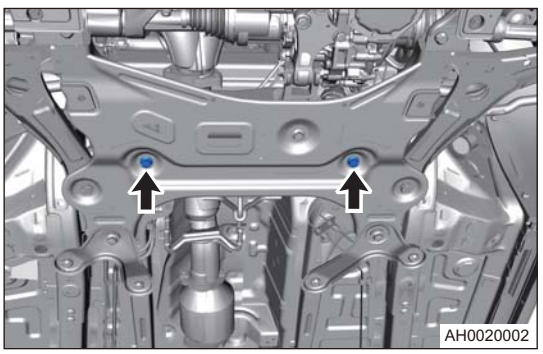
8. Remove 2 through bolts (arrow) between power steering gear with tie rod assembly and sub frame.
   Tightening torque: 110 N•m + 240°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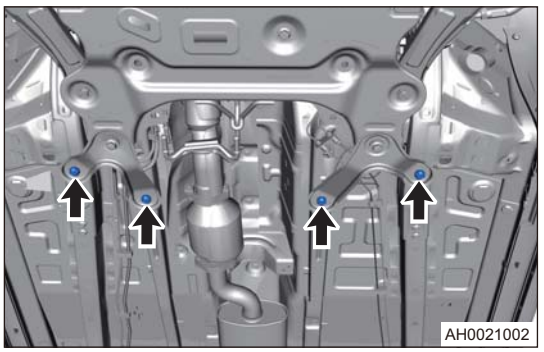
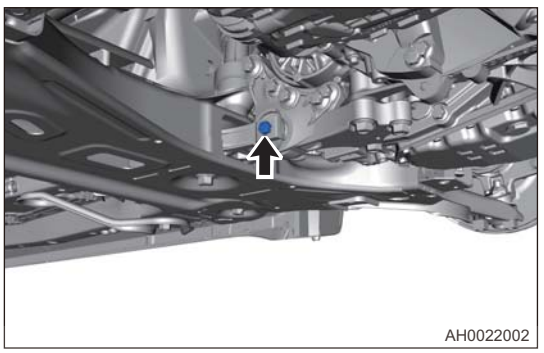
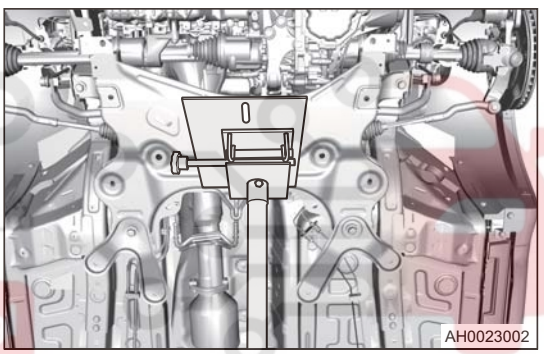
9. Remove 4 fixing bolts (arrow) between rear sub frame bracket and body.
   Tightening torque: 120 ± 12 N•m



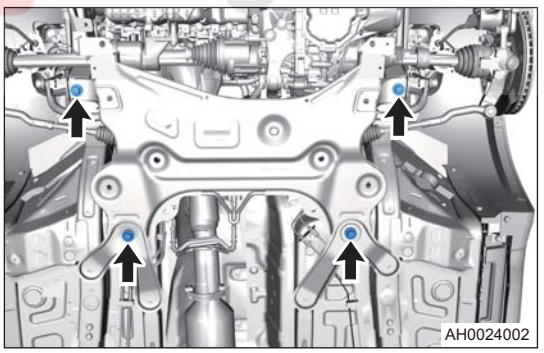
10. Remove 1 coupling bolt (arrow) between rear mounting upper body and transmission lower body.
    Tightening torque: 105 ± 10 N•m



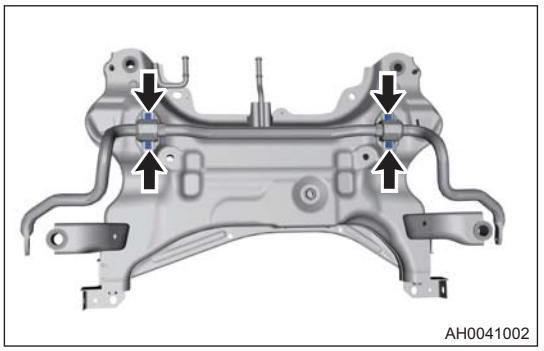
11. Using a transmission carrier, support the sub frame welding assembly.



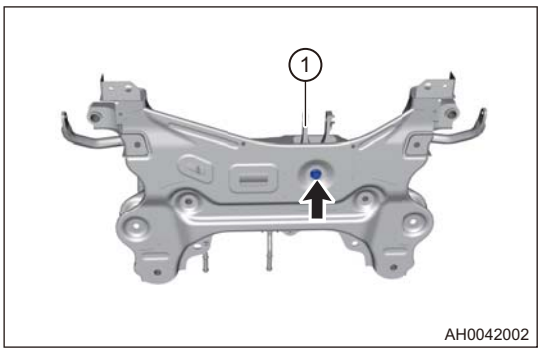
12. Remove 4 fixing bolts (arrow) between sub frame and body.
    Tightening torque: 140 N•m + (45 ± 2) Deg (Rear Left, Rear Right, Front Right); 140 N•m + (39 ± 2) Deg (Front Left)



13. Slowly lower the sub frame welding assembly with stabilizer bar.
14. Remove 4 fixing bolts (arrow) of stabilizer bar on sub frame, and remove front stabilizer bar assembly.
    Tightening torque: 25 ± 3 N•m



15. Remove the coupling bolt, nut (arrow) and rear mounting lower body (1).
    Tightening torque: 150 ± 10 N•m



16. Remove the front sub frame welding assembly.

Installation

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.

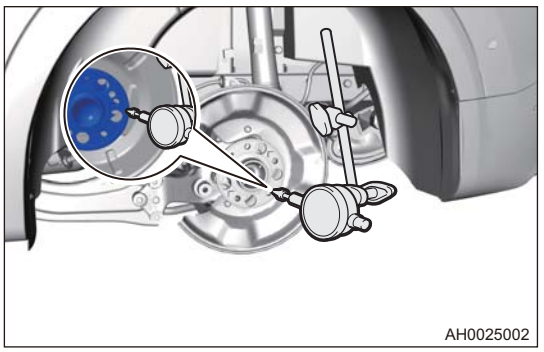
Rear Hub Bearing Assembly

On-vehicle Inspection

1. Remove the rear wheel.
2. Remove the rear brake caliper assembly.
3. Remove the rear brake disc.
4. Check the rear hub bearing looseness.
5. Check looseness near center of the rear hub bearing with a dial indicator.

   Caution:

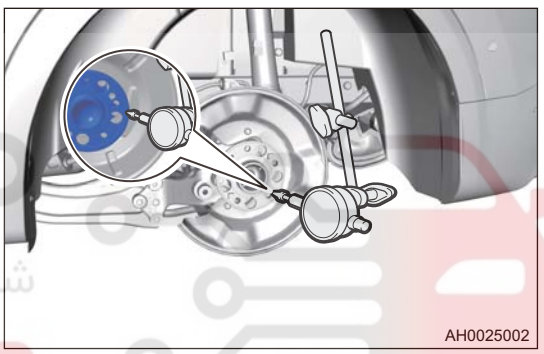
   - Ensure that dial indicator is perpendicular to measurement surface.
   - If looseness exceeds maximum value, replace the rear hub bearing assembly.


AH0025002

6. Check the rear hub bearing runout.
7. Check runout of the rear hub bearing assembly surface 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.


AH0025002

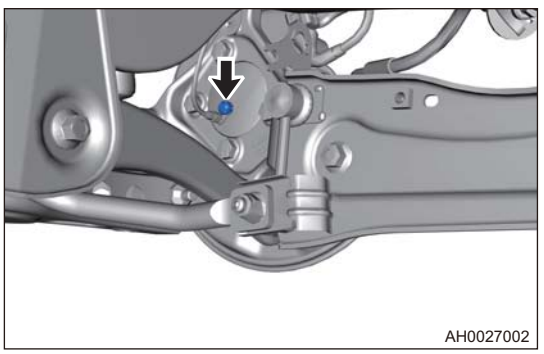
Removal

Hint:

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

1. Remove the rear left wheel.
2. Remove the rear left brake caliper assembly.
3. Remove the rear left brake disc.
4. Remove 1 fixing bolt (arrow) from rear left wheel speed sensor, and remove wheel speed sensor.

   Tightening torque: 10 ± 1.0 N•m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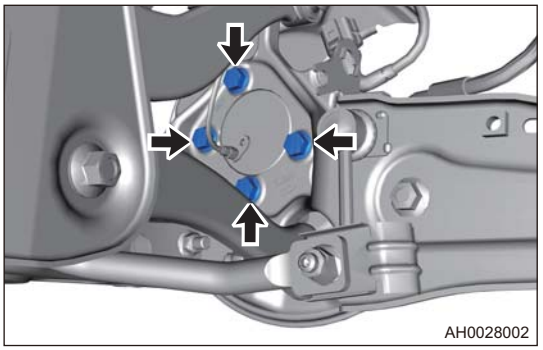
5. Remove 4 fixing bolts (arrow) from rear left hub bearing.
   Tightening torque: 120 ± 12 N•m



6. Replace 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

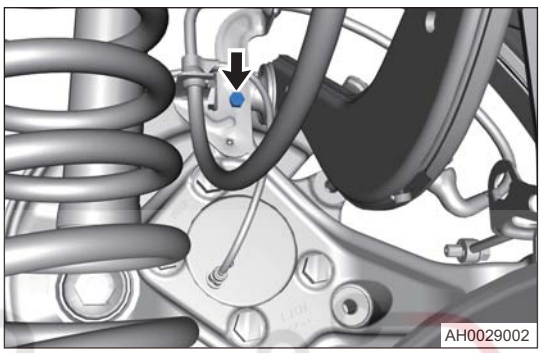
Hint:

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

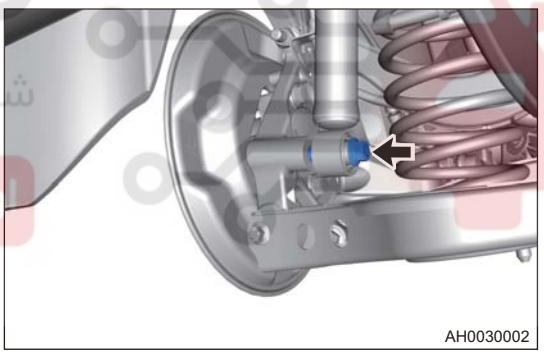
Warning:

- 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.

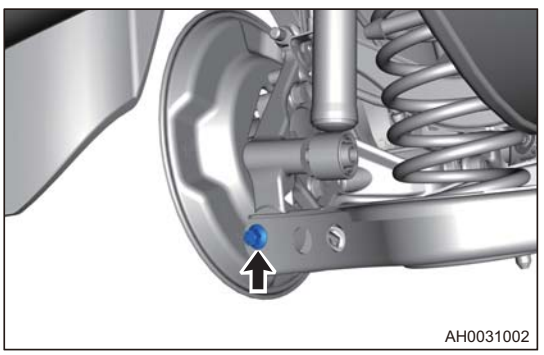
1. Remove the rear wheel.
2. Remove the rear brake caliper assembly.
3. Remove the rear brake disc.
4. Remove 1 coupling bolt (arrow) between EPB wire harness fixing bracket and rear steering knuckle assembly.
   Tightening torque: 15 ± 5 N•m



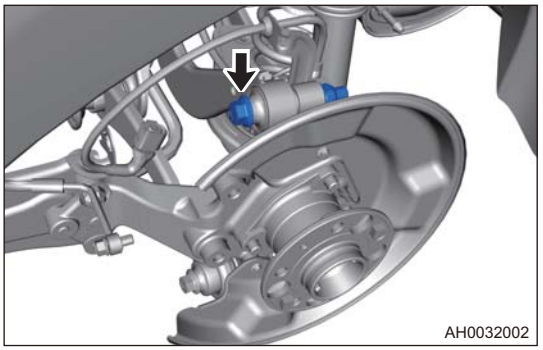
5. Remove coupling bolt (arrow) between rear shock absorber assembly and rear steering knuckle assembly.
   Tightening torque: 160 ± 16 N•m



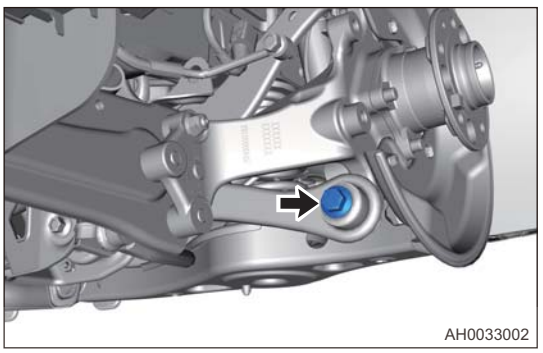
6. Remove the coupling bolt and nut (arrow) between rear lower control arm assembly and rear steering knuckle assembly.
   Tightening torque: 110 ± 11 N•m



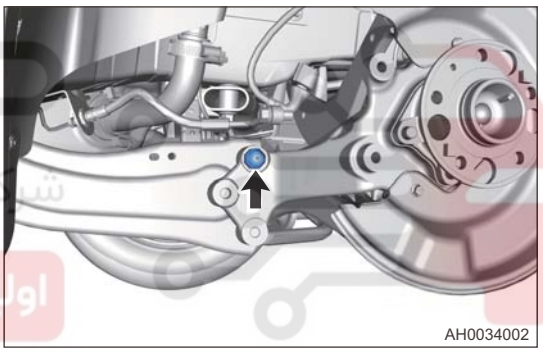
7. Remove the coupling bolt and nut (arrow) between rear upper control arm assembly and rear steering knuckle assembly.
   Tightening torque: 160 ± 16 N•m



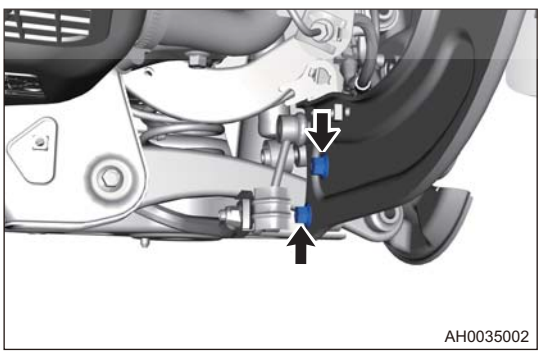
8. Remove the coupling bolt and nut (arrow) between pull rod assembly and rear steering knuckle assembly.
   Tightening torque: 160 ± 16 N•m



9. Remove the fixing nut (arrow) between rear connecting rod small end and rear steering knuckle assembly.
   Tightening torque: 60 ± 6.0 N•m



10. Remove 2 coupling bolts (arrow) between rear steering knuckle assembly and rear trailing arm assembly.
    Tightening torque: 110 ± 11 N•m



11. Remove the rear left 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.

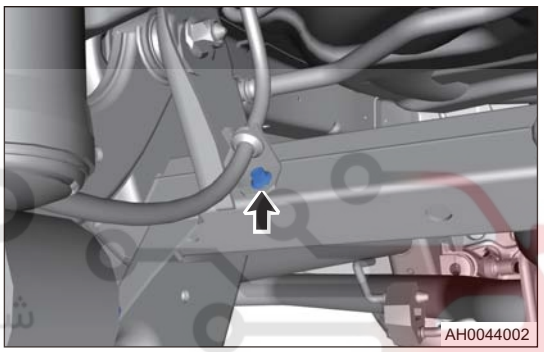
Rear Sub Frame Assembly

Removal

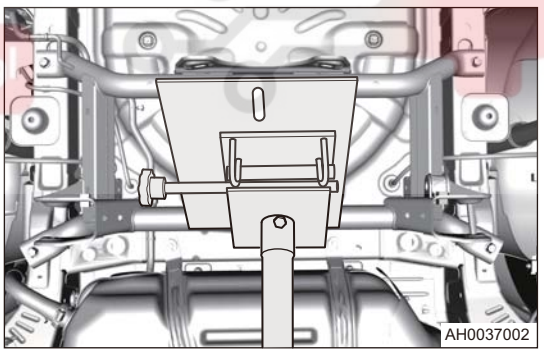
Warning:

- 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.

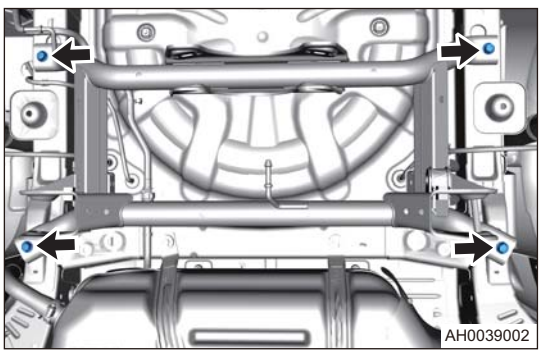
1. Remove the rear wheel.
2. Remove the rear brake caliper assembly.
3. Remove the rear brake disc.
4. Remove the rear hub shaft assembly.
5. Remove the rear steering knuckle.
6. Remove the rear lower control arm assembly.
7. Remove the pull rod assembly.
8. Remove the rear stabilizer bar assembly.
9. Remove the muffler assembly.
10. Remove 1 coupling bolt (arrow) between EPB wire harness fixing bracket and rear sub frame assembly. Use same removal procedure for right side.
    Tightening torque: 15 ± 5 N•m



11. Install the transmission carrier to support rear sub frame assembly.



12. Remove 4 coupling bolts (arrow) between rear sub frame assembly and body.
    Tightening torque: 120 ± 12 N•m



13. Slowly lower the transmission carrier, and 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.