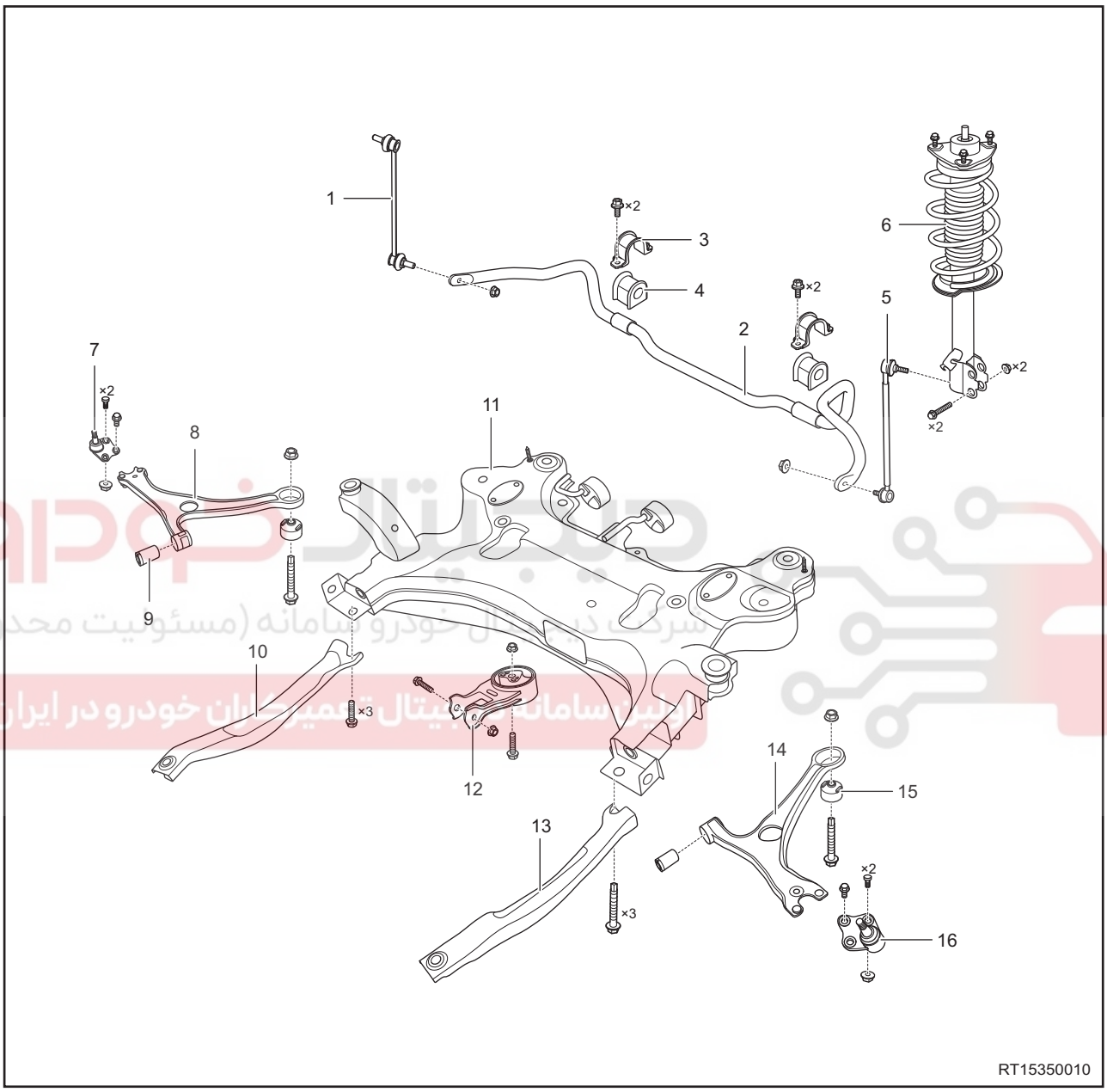
SUSPENSION

GENERAL INFORMATION

Description

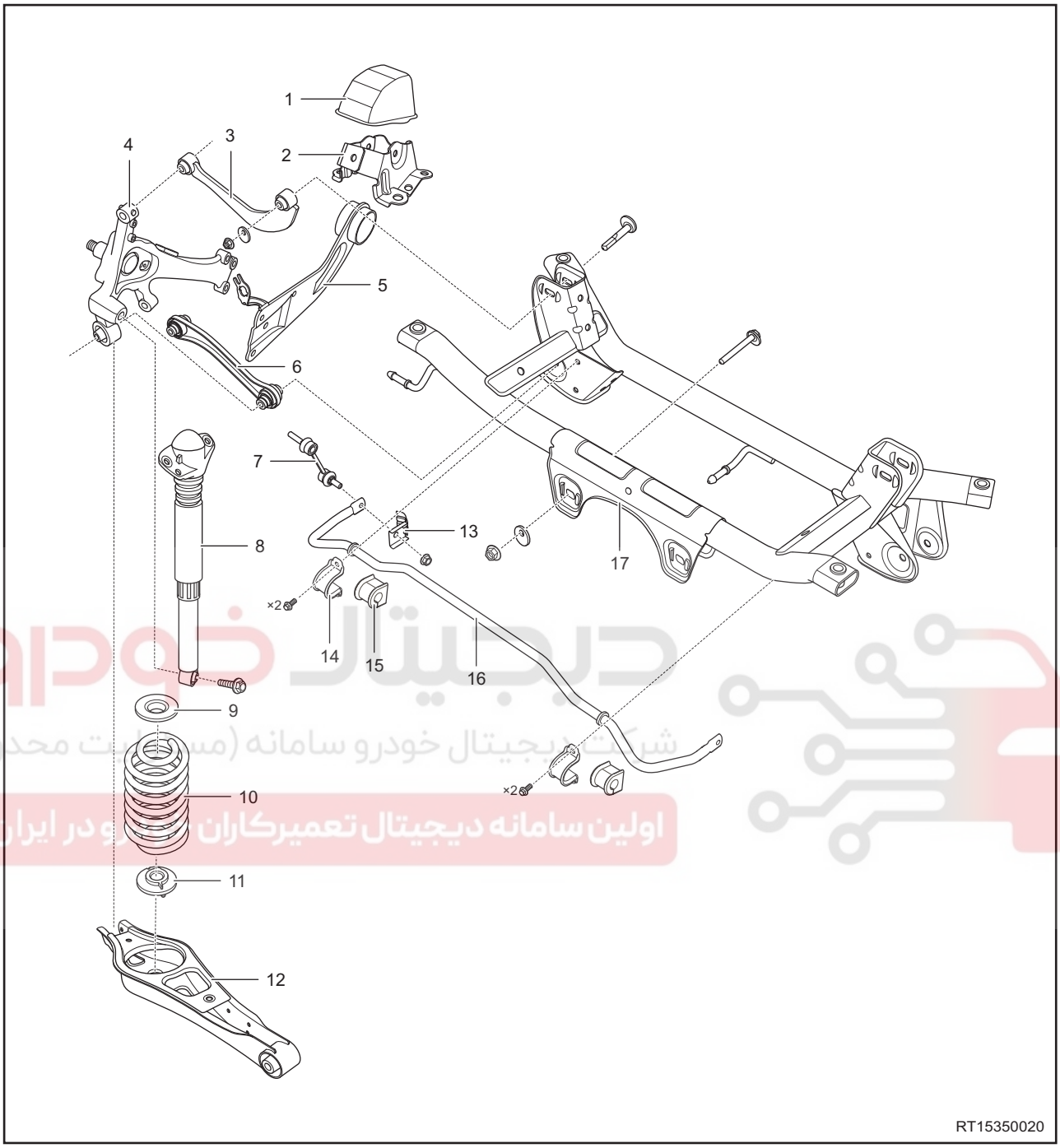
Front Suspension



1 - Front Right Stabilizer Bar Link	2 - Front Stabilizer Bar Assembly
3 - Front Stabilizer Bar Clamp	4 - Front Stabilizer Bar Rubber Boot
5 - Front Left Stabilizer Bar Link	6 - Front Shock Absorber Assembly
7 - Front Right Control Arm Ball Pin Assembly	8 - Front Right Control Arm Assembly
9 - Front Rubber Bushing Assembly	10 - Right Side Rail Welding Assembly
11 - Front Sub Frame Assembly	12 - Rear Mounting Lower Body
13 - Left Side Rail Welding Assembly	14 - Front Left Control Arm Assembly
15 - Front Left Control Arm Rear Rubber Bushing Assembly	16 - Front Left Control Arm Ball Pin Assembly

Front suspension of this model uses Macpherson independent suspension (height is non-adjustable), which is equipped with cylindrical coil spring, double action telescopic shock absorber and lateral stabilizer. Front suspension has driving and steering functions. Upper end of suspension connects with body, and lower end with front steering knuckle. Sub frame is fitted with the body by bolts, thus improving driving stability and safety.

Rear Suspension



1 - Bracket	2 - Rear Left Brake Caliper Assembly
3 - Rear Upper Control Arm Assembly	4 - Rear Right Steering Knuckle
5 - Trailing Arm	6 - Right Connecting Rod Assembly
7 - Rear Stabilizer Link Assembly	8 - Rear Shock Absorber Assembly
9 - Rear Coil Spring Upper Cushion	10 - Rear Coil Spring
11 - Rear Coil Spring Lower Cushion	12 - Rear Lower Control Arm Assembly
13 - Rear Stabilizer Link Protector	14 - Rear Stabilizer Bar Clamp
15 - Rear Stabilizer Bar Rubber Boot	16 - Rear Stabilizer Bar Assembly
17 - Rear Sub Frame Welding Assembly	

Rear suspension of this model uses multi-link independent suspension (height is non-adjustable), which is equipped with cylindrical coil spring, double action telescopic shock absorber and lateral stabilizer. This suspension features easy-removal and quick-installation, and driving stability and ride comfort have greatly improved.

Specifications

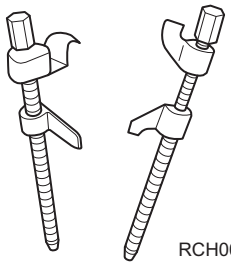
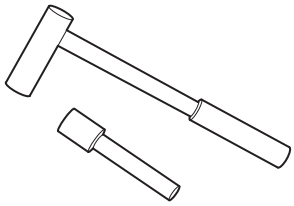
Torque Specifications

Description	Torque (N·m)
Coupling Nut Between Front Stabilizer Link Assembly and Front Shock Absorber Assembly	60 ± 5
Coupling Bolt Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	240 ± 24
Coupling Nut Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	240 ± 24
Coupling Nut Between Front Shock Absorber Assembly and Body	60 ± 6
Coupling Nut Between Front Control Arm Assembly Ball Pin and Front Steering Knuckle Assembly	120 ± 12
Coupling Bolt Between Front Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly	135 ± 10
Coupling Nut Between Front Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly	180 ± 18
Coupling Bolt Between Rear Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly	180 ± 18
Coupling Nut and Bolt Between Front Control Arm Ball Pin Assembly and Front Control Arm Assembly	150 ± 10
Coupling Nut Between Front Stabilizer Bar Assembly and Front Stabilizer Link Assembly	60 ± 6
Coupling Bolt Between Front Sub Frame Welding Assembly and Steering Gear Assembly	180 ± 18
Coupling Bolt Between Front Part of Front Sub Frame Welding Assembly and Body	180 ± 18

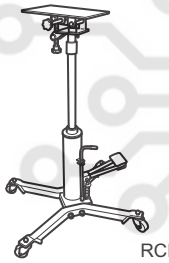
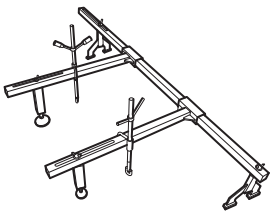
Description	Torque (N·m)
Coupling Bolt Between Front Sub Frame Welding Assembly and Body	180 ± 18
Coupling Bolt Between Rear Part of Front Sub Frame Bracket and Body	120 ± 12
Coupling Bolt Between Rear Shock Absorber Assembly and Body	60 ± 6
Coupling Bolt Between Rear Shock Absorber Assembly and Rear Steering Knuckle Assembly	160 ± 16
Coupling Nut Between Rear Stabilizer Link and Rear Steering Knuckle	60 ± 6
Coupling Nut Between Rear Stabilizer Link and Rear Sub Frame	25 ± 4
Coupling Bolt Between Rear Trailing Arm and Mounting Bracket	120 ± 12
Coupling Bolt Between Rear Trailing Arm and Steering Knuckle	110 ± 11
Coupling Nut Between Upper Control Arm and Rear Steering Knuckle	160 ± 16
Coupling Nut Between Upper Control Arm and Rear Sub Frame	110 ± 11
Coupling Nut Between Lower Control Arm and Rear Sub Frame	110 ± 11
Coupling Nut Between Connecting Rod Assembly and Rear Sub Frame	110 ± 11
Coupling Bolt Between Connecting Rod Assembly and Rear Steering Knuckle	160 ± 16
Coupling Bolt Between Rear Trailing Arm Bracket and Body Side Rail	60 ± 6
Coupling Bolt Between Brake Hose Assembly and Brake Pipe	18 ± 2
Coupling Bolt Between Brake Rear Cable Assembly Fixing Bracket and Rear Trailing Arm Assembly	23 ± 2
Coupling Bolt Between Rear Sub Frame and Body	120 ± 12

Tools

Special Tools

Spring Compressor	 RCH0000021
Shock Absorber Nut Remover	 RCH0000022

General Tools

Transmission Carrier	 RCH0000005
Engine Equalizer	 RCH0000026

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.

Front Suspension

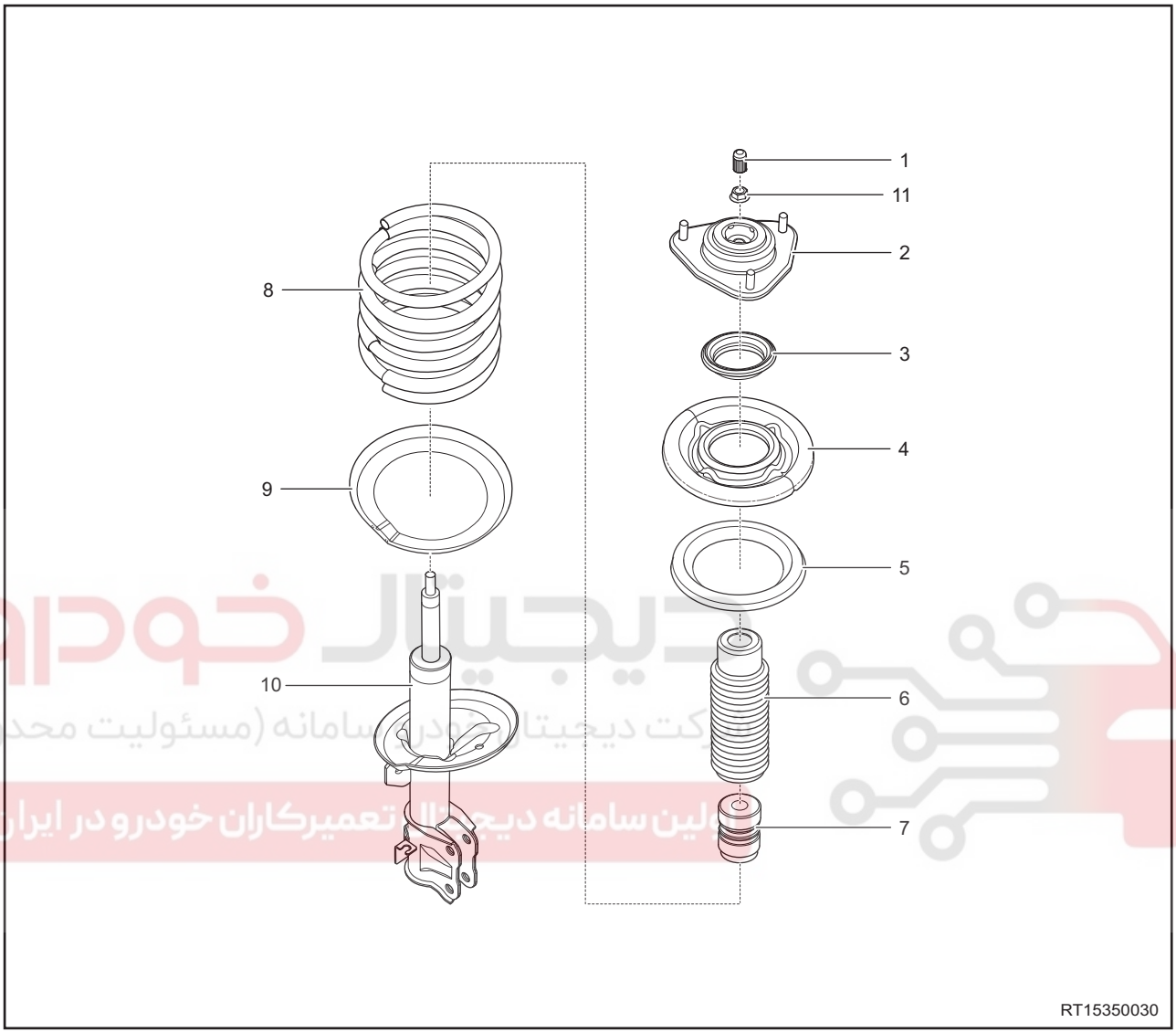
Symptom	Suspected Area	See page
Vehicle pulls	Front tire (worn or improperly inflated)	37-8
	Front wheel alignment (incorrect)	36-47
	Control arm ball pin assembly (loose)	36-21
	Steering tie rod (loose or worn)	42-20
	Front hub bearing (excessively worn)	35-14
	Front suspension components (excessively worn or deformed)	36-11
Droop	Vehicle (overloaded)	-
	Front coil spring (too soft)	36-14
	Front shock absorber assembly (worn or damaged)	36-11
	Front suspension components (excessively worn or deformed)	36-11
Sways/pitches	Front tire (worn or improperly inflated)	37-8
	Front stabilizer bar assembly (bent or broken)	36-23
	Front shock absorber assembly (worn or damaged)	36-11
Wheel shimmy	Front tire (worn or improperly inflated)	37-8
	Front wheel (out of balance)	37-10
	Front shock absorber assembly (worn or damaged)	36-11
	Front wheel alignment (incorrect)	36-47
	Control arm ball pin assembly (loose)	36-21
	Front hub bearing (excessively worn)	35-14
	Steering gear (misaligned or damaged)	42-22
Droop	Front tire (improperly inflated)	37-8
	Front wheel alignment (incorrect)	36-47
	Front shock absorber assembly (worn or deformed)	36-11
	Front suspension components (worn or deformed)	36-11

Rear Suspension

Symptom	Suspected Area	See page
Vehicle pulls	Rear tire (worn or improperly inflated)	37-8
	Rear wheel alignment (incorrect)	36-47
	Rear hub bearing (excessively worn)	35-19
	Rear suspension components (worn or deformed)	36-28
Droop	Vehicle (overloaded)	-
	Rear coil spring (too soft)	36-33
	Rear shock absorber assembly (worn or damaged)	36-11
	Rear suspension components (excessively worn or deformed)	36-28
Sways/pitches	Rear tire (worn or improperly inflated)	37-8
	Rear stabilizer bar assembly (bent or broken)	36-43
	Rear shock absorber assembly (worn or deformed)	36-11
Wheel shimmy	Rear tire (worn or improperly inflated)	37-8
	Rear wheel (out of balance)	37-10
	Rear shock absorber assembly (worn or damaged)	36-11
	Rear wheel alignment (incorrect)	36-47
	Rear hub bearing (worn)	35-19
Droop	Rear tire (improperly inflated)	37-8
	Rear wheel alignment (incorrect)	36-47
	Rear shock absorber assembly (damaged or deformed)	36-28
	Rear suspension components (worn or deformed)	36-28

ON-VEHICLE SERVICE

Front Shock Absorber Assembly



1 - Front Shock Absorber Cover Cap	2 - Front Strut Upper Connecting Plate Assembly (w/ Insulator)
3 - Bearing Assembly	4 - Front Spring Upper Tray
5 - Front Spring Upper Cushion	6 - Dust Boot
7 - Buffer Block	8 - Spring
9 - Front Spring Lower Cushion	10 - Shock Absorber

On-vehicle Inspection

1. Check the front shock absorber assembly.
   a. Park vehicle on level ground, and bounce vehicle up and down, then check if vehicle shakes up and down when body bounds. If vehicle shakes up and down consecutively, shock absorber assembly may be damaged and should be replaced.
2. Check front shock absorber assembly for leakage.
   a. As shock absorber assembly operates frequently while driving vehicle, shock absorber fluid temperature rises and oil gas is formed and adheres to dust boot. This is a normal phenomenon, and it is not necessary to replace shock absorber assembly.
   b. Shock absorber is designed with a thin layer of oil film on surface of piston rod. While shock absorber is being compressed, oil film will be scraped off by dust plate on shock absorber oil seal and a small amount of oil will deposit on upper part of oil seal. Due to high oil permeability, oil deposited on upper part of oil seal spreads slowly from upper part of shock absorber to lower part of shock absorber, thus forming a thin coat of oil film.

      When any of following conditions occur:
      - Oil film is between dust boot and spring seat.
      - Oil traces in circumferential direction are even.

      For above conditions, oil traces are formed through volatilization, so we can judge it as minor leaks. This is a normal phenomenon, and it is not necessary to replace shock absorber assembly.
   c. If following conditions occur:
      - Oil traces in circumferential direction are uneven;
      - Oil traces reach lower connecting positions.

      Above conditions indicate that there may be leakage in shock absorber assembly, and it is necessary to replace shock absorber assembly.
   d. If it is difficult to accurately judge shock absorber assembly for leakage from appearance. Perform road test after wiping off oil on surface of malfunctioning shock absorber. Under normal road conditions, drive vehicle for 5 to 10 minutes and perform inspection. If there are oil traces on shock absorber assembly surface, it indicates that oil leakage exists, and it is necessary to replace shock absorber assembly.

Removal

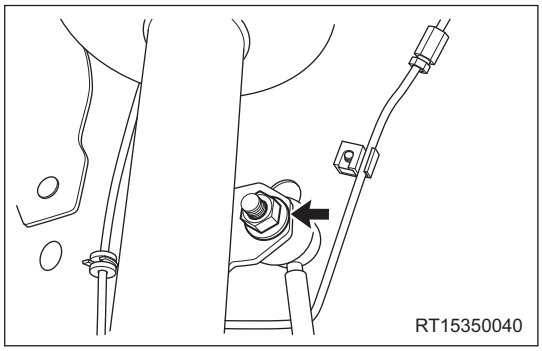
⚠ WARNING

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts and guide parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.
- Operate carefully when removing and installing coil spring, to prevent spring from jumping out and causing personal injury.

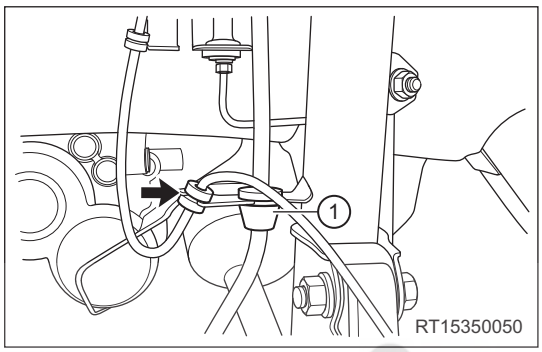
HINT:

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

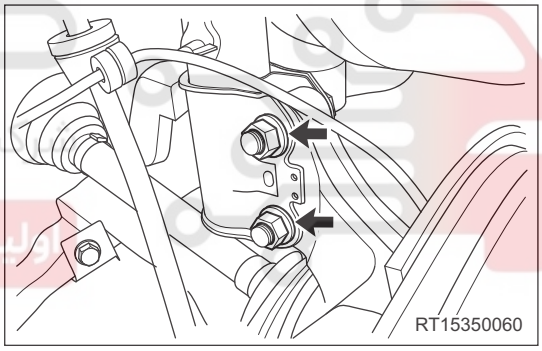
1. Remove the front left wheel (See page 37-7).
2. Remove the front left shock absorber assembly.
   a. Remove coupling nut (arrow) between front left stabilizer link assembly and front left shock absorber assembly.
      (Tightening torque: 60 ± 5 N·m)



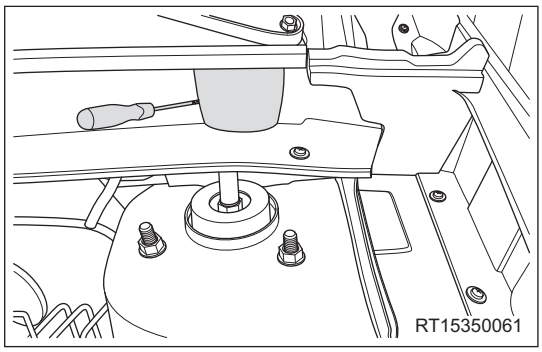
   b. Disengage front left wheel speed sensor wire harness (arrow) and front left brake hose assembly (1) from front left shock absorber assembly.



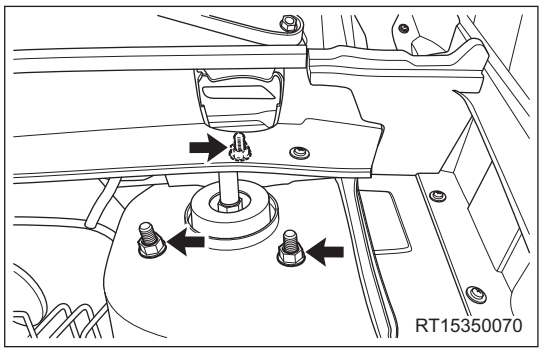
   c. Remove 2 coupling bolts and nuts (arrow) between front left shock absorber assembly and front left steering knuckle assembly.
      (Tightening torque: 240 ± 24 N·m)



   d. Remove the front windshield trim board.



e. Remove 3 coupling nuts between front left shock absorber assembly and body.
(Tightening torque: 60 ± 6 N·m)



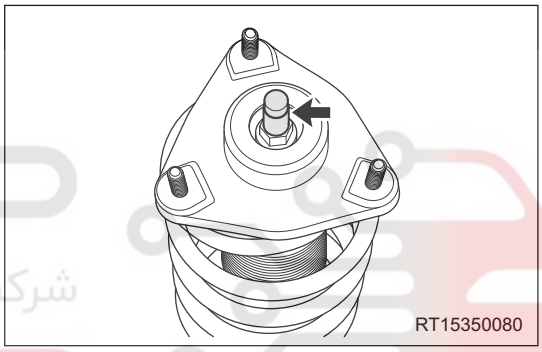
f. Remove the front left shock absorber assembly with front coil spring.

Disassembly

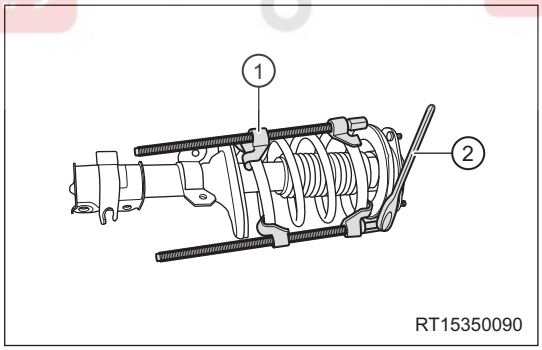
HINT:

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

1. Remove the front shock absorber cover cap.
   a. Remove the front shock absorber cover cap (arrow) from front left shock absorber assembly.



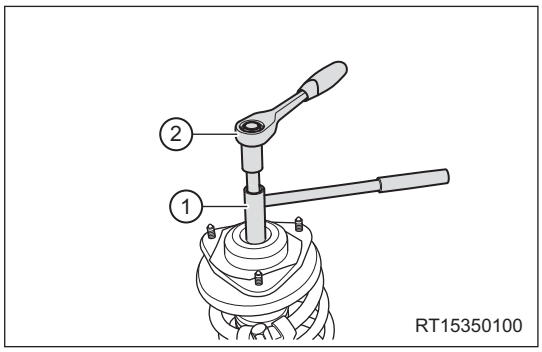
2. Remove the locking nut from front shock absorber assembly.
   a. Using spring compressor (1) and wrench (2), tighten end lever of spring compressor to compress front coil spring.



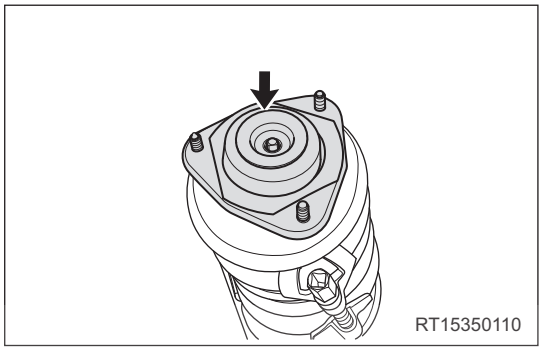
⚠ WARNING

- When removing front coil spring, compress spring until locking nut can be rotated. DO NOT compress spring more than necessary, avoid damaging spring and personal injury.

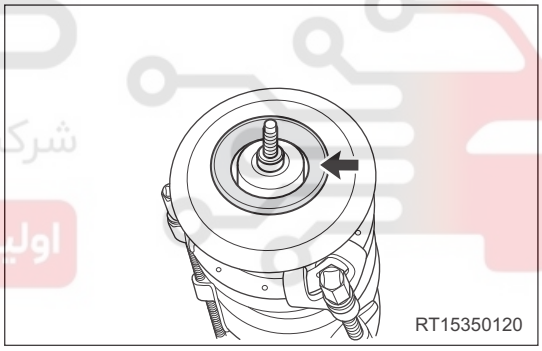
b. Hold end of front left shock absorber assembly lever with a shock absorber nut remover (1), and then remove locking nut from front left shock absorber assembly with a wrench (2).
(Tightening torque: 60 ± 6 N·m)



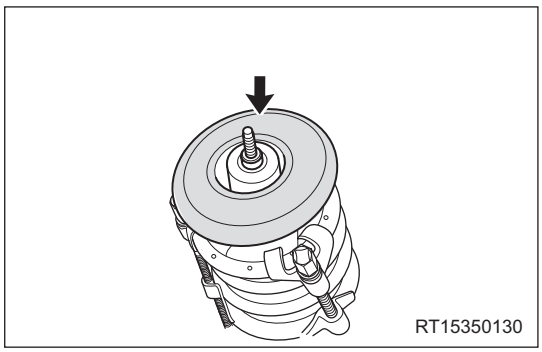
3. Remove front strut upper connecting plate assembly (w/insulator).
   a. Remove front strut upper connecting plate assembly (w/insulator) (arrow) from upper part of front left shock absorber assembly.



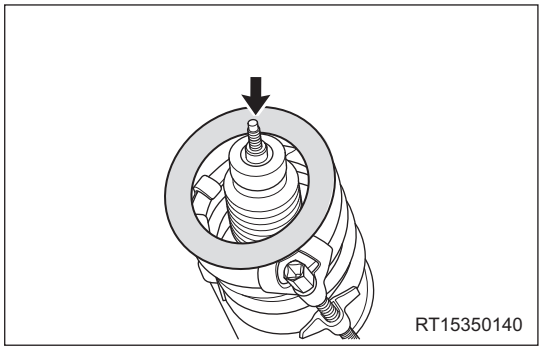
4. Remove the bearing assembly.
   a. Remove bearing assembly (arrow) from upper part of front left shock absorber assembly.



5. Remove the front spring upper tray.
   a. Remove front spring upper tray (arrow) from upper part of front left shock absorber assembly.



6. Remove the front spring upper cushion.
   a. Remove front spring upper cushion (arrow) from upper part of front left shock absorber assembly.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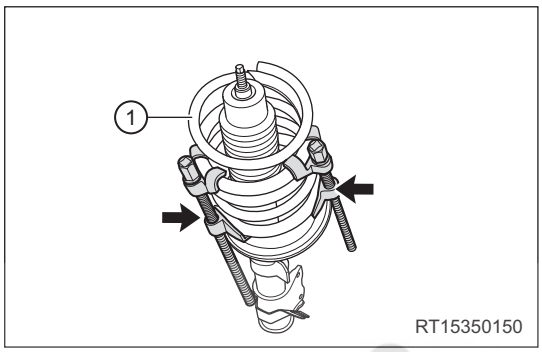
7. Remove the front coil spring.
   a. Remove front coil spring (1) with spring compressor (arrow) from front left shock absorber assembly.



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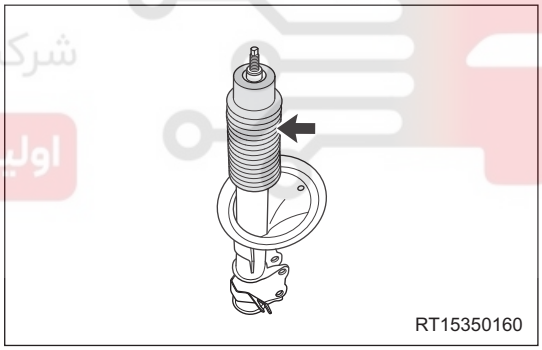
   b. Slowly loosen spring compressor, and carefully remove front coil spring.
8. Remove the front dust boot.
   a. Remove front dust boot (arrow) from upper part of front left shock absorber assembly.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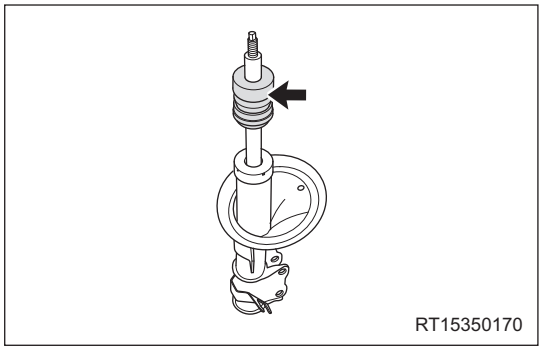
9. Remove the front buffer block.
   a. Detach front buffer block (arrow) from front left shock absorber assembly, and remove it.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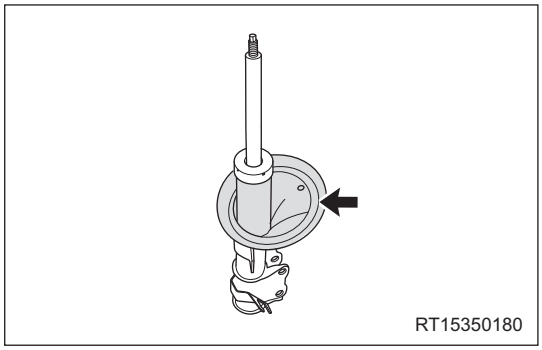
10.Remove the front spring lower cushion.

a. Remove front spring lower cushion (arrow) from lower end of front left shock absorber assembly strut.



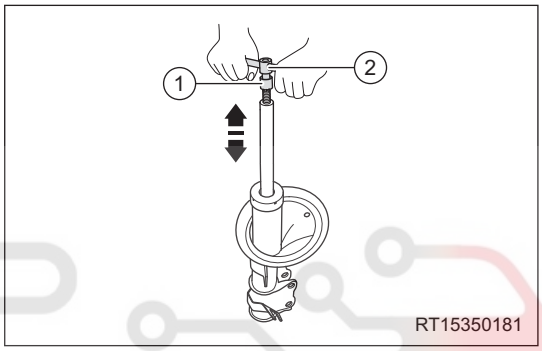
Inspection

1. Check the front shock absorber assembly.

   Manual check:

   a. Install locking nut (1) to upper end of front shock absorber assembly strut, and then install T-wrench (2) or equivalent.

   b. Compress and extend front shock absorber assembly strut several times by hands in direction of arrow as shown in illustration. Check that there is no abnormal resistance or unusual sound during operation. If there is any abnormality, replace front shock absorber assembly with a new one.



2. Check other components of front shock absorber assembly.

   a. Check front shock absorber cover cap, front spring upper cushion, front dust boot, front buffer block and front spring lower cushion for cracks, wear or deformation. Replace as necessary.

   b. Check front strut upper connecting plate assembly (w/insulator) and bearing assembly for damage. Replace as necessary.

   c. Check front coil spring for wear, cracks or deformation. Replace as necessary.

Assembly

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

Installation is in the reverse order of removal.

CAUTION

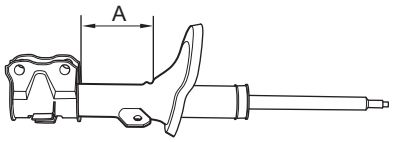
- Be sure to tighten coupling bolts and nuts to specified torque.
- Check wheel alignment after installation. Adjust wheel alignment to standard range as necessary.

Disposal

CAUTION

- Shock absorber assembly contains nitrogen and oil, which are under negative pressure. Before handling, be sure to wear goggles and release pressure inside shock absorber assembly to avoid personal injury.

1. Disposal of front shock absorber assembly.
   a. Extend front shock absorber assembly strut fully, and clamp it in a vise at an angle.
   b. Using a drill or equivalent, make a hole slowly at area A shown in the illustration, to discharge gas in the front shock absorber assembly.



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   c. Handle front shock absorber assembly properly after discharging gas.

ENVIRONMENTAL PROTECTION

- Recycle disposed front shock absorber assembly according to local environmental regulations.

Front Control Arm Assembly

Removal

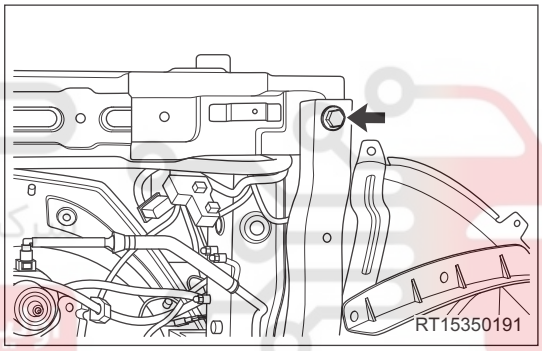
⚠ WARNING

- 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 suspension bearing parts and guide parts.
- When removing chassis parts, replace self-locking nuts and rusted nuts for safety.

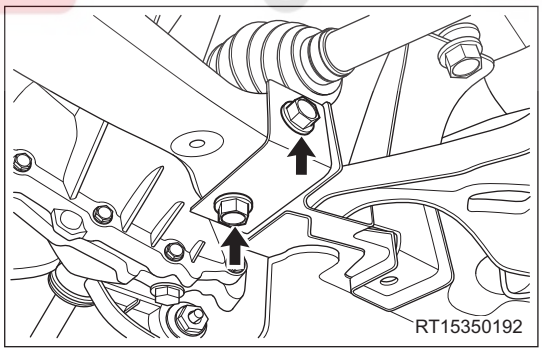
HINT:

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

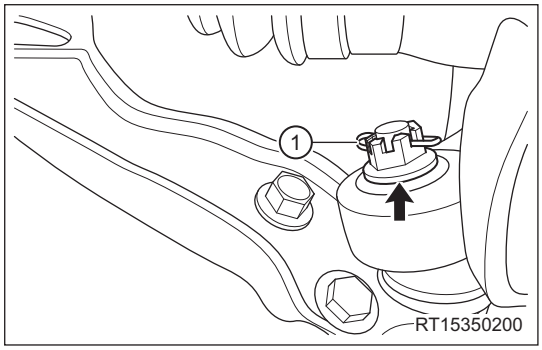
1. Remove the front left wheel (See page 37-7).
2. Remove the front bumper assembly (See page 63-6).
3. Remove the front left control arm assembly.
   a. Remove coupling bolt (arrow) between front left side rail and tank lower crossmember.
   (Tightening torque: 180 ± 18 N·m)



   b. Remove 2 coupling bolts (arrow) between front left side rail and front sub frame, and remove front left side rail.
   (Tightening torque: 120 ± 12 N·m)



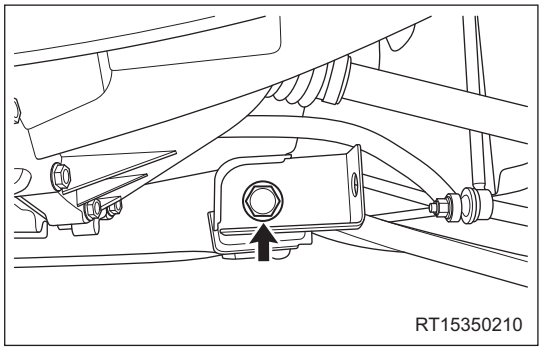
   c. Remove lock pin (1) and coupling nut (arrow) between front left control arm assembly ball pin and front left steering knuckle assembly.
   (Tightening torque: 120 ± 12 N·m)



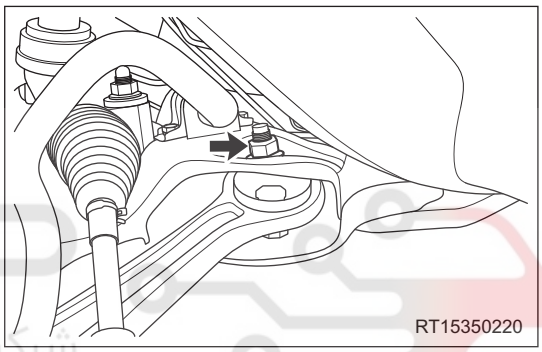
CAUTION

- If it is difficult to remove control arm ball pin end from steering knuckle, disengage ball pin by striking the end of steering knuckle uniformly and slightly with a hammer or equivalent.

d. Remove coupling bolt (arrow) between front part of front left control arm assembly and front sub frame welding assembly.
(Tightening torque: 180 ± 18 N·m)


RT15350210

e. Remove coupling bolt and nut (arrow) between rear part of front left control arm assembly and front sub frame welding assembly.
(Tightening torque: 180 ± 18 N·m)


RT15350220

f. Remove the front left control arm assembly with ball pin.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Make sure that ball pin assembly rotates smoothly and there is no seizuring after installation.
- Check wheel alignment after installation. Adjust wheel alignment to standard range as necessary.

Front Control Arm Ball Pin Assembly

Removal

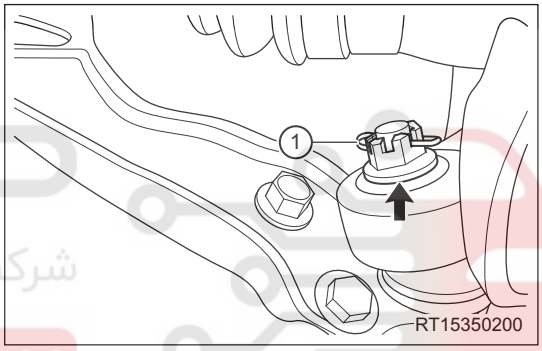
⚠ WARNING

- 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 suspension bearing parts and guide parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

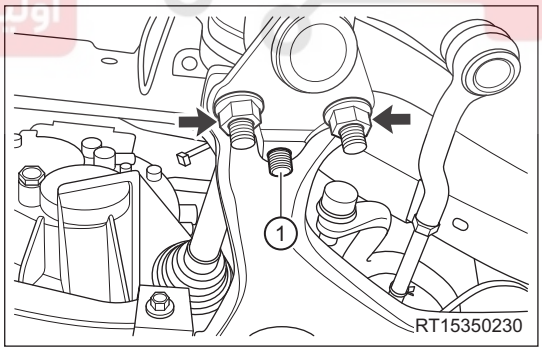
HINT:

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

1. Remove the front wheel (See page 37-7).
2. Remove the front left control arm ball pin assembly.
   a. Remove lock pin (1) and coupling nut (arrow) between front left control arm assembly ball pin and front left steering knuckle assembly.
   (Tightening torque: 120 ± 12 N·m)



   b. Remove 2 fixing nuts (arrow) and bolt (1) between front left control arm and front left control arm ball pin.
   (Tightening torque: 150 ± 10 N·m)



   c. Remove the front left control arm ball pin assembly.

Inspection

1. Check the control arm ball pin assembly.
   a. Check control arm assembly ball pin bushes for wear, cracks, deformation, damage or grease leakage. Replace as necessary.
   b. Check if control arm assembly ball pin rotates smoothly. Replace as necessary.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Make sure that ball pin assembly rotates smoothly and there is no seizuring after installation.
- Check wheel alignment after installation. Adjust wheel alignment to standard range as necessary.

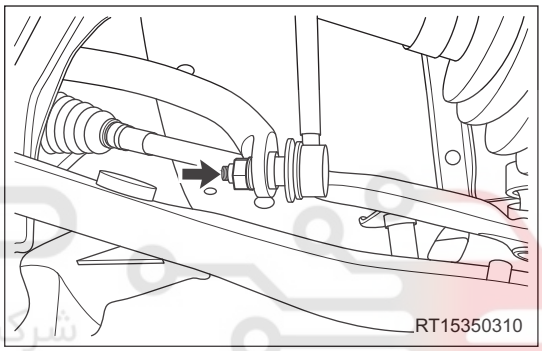
Front Stabilizer Bar Assembly

Removal

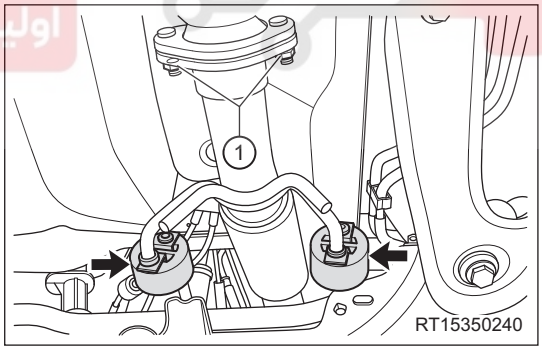
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.
- When lowering front sub frame welding assembly, you need to support engine and transmission assembly securely with engine equalizer to avoid damage.

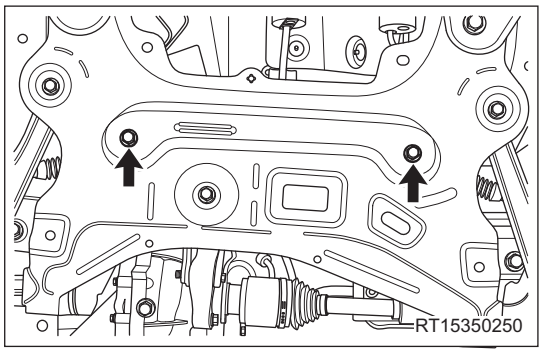
1. Remove the front wheel (See page 37-7).
2. Remove the front stabilizer bar assembly.
   a. Remove fixing nut (arrow) between stabilizer bar and small link.
      (Tightening torque: 60 ± 6 N·m)



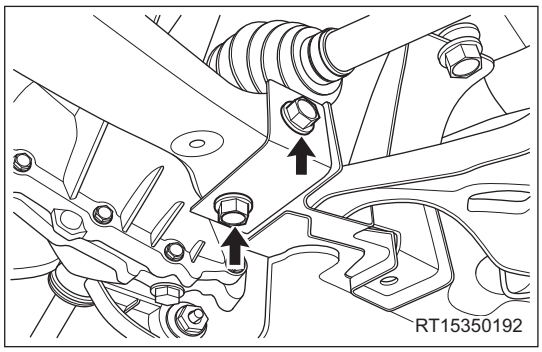
   b. Using an engine equalizer, support the engine and transmission assembly securely.
   c. Detach exhaust pipe fixing rubber lugs (arrow) from front sub frame welding assembly.



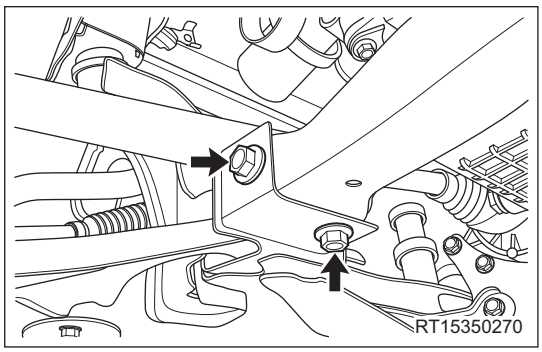
   d. Remove 2 through bolts (arrow) between steering gear with tie rod assembly and sub frame.
      (Tightening torque: 180 ± 18 N·m)



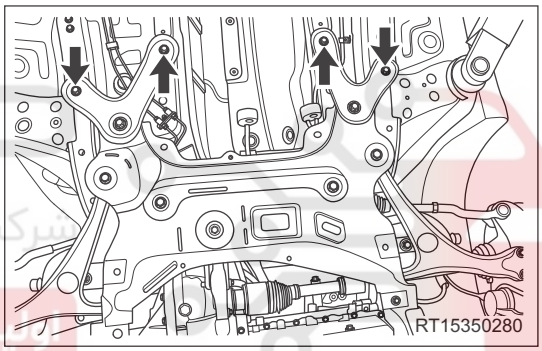
e. Remove 2 fixing bolts (arrow) between front left side rail and sub frame.
(Tightening torque: 120 ± 12 N·m)



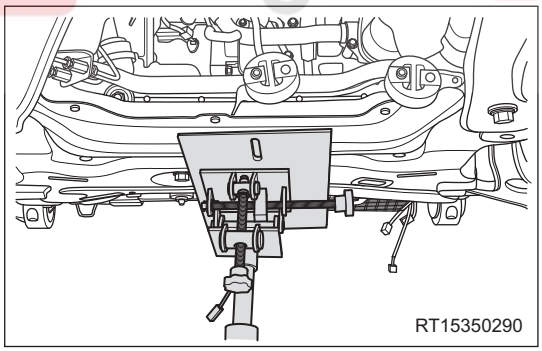
f. Remove 2 fixing bolts (arrow) between front right side rail and sub frame.
(Tightening torque: 120 ± 12 N·m)



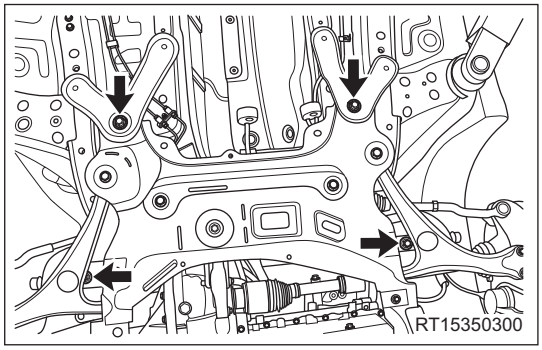
g. Remove 4 fixing bolts (arrow) between rear part of sub frame bracket and body.
(Tightening torque: 120 ± 12 N·m)



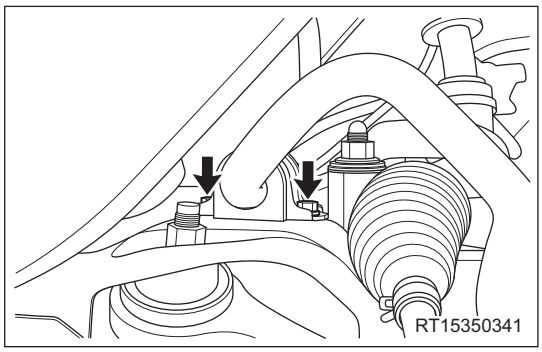
h. Using a transmission carrier, support front sub frame welding assembly.



i. Remove 4 fixing bolts (arrow) between sub frame and body.
(Tightening torque: 180 ± 18 N·m)

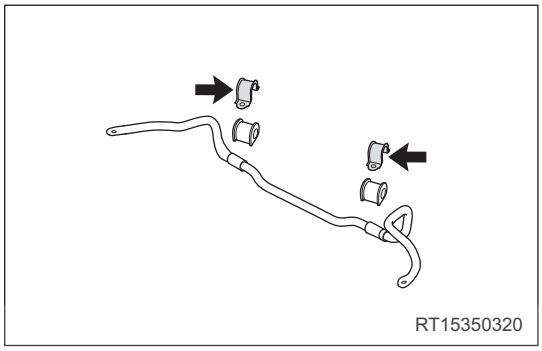


j. Remove 4 coupling nuts between sub frame and stabilizer bar (take left side as an example).
(Tightening torque: 25 ± 4 N·m)

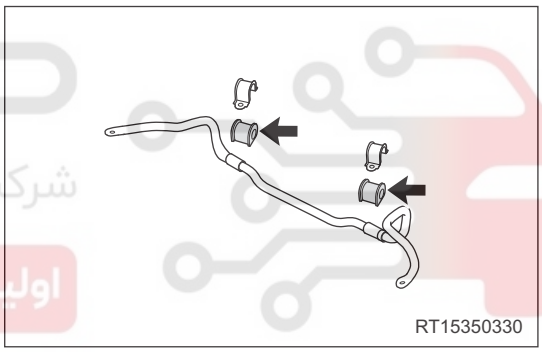


k. Lower front sub frame welding assembly, and remove front stabilizer bar assembly.

l. Detach left and right fixing clamps (arrow) from front stabilizer bar assembly.



m. Detach left and right rubber supports (arrow) from front stabilizer bar assembly.



Inspection

1. Check the front stabilizer bar assembly.
   a. Check front stabilizer bar assembly fixing clamps for wear, cracks, deformation or damage. Replace as necessary.
   b. Check front stabilizer bar assembly rubber supports for dirt, wear, cracks, deformation or damage. Replace as necessary.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.

Front Stabilizer Link Assembly

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

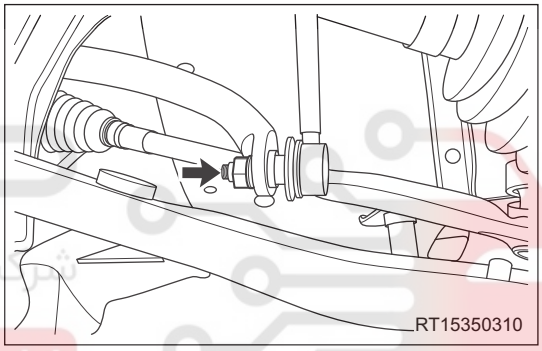
HINT:

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

1. Remove the rear wheel (See page 37-7).
2. Remove the front left stabilizer link assembly.

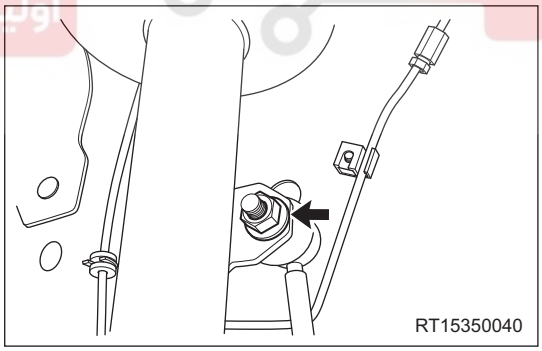
a. Hold the lower end of front left stabilizer link assembly with an inner hexagon wrench, and remove the coupling nut (arrow) between front left stabilizer bar assembly and front left stabilizer link assembly with a fixing wrench.

(Tightening torque: 60 ± 6 N·m)



b. Hold the upper end of front left stabilizer link assembly with an inner hexagon wrench, and remove the coupling nut (arrow) between front left stabilizer bar assembly and front left shock absorber assembly with a fixing wrench.

(Tightening torque: 60 ± 6 N·m)



c. Remove the front left stabilizer link assembly.

Inspection

1. Check the front stabilizer link assembly.
   a. Check front stabilizer link assembly bush for wear, cracks, deformation, damage or grease leakage. Replace as necessary.
   b. Check if end of front stabilizer link assembly rotates smoothly. Replace as necessary.

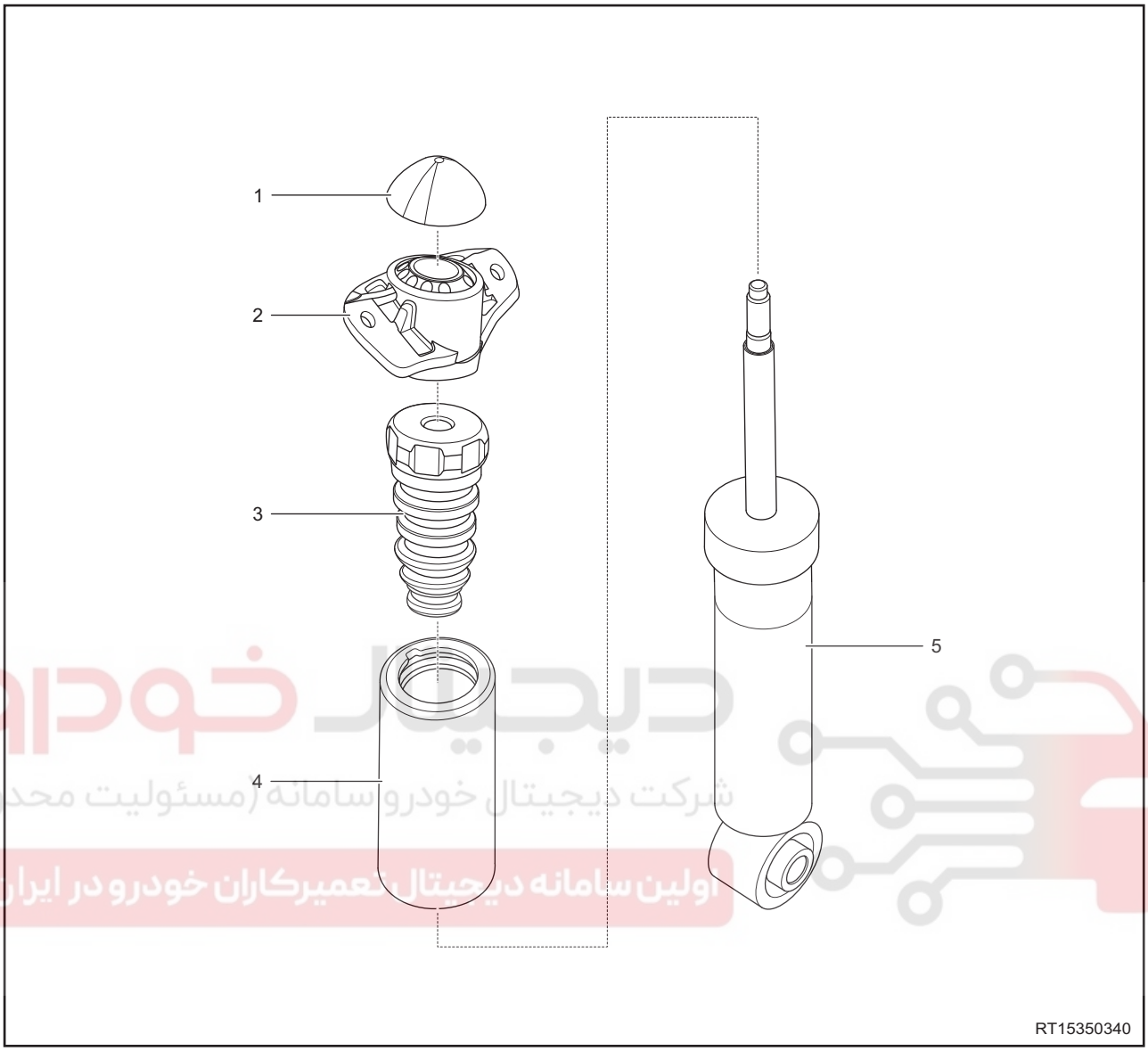
Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling nuts to specified torque.
- Make sure that end of front stabilizer link assembly rotates smoothly and there is no seizuring after installation.

Rear Shock Absorber Assembly



1 - Rear Shock Absorber Cover Cap	2 - Rear Shock Absorber Upper Connecting Plate Assembly (w/Insulator)
3 - Rear Buffer Block	4 - Rear Dust Boot
5 - Rear Shock Absorber Assembly	

Removal

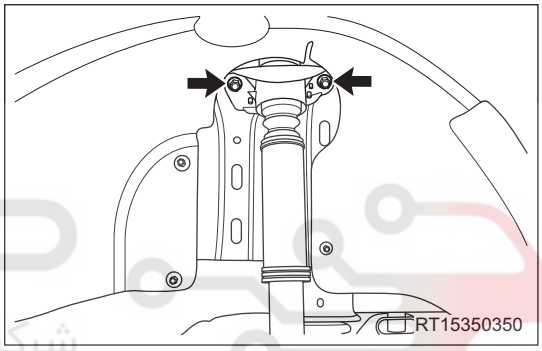
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

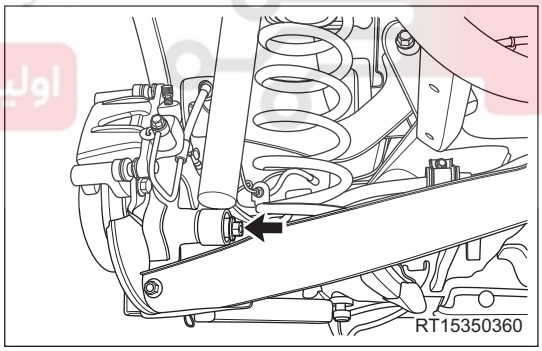
HINT:

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

1. Remove the rear left wheel (See page 37-7).
2. Remove the rear left shock absorber assembly.
   a. Remove 2 coupling bolts (arrow) between upper part of rear left shock absorber assembly and body.
   (Tightening torque: 60 ± 6 N·m)



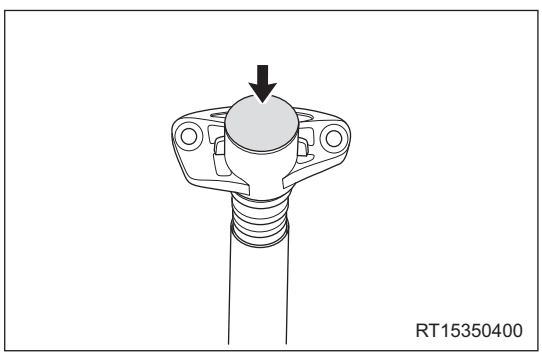
   b. Remove coupling bolt (arrow) between lower part of rear left shock absorber assembly and rear left steering knuckle assembly.
   (Tightening torque: 160 ± 16 N·m)



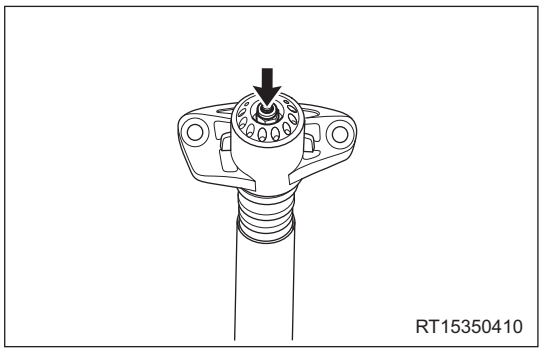
   c. Remove the rear left shock absorber assembly.

Disassembly

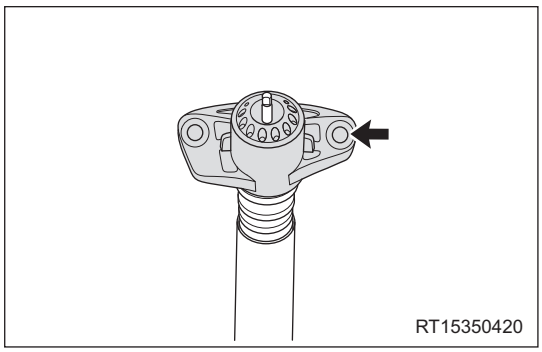
1. Remove the rear left shock absorber assembly.
   a. Remove the rear shock absorber cover cap (arrow).



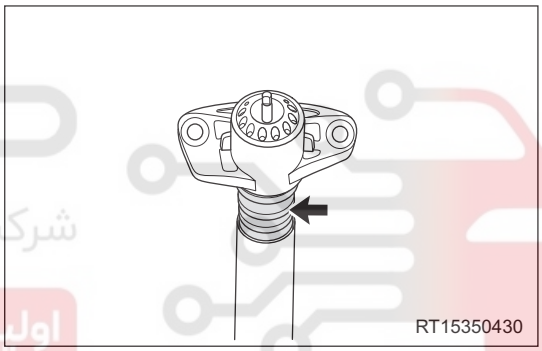
b. Remove fixing nut (arrow) from rear shock absorber assembly.
(Tightening torque: 60 ± 6 N·m)


RT15350410

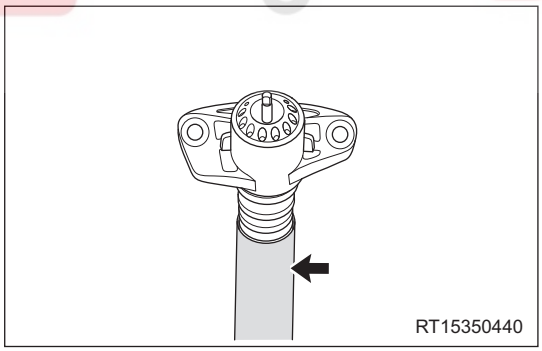
c. Remove the rear shock absorber upper connecting plate assembly (w/insulator) (arrow).


RT15350420

d. Remove the rear buffer block (arrow).


RT15350430

e. Remove the rear dust boot (arrow).


RT15350440

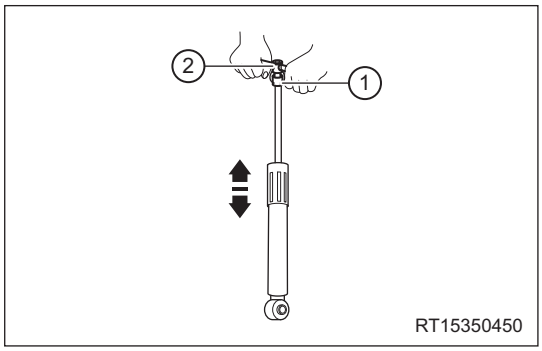
Inspection

1. Check the rear shock absorber assembly.

   Manual check:

   a. Install nut (1) to upper end of rear shock absorber assembly strut, and then install T-wrench (2) or equivalent.

   b. Compress and extend rear shock absorber assembly strut several times by hands in direction of arrow as shown in illustration. Check that there is no abnormal resistance or unusual sound during operation. If there is any abnormality, replace rear shock absorber assembly with a new one.



2. Check the other components of rear shock absorber assembly.

   a. Check rear dust boot, rear buffer block and rear shock absorber cover cap for cracks, wear or deformation. Replace as necessary.

   b. Check front coil spring for wear, cracks or deformation. Replace as necessary.

Assembly

Assembly is in the reverse order of disassembly.

Installation

Installation is in the reverse order of removal.

CAUTION

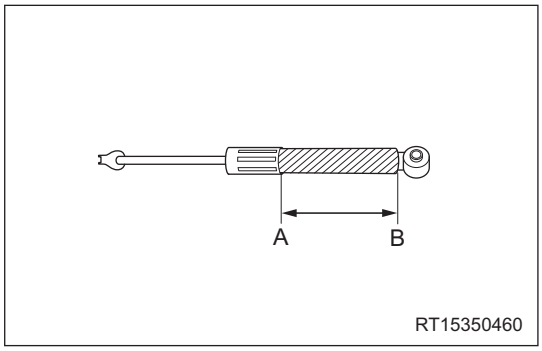
- Be sure to tighten coupling bolts and nuts to specified torque.
- Bounce vehicle up and down several times to stabilize rear suspension after installation.

Disposal

1. Disposal of the rear shock absorber assembly.

   a. Extend the rear shock absorber assembly strut fully.

   b. Using a drill, make a hole between A and B in the strut as shown in illustration, to discharge gas from rear shock absorber assembly.



CAUTION

- Be careful when drilling, because mental chips may fly about. Always perform operations with proper safety equipment to avoid personal injury.
- Gas discharged from shock absorber is colorless, odorless and nonpoisonous.

c. After discharging gas from rear shock absorber assembly, handle the rear shock absorber assembly properly.

ENVIRONMENTAL PROTECTION

- Recycle disposed rear shock absorber assembly according to local environmental regulations.

Rear Coil Spring

Removal

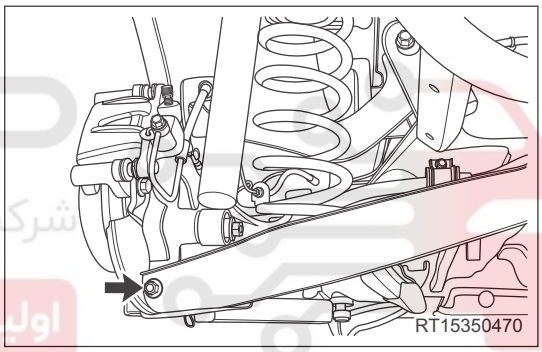
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

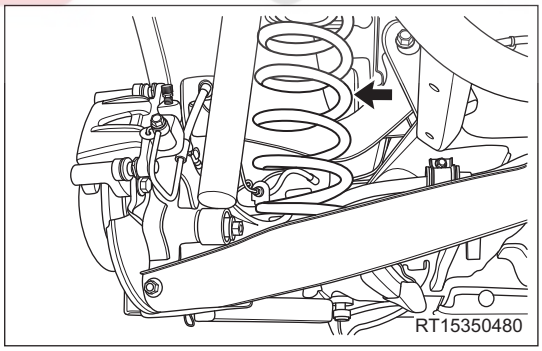
HINT:

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

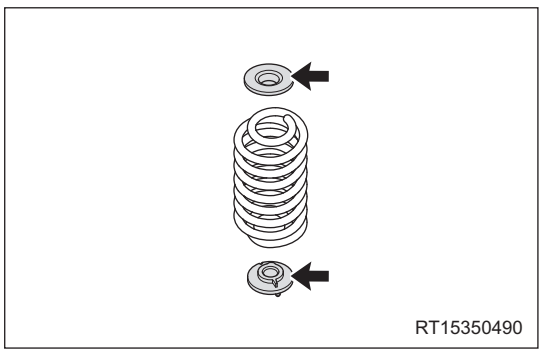
1. Remove the rear wheel (See page 37-7).
2. Remove the rear coil spring.
   a. Support rear lower control arm assembly securely with a transmission carrier.
   b. Remove coupling bolt and nut (arrow) between rear lower control arm assembly and rear steering knuckle assembly.
   (Tightening torque: 110 ± 11 N·m)



   c. Lower transmission carrier slowly to a proper height and remove rear coil spring (arrow) carefully.



   d. Remove rear coil spring upper and lower cushions (arrow).



Inspection

1. Check the rear coil spring assembly.
   a. Check rear coil spring for wear, cracks or permanent deformation due to excessive use. Replace as necessary.
   b. Check rear coil spring upper and lower cushions for dirty, wear, cracks, deformation or damage. Replace as necessary.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Align protrusion of rear coil spring lower cushion with positioning hole of rear lower control arm during installation.
- After installation, lower vehicle and bounce vehicle up and down several times to stabilize rear suspension.

Rear Upper Control Arm Assembly

Removal

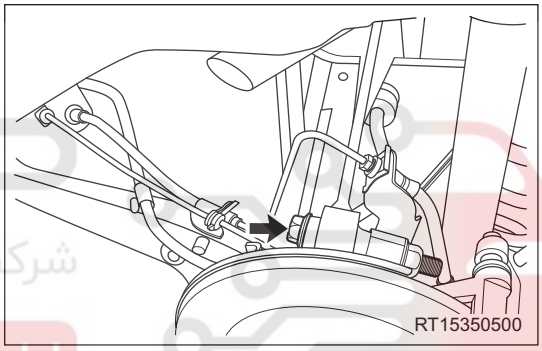
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

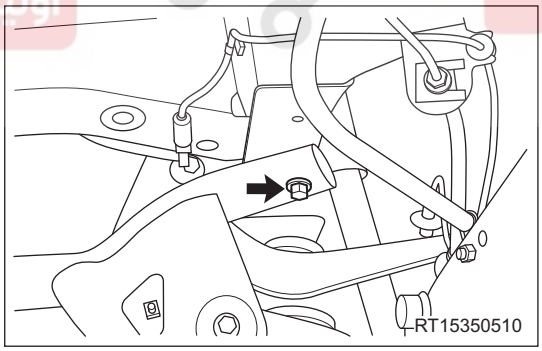
HINT:

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

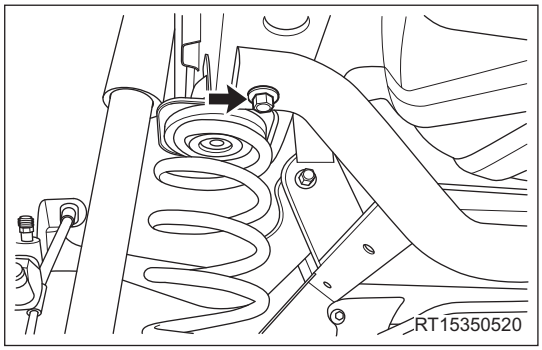
1. Remove the rear wheel (See page 37-7).
2. Remove the rear upper control arm assembly.
   a. Remove coupling bolt and nut (arrow) between rear upper control arm assembly and rear steering knuckle assembly.
   (Tightening torque: 160 ± 16 N·m)



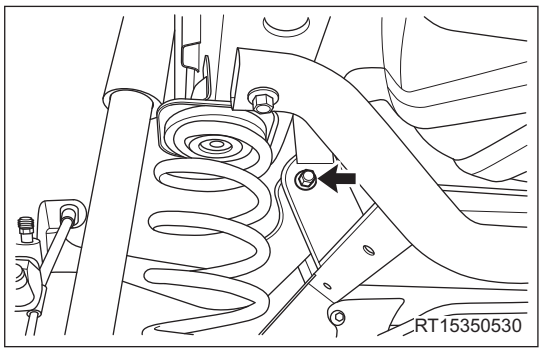
   b. Remove coupling bolt (arrow) between front left part of rear sub frame welding assembly and body.
   (Tightening torque: 120 ± 12 N·m)



   c. Remove coupling bolt (arrow) between rear left part of rear sub frame welding assembly and body.
   (Tightening torque: 120 ± 12 N·m)



d. Remove coupling bolt, nut and adjusting washer (arrow) between rear upper control arm assembly and rear sub frame welding assembly.
(Tightening torque: 110 ± 11 N·m)



e. Remove the rear upper control arm assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

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

Rear Lower Control Arm Assembly

Removal

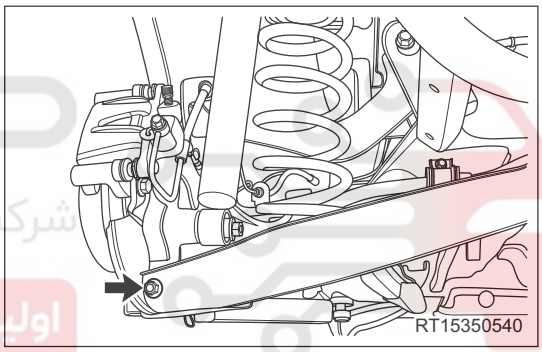
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

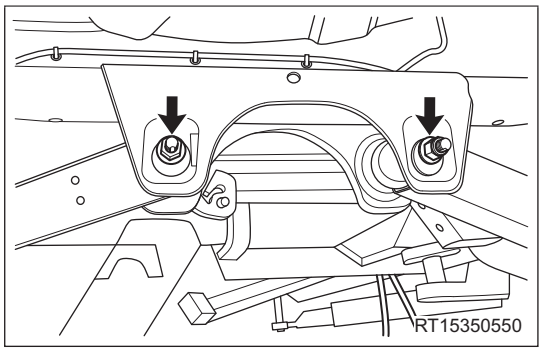
HINT:

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

1. Remove the rear wheel (See page 37-7).
2. Remove the rear lower control arm assembly.
   a. Support rear lower control arm assembly securely with a transmission carrier.
   b. Remove coupling bolt and nut (arrow) between rear lower control arm assembly and rear steering knuckle assembly.
      (Tightening torque: 110 ± 11 N·m)



   c. Lower transmission carrier slowly to a proper height and remove rear coil spring, rear coil spring upper cushion and rear coil spring lower cushion carefully.
   d. Remove coupling bolts, nuts and adjusting washers (arrow) between rear lower control arm assembly and rear sub frame welding assembly.
      (Tightening torque: 110 ± 11 N·m)



   e. Remove the rear lower control arm assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

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

Rear Trailing Arm Assembly

Removal

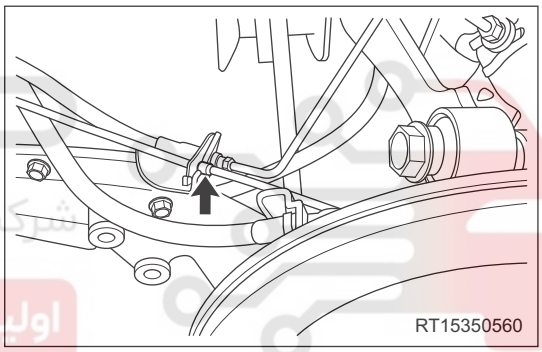
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

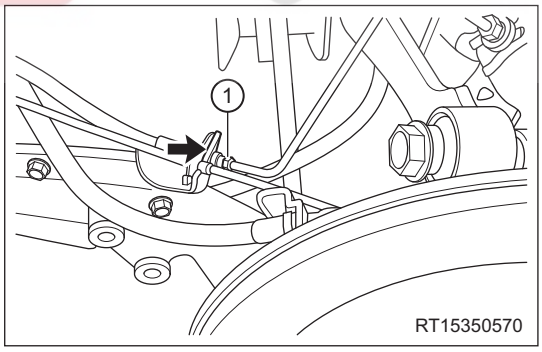
HINT:

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

1. Remove the rear wheel (See page 37-7).
2. Drain the brake fluid (See page 39-15).
3. Remove the rear trailing arm assembly.
   a. Disengage rear wheel speed sensor wire harness (arrow) from rear trailing arm assembly.



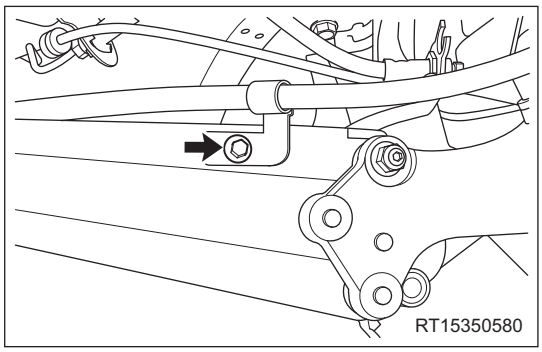
   b. Loosen coupling bolt (1) between rear brake hose assembly and brake pipe, and disengage fixing clamp (arrow).
   (Tightening torque: 18 ± 2 N·m)



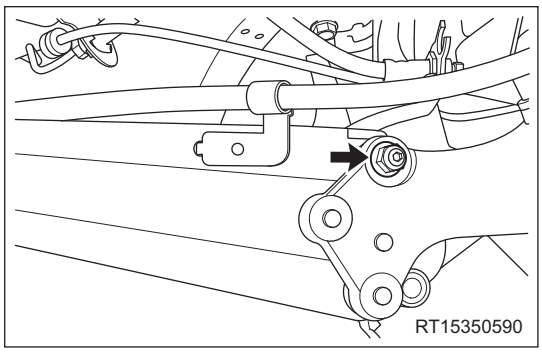
CAUTION

- DO NOT bend or damage brake tube.
- DO NOT allow any foreign matter such as dirt and dust to enter brake line from joint parts.
- After removing brake line, perform sealing treatment to prevent foreign matter from entering.

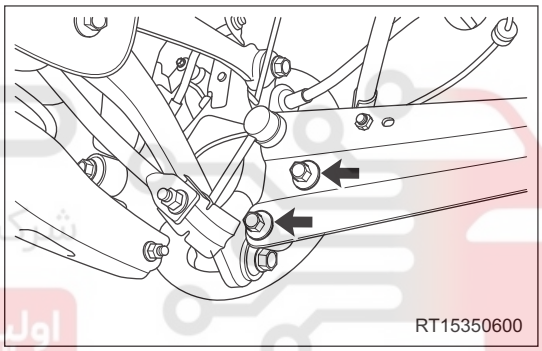
c. Remove coupling bolt (arrow) between parking brake rear cable assembly fixing bracket and rear trailing arm assembly.
(Tightening torque: 23 ± 2 N·m)



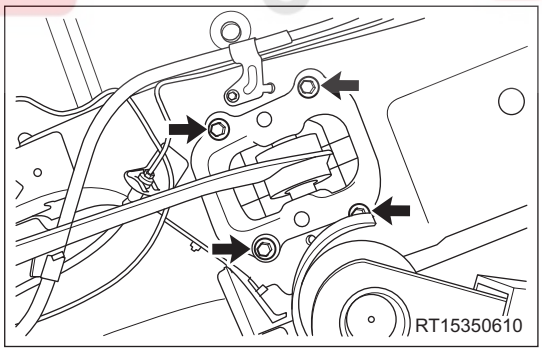
d. Remove coupling nut (arrow) between rear stabilizer link assembly and rear trailing arm assembly, and disengage rear stabilizer link assembly.
(Tightening torque: 60 ± 6 N·m)



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



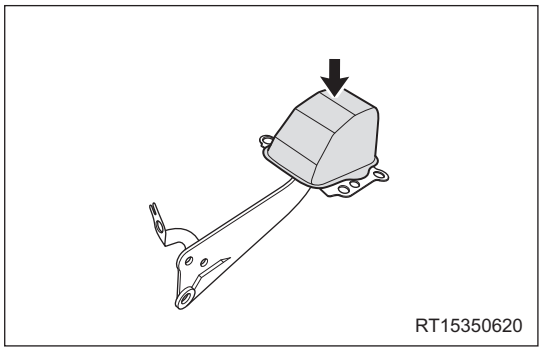
f. Remove 4 coupling bolts (arrow) between rear trailing arm assembly mounting bracket and body.
(Tightening torque: 60 ± 6 N·m)



g. Remove the rear trailing arm assembly (w/mounting bracket).

Disassembly

1. Remove the rear trailing arm assembly (w/mounting bracket).
   a. Remove the rear trailing arm mounting bracket dust cover (arrow).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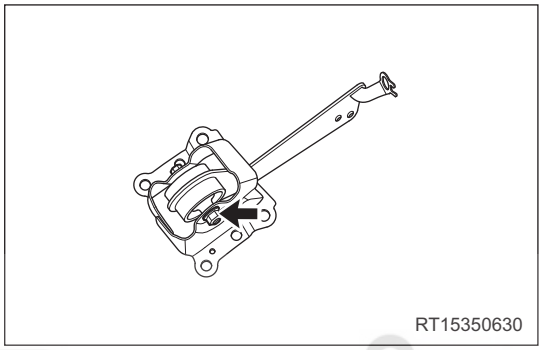
   b. Remove coupling bolt and nut (arrow) between rear trailing arm assembly and mounting bracket.
   (Tightening torque: 120 ± 12 N·m)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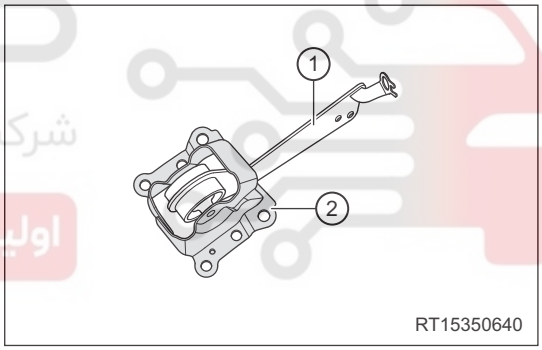
   c. Separate rear trailing arm assembly (1) and mounting bracket (2).



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Assembly

Assembly is in the reverse order of disassembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.

Rear Connecting Rod Assembly

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

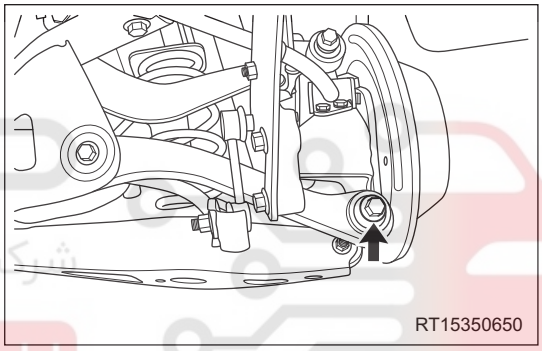
HINT:

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

1. Remove the rear wheel (See page 37-7).
2. Remove the rear connecting rod assembly.

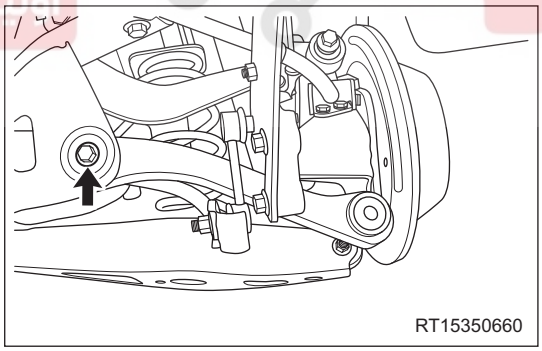
a. Remove coupling bolt and nut (arrow) between rear connecting rod assembly and rear steering knuckle assembly.

(Tightening torque: 160 ± 16 N·m)



b. Remove coupling bolt and nut (arrow) between rear connecting rod assembly and rear sub frame welding assembly.

(Tightening torque: 110 ± 11 N·m)



c. Remove the rear connecting rod assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.

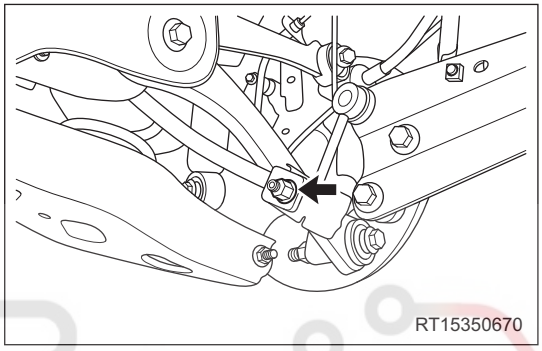
Rear Stabilizer Bar Assembly

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

1. Remove the rear stabilizer bar assembly.
   a. Remove coupling nut (arrow) between rear left stabilizer link assembly and rear stabilizer bar assembly. Use same removal procedure for right side.
   (Tightening torque: 60 ± 6 N·m)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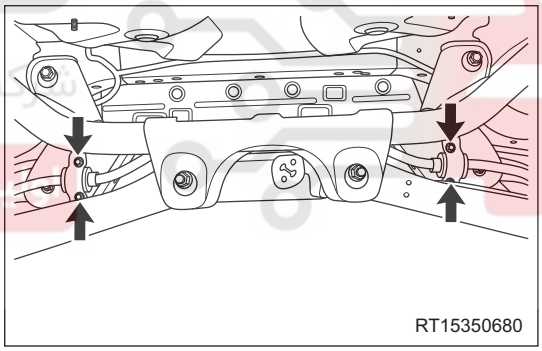
   b. Remove 4 coupling bolts (arrow) between rear stabilizer bar assembly and rear sub frame welding assembly.
   (Tightening torque: 25 ± 4 N·m)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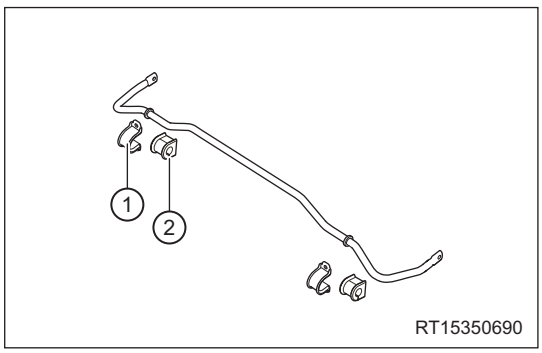
   c. Remove the rear stabilizer bar assembly.
   d. Remove rear stabilizer bar fixing clamps (1) and rear stabilizer bar rubber supports (2) from rear stabilizer bar assembly.



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Inspection

1. Check the rear stabilizer bar assembly.
   a. Check rear stabilizer bar assembly fixing clamps for wear, cracks, deformation or damage. Replace as necessary.
   b. Check rear stabilizer bar assembly rubber supports for dirt, wear, cracks, deformation or damage. Replace as necessary.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.

Rear Stabilizer Link Assembly

Removal

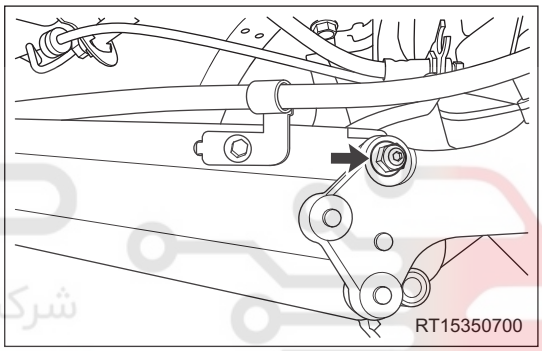
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing 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 rear stabilizer link assembly.
   a. Remove coupling nut (arrow) between rear stabilizer link assembly and rear trailing arm assembly, and disengage rear stabilizer link assembly.
   (Tightening torque: 60 ± 6 N·m)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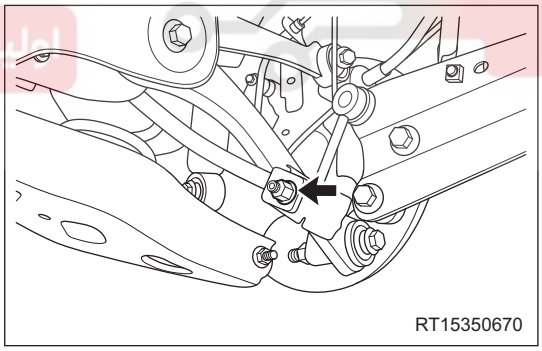
   b. Remove coupling nut (arrow) between rear stabilizer link assembly and rear stabilizer bar assembly.
   (Tightening torque: 60 ± 6 N·m)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   c. Remove the rear stabilizer link assembly.

Inspection

1. Check the rear stabilizer link assembly.
   a. Check rear stabilizer link assembly bush for wear, cracks, deformation, damage or grease leakage. Replace as necessary.
   b. Check if end of rear stabilizer link assembly rotates smoothly. Replace as necessary.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling nuts to specified torque.
- Make sure that end of rear stabilizer link assembly rotates smoothly and there is no seizuring after installation.

Wheel Alignment

Description

CAUTION

- Be sure to perform wheel alignment procedures according to operating instructions of four-wheel alignment device.
- Periodic maintenance and service for four-wheel alignment device should be performed.

In general, wheel alignment has following 6 parameters:

1. Check front wheel camber.
2. Check front wheel toe-in.
3. Check kingpin caster.
4. Check kingpin inclination.
5. Check rear wheel camber.
6. Check rear wheel toe-in.

If following components have been removed, installed or replaced, check and perform wheel alignment procedures:

- Front control arm assembly
- Front control arm ball pin assembly
- Front steering knuckle
- Front shock absorber assembly
- Steering gear and steering tie rod
- Drive shaft
- Front sub frame welding assembly
- Rear lower control arm assembly
- Rear upper control arm assembly
- Rear steering knuckle assembly
- Rear sub frame welding assembly

Specifications (parameters standard for four-wheel alignment)

Item		Specified Value
Front Wheel	Front wheel camber	-0°25' ± 45'
	Front wheel toe-in	0°5' ± 5' (one side)
	Kingpin inclination	11°30' ± 60'
	Kingpin caster	4°14' ± 60'
Rear Wheel	Rear wheel camber	-0°42' ± 30'
	Rear wheel toe-in	0°5' ± 10' (one side)
Sideways Sliding		-

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	See page
Vehicle pulls	Front wheel alignment (incorrect)	36-47
	Rear wheel alignment (incorrect)	36-47
Wheel shimmy	Front wheel alignment (incorrect)	36-47
	Rear wheel alignment (incorrect)	36-47
Abnormal tire wear	Tire (worn or improperly inflated)	37-8
	Front wheel alignment (incorrect)	36-47
	Rear wheel alignment (incorrect)	36-47

Inspection before Wheel Alignment

1. Vehicle is in unloaded state.
2. Use a lift to support and raise vehicle to a proper height.
3. Check hub bearing for excessive clearance, and replace as necessary.
4. Check suspension components, steering tie rod and ball pin for wear, deformation or damage. Replace malfunctioning parts as necessary.
5. Check shock absorber assembly for proper operation.
6. Check if tire pressure is within specified range and adjust it to specified pressure as necessary.

Item	Front Wheel	Rear Wheel	Spare Tire
Tire (Unloaded)	230	230	420

7. Check rim and tire.
   a. Visually check rim and tire for scratches, wear or damage.
   b. Perform wheel dynamic balance procedures (See page 37-10).

Front Wheel Camber

Incorrect front wheel camber will cause abnormal tire wear. Check and adjust front wheel camber as necessary.

In normal conditions, it is not necessary to adjust camber after assembling the independent suspension and wheel steering knuckle. If wheel camber is not within tolerance due to other reasons, adjust with coupling bolt between independent suspension and steering knuckle.

Specified Value for Front Wheel Camber

Item	Specified Value
Front Wheel Camber	-0°25' ± 45'

Inspection

1. Visually check driving system components for deformation and damage before adjustment. Replace deformed or damaged components as necessary.

2. Install wheel alignment device onto front wheel, and perform inspection procedures according to operating instructions for wheel alignment device.

Front Wheel Toe-in

Incorrect front wheel toe-in will cause wheel pull and abnormal tire wear. Check and adjust front wheel toe-in as necessary.

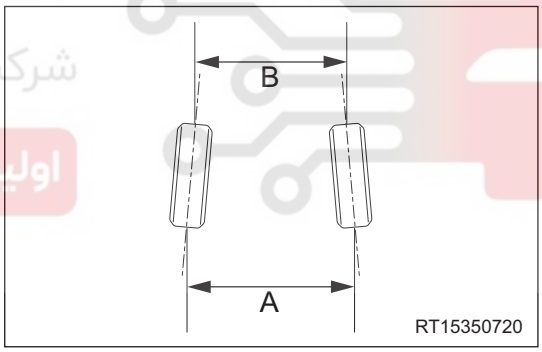
If front wheel toe-in is not within tolerance due to other reasons, adjust length of steering tie rod to return toe-in to specified value.

Specified Value for Front Wheel Toe-in

Item	Specified Value
Front Wheel Toe-in	0°5' ± 5' (one side)

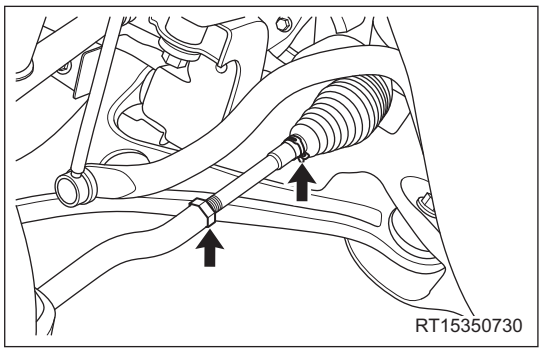
Inspection

1. Perform inspection with four-wheel alignment device (perform inspection procedures by referring to operating instructions for four-wheel alignment device).
2. Manual check:
   a. Park vehicle on level ground, check if front tire pressure is within specified range and adjust it to specified value as necessary.
   b. Place marks on center position in front of front wheels, and measure distance A between marks with a tape measure.
   c. Push vehicle to rotate wheels 180°, and measure distance B between marks with a tape measure when marks are turned to rear of wheels.
   d. Calculation method: front wheel toe-in = A - B ≤ 1 mm



Adjustment

1. Make adjusting preparation for wheel alignment according to requirement of tester.
2. Loosen steering tie rod locking nut (1), and turn tie rod to adjust length as required until front wheel toe-in reaches specified value.



3. Tighten steering tie rod locking nut and reinstall elastic jacket snap ring. Check if locking nut is tightened in place and if jacket position is correct.
   (Tightening torque: 55 ± 5 N·m)

CAUTION

- If elasticity of elastic jacket snap ring is not enough, replace it.

4. After adjusting front wheel toe-in, check steering wheel for eccentricity. If necessary, loosen steering wheel locking nut and adjust steering wheel to horizontal position, and then tighten steering wheel locking nut to specified torque.
   (Tightening torque: 30 ± 3 N·m)

Kingpin Caster & Kingpin Inclination

1. Kingpin caster and kingpin inclination can only be checked by using four-wheel alignment device.
2. Kingpin caster and kingpin inclination are assured by design structure and cannot be adjusted. If measured value is not within specified range, check if other components that connect to steering knuckle are deformed or damaged. Also, check if connected part of steering knuckle is deformed or damaged. If so, replace corresponding components.

Specified Value for Kingpin Caster & Kingpin Inclination

Item	Specified Value
Kingpin Caster	4°14' ± 60'
Kingpin Inclination	11°30' ± 60'

Rear Wheel Camber

Incorrect rear wheel camber will cause wheel pull and abnormal tire wear. Check and adjust rear wheel camber as necessary.

If rear wheel camber is not within tolerance due to other reasons, adjust eccentric adjusting bolt and eccentric adjusting sleeve between rear upper control arm assembly and rear sub frame welding assembly to return camber to specified value.

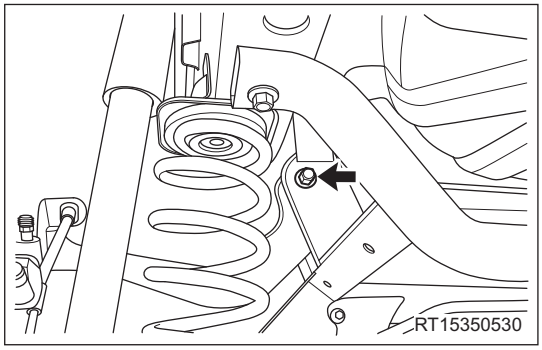
If rear wheel camber is not as specified, check rear suspension and wheels for damage or deformation. Replace damaged or deformed components as necessary.

Specified Value for Rear Wheel Camber

Item	Specified Value
Rear Wheel Camber	-0°42' ± 30'

Adjustment

1. Make adjusting preparation for wheel alignment according to requirement of tester.
2. Loosen coupling bolt (arrow) between rear upper control arm assembly and rear sub frame assembly, be careful that eccentric adjusting sleeve does not detach from groove.



3. Rotate eccentric adjusting sleeve and eccentric adjusting bolt to adjust rear wheel camber to specified value.
4. Tighten coupling bolt between rear upper control arm assembly and rear sub frame welding assembly to specified torque after adjustment (adjusting method of left and right wheels is the same).
   (Tightening torque: 110 ± 11 N·m)

Rear Wheel Toe-in

Incorrect rear wheel toe-in will cause wheel pull and abnormal tire wear. Check and adjust rear wheel toe-in as necessary.

If rear wheel toe-in is not within tolerance due to other reasons, adjust eccentric adjusting bolt and eccentric adjusting sleeve between rear lower control arm assembly and rear sub frame welding assembly to return toe-in to specified value.

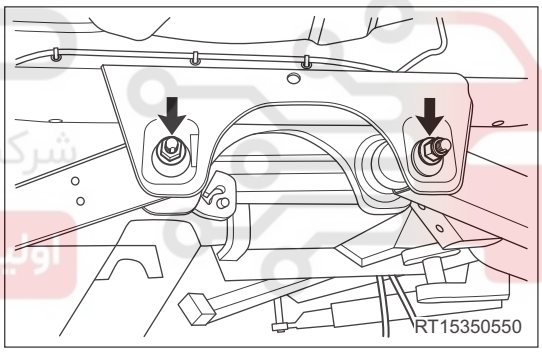
If rear wheel toe-in is not as specified, check rear suspension and wheels for damage or deformation. Replace damaged or deformed components as necessary.

Specified Value for Rear Wheel Toe-in

Item	Specified Value
Rear Wheel Toe-in	0°5' ± 10' (one side)

Adjustment

1. Make adjusting preparation for wheel alignment according to requirement of tester.
2. Loosen coupling bolt (arrow) between rear lower control arm assembly and rear sub frame welding assembly, be careful that eccentric adjusting sleeve does not detach from groove.



3. Rotate eccentric adjusting bolt and eccentric adjusting sleeve to adjust rear wheel toe-in to specified value.
4. Tighten coupling bolt between rear lower control arm assembly and rear sub frame welding assembly to specified torque after adjustment (adjusting method of left and right wheels is the same).
   (Tightening torque: 110 ± 11 N·m)

- MEMO -