

# SUSPENSION

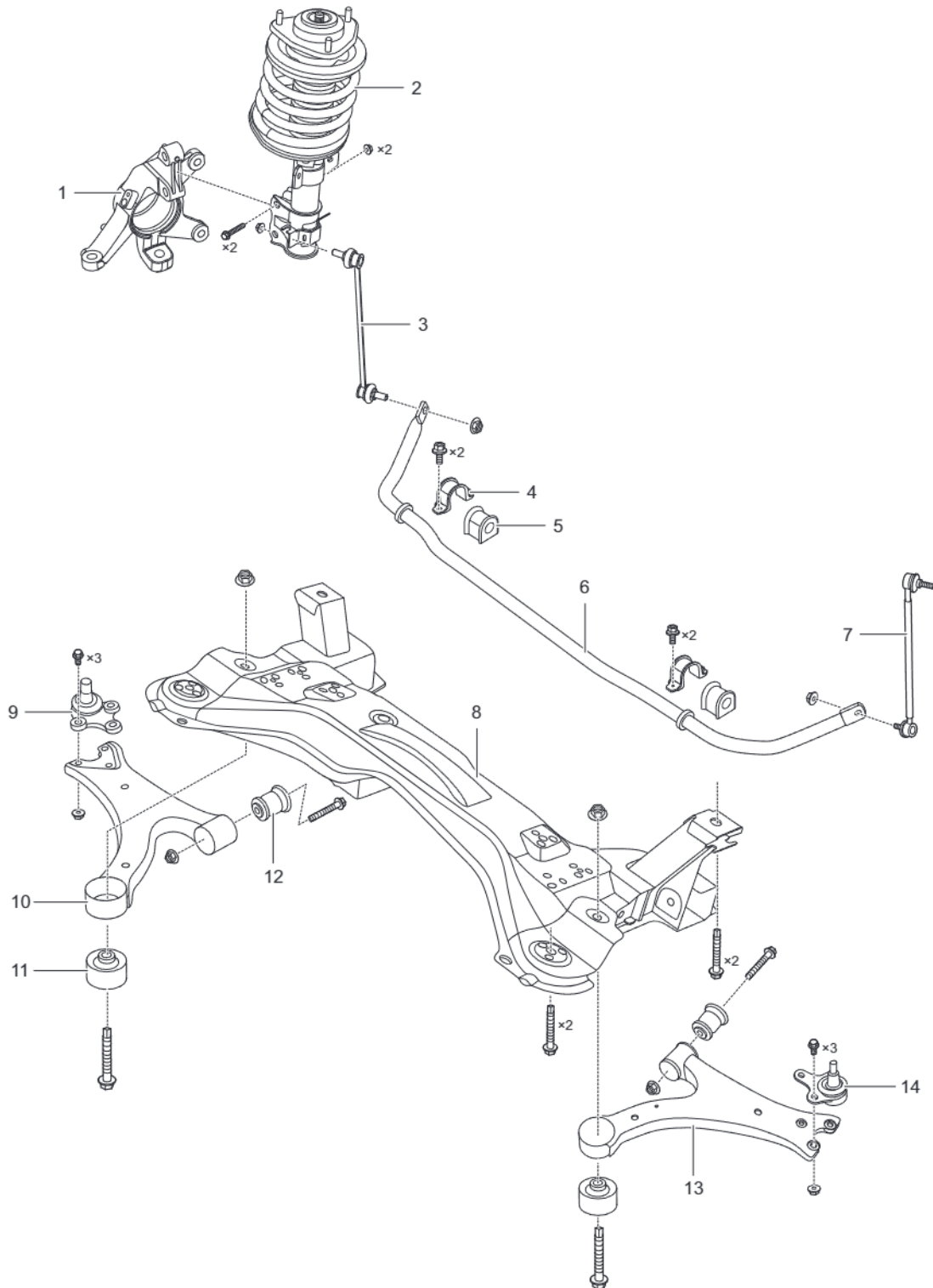
|                                            |              |                                                 |              |
|--------------------------------------------|--------------|-------------------------------------------------|--------------|
| <b>GENERAL INFORMATION</b>                 | <b>23-3</b>  | <b>Rear Upper Control Arm Assembly</b>          | <b>23-37</b> |
| Description                                | 23-3         | Removal                                         | 23-37        |
| Specifications                             | 23-6         | Installation                                    | 23-38        |
| Tools                                      | 23-8         | <b>Rear Lower Control Arm Assembly</b>          | <b>23-39</b> |
| <b>DIAGNOSIS &amp; TESTING</b>             | <b>23-10</b> | Removal                                         | 23-39        |
| Problem Symptoms Table                     | 23-10        | Installation                                    | 23-40        |
| <b>ON-VEHICLE SERVICE</b>                  | <b>23-12</b> | <b>Rear Trailing Arm Assembly</b>               | <b>23-41</b> |
| <b>Front Shock Absorber Assembly</b>       | <b>23-12</b> | Removal                                         | 23-41        |
| On-vehicle Inspection                      | 23-13        | Disassembly                                     | 23-43        |
| Removal                                    | 23-13        | Assembly                                        | 23-43        |
| Disassembly                                | 23-15        | Installation                                    | 23-43        |
| Inspection                                 | 23-18        | <b>Rear Connecting Rod Assembly</b>             | <b>23-44</b> |
| Assembly                                   | 23-18        | Removal                                         | 23-44        |
| Installation                               | 23-18        | Installation                                    | 23-44        |
| Disposal                                   | 23-19        | <b>Rear Stabilizer Bar Assembly</b>             | <b>23-45</b> |
| <b>Front Control Arm Assembly</b>          | <b>23-20</b> | Removal                                         | 23-45        |
| Removal                                    | 23-20        | Inspection                                      | 23-46        |
| Installation                               | 23-21        | Installation                                    | 23-46        |
| <b>Front Control Arm Ball Pin Assembly</b> | <b>23-22</b> | <b>Rear Stabilizer Link Assembly</b>            | <b>23-47</b> |
| Removal                                    | 23-22        | Removal                                         | 23-47        |
| Inspection                                 | 23-23        | Inspection                                      | 23-47        |
| Installation                               | 23-23        | Installation                                    | 23-48        |
| <b>Front Stabilizer Bar Assembly</b>       | <b>23-24</b> | <b>WHEEL ALIGNMENT</b>                          | <b>23-49</b> |
| Removal                                    | 23-24        | Description                                     | 23-49        |
| Inspection                                 | 23-26        | Specifications                                  | 23-49        |
| Installation                               | 23-27        | Problem Symptoms Table                          | 23-50        |
| <b>Front Stabilizer Link Assembly</b>      | <b>23-28</b> | Inspection before Wheel Alignment               | 23-50        |
| Removal                                    | 23-28        | <b>Front Wheel Camber</b>                       | <b>23-51</b> |
| Inspection                                 | 23-28        | Inspection                                      | 23-51        |
| Installation                               | 23-29        | Adjustment                                      | 23-51        |
| <b>Rear Shock Absorber Assembly</b>        | <b>23-30</b> | <b>Front Wheel Toe-in</b>                       | <b>23-52</b> |
| Removal                                    | 23-31        | Inspection                                      | 23-52        |
| Disassembly                                | 23-31        | Adjustment                                      | 23-52        |
| Inspection                                 | 23-33        | <b>Kingpin Caster &amp; Kingpin Inclination</b> | <b>23-54</b> |
| Assembly                                   | 23-33        | <b>Rear Wheel Camber</b>                        | <b>23-55</b> |
| Installation                               | 23-33        | Adjustment                                      | 23-55        |
| Disposal                                   | 23-34        | <b>Rear Wheel Toe-in</b>                        | <b>23-56</b> |
| <b>Rear Coil Spring</b>                    | <b>23-35</b> | Adjustment                                      | 23-56        |
| Removal                                    | 23-35        |                                                 |              |
| Inspection                                 | 23-36        |                                                 |              |
| Installation                               | 23-36        |                                                 |              |



# GENERAL INFORMATION

## Description

### Front Suspension

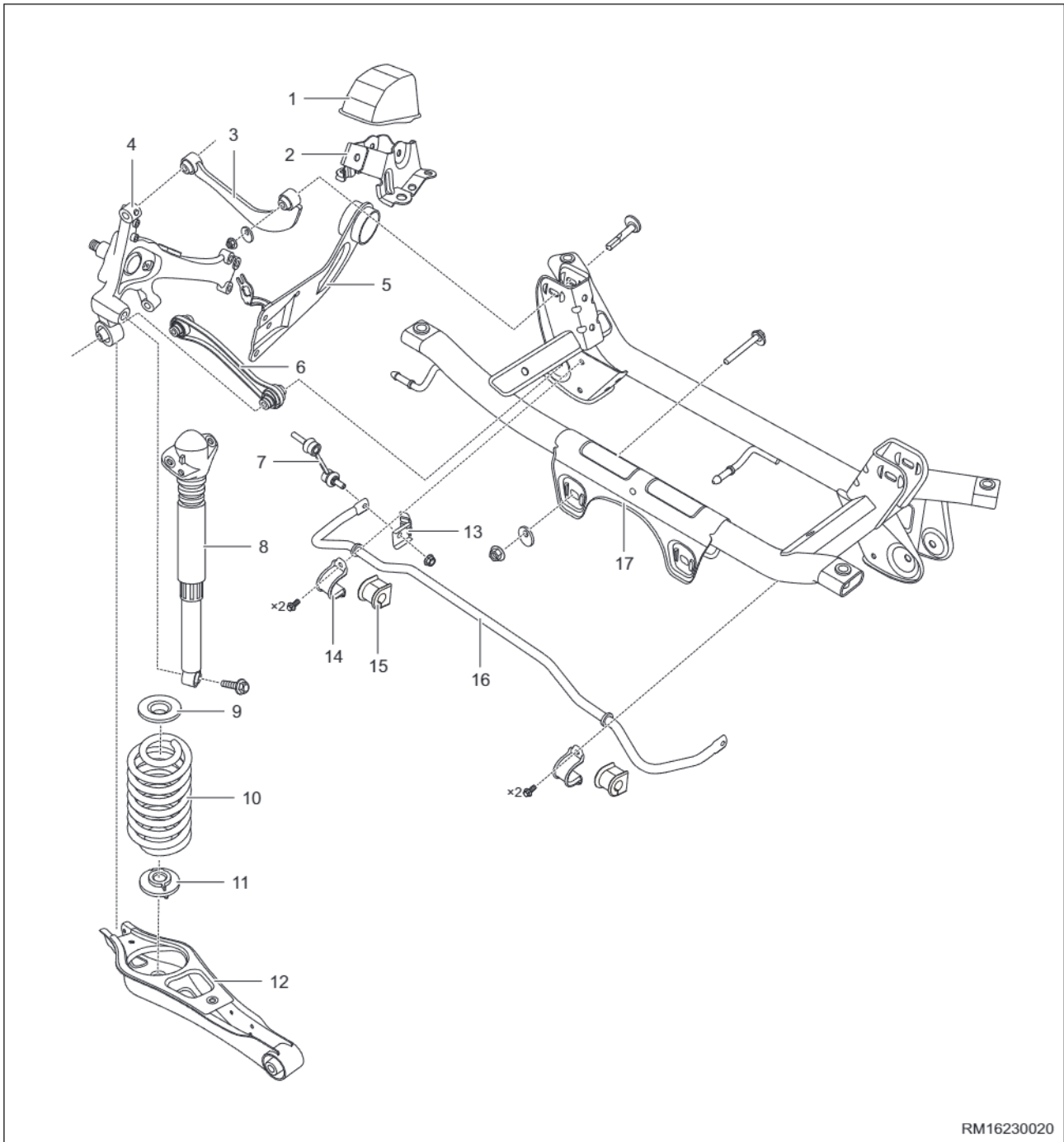


RM16230010

|                                              |                                                |
|----------------------------------------------|------------------------------------------------|
| 1 - Front Steering Knuckle                   | 2 - Front Shock Absorber Assembly              |
| 3 - Front Left stabilizer Link Assembly      | 4 - Front Stabilizer Bar Clamp                 |
| 5 - Front Stabilizer Bar Rubber Support      | 6 - Front Stabilizer Bar Assembly              |
| 7 - Front Right Stabilizer Link Assembly     | 8 - Front Sub Frame Welding Assembly           |
| 9 - Front Left Control Arm Ball Pin Assembly | 10 - Front Left Control Arm Assembly           |
| 11 - Rubber Bushing                          | 12 - Rubber Bushing                            |
| 13 - Front Right Control Arm Assembly        | 14 - Front Right 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



RM16230020

|                                                   |                                        |
|---------------------------------------------------|----------------------------------------|
| 1 - Rear Trailing Arm Mounting Bracket Dust Cover | 2 - Rear Trailing Arm Mounting Bracket |
| 3 - Rear Upper Control Arm Assembly               | 4 - Rear Steering Knuckle Assembly     |
| 5 - Rear Trailing Arm Assembly                    | 6 - Rear 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 - Fixing Bracket                               | 14 - Rear Stabilizer Bar Clamp         |
| 15 - Rear Stabilizer Bar Rubber Support           | 16 - Rear Stabilizer Bar               |
| 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               | 50 ± 5       |
| Coupling Bolt Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly             | 110 ± 10     |
| Coupling Nut Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly              | 110 ± 10     |
| Coupling Nut Between Front Shock Absorber Assembly and Body                                         | 50 ± 5       |
| Front Shock Absorber Assembly Locking Nut                                                           | 75 ± 5       |
| Coupling Nut Between Front Control Arm Ball Pin Assembly and Front Steering Knuckle Assembly        | 100 ± 10     |
| 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  | 135 ± 10     |
| Coupling Bolt Between Rear Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly  | 135 ± 10     |
| Coupling Nut Between Rear Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly   | 135 ± 10     |
| Coupling Nut Between Front Control Arm Ball Pin Assembly and Front Control Arm Assembly             | 50 ± 5       |

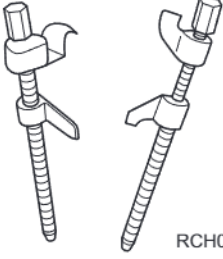
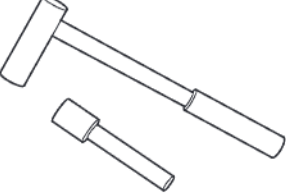
| Description                                                                                                   | Torque (N·m) |
|---------------------------------------------------------------------------------------------------------------|--------------|
| Coupling Bolt Between Front Control Arm Ball Pin Assembly and Front Control Arm Assembly                      | 50 ± 5       |
| Coupling Nut Between Front Stabilizer Bar Assembly and Front Stabilizer Link Assembly                         | 50 ± 5       |
| Coupling Bolt Between Front Sub Frame Welding Assembly and Steering Gear Assembly                             | 100 ± 10     |
| Coupling Bolt Between Upper Part of Front Sub Frame Welding Assembly and Body                                 | 180 ± 10     |
| Coupling Bolt Between Rear Part of Front Sub Frame Welding Assembly and Body                                  | 180 ± 10     |
| Coupling Bolt Between Rear Mounting Cushion Assembly Upper Body and Rear Mounting Cushion Assembly Lower Body | 80 ± 5       |
| Coupling Nut Between Rear Mounting Cushion Assembly Upper Body and Rear Mounting Cushion Assembly Lower Body  | 80 ± 5       |
| Coupling Bolt Between Front Stabilizer Bar Assembly and Front Sub Frame Welding Assembly                      | 20 ± 2       |
| Coupling Bolt Between Lower Part of Rear Shock Absorber Assembly and Rear Steering Knuckle Assembly           | 160 ± 10     |
| Coupling Bolt Between Upper Part of Rear Shock Absorber Assembly and Body                                     | 50 ± 5       |
| Rear Shock Absorber Assembly Fixing Nut                                                                       | 33 ± 3       |
| Coupling Bolt Between Rear Lower Control Arm Assembly and Rear Steering Knuckle Assembly                      | 90 ± 5       |
| Coupling Nut Between Rear Lower Control Arm Assembly and Rear Steering Knuckle Assembly                       | 90 ± 5       |
| Coupling Bolt Between Rear Upper Control Arm Assembly and Rear Steering Knuckle Assembly                      | 160 ± 10     |
| Coupling Nut Between Rear Upper Control Arm Assembly and Rear Steering Knuckle Assembly                       | 160 ± 10     |
| Coupling Bolt Between Rear Upper Control Arm Assembly and Rear Sub Frame Welding Assembly                     | 90 ± 5       |
| Coupling Nut Between Rear Upper Control Arm Assembly and Rear Sub Frame Welding Assembly                      | 90 ± 5       |
| Coupling Bolt Between Rear Lower Control Arm Assembly and Rear Sub Frame Welding Assembly                     | 90 ± 5       |
| Coupling Nut Between Rear Lower Control Arm Assembly and Rear Sub Frame Welding Assembly                      | 90 ± 5       |
| Coupling Plug Between Rear Brake Hose Assembly and Brake Pipe                                                 | 16 ± 1       |
| Coupling Bolt Between Parking Brake Rear Cable Assembly Fixing Bracket and Rear Trailing Arm Assembly         | 27 ± 3       |



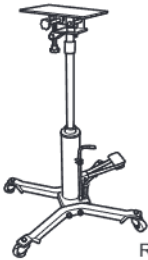
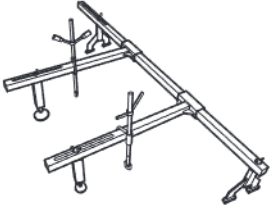
| Description                                                                            | Torque (N·m) |
|----------------------------------------------------------------------------------------|--------------|
| Coupling Bolt Between Rear Steering Knuckle Assembly and Rear Trailing Arm Assembly    | 90 ± 5       |
| Coupling Bolt Between Rear Trailing Arm Assembly Mounting Bracket and Body             | 50 ± 5       |
| Coupling Bolt Between Rear Trailing Arm Assembly and Mounting Bracket                  | 90 ± 5       |
| Coupling Nut Between Rear Trailing Arm Assembly and Mounting Bracket                   | 90 ± 5       |
| Coupling Bolt Between Rear Connecting Rod Assembly and Rear Steering Knuckle Assembly  | 160 ± 10     |
| Coupling Nut Between Rear Connecting Rod Assembly and Rear Steering Knuckle Assembly   | 160 ± 10     |
| Coupling Bolt Between Rear Connecting Rod Assembly and Rear Sub Frame Welding Assembly | 90 ± 5       |
| Coupling Nut Between Rear Connecting Rod Assembly and Rear Sub Frame Welding Assembly  | 90 ± 5       |
| Coupling Nut Between Rear Stabilizer Link Assembly and Rear Stabilizer Bar Assembly    | 50 ± 5       |
| Coupling Bolt Between Rear Stabilizer Bar Assembly and Rear Sub Frame Welding Assembly | 20 ± 2       |
| Coupling Nut Between Rear Stabilizer Link Assembly and Rear Trailing Arm Assembly      | 50 ± 5       |
| Steering Tie Rod Locking Nut                                                           | 50 - 60      |
| Steering Wheel Locking Nut                                                             | 35 ± 3       |

## Tools

### Special Tools

|                            |                                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------------------------|
| Spring Compressor          | <br>RCH0000021 |
| Shock Absorber Nut Remover | <br>RCH0000022  |

**General Tools**

|                      |                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------|
| Transmission Carrier |  <p>RCH0000005</p> |
| Engine Equalizer     |  <p>RCH0000026</p>  |

## 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)                   | 24-7     |
|                    | Front wheel alignment (incorrect)                          | 23-49    |
|                    | Control arm ball pin assembly (loose)                      | 23-22    |
|                    | Steering tie rod (loose or worn)                           | 29-19    |
|                    | Front hub bearing (excessively worn)                       | 22-14    |
|                    | Front suspension components (excessively worn or deformed) | 23-12    |
| Droop              | Vehicle (overloaded)                                       | -        |
|                    | Front coil spring (too soft)                               | 23-15    |
|                    | Front shock absorber assembly (worn or damaged)            | 23-12    |
|                    | Front suspension components (excessively worn or deformed) | 23-12    |
| Sways/pitches      | Front tire (worn or improperly inflated)                   | 24-7     |
|                    | Front stabilizer bar assembly (bent or broken)             | 23-24    |
|                    | Front shock absorber assembly (worn or damaged)            | 23-12    |
| Wheel shimmy       | Front tire (worn or improperly inflated)                   | 24-7     |
|                    | Front wheel (out of balance)                               | 24-11    |
|                    | Front shock absorber assembly (worn or damaged)            | 23-12    |
|                    | Front wheel alignment (incorrect)                          | 23-49    |
|                    | Control arm ball pin assembly (loose)                      | 23-22    |
|                    | Front hub bearing (excessively worn)                       | 22-14    |
|                    | Steering gear (misaligned or damaged)                      | 29-21    |
| Abnormal tire wear | Front tire (improperly inflated)                           | 24-7     |
|                    | Front wheel alignment (incorrect)                          | 23-49    |
|                    | Front shock absorber assembly (worn or deformed)           | 23-12    |
|                    | Front suspension components (worn or deformed)             | 23-12    |

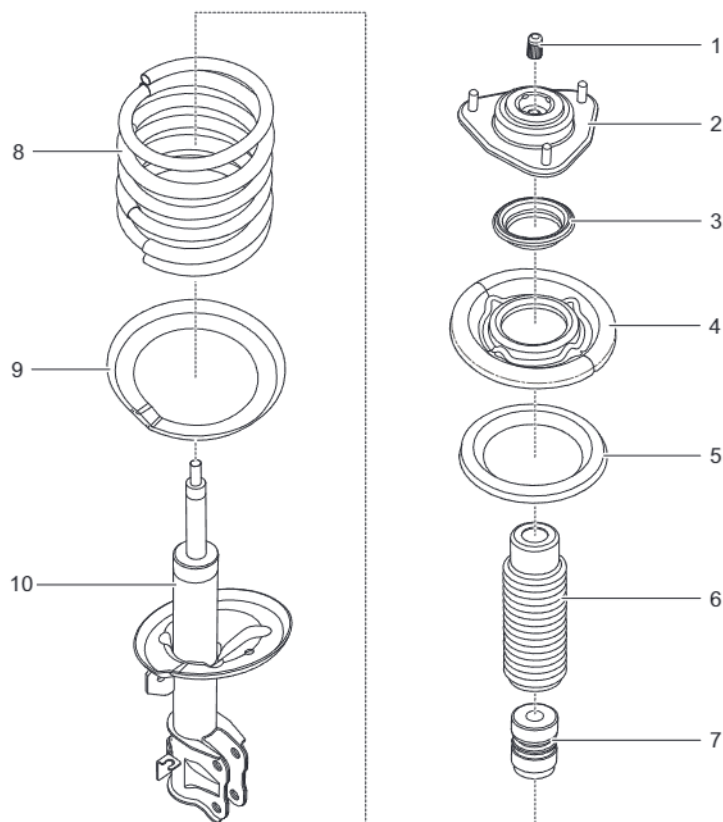
## Rear Suspension

| Symptom            | Suspected Area                                            | See page |
|--------------------|-----------------------------------------------------------|----------|
| Vehicle pulls      | Rear tire (worn or improperly inflated)                   | 24-7     |
|                    | Rear wheel alignment (incorrect)                          | 23-49    |
|                    | Rear hub bearing (excessively worn)                       | 22-20    |
|                    | Rear suspension components (worn or deformed)             | 23-30    |
| Droop              | Vehicle (overloaded)                                      | -        |
|                    | Rear coil spring (too soft)                               | 23-35    |
|                    | Rear shock absorber assembly (worn or damaged)            | 23-30    |
|                    | Rear suspension components (excessively worn or deformed) | 23-30    |
| Sways/pitches      | Rear tire (worn or improperly inflated)                   | 24-7     |
|                    | Rear stabilizer bar assembly (bent or broken)             | 23-45    |
|                    | Rear shock absorber assembly (worn or deformed)           | 23-30    |
| Wheel shimmy       | Rear tire (worn or improperly inflated)                   | 24-7     |
|                    | Rear wheel (out of balance)                               | 24-11    |
|                    | Rear shock absorber assembly (worn or damaged)            | 23-30    |
|                    | Rear wheel alignment (incorrect)                          | 23-49    |
|                    | Rear hub bearing (worn)                                   | 22-20    |
| Abnormal tire wear | Rear tire (improperly inflated)                           | 24-7     |
|                    | Rear wheel alignment (incorrect)                          | 23-49    |
|                    | Rear shock absorber assembly (worn or deformed)           | 23-30    |
|                    | Rear suspension components (worn or deformed)             | 23-30    |



# ON-VEHICLE SERVICE

## Front Shock Absorber Assembly



RM16230030

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 - Front Dust Boot

7 - Front Buffer Block

8 - Front Coil Spring

9 - Front Spring Lower Cushion

10 - Front Strut Assembly

## 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 the shock absorber assembly.
  - b. Shock absorber is designed with a thin layer of oil film on the surface of piston rod. While the shock absorber is being compressed, the oil film will be scraped off by dust plate on shock absorber oil seal and a small amount of oil will deposit on the upper part of oil seal. Due to high oil permeability, the oil deposited on the 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 the following conditions occurs:
    - 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 the 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 the 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 the surface of malfunctioning shock absorber. Under normal road conditions, drive vehicle for 5 to 10 minutes and perform inspection. If there are oil traces at the shock absorber assembly surface, it indicates that oil leakage exists, and it is necessary to replace the shock absorber assembly.

## Removal

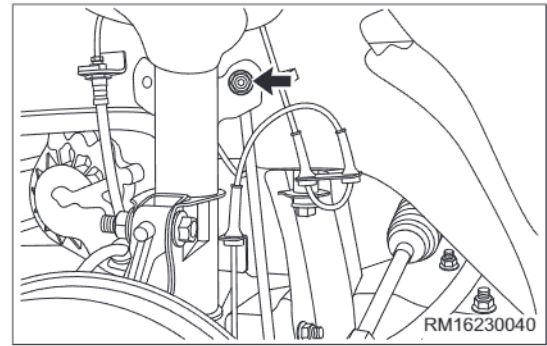
### WARNING

- 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.

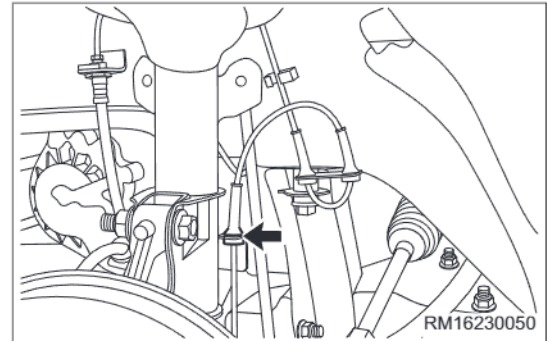
### HINT:

- Use same procedures for right and left sides.
  - Procedures listed below are for left side.
1. Remove the front left wheel ([See page 24-9](#)).
  2. Remove the front left shock absorber assembly.

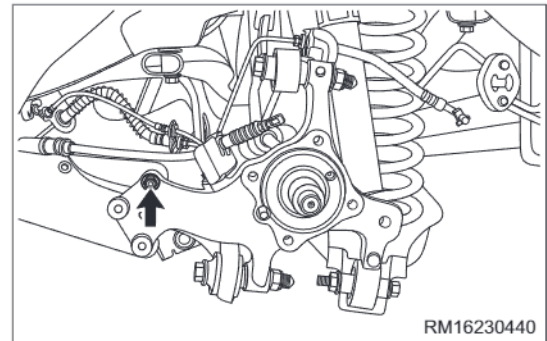
- a. Remove the coupling nut (arrow) between front left stabilizer link assembly and front left shock absorber assembly.  
(Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$ )



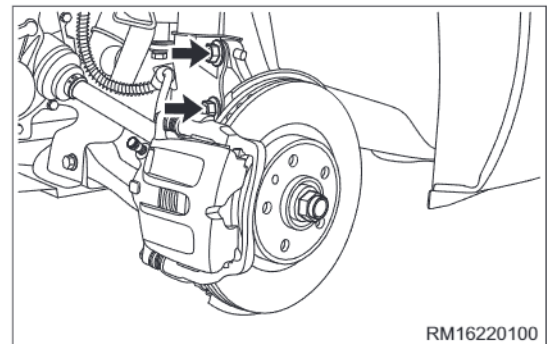
- b. Disengage the front left wheel speed sensor wire harness (arrow) from front left shock absorber assembly.



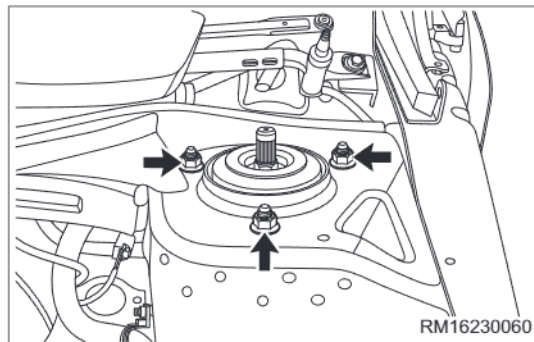
- c. Disengage the front left brake hose assembly (arrow) from front left shock absorber assembly.



- d. Remove 2 coupling bolts and nuts (arrow) between front left shock absorber assembly and front left steering knuckle assembly.  
(Tightening torque:  $110 \pm 10 \text{ N}\cdot\text{m}$ )



- e. Remove 3 coupling nuts (arrow) between front left shock absorber assembly and body.  
(Tightening torque:  $50 \pm 5$  N·m)

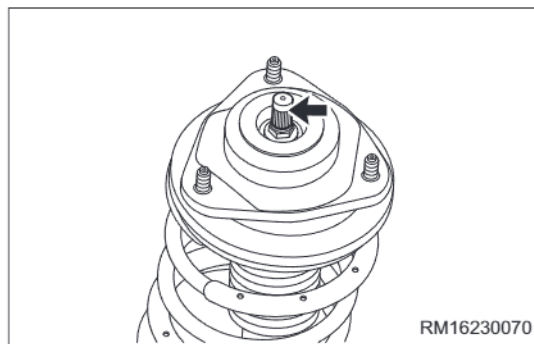


- f. Remove the front left shock absorber assembly with front coil spring.

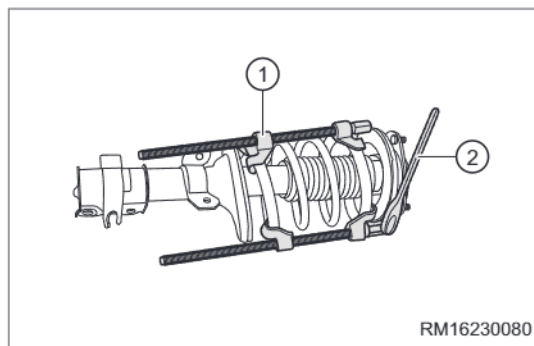
## Disassembly

### 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.



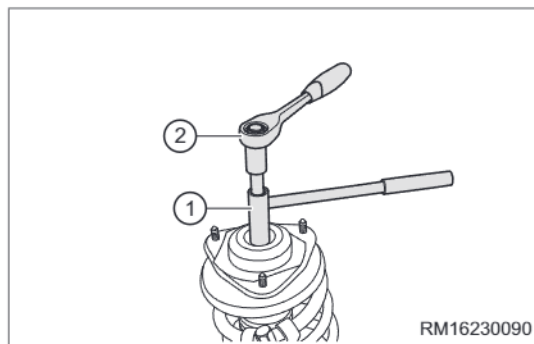
2. Remove the locking nut from front shock absorber assembly.
  - a. Using spring compressor (1) and wrench (2), tighten the end lever of spring compressor to compress the front coil spring.



### WARNING

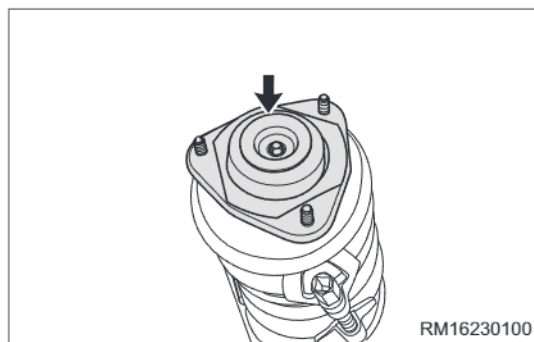
- When removing front coil spring, compress spring until locking nut can be rotated. DO NOT compress spring more than necessary, avoid damaging spring and personal injury.

- b. Hold the end of front left shock absorber assembly lever with a shock absorber nut remover (1), and then remove the locking nut from front left shock absorber assembly with a wrench (2).  
(Tightening torque:  $75 \pm 5 \text{ N}\cdot\text{m}$ )



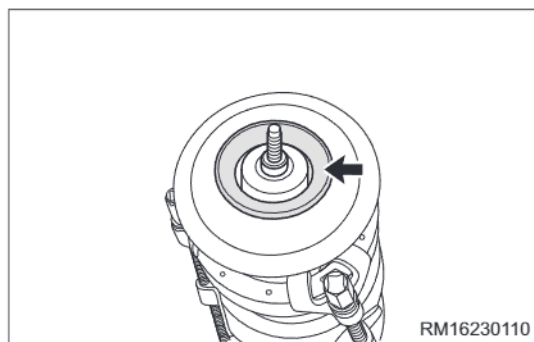
3. Remove the front strut upper connecting plate assembly (w/ insulator).

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



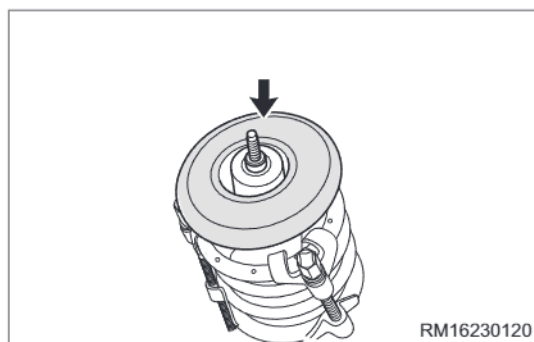
4. Remove the bearing assembly.

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



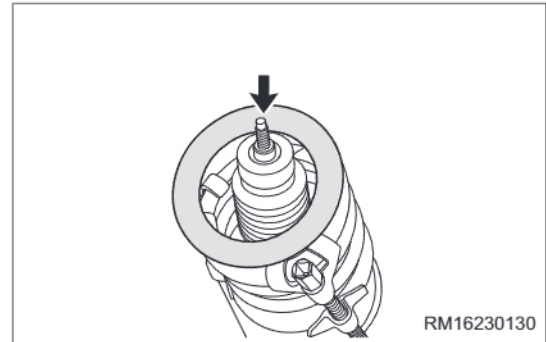
5. Remove the front spring upper tray.

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



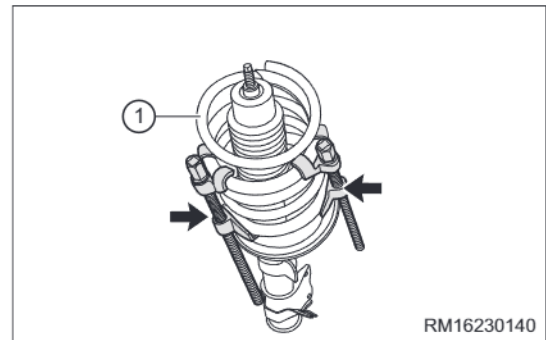
## 6. Remove the front spring upper cushion.

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



## 7. Remove the front coil spring.

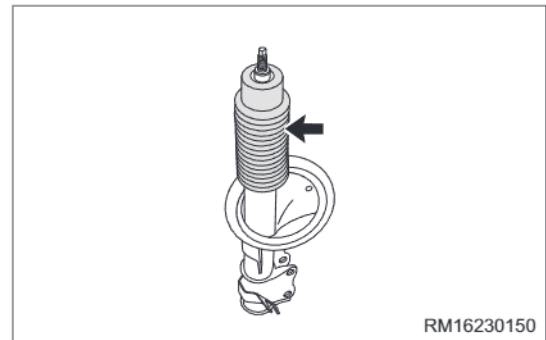
- a. Remove the front coil spring (1) with spring compressor (arrow) from front left shock absorber assembly.



- b. Slowly loosen the spring compressor, and carefully remove the front coil spring.

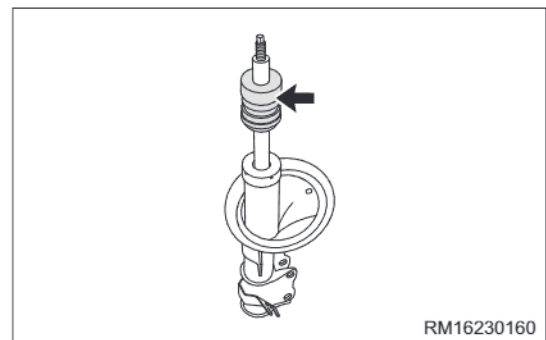
## 8. Remove the front dust boot.

- a. Remove the front dust boot (arrow) from the upper part of front left shock absorber assembly.



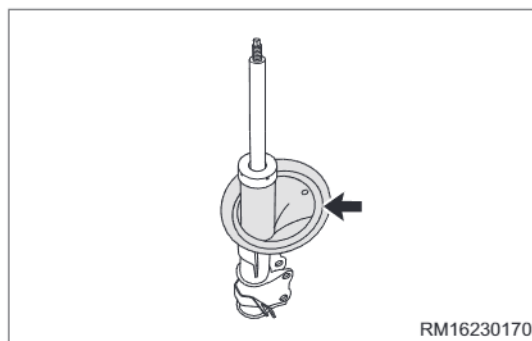
## 9. Remove the front buffer block.

- a. Detach the front buffer block (arrow) from front left shock absorber assembly, and remove it.



### 10. Remove the front spring lower cushion.

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

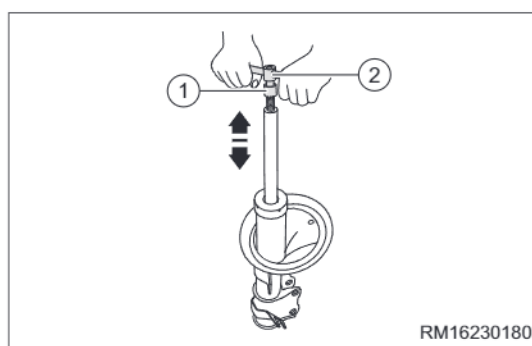


## Inspection

### 1. Check the front shock absorber assembly.

Manual check:

- a. Install the locking nut (1) to the upper end of front shock absorber assembly strut, and then install the T-wrench (2) or equivalent.
- b. Compress and extend the 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 the front shock absorber assembly with a new one.



### 2. Check the 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.

## Installation

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.

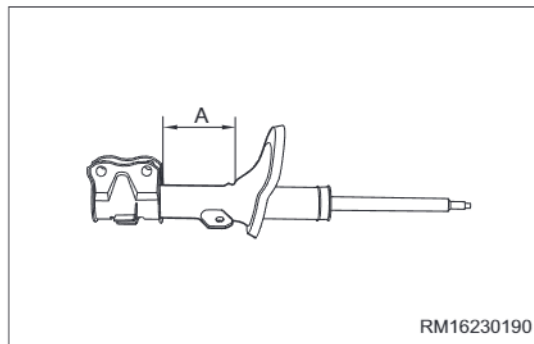
## Disposal

### WARNING

- 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 the front shock absorber assembly.

- Extend the front shock absorber assembly strut fully, and clamp it in a vise at an angle.
- 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.



### CAUTION

- Gas discharged from shock absorber is colorless and harmless. Be careful when drilling, because iron chips may fly out.

- Handle the 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

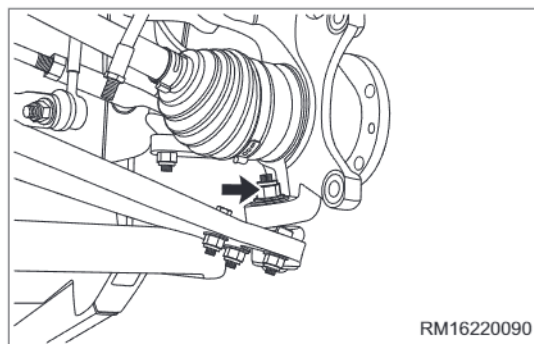
### Removal

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

#### HINT:

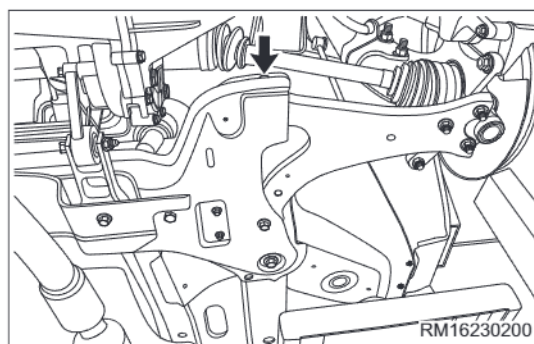
- Use same procedures for right and left sides.
  - Procedures listed below are for left side.
1. Remove the front left wheel (See page 24-9).
  2. Remove the front left control arm assembly.
    - a. Remove the coupling nut (arrow) between front left control arm ball pin assembly and front left steering knuckle assembly.  
(Tightening torque:  $100 \pm 10$  N·m)



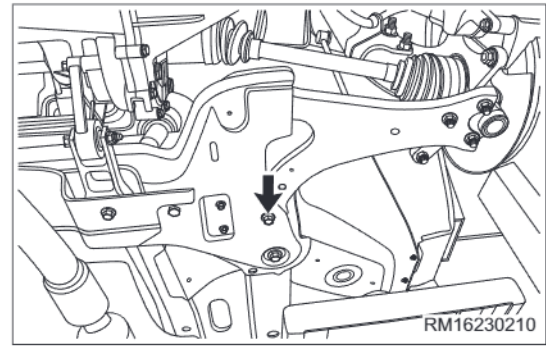
#### CAUTION

- 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.

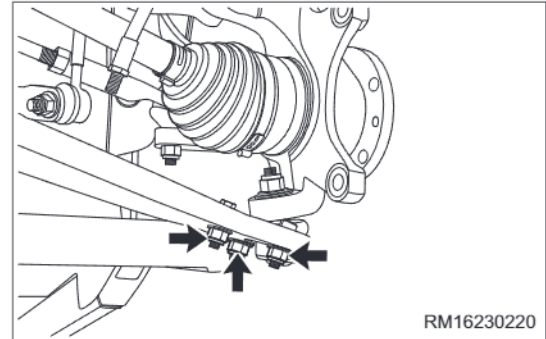
- b. Remove the coupling bolt and nut (arrow) between front part of front left control arm assembly and front sub frame welding assembly.  
(Tightening torque:  $135 \pm 10$  N·m)



- c. Remove the coupling bolt and nut (arrow) between rear part of front left control arm assembly and front sub frame welding assembly.  
(Tightening torque:  $135 \pm 10$  N·m)



- d. Remove the front left control arm assembly with ball pin.  
e. Remove 3 coupling bolts and nuts (arrow) between front left control arm assembly and front left control arm ball pin assembly.  
(Tightening torque:  $50 \pm 5$  N·m)



- f. Separate the front left control arm assembly and front left control arm ball pin assembly.

## Installation

Installation is in the reverse order of removal.

### CAUTION

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

## Front Control Arm Ball Pin Assembly

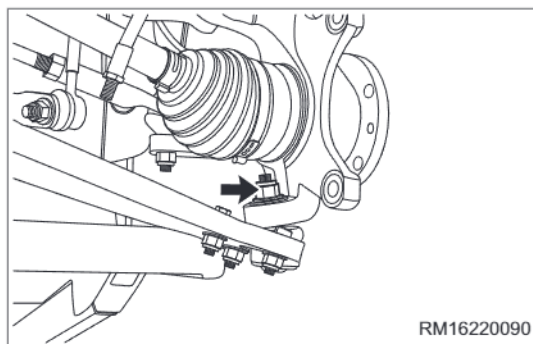
### Removal

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

#### HINT:

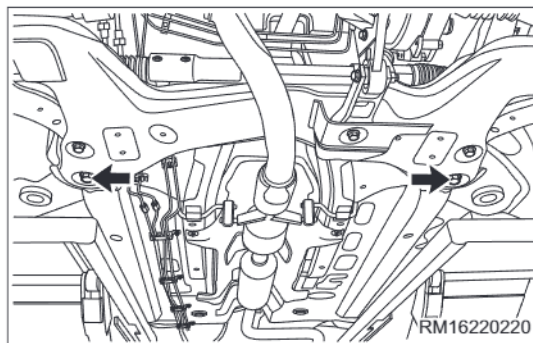
- Use same procedures for right and left sides.
  - Procedures listed below are for left side.
1. Remove the front left wheel ([See page 24-9](#)).
  2. Remove the front left control arm ball pin assembly.
    - a. Remove the coupling nut (arrow) between front left control arm ball pin assembly and front left steering knuckle assembly.  
(Tightening torque:  $100 \pm 10 \text{ N}\cdot\text{m}$ )



#### 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.

- b. Remove 3 coupling bolts and nuts (arrow) between front left control arm assembly and front left control arm ball pin assembly.  
(Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$ )



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

## Inspection

1. Check the control arm ball pin assembly.
  - a. Check control arm ball pin assembly bushes for wear, cracks, deformation, damage or grease leakage. Replace as necessary.
  - b. Check if control arm ball pin assembly 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 torques.
- Make sure that ball pin assembly rotates smoothly and there is no seizing after installation.
- Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

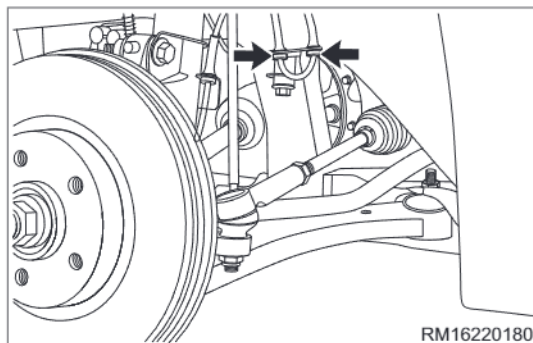
## Front Stabilizer Bar Assembly

### Removal

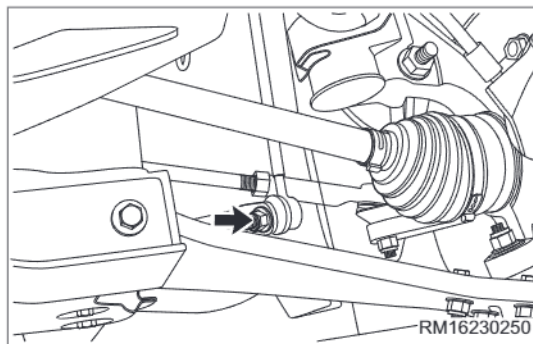
#### CAUTION

- 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.

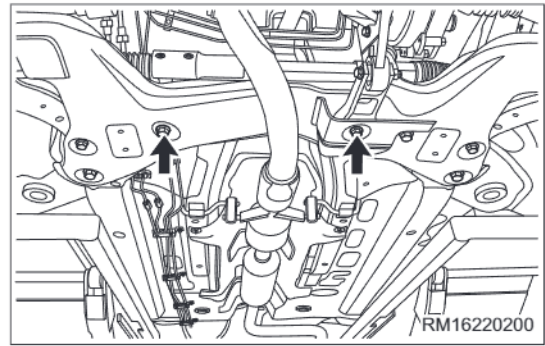
1. Remove the front wheel ([See page 24-9](#)).
2. Remove the front control arm assembly ([See page 23-20](#)).
3. Remove the engine lower protector assembly ([See page 49-22](#)).
4. Remove the main catalytic converter assembly ([See page 11-9](#)).
5. Remove the front stabilizer bar assembly.
  - a. Using an engine equalizer, support the engine and transmission assembly securely.
  - b. Disengage the front wheel speed sensor fixing parts (arrow) from front sub frame welding assembly.



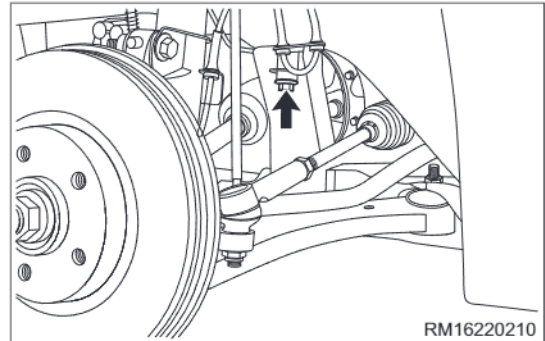
- c. Remove the coupling nut (arrow) between front left stabilizer bar assembly and front left stabilizer link assembly with a fixing wrench. Use same removal procedure for right side.  
(Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$ )



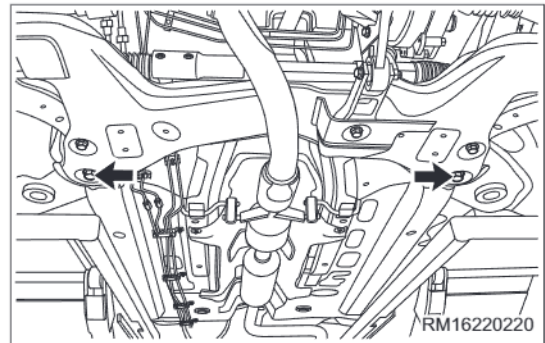
- d. Remove 2 coupling bolts (arrow) between front sub frame welding assembly and steering gear assembly.  
(Tightening torque:  $100 \pm 10$  N·m)



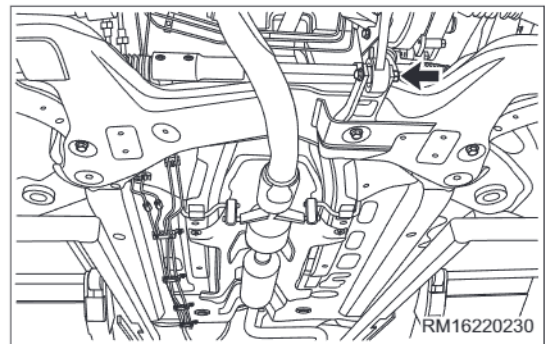
- e. Remove the coupling bolt (arrow) between rear left part of front sub frame welding assembly and body.  
Use same removal procedure for right side.  
(Tightening torque:  $180 \pm 10$  N·m)



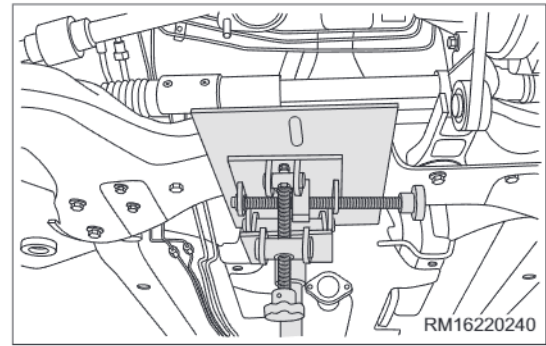
- f. Remove 2 coupling bolts (arrow) between rear part of front sub frame welding assembly and body.  
(Tightening torque:  $180 \pm 10$  N·m)



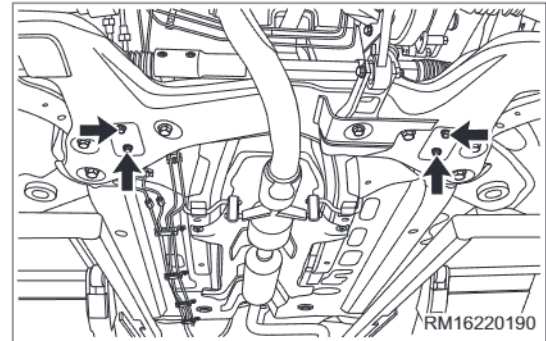
- g. Remove the coupling bolt and nut (arrow) between rear mounting cushion assembly upper body and rear mounting cushion assembly lower body.  
(Tightening torque:  $80 \pm 5$  N·m)



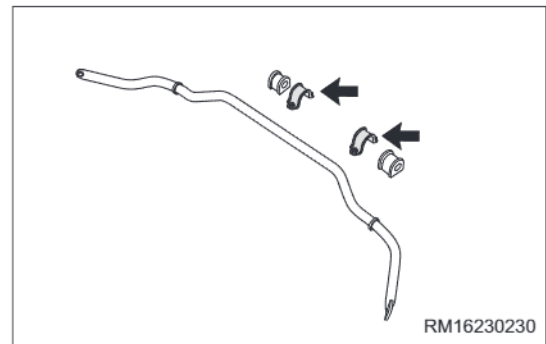
- h. Using a transmission carrier, support the front sub frame welding assembly and lower it carefully.



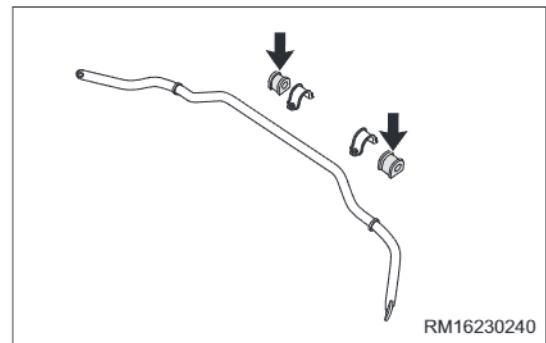
- i. Remove 4 coupling bolts (arrow) between front stabilizer bar assembly and front sub frame welding assembly.  
(Tightening torque:  $20 \pm 2$  N·m)



- j. Remove the front stabilizer bar assembly.  
k. Detach the left and right fixing clamps (arrow) from front stabilizer bar assembly.



- l. Detach the 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 torques.

## Front Stabilizer Link Assembly

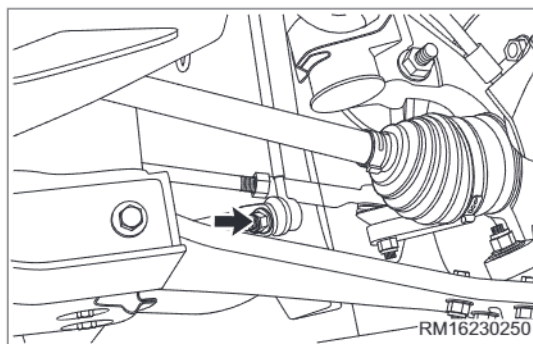
### Removal

#### CAUTION

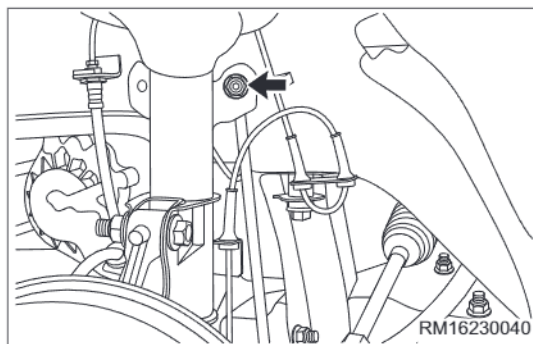
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts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

#### HINT:

- Use same procedures for right and left sides.
  - Procedures listed below are for left side.
1. Remove the front left wheel (See page 24-9).
  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:  $50 \pm 5$  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 link assembly and front left shock absorber assembly with a fixing wrench.  
(Tightening torque:  $50 \pm 5$  N·m)



- c. Remove the front left stabilizer link assembly.

### Inspection

23

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.

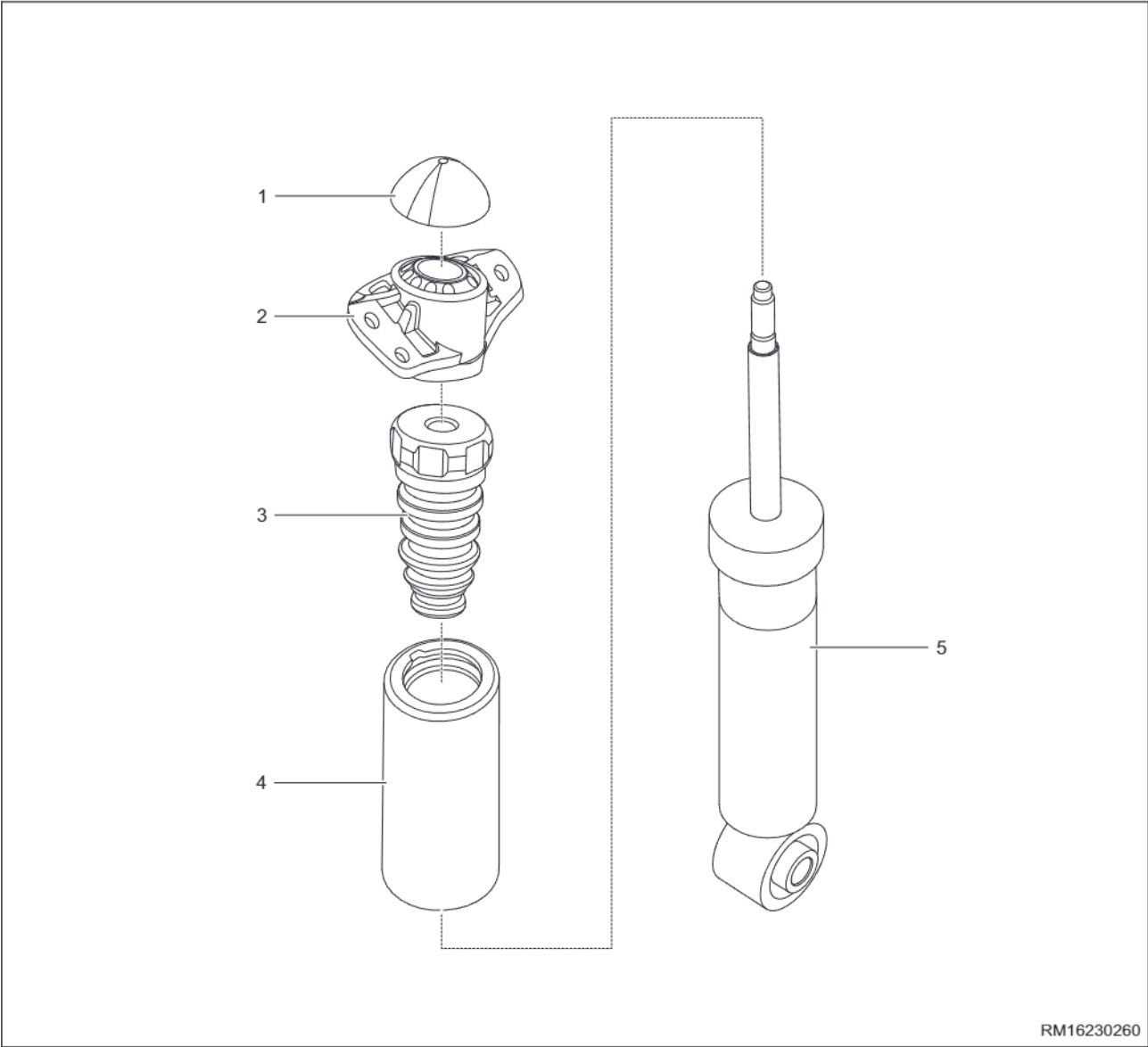
## Installation

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 seizing after installation.

# Rear Shock Absorber Assembly



RM16230260

|                                   |                                                                        |
|-----------------------------------|------------------------------------------------------------------------|
| 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  |                                                                        |

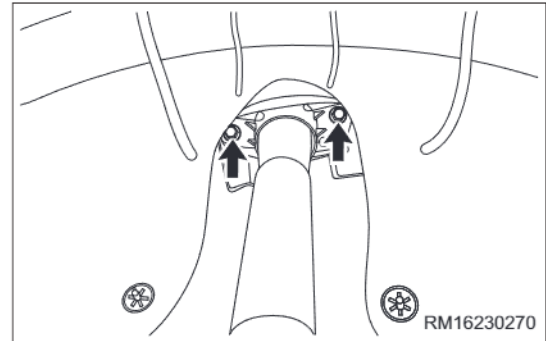
## Removal

### CAUTION

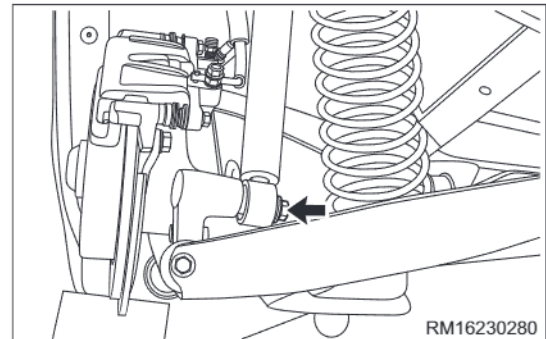
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts 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 shock absorber assembly.
    - a. Remove 2 coupling bolts (arrow) between upper part of rear left shock absorber assembly and body.  
(Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$ )



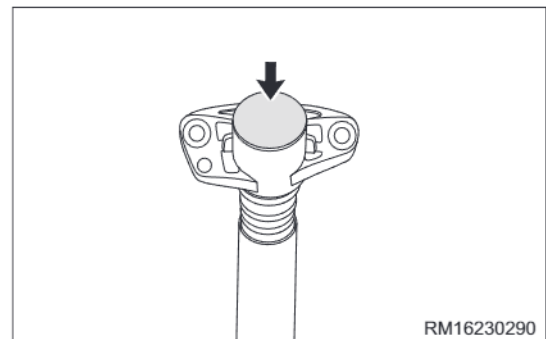
- b. Remove the coupling bolt (arrow) between lower part of rear left shock absorber assembly and rear left steering knuckle assembly.  
(Tightening torque:  $160 \pm 10 \text{ N}\cdot\text{m}$ )



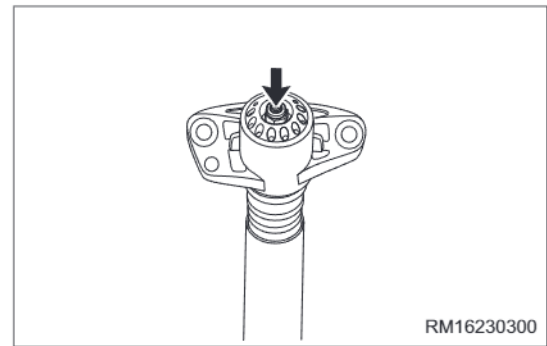
- c. Remove the rear left shock absorber assembly.

## Disassembly

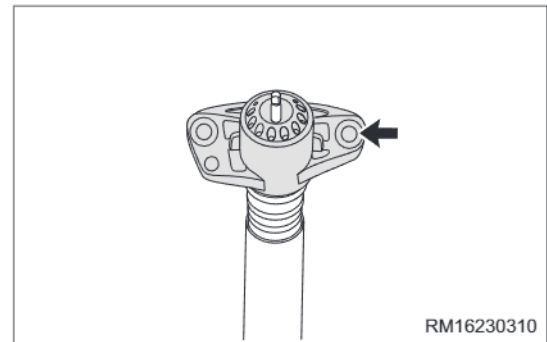
1. Remove the rear shock absorber assembly.
  - a. Remove the rear shock absorber cover cap (arrow).



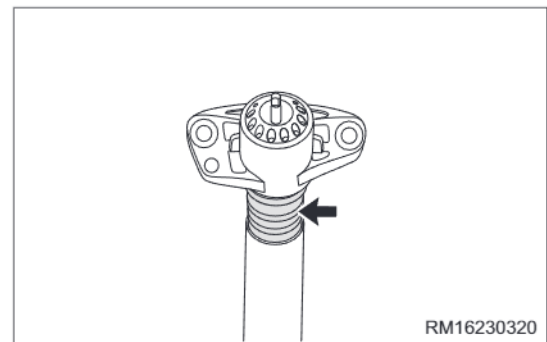
- b. Remove the fixing nut (arrow) from rear shock absorber assembly.  
(Tightening torque:  $33 \pm 3$  N·m)



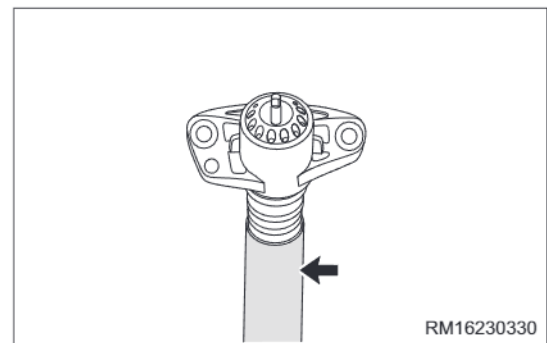
- c. Remove the rear shock absorber upper connecting plate assembly (w/ insulator) (arrow).



- d. Remove the rear buffer block (arrow).



- e. Remove the rear dust boot (arrow).

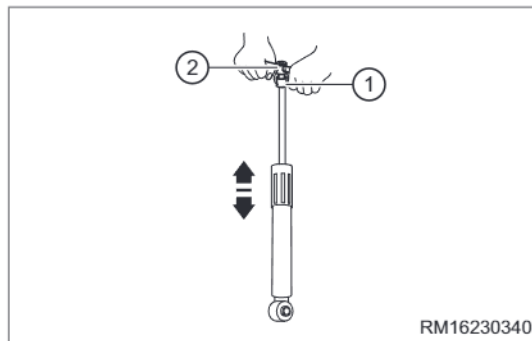


## Inspection

### 1. Check the rear shock absorber assembly.

Manual check:

- a. Install the nut (1) to the upper end of rear shock absorber assembly strut, and then install the T-wrench (2) or equivalent.
- b. Compress and extend the 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 the 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 rear shock absorber upper connecting plate assembly (w/ insulator) for damage. Replace as necessary.

## Assembly

Assembly is in the reverse order of disassembly.

## Installation

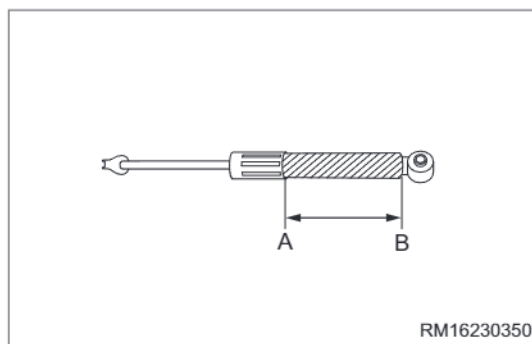
Installation is in the reverse order of removal.

### CAUTION

- Be sure to tighten coupling bolts and nuts to specified torques.
- Make sure installation angle is  $14.423^\circ$ , when connecting rear shock absorber and rear steering knuckle.
- 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 the illustration, to discharge gas from rear shock absorber assembly.



### CAUTION

- Be careful when drilling, because metal 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

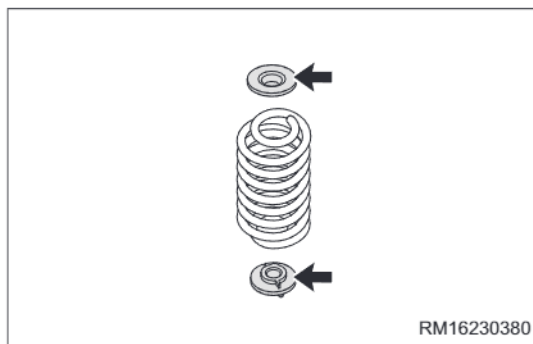
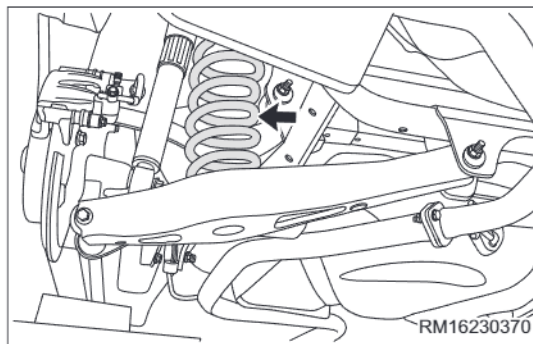
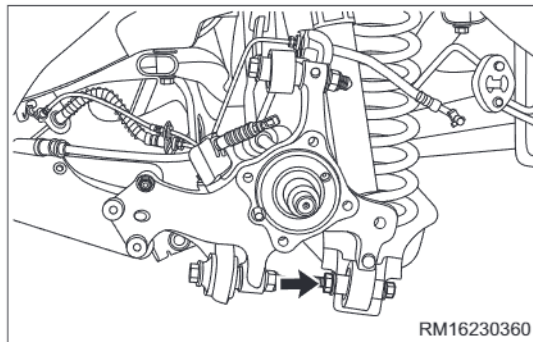
### Removal

#### 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 24-9](#)).
  2. Remove the rear coil spring.
    - a. Support the rear lower control arm assembly with a transmission carrier securely.
    - b. Remove the coupling bolt and nut (arrow) between rear lower control arm assembly and rear steering knuckle assembly.  
(Tightening torque:  $90 \pm 5 \text{ N}\cdot\text{m}$ )
    - c. Lower the transmission carrier slowly to an appropriate height and remove the rear coil spring (arrow) carefully.
    - d. Remove the 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 cushion and rear coil spring lower cushion 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 the protrusion of rear coil spring lower cushion with the positioning hole of rear lower control arm assembly during installation.
- After installation, lower vehicle and bounce vehicle up and down several times to stabilize rear suspension.

## Rear Upper Control Arm Assembly

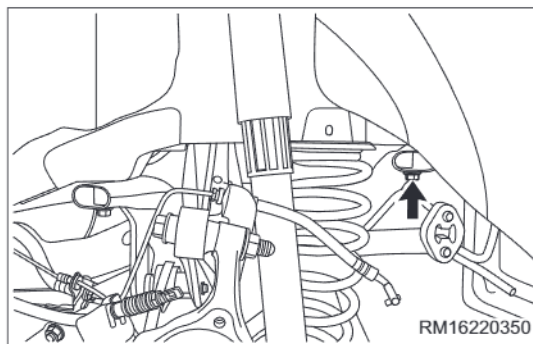
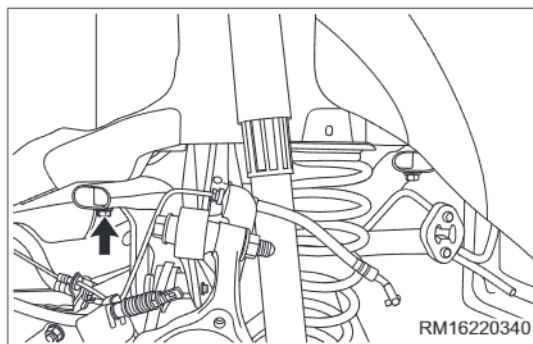
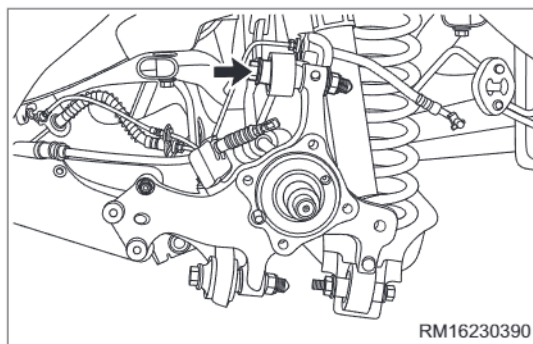
### Removal

#### CAUTION

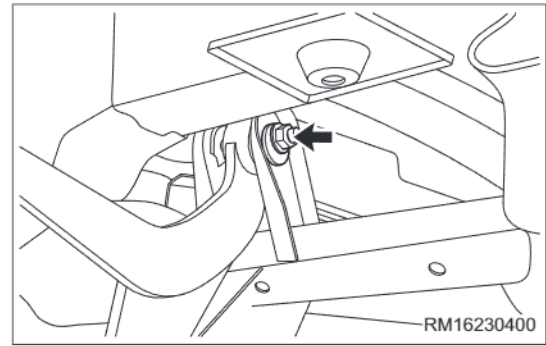
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts 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 24-9](#)).
  2. Remove the rear upper control arm assembly.
    - a. Remove the coupling bolt and nut (arrow) between rear upper control arm assembly and rear steering knuckle assembly.  
(Tightening torque:  $160 \pm 10$  N·m)
    - b. Remove the coupling bolt (arrow) between front left part of rear sub frame welding assembly and body.  
(Tightening torque:  $135 \pm 10$  N·m)
    - c. Remove the coupling bolt (arrow) between rear left part of rear sub frame welding assembly and body.  
(Tightening torque:  $135 \pm 10$  N·m)



- d. Remove the coupling bolt, nut and adjusting washer (arrow) between rear upper control arm assembly and rear sub frame welding assembly.  
(Tightening torque:  $90 \pm 5$  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 torques.
- Check wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

## Rear Lower Control Arm Assembly

### Removal

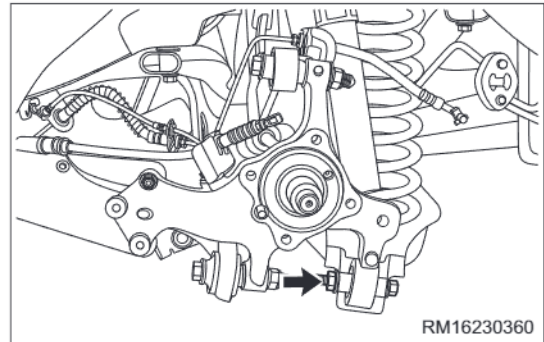
#### CAUTION

- 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.

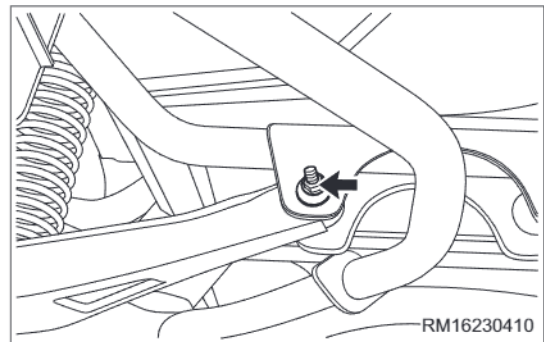
#### HINT:

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

1. Remove the rear wheel ([See page 24-9](#)).
2. Remove the rear lower control arm assembly.
  - a. Support the rear lower control arm assembly with a transmission carrier securely.
  - b. Remove the coupling bolt and nut (arrow) between rear lower control arm assembly and rear steering knuckle assembly.  
(Tightening torque:  $90 \pm 5 \text{ N}\cdot\text{m}$ )



- c. Lower the transmission carrier slowly to an appropriate height and remove the rear coil spring, rear coil spring upper cushion and rear coil spring lower cushion carefully.
- d. Remove the coupling bolt, nut and adjusting washer (arrow) between rear lower control arm assembly and rear sub frame welding assembly.  
(Tightening torque:  $90 \pm 5 \text{ N}\cdot\text{m}$ )



- 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 front wheel alignment after installation. Adjust wheel alignment to the standard range as necessary.

## Rear Trailing Arm Assembly

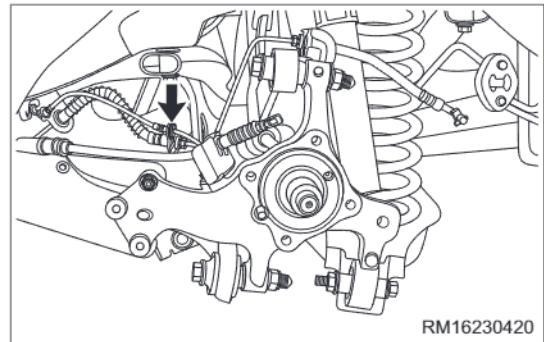
### Removal

#### CAUTION

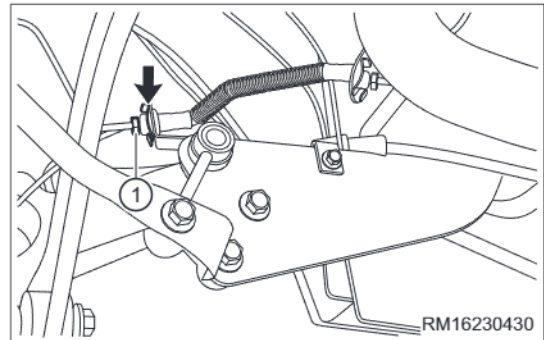
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts 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 24-9](#)).
  2. Remove the rear trailing arm assembly (w/ mounting bracket).
    - a. Disengage the rear wheel speed sensor wire harness (arrow) from rear trailing arm assembly.



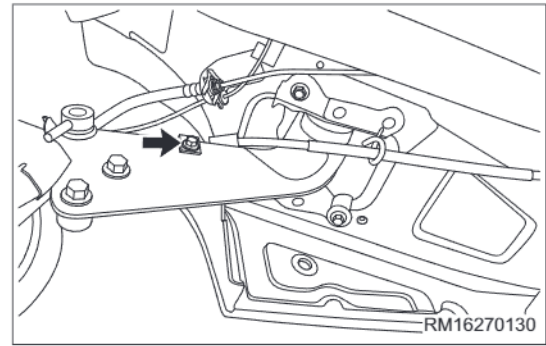
- b. Disengage the fixing clip (arrow) and loosen the coupling plug (1) between rear brake hose assembly and brake pipe.  
(Tightening torque:  $16 \pm 1$  N·m)



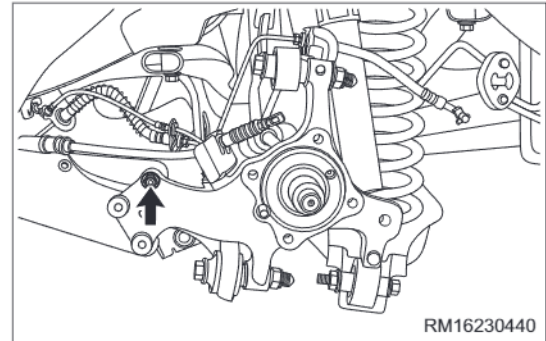
#### CAUTION

- 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.

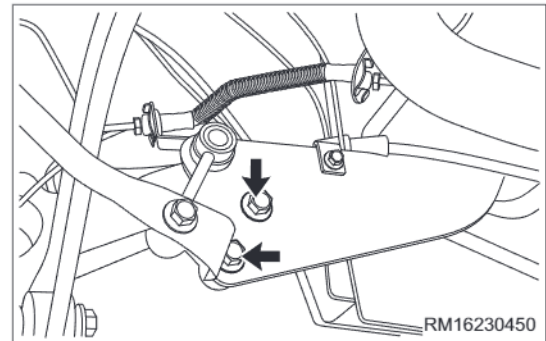
- c. Remove the coupling bolt (arrow) between parking brake rear cable assembly fixing bracket and rear trailing arm assembly.  
(Tightening torque:  $27 \pm 3$  N·m)



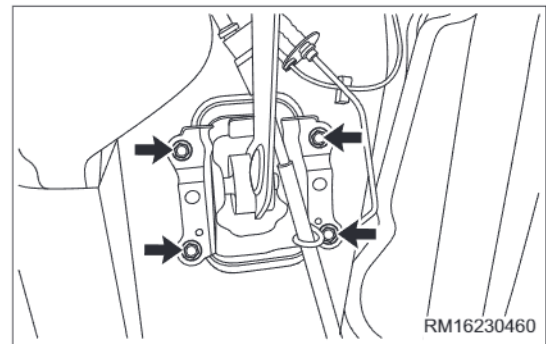
- d. Remove the coupling nut (arrow) between rear stabilizer link assembly and rear trailing arm assembly, and disengage the rear stabilizer link assembly.  
(Tightening torque:  $50 \pm 5$  N·m)



- e. Remove 2 coupling bolts (arrow) between rear steering knuckle assembly and rear trailing arm assembly.  
(Tightening torque:  $90 \pm 5$  N·m)



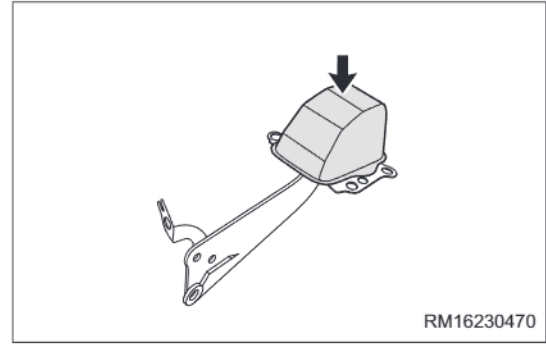
- f. Remove 4 coupling bolts (arrow) between rear trailing arm assembly mounting bracket and body.  
(Tightening torque:  $50 \pm 5$  N·m)



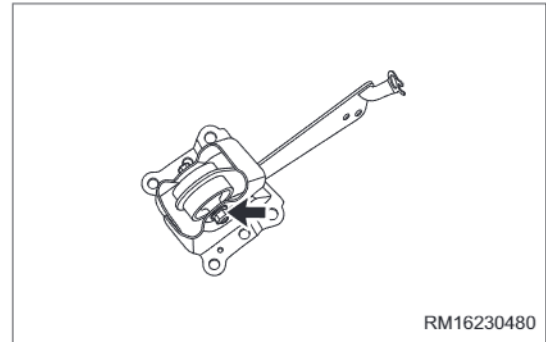
- g. Remove the rear trailing arm assembly (w/ mounting bracket).

## Disassembly

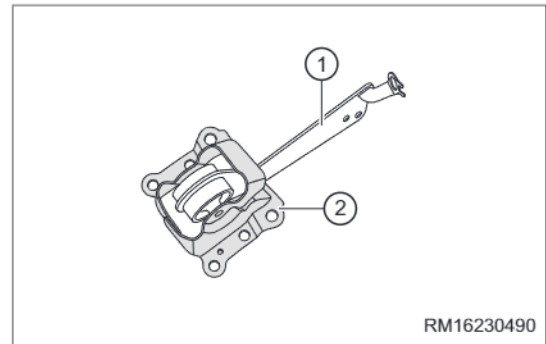
1. Remove the rear trailing arm assembly (w/ mounting bracket).
  - a. Remove the rear trailing arm mounting bracket dust cover (arrow).



- b. Remove the coupling bolt and nut (arrow) between rear trailing arm assembly and mounting bracket. (Tightening torque:  $90 \pm 5 \text{ N}\cdot\text{m}$ )



- c. Separate the rear trailing arm assembly (1) and mounting bracket (2).



## 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 torques.

## Rear Connecting Rod Assembly

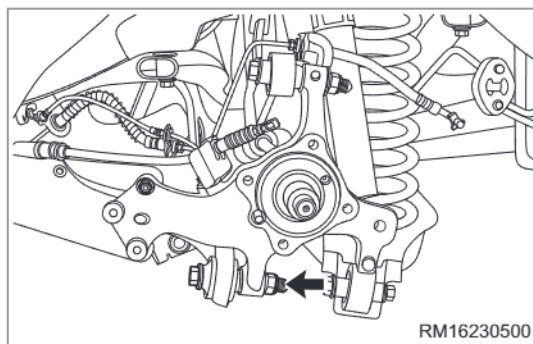
### Removal

#### CAUTION

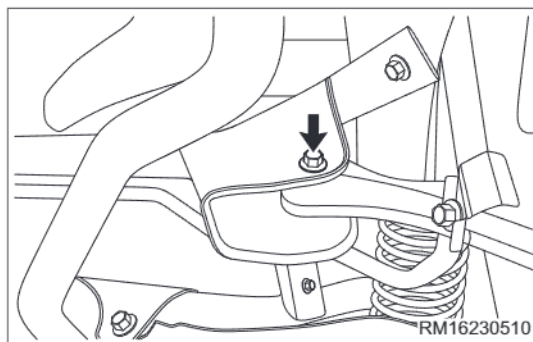
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts 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 24-9](#)).
  2. Remove the rear connecting rod assembly.
    - a. Remove the coupling bolt and nut (arrow) between rear connecting rod assembly and rear steering knuckle assembly.  
(Tightening torque:  $160 \pm 10 \text{ N}\cdot\text{m}$ )



- b. Remove the coupling bolt and nut (arrow) between rear connecting rod assembly and rear sub frame welding assembly.  
(Tightening torque:  $90 \pm 5 \text{ N}\cdot\text{m}$ )



- c. Remove the rear connecting rod assembly.

### Installation

23

Installation is in the reverse order of removal.

#### CAUTION

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

## Rear Stabilizer Bar Assembly

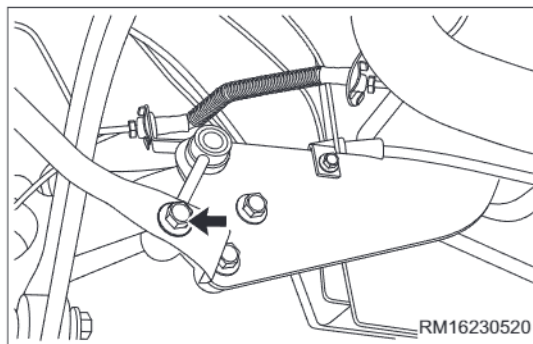
### Removal

#### CAUTION

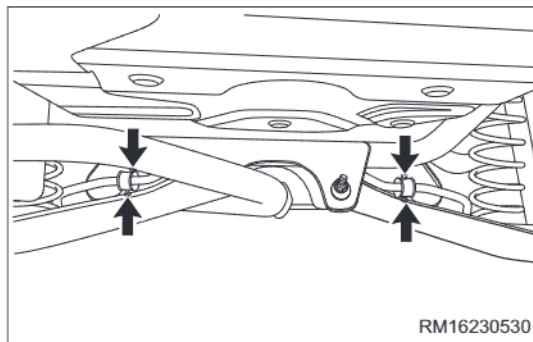
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts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

#### 1. Remove the rear stabilizer bar assembly.

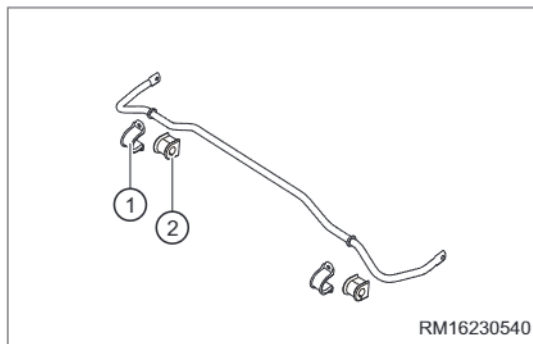
- a. Remove the coupling nut (arrow) between rear left stabilizer link assembly and rear stabilizer bar assembly. Use same removal procedure for right side. (Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$ )



- b. Remove 4 coupling bolts (arrow) between rear stabilizer bar assembly and rear sub frame welding assembly. (Tightening torque:  $20 \pm 2 \text{ N}\cdot\text{m}$ )



- c. Remove the rear stabilizer bar assembly.
- d. Remove the rear stabilizer bar fixing clamps (1) and rear stabilizer bar rubber supports (2) from rear stabilizer bar assembly.



## 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 torques.

## Rear Stabilizer Link Assembly

### Removal

#### CAUTION

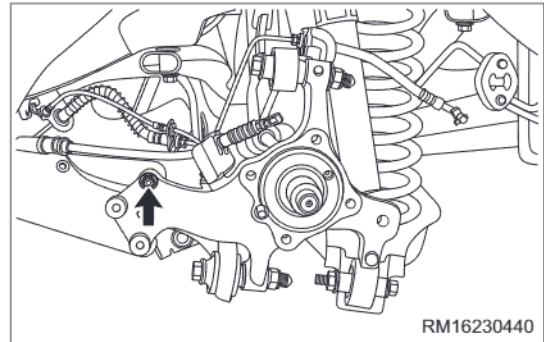
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts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

#### HINT:

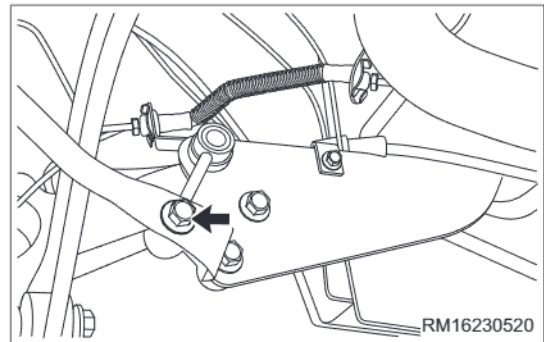
- Use same procedures for right and left sides.
- Procedures listed below are for left side.

#### 1. Remove the rear stabilizer link assembly.

- Remove the coupling nut (arrow) between rear stabilizer link assembly and rear trailing arm assembly, and disengage the rear stabilizer link assembly.  
(Tightening torque:  $50 \pm 5$  N·m)



- Remove the coupling nut (arrow) between rear stabilizer link assembly and rear stabilizer bar assembly.  
(Tightening torque:  $50 \pm 5$  N·m)



- Remove the rear stabilizer link assembly.

### Inspection

#### 1. Check the rear stabilizer link assembly.

- Check rear stabilizer link assembly bush for wear, cracks, deformation, damage or grease leakage. Replace as necessary.
- 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 seizing 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 the 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

Specifications (parameters standard for four-wheel alignment)

| Item             |                     | Specified Value         |
|------------------|---------------------|-------------------------|
| Front Wheel      | Front Wheel Camber  | $-0.4^{\circ} \pm 20'$  |
|                  | Front Wheel Toe-in  | $-0.05^{\circ} \pm 6'$  |
|                  | Kingpin Inclination | $12.56^{\circ} \pm 30'$ |
|                  | Kingpin Caster      | $3.95^{\circ} \pm 30'$  |
| Rear Wheel       | Rear Wheel Camber   | $-0.7^{\circ} \pm 20'$  |
|                  | Rear Wheel Toe-in   | $0.11^{\circ} \pm 10'$  |
| Sideways Sliding |                     | $\leq 3 \text{ m/km}$   |

## 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)  | <a href="#">23-49</a> |
|                    | Rear wheel alignment (incorrect)   | <a href="#">23-49</a> |
| Wheel shimmy       | Front wheel alignment (incorrect)  | <a href="#">23-49</a> |
|                    | Rear wheel alignment (incorrect)   | <a href="#">23-49</a> |
| Abnormal tire wear | Tire (worn or improperly inflated) | <a href="#">24-7</a>  |
|                    | Front wheel alignment (incorrect)  | <a href="#">23-49</a> |
|                    | Rear wheel alignment (incorrect)   | <a href="#">23-49</a> |

## Inspection before Wheel Alignment

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

### Standard Cold Tire Inflation Pressure (kPa)

| Item            | Front Wheel | Rear Wheel | Spare Tire |
|-----------------|-------------|------------|------------|
| Tire (Unloaded) | 220         | 220        | 250        |

- Check the rim and tire.
  - Visually check rim and tire for scratches, wear or damage.
  - Perform wheel dynamic balance procedures ([See page 24-11](#)).

## 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 the tolerance due to other reasons, adjust through the coupling bolt between independent suspension and steering knuckle.

### Specified Value for Front Wheel Camber

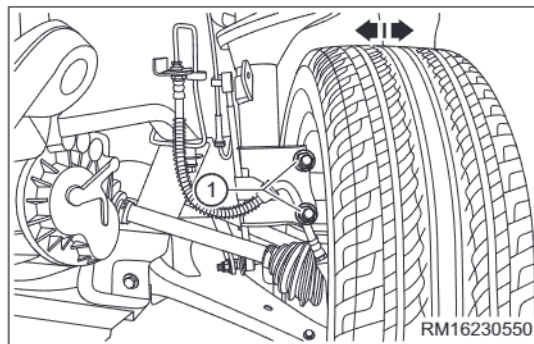
| Item               | Specified Value        |
|--------------------|------------------------|
| Front Wheel Camber | $-0.4^{\circ} \pm 20'$ |

## 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.

## Adjustment

1. If front wheel camber is not within the tolerance of specified value, loosen the coupling bolts (1) between front shock absorber assembly and front steering knuckle, and move wheel to adjust.



2. Tighten coupling bolts to the specified torque after adjusting front wheel camber.  
(Tightening torque:  $110 \pm 10 \text{ N}\cdot\text{m}$ )

## 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.

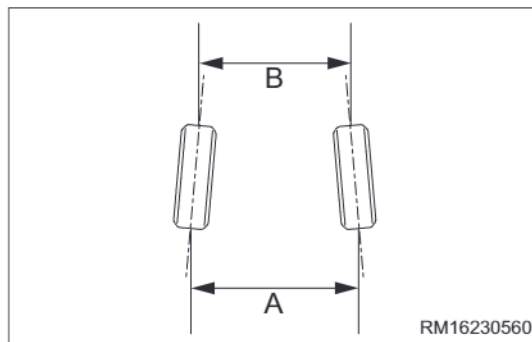
If front wheel toe-in is not within the tolerance due to other reasons, adjust the length of steering tie rod to return the toe-in to specified value.

### Specified Value for Front Wheel Toe-in

| Item               | Specified Value        |
|--------------------|------------------------|
| Front Wheel Toe-in | $-0.05^{\circ} \pm 6'$ |

## Inspection

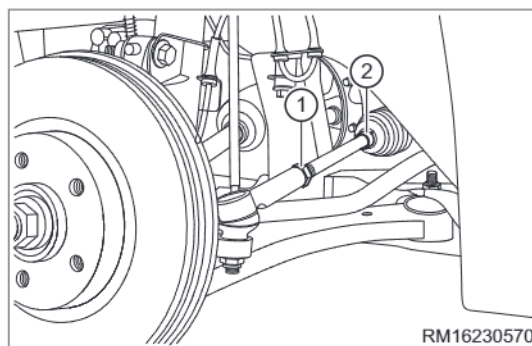
1. Perform inspection with four-wheel alignment device (perform inspection procedures referring to operating instructions for four-wheel alignment device).
2. Manual check:
  - a. Park vehicle on level ground, check if front tire pressure is within the specified range and adjust it to specified value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



RM16230560

## Adjustment

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



RM16230570

3. Tighten the steering tie rod locking nut and reinstall the elastic jacket snap ring. Check if locking nut is tightened in place and if jacket position is correct.  
(Tightening torque: 50 - 60 N·m)

23

### 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 the steering wheel locking nut and adjust the steering wheel to horizontal position, and then tighten the steering wheel locking nut to specified torque.  
(Tightening torque:  $35 \pm 3 \text{ N}\cdot\text{m}$ )

## 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 the 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 it is, replace corresponding components.

### Specified Value for Kingpin Caster & Kingpin Inclination

| Item                | Specified Value         |
|---------------------|-------------------------|
| Kingpin Caster      | $3.95^{\circ} \pm 30'$  |
| Kingpin Inclination | $12.56^{\circ} \pm 30'$ |

## 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 the 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 the camber to specified value.

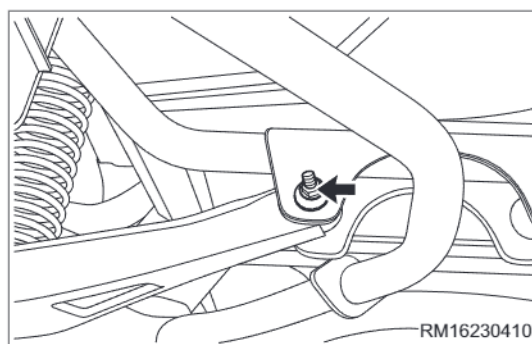
If rear wheel camber is not as specified, check rear suspension and wheels for damage or deformation. Replace damaged or deformed components as necessary.

### Specified Value for Rear Wheel Camber

| Item              | Specified Value        |
|-------------------|------------------------|
| Rear Wheel Camber | $-0.7^{\circ} \pm 20'$ |

## Adjustment

1. Make adjusting preparation for wheel alignment according to the requirement of tester.
2. Loosen the 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 the eccentric adjusting sleeve and eccentric adjusting bolt to adjust rear wheel camber to specified value.
4. Tighten the 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:  $90 \pm 5 \text{ N}\cdot\text{m}$ )

## 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 the 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 the toe-in to specified value.

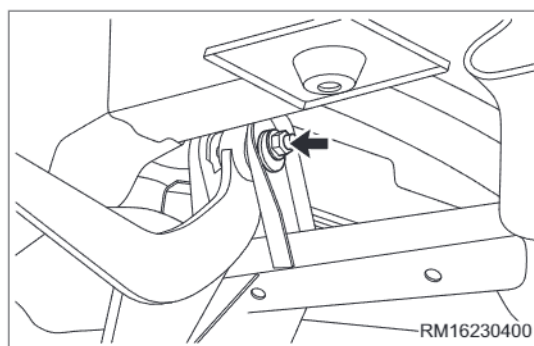
If rear wheel toe-in is not as specified, check rear suspension and wheels for damage or deformation. Replace damaged or deformed components as necessary.

### Specified Value for Rear Wheel Toe-in

| Item              | Specified Value        |
|-------------------|------------------------|
| Rear Wheel Toe-in | $0.11^{\circ} \pm 10'$ |

## Adjustment

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



3. Rotate the eccentric adjusting bolt and eccentric adjusting sleeve to adjust rear wheel toe-in to specified value.
4. Tighten the 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:  $90 \pm 5 \text{ N}\cdot\text{m}$ )

