

SECTION **FSU**  
FRONT SUSPENSION

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**FSU**

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# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

#### Precaution for Technicians Using Medical Electric

INFOID:000000009347472

##### OPERATION PROHIBITION

###### **WARNING:**

- Parts with strong magnet is used in this vehicle.
- Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.

##### NORMAL CHARGE PRECAUTION

###### **WARNING:**

- If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.
- As radiated electromagnetic wave generated by PDM (Power Delivery Module) at normal charge operation may affect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not approach motor room [PDM (Power Delivery Module)] at the hood-opened condition during normal charge operation.

##### PRECAUTION AT TELEMATICS SYSTEM OPERATION

###### **WARNING:**

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.

##### PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

###### **WARNING:**

- If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.
- The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.
- If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.

#### Point to Be Checked Before Starting Maintenance Work

INFOID:000000008744067

The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.

###### **NOTE:**

If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

#### Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000009326318

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS

# PRECAUTIONS

## < PRECAUTION >

system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

## PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

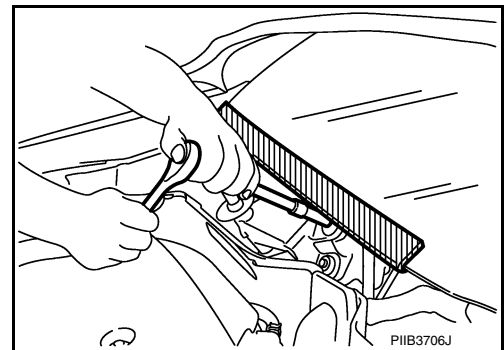
### **WARNING:**

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery and wait at least three minutes before performing any service.

## Precaution for Procedure without Cowl Top Cover

INFOID:000000008744069


When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



## High Voltage Precautions

INFOID:000000009347474

### **DANGER:**

 Since hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.

### **WARNING:**

- Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.
- Be sure to wear insulated protective equipment before beginning work on the high voltage system.
- Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.

### **CAUTION:**

Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.

## HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

# PRECAUTIONS

## < PRECAUTION >

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All the high voltage harnesses and connectors are orange. The Li-ion battery and other high voltage devices include an orange high voltage label. Never touch these harnesses and high voltage parts.

### HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

Immediately insulate disconnected high voltage connectors and terminals with insulating tape.

### REGULATIONS ON WORKERS WITH MEDICAL ELECTRONICS

#### **WARNING:**

**The vehicle contains parts that contain powerful magnets. If a person who is wearing a heart pacemaker or other medical device is close to these parts, the medical device may be affected by the magnets. Such persons must not perform work on the vehicle.**

### PROHIBITED ITEMS TO CARRY DURING THE WORK

Hybrid vehicles and electric vehicles contain parts with high voltage and intense magnetic force. Never carry metal products and magnetic recording media (e.g. cash card, prepaid card) to repair/inspect high voltage parts. If this is not observed, the metal products may create a risk of short circuit and the magnetic recording media may lose their magnetic recording.

POSTING A SIGN OF “DANGER! HIGH VOLTAGE AREA. KEEP OUT”

# PRECAUTIONS

## < PRECAUTION >

Indicate "HIGH VOLTAGE. DO NOT TOUCH" on the vehicle under repair/inspection to call attention to other workers.

**Person in charge: \_\_\_\_\_**

**DO NOT TOUCH!**

**REPAIR IN PROGRESS.**

**HIGH VOLTAGE**

**DANGER:**

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**DANGER:**

**HIGH VOLTAGE**

**REPAIR IN PROGRESS.**

**DO NOT TOUCH!**

**Person in charge: \_\_\_\_\_**

**Copy this page and put it after folding on the roof of the vehicle in service.**

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### Precaution for Removing 12V Battery

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1. Check that EVSE is not connected.  
**NOTE:**  
If EVSE is connected, the air conditioning system may be automatically activated by the timer A/C function.
2. Turn the power switch OFF → ON → OFF. Get out of the vehicle. Close all doors (including back door).

## PRECAUTIONS

### < PRECAUTION >

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3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more.

**NOTE:**

If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected.

4. Remove 12V battery within 1 hour after turning the power switch OFF → ON → OFF.

**NOTE:**

- The 12V battery automatic charge control may start automatically even when the power switch is in OFF state.
- Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.

**CAUTION:**

- **After all doors (including back door) are closed, if a door (including back door) is opened before battery terminals are disconnected, start over from Step 1.**
- **After turning the power switch OFF, if “Remote A/C” is activated by user operation, stop the air conditioner and start over from Step 1.**

### Precautions for Suspension

INFOID:000000008744072

- When installing rubber bushings, the final tightening must be carried out under unladen conditions with tires on ground. Spilled oil might shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fluids and lubricants are full. Tire repair kit and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Self-lock nuts are not reusable. Always use new ones when installing. Since new self-lock nuts are pre-oiled, tighten as they are.
- The tightening surface must be kept free from oil/grease.
- When jacking up the vehicle with a floor jack, never hang the jack on the torque rod.

# PREPARATION

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## PREPARATION

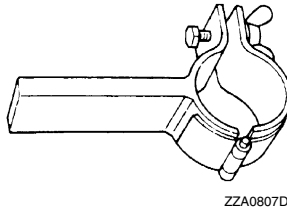
### PREPARATION

#### Special Service Tools

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The actual shape of the tools may differ from those illustrated here.

| Tool number<br>(TechMate No.)<br>Tool name | Description                        |
|--|------------------------------------|
| ST35652000<br>( — )<br>Strut attachment    | Disassembling and assembling strut |

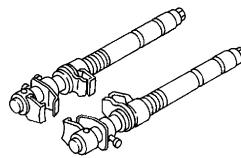


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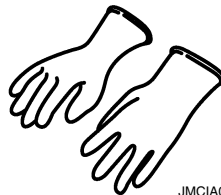
#### Commercial Service Tools

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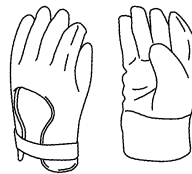
| Tool name  | Description   |
|--|---|
| Spring compressor  | Removing and installing coil spring   |
| Insulated gloves<br>[Guaranteed insulation performance for 1000V/300A] | Removing and installing high voltage components   |
| Leather gloves<br>[Use leather gloves that can fasten the wrist tight] | <ul style="list-style-type: none"> <li>• Removing and installing high voltage components</li> <li>• Protect insulated gloves</li> </ul> |
| Insulated safety shoes   | Removing and installing high voltage components   |



S-NT717



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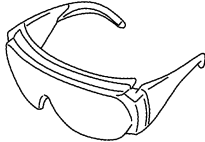
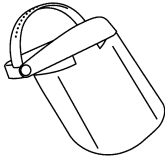
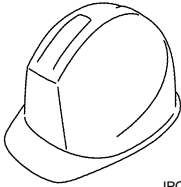
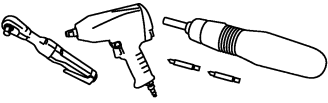
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# PREPARATION

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| Tool name   | Description  |
|---|--|
| <p>Safety glasses<br/>[ANSI Z87.1]</p>  <p>JPCIA0012ZZ</p> | <ul style="list-style-type: none"> <li>• Removing and installing high voltage components</li> <li>• To protect eye from the spatter on the work to electric line</li> </ul>  |
| <p>Face shield</p>  <p>JPCIA0167ZZ</p>                     | <ul style="list-style-type: none"> <li>• Removing and installing high voltage components</li> <li>• To protect face from the spatter on the work to electric line</li> </ul> |
| <p>Insulated helmet</p>  <p>JPCIA0013ZZ</p>                | <p>Removing and installing high voltage components</p>   |
| <p>Power tool</p>  <p>PIIB1407E</p>                      | <p>Loosening nuts, screws and bolts</p>  |



# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000008744075

Use chart below to find the cause of the symptom. If necessary, repair or replace these parts.

| Symptom                       |                  | Possible cause and SUSPECTED PARTS |  |                                   |                    |                |                      |                           |                        |            |      |            | Reference |             |       |                                    |
|-------------------------------|------------------|------------------------------------|--|-----------------------------------|--------------------|----------------|----------------------|---------------------------|------------------------|------------|------|------------|-----------|-------------|-------|------------------------------------|
|                               |                  | Improper installation, looseness   | Shock absorber deformation, damage or deflection | Bushing or mounting deterioration | Parts interference | Spring fatigue | Suspension looseness | Incorrect wheel alignment | Stabilizer bar fatigue | FRONT AXLE | TIRE | ROAD WHEEL |           | DRIVE SHAFT | BRAKE | STEERING                           |
| Noise                         | FRONT SUSPENSION | x                                  | x  | x                                 | x                  | x              | x                    |                           |                        | x          | x    | x          | x         | x           | x     | FSU-13, FSU-17, FSU-19, FSU-22     |
|                               |                  | x                                  | x  | x                                 | x                  |                | x                    |                           |                        | x          | x    | x          | x         | x           | x     | FSU-16                             |
|                               |                  | x                                  | x  | x                                 | x                  | x              |                      |                           |                        | x          | x    |            |           |             |       | —                                  |
|                               |                  | x                                  | x  | x                                 | x                  |                |                      |                           |                        |            |      |            |           |             |       | —                                  |
|                               |                  | x                                  | x  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | FSU-16                             |
|                               |                  | x                                  | x  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | FSU-13, FSU-17, FSU-19, FSU-22     |
| Shake                         | FRONT SUSPENSION |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | FSU-11                             |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | FSU-21                             |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | FAX-6                              |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | WT-46                              |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | WT-46                              |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | FAX-6                              |
| Vibration                     | FRONT SUSPENSION |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | BR-503                             |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       | ST-32 (WITH HEATED STEERING WHEEL) |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
| Shimmy                        | FRONT SUSPENSION |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
| Judder                        | FRONT SUSPENSION |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
| Poor quality ride or handling | FRONT SUSPENSION |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |
|                               |                  |                                    |  |                                   |                    |                |                      |                           |                        |            |      |            |           |             |       |                                    |

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# FRONT SUSPENSION ASSEMBLY

< PERIODIC MAINTENANCE >

## PERIODIC MAINTENANCE

### FRONT SUSPENSION ASSEMBLY

#### Inspection

INFOID:000000008744076

#### COMPONENT PART

Check the mounting conditions (looseness, backlash) of each component and component conditions (wear, damage) are normal.

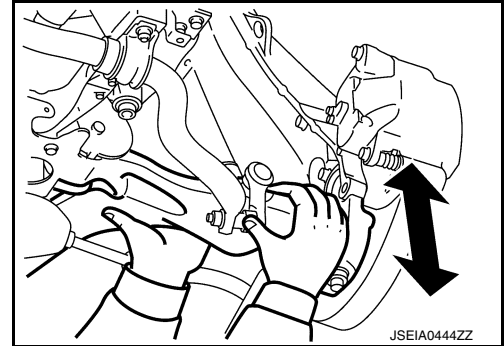
#### Ball Joint Axial End Play

1. Set front wheels in a straight-ahead position.
2. Move axle side of transverse link in the axial direction by hand. Check there is no end play.

**Axial end play** : Refer to [FSU-28, "Ball Joint"](#).

#### CAUTION:

- Never depress brake pedal when measuring.
- Never perform with tires on level ground.
- Be careful not to damage ball joint boot. Never damage the installation position by applying excessive force.



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#### STRUT ASSEMBLY

Check for oil leakage, damage, and replace if necessary.

# WHEEL ALIGNMENT

< PERIODIC MAINTENANCE >

## WHEEL ALIGNMENT

### Inspection

INFOID:000000008744077

### DESCRIPTION

#### CAUTION:

- The adjustment mechanisms of camber, caster, and kingpin inclination angles are not included.
- If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage. Replace suspect parts if a malfunction is detected.
- Kingpin inclination angle is reference value, no inspection is required.

Measure wheel alignment under unladen conditions.

#### NOTE:

“Unladen conditions” means that fluids and lubricants are full. Tire repair kit and mats are in designated positions.

### PRELIMINARY CHECK

Check the following:

- Tires for improper air pressure and wear. Refer to [WT-55, "Tire Air Pressure"](#).
- Road wheels for runout.
- Wheel bearing axial end play. Refer to [FAX-7, "Inspection"](#).
- Transverse link ball joint axial end play. Refer to [FSU-10, "Inspection"](#).
- Strut operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of suspension member, strut assembly and transverse link for cracks, deformation and other damage.
- Vehicle height (posture).

### GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
- This type of alignment is recommended for any NISSAN/INFINITI vehicle.
- The four-wheel “thrust” process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
- The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
- The rack should be checked to ensure that it is level.
- Check the machine is properly calibrated.
- Your alignment equipment should be regularly calibrated in order to give correct information.
- Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

### ALIGNMENT PROCESS

#### IMPORTANT:

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Never use these indicators.**
- The alignment specifications programmed into your machine that operate these indicators may not be correct.
- This may result in an ERROR.
- Most camera-type alignment machines are equipped with both “Rolling Compensation” method and optional “Jacking Compensation” method to “compensate” the alignment targets or head units. “Rolling Compensation” is the preferred method.
- If using the “Rolling Compensation” method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. **Do not push or pull on the vehicle body.**
- If using the “Jacking Compensation” method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.

#### NOTE:

- Do not use the “Rolling Compensation” method if you are using sensor-type alignment equipment.
- Follow all instructions for the alignment machine you're using for more information.

### Adjustment

INFOID:000000008744078

### TOE-IN

- Loosen the steering outer socket, and then adjust the length using steering inner socket.

# WHEEL ALIGNMENT

< PERIODIC MAINTENANCE >

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Toe-in : Refer to [FSU-28, "Wheel Alignment"](#).

**CAUTION:**

- Always evenly adjust both toe-in alternately and adjust the difference between the left and right to the standard.
- Always fix the steering inner socket when tightening the steering outer socket.
- After toe-in adjustment, adjust neutral position of steering angle sensor. Refer to [BRC-80, "Work Procedure"](#).

# FRONT COIL SPRING AND STRUT

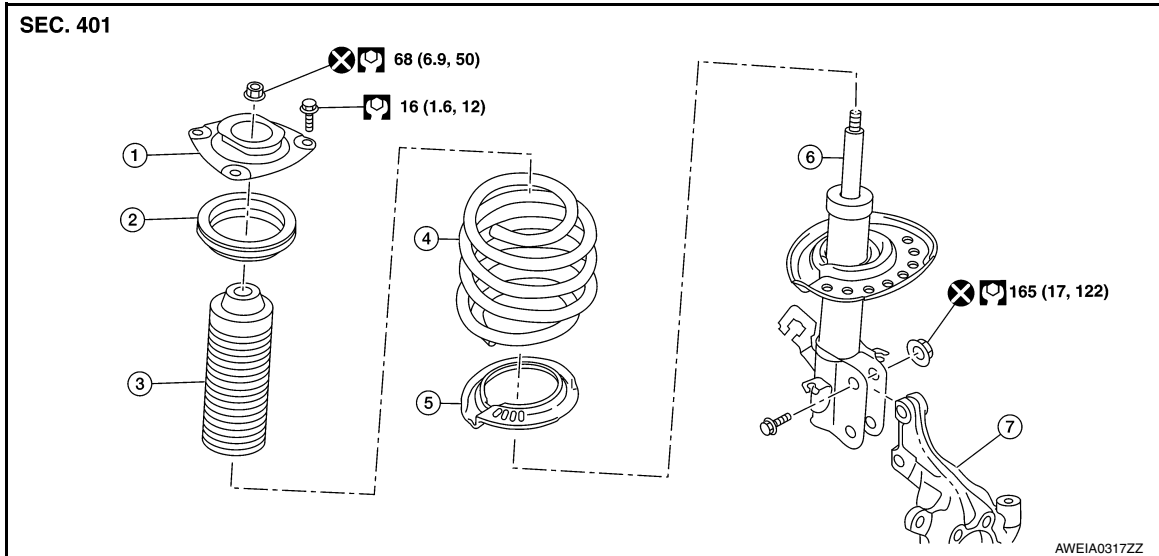
< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

### FRONT COIL SPRING AND STRUT

Exploded View

INFOID:000000008744079



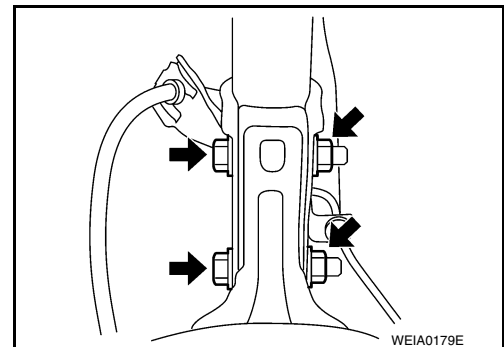
- |                       |                      |                 |
|-----------------------|----------------------|-----------------|
| 1. Mounting insulator | 2. Mounting bearing  | 3. Bound bumper |
| 4. Coil spring        | 5. Lower rubber seat | 6. Strut        |
| 7. Steering knuckle   |                      |                 |

### Removal and Installation

INFOID:000000008744080

#### REMOVAL

1. Remove tires with power tool. Refer to [WT-49. "Exploded View"](#).
2. Remove lock plate from strut assembly. Refer to [BR-526. "FRONT : Exploded View"](#).
3. Remove wheel sensor. Refer to [BRC-172. "FRONT WHEEL SENSOR : Removal and Installation"](#).
4. Remove stabilizer connecting rod from strut assembly. Refer to [FSU-19. "Removal and Installation"](#).
5. Remove strut mounting bolts and nuts from steering knuckle with power tool.
6. Remove cowl top cover. Refer to [EXT-19. "Removal and Installation"](#).
7. Remove mounting bolt of mounting insulator, and then remove strut assembly.



#### INSTALLATION

Note the following, and install in the reverse order of removal.

# FRONT COIL SPRING AND STRUT

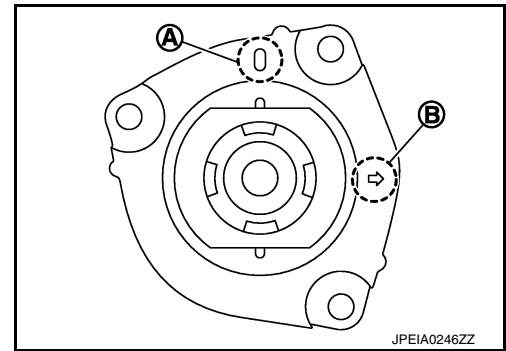
## < REMOVAL AND INSTALLATION >

- Install strut assembly with the identification mark (A) of mounting insulator faced forward of the vehicle and the arrow (B) faced outside.

### NOTE:

The identification mark "0" shows the right mounting insulator and "1" shows left.

- Never reuse strut mounting nut.
- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to [FSU-16. "Inspection"](#).
- After replacing the strut, always follow the disposal procedure to discard the strut. Refer to [FSU-16. "Disposal"](#).



## Disassembly and Assembly

INFOID:000000008744081

### DISASSEMBLY

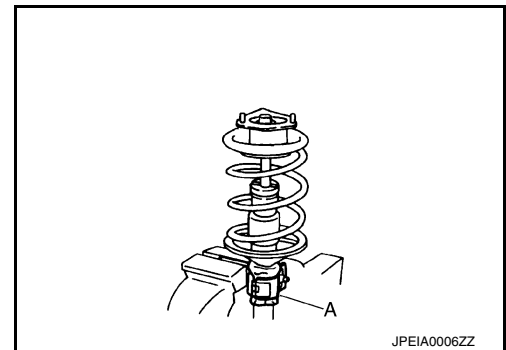
#### CAUTION:

**Never damage strut assembly piston rod when removing components from strut assembly.**

1. Remove the cap.
2. Install strut attachment (A) [SST: ST35652000 ( — )] to strut assembly and secure it in a vise.

#### CAUTION:

**When installing the strut attachment to strut assembly, wrap a shop cloth around strut to protect from damage.**

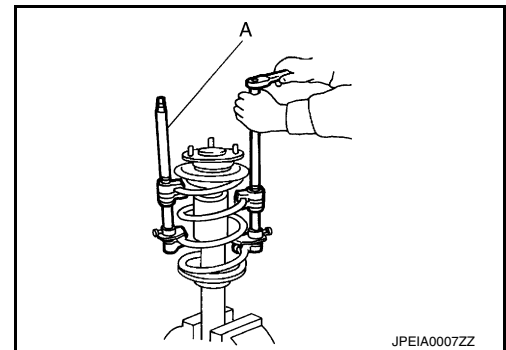


3. Using a spring compressor (A) (commercial service tool), compress coil spring between spring upper seat and lower seat (strut assembly) until coil spring with a spring compressor is free.

#### CAUTION:

**Be sure a spring compressor is securely attached to coil spring. Compress coil spring.**

4. Check coil spring with a spring compressor between spring upper seat and lower seat (strut assembly) is free. And then remove piston rod lock nut while securing the piston rod tip so that piston rod does not turn.



5. Remove mounting insulator, mounting bearing, and bound bumper from strut.
6. After removing coil spring with a spring compressor (commercial service tool), then gradually release a spring compressor.

#### CAUTION:

**Loosen while making sure coil spring attachment position does not move.**

7. Remove lower rubber seat.
8. Remove strut attachment [SST: ST35652000 ( — )] from strut assembly.
9. Perform inspection after disassembly. Refer to [FSU-16. "Inspection"](#).

### ASSEMBLY

#### CAUTION:

**Never damage strut assembly piston rod when installing components from strut assembly.**

1. Install strut attachment [SST: ST35652000 ( — )] to strut and secure it in a vise.

#### CAUTION:

# FRONT COIL SPRING AND STRUT

## < REMOVAL AND INSTALLATION >

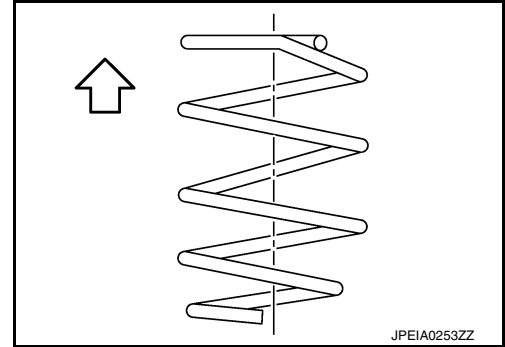
**When installing the strut attachment to strut assembly, wrap a shop cloth around strut to protect from damage.**

2. Install lower rubber seat.
3. Compress coil spring using a spring compressor (commercial service tool), and install it onto strut assembly.

**CAUTION:**

- Be sure a compressor is securely attached to coil spring. **Compress coil spring.**
- Be careful with the vertical direction of the coil spring.

↶ : Upper side



- Align the lower end of coil spring (1) with (A) of lower rubber seat (2) as shown in the figure.

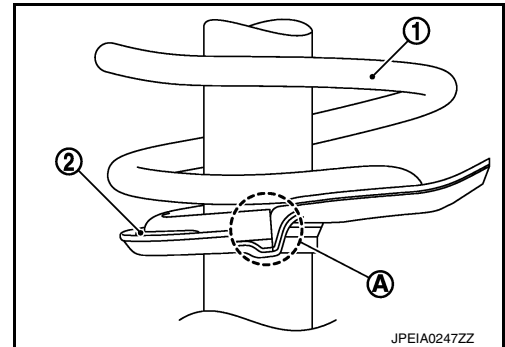
4. Apply soapy water to bound bumper.
5. Insert bound bumper into mounting insulator.
6. Install mounting bearing.

**CAUTION:**

**Never use machine oil.**

**CAUTION:**

**Never apply oils, such as grease, when installing the mounting bearing.**



7. Check the location of identification mark (A) of the mounting insulator and install it with the arrow (B) faced outside of the vehicle to the strut.

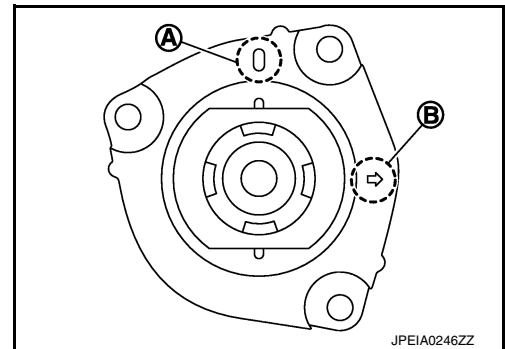
**NOTE:**

The identification mark "0" shows right mounting insulator and "1" shows left.

8. Secure piston rod tip so that piston rod does not turn, then tighten piston rod lock nut with specified torque.

**CAUTION:**

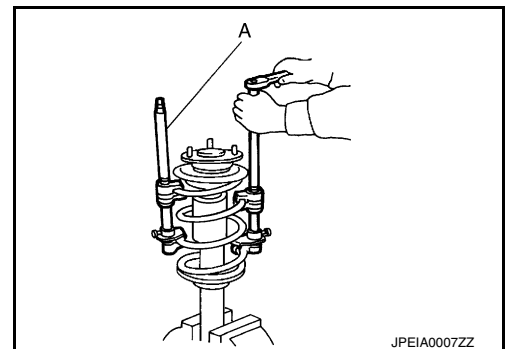
**Never reuse piston rod lock nut.**



9. Gradually release a spring compressor (A) (commercial service tool), and remove coil spring.

**CAUTION:**

**Loosen while making sure coil spring attachment position does not move.**

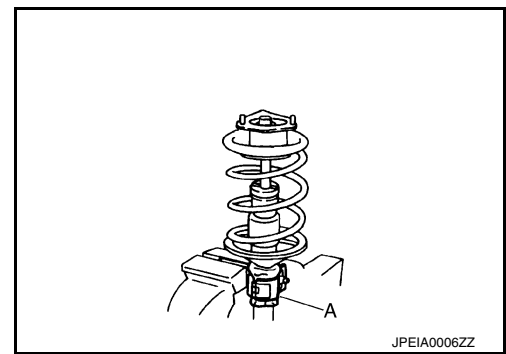


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P

# FRONT COIL SPRING AND STRUT

## < REMOVAL AND INSTALLATION >

10. Remove the strut attachment (A) [SST: ST35652000 ( — )] from strut assembly.
11. Install the cap.



INFOID:000000008744082

## Inspection

### INSPECTION AFTER DISASSEMBLY

Check the following items, and replace the parts if necessary.

#### Strut

- Strut for deformation, cracks or damage
- Piston rod for damage, uneven wear or distortion
- Oil leakage

#### Strut Mounting Insulator and bound bumper

Check strut mounting insulator and bound bumper for cracks, wear or damage.

#### Coil Spring

Check coil spring for cracks, wear or damage.

### INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connector. Refer to [BRC-172, "FRONT WHEEL SENSOR : Exploded View"](#).
2. Check wheel alignment. Refer to [FSU-11, "Inspection"](#).

## Disposal

INFOID:000000008744083

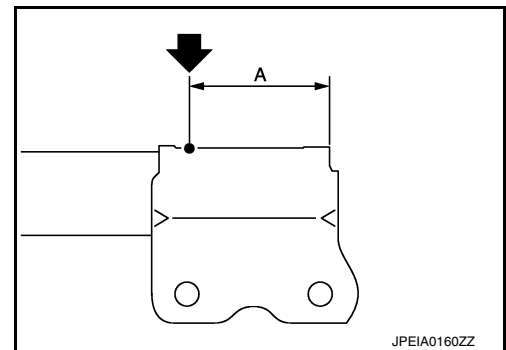
1. Set strut assembly horizontally to the ground with the piston rod fully extracted.
2. Drill 2 – 3 mm (0.08 – 0.12 in) hole at the position (●) from top as shown in the figure to release gas gradually.

#### CAUTION:

- **Wear eye protection (safety glasses).**
- **Wear gloves.**
- **Be careful with metal chips or oil blown out by the compressed gas.**

#### NOTE:

- Drill vertically in the direction show by arrow.
- Directly to the outer tube avoiding brackets.
- The gas is clear, colorless, odorless, and harmless.



**A : 20 – 30 mm (0.79 – 1.18 in)**

3. Position the drilled hole downward and drain oil by moving the piston rod several times.

#### CAUTION:

**Dispose of drained oil according to the law and local regulations.**



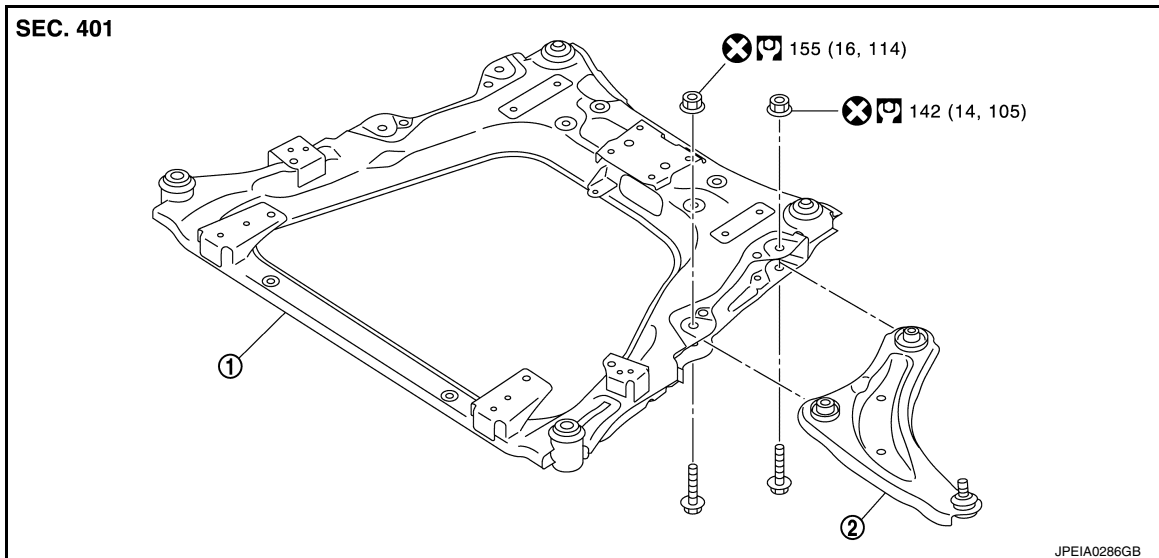
# TRANSVERSE LINK

< REMOVAL AND INSTALLATION >

## TRANSVERSE LINK

### Exploded View

INFOID:000000008744084



1. Front suspension member
2. Transverse link

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

### Removal and Installation

INFOID:000000008744085

#### REMOVAL

1. Remove tires with power tool. Refer to [WT-49, "Exploded View"](#).
2. Separate stabilizer connecting rod from strut assembly. Refer to [FSU-19, "Removal and Installation"](#).
3. Separate steering outer socket from steering knuckle. Refer to [ST-42, "Removal and Installation"](#).
4. Remove transverse link from steering knuckle with power tool. Refer to [FAX-9, "Removal and Installation"](#).
5. Remove transverse link from suspension member with power tool.

#### NOTE:

To remove transverse link mounting nut, move stabilizer bar.

#### INSTALLATION

Note the following, and install in the reverse order of removal.

- Never reuse transverse link mounting nut.
- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to [FSU-17, "Inspection"](#).

### Inspection

INFOID:000000008744086

#### INSPECTION AFTER REMOVAL

Check the following items, and replace the parts if necessary.

##### Transverse Link

- Transverse link and bushing for deformation, cracks or damage.
- Ball joint boot for cracks or other damage, and also for grease leakage.

##### Swing Torque

1. Manually move ball stud to confirm it moves smoothly with no binding.
2. Move ball stud at least ten times by hand to check for smooth movement.

## TRANSVERSE LINK

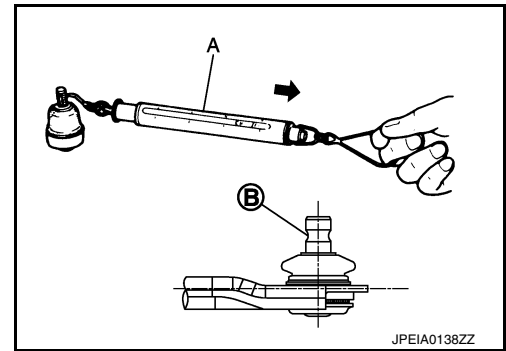
### < REMOVAL AND INSTALLATION >

- Hook a spring balance (A) at cutout on ball stud (B). Confirm spring balance measurement value is within specifications when ball stud begins moving.

**Swing torque** : Refer to [FSU-28, "Ball Joint"](#).

**Measurement on spring balance** : Refer to [FSU-28, "Ball Joint"](#)

- If swing torque exceeds standard range, replace transverse link assembly.



### Axial End Play

- Move ball stud at least ten times by hand to check for smooth movement.
- Move tip of ball stud in axial direction to check for looseness.

**Axial end play** : Refer to [FSU-28, "Ball Joint"](#).

- If axial end play exceeds the standard value, replace transverse link assembly.

### INSPECTION AFTER INSTALLATION

Check wheel alignment. Refer to [FSU-11, "Inspection"](#).

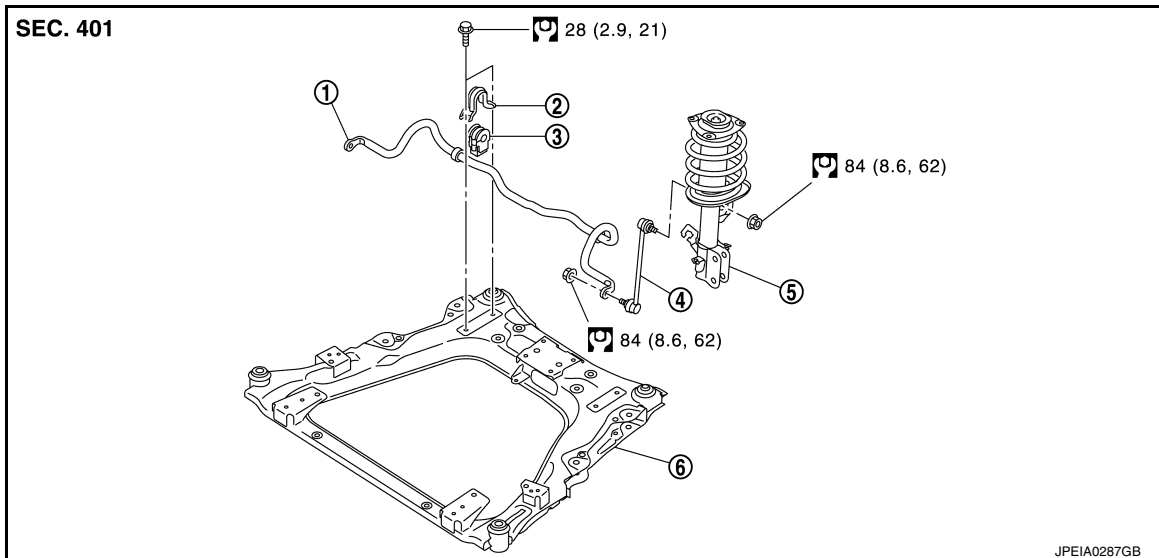
# FRONT STABILIZER

< REMOVAL AND INSTALLATION >

## FRONT STABILIZER

Exploded View

INFOID:000000008744087



- |                              |                     |                            |
|------------------------------|---------------------|----------------------------|
| 1. Stabilizer bar            | 2. Stabilizer clamp | 3. Stabilizer bushing      |
| 4. Stabilizer connecting rod | 5. Strut assembly   | 6. Front suspension member |

: N·m (kg-m, ft-lb)

## Removal and Installation

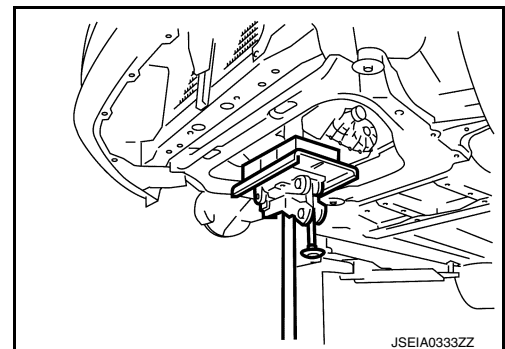
INFOID:000000008744088

### REMOVAL

1. Remove tires with power tool. Refer to [WT-49, "Exploded View"](#).
2. Separate intermediate shaft from steering gear assembly. Refer to [ST-39, "Removal and Installation"](#).
3. Remove front under cover. Refer to [EXT-23, "FRONT UNDER COVER : Removal and Installation"](#).
4. Remove Li-ion battery under cover (front). Refer to [EVB-194, "Exploded View"](#).
5. Remove fender protector. Refer to [EXT-21, "FENDER PROTECTOR : Removal and Installation"](#).
6. Remove stabilizer connecting rod.
7. Remove steering outer socket from steering knuckle. Refer to [ST-42, "Removal and Installation"](#).
8. Separate transverse link from steering knuckle with power tool. Refer to [FAX-9, "Exploded View"](#).
9. Set suitable jack under reduction gear and traction motor.

### CAUTION:

- Never damage the reduction gear and traction motor with a jack.
- Check the stable condition when using a jack.

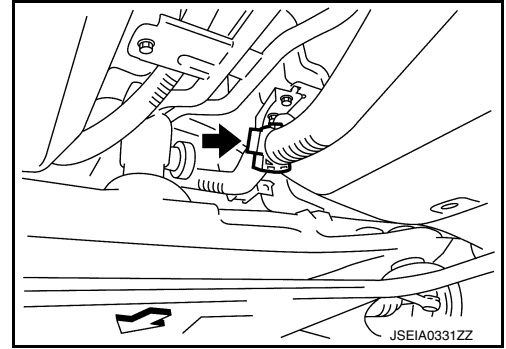


# FRONT STABILIZER

## < REMOVAL AND INSTALLATION >

10. Separate high voltage harness clip from bracket.

⇐ : Vehicle front



11. Remove motor mounting rear mounting bolt. Refer to [TMS-114, "Removal and Installation"](#).

⇐ : Vehicle front

12. Remove motor mounting (LH and RH) mounting bolts from front suspension member. Refer to [TMS-114, "Removal and Installation"](#).

13. Remove member stay and rebound stopper with power tool. Refer to [FSU-22, "Exploded View"](#).

14. Remove suspension member mounting bolts, washer, and rebound stopper rubber with power tool. Refer to [FSU-22, "Exploded View"](#).

15. Remove front suspension member from vehicle body.

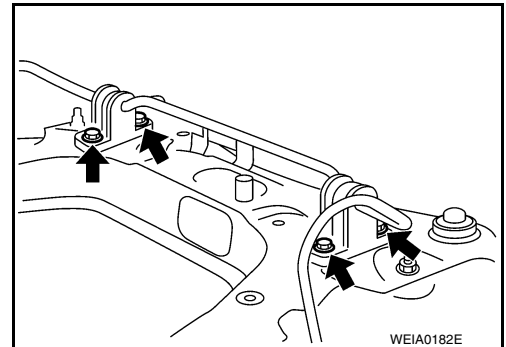
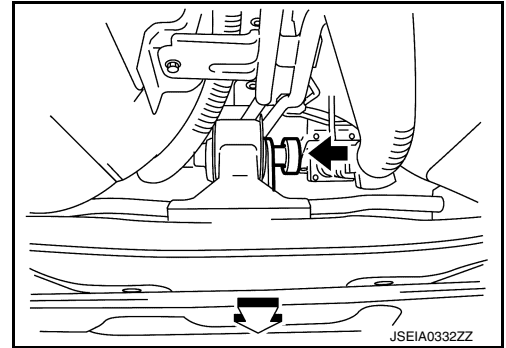
**CAUTION:**

**Check the stable condition when using a jack.**

16. Remove mounting bolts (⇐) of stabilizer clamp, and then remove stabilizer clamp and stabilizer bushing from front suspension member with power tool.

17. Remove stabilizer bar.

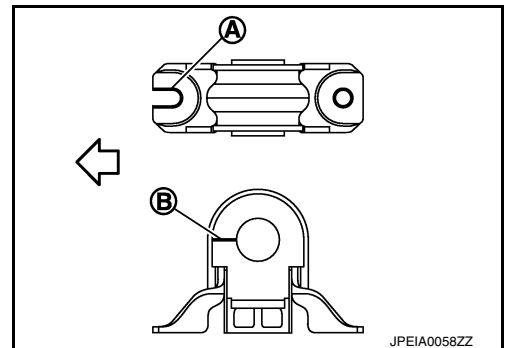
18. Perform inspection after removal. Refer to [FSU-21, "Inspection"](#).



## INSTALLATION

Note the following, and install in the reverse order of removal.

- Install stabilizer clamp and stabilizer bush with notch (A) and slit (B) faced forward of the vehicle (⇐).



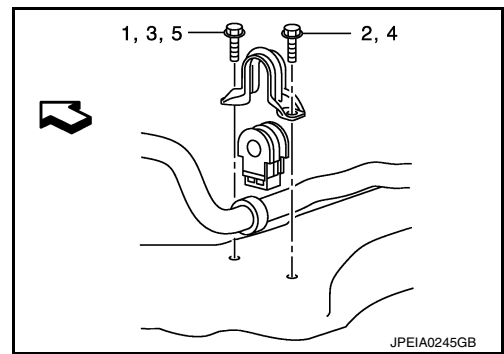
# FRONT STABILIZER

## < REMOVAL AND INSTALLATION >

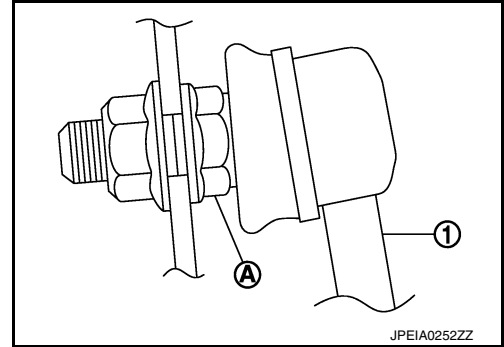
- To install stabilizer clamp mounting bolt, follow the tightening method and the numerical order shown below:

Manual tightening : 1  
Temporary tightening : 2 → 3  
Final tightening (Specified torque) : 4 → 5

← : Vehicle front



- To install stabilizer connecting rod (1), tighten the mounting nut with the hexagonal part (A) on the stabilizer connecting rod side fixed.
- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to [FSU-17, "Inspection"](#).



## Inspection

### INSPECTION AFTER REMOVAL

Check stabilizer bar, stabilizer connecting rod, stabilizer bushing and stabilizer clamp for deformation, cracks or damage. Replace it if necessary.

### INSPECTION AFTER INSTALLATION

Check wheel alignment. Refer to [FSU-11, "Inspection"](#).

INFOID:000000008744089

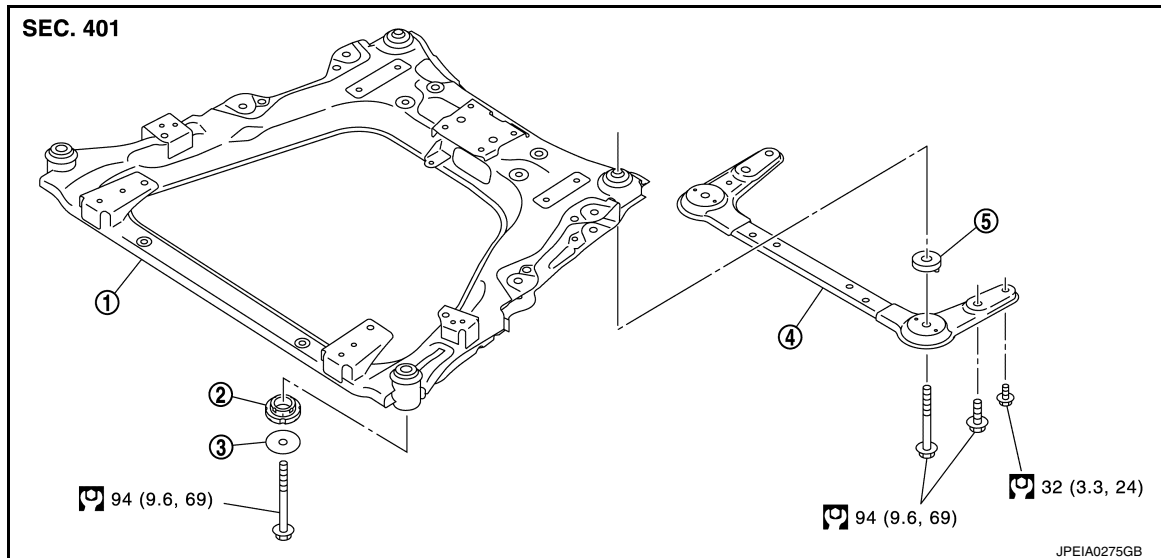
# FRONT SUSPENSION MEMBER

< REMOVAL AND INSTALLATION >


## FRONT SUSPENSION MEMBER

Exploded View

INFOID:000000008744090



- |                            |                           |              |
|----------------------------|---------------------------|--------------|
| 1. Front suspension member | 2. Rebound stopper rubber | 3. Insulator |
| 4. Member stay             | 5. Rebound stopper        |              |

: N·m (kg-m, ft-lb)

## Removal and Installation

INFOID:000000008744091

### WARNING:

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses before beginning work on the high voltage system.
- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them. Refer to [GI-33, "How to Disconnect High Voltage"](#).

### CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

### REMOVAL

### WARNING:

Disconnect high voltage circuit. Refer to [GI-33, "How to Disconnect High Voltage"](#).

1. Check voltage in high voltage circuit. (Check that condenser are discharged.)
  - a. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB-194, "Exploded View"](#).
  - b. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [GI-33, "How to Disconnect High Voltage"](#).

# FRONT SUSPENSION MEMBER

## < REMOVAL AND INSTALLATION >

- c. Measure voltage between high voltage harness terminals.

**DANGER:**



Touching high voltage components without using the appropriate protective equipment will cause electrocution.

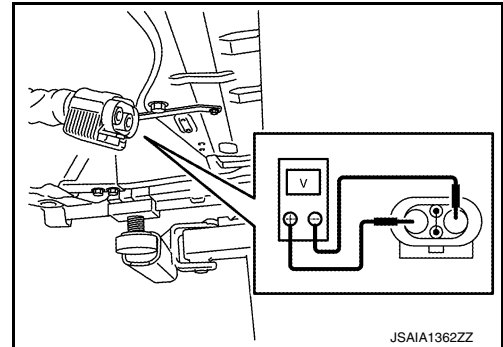


Standard

: 5 V or less

**CAUTION:**

For voltage measurements, use a tester which can measure to 500 V or higher.



JSAIA1362ZZ

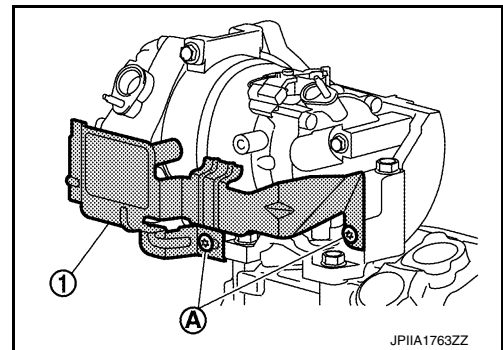
2. Remove 12V battery. Refer to [FSU-5, "Precaution for Removing 12V Battery"](#).
3. Remove front under cover. Refer to [EXT-23, "FRONT UNDER COVER : Removal and Installation"](#).
4. Remove traction motor inverter. Refer to [TMS-108, "Removal and Installation"](#).

5. Remove the mounting bolts (A), then remove the compressor stay (1).

**WARNING:**



To prevent electric shock hazards, be sure to wear protective gear.



JPIIA1763ZZ

6. Disconnect the high voltage harness connector (A) from electric compressor.

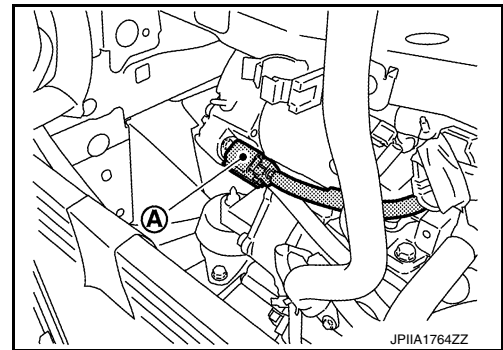
**WARNING:**



To prevent electric shock hazards, be sure to wear protective gear.

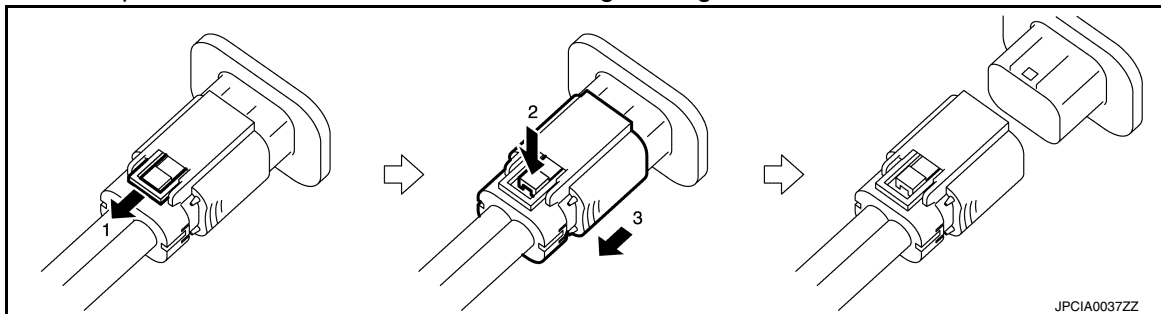


- Protect the terminals of disconnected high voltage harness connector with insulation tape so that they are not exposed.



JPIIA1764ZZ

- Follow the procedure below and disconnect the high voltage harness connector.



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# FRONT SUSPENSION MEMBER

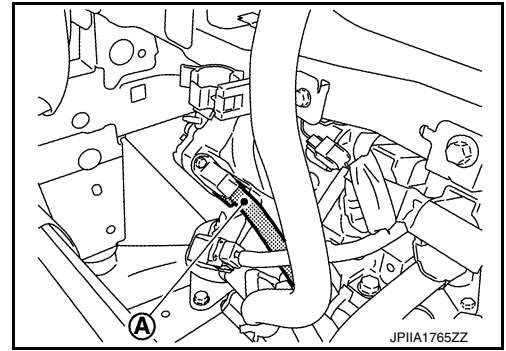
## < REMOVAL AND INSTALLATION >

7. Disconnect the low voltage harness connector (A) from electric compressor.

**WARNING:**



To prevent electric shock hazards, be sure to wear protective gear.



8. Remove electric compressor (1). Hang electric compressor not to interfere with work.

**WARNING:**

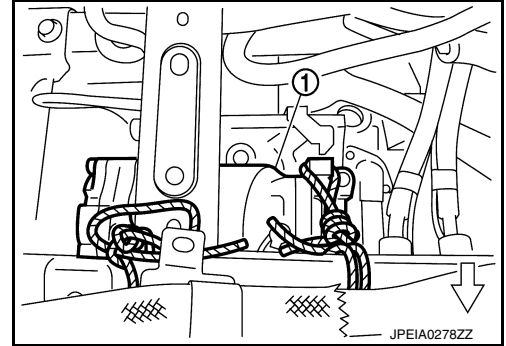


To prevent electric shock hazards, be sure to wear protective gear.



**CAUTION:**

Never apply excessive stress to high-pressure flexible hose and low-pressure flexible hose.



⇐ : Vehicle front

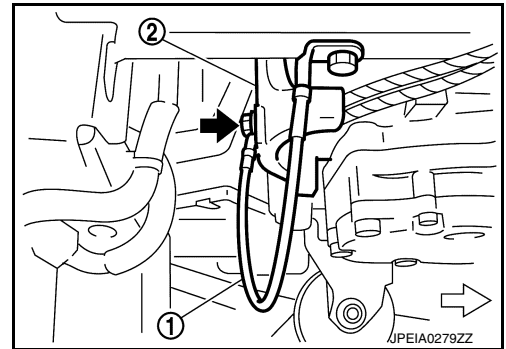
9. Remove ground cable (1) from compressor bracket (2).

⇐ : Vehicle front

**WARNING:**



To prevent electric shock hazards, be sure to wear protective gear.



10. Remove traction motor harness connector (1).

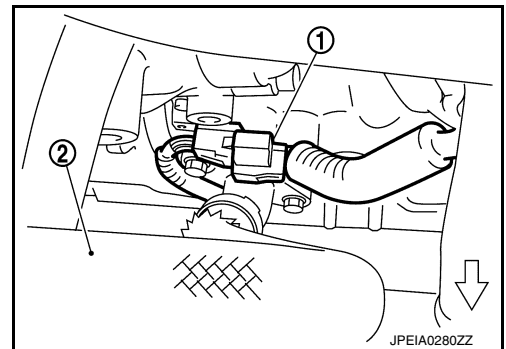
2 : Water hose (lower side)

⇐ : Vehicle front

**WARNING:**



To prevent electric shock hazards, be sure to wear protective gear.



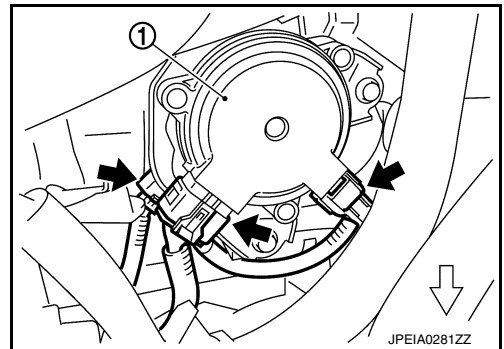


# FRONT SUSPENSION MEMBER

## < REMOVAL AND INSTALLATION >

11. Remove low voltage harness connectors from parking actuator (1).

← : Vehicle front



12. Remove water hose (upper side) (1) from traction motor.

← : Vehicle front

**WARNING:**

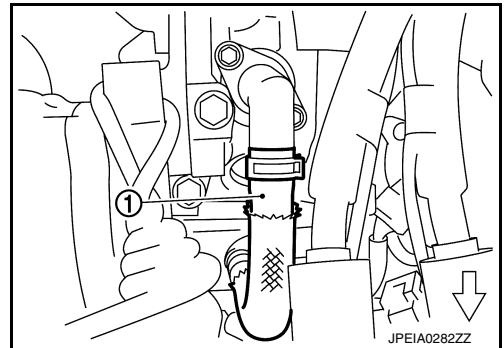


To prevent electric shock hazards, be sure to wear protective gear.



**CAUTION:**

- Take care that coolant does not contact the high voltage harness connectors.
- If coolant contacts a high voltage harness connector, immediately use an air blow and fully remove the liquid.



13. Remove water hose (lower side) (1) from traction motor.

← : Vehicle front

**WARNING:**

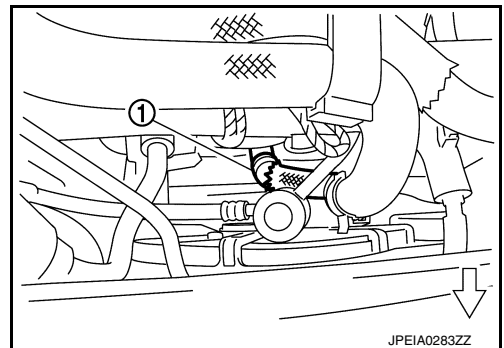


To prevent electric shock hazards, be sure to wear protective gear.



**CAUTION:**

- Take care that coolant does not contact the high voltage harness connectors.
- If coolant contacts a high voltage harness connector, immediately use an air blow and fully remove the liquid.



14. Remove tires with power tool. Refer to [WT-49. "Exploded View"](#).

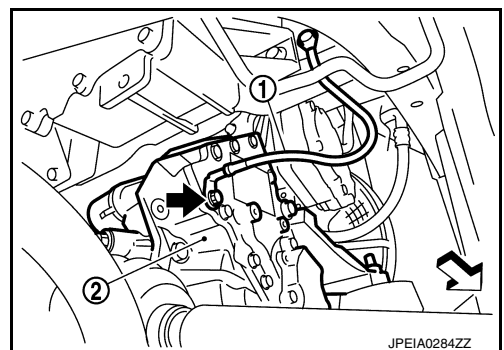
15. Remove ground cable (1) from traction motor (2).

← : Vehicle front

**WARNING:**



To prevent electric shock hazards, be sure to wear protective gear.



16. Remove drive shaft.

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# FRONT SUSPENSION MEMBER

## < REMOVAL AND INSTALLATION >

- Left side: Refer to [FAX-18, "LEFT SIDE : Removal and Installation"](#).
  - Right side: Refer to [FAX-20, "RIGHT SIDE : Removal and Installation"](#).
17. Separate stabilizer connecting rod from strut assembly. Refer to [FSU-19, "Removal and Installation"](#).
  18. Separate intermediate shaft from steering gear assembly. Refer to [ST-39, "Removal and Installation"](#).
  19. Set suitable jack under front suspension member.

**CAUTION:**

- **Never damage the front suspension member with a jack.**
- **Check the stable condition when using a jack.**

20. Remove member stay and rebound stopper with power tool.
21. Remove suspension member mounting bolts, insulator, and rebound stopper rubber with power tool.
22. Gradually lower the jack to remove front suspension member from vehicle body.

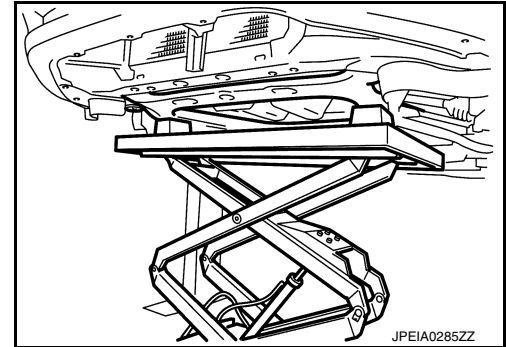
**CAUTION:**

**Operate while checking that jack supporting status is stable.**

**NOTE:**

Remove it with each component parts.

23. Remove the following parts from front suspension member.
  - Reduction gear: Refer to [TM-21, "Removal and Installation"](#).
  - Traction motor: Refer to [TMS-114, "Removal and Installation"](#).
  - Steering gear assembly: Refer to [ST-42, "Removal and Installation"](#).
  - Stabilizer bar: Refer to [FSU-19, "Removal and Installation"](#).
  - Transverse link: Refer to [FSU-17, "Removal and Installation"](#).
24. Perform inspection after removal. Refer to [FSU-17, "Inspection"](#).



## INSTALLATION

Note the following, and install in the reverse order of removal.

**WARNING:**



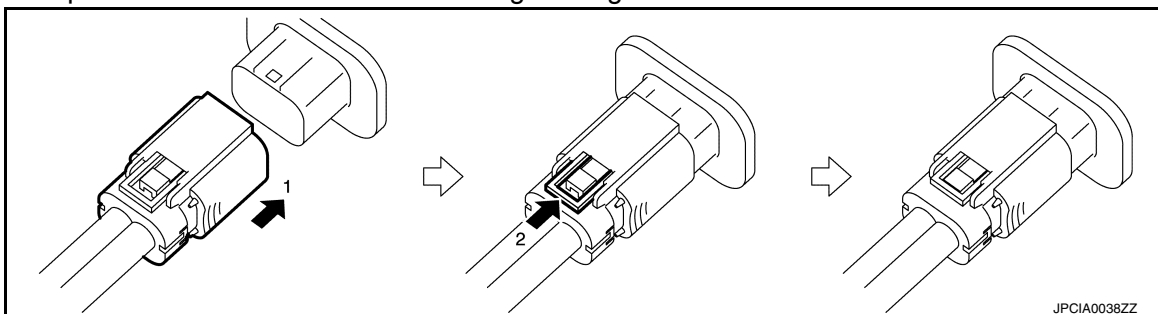
To prevent electric shock hazards, be sure to wear protective gear.



**CAUTION:**

**Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.**

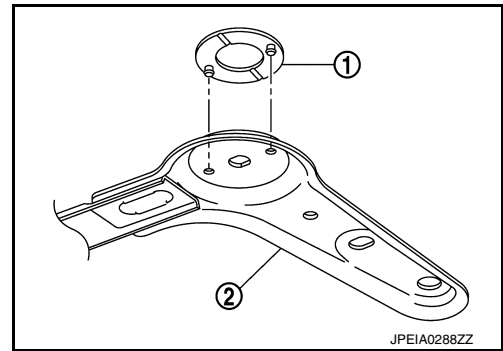
- Follow the procedure below and connect the high voltage harness connector.



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- To install rebound stopper (1), insert it with the protrusion aligned with the hole of member stay (2).

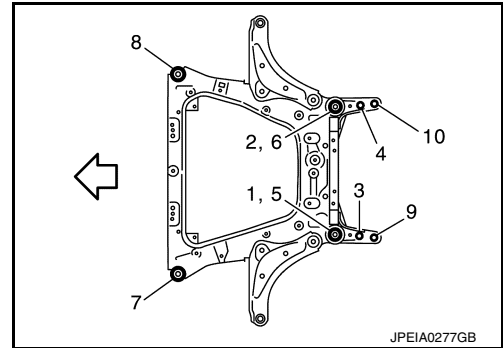


- To install member stay and mounting bolts of front suspension member, temporarily tighten the bolts before tightening to the specified torque, referring to the tightening method and the numerical order shown below:

Temporary tightening : 1 → 2

Final tightening (Specified torque) : 3 → 4 → 5 → 6 → 7 → 8 → 9 → 10

← : Vehicle front



- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection and adjustment after installation. Refer to [FSU-17, "Inspection"](#).

## Inspection and Adjustment

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### INSPECTION AFTER REMOVAL

Check front suspension member for cracks, wear or damage. Replace it if necessary.

### INSPECTION AFTER INSTALLATION

- When all parts are installed, be sure to check equipotential of traction motor, electric compressor, and traction motor inverter.
  - Traction motor: Refer to [TMS-118, "Inspection and Adjustment"](#).
  - Electric compressor: Refer to [HA-42, "Inspection"](#).
  - Traction motor inverter: Refer to [TMS-112, "Inspection and Adjustment"](#).
- Check wheel alignment. Refer to [FSU-11, "Inspection"](#).

### ADJUSTMENT AFTER INSTALLATION

Perform steering angle sensor neutral position adjustment. Refer to [BRC-80, "Work Procedure"](#).

# SERVICE DATA AND SPECIFICATIONS (SDS)

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#### Wheel Alignment

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| Item  |   | Standard                          |                          |
|---|---|-----------------------------------|--------------------------|
| Camber<br>Degree minute (Decimal degree)              | Minimum   | -1° 10' (-1.17°)                  |                          |
|   | Nominal   | -0° 25' (-0.42°)                  |                          |
|   | Maximum   | 0° 20' (0.33°)                    |                          |
|   | Left and right difference*1                       | -0° 45' (-0.75°) - 0° 45' (0.75°) |                          |
| Caster<br>Degree minute (Decimal degree)              | Minimum   | 4° 05' (4.08°)                    |                          |
|   | Nominal   | 4° 50' (4.83°)                    |                          |
|   | Maximum   | 5° 35' (5.58°)                    |                          |
|   | Left and right difference*1                       | -0° 45' (-0.75°) - 0° 45' (0.75°) |                          |
| Kingpin inclination<br>Degree minute (Decimal degree) | Minimum   | 11° 10' (11.17°)                  |                          |
|   | Nominal   | 11° 55' (11.92°)                  |                          |
|   | Maximum   | 12° 40' (12.67°)                  |                          |
| Toe-in  | Total toe-in<br>Distance                          | Minimum                           | 0 mm (0 in)              |
|   |   | Nominal                           | In 2 mm (In 0.08 in)     |
|   |   | Maximum                           | In 4 mm (In 0.15 in)     |
|   | Total toe-angle<br>Degree minute (Decimal degree) | Minimum                           | 0° 00' (0.00°)           |
|   |   | Nominal                           | In 0° 10' 48" (In 0.18°) |
|   |   | Maximum                           | In 0° 21' 36" (In 0.36°) |

Measure value under unladen\*2 conditions.

\*1: A difference when assuming the left side a standard.

\*2: Fluids and lubricants are full. Tire repair kit and mats are in designated positions.

#### Ball Joint

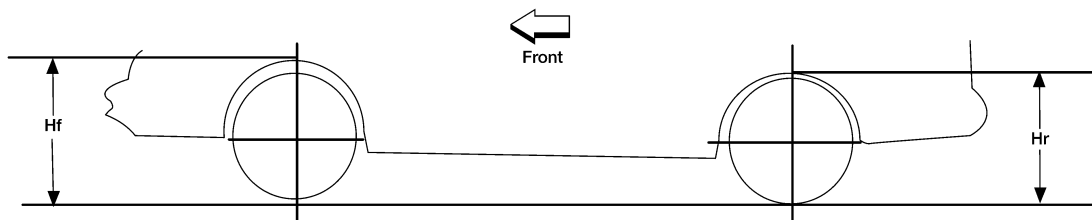
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| Item                          | Standard                                       |
|-------------------------------|--|
| Swing torque                  | 0.5 – 4.9 N·m (0.06 – 0.49 kg-m, 5 – 43 in-lb) |
| Measurement on spring balance | 15.4 – 150.8 N (1.6 – 15.3 kg, 3.5 – 33.8 lb)  |
| Axial end play                | 0 mm (0 in)                                    |

#### Wheelarch Height

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#### UNITED STATES



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# SERVICE DATA AND SPECIFICATIONS (SDS)

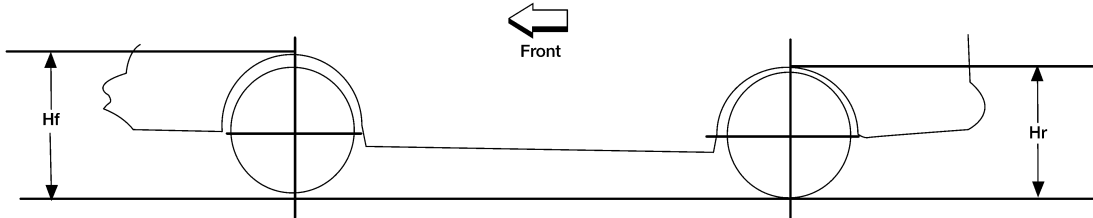
## < SERVICE DATA AND SPECIFICATIONS (SDS)

| Tire size  | 205/55R16         | 215/50R17         |
|------------|-------------------|-------------------|
| Front (Hf) | 706 mm (27.80 in) | 714 mm (28.11 in) |
| Rear (Hr)  | 708 mm (27.87 in) | 714 mm (28.11 in) |

Measure value under unladen\* conditions.

\*:Fluids and lubricants are full. Tire repair kit and mats are in designated positions.

### CANADA



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| Tire size  | 205/55R16         | 215/50R17         |
|------------|-------------------|-------------------|
| Front (Hf) | 706 mm (27.80 in) | 714 mm (28.11 in) |
| Rear (Hr)  | 709 mm (27.91 in) | 715 mm (28.15 in) |

Measure value under unladen\* conditions.

\*:Fluids and lubricants are full. Tire repair kit and mats are in designated positions.