SECTION FSU
FRONT SUSPENSION

CONTENTS

PRECAUTION 2

PRECAUTIONS 2
- Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2
- Precaution Necessary for Steering Wheel Rotation After Battery Disconnect 2
- Precautions for Removing Battery Terminal 3
- Precautions for Suspension 4

PREPARATION 5

PREPARATION 5
- Special Service Tools 5
- Commercial Service Tools 5

SYMPTOM DIAGNOSIS 6

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 6
- NVH Troubleshooting Chart 6

PERIODIC MAINTENANCE 7

FRONT SUSPENSION ASSEMBLY 7
- Inspection 7

WHEEL ALIGNMENT 8
- Inspection 8
- Adjustment 9

REMOVAL AND INSTALLATION 10

FRONT COIL SPRING AND STRUT 10
- Exploded View 10
- Removal and Installation 10
- Disassembly and Assembly 12
- Inspection 15
- Disposal 16

TRANSVERSE LINK 17
- Exploded View 17
- Removal and Installation 17
- Inspection 18

FRONT STABILIZER 19
- Exploded View 19
- Removal and Installation 19
- Inspection 21

FRONT SUSPENSION MEMBER 22
- Exploded View 22
- Removal and Installation 22
- Inspection 23

SERVICE DATA AND SPECIFICATIONS (SDS) 24

SERVICE DATA AND SPECIFICATIONS (SDS) 24
- Wheel Alignment 24
- Ball Joint 24
- Wheelarch Height 24

PRECAUTION

PRECAUTIONS

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

INFOID:0000000010822743

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. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never 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:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000010822744

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Before removing and installing any control units, first turn the ignition power source and accessory power source to the OFF, then disconnect both battery cables.**
- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**
- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Open driver door.
3. Turn the ignition switch to the ON position.
   (At this time, the steering lock will be released.)
4. Turn the ignition switch to OFF position with driver door open.
5. Wait for 3 minutes or longer with driver door open.
   NOTE:
   - Do not close driver door because the steering wheel locks when driver door is closed.

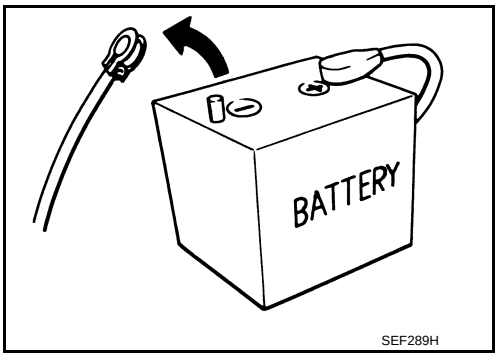
- The auto acc function is adapted to this vehicle. For this reason, even when the ignition switch is turned to OFF position, the accessory power source does not turned OFF and continues to be supplied for a certain amount of time.

6. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
7. Perform the necessary repair operation.
8. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from OFF position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
9. Perform self-diagnosis check of all control units using CONSULT.

Precautions for Removing Battery Terminal

INFOID:0000000010822745

- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the intelligent key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.



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HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to Instruction 1 or Instruction 2 described below.
For vehicles parked by ignition switch OFF, refer to Instruction 2.

INSTRUCTION 1

1. Open the hood.
2. Turn key switch to the OFF position with the driver side door opened.
3. Get out of the vehicle and close the driver side door.
4. Wait at least 3 minutes.
   CAUTION:
   While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.
5. Remove 12V battery terminal.
   CAUTION:
   After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

INSTRUCTION 2 (FOR VEHICLES PARKED BY IGNITION SWITCH OFF)

1. Unlock the door with intelligent key or remote keyless entry.
   NOTE:
   At this moment, ACC power is supplied.
2. Open the driver side door.
3. Open the hood.
4. Close the driver side door.
5. Wait at least 3 minutes.
   CAUTION:

While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

6. Remove 12V battery terminal.
   CAUTION:
   After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

Precautions for Suspension

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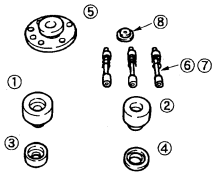
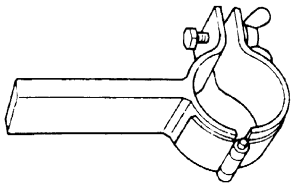
- When installing rubber bushings, the final tightening must be carried out under unladen conditions with tires on ground. Spilled oil might shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools 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.

PREPARATION

PREPARATION

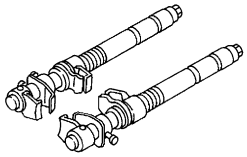
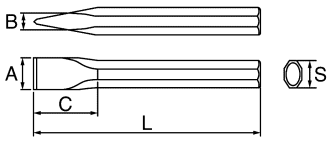
Special Service Tools

INFOID:0000000010822747

Tool number Tool name	Description
KV991040S1 ① KV99104020 Adapter A ② KV99104030 Adapter B ③ KV99104040 Adapter C ④ KV99104050 Adapter D ⑤ KV99104060 Plate ⑥ KV99104070 Guide bolt ⑦ KV99104080 Spring ⑧ KV99104090 Center plate  ZZA1167D	Measuring wheel alignment
ST35652000 Strut attachment  ZZA0807D	Disassembling and assembling strut

Commercial Service Tools

INFOID:0000000010822748

Tool name	Description
Spring compressor  S-NT717	Removing and installing coil spring
Chisel  JSEIA0915ZZ	Removing and installing steering knuckle and strut assembly A: 16 – 32 mm (0.63 – 1.26 in) B: 10 mm (0.39 in) or more C: 40 – 70 mm (1.57 – 2.76 in) L: 220 mm (7.87 in) or less S: 14 mm (0.55 in) or more

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000010822749

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

Reference			FSU-10, FSU-17, FSU-19, FSU-22	FSU-15	—	—	—	FSU-10, FSU-17, FSU-19, FSU-22	FSU-8	—	NVH in FAX and FSU sections	NVH in WT section	NVH in WT section	NVH in FAX section	NVH in BR section	NVH in ST section
Possible cause and SUSPECTED PARTS			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 AND FRONT SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	FRONT SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×
		Shake	×	×	×	×		×			×	×	×	×	×	×
		Vibration	×	×	×	×	×				×	×		×		×
		Shimmy	×	×	×	×			×		×	×	×		×	×
		Judder	×	×	×						×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×	×	×	×			

×: Applicable

PERIODIC MAINTENANCE

FRONT SUSPENSION ASSEMBLY

Inspection

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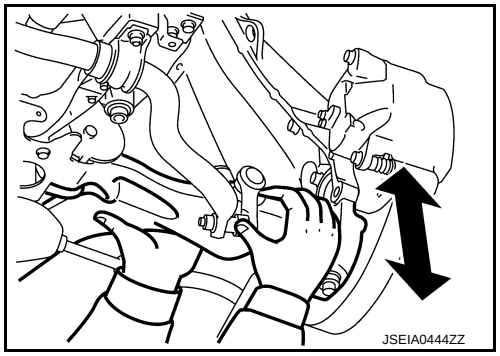
COMPONENT PART

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-24, "Ball Joint".

CAUTION:

- **Never depress brake pedal when measuring.**
- **Never perform with tires on level ground.**
- **Never damage ball joint boot. Never damage the installation position by applying excessive force.**

STRUT ASSEMBLY

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

WHEEL ALIGNMENT

Inspection

INFOID:0000000010822751

DESCRIPTION

CAUTION:

- **The adjustment mechanisms of camber, caster, and kingpin inclination angles are not included.**
- **If camber, caster, or kingpin inclination angle exceeds the standard value, 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 fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

PRELIMINARY CHECK

Check the following:

- Tires for improper air pressure and wear. Refer to WT-66, "Tire Air Pressure".
- Road wheels for runout.
- Wheel bearing axial end play. Refer to FAX-16, "Inspection" (2WD), FAX-77, "Inspection" (4WD).
- Transverse link ball joint axial end play. Refer to FSU-18, "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).

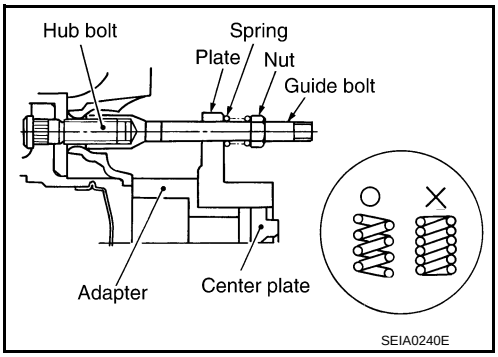
CAMBER, CASTER, AND KINGPIN INCLINATION ANGLES

- Camber, caster, kingpin inclination angles cannot be adjusted.
- Before inspection, mount front wheels onto turning radius gauge. Mount rear wheels onto a stand at the same height so that vehicle remains horizontal.

Using a CCK Gauge

Install the CCK gauge attachment (SST: KV991040S1) with the following procedure on wheel, then measure wheel alignment.

1. Remove three wheel to nuts, and install the guide bolts to hub bolt.
2. Screw the adapter into the plate until it contacts the plate tightly.
3. Screw the center plate into the plate.
4. Insert the plate assembly on the guide bolt. Put the spring in, and then evenly screw the three guide bolt nuts. When fastening the guide nuts, do not completely compress the spring.

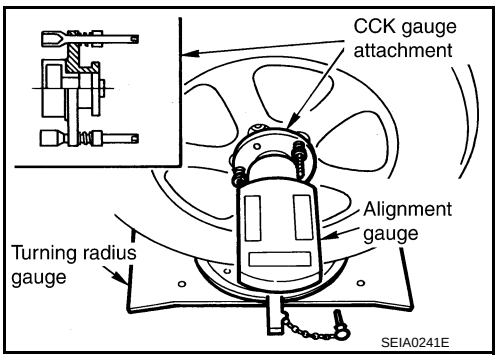


5. Place the dent of alignment gauge onto the projection of the center plate and tightly contact them to measure.

Camber, caster, kingpin inclination angles	**: Refer to FSU-24, "Wheel Alignment".**

CAUTION:

- **If camber, caster, or kingpin inclination angle exceeds the standard value, 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.**



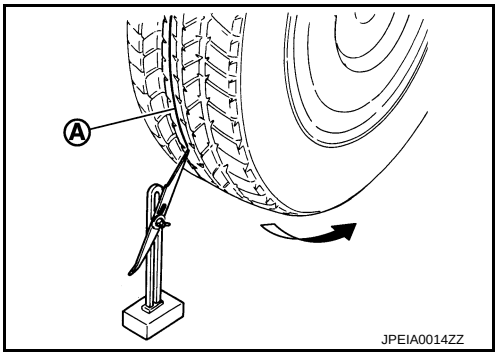
TOE-IN

Measure toe-in by the following procedure.

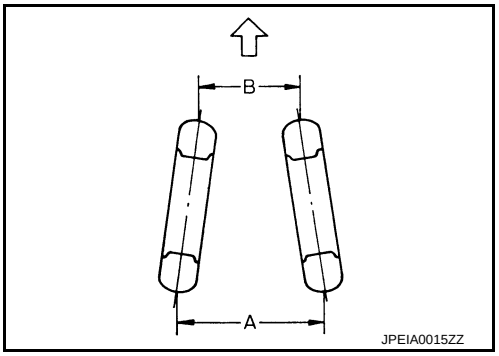
WARNING:

- **Always perform the following procedure on a flat surface.**
- **Make sure that no person is in front of vehicle before pushing it.**

1. Bounce front of vehicle up and down to stabilize the vehicle height (posture).
2. Push vehicle straight ahead about 5 m (16 ft).
3. Put matching mark Ⓐ on base line of the tread (rear side) of both tires at the same height of hub center. These are measuring points.



4. Measure distance (A) (rear side).
5. Push vehicle slowly ahead to rotate wheels 180 degrees (1/2 turn).
   NOTE:
   If the wheels rotates more than 180 degrees (1/2 turn), start this procedure again from the beginning. Do not push the vehicle backward.
6. Measure distance (B) (front side).



Standard

Total toe-in = A – B

Total toe-in : Refer to FSU-24, "Wheel Alignment".

- If toe-in exceeds the standard value, adjust toe-in by varying the length of between steering outer socket and inner socket. Refer to FSU-9, "Adjustment".

Adjustment

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TOE-IN

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

Toe-in : Refer to FSU-24, "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-99, "Work Procedure".

REMOVAL AND INSTALLATION

FRONT COIL SPRING AND STRUT

Exploded View

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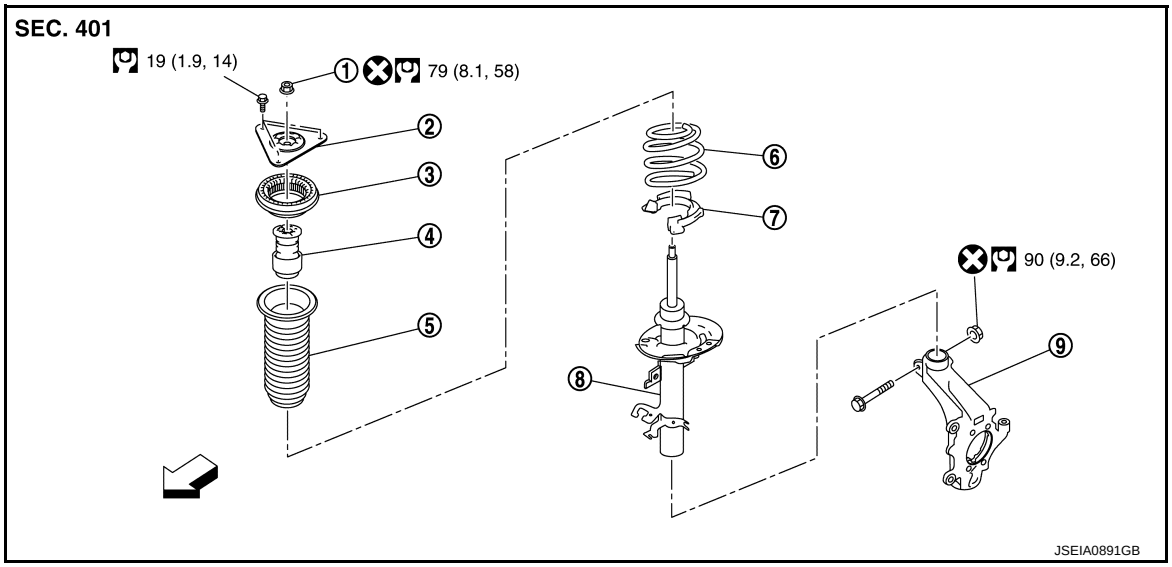

① Piston rod lock nut	② Mounting insulator	③ Mounting bearing
④ Bound bumper	⑤ Upper rubber seat	⑥ Coil spring
⑦ Lower rubber seat	⑧ Strut	⑨ Steering knuckle

: Always replace after every disassembly.

: N·m (kg-m, ft-lb)

⇦: Vehicle front

Removal and Installation

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REMOVAL

1. Remove cowl top cover. Refer to EXT-25, "Removal and Installation".
2. Remove tires. Refer to WT-61, "Removal and Installation".
3. Remove lock plate from strut assembly.
   - LHD: Refer to BR-24, "FRONT : Exploded View".
   - RHD: Refer to BR-88, "FRONT : Exploded View".
4. Remove wheel sensor. Refer to BRC-212, "FRONT WHEEL SENSOR : Removal and Installation".
5. Separate stabilizer connecting rod from strut assembly. Refer to FSU-19, "Removal and Installation".
6. Separate the connection of strut assembly and steering knuckle as follows.

CAUTION:

Be sure to keep the following procedure because steering knuckle may be damaged when you enlarge the gap of steering knuckle too much.

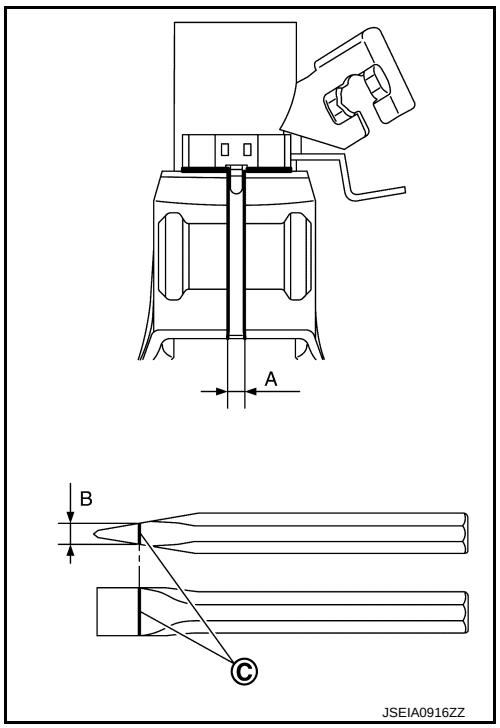
a. Remove strut mounting bolts from steering knuckle.

b. Measure the gap (A) of the steering knuckle. And then mark the enlarged limit (B) to the chisel.

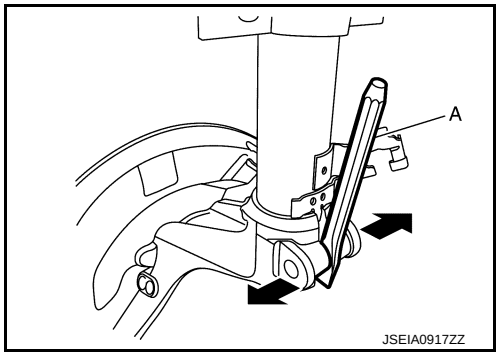
Ⓒ Marking

Enlarged limit (B) = gap (A) + 2.5 mm (0.098 in)

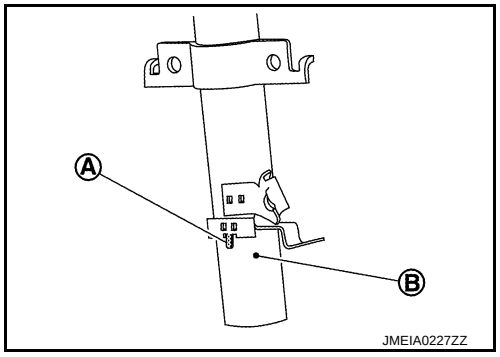
NOTE:
Standard of gap: 6.9 ± 0.5 mm (2.56 ± 0.02 in)



c. Enlarge the gap of the steering knuckle with the chisel (A) not to surpass a limit as shown in the figure.
CAUTION:
- **Never enlarge the gap more than 2.5mm (0.098in).**



- **Be careful not to damage the projection Ⓐ and strut assembly Ⓑ with the chisel.**



d. Separate the connection of strut assembly and steering knuckle.
CAUTION:
- **Never place drive shaft joint at an extreme angle.**
- **Be careful not to overextend slide joint.**
- **Never allow drive shaft to hang down without support for joint sub-assembly, shaft and the other parts.**
- **Be sure to remove lubricants if lubricant has been used to separate the connection of strut assembly and steering knuckle.**

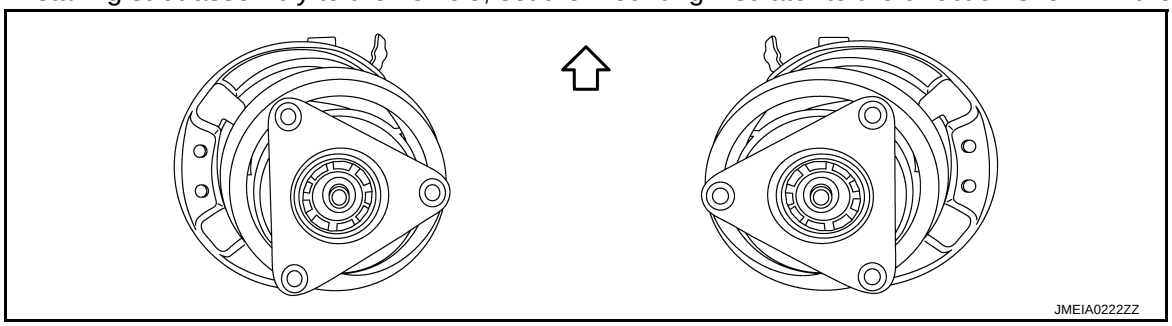
7. Remove mounting bolt of mounting insulator, and then remove strut assembly.

INSTALLATION

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

Strut Assembly

- When installing strut assembly to the vehicle, set the mounting insulator to the direction shown in the figure.



⇦ : Vehicle front

CAUTION:
Never reuse strut mounting nut.

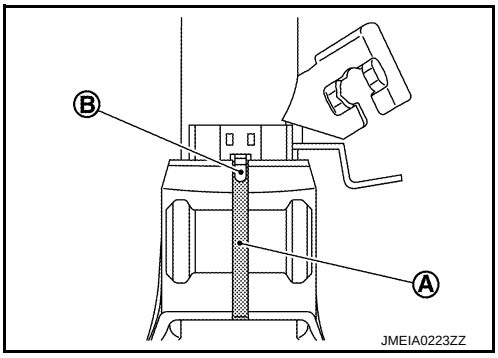
- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to FSU-15, "Inspection".
- After replacing the strut, always follow the disposal procedure to discard the strut. Refer to FSU-16, "Disposal".

Strut Assembly and Steering Knuckle Connection

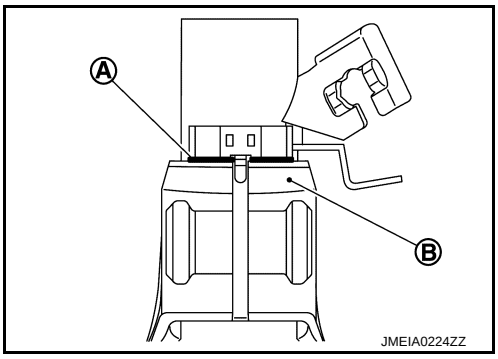
CAUTION:
Be sure to remove lubricants if lubricant has been used to separate the connection of strut assembly and steering knuckle.

Install the steering knuckle to strut assembly as follows.

1. Set suitable jack under steering knuckle.
2. Align the gap Ⓐ of steering knuckle to the projection part Ⓑ of strut.



3. Tighten the mounting bolt with pushing up the steering knuckle Ⓑ until contacts stopper bracket Ⓐ end face, using a suitable jack.
   CAUTION:
   Check the stable condition when using a jack.



Disassembly and Assembly

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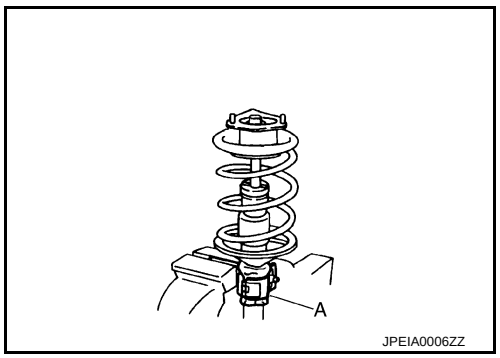
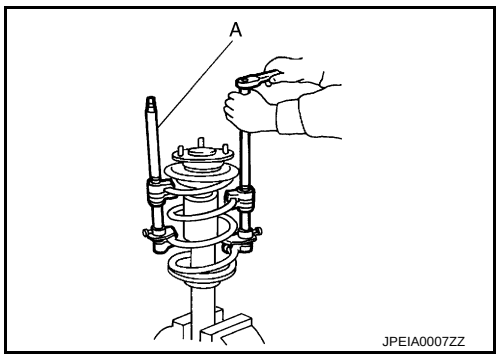
DISASSEMBLY

CAUTION:
Never damage strut assembly piston rod when removing components from strut assembly.

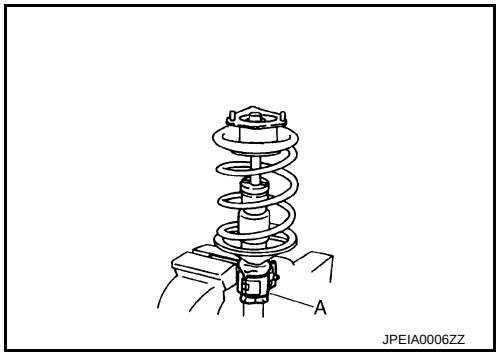
1. Install strut attachment (A) (SST: ST35652000) to strut assembly and secure it in a vise.
CAUTION:
When installing the strut attachment to strut assembly, wrap a shop cloth around strut to protect from damage.



2. 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.



3. 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.
4. Remove mounting insulator, mounting bearing, upper rubber seat and bound bumper from strut.
5. 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.
6. Remove lower rubber seat.
7. Remove strut attachment (A) (SST: ST35652000) from strut.



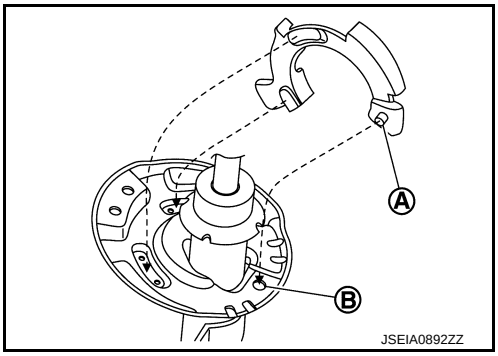
8. Perform inspection after disassembly. Refer to FSU-15, "Inspection".

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

2. Install lower rubber seat with its protrusion Ⓐ on the lower area aligned with the hole Ⓑ on the strut.

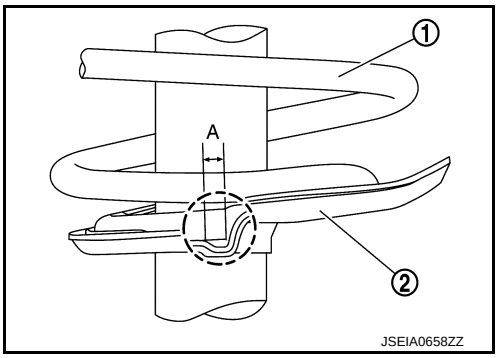


3. Compress coil spring using a spring compressor (commercial service tool), and install it onto strut assembly.

CAUTION:

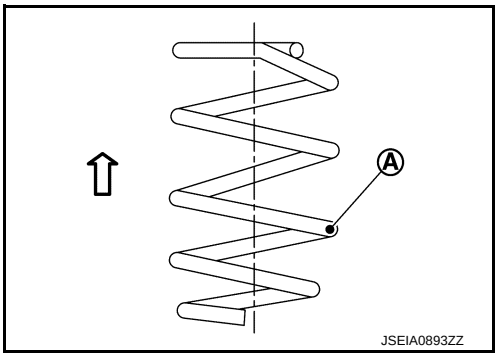
- **Be sure a spring compressor is securely attached to coil spring, before compress coil spring.**
- **Align the lower end of coil spring ① with lower rubber seat ② as shown in the figure.**

Dimension (A) : 5 mm (0.20 in) or less



- **Set coil spring so that its paint marks Ⓐ is aligned with the position of 1.75 turns from the bottom end of the coil spring.**

⇦ : Upper side



4. Apply soapy water to bound bumper.

CAUTION:

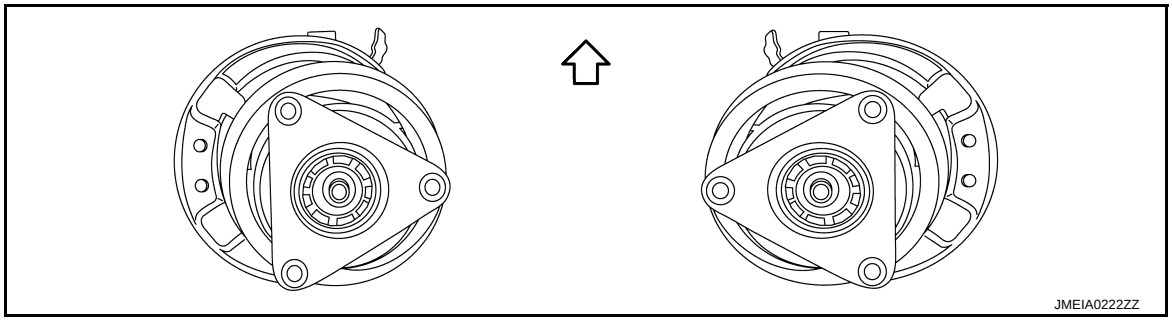
Never use machine oil.

5. Set bound bumper to piston rod of strut.
6. Install mounting bearing, mounting insulator and upper rubber seat on to spring.

CAUTION:

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

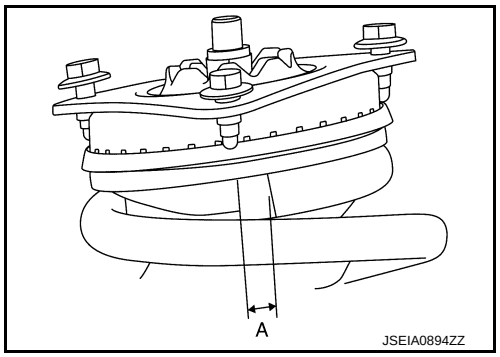
7. Set the mounting insulator to the direction shown in the figure, and then install the mounting insulator, the upper rubber seat and the mounting bearing to the strut.



CAUTION:

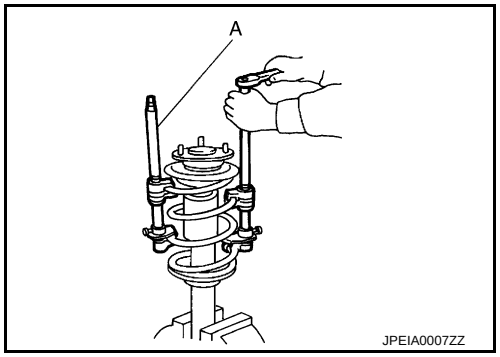
- **Align the upper end of coil spring with upper rubber seat as shown in the figure.**

Dimension (A) : 5 mm (0.20 in) or less

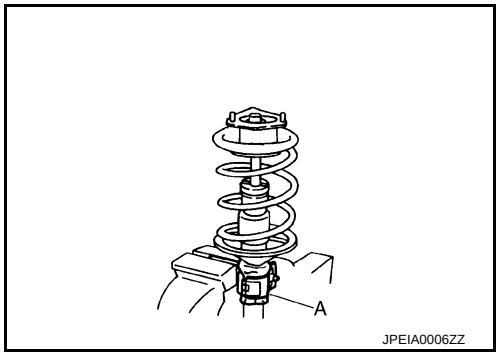


8. Secure piston rod tip so that piston rod does not turn, then tighten piston rod lock nut with specified torque.
   CAUTION:
   Never reuse piston rod lock nut.

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.



10. Remove the strut attachment (A) (SST: ST35652000) from strut assembly.



Inspection

INFOID:0000000010822756

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-212, "FRONT WHEEL SENSOR : Exploded View".

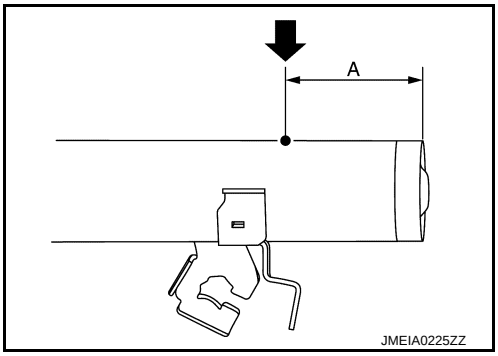
2. Check wheel alignment. Refer to FSU-7, "Inspection".
3. Adjust neutral position of steering angle sensor. Refer to BRC-99, "Work Procedure".

Disposal

INFOID:0000000010822757

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



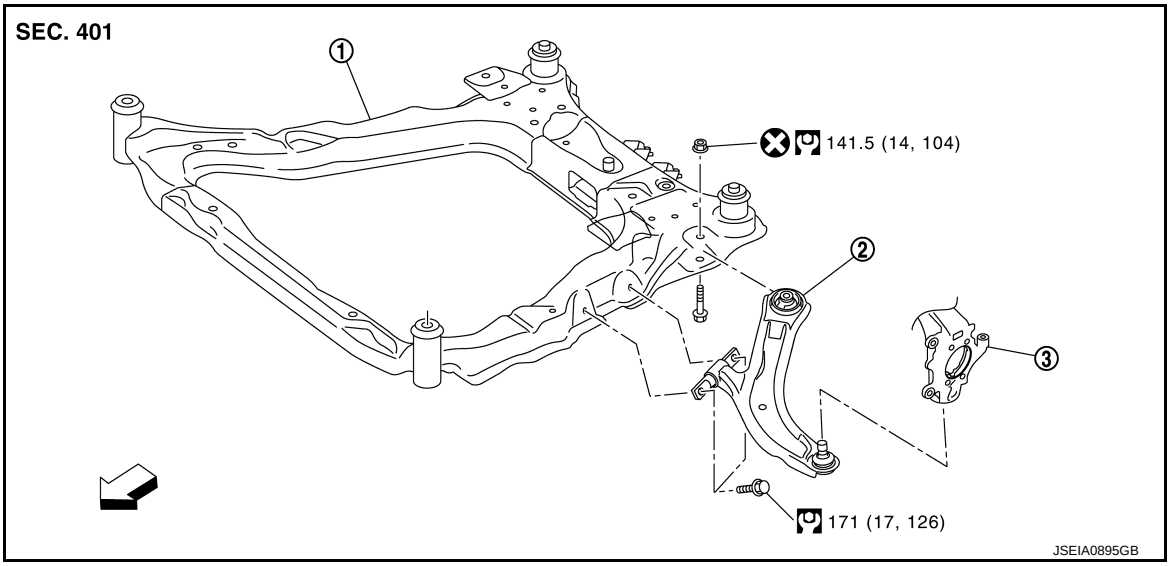
A : 20 – 30 mm (0.79 – 1.18 in)

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

Exploded View

INFOID:0000000010822758



① Front suspension member ② Transverse link ③ Steering knuckle

: Always replace after every disassembly.

: N·m (kg-m, ft-lb)

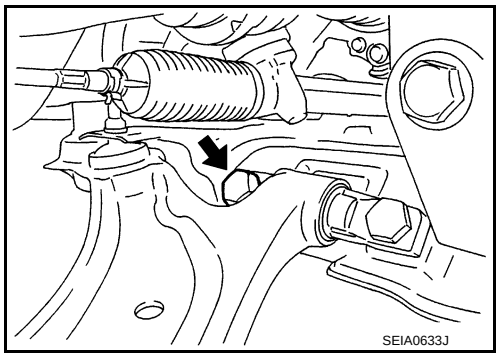
: Vehicle front

Removal and Installation

INFOID:0000000010822759

REMOVAL

1. Remove tires. Refer to WT-61, "Removal and Installation".
2. Remove under cover. Refer to EXT-39, "ENGINE UNDER COVER : Exploded View".
3. Separate transverse link from steering knuckle.
   - 2WD: Refer to FAX-11, "Removal and Installation".
   - 4WD: Refer to FAX-72, "Removal and Installation".
4. Remove transverse link from suspension member.
   NOTE:
   When removing transverse link, the stabilizer interferes with the transverse link mounting bolt (⬅). Move the stabilizer to the position where the mounting bolt can be removed. Refer to FSU-19, "Removal and Installation".



5. Perform inspection after removal. Refer to FSU-18, "Inspection".

INSTALLATION

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

- Never reuse transverse link mounting nut.
- Perform final tightening of bolts and nuts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to FSU-18, "Inspection".

Inspection

INFOID:0000000010822760

INSPECTION AFTER REMOVAL

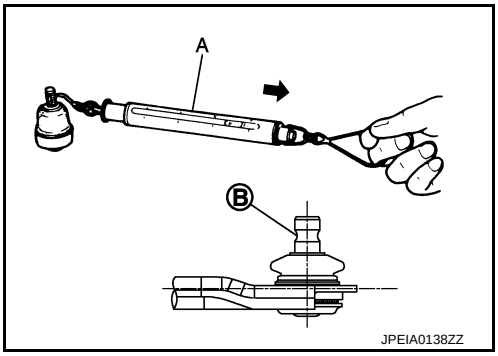
Check the following items, and replace the parts if necessary.

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



Swing torque : **Refer to FSU-24, "Ball Joint".**

Measurement on spring balance : **Refer to FSU-24, "Ball Joint"**

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

Axial End Play

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

Axial end play : **Refer to FSU-24, "Ball Joint".**

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

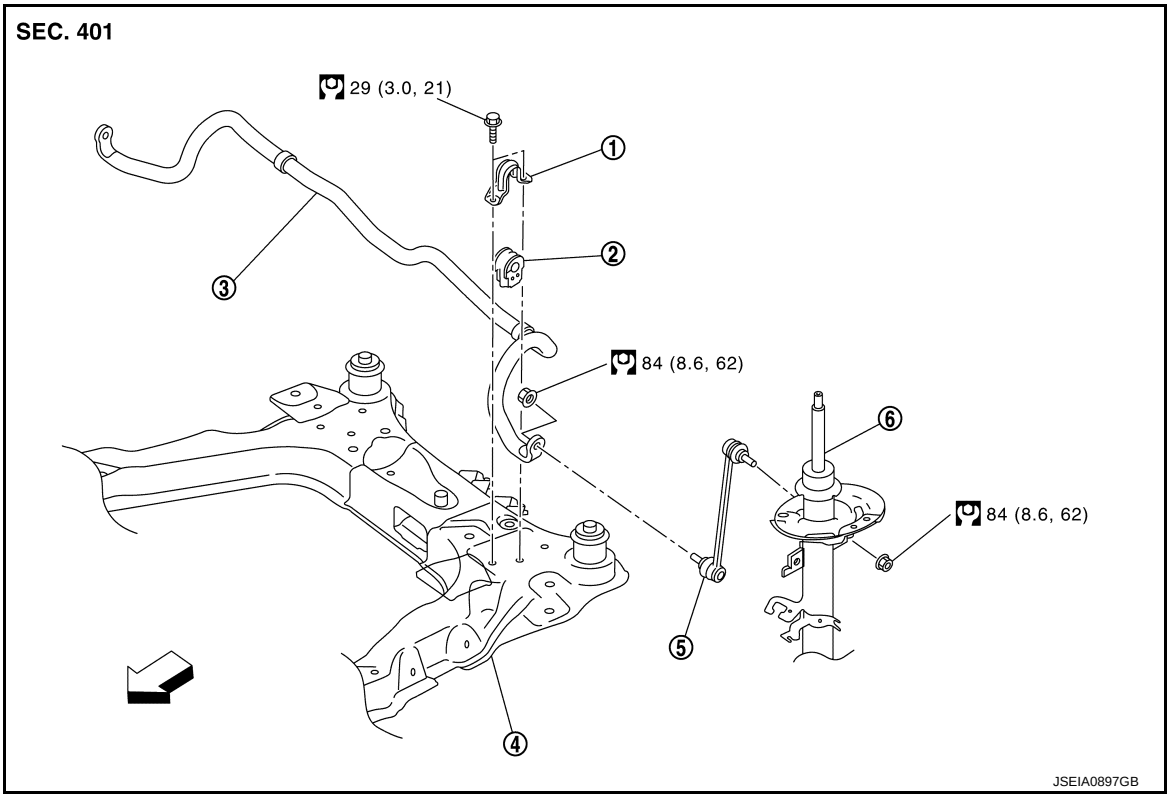
INSPECTION AFTER INSTALLATION

1. Check wheel alignment. Refer to FSU-8, "Inspection".
2. Adjust neutral position of steering angle sensor. Refer to BRC-99, "Work Procedure".

FRONT STABILIZER

Exploded View

INFOID:0000000010822761



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

: N·m (kg-m, ft-lb)

: Vehicle front

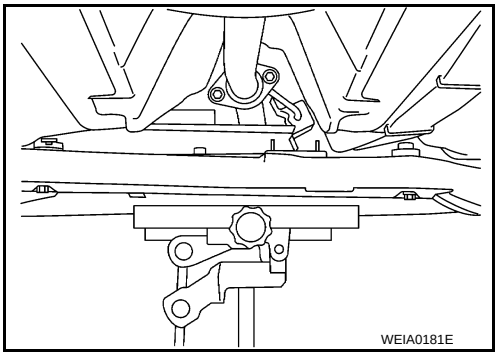
Removal and Installation

INFOID:0000000010822762

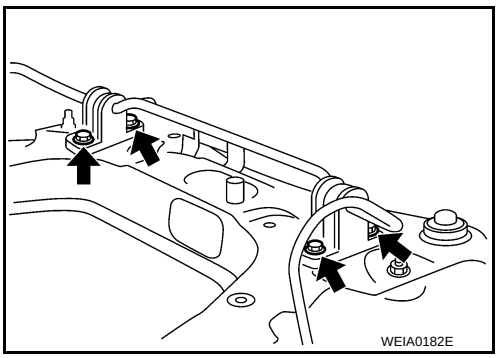
REMOVAL

1. Remove tires. Refer to WT-61, "Removal and Installation".
2. Remove under cover. Refer to EXT-39, "ENGINE UNDER COVER : Exploded View".
3. Remove steering outer socket from steering knuckle. Refer to ST-22, "Removal and Installation".
4. Remove stabilizer connecting rod.
5. Remove member stay. Refer to FSU-22, "Removal and Installation"
6. Remove rear torque rod.
   - MR20DD: Refer toEM-56, "Removal and Installation" .
   - QR25DE: Refer to EM-200, "Removal and Installation".
   - R9M: Refer to EM-366, "Removal and Installation".
7. Separate steering gear assembly from steering shaft. Refer to ST-22, "Removal and Installation".

8. Using jack, lower front suspension member to the position where the mounting bolts of stabilizer clamp can be removed. Refer to FSU-22, "Removal and Installation".



9. Remove mounting bolts (⬅) of stabilizer clamp, and then remove stabilizer clamp and stabilizer bushing from front suspension member.



10. Remove stabilizer bar.
11. Perform inspection after removal. Refer to FSU-21, "Inspection".

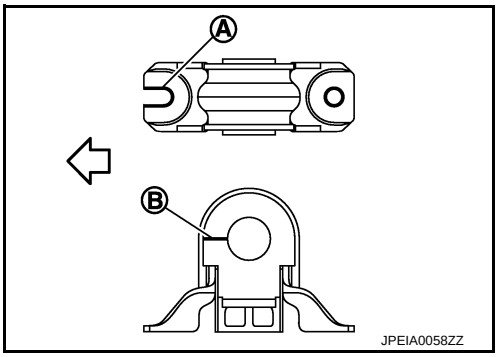
INSTALLATION

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

- Install stabilizer clamp and stabilizer bush as follows.

- The notch Ⓐ is facing front of the vehicle.
- The slit Ⓑ is facing rear of the vehicle.

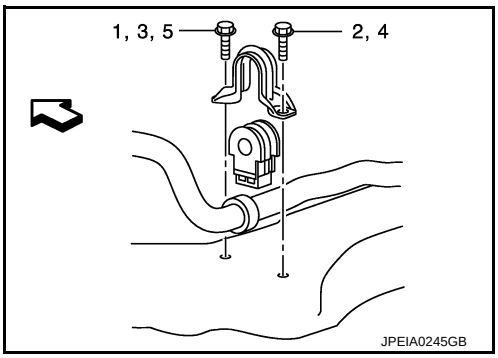
⇦ : Vehicle front



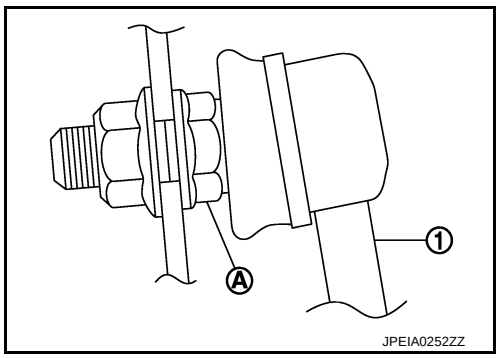
- When installing the stabilizer clamp mounting bolts, tighten in numerical order.

Temporary tightening (by hand)	: 1
Temporary tightening (by tool)	: 2→3
Final tightening (Specified torque)	: 4→5

⇦ : Vehicle front



- To install stabilizer connecting rod ①, tighten the mounting nut with the hexagonal part Ⓐ on the stabilizer connecting rod side fixed.



- Perform final tightening of bolts and nuts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to FSU-18, "Inspection".

Inspection

INFOID:0000000010822763

INSPECTION AFTER REMOVAL

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

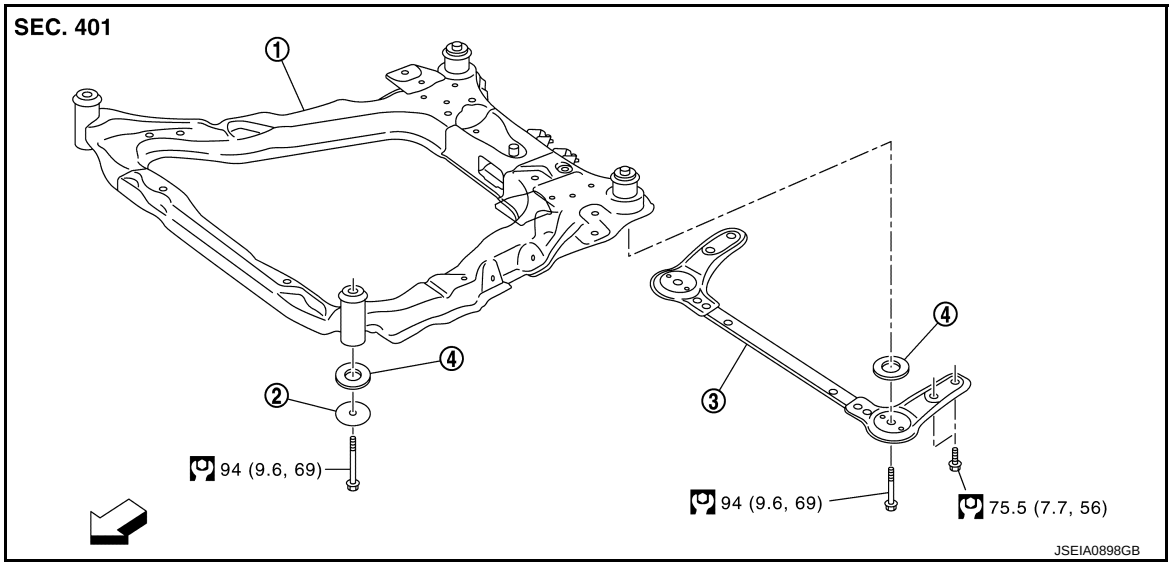
INSPECTION AFTER INSTALLATION

1. Check wheel alignment. Refer to FSU-8, "Inspection".
2. Adjust neutral position of steering angle sensor. Refer to BRC-99, "Work Procedure".

FRONT SUSPENSION MEMBER

Exploded View

INFOID:0000000010822764



① Front suspension member ② Rebound stopper ③ Member stay
④ Rebound stopper

: N·m (kg-m, ft-lb)
: Vehicle front

Removal and Installation

INFOID:0000000010822765

REMOVAL

1. Remove tires. Refer to WT-61, "Removal and Installation".
2. Remove under cover. Refer to EXT-39, "ENGINE UNDER COVER : Exploded View".
3. Remove wheel sensor. Refer to BRC-212, "FRONT WHEEL SENSOR : Removal and Installation".
4. Separate stabilizer connecting rod (strut side) from strut. Refer to FSU-19, "Removal and Installation".
5. Remove steering outer socket from steering knuckle. Refer to ST-22, "Removal and Installation".
6. Remove steering gear assembly. Hang steering gear assembly not to interfere with work. Refer to ST-22, "Removal and Installation".
7. Separate transverse link from steering knuckle. Refer to FSU-17, "Removal and Installation".
8. Remove rear torque rod.
   - MR20DD: Refer toEM-56, "Removal and Installation" .
   - QR25DE: Refer to EM-200, "Removal and Installation".
   - R9M: Refer to EM-366, "Removal and Installation".
9. Set suitable jack under front suspension member.
   CAUTION:
   - **At this step, the jack must be set only for supporting the removal procedure. For details on jacking up the vehicle, refer to GI-31, "Garage Jack and Safety Stand and 2-Pole Lift".**
   - **Never damage the front suspension member with a jack.**
   - **Check the stable condition when using a jack.**
10. Remove member stay.
11. Remove front suspension member mounting bolts and rebound stopper rubber.
12. Gradually lower the jack to remove front suspension member from vehicle body.
    CAUTION:
    Operate while checking that jack supporting status is stable.
    NOTE:

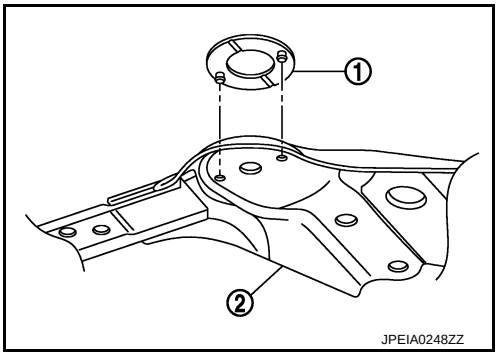
Remove suspension member with stabilizer bar and transverse link.

13. Remove the following parts.
    - Stabilizer bar: Refer to FSU-19, "Removal and Installation".
    - Transverse link: Refer to FSU-17, "Removal and Installation".
14. Perform inspection after removal. Refer to FSU-18, "Inspection".

INSTALLATION

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

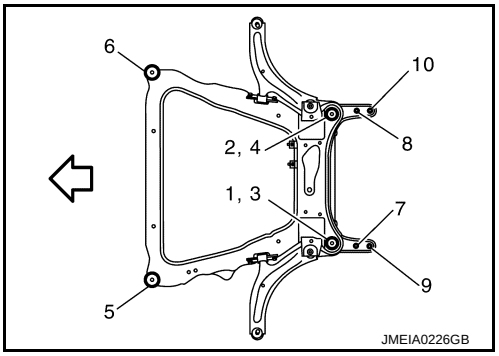
- To install rebound stopper ①, insert it with the protrusion aligned with the hole of member stay ②.



- 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 bolts and nuts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to FSU-18, "Inspection".

Inspection

INFOID:0000000010822766

INSPECTION AFTER REMOVAL

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

INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connector. Refer to BRC-212, "FRONT WHEEL SENSOR : Exploded View".
2. Check wheel alignment. Refer to FSU-8, "Inspection".
3. Adjust neutral position of steering angle sensor. Refer to BRC-99, "Work Procedure".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

INFOID:0000000010822767

Item			Standard
Camber Degree minute (Decimal degree)		Minimum	–1° 15′ (–1.25°)
		Nominal	–0° 30′ (–0.50°)
		Maximum	0° 15′ (0.25°)
		Left and right difference*1	–0° 35′ (–0.58°) - 0° 35′ (0.58°)
Caster Degree minute (Decimal degree)		Minimum	4° 50′ (4.84°)
		Nominal	5° 35′ (5.58°)
		Maximum	6° 20′ (6.33°)
		Left and right difference*1	–0° 35′ (–0.58°) - 0° 35′ (0.58°)
Kingpin inclination Degree minute (Decimal degree)		Minimum	10° 55′ (10.92°)
		Nominal	11° 40′ (11.67°)
		Maximum	12° 25′ (12.41°)
Toe-in	Total toe-in Distance	Minimum	Out 0.2 mm (Out 0.008 in)
		Nominal	In 1.8 mm (In 0.071 in)
		Maximum	In 3.8 mm (In 0.150 in)
	Total toe-angle Degree minute (Decimal degree)	Minimum	Out 0° 04′ (Out 0.06°)
		Nominal	In 0° 08′ (In 0.13°)
		Maximum	In 0° 20′ (In 0.33°)

Measure value under unladen*2 conditions.

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

*2: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

Ball Joint

INFOID:0000000010822768

Item	Standard
Swing torque	0.5 – 3.4 N·m (0.06 – 0.34 kg-m, 5 – 30 in-lb)
Measurement on spring balance	13.5 – 91.9 N (1.4 – 9.4 kg, 3 – 21 lb)
Axial end play	0 mm (0 in)

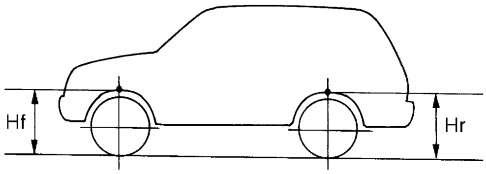
Wheelarch Height

INFOID:0000000010822769

2ROW

Item	Standard								
Engine	MR20DD/QR25DE				R9M				
Drive	2WD		4WD		2WD		4WD		
Tire Size	17 inch	18 inch	17 inch	18 inch	17 inch	19 inch	17 inch	18 inch	19 inch
Front (Hf)	800 mm (31.50 in)	803 mm (31.61 in)	799 mm (31.46 in)	801 mm (31.54 in)	797 mm (31.38 in)	802 mm (31.57 in)	796 mm (31.34 in)	799 mm (31.46 in)	802 mm (31.57 in)

Item	Standard								
Engine	MR20DD/QR25DE				R9M				
Drive	2WD		4WD		2WD		4WD		
Tire Size	17 inch	18 inch	17 inch	18 inch	17 inch	19 inch	17 inch	18 inch	19 inch
Rear (Hr)	798 mm (31.42 in)	800 mm (31.50 in)	796 mm (31.34 in)	799 mm (31.46 in)	798 mm (31.42 in)	802 mm (31.57 in)	797 mm (31.38 in)	799 mm (31.46 in)	801 mm (31.54 in)



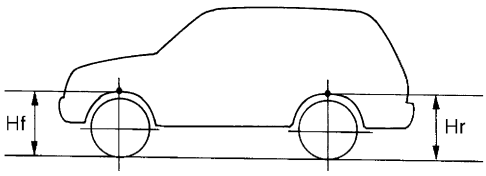
SFA746B

Measure value under unladen* conditions.

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

3ROW

Item	Standard			
Engine	R9M			
Drive	2WD		4WD	
Tire Size	17 inch	19 inch	17 inch	19 inch
Front (Hf)	797 mm (31.38 in)	802 mm (31.57 in)	797 mm (31.38 in)	802 mm (31.57 in)
Rear (Hr)	796 mm (31.34 in)	801 mm (31.54 in)	795 mm (31.30 in)	800 mm (31.50 in)



SFA746B

Measure value under unladen* conditions.

*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.