

SECTION **FSU**
FRONT SUSPENSION

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FSU

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PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000007208051

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 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 3 minutes before performing any service.

Precautions for Suspension

INFOID:000000007208053

- When installing rubber bushings, the final tightening must be carried out under unladen conditions with tires on ground. 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.

PREPARATION

< PREPARATION >

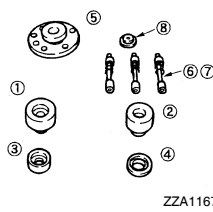
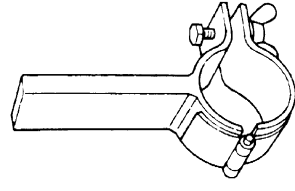
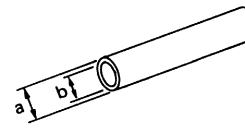
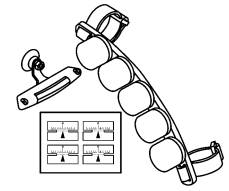
PREPARATION

PREPARATION

Special Service Tools

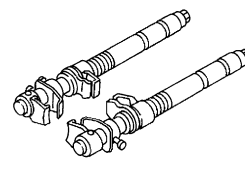
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The actual shapes of Kent-Moore tools may differ from those of special tools illustrated here.

Tool number (Kent-Moore No.) 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	Measuring wheel alignment  ZZA1167D
ST35652000 (—) Strut attachment	Disassembling and assembling strut  ZZA0807D
KV10106700 (—) Drift	Disassembling and assembling strut mounting bearing a: 25 mm (0.98 in) dia. b: 18.5 mm (0.728 in) dia.  ZZA0534D
— (J-49286) Drift and Pull gauge	Measuring drift and pull  AWEIA0156ZZ

Commercial Service Tools

INFOID:000000007208055

Tool name	Description
Spring compressor	Removing and installing coil spring  S-NT717

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

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

Symptom		Possible cause and SUSPECTED PARTS											Reference page	
		Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	FRONT AXLE AND FRONT SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Symptom	Noise	x	x	x	x	x	x		x	x	x	x	x	
	Shake	x	x	x	x		x		x	x	x	x	x	
	Vibration	x	x	x	x	x			x	x		x		
	Shimmy	x	x	x	x			x	x	x	x		x	x
	Shudder	x	x	x					x	x	x		x	x
	Poor quality ride or handling	x	x	x	x	x		x	x	x	x			

x: Applicable

FRONT SUSPENSION ASSEMBLY

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

FRONT SUSPENSION ASSEMBLY

Inspection and Adjustment

INFOID:000000007208058

INSPECTION

Make sure the mounting conditions (looseness, back lash) of each component and component conditions (wear, damage) are normal.

LOWER BALL JOINT END PLAY

1. Set front wheels in a straight-ahead position. Do not depress brake pedal.
2. Place an iron bar or similar tool between upper link and steering knuckle.
3. Measure axial end play by prying it up and down. Refer to [FSU-16, "Ball Joint"](#).

CAUTION:

Be careful not to damage ball joint boot. Do not damage the installation position by applying excessive force.

SHOCK ABSORBER

Check for oil leakage, damage and replace if malfunction is detected.

WHEEL ALIGNMENT

Description

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.

General Information and Recommendations

- A four-wheel thrust alignment should be performed.
- This type of alignment is recommended for any NISSAN 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 vehicle.
- The rack should be checked to ensure that it is level.
- Make sure 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.

Preliminary Check

Check the following:

1. Tires for improper air pressure and wear.
2. Road wheels for runout. Refer to [WT-45, "Road Wheel"](#).
3. Wheel bearing axial end play. Refer to [FAX-24, "Wheel Bearing"](#).
4. Transverse link ball joint axial end play. Refer to [FSU-11, "Removal and Installation"](#).
5. Shock absorber operation.
6. Each mounting part of axle and suspension for looseness and deformation.
7. Each of suspension member, shock absorber, upper link and transverse link for cracks, deformation and other damage.
8. Vehicle height (posture).

Alignment Process

IMPORTANT:

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use "indicators" **Do not use these indicators.**: (Green/red, plus or minus, Go/No Go).
- The alignment specifications programmed into your machine that operate these indicators may not be correct.

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FRONT SUSPENSION ASSEMBLY

< PERIODIC MAINTENANCE >

- 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.
- Use 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

Camber, Caster and Kingpin Inclination Angles

CAUTION:

Camber, caster, kingpin inclination angles cannot be adjusted.

FRONT COIL SPRING AND STRUT

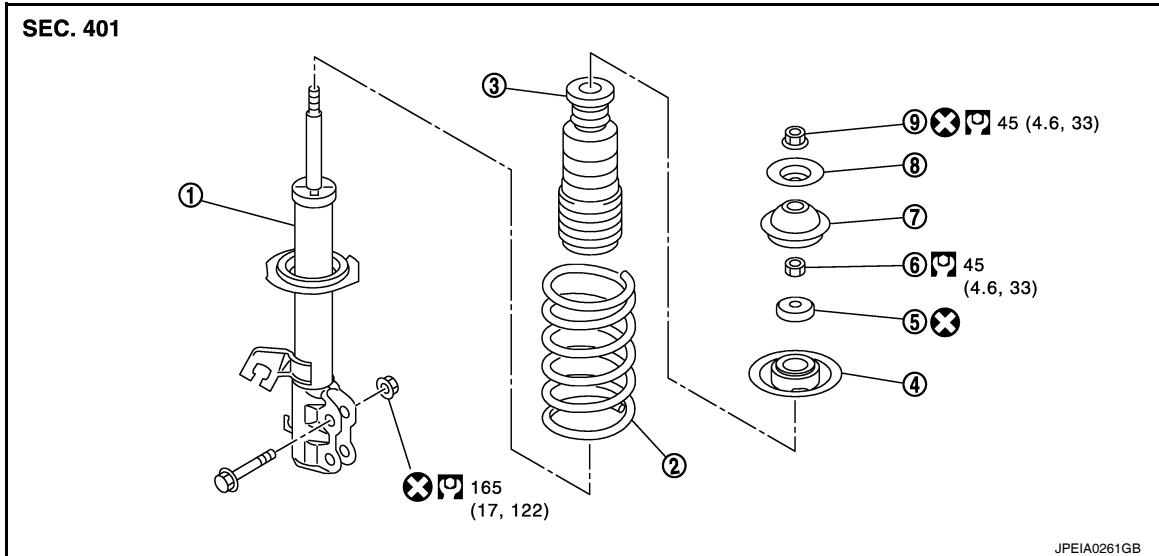
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

FRONT COIL SPRING AND STRUT

Exploded View

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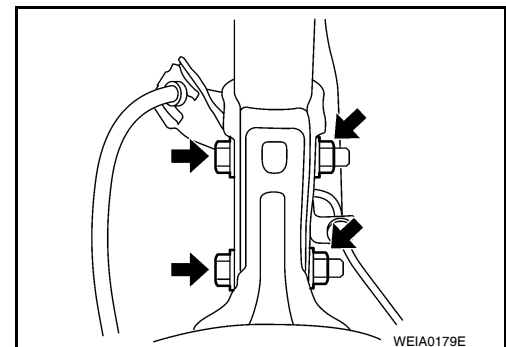
- | | | |
|-----------------------------|---------------------------|-------------------------------|
| 1. Strut assembly | 2. Coil spring | 3. Bound bumper |
| 4. Spring upper seat | 5. Strut mounting bearing | 6. Piston rod lock nut |
| 7. Strut mounting insulator | 8. Stopper insulator | 9. Stopper insulator lock nut |

Removal and Installation

INFOID:000000007208060

REMOVAL

1. Remove the wheel and tire assembly using power tool.
2. Remove brake hose lock plate from strut assembly.
3. Remove stabilizer connecting rod from strut assembly. Refer to [FSU-13, "Removal and Installation"](#).
4. Remove strut mounting bolts and nuts from steering knuckle.
5. Remove stopper insulator lock nut and stopper insulator.
6. Remove strut assembly.



INSTALLATION

Installation is in the reverse order of removal.

- Secure the head of strut piston rod to keep it from rotating, then tighten the stopper insulator lock nut to the specified torque.

CAUTION:

Do not reuse stopper insulator lock nut.

- Do not reuse the nuts that secure the strut to the steering knuckle and stopper insulator lock nut.
- Perform inspection after installation. Refer to [FSU-5, "Inspection and Adjustment"](#).
- After replacing the strut assembly, always follow the disposal procedure to discard the strut assembly. Refer to [FSU-9, "Disposal"](#).

FRONT COIL SPRING AND STRUT

< REMOVAL AND INSTALLATION >

Disassembly and Assembly

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DISASSEMBLY

CAUTION:

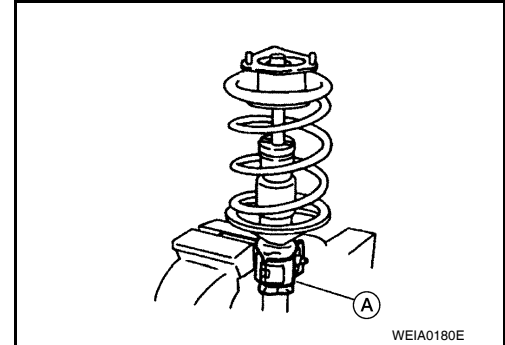
Do not damage strut assembly piston rod when removing components from strut assembly.

1. Remove strut mounting insulator.
2. Install Tool (A) to strut assembly and secure it in a vise.

Tool number : ST35652000 (—)

CAUTION:

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

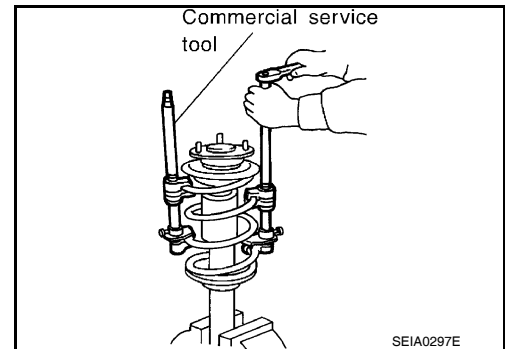


3. Using a suitable tool, compress coil spring between spring upper seat and lower seat (strut assembly) until coil spring is free.

CAUTION:

Be sure the tool is securely attached to the coil spring before compressing 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 strut mounting bearing, spring upper seat, and bound bumper as a set.



6. Remove bound bumper from spring upper seat.
7. After removing coil spring with a spring compressor, then gradually release a spring compressor.

CAUTION:

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

8. Remove the Tool from strut.

Tool number : ST35652000 (—)

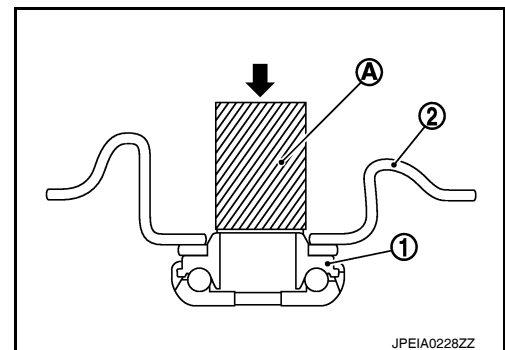
9. If necessary, remove strut mounting bearing (1) from spring upper seat (2), using a Tool (A).

Tool number : KV10106700 (—)

CAUTION:

Do not disassemble the strut mounting bearing unless damage exists.

10. Perform inspection after disassembly. Refer to [FSU-5. "Inspection and Adjustment"](#).



INSPECTION AFTER DISASSEMBLY

Strut Inspection

Check the following:

- Strut for deformation, cracks or damage, and replace it if necessary.
- Piston rod for damage, uneven wear or distortion, and replace it if necessary.
- For oil leakage, and replace it if necessary.

Strut Mounting Insulator and Rubber Parts Inspection

Check strut mounting insulator for cracks and rubber parts for wear. Replace it if malfunction is detected.

FRONT COIL SPRING AND STRUT

< REMOVAL AND INSTALLATION >

Coil Spring Inspection

Check coil spring for cracks, wear or damage, and replace it if necessary.

ASSEMBLY

1. Install Tool (A) to strut and secure it in a vise.

Tool number : ST35652000

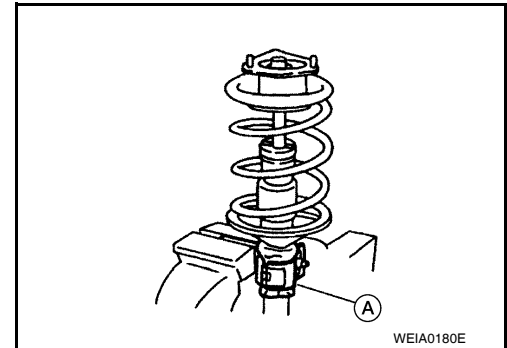
CAUTION:

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

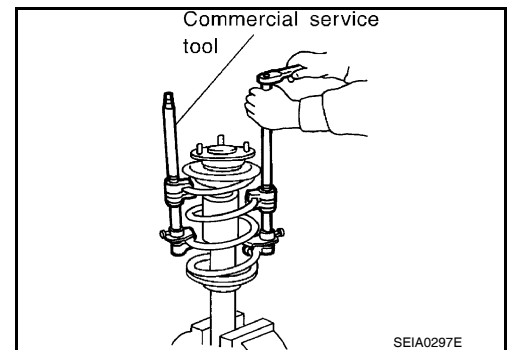
2. Apply soapy water to bound bumper.

CAUTION:

Do not use machine oil.



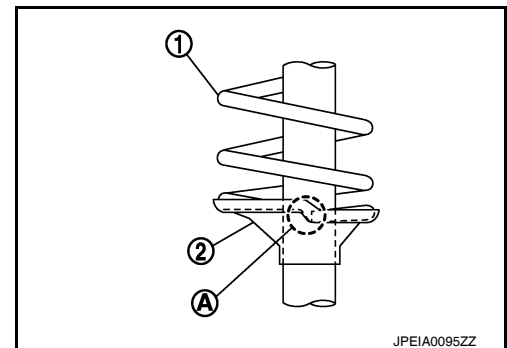
3. Insert bound bumper into spring upper seat.
4. Compress coil spring using a spring compressor (commercial service tool), and install it onto strut assembly.



CAUTION:

- Face tube side of coil spring (1) downward. Align the lower end (A) to lower seat (strut assembly) (2).
- Be sure a compressor is securely attached to coil spring. Compress coil spring.

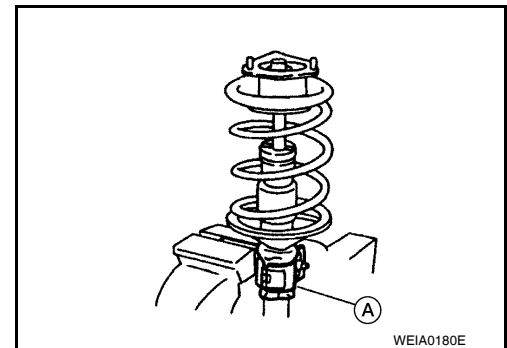
5. Install strut mounting bearing, spring upper seat, and bound bumper as a set.
6. Secure piston rod tip so that piston rod does not turn, then tighten piston rod lock nut with specified torque.
7. Gradually release a spring compressor, and remove coil spring.



CAUTION:

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

8. Remove the Tool (A) from strut assembly.
9. Install strut mounting insulator.



Disposal

1. Set strut assembly horizontally to the ground with the piston rod fully extracted.

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FRONT COIL SPRING AND STRUT

< REMOVAL AND INSTALLATION >

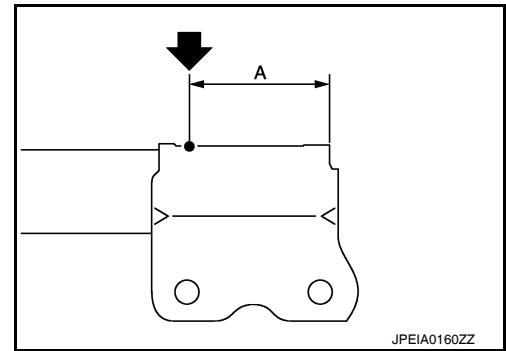
2. Drill 2 – 3 mm (0.08 – 0.12 in) hole at the position (●) from top as shown in the figure to release gas gradually.

CAUTION:

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

NOTE:

- Drill vertically in this direction.
- 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.

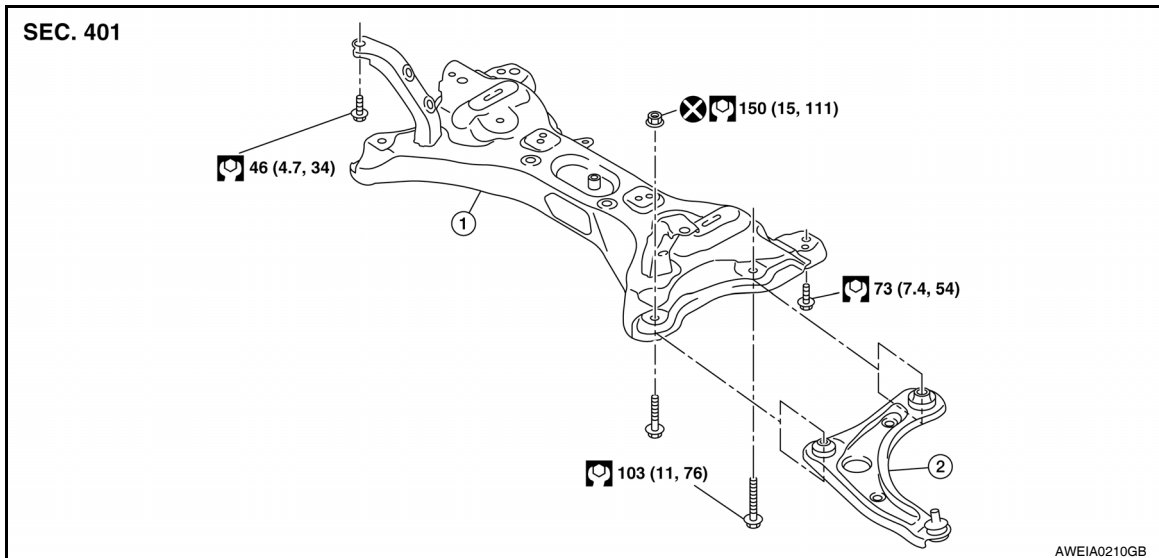
TRANSVERSE LINK

< REMOVAL AND INSTALLATION >

TRANSVERSE LINK

Exploded View

INFOID:000000007208064



1. Front suspension member
2. Transverse link

Removal and Installation

INFOID:000000007208065

REMOVAL

1. Remove the wheel and tire assembly using power tool.
2. Remove transverse link from steering knuckle. Refer to [FAX-9, "Exploded View"](#).
3. Remove transverse link from suspension member.

INSPECTION AFTER REMOVAL

Visual Inspection

Check the following:

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

Ball Joint Inspection

Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

NOTE:

Before measurement, move ball stud at least ten times by hand to check for smooth movement.

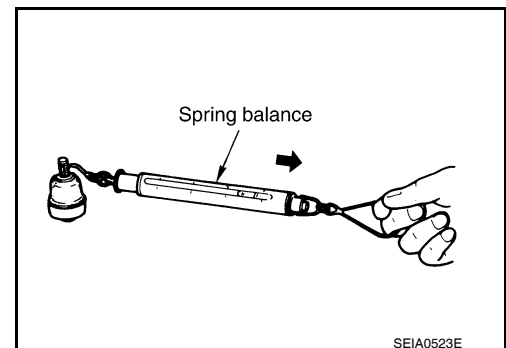
- Hook Tool at the cutout on ball stud. Confirm Tool measurement value is within specifications when ball stud begins moving.

Tool number : — (J-44372)

Swing torque : Refer to [FSU-16, "Ball Joint"](#).

Spring balance measurement : Refer to [FSU-16, "Ball Joint"](#).

- If it is outside the specified range, replace transverse link assembly.



Axial End Play Inspection

TRANSVERSE LINK

< REMOVAL AND INSTALLATION >

- Move tip of ball stud in axial direction to check for looseness.

Axial end play : Refer to [FSU-16, "Ball Joint"](#).

- If it is outside the specified range, replace transverse link assembly.

INSTALLATION

Installation is in the reverse order of removal.

- For tightening specifications, refer to [FSU-11, "Exploded View"](#).
- Perform final tightening of bolts and at the front suspension member installation position (rubber bushing) under unladen conditions with tires on level ground. Check wheel alignment. Refer to [FSU-16, "Wheel Alignment"](#).

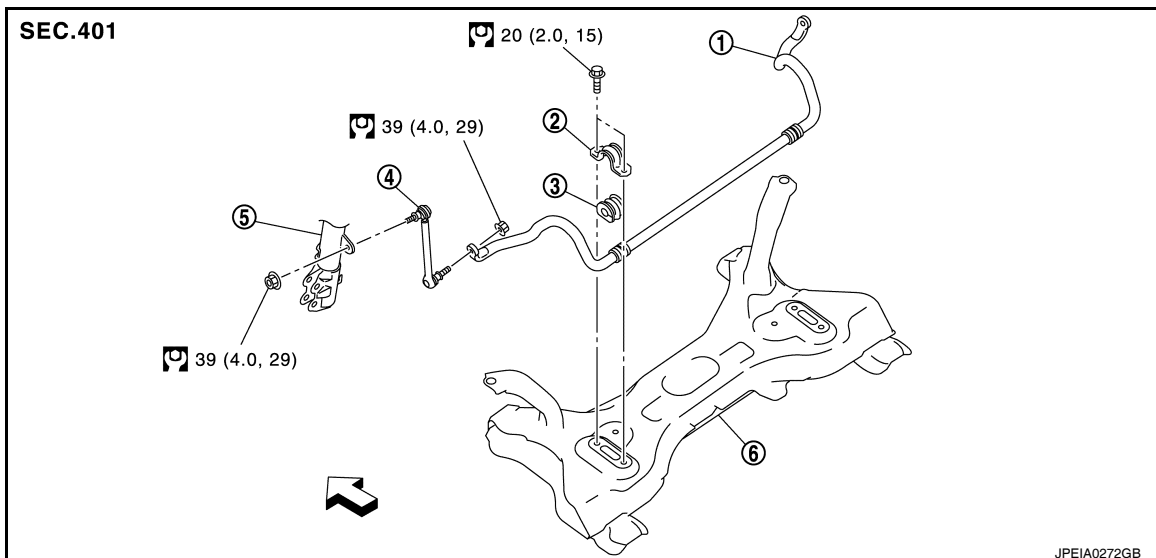
FRONT STABILIZER

< REMOVAL AND INSTALLATION >

FRONT STABILIZER

Exploded View

INFOID:000000007208067



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

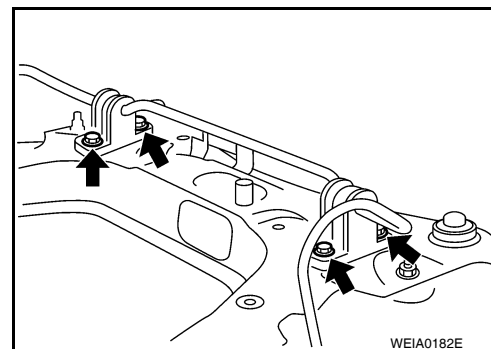
↔ Vehicle front

Removal and Installation

INFOID:000000007208068

REMOVAL

1. Remove wheel and tire assemblies using power tool.
2. Remove stabilizer connecting rod.
3. Remove the pinch bolt and separate the intermediate shaft from the lower joint. Refer to [ST-14. "Removal and Installation"](#).
4. Remove the engine rear torque rod.
5. Position a suitable jack under front suspension member.
CAUTION:
Do not damage the front suspension member with jack.
6. Remove front suspension member bolts. Refer to [FSU-15. "Removal and Installation"](#).
7. Gradually lower jack front suspension member in order to remove stabilizer mounting bolts.
8. Remove the stabilizer clamp bolts, stabilizer clamps and stabilizer bushings from front suspension member.
9. Remove stabilizer bar.



INSPECTION AFTER REMOVAL

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

INSTALLATION

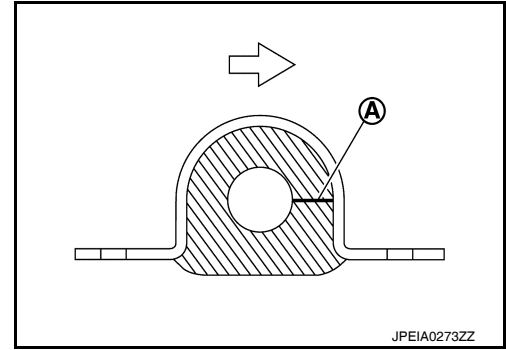
FRONT STABILIZER

< REMOVAL AND INSTALLATION >

Installation is in the reverse order of removal.

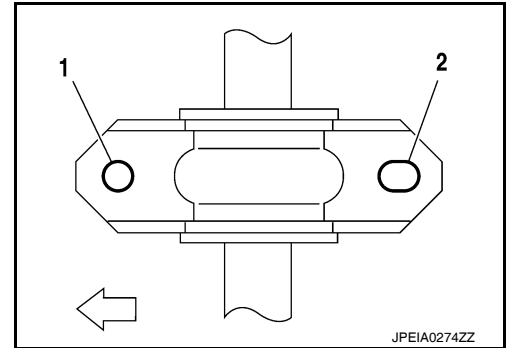
- Install the stabilizer bushing with the slit (A) facing the rear of the vehicle.

← : Vehicle rear

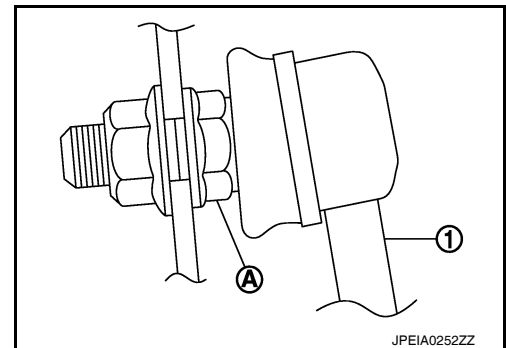


- To install stabilizer clamp bolt, temporarily tighten them in numerical order as shown and tighten them to the specified torque.

← : Vehicle front



- Install the stabilizer connecting rod (1) by tightening the nut with the hexagonal part (A) on the stabilizer connecting rod side.
- Perform final tightening of bolts and nuts with the vehicle under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to [FSU-5, "Inspection and Adjustment"](#).



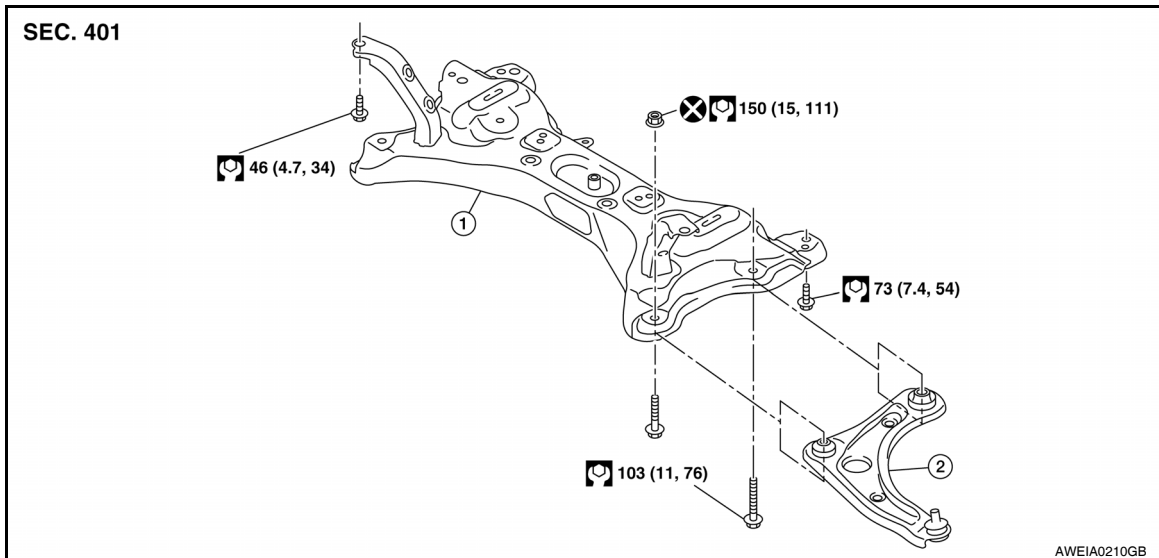
FRONT SUSPENSION MEMBER

< REMOVAL AND INSTALLATION >

FRONT SUSPENSION MEMBER

Exploded View

INFOID:000000007208070



1. Front suspension member
2. Transverse link

Removal and Installation

INFOID:000000007208071

REMOVAL

1. Remove the wheel and tire assemblies using power tool.
2. Remove transverse link. Refer to [FSU-11, "Removal and Installation"](#).
3. Remove steering outer socket from steering knuckle. Refer to [ST-14, "Removal and Installation"](#).
4. Separate intermediate shaft from the lower joint. Refer to [ST-8, "Removal and Installation"](#).
5. Remove the engine rear torque rod.
6. Set suitable jack under front suspension member.
- CAUTION:**
Do not damage the front suspension member with jack.
7. Remove suspension member bolts.
8. Gradually lower the jack to remove front suspension member from vehicle body.
9. Remove steering gear assembly from suspension member. Refer to [ST-14, "Removal and Installation"](#).

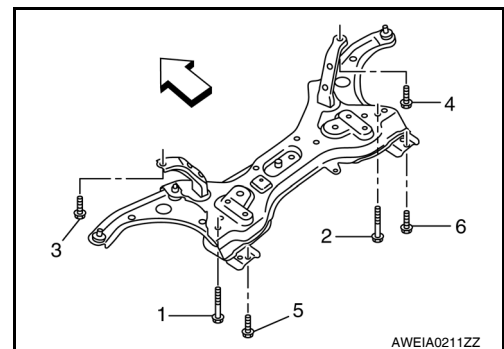
INSTALLATION

Installation is in the reverse order of removal.

- For installation of the suspension member, temporarily tighten the bolts in the sequence shown and tighten them to the specified torque.

← : Vehicle front

- Refer to [FSU-15, "Exploded View"](#) for tightening torque.
- Tighten the wheel nuts to specification. Refer to [WT-38, "Adjustment"](#).
- After installation, perform final tightening of each part under unladen conditions with tires on ground. Check wheel alignment. Refer to [FSU-5, "Inspection and Adjustment"](#).



SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

INFOID:000000007208073

Item		Standard	
Camber Degree minute (Decimal degree)	Minimum	-0° 50' (-0.83°)	
	Nominal	-0° 05' (-0.08°)	
	Maximum	0° 40' (0.66°)	
	Left and right difference	0° 35' (0.58°)	
Caster Degree minute (Decimal degree)	Minimum	2° 55' (2.92°)	
	Nominal	3° 40' (3.67°)	
	Maximum	4° 25' (4.41°)	
	Left and right difference	0° 45' (0.75°)	
Kingpin inclination Degree minute (Decimal degree)	Minimum	11° 00' (11.00°)	
	Nominal	11° 45' (11.75°)	
	Maximum	12° 30' (12.50°)	
Total toe-in	Distance (A - B)	Minimum	0 mm (0 in)
		Nominal	In 1.0 mm (0.05 in)
		Maximum	In 2.0 mm (0.07 in)
	Angle (left or right, each side) Degree minute second (Decimal degree)	Minimum	0° 0' 0" (0.00°)
		Nominal	In 0° 5' 0" (0.08°)
		Maximum	In 0° 10' 0" (0.17°)

Measure value under unladen* conditions.

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

Ball Joint

INFOID:000000007208074

Item	Standard
Swing torque	0.5 – 3.4 N·m (0.05 – 0.34 kg·m, 4.4 – 30 in·lb)
Measurement on spring balance	15.4 – 104.7 N (1.6 – 10.7 kg, 3.5 – 23.5 lb)
Axial end play	0 mm (0 in)

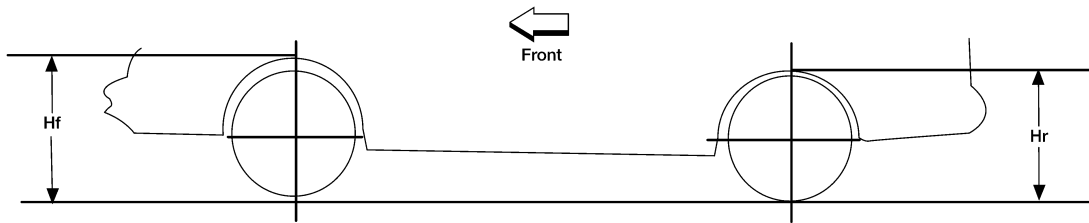
SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

Wheelarch Height

INFOID:000000007208075

Unit: mm (in)



LEIA0085E

Market	United States	Canada
Front (Hf)	683 (26.89)	684 (26.93)
Rear (Hr)	668 (26.30)	668 (26.30)

Measure value under unladen* conditions.

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

A
B
C
D
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