

SECTION **FSU**
FRONT SUSPENSION

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FSU

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[2WD]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000012173895

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	PROPELLER SHAFT	FRONT AXLE AND FRONT SUSPENSION		ROAD WHEEL	BRAKE	STEERING			
Symptom	FRONT SUSPENSION	Noise	x	x	x	x	x	x			x	x	x	x			FSU-10, FSU-14, FSU-16, FSU-18, FSU-19	
		Shake	x	x	x	x		x			x	x	x	x			FSU-13	
		Vibration	x	x	x	x	x				x	x						FSU-10, FSU-14, FSU-16, FSU-18, FSU-19
		Shimmy	x	x	x	x			x			x	x	x	x			FSU-8
		Judder	x	x	x							x	x	x	x			FSU-18
		Poor quality ride or handling	x	x	x	x	x		x	x			x	x				NVH in DLN section NVH in FAX and FSU section NVH in WT section NVH in BR section NVH in ST section

x: Applicable

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FSU

PRECAUTION

PRECAUTIONS

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

INFOID:000000012173896

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 "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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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:

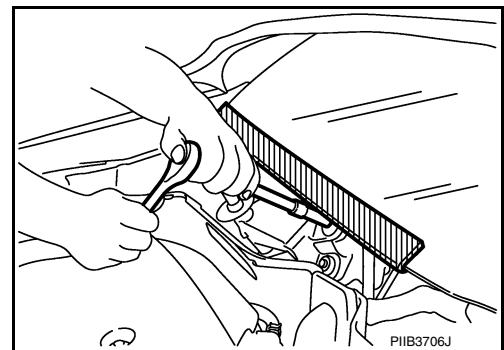
Always observe the following items for preventing accidental activation.

- 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 or batteries, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:000000012173897

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



Precautions for Removing Battery Terminal

INFOID:000000012720596

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.

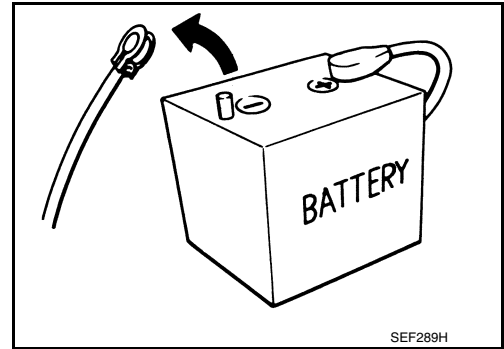
PRECAUTIONS

[2WD]

< PRECAUTION >

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	YD25DDTi	: 2 minutes
D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		



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NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
 - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
 - Driving for 30 minutes or more on a steep slope.
- 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.

Precautions for Suspension

INFOID:000000012173898

- 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.

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PREPARATION

< PREPARATION >

[2WD]

PREPARATION

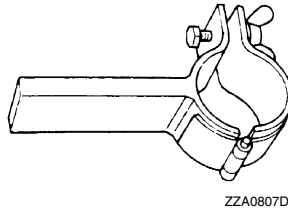
PREPARATION

Special Service Tool

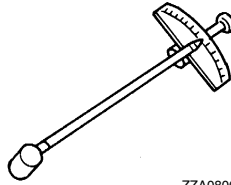
INFOID:000000012173900

The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

Tool number (TechMate No.) Tool name	Description
ST35652000 (-) Shock absorber attachment	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A) Preload gauge	Measuring rotating torque of ball joint



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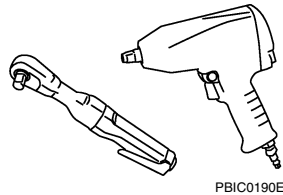


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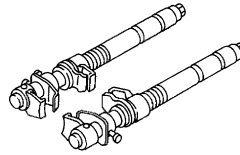
Commercial Service Tool

INFOID:000000012173901

Tool name	Description
Power tool	Loosening bolts and nuts
Spring compressor	Removing and installing coil spring



PBIC0190E



S-NT717

FRONT SUSPENSION ASSEMBLY

< PERIODIC MAINTENANCE >

[2WD]

PERIODIC MAINTENANCE

FRONT SUSPENSION ASSEMBLY

Inspection

INFOID:0000000012173902

COMPONENT PART

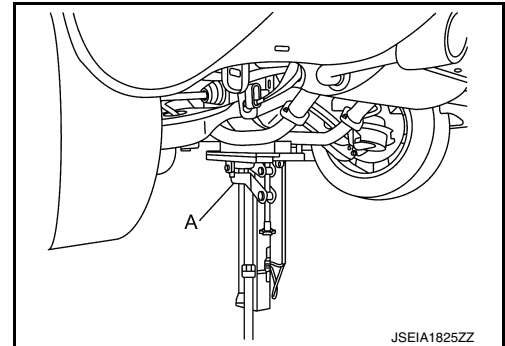
Check the mounting conditions (looseness, backlash) of each component and component conditions (wear, damage) are normal.

Ball Joint Axial End Play

CAUTION:

When vertically swinging tires with the vehicle lifted, set a jack (A) to garage jack point (rear) or other position to prevent wheel separations.

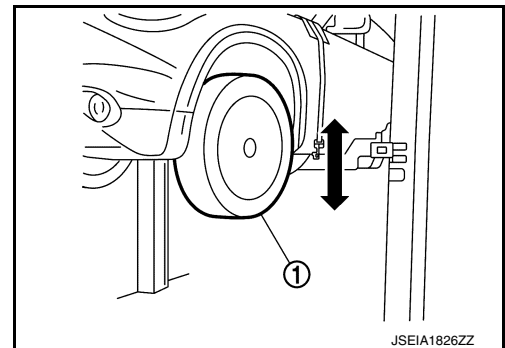
1. Set front wheels in a straight-ahead position.
2. Check ball joint boot for cracks or other damage. If there are cracks or other damage, replace lower link.



3. Lift the vehicle and vertically swing tires ① by hand to check if the ball joint has a backlash. If it has a backlash, replace lower link.

NOTE:

- If a rattling noise is generated while travelling, check ball joint axial end play.
- If a roaring noise is generated while travelling, check if the wheel hub assembly bearing has a axial end play. Refer to [FAX-7, "Inspection"](#).



Shock absorber

Check for oil leakage, damage. Replace it if necessary.

WHEEL ALIGNMENT

Inspection

INFOID:000000012173903

DESCRIPTION

CAUTION:

- **Camber, caster, kingpin inclination angles cannot be adjusted.**
- **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 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-54, "Tire Air Pressure"](#).
- Road wheels for runout.
- Wheel bearing axial end play. Refer to [FAX-7, "Inspection"](#).
- Transverse link or upper link ball joint axial end play. Refer to [FSU-7, "Inspection"](#).
- Shock absorber operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of suspension member, shock absorber, upper link 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.
- 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.

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:000000012173904

TOE-IN

WHEEL ALIGNMENT

< PERIODIC MAINTENANCE >

[2WD]

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

Toe-in : Refer to [FSU-21, "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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

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FSU

FRONT COIL SPRING AND SHOCK ABSORBER

< REMOVAL AND INSTALLATION >

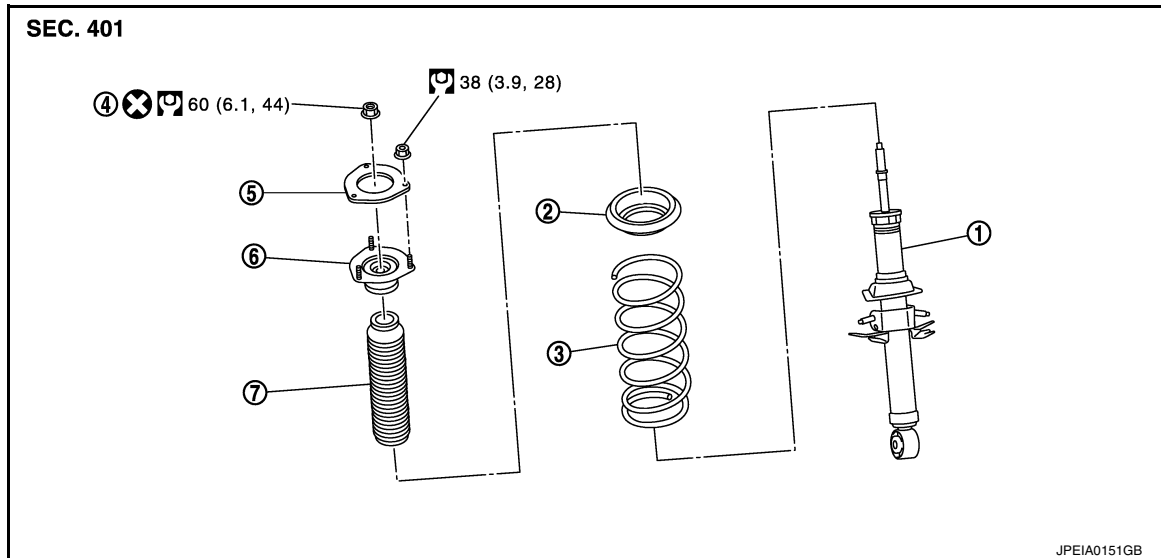
[2WD]

REMOVAL AND INSTALLATION

FRONT COIL SPRING AND SHOCK ABSORBER

Exploded View

INFOID:000000012173905



- | | | |
|------------------------|------------------|------------------------------------|
| 1. Shock absorber | 2. Rubber seat | 3. Coil spring |
| 4. Piston rod lock nut | 5. Mounting seal | 6. Shock absorber mounting bracket |
| 7. Bound bumper | | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173906

REMOVAL

1. Remove tires with power tool.
2. Remove wheel sensor and harness connector from shock absorber. Refer to [BRC-156, "FRONT WHEEL SENSOR : Exploded View"](#).
3. Remove brake hose bracket. Refer to [BR-23, "FRONT : Exploded View"](#).
4. Remove stabilizer connecting rod with power tool. Refer to [FSU-18, "Exploded View"](#).
5. Separate upper link from steering knuckle. Refer to [FAX-8, "Exploded View"](#).
6. Remove shock absorber mounting bracket mounting nuts, and remove shock absorber assembly.

NOTE:

If removing shock absorber is difficult, loosen upper link mounting bolts (vehicle side).

INSTALLATION

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

- Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting the stabilizer connecting rod into the transverse link.
- Perform final tightening of bolts and nuts at the shock absorber lower side (rubber bushing), under unladen conditions with tires on level ground.

Disassembly and Assembly

INFOID:000000012173907

DISASSEMBLY

CAUTION:

Never damage shock absorber piston rod when removing components from shock absorber.

FRONT COIL SPRING AND SHOCK ABSORBER

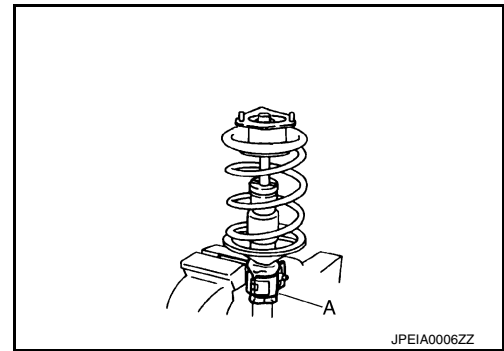
< REMOVAL AND INSTALLATION >

[2WD]

1. Install shock absorber attachment (A) [SST: ST35652000 (-)] to shock absorber and secure it in a vise.

CAUTION:

When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.

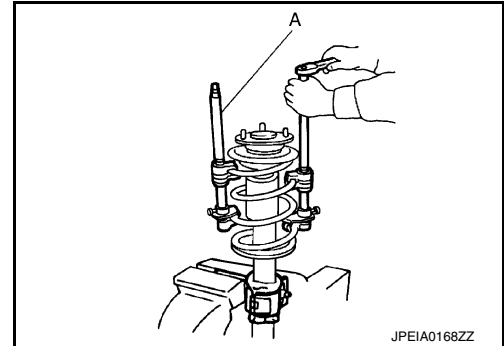


2. Using a spring compressor (A) (commercial service tool), compress coil spring between rubber seat and shock absorber until coil spring with a spring compressor is free.

CAUTION:

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

3. Make sure coil spring with a spring compressor between rubber seat and shock absorber 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 seal, shock absorber mounting bracket, rubber seat, bound bumper from shock absorber.



5. After remove coil spring with a spring compressor (commercial service tool), and then gradually release a spring compressor.

CAUTION:

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

6. Remove the shock absorber attachment [SST: ST35652000 (-)] from shock absorber.

ASSEMBLY

1. Install shock absorber attachment [SST: ST35652000 (-)] to shock absorber and secure it in a vise.

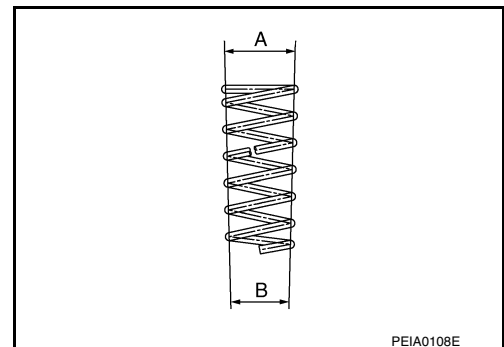
CAUTION:

When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.

2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.

CAUTION:

- Install with the large-diameter side (A) facing up and the small-diameter side (B) facing down.
- Be sure a spring compressor is securely attached to coil spring. Compress coil spring.

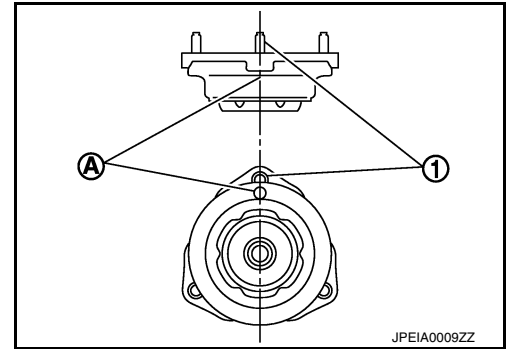


FRONT COIL SPRING AND SHOCK ABSORBER

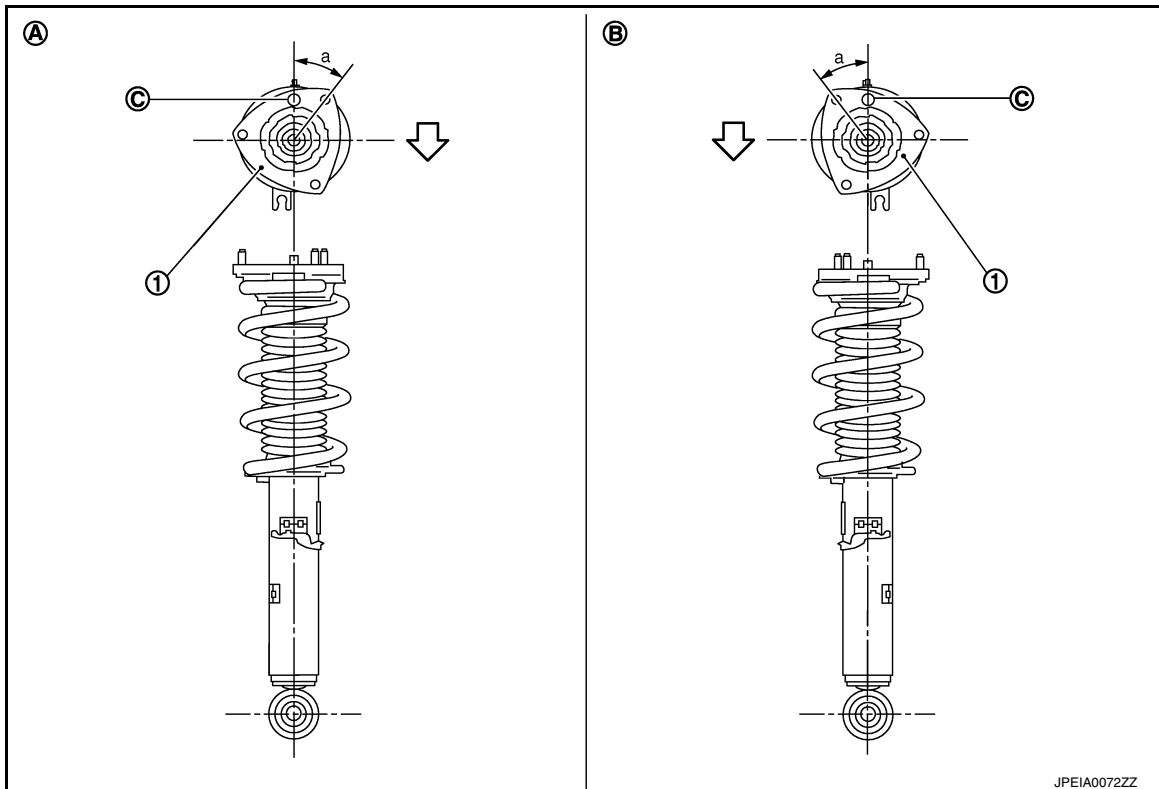
< REMOVAL AND INSTALLATION >

[2WD]

3. Install the shock absorber mounting bracket and rubber seat.
CAUTION:
Align the paint mark (A) to the stud bolt (1) position when assembling.
4. Apply soapy water to bound bumper.
CAUTION:
Never use machine oil.



5. Insert bound bumper into shock absorber mounting bracket, and then install it to shock absorber together with rubber seat.



1. shock absorber mounting bracket

A. Right side

B. Left side

C. Coil spring lower end position

⇐ Vehicle front

- Install the shock absorber mounting bracket as shown in the figure.

Angle (a) : 35.4°

- Check that the lower end of the coil spring (C) is positioned at the spring lower seat of the shock absorber.
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 (commercial service tool), and remove coil spring.
CAUTION:
Loosen while making sure coil spring attachment position does not move.
 8. Remove the shock absorber attachment [SST: ST35652000 (-)] from shock absorber.
 9. Install the mounting seal to shock absorber mounting bracket.

FRONT COIL SPRING AND SHOCK ABSORBER

< REMOVAL AND INSTALLATION >

[2WD]

Inspection

INFOID:000000012173908

INSPECTION AFTER DISASSEMBLY

Shock absorber

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

- Shock absorber for deformation, cracks or damage.
- Piston rod for damage, uneven wear or distortion.
- Oil leakage.

Shock absorber Mounting Bracket and Rubber Parts Inspection

Check shock absorber mounting bracket for cracks and rubber parts for wear. Replace it if necessary.

Coil Spring

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

INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to [BRC-156, "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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

Disposal

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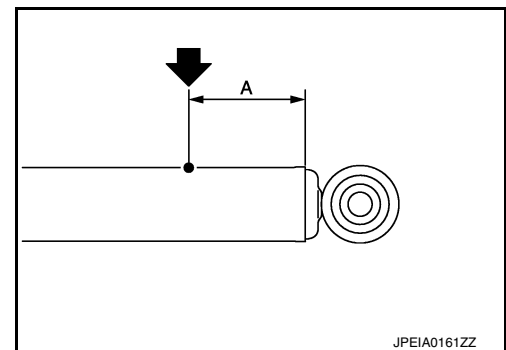
1. Set shock absorber horizontally with the piston rod fully extended.
2. Drill 2 – 3 mm (0.08 – 0.12 in) hole at the position (●) from top as shown in the figure to release gas gradually.

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 (←).
- 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

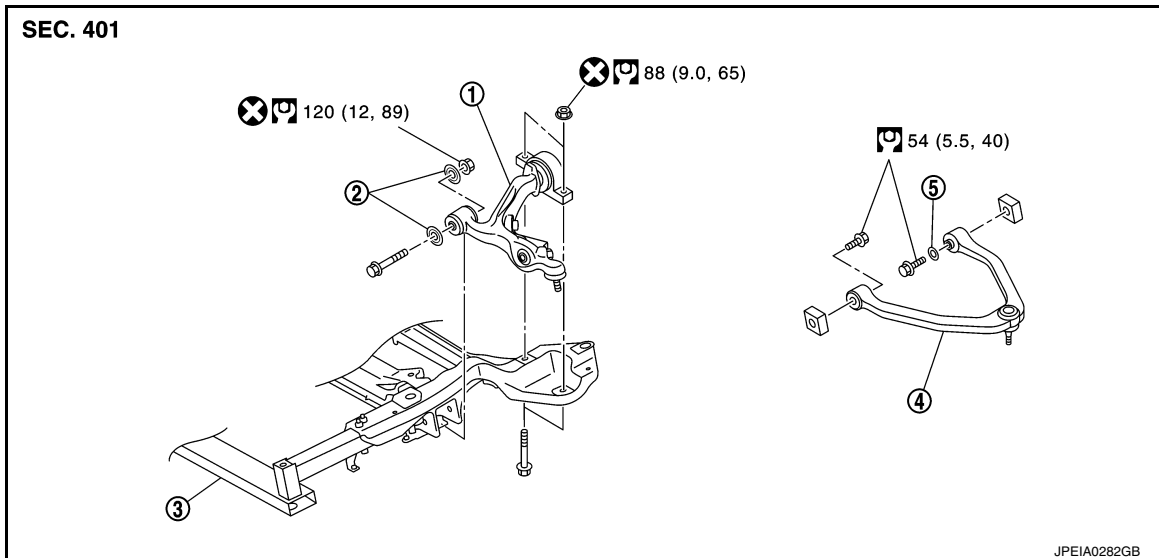
< REMOVAL AND INSTALLATION >

[2WD]

TRANSVERSE LINK

Exploded View

INFOID:000000012173910



- | | | |
|--------------------|--------------------|----------------------------|
| 1. Transverse link | 2. Stopper bushing | 3. Front suspension member |
| 4. Upper link | 5. Stopper rubber | |

Refer to [GI-4. "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173911

REMOVAL

1. Remove tires with power tool.
2. Remove under cover with power tool.
3. Remove shock absorber. Refer to [FSU-10. "Exploded View"](#).
4. Remove steering outer socket from steering knuckle. Refer to [ST-26. "2WD : Exploded View"](#).
5. Remove transverse link from steering knuckle.
6. Set suitable jack under transverse link.
7. Remove transverse link and stopper bushing.

INSTALLATION

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

- Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting the stabilizer connecting rod into the transverse link.
- Perform final tightening of bolts and nuts at the front suspension member installation and shock absorber lower side (rubber bushing), under unladen conditions with tires on level ground.

Inspection

INFOID:000000012173912

INSPECTION AFTER REMOVAL

Appearance

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

- Transverse link for deformation, cracks or damage.
- Check the bushing for complete separation. (If completely separated, inner metal can be pulled out from transverse link.)
- Ball joint boot for cracks or other damage, and also for grease leakage.

Ball Joint Inspection

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

TRANSVERSE LINK

< REMOVAL AND INSTALLATION >

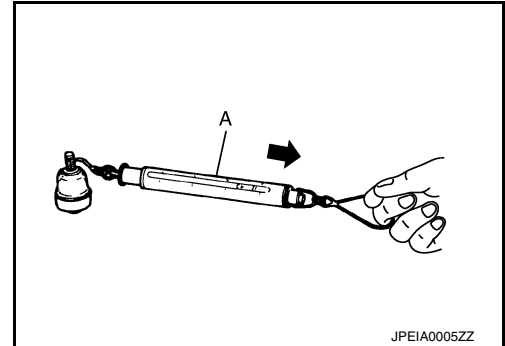
[2WD]

Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.
2. Hook a spring balance (A) at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

Swing torque : Refer to [FSU-21, "Ball Joint"](#).

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

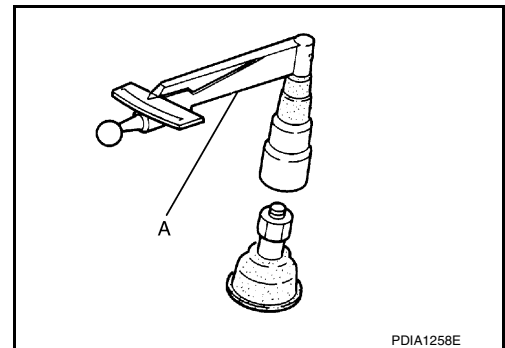


Rotating Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.
2. Attach mounting nut to ball stud. Make sure that rotating torque is within specifications with a preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Rotating torque : Refer to [FSU-21, "Ball Joint"](#).

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



Axial End Play Inspection

1. Move the 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-21, "Ball Joint"](#).

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

INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to [BRC-156, "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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

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UPPER LINK

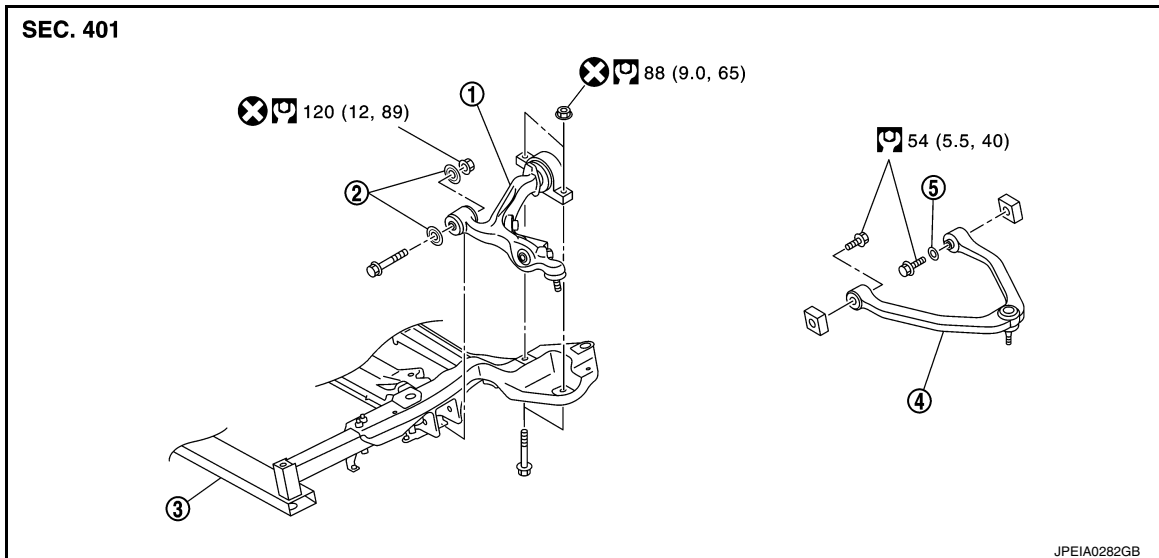
< REMOVAL AND INSTALLATION >

[2WD]

UPPER LINK

Exploded View

INFOID:000000012173913



- | | | |
|--------------------|--------------------|----------------------------|
| 1. Transverse link | 2. Stopper bushing | 3. Front suspension member |
| 4. Upper link | 5. Stopper rubber | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173914

REMOVAL

1. Remove tires with power tool.
2. Remove shock absorber. Refer to [FSU-10, "Exploded View"](#).
3. Remove upper link from steering knuckle. Refer to [FAX-8, "Exploded View"](#).
4. Remove upper link and stopper rubber.

INSTALLATION

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

- Perform final tightening of bolts and nuts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.

Inspection

INFOID:000000012173915

INSPECTION AFTER REMOVAL

Appearance

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

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

Ball Joint Inspection

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

Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.

UPPER LINK

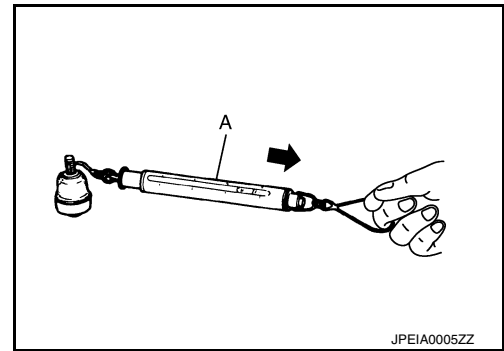
< REMOVAL AND INSTALLATION >

[2WD]

- 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-21, "Ball Joint"](#).

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



Axial End Play Inspection

- Move the 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.
- If there is axial end play, replace upper link assembly.

INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to [BRC-156, "FRONT WHEEL SENSOR : Exploded View"](#).
- Check wheel alignment. Refer to [FSU-8, "Inspection"](#).
- Adjust neutral position of steering angle sensor. Refer to [BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

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FRONT STABILIZER

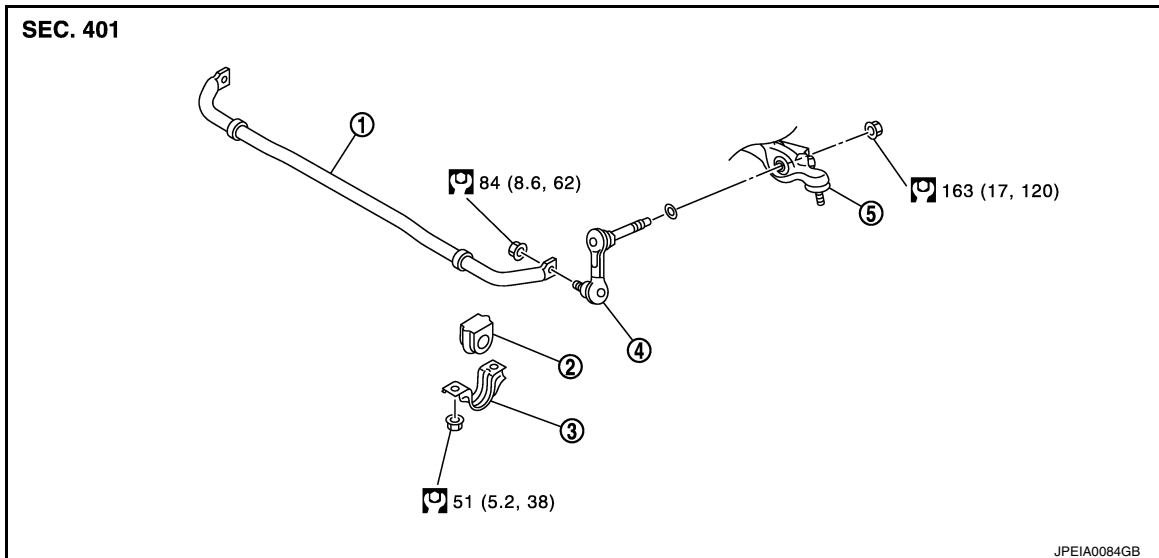
< REMOVAL AND INSTALLATION >

[2WD]

FRONT STABILIZER

Exploded View

INFOID:000000012173916



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|------------------------------|-----------------------|---------------------|
| 1. Stabilizer bar | 2. Stabilizer bushing | 3. Stabilizer clamp |
| 4. Stabilizer connecting rod | 5. Transverse link | |

Refer to [GI-4. "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173917

REMOVAL

1. Remove tires with power tool.
2. Remove under cover with power tool.
3. Remove stabilizer connecting rods.

CAUTION:

Apply a matching mark to identify the installation position.

4. Remove stabilizer clamps and stabilizer bushings.
5. Remove stabilizer bar.

INSTALLATION

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

- Check the matching mark when installing.
- Tighten the mounting nut to the specified torque while holding a hexagonal part of stabilizer connecting rod side.

Inspection

INFOID:000000012173918

INSPECTION AFTER REMOVAL

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

FRONT SUSPENSION MEMBER

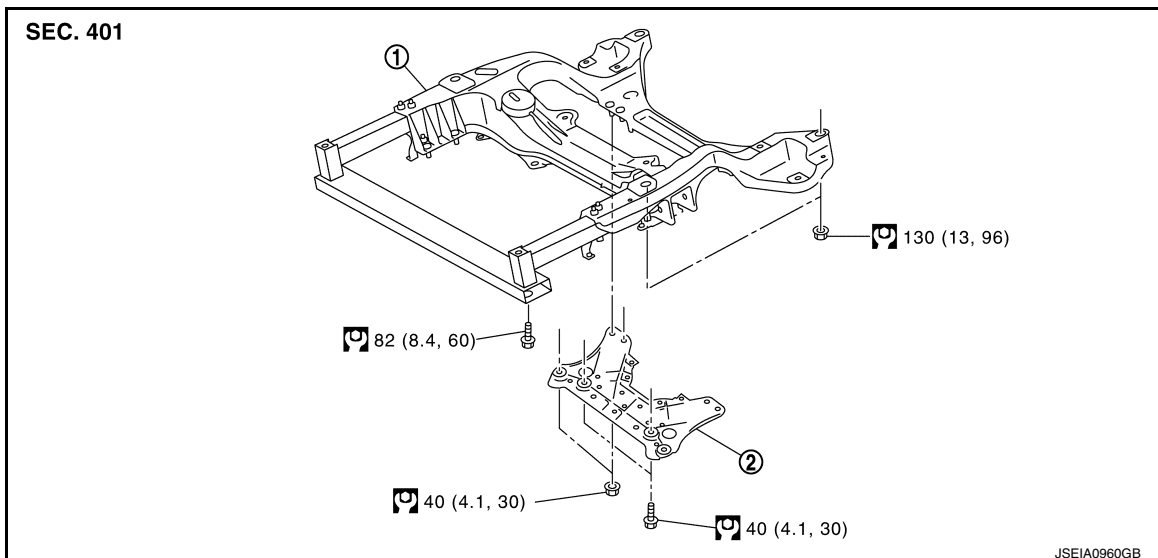
< REMOVAL AND INSTALLATION >

[2WD]

FRONT SUSPENSION MEMBER

Exploded View

INFOID:000000012173919



1. Front suspension member
2. Suspension member stay

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173920

REMOVAL

1. Remove tires with power tool.
2. Remove under cover with power tool.
3. Remove suspension member stays with power tool.
4. Separate steering gear assembly and lower joint. Refer to [ST-26, "2WD : Exploded View"](#).
5. Remove steering outer sockets from steering knuckles. Refer to [ST-26, "2WD : Exploded View"](#).
6. Remove wheel sensors and sensor harness from steering knuckles. Refer to [BRC-156, "FRONT WHEEL SENSOR : Exploded View"](#).
7. Remove stabilizer connecting rods and stabilizer bar. Refer to [FSU-18, "Exploded View"](#).
8. Install engine slinger, and then hoist engine. Refer to [EM-70, "2WD : Removal and Installation"](#).
9. Remove transverse link from front suspension member. Refer to [FSU-14, "Exploded View"](#).
10. Remove steering hydraulic piping bracket and steering gear from front suspension member. Refer to [ST-52, "2WD : Exploded View"](#).
11. Set suitable jack front suspension member.
12. Remove mounting nuts between engine mounting insulator and from suspension member. Refer to [EM-70, "2WD : Exploded View"](#).
13. Remove mounting bolts and nuts of front suspension member with power tool.
14. Gradually lower jack to remove front suspension assembly from vehicle.

INSTALLATION

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

- Perform final tightening of bolts and nuts at the vehicle installation position (rubber bushing), under unladen condition with tires on level ground.

Inspection

INFOID:000000012173921

INSPECTION AFTER REMOVAL

Check the front suspension member for significant deformation, cracks, or damages. Replace if necessary.

FRONT SUSPENSION MEMBER

< REMOVAL AND INSTALLATION >

[2WD]

INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to [BRC-156, "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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

INFOID:0000000012173922

Item		Standard	
Camber Degree minute (Decimal degree)	Minimum	-0° 10' (-0.16°)	
	Nominal	0° 35' (0.58°)	
	Maximum	1° 20' (1.33°)	
	Left and right difference	0° 33' (0.55°) or less	
Caster Degree minute (Decimal degree)	Minimum	3° 05' (3.09°)	
	Nominal	3° 50' (3.83°)	
	Maximum	4° 35' (4.58°)	
	Left and right difference	0° 39' (0.65°) or less	
Kingpin inclination Degree minute (Decimal degree)	Minimum	5° 40' (5.67°)	
	Nominal	6°25' (6.42°)	
	Maximum	7° 10' (7.16°)	
Toe-in	Total toe-in Distance	Minimum	Out 1 mm (Out 0.03 in)
		Nominal	In 1 mm (In 0.04 in)
		Maximum	In 3 mm (In 0.11 in)
	Total toe-angle Degree minute (Decimal degree)	Minimum	Out 0° 04' 48" (Out 0.08°)
		Nominal	In 0° 04' 48" (In 0.08°)
		Maximum	In 0° 14' 24" (In 0.24°)

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:0000000012173923

Item		Standard
Swing torque	Transverse link	0.5 – 3.6 N·m (0.06 – 0.36 kg·m, 5 – 31 in-lb)
	Upper link	0 – 2.0 N·m (0 – 0.20 kg·m, 0 – 17 in-lb)
Measurement on spring balance	Transverse link	7.8 – 56.3 N (0.8 – 5.7 kg, 1.8 – 12.6 lb)
	Upper link	0 – 61.5 N (0 – 6.2 kg, 0 – 13.8 lb)
Rotating torque	Transverse link	0.5 – 3.9 N·m (0.06 – 0.39 kg·m, 5 – 34 in-lb)

Wheelarch Height

INFOID:0000000012173924

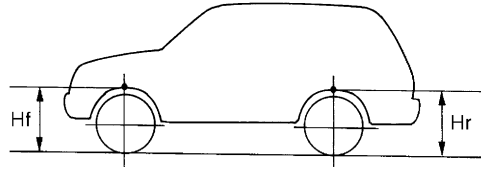
Item	Standard	
Wheel size	18 inch	19 inch
Front (Hf)	766 mm (30.16 in)	767 mm (30.20 in)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD]

Item	Standard	
Wheel size	18 inch	19 inch
Rear (Hr)	776 mm (30.55 in)	778 mm (30.63 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.

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[AWD]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012173925

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

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

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PRECAUTION

PRECAUTIONS

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

INFOID:000000012720903

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 "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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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:

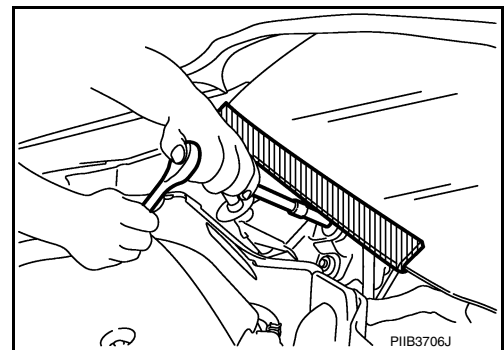
Always observe the following items for preventing accidental activation.

- 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 or batteries, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:000000012173927

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



Precautions for Removing Battery Terminal

INFOID:000000012720849

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.

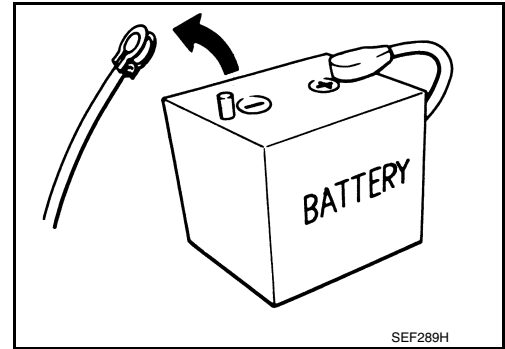
PRECAUTIONS

[AWD]

< PRECAUTION >

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	YD25DDTi	: 2 minutes
D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		



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NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
 - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
 - Driving for 30 minutes or more on a steep slope.
- 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.

Precautions for Suspension

INFOID:000000012173928

- 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.

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PREPARATION

< PREPARATION >

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PREPARATION

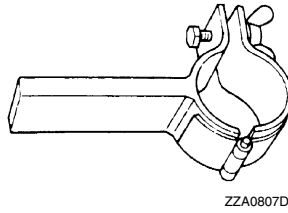
PREPARATION

Special Service Tool

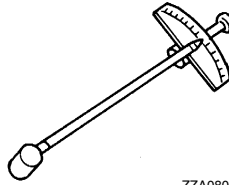
INFOID:000000012173930

The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

Tool number (TechMate No.) Tool name	Description
ST35652000 (-) Shock absorber attachment	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A) Preload gauge	Measuring rotating torque of ball joint



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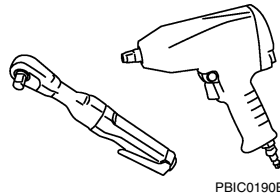


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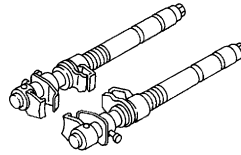
Commercial Service Tool

INFOID:000000012173931

Tool name	Description
Power tool	Loosening bolts and nuts
Spring compressor	Removing and installing coil spring



PBIC0190E



S-NT717

FRONT SUSPENSION ASSEMBLY

< PERIODIC MAINTENANCE >

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PERIODIC MAINTENANCE

FRONT SUSPENSION ASSEMBLY

Inspection

INFOID:0000000012173932

COMPONENT PART

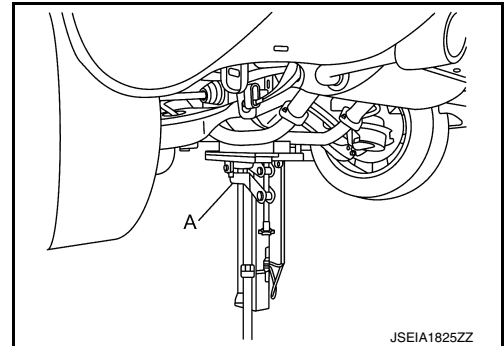
Check the mounting conditions (looseness, backlash) of each component and component conditions (wear, damage) are normal.

Ball Joint Axial End Play

CAUTION:

When vertically swinging tires with the vehicle lifted, set a jack (A) to garage jack point (rear) or other position to prevent wheel separations.

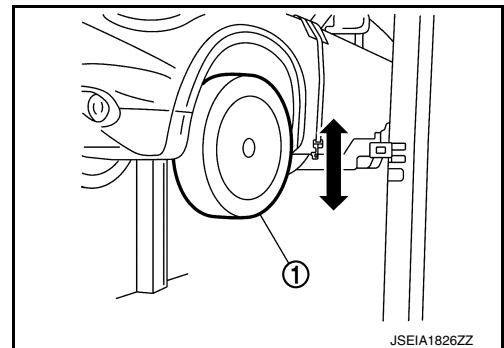
1. Set front wheels in a straight-ahead position.
2. Check ball joint boot for cracks or other damage. If there are cracks or other damage, replace lower link.



3. Lift the vehicle and vertically swing tires ① by hand to check if the ball joint has a backlash. If it has a backlash, replace lower link.

NOTE:

- If a rattling noise is generated while travelling, check ball joint axial end play.
- If a roaring noise is generated while travelling, check if the wheel hub assembly bearing has a axial end play. Refer to [FAX-16. "Inspection"](#).



Shock absorber

Check for oil leakage, damage. Replace it if necessary.

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WHEEL ALIGNMENT

Inspection

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DESCRIPTION

CAUTION:

- **Camber, caster, kingpin inclination angles cannot be adjusted.**
- **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 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-54, "Tire Air Pressure"](#).
- Road wheels for runout.
- Wheel bearing axial end play. Refer to [FAX-16, "Inspection"](#).
- Transverse link or upper link ball joint axial end play. Refer to [FSU-27, "Inspection"](#).
- shock absorber operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of suspension member, shock absorber, upper link 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.
- 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.

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:000000012173934

TOE-IN

WHEEL ALIGNMENT

< PERIODIC MAINTENANCE >

[AWD]

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

Toe-in : Refer to [FSU-41, "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-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

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FRONT COIL SPRING AND SHOCK ABSORBER

< REMOVAL AND INSTALLATION >

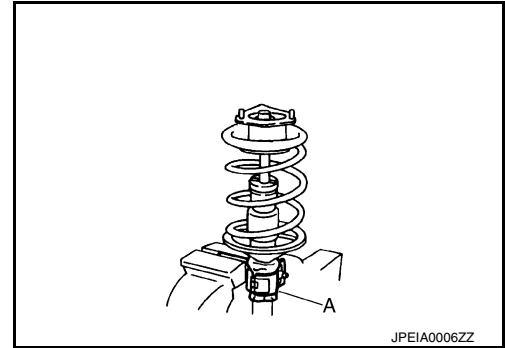
[AWD]

Never damage shock absorber piston rod when removing components from shock absorber.

1. Remove the shock absorber arm from shock absorber.
2. Install shock absorber attachment (A) [SST: ST35652000 (-)] to shock absorber and secure it in a vise.

CAUTION:

When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.



3. Using a spring compressor (A) (commercial service tool), compress coil spring between rubber seat and shock absorber until coil spring with a spring compressor is free.

CAUTION:

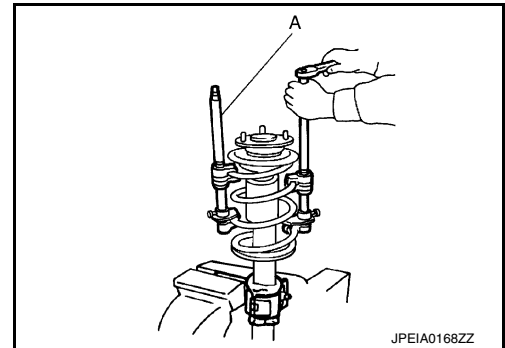
Be sure a spring compressor is securely attached coil spring. Compress coil spring

4. Make sure coil spring with a spring compressor between rubber seat and shock absorber 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 seal, shock absorber mounting bracket, rubber seat, bound bumper from shock absorber.
6. After remove coil spring with a spring compressor (commercial service tool), and then gradually release a spring compressor.

CAUTION:

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

7. Remove the shock absorber attachment [SST: ST35652000 (-)] from shock absorber.



ASSEMBLY

1. Install shock absorber attachment [SST: ST35652000 (-)] to shock absorber and secure it in a vise.

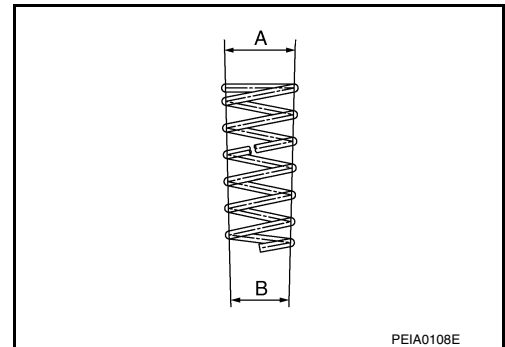
CAUTION:

When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.

2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.

CAUTION:

- Install with the large-diameter side (A) facing up and the small-diameter side (B) facing down.
- Be sure a spring compress or is securely attached to coil spring. Compress coil spring.

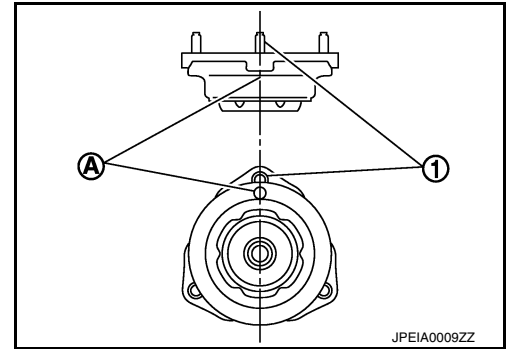


FRONT COIL SPRING AND SHOCK ABSORBER

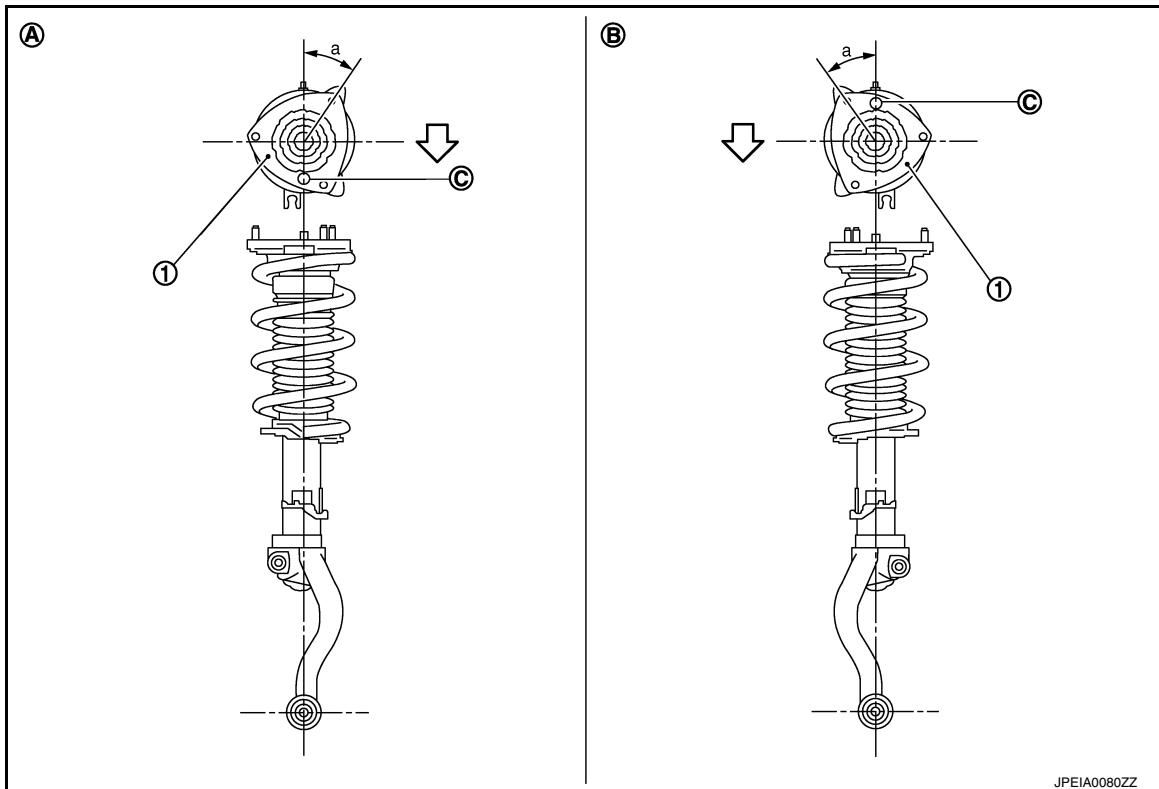
< REMOVAL AND INSTALLATION >

[AWD]

3. Install the shock absorber mounting bracket and rubber seat.
CAUTION:
Align the paint mark (A) to the stud bolt (1) position when assembling.
4. Apply soapy water to bound bumper.
CAUTION:
Never use machine oil.



5. Insert bound bumper into shock absorber mounting bracket, and then install it to shock absorber together with rubber seat.



1. shock absorber mounting bracket

A. Right side

B. Left side

C. Coil spring lower end position

⇐: Vehicle front

- Install the shock absorber mounting bracket as shown in the figure.

Angle (a) : 35.4°

- Check that the lower end of the coil spring (C) is positioned at the spring lower seat of the shock absorber.
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 (commercial service tool), and remove coil spring.
CAUTION:
Loosen while making sure coil spring attachment position does not move.
 8. Remove the shock absorber attachment [SST: ST35652000 (-)] from shock absorber.
 9. Install the shock absorber arm to shock absorber.
CAUTION:

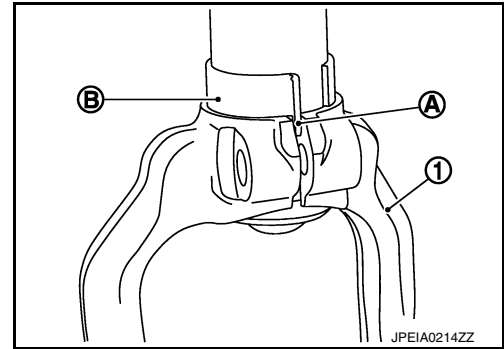
FRONT COIL SPRING AND SHOCK ABSORBER

< REMOVAL AND INSTALLATION >

[AWD]

To install, align the shock absorber protrusion (A) with the groove of shock absorber arm (1) and press it all the way to the locating bracket (B).

10. Install the mounting seal to shock absorber mounting bracket.



INFOID:0000000012173938

Inspection

INSPECTION AFTER DISASSEMBLY

Shock absorber

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

- Shock absorber for deformation, cracks or damage.
- Piston rod for damage, uneven wear or distortion.
- Oil leakage.

Shock absorber Mounting Bracket and Rubber Parts Inspection

Check shock absorber mounting bracket for cracks and rubber parts for wear. Replace it if necessary

Coil Spring

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

INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to [BRC-156. "FRONT WHEEL SENSOR : Exploded View"](#).
2. Check wheel alignment. Refer to [FSU-28. "Inspection"](#).
3. Adjust neutral position of steering angle sensor. Refer to [BRC-8. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

Disposal

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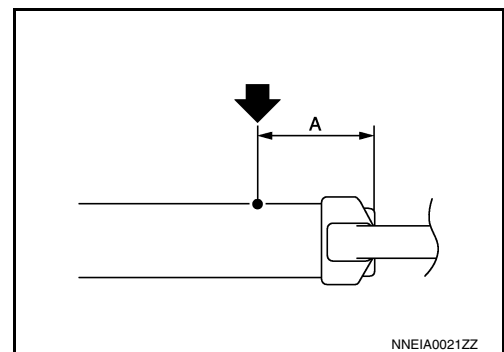
1. Set shock absorber horizontally with the piston rod fully extended.
2. Drill 2 – 3 mm (0.08 – 0.12 in) hole at the position (●) from top as shown in the figure to release gas gradually.

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 (←).
- 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

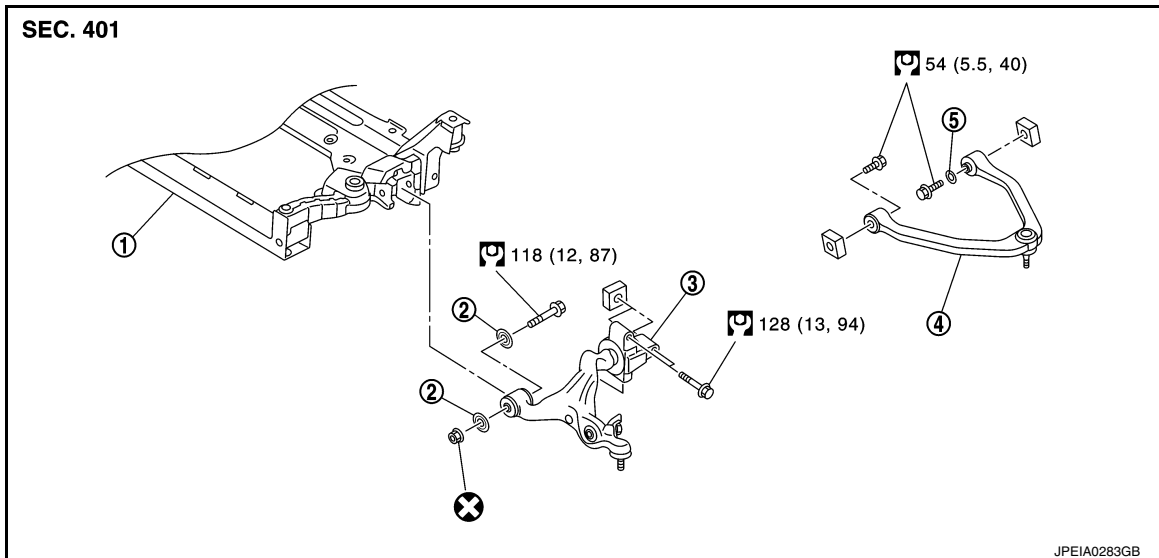
< REMOVAL AND INSTALLATION >

[AWD]

TRANSVERSE LINK

Exploded View

INFOID:000000012173940



- | | | |
|----------------------------|--------------------|--------------------|
| 1. Front suspension member | 2. Stopper bushing | 3. Transverse link |
| 4. Upper link | 5. Stopper rubber | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173941

REMOVAL

1. Remove tires with power tool.
2. Remove under cover with power tool.
3. Remove shock absorber. Refer to [FSU-30, "Exploded View"](#).
4. Remove front crossbar. Refer to [FSU-39, "Exploded View"](#).
5. Remove steering outer socket from steering knuckle. Refer to [ST-35, "AWD : Exploded View"](#).
6. Remove transverse link from steering knuckle.
7. Set suitable jack under transverse link.
8. Remove transverse link and stopper bushing.

INSTALLATION

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

- Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting the stabilizer connecting rod into the transverse link.
- Perform final tightening of bolts and nuts at the front suspension member installation and shock absorber lower side (rubber bushing), under unladen conditions with tires on level ground.

Inspection

INFOID:000000012173942

INSPECTION AFTER REMOVAL

Appearance

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

- Transverse link for deformation, cracks or damage.
- Check the bushing for complete separation. (If completely separated, inner metal can be pulled out from transverse link.)
- Ball joint boot for cracks or other damage, and also for grease leakage.

Ball Joint Inspection

TRANSVERSE LINK

[AWD]

< REMOVAL AND INSTALLATION >

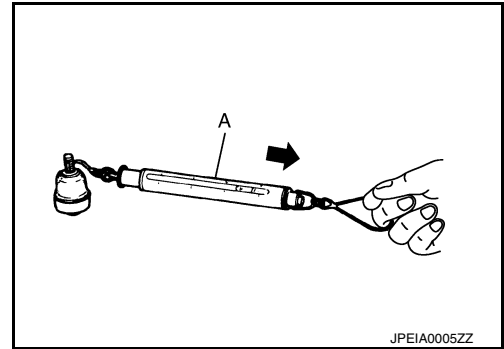
Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.
2. Hook a spring balance (A) at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

Swing torque :Refer to [FSU-41, "Ball Joint"](#).

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

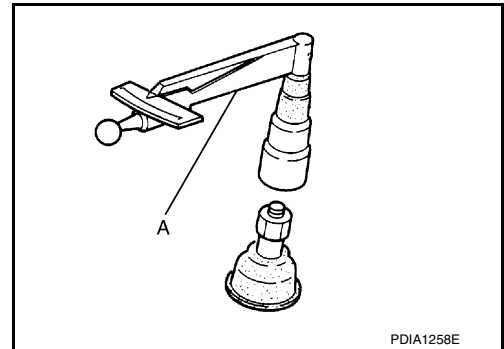


Rotating Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.
2. Attach mounting nut to ball stud. Make sure that rotating torque is within specifications with a preload gauge (A) [SST: 3127S000 (J-25765-A)].

Rotating torque : Refer to [FSU-41, "Ball Joint"](#).

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



Axial End Play Inspection

1. Move the 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-41, "Ball Joint"](#).

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

INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to [BRC-156, "FRONT WHEEL SENSOR : Exploded View"](#).
2. Check wheel alignment. Refer to [FSU-28, "Inspection"](#).
3. Adjust neutral position of steering angle sensor. Refer to [BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

UPPER LINK

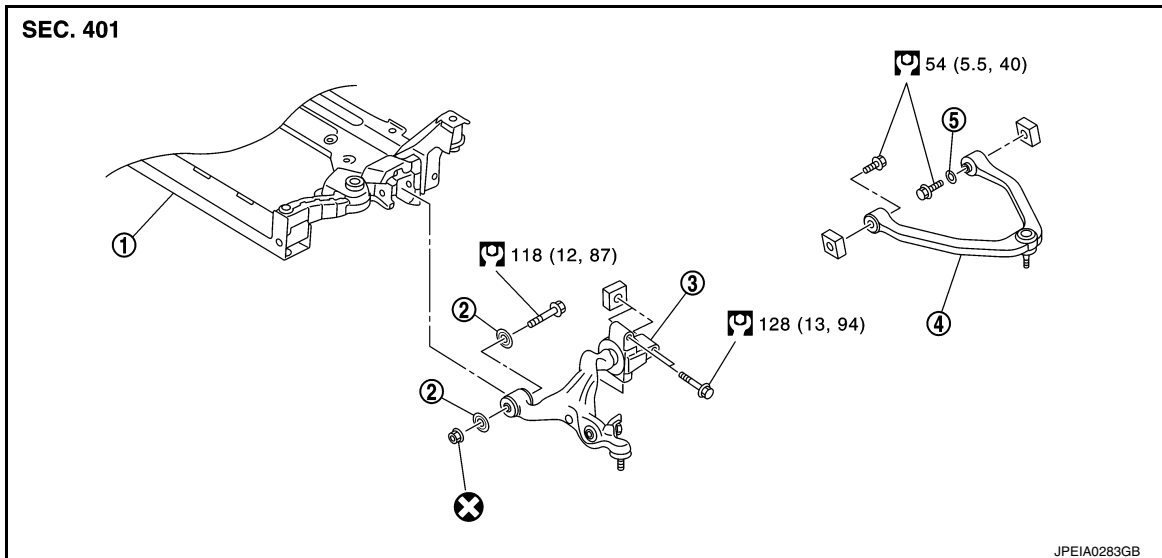
< REMOVAL AND INSTALLATION >

[AWD]

UPPER LINK

Exploded View

INFOID:000000012173943



- | | | |
|----------------------------|--------------------|--------------------|
| 1. Front suspension member | 2. Stopper bushing | 3. Transverse link |
| 4. Upper link | 5. Stopper rubber | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173944

REMOVAL

1. Remove tires from with power tool.
2. Remove shock absorber. Refer to [FSU-30, "Exploded View"](#).
3. Remove upper link from steering knuckle.
4. Remove upper link and stopper rubber.

INSTALLATION

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

- Perform final tightening of bolts and nuts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.

Inspection

INFOID:000000012173945

INSPECTION AFTER REMOVAL

Appearance

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

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

Ball Joint Inspection

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

Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.

UPPER LINK

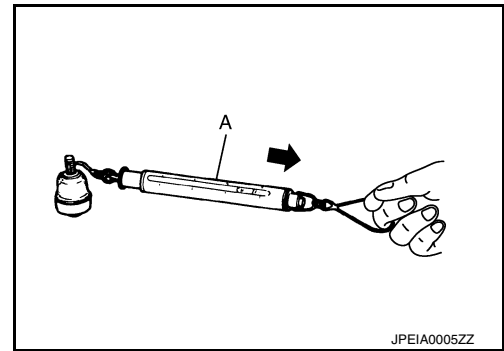
< REMOVAL AND INSTALLATION >

[AWD]

- 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-41, "Ball Joint"](#).

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



Axial End Play Inspection

- Move the 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.
- If there is axial end play, replace upper link assembly.

INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to [BRC-156, "FRONT WHEEL SENSOR : Exploded View"](#).
- Check wheel alignment. Refer to [FSU-28, "Inspection"](#).
- Adjust neutral position of steering angle sensor. Refer to [BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

A
B
C
D

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FRONT STABILIZER

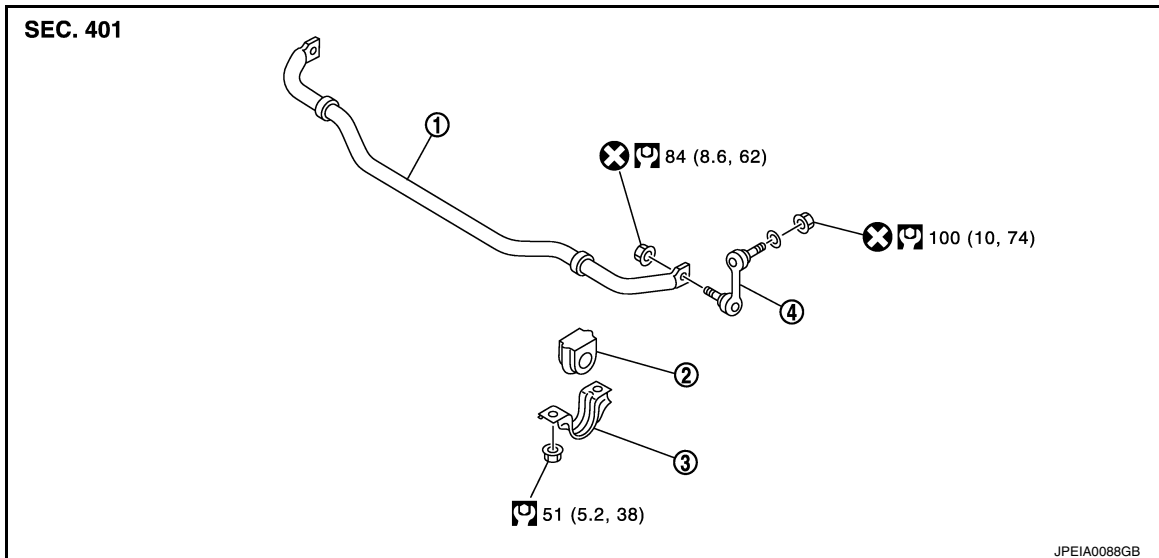
< REMOVAL AND INSTALLATION >

[AWD]

FRONT STABILIZER

Exploded View

INFOID:000000012173946



1. Stabilizer bar
2. Stabilizer bushing
3. Stabilizer clamp
4. Stabilizer connecting rod

Refer to [GI-4. "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173947

REMOVAL

1. Remove tires with power tool.
2. Remove under cover with power tool.
3. Remove stabilizer connecting rods.
CAUTION:
Apply a matching mark to identify the installation position.
4. Remove stabilizer clamps and stabilizer bushings.
5. Remove stabilizer bar.

INSTALLATION

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

- Check the matching mark when installing.
- Tighten the mounting nut to the specified torque while holding a hexagonal part of stabilizer connecting rod side.

Inspection

INFOID:000000012173948

INSPECTION AFTER REMOVAL

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

FRONT SUSPENSION MEMBER

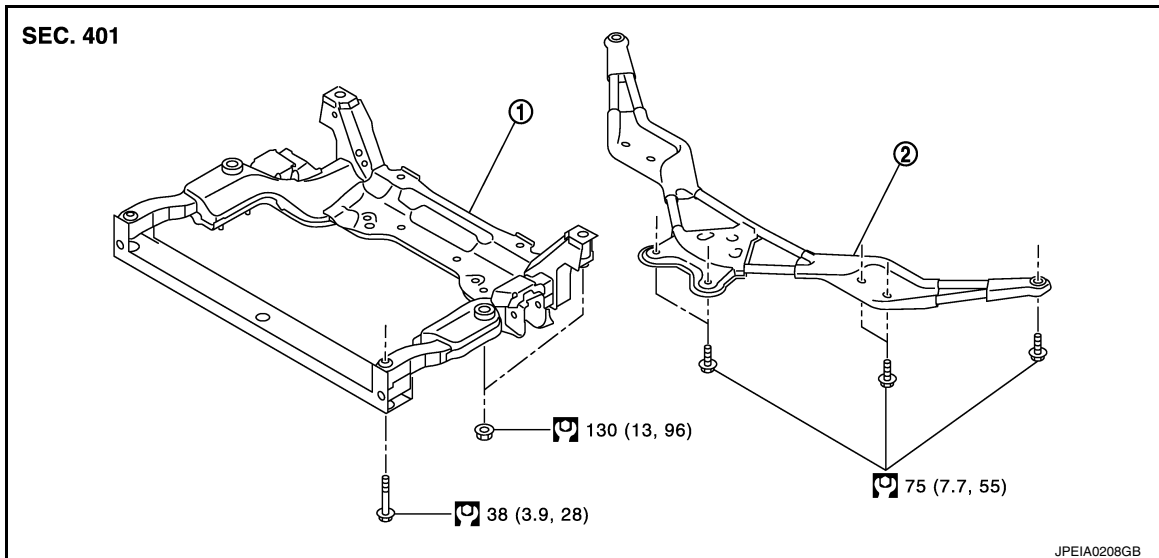
< REMOVAL AND INSTALLATION >

[AWD]

FRONT SUSPENSION MEMBER

Exploded View

INFOID:000000012173949



1. Front suspension member
2. Front cross bar

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000012173950

REMOVAL

1. Remove tires with power tool.
2. Remove under cover with power tool.
3. Remove front cross bar with power tool.
4. Separate steering gear assembly and lower joint. Refer to [ST-35, "AWD : Exploded View"](#) and [ST-24, "Exploded View"](#).
5. Remove steering outer sockets from steering knuckles. Refer to [ST-35, "AWD : Exploded View"](#).
6. Remove wheel sensors and sensor harness from steering knuckles. Refer to [BRC-156, "FRONT WHEEL SENSOR : Exploded View"](#).
7. Remove shock absorbers from transverse links. Refer to [FSU-30, "Exploded View"](#).
8. Remove stabilizer connecting rods and stabilizer bar. Refer to [FSU-38, "Exploded View"](#).
9. Install engine slinger, and then hoist engine. Refer to [EM-75, "AWD : Removal and Installation"](#).
10. Remove transverse links from front suspension member. Refer to [FSU-34, "Exploded View"](#).
11. Remove steering hydraulic piping bracket and steering gear from front suspension member. Refer to [ST-53, "AWD : Exploded View"](#).
12. Set suitable jack front suspension member.
13. Remove mounting nuts between engine mounting insulator and from suspension member. Refer to [EM-74, "AWD : Exploded View"](#).
14. Remove mounting bolts and nuts of front suspension member with power tool.
15. Gradually lower jack to remove front suspension assembly from vehicle.

INSTALLATION

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

- Perform final tightening of bolts and nut at the vehicle installation position (rubber bushing), under unladen condition with tires on level ground.

FRONT SUSPENSION MEMBER

< REMOVAL AND INSTALLATION >

[AWD]

Inspection

INFOID:000000012173951

INSPECTION AFTER REMOVAL

Check the front suspension member for significant deformation, cracks, or damages. Replace if necessary.

INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to [BRC-156, "FRONT WHEEL SENSOR : Exploded View"](#).
2. Check wheel alignment. Refer to [FSU-28, "Inspection"](#).
3. Adjust neutral position of steering angle sensor. Refer to [BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[AWD]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

INFOID:0000000012173952

Item		Standard	
Camber Degree minute (Decimal degree)	Minimum	-0° 40' (-0.66°)	
	Nominal	0° 05' (0.08°)	
	Maximum	0° 50' (0.83°)	
	Left and right difference	0° 33' (0.55°) or less	
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° 39' (0.65°) or less	
Kingpin inclination Degree minute (Decimal degree)	Minimum	6° 10' (6.17°)	
	Nominal	6° 55' (6.92°)	
	Maximum	7° 40' (7.66°)	
Toe-in	Total toe-in Distance	Minimum	Out 1 mm (Out 0.03 in)
		Nominal	In 1 mm (In 0.04 in)
		Maximum	In 3 mm (In 0.11 in)
	Total toe-angle Degree minute (Decimal degree)	Minimum	Out 0° 04' 48" (Out 0.08°)
		Nominal	In 0° 04' 48" (In 0.08°)
		Maximum	In 0° 14' 24" (In 0.24°)

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:0000000012173953

Item		Standard
Swing torque	Transverse link	0.5 – 3.6 N·m (0.06 – 0.36 kg·m, 5 – 31 in-lb)
	Upper link	0 – 2.0 N·m (0 – 0.20 kg·m, 0 – 17 in-lb)
Measurement on spring balance	Transverse link	7.8 – 56.3 N (0.8 – 5.7 kg, 1.8 – 12.6 lb)
	Upper link	0 – 61.5 N (0 – 6.2 kg, 0 – 13.8 lb)
Rotating torque	Transverse link	0.5 – 3.9 N·m (0.06 – 0.39 kg·m, 5 – 34 in-lb)

Wheelarch Height

INFOID:0000000012173954

EXCEPT FOR CANADA MODELS

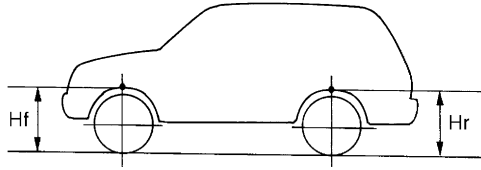
Item	Standard	
Wheel size	18 inch	19 inch
Front (Hf)	763 mm (30.04 in)	764 mm (30.08 in)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[AWD]

Item	Standard	
Wheel size	18 inch	19 inch
Rear (Hr)	776 mm (30.55 in)	778 mm (30.63 in)



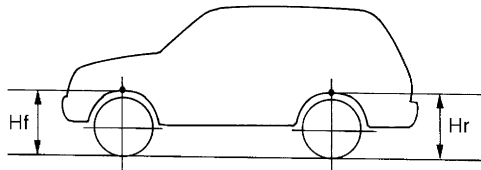
SFA746B

Measure value under unladen* conditions.

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

FOR CANADA MODELS

Item	Standard	
Wheel size	18 inch	19 inch
Front (Hf)	763 mm (30.04 in)	764 mm (30.08 in)
Rear (Hr)	777 mm (30.59 in)	779 mm (30.67 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.