SECTION FSU
FRONT SUSPENSION

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006058190

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:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **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 Air Bag Diagnosis Sensor Unit or other Air Bag 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.**

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:0000000006058192

NOTE:

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

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

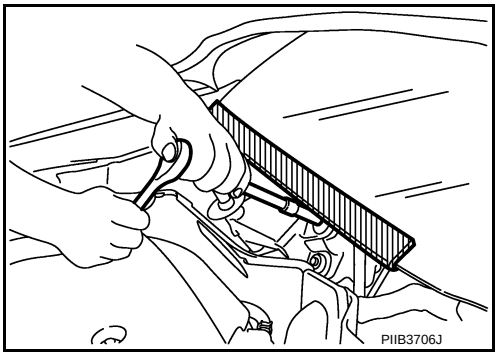
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Turn the push-button ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000006058194

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



Precautions for Suspension

INFOID:0000000006058136

- When installing rubber bushings, the final tightening must be carried out under unladen conditions with tires on ground. Spilled oil might shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Self-lock nuts are not reusable. Always use new ones when installing. Since new self-lock nuts are pre-oiled, tighten as they are.

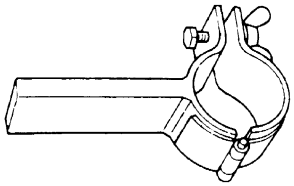
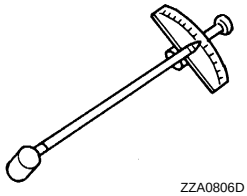
PREPARATION

PREPARATION

Special Service Tools

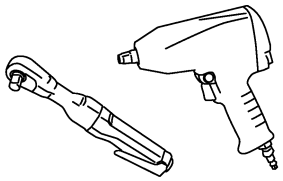
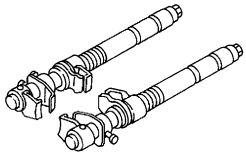
INFOID:0000000006058137

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

Tool number (Kent-Moore No.) Tool name		Description
ST35652000 (–) Shock absorber attachment	 ZZA0807D	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A) Preload gauge	 ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

INFOID:0000000006058138

Tool name		Description
Power tool	 PBIC0190E	Loosening bolts and nuts
Spring compressor	 S-NT717	Removing and installing coil spring

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000006058132

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

Reference page			FSU-9, FSU-13, FSU-36, FSU-18, FSU-19	FSU-12	—	—	—	FSU-9, FSU-13, FSU-16, FSU-18, FSU-19	FSU-8	FSU-18	NVH in DLN section	NVH in FAX and FSU section	NVH in WT section	NVH in BR section	NVH in ST section
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	FRONT AXLE AND FRONT SUSPENSION	ROAD WHEEL	BRAKE	STEERING
Symptom	FRONT SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×
		Shake	×	×	×	×		×			×	×	×	×	×
		Vibration	×	×	×	×	×				×	×			×
		Shimmy	×	×	×	×			×			×	×	×	×
		Judder	×	×	×							×	×	×	×
		Poor quality ride or handling	×	×	×	×	×		×	×		×	×		

×: Applicable

PERIODIC MAINTENANCE

FRONT SUSPENSION ASSEMBLY

Inspection

INFOID:0000000006058139

MOUNTING INSPECTION

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

BALL JOINT AXIAL END PLAY

1. Set front wheels in a straight-ahead position.
2. Place an iron bar or equivalent between transverse link or upper link and steering knuckle.
3. Measure axial end play by playing it up and down.

Axial end play : Refer to FSU-21, "Ball Joint".

CAUTION:

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

Shock absorber

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

WHEEL ALIGNMENT

Inspection

INFOID:0000000006058140

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.
- Road wheels for runout. Refer to WT-68, "Inspection".
- Wheel bearing axial end play. Refer to FAX-6, "Inspection".
- Transverse link or upper link ball joint axial end play. Refer to FSU-14, "Inspection and Adjustment" or FSU-16, "Inspection and Adjustment".
- 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.

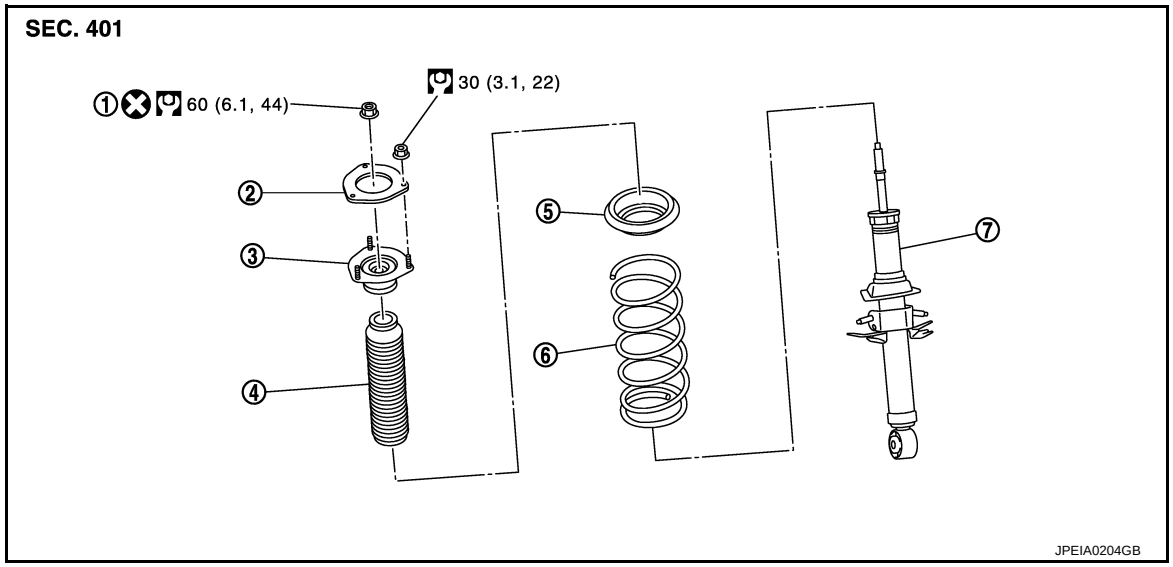
- When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Never use these indicators.**
  - The alignment specifications programmed into your machine that operate these indicators may not be correct.
  - This may result in an ERROR.
- Some newer alignment machines are equipped with an “optional Rolling Compensation” method to “compensate” the sensors (alignment targets or head units). **Never use this “Rolling Compensation” method.**
  - 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.
  - See Instructions in the alignment machine you're using for more information on this.

REMOVAL AND INSTALLATION

FRONT COIL SPRING AND SHOCK ABSORBER

Exploded View

INFOID:0000000006058141



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

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058142

REMOVAL

1. Perform adjustment before removal. (With 4WAS) Refer to FSU-12, "Inspection and Adjustment".
2. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
3. Remove wheel sensor harness from shock absorber. Refer to BRC-137, "FRONT WHEEL SENSOR : Removal and Installation".
   CAUTION:
   Never pull on wheel sensor harness.
4. Remove brake hose mounting nut, and separate brake hose from shock absorber. Refer to BR-24, "FRONT : Removal and Installation".
5. Remove stabilizer connecting rod from transverse link. Refer to FSU-18, "Removal and Installation".
6. Separate upper link from steering knuckle. Refer to FSU-16, "Removal and Installation".
7. Remove shock absorber mounting bracket mounting nuts, and remove shock absorber assembly.

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.
- Perform inspection after installation. Refer to FSU-12, "Inspection and Adjustment".
- After replacing the shock absorber, always follow the disposal procedure to discard the shock absorber. Refer to FSU-12, "Disposal".

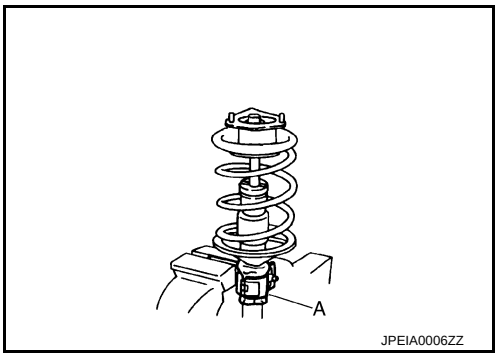
Disassembly and Assembly

INFOID:0000000006058143

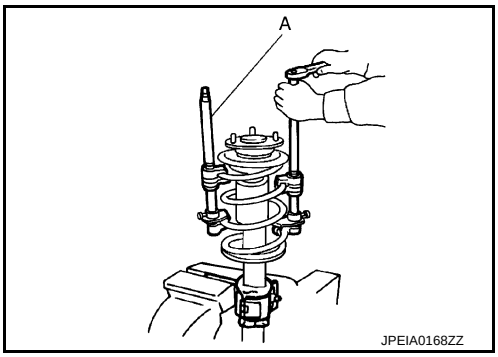
DISASSEMBLY

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

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.
   CAUTION:
   Start compressing the coil spring after checking that the spring compressor is completely attached.



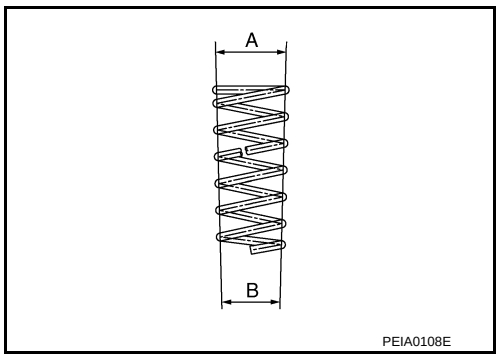
4. Remove mounting seal, shock absorber mounting bracket, rubber seat, bound bumper from shock absorber.
5. After remove coil spring with a spring compressor, and then gradually release a spring compressor.
   CAUTION:
   Loosen while making sure coil spring attachment position does not move.
6. Remove the shock absorber attachment from shock absorber.
7. Perform inspection after disassembly. Refer to FSU-12, "Inspection and Adjustment".

ASSEMBLY

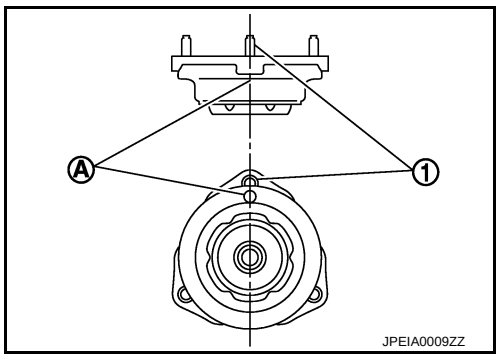
CAUTION:
Never damage shock absorber piston rod when installing components from shock absorber.

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:

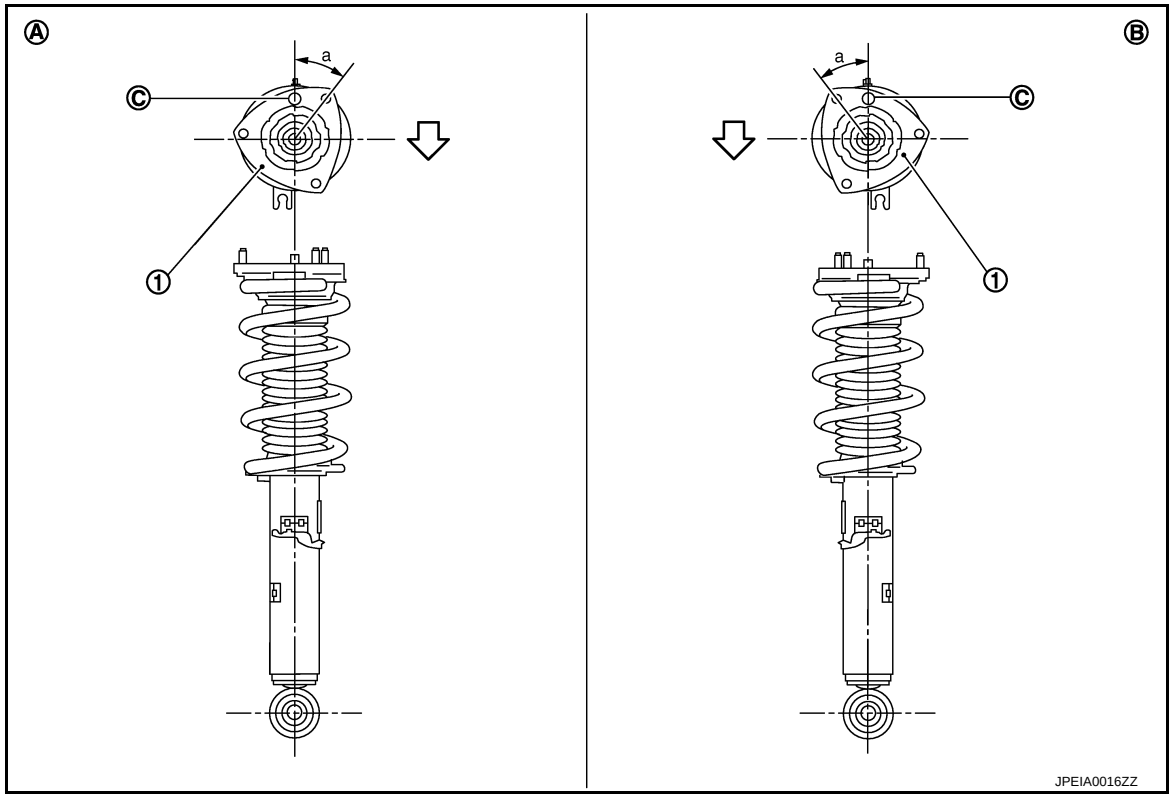
- **Install with the large-diameter side (A) facing up and the small-diameter side (B) facing down.**
- **Be sure a spring compressor is securely attached to coil spring. Compress coil spring.**



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.
   CAUTION:
   Never reuse piston rod lock nut.
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 shock absorber attachment from shock absorber.
9. Install the mounting seal to shock absorber mounting bracket.

Inspection and Adjustment

INFOID:0000000006058144

ADJUSTMENT BEFORE REMOVAL

Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 1)".

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

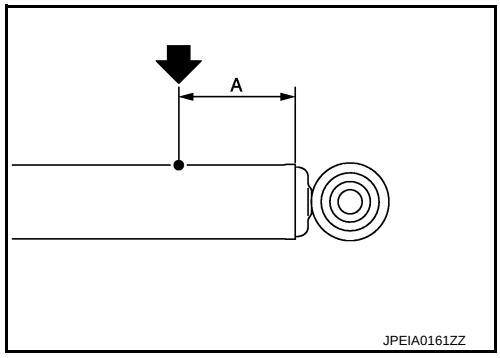
1. Check wheel sensor harness for proper connection. Refer to BRC-137, "FRONT WHEEL SENSOR : Exploded View".
2. Check wheel alignment. Refer to FSU-8, "Inspection".
3. Adjust neutral position of steering angle sensor. (Without 4WAS) Refer to BRC-68, "Work Procedure".
4. Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 2)".

Disposal

INFOID:0000000006058145

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.



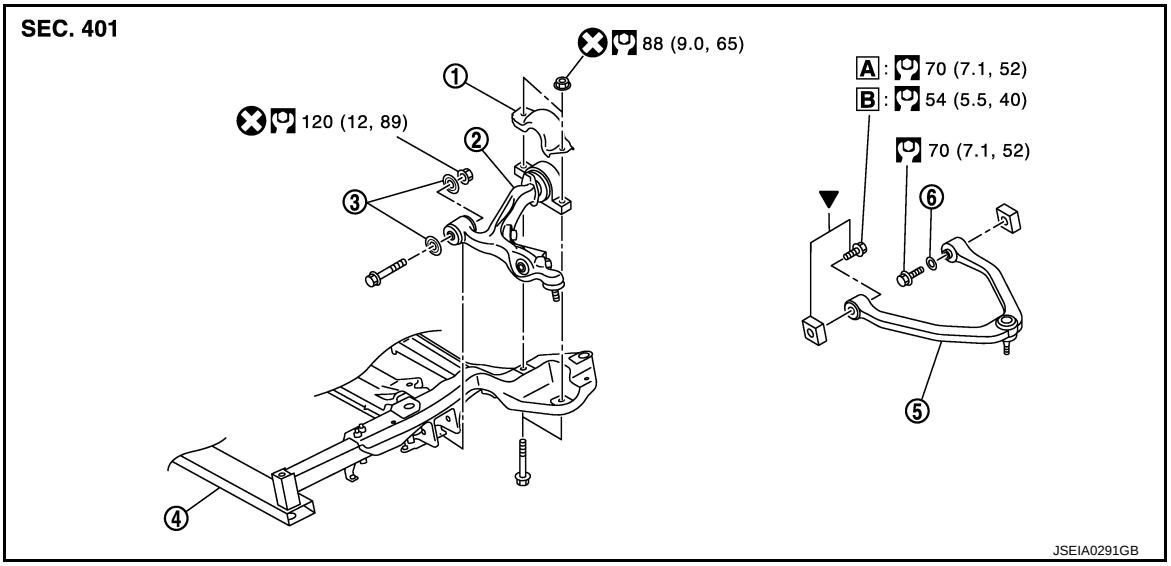
A : 20 – 30 mm (0.79 – 1.18 in)

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

Exploded View

INFOID:0000000006058146



1. Insulator (VK56VD)
2. Transverse link
3. Stopper bushing
4. Front suspension member
5. Upper link
6. Stopper rubber

A: Black

B: Silver

▼: Use the same color for bolt and nut.

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058147

REMOVAL

1. Perform adjustment before removal. (With 4WAS) Refer to FSU-14, "Inspection and Adjustment".
2. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
3. Remove engine under cover with power tool. Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
4. Remove stabilizer connecting rod and shock absorber from transverse link. Refer to FSU-18, "Removal and Installation".
5. Separate steering outer socket from steering knuckle. Refer to ST-45, "2WD : Removal and Installation".
6. Remove transverse link from steering knuckle.
7. Set suitable jack under transverse link.
   CAUTION:
   Check that jack supporting status is stable.
8. Remove insulator from transverse link. (VK56VD)
9. Remove mounting bolts, nuts, and stopper bushing, and then remove transverse link from front suspension member.
10. Perform inspection after removal. Refer to FSU-14, "Inspection and Adjustment".

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.

- Perform inspection after installation. Refer to FSU-14, "Inspection and Adjustment".

Inspection and Adjustment

INFOID:0000000006058148

ADJUSTMENT BEFORE REMOVAL

Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 1)".

INSPECTION AFTER REMOVAL

Appearance

Check the following items, and replace the part if necessary.
- Transverse link and bushing for deformation, cracks or damage.
- Ball joint boot for cracks or other damage, and also for grease leakage.

Ball Joint Inspection

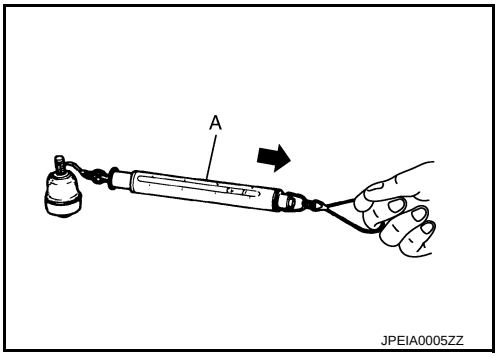
Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.
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 toque : Refer to FSU-21, "Ball Joint".

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

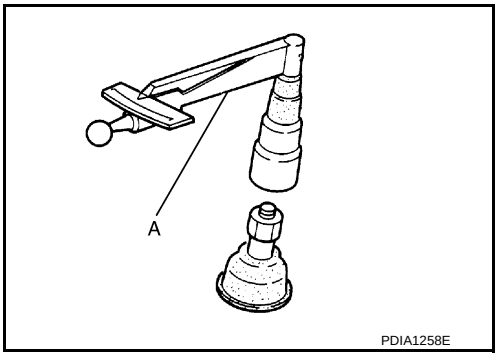


Rotating Torque Inspection

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 toque : 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

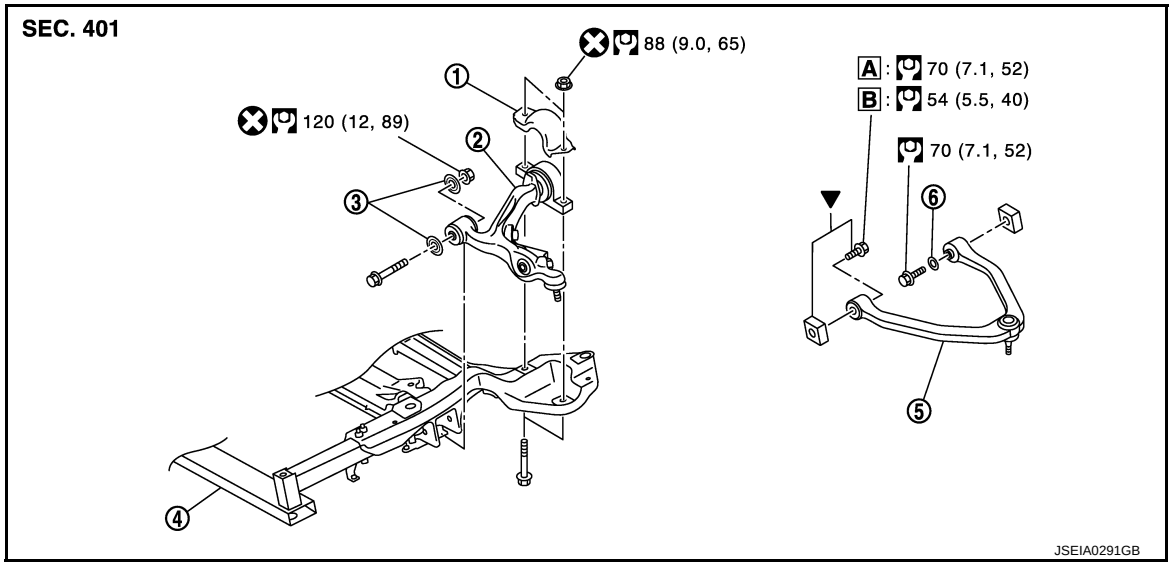
1. Check wheel sensor harness for proper connection. Refer to BRC-137, "FRONT WHEEL SENSOR : Exploded View".
2. Check wheel alignment. Refer to FSU-8, "Inspection".
3. Adjust neutral position of steering angle sensor. (Without 4WAS) Refer to BRC-68, "Work Procedure".

4. Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 2)".

UPPER LINK

Exploded View

INFOID:0000000006058406



1. Insulator (VK56VD)
2. Transverse link
3. Stopper bushing
4. Front suspension member
5. Upper link
6. Stopper rubber

A: Black

B: Silver

▼: Use the same color for bolt and nut.

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058150

REMOVAL

1. Perform adjustment before removal. (With 4WAS) Refer to FSU-16, "Inspection and Adjustment".
2. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
3. Remove shock absorber. Refer to FSU-9, "Removal and Installation".
4. Remove mounting bolts and stopper rubber, and then remove upper link from vehicle.
5. Perform inspection after removal. Refer to FSU-16, "Inspection and Adjustment".

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.
- Perform inspection after installation. Refer to FSU-16, "Inspection and Adjustment".

Inspection and Adjustment

INFOID:0000000006058151

ADJUSTMENT BEFORE REMOVAL

Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 1)".

INSPECTION AFTER REMOVAL

Appearance

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

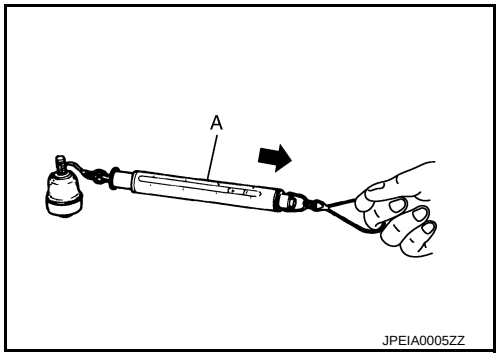
- Upper link and bushing for deformation, cracks or damage.
- Ball joint boot for cracks or other damage, and also for grease leakage.

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.
2. 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".**

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

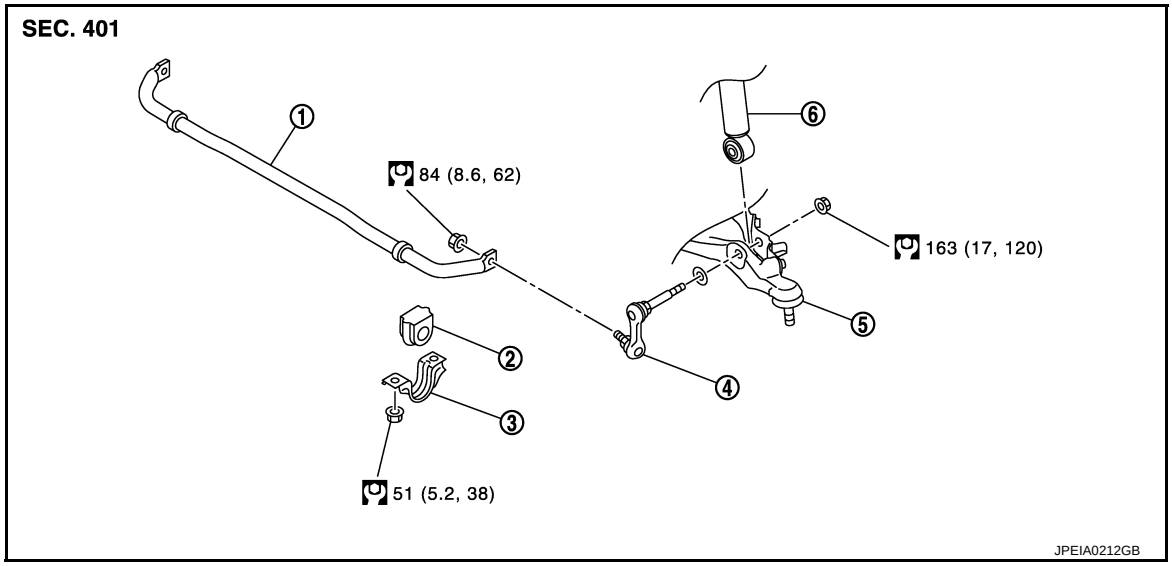
INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to BRC-137, "FRONT WHEEL SENSOR : Exploded View".
2. Check wheel alignment. Refer to FSU-8, "Inspection".
3. Adjust neutral position of steering angle sensor. (Without 4WAS) Refer to BRC-68, "Work Procedure".
4. Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 2)".

FRONT STABILIZER

Exploded View

INFOID:0000000006058152



1. Stabilizer bar
2. Stabilizer bushing
3. Stabilizer clamp
4. Stabilizer connecting rod
5. Transverse link
6. Shock absorber

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058153

REMOVAL

1. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
2. Remove engine under cover with power tool. Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
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.
6. Perform inspection after removal. Refer to FSU-18, "Inspection".

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:0000000006058154

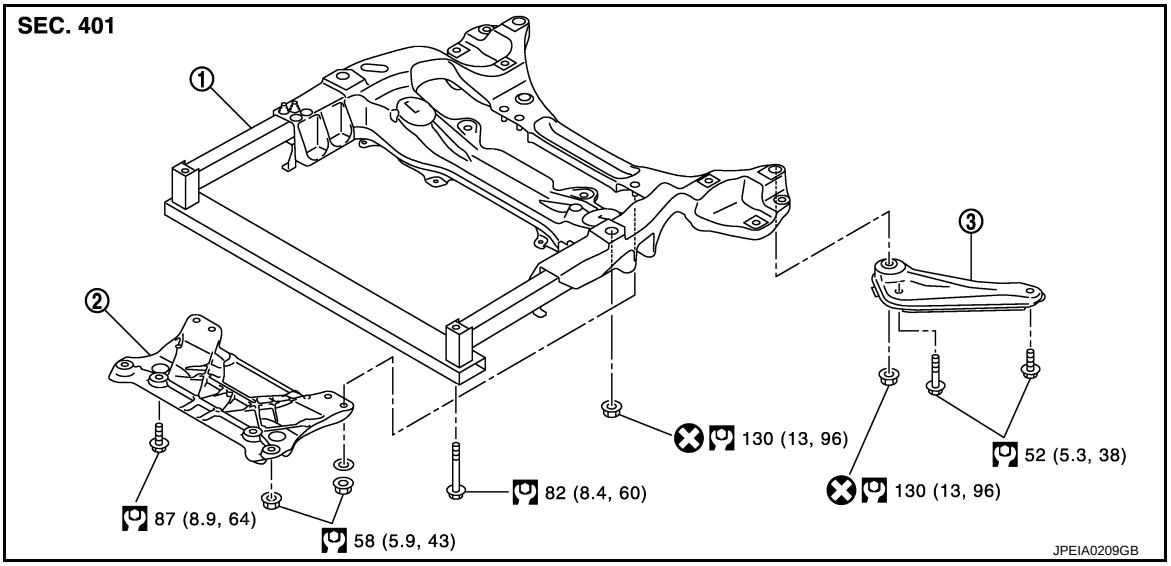
INSPECTION AFTER REMOVAL

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

FRONT SUSPENSION MEMBER

Exploded View

INFOID:0000000006058155



1. Front suspension member
2. Suspension member stay
3. Front suspension member stay

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058156

REMOVAL

1. Perform adjustment before removal. (With 4WAS) Refer to FSU-20, "Inspection and Adjustment".
2. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
3. Remove front under cover with power tool. Refer to EXT-29, "FRONT UNDER COVER : Removal and Installation".
4. Remove engine under cover with power tool. Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
5. Remove suspension member stay with power tool.
6. Separate steering gear assembly and lower joint. Refer to ST-39, "WITHOUT 4WAS : Removal and Installation" (without 4WAS), ST-41, "WITH 4WAS : Removal and Installation" (with 4WAS).
7. Separate steering outer socket from steering knuckle. Refer to ST-45, "2WD : Removal and Installation".
8. Remove wheel sensor and sensor harness from steering knuckle. Refer to BRC-137, "FRONT WHEEL SENSOR : Removal and Installation".
9. Remove stabilizer connecting rod and shock absorber from transverse link. Refer to FSU-18, "Removal and Installation".
10. Remove stabilizer bar. Refer to FSU-18, "Removal and Installation".
11. Install engine slinger, and then hoist engine. Refer to EM-71, "2WD : Removal and Installation" (VQ37VHR), EM-211, "2WD : Removal and Installation" (VK56VD).
12. Remove transverse link from front suspension member. Refer to FSU-13, "Removal and Installation".
13. Remove steering hydraulic piping bracket and steering gear from front suspension member. Refer to ST-79, "2WD : Exploded View" and ST-45, "2WD : Removal and Installation".
14. Set suitable jack front suspension member.
    CAUTION:
    Check that jack supporting status is stable.
15. Remove mounting nuts between engine mounting insulator and from front suspension member. Refer to EM-71, "2WD : Removal and Installation" (VQ37VHR), EM-211, "2WD : Removal and Installation" (VK56VD).

16. Remove front suspension member stay.
17. Remove suspension member mounting bolts and nuts, and then remove front suspension member.
    CAUTION:
    Operate while checking that jack supporting status is stable.
18. Perform inspection after removal. Refer to FSU-20, "Inspection and Adjustment".

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.
- Perform inspection after installation. Refer to FSU-20, "Inspection and Adjustment".

Inspection and Adjustment

INFOID:0000000006058157

ADJUSTMENT BEFORE REMOVAL

Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 1)".

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-137, "FRONT WHEEL SENSOR : Exploded View".
2. Check wheel alignment. Refer to FSU-8, "Inspection".
3. Adjust neutral position of steering angle sensor. (Without 4WAS) Refer to BRC-68, "Work Procedure".
4. Adjust neutral position of 4WAS front actuator. (With 4WAS) Refer to STC-87, "Work Procedure (Pattern 2)".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

INFOID:0000000006058158

Item			Standard	
Wheel size			18 inch	20 inch
Camber Degree minute (Decimal degree)		Minimum	–0° 55′ (–0.91°)	–1° 00′ (–1.00°)
		Nominal	–0° 10′ (–0.17°)	–0° 15′ (–0.25°)
		Maximum	0° 35′ (0.58°)	0° 30′ (0.50°)
		Left and right difference	0° 33′ (0.55°) or less	
Caster Degree minute (Decimal degree)		Minimum	3° 10′ (3.17°)	
		Nominal	4° 30′ (4.50°)	
		Maximum	5° 50′ (5.83°)	
		Left and right difference	0° 39′ (0.65°) or less	
Kingpin inclination Degree minute (Decimal degree)		Minimum	6° 25′ (6.42°)	6° 30′ (6.50°)
		Nominal	7° 10′ (7.17°)	7° 15′ (7.25°)
		Maximum	7° 55′ (7.91°)	8° 00′ (8.00°)
Toe-in	Total toe-in Distance	Minimum	0 mm (0 in)	
		Nominal	In 1 mm (0.04 in)	
		Maximum	In 2 mm (0.08 in)	
	Toe angle (left wheel or right wheel) Degree minute (Decimal Degree)	Minimum	0° 00′ (0.00°)	
		Nominal	In 0° 02′ 24″ (0.04°)	
		Maximum	In 0° 04′ 48″ (0.08°)	

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:0000000006058159

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)
Axial end play		0 mm (0 in)

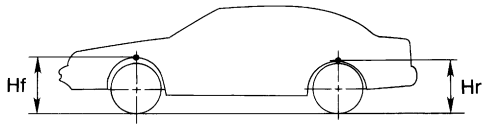
Wheelarch Height

INFOID:0000000006058160

VQ37VHR

Item	Standard	
Wheel size	18 inch	20 inch
Front (Hf)	752 mm (29.61 in)	751 mm (29.57 in)

Item	Standard	
Wheel size	18 inch	20 inch
Rear (Hr)	743 mm (29.25 in)	742 mm (29.21 in)



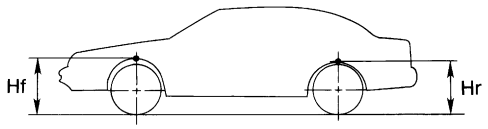
SFA818A

Measure value under unladen* conditions

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

VK56VD

Item	Standard	
Wheel size	18 inch	20 inch
Front (Hf)	751 mm (29.57 in)	750 mm (29.53 in)
Rear (Hr)	743 mm (29.25 in)	741 mm (29.17 in)



SFA818A

Measure value under unladen* conditions

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

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006058191

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:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **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 Air Bag Diagnosis Sensor Unit or other Air Bag 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.**

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:0000000006058193

NOTE:

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

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

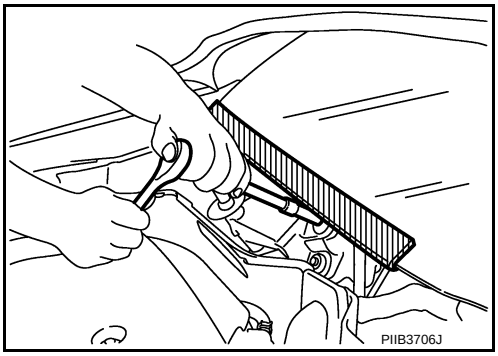
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Turn the push-button ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000006058195

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



Precautions for Suspension

INFOID:0000000006058165

- When installing rubber bushings, the final tightening must be carried out under unladen conditions with tires on ground. Spilled oil might shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Self-lock nuts are not reusable. Always use new ones when installing. Since new self-lock nuts are pre-oiled, tighten as they are.

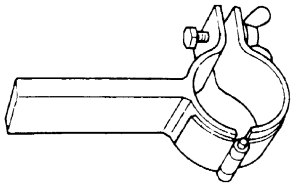
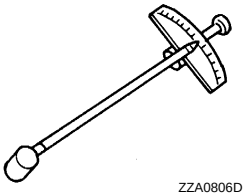
PREPARATION

PREPARATION

Special Service Tools

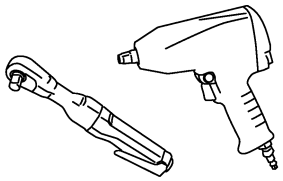
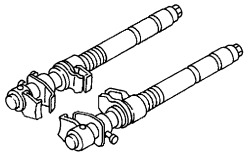
INFOID:0000000006058166

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

Tool number (Kent-Moore No.) Tool name		Description
ST35652000 (–) Shock absorber attachment	 ZZA0807D	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A) Preload gauge	 ZZA0806D	Measuring rotating torque of ball joint

Commercial Service Tools

INFOID:0000000006058167

Tool name		Description
Power tool	 PBIC0190E	Loosening bolts and nuts
Spring compressor	 S-NT717	Removing and installing coil spring

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000006058161

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

			Reference page	FSU-29, FSU-34, FSU-36, FSU-38, FSU-39	FSU-32	—	—	—	FSU-29, FSU-34, FSU-36, FSU-38, FSU-39	FSU-28	FSU-38	NVH in DLN section.	NVH in RFD section.	NVH in FAX and FSU sections.	NVH in WT section.	NVH in WT section.	NVH in FAX section.	NVH in BR section.	NVH in ST section.
			Possible cause and SUSPECTED PARTS	Improper installation, looseness	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
Symptom	FRONT SUSPENSION	Noise		×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake		×	×	×	×		×			×		×	×	×	×	×	×
		Vibration		×	×	×	×	×				×		×	×		×		×
		Shimmy		×	×	×	×			×				×	×	×		×	×
		Judder		×	×	×								×	×	×		×	×
		Poor quality ride or handling		×	×	×	×	×		×	×			×	×	×			

×: Applicable

PERIODIC MAINTENANCE

FRONT SUSPENSION ASSEMBLY

Inspection

INFOID:0000000006058168

MOUNTING INSPECTION

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

BALL JOINT AXIAL END PLAY

1. Set front wheels in a straight-ahead position.
2. Place an iron bar or equivalent between transverse link or upper link and steering knuckle.
3. Measure axial end play by playing it up and down.

Axial end play : Refer to FSU-41, "Ball Joint".

CAUTION:

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

Shock absorber

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

WHEEL ALIGNMENT

Inspection

INFOID:0000000006058169

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.
- Road wheels for runout. Refer to WT-68, "Inspection".
- Wheel bearing axial end play. Refer to FAX-15, "Inspection".
- Transverse link or upper link ball joint axial end play. Refer to FSU-35, "Inspection" or FSU-36, "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.

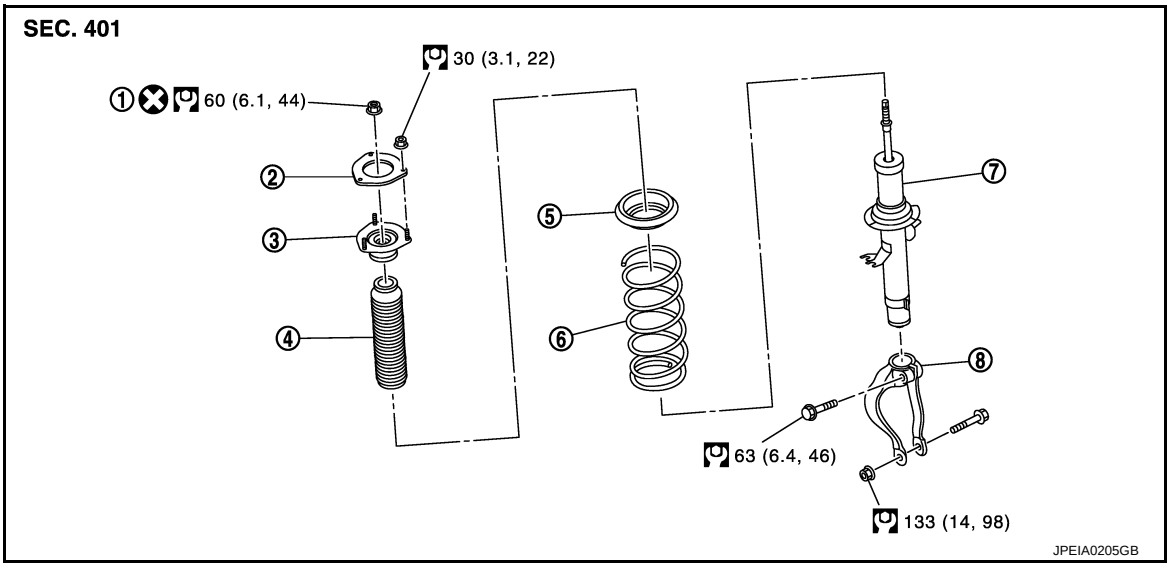
- When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Never use these indicators.**
  - The alignment specifications programmed into your machine that operate these indicators may not be correct.
  - This may result in an ERROR.
- Some newer alignment machines are equipped with an optional “Rolling Compensation” method to “compensate” the sensors (alignment targets or head units). **Never use this “Rolling Compensation” method.**
  - 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.
  - See Instructions in the alignment machine you're using for more information on this.

REMOVAL AND INSTALLATION

FRONT COIL SPRING AND SHOCK ABSORBER

Exploded View

INFOID:0000000006058170



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

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058171

REMOVAL

1. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
2. Remove wheel sensor harness from shock absorber. Refer to BRC-137, "FRONT WHEEL SENSOR : Removal and Installation".
   CAUTION:
   Never pull on wheel sensor harness.
3. Remove brake hose mounting nut, and separate brake hose from shock absorber. Refer to BR-24, "FRONT : Removal and Installation".
4. Remove stabilizer connecting rod from transverse link. Refer to FSU-18, "Removal and Installation".
5. Separate upper link from steering knuckle. Refer to FSU-36, "Removal and Installation".
6. Remove cotter pin, and then loosen wheel hub lock nut with power tool.
7. Patch wheel hub lock nut with a piece of wood. Hammer the wood to disengage wheel hub and bearing assembly from drive shaft.
   CAUTION:
   - **Never place drive shaft joint at an extreme angle. Also be careful not to overextend slide joint.**
   - **Never allow drive shaft to hang down without support for or joint sub-assembly, shaft and the other parts.**

   NOTE:
   Use suitable puller, if wheel hub and bearing assembly and drive shaft cannot be separated even after performing the above procedure.
8. Remove shock absorber from transverse link with power tool.
9. Remove shock absorber mounting bracket nuts, and then remove shock absorber assembly.

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.
- Perform inspection after installation. Refer to FSU-32, "Inspection".
- After replacing the shock absorber, always follow the disposal procedure to discard the shock absorber. Refer to FSU-32, "Disposal".

Disassembly and Assembly

INFOID:0000000006058172

DISASSEMBLY

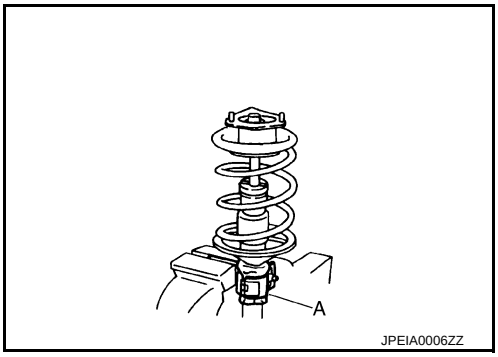
CAUTION:

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:

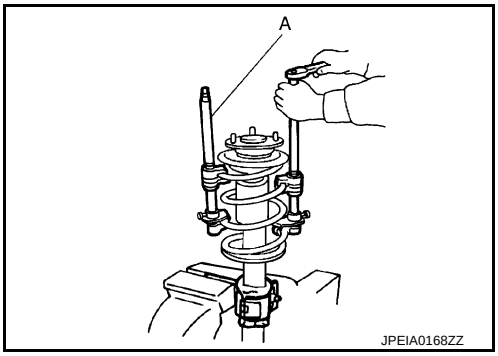
   When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.



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, 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 from shock absorber.
8. Perform inspection after disassembly. Refer to FSU-32, "Inspection".

ASSEMBLY

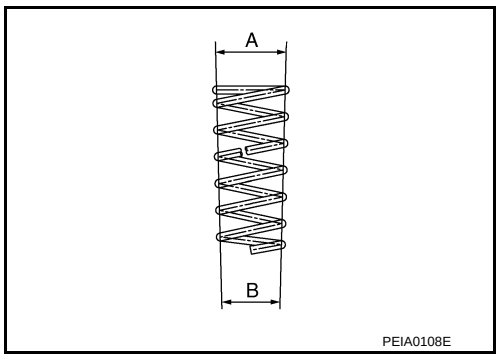
1. Install shock absorber attachment [SST: ST35652000 (–)] to shock absorber and secure it in a vise.

   CAUTION:

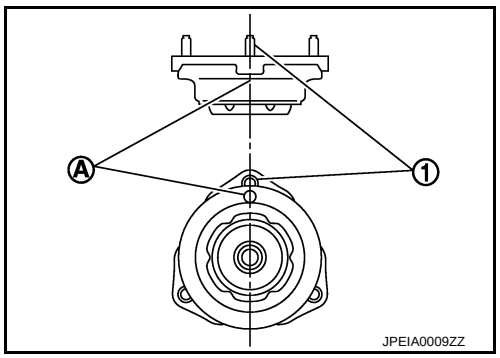
   When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.
2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.

   CAUTION:

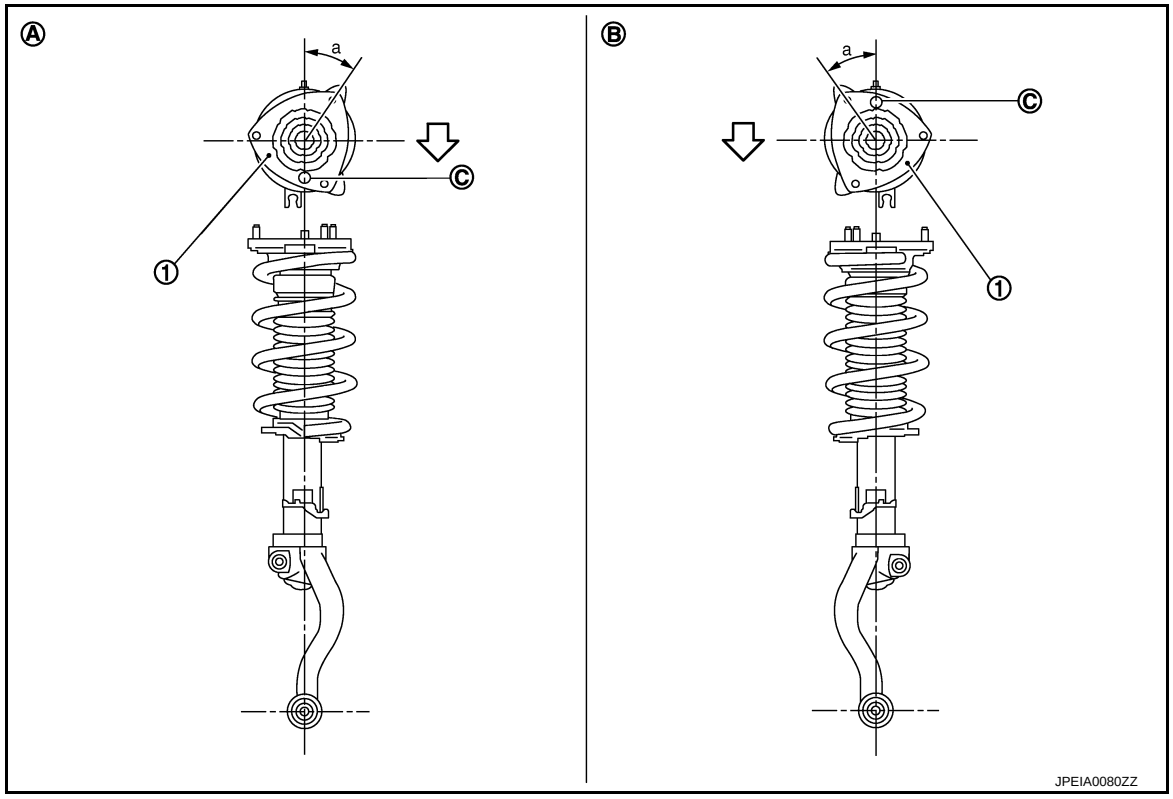
- **Install with the large-diameter side (A) facing up and the small-diameter side (B) facing down.**
- **Be sure a spring compressor is securely attached to coil spring. Compress coil spring.**



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

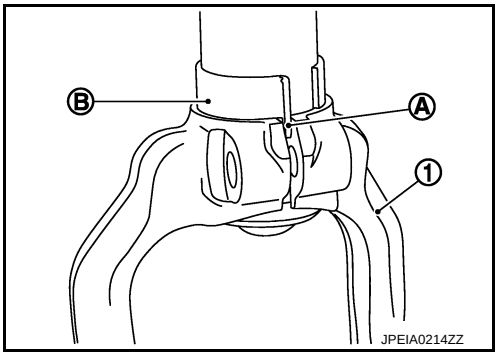
⇦: Vehicle front

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

Angle (a) : 25.1°

- 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.
   CAUTION:
   Never reuse piston rod lock nut.
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 shock absorber attachment from shock absorber.
9. Install the shock absorber arm to shock absorber.
   CAUTION:
   Align the shock absorber protrusion (A) with the groove of the shock absorber arm (1). The upper surface of the shock absorber arm must be in full contact with the lower surface of locating bracket (B).
10. Install the mounting seal to shock absorber mounting bracket.



Inspection

INFOID:0000000006058173

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

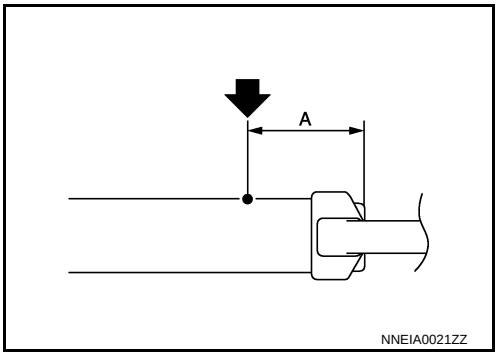
1. Check wheel sensor harness for proper connection. Refer to BRC-137, "FRONT WHEEL SENSOR : Exploded View".
2. Check wheel alignment. Refer to FSU-28, "Inspection".
3. Adjust neutral position of steering angle sensor. Refer to BRC-68, "Work Procedure".

Disposal

INFOID:0000000006058174

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.



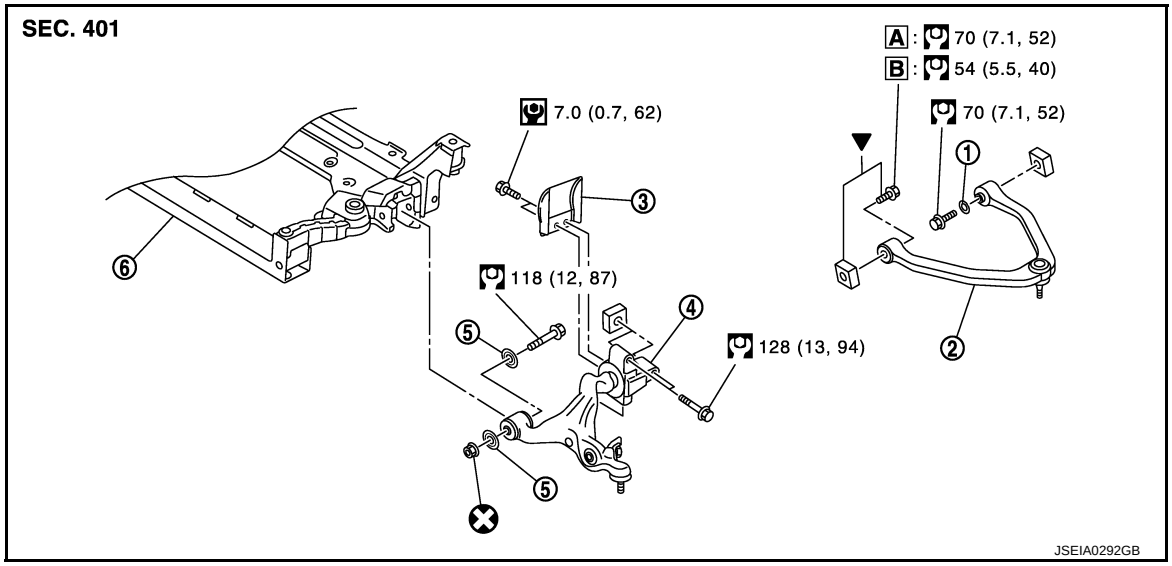
A : 20 – 30 mm (0.79 – 1.18 in)

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

Exploded View

INFOID:0000000006058175



1. Stopper rubber
2. Upper link
3. Insulator (VK56VD)
4. Transverse link
5. Stopper bushing
6. Front suspension member

A: Black

B: Silver

▼: Use the same color for bolt and nut.

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058176

REMOVAL

1. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
2. Remove engine under cover with power tool. Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
3. Remove shock absorber assembly. Refer to FSU-29, "Removal and Installation".
4. Remove front crossbar. Refer to FSU-39, "Removal and Installation".
5. Separate steering outer socket from steering knuckle. Refer to ST-55, "AWD : Removal and Installation".
6. Remove transverse link from steering knuckle.
7. Set suitable jack under transverse link.
   CAUTION:
   Check that jack supporting status is stable.
8. Remove insulator form transverse link. (VK56VD)
9. Remove mounting bolts, nuts, and stopper bushings, and then remove transverse link from suspension and vehicle.
10. Perform inspection after removal. Refer to FSU-35, "Inspection".

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.
- Perform inspection after installation. Refer to FSU-35, "Inspection".

Inspection

INFOID:0000000006058177

INSPECTION AFTER REMOVAL

Appearance

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

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

Ball Joint Inspection

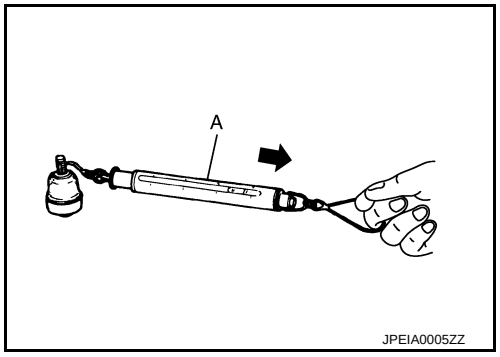
Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.
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 toque :Refer to FSU-41, "Ball Joint".

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

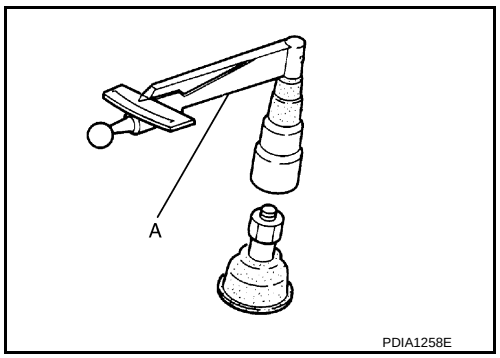


Rotating Torque Inspection

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 toque : 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.

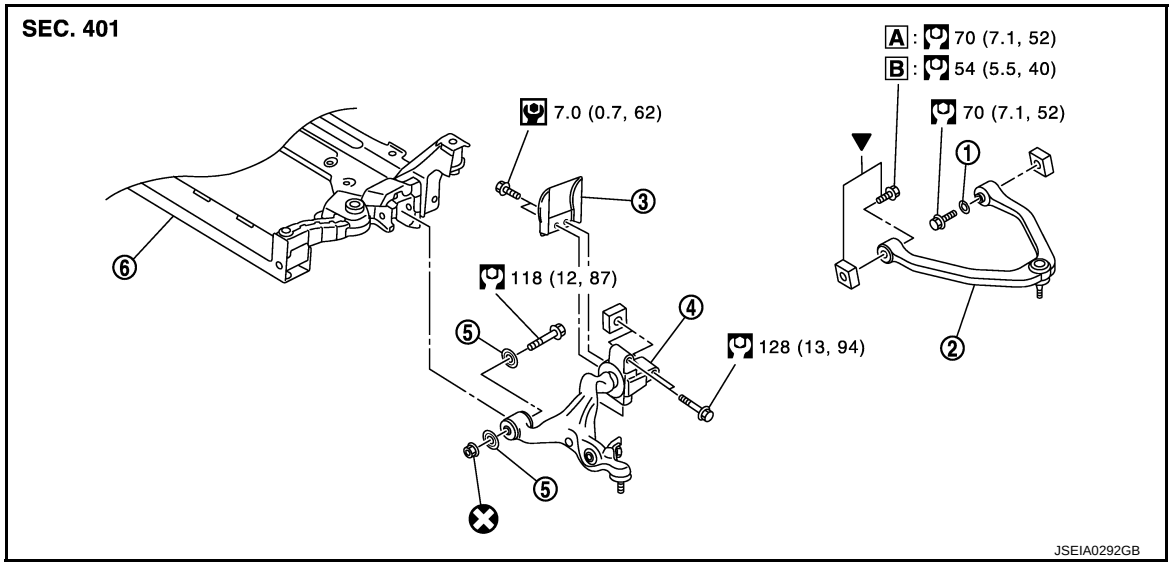
INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to BRC-137, "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-68, "Work Procedure".

UPPER LINK

Exploded View

INFOID:0000000006059221



1. Stopper rubber
2. Upper link
3. Insulator (VK56VD)
4. Transverse link
5. Stopper bushing
6. Front suspension member

A: Black

B: Silver

▼: Use the same color for bolt and nut.

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058179

REMOVAL

1. Remove tires from with power tool. Refer to WT-68, "Removal and Installation".
2. Remove shock absorber assembly. Refer to FSU-29, "Removal and Installation".
3. Remove mounting bolts and stopper rubber, and then remove upper link from vehicle.
4. Perform inspection after removal. Refer to FSU-36, "Inspection".

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.
- Perform inspection after installation. Refer to FSU-36, "Inspection".

Inspection

INFOID:0000000006058180

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

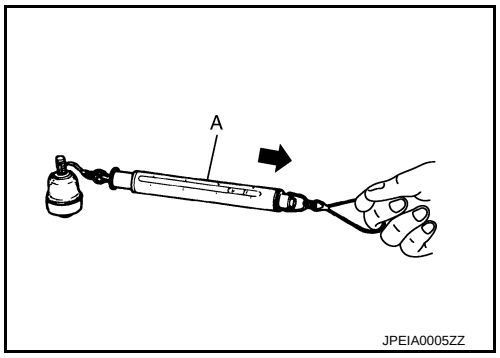
Manually move ball stud to confirm it moves smoothly with no binding.

Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.
2. 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

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 upper link assembly.

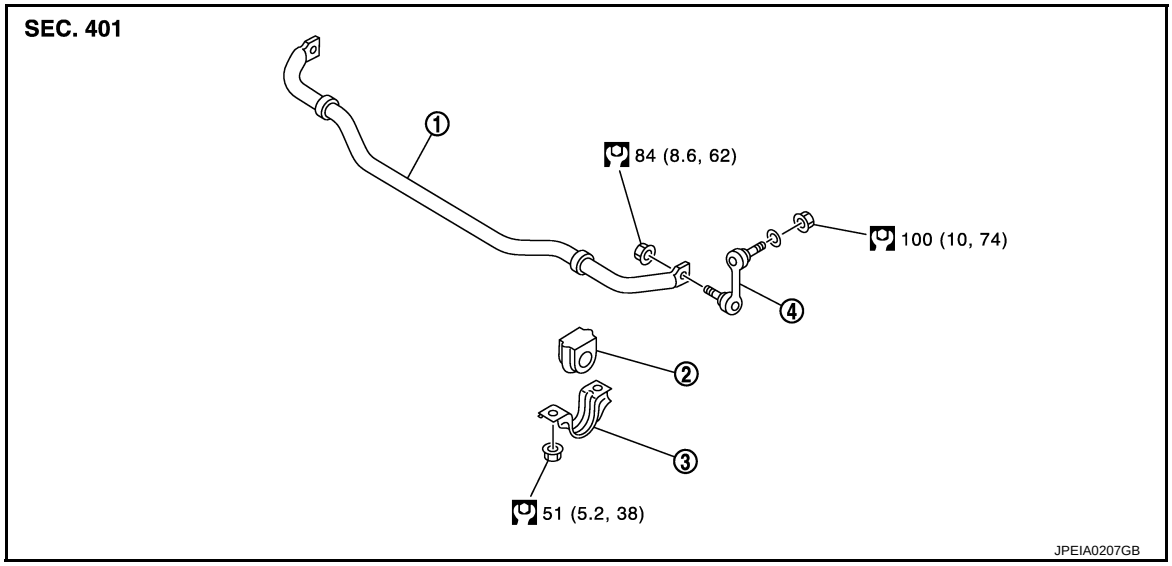
INSPECTION AFTER INSTALLATION

1. Check wheel sensor harness for proper connection. Refer to BRC-137, "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-68, "Work Procedure".

FRONT STABILIZER

Exploded View

INFOID:0000000006058181



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:0000000006058182

REMOVAL

1. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
2. Remove engine under cover with power tool. Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
3. Remove stabilizer connecting rod.
   CAUTION:
   Apply a matching mark to identify the installation position.
4. Remove stabilizer clamp and stabilizer bushing.
5. Remove stabilizer bar.
6. Perform inspection after removal. Refer to FSU-38, "Inspection".

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:0000000006058183

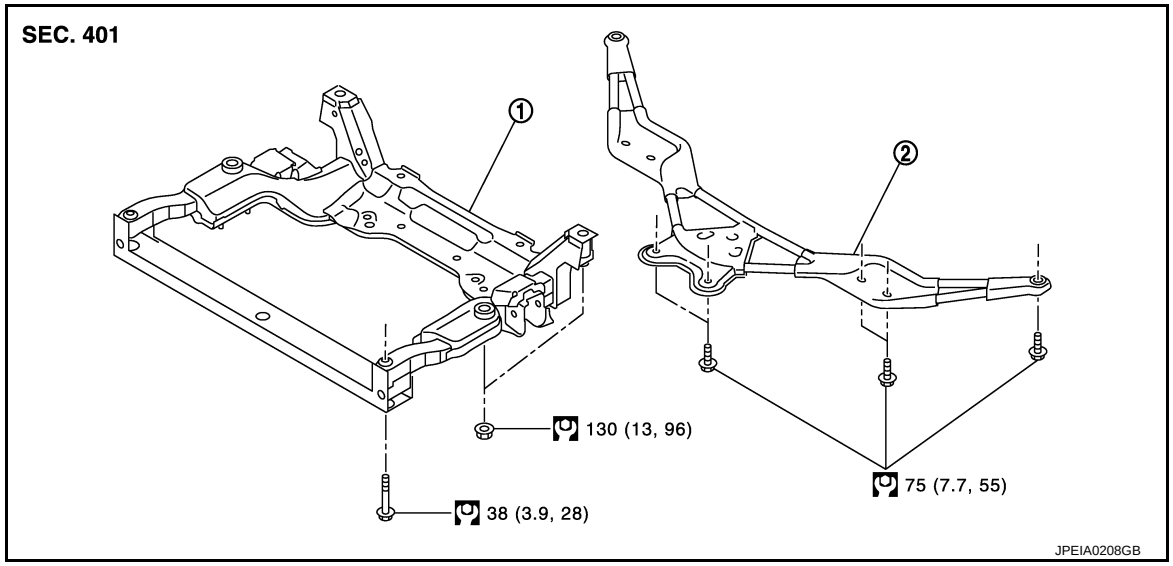
INSPECTION AFTER REMOVAL

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

FRONT SUSPENSION MEMBER

Exploded View

INFOID:0000000006058184



1. Front suspension member
2. Front cross bar

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000006058185

REMOVAL

1. Remove tires with power tool. Refer to WT-68, "Removal and Installation".
2. Remove front under cover with power tool. Refer to EXT-29, "FRONT UNDER COVER : Removal and Installation".
3. Remove engine under cover with power tool. Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
4. Remove front cross bar with power tool.
5. Separate steering gear assembly and lower joint. Refer to ST-39, "WITHOUT 4WAS : Removal and Installation".
6. Separate steering outer sockets from steering knuckles. Refer to ST-55, "AWD : Removal and Installation".
7. Remove wheel sensors and sensor harness from steering knuckles. Refer to BRC-137, "FRONT WHEEL SENSOR : Removal and Installation".
8. Remove shock absorber from transverse link. Refer to FSU-29, "Removal and Installation".
9. Remove stabilizer. Refer to FSU-38, "Removal and Installation".
10. Install engine slinger, and then hoist engine. Refer to EM-76, "AWD : Removal and Installation" (VQ37VHR), EM-211, "2WD : Removal and Installation" (VK56VD).
11. Remove transverse link from front suspension member. Refer to FSU-34, "Removal and Installation".
12. Remove steering hydraulic piping bracket and steering gear from front suspension member. Refer to ST-81, "AWD : Exploded View" and ST-55, "AWD : Removal and Installation".
13. Set suitable jack front suspension member.
    CAUTION:
    Check that jack supporting status is stable.
14. Remove mounting nuts between engine mounting insulator and from front suspension member. Refer to EM-76, "AWD : Removal and Installation" (VQ37VHR), EM-216, "AWD : Removal and Installation" (VK56VD).
15. Remove suspension member mounting bolts and nuts, and then remove suspension member.

CAUTION:
Operate while checking that jack supporting status is stable.

16. Perform inspection after removal. Refer to FSU-40, "Inspection".

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.
- Perform inspection after installation. Refer to FSU-40, "Inspection".

Inspection

INFOID:0000000006058186

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-137, "FRONT WHEEL SENSOR : Exploded View".
2. Check wheel alignment. Refer to FSU-28, "Inspection".
3. Adjust the neutral position of the steering angle sensor. Refer to BRC-68, "Work Procedure".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

INFOID:0000000006058187

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° 33′ (0.55°) or less
Caster Degree minute (Decimal degree)		Minimum	2° 40′ (2.67°)
		Nominal	4° 00′ (4.00°)
		Maximum	5° 20′ (5.33°)
		Left and right difference	0° 39′ (0.65°) or less
Kingpin inclination Degree minute (Decimal degree)		Minimum	6° 20′ (6.34°)
		Nominal	7° 05′ (7.08°)
		Maximum	7° 50′ (7.83°)
Toe-in	Total toe-in Distance	Minimum	0 mm (0 in)
		Nominal	In 1 mm (0.04 in)
		Maximum	In 2 mm (0.08 in)
	Toe angle (left wheel or right wheel) Degree minute (Decimal degree)	Minimum	0° 00′ (0.00°)
		Nominal	In 0° 02′ 24″ (0.04°)
		Maximum	In 0° 04′ 48″(0.08°)

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:0000000006058188

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)
Axial end play		0 mm (0 in)

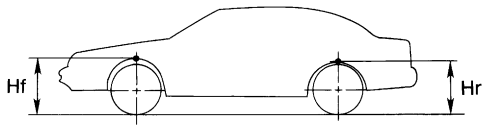
Wheelarch Height

INFOID:0000000006058189

VQ37VHR

Item	Standard
Front (Hf)	765 mm (30.12 in)

Item	Standard
Rear (Hr)	757 mm (29.80 in)



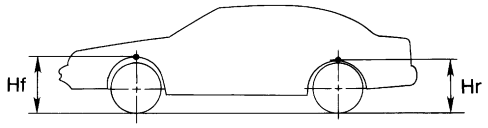
SFA818A

Measure value under unladen* conditions.

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

VK56VD

Item	Standard
Front (Hf)	763 mm (30.04 in)
Rear (Hr)	757 mm (29.80 in)



SFA818A

Measure value under unladen* conditions.

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