REAR AXLE AND REAR SUSPENSION

SECTION **RA**

CONTENTS

PRECAUTION AND PREPARATION

Precaution 2
Preparation 3

WHEEL HUB

On-Vehicle Inspection 4
Rear Wheel Bearing 4
Removal • Installation 4

REAR SUSPENSION

Components Diagram 7
On-Vehicle Inspection And Service 7
Wheel Alignment 7
Inspection Before Service 7
Camber Inspection 8
Tow-In Inspection 8
Removal • Installation 9

COIL SPRING AND SHOCK ABSORBER

Removal • Installation 10
Disassembly • Assembly 10
Inspection after Disassembly 11

LATERAL LINK AND CONTROL ROD

Removal • Installation 12
Inspection after Removal 12
Installation 12

SERVICE DATA

Wheel Alignment 13
Tightening Torque 13

Precaution

Caution (Rear Axle)

Observe following cautions while disassembling the drive shaft.

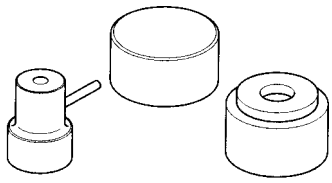
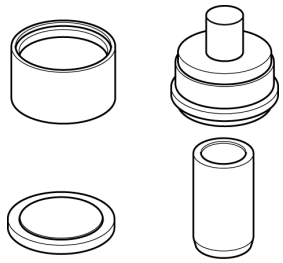
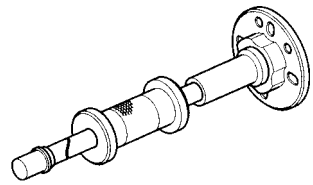
- Do not disassemble the connecting sections towards wheel.
- Operate in a clean location.
- Clean the components before disassembling.
- Keep the operation location clean to prevent dirtying the components or inlet of foreign particles.
- Install the disassembled components in correct order. Cover the components when stopping the operation.
- Use a paper towel for cleaning. The cloth towel can cause problems due to waste threads. Do not use it.
- Clean the disassembled components (except for the rubber components) with white kerosene and wipe the oil using the compressed air or paper towel.

Caution (Rear Suspension)

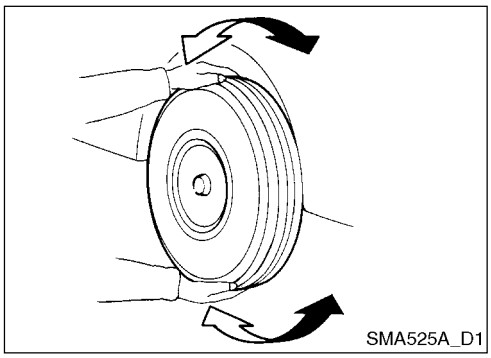
- Bushes should be installed completely while vehicle empty and on the ground. Wipe out all oil that can deteriorate the durability of bushes.
- An empty vehicle means it has all the necessary fluids that allow being ready for driving such as full tank of fuel, coolant and all lubricants. However, jack and other service tools are excluded.
- Always inspect the wheel alignment after suspension system service.
- The lock nut cannot be reused. Replace it with new when installing. Oil is applied on it when new, but install as it is.

Preparation

Special Service Tools

Item	Description	
ABS sensor rotor drift set KV38100500 KV40101840 Rear ABS sensor rotor drift KV10105501	 ZZA09425D_D1	Assembling front and rear ABS sensor rotor
Wheel hub support KV40104710 KV40106200 KV40105310		Assembling wheel hub Disassembling/assembling wheel hub bearing
Wheel hub puller KV40104100 ST36230000	 ZZA09425D_D1	Disassembling wheel hub

Wheel Hub



On-Vehicle Inspection

Inspect the rear axle for any excessive free play, damage, wear and others.

- Inspect the free play by moving the rear wheel (left and right).

Rear Wheel Bearing

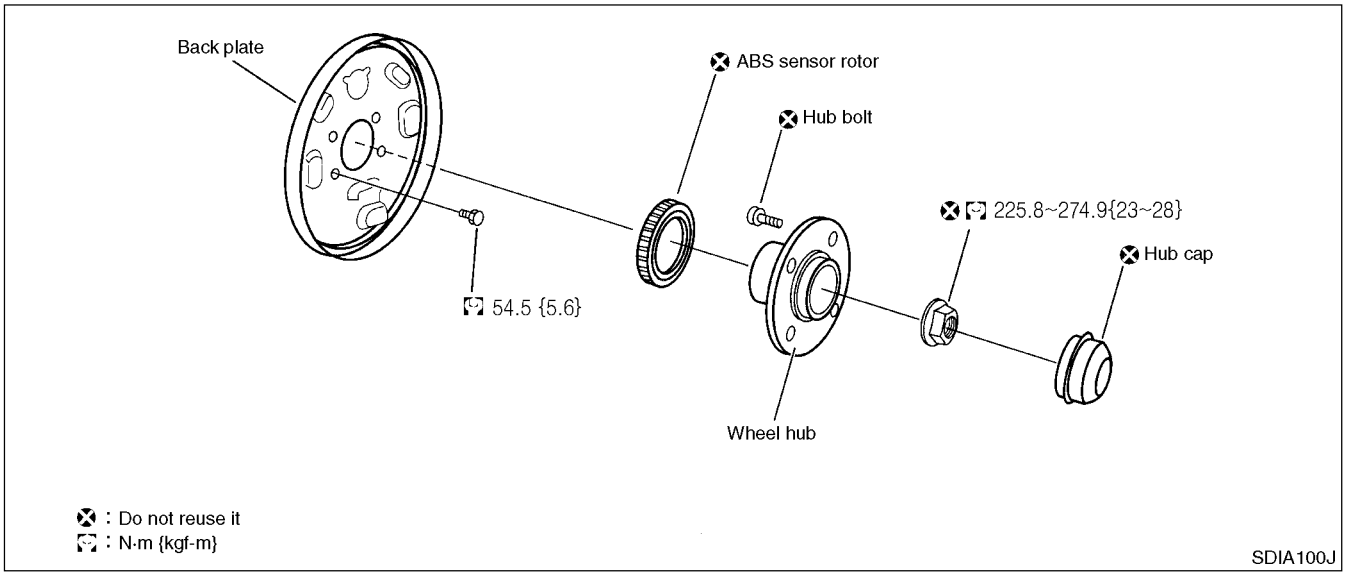
Inspect the following while vehicle lifted up.

- Inspect for any rattles in the front wheel bearing by moving the wheel hub in the axial direction.

  Axial direction endplay: 0.05 mm

- Inspect for any abnormal noises by rotating the wheels. If defective, replace the wheel bearing.
- If defective while inspection, replace the wheel hub.

Removal • Installation

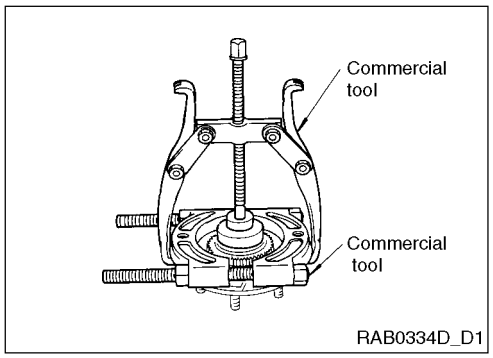


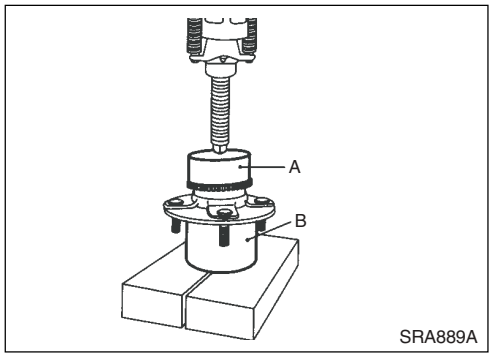
REMOVAL

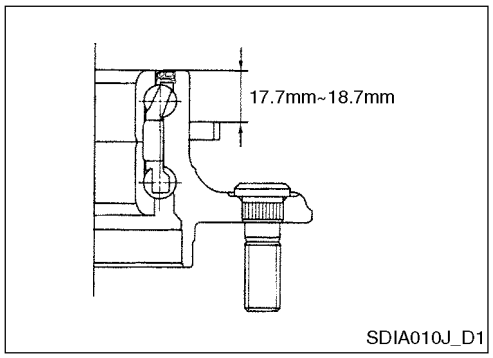
1. Remove the tires and remove the hub cap from the wheel hub using a hub cap pliers (commercial tool).
2. Lift up the lock nut caulking section with a minus (-) screwdriver.
3. Remove the lock nut and remove the wheel hub from the rear spindle.
4. Remove the ABS wheel speed sensor from the rear suspension trailing arm.
5. Remove the parking cable, brake drum, brake shoes and wheel cylinder from the back plate.

CAUTION:

- **Be careful not to stain the brake fluid on the painted surfaces during wheel cylinder removal.**
- **Do not depress the brake pedal while the brake shoes, wheel cylinder and brake drum are removed.**







6. Remove the back plate from the rear suspension beam complete assembly.
7. Remove the ABS sensor rotor from the wheel hub using the puller (commercial tool), drift (KV38100500, KV40101840) and bearing repressor (commercial tool).

INSPECTION AFTER REMOVAL

- Inspect the wheel hub for any deformation, cracks or damages and replace if defective.

INSTALLATION

1. Install the ABS sensor rotor to the wheel hub using a drift (A: KV10105501), (B: KV40104710, KV40106200, KV40105310).

CAUTION:

- **The ABS sensor rotor cannot be reused. Do not reuse.**
- Install the ABS sensor rotor to the illustrated location.

2. Install the back plate to the rear suspension beam complete assembly and tighten the mounting bolts to the specified torque.
3. Install the parking cable, brake shoes and wheel cylinder to the back plate.
4. Install the wheel hub to the rear spindle and tighten the lock nut to the specified torque.

CAUTION:

- **The lock nut cannot be reused. Do not reuse.**

5. Tighten the lock nut.
6. Rotate the wheel hub 10 times in reverse direction at the speed of 60 RPM.
7. Place a spring balance at the hub bolt location and measure the turning torque while rotating 10 ± 2 RPM.

   Turning torque:

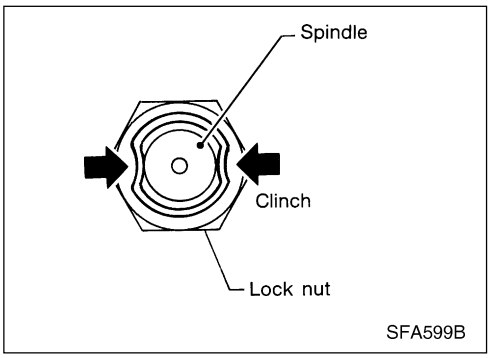
   0.150 - 0.980 N•m (0.015 - 0.100 kgf-m)

   Measured value by spring balance:

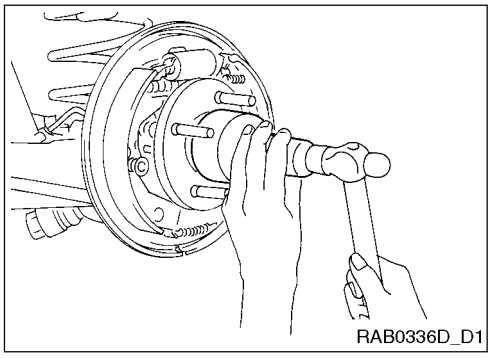
   3.0 - 19 N (0.3 - 2.0 kg)

   - If the value is out of the standard, replace the wheel hub as an assembly.

8. Install the ABS wheel speed sensor to the rear suspension trailing arm and beam complete assembly.



9. Clinch two places of lock nut.



10. Install the hub cap to the wheel hub.

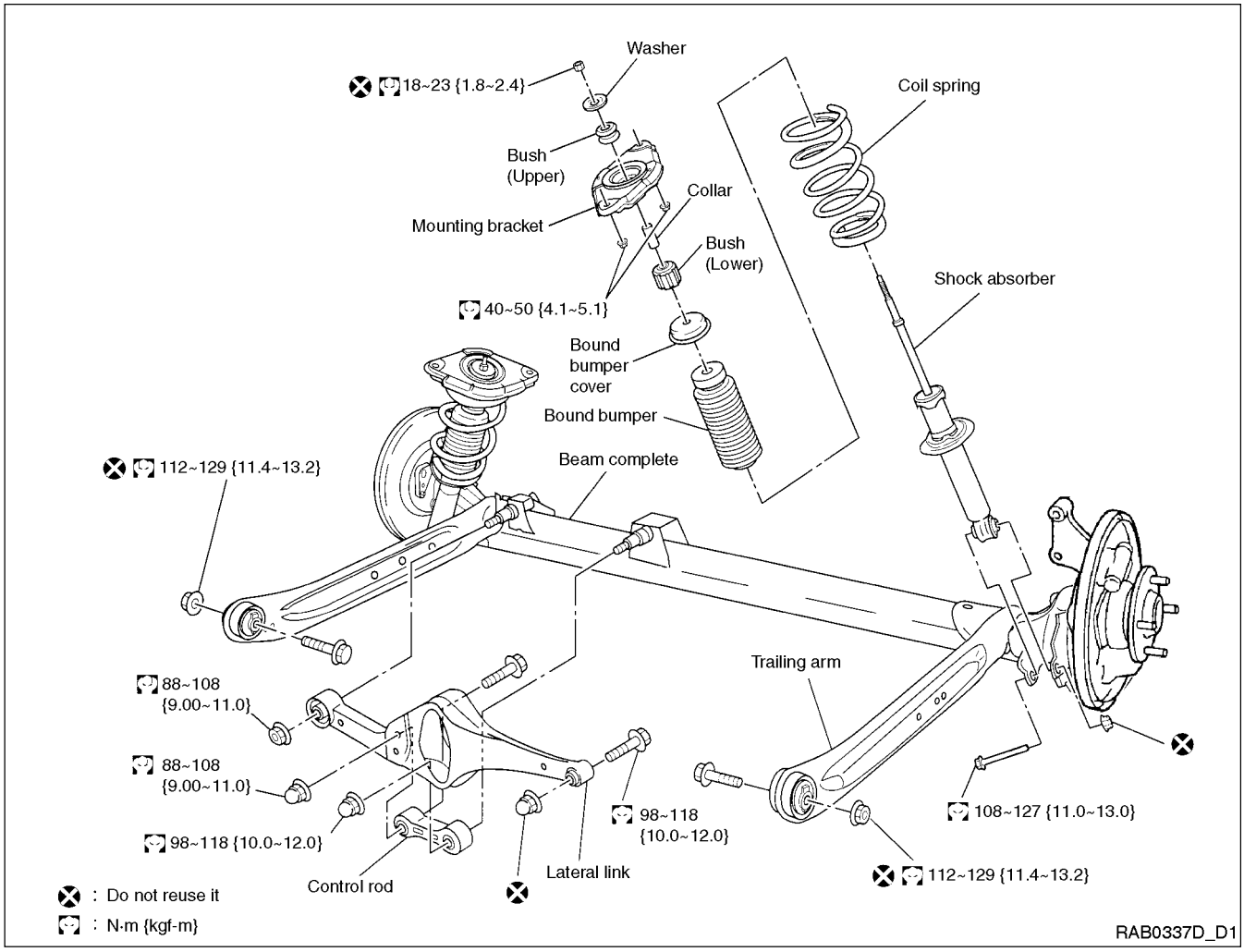
CAUTION:

- **The hub cap cannot be reused. Do not reuse.**

11. Install the brake drum.
12. Perform air bleeding to the brake system.
13. Install the tires.

Rear Suspension

Components Diagram



On-Vehicle Inspection and Service

Inspect for any excessive free play, wear and damages on rear axle and suspension components.

- Inspect for any excessive free play by moving the rear wheels (left and right).
- Tighten all nuts and bolts to the specified torque again.
- Inspect the shock absorber for any oil leakage and damages.

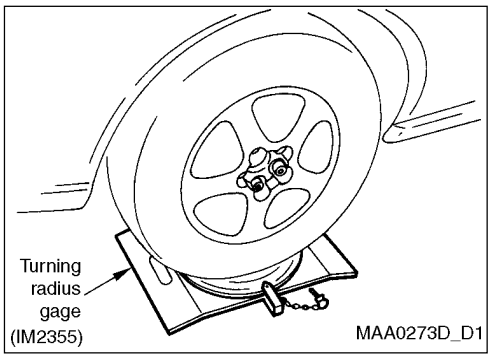
Wheel Alignment

GENERAL

- Perform the wheel alignment while vehicle is empty. An empty vehicle means it has all the necessary fluids that allow being ready for driving such as full tank of fuel, coolant and all lubricants but except for jack and service tools.

Inspection Before Service

1. Inspect the tire inflation pressure and wear.
2. Inspect the rod wheel for any vibration.
3. Inspect the axial direction endplay of the wheel bearing.
4. Inspect the shock absorber operation.
5. Inspect the axle and suspension mountings for any looseness and deformation.
6. Inspect the links and arms for any damages, cracks or deformation.
7. Inspect if the vehicle exterior is normal.

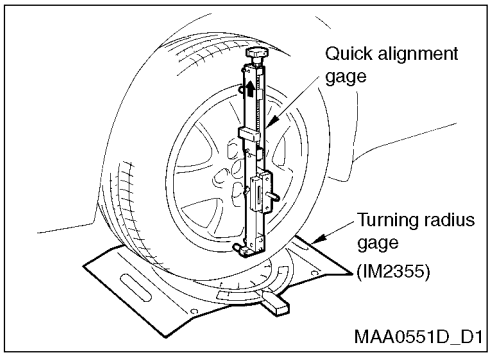


Camber Inspection

CAUTION:

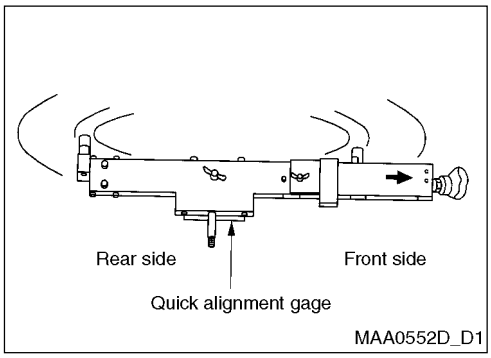
- **The rear alignment inspection can be done with quick alignment gage quickly and accurately.**
- **Refer to the user's manual for detailed instructions of quick alignment gage.**

1. Keep the vehicle leveled by placing the rear wheels on the turning radius gage and the front wheels on the support with the same height with the turning radius gage before installation.
2. Install the quick alignment gage assembly so that the arrow sticker faces upwards and perpendicular with the floor as in the illustration before measurement.



Tow-in Inspection

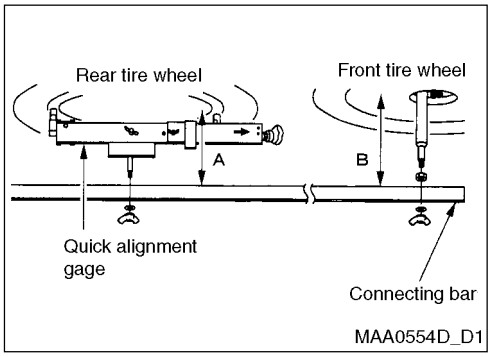
1. Place the quick alignment gage assembly on a flat board and adjust the tow angle measurement meter to 0° using device block.
2. Install the quick alignment gage onto the wheel to be measured so that the arrow sticker faces towards vehicle front.
3. Remove one wheel nut from front wheel which is nearest to the center line and install the hub bolt adaptor.



4. Install the connecting bar to the vehicle.

CAUTION:

- **Adjust the distance A and B by considering tread so that the connecting bar and the vehicle become parallel.**



5. Remove the quick alignment gage assembly from the vehicle and place on the flat board. Then convert the measured value to regular value using the conversion formula.

   Sin [Measured value (decimal method) tire outer diameter (mm)]= Tow-in (mm)

   Example:

   When measured value is 0° 30′ (0.5°) and tire outer diameter is 600 mm

   Sin 0.5 X 600 = 5.2 mm

   Tow-in: In 5 mm - Out 3 mm

Removal • Installation

REMOVAL

1. Remove the tires.
2. Remove the brake related components.
3. Remove the parking brake cable and brake hose from the trailing arm and beam complete assembly.

CAUTION:

- **Do not stain the brake fluid on the painted surface when the brake hose is removed.**
- **Do not depress the brake pedal while brake hose is removed.**

4. Remove the ABS wheel speed sensor from the beam complete and trailing arm.
5. Lift the vehicle up and install the transmission jack at the center of beam complete assembly.

CAUTION:

- **Do not perform removal operation when the shock absorber is under loads.**

6. Remove the mounting bolts under the shock absorber.
7. Remove the lateral link mounting bolts and nuts.
8. Remove the trailing arm mounting bolts and nuts and remove the rear suspension assembly from the vehicle by slowly lowering the transmission jack.

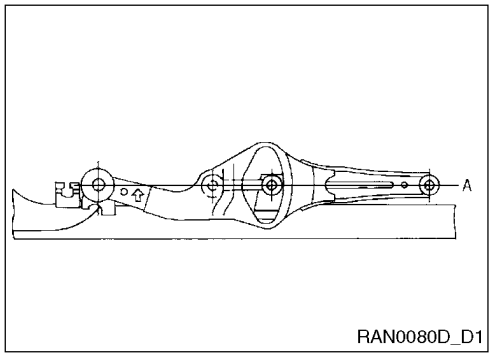
INSTALLATION

- Refer to “Components Diagram” (RA-7) in “Rear Suspension” for tightening torque and other information.

CAUTION:

- **The brake fluid cannot be reused. Do not reuse.**
- Perform the air bleeding to the brake system after installation.

1. Install the control rod to the lateral link.
   - Do not tighten the mounting bolts and nuts completely. Just leave it as inserted.
2. Install the lateral link and control rod to the beam complete assembly.
   - Do not tighten the mounting bolts and nuts completely. Just leave it as inserted.
3. Locate the transmission jack at the center of the beam complete assembly. Jack it up and then install the trailing arm and lateral link to the vehicle.
   - Do not tighten the mounting bolts and nuts completely. Just leave it as inserted.
4. Install the shock absorber to the vehicle and rear suspension assembly.
5. Remove the transmission jack from the beam complete assembly.
6. Tighten all the bolts and nuts while the beam complete assembly and the lateral link (A line) forms parallel as shown in the illustration when vehicle empty and on the ground.



Coil Spring and Shock Absorber

Removal • Installation

REMOVAL

CAUTION:

- **Do not loosen the piston rod lock nut when it is installed on the vehicle.**

1. Remove the tires.
2. After lifting up the vehicle, install the transmission jack at the center of the beam complete assembly.

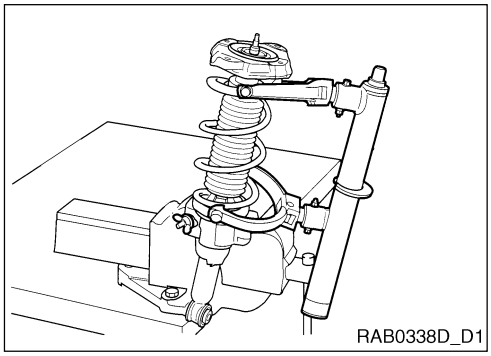
CAUTION:

- **Do not perform removal operation or lifting on the beam section when the shock absorber is under load.**

3. Remove the lower mounting bolts and nuts from the shock absorber.
4. Remove the upper mounting bolts and nuts from the shock absorber and remove the shock absorbers from the vehicle.

INSTALLATION

- Refer to “Components Diagram” (RA-7) in “Rear Suspension” for tightening torque and install in the reverse order of removal.



Disassembly • Assembly

DISASSEMBLY

1. Install the strut attachment (commercial tool) to the shock absorber and secure at the vise.

CAUTION:

- **Cover the lock strut with oil cloth during strut attachment (commercial tool) installation to prevent from damaging.**

2. Loosen the piston rod lock nut gradually.

CAUTION:

- **Do not release the piston rod lock nut completely. If so, the coil spring will bounce out and cause injury.**

3. Compress the coil spring using a spring compressor (commercial tool).

CAUTION:

- **Check if the spring compressor (commercial tool) is securely installed on the coil spring and then perform the coil spring compression.**

4. After finishing the step 3, check if the coil spring is fully released between the upper seat and lower seat and remove the piston rod lock nut.
5. Remove the small components of the shock absorber.
   - Remove the washer, bushing (upper), mounting bracket, collar, bushing (lower) bound bumper cover and bound bumper and then remove the coil spring from the shock absorber.
6. Slowly release the spring compressor (commercial tool) and remove the coil spring.

Inspection after Disassembly

SHOCK ABSORBER

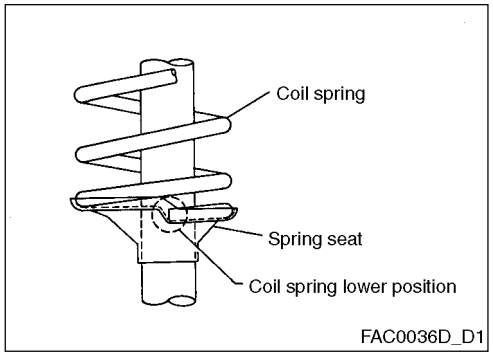
- Inspect the shock absorber for any deformation, cracks or damages and replace if defective.
- Inspect the piston rod for any damages, uneven wear and refraction and replace the shock absorber if defective.
- Inspect the welded sections and sealing sections for any oil leakages and replace if defective.

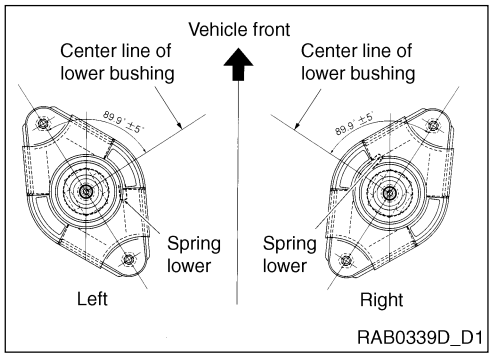
UPPER RUBBER SEAT AND BUSHING

- Inspect the bushing for any cracks and damages and replace if defective.

COIL SPRING

- Inspect for any cracks, wear and damages and replace if defective.





ASSEMBLY

1. Compress the coil spring using the spring compressor (commercial tool) and install it to the shock absorber.

CAUTION:

- **Face the coil spring tube side downwards and adjust the lower section to the spring seat as shown in the illustration.**
- **Check if the spring compressor (commercial tool) is securely installed on the coil spring and then compress the coil spring.**

2. Install the small components of the shock absorber.
   - Install the bound bumper, bound bumper cover, collar, bushing (lower), mounting bracket, bushing (upper) and washer and insert the piston rod lock nut.

CAUTION:

- **The piston rod lock nuts cannot be reused. Do not reuse.**
- **Check if the collar is securely installed.**

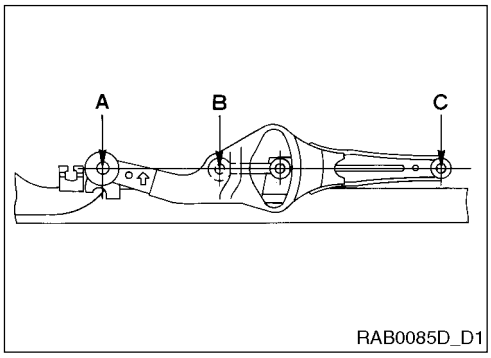
3. Install the mounting bracket as shown in the illustration.
4. Check if the coil spring is securely installed on the mounting bracket and release the spring compressor (commercial tool) slowly.
5. Tighten the piston rod lock nut to the specified torque.
6. Remove the strut attachment (commercial tool) from the strut.

Lateral Link and Control Rod

Removal • Installation

REMOVAL

1. Support the center of the beam complete assembly with a transmission jack. Loosen the mounting bolt from the lateral link and the beam complete, mounting bolt and nut from the lateral link and the vehicle, and the mounting nuts from the control rod and the beam complete. Then remove the lateral link and control rod from the vehicle.
2. Remove the mounting bolts and nuts from the lateral link and control rod and remove the control rod from the lateral link.



Inspection after Removal

LATERAL LINK

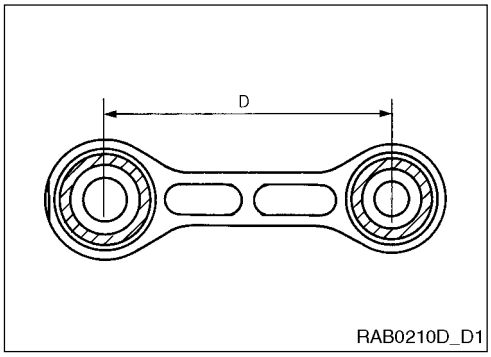
- Inspect the lateral link and bushing for any deformation, cracks and damages and replace if defective.
- Measure the distance AB, BC and AC as shown in the illustration. If much different from the standard value, replace the lateral link assembly.

  Standard value (Distance between the collar and hole center)

  Distance AB: 207.5 ± 0.5 mm

  Distance BC: 394.5 ± 0.5 mm

  Distance AC: 602.0 ± 1.0 mm

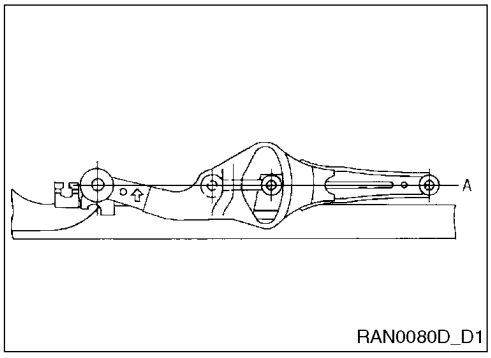


CONTROL ROD

- Inspect the control rod and bushing for any deformation, cracks and damages and replace if defective.
- Measure the distance D as shown in the illustration. If much different from the standard value, replace the control rod assembly.

  Standard value (Distance between the collar centers):

  107.0 ± 1.0 mm



Installation

- Refer to “Components Diagram” for tightening torque and install in the reverse order of removal.
- Tighten the mounting bolts (2 EA) and nuts (4 EA) to the specified torque while the beam complete and the lateral link (A line) is parallel during vehicle empty and on the ground.

Service Data

Wheel Alignment

Engine model	QG16DE
Camber	-1° 00' ± 45'
Tow-in (mm)	In 5 - Out 3

Tightening Torque

N•m (kgf-m)

Piston rod lock nut	18 - 23 (1.8 - 2.4)
Trailing arm - Body	112 - 129 (11.4 - 13.2)
Lateral link - Body	98 - 118 (10.0 - 12.0)
Shock absorber - Beam complete	108 - 127 (11.0 - 13.0)
Shock absorber - Body	40 - 50 (4.1 - 5.1)