

# REAR AXLE & REAR SUSPENSION

## SECTION **RA**

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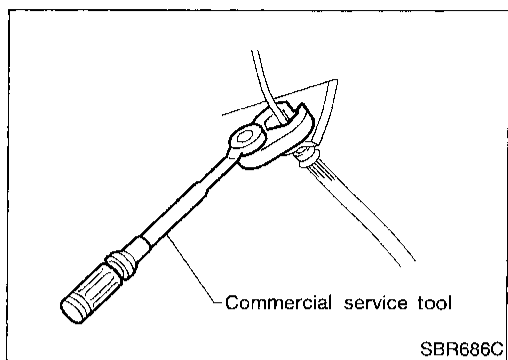
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# PRECAUTIONS AND PREPARATION

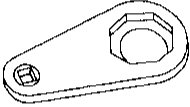
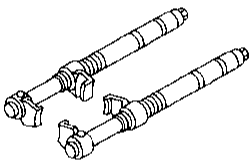
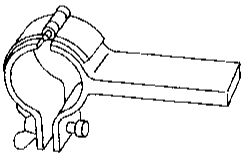


## Precautions

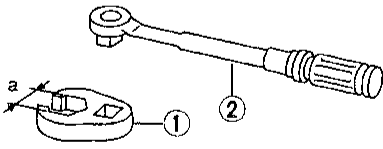
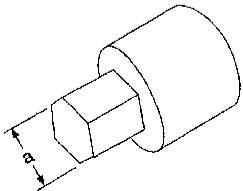
- When installing rubber parts, final tightening must be carried out under unladen condition\* with tires on ground.
- \*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
- After installing removed suspension parts, check wheel alignment and adjust if necessary.
- Do not jack up at the parallel links.
- Use flare nut wrench when removing or installing brake tubes.
- Always torque brake lines when installing.

## Special Service Tools

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
ST35490000 (J26083) Gland packing wrench	 Removing and installing gland packing NT158
HT71780000 ( — ) Spring compressor	 Removing and installing coil spring NT144
ST35652000 ( — ) Strut attachment	 Fixing strut assembly NT145

## Commercial Service Tools

Tool name	Description
① Flare nut crowfoot ② Torque wrench	 Removing and installing brake tubes NT360 a: 10 mm (0.39 in)
Hexagon socket	 Removing and installing strut damper ARA079 a: 17 mm (0.67 in)

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

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

## NVH Troubleshooting Chart

### REAR AXLE AND REAR SUSPENSION

Reference page		RA-4, 10	RA-13	RA-5	RA-5	RA-5	RA-5	NVH in FA section	NVH in FA section	NVH in FA section	NVH in FA section	NVH in ST section	NVH in BR section	RA-6	RA-5	RA-5
SUSPECTED PARTS (Possible cause)		Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	DRIVE SHAFT	FRONT AXLE AND FRONT SUSPENSION	TIRE	ROAD WHEEL	STEERING	BRAKE	Incorrect wheel alignment	Stabilizer bar fatigue	Wheel bearing damage
Symptom	Noise	X	X	X	X	X			X							
	Shake	X	X	X	X		X	X	X	X	X	X	X			
	Vibration	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	X

X: Applicable

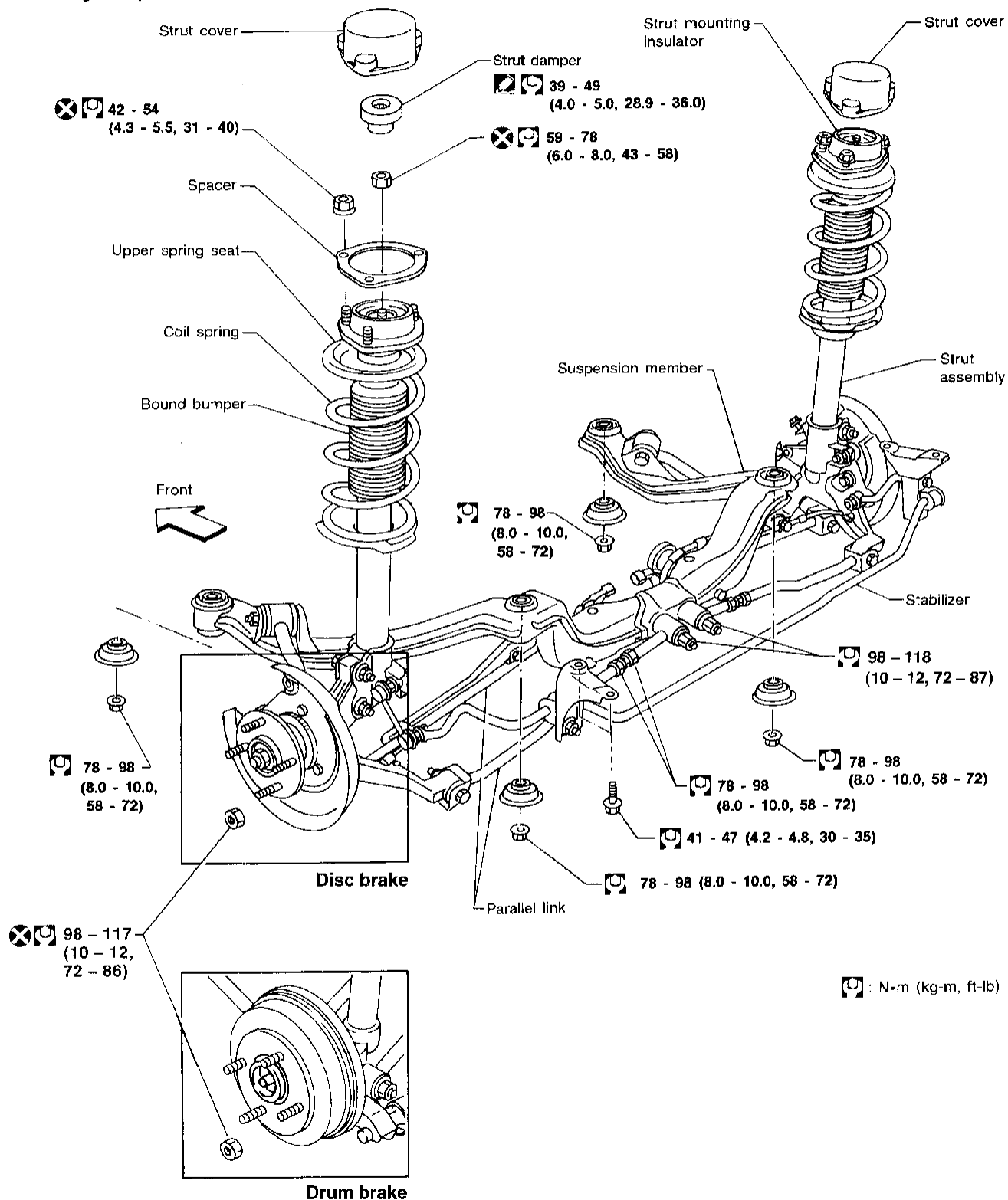
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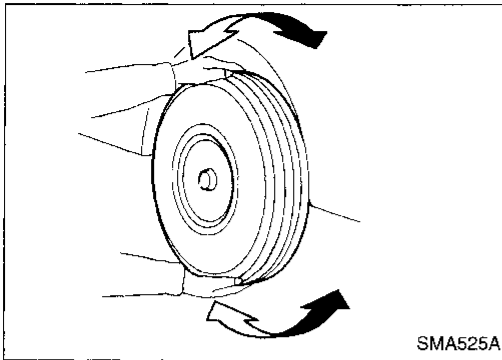
# REAR AXLE AND REAR SUSPENSION

## SEC. 431

When installing rubber parts, final tightening must be carried out under unladen condition\* with tires on ground.

\* Fuel, radiator coolant and engine oil full.  
Spare tire, jack, hand tools and mats in designated positions.



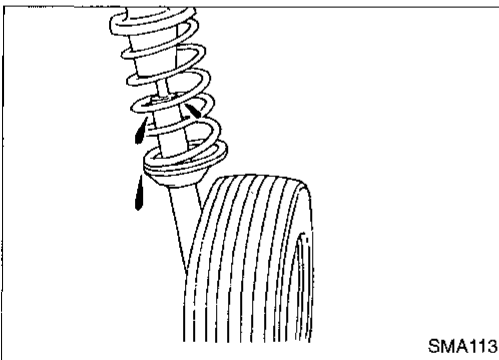
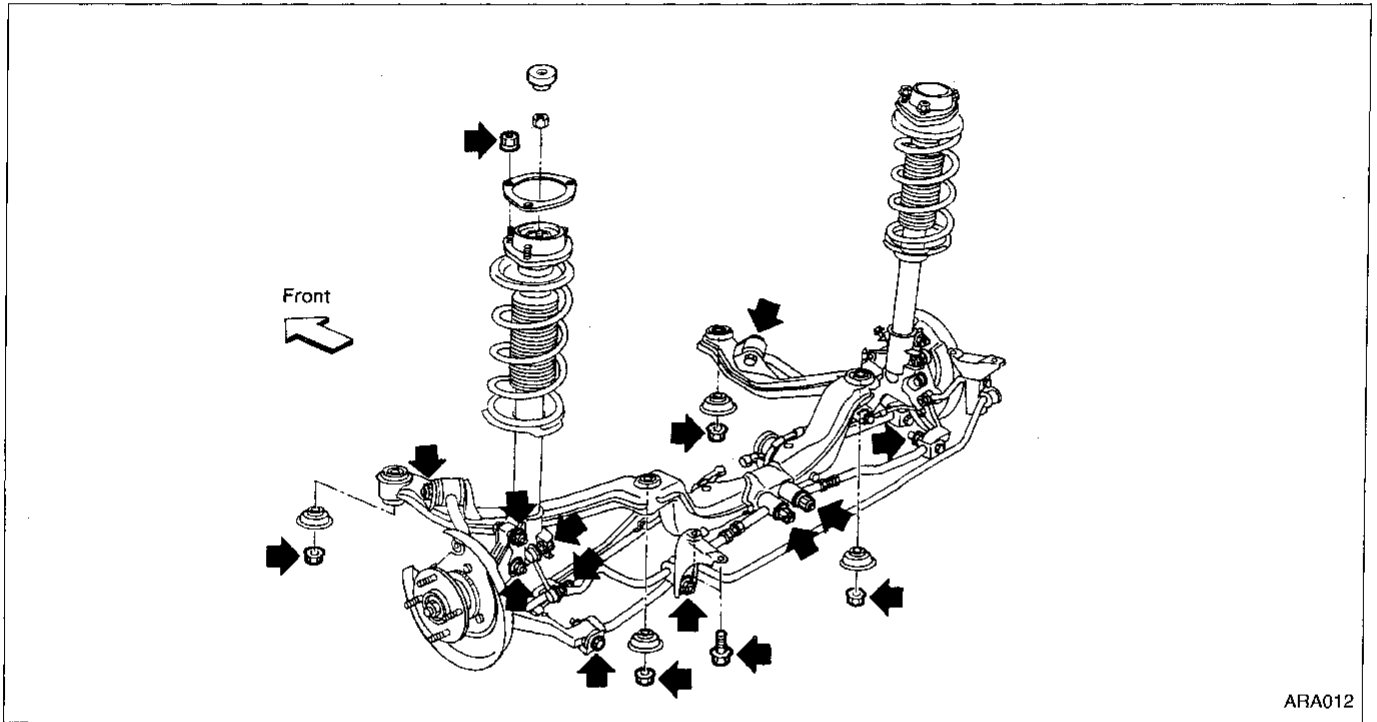


## Rear Axle and Rear Suspension Parts

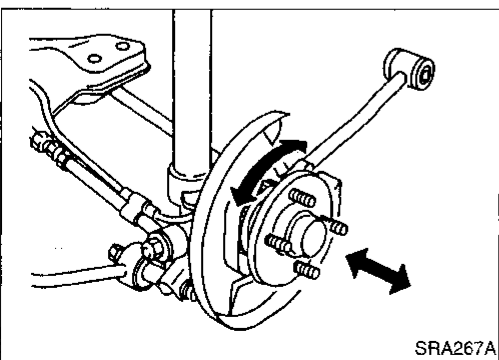
Check axle and suspension parts for excessive play, wear and damage.

- Shake each rear wheel to check excessive play.

- Retighten all nuts and bolts to the specified torque.  
**Tightening torque: Refer to RA-10.**



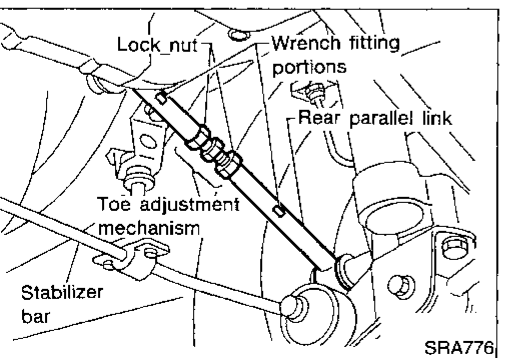
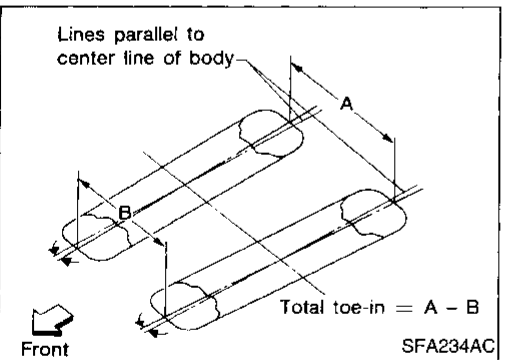
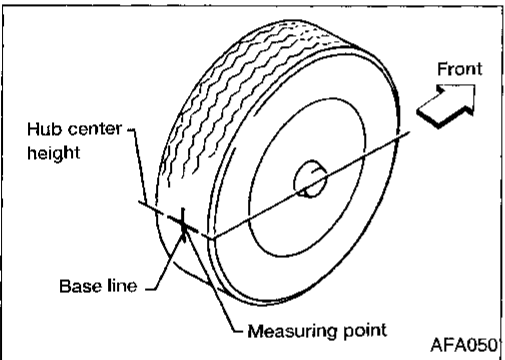
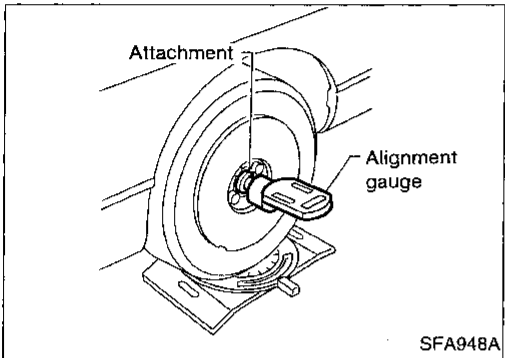
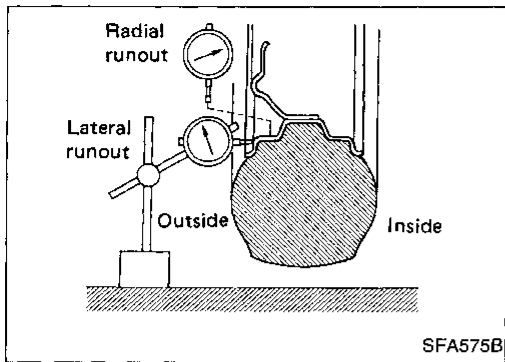
- Check strut (shock absorber) for oil leakage and damage.
- Check wheelarch height. Refer to FA section ("Front Axle and Front Suspension Parts", "ON-VEHICLE SERVICE").



## Rear Wheel Bearing

- Check axial end play.  
**Axial end play:**  
**0.05 mm (0.0020 in) or less**
- Check that wheel bearings operate smoothly.
- Check tightening torque of wheel bearing lock nut.  
**⌚: 186 - 255 N·m**  
**(19 - 26 kg-m, 137 - 188 ft-lb)**
- If axial end play is not within specification or wheel bearing does not turn smoothly, replace wheel bearing assembly. Refer to RA-8.

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## Rear Wheel Alignment

### PRELIMINARY INSPECTION

Make following checks. Adjust, repair or replace if necessary.

- Check tires for wear and for proper inflation.
- Check rear wheel bearings for excessive play.
- Check wheel runout.

**Wheel runout: Refer to FA section ("Inspection and Adjustment", "SDS").**

- Check that rear strut (shock absorber) works properly.
- Check rear axle and rear suspension parts for excessive play.
- Check vehicle posture (unladen\*).

\*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

### CAMBER

**Camber is preset at factory and cannot be adjusted.**

**Camber:**

**Refer to SDS, RA-15.**

- If the camber is not within specification, inspect and replace any damaged or worn rear suspension parts.

### TOE-IN

#### WARNING:

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

1. Bounce rear of vehicle up and down to stabilize the posture.
2. Push the vehicle straight ahead about 5 m (16 ft).
3. Put a mark on base line of the tread (rear side) of both rear tires at the same height of hub center. This mark is a measuring point.
4. Measure distance "A" (rear side).
5. Push the vehicle slowly ahead to rotate the wheels 180 degrees (1/2 turn).

- **If the wheels have rotated more than 180 degrees (1/2 turn), try the above procedure again from the beginning. Never push vehicle backward.**

6. Measure distance "B" (front side).

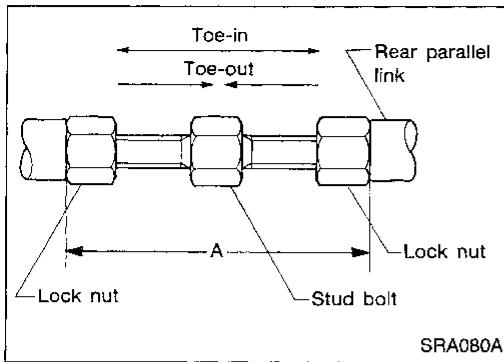
**Total toe-in (A - B):**

**Refer to SDS, RA-15.**

7. Adjust toe-in by varying the lengths of rear parallel links.

## ON-VEHICLE SERVICE


### Rear Wheel Alignment (Cont'd)



- Adjust left and right rear parallel links to the same length "A".
- Tighten lock nut while holding rear parallel link with wrench to prevent bushing from twisting.

**Standard length "A":**

50 - 55 mm (1.97 - 2.17 in)

: 78 - 98 N·m (8.0 - 10.0 kg-m, 58 - 72 ft-lb)

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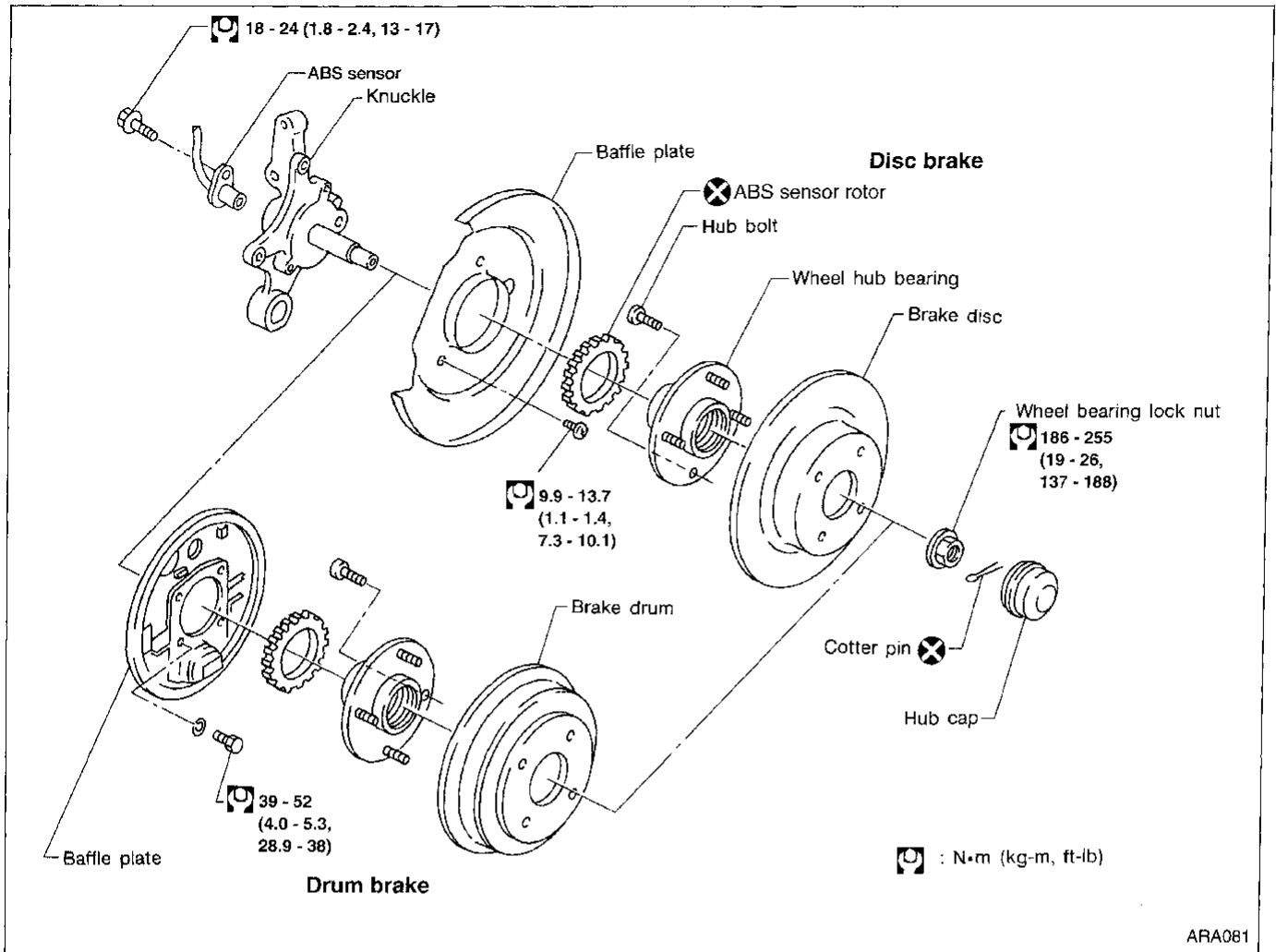
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# REAR AXLE

## Wheel Hub



### REMOVAL

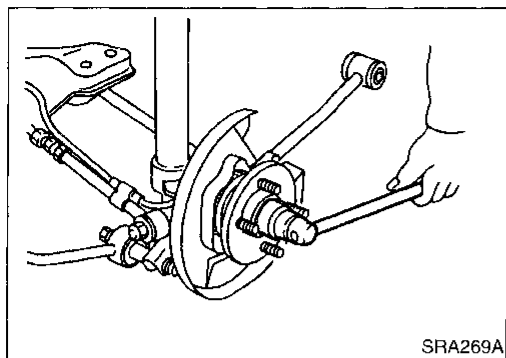
#### CAUTION:

- Before removing the rear wheel hub assembly, disconnect the ABS wheel sensor from the assembly. Move it away from the hub assembly. Failure to do so may result in damaged sensor wires and the sensor becoming inoperative.
- Wheel hub bearing does not require maintenance. If any of the following occurs, replace wheel hub bearing assembly.
  - (1) Growling noise is emitted from wheel hub bearing during operation.
  - (2) Wheel hub bearing drags or turns roughly. This occurs when turning hub by hand after bearing lock nut is tightened to specified torque.
  - (3) Wheel hub bearing is removed from knuckle spindle.



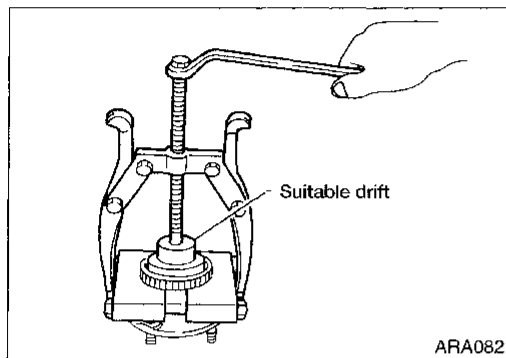
## REAR AXLE

### Wheel Hub (Cont'd)

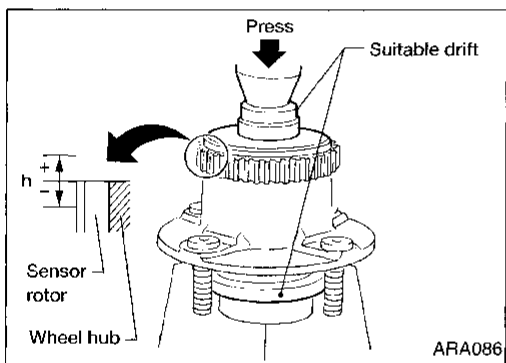


1. Remove brake caliper assembly.
2. Remove wheel bearing lock nut.
3. Remove brake rotor (models with disc brake) or brake drum (models with drum brakes).
4. Remove wheel hub bearing from spindle.

- Brake hose does not need to be disconnected from brake caliper.
- Be careful not to depress brake pedal, or caliper piston will pop out.
- Make sure brake hose is not twisted.



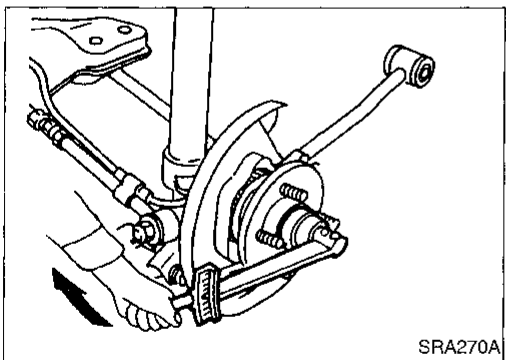
5. Remove the sensor rotor using suitable puller, drift and bearing replacer.



### INSTALLATION

1. Install the sensor rotor. Use suitable drift and press.
- Always replace sensor rotor with new one.
2. Pay attention to the dimension of rear sensor rotor as shown in figure.

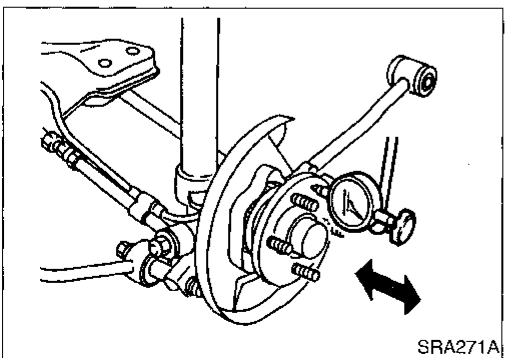
$$h: \pm 0.3 \text{ mm } (\pm 0.012 \text{ in})$$



3. Install wheel hub bearing.
  4. Tighten wheel bearing lock nut.
- Before tightening, apply oil to threaded portion of rear spindle.

$$\text{Torque: } 186 - 255 \text{ N}\cdot\text{m} \\ (19 - 26 \text{ kg}\cdot\text{m}, 137 - 188 \text{ ft}\cdot\text{lb})$$

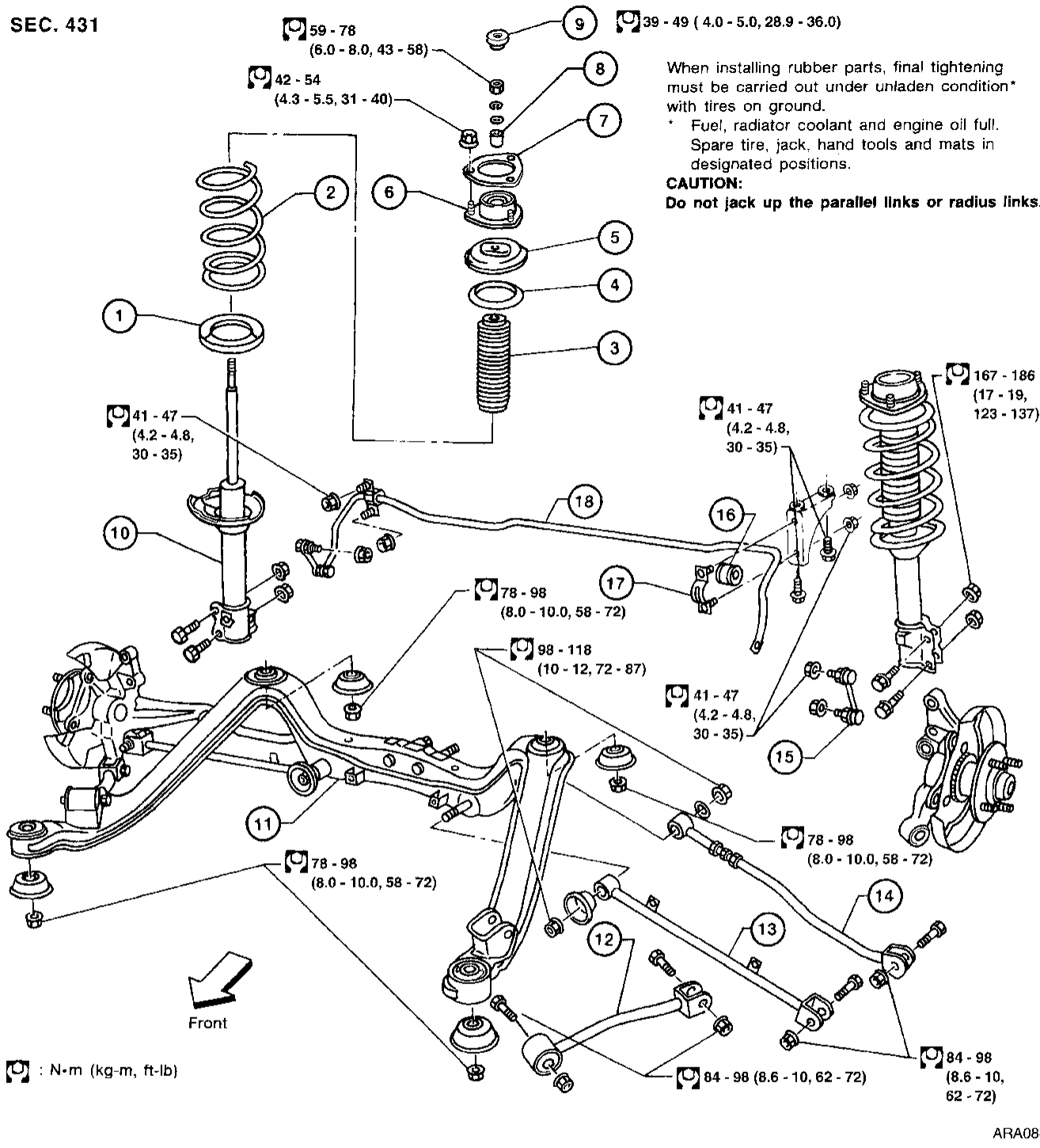
5. Check that wheel bearings operate smoothly.



6. Check wheel bearing axial end play.
- Axial end play:**  
0.05 mm (0.0020 in) or less

# REAR SUSPENSION

SEC. 431

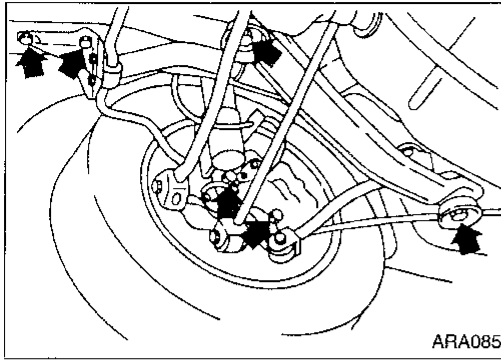


- ① Lower spring rubber seat
- ② Coil spring
- ③ Bound bumper with dust cover
- ④ Upper spring rubber seat
- ⑤ Upper spring seat
- ⑥ Strut mounting insulator

- ⑦ Spacer
- ⑧ Strut mounting collar
- ⑨ Strut damper
- ⑩ Strut assembly
- ⑪ Suspension member
- ⑫ Radius link

- ⑬ Front parallel link
- ⑭ Rear parallel link
- ⑮ Connecting rod
- ⑯ Bushing
- ⑰ Clamp
- ⑱ Stabilizer bar

# REAR SUSPENSION



## Removal and Installation

### CAUTION:

- Do not jack up at the parallel links or radius links.
- Before removing the rear suspension assembly, disconnect the ABS wheel sensor from the assembly. Failure to do so may result in damaged sensor wires and the sensor becoming inoperative.

1. Disconnect brake hydraulic line and parking brake cable at equalizer. (Models with rear drum brake.)
  - Drain brake fluid before disconnecting brake lines.
2. Disconnect parking brake cable from caliper and remove brake caliper and rotor. (Models with rear disc brake.)
  - Suspend caliper assembly with wire so as not to stretch brake hose.
  - Brake hose need not be disconnected from brake caliper.
  - Be careful not to depress brake pedal, or caliper piston will pop out.
  - Make sure brake hose is not twisted.
3. Remove parking brake cable fixing bolts. (Models with rear drum brake.)
4. Remove stabilizer fixing bolts and suspension member fixing bolts.
5. Remove rear seat. Refer to BT section ("Rear Seat", "SEAT").
6. Remove rear parcel shelf. Refer to BT section ("Side and Floor Trim", "INTERIOR TRIM").

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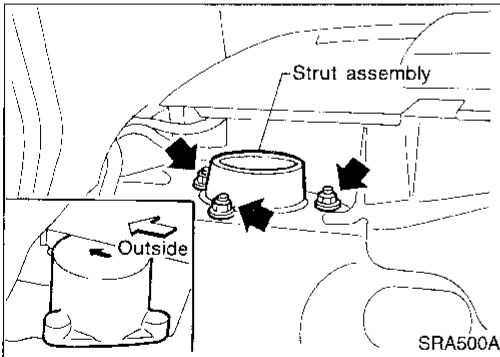
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7. Remove strut securing nuts (upper side). Then pull out strut assembly.

### WARNING:

- Do not remove piston rod lock nut on vehicle.

## Coil Spring and Strut Assembly

### REMOVAL AND INSTALLATION

#### CAUTION:

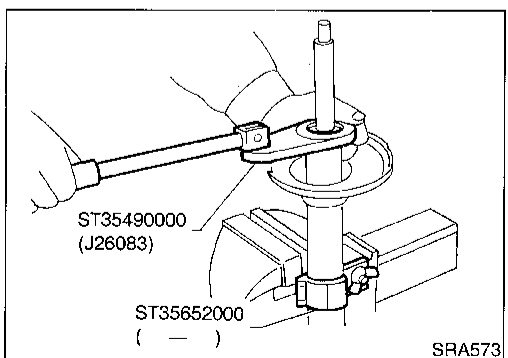
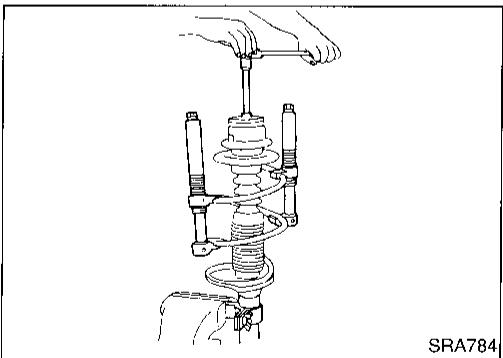
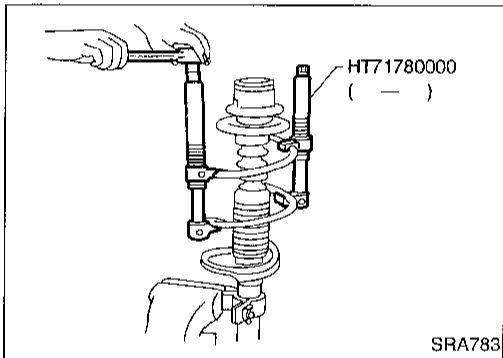
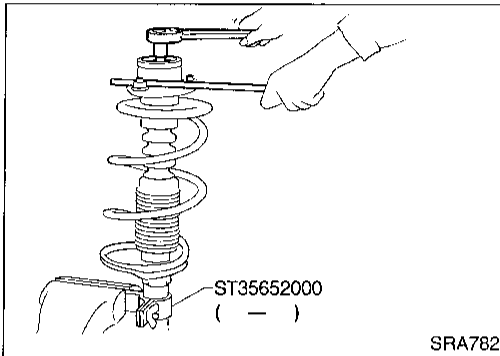
- Before removing the rear strut (shock absorber) assembly, disconnect the ABS wheel sensor from the assembly. Failure to do so may result in damaged sensor wires and the sensor becoming inoperative.
  1. Remove brake hose bracket.
  2. Remove stabilizer bar connecting rod.
  3. Remove strut (shock absorber) fixing bolts (lower side) and nuts (upper side).

#### DISASSEMBLY

1. Set strut assembly in vise with attachment, then remove strut damper with hexagon socket (17 mm (0.67 in)) and **loosen** piston rod lock nut.

#### WARNING:

- Do not remove piston rod lock nut at this time.



2. Compress spring with Tool so that the strut mounting insulator can be turned by hand.
3. Remove piston rod lock nut.
4. Remove gland packing with Tool.
  - **Avoid getting dirt and dust into gland packing portion.**
5. Retract piston rod by pushing it down until it bottoms. Slowly withdraw piston rod from cylinder together with piston guide.

# REAR SUSPENSION

## Coil Spring and Strut Assembly (Cont'd) INSPECTION

### Strut assembly

- Check both compression and extension for smooth operation through a full stroke.
- Check for oil leakage on welded or gland packing portions.
- Check piston rod for cracks, deformation and other damage. Replace if necessary.

### Upper rubber seat and bushing

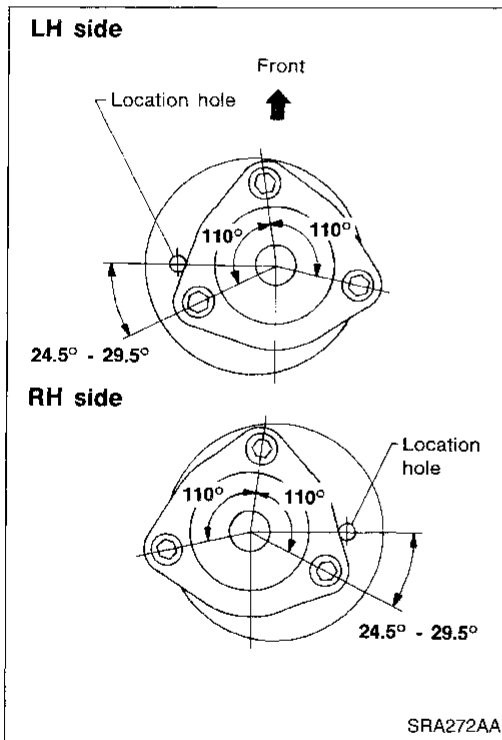
- Check rubber parts for deterioration and cracks. Replace if necessary.

### Strut mounting insulator

- Check cemented rubber-to-metal portion for melting and cracks.
- Check rubber parts for deterioration. Replace if necessary.

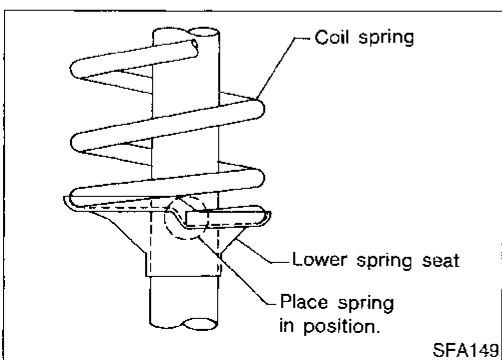
### Coil spring

- Check for cracks, deformation and other damage. Replace if necessary.



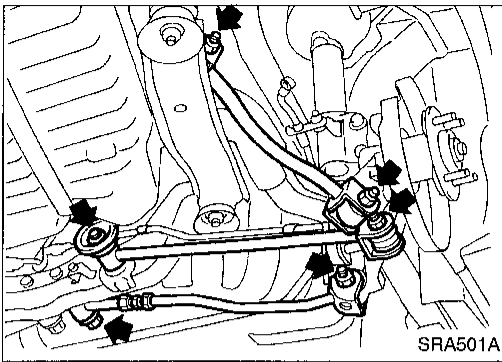
## ASSEMBLY

1. Locate upper spring seat as shown.



2. After placing coil spring in position on lower spring seat, tighten lock nut. Then gradually release spring compressor. Install strut damper.

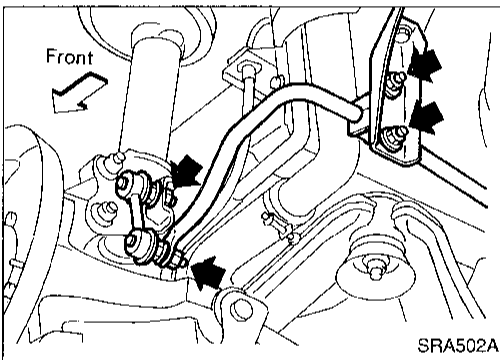
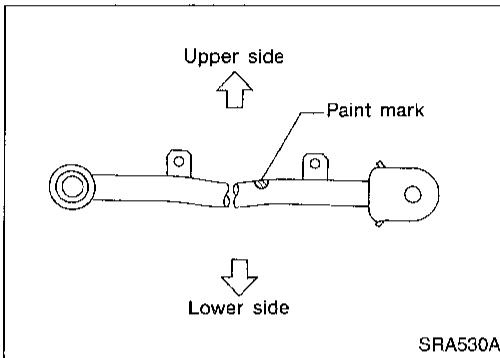
## REAR SUSPENSION



### Parallel Link, Radius Link and Stabilizer Bar REMOVAL AND INSTALLATION

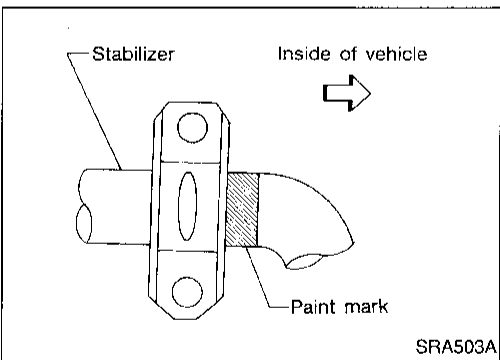
#### Parallel link and radius link

- Remove parallel link and radius link.
- Models without ABS —
- When installing front parallel link, make sure that paint mark faces in the correct direction.
- During installation, final tightening must be carried out at curb weight with tires on the ground.
- After installation, check wheel alignment. Refer to RA-6.
- **Check parallel link for cracks, deformation and other damage. Replace if necessary.**
- **Check radius link for cracks, deformation and other damage. Replace if necessary.**

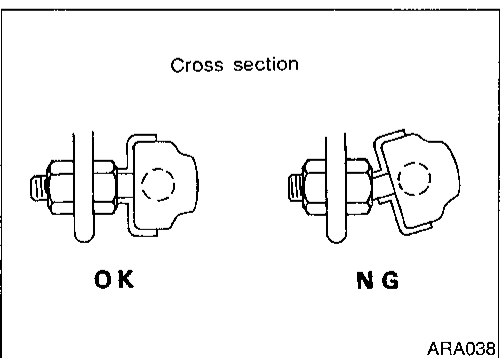


#### Stabilizer bar

- Remove stabilizer bar.



- When installing stabilizer, align paint marks with inside edge of clamps.



- Install stabilizer bar with ball joint socket properly placed.

# SERVICE DATA AND SPECIFICATIONS (SDS)

## General Specifications

### COIL SPRING

Applied model		XE/GLE/GXE	SE
Wire diameter	mm (in)	12.0 (0.472)	12.2 (0.480)
Coil diameter	mm (in)	142.0 (5.59)	142.4 (5.61)
Free length	mm (in)	327.6 (12.90)	317.2 (12.49)
Spring constant	N/mm (kg/mm, lb/in)	19.6 (2.0, 112)	21.6 (2.2, 123)
Identification color		Yellow x 2	Yellow x 1, Pink x 1

### STABILIZER BAR

Applied model		XE/GLE/GXE	SE
Diameter	mm (in)	15 (0.59)	16 (0.63)

### STRUT

Applied model		XE/GLE/GXE	SE
Piston rod diameter	mm (in)	22 (0.87)	
Damping force [at 0.3 m (1.0 ft)/sec.]	N (kg, lb)		
Expansion		628 - 853 (64 - 87, 141 - 192)	799.3 - 1,083.7 (81.5 - 110.5, 179.7 - 243.7)
Compression		294 - 451 (30 - 46, 66 - 101)	407.0 - 612.9 (41.5 - 62.5, 91.5 - 137.8)

## Inspection and Adjustment

### WHEEL ALIGNMENT (Unladen\*)

Camber	Minimum	-2°00' (-2.00°)
	Nominal	-1°15' (-1.25°)
	Maximum	-0°30' (-0.50°)
Total toe-in	Minimum	1 (0.04)
	Nominal	2 (0.08)
	Maximum	3 (0.12)
Angle (left plus right)	Minimum	6' (0.10°)
	Nominal	12' (0.20°)
	Maximum	18' (0.30°)

\*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

### WHEEL BEARING

Applied model	All
Wheel bearing axial end play	0.05 (0.0020) or less
Wheel bearing lock nut tightening torque	186 - 255
	(19 - 26, 137 - 188)

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