

# FRONT & REAR SUSPENSION

# SU

## SECTION

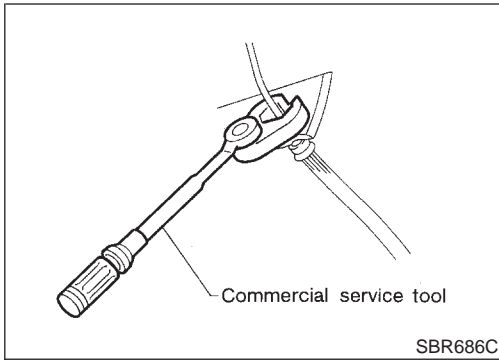
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# FRONT SUSPENSION

## Precautions



## Precautions

### PRECAUTIONS

NCSU0001

- 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.
- Use flare nut wrench when removing or installing brake tubes.
- Always torque brake lines when installing.

## Preparation

## SPECIAL SERVICE TOOLS

NCSU0002

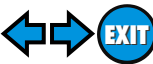
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
HT72520000 (J25730-B) Ball joint remover	<p>Removing tie-rod outer end and lower ball joint</p> <p>NT146</p>

## COMMERCIAL SERVICE TOOLS

NCSU0003

Tool name	Description
Attachment Wheel alignment	<p>Measure wheel alignment  <b>a: Screw M24 x 1.5 pitch</b>  <b>b: 35 mm (1.38 in) dia.</b>  <b>c: 65 mm (2.56 in) dia.</b>  <b>d: 56 mm (2.20 in)</b>  <b>e: 12 mm (0.47 in)</b></p> <p>NT148</p>
1 Flare nut crowfoot 2 Torque wrench	<p>Removing and installing each brake piping  <b>a: 10 mm (0.39 in)</b></p> <p>NT360</p>
Spring compressor	<p>Removing and installing coil spring</p> <p>NT717</p>



# FRONT SUSPENSION

Noise, Vibration and Harshness (NVH) Troubleshooting

## Noise, Vibration and Harshness (NVH) Troubleshooting

=NCSU0004

### NVH TROUBLESHOOTING CHART

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

		Reference page	SU-4, 18	SU-10, 23	—	—	—	SU-9, 22	SU-6	SU-13	SU-6	—	—	—	—	—	AX-3	AX-3	—	—	—	BR-6	ST-5		
		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	Out-of-round	Imbalance	Incorrect air pressure	Uneven tire wear	Deformation or damage	Non-uniformity	Incorrect tire size	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	BRAKES	STEERING	
Symptom	SUSPENSION	Noise	x	x	x	x	x	x									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	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		
	TIRES	Noise	x									x	x	x	x	x		x	x	x			x	x	x
		Shake	x									x	x	x	x		x	x	x	x			x	x	x
		Vibration																x	x	x					x
		Shimmy	x									x	x	x	x	x	x		x	x			x	x	x
		Judder	x									x	x	x	x		x		x	x			x	x	x
		Poor quality ride or handling	x									x	x	x	x		x		x	x			x		
	ROAD WHEEL	Noise	x									x	x			x		x	x	x	x		x	x	
Shake		x									x	x			x		x	x	x	x		x	x		
Shimmy, Judder		x									x	x			x			x	x	x		x	x		
Poor quality ride or handling		x									x	x			x			x	x	x					

x: Applicable

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# FRONT SUSPENSION

Components

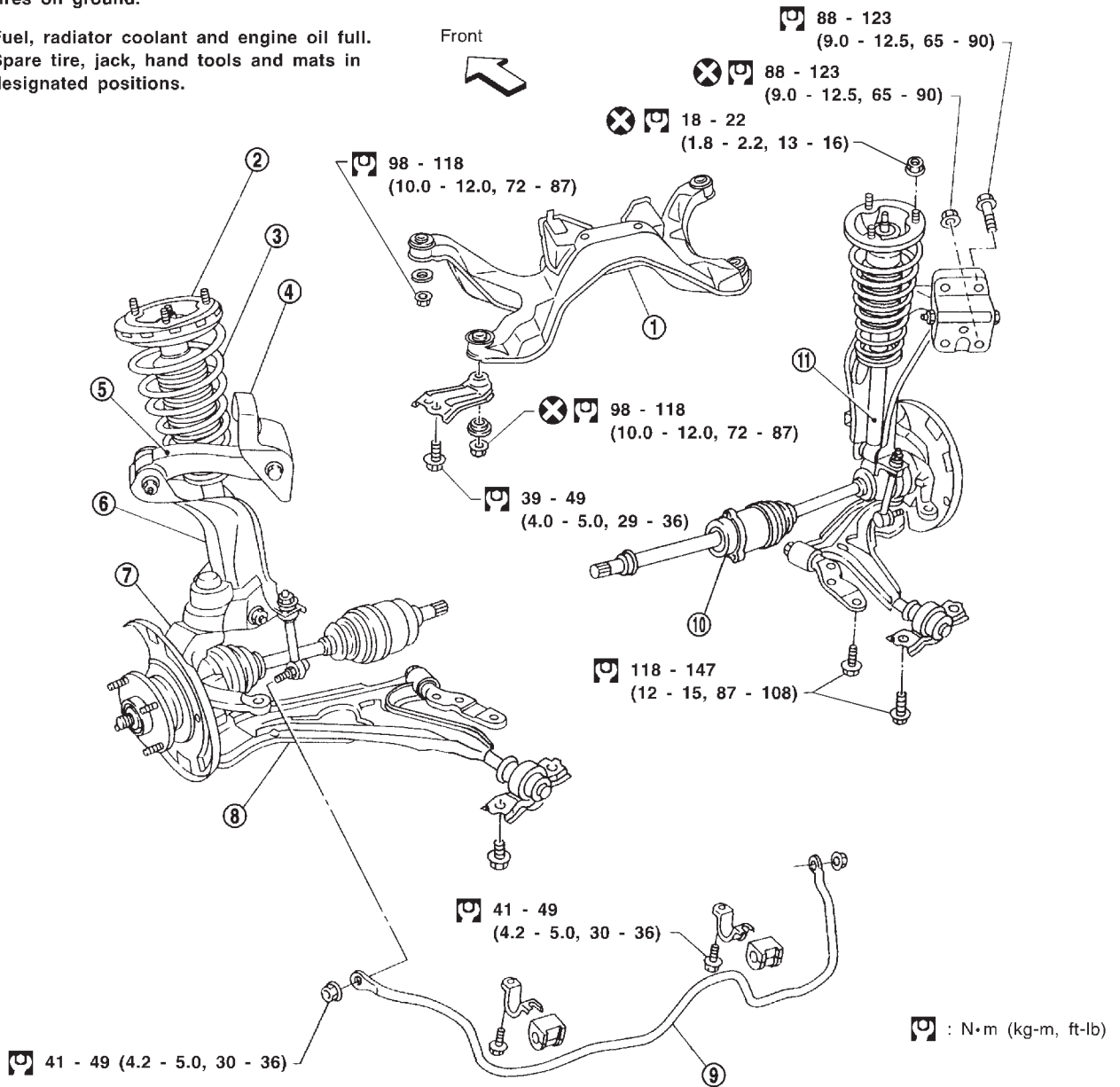
## Components

NCSU0005

### SEC. 391•400•401

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.

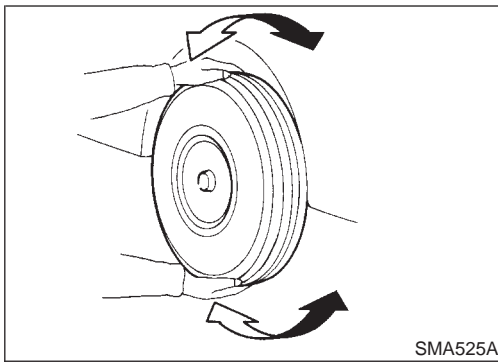


SFA808BA

- 1. Front suspension member
- 2. Shock absorber mounting insulator
- 3. Coil spring
- 4. Upper link bracket

- 5. Upper link
- 6. Third link
- 7. Knuckle
- 8. Transverse link

- 9. Stabilizer bar
- 10. Drive shaft
- 11. Shock absorber



## On-vehicle Service FRONT SUSPENSION PARTS

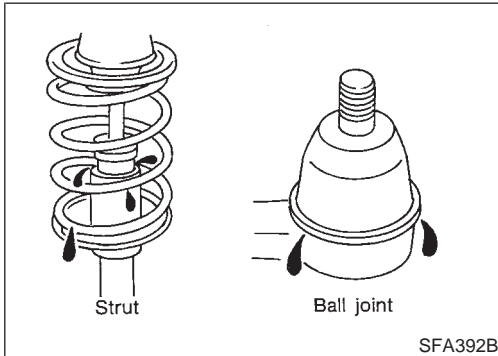
NCSU0006

Check front axle and front suspension parts for excessive play, cracks, wear or other damage.

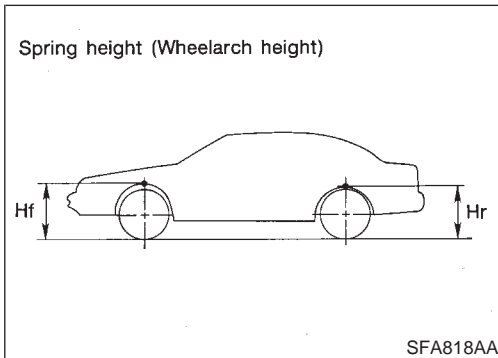
- Shake each front wheel to check for excessive play.
- Make sure that cotter pin is inserted.
- Retighten all axle and suspension nuts and bolts to the specified torque.

### Tightening torque:

Refer to “FRONT SUSPENSION”, SU-4.

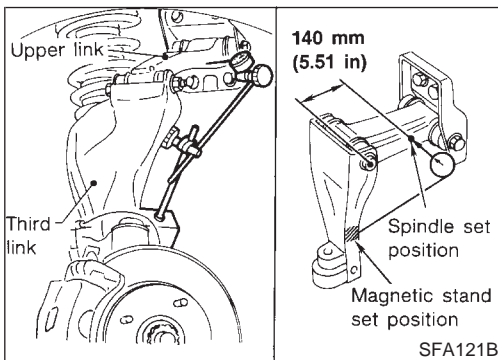


- Check strut (shock absorber) for oil leakage or other damage.
- Check suspension ball joint for grease leakage and ball joint dust cover for cracks or other damage. If ball joint dust cover is cracked or damaged, replace transverse link.



- Check spring height from top of wheelarch to the ground.
  - a) Vehicle must be unladen\*, parked on a level surface, and tires checked for proper inflation and wear (tread wear indicator must not be showing).
 

\*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
  - b) Bounce vehicle up and down several times before measuring. **Standard height: Refer to SDS (SU-16).**
  - c) Spring height is not adjustable. If out of specification, check for worn springs or suspension parts.

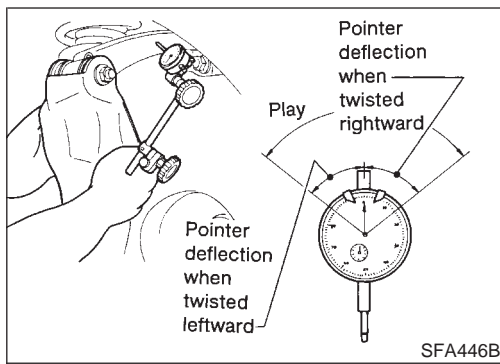


- Check upper link free play.
  - a) Jack up front of vehicle and set stands.
  - b) Set steering wheel in straight-forward direction and lock it using key lock.
  - c) Remove front wheels.
  - d) **On axle side**
    - i) Install magnet stand on third link.
    - ii) Set dial gauge in position. Set dial gauge spindle in contact with flat surface of upper link. Set at 140 mm (5.51 in) from center of upper link retaining bolt on the third link side. (Reset dial gauge.)

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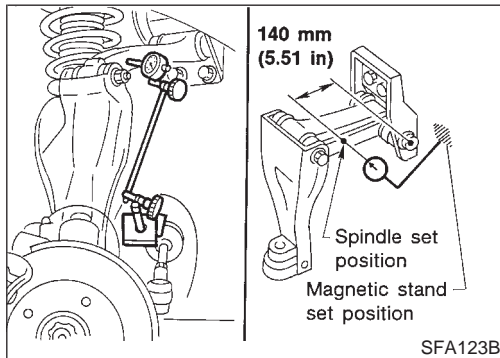
# FRONT SUSPENSION

On-vehicle Service (Cont'd)



- e) Hold flanges of third link with both hands. Twist third link fully to the right and read dial gauge indication. Similarly, twist third link to the left and read dial gauge indication.  
Free play = (Gauge indication when third link is fully twisted to the right) + (Gauge indication when third link is fully twisted to the left)

**Allowable free play range:**  
**7.0 mm (0.276 in), max.**



## On body side

- a) Install dial gauge.  
i) Install magnet stand on front suspension mount member.  
ii) Set dial gauge in position.  
Set dial gauge spindle in contact with flat surface of upper link. Set at 140 mm (5.51 in) from center of retaining bolt on bracket side. (Reset dial gauge.)

- b) Measure free play in the same manner as on axle side.

**Allowable free play range: 5.0 mm (0.197 in), max.**

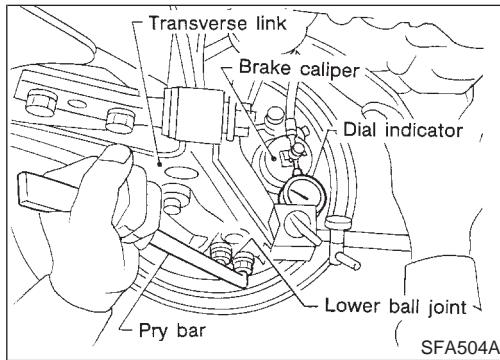
- c) If free play exceeds specifications, replace upper link assembly.

- Check suspension ball joint end play.

- a) Jack up front of vehicle and set the stands.  
b) Clamp dial indicator onto transverse link and place indicator tip on lower edge of brake caliper.  
c) Make sure front wheels are straight and brake pedal is depressed.  
d) Place a pry bar between transverse link and inner rim of road wheel.  
e) While raising and releasing pry bar, observe maximum dial indicator value.

**Vertical end play:**  
**0 mm (0 in)**

If ball joint vertical end play exists, remove transverse link and recheck the ball joint. Refer to SU-14.



## FRONT WHEEL ALIGNMENT

Before checking front wheel alignment, be sure to make a preliminary inspection (Unladen\*). NCSU0007

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

### Preliminary Inspection

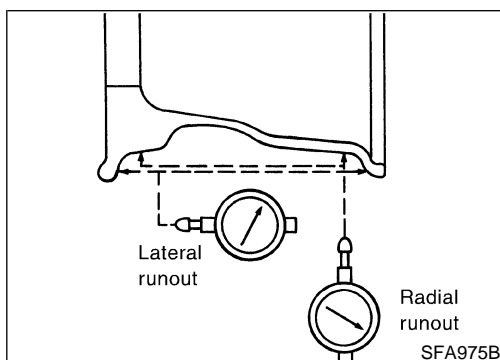
#### Aluminum wheel

NCSU0007S01

NCSU0007S0101

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.
  - a. Remove tire from aluminum wheel and mount on a tire balance machine.
  - b. Set dial indicator as shown in the illustration.

**Wheel runout (Dial indicator value):**  
**Refer to SDS, SU-16.**



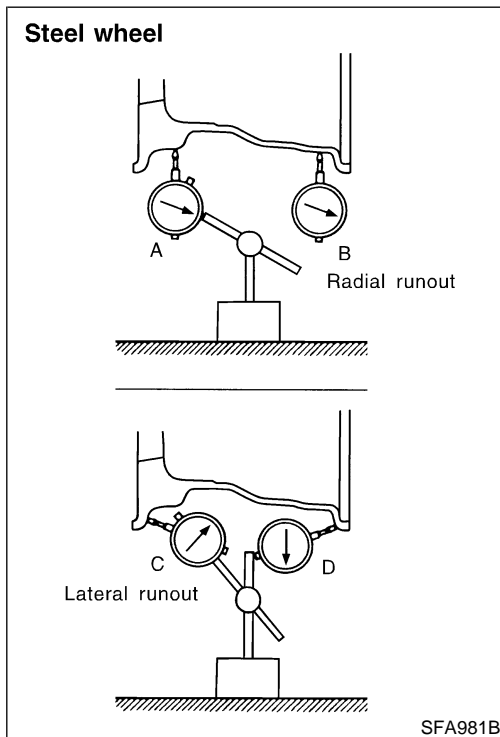
3. Check front wheel bearings for looseness.
4. Check front suspension for looseness.
5. Check steering linkage for looseness.
6. Check that front shock absorbers work properly.
7. Check vehicle posture (Unladen).

GI

MA

EM

LC



## Steel wheel

NCSU0007S0102

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.
  - a. Remove tire from steel wheel and mount wheel on a tire balance machine.
  - b. Set two dial indicators as shown in the illustration.
  - c. Set each dial indicator to 0.
  - d. Rotate wheel and check dial indicators at several points around the circumference of the wheel.
  - e. Calculate runout at each point as shown below.  
 Radial runout =  $(A + B)/2$   
 Lateral runout =  $(C + D)/2$
  - f. Select maximum positive runout value and the maximum negative value. Add the two values to determine total runout. In case a positive or negative value is not available, use the maximum value (negative or positive) for total runout. If the total runout value exceeds the limit, replace steel wheel.

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### Wheel runout:

Refer to SDS, SU-16.

3. Check front wheel bearings for looseness.
4. Check front suspension for looseness.
5. Check steering linkage for looseness.
6. Check that front shock absorbers work properly.
7. Check vehicle posture (Unladen).

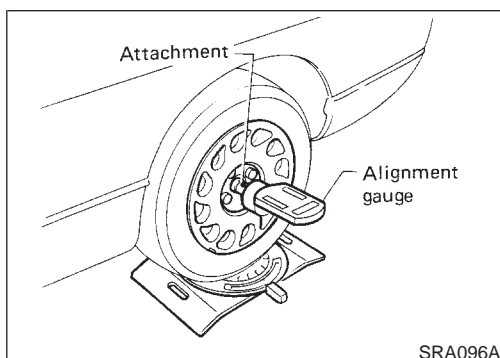
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## Camber, Caster and Kingpin Inclination

NCSU0007S02

**Camber, caster and kingpin inclination are preset at factory and cannot be adjusted.**

1. Measure camber, caster and kingpin inclination of both right and left wheels with a suitable alignment gauge.

### Camber, caster and kingpin inclination:

Refer to SDS, SU-15.

2. If camber, caster or kingpin inclination is not within specification, inspect front suspension parts. Replace damaged or worn out parts.

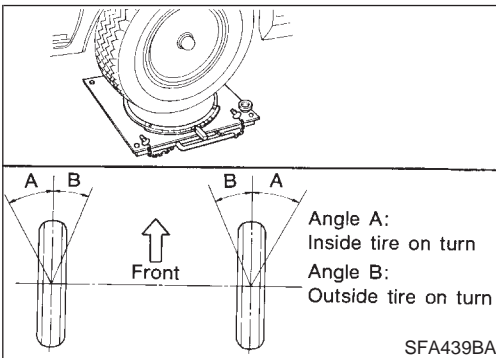
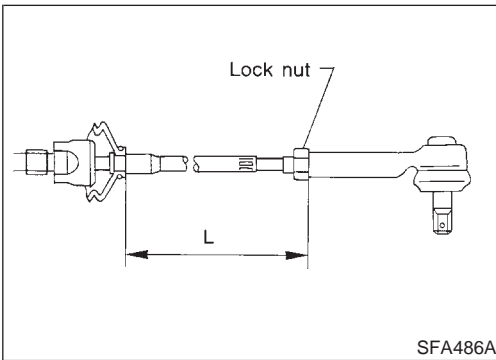
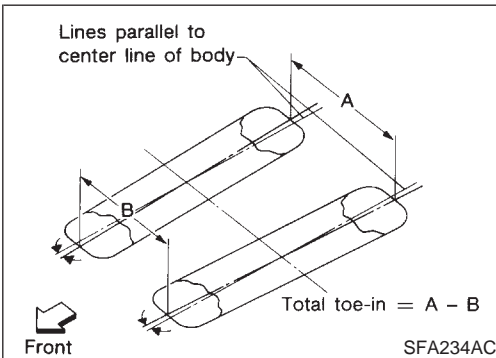
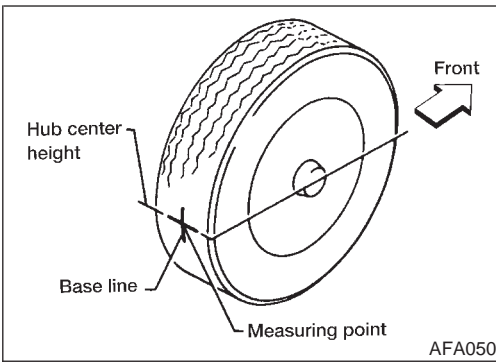
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# FRONT SUSPENSION

On-vehicle Service (Cont'd)



## Toe-in

Measure toe-in using the following procedure.

NCSU0007S03

### WARNING:

- Always perform the following procedure on a flat surface.
  - Make sure that no person is in front of the vehicle before pushing it.
1. Bounce front 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 tread (rear side) of both tires at the same height as hub center. These are measuring points.
  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:**

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

7. Adjust toe-in by varying the length of steering tie-rods.

- a. Loosen lock nuts.
- b. Adjust toe-in by screwing tie-rods in and out.

**Standard length "L":**

**Refer to ST-31, "SDS".**

- c. Tighten lock nuts to specified torque.

**Lock nut tightening torque:**

**Refer to ST-15, "POWER STEERING GEAR AND LINK-AGE".**

## Front Wheel Turning Angle

NCSU0007S04

1. Set wheels in straight-ahead position. Then move vehicle forward until front wheels rest on turning radius gauge properly.
2. Rotate steering wheel all the way right and left; measure turning angle.

**Wheel turning angle (Full turn):**

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



# FRONT SUSPENSION

Coil Spring and Shock Absorber

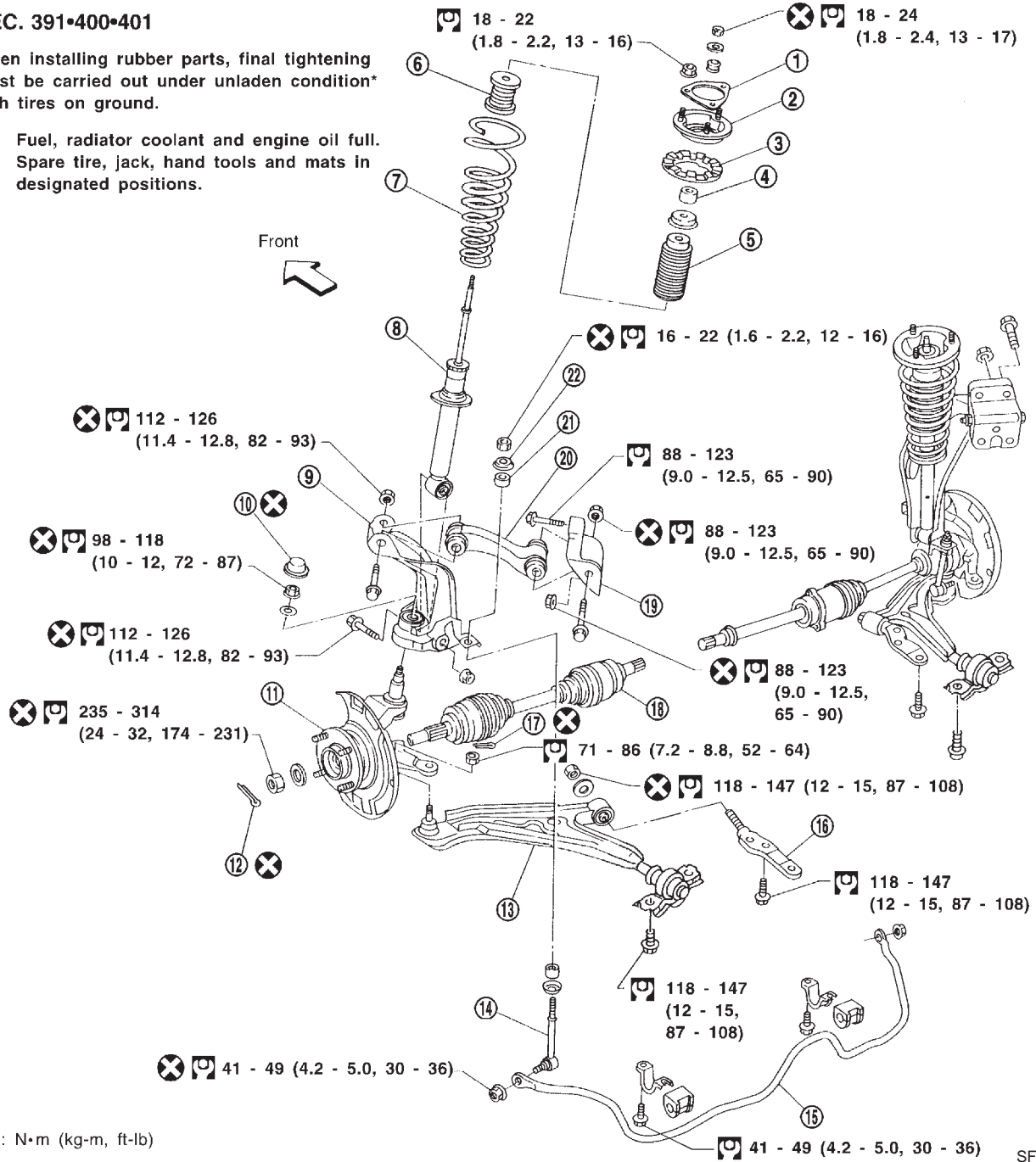
## Coil Spring and Shock Absorber COMPONENTS

=NCSU0008

### SEC. 391•400•401

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.



- |                                      |   |                        |
|--------------------------------------|---|------------------------|
| 1. Gasket                            | 9. Third link                               | 16. Gusset pin         |
| 2. Shock absorber mounting insulator | 10. Cap                                     | 17. Cotter pin         |
| 3. Upper rubber seat                 | 11. Wheel hub and steering knuckle assembly | 18. Drive shaft        |
| 4. Shock absorber bushing            | 12. Cotter pin                              | 19. Upper link bracket |
| 5. Dust cover                        | 13. Transverse link                         | 20. Upper link         |
| 6. Bound bumper rubber               | 14. Connecting rod                          | 21. Bushing            |
| 7. Coil spring                       | 15. Stabilizer bar                          | 22. Washer             |
| 8. Shock absorber                    |   |                        |

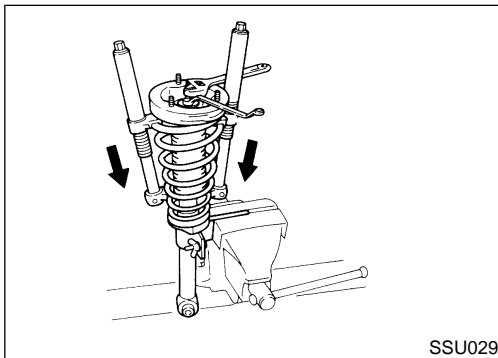
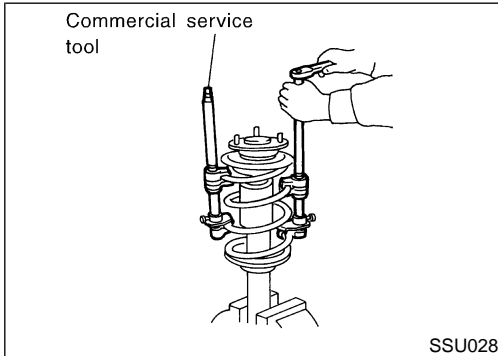
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# FRONT SUSPENSION

Coil Spring and Shock Absorber (Cont'd)

## REMOVAL

- Remove shock absorber fixing bolt and nut (to hoodledge). =NCSU0009
- Do not remove piston rod lock nut on vehicle.



## DISASSEMBLY

1. Set shock absorber on vise. NCSU0010
2. Compress spring with Tool so that shock absorber mounting insulator can be turned by hand.

### WARNING:

Make sure that the pawls of the two spring compressors are firmly hooked on the spring. The spring compressors must be tightened alternately so as not to tilt the spring.

3. While holding the piston rod as shown in the left figure, remove the piston rod lock nut.
  - Be sure to loosen the piston rod lock nut after compressing the spring. If it is loosened before the spring is compressed, the piston valve nut inside the shock absorber may be loosened.

## INSPECTION

### Shock Absorber Assembly

- Check for smooth operation through a full stroke, both compression and extension. NCSU0011
- Check for oil leakage on welded or gland packing portions. NCSU0011S01
- Check piston rod for cracks, deformation or other damage. Replace if necessary.

### Mounting Insulator and Rubber Parts

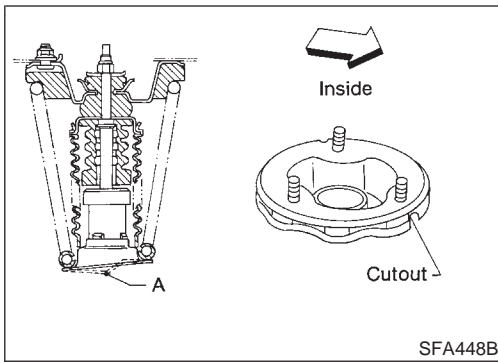
- Check cemented rubber-to-metal portion for separation or cracks. Check rubber parts for deterioration. Replace if necessary. NCSU0011S02

### Coil Spring

- Check for cracks, deformation or other damage. Replace if necessary. NCSU0011S03

# FRONT SUSPENSION

Coil Spring and Shock Absorber (Cont'd)



## ASSEMBLY

NCSU0012

- Install shock absorber so that arrow A faces rearward on LH and forward on RH sides.
- Install upper mounting insulator with its cutout facing the inside of the vehicle.

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## Third Link and Upper Link

### REMOVAL

NCSU0013

#### CAUTION:

Kingpin bearing usually does not require maintenance. If any of the following symptoms are noted, replace kingpin bearing assembly.

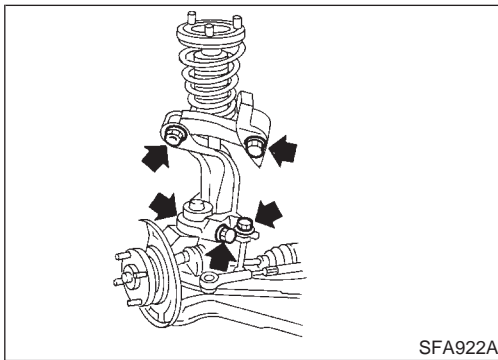
- Growling noise is emitted from kingpin bearing during operation.
- Kingpin bearing drags or turns roughly when steering knuckle is turned by hand.

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1. Remove cap and kingpin nut.
2. Remove shock absorber fixing nut and upper link fixing bolts.
3. Remove stabilizer connecting rod.
4. Remove third link and upper link.

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## INSTALLATION

NCSU0014

### Third Link

NCSU0014S01

- Pack kingpin housing and cap with multi-purpose grease before installing third link and cap.

#### Grease capacity:

**Kingpin housing 4 g (0.14 oz)**

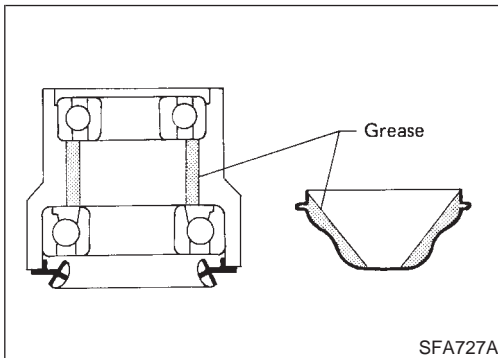
**Cap 10 g (0.35 oz)**

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### Upper Link

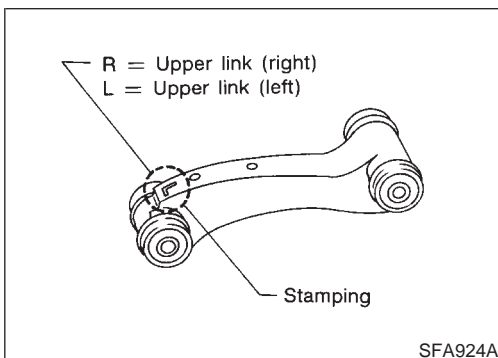
NCSU0014S02

- Upper link has "L" or "R" stamped on it as shown. **Upper link bushings cannot be disassembled.**
- When installing upper link, make sure that parts are in their correct positions.

SC

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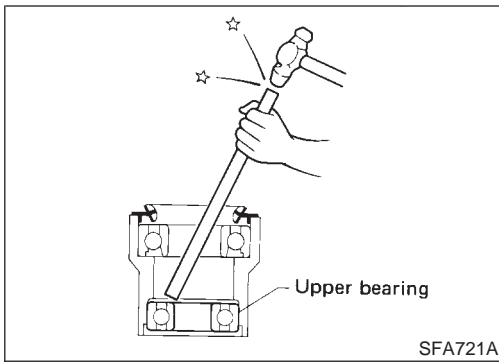
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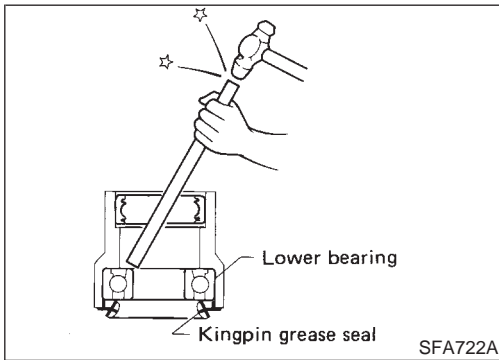
## Third Link and Upper Link (Cont'd)

NCSU0015

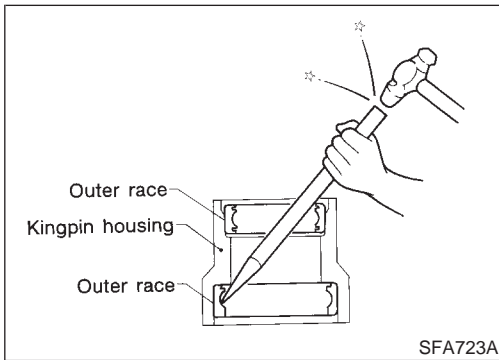


### DISASSEMBLY

1. Remove upper bearing (inner race and ball).
2. Remove kingpin grease seal.
3. Remove lower bearing (inner race and ball).



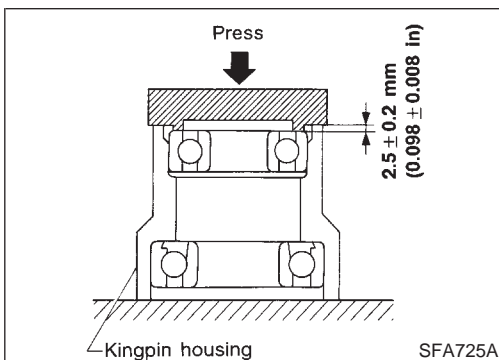
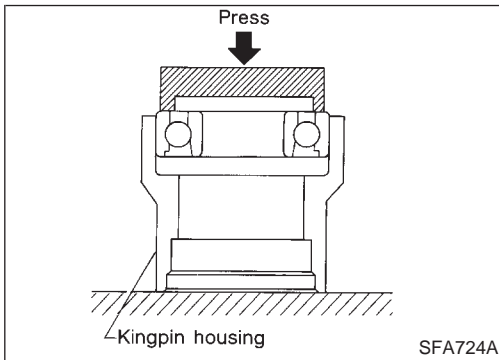
4. Remove upper and lower outer race.
  - **Be careful not to damage kingpin housing.**



### ASSEMBLY

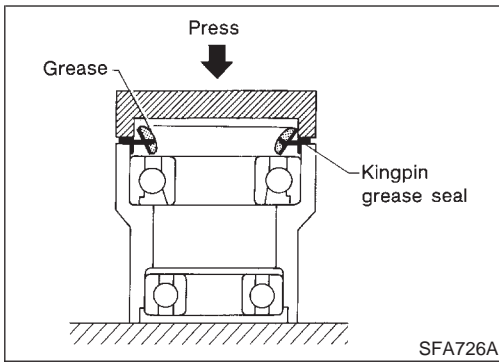
NCSU0016

1. Install lower bearing.
2. Install upper bearing.



# FRONT SUSPENSION

Third Link and Upper Link (Cont'd)



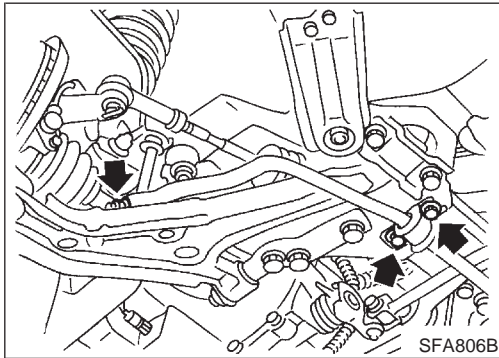
3. Install kingpin grease seal.
4. Apply multi-purpose grease to oil seal lip.

GI

MA

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LC



## Stabilizer Bar REMOVAL AND INSTALLATION

NCSU0017

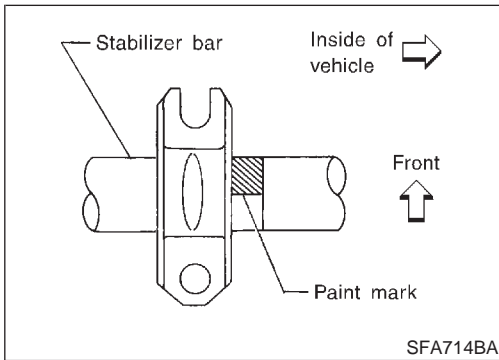
EC

- Remove stabilizer bar.

FE

CL

MT



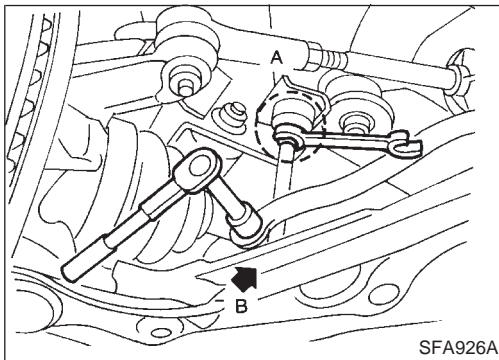
- When installing stabilizer bar, make sure that paint mark and clamp face in their correct directions.

AT

AX

**SU**

BR



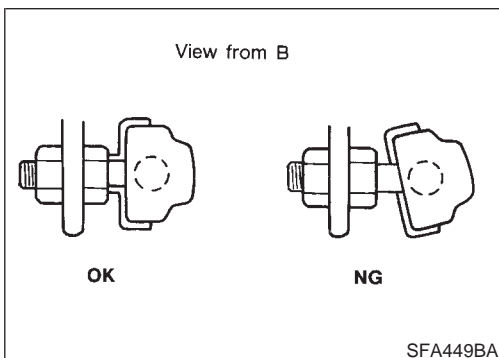
- When removing and installing stabilizer bar, fix portion A.

ST

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HA



- Install stabilizer bar with ball joint socket properly placed.

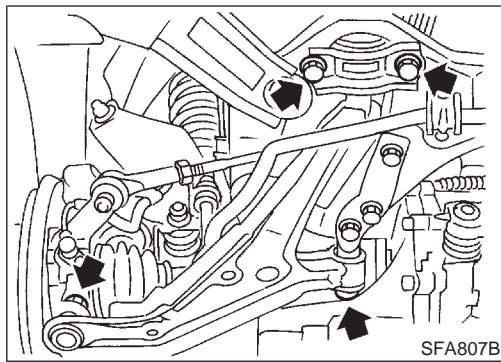
SC

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IDX

# FRONT SUSPENSION

## Transverse Link and Lower Ball Joint



### Transverse Link and Lower Ball Joint REMOVAL AND INSTALLATION

NCSU0018

- Remove ball joint and transverse link assembly.
- During installation, final tightening must be carried out at curb weight with tires on ground.
- After installation, check wheel alignment. Refer to "FRONT WHEEL ALIGNMENT", "On-vehicle Service", SU-6.

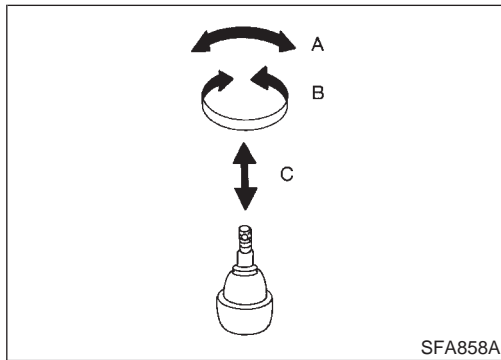
### INSPECTION

NCSU0019

#### Transverse Link

NCSU0019S01

- Check transverse link for damage, cracks or deformation. Replace it if necessary.
- Check rubber bushing for damage, cracks and deformation. Replace transverse link if necessary.



#### Lower Ball Joint

NCSU0019S02

- Check ball joint for excessive play. Replace transverse link assembly if any of the following exists:
- Ball stud is worn.
- Joint is hard to swing.
- Play in axial direction is excessive. Before checking, turn ball joint at least 10 revolutions so that ball joint is properly broken in.

#### Swinging force "A":

(measuring point: cotter pin hole of ball stud)

7.8 - 54.9 N (0.8 - 5.6 kg, 1.8 - 12.3 lb)

#### Turning torque "B":

0.49 - 3.43 N·m (5.0 - 35.0 kg-cm, 4.3 - 30.4 in-lb)

#### Vertical end play "C":

0 mm (0 in)

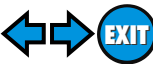
- Check dust cover for damage. Replace it and cover clamp if necessary.

## Service Data and Specifications (SDS)

### GENERAL SPECIFICATIONS (FRONT)

NCSU0020

Suspension type	Independent multi-link with coil spring
Shock absorber type	Double-acting hydraulic
Stabilizer bar	Standard equipment



# FRONT SUSPENSION

Service Data and Specifications (SDS) (Cont'd)

## FRONT WHEEL ALIGNMENT (UNLADEN\*1)

NCSU0021

Camber Degree minute (Decimal degree)	Minimum	-0°45' (-0.75°)	GI	
	Nominal	0°00' (0.00°)		
	Maximum	0°45' (0.75°)	MA	
	Left and right difference	45' (0.75°) or less		
Caster Degree minute (Decimal degree)	Minimum	1°10' (1.17°)	EM	
	Nominal	1°55' (1.92°)		
	Maximum	2°40' (2.67°)	LC	
	Left and right difference	45' (0.75°) or less		
Kingpin inclination Degree minute (Decimal degree)	Minimum	13°45' (13.75°)	EC	
	Nominal	14°30' (14.50°)		
	Maximum	15°15' (15.25°)	FE	
Total toe-in	Distance (A - B) mm (in)	Minimum	0 (0)	
		Nominal	1 (0.04)	CL
		Maximum	2 (0.08)	
	Angle (left plus right) Degree minute (Decimal degree)	Minimum	0' (0.00°)	MT
		Nominal	6' (0.10°)	
		Maximum	12' (0.20°)	AT
Wheel turning angle Full turn*2	Inside Degree minute (Decimal degree)	Minimum	31°00' (31.00°)	
		Nominal	34°00' (34.00°)	AX
		Maximum	35°00' (35.00°)	
	Outside Degree minute (Decimal degree)	Nominal	29°00' (29.00°)	SU

\*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

\*2: On power steering models, wheel turning force (at circumference of steering wheel) of 98 to 147 N (10 to 15 kg, 22 to 33 lb) with engine idle.

## LOWER BALL JOINT

NCSU0022

Swinging force "A" (Measuring point: cotter pin hole of ball stud) N (kg, lb)	7.8 - 54.9 (0.8 - 5.6, 1.8 - 12.3)	RS
Turning torque "B" N-m (kg-cm, in-lb)	0.49 - 3.43 (5.0 - 35.0, 4.3 - 30.4)	
Vertical end play "C" mm (in)	0 (0)	BT

HA

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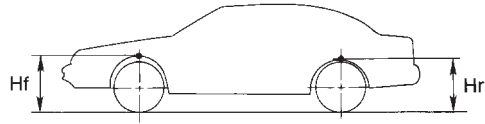


# FRONT SUSPENSION

Service Data and Specifications (SDS) (Cont'd)

## WHEELARCH HEIGHT (UNLADEN\*)

=NCSU0041



SFA818A

Applied model	195/60 R15 tire	195/65 R15 tire
Front (Hf) mm (in)	666 (26.22)	671 (26.42)
Rear (Hr) mm (in)	653 (25.71)	658 (25.91)

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

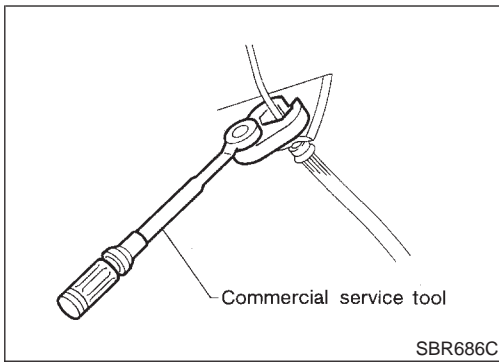
## WHEEL RUNOUT

NCSU0023

Wheel type	Aluminum
Radial runout limit mm (in)	0.3 (0.012)
Lateral runout limit mm (in)	0.3 (0.012)

# REAR SUSPENSION

Precautions



## Precautions

### PRECAUTIONS

- When installing each rubber part, 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.
- Use flare nut wrench when removing or installing brake tubes.
- After installing removed suspension parts, check wheel alignment.
- Do not jack up at the trailing arm and lateral link.
- Always torque brake lines when installing.

NCSU0024

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## Preparation

### COMMERCIAL SERVICE TOOLS

NCSU0026

Tool name	Description
Equivalent to GG94310000 1 Flare nut crowfoot 2 Torque wrench	<p>Removing and installing brake piping a: 10 mm (0.39 in)</p> <p>NT360</p>
Spring compressor	<p>Removing and installing coil spring</p> <p>NT717</p>

AT

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## Noise, Vibration and Harshness (NVH) Troubleshooting

Refer to "Noise, Vibration and Harshness (NVH) Troubleshooting", "FRONT SUSPENSION", SU-3.

NCSU0027

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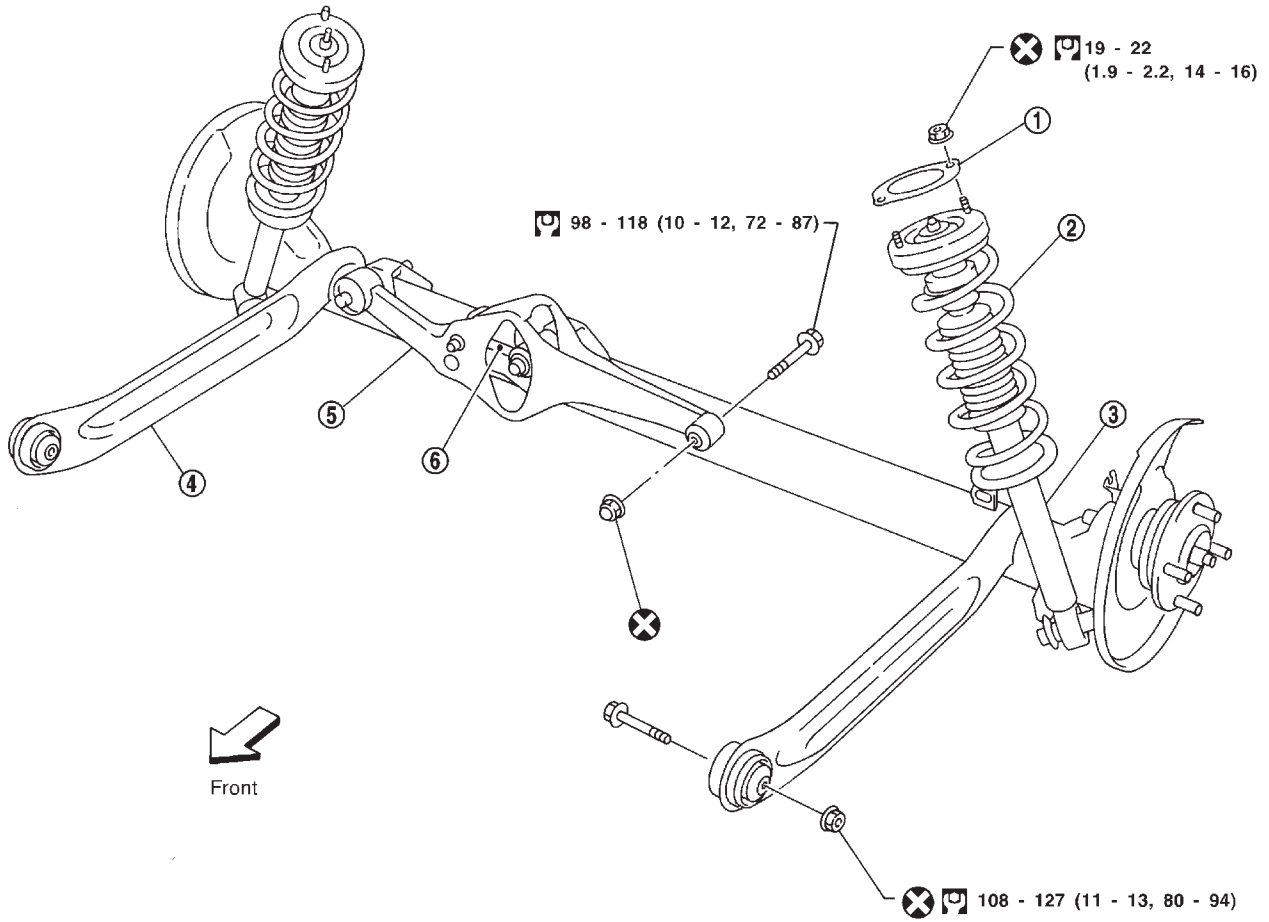
# REAR SUSPENSION

Components

## Components

NCSU0028

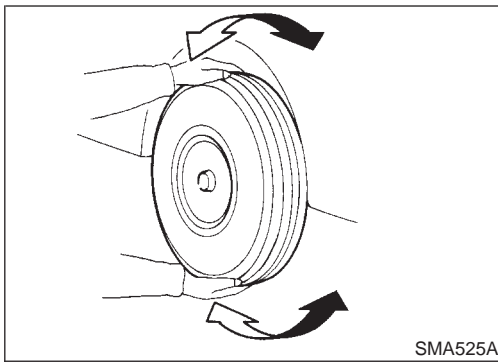
SEC. 431



: N·m (kg-m, ft-lb)

SRA788AB

- |                |                   |                 |
|----------------|-------------------|-----------------|
| 1. Gasket      | 3. Shock absorber | 5. Lateral link |
| 2. Coil spring | 4. Torsion beam   | 6. Control rod  |

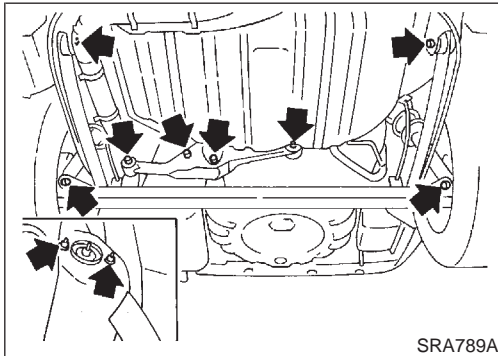


## On-vehicle Service

### REAR SUSPENSION PARTS

Check axle and suspension parts for excessive play, wear or damage. NCSU0029

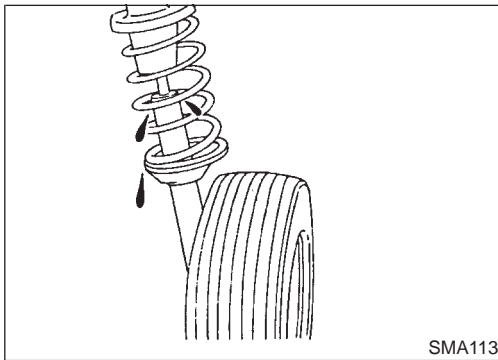
- Shake each rear wheel to check for excessive play.



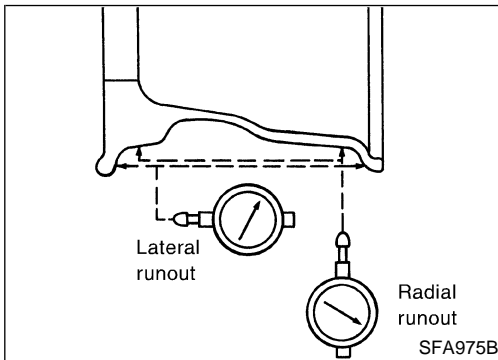
- Retighten all nuts and bolts to the specified torque.

**Tightening torque:**

Refer to "REAR SUSPENSION", SU-18.



- Check shock absorber for oil leakage or other damage.
- Check wheelarch height. Refer to SU-5 ("FRONT SUSPENSION PARTS", "On-vehicle Service").



## REAR WHEEL ALIGNMENT

### Preliminary Inspection

#### Aluminum wheel

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.
  - a. Remove tire from aluminum wheel and mount on a tire balance machine.
  - b. Set dial indicator as shown in the illustration.

**Wheel runout (Dial indicator value):**

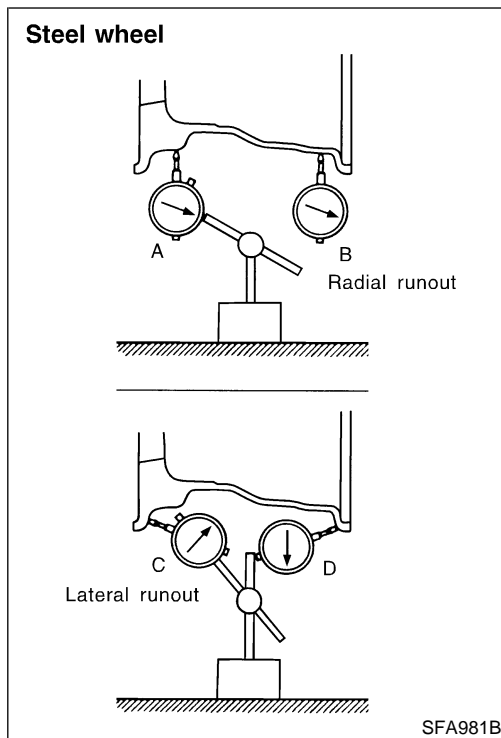
Refer to SDS, SU-16.

3. Check front wheel bearings for looseness.
4. Check front suspension for looseness.
5. Check steering linkage for looseness.
6. Check that front shock absorbers work properly.
7. Check vehicle posture (Unladen).

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# REAR SUSPENSION

On-vehicle Service (Cont'd)



## Steel wheel

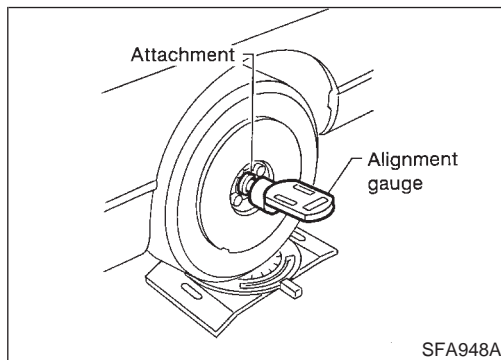
NCSU0030S0102

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.
  - a. Remove tire from steel wheel and mount wheel on a tire balance machine.
  - b. Set two dial indicators as shown in the illustration.
  - c. Set each dial indicator to 0.
  - d. Rotate wheel and check dial indicators at several points around the circumference of the wheel.
  - e. Calculate runout at each point as shown below.  
 Radial runout =  $(A + B)/2$   
 Lateral runout =  $(C + D)/2$
  - f. Select maximum positive runout value and the maximum negative value. Add the two values to determine total runout. In case a positive or negative value is not available, use the maximum value (negative or positive) for total runout. If the total runout value exceeds the limit, replace steel wheel.

### Wheel runout:

Refer to SDS, SU-16.

3. Check front wheel bearings for looseness.
4. Check front suspension for looseness.
5. Check steering linkage for looseness.
6. Check that front shock absorbers work properly.
7. Check vehicle posture (Unladen).



## Camber

NCSU0030S02

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

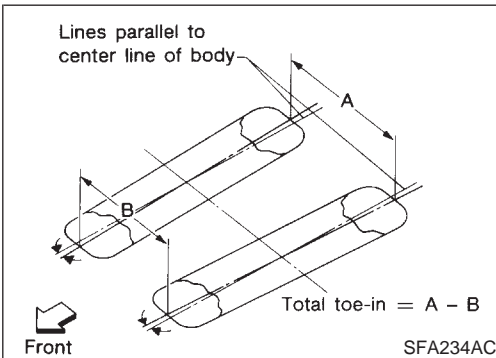
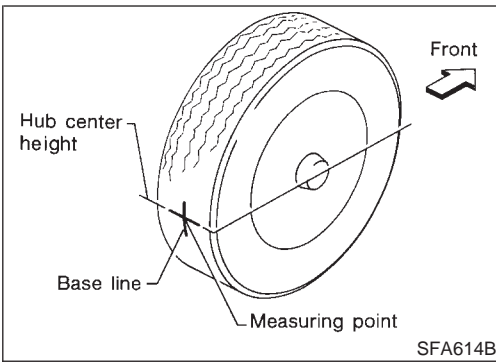
### Camber:

Refer to SDS, SU-26.

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

# REAR SUSPENSION

On-vehicle Service (Cont'd)



## Toe-in

NCSU0030S03

Toe-in is preset at factory and cannot be adjusted. Measure toe-in using following procedure. If out of specification, inspect and replace any damaged or worn rear suspension parts.

### WARNING:

- Perform following procedure always on a flat surface.
- Make sure that no person 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 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:**

**Refer to SDS, SU-26.**

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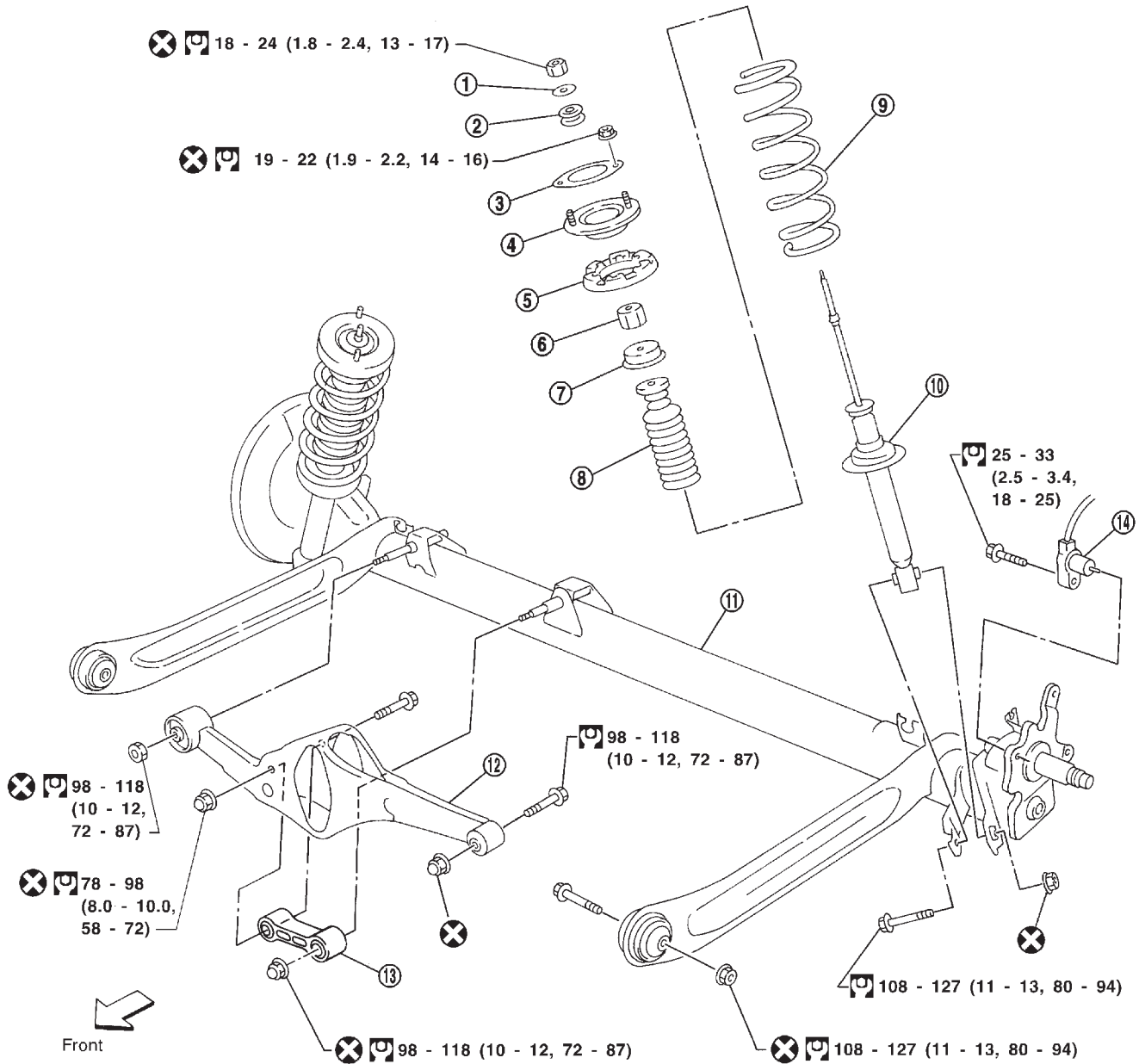
# REAR SUSPENSION

Removal and Installation

## Removal and Installation

NCSU0031

SEC. 431



: N·m (kg-m, ft-lb)

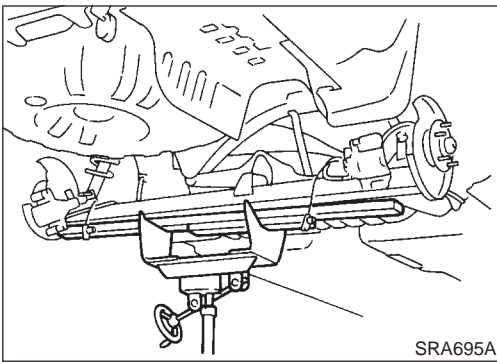
SRA791AB

- |                                    |                       |                  |
|------------------------------------|-----------------------|------------------|
| 1. Washer                          | 6. Bushing            | 11. Torsion beam |
| 2. Bushing                         | 7. Bound bumper cover | 12. Lateral link |
| 3. Shock absorber mounting seal    | 8. Bound bumper       | 13. Control rod  |
| 4. Shock absorber mounting bracket | 9. Coil spring        | 14. ABS sensor   |
| 5. Upper spring seat rubber        | 10. Shock absorber    |                  |

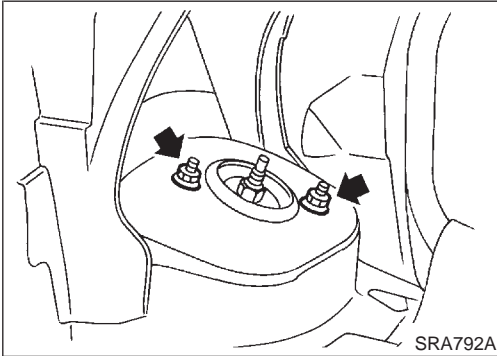


# REAR SUSPENSION

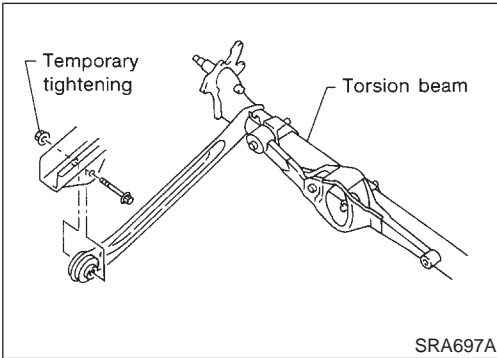
Removal and Installation (Cont'd)



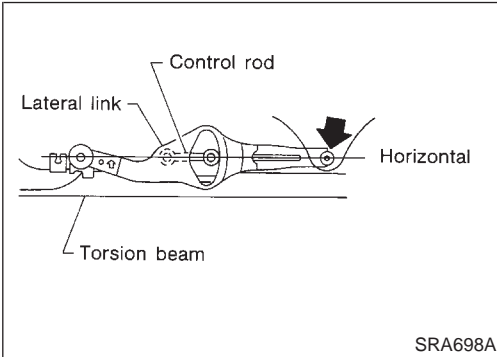
SRA695A



SRA792A



SRA697A



SRA698A

## REMOVAL

NCSU0031S01

### CAUTION:

- Before removing the rear suspension assembly, disconnect the ABS wheel sensor from the assembly. Failure to do so may result in damage to the sensor wires and the sensor becoming inoperative.

- Remove suspension assembly.

1. Disconnect parking brake cable from caliper and remove brake caliper and rotor.

**Suspend caliper assembly with wire so as not to stretch brake hose.**

**Be careful not to depress brake pedal, or piston will pop out. Make sure brake hose is not twisted.**

2. Using a transmission jack, raise torsion beam a little, and remove nuts and bolts from the trailing arm, shock absorber assembly (lower side) and lateral link.
3. Lower transmission jack, and remove suspension.
4. Remove trunk room trim. Refer to BT-32, "Trunk Room".
5. Remove strut securing nuts (upper side). Then pull out strut assembly.

## INSTALLATION

NCSU0031S02

- Install suspension assembly.

### CAUTION:

**Refill with new brake fluid "DOT 3".**

**Never reuse drained brake fluid.**

1. Attach control rod to lateral link. Do not tighten bolts at this time.
2. Attach lateral link, control rod and torsion beam to vehicle. Do not tighten bolts at this time.

3. Using a transmission jack to lift the torsion beam, place lateral link and control rod horizontally against torsion beam. Tighten bolts and nuts to specified torque.

4. Attach shock absorber assembly to vehicle. Then tighten the upper side of shock absorber assembly.

5. Remove transmission jack and lower torsion beam so that the shock absorber assembly reaches full extension. Tighten torsion beam at trailing arm and lower side of shock absorber assembly to specified torque.

## Coil Spring and Shock Absorber

### REMOVAL

NCSU0032

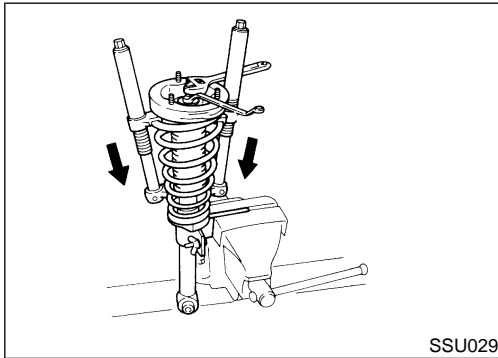
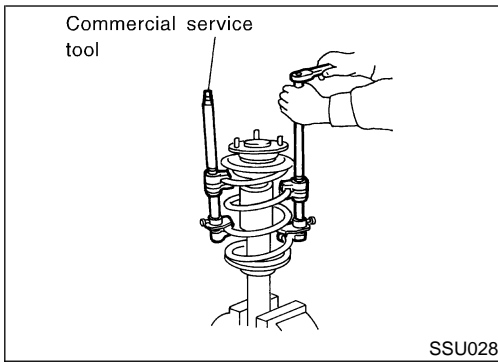
Remove shock absorber upper and lower fixing nuts.

**Do not remove piston rod lock nut on vehicle.**

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# REAR SUSPENSION

## Coil Spring and Shock Absorber (Cont'd)



### DISASSEMBLY

NCSU0033

1. Set shock absorber in vise.
2. Compress spring with Tool so that the shock absorber upper spring seat can be turned by hand.

#### WARNING:

Make sure that the pawls of the two spring compressors are firmly hooked on the spring. The spring compressors must be tightened alternately so as not to tilt the spring.

3. While holding the piston rod as shown in the left figure, remove the piston rod lock nut.
  - Be sure to loosen the piston rod lock nut after compressing the spring. If it is loosened before the spring is compressed, the piston valve nut inside the shock absorber may be loosened.

### INSPECTION

NCSU0034

#### Shock Absorber Assembly

NCSU0034S01

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

#### Upper Rubber Seat and Bushing

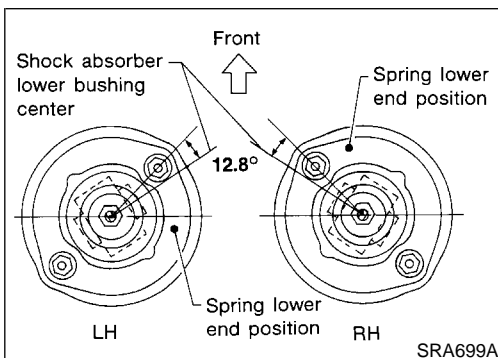
NCSU0034S02

Check rubber parts for deterioration or cracks. Replace if necessary.

#### Coil Spring

NCSU0034S03

Check for cracks, deformation or other damage. Replace if necessary.



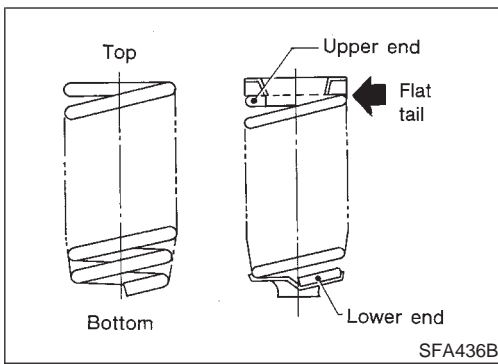
### ASSEMBLY

NCSU0035

- Locate upper spring seat as shown.

# REAR SUSPENSION

Coil Spring and Shock Absorber (Cont'd)



- When installing coil spring, be careful not to reverse top and bottom direction. (Top end is flat.)
- When installing coil spring on shock absorber, it must be positioned as shown in figure at left.

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## Torsion Beam, Lateral Link and Control Rod DISASSEMBLY

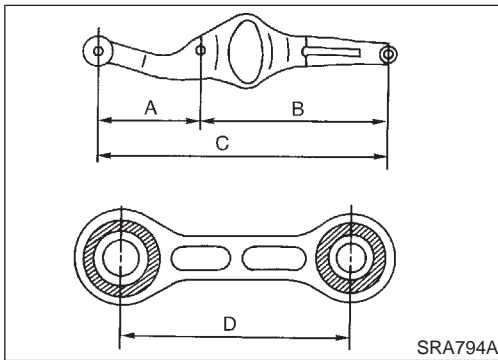
- Remove torsion beam assembly. Refer to "Removal and Installation", "REAR SUSPENSION", SU-23.
- Remove lateral link and control rod from torsion beam.

EC

FE

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MT



## INSPECTION

- Check for cracks, distortion or other damage. Replace if necessary.

### Standard length:

A 207 - 208 mm (8.15 - 8.19 in)

B 394 - 395 mm (15.51 - 15.55 in)

C 601 - 603 mm (23.66 - 23.74 in)

D 106 - 108 mm (4.17 - 4.25 in)

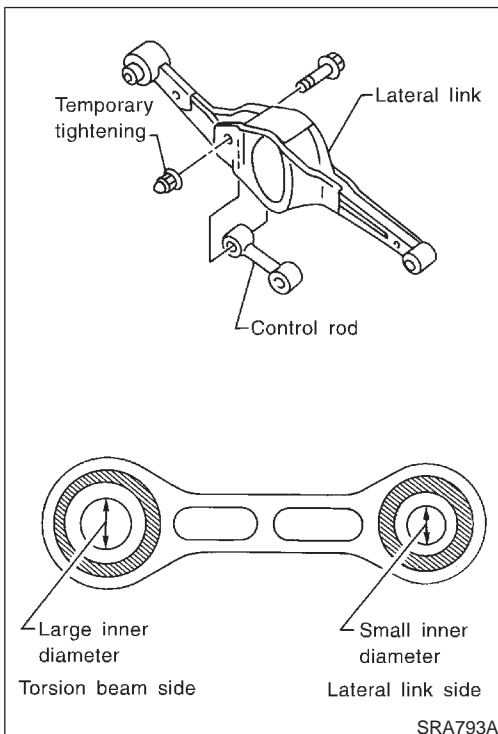
- Check all rubber parts for wear, cracks or deformation. Replace if necessary.

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## ASSEMBLY

1. Temporarily assemble lateral link and control rod.
- When installing the control rod, connect the bush with the smaller inner diameter to the lateral link.

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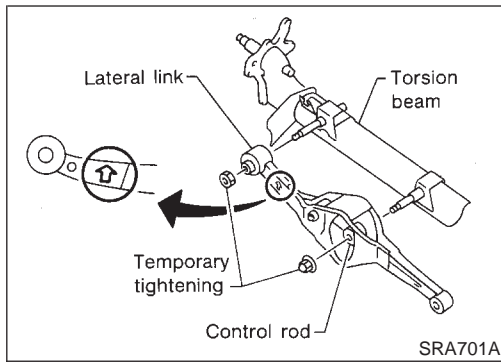
SC

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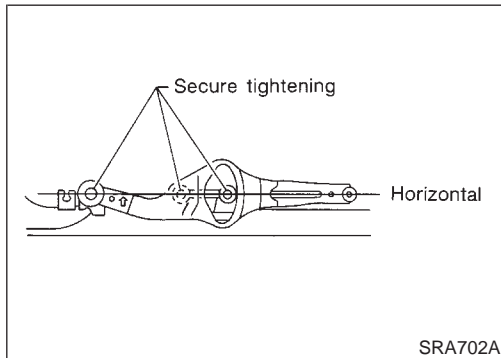
IDX

# REAR SUSPENSION

## Torsion Beam, Lateral Link and Control Rod (Cont'd)



2. Temporarily install lateral link and control rod on torsion beam.
  - When installing, place lateral link with the arrow topside.



3. Place lateral link and control rod horizontally against torsion beam, and tighten to the specified torque.
4. Install torsion beam assembly. Refer to "Removal and Installation", "REAR SUSPENSION", SU-23.

## Service Data and Specifications (SDS)

### GENERAL SPECIFICATIONS (REAR)

NCSU0039

Suspension type	Multi-link beam suspension
Shock absorber type	Double-acting hydraulic

### REAR WHEEL ALIGNMENT (UNLADEN\*)

NCSU0040

Camber Degree minute (Decimal degree)		Minimum	-2°03' (-2.05°)
		Nominal	-1°18' (-1.30°)
		Maximum	-0°33' (-0.55°)
Total toe-in	Distance (A - B) mm (in)	Minimum	0 (0)
		Nominal	4 (0.16)
		Maximum	8 (0.31)
	Angle (left plus right) Degree minute (Decimal degree)	Minimum	0' (0.00°)
		Nominal	24' (0.40°)
		Maximum	48' (0.80°)

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