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# STEERING, SUSPENSION, WHEELS AND TIRES

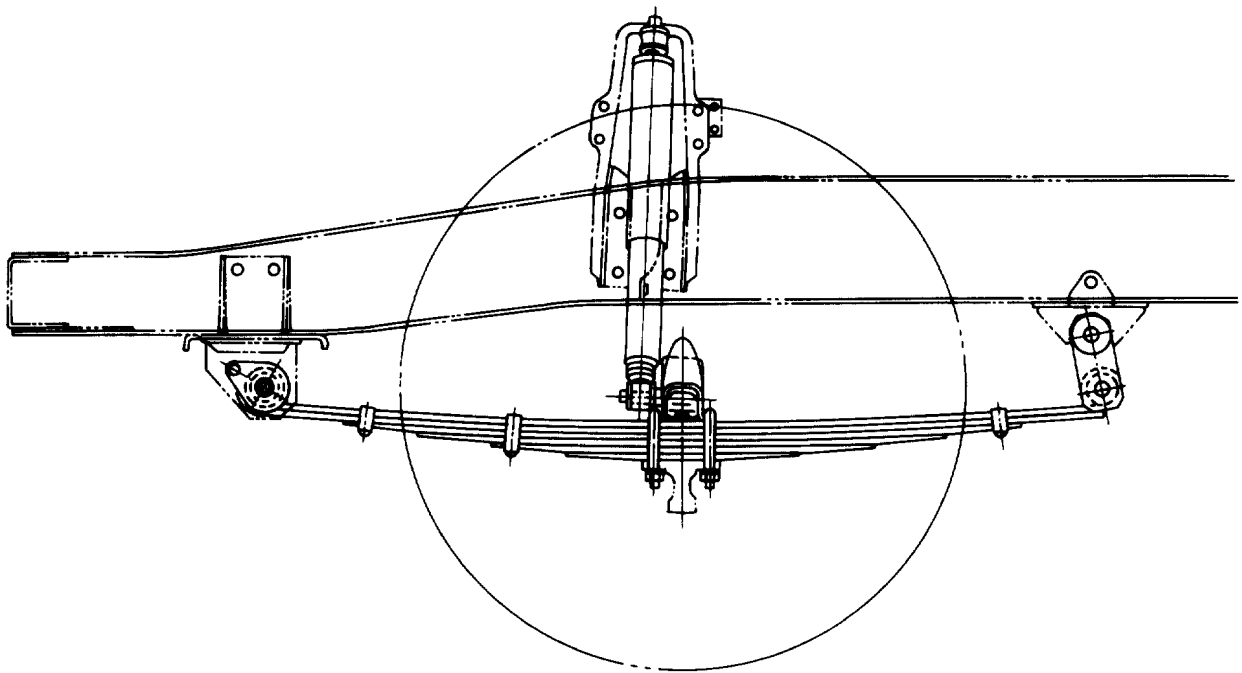
## SECTION 3C FRONT SUSPENSION

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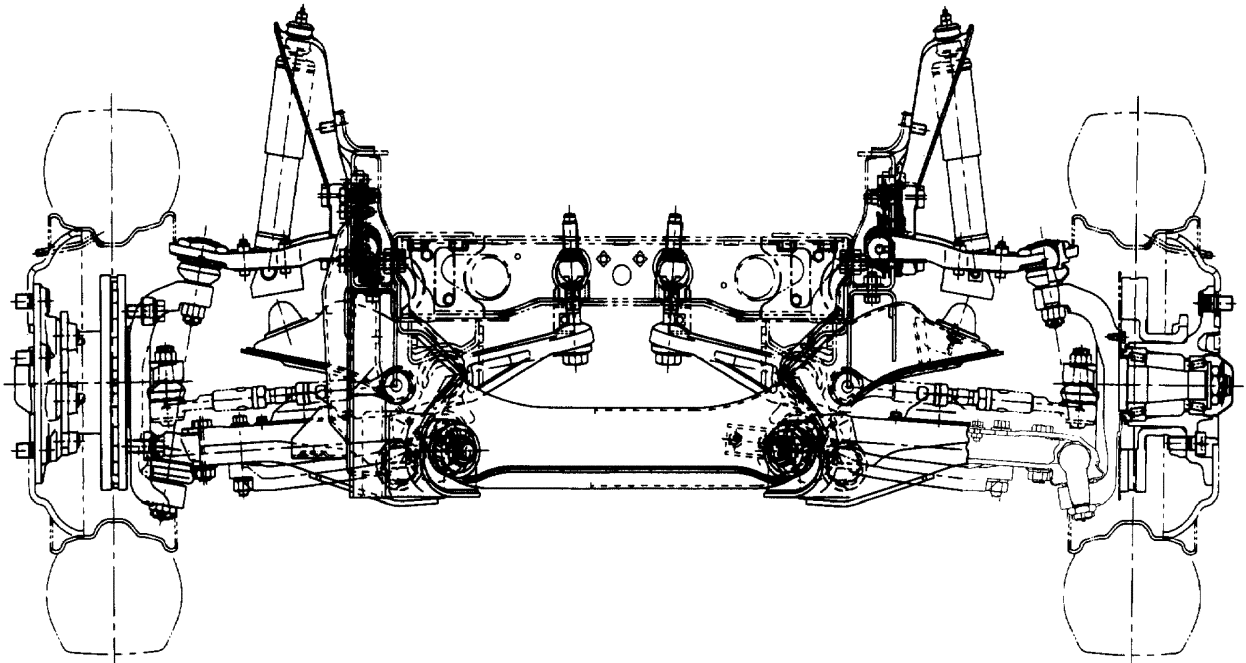
## GENERAL DESCRIPTION

### Rigid Suspension

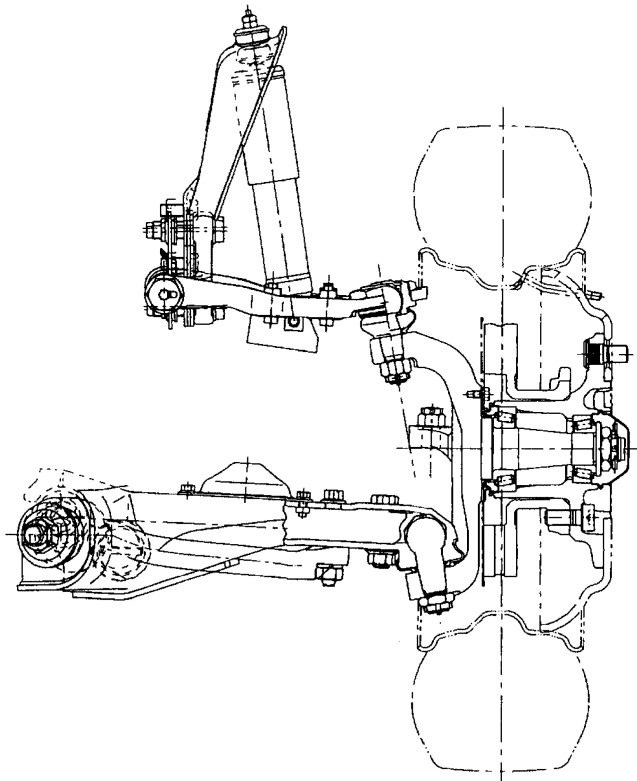


N3A0347E

## Wishbone Suspension



N3A0348E

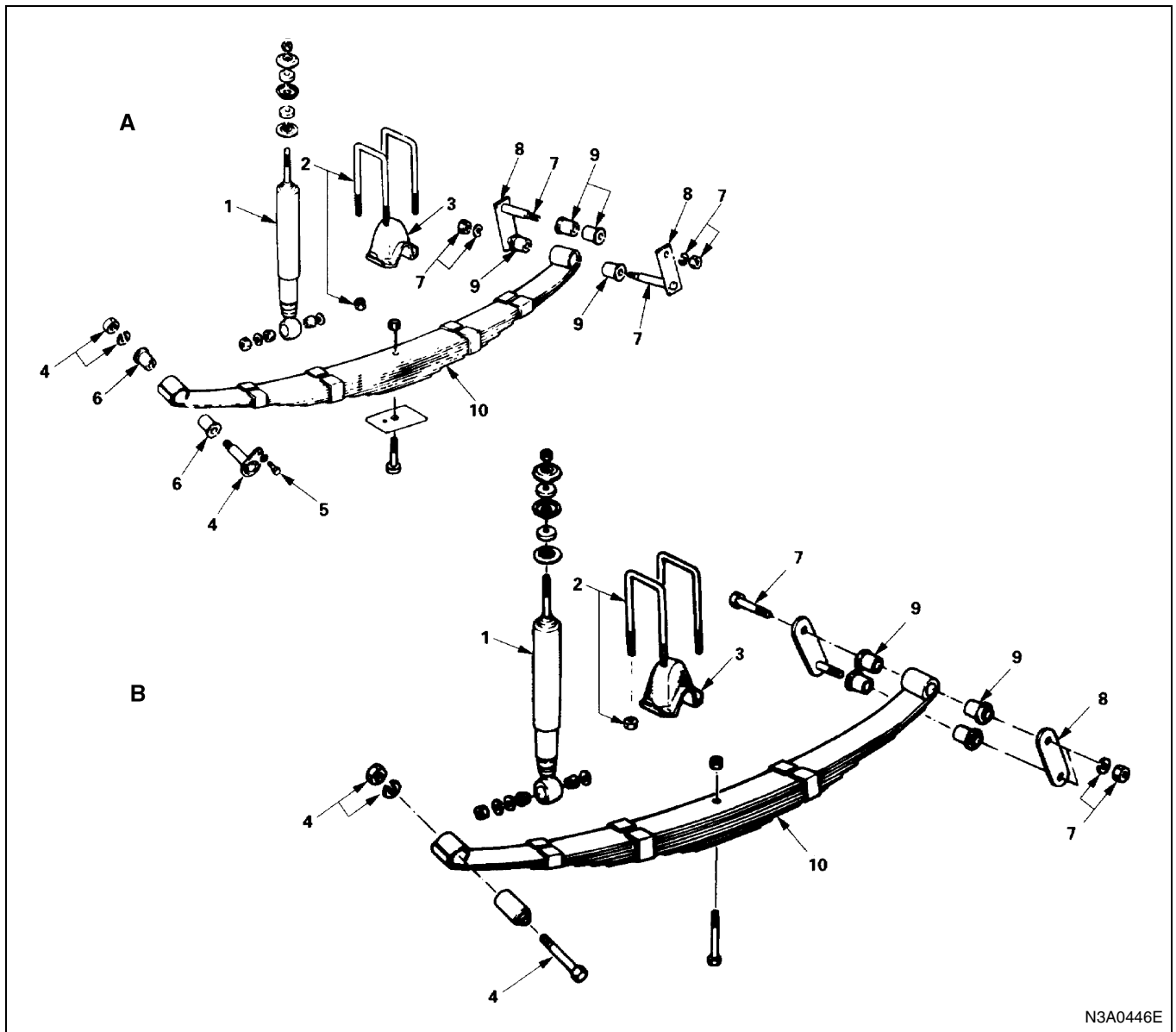


N3A0349E

## ON-VEHICLE SERVICE

### Front Suspension (Rigid Suspension)

#### Leaf Spring



N3A0446E

#### Legend

- A. NHR and NKR  
B. NPR, NQR and NPS

1. Shock absorber  
2. U-bolt and nut  
3. Helper rubber  
4. Spring pin, nut and washer

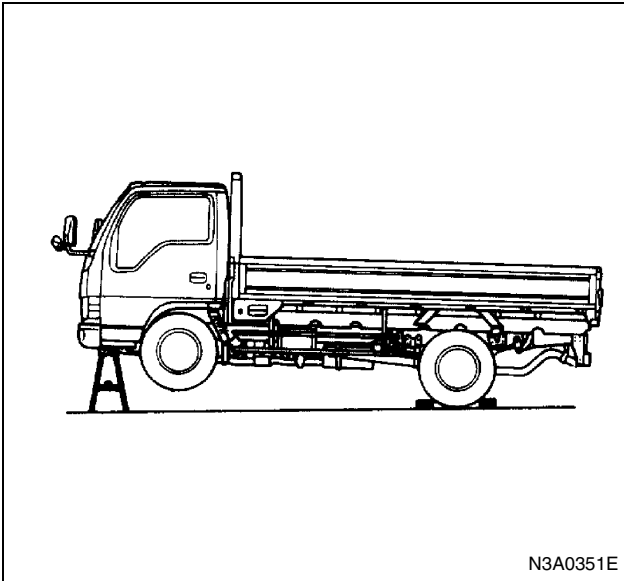
5. Bolt  
6. Rubber bushing  
7. Shackle pin, nut and washer  
8. Shackle  
9. Rubber bushing  
10. Leaf spring

## Removal

### Preparation

Make the following preparation before removing the leaf spring.

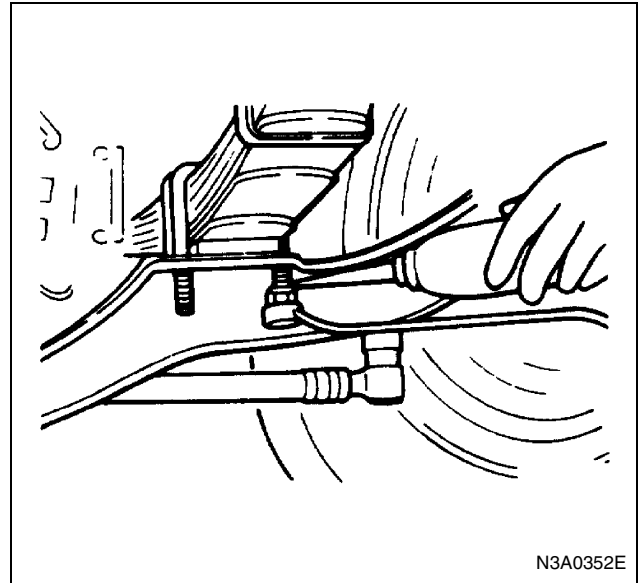
1. Brace the rear wheels.
2. Jack up the front axle until the front wheels are lifted off the ground and position safety stand under the chassis frame.  
Refer to "Lifting Instruction" in Section 0A for acceptable lifting point and supportable point location.



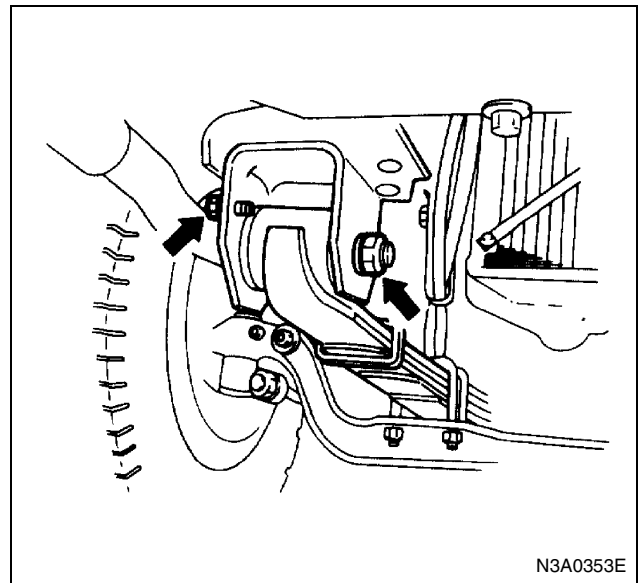
3. Position a garage jack under the front axle.
4. For the vehicle model with a stabilizer, remove the mounting portion on the axle side of the stabilizer in advance before removing the leaf spring. (Refer to the removal procedure of the stabilizer.)

### NHR and NKR

1. Shock Absorber
2. U-bolt and Nut
3. Helper Rubber  
If the U-bolts are heavily rusted, apply a generous amount of oil to the threads before loosening them to prevent seizure.



4. Spring Pin, Nut and Washer
5. Bolt
6. Rubber Bushing  
Take out the rubber bushings after removal of the spring pin.



7. Shackle Pin, Nut and Washer
8. Shackle
9. Rubber Bushing  
Take out the rubber bushings after removal of the shackle.
10. Leaf Spring  
Lower the garage jack slowly and remove the front spring assembly. When removing the front spring assembly, exercise care not to cause damage to the brake flexible hoses and drag link. Also, exercise care not to cause the spring to come down.

### NPR, NQR and NPS

1. Shock Absorber
2. U-bolt and Nut  
Refer to page NHR and NKR.

## 3C-6 FRONT SUSPENSION

3. Helper Rubber
4. Spring Pin, Nut and Washer  
Drive out the spring pin with a hammer using a brass bar after removal of the spring pin nut.
5. Shackle Pin, Nut and Washer
6. Shackle  
Drive out the shackle pin with a hammer using a brass bar after removal of the shackle pin nut.
7. Rubber Bushing
8. Leaf Spring  
Refer to NHR and NKR.

### Inspection and Repair

Make the necessary adjustments, repairs and part replacements if excessive wear or damage is discovered during inspection.

#### Visual Check

Inspect the following parts for wear, damage or other abnormal conditions.

- Leaf spring assembly
- Clip
- Center bolt
- U-bolt
- Spring pin
- Shackle pin
- Helper rubber
- Rubber bushing

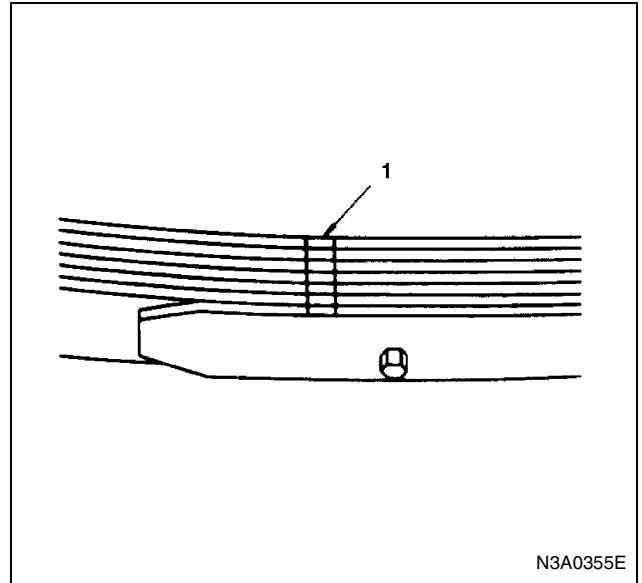
#### Shock Absorber

1. Inspect for extreme oil leakage.  
Slight oil leakage is allowed.
2. Inspect for temperature after running.  
Unchanged temperature indicates deteriorated function.
3. Inspect if large resistance is felt when the shock absorber is expanded and contracted by holding either end, or if play is eliminated after several times of expansion and contraction.  
The function has deteriorated if the above condition is not observed.
4. Inspect the bushing for wear or deterioration.  
Replace if abnormality is found.

#### Leaf Spring Assembly Replacement

- Apply a setting mark (1) across the springs before disassembling the leaf spring assembly.
- Apply grease to both faces of each leaf spring at reassembly.
- Use a bench press for disassembly and reassembly.
- Discard center bolt and install a new one.

When replacing the leaf spring assembly, use the leaf spring with the same camber represented by "+, -, I" on both right and left sides.

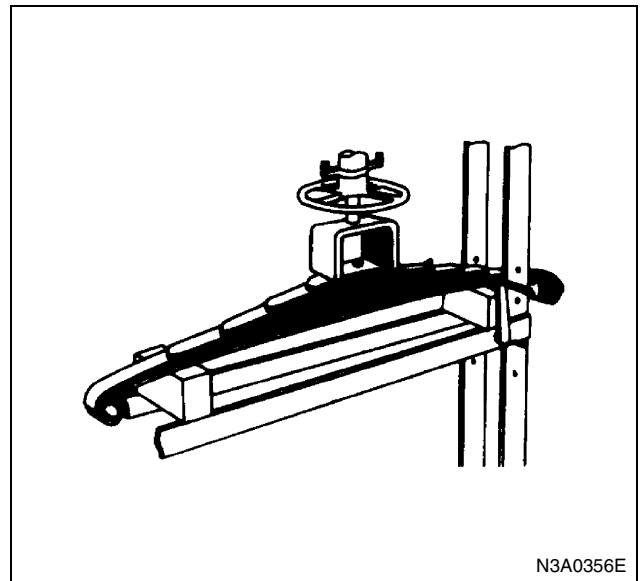


#### Center Bolt

Tighten the center bolt nut to the specified torque.

#### Tighten:

- Center bolt to 39 N·m (4 kg·m/29 lb·ft)

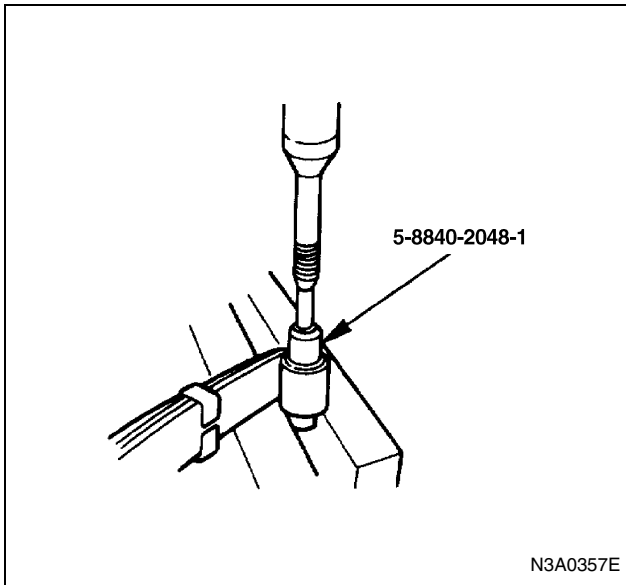


#### Bushing Replacement

When replacing bushing, drive out the bushing using a bench press.

Leaf Spring Rubber Bush Remover & Installer:  
5-8840-2048-1

Leaf Spring Metal Bush Remover & Installer:  
5-8840-2049-1

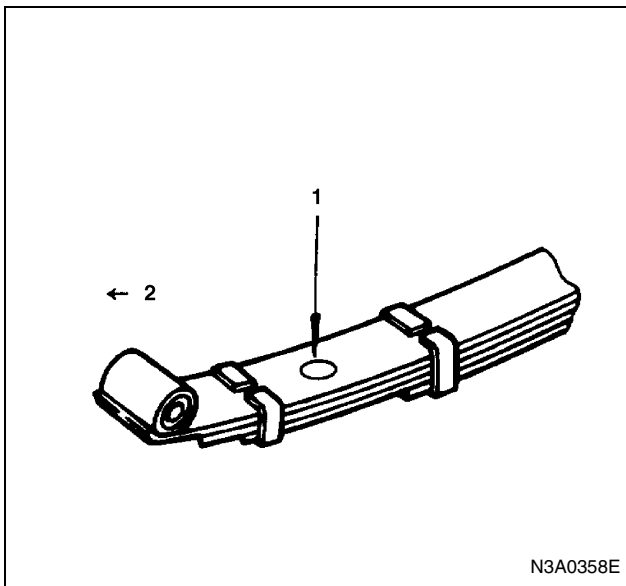


### Installation

#### NHR and NKR

##### 1. Leaf Spring

Install the leaf spring assembly with the camber mark (1) turned to front side (2) on the front axle.



##### 2. Helper Rubber

##### 3. U-Bolt and Nut

Position the U-bolts and helper rubber on the leaf spring assemblies and jack up the front axle.

When tightening the nuts, apply oil as necessary to prevent damaging the threads.

#### Tighten:

- U-bolt nut to 127 N·m (13 kg·m/94 lb·ft)

##### 4. Rubber Bushing

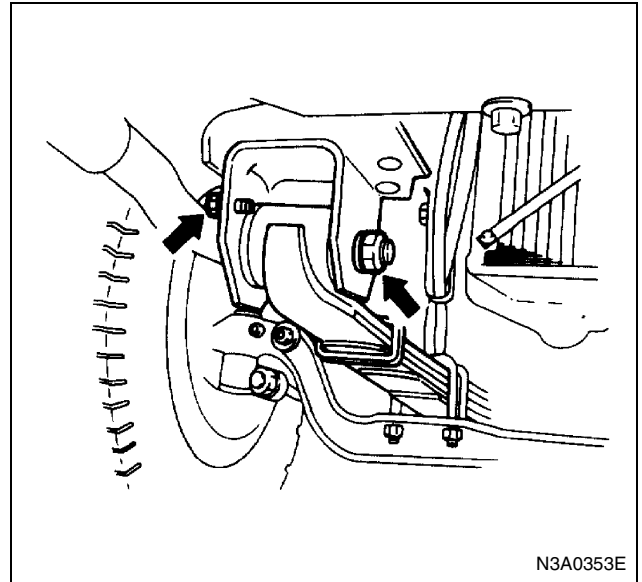
##### 5. Spring Pin, Nut and Washer

##### 6. Bolt

Finger tighten first, and tighten to specified torque after lowering the vehicle to ground.

#### Tighten:

- Spring pin bolt and nut to  
Bolt: 27 N·m (2.8 kg·m/20 lb·ft)  
Nut: 177 N·m (18 kg·m/130 lb·ft)



##### 7. Rubber Bushing

##### 8. Shackle

##### 9. Shackle Pin, Nut and Washer

Finger tighten first, and tighten to specified torque after lowering the vehicle to ground.

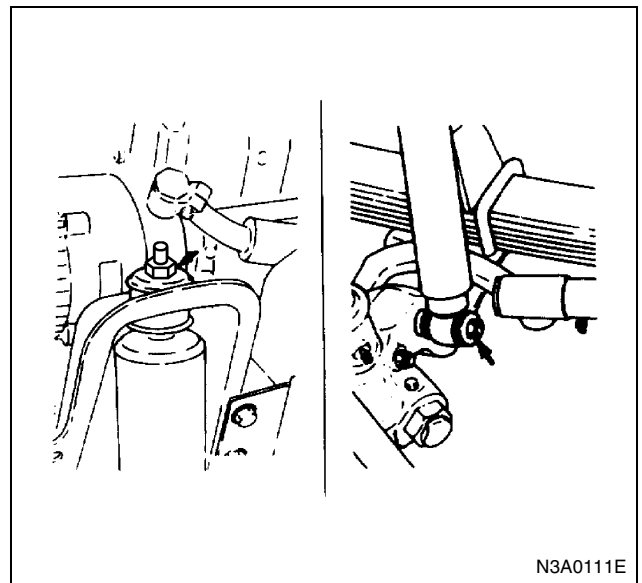
#### Tighten:

- Shackle pin nut to 137 N·m (14 kg·m /101 lb·ft)

##### 10. Shock Absorber

#### Tighten:

- Shock absorber nut to  
Upper nut: 21 N·m (2.1 kg·m/16 lb·ft)  
Lower nut: 61 N·m (6.2 kg·m/45 lb·ft)



## 3C-8 FRONT SUSPENSION

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### **NPR, NQR and NPS**

1. Leaf Spring  
Refer to NHR and NKR.
2. Helper Rubber
3. U-Bolt and Nut

### **Tighten:**

- U-bolt nut to  
NPR, NPS: 127 N·m (13 kg·m/94 lb·ft)  
NQR: 196 N·m (20 kg·m/145 lb·ft)
- 4. Spring Pin, Nut and Washer  
Refer to NHR and NKR.

### **Tighten:**

- Shackle pin nut to 202 N·m (20.6 kg·m/149 lb·ft)
- 5. Rubber Bushing
- 6. Shackle
- 7. Shackle Pin, Nut and Washer  
Refer to NHR and NKR.

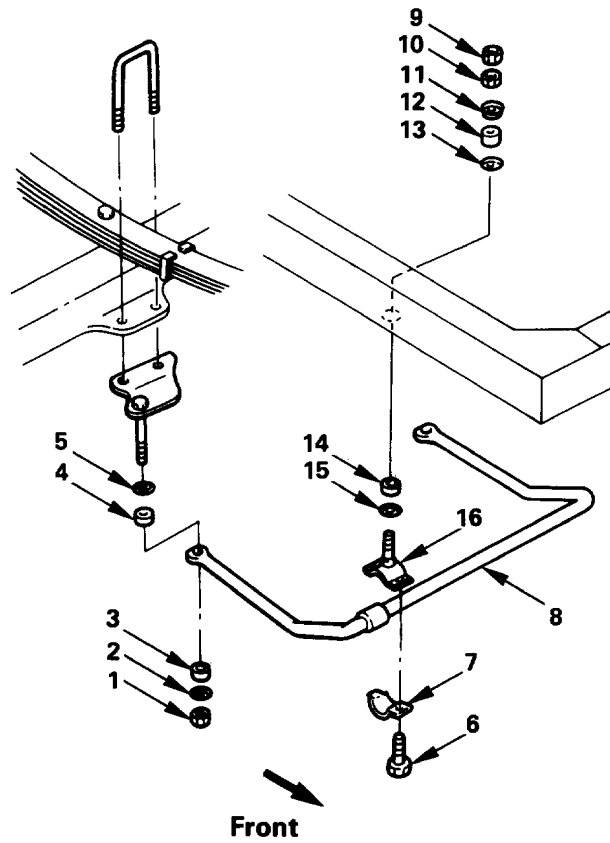
### **Tighten:**

- Shackle pin nut to 202 N·m (20.6 kg·m/149 lb·ft)
- 8. Shock Absorber

### **Tighten:**

- Shock absorber nut to  
Upper nut: 21 N·m (2.1 kg·m/16 lb·ft)  
Lower nut: 95 N·m (9.7 kg·m/70 lb·ft)

Front Stabilizer (NKR)



N3A0361E

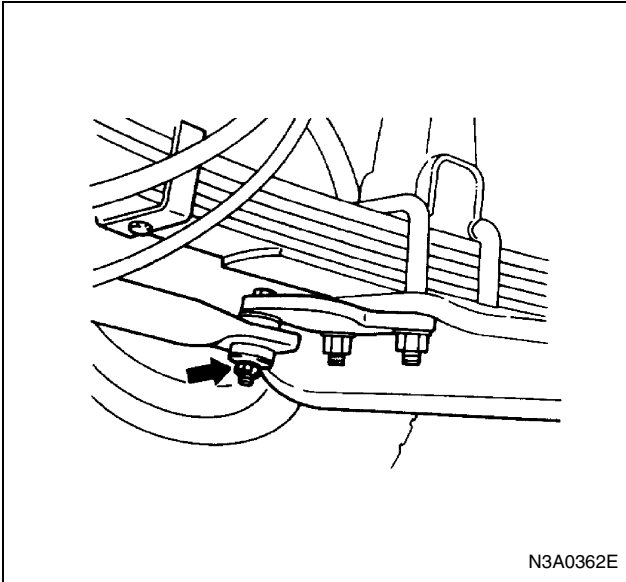
Legend

- |                   |                    |
|-------------------|--------------------|
| 1. Nut            | 9. Nut             |
| 2. Washer         | 10. Nut            |
| 3. Rubber bushing | 11. Washer         |
| 4. Rubber bushing | 12. Rubber bushing |
| 5. Washer         | 13. Washer         |
| 6. Bolt           | 14. Rubber bushing |
| 7. Rod link cap   | 15. Washer         |
| 8. Stabilizer bar | 16. Rod link       |

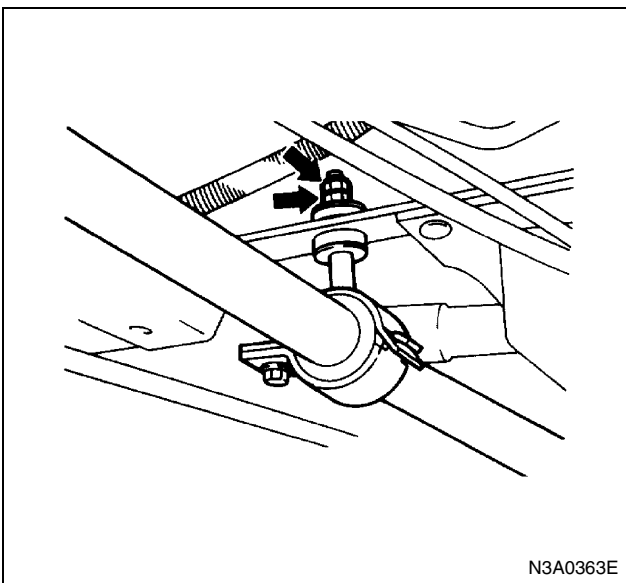
## 3C-10 FRONT SUSPENSION

### Removal

1. Nut
2. Washer
3. Rubber Bushing
4. Rubber Bushing
5. Washer



6. Bolt
7. Rod Link Cap
8. Stabilizer Bar
9. Nut
10. Nut
11. Washer
12. Rubber Bushing
13. Washer
14. Rubber Bushing
15. Washer
16. Rod Link



### Inspection and Repair

Make the necessary adjustments, repairs and part replacements if excessive wear or damage is discovered during inspection.

#### Stabilizer

Inspect the stabilizer bar and attachments for the following conditions:

1. Cracks, bends or damage to the bar.
2. Worn bushings.
3. Damaged brackets.
  - Replace any worn or damaged parts.

### Installation

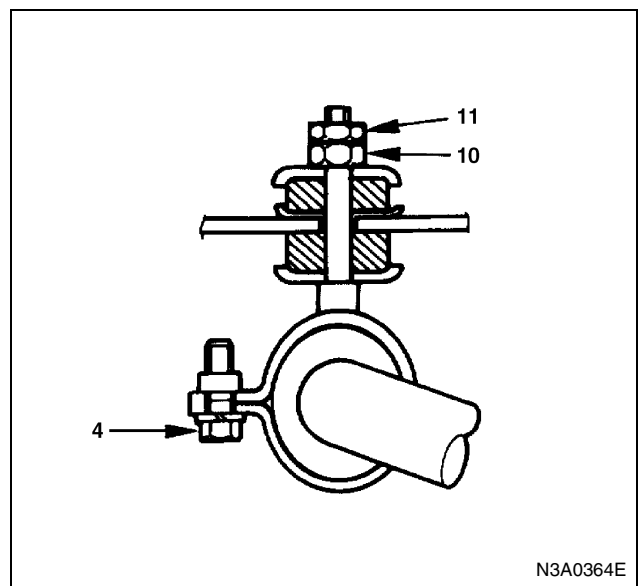
#### Notice:

During installation, place the vehicle on flat ground and tighten each part to the specified torque.

1. Stabilizer Bar
2. Rod Link
3. Rod Link Cap
4. Bolt
5. Washer
6. Rubber Bushing
7. Washer
8. Rubber Bushing
9. Washer
10. Nut
11. Nut

#### Tighten:

- Rod link bolt and nut to
  4. Bolt: 57 N·m (5.8 kg·m/42 lb·ft)
  10. Nut: 20 N·m (2.0 kg·m/14 lb·ft)
  11. Nut: 40 N·m (4.1 kg·m/30 lb·ft)



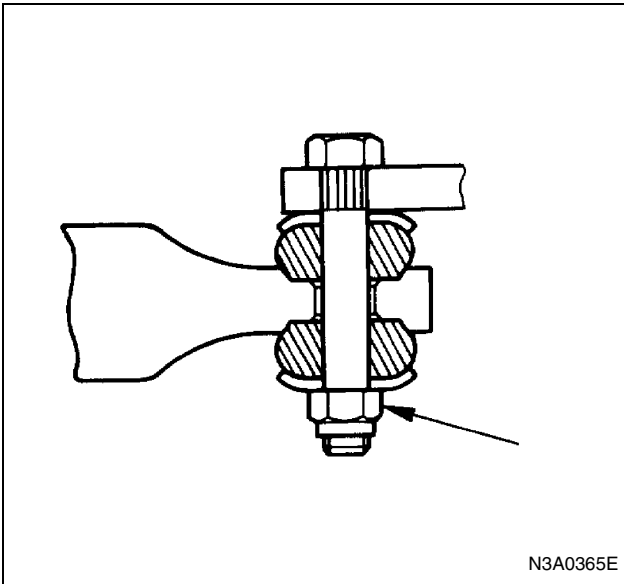
12. Washer
13. Rubber Bushing
14. Rubber Bushing

15. Washer

16. Nut

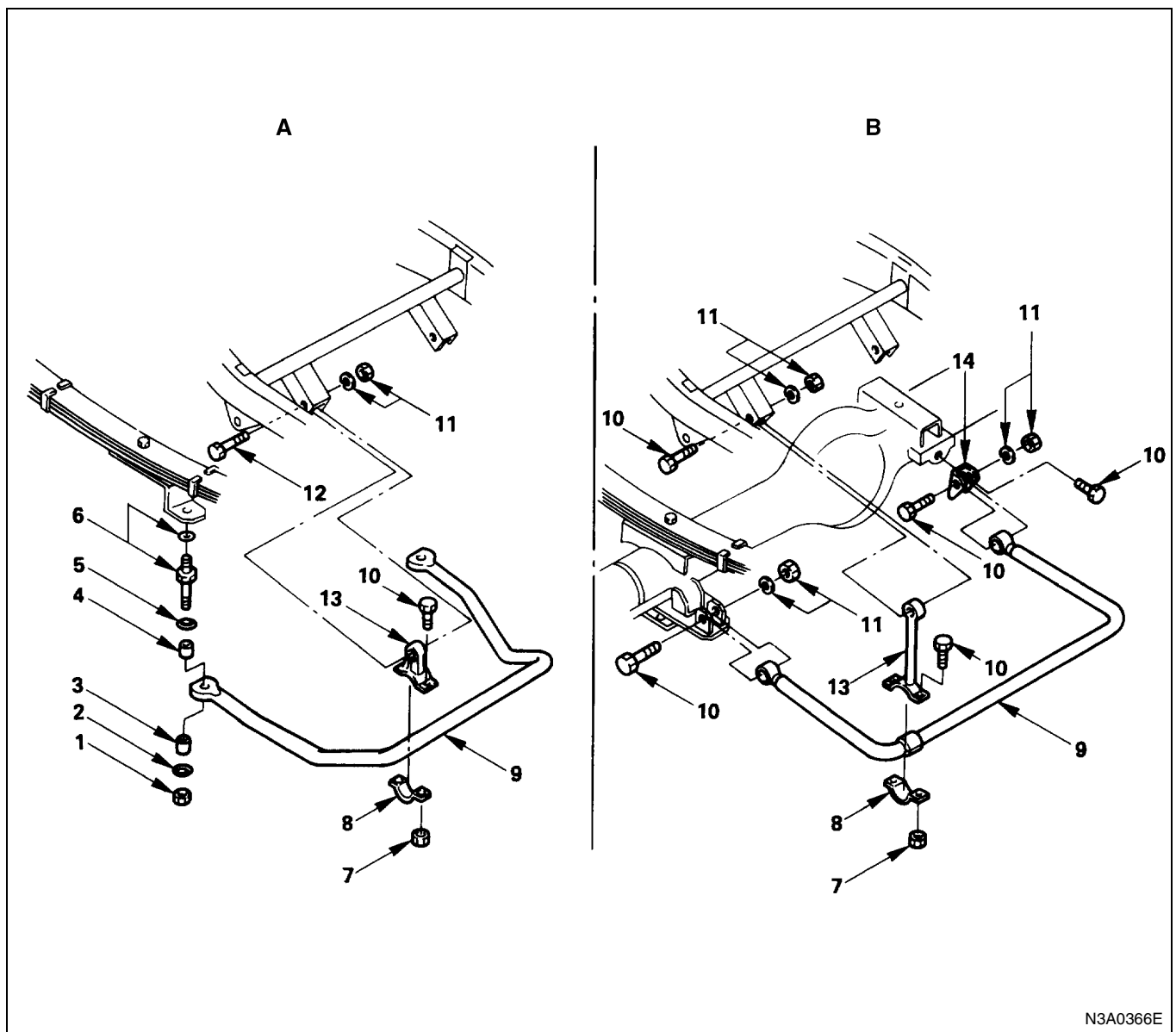
**Tighten:**

- Nut to 29 N·m (3.0 kg·m/22 lb·ft)



## 3C-12 FRONT SUSPENSION

### Front Stabilizer (NPR, NQR and NPS)



#### Legend

A. NPR and NQR

B. NPS

1. Nut

2. Washer

3. Rubber bushing

4. Rubber bushing

5. Washer

6. Stud bolt and spring washer

7. Nut

8. Rod link cap

9. Stabilizer bar

10. Bolt

11. Nut and spring washer

12. Bolt

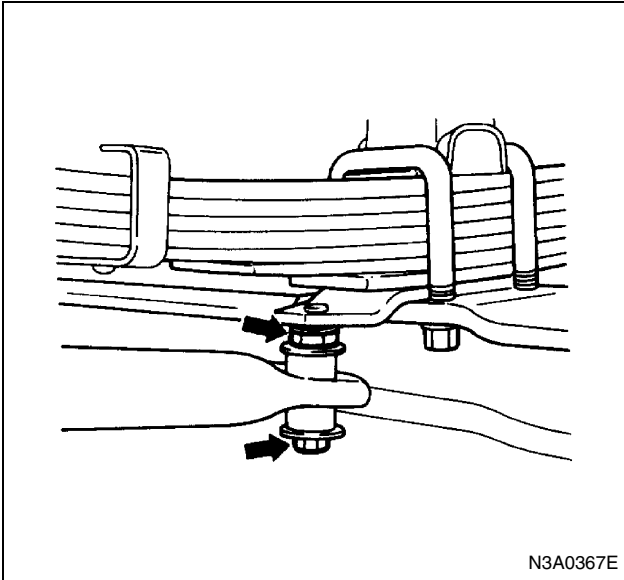
13. Rod link

14. Stabilizer bracket

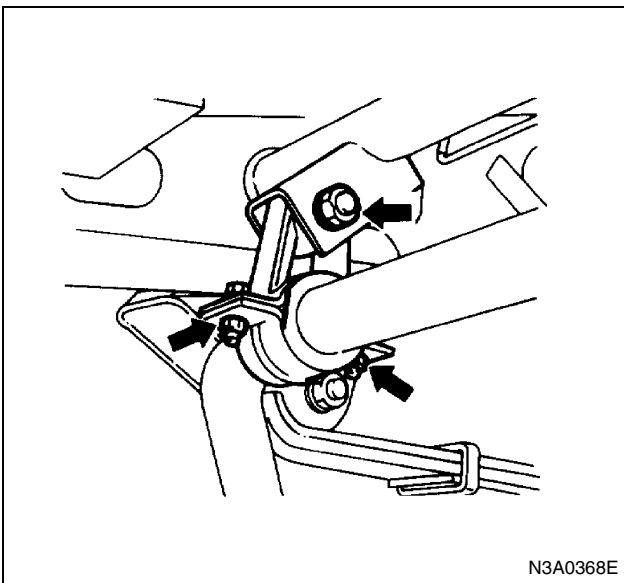
## Removal

### NPR and NQR

1. Nut
2. Washer
3. Rubber Bushing
4. Rubber Bushing
5. Washer
6. Stud Bolt and Spring Washer

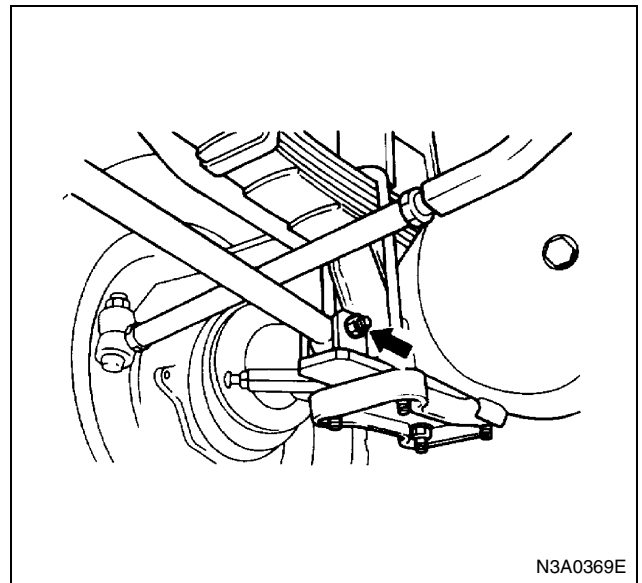


7. Nut
8. Rod Link Cap
9. Stabilizer Bar
10. Bolt
11. Nut and Spring Washer
12. Bolt
13. Rod Link

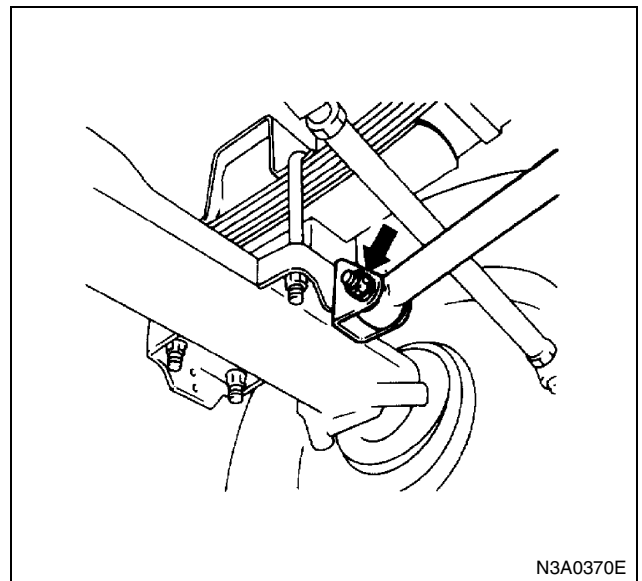


### NPS

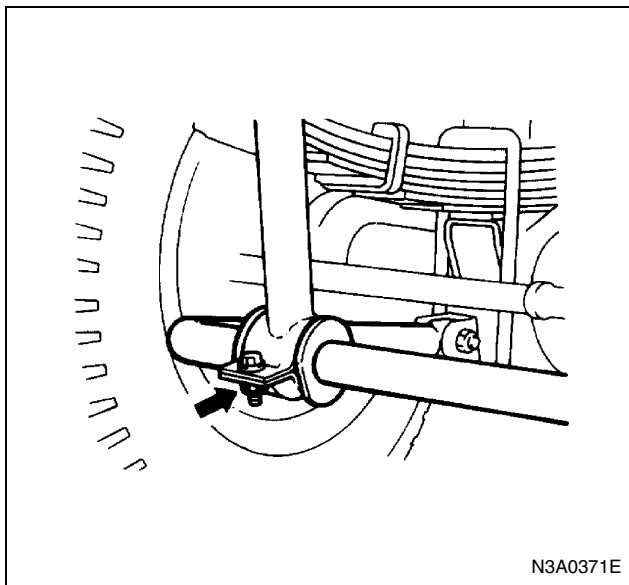
1. Nut and Spring Washer
2. Bolt



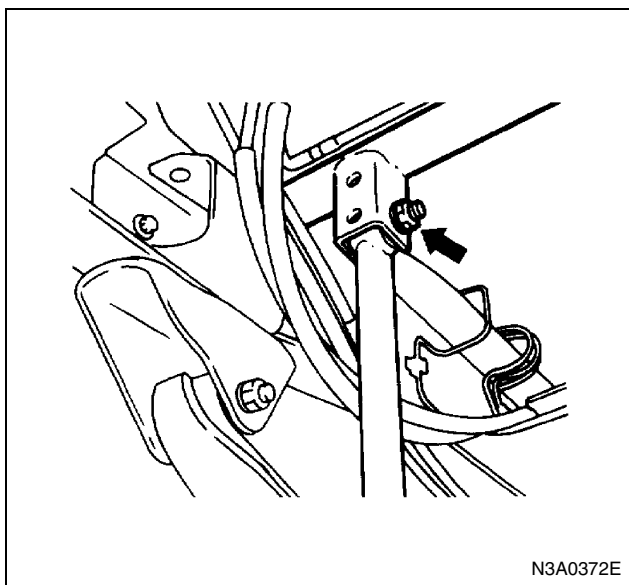
3. Nut and Spring Washer
4. Bolt
5. Bolt
6. Stabilizer Bracket



7. Nut
8. Rod Link Cap
9. Stabilizer Bar
10. Bolt



11. Nut and Spring Washer
12. Bolt
13. Rod Link



### Inspection and Repair

Make the necessary adjustments, repairs and part replacements if excessive wear or damage is discovered during inspection.

#### Stabilizer

Inspect the stabilizer bar and attachments for the following conditions:

1. Cracks, bends or damage to the bar.
2. Worn bushings.
3. Damaged brackets.
  - Replace any worn or damaged parts.

### Installation

#### Notice:

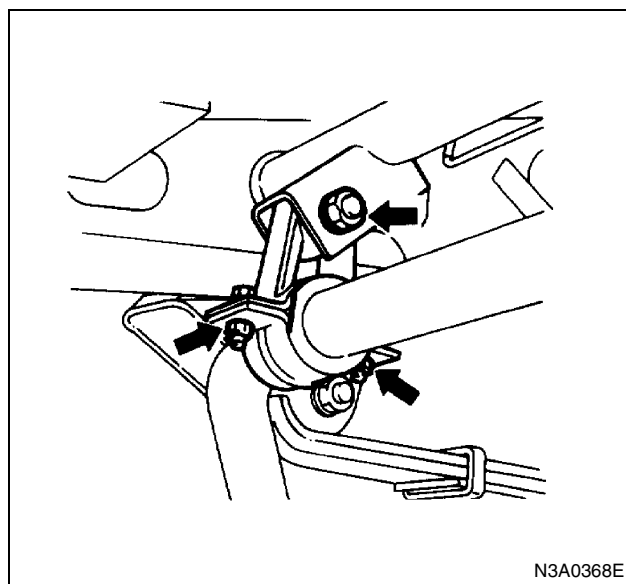
During installation, place the vehicle on flat ground and tighten each part to the specified torque.

#### NPR and NQR

1. Stabilizer Bar
2. Rod Link
3. Rod Link Cap
4. Bolt
5. Nut
6. Bolt
7. Nut and Spring Washer

#### Tighten:

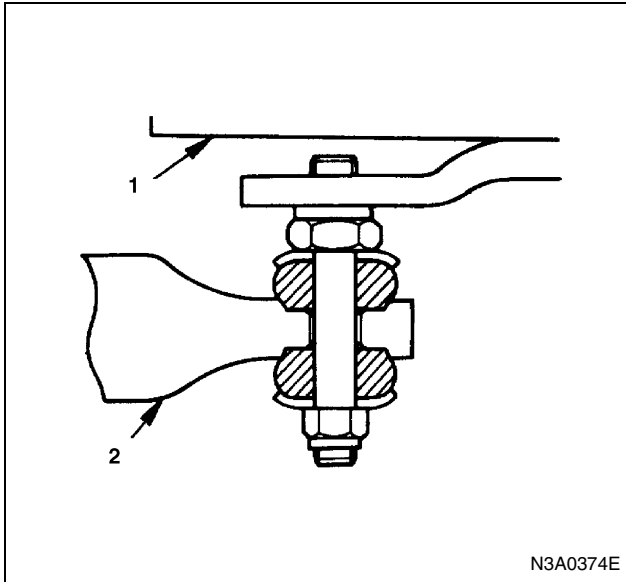
- Rod link nut to
  - Rod link cap nut: 57 N·m (5.8 kg·m/42 lb·ft)
  - Rod link bracket nut: 127 N·m (13 kg·m/94 lb·ft)



8. Stud Bolt and Spring Washer
9. Washer
10. Rubber Bushing
11. Rubber Bushing
12. Washer
13. Nut

**Tighten:**

- Stud bolt and nut to  
Stud bolt: 117 N·m (11.9 kg·m/86 lb·ft)  
Nut: 29 N·m (3.0 kg·m/22 lb·ft)



**Legend**

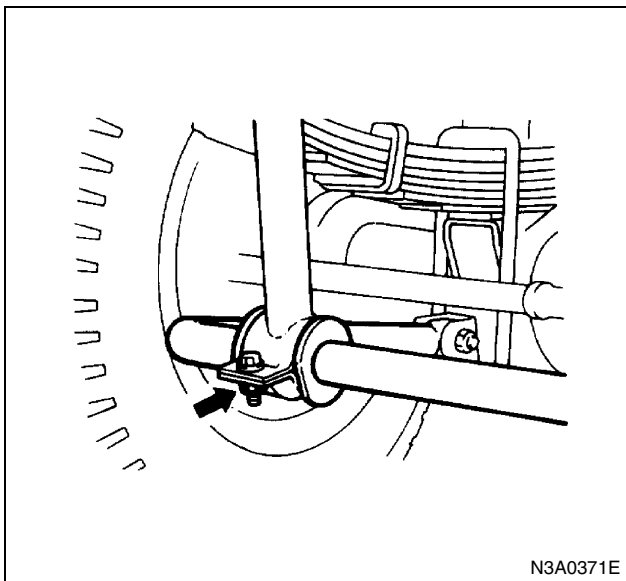
1. Leaf spring
2. Stabilizer

**NPS**

1. Stabilizer Bar
2. Rod Link
3. Rod Link Cap
4. Bolt
5. Nut

**Tighten:**

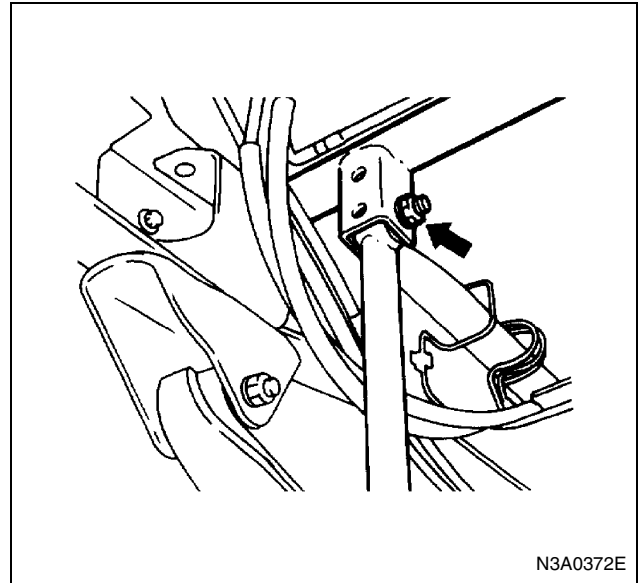
- Nut to 57 N·m (5.8 kg·m/42 lb·ft)



6. Bolt
7. Nut and Spring Washer

**Tighten:**

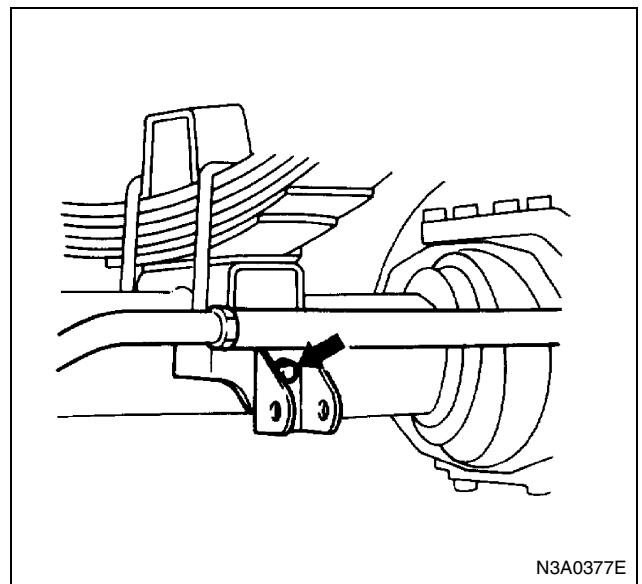
- Nut to 127 N·m (13 kg·m/94 lb·ft)



8. Stabilizer Bracket
9. Bolt

**Tighten:**

- Bolt to 19 N·m (1.9 kg·m/14 lb·ft)



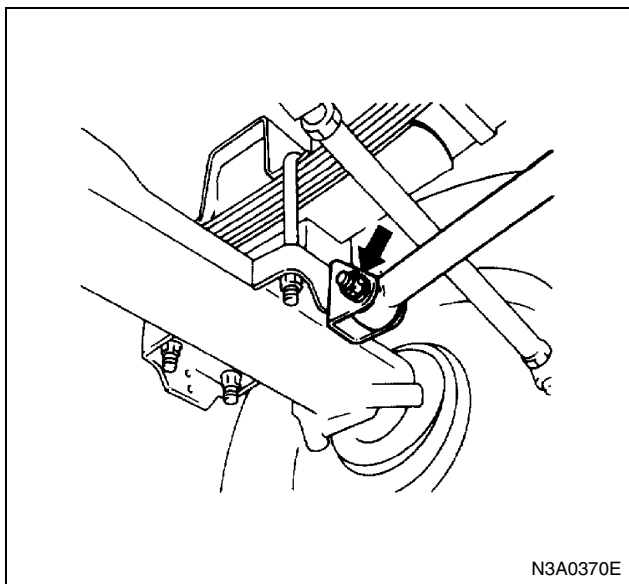
10. Bolt
11. Nut and Spring Washer

## 3C-16 FRONT SUSPENSION

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### Tighten:

- Nut to 127 N·m (13 kg·m/94 lb·ft)

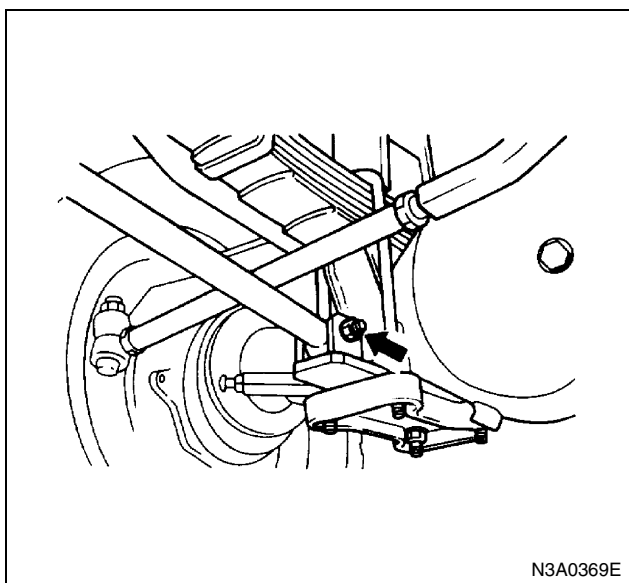


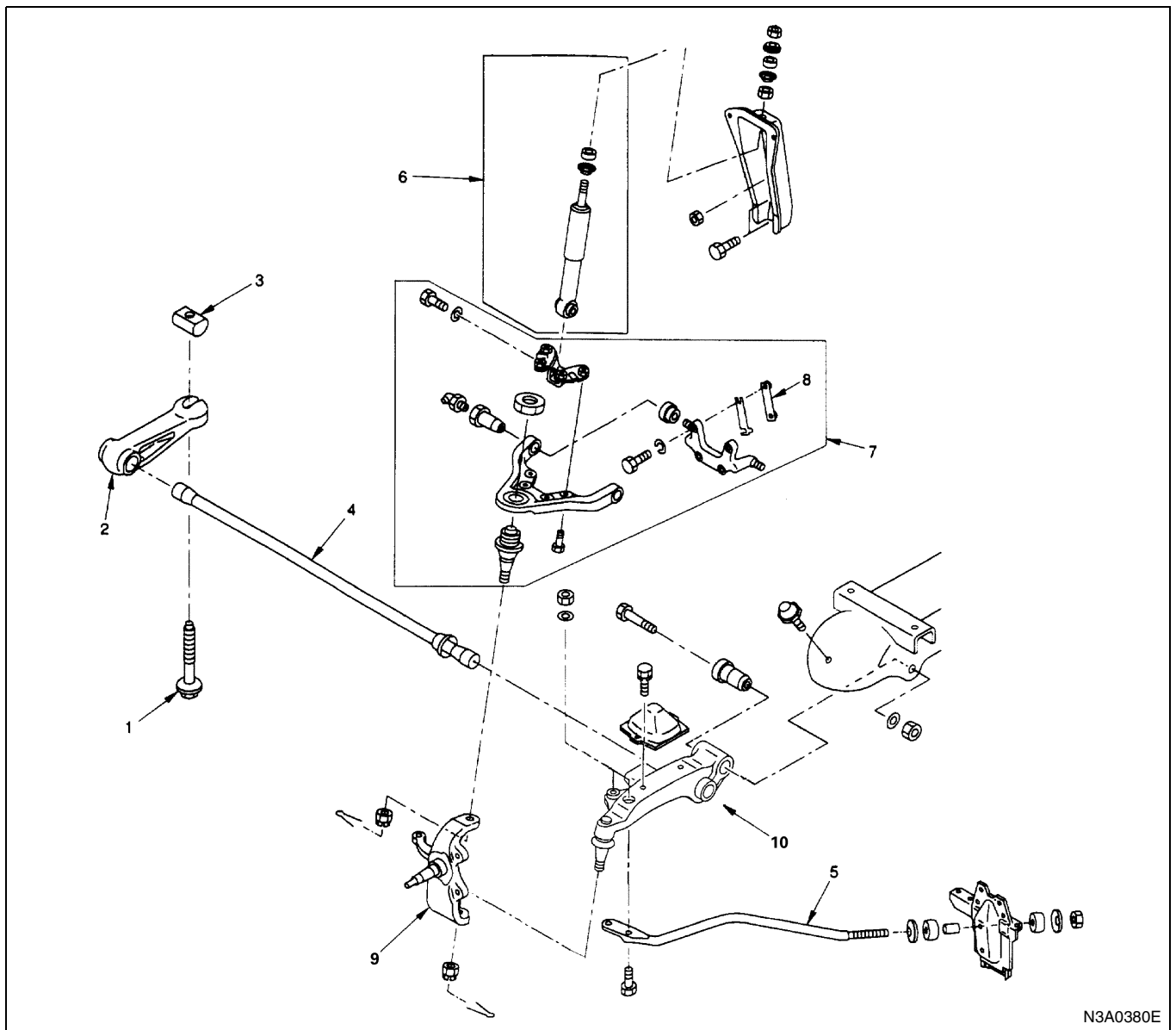
12. Bolt

13. Nut and Spring Washer

### Tighten:

- Nut to 127 N·m (13 kg·m/94 lb·ft)



**Front Suspension (Wishbone Suspension)****Legend**

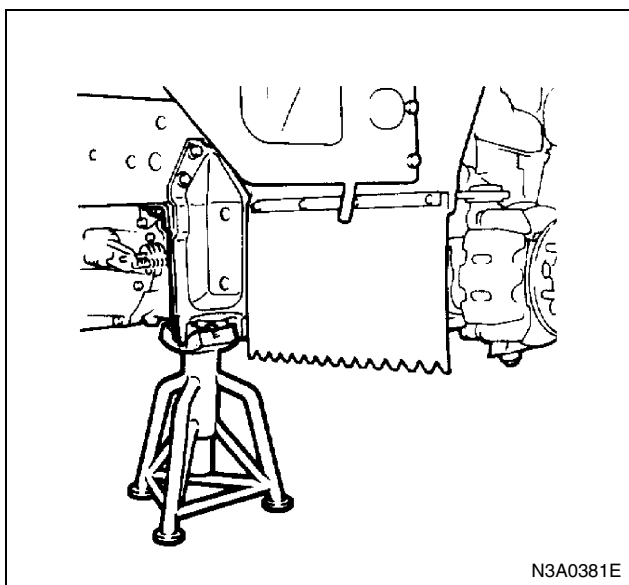
- |                       |                            |
|-----------------------|----------------------------|
| 1. Adjusting bolt     | 6. Shock absorber assembly |
| 2. Height control arm | 7. Upper link assembly     |
| 3. End piece          | 8. Adjusting shim          |
| 4. Torsion bar        | 9. Knuckle                 |
| 5. Strut bar assembly | 10. Lower link             |

## 3C-18 FRONT SUSPENSION

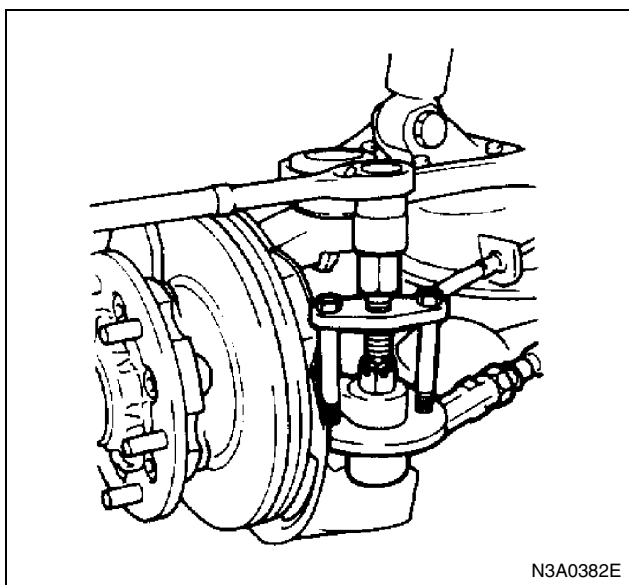
### Removal

#### Preparations

- Raise the vehicle and support the jack up point with suitable safety stands. Refer to "Lifting Instruction" in Section 0A.
- Remove front tire and wheels. Refer to "Wheels and Tires" in Section 3E.
- Remove brake caliper assembly. Refer to "Hydraulic Brakes" in Section 5A.
- Remove hub and rotor assembly. Refer to "Front Axle" in Section 4C.

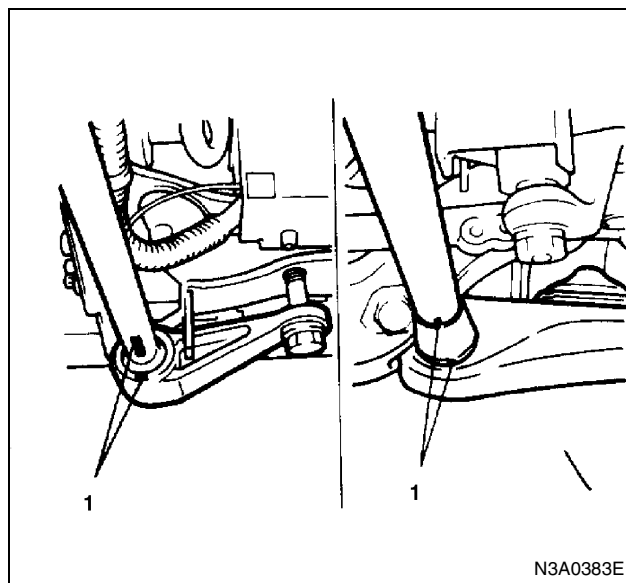


- Disconnect the outer track rod ball joint from the knuckle.  
Remover: 5-8840-2017-0

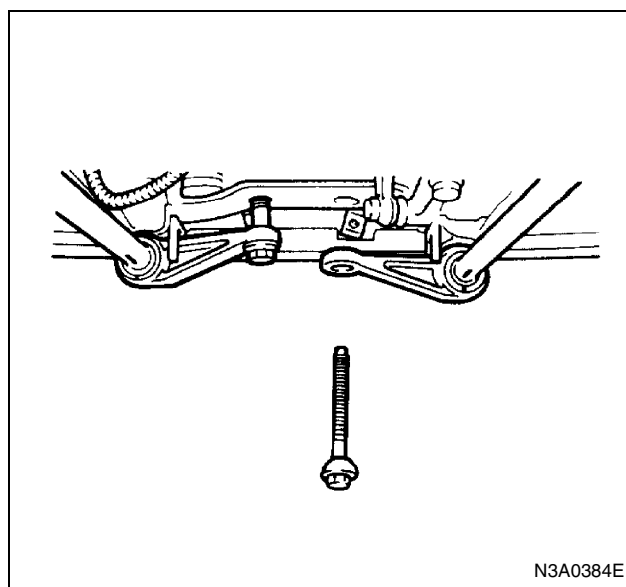


1. Adjusting Bolt
2. Height Control Arm
3. End Piece
4. Torsion Bar

- Apply setting marks (1) to torsion bar, height control arm and lower link to ensure installation of the parts in their original position.

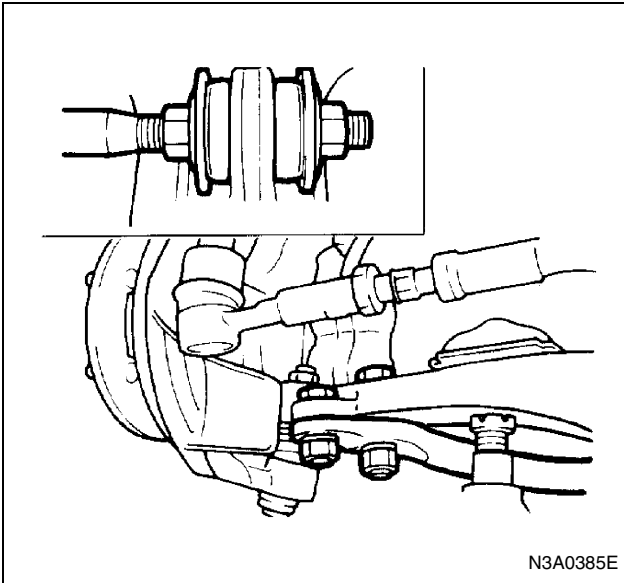


Apply setting marks to adjusting bolt threads to ensure installation of the parts in their original position.

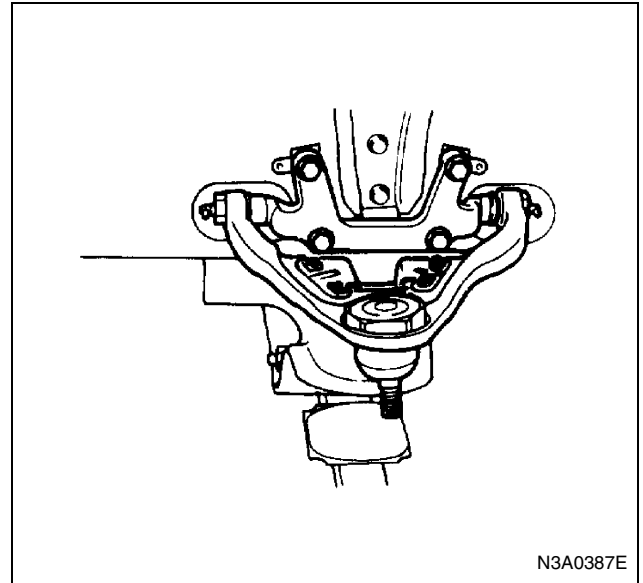


#### 5. Strut Bar Assembly

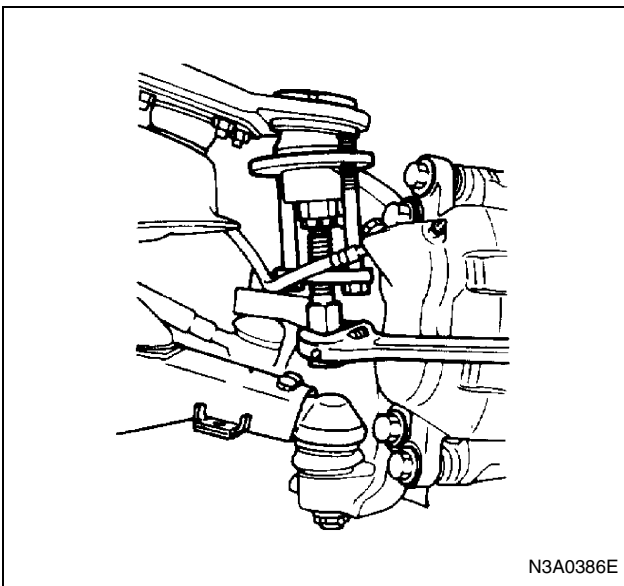
- Raise and support the lower link with a jack.
- Loosen the rear side nut, and remove the nut, washer and rubber bushing.
- Loosen two fixing bolts of lower link side and remove the strut bar to front side.



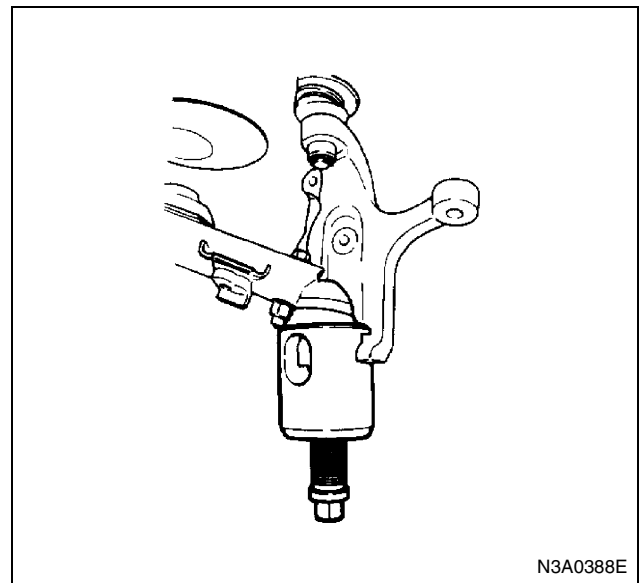
6. Shock Absorber
7. Upper Link Assembly
8. Adjusting Shim  
Disconnect upper link joint ball at the knuckle.  
Remover: 5-8840-2017-0



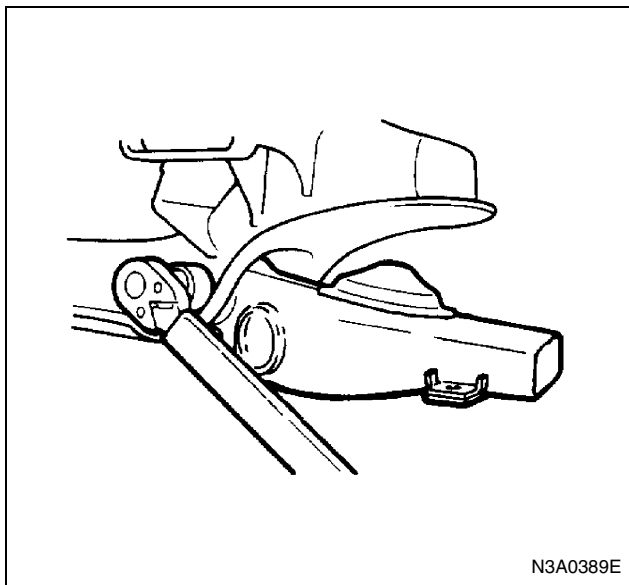
9. Knuckle
  - Disconnect the lower link ball joint at the knuckle.  
Remover: 5-8840-2366-0
  - Remove two fixing bolts and the ball joint from lower link.



- Remove the fulcrum pin fixing bolt.
- Note the thickness and number of shims.



10. Lower Link



### Inspection and Repair

Make necessary correction or parts replacements if excessive wear, damage, corrosion or any other abnormal condition are found through inspection.

#### Visual Check

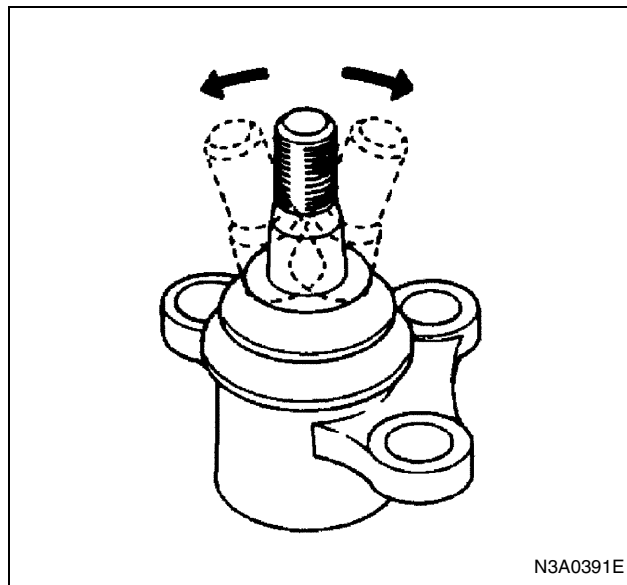
Inspect the following parts for excessive wear, damage, bending, oil leak or any other abnormal conditions.

- Torsion Bar
- End Piece
- Height Control Arm
- Rubber Bushings
- Strut Bar
- Shock Absorber

#### Ball Joint

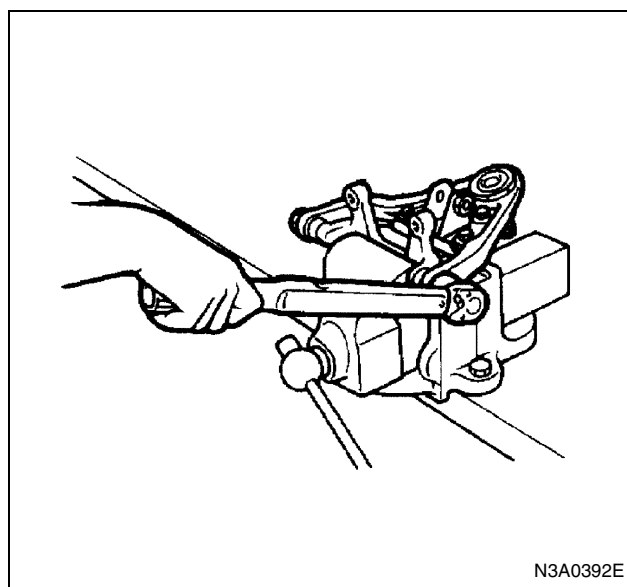
- Inspect the ball joint boot for damage or grease leak.
- Move the ball joint to confirm its normal movement.
- Inspect screw / taper area of ball for flaws.

If any defects are found by the above inspections, replace the ball joint with new one.



### Upper Ball Joint Replacement

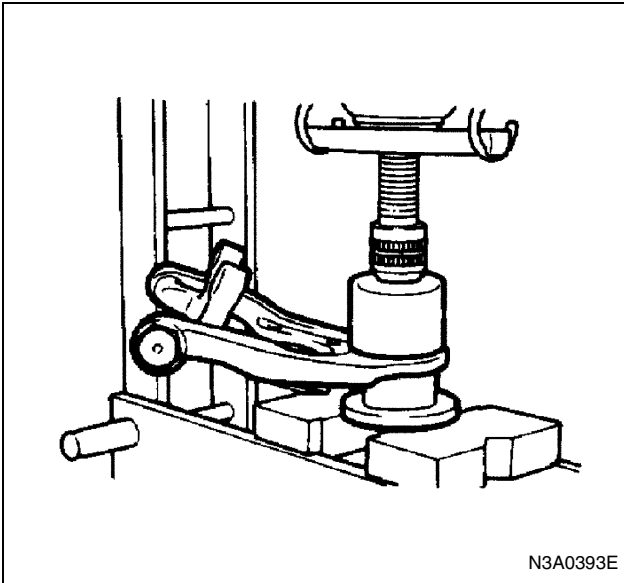
- Remove the ball joint fixing nut (Hex. 63mm).
- Remove the ball joint from the upper link using a special tool.  
Remover: 5-8840-2364-0



- Install the ball joint to the upper link using a bench press and special tool.  
Installer: 5-8840-2365-0
- Tighten nut to specified torque.

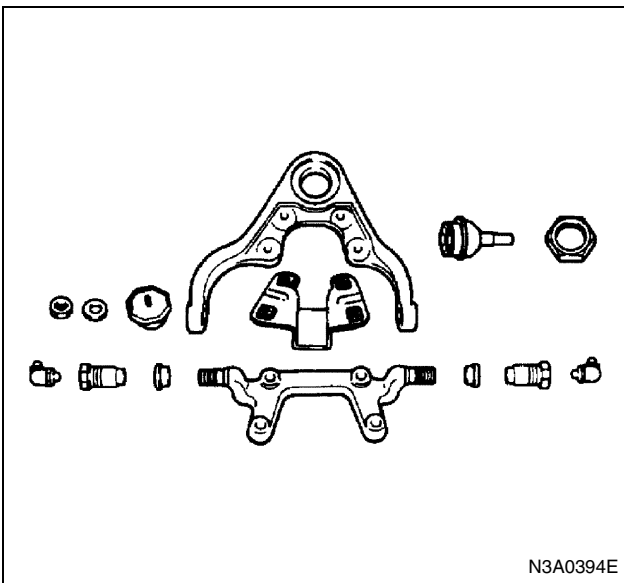
### Tighten:

- Joint ball nut to 206 N·m (21.0 kg·m/152 lb·ft)



### Upper Link Assembly

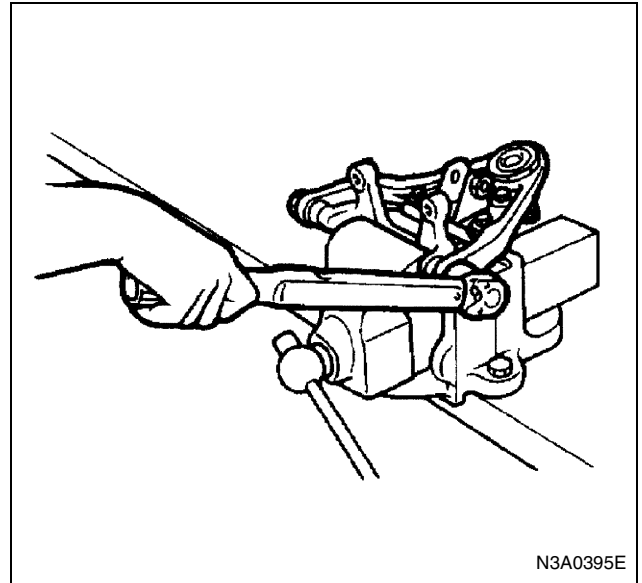
- Disassemble the upper link assembly.
- Inspect the following parts as shown in the figure for wear, damage, bending or any other abnormal conditions.



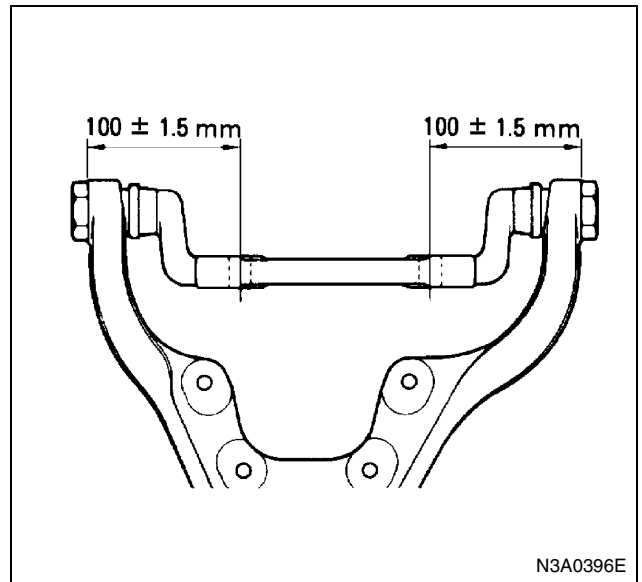
- Reassemble the upper link assembly.
- Apply multi-purpose with MoS<sub>2</sub> grease to the fulcrum pin threads.
- Fill multi-purpose with MoS<sub>2</sub> grease to bushings.
- Install the fulcrum pin to the upper link and tighten bushings to specified torque.

### Tighten:

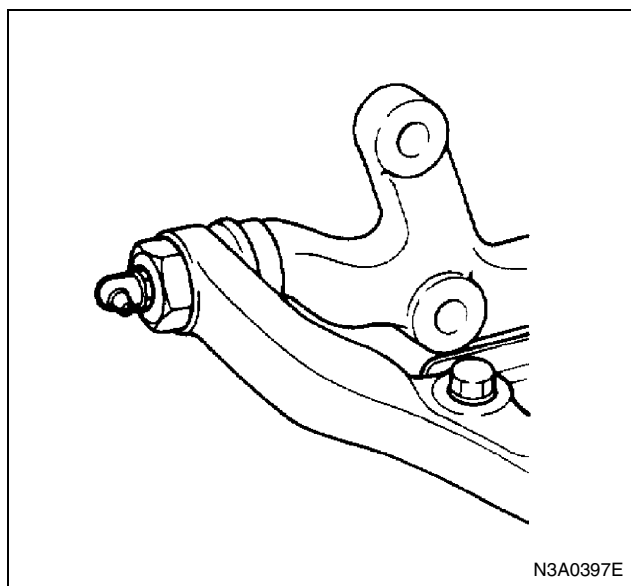
- Bushing to 294 N·m (30 kg·m/217 lb·ft)



- Adjust the fulcrum pin as shown in the figure.



- Install grease fitting to upper link in parallel with upper link.



### Lower Link Bushing Replacement

- Remove the lower link bushing using a bench press and special tool.  
Remover: 5-8840-2367-0
- Inspect the bushing for wear, damage or any other abnormal condition.
- Install the bushing to the lower link from vehicle forward direction.  
Installer: 5-8840-2367-0

### Installation

1. Lower Link
  - Install the lower link fixing bolt from the vehicle forward direction and set the bolt head to the bolt stopper completely.
  - Tighten the nut temporarily.

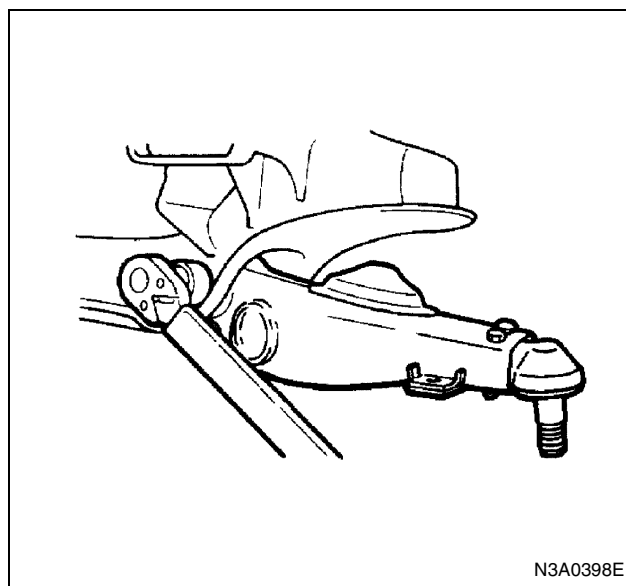
### Notice:

Tighten nuts to specified torque after following steps;

- Park the vehicle on a level ground.
- Move the front of the vehicle up and down several times to settle the suspension.

### Tighten:

- Lower link nut to 579 N·m (59.0 kg·m/427 lb·ft)



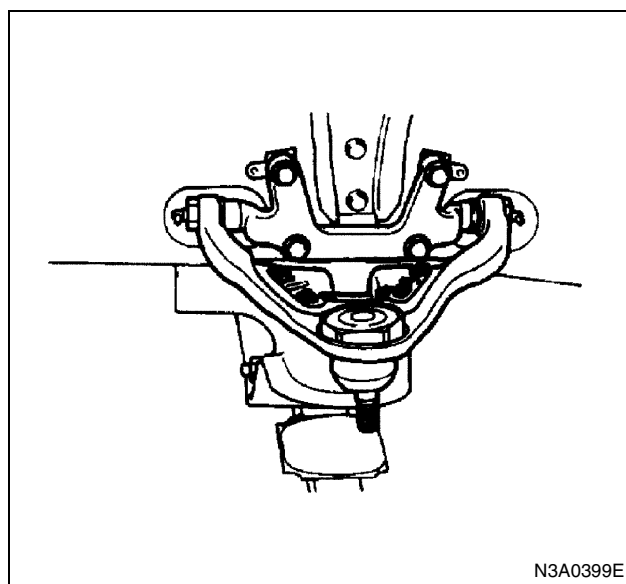
2. Shim
3. Upper Link Assembly
  - Install the shims and upper link assembly.
  - Tighten the fixing bolts to the specified torque.

### Thickness of Shims Available

0.8 mm (0.031 in), 1.6 mm (0.063 in), 3.2 mm (0.126 in)

### Tighten:

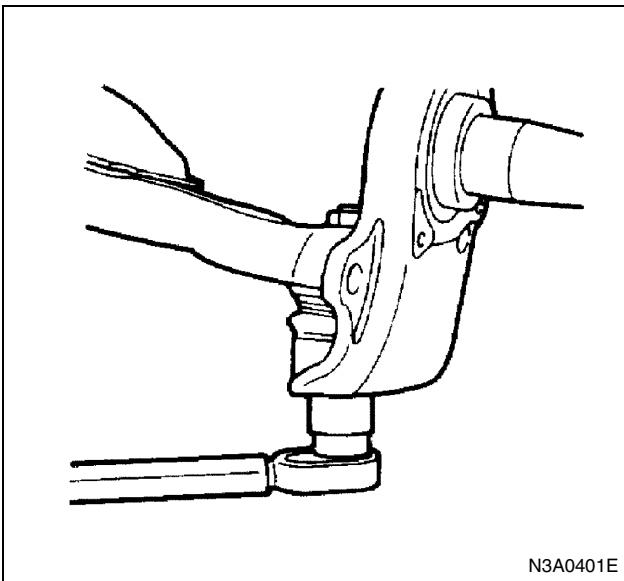
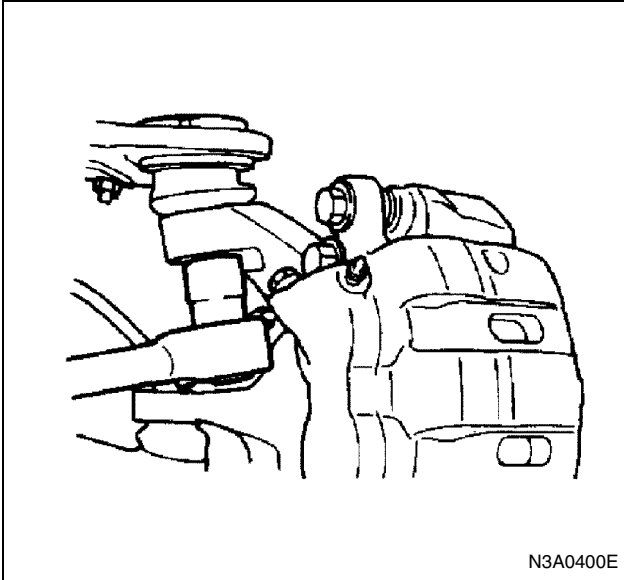
- Upper link bolt to 152 N·m (15.5 kg·m/112 lb·ft)  
For adjustment of camber and caster angle, refer to "Front End Alignment" in Section 3A.



4. Knuckle
  - Connect the upper ball joint, lower ball joint to the knuckle.
  - Tighten the fixing nuts temporarily.
  - After installation of tie rod end and strut bar assembly, tighten fixing nuts to specified torque, with just enough additional torque to align cotter pin holes.  
Install new cotter pin.

**Tighten:**

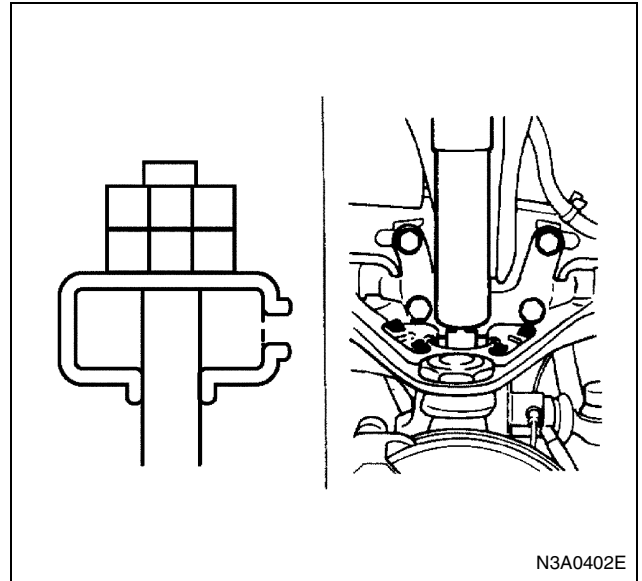
- Ball joint nut to  
Upper: 205 N·m (20.9 kg·m/151 lb·ft)  
Lower: 377 N·m (38.4 kg·m/278 lb·ft)



**5. Shock Absorber Assembly**

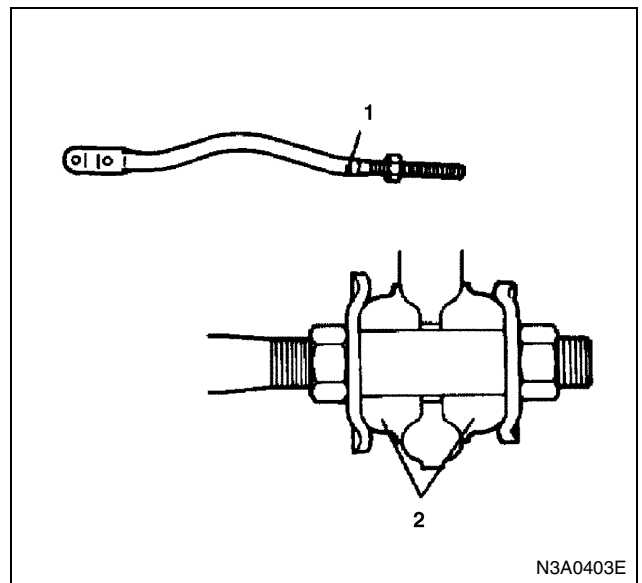
**Tighten:**

- Shock absorber bolt and nut to  
Double nut (upper): 40 N·m (4.1 kg·m/30 lb·ft)  
Double nut (lower): 21 N·m (2.1 kg·m/16 lb·ft)  
Lower: 103 N·m (10.5 kg·m/76 lb·ft)



**6. Strut Bar Assembly**

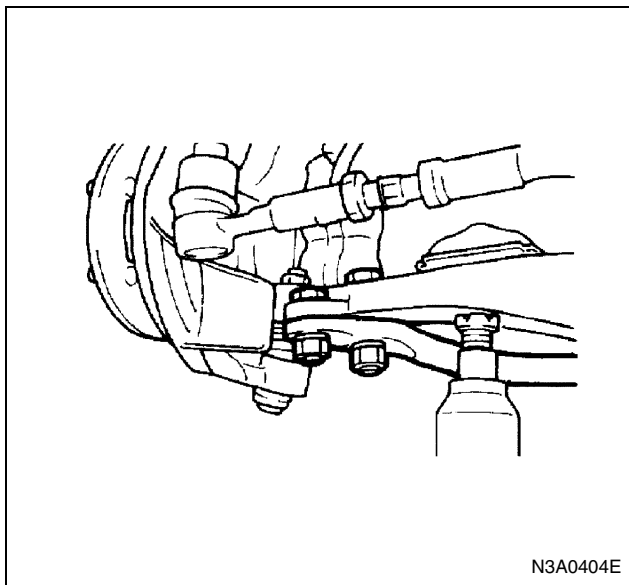
- Install the strut bar assembly.
- White paint (1) is aligned to right side strut bar. Be careful not to install to the opposite side.
- Apply a thin coat of rubber grease to inside of the rubber bushing (2).
- Tighten the rear side fixing nuts temporarily.



- Tighten the lower link side fixing bolts to specified torque.

**Tighten:**

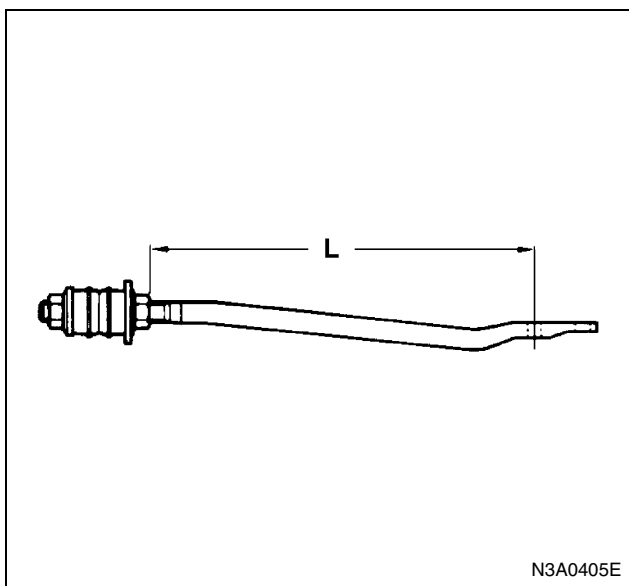
- Strut bar bolt and nut to 219 N·m (22.3 kg·m/161 lb·ft)



- Adjust the strut bar length (L) after installation.

## Strut Bar Length (L)

485.0 mm (19.095 in)



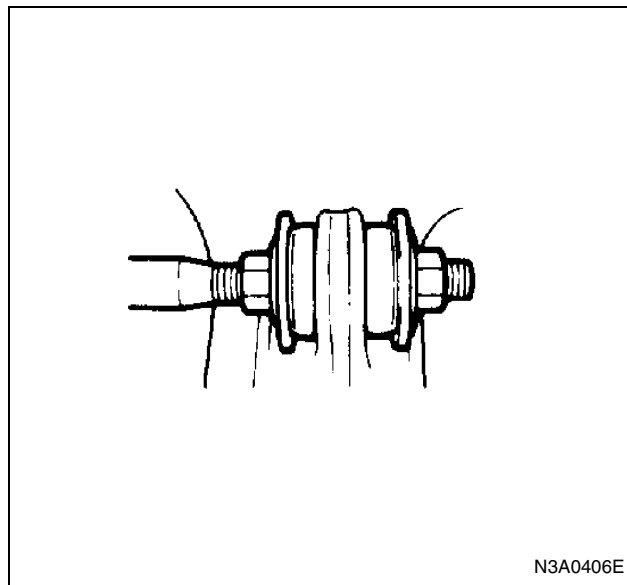
## Notice:

Tighten nuts to specified torque after following steps;

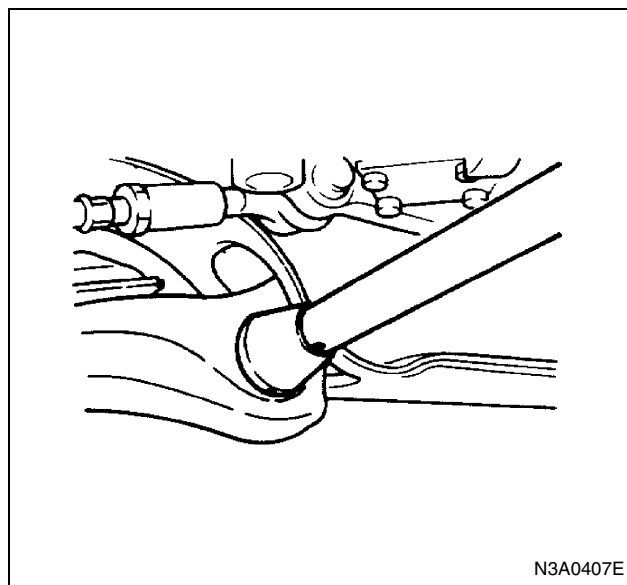
- Park the vehicle on a level ground.
- Move the front of the vehicle up and down several times to settle the suspension.

## Tighten:

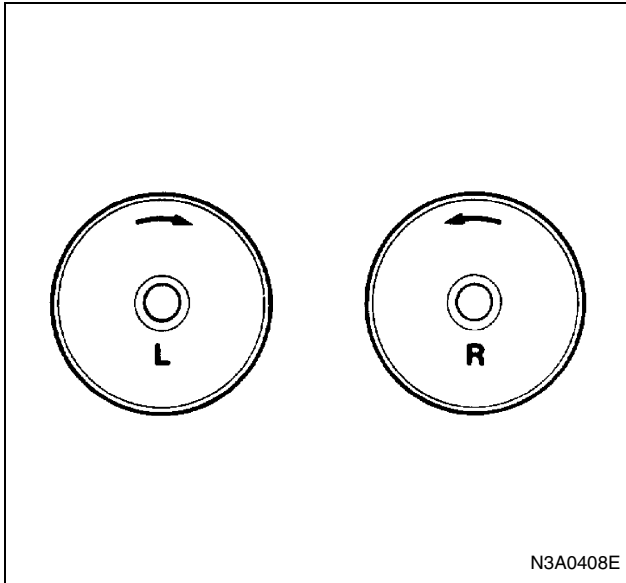
- Strut bar nut to 235 N·m (24 kg·m/174 lb·ft)



7. Torsion Bar
8. End Piece
9. Height Control Arm
10. Adjusting Bolt
  - Apply chassis type grease to serrated portions of torsion bar, lower arms, threaded portion of end piece.
  - Make sure the bars are on their correct respective sides.



- Align the setting marks applied at removal.



- Tighten adjusting bolts to the original portion temporarily.
- Install the outer track rod end to the knuckle. Tighten nuts to specified torque, with just enough additional torque to align cotter pin holes. Install new cotter pin.

**Tighten:**

- Tie rod end nut to 108 N·m (11 kg·m/80 lb·ft)
  - Park the vehicle on a level ground.
  - Move the front of the vehicle up and down several times to settle the suspension.
  - Tighten temporarily tightening bolts and nuts to specified torque.
  - Install the hub and rotor assembly. Refer to "Front Axle".
  - Install the brake caliper assembly. Refer to "Hydraulic Brakes".

**Tighten:**

- Brake caliper bolt to 219 N·m (22.3 kg·m/161 lb·ft)
  - Install front wheel and tire assembly. Refer to "Wheels and Tires" in Section 3E.
  - Adjust the trim height.

**Notice:**

Adjust the front end alignment. Refer to "Front End Alignment".

Bleed brakes. Refer to "Brake Bleeding".

**Adjustment of Trim Height**

Adjust the trim height by means of adjusting bolt on the height control arms.

**Caution:**

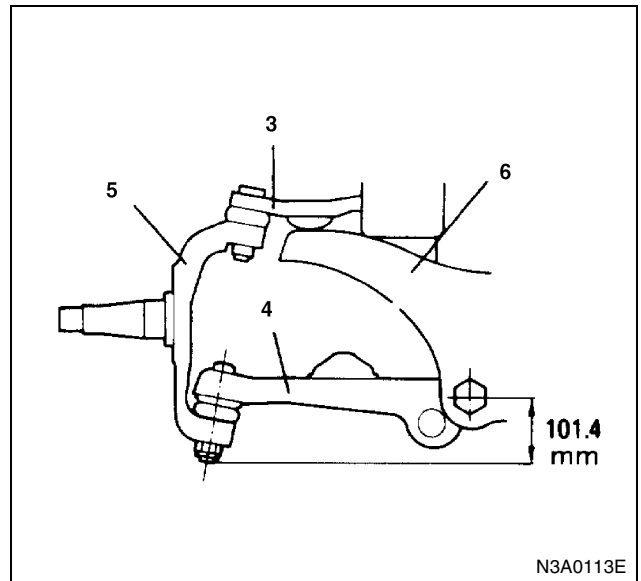
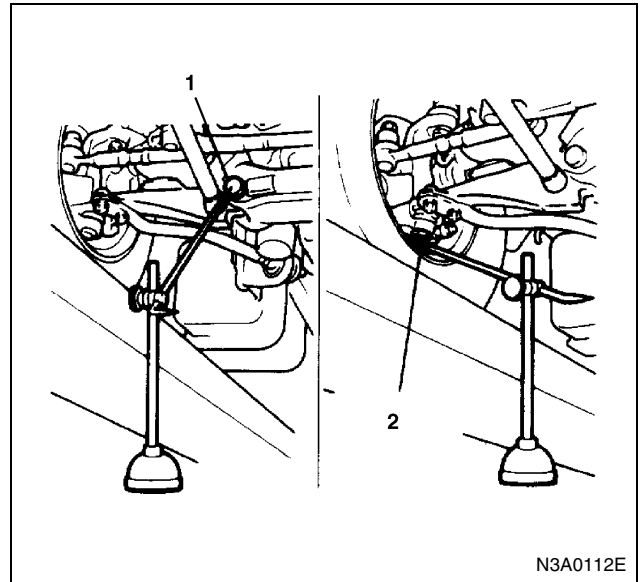
When adjusting front end alignment, be sure to begin with trim height as trim height adjustment may change other adjusted alignments.

1. Check and adjust the tire inflation pressures.

2. Park the vehicle on a level ground and move the front of the vehicle up and down several times to settle the suspension.
3. Make necessary adjustment with the adjusting bolt on the height control arms.

**Trim Height**

101.4±5 mm (3.992±0.197 in)



**Legend**

1. Lower link bolt
2. Lower joint ball
3. Upper link
4. Lower link
5. Knuckle arm
6. Cross member