

SUSPENSION

FRONT SUSPENSION

CONTENTS

Service Precaution	3C-1	Upper Control Arm	3C-13
General Description	3C-2	Upper Control Arm and Associated Parts . .	3C-13
Diagnosis	3C-2	Removal	3C-13
Shock Absorber	3C-6	Inspection and Repair	3C-14
Shock Absorber and Associated Parts	3C-6	Installation	3C-14
Removal	3C-6	Lower Control Arm	3C-16
Inspection and Repair	3C-6	Lower Control Arm and Associated Parts . .	3C-16
Installation	3C-6	Removal	3C-16
Stabilizer Bar	3C-7	Inspection and Repair	3C-17
Stabilizer Bar and Associated Parts	3C-7	Installation	3C-18
Removal	3C-7	Upper Ball Joint	3C-19
Inspection and Repair	3C-7	Upper Ball Joint and Associated Parts . . .	3C-19
Installation	3C-7	Removal	3C-19
Torsion Bar	3C-8	Inspection and Repair	3C-20
Torsion Bar and Associated Parts	3C-8	Installation	3C-20
Removal	3C-8	Lower Ball Joint	3C-21
Inspection and Repair	3C-9	Lower Ball Joint and Associated Parts . . .	3C-21
Installation	3C-9	Removal	3C-21
Knuckle	3C-11	Inspection and Repair	3C-22
Knuckle and Associated Parts	3C-11	Installation	3C-22
Removal	3C-11	Main Data and Specifications	3C-23
Inspection and Repair	3C-12	Special Tools	3C-24
Installation	3C-12		

Service Precaution

WARNING: THIS VEHICLE HAS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). REFER TO THE SRS COMPONENT AND WIRING LOCATION VIEW IN ORDER TO DETERMINE WHETHER YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING. WHEN YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING, REFER TO THE SRS SERVICE INFORMATION. FAILURE TO FOLLOW WARNINGS COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY, OR OTHERWISE UNNEEDED SRS SYSTEM REPAIRS.

CAUTION: Always use the correct fastener in the proper location. When you replace a fastener, use **ONLY** the exact part number for that application. ISUZU will call out those fasteners that require a replacement after removal. ISUZU will also call out the fasteners that require thread lockers or thread sealant. **UNLESS OTHERWISE SPECIFIED**, do not use supplemental coatings (Paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener. When you install fasteners, use the correct tightening sequence and specifications. Following these instructions can help you avoid damage to parts and systems.

3C-2 FRONT SUSPENSION

General Description

The front suspension is designed to allow each wheel to compensate for changes in the road surface level without greatly affecting the opposite wheel. Each wheel is independently connected to the frame by a steering knuckle, ball joint assemblies, and upper and lower control arms. The front wheels are held in proper relationship to each other by two tie-rods which are connected to steering arms on the knuckles, and to a steering unit.

All models have a front suspension system consisting of control arms, stabilizer bar, shock absorber and a torsion bar. The front end of the torsion bar is attached to the lower control arm. The rear of the torsion bar is mounted into a height control arm at the crossmember. Vehicle trim height is controlled by adjusting this arm. Shock absorbers are mounted between the brackets on

the frame and the lower control arms. The lower portion of each shock absorber is attached to the lower control arm. The upper portion of each shock absorber extends through a frame bracket and is secured with two rubber bushings, two retainers and a nut.

Ball joint assemblies are bolted to the outer end of the upper and lower control arm and are attached to the steering knuckle.

The inner ends of the upper control arm have pressed in bushings. Bolts, passing through the bushing, attach the control arm to the frame. The inner ends of the lower control arm are attached to the frame by bolts passing through the bushings.

Side roll of the front suspension is controlled by a spring steel stabilizer bar. It is mounted in rubber bushings, which are held to the frame by brackets. The ends of the stabilizer bar are connected to the lower control arms by links.

Diagnosis

Condition	Possible cause	Correction
Vehicle Pulls	Mismatched or uneven tires.	Replace tire.
	Tires not adequately inflated.	Adjust tire pressure.
	Broken or sagging springs.	Replace spring.
	Radial tire lateral force.	Replace tire.
	Improper wheel alignment.	Adjust wheel alignment.
	Brake dragging in one wheel.	Repair brake.
	Loose, bent or broken front or rear suspension parts.	Tighten or replace the appropriate suspension part(s).
	Faulty shock absorbers.	Replace shock absorber.
	Parts in power steering valve defective.	Replace power steering unit.
Abnormal or Excessive Tire Wear	Sagging or broken spring.	Replace spring.
	Tire out of balance.	Balance or replace tire.
	Improper wheel alignment.	Check front end alignment.
	Faulty shock absorber.	Replace shock absorber.
	Hard driving.	Replace tire.
	Overloaded vehicle.	Replace tire and reduce load.
	Tires not rotated periodically.	Replace or rotate tire.
	Worn or loose road hub unit bearings.	Replace hub unit bearing.
	Wobbly wheel or tires.	Replace wheel or tire.
	Tires not adequately inflated.	Adjust the pressure.
Wheel Hop	Blister or bump on tire.	Replace tire.
	Improper shock absorber operation.	Replace shock absorber.

Condition	Possible cause	Correction
Shimmy, Shake or Vibration	Tire or wheel out of balance.	Balance wheels or replace tire/or wheel.
	Loose hub unit bearings.	Replace hub unit bearing.
	Worn steering linkage ball joints.	Replace ball joints.
	Worn upper or lower end ball joints.	Replace ball joints.
	Excessive wheel runout.	Repair or replace wheel and/or tire.
	Blister or bump on tire.	Replace tire.
	Excessive loaded radial runout of tire/wheel assembly.	Replace tire or wheel.
	Improper wheel alignment.	Check wheel alignment.
	Loose or worn steering linkage.	Tighten or replace steering linkage.
	Loose steering unit.	Tighten steering unit.
	Tires not adequately inflated.	Adjust tire pressure.
	Loose, bent or broken front or rear suspension parts.	Tighten or replace the appropriate suspension parts.
	Faulty shock absorber.	Replace shock absorber.
	Parts in power steering valve defective.	Replace power steering unit.
Hard Steering	Bind in steering linkage ball studs, upper or lower ball joint.	Replace ball joint.
	Improper wheel alignment.	Check wheel alignment.
	Tire not adequately inflated.	Inflate tires to proper pressure.
	Bind in steering column or shaft.	Repair or replace.
	Improper power steering system operation.	Repair or replace. Refer to <i>Steering</i> section.
Too Much Play In Steering	Hab unit bearings worn.	Replace hub unit bearings.
	Loose steering unit or linkage.	Retighten or repair.
	Worn or loose steering shaft universal joint.	Retighten or replace steering shaft.
	Worn steering linkage ball joints.	Replace ball joints.
	Worn upper or lower end ball joints.	Replace ball joints.
Poor Steering Wheel Returnability	Bind in steering linkage ball joints.	Replace ball joints.
	Bind in upper or lower ball joints.	Replace ball joints.
	Bind in steering column and shaft.	Repair or replace.
	Bind in steering gear.	Check and repair steering gear.
	Improper wheel alignment.	Adjust wheel alignment.
	Tires not adequately inflated.	Adjust pressure.
	Loose steering wheel nut.	Retighten.
	Worn hab unit bearing.	Replace.
	Misassemble Transfer Gear ASM	Reassemble Transfer Gear to proper portion

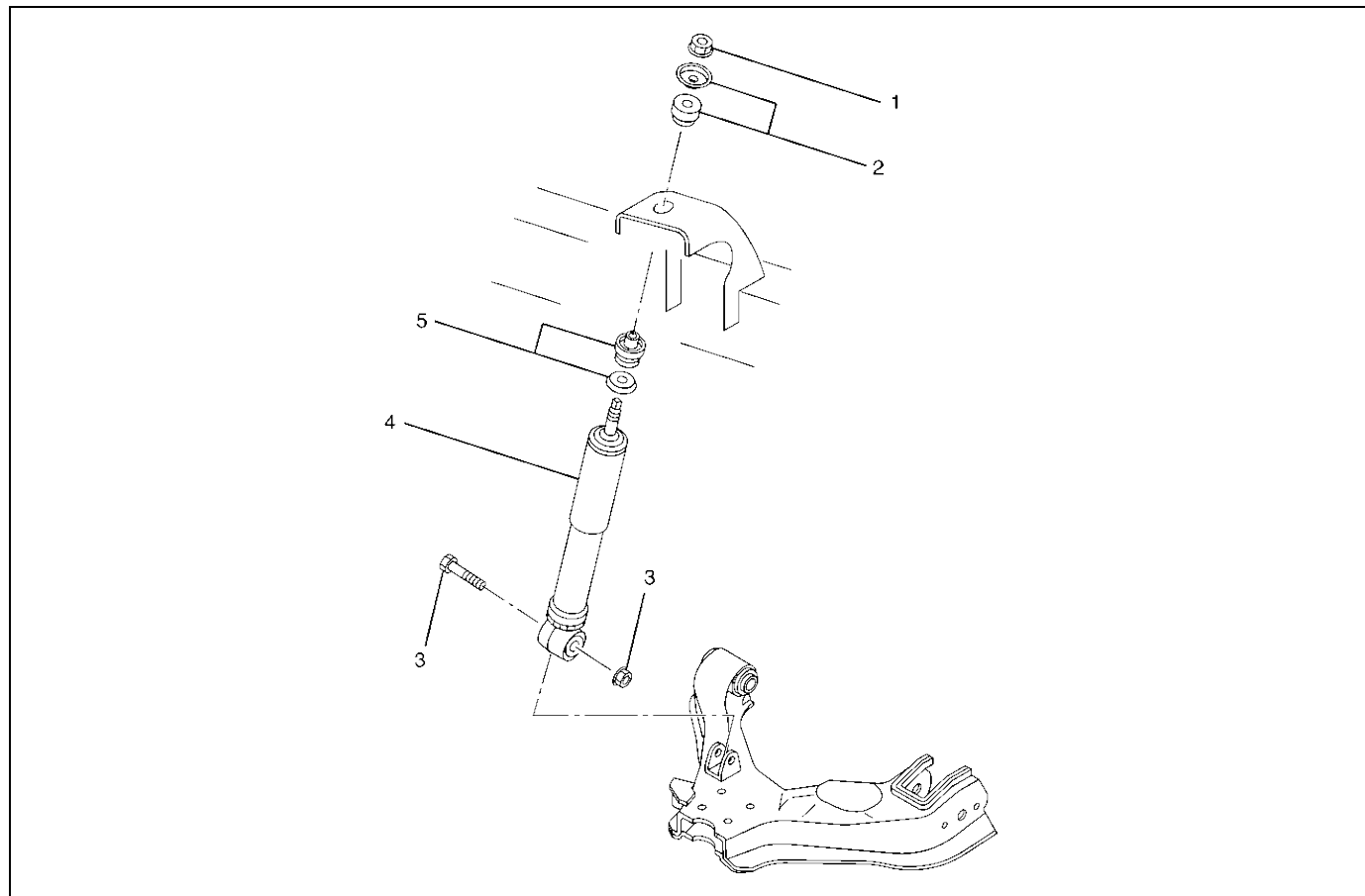
3C-4 FRONT SUSPENSION

Condition	Possible cause	Correction
Abnormal Noise	Worn, sticky or loose upper or lower ball joint, steering linkage ball joints or drive axle joints.	Replace.
	Faulty shock absorbers.	Replace.
	Worn upper or lower control arm bushing.	Replace.
	Loose stabilizer bar.	Retighten bolts or replace bushings.
	Loose wheel nuts.	Tighten nuts. Check for elongated wheel nut holes. Replace wheel if required.
	Loose suspension bolts or nuts.	Retighten suspension bolts or nuts.
	Broken or otherwise damaged hub unit bearings.	Replace hub unit bearing.
	Broken suspension springs.	Replace spring.
	Loose steering unit.	Retighten mounting bolt.
	Faulty steering unit.	Replace steering unit.
Wandering or Poor Steering Stability	Mismatched or unevenly worn tires.	Replace tire or inflate tires to proper pressure.
	Loose steering linkage ball joints.	Replace ball joints.
	Faulty shock absorbers.	Replace shock absorber.
	Loose stabilizer bar.	Tighten or replace stabilizer bar or bushings.
	Broken or sagging springs.	Replace spring (pairs).
	Improper wheel alignment.	Adjust wheel alignment.
Erratic Steering When Braking	Worn hub unit bearings.	Replace hub unit bearings.
	Broken or sagging springs.	Replace spring (pairs).
	Leaking caliper.	Repair or replace caliper.
	Warped discs.	Replace brake disc.
	Badly worn brake pads.	Replace brake pads.
	Tires are inflated unequally.	Inflate tires to proper pressure.
Low or Uneven Trim Height	Broken or sagging springs.	Replace springs (In pairs).
	Vehicle overloaded.	Reduce load.
	Incorrect springs.	Adjust or replace torsion bar.
	Trim Height out of spec	Adjust trim Height
Suspension Bottoms	Vehicle overloaded.	Reduce load.
	Faulty shock absorber.	Replace shock absorber.
	Incorrect, broken or sagging springs.	Replace springs.
Body Leans	Trim Height out of spec	Adjust trim Height
	Loose stabilizer bar.	Tighten stabilizer bar bolts or replace bushings.
	Faulty shock absorber, struts or mounting.	Replace shock absorber.
	Broken or sagging springs.	Replace springs (In pairs).
	Vehicle overloaded.	Reduce load.

Condition	Possible cause	Correction
Cupped Tires	Worn hub unit bearings.	Replace hub unit bearing.
	Excessive tire or wheel run out.	Replace tire or wheel.
	Worn ball joints.	Replace ball joints.
	Tire out of balance.	Adjust tire balance.

Shock Absorber

Shock Absorber and Associated Parts



Legend

(1) Nut

(2) Rubber Bushing and Washer

(3) Bolt and Nut

(4) Shock Absorber

(5) Rubber Bushing and Washer

Removal

1. Raise the vehicle and support it with suitable safety stands.
2. Remove wheel and tire assembly. Refer to *Wheel Replacement* in this section.
3. Remove bolt and nut.
4. Remove nut.
5. Remove rubber bushing and washer.
6. Remove shock absorber.
7. Remove rubber bushing and washer.

Installation

1. Install rubber bushing and washer.
2. Install shock absorber.
3. Install rubber bushing and washer.
4. Install nut, then tighten it to the specified torque.

Torque: 20N·m (14lb ft)

5. Install bolt and nut, then tighten to the specified torque.

Torque: 93N·m (69lb ft)

Inspection and Repair

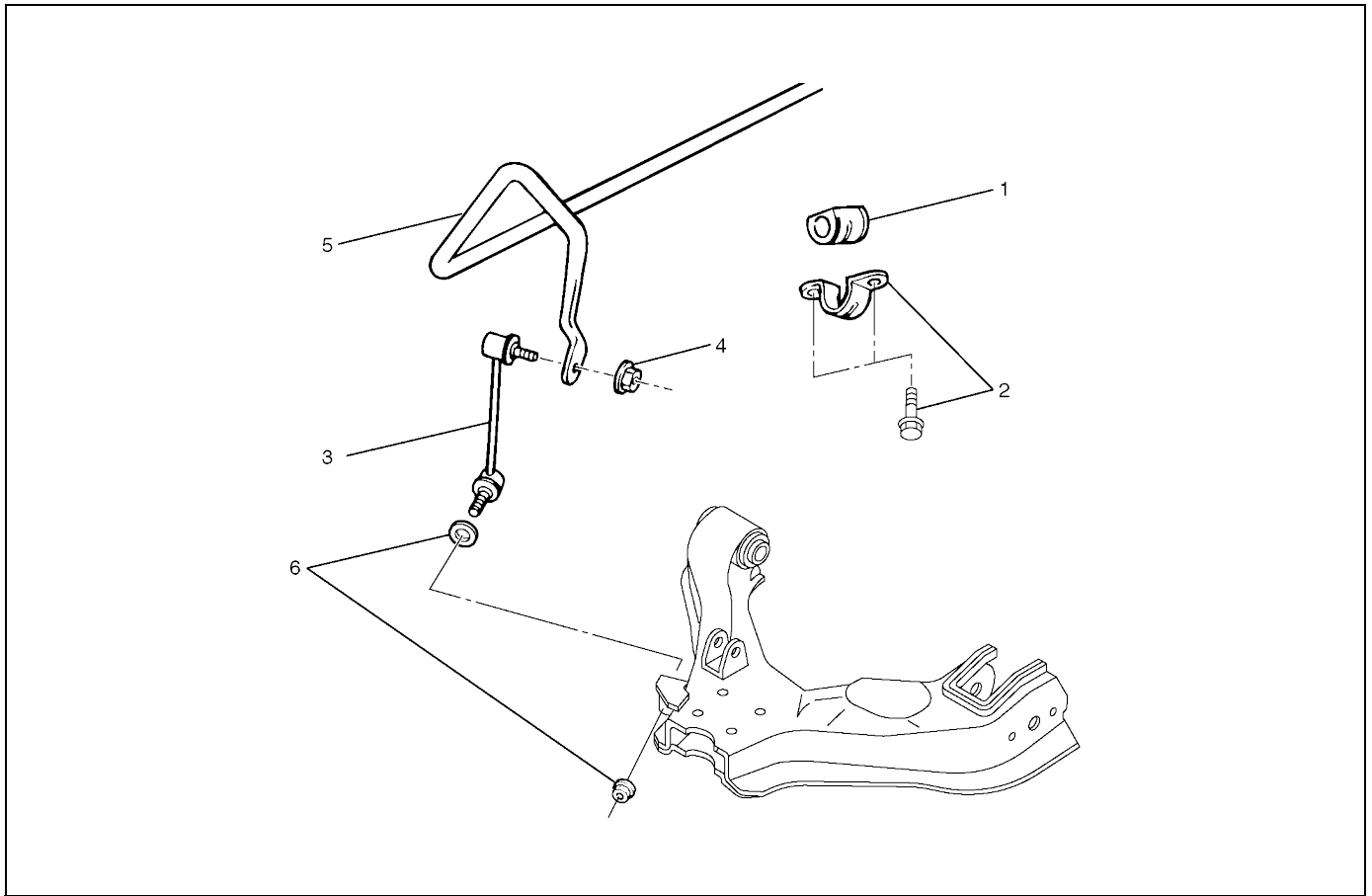
Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection.

Check the following parts :

- Shock absorber
- Rubber bushing

Stabilizer Bar

Stabilizer Bar and Associated Parts



410R100001

Legend

- (1) Rubber Bushing
- (2) Bracket and Bolt
- (3) Link

- (4) Nut
- (5) Stabilizer Bar
- (6) Nut and Washer

Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove the stone guard.
3. Remove wheel and tire assembly. Refer to *Wheel Replacement* in this section.
4. Remove nut (4) and (6).

CAUTION: Be careful not to break the ball joint boot.

5. Remove link.
6. Remove bracket.
7. Remove stabilizer bar.
8. Remove rubber bushing.

Inspection and Repair

Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are

found through inspection.
Check the following parts :

- Stabilizer bar
- Rubber bushing
- Link ball joint

Installation

1. Install rubber bushing.
2. Install stabilizer bar.
3. Install bracket and bolt, then tighten it to the specified torque.

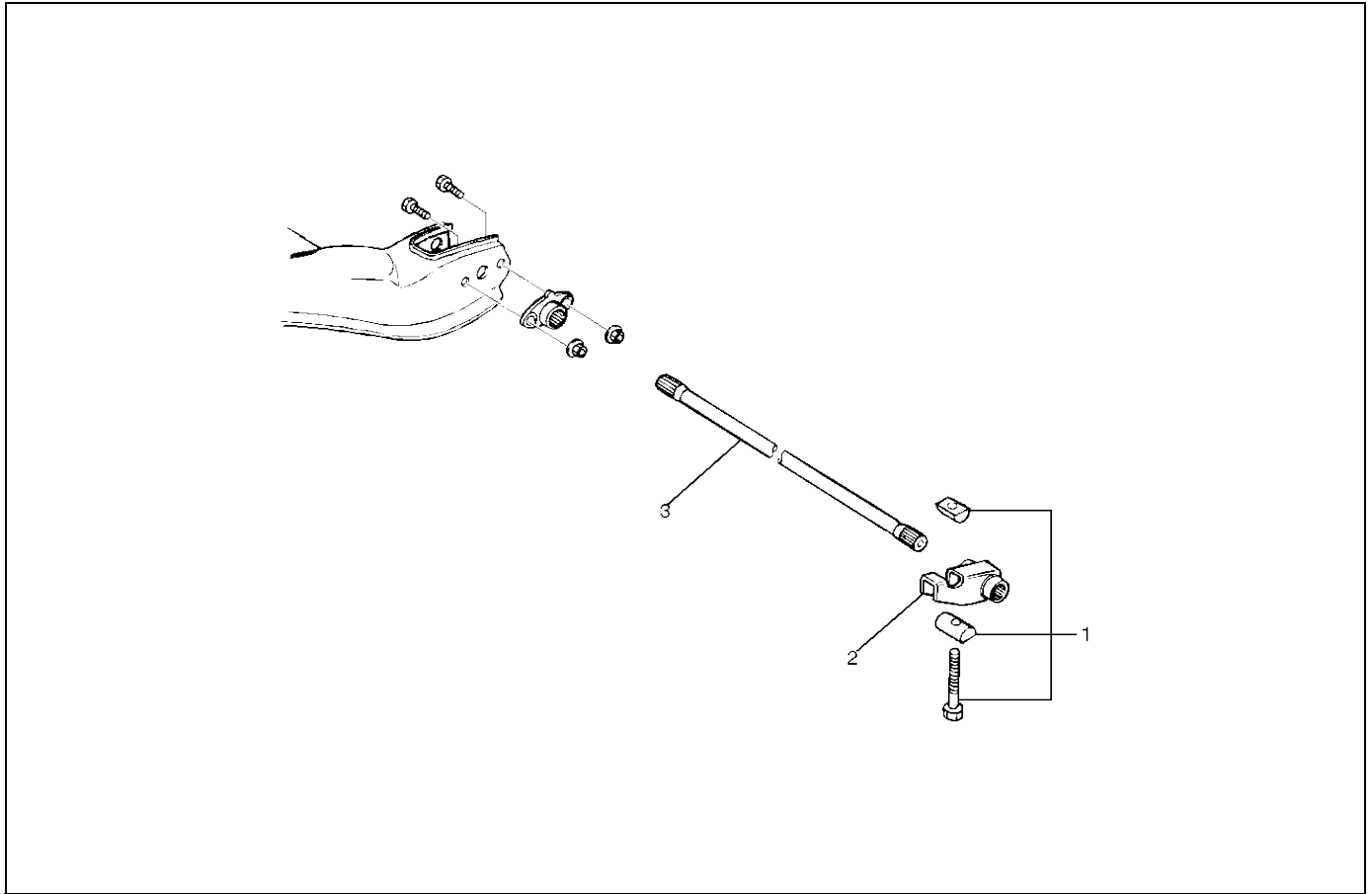
Torque: 25N·m (18lb ft)

4. Install link.
5. Install nut (4),(6) and washer, then tighten it to the specified torque.

Torque: 50N·m (37lb ft)

Torsion Bar

Torsion Bar and Associated Parts



410RS003

Legend

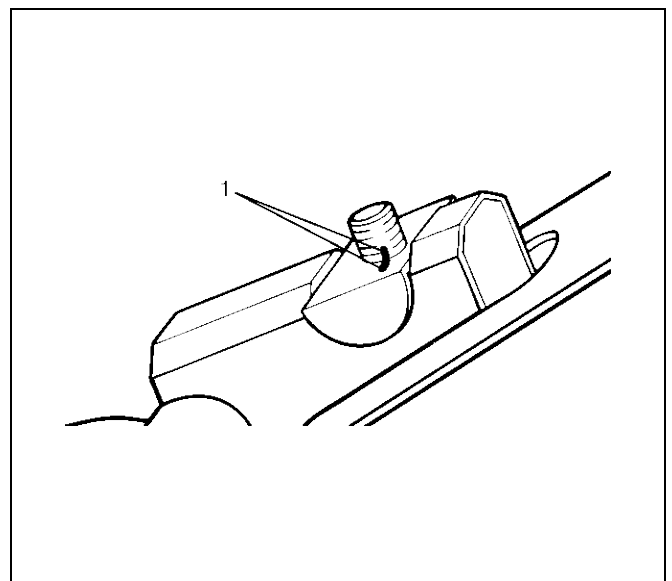
(1) Adjust Bolt, End Piece and Seat

(2) Height Control Arm

(3) Torsion Bar

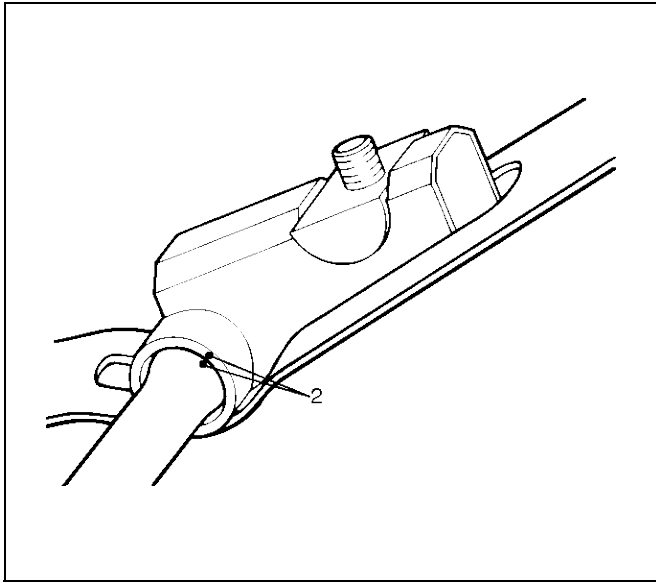
Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Apply the setting marks(1) to the adjust bolt and end piece, then remove adjust bolt, end piece and seat.



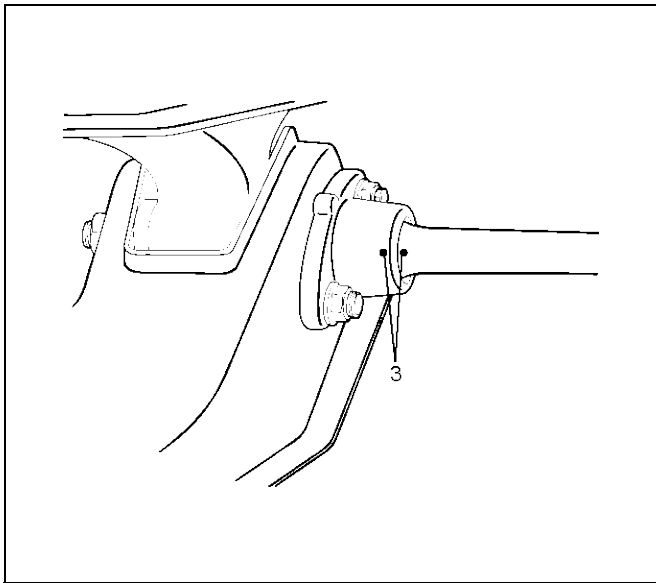
410RS004

3. Apply the setting marks(2) to the height control arm and torsion bar, then remove height control arm.



410RS005

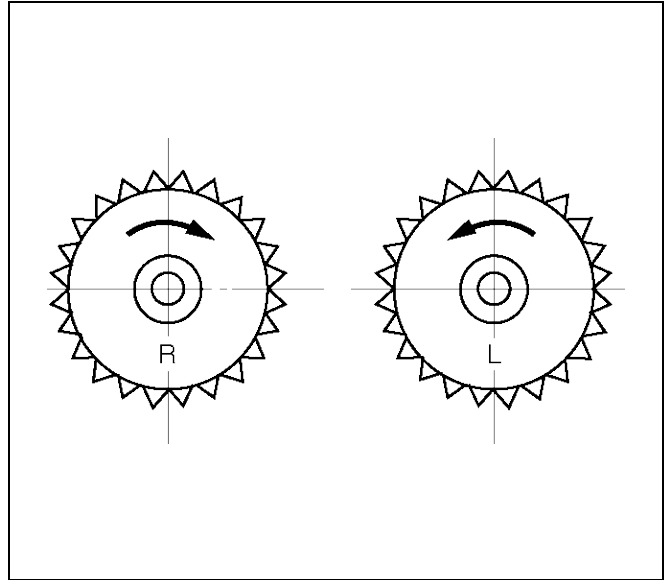
4. Apply the setting marks(3) to the torsion bar and lower control arm, then remove torsion bar.



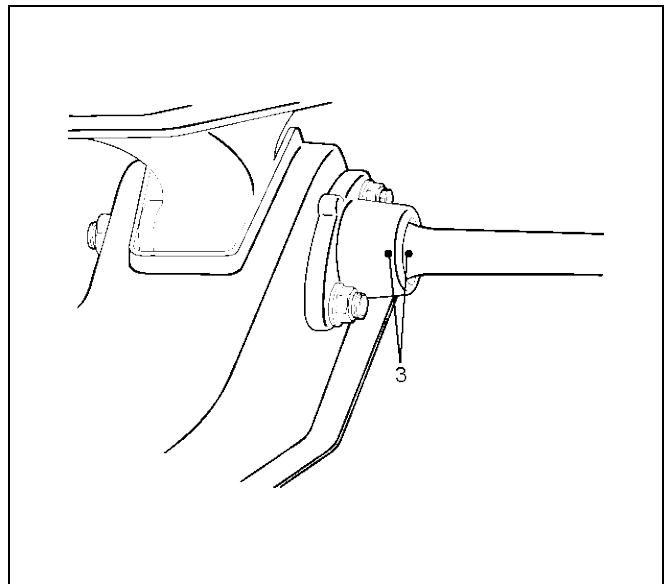
410RS006

Installation

1. Apply grease to the serrated portions, then install torsion bar. Make sure the bars are on their correct respective sides and align the setting marks(3).



410RS007



410RS008

Inspection and Repair

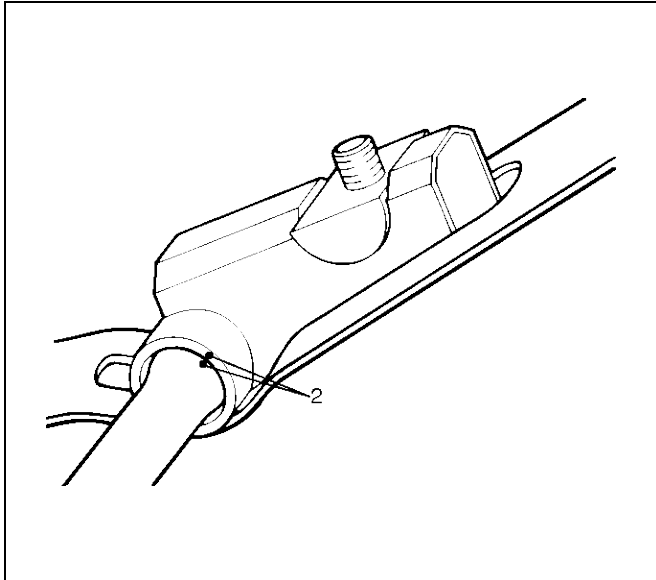
Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection.

Check the following parts:

- Torsion bar
- Height control arm
- Adjust bolt
- Rubber seat

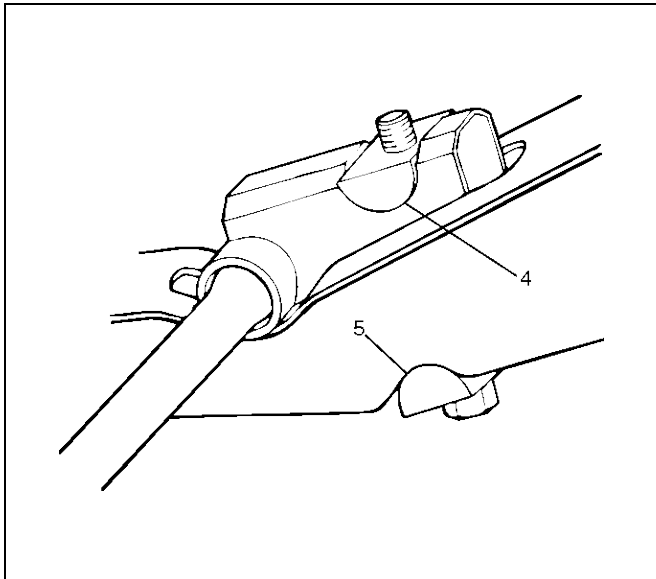
3C-10 FRONT SUSPENSION

2. Apply grease to the portion that fits into the bracket then install height control arm and align the setting marks(2).



410RS005

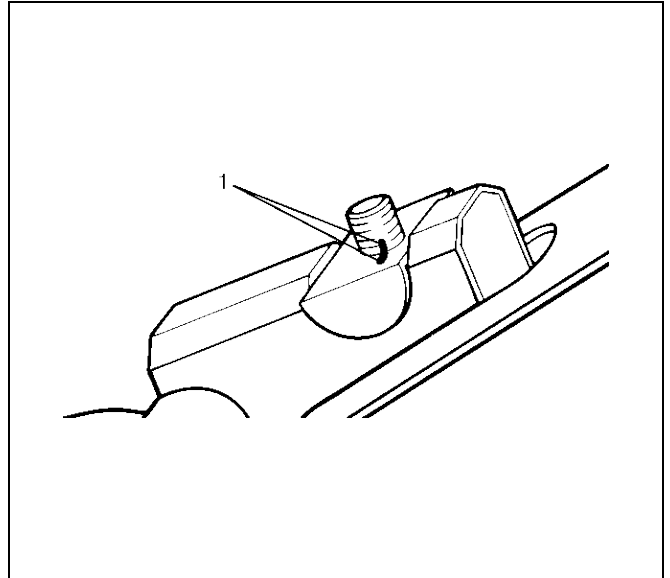
3. Apply grease to the bolt portion of the end piece(4). Apply grease to the portion of the seat(5) that fits into the bracket.



410RS008

4. Apply grease to the serrated portions.
5. Install adjust bolt and seat, then turn the adjust bolt to the setting mark(1) applied during disassembly.

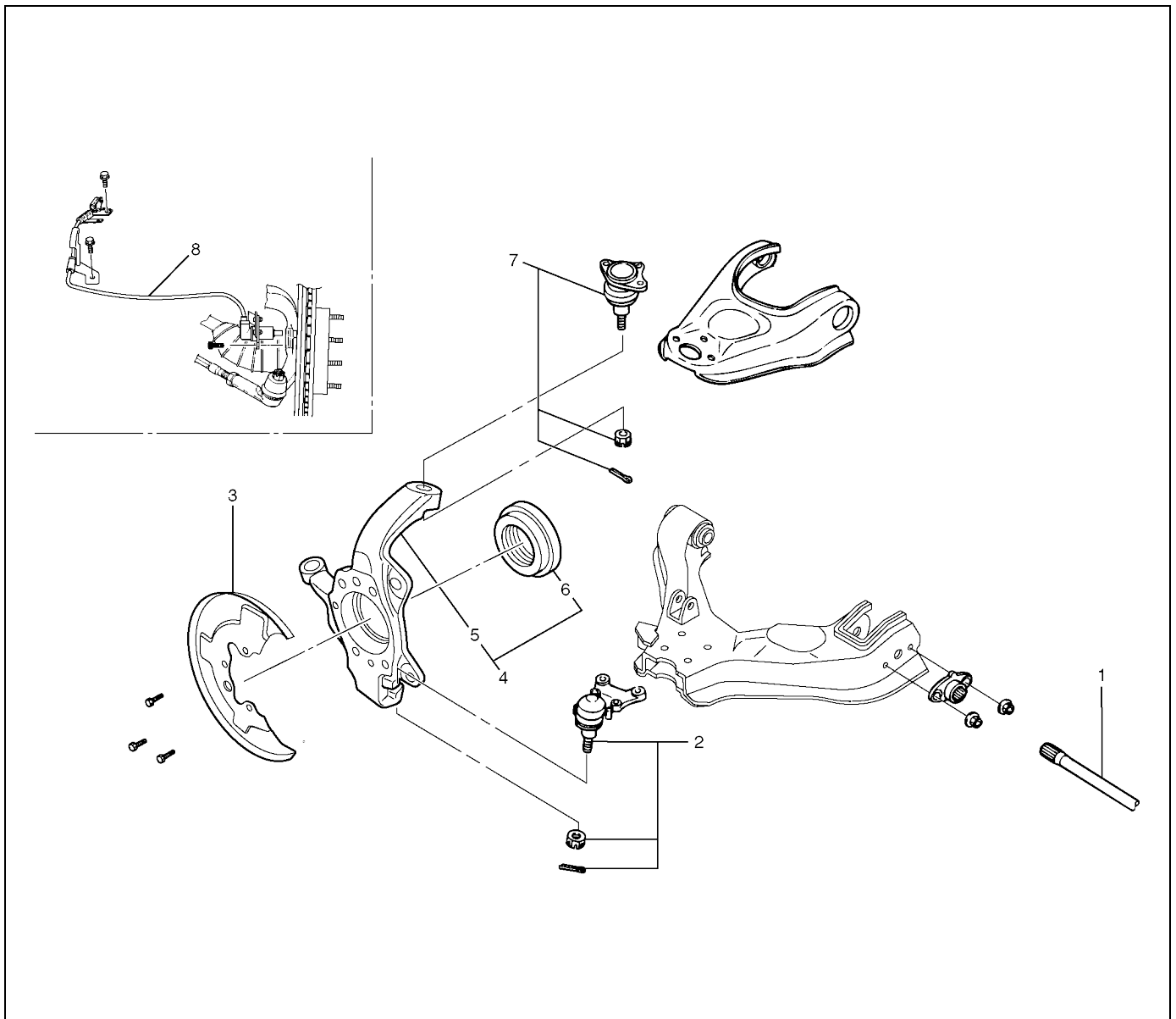
NOTE: Adjust the trim height. Refer to *Front End Alignment Inspection and Adjustment in Steering* section.



410RS004

Knuckle

Knuckle and Associated Parts



410R200002

Legend

- | | |
|--|--|
| (1) Torsion Bar | (5) Knuckle |
| (2) Lower Ball Joint, Nut and cotter Pin | (6) Oil Seal |
| (3) Back Plate | (7) Upper Ball Joint, Nut and cotter Pin |
| (4) Knuckle Assembly | (8) Wheel Speed Sensor |

Removal

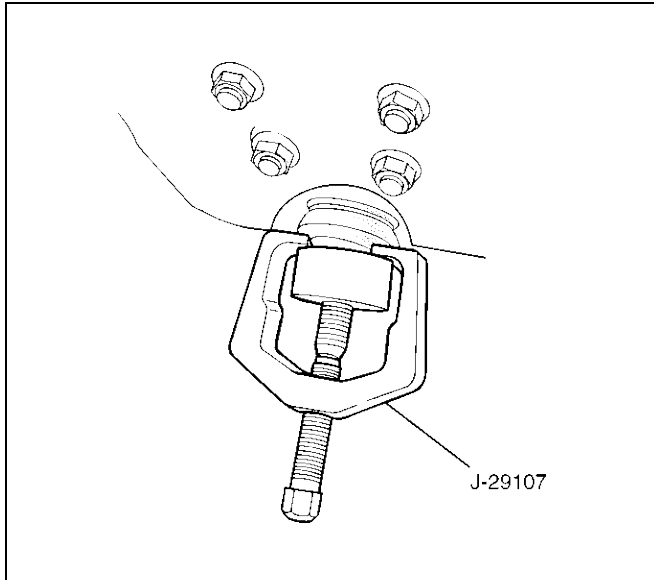
1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove wheel and tire assembly. Refer to *Wheel* in this section.
3. Remove the brake caliper. Refer to *Disc Brakes in Brake* section.
4. Remove the disk rotor. Refer to *Disk Brakes in Brake* section.
5. Remove the hub assembly. Refer to *Front Hub and Disk* in this section.
6. Remove tie-rod end from the knuckle. Refer to *Power Steering Unit in Steering* section.
7. Remove the speed sensor from the knuckle.
8. Loosen torsion bar by height control arm adjust bolt, then remove torsion bar. Refer to *Torsion Bar* in this section.
9. Remove wheel speed sensor.

3C-12 FRONT SUSPENSION

10. Remove back plate.

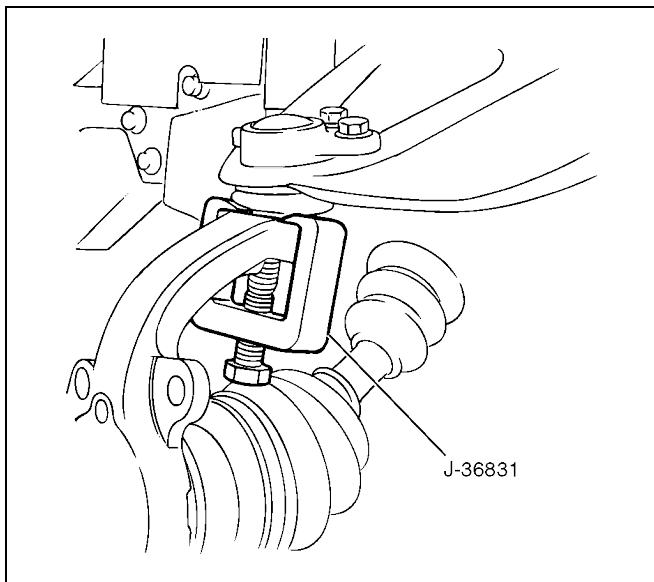
11. Remove lower ball joint by using remover J-29107.

CAUTION: Be careful not to damage the ball joint boot.



12. Remove upper ball joint by using remover J-36831.

CAUTION: Be careful not to damage the ball joint boot.



13. Remove knuckle assembly.

14. Remove oil seal (Except 2WD model).

Inspection and Repair

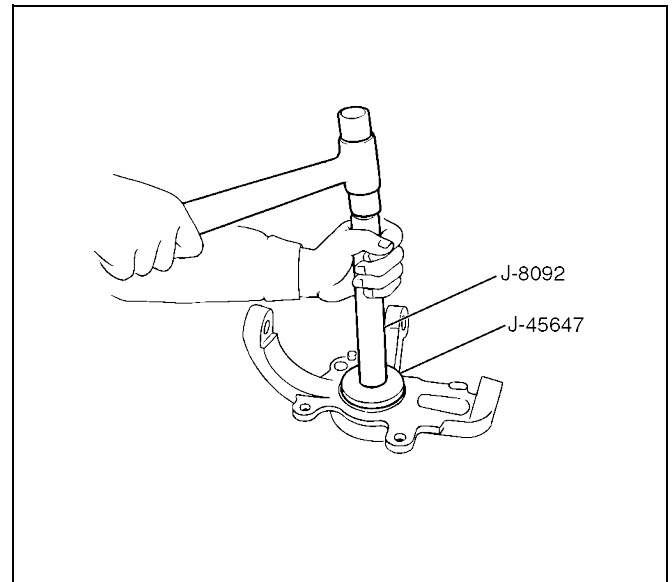
Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection.

Check the following parts:

- Knuckle
- Knuckle arm

Installation

1. Use a new oil seal, and apply multipurpose type grease to the area surrounded by the lip (approx. 2 g). Then use installer J-45647 and J-8092 to install oil seal. After fitting the oil seal to the installer, drive it to the knuckle using a hammer or bench press (Except 2WD model).



2. Install knuckle assembly.
3. Install upper ball joint and tighten the nut to the specified torque, with just enough additional torque to align cotter pin holes. Install new cotter pin.

Torque: 98N·m (72lbft)

4. Install lower ball joint and tighten the nut to the specified torque, with just enough additional torque to align cotter pin holes. Install new cotter pin.

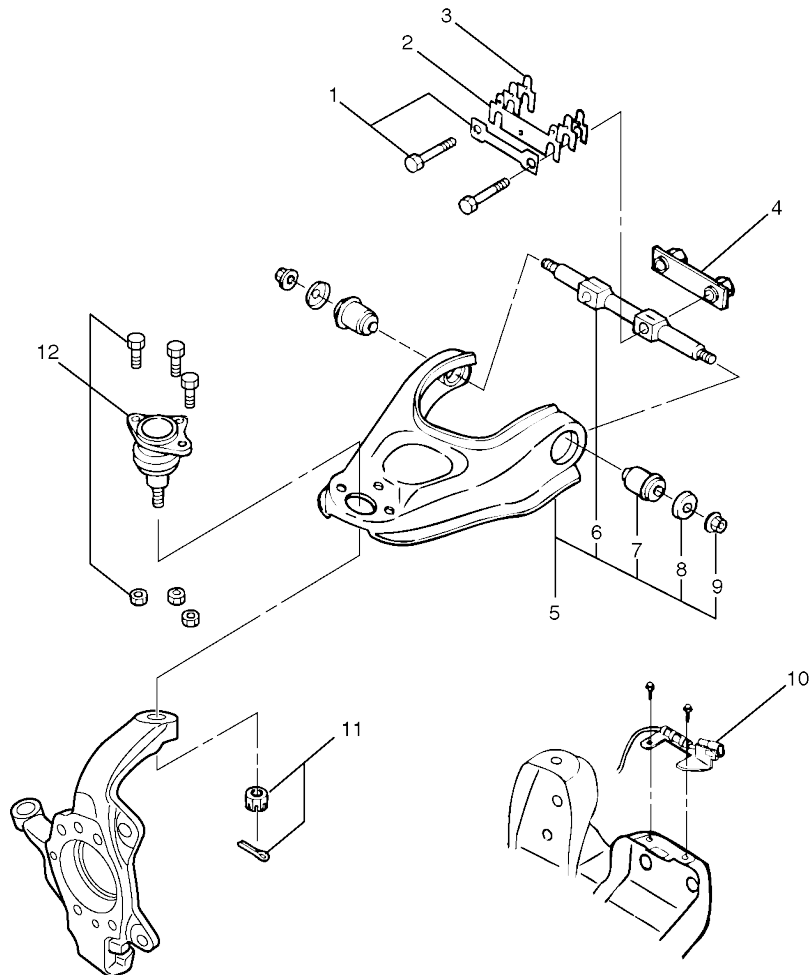
Torque: 147N·m (108lbft)

5. Install back plate.
6. Install wheel speed sensor.
7. Install torsion bar, refer to *Torsion Bar* in this section.

NOTE: Adjust the trim height. Refer to *Front End Alignment Inspection and Adjustment in Steering*.

Upper Control Arm

Upper Control Arm and Associated Parts



450R200005

Legend

- | | |
|--------------------------------|-------------------------------------|
| (1) Bolt and Plate | (7) Bushing |
| (2) Camber Shims | (8) Plate |
| (3) Caster Shims | (9) Nut |
| (4) Nut Assembly | (10) Speed Sensor Cable |
| (5) Upper Control Arm Assembly | (11) Nut and Cotter Pin |
| (6) Fulcrum Pin | (12) Upper Ball Joint, Bolt and Nut |

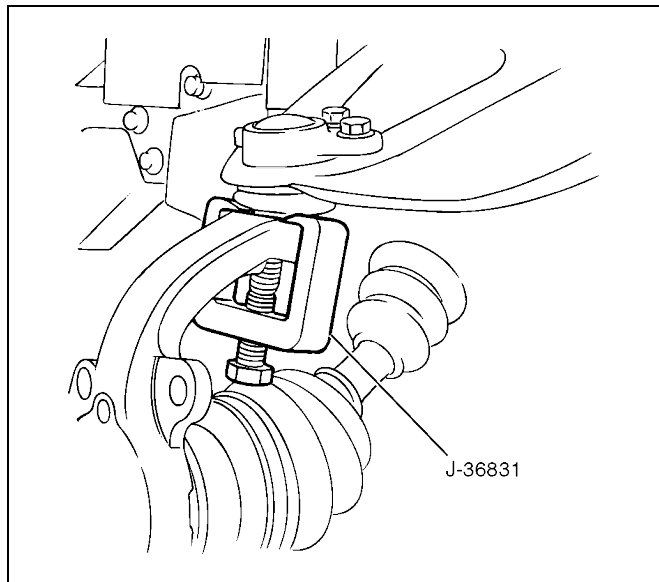
Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove wheel and tire assembly. Refer to *Wheel* in this section.
3. Remove the brake caliper and disconnect brake pipe. Refer to *Disc Brakes in Brake* section.
4. Support lower control arm with a jack.
5. Remove speed sensor cable.

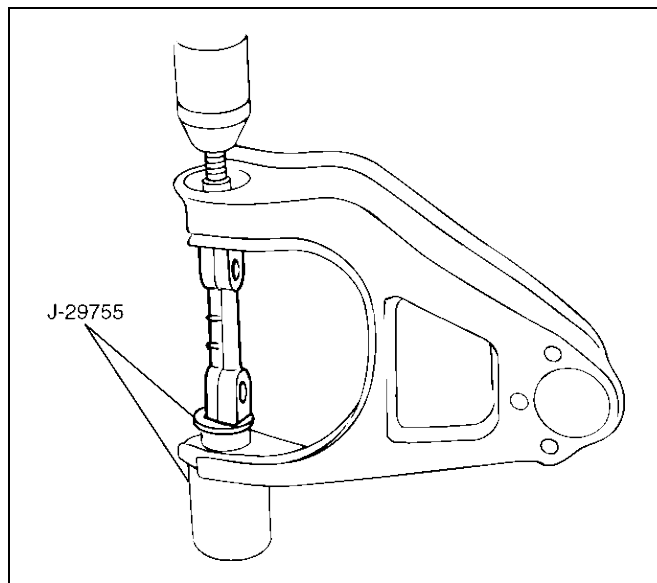
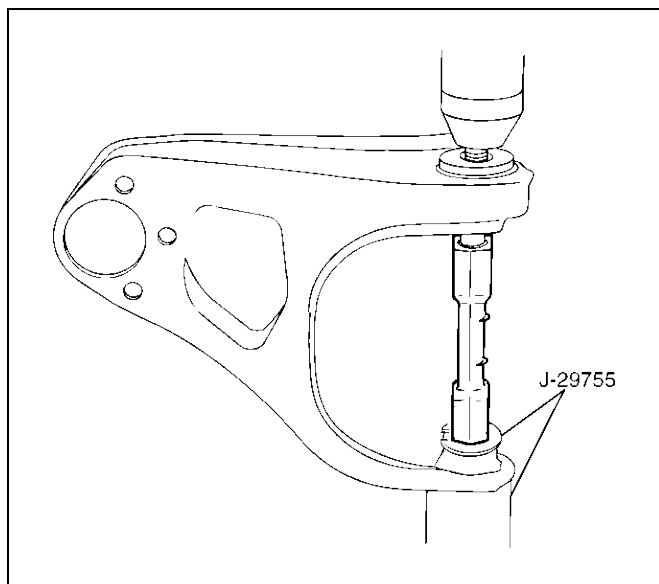
3C-14 FRONT SUSPENSION

6. Remove nut and cotter pin then use remover J-36831.

CAUTION: Be careful not to damage the ball joint boot.



7. Remove upper ball joint.
8. Remove bolt and plate.
9. Remove nut assembly.
10. Remove camber shims and note the positions and number of shims.
11. Remove caster shims and note the positions and number of shims.
12. Remove upper control arm assembly.
13. Remove nut (9).
14. Remove plate (8).
15. Remove bushing (7) by using remover J-29755.



16. Remove fulcrum pin (6).

Inspection and Repair

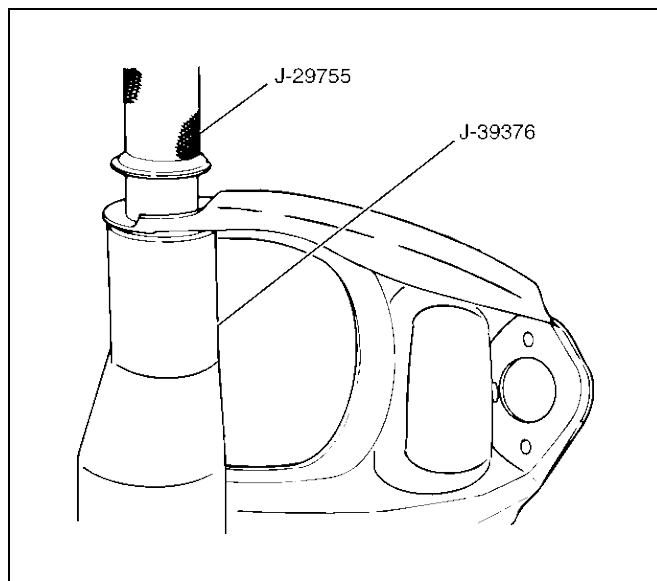
Make necessary parts replacement if wear, damage, corrosion or any other abnormal conditions are found through inspection.

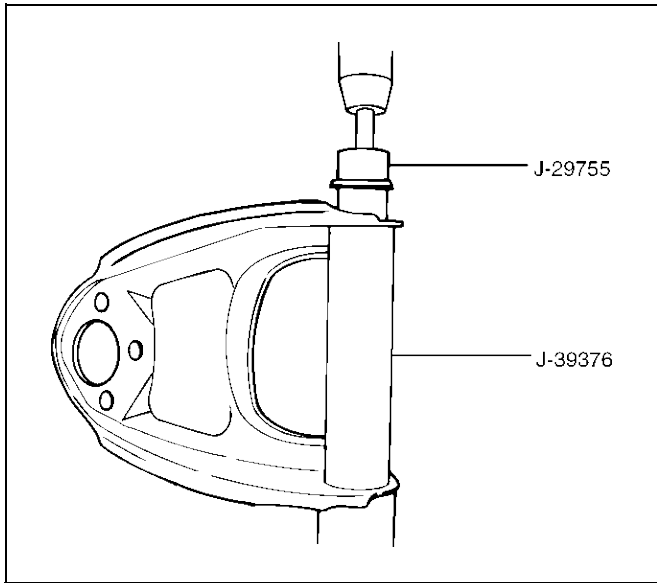
Check the following parts:

- Upper control arm
- Bushing
- Fulcrum pin

Installation

1. Install fulcrum pin.
2. Install bushing by using installer J-29755 and J-39376.





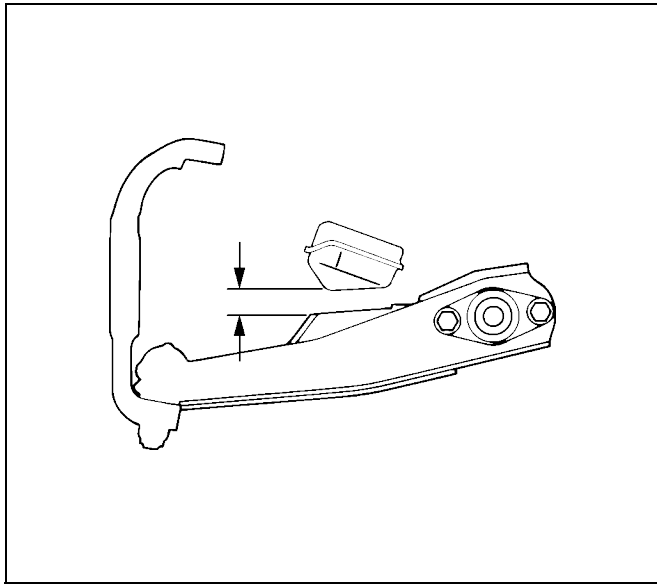
3. Install plate (8).

4. Install nut (9) and tighten fulcrum pin nut finger-tight.

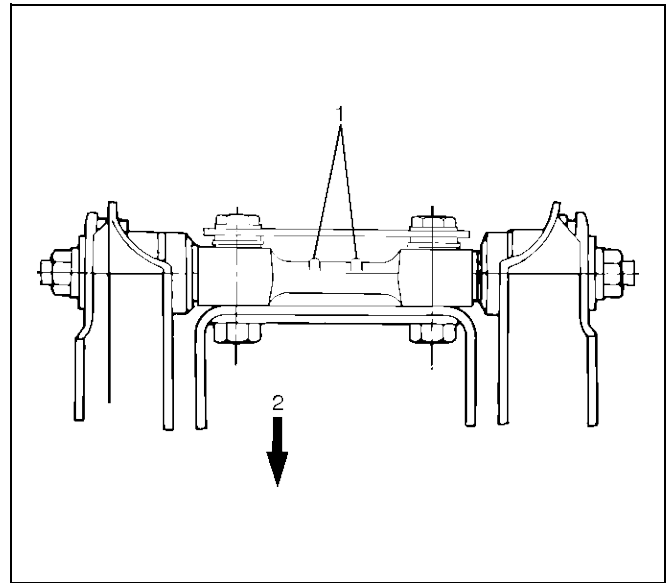
NOTE: Torque fulcrum pin nut after adjusting buffer clearance.

Buffer clearance: 22mm (0.87 in)

Torque: 108N·m (80lbft)



5. Install upper control arm assembly with the fulcrum pin projections turned inward.

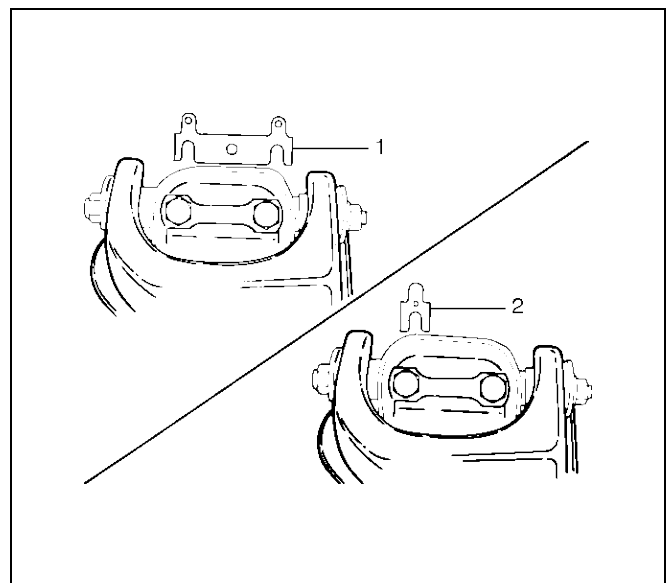


Legend

- (1) Projection
- (2) Outward

6. Install the caster shims(2) between the chassis frame and fulcrum pin.

7. Install the camber shims(1) between the chassis frame and fulcrum pin.



8. Install nut assembly.

9. Install bolt and plate, then tighten the bolt to the specified torque.

Torque: 152N·m (112lbft)

10. Install upper ball joint and tighten it to the specified torque.

Torque: 57N·m (42lbft)

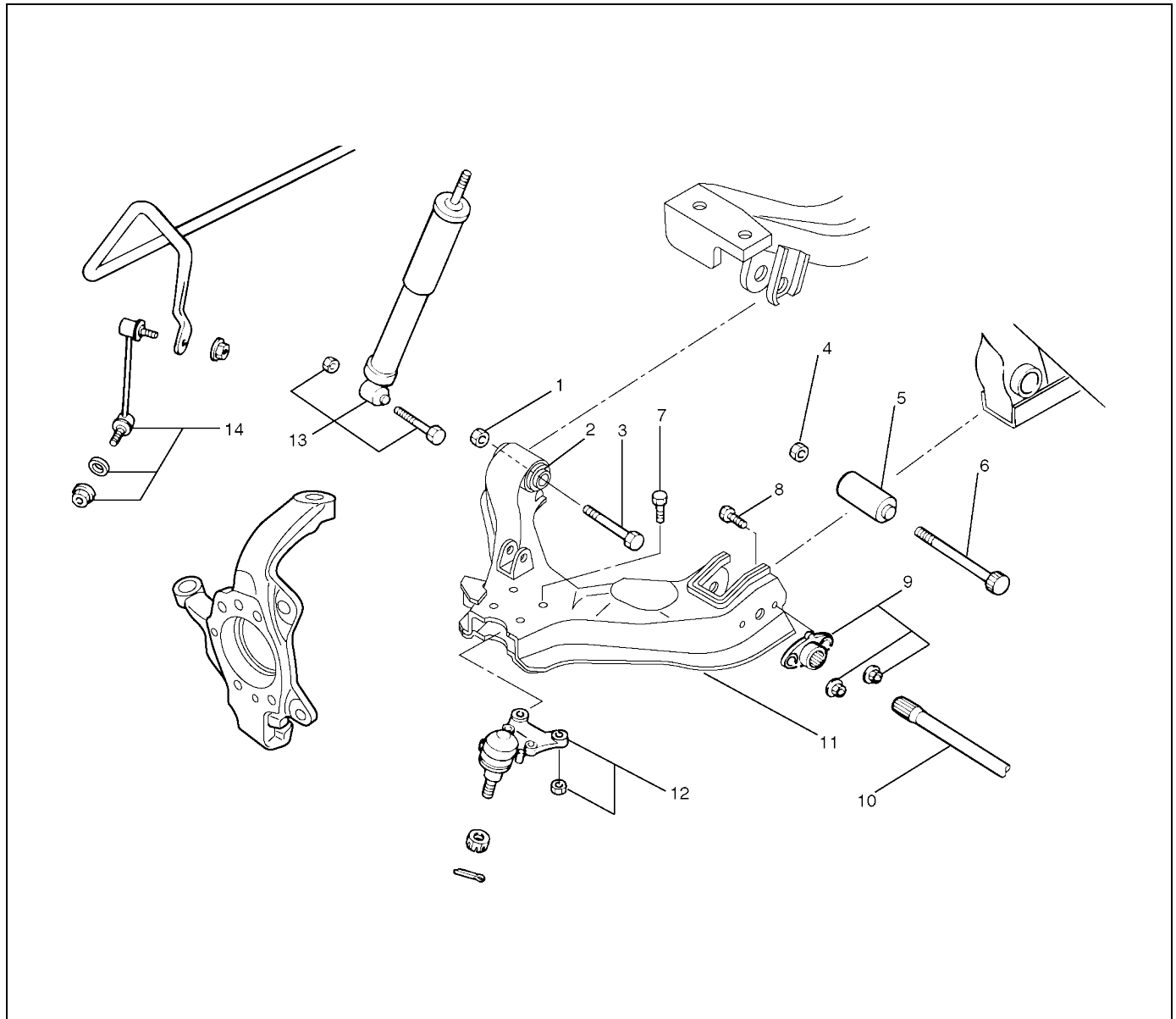
11. Install nut and cotter pin then tighten the nut to the specified torque, with just enough additional torque to align cotter pin holes. Install new cotter pin.

Torque 98N·m (72lbft)

12. Install speed sensor cable.

Lower Control Arm

Lower Control Arm and Associated Parts



450R200006

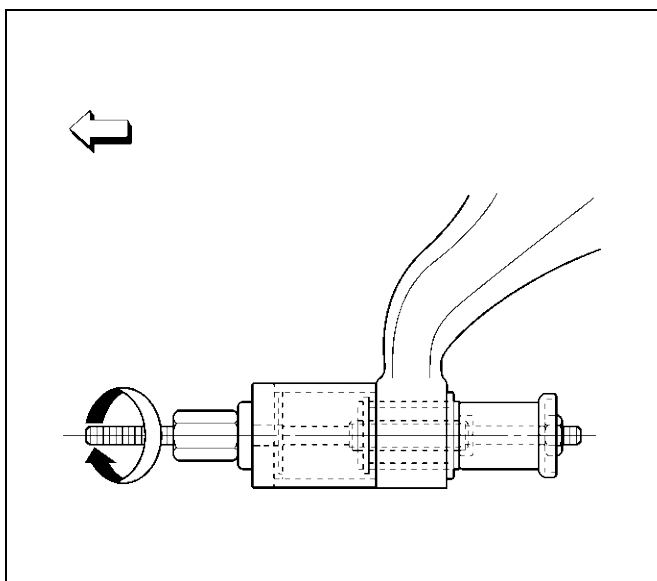
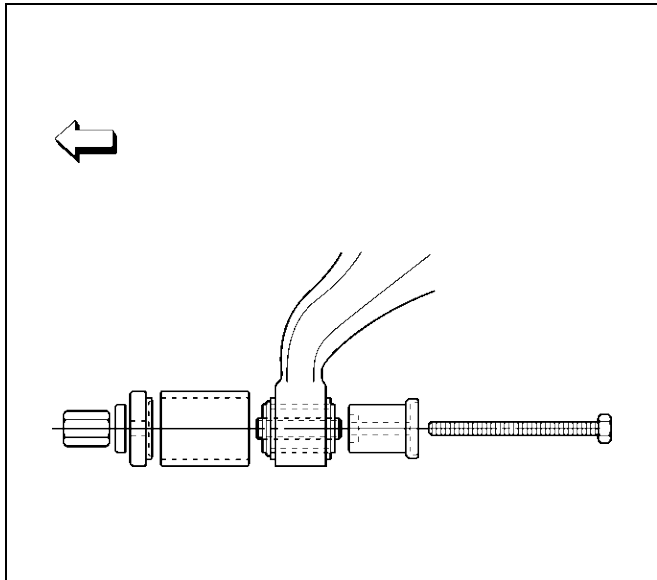
Legend

- | | |
|----------------------------|--------------------------------------|
| (1) Nut, Front | (8) Bolt, Torsion Bar Arm |
| (2) Bush, Front | (9) Torsion Bar Arm Bracket and Nut |
| (3) Bolt, Front | (10) Torsion Bar |
| (4) Nut, Rear | (11) Lower Control Arm |
| (5) Bush, Rear | (12) Lower Ball Joint and Nut |
| (6) Bolt, Rear | (13) Shock Absorber Bolt and Nut |
| (7) Bolt, Lower Ball Joint | (14) Stabilizer Link, Washer and Nut |

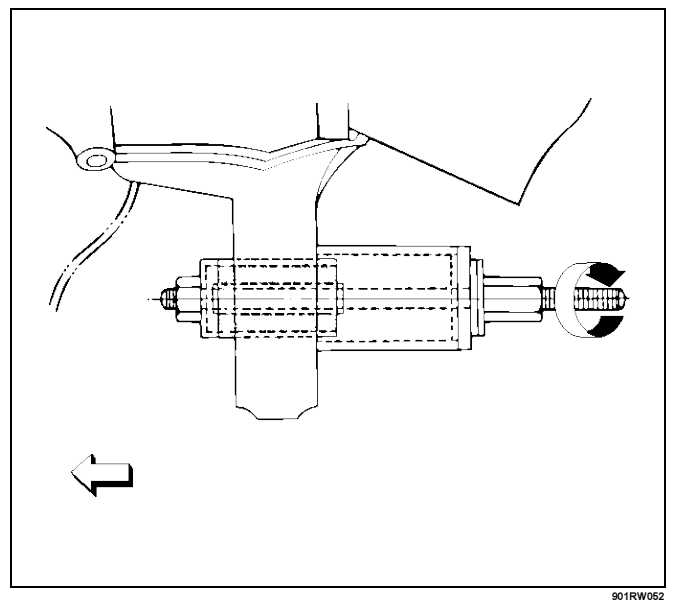
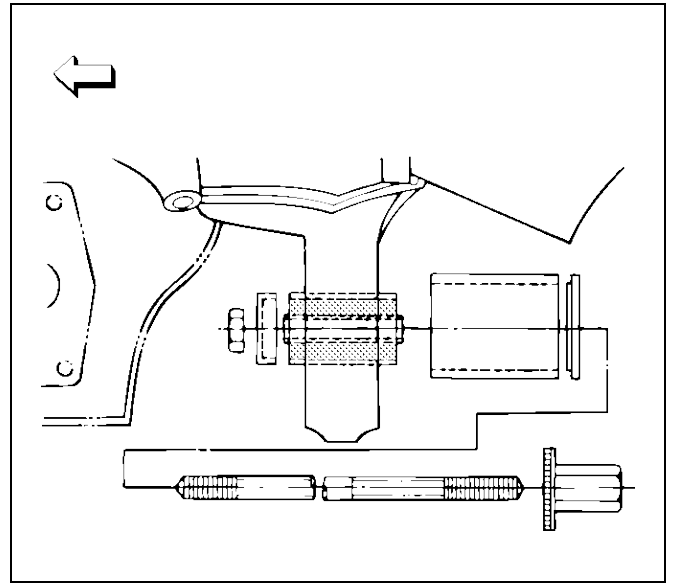
Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove wheel and tire assembly. Refer to *Wheel* in this section.
3. Remove the tie-rod end from the knuckle. Refer to *Power Steering Unit in Steering* section.
4. Remove the retaining ring from the front axle driving shaft to release the shaft from hub(Except 2WD model). Refer to *Front Hub and Disc in Driveline/Axle* section.
5. Support lower control arm with a jack.

6. Remove front nut.
7. Remove rear nut.
8. Remove torsion bar, refer to *Torsion Bar* in this section.
9. Remove torsion bar arm bracket.
10. Disconnect the stabilizer link at the lower control arm.
11. Remove the shock absorber lower end from the lower control arm.
12. Remove the lower ball joint from the lower control arm.
13. Remove front bolt.
14. Remove rear bolt.
15. Remove lower control arm.
16. Remove torsion bar arm bolt.
17. Remove lower ball joint bolt.
18. Remove front bushing by using remover J-36833.



19. Remove rear bushing by using remover J-36834.



Inspection and Repair

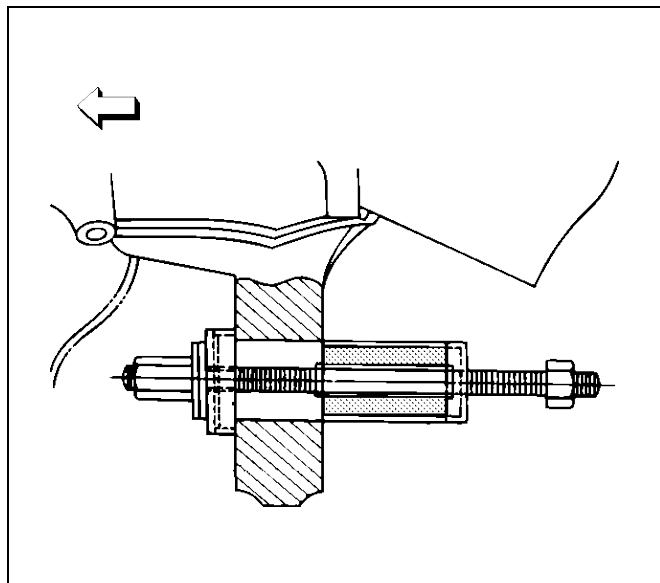
Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection.

Check the following parts:

- Lower control arm
- Bushing

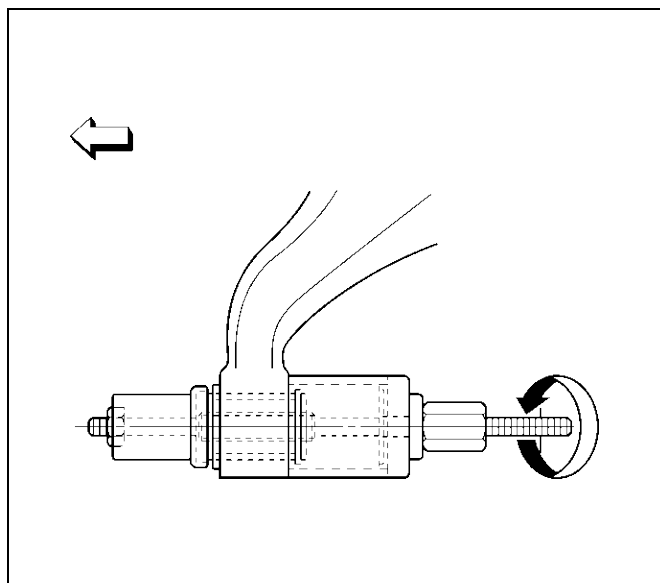
Installation

1. Install rear bushing by using installer J-36834.



901 RW053

2. Install front bushing by using installer J-36833.



901 RW156

3. Install lower ball joint bolt.
4. Install torsion bar arm bolt.
5. Install lower control arm.
6. Install rear bolt.
7. Install front bolt.
8. Install lower ball joint and tighten it to the specified torque.
Torque: 116 N·m (85 lbft)
9. Install shock absorber and tighten it to the specified torque.
Torque: 93 N·m (69 lbft)
10. Install stabilizer link and tighten it to the specified torque.
Torque: 50 N·m (37 lbft)

11. Install torsion bar arm bracket and tighten it to the specified torque.

Torque: 116 N·m (85 lbft)

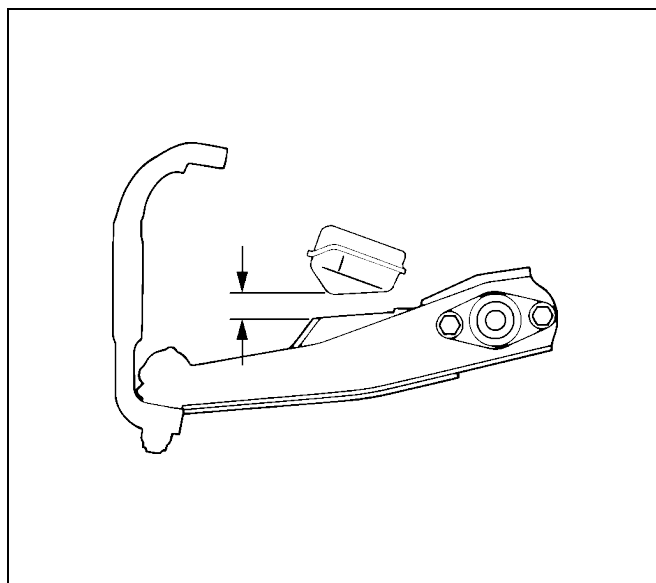
12. Install Torsion bar, refer to *Torsion Bar* in this section.

13. Install rear nut and tighten lower link nut finger-tight.

NOTE: Torque lower control arm nut after adjusting buffer clearance.

Buffer clearance: 22 mm (0.87 in)

Torque: 235 N·m (174 lbft)



450R200009

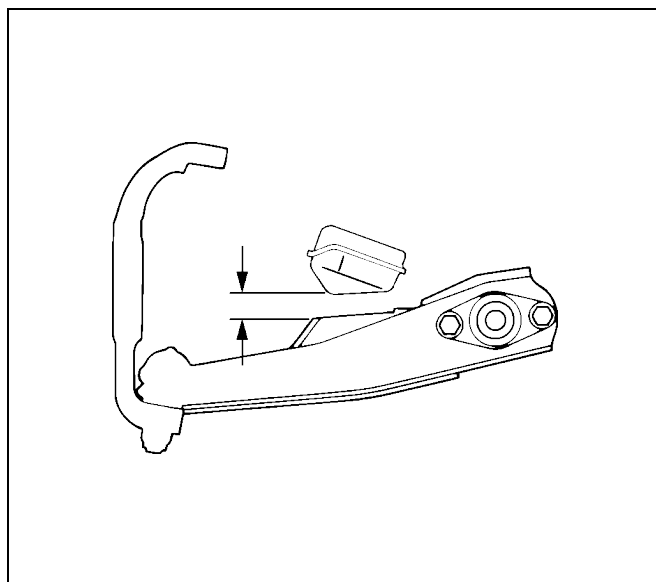
14. Install front nut then tighten lower link nut finger-tight.

NOTE: Torque lower control arm nut after adjusting buffer clearance .

Buffer clearance: 22 mm (0.87 in)

Torque: 186 N·m (137 lbft)

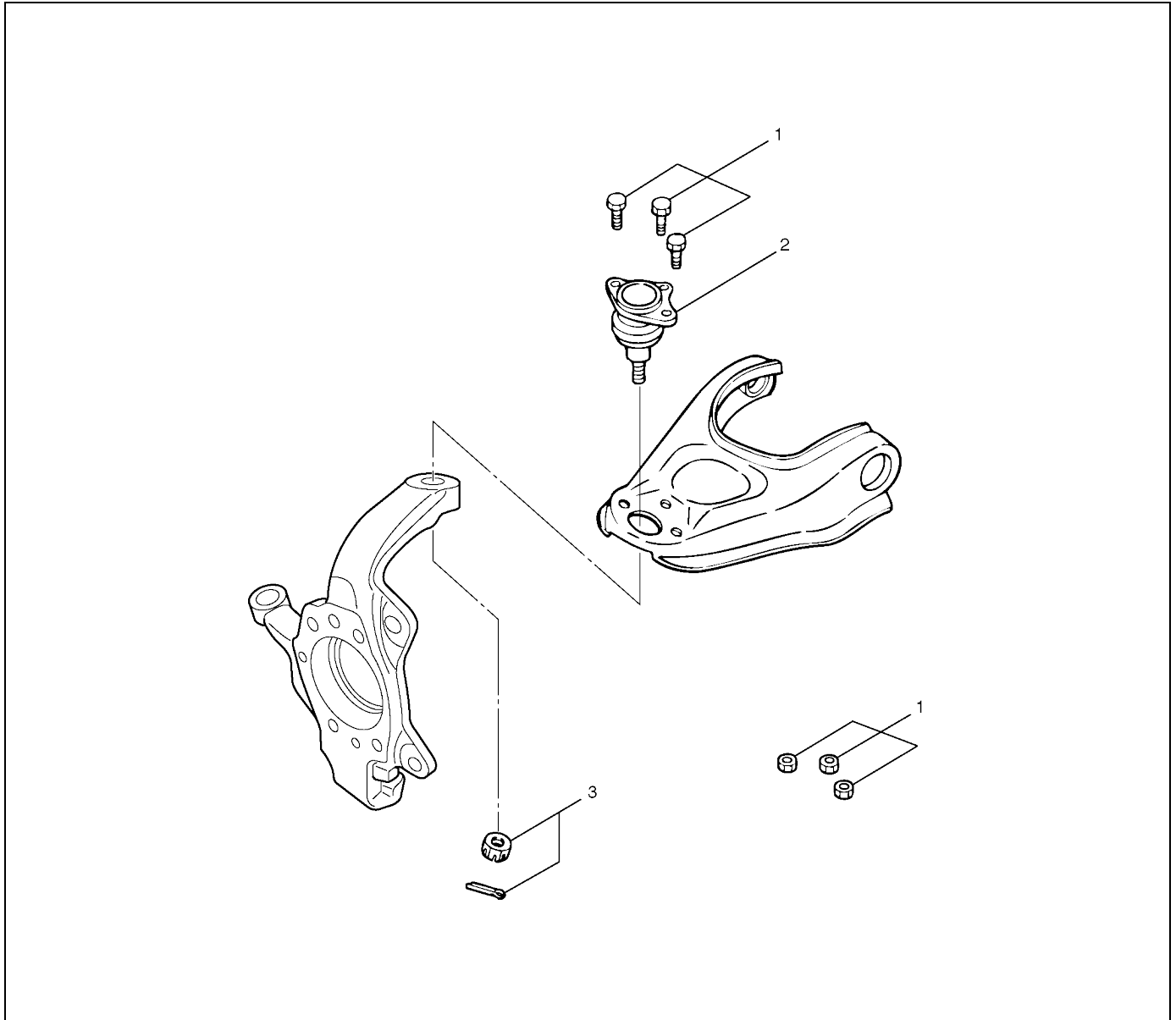
NOTE: Adjust the trim height. Refer to *Front End Alignment Inspection and Adjustment in Steering* section.



450R200009

Upper Ball Joint

Upper Ball Joint and Associated Parts



450R200007

Legend

(1) Bolt and Nut

(2) Upper Ball Joint

(3) Nut and Cotter Pin

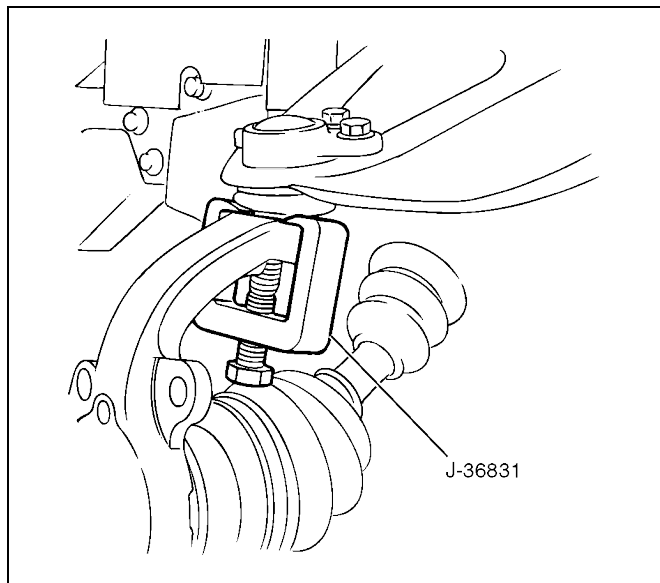
Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove the speed sensor from the knuckle.

3C-20 FRONT SUSPENSION

3. Remove upper ball joint nut and cotter pin, then use remover J-36831 to remove the upper ball joint from the knuckle.

CAUTION: Be careful not to damage the ball joint boot.

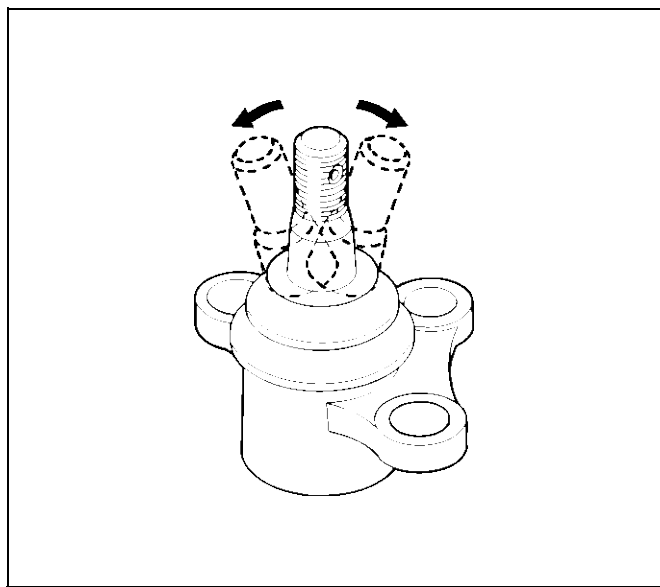


4. Remove bolt and nut.
5. Remove upper ball joint.

Inspection and Repair

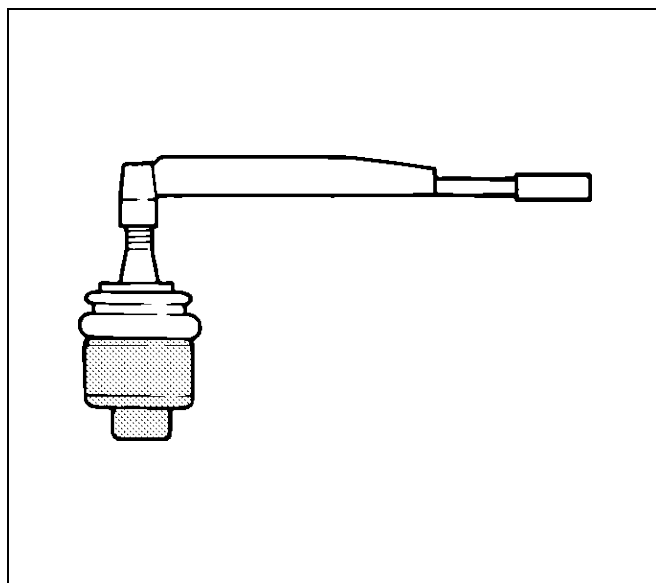
Make necessary parts replacement if wear, damage, corrosion or any other abnormal conditions are found through inspection.

- Inspect the lower end boot for damage or grease leak. Move the ball joint as shown in the figure to confirm its normal movement.
- Inspect screw/taper area of ball for damage.
- If any defects are found by the above inspections, replace the ball joint assembly with a new one.



- After moving the ball joint 4 or 5 times, attach nut then measure the preload.

Starting torque: 0.5 –3.2N·m (0.4–2.4lbft)



If the above limits specified are exceeded, replace the ball joint assembly.

Installation

1. Install upper ball joint.
2. Install bolt and nut, then tighten them to the specified torque.

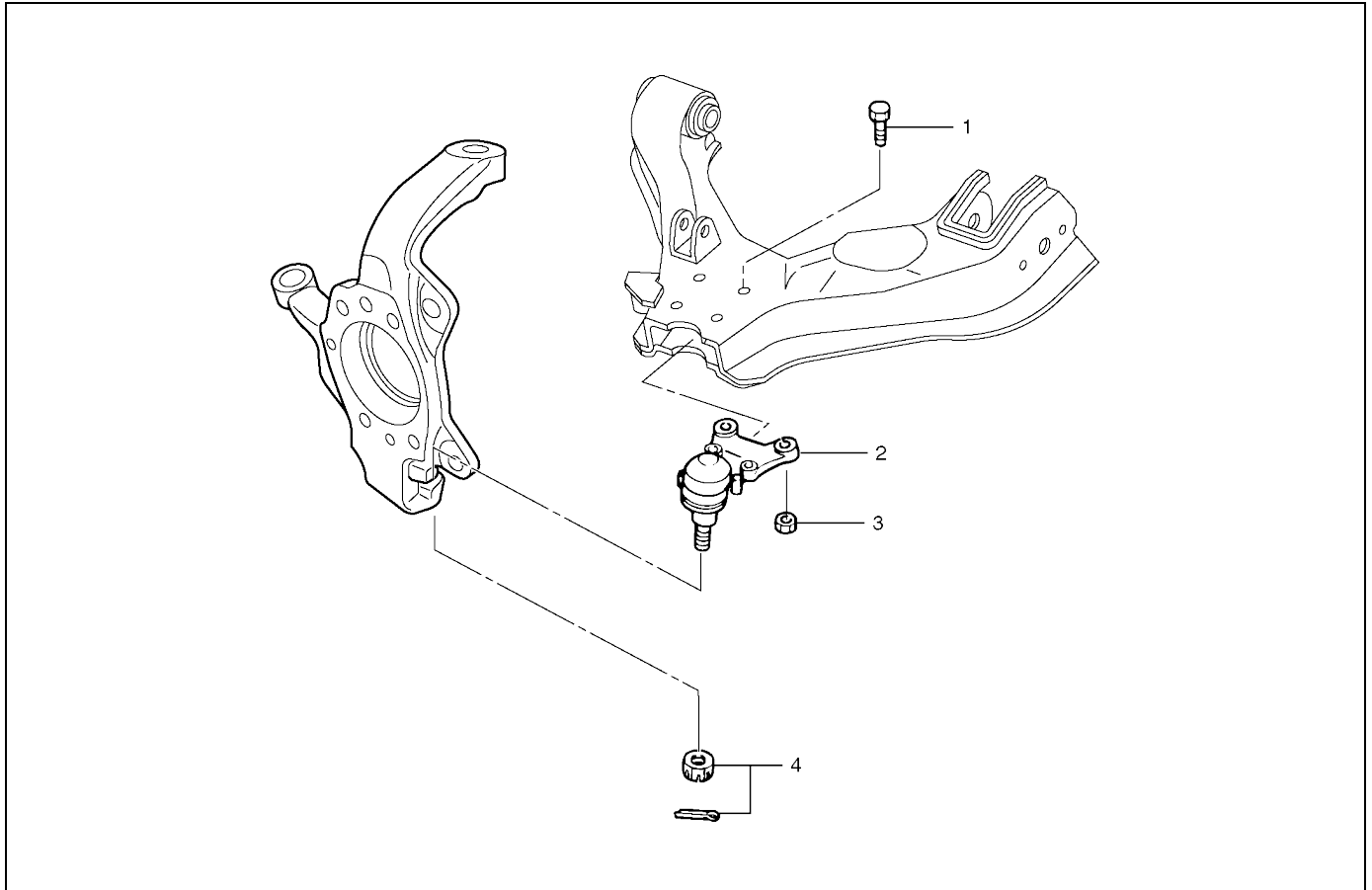
Torque: 57N·m (42lbft)

3. Install nut and cotter pin, then tighten the nut to the specified torque with just enough additional torque to align cotter pin holes. Install new cotter pin.

Torque: 98N·m (72lbft)

Lower Ball Joint

Lower Ball Joint and Associated Parts



450R200008

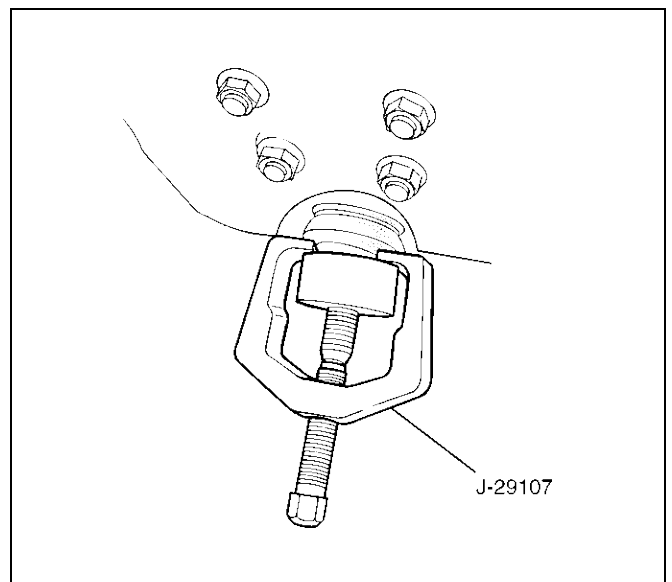
Legend

- | | |
|----------------------|------------------------|
| (1) Bolt | (3) Nut |
| (2) Lower Ball Joint | (4) Nut and Cotter Pin |

Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove wheel and tire assembly. Refer to *Wheel* in this section.
3. Remove the tie-rod end from the knuckle. Refer to *Power Steering Unit in Steering* section.
4. Remove the retaining ring from the front axle driving shaft to release the shaft from hub(Except 2WD model). Refer to *Front Hub and Disc in Driveline/Axle* section.
5. Support lower control arm with a jack.
6. Remove lower ball joint nut and cotter pin, then use remover J-29107 to remove the lower ball joint from the knuckle.

CAUTION: Be careful not to damage the ball joint boot.



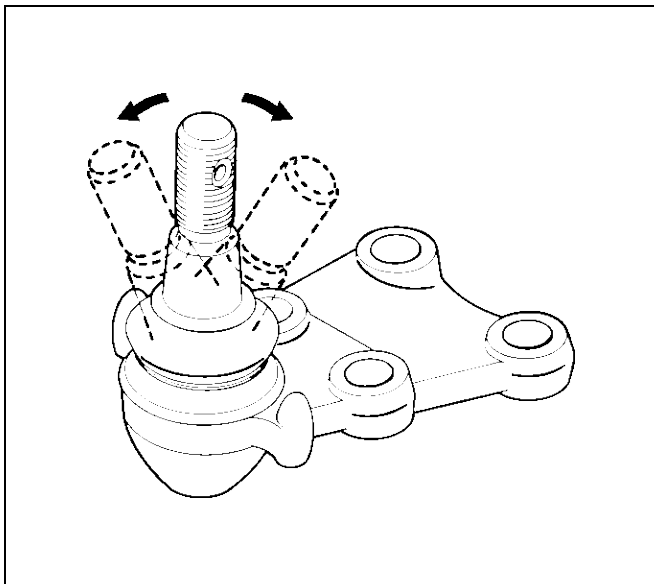
901RW163

7. Remove nut.
8. Remove bolt.
9. Remove lower ball joint.

Inspection and Repair

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

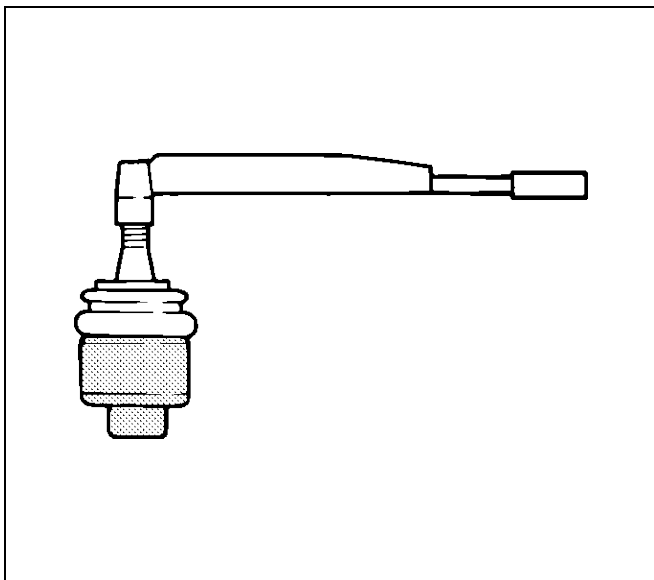
- Inspect the lower end boot for damage or grease leak. Move the ball joint as shown in the figure to confirm its normal movement.
- Inspect screw/taper area of ball for damage.
- If any defects are found by the above inspections, replace the ball joint assembly with a new one.



450RS026

- After moving the ball joint 4 or 5 times, attach nut then measure the preload.

Starting torque: 0.5–6.4 N·m (0.4–4.7 lbft)



450RS024

- If the above limits specified are exceeded, replace the ball joint assembly.

Installation

1. Install lower ball joint.
2. Install bolt.
3. Install nut and tighten it to the specified torque.

Torque: 116 N·m (85 lb ft)

4. Install ball joint nut, then tighten it to the specified torque with just enough additional torque to align cotter pin holes. Install new cotter pin.

Torque: 147 N·m (108 lb ft)

Special Tools

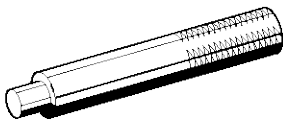
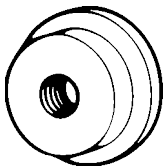
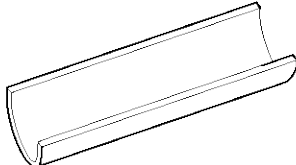
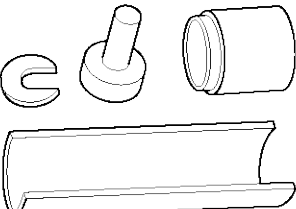
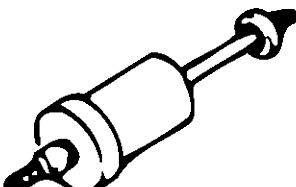
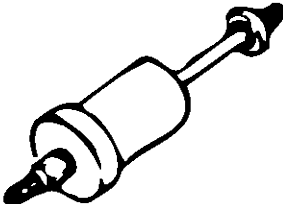
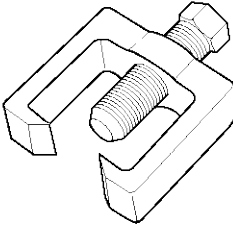
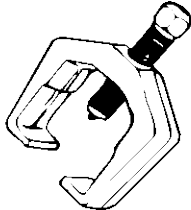
ILLUSTRATION	TOOL NO. TOOL NAME
 901RS235	J-8092 Grip
 901RS236	J-45647 Installer; Oil seal
 901RS236	J-39376 Installer; Upper arm bushing
 901RS237	J-29775 Remover and Installer Upper arm bushing
 901RS238	J-36833 Remover and Installer kit; Lower arm front bushing
 901RS239	J-36834 Remover and Installer kit; Lower arm rear bushing

ILLUSTRATION	TOOL NO. TOOL NAME
 901RS290	J-36831 Ball joint remover
 901RS279	J-29107 Tie-rod end remover

SUSPENSION

REAR SUSPENSION

CONTENTS

Service Precaution	3D-1	Upper Link	3D-10
General Description	3D-1	Upper Link and Associated Parts	3D-10
Diagnosis	3D-2	Removal	3D-10
Coil Spring	3D-5	Inspection and Repair	3D-10
Coil Spring and Associated Parts	3D-5	Installation	3D-11
Removal	3D-5	Lateral Rod	3D-12
Inspection and Repair	3D-6	Lateral Rod and Associated Parts	3D-12
Installation	3D-6	Removal	3D-12
Shock Absorber	3D-7	Inspection and Repair	3D-12
Shock Absorber and Associated Parts	3D-7	Installation	3D-13
Removal	3D-7	Stabilizer Bar	3D-14
Inspection and Repair	3D-7	Stabilizer Bar and Associated Parts	3D-14
Installation	3D-7	Removal	3D-14
Trailing Link	3D-8	Inspection and Repair	3D-14
Trailing Link and Associated Parts	3D-8	Installation	3D-15
Removal	3D-8	Main Data and Specifications	3D-15
Inspection and Repair	3D-8	Special Tools	3D-17
Installation	3D-9		

Service Precaution

WARNING: THIS VEHICLE HAS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). REFER TO THE SRS COMPONENT AND WIRING LOCATION VIEW IN ORDER TO DETERMINE WHETHER YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING. WHEN YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING, REFER TO THE SRS SERVICE INFORMATION. FAILURE TO FOLLOW WARNINGS COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY, OR OTHERWISE UNNEEDED SRS SYSTEM REPAIRS.

CAUTION: Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application. ISUZU will call out those fasteners that require a replacement after removal. ISUZU will also call out the fasteners that require thread lockers or thread sealant. UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (Paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener. When you install fasteners, use the correct tightening sequence and specifications. Following these instructions can help you avoid damage to parts and systems.

General Description

The rear suspension is a 5-link, coil spring type suspension with a stabilizer bar, consisting of two trailing links, two upper links, lateral rod, shock absorber, and stabilizer. In this suspension, the links are specially arranged to enable the rear axle to move freely, thereby expanding suspension stroke, reducing friction, and improving lateral rigidity and roll control. All these result in improved stability, riding comfort, and rough road maneuverability.

Each link connects the axle housing with the frame through a runner bushing. The axle housing is supported by the trailing links and upper links longitudinally and by the lateral rod latitudinally.

3D-2 REAR SUSPENSION**Diagnosis**

Condition	Possible cause	Correction
Vehicle Pulls	Mismatched or uneven tires.	Replace tire.
	Tires not adequately inflated.	Adjust tire pressure.
	Broken or sagging springs.	Replace spring.
	Radial tire lateral force.	Replace tire.
	Improper wheel alignment.	Adjust wheel alignment.
	Brake dragging in one wheel.	Repair brake.
	Loose, bent or broken front or rear suspension parts.	Tighten or replace the appropriate suspension part(s).
	Faulty shock absorbers.	Replace shock absorber.
	Parts in power steering valve defective.	Replace power steering unit.
Abnormal or Excessive Tire Wear	Sagging or broken spring.	Replace spring.
	Tire out of balance.	Balance or replace tire.
	Improper wheel alignment.	Check front end alignment.
	Faulty shock absorber.	Replace shock absorber.
	Hard driving.	Replace tire.
	Overloaded vehicle.	Replace tire and reduce load.
	Tires not rotated periodically.	Replace or rotate tire.
	Worn or loose road wheel bearings.	Replace wheel bearing.
	Wobbly wheel or tires.	Replace wheel or tire.
	Tires not adequately inflated.	Adjust the pressure.
Wheel Hop	Blister or bump on tire.	Replace tire.
	Improper shock absorber operation.	Replace shock absorber.
Shimmy, Shake or Vibration	Tire or wheel out of balance.	Balance wheels or replace tire/or wheel.
	Loose wheel bearings.	Replace wheel bearing.
	Worn steering linkage ball joints.	Replace ball joints.
	Worn upper or lower end ball joints.	Replace ball joints.
	Excessive wheel runout.	Repair or replace wheel and/or tire.
	Blister or bump on tire.	Replace tire.
	Excessive loaded radial runout of tire/wheel assembly.	Replace tire or wheel.
	Improper wheel alignment.	Check wheel alignment.
	Loose or worn steering linkage.	Tighten or replace steering linkage.
	Loose steering unit.	Tighten steering unit.
	Tires not adequately inflated.	Adjust tire pressure.
	Loose, bent or broken front or rear suspension parts.	Tighten or replace the appropriate suspension parts.
	Faulty shock absorber.	Replace shock absorber.
	Hub bearing preload misadjustment.	Adjust preload.
	Parts in power steering valve defective.	Replace power steering unit.

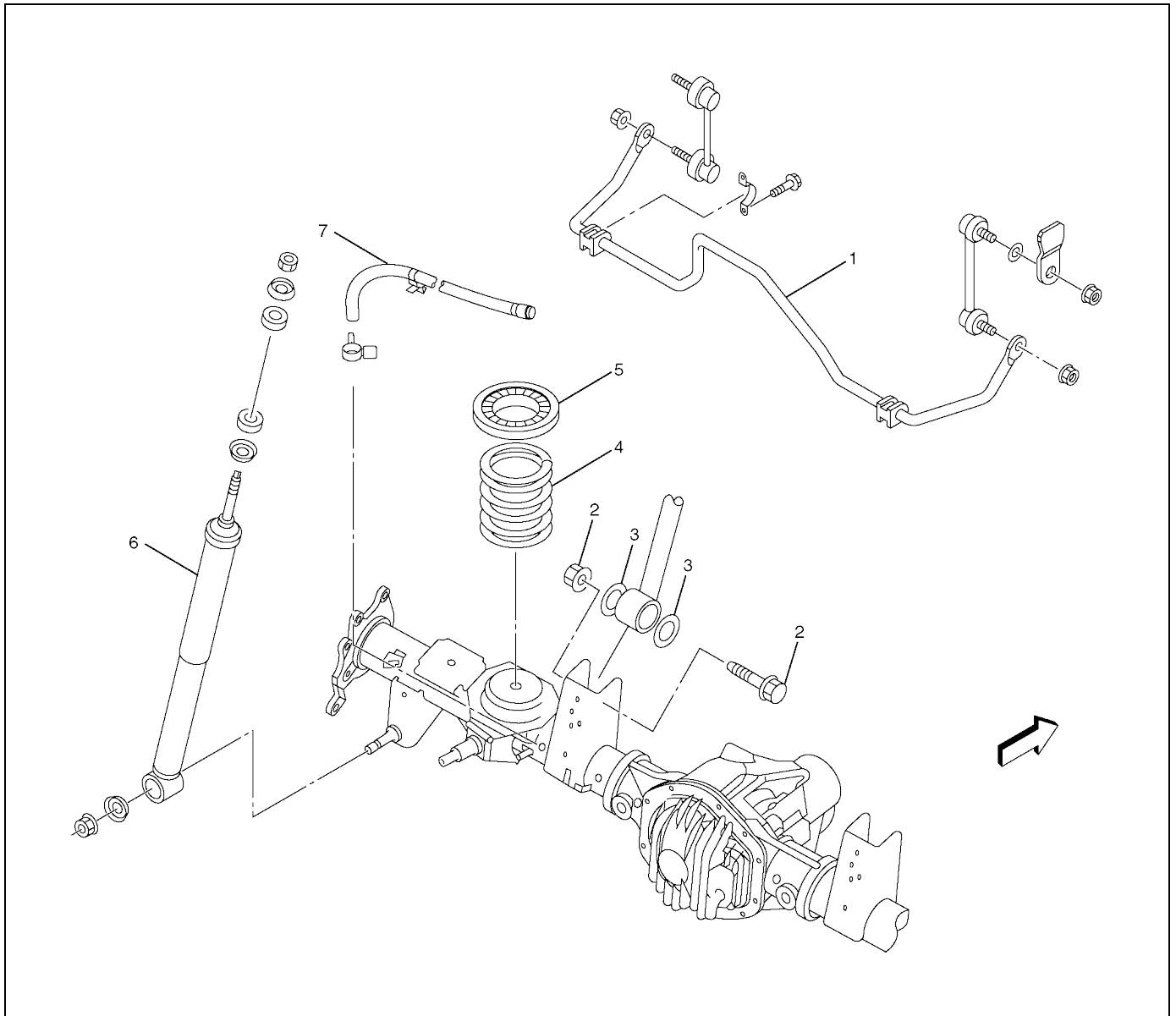
Condition	Possible cause	Correction
Hard Steering	Bind in steering linkage ball studs, upper or lower ball joint.	Replace ball joint.
	Improper wheel alignment.	Check wheel alignment.
	Tire not adequately inflated.	Inflate tires to proper pressure.
	Bind in steering column or shaft.	Repair or replace.
	Improper power steering system operation.	Repair or replace. Refer to <i>Steering</i> section.
Too Much Play In Steering	Wheel bearings worn.	Replace wheel bearings.
	Loose steering unit or linkage.	Retighten or repair.
	Worn or loose steering shaft universal joint.	Retighten or replace steering shaft.
	Worn steering linkage ball joints.	Replace ball joints.
	Worn upper or lower end ball joints.	Replace ball joints.
Poor Steering Wheel Returnability	Bind in steering linkage ball joints.	Replace ball joints.
	Bind in upper or lower ball joints.	Replace ball joints.
	Bind in steering column and shaft.	Repair or replace.
	Bind in steering gear.	Check and repair steering gear.
	Improper wheel alignment.	Adjust wheel alignment.
	Tires not adequately inflated.	Adjust pressure.
	Loose steering wheel nut.	Retighten.
	Worn wheel bearing.	Replace.
	Miassemble Transfer Gear ASM	Reassemble Transfer Gear to proper portion
Abnormal Noise	Worn, sticky or loose upper or lower ball joint, steering linkage ball joints or drive axle joints.	Replace.
	Faulty shock absorbers.	Replace.
	Worn upper or lower control arm bushing.	Replace.
	Loose stabilizer bar.	Retighten bolts or replace bushings.
	Loose wheel nuts.	Tighten nuts. Check for elongated wheel nut holes. Replace wheel if required.
	Loose suspension bolts or nuts.	Retighten suspension bolts or nuts.
	Broken or otherwise damaged wheel bearings.	Replace wheel bearing.
	Broken suspension springs.	Replace spring.
	Loose steering unit.	Retighten mounting bolt.
	Faulty steering unit.	Replace steering unit.

3D-4 REAR SUSPENSION

Condition	Possible cause	Correction
Wandering or Poor Steering Stability	Mismatched or unevenly worn tires.	Replace tire or inflate tires to proper pressure.
	Loose steering linkage ball joints.	Replace ball joints.
	Faulty shock absorbers.	Replace shock absorber.
	Loose stabilizer bar.	Tighten or replace stabilizer bar or bushings.
	Broken or sagging springs.	Replace spring (pairs).
	Improper wheel alignment.	Adjust wheel alignment.
Erratic Steering When Braking	Worn wheel bearings.	Replace wheel bearings.
	Broken or sagging springs.	Replace spring (pairs).
	Leaking caliper.	Repair or replace caliper.
	Warped discs.	Replace brake disc.
	Badly worn brake pads.	Replace brake pads.
	Tires are inflated unequally.	Inflate tires to proper pressure.
Low or Uneven Trim Height	Broken or sagging springs.	Replace springs (In pairs).
	Vehicle overloaded.	Reduce load.
	Incorrect springs.	Adjust or replace torsion bar.
	Trim Height out of spec	Adjust Trim Height
Suspension Bottoms	Vehicle overloaded.	Reduce load.
	Faulty shock absorber.	Replace shock absorber.
	Incorrect, broken or sagging springs.	Replace springs.
Body Leans	Trim Height out of spec	Adjust Trim Height
	Loose stabilizer bar.	Tighten stabilizer bar bolts or replace bushings.
	Faulty shock absorber, struts or mounting.	Replace shock absorber.
	Broken or sagging springs.	Replace springs (In pairs).
	Vehicle overloaded.	Reduce load.
Cupped Tires	Worn wheel bearings.	Replace wheel bearing.
	Excessive tire or wheel run out.	Replace tire or wheel.
	Worn ball joints.	Replace ball joints.
	Tire out of balance.	Adjust tire balance.

Coil Spring

Coil Spring and Associated Parts



460R200004

Legend

- | | |
|------------------------------------|--------------------|
| (1) Stabilizer Bar | (4) Coil Spring |
| (2) Upper Link Fixing Bolt and Nut | (5) Insulator |
| (3) Rubber Plate | (6) Shock Absorbar |
| | (7) Breather Hose |

Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Support the rear axle case with a jack.
3. Disconnect brake hose at the crossmember.
4. Remove breather hose.
5. Remove upper link fixing bolt, nut and rubber plate on the rear axle case (left-side only).
6. Disconnect the stabilizer bar at the stabilizer link.
7. Remove the shock absorber from the axle case.
8. Remove spring insulator.
9. Remove the insulator and coil spring while lowering the rear axle case.

CAUTION: Be sure not to let the brake hose, parking brake cable, and breather hose extend to their full length.

Inspection and Repair

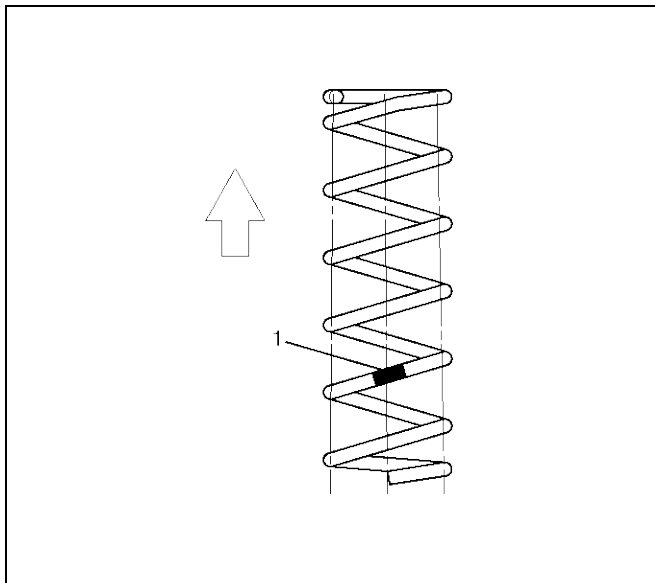
Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection.

Check the following parts:

- Coil spring
- Insulator

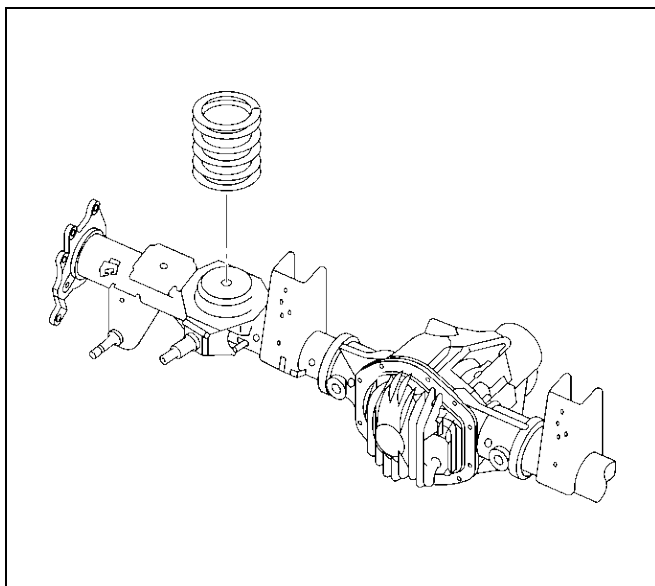
Installation

1. Install coil spring and make sure that the coil spring is installed in the proper position. Paint mark(1) should be downward.



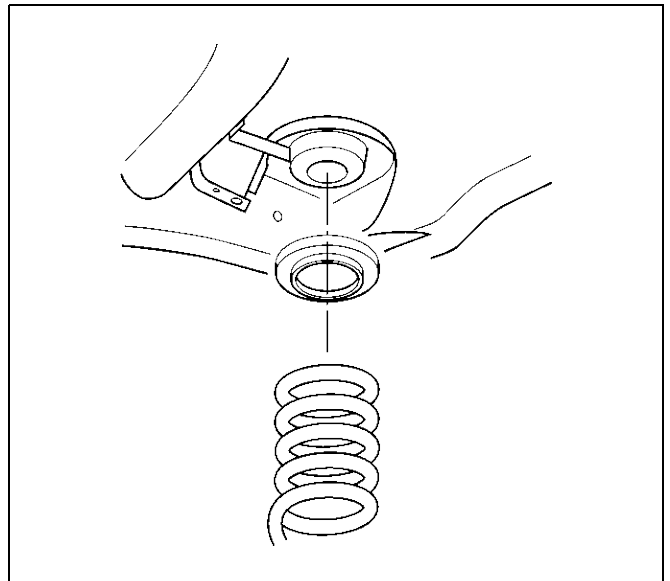
460 RW001

2. Fit the end of the coil spring to the coil spring seat and mount the coil spring on the rear axle case.



460 RW004

3. Install the insulator on the coil spring. Jack up the axle case gently with the top of the coil spring set to the spring seat on the frame side.



460 RW013

4. Install shock absorber and tighten the nut lightly, then retighten it to the specified torque after the vehicle is at curb height.

NOTE: When mounting shock absorber, be sure not to use grease on bushings or any other nearby part.

Torque: 78 N·m (58 lb ft)

5. Install stabilizer bar at the stabilizer link.

Torque: 31 N·m (23 lb ft)

6. Install upper link with rubber plate and tighten fixing bolt.

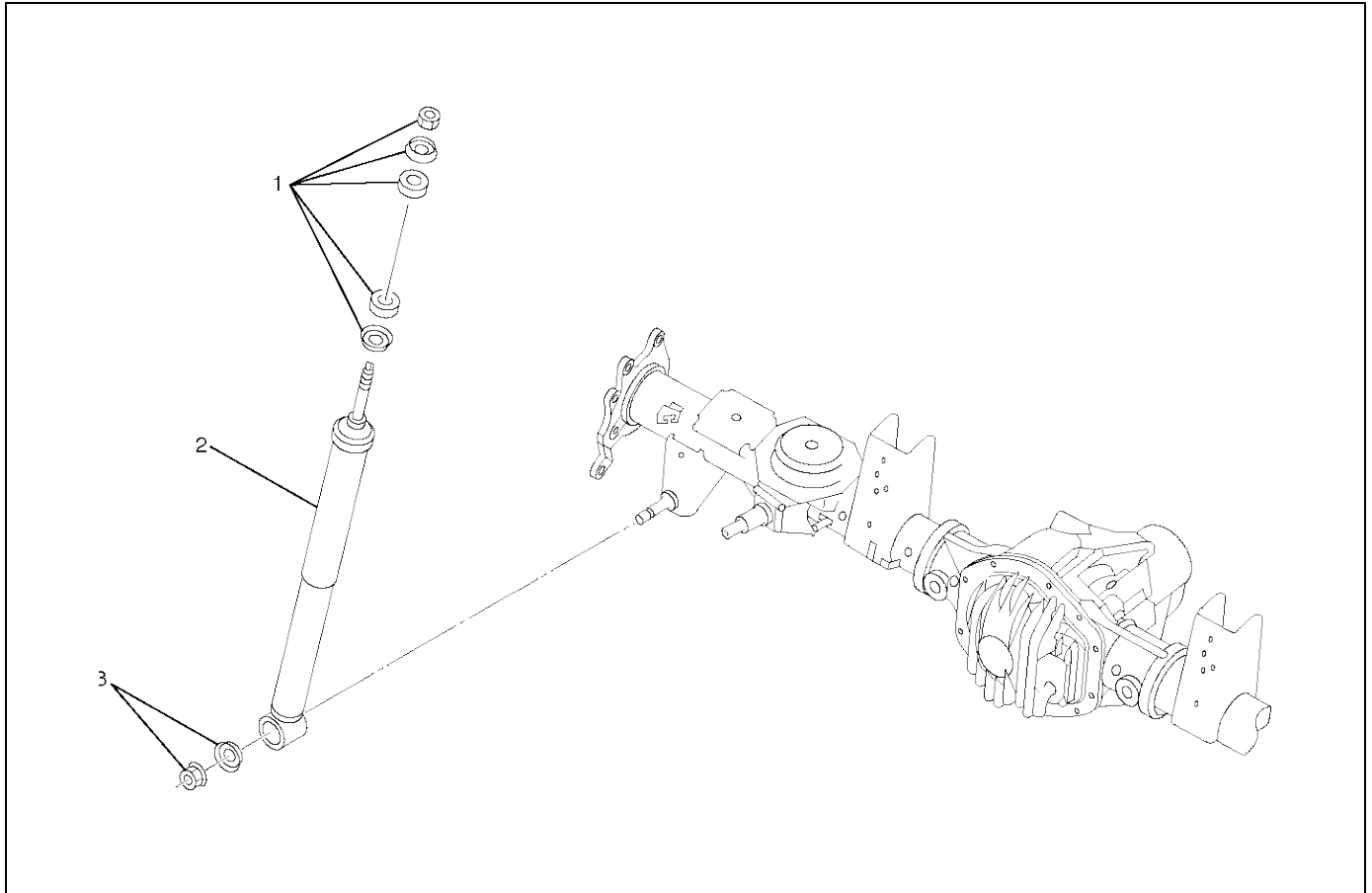
Torque: 137 N·m (101 lb ft)

7. Install breather hose.

8. Connect brake hose and bleed the brake system. Refer to *Bleeding the Brake Hydraulic System in Brake* section.

Shock Absorber

Shock Absorber and Associated Parts



461RW001

Legend

(1) Nut, Bush and Washer

(2) Shock Absorber

(3) Nut and Washer

Removal

1. Remove shock absorber fixing nut, bush and washer (upper side).
2. Remove shock absorber fixing nut and washer (lower side).
3. Remove shock absorber.

Inspection and Repair

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

Check the following parts:

- Shock absorber
- Rubber bushing

NOTE: When mounting rubber bushings, be sure not to use grease on bushings or any other nearby part.

Installation

1. Install shock absorber. When mounting shock absorber, be sure not to use grease on bushings or any other nearby part.
2. Install nut and washer (lower side), then tighten the nut lightly. Retighten to the bolt and nut specified torque after the vehicle is at curb height.

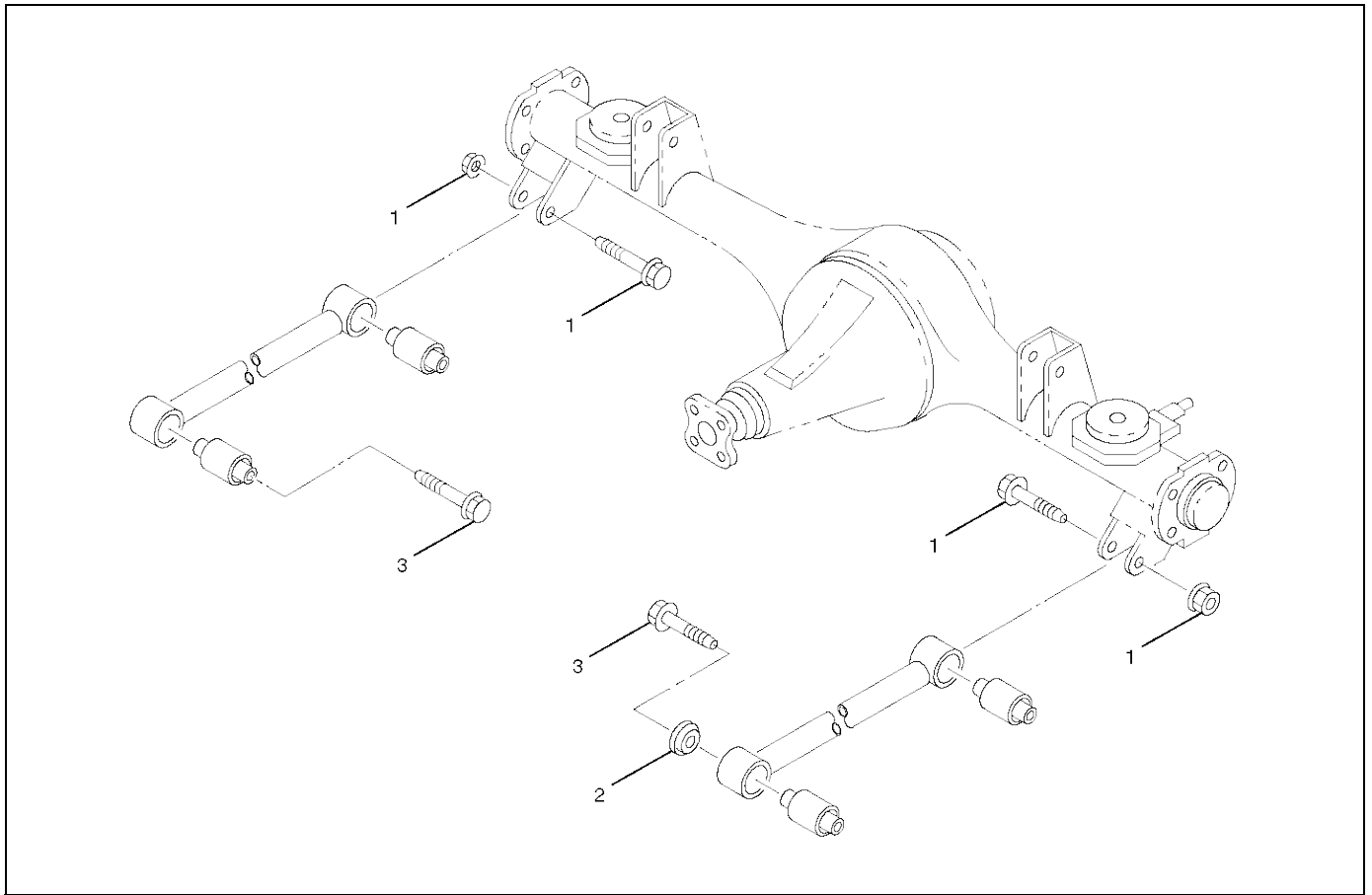
Torque: 78N·m (58lb ft)

3. Install nut, bush and washer (upper side), then tighten the nut lightly. Retighten to the nut specified torque after the vehicle is at curb height.

Torque: 20N·m (14lb ft)

Trailing Link

Trailing Link and Associated Parts



460RW005

Legend

(1) Bolt and Nut (Axle side)

(2) Protector (Left side only)

(3) Bolt (Frame side)

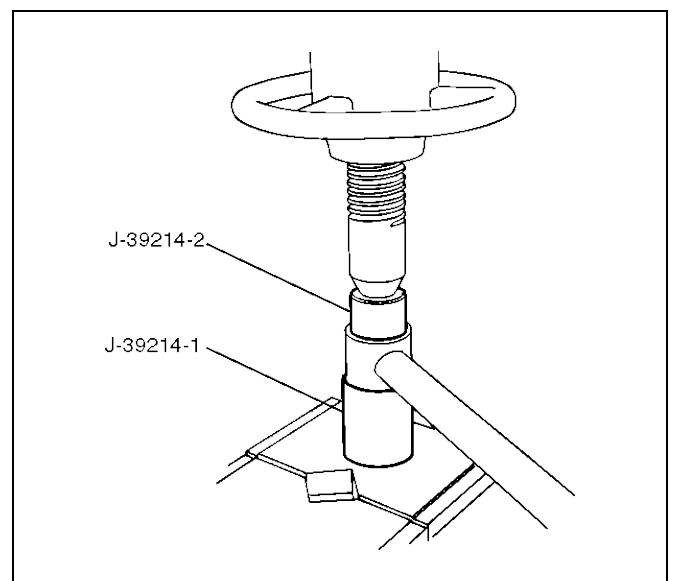
Removal

1. Remove the parking brake cable from the trailing link.
2. Remove the trailing link fixing bolt, nut and protector.
3. Remove trailing link.

Inspection and Repair

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

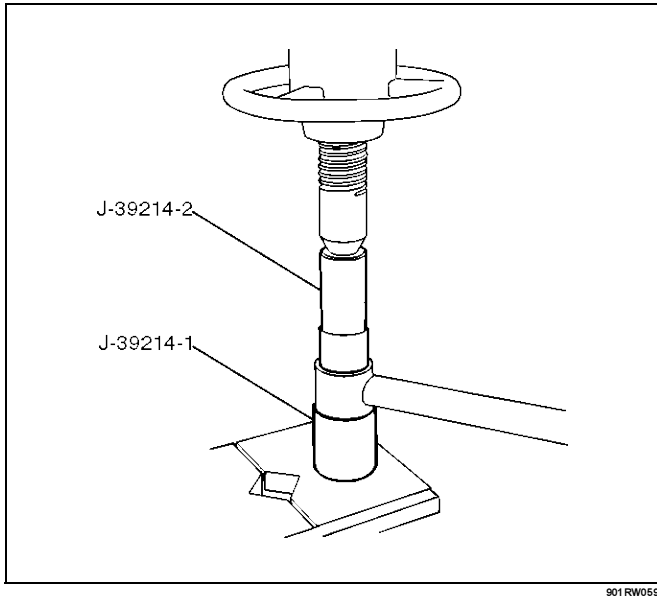
1. Trailing link
2. Rubber bushing
 - Remove the rubber bushing by using remover J-39214.



901RW058

- Install the rubber bushing by using installer J-39214.

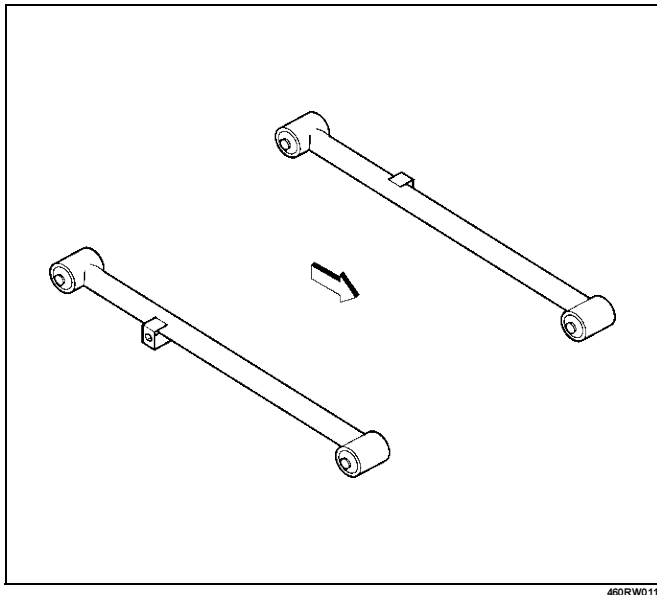
NOTE: When mounting rubber bushings, be sure not to use grease on bushings or any other nearby part.



Installation

1. Install trailing link. Make sure that the trailing link is in its correct position.

NOTE: When mounting trailing link, be sure not to use grease on bushings or any other nearby part.



2. Install bolt, nut and protector. Tighten the bolts and nuts lightly, then retighten them to the specified torque after the vehicle is at curb height.

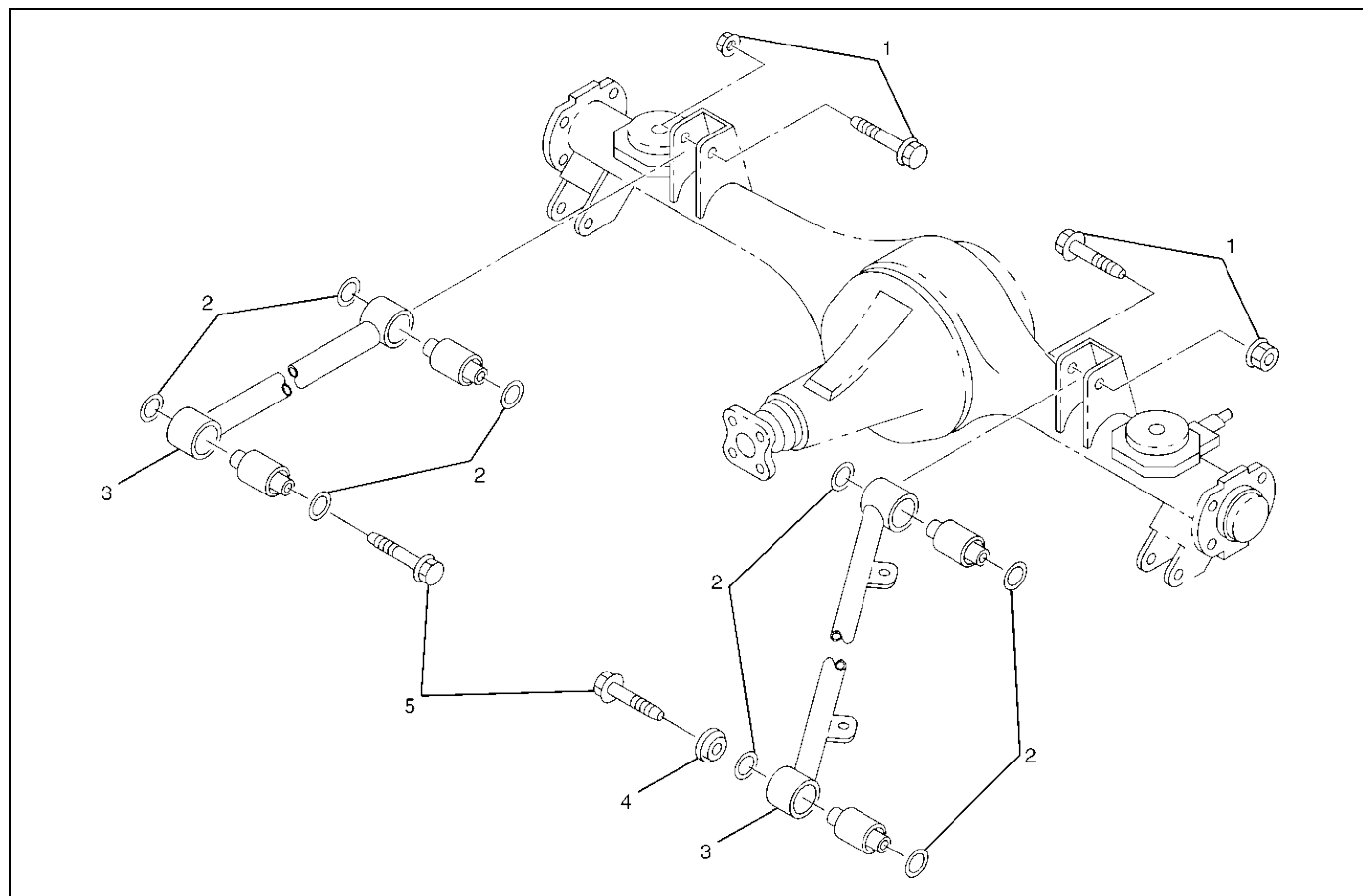
Torque: 137 N·m (101 lbft)

3. Install parking brake cable.

CAUTION: The parking brake cable should not be overstrained or slackened.

Upper Link

Upper Link and Associated Parts



460RW006

Legend

- | | |
|------------------------------|--------------------------------|
| (1) Bolt and Nut (Axle side) | (3) Upper Link |
| (2) Rubber Plate | (4) Protector (Left side only) |
| | (5) Bolt (Frame side) |

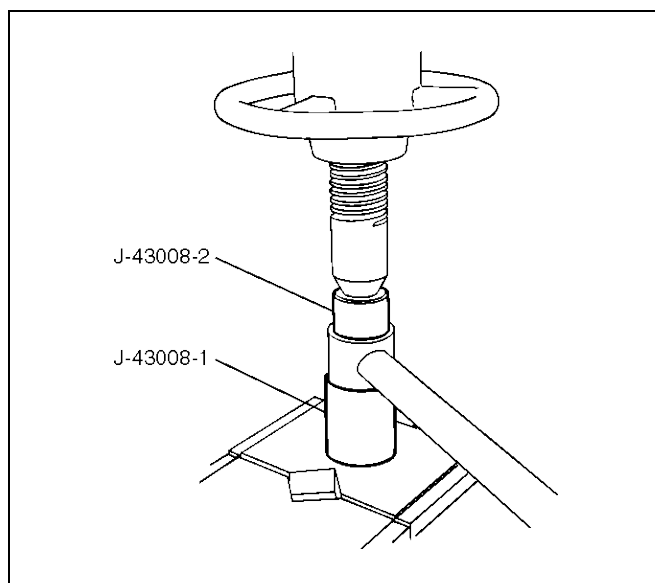
Removal

1. Remove fuel tank. Refer to *Engine Fuel in Engine* section.
2. Remove the speed sensor cable from the upper link.
3. Remove bolt, nut, rubber plate and protector.
4. Remove upper link.

Inspection and Repair

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

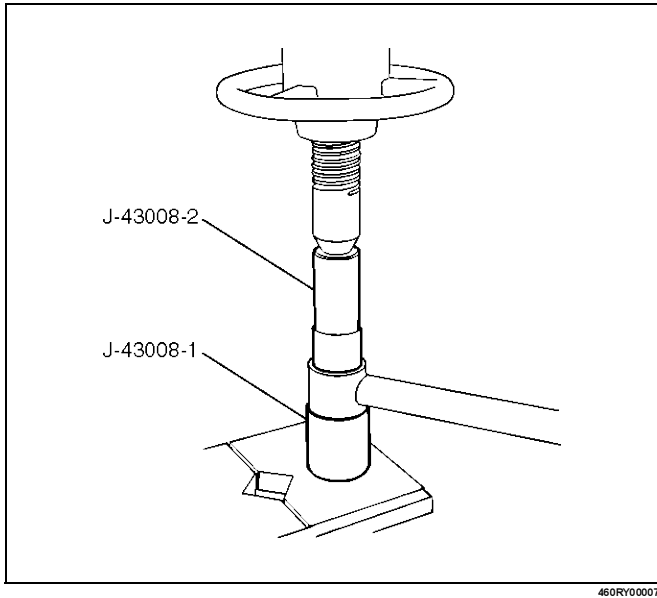
1. Upper link
2. Rubber bushing
 - Remove the rubber bushing by using remover J-43008.



460RY0006

- Install the rubber bushing by using to installer J-43008.

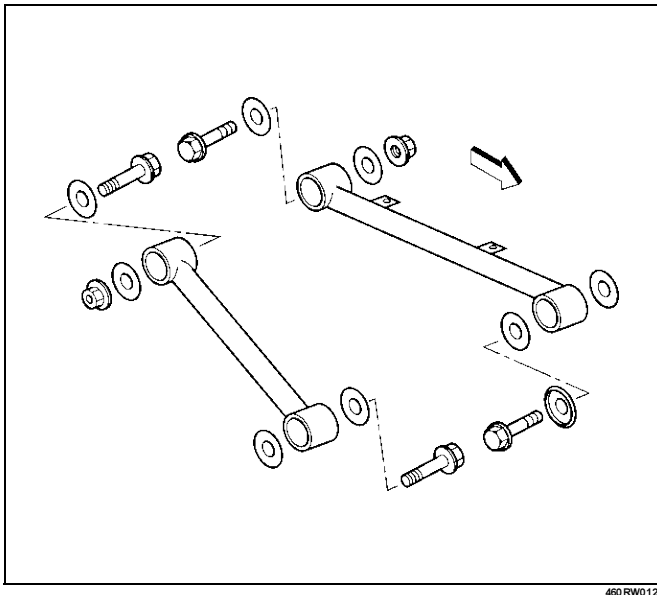
NOTE: When mounting rubber bushings, be sure not to use grease on bushings or any other nearby part.



Installation

1. Install upper link. Make sure that the upper link is in its correct position.

NOTE: When mounting upper link, be sure not to use grease bushings or any other nearby part.



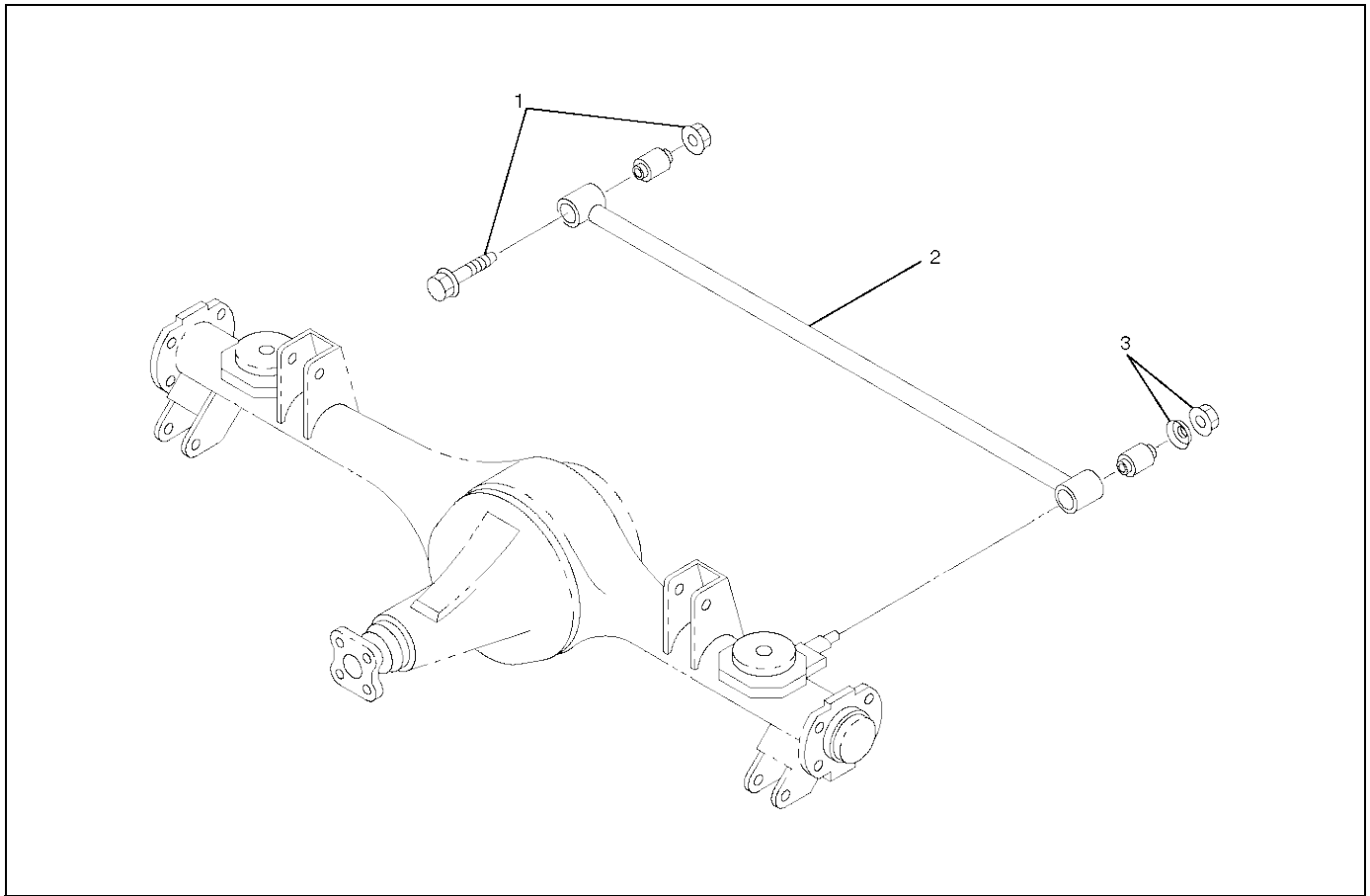
2. Install bolt, nut, rubber plate and protector. Tighten the bolts and nuts lightly, then retighten them to the specified torque after the vehicle is at curb height.

Torque: 137 N·m (101 lbft)

3. Install speed sensor cable.
4. Install fuel tank.

Lateral Rod

Lateral Rod and Associated Parts



Legend

(1) Bolt and Nut (Frame side)

(2) Lateral Rod

(3) Nut and Washer (Axle side)

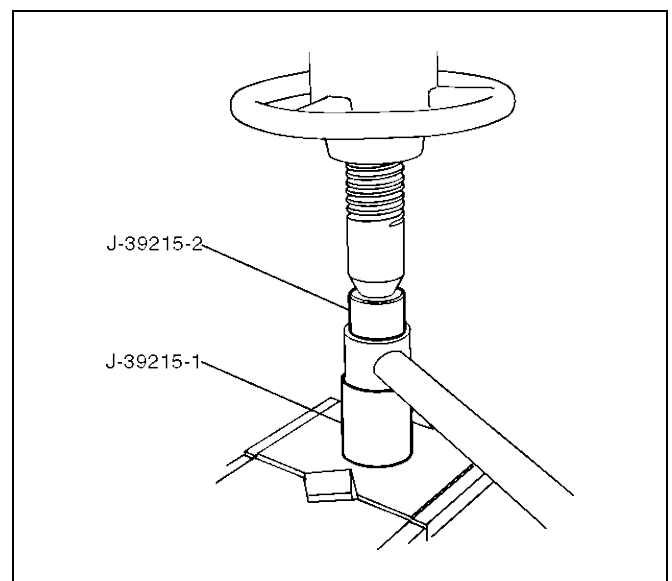
Removal

1. Remove nut and washer.
2. Remove bolt and nut.
3. Remove lateral rod.

Inspection and Repair

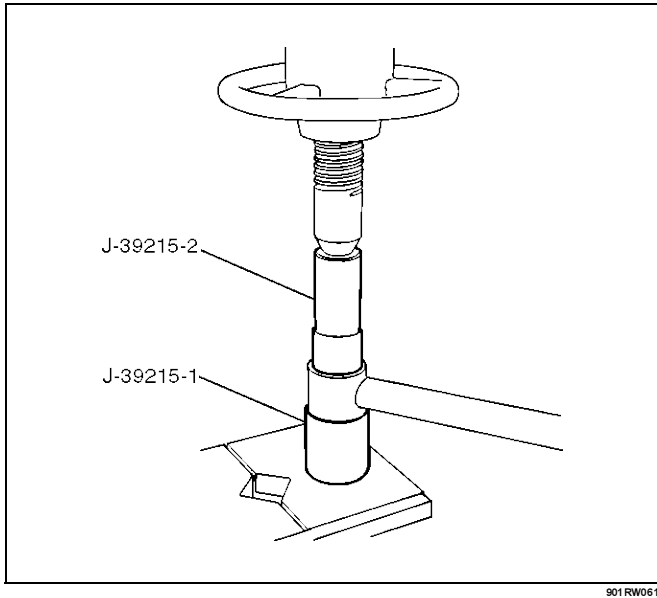
Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection.

1. Lateral rod
2. Rubber bushing (Frame side)
 - Remove the rubber bushing (Frame side) by using remover J-39215.



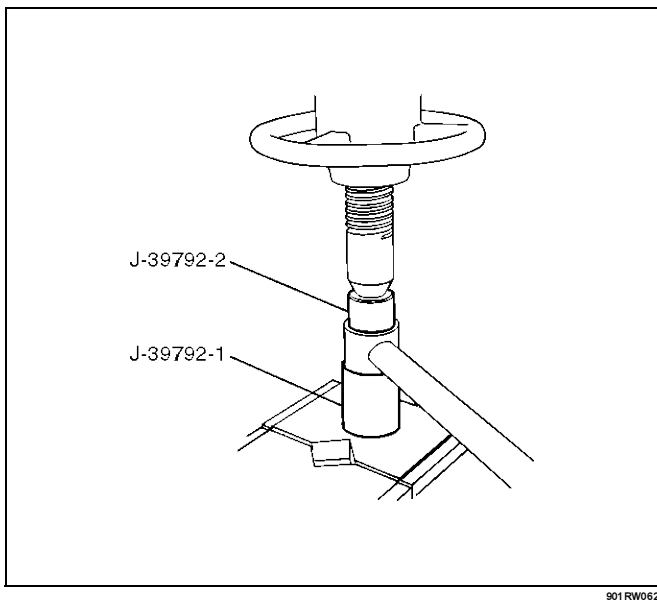
- Install the rubber bushing (Frame side) by using Installer J-39215.

NOTE: When mounting rubber bushings, do not use grease on bushings or any other nearby parts.

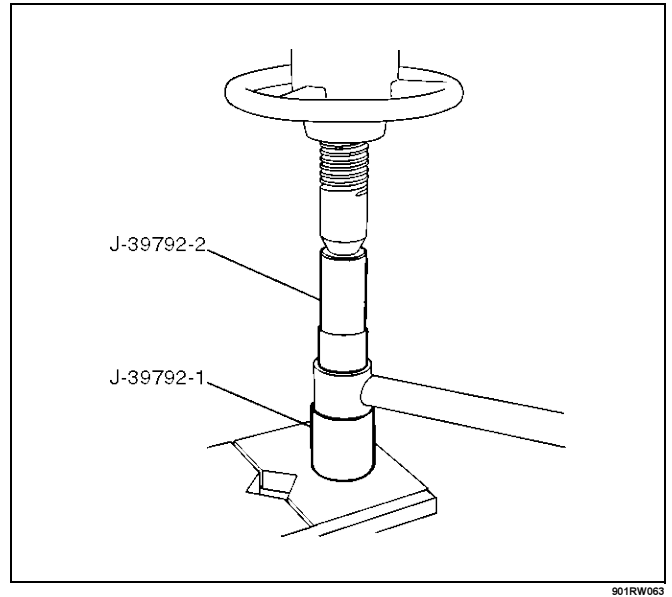


3. Rubber bushing (Axle side)

- Remove the rubber bushing (Axle side) by using remover J-39792.



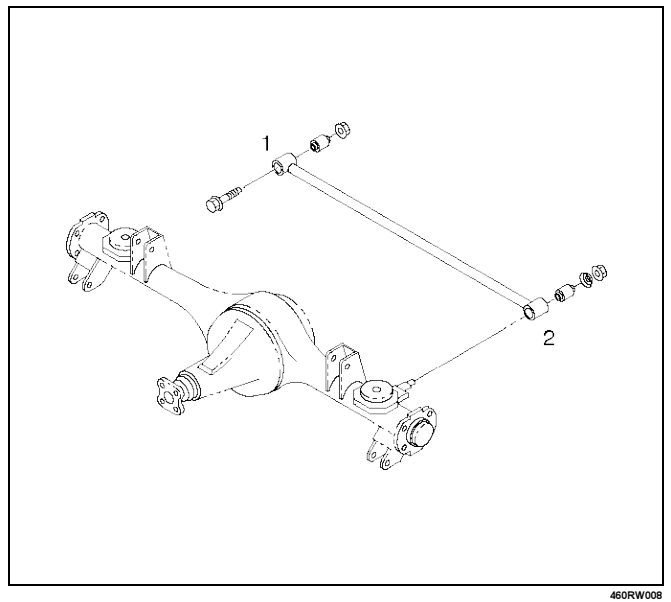
- Install the rubber bushing (Axle side) by using installer J-39792.



Installation

1. Install lateral rod and make sure that the lateral rod is in its correct position.

NOTE: When mounting lateral rod, be sure not to use grease on bushings or any other nearby part.



Legend

- (1) Frame Side
- (2) Axle Side

2. Install bolt and nut (Frame side). Tighten the bolt and nut lightly, then retighten them to the specified torque after the vehicle is at curb height.

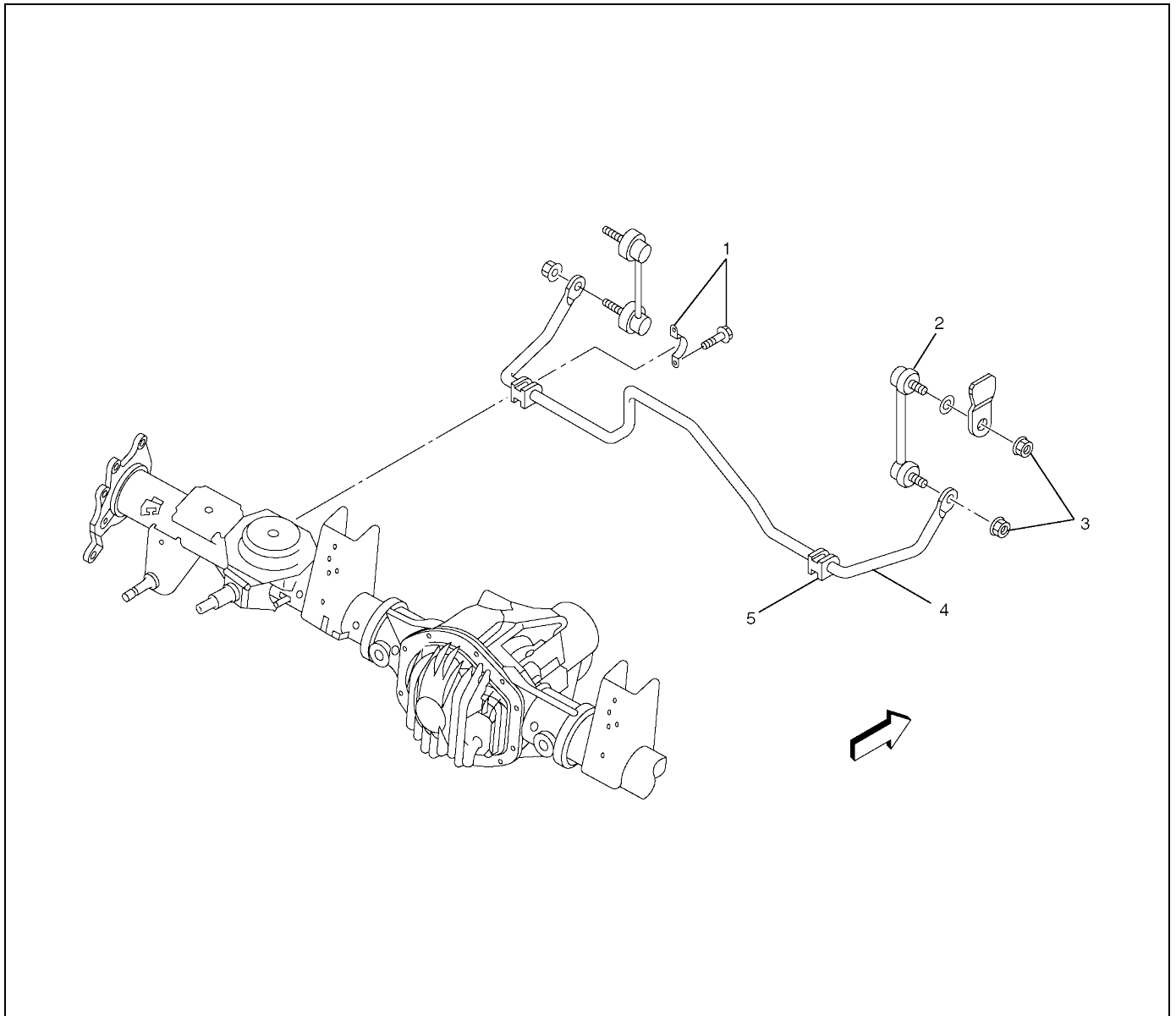
Torque: 137 N·m (101 lb ft)

3. Install nut and washer (Axle side). Tighten the nut lightly, then retighten the nut to the specified torque after the vehicle is at curb height.

Torque: 78 N·m (58 lb ft)

Stabilizer Bar

Stabilizer Bar and Associated Parts



460R200003

Legend

- (1) Bracket and Blot
- (2) Link

- (3) Bolt and Nut
- (4) Stabilizer Bar
- (5) Rubber Bushing

Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove wheel and tire assembly. Refer to *Wheel* in this section.
3. Remove bolt and nut.
4. Remove link.
5. Remove bracket.
6. Remove rubber bushing.

Inspection and Repair

Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection. Check the following parts:

- Stabilizer bar
- Rubber bushing
- Link

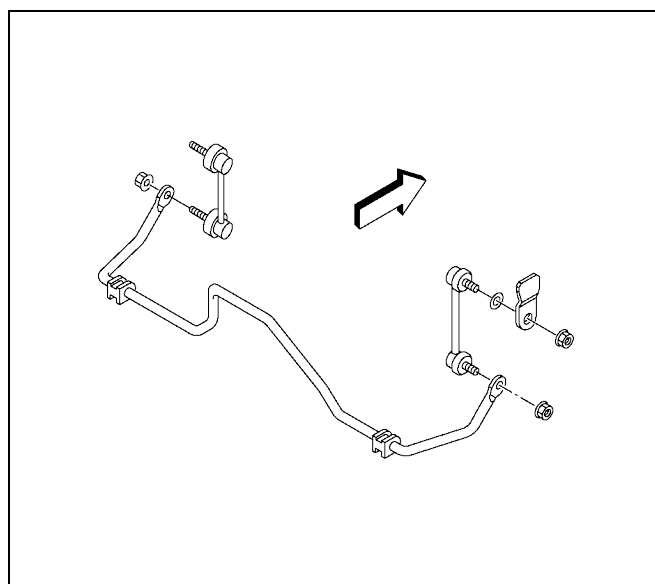
Installation

1. Install rubber bushing.
2. Install bracket to axle housing and tighten to the specified torque.

Torque: 25N·m (18lbft)

3. Install link.
4. Install bolt and nut, then tighten the nut to the specified torque.

Torque: 50N·m (37lbft)



460R200002

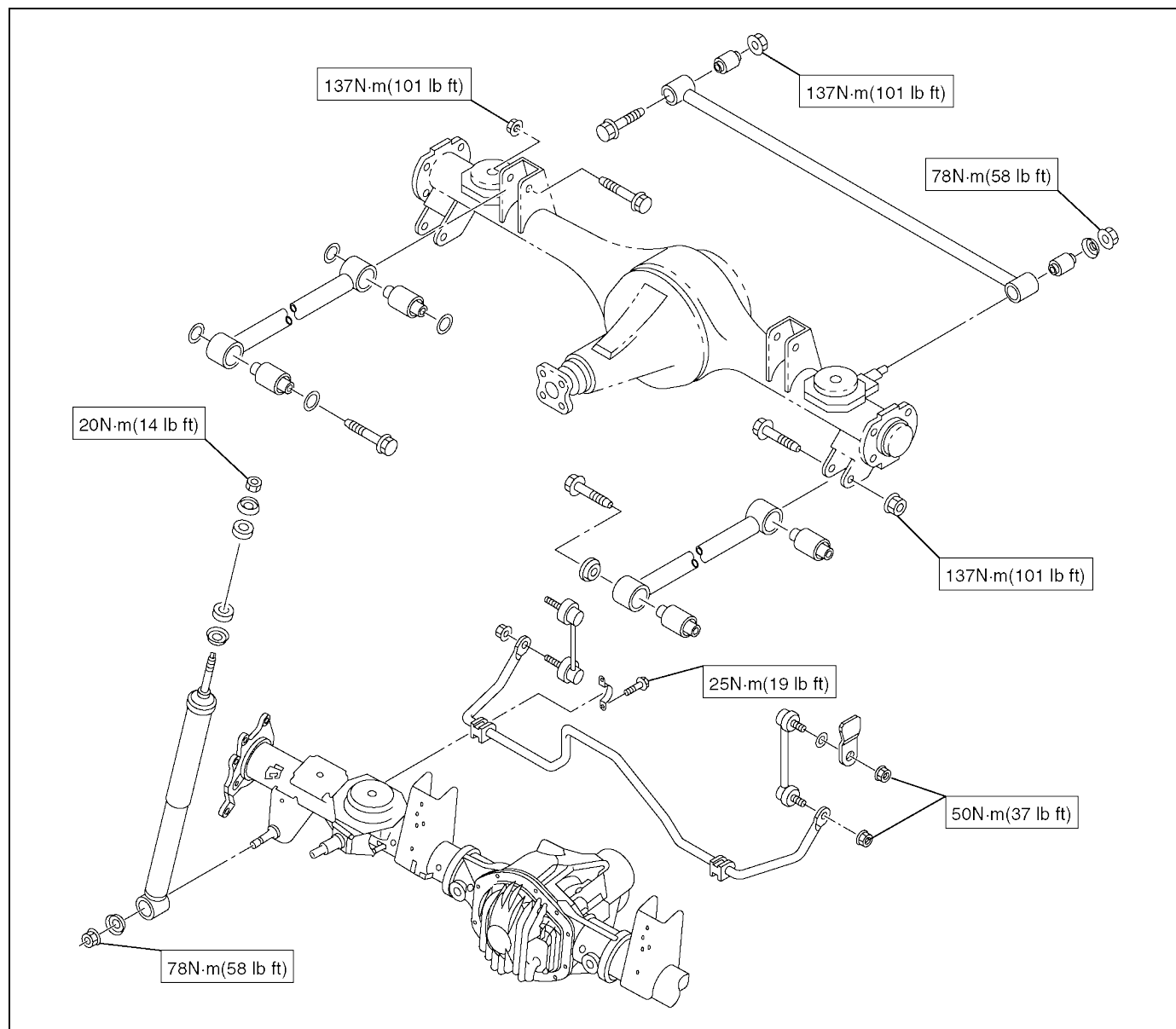
Main Data and Specifications

General Specifications

Rear suspension	Type	5-Link, coil spring type with stabilizer bar.			
Coil spring	Free length	Soft Top		Resin Top	
		374.5mm (14.74in)		383.5mm (15.10in)	
	Spring diameter	12.3mm (0.48in)		12.5mm (0.49in)	
	Coil diameter (inner)	105mm (4.13in)			
	Effective No. of turns	6.23		6.59	
	Total No. of turns	7.73		8.09	
Shock absorber	Type	Hydraulic, double acting, telescopic			
	Piston diameter	30mm (1.18in)			
	Stroke	Without ISC shock absorber	175.0mm (6.89in)	With ISC shock absorber	159mm (6.26in)
	Extended length		473.5 mm (18.64in)		518mm (20.39in)
	Compressed length		298.5 mm (11.75in)		359mm (14.13in)
Stabilizer bar	Diameter	19mm (0.71in)			

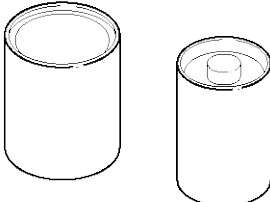
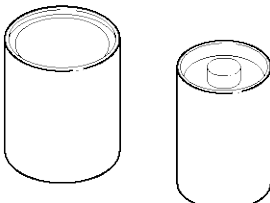
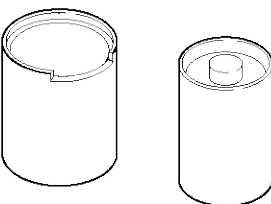
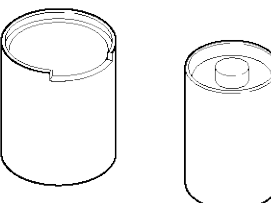
3D-16 REAR SUSPENSION

Torque Specifications



E03R200006

Special Tools

ILLUSTRATION	TOOL NO. TOOL NAME
 901RS291	J-39214 Remover and Installer; Trailing link bushing
 901RS291	J-43008 Remover and Installer; Upper link bushing
 901RS292	J-39792 Remover and Installer; Lateral rod bushing (Axle side)
 901RS293	J-39215 Remover and Installer; Lateral rod bushing (Frame side)

RODEO SPORT

SUSPENSION

CONTENTS

Front Suspension 3C

Rear Suspension 3D

Wheel and Tire System See 2002 Rodeo(UE) Workshop Manual

Intelligent Suspension Control See 2002 Rodeo(UE) Workshop Manual

RODEO SPORT

DRIVELINE/AXLE

CONTENTS

Differential (Front)	See 2002 Rodeo(UE) Workshop Manual
Differential (Rear)	See 2002 Rodeo(UE) Workshop Manual
Driveline Control System	See 2002 Rodeo(UE) Workshop Manual
Drive Shaft System	4C
Transfer Case	See 2002 Rodeo(UE) Workshop Manual