

SUSPENSION

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ALIGNMENT

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DESCRIPTION AND OPERATION

WHEEL ALIGNMENT

Wheel alignment involves the correct positioning of the wheels in relation to the vehicle. The positioning is accomplished through suspension and steering linkage adjustments. An alignment is considered essential for efficient steering, good directional stability and to minimize tire wear. The most important measurements of an alignment are caster, camber and toe position (Fig. 1).

- **CASTER** is the forward or rearward tilt of the steering knuckle from vertical. Tilting the top of the knuckle rearward provides positive caster. Tilting the top of the knuckle forward provides negative caster. Caster is a directional stability angle. This angle enables the front wheels to return to a straight ahead position after turns.

- **CAMBER** is the inward or outward tilt of the wheel relative to the center of the vehicle. Tilting the top of the wheel inward provides negative camber. Tilting the top of the wheel outward provides positive camber. Incorrect camber will cause wear on the inside or outside edge of the tire. The angle is not adjustable, damaged component(s) must be replaced to correct the camber angle.

- **WHEEL TOE POSITION** is the difference between the leading inside edges and trailing inside edges of the front tires. Incorrect wheel toe position is the most common cause of unstable steering and

uneven tire wear. The wheel toe position is the **final** front wheel alignment adjustment.

- **STEERING AXIS INCLINATION ANGLE** is measured in degrees and is the angle that the steering knuckles are tilted. The inclination angle has a fixed relationship with the camber angle. It will not change except when a spindle or ball stud is damaged or bent. The angle is not adjustable, damaged component(s) must be replaced to correct the steering axis inclination angle.

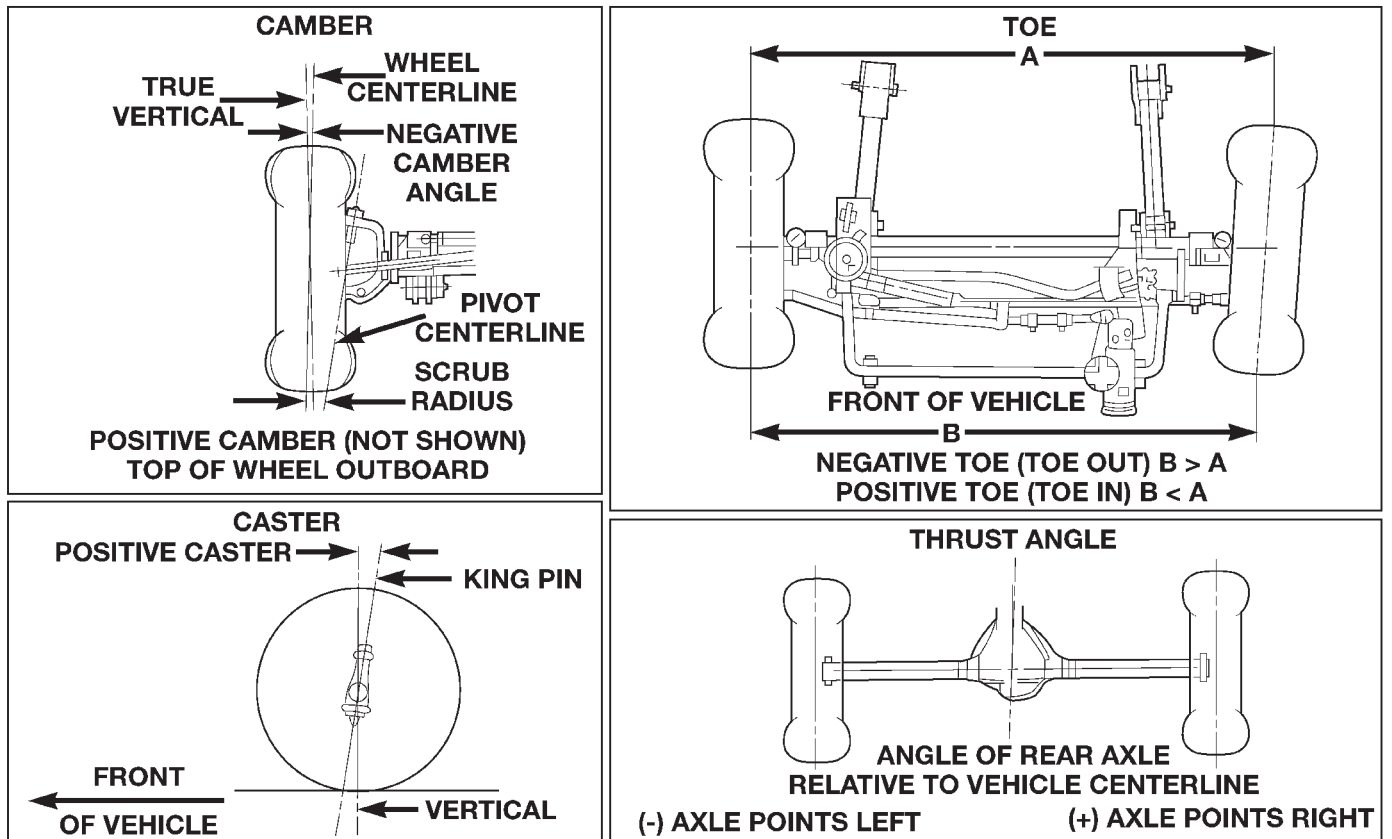
- **THRUST ANGLE** is the angle of the rear axle relative to the centerline of the vehicle. Incorrect thrust angle can cause off-center steering and excessive tire wear. This angle is not adjustable, damaged component(s) must be replaced to correct the thrust angle.

CAUTION: Never attempt to modify suspension or steering components by heating or bending.

CAUTION: Components attached with a nut and cotter pin must be torqued to specification. Then if the slot in the nut does not line up with the cotter pin hole, tighten nut until it is aligned. Never loosen the nut to align the cotter pin hole.

NOTE: Periodic lubrication of the front suspension/steering system components may be required. Rubber bushings must never be lubricated. Refer to Group 0, Lubrication And Maintenance for the recommended maintenance schedule.

DESCRIPTION AND OPERATION (Continued)



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Fig. 1 Wheel Alignment Measurements

SERVICE PROCEDURES

PRE-ALIGNMENT

Before starting wheel alignment, the following inspection and necessary corrections must be completed. Refer to Suspension and Steering System Diagnosis Chart for additional information.

- (1) Inspect tires for size and tread wear.
- (2) Set tire air pressure.
- (3) Inspect front wheel bearings for wear.
- (4) Inspect front wheels for excessive radial or lateral runout and balance.
- (5) Inspect ball studs, linkage pivot points and steering gear for looseness, roughness or binding.
- (6) Inspect suspension components for wear and noise.

WHEEL ALIGNMENT

Before each alignment reading the vehicle should be jounced (rear first, then front). Grasp each bumper at the center and jounce the vehicle up and down three times. Always release the bumper in the down position.

To obtain an accurate alignment, a 4 wheel alignment machine must be used and the equipment calibration verified.

CAMBER

The wheel camber angle is preset. This angle is not adjustable and cannot be altered.

CASTER

The wheel caster angle is preset. This angle is not adjustable and cannot be altered.

TOE POSITION

NOTE: For an accurate wheel toe position adjustment the engine must be engine running.

- (1) Apply parking brakes.
- (2) Start the engine and turn wheels both ways before straightening the steering wheel. Center and secure the steering wheel.
- (3) Loosen the tie rod adjustment sleeve clamp bolts (Fig. 2).
- (4) Turn the sleeve to obtain the preferred positive TOE-IN specification. Position the clamp bolts as shown (Fig. 2) for proper clearance.
- (5) Tighten the clamp bolts to 68 N·m (50 ft. lbs.).

NOTE: Make sure the toe setting does not change during clamp tightening.

SERVICE PROCEDURES (Continued)

(6) Verify alignment specifications, then turn the engine off.

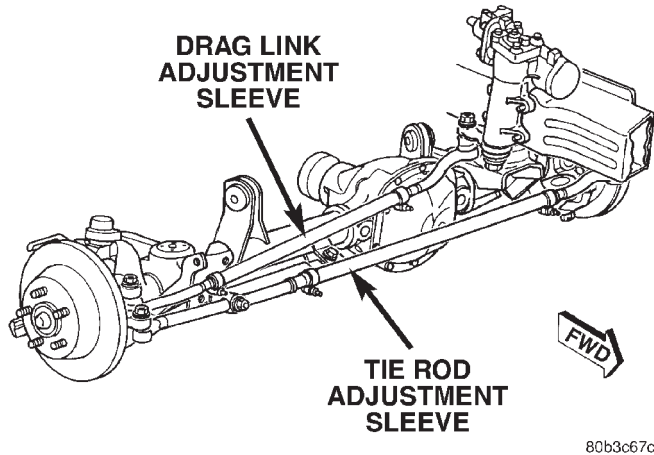


Fig. 2 Steering Linkage

STEERING WHEEL CENTERING

NOTE: The steering wheel can be centered without affecting the toe position.

- (1) Loosen the drag link adjustment sleeve clamp bolts.
- (2) Turn the adjustment sleeve to center the wheel.
- (3) Position the clamp bolts as shown (Fig. 2) for proper clearance.
- (4) Tighten the clamp bolts to 68 N·m (50 ft. lbs.).
- (5) Road test the vehicle to verify the wheel is centered.

SPECIFICATIONS

ALIGNMENT

NOTE: Specifications are in degrees.

FRONT WHEELS - STANDARD SUSPENSION

ANGLE	PREFERRED	RANGE
CASTER	NA	+6.0° to +8.0°
CAMBER	NA	0° to -0.5°
TOE-IN (each wheel)	+0.125°	0° to +0.25°
Toe Differential Left to Right .05°		

FRONT WHEELS - UP-COUNTRY SUSPENSION

ANGLE	PREFERRED	RANGE
CASTER	NA	+5.5° to +7.5°
CAMBER	NA	0° to -0.5°
TOE-IN (each wheel)	+0.125°	0° to +0.25°
Toe Differential Left to Right .05°		

REAR AXLE

ANGLE	RANGE
CAMBER	0° to -0.5
THRUST ANGLE	± 0.25°
TOTAL TOE-IN	0° to +0.5°

FRONT SUSPENSION

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DESCRIPTION AND OPERATION

FRONT SUSPENSION

The front suspension (Fig. 1) is a link/coil design comprised of:

- Drive axle
- Shock absorbers
- Coil springs
- Upper and lower suspension arms
- Stabilizer bar
- Track bar
- Jounce bumpers

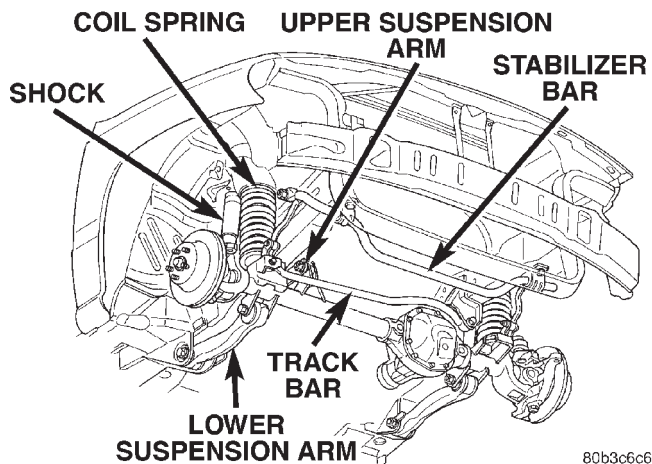


Fig. 1 Front Suspension

CAUTION: Components attached with a nut and cotter pin must be torqued to specification. Then if the slot in the nut does not line up with the cotter pin hole, tighten nut until it is aligned. Never loosen the nut to align the cotter pin hole.

CAUTION: Suspension components with rubber bushings must be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort will be affected and cause premature bushing wear.

SHOCK ABSORBERS

DESCRIPTION

The top of the shock absorbers are bolted to the body. The bottom of the shocks are bolted to the axle brackets. The standard shocks have conventional twin tube construction and are low pressure gas charged. Gas charging prevents cavitation during rough road operation. Up-Country shocks are mono tube design and are high pressure gas charged.

OPERATION

The shock absorbers dampen jounce and rebound motion of the vehicle over various road conditions and limit suspension rebound travel.

DESCRIPTION AND OPERATION (Continued)

JOUNCE BUMPER**DESCRIPTION**

They are mounted under the unibody rails to minimize transmission of noise to the passenger compartment.

OPERATION

The jounce bumpers are used to limit suspension travel in compression.

COIL SPRINGS AND ISOLATORS**DESCRIPTION**

The coil springs mount up in the wheelhouse which is part of the unitized body bracket. A rubber doughnut isolator is located between the top of the spring and the body. The bottom of the spring seats on a axle isolator made of rubber with a steel insert.

OPERATION

The coil springs control ride quality and maintain proper ride height. The isolators provide road noise isolation.

STEERING KNUCKLE**DESCRIPTION**

The knuckle is a single casting with legs machined for the upper and lower ball joints. The knuckle also has machined mounting locations for the front brake calipers and hub bearing.

OPERATION

The steering knuckle pivot between the upper and lower ball joint. Steering linkage attached to the knuckle allows the vehicle to be steered.

LOWER SUSPENSION ARMS AND BUSHINGS**DESCRIPTION**

The lower suspension arms are hydroformed steel and use voided oval bushings at one end of the arm.

OPERATION

The bushings provide isolation from the axle. The arms mount to the unibody frame rail bracket and the axle brackets. The arm and bushings provide location and react to loads from the axle.

UPPER SUSPENSION ARMS AND BUSHINGS**DESCRIPTION**

The upper suspension arms are hydroformed steel and use rubber bushings at each end of the arm.

OPERATION

The arms mount to the unibody frame rail bracket and the axle brackets. The arm and bushings provide location and react to loads from the axle. The bushings provide isolation from the axle.

STABILIZER BAR**DESCRIPTION**

The bar extends across the front underside of the chassis and is mounted to the frame rails. Links are connected from the bar to the axle brackets. The stabilizer bar and links are isolated by rubber bushings.

OPERATION

The stabilizer bar is used to control vehicle body roll during turns. The spring steel bar helps to control the vehicle body in relationship to the suspension.

TRACK BAR**DESCRIPTION**

The bar is attached to a frame rail bracket and axle bracket. The bar is forged and has non replaceable isolator bushings at both ends.

OPERATION

The track bar is used to control front axle lateral movement and provides cross car location of the axle assembly.

HUB/BEARING**DESCRIPTION**

The bearing used on the front hub of this vehicle is the combined hub and bearing unit type assembly. This unit assembly combines the front wheel mounting hub (flange) and the front wheel bearing into a one piece unit. The wheel mounting studs are the only replaceable component of the hub/bearing assembly.

OPERATION

The hub/bearing assembly is mounted to the steering knuckle and is retained by three mounting bolts accessible from the back of the steering knuckle. The hub/bearing unit is not serviceable and must be replaced as an assembly if the bearing or the hub is determined to be defective.

DIAGNOSIS AND TESTING

SUSPENSION AND STEERING SYSTEM

CONDITION	POSSIBLE CAUSES	CORRECTION
FRONT END NOISE	<ol style="list-style-type: none"> 1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 	<ol style="list-style-type: none"> 1. Adjust or replace wheel bearings. 2. Tighten or replace components as necessary.
EXCESSIVE PLAY IN STEERING	<ol style="list-style-type: none"> 1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Loose or worn steering gear. 	<ol style="list-style-type: none"> 1. Adjust or replace wheel bearings. 2. Tighten or replace components as necessary. 3. Adjust or replace steering gear.
FRONT WHEELS SHIMMY	<ol style="list-style-type: none"> 1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Tires worn or out of balance. 4. Alignment. 5. Leaking steering dampener. 	<ol style="list-style-type: none"> 1. Adjust or replace wheel bearings. 2. Tighten or replace components as necessary. 3. Replace or balance tires. 4. Align vehicle to specifications. 5. Replace steering dampener.
VEHICLE INSTABILITY	<ol style="list-style-type: none"> 1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Tire pressure. 4. Alignment. 	<ol style="list-style-type: none"> 1. Adjust or replace wheel bearings. 2. Tighten or replace components as necessary. 3. Adjust tire pressure. 4. Align vehicle to specifications.
EXCESSIVE STEERING EFFORT	<ol style="list-style-type: none"> 1. Loose or worn steering gear. 2. Power steering fluid low. 3. Column coupler binding. 4. Tire pressure. 5. Alignment. 	<ol style="list-style-type: none"> 1. Adjust or replace steering gear. 2. Add fluid and repair leak. 3. Replace coupler. 4. Adjust tire pressure. 5. Align vehicle to specifications.
VEHICLE PULLS TO ONE SIDE	<ol style="list-style-type: none"> 1. Tire pressure. 2. Alignment. 3. Loose, worn or bent steering/suspension components. 4. Radial tire lead. 5. Brake pull. 6. Weak or broken spring. 	<ol style="list-style-type: none"> 1. Adjust tire pressure. 2. Align vehicle to specifications. 3. Inspect, tighten or replace components as necessary. 4. Rotate or replace tire as necessary. 5. Repair brake as necessary. 6. Replace spring.
KNOCKING, RATTLING OR SQUEAKING	<ol style="list-style-type: none"> 1. Worn shock bushings. 2. Loose, worn or bent steering/suspension components. 3. Shock valve. 	<ol style="list-style-type: none"> 1. Replace shock. 2. Inspect, tighten or replace components as necessary. 3. Replace shock.
IMPROPER TRACKING	<ol style="list-style-type: none"> 1. Loose, worn or bent track bar. 2. Loose, worn or bent steering/suspension components. 	<ol style="list-style-type: none"> 1. Inspect, tighten or replace component as necessary. 2. Inspect, tighten or replace components as necessary.

REMOVAL AND INSTALLATION

SERVICE WARNINGS AND CAUTIONS

CAUTION: Suspension components with rubber bushings must be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort will be affected and cause premature bushing wear.

SHOCK ABSORBER

REMOVAL

(1) Remove the nut, retainer and grommet from the shock stud in the engine compartment (Fig. 2).

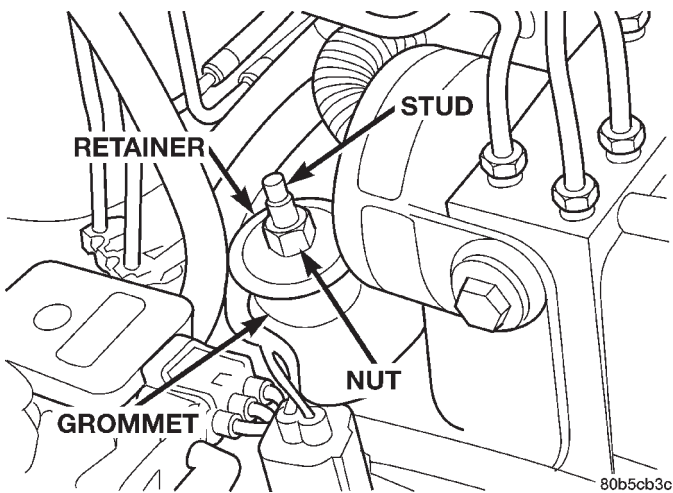


Fig. 2 Upper Shock Mounting

(2) Raise and support the front axle.
 (3) Remove the lower mounting nuts from the axle bracket (Fig. 3). Remove the shock absorber.

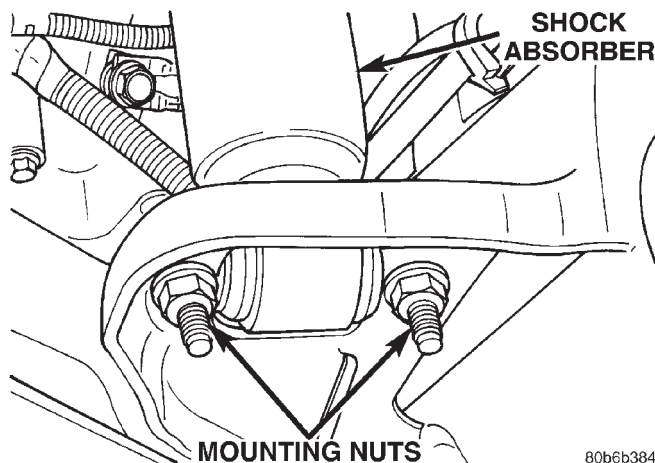


Fig. 3 Lower Shock Mounting

INSTALLATION

- (1) Position the lower retainer and grommet on the shock stud. Insert the shock absorber through the shock tower hole.
- (2) Install the lower shock studs into the axle bracket.
- (3) Install the mounting nuts and tighten to 28 N·m (250 in. lbs.).
- (4) Remove support and lower the vehicle.
- (5) Install the upper grommet, retainer and nut on the stud in the engine compartment. Tighten the nut to 35 N·m (26 ft. lbs.).

COIL SPRINGS

REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support it.
- (2) Remove the wheel and tire assemblies.
- (3) Remove stabilizer bar links mounting nuts and bolts from the axle brackets.
- (4) Remove shock absorbers lower mounting nuts from the axle brackets.
- (5) Remove the track bar mounting bolt from the axle bracket.
- (6) Lower the axle until the spring is free from the upper mount and isolator (Fig. 4).

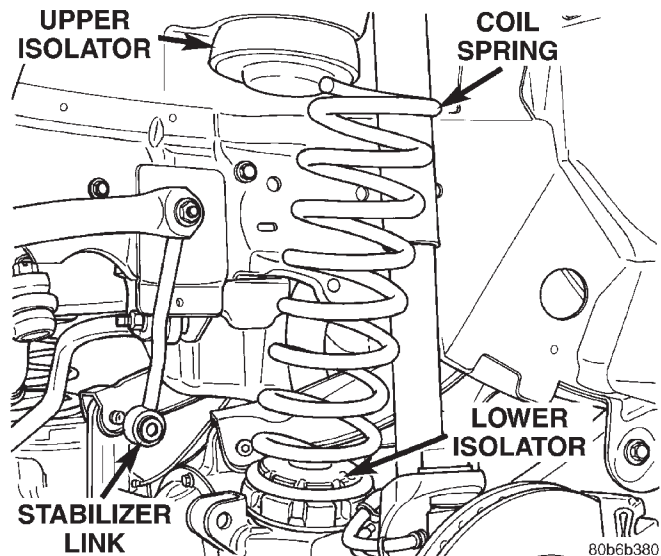


Fig. 4 Front Coil Spring

- (7) Remove the spring from the vehicle.
- (8) Remove and inspect the upper and lower spring isolators.

INSTALLATION

- (1) Install the upper isolator.
- (2) Install the lower isolator with the isolator locator nub in the axle pad hole (Fig. 5).

REMOVAL AND INSTALLATION (Continued)

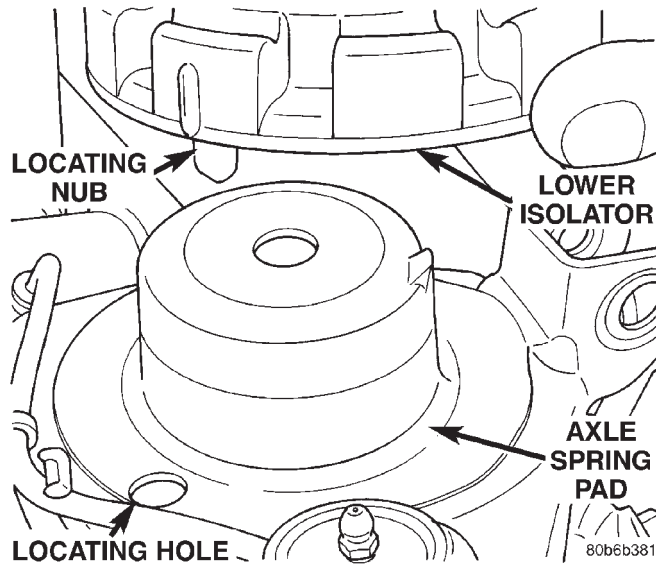


Fig. 5 Lower Isolator

- (3) Position the coil spring on the axle spring pad.

CAUTION: Ensure the spring is positioned on the lower isolator with the end of the spring coil against the isolator spring locator (Fig. 6).

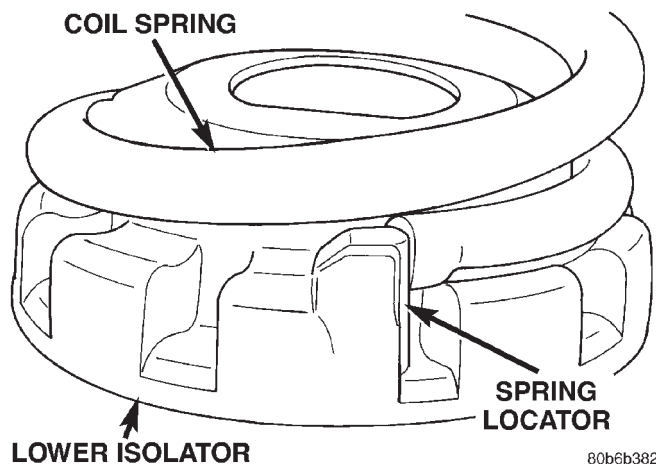


Fig. 6 Isolator Spring Locator

- (4) Raise the axle and guide the springs onto the spring upper mounts and lower shock studs into the axle brackets.
- (5) Install the shock absorbers lower mounting nuts.
- (6) Install the stabilizer bar link to the axle bracket and install the mounting bolts and nuts.
- (7) Install the track bar to the axle bracket and install the mounting bolt.

NOTE: It may be necessary to pry the axle assembly over to install the track bar bolt.

- (8) Tighten all suspension components to proper torque.
- (9) Install the wheel and tire assemblies.
- (10) Remove support and lower vehicle.

STEERING KNUCKLE AND BALL JOINTS

KNUCKLE REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove hub bearing.
- (4) Remove the axle, shaft refer to Group 3 Differential and Driveline.
- (5) Remove the tie rod on left steering knuckle. Remove the tie rod and drag link on right steering knuckle.
- (6) Remove the cotter pins from the upper and lower ball studs.
- (7) Remove the upper and lower ball stud nuts.
- (8) Strike the steering knuckle with a brass hammer to loosen knuckle from the ball studs. Remove knuckle from ball studs.

UPPER BALL JOINT REPLACEMENT

- (1) Position tools as shown to remove and install ball joint (Fig. 7).

LOWER BALL JOINT REPLACEMENT

- (1) Position tools as shown to remove and install ball joint (Fig. 8).

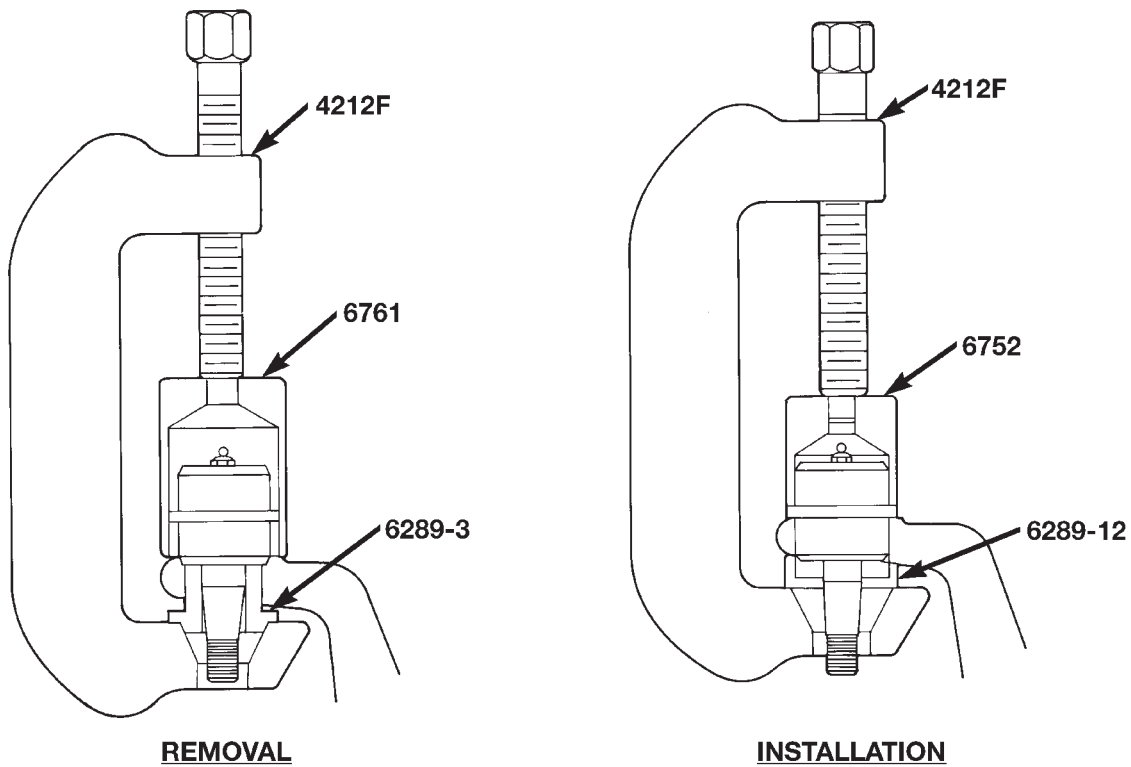
KNUCKLE INSTALLATION

- (1) Position the steering knuckle on the ball joints.
- (2) Install and tighten the bottom retaining nut to 109 N-m (80 ft. lbs.) torque. Install new cotter pin.
- (3) Install and tighten the top retaining nut to 101 N-m (75 ft. lbs.) torque. Install new cotter pin.
- (4) Install the axle shaft, refer to Group 3 Differential and Driveline.
- (5) Install the hub bearing.
- (6) Install the tie rod on the left steering knuckle. Install the tie rod and drag link end on the right steering knuckle.
- (7) Install wheel and tire assembly.
- (8) Remove support and lower vehicle.

LOWER SUSPENSION ARM

REMOVAL

- (1) Raise the vehicle and support the front axle.
- (2) Remove the lower suspension arm nut and bolt from the axle bracket (Fig. 9).
- (3) Remove the nut and bolt from the frame rail bracket and remove the lower suspension arm (Fig. 9).



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Fig. 7 Upper Ball Joint Remove/Install

INSTALLATION

(1) Position the lower suspension arm in the axle bracket and frame rail bracket.

NOTE: The end of the arm with the oval bushing attaches to the axle bracket.

(2) Install the axle bracket bolt and nut finger tight.

(3) Install the frame rail bracket bolt and nut finger tight.

(4) Remove support and lower the vehicle.

(5) With the vehicle on the ground tighten the axle bracket nut and the frame bracket bolt to 176 N·m (130 ft. lbs.).

(6) Check the alignment if new parts were installed.

UPPER SUSPENSION ARM

REMOVAL

(1) Raise vehicle and support the axle.

(2) Remove the upper suspension arm mounting nut and bolt (Fig. 10) from the axle bracket.

(3) Remove the nut and bolt (Fig. 10) at the frame rail and remove the upper suspension arm.

INSTALLATION

(1) Position the upper suspension arm at the axle and frame rail.

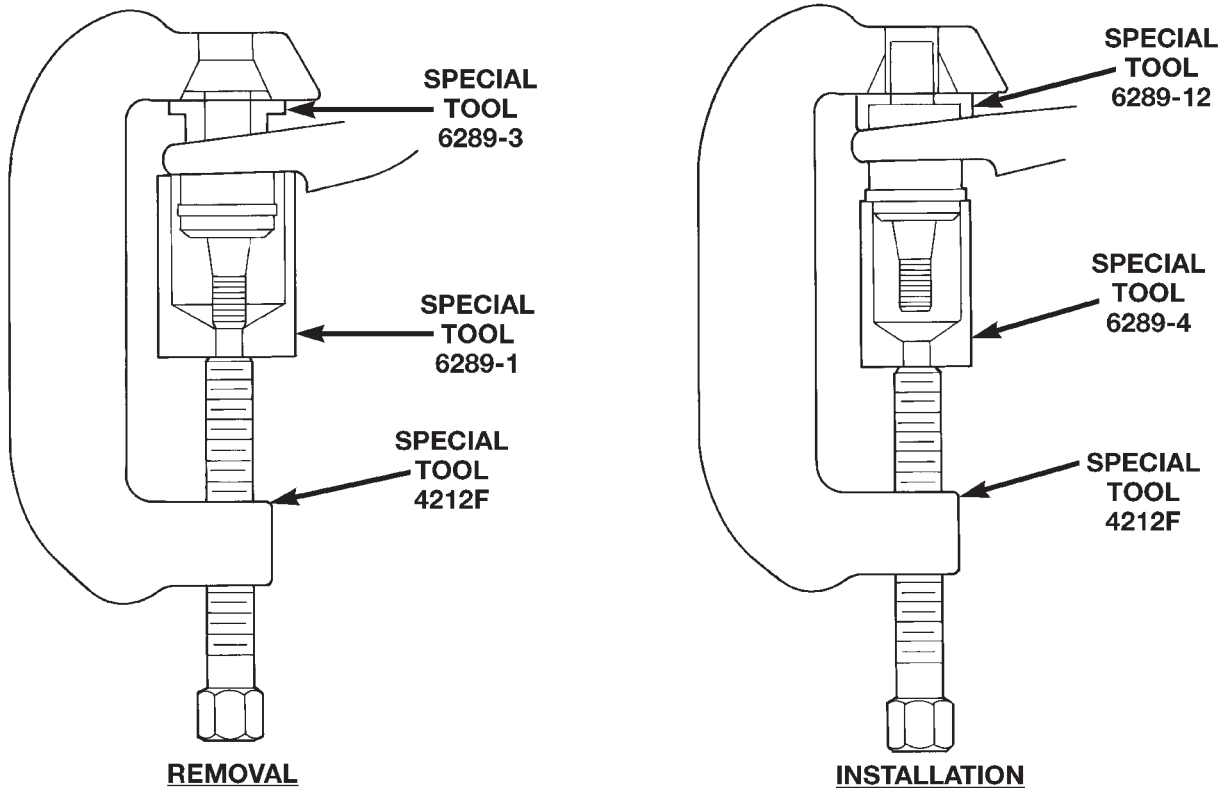
(2) Install the bolts and finger tighten the nuts.

(3) Remove the supports and lower the vehicle.

(4) With the vehicle on the ground tighten the axle bracket nut and the frame bracket bolt to 61 N·m (45 ft. lbs.).

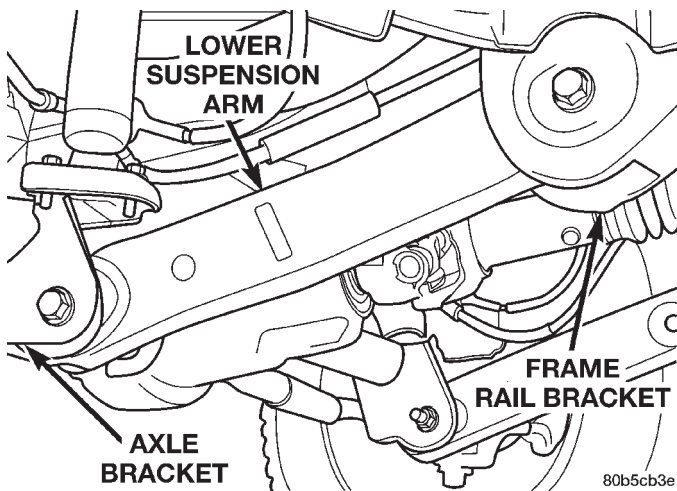
(5) Check the alignment if new parts were installed.

REMOVAL AND INSTALLATION (Continued)



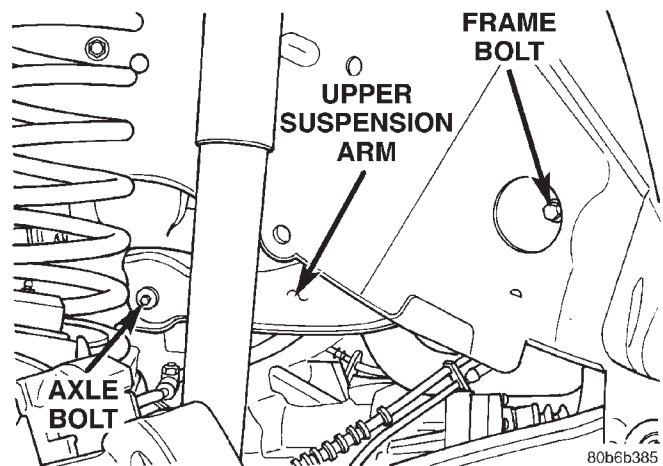
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Fig. 8 Lower Ball Joint Remove/Install



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Fig. 9 Lower Suspension Arm



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Fig. 10 Upper Suspension Arm

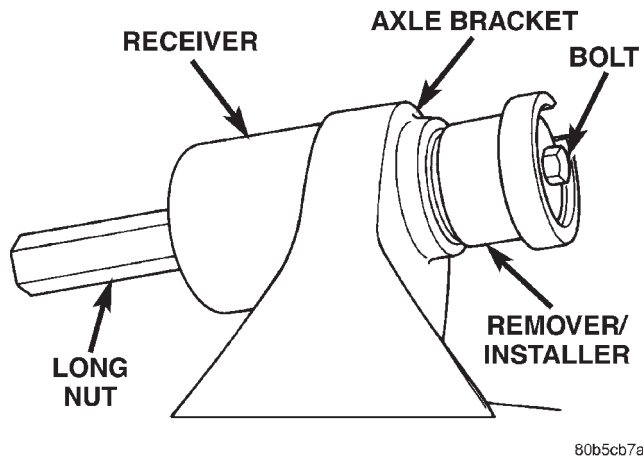
FRONT AXLE BUSHING

REMOVAL

- (1) Remove the upper suspension arm from axle.
- (2) Position Spacer 8279 over the axle bushing on a 4x2 vehicle and right side on a 4x4 vehicle.
- (3) Place Receiver 7932-1 over flanged end of the bushing (Fig. 11).

- (4) Place small end of Remover/Install 7932-2 against other side of the bushing.
- (5) Install bolt 7604 through remover, bushing and receiver.
- (6) Install Long Nut 7603 and tighten nut too pull bushing out of the axle bracket.
- (7) Remove nut, bolt, receiver, remover and bushing.

REMOVAL AND INSTALLATION (Continued)



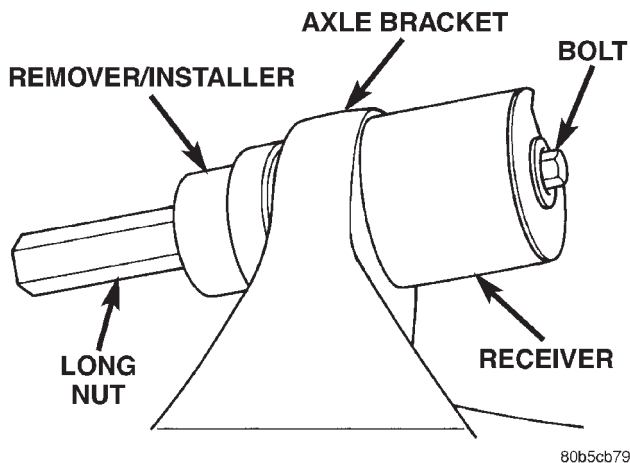
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Fig. 11 Bushing Removal

NOTE: On 4x2 vehicle and right side of 4x4 vehicle, leave Spacer 8279 in position for bushing installation.

INSTALLATION

- (1) Place Receiver 7932-1 on the other side of the axle bracket.
- (2) Position new bushing up to the axle bracket, and large end of Remover/Install 7932-2 against the bushing (Fig. 12).
- (3) Install bolt 7604 through receiver, bushing and installer.
- (4) Install Long Nut 7603 and tighten nut to draw the bushing into the axle bracket.



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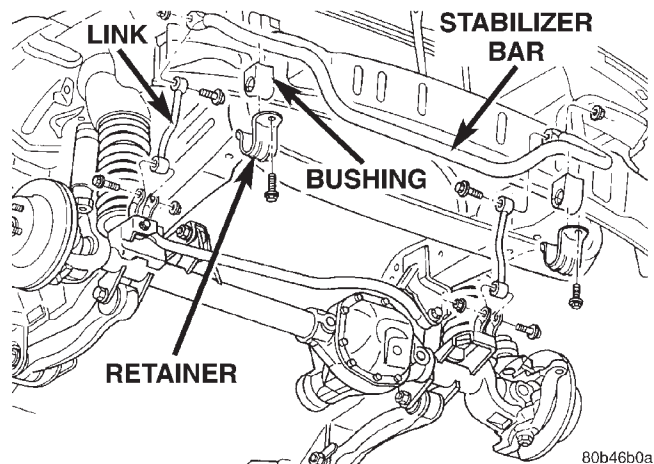
Fig. 12 Bushing Installation

- (5) Remove tools and install the upper suspension arm.

STABILIZER BAR

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove link nuts and bolts (Fig. 13) and remove the links.
- (3) Remove the stabilizer bar retainer bolts (Fig. 13) from the frame rails and remove the stabilizer bar.



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Fig. 13 Stabilizer Bar

INSTALLATION

- (1) Position the stabilizer bar on the frame rail and install the retainers and bolts. Ensure the bar is centered with equal spacing on both sides. Tighten the bolts to 92 N·m (68 ft. lbs.).
- (2) Install the links onto the stabilizer bar and axle brackets and install the bolts and nuts finger tight.
- (3) Remove the supports and lower the vehicle.
- (4) With the vehicle on the ground tighten the stabilizer bar link nuts to 106 N·m (78 ft. lbs.).

TRACK BAR

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the nut and bolt from the frame rail bracket (Fig. 14).
- (3) Remove the bolt from the axle shaft tube bracket (Fig. 15). Remove the track bar.

INSTALLATION

- (1) Install the track bar to the axle tube bracket. Install the retaining bolt finger tight.
- (2) Install track bar to the frame rail bracket. Install the bolt and nut finger tight.

REMOVAL AND INSTALLATION (Continued)

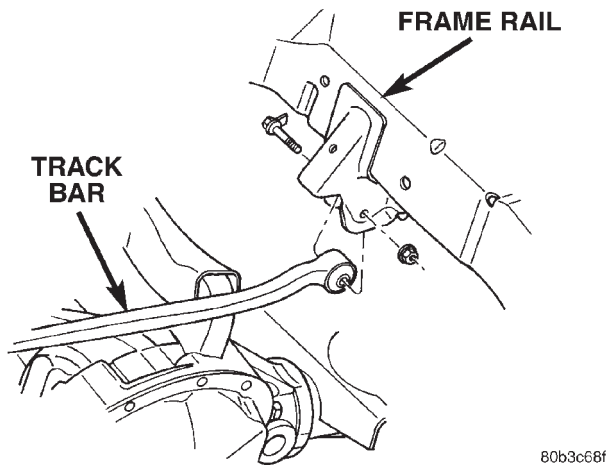


Fig. 14 Track Bar Frame Rail Bracket

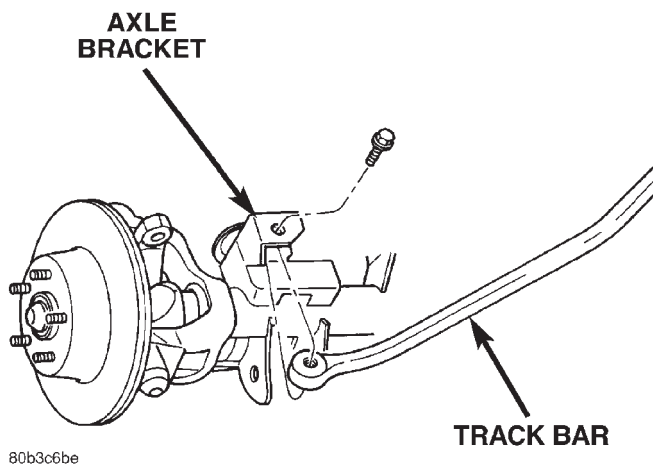


Fig. 15 Track Bar Axle Bracket

NOTE: It may be necessary to pry the axle assembly over to install the track bar to the frame rail bracket.

- (3) Remove the supports and lower the vehicle.
- (4) With the vehicle on the ground tighten the nut at the frame rail bracket and to the bolt at the axle bracket to 100 N·m (74 ft. lbs.).
- (5) Check alignment specifications if a new track bar was installed.

HUB BEARING

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assembly.
- (3) Remove the brake caliper, caliper anchor, rotor and ABS wheel speed sensor, refer to Group 5 Brakes.
- (4) Remove the cotter pin, nut retainer and axle hub nut.

- (5) Remove the hub bearing mounting bolts from the back of the steering knuckle. Remove hub bearing (Fig. 16) from the steering knuckle and off the axle shaft.

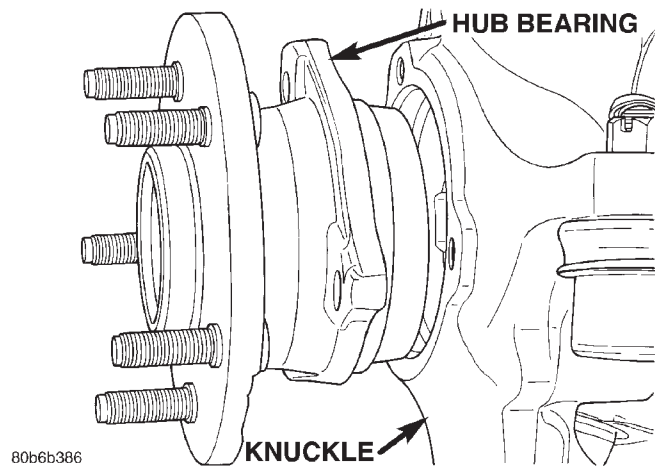


Fig. 16 Hub Bearing & Knuckle

INSTALLATION

- (1) Install the hub bearing to the knuckle.
- (2) Install the hub bearing to knuckle bolts and tighten to 102 N·m (75 ft. lbs.).
- (3) Install the hub washer and nut. Tighten the hub nut to 237 N·m (175 ft. lbs.). Install the nut retainer and a new cotter pin.
- (4) Install the brake rotor, caliper anchor, caliper and ABS wheel speed sensor, refer to Group 5 Brakes.
- (5) Install the wheel and tire assembly.
- (6) Remove support and lower the vehicle.

WHEEL MOUNTING STUDS

CAUTION: Do not use a hammer to remove wheel studs.

REMOVAL

- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove brake caliper and rotor, refer to Group 5 Brakes for procedure.
- (4) Remove stud from hub with Remover C-4150A (Fig. 17).

INSTALLATION

- (1) Install new stud into hub flange.
- (2) Install three washers onto stud, then install lug nut with the flat side of the nut against the washers.
- (3) Tighten lug nut until the stud is pulled into the hub flange. Verify that the stud is properly seated into the flange.

REMOVAL AND INSTALLATION (Continued)

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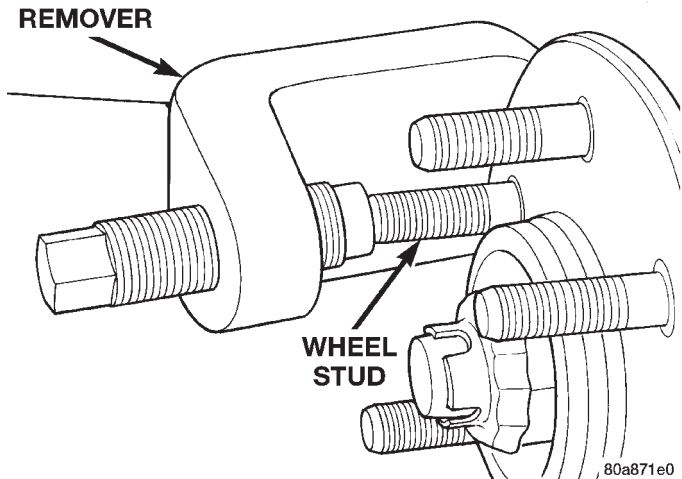
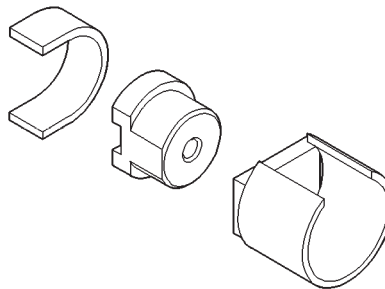


Fig. 17 Wheel Stud Removal

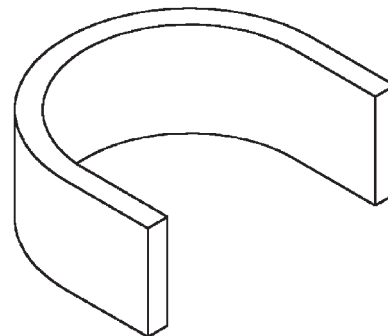
- (4) Remove lug nut and washers.
- (5) Install the brake rotor and caliper, refer to Group 5 Brakes for procedure.
- (6) Install wheel and tire assembly, use new lug nut on stud or studs that were replaced.
- (7) Remove support and lower vehicle.

SPECIAL TOOLS

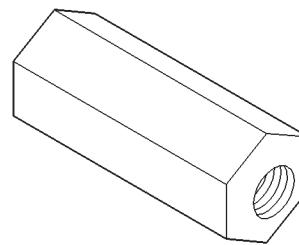
FRONT SUSPENSION



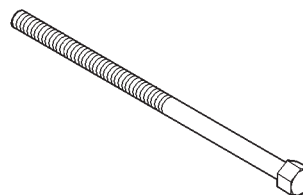
Remover/Installer Suspension Bushing 7932



Spacer 8279



Nut, Long 7603



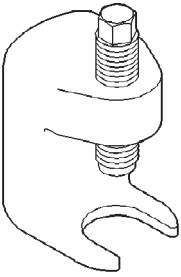
Bolt, Special 7604

SPECIFICATIONS

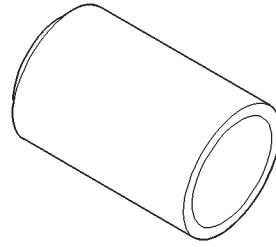
TORQUE CHART

DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	35 N·m (26 ft. lbs.)
Lower Nuts	28 N·m (250 in. lbs.)
Suspension Arm Upper	
Axle Bracket Nut	61 N·m (45 ft. lbs.)
Frame Bracket Bolt	61 N·m (45 ft. lbs.)
Suspension Arm Lower	
Axle Bracket Nut	176 N·m (130 ft. lbs.)
Frame Bracket Bolt	176 N·m (130 ft. lbs.)
Stabilizer Bar	
Retainer Bolts	92 N·m (68 ft. lbs.)
Link Upper Nut	106 N·m (78 ft. lbs.)
Link Lower Nut	106 N·m (78 ft. lbs.)
Track Bar	
Frame Bracket Nut	108 N·m (80 ft. lbs.)
Axle Bracket Bolt	100 N·m (74 ft. lbs.)
Hub Bearing	
Knuckle Bolts	102 N·m (75 ft. lbs.)

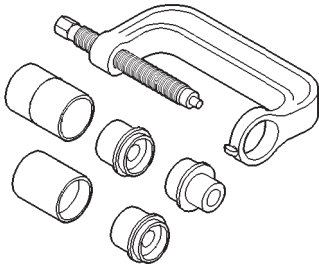
SPECIAL TOOLS (Continued)



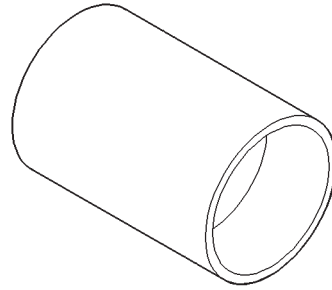
Remover C-4150A



Reciever 6761



Remover/Installer 6289



Installer 6752

REAR SUSPENSION

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DESCRIPTION AND OPERATION

REAR SUSPENSION

The rear suspension (Fig. 1) is comprised of :

- Drive axle
- Shock absorbers
- Coil springs
- Lower suspension arms
- Upper suspension arm
- Stabilizer bar

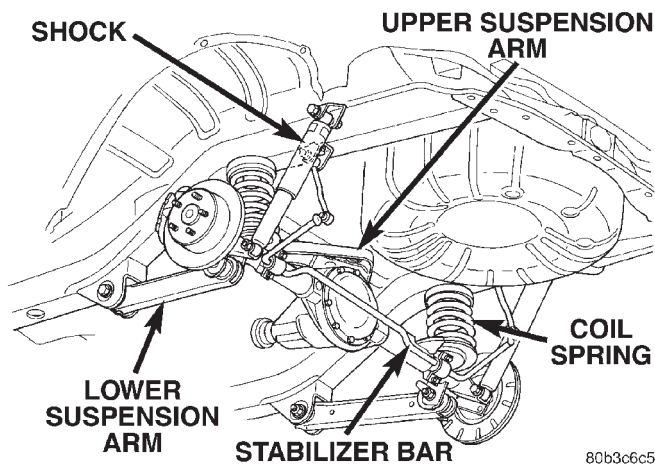


Fig. 1 Rear Suspension

CAUTION: Suspension components with rubber/urethane bushings should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. This will maintain vehicle ride comfort and prevent premature bushing wear.

SHOCK ABSORBERS

DESCRIPTION

The top of the shock absorbers are bolted to the body. The bottom of the shocks are bolted to the axle brackets. The standard shocks have conventional twin tube construction and are low pressure gas charged. Gas charging prevents cavitation during rough road operation. Up-Country shocks are mono tube design and are high pressure gas charged.

OPERATION

The shock absorbers dampen jounce and rebound motion of the vehicle over various road conditions and limit suspension rebound travel.

JOUNCE BUMPERS

DESCRIPTION

The jounce bumpers are mounted inside the coil spring, between the axle and the frame rail, to minimize transmission of noise to the passenger compartment.

OPERATION

The jounce bumpers are used to limit suspension travel in compression.

COIL SPRINGS AND ISOLATORS

DESCRIPTION

The coil springs mount up in the wheelhouse which is part of the unitized body bracket. A rubber doughnut isolator is located between the top of the spring and the body. The bottom of the spring seats on a axle isolator

DESCRIPTION AND OPERATION (Continued)

made of rubber with a steel insert. The isolators provide road noise isolation.

OPERATION

The coil springs control ride quality and maintain proper ride height.

LOWER SUSPENSION ARMS AND BUSHINGS**DESCRIPTION**

The lower suspension arms are hydroformed steel and use voided oval bushings at each end of the arm.

OPERATION

The bushings provide isolation from the axle. The arms mount to the unibody frame rail bracket and the axle brackets. The arm and bushings provide location and react to loads.

UPPER SUSPENSION ARM, BUSHINGS, AND BALL JOINT**DESCRIPTION**

The suspension arm uses vertical spool bushings to isolate road noise. The suspension arm is bolted through bushings to cage nuts in the body and a ball joint plate to the top of the differential housing.

OPERATION

The upper suspension arm provides fore/aft and lateral location of the rear axle. The suspension arm travel is limited through the use of jounce bumpers in compression and shock absorbers in rebound.

STABILIZER BAR AND LINKS

Inspect for broken or distorted stabilizer bar bushings, bushing retainers, and worn, damaged, or squeaking stabilizer bar to frame links. The stabilizer bar should also be inspected for signs of cracking or breaking.

DIAGNOSIS AND TESTING

REAR SUSPENSION

CONDITION	POSSIBLE CAUSES	CORRECTION
VEHICLE INSTABILITY	<ol style="list-style-type: none"> 1. Loose or worn wheel bearings. 2. Loose, worn or bent suspension components. 3. Tire pressure. 	<ol style="list-style-type: none"> 1. Replace wheel bearings. 2. Inspect, tighten or replace components as necessary. 3. Adjust tire pressure.
VEHICLE PULLS TO ONE SIDE	<ol style="list-style-type: none"> 1. Weak or broken spring. 2. Alignment. 3. Tires. 4. Brakes. 	<ol style="list-style-type: none"> 1. Replace spring. 2. Align vehicle to specifications. 3. Replace tires. 4. Repair as necessary.
KNOCKING, RATTLING OR SQUEAKING	<ol style="list-style-type: none"> 1. Worn shock bushings. 2. Loose shock mounting. 3. Shock valve. 4. Loose upper ball joint. 5. Loose, worn or bent suspension components. 	<ol style="list-style-type: none"> 1. Replace shock. 2. Tighten to specifications. 3. Replace shock. 4. Replace ball joint. 5. Inspect, tighten or replace components as necessary.
IMPROPER TRACKING	<ol style="list-style-type: none"> 1. Bent track bar. 2. Loose, worn or bent suspension components. 3. Bent axle. 	<ol style="list-style-type: none"> 1. Replace track bar. 2. Inspect, tighten or replace components as necessary. 3. Replace axle.

REMOVAL AND INSTALLATION

SERVICE WARNINGS AND CAUTIONS

CAUTION: Suspension components with rubber bushings must be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort will be affected and cause premature bushing wear.

SHOCK ABSORBER

REMOVAL

(1) Raise and support the vehicle. Position a hydraulic jack under the axle to support the axle.

CAUTION: Do not allow the axle to hang from the upper suspension arm ball joint.

(2) Remove the upper nut and bolt from the frame bracket (Fig. 2).

(3) Remove the lower nut and bolt from the axle bracket. Remove the shock absorber.

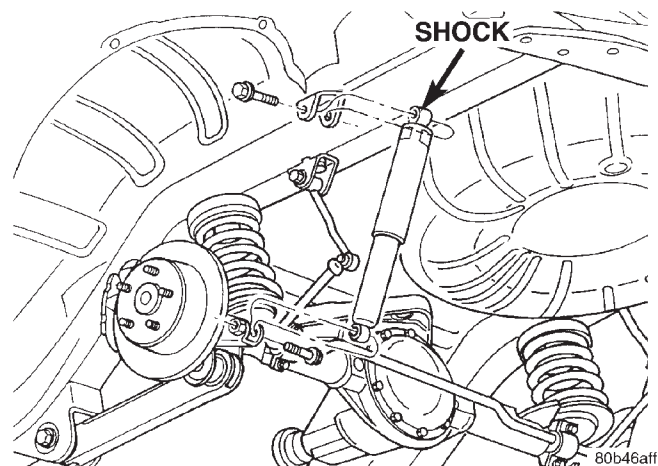


Fig. 2 Shock Absorber

INSTALLATION

(1) Install the shock absorber in the frame bracket and install the bolt and nut.

REMOVAL AND INSTALLATION (Continued)

- (2) Install the shock absorber in the axle bracket and install the bolt and nut.
- (3) Tighten the upper and lower mounting nuts to 92 N·m (68 ft. lbs.).
- (4) Remove the supports and lower the vehicle.

COIL SPRING

REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support the axle.
- (2) Remove the wheel and tire assemblies.
- (3) Remove the stabilizer bar link from the stabilizer bar (Fig. 3).
- (4) Remove the shock absorber lower bolt from the axle bracket.
- (5) Lower the hydraulic jack and tilt the axle and remove the coil spring (Fig. 3).

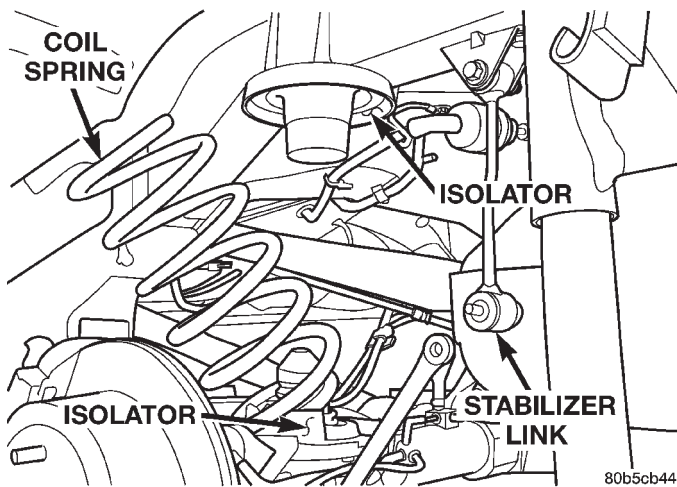


Fig. 3 Coil Spring

- (6) Remove and inspect the upper and lower spring isolators (Fig. 3).

INSTALLATION

- (1) Install the upper isolator.
- (2) Install the lower isolator with the isolator locator nub in the axle pad hole (Fig. 4).
- (3) Pull down on the axle and position the coil spring in the lower isolator.

CAUTION: Ensure the spring is positioned on the lower isolator with the end of the spring coil against the isolator spring locator (Fig. 5).

- (4) Raise the axle with the hydraulic jack.
- (5) Install the shock absorber to the axle bracket and tighten to specification.
- (6) Install the stabilizer bar link to the stabilizer bar.
- (7) Install the wheel and tire assemblies.
- (8) Remove the supports and lower the vehicle.

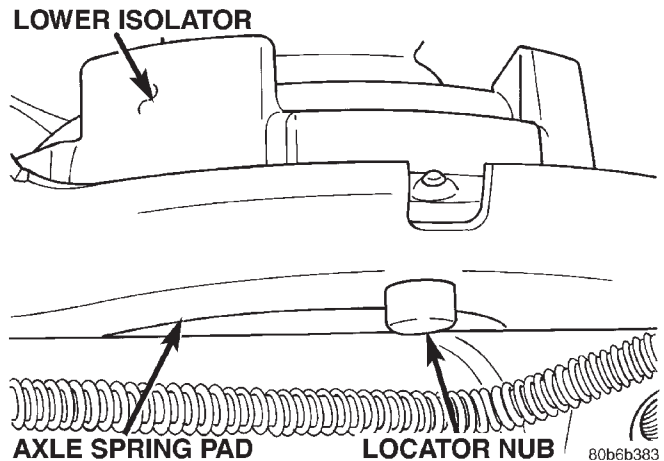


Fig. 4 Isolator Locator Nub

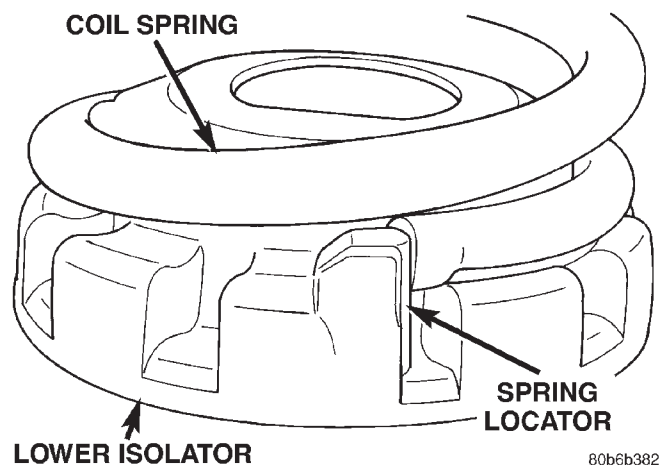


Fig. 5 Isolator Spring Locator - Typical

- (9) Tighten the stabilizer bar links to specification.

LOWER SUSPENSION ARM

REMOVAL

- (1) Raise the vehicle and support the rear axle.
- (2) Remove the lower suspension arm nut and bolt from the axle bracket (Fig. 6).
- (3) Remove the nut and bolt (Fig. 6) from the frame rail and remove the lower suspension arm.

INSTALLATION

- (1) Position the lower suspension arm in the axle bracket and frame rail bracket.

NOTE: The end of the arm with the oval bushing attaches to the axle bracket.

- (2) Install the axle bracket bolt and nut finger tight.
- (3) Install the frame rail bracket bolt and nut finger tight.

REMOVAL AND INSTALLATION (Continued)

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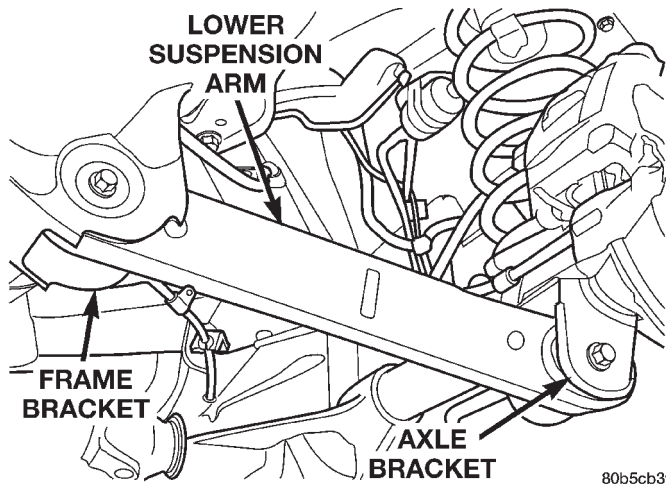


Fig. 6 Lower Suspension Arm

- (4) Remove the supports and lower the vehicle.
- (5) With the vehicle on the ground tighten the lower suspension arm nuts to 177 N·m (130 ft. lbs.).

UPPER SUSPENSION ARM

REMOVAL

- (1) Raise and support the vehicle.
- (2) Support the rear axle with a hydraulic jack.
- (3) Remove the park brake cables and brake hose from the arm (Fig. 7).

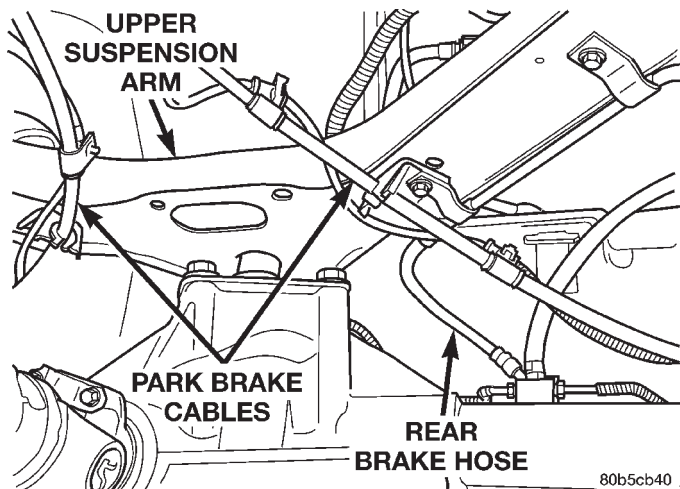


Fig. 7 Park Brake Cables And Brake Hose

- (4) Remove the ball joint nut from the top of the upper suspension arm (Fig. 8).
- (5) Separate ball joint from the arm with Remover 8278 (Fig. 9).
- (6) Remove the upper suspension arm mounting bolts and remove the arm (Fig. 10).

INSTALLATION

- (1) Position the upper suspension arm in the frame rail brackets.

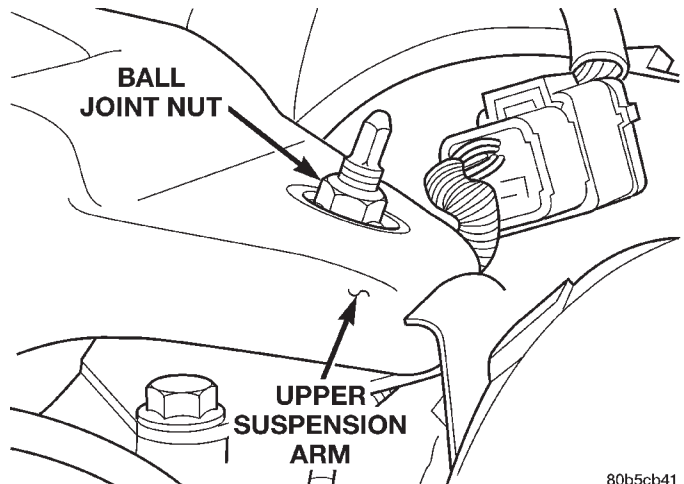


Fig. 8 Ball Joint Nut

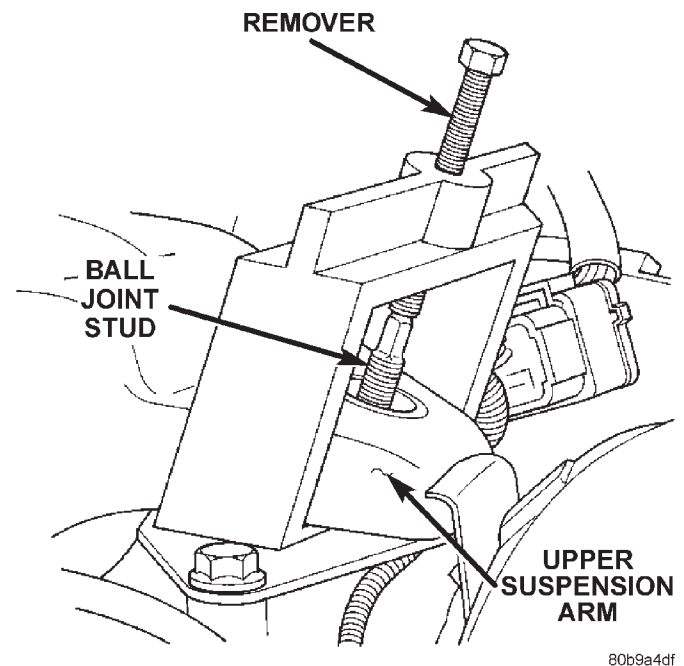


Fig. 9 Separate Ball Joint

- (2) Install the mounting bolts and tighten to 100 N·m (74 ft. lbs.).
- (3) Pull the arm down on the ball joint stud and install a **new** nut. Tighten the nut to 142 N·m (105 ft. lbs.).
- (4) Install the park brake cables and brake hose to the arm.
- (5) Remove the supports and lower the vehicle.

BALL JOINT

REMOVAL

- (1) Raise and support the vehicle.
- (2) Support the rear axle with a hydraulic jack.
- (3) Remove the ball joint nut from the top of the upper suspension arm (Fig. 11).

REMOVAL AND INSTALLATION (Continued)

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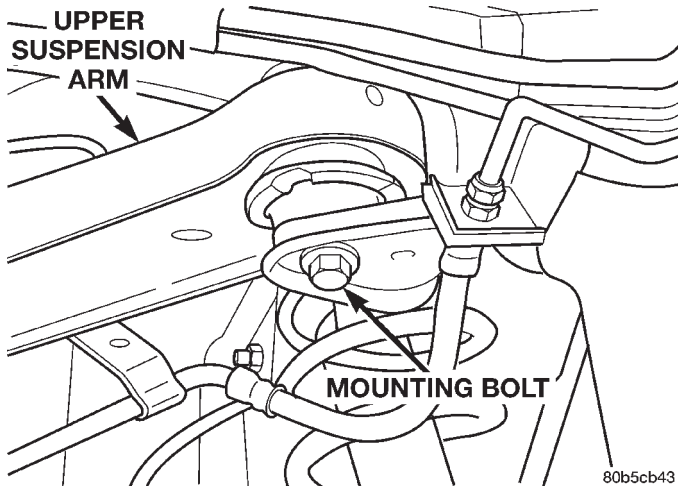


Fig. 10 Upper Suspension Arm Mounting Bolt

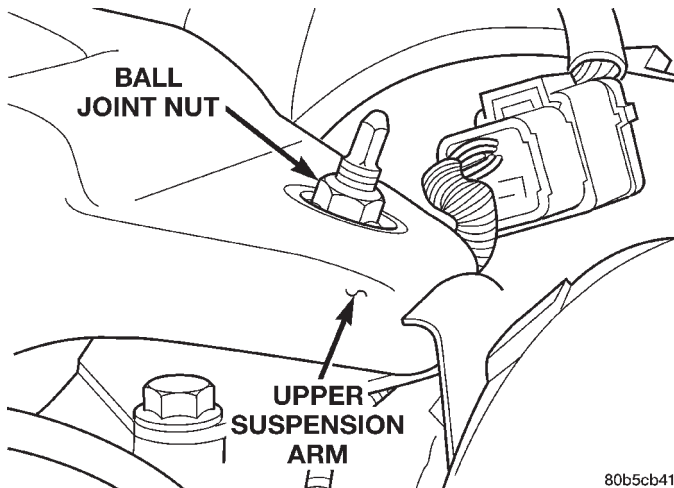


Fig. 11 Ball Joint Nut

(4) Separate ball joint from the arm with Remover 8278 (Fig. 12).

(5) Remove the ball joint mounting bolts (Fig. 13) from the differential housing.

(6) Remove the ball joint from the differential housing.

INSTALLATION

(1) Install the ball joint on the differential housing.

(2) Install the ball joint mounting bolts and tighten to 136 N·m (100 ft. lbs.).

(3) Raise the rear axle with a hydraulic jack to align the upper arm with the ball joint.

(4) Pull the arm down on the ball joint stud and install a **new** nut. Tighten the nut to 142 N·m (105 ft. lbs.).

(5) Remove the supports and lower the vehicle.

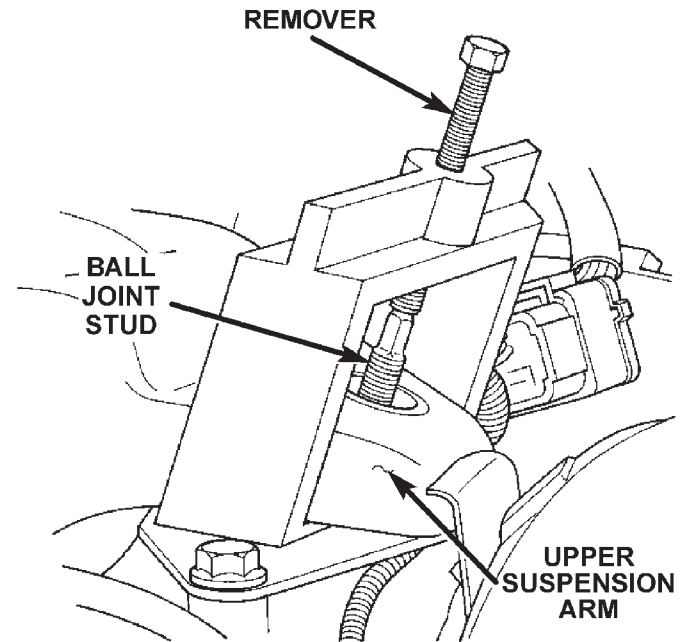


Fig. 12 Separate Ball Joint

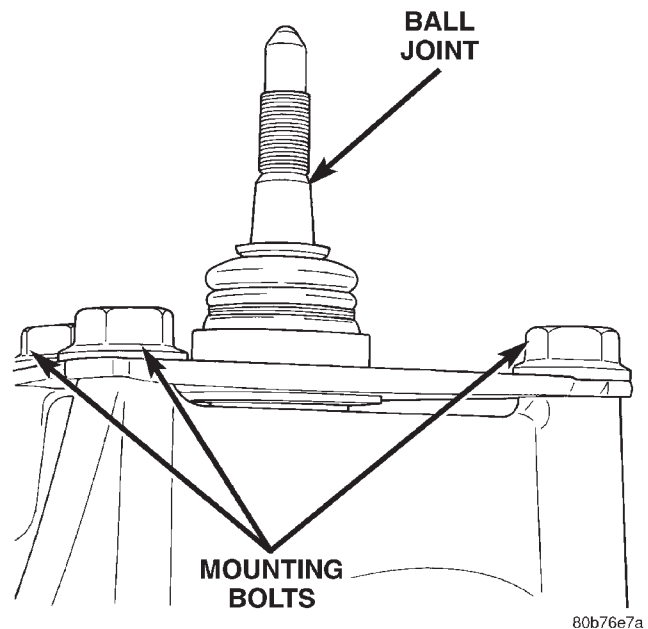


Fig. 13 Ball Joint Mounting Bolts

STABILIZER BAR

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the stabilizer bar links from stabilizer bar and frame mount. (Fig. 14).
- (3) Remove the stabilizer bar retainer bolts.
- (4) Remove the stabilizer bar.

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SPECIFICATIONS

TORQUE CHART

DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	92 N·m (68 ft. lbs.)
Lower Nut	92 N·m (68 ft. lbs.)
Suspension Arm Upper	
Ball Joint Nut	142 N·m (105 ft. lbs.)
Frame Bolts	100 N·m (74 ft. lbs.)
Ball Joint	
Plate Bolts	136 N·m (100 ft. lbs.)
Suspension Arms Lower	
Nuts	177 N·m (130 ft. lbs.)
Stabilizer Bar	
Retainer Bolts	54 N·m (40 ft. lbs.)
Bar Link Nut	54 N·m (40 ft. lbs.)
Bracket Link Nut	92 N·m (68 ft. lbs.)

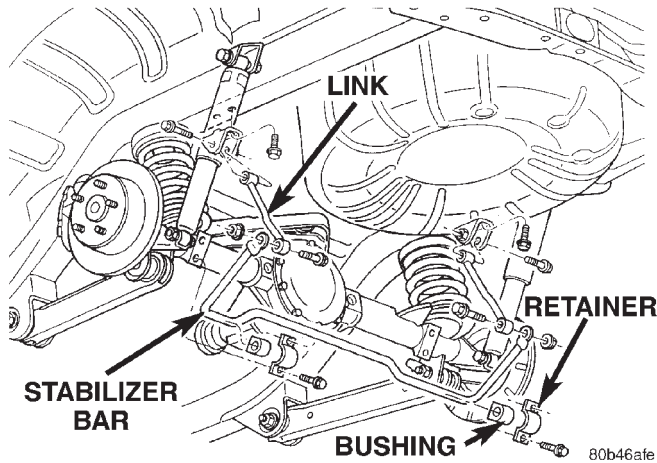


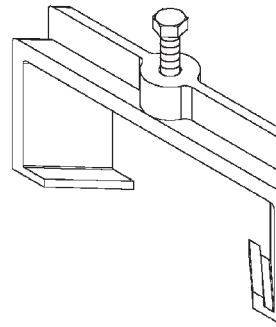
Fig. 14 Rear Stabilizer Bar

INSTALLATION

- (1) Position the stabilizer bar on the axle and install the retainers and bolts. Ensure the bar is centered with equal spacing on both sides. Tighten the bolts to 54 N·m (40 ft. lbs.).
- (2) Install the links to the stabilizer bar and frame brackets.
- (3) Tighten the nuts at the stabilizer bar to 54 N·m (40 ft. lbs.).
- (4) Tighten the nuts at the frame brackets to 92 N·m (68 ft. lbs.).
- (5) Remove support and lower the vehicle.

SPECIAL TOOLS

REAR SUSPENSION



Remover 8278

