

# SUSPENSION

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## WHEEL ALIGNMENT

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## WHEEL ALIGNMENT

### DESCRIPTION

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).

**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 Lubrication And Maintenance for the recommended maintenance schedule.

### OPERATION

- **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 (Fig. 1)

- **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 (Fig. 1)

## WHEEL ALIGNMENT (Continued)

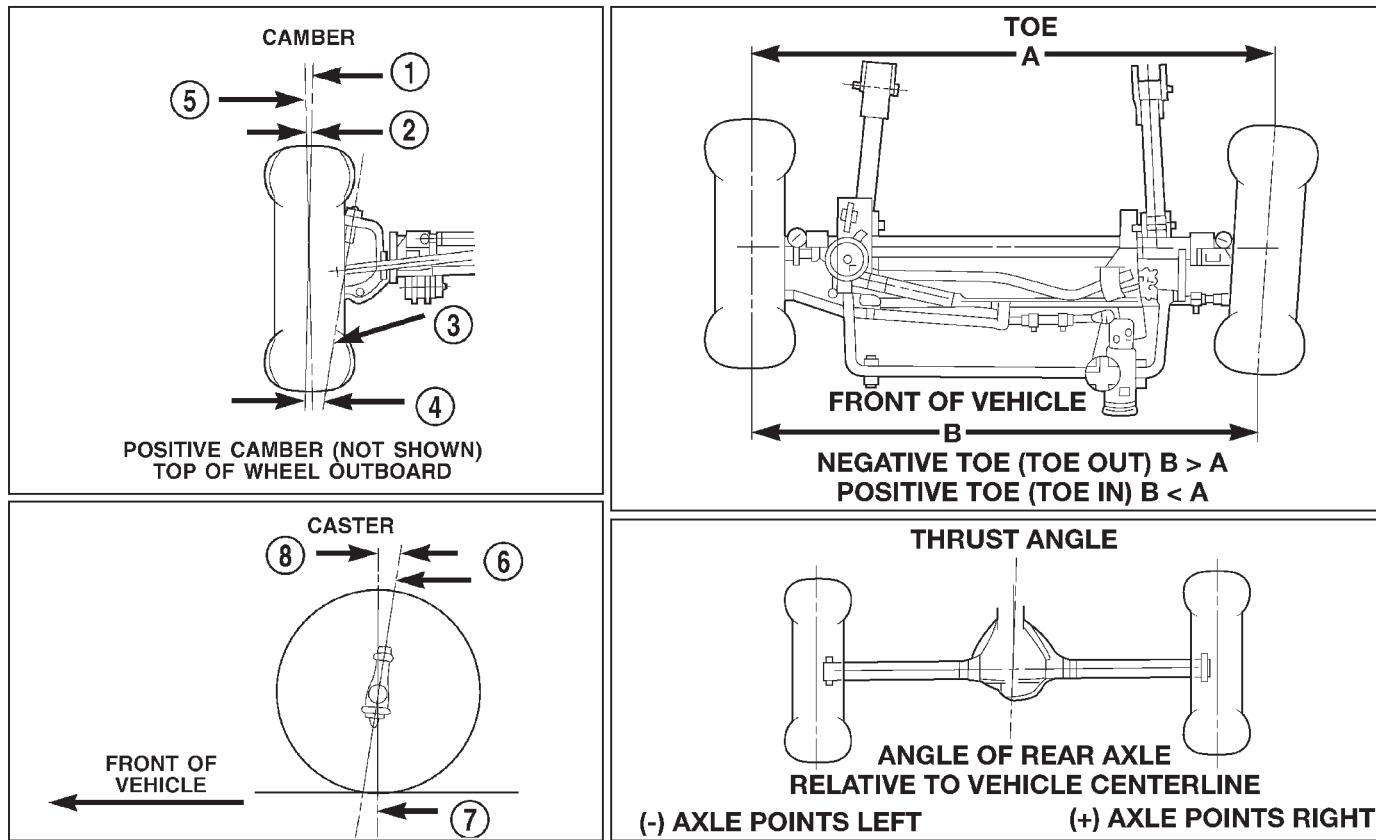


Fig. 1 Wheel Alignment Measurements

- 1 - WHEEL CENTERLINE
- 2 - NEGATIVE CAMBER ANGLE
- 3 - PIVOT CENTERLINE
- 4 - SCRUB RADIUS
- 5 - TRUE VERTICAL

- 6 - KING PIN
- 7 - VERTICAL
- 8 - POSITIVE CASTER

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- **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 (Fig. 1).

- **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 (Fig. 1).

- **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 (Fig. 1).

## WHEEL ALIGNMENT (Continued)

## DIAGNOSIS AND TESTING - SUSPENSION AND STEERING SYSTEM

CONDITION	POSSIBLE CAUSES	CORRECTION
FRONT END NOISE	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components.	1. Adjust or replace wheel bearings. 2. Tighten or replace components as necessary.
EXCESSIVE PLAY IN STEERING	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Loose or worn steering gear.	1. Adjust or replace wheel bearings. 2. Tighten or replace components as necessary. 3. Adjust or replace steering gear.
FRONT WHEELS SHIMMY	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.	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	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Tire pressure. 4. Alignment.	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	1. Loose or worn steering gear. 2. Power steering fluid low. 3. Column coupler binding. 4. Tire pressure. 5. Alignment.	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 DURING BRAKING	1. Uneven tire pressure. 2. Worn brake components. 3. Air in brake line.	1. Adjust tire pressure. 2. Repair brakes as necessary. 3. Repair as necessary.
VEHICLE LEADS OR DRIFTS FROM STRAIGHT AHEAD DIRECTION ON UNCROWNED ROAD	1. Radial tire lead. 2. Brakes dragging. 3. Weak or broken spring. 4. Uneven tire pressure. 5. Wheel Alignment. 6. Loose or worn steering or suspension components. 7. Cross caster out of spec.	1. Cross front tires. 2. Repair brake as necessary. 3. Replace spring. 4. Adjust tire pressure. 5. Align vehicle. 6. Repair as necessary. 7. Align vehicle.

## WHEEL ALIGNMENT (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
KNOCKING, RATTLING OR SQUEAKING	1. Worn shock bushings. 2. Loose, worn or bent steering/suspension components. 3. Shock valve.	1. Replace shock. 2. Inspect, tighten or replace components as necessary. 3. Replace shock.
IMPROPER TRACKING	1. Loose, worn or bent track bar. 2. Loose, worn or bent steering/suspension components.	1. Inspect, tighten or replace component as necessary. 2. Inspect, tighten or replace components as necessary.

## STANDARD PROCEDURE

## STANDARD PROCEDURE - CAMBER

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.

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

## STANDARD PROCEDURE - CASTER

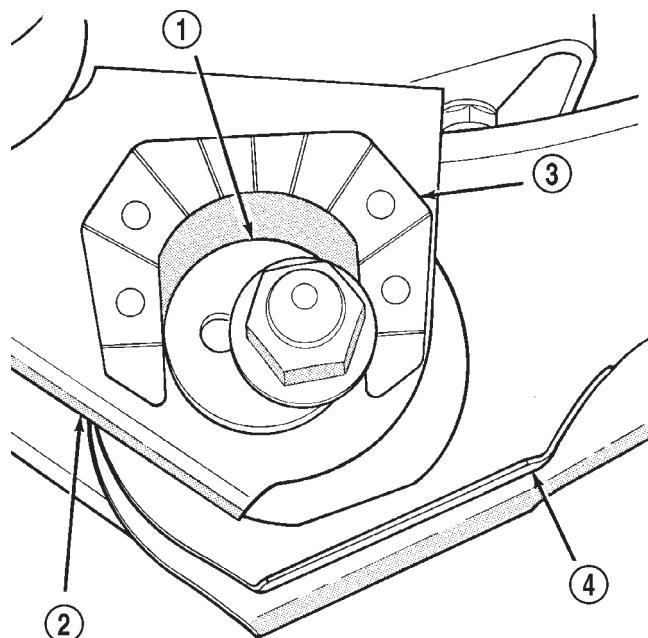
Before each alignment reading the vehicle should be jounced (rear first, then front). Grasp each bumper at the center and jounce the vehicle up and down three times. Always release the bumper in the down position.

Check the caster of the front axle for correct angle. Be sure the axle is not bent or twisted. Road test the vehicle and observe the steering wheel return-to-center position. Low caster will cause poor steering wheel returnability.

During the road test, turn the vehicle to both the left and right. If the steering wheel returns to the center position unassisted, the caster angle is correct. However, if steering wheel does not return toward the center position unassisted, a low caster angle is probable.

Caster can be adjusted by installing cam bolts and rotating the cams on the lower suspension arm (Fig. 2).

**NOTE: Changing caster angle will also change the front propeller shaft angle. The propeller shaft angle has priority over caster. Refer to Group 3, Differential and Driveline for additional information.**



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Fig. 2 Cam Adjuster

1 - ADJUSTMENT CAM  
2 - AXLE BRACKET  
3 - BRACKET REINFORCEMENT  
4 - LOWER SUSPENSION ARM

## STANDARD PROCEDURE - TOE POSITION

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.

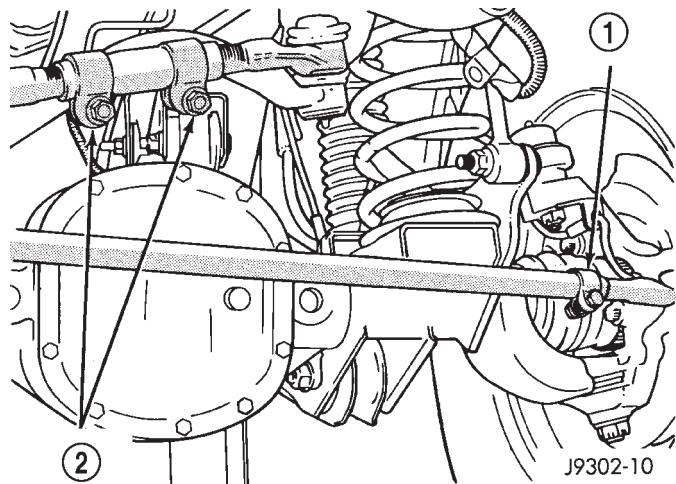
**NOTE: The wheel toe position adjustment is the final adjustment. This adjustment must be performed with the engine running, if the vehicle is equipped with power steering.**

## WHEEL ALIGNMENT (Continued)

(1) Start the engine and turn wheels both ways before straightening the steering wheel. Center and secure the steering wheel.

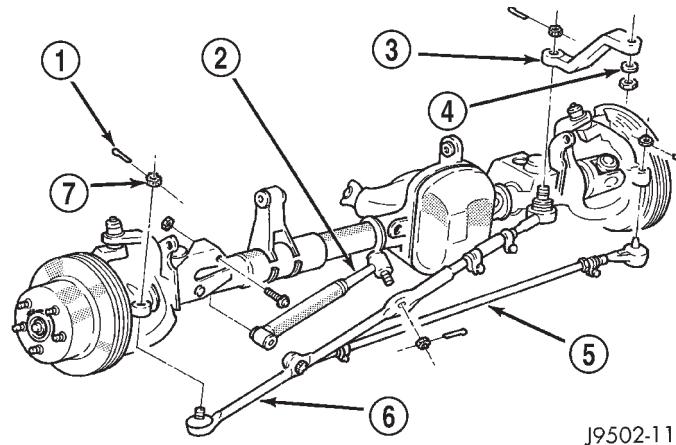
(2) Loosen the adjustment sleeve clamp bolts (Fig. 3).

(3) Adjust the right wheel toe position with the drag link (Fig. 4). Turn the sleeve until the right wheel is at the correct positive TOE-IN position. Position the clamp bolts as shown (Fig. 3) and tighten to 49 N·m (36 ft. lbs.). **Make sure the toe setting does not change during clamp tightening.**



**Fig. 3 Drag Link and Tie Rod Clamp**

1 - TIE ROD CLAMP  
2 - DRAG LINK CLAMPS



**Fig. 4 Steering Linkage**

1 - COTTER PIN  
2 - DAMPENER  
3 - PITMAN ARM  
4 - WASHER  
5 - TIE ROD  
6 - DRAG LINK  
7 - NUT

(4) Adjust the left wheel toe position with the tie rod. Turn the sleeve until the left wheel is at the same TOE-IN position as the right wheel. Position the clamp bolts as shown (Fig. 3) and tighten to 27 N·m (20 ft. lbs.). **Make sure the toe setting does not change during clamp tightening.**

(5) Verify the right toe specifications and turn off the engine.

## SPECIFICATIONS

## ALIGNMENT SPECIFICATIONS

**NOTE:** Alignment specifications are in degrees.

## SPECIFICATIONS

DESCRIPTION		SPECIFICATION	
PREFERRED		CASTER + 7.0°	CAMBER (fixed angle) - 0.25°
RANGE		± 1.0°	± 0.63°
MAX RT/LT DIFFERENCE		0.65°	± 1.0°
REAR SPECIFICATION			
PREFERRED	N/A	REAR CAMBER -0.25°	TOTAL TOE-IN +0.25°
RANGE	N/A	0° to -50°	0° to .5°
THRUST ANGLE 0° ± 0.25°			

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## FRONT

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## FRONT

## DESCRIPTION

## FRONT SUSPENSION

The front suspension is a link/coil design comprised of:

- Shock absorbers
- Jounce Bumper
- Coil springs
- Upper and lower suspension arms
- Stabilizer bar
- Track bar

**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/urethane bushings (except stabilizer bar) 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. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

## STANDARD PROCEDURE - LUBRICATION

Periodic lubrication of the suspension system is required. Refer to Lubrication And Maintenance for the recommended maintenance schedule.

The following component must be lubricated:

- Track bar

FRONT (Continued)

## SPECIFICATIONS

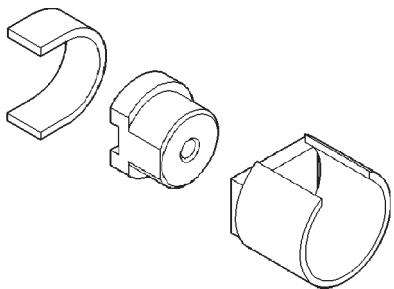
## TORQUE CHART

## TORQUE SPECIFICATIONS

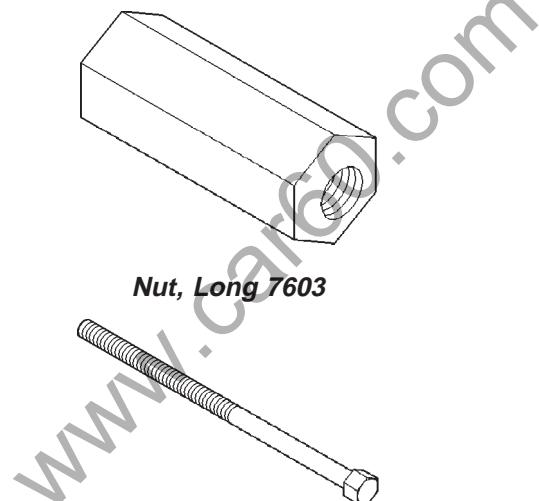
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Shock Absorber Upper Nut	23	17	—
Shock Absorber Lower Nut	28	—	250
Suspension Arm Lower Axle Bracket Nut	115	85	—
Suspension Arm Lower Frame Bracket Nut	176	130	—
Suspension Arm Upper Axle Bracket Nut	75	55	—
Suspension Arm Upper Frame Bracket Bolt	75	55	—
Stabilizer Bar Retainer Bolts	54	40	—
Stabilizer Bar Link Upper Nut	61	45	—
Stabilizer Bar Link Lower Bolt	95	70	—
Track Bar Ball Stud Nut	81	60	—
Track Bar Axle Bracket Bolt	47	40	—
Hub/Bearing Bolts	102	75	—
Hub/Bearing Axle Nut	237	175	—

## SPECIAL TOOLS

## FRONT SUSPENSION



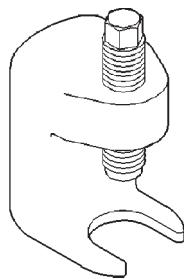
Remover/Installer Suspension Bushing 7932



Nut, Long 7603

Bolt, Special 7604

## FRONT (Continued)



Remover C-4150A

## BUSHINGS

## REMOVAL

- (1) Remove the upper suspension arm from axle.
- (2) Position Spacer 7932-3 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. 1).
- (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 to pull bushing out of the axle bracket.

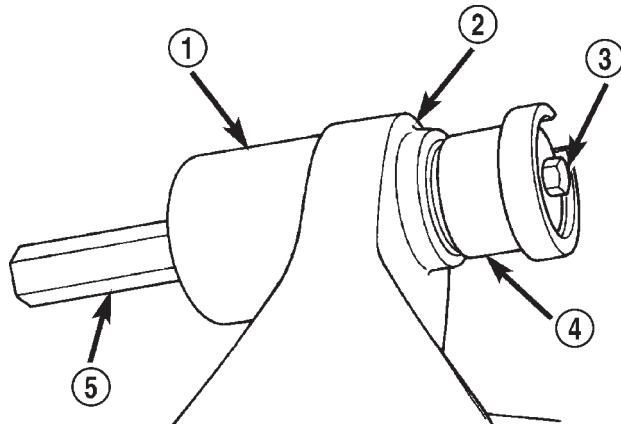


Fig. 1 Bushing Removal

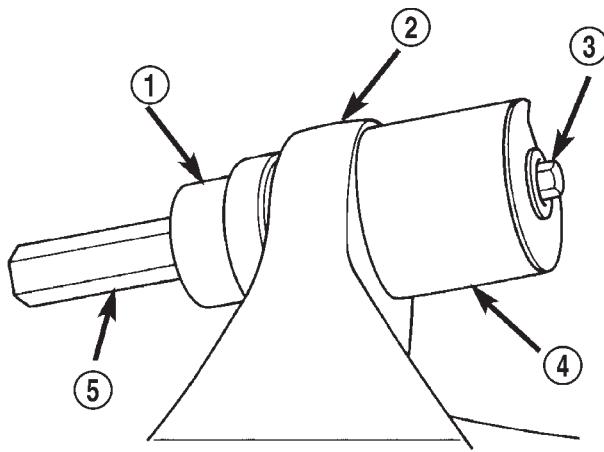
- 1 - RECEIVER
- 2 - AXLE BRACKET
- 3 - BOLT
- 4 - REMOVER/INSTALLER
- 5 - LONG NUT

- (7) Remove nut, bolt, receiver, remover and bushing.

**NOTE:** On 4x2 vehicle and right side of 4x4 vehicle, leave Spacer 7932-3 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. 2).
- (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. 2 Bushing Installation

- 1 - REMOVER/INSTALLER
- 2 - AXLE BRACKET
- 3 - BOLT
- 4 - RECEIVER
- 5 - LONG NUT

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

## 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.

## HUB / BEARING (Continued)

## REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assembly.
- (3) Remove the brake caliper, rotor and ABS wheel speed sensor, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - REMOVAL).
- (4) Remove the cotter pin, nut retainer and axle hub nut (Fig. 3).
- (5) Remove the hub bearing mounting bolts from the back of the steering knuckle. Remove hub bearing from the steering knuckle and off the axle shaft.

## INSTALLATION

- (1) Install the hub bearing and brake dust shield 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 and ABS wheel speed sensor, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - INSTALLATION).
- (5) Install the wheel and tire assembly. (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

- (6) Remove support and lower the vehicle.

## JOUNCE BUMPER

## DESCRIPTION

The jounce bumpers are mounted under the frame rails inside of the coil springs.

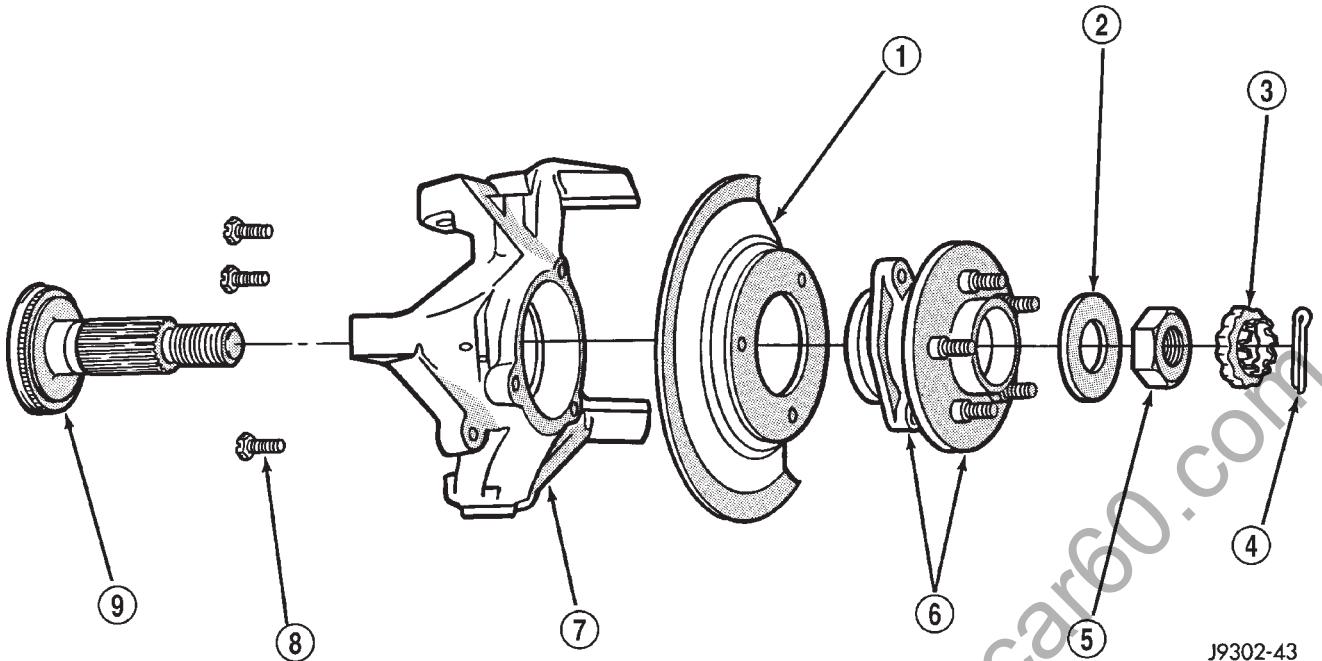
## KNUCKLE

## REMOVAL

Ball stud service procedures below require removal of the hub bearing and axle shaft. Removal and installation of upper and lower ball studs require the use of Tool Kit 6289.

- (1) Remove hub bearing and axle shaft. (Refer to 2 - SUSPENSION/FRONT/HUB / BEARING - REMOVAL) (Refer to 3 - DIFFERENTIAL & DRIVELINE/FRONT AXLE - 181FBI/AXLE SHAFTS - REMOVAL).

- (2) Disconnect the tie-rod or drag link from the steering knuckle arm, (Refer to 19 - STEERING/LINKAGE/TIE ROD END - REMOVAL) OR (Refer to 19 - STEERING/LINKAGE/DRAG LINK - REMOVAL).



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Fig. 3 Hub Bearing &amp; Knuckle

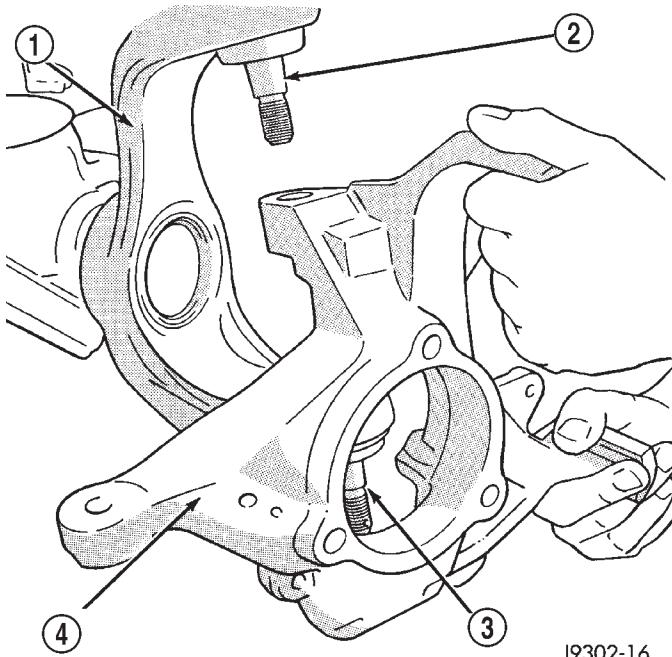
1 - BRAKE SHIELD  
 2 - WASHER  
 3 - RETAINER  
 4 - COTTER PIN  
 5 - NUT  
 6 - HUB AND BEARING ASSEMBLY  
 7 - STEERING KNUCKLE  
 8 - BOLT  
 9 - TONE WHEEL (ABS)

## KNUCKLE (Continued)

(3) Remove the cotter pins from the upper and lower ball studs.

(4) Remove the upper and lower ball stud nuts.

(5) Using special tool C-4150A separate the ball joints from the steering knuckle. Remove knuckle from ball studs (Fig. 4).



**Fig. 4 Steering Knuckle Removal/Installation**

- 1 - AXLE YOKE
- 2 - UPPER BALL STUD
- 3 - LOWER BALL STUD
- 4 - STEERING KNUCKLE

## INSTALLATION

Ball stud service procedures below require removal of the hub bearing and axle shaft. Removal and installation of upper and lower ball studs require the use of Tool Kit 6289.

(1) Position the steering knuckle on the ball studs.

(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 hub bearing and axle shaft. (Refer to 2 - SUSPENSION/FRONT/HUB / BEARING - INSTALLATION) (Refer to 3 - DIFFERENTIAL & DRIVELINE/FRONT AXLE - 181FBI/AXLE SHAFTS - INSTALLATION).

(5) Connect the tie-rod or drag link end to the steering knuckle arm. (Refer to 19 - STEERING/LINKAGE/TIE ROD END - INSTALLATION) OR (Refer to 19 - STEERING/LINKAGE/DRAG LINK - INSTALLATION).

## LOWER BALL JOINT

## REMOVAL

Ball stud service procedures below require removal of the hub bearing and axle shaft. (Refer to 2 - SUSPENSION/FRONT/HUB / BEARING - REMOVAL) (Refer to 3 - DIFFERENTIAL & DRIVELINE/FRONT AXLE - 181FBI/AXLE SHAFTS - REMOVAL). Removal and installation of upper and lower ball studs require the use of Tool Kit 6289.

(1) Position tools as shown to remove and install ball stud (Fig. 5).

## LOWER CONTROL ARM

## DESCRIPTION

The lower suspension arms are steel and use bushings at one end of the arm. The arms mount to the frame rail bracket and the axle brackets.

## OPERATION

The lower suspension arm bushings provide isolation from the axle. The arm and bushings provide location and react to loads from the axle. The lower suspension arms can be used to adjust caster and pinion angle by installing a cam bolt service package.

## REMOVAL

(1) Raise and support the vehicle.

(2) If equipped with ABS brakes remove sensor wire from the inboard side of the arm.

(3) If the vehicle is equipped with a cam bolt service package paint or scribe alignment marks on the cam adjusters and suspension arm for installation reference (Fig. 6) .

(4) Remove the lower suspension arm nut and bolt from the axle (Fig. 7) .

(5) Remove the nut and bolt/cam bolt from the frame rail bracket and remove the lower suspension arm (Fig. 7) .

## INSTALLATION

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

**NOTE: Small holes in the side of the arm face inboard.**

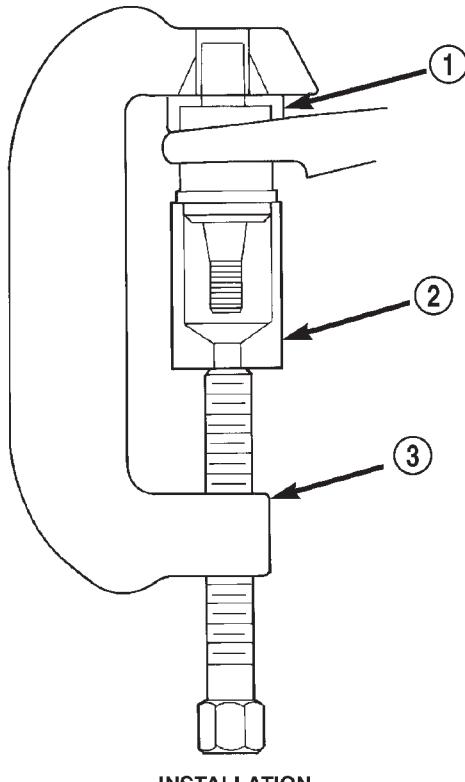
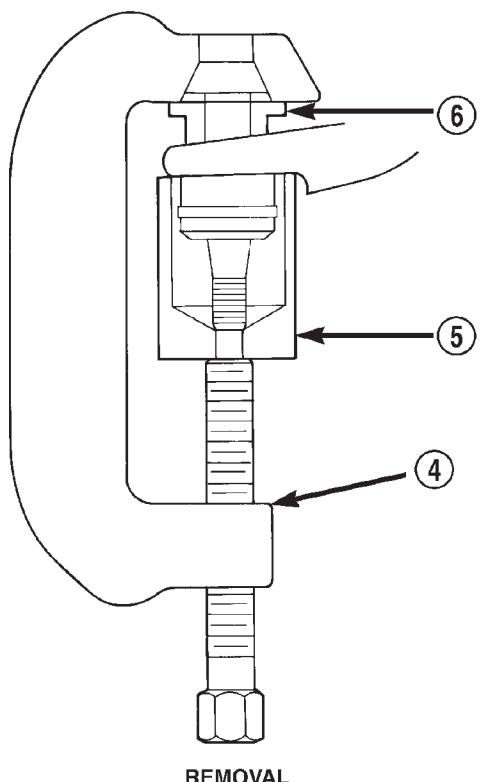
(2) Install the rear bolt and nut finger tighten.

(3) Install bolt/cam bolt and new nut finger tighten in the axle and align the reference marks.

(4) If equipped with ABS brakes install sensor wire to the inboard side of the arm with new clips.

(5) Lower the vehicle.

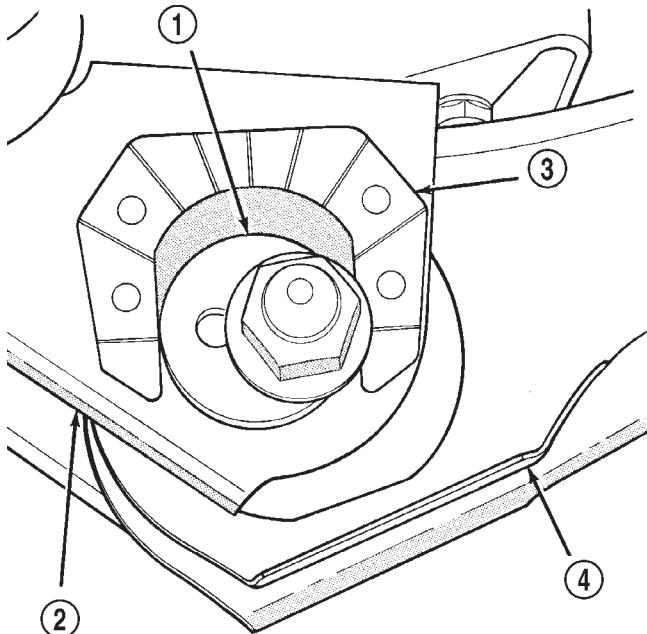
## LOWER CONTROL ARM (Continued)

**Fig. 5 Lower Ball Stud Remove/Install**

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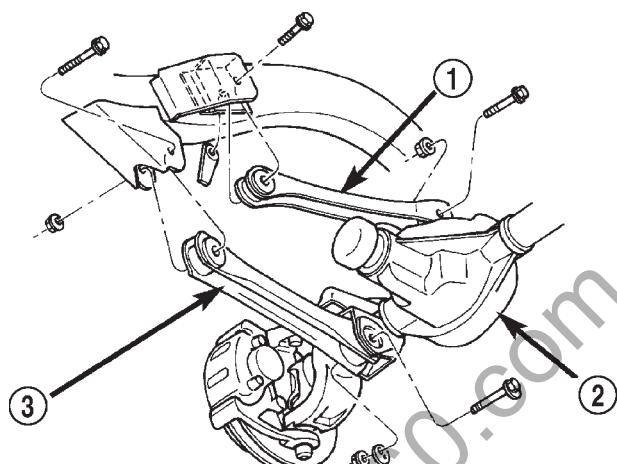
1 - SPECIAL TOOL 6289-12  
 2 - SPECIAL TOOL 6289-4  
 3 - SPECIAL TOOL 4212F

4 - SPECIAL TOOL 4212F  
 5 - SPECIAL TOOL 6289-1  
 6 - SPECIAL TOOL 6289-3

**Fig. 6 Cam Bolt Service Package**

1 - ADJUSTMENT CAM  
 2 - AXLE BRACKET  
 3 - BRACKET REINFORCEMENT  
 4 - LOWER SUSPENSION ARM

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**Fig. 7 Upper & Lower Suspension Arms**

1 - UPPER SUSPENSION ARM  
 2 - FRONT AXLE  
 3 - LOWER SUSPENSION ARM

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- (6) Tighten axle bracket nut to 115 N·m (85 ft. lbs.).
- (7) Tighten frame bracket nut to 176 N·m (130 ft. lbs.).

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## LOWER CONTROL ARM (Continued)

(8) Align vehicle to specifications. (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

## SHOCK

## DESCRIPTION

The top of the shock absorbers are bolted to a frame bracket. The bottom of the shocks are bolted to the axle brackets.

## OPERATION

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

## DIAGNOSIS AND TESTING - SHOCK ABSORBER

A knocking or rattling noise from a shock absorber may be caused by movement between mounting bushings and metal brackets or attaching components. These noises can usually be stopped by tightening the attaching nuts. If the noise persists, inspect for damaged and worn bushings, and attaching components. Repair as necessary if any of these conditions exist.

A squeaking noise from the shock absorber may be caused by the hydraulic valving and may be intermittent. This condition is not repairable and the shock absorber must be replaced.

The shock absorbers are not refillable or adjustable. If a malfunction occurs, the shock absorber must be replaced. To test a shock absorber, hold it in an upright position and force the piston in and out of the cylinder four or five times. The action throughout each stroke should be smooth and even.

The shock absorber bushings do not require any type of lubrication. Do not attempt to stop bushing noise by lubricating them. Grease and mineral oil-base lubricants will deteriorate the bushing.

## REMOVAL

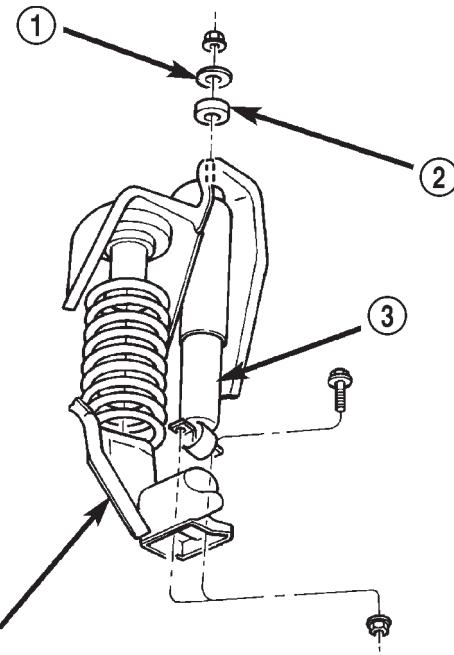
(1) Remove the nut, retainer and grommet from the upper stud through engine compartment access hole (Fig. 8).

(2) Remove the lower nuts and bolts from the axle bracket and remove the shock absorber.

## INSTALLATION

(1) Position the lower retainer and grommet on the upper stud. Insert the shock absorber through the shock bracket hole.

(2) Install the lower bolts and nuts. Tighten nuts to 28 N·m (250 in. lbs.).



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**Fig. 8 Coil Spring & Shock Absorber**

- 1 - RETAINER
- 2 - GROMMET
- 3 - SHOCK
- 4 - FRONT AXLE

(3) Install the upper grommet and retainer on the stud and install the nut and tighten to 23 N·m (17 ft. lbs.).

## SPRING

## 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 bracket. The bottom of the spring seats on a axle pad.

## OPERATION

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

## REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assemblies.
- (3) Position a hydraulic jack under the axle to support it.
- (4) Remove the front shocks at the lower mountings. (Refer to 2 - SUSPENSION/FRONT/SHOCK - REMOVAL).

## SPRING (Continued)

(5) Remove the ABS wire mounting brackets at the axle. (if equipped)

(6) Remove lower suspension arms mounting nuts and bolts from the frame, (Refer to 2 - SUSPENSION/FRONT/LOWER CONTROL ARM - REMOVAL).

(7) Remove the track bar from the axle bracket, (Refer to 2 - SUSPENSION/FRONT/TRACK BAR - REMOVAL).

(8) Remove the right side of the drag link from the right side knuckle, (Refer to 19 - STEERING/LINKAGE/DRAG LINK - REMOVAL).

(9) Lower the axle until the spring is free from the upper mount.

**NOTE: Rotation of the spring and prying down slightly on the axle will aid in removal.**

(10) Remove the coil spring retainer clip and remove the spring.

(11) Remove the upper spring isolator. (if needed)

(12) Pull jounce bumper out of mount. (if needed)

## INSTALLATION

(1) Install jounce bumper into mount.

(2) Install the spring isolator.

**NOTE: Rotation of the spring and prying down slightly on the axle will aid in installation.**

(3) Position the coil spring on the axle pad. It may be necessary to rotate the spring while installing.

(4) Install the spring retainer clip and bolt. Tighten bolt to 21 N·m (16 ft. lbs.).

(5) Raise the axle into position until the spring seats in the upper mount.

(6) Install the shock at the axle, (Refer to 2 - SUSPENSION/FRONT/SHOCK - INSTALLATION).

(7) Install the ABS wire mounting brackets at the axle (if equipped).

(8) Install the track bar to the axle bracket, (Refer to 2 - SUSPENSION/FRONT/TRACK BAR - INSTALLATION).

(9) Install the lower suspension arms to the frame. Install mounting bolts and nuts finger tight, (Refer to 2 - SUSPENSION/FRONT/LOWER CONTROL ARM - INSTALLATION).

(10) Install the drag link to the right side knuckle, (Refer to 19 - STEERING/LINKAGE/DRAG LINK - INSTALLATION).

(11) Remove the hydraulic jack from under the axle.

(12) Install the wheel and tire assemblies, (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

(13) Remove the supports and lower the vehicle.

(14) Tighten the lower suspension arms nuts to 115 N·m (85 ft. lbs.) at normal ride height with the vehicle weight.

## STABILIZER BAR

## DESCRIPTION

The spring steel bar extends across the top of the chassis 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 bar helps to control the vehicle body in relationship to the suspension.

## REMOVAL

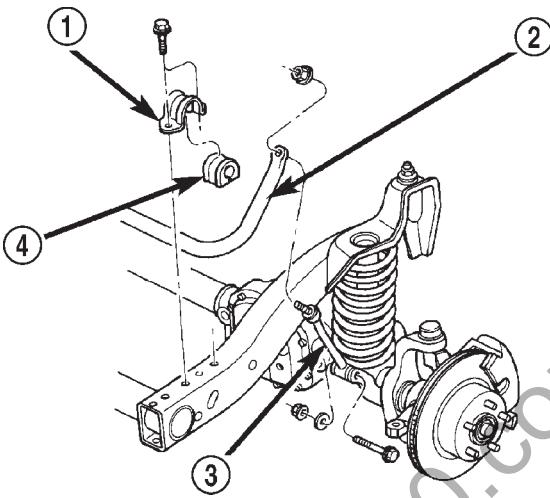
(1) Remove upper link nuts (Fig. 9) and separate the links from the stabilizer bar with Remover MB-991113.

(2) Remove front bumper valence.

(3) Remove stabilizer retainer bolts (Fig. 9) and remove retainers.

(4) Remove stabilizer bar.

(5) Remove lower link nuts and bolts and remove links (Fig. 9).



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**Fig. 9 Stabilizer Bar**

- 1 - RETAINER
- 2 - STABILIZER BAR
- 3 - LINK
- 4 - BUSHING

## INSTALLATION

(1) Center stabilizer bar on top of the frame rails and install retainers and bolts. Tighten bolts to 54 N·m (40 ft. lbs.).

## STABILIZER BAR (Continued)

(2) Position links on axle brackets and into the stabilizer bar. Install lower link bolts and nuts and tighten to 95 N·m (70 ft. lbs.).

(3) Install upper link nuts and tighten to 61 N·m (45 ft. lbs.).

(4) Install bumper valence.

## TRACK BAR

## DESCRIPTION

The bar is attached to a frame rail bracket with a ball stud and an axle bracket with a bushing. The bar is forged and has non replaceable isolator bushing and ball stud.

## OPERATION

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

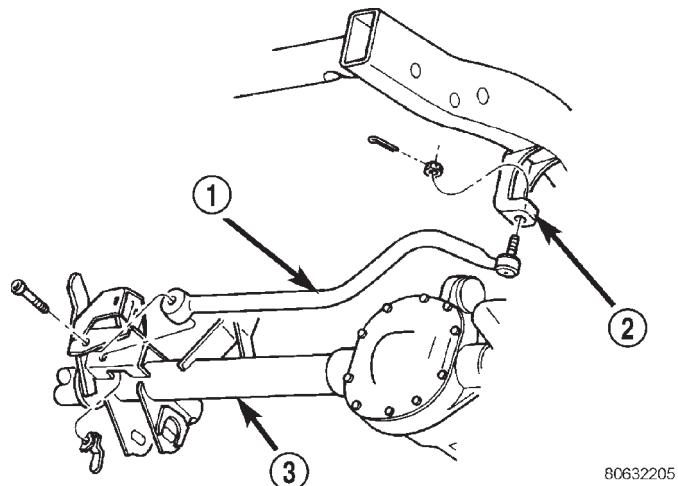
## REMOVAL

(1) Raise and support the vehicle.

(2) Remove the cotter pin and nut from the ball stud end at the frame rail bracket (Fig. 10).

(3) Use a universal puller tool to separate the track bar ball stud from the frame rail bracket.

(4) Remove the bolt and flag nut from the axle bracket (Fig. 10). Remove the track bar.



## INSTALLATION

(1) Install the track bar at axle tube bracket. Loosely install the retaining bolt and flag nut.

(2) It may be necessary to pry the axle assembly over to install the track bar at the frame rail. Install track bar at the frame rail bracket. Install the retaining nut on the stud.

(3) Tighten the ball stud nut to 81N·m (60 ft. lbs.) and install a new cotter pin.

(4) Remove the supports and lower the vehicle.

(5) Tighten the bolt at the axle bracket to 47 N·m (40 ft. lbs.).

(6) Check alignment if a new track bar was installed. (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

## UPPER BALL JOINT

## REMOVAL

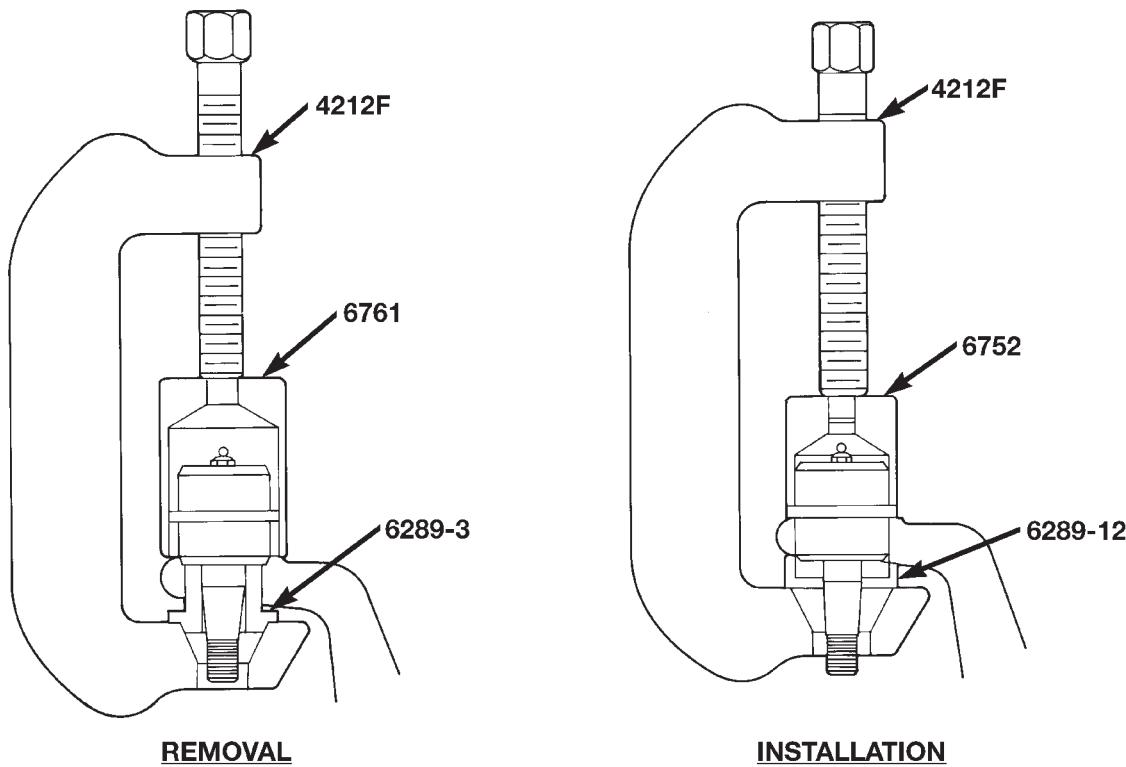
Ball stud service procedures below require removal of the hub bearing and axle shaft. (Refer to 2 - SUSPENSION/FRONT/HUB / BEARING - REMOVAL) (Refer to 3 - DIFFERENTIAL & DRIVELINE/FRONT AXLE - 181FBI/AXLE SHAFTS - REMOVAL). Removal and installation of upper and lower ball studs require the use of Tool Kit 6289.

(1) Position tools as shown to remove and install ball stud (Fig. 11).

Fig. 10 Track Bar

- 1 - TRACK BAR
- 2 - FRAME BRACKET
- 3 - FRONT AXLE

## UPPER BALL JOINT (Continued)



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Fig. 11 Upper

## UPPER CONTROL ARM

## DESCRIPTION

The upper suspension arms are steel and use rubber bushings at each end of the arm. The arms mount to the frame rail bracket and the axle brackets.

## OPERATION

The arm and bushings provide location and react to loads from the axle. The bushings provide isolation from the axle.

## REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the upper suspension arm nut and bolt at the axle bracket (Fig. 7).
- (3) Remove the nut and bolt 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) Tighten the nut at the axle and frame brackets to 75 N·m (55 ft. lbs.).

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# REAR

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## REAR

### DESCRIPTION

#### REAR SUSPENSION

The rear suspension is link/coil design comprised of:

- Shock absorbers
- Coil springs
- Upper and lower suspension arms

- Stabilizer bar
- Track bar

**CAUTION:** Suspension components with rubber/urethane bushings (except stabilizer bar) 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.

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REAR (Continued)

## SPECIFICATIONS

## TORQUE CHART

## TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Shock Absorber Upper Bolts	35	26	—
Shock Absorber Lower Nut	100	74	—
Suspension Arm Lower Axe Bracket Nut	177	130	—
Suspension Arm Lower Frame Bracket Nut	177	130	—
Suspension Arm Upper Axe Bracket Nut	75	55	—
Suspension Arm Upper Frame Bracket Bolt	75	55	—
Stabilizer Bar Retainer Bolts	54	40	—
Stabilizer Bar Link Nut/Bolt	54	40	—
Track Bar Frame Bracket Nut	100	74	—
Track Bar Axe Bracket Bolt	100	74	—

## JOUNCE BUMPER

## DESCRIPTION

The jounce bumpers are mounted inside the coil spring to the frame rail.

## OPERATION

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

## LOWER CONTROL ARM

## DESCRIPTION

The lower suspension arms are steel and use bushings at each end of the arm. The arms are mounted from the frame to the axle brackets.

## OPERATION

The bushings isolation axle and road noise. The arm and bushings provide location and react to loads from the axle.

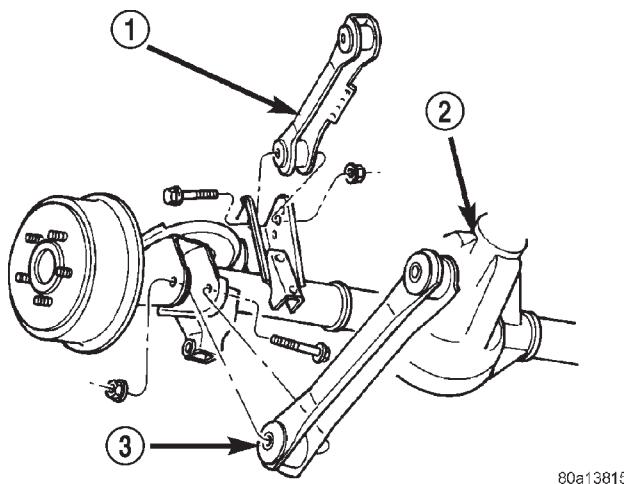
## REMOVAL

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

## INSTALLATION

- (1) Position the lower suspension arm in the axle bracket and frame rail mount.
- (2) Install the mounting bolts and finger tighten the nuts.
- (3) Remove the supports and lower the vehicle.
- (4) Tighten the lower suspension arm nuts to 177 N·m (130 ft. lbs.).

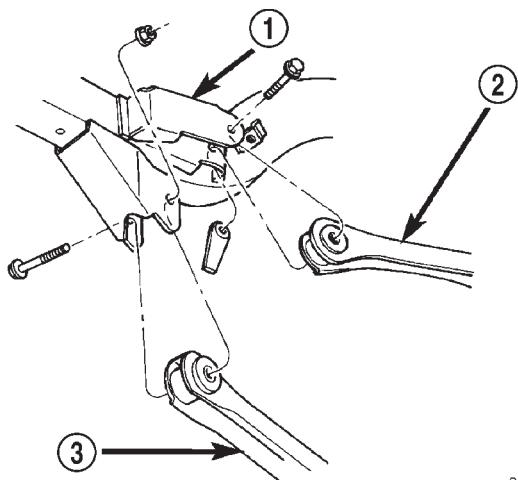
## LOWER CONTROL ARM (Continued)



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**Fig. 1 Upper & Lower Suspension Arms**

1 - UPPER SUSPENSION ARM  
2 - REAR AXLE  
3 - LOWER SUSPENSION ARM



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**Fig. 2 Upper & Lower Suspension Arms**

1 - FRAME MOUNT  
2 - UPPER SUSPENSION ARM  
3 - LOWER SUSPENSION ARM

**SHOCK****DESCRIPTION**

The top of the shock absorbers are bolted to the frame. The bottom of the shocks are bolted to the axle brackets.

**OPERATION**

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

**DIAGNOSIS AND TESTING - SHOCK ABSORBER**

A knocking or rattling noise from a shock absorber may be caused by movement between mounting bushings and metal brackets or attaching components. These noises can usually be stopped by tightening the attaching nuts. If the noise persists, inspect for damaged and worn bushings, and attaching components. Repair as necessary if any of these conditions exist.

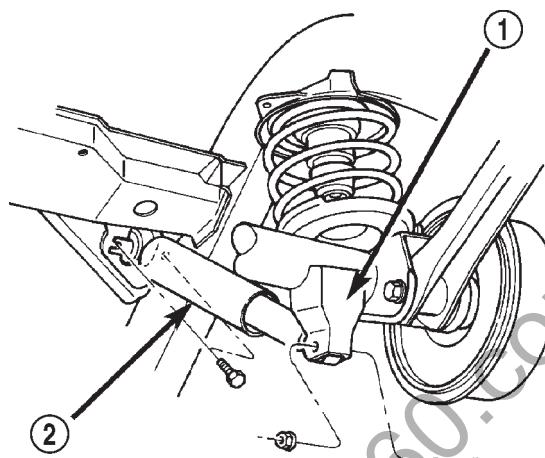
A squeaking noise from the shock absorber may be caused by the hydraulic valving and may be intermittent. This condition is not repairable and the shock absorber must be replaced.

The shock absorbers are not refillable or adjustable. If a malfunction occurs, the shock absorber must be replaced. To test a shock absorber, hold it in an upright position and force the piston in and out of the cylinder four or five times. The action throughout each stroke should be smooth and even.

The shock absorber bushings do not require any type of lubrication. Do not attempt to stop bushing noise by lubricating them. Grease and mineral oil-base lubricants will deteriorate the bushing.

**REMOVAL**

- (1) Raise and support the vehicle and the axle.
- (2) Remove the upper mounting bolts (Fig. 3).
- (3) Remove the lower nut and bolt from the axle bracket. Remove the shock absorber.



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**Fig. 3 Shock Absorber**

1 - AXLE BRACKET  
2 - SHOCK

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## SHOCK (Continued)

## INSTALLATION

- (1) Install the shock absorber on the upper frame rail and install mounting bolts.
- (2) Tighten the upper bolts to 31 N·m (23 ft. lbs.).
- (3) Install lower bolt and nut finger tight.
- (4) Remove the supports and lower the vehicle.
- (5) Tighten the lower nut to 100 N·m (74 ft. lbs.).

## SPRING

## DESCRIPTION

The coil springs mount between the bottom of the frame rail and the top of the axle. A rubber doughnut isolator is located between the top of the spring and the frame rail. A plastic isolator is located between the bottom of the spring and the axle.

## OPERATION

The coil springs control ride quality and maintain proper ride height. The isolators are used to isolate road noise.

## REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support it.
- (2) Disconnect the stabilizer bar links and shock absorbers from the axle brackets. (Refer to 2 - SUSPENSION/REAR/STABILIZER BAR - REMOVAL) (Refer to 2 - SUSPENSION/REAR/SHOCK - REMOVAL).
- (3) Disconnect the track bar from the frame rail bracket. (Refer to 2 - SUSPENSION/REAR/TRACK BAR - REMOVAL).
- (4) Lower the axle until the spring is free from the upper mount seat and remove the spring.

## INSTALLATION

**NOTE: Springs can be install with either end up.**

- (1) Position the coil spring on the axle pad isolator.
- (2) Raise the axle into position until the spring seats on the upper isolator.
- (3) Connect the stabilizer bar links and shock absorbers to the axle bracket. Connect the track bar to the frame rail bracket.
- (4) Remove the supports and lower the vehicle.
- (5) Tighten the stabilizer bar links, shock absorbers and track bar to specified torque.

## STABILIZER BAR

## DESCRIPTION

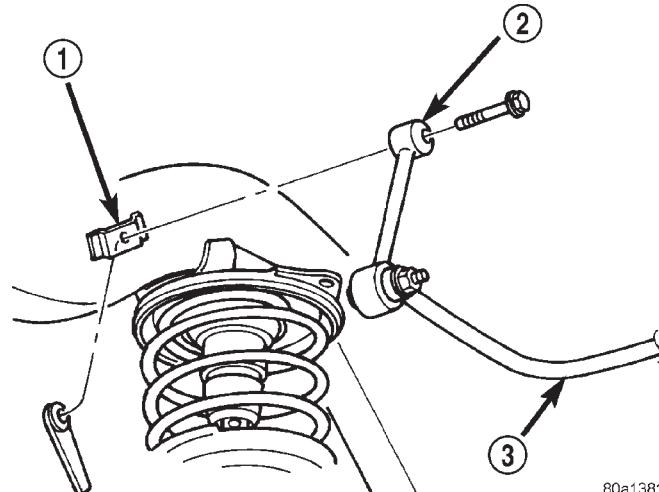
The spring steel bar extends across the axle and mounts to bracket on the axle. Links are connected from the bar to the side of the frame rail. The stabilizer bar and links are isolated by rubber bushings.

## OPERATION

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

## REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the stabilizer bar link bolts from the frame mounts (Fig. 4).
- (3) Remove the link bolts from the stabilizer bar.
- (4) Remove the stabilizer bar retainer bolts and retainers from the axle mounts (Fig. 5) and remove the bar.



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**Fig. 4 Stabilizer Bar Link**

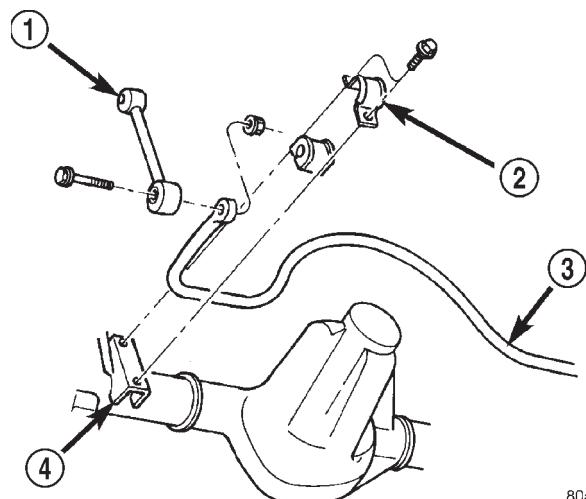
1 - FRAME MOUNT  
2 - LINK  
3 - STABILIZER BAR

## INSTALLATION

- (1) Install the stabilizer bar on the axle mounts and install the retainers and bolts.

**NOTE: Ensure the bar is centered with equal spacing on both sides and is positioned above the differential housing (Fig. 5).**

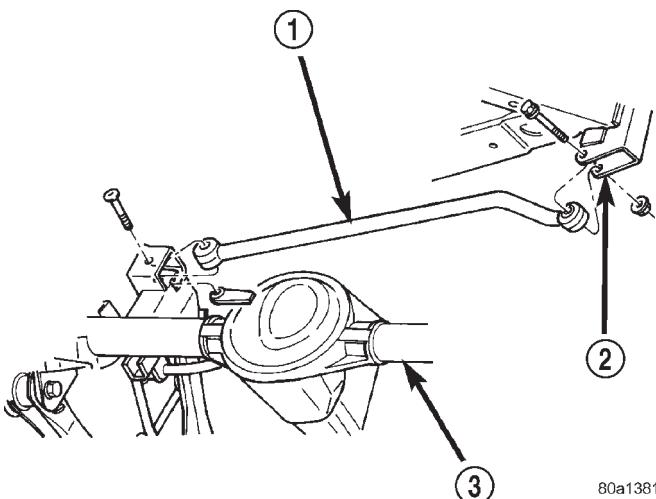
## STABILIZER BAR (Continued)



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**Fig. 5 Stabilizer Bar**

1 - LINK  
2 - RETAINER  
3 - STABILIZER BAR  
4 - AXLE MOUNT



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**Fig. 6 Rear Track Bar**

1 - TRACK BAR  
2 - FRAME BRACKET  
3 - REAR AXLE

(2) Tighten the retainer bolts to 54 N·m (40 ft. lbs.).  
 (3) Install the links onto the stabilizer bar and frame mounts. Install the bolts and nuts finger tight.  
 (4) Remove support and lower vehicle.  
 (5) Tighten the link nuts/bolts to 54 N·m (40 ft. lbs.).

**TRACK BAR****DESCRIPTION**

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

**OPERATION**

The track bar is used to control rear axle lateral movement.

**REMOVAL**

(1) Raise and support the vehicle.  
 (2) Remove the bolt and nut from the frame rail bracket (Fig. 6).  
 (3) Remove the bolt from the axle bracket (Fig. 6) and remove the track bar.

**INSTALLATION**

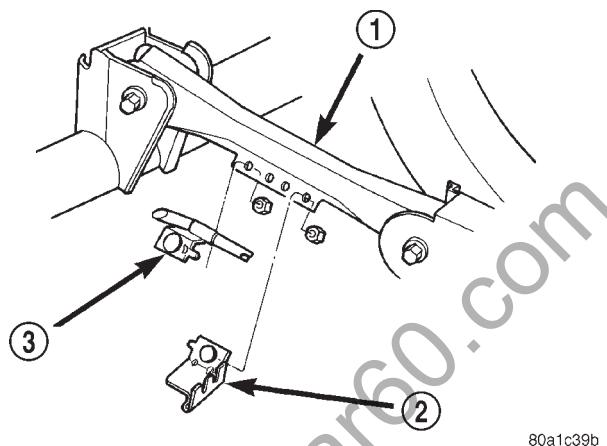
(1) Install the track bar in the axle bracket and install the bolt loosely.  
 (2) Install the track bar in the frame rail bracket and loosely install the bolt and nut.

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

(3) Remove supports and lower the vehicle.  
 (4) Tighten the track bar nut/bolt at both ends to 100 N·m (74 ft. lbs.).

**UPPER CONTROL ARM****REMOVAL**

(1) Raise and support the vehicle.  
 (2) Remove the parking brake cable/bracket and ABS wiring bracket from the arm if equipped (Fig. 7).



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**Fig. 7 Parking Brake Cable/Bracket And Wiring Bracket**

1 - UPPER SUSPENSION ARM  
2 - WIRING BRACKET  
3 - PARKING BRAKE CABLE BRACKET

## UPPER CONTROL ARM (Continued)

(3) Remove the upper suspension arm nut and bolt from the axle bracket (Fig. 1).

(4) Remove the nut and bolt from the frame rail bracket (Fig. 2) and remove the upper suspension arm.

## INSTALLATION

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

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

(3) Install the parking brake cable/bracket and ABS wiring bracket on the arm if equipped.

(4) Remove the supports and lower the vehicle.

(5) Tighten the upper suspension arm frame rail bracket bolt to 75 N·m (55 ft. lbs.).

(6) Tighten the upper suspension arm axle bracket nut to 75 N·m (55 ft. lbs.).

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