

SUSPENSION

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ALIGNMENT

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GENERAL INFORMATION

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, the damaged component(s) must be replaced to correct mis-alignment.

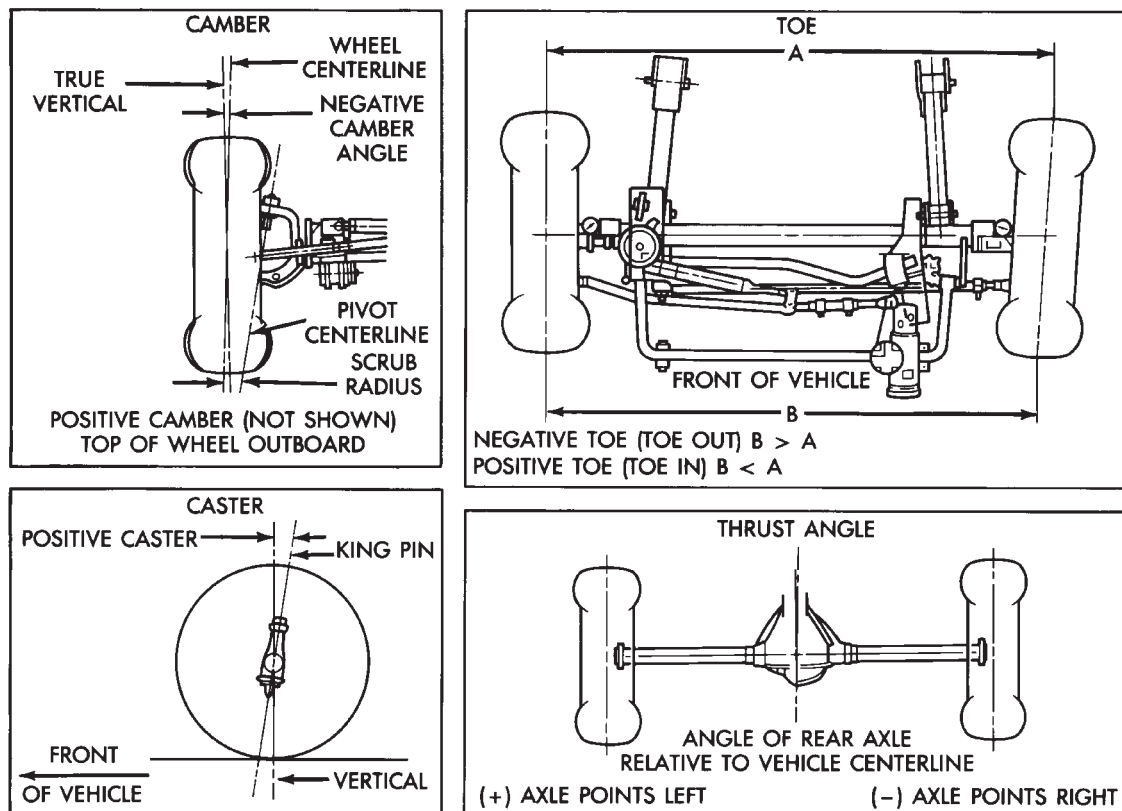
- **WHEEL TOE POSITION** is the difference between the leading inside edges and trailing inside edges of the front tires. Incorrect wheel toe position is the most common cause of unstable steering and uneven tire wear. The wheel toe position is the **final** front wheel alignment adjustment.

- **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, the damaged component(s) must be replaced to correct mis-alignment.

- **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, the damaged component(s) must be replaced to correct mis-alignment.

CAUTION: Do not attempt to modify any suspension or steering component by heating and bending.

GENERAL INFORMATION (Continued)



J9402-57

Fig. 1 Wheel Alignment Measurements

DIAGNOSIS AND TESTING

PRE-ALIGNMENT INSPECTION

Before starting wheel alignment, the following inspection is necessary and must be completed.

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

SERVICE PROCEDURES

SPECIFICATIONS

ALIGNMENT

FRONT WHEELS

ADJUSTMENT	PREFERRED	RANGE
CASTER	7°	6.5° to 7.5°
CAMBER (not adjustable)	NA	- 1.13° to + 0.13°
TOE-IN (each wheel)	0.12°	0° to + 0.22°
Toe Differential Left to Right .05°		

REAR AXLE

ADJUSTMENT	SPECIFICATION
THRUST ANGLE (not adjustable)	± .25°
TOTAL TOE-IN (not adjustable)	0.00 to + 0.5°

FRONT SUSPENSION

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DESCRIPTION AND OPERATION

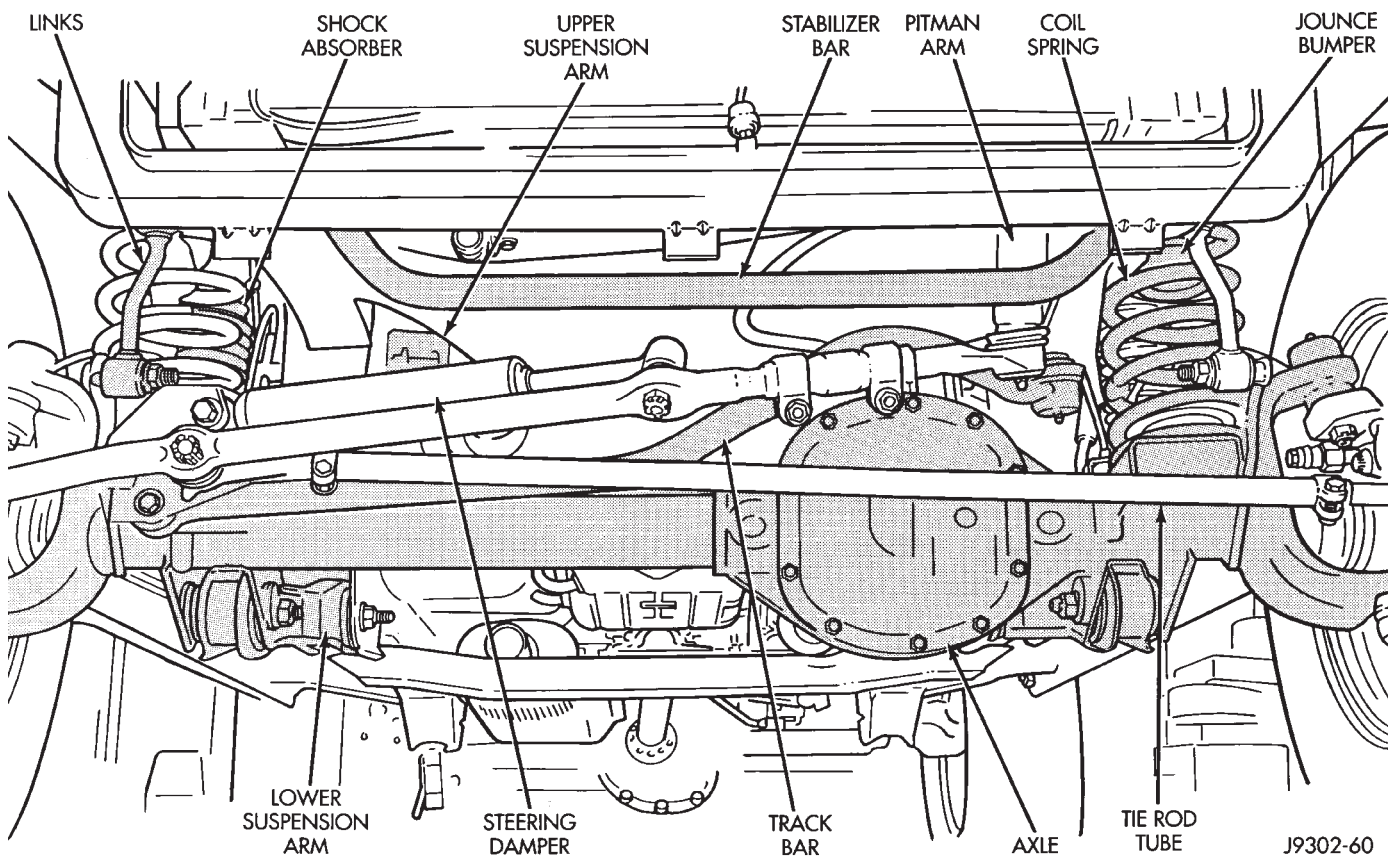
FRONT SUSPENSION

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

- Drive axle (4WD), tube axle (2WD)
- Dual-action shock absorbers
- Coil springs
- Upper and lower suspension arms

- Stabilizer bar
- Track bar
- Jounce bumpers

Link/Coil Suspension: The link/coil suspension allows each wheel to adapt to different road surfaces without greatly affecting the opposite wheel. Wheels are attached to a hub/bearings which bolts to the knuckles. The hub/bearing is not serviceable and is replaced as a unit. Steering knuckles pivot on



J9302-60

Fig. 1 Front Suspension

DESCRIPTION AND OPERATION (Continued)

replaceable ball studs attached to the axle tube yokes.

Shock Absorbers: The shock absorbers dampen bounce and rebound motion of the vehicle over various road conditions. The top of the shock absorbers are bolted to the body. The bottom of the shocks are bolted to the axle brackets.

Coil Springs: The coil springs control ride quality and maintain proper ride height. 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 pad and is retained with a clip.

Upper And Lower Suspension Arms: The suspension arms use bushings to isolate road noise. The suspension arms are bolted to the frame and axle through the rubber bushings. The lower suspension arm uses cam bolts at the axle to allow for caster and pinion angle adjustment. The suspension arm travel is limited through the use of jounce bumpers in compression and shocks absorbers in rebound.

Stabilizer Bar: 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. The bar extends across the front underside of the chassis and connects to the frame rails. Links are connected from the bar to the axle brackets. Stabilizer bar mounts are isolated by rubber bushings.

Track Bar: The track bar is used to control front axle lateral movement. The bar is attached to a frame rail bracket with a ball stud and isolated with a bushing at the axle bracket.

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 (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. Rubber bushings must never be lubricated.

NOTE: Periodic lubrication of the front suspension (steering) system components is required. Refer to Group 0, Lubrication And Maintenance for the recommended maintenance schedule.

DIAGNOSIS AND TESTING

SHOCK DIAGNOSIS

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 AND INSTALLATION

SHOCK ABSORBER

REMOVAL

- (1) Remove the nut, retainer and grommet from the upper stud in the engine compartment (Fig. 2).
- (2) Remove the lower nuts and bolts from the axle bracket. Remove the shock absorber.

INSTALLATION

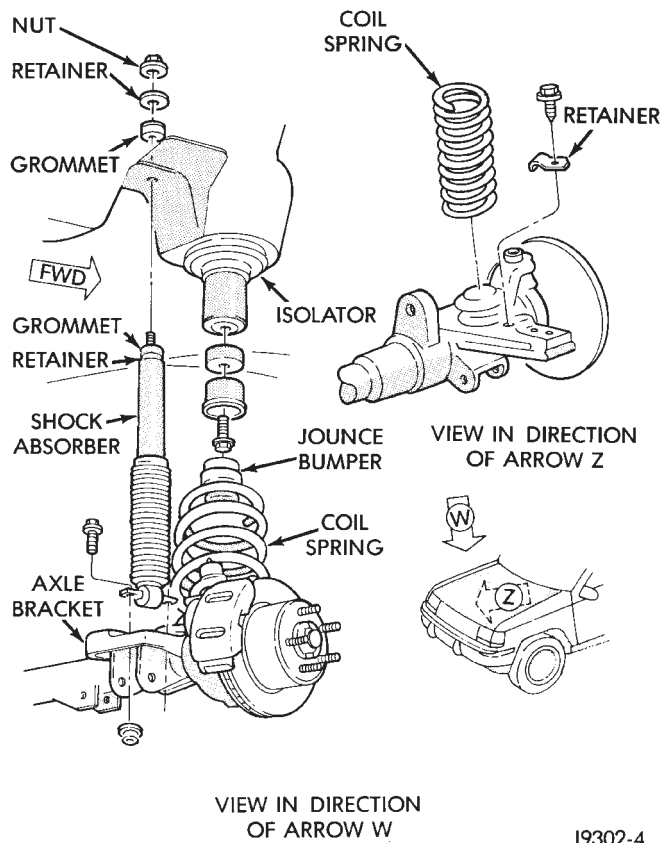
- (1) Position the lower retainer and grommet on the upper stud. Insert the shock absorber through the shock tower hole.
- (2) Install the lower bolts and nuts. Tighten nuts to 28 N·m (250 in. lbs.).
- (3) Install the upper grommet and retainer on the stud in the engine compartment. Install the nut and tighten to 23 N·m (17 ft. lbs.).

COIL SPRING

REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support it.
- (2) Remove rear lower suspension arm bolts.
- (3) Remove caliper flex hose brackets from the frame rails.
- (4) Remove ABS sensor wires from brackets.

REMOVAL AND INSTALLATION (Continued)

**Fig. 2 Coil Spring & Shock Absorber**

(5) Disconnect the stabilizer bar link and shock absorber from the axle.

(6) Disconnect the track bar from the frame rail bracket.

(7) Disconnect the drag link from the pitman arm.

(8) Lower the axle until the spring is free from the upper mount. Remove the coil spring retainer bolt (Fig. 2) and remove the spring.

(9) Remove the jounce bumper if necessary from the upper spring mount (Fig. 2).

INSTALLATION

(1) Install the jounce bumper on the upper spring mount.

(2) Position the coil spring on the axle pad. Install the spring retainer and bolt.

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

(4) Install lower suspension arms and rear bolts.

(5) Install caliper flex hose brackets to the frame rails.

(6) Install ABS sensor wires into brackets.

(7) Connect the stabilizer bar links and shock absorbers to the axle bracket. Connect the track bar to the frame rail bracket.

(8) Install drag link to pitman arm.

(9) Remove the supports and lower the vehicle.

(10) Tighten all suspension components to proper torque.

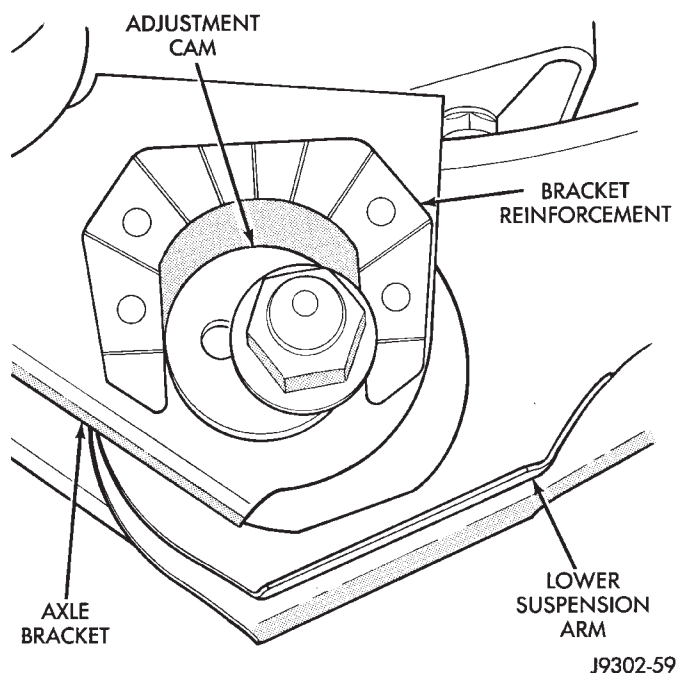
STEERING KNUCKLE

For service procedures on the steering knuckle and ball studs refer to Group 3 Differentials And Driveline.

LOWER SUSPENSION ARM**REMOVAL**

(1) Raise and support the vehicle.

(2) Paint or scribe alignment marks on the cam adjusters and suspension arm for installation reference (Fig. 3).

**Fig. 3 Cam Adjuster**

(3) Remove the lower suspension arm nut, cam and cam bolt from the axle (Fig. 4).

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

INSTALLATION

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

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

(3) Install a new cam bolt, cam and new nut in the axle. Re-align the reference marks.

(4) Install the bolts and finger tighten the new nuts.

(5) Lower the vehicle.

(6) Tighten the axle bracket nut to 115 N·m (85 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

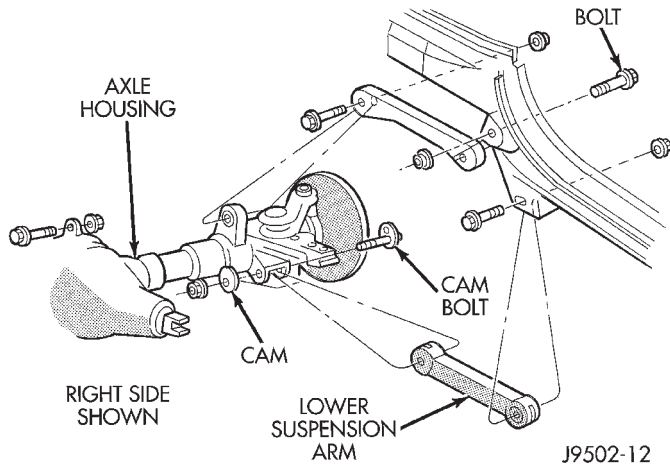


Fig. 4 Upper & Lower Suspension Arms

(7) Tighten the frame bracket nut to 176 N·m (130 ft. lbs.).

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

UPPER SUSPENSION ARM

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the upper suspension arm nut and bolt at the axle bracket (Fig. 4).
- (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 bracket to 75 N·m (55 ft. lbs.).

AXLE BUSHING

REMOVAL

- (1) Remove the upper suspension arm from axle
- (2) Position Receiver 7932-1 (J-35581-1) over the bushing in the axle and install Bushing Removal/Installer (Fig. 5).
- (3) Remove the bushing by tightening the Long Nut.

NOTE: For two-wheel drive axles and right side on Model 30 axle, do not remove Receiver 7932-1 (J-35581-1) at this time.

INSTALLATION

- (1) Position new bushing, Receiver and Installer on axle (Fig. 6).

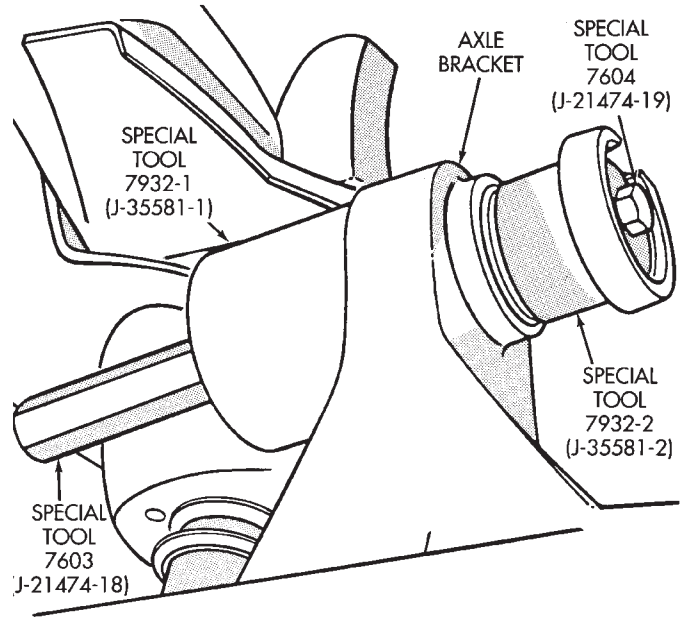


Fig. 5 Bushing Removal

- (2) Install the bushing by tightening the Long Nut.

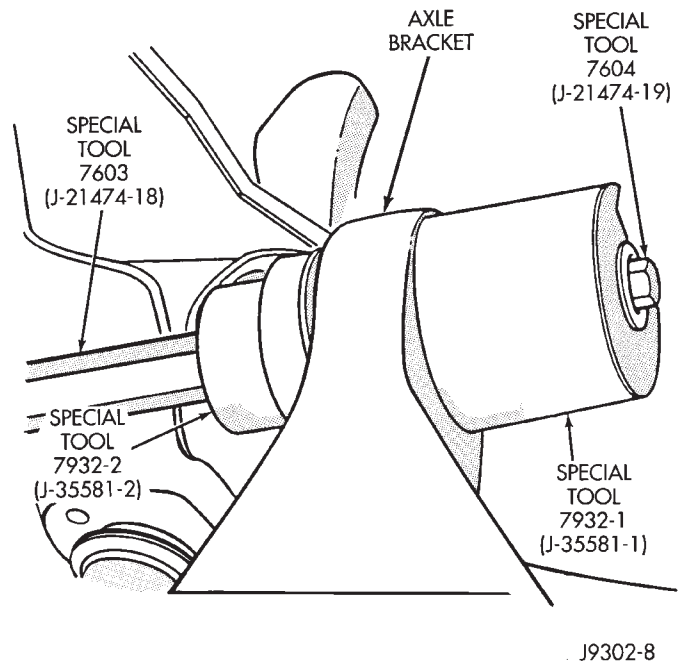


Fig. 6 Bushing Installation

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

STABILIZER BAR

REMOVAL

- (1) Raise and support the vehicle.

REMOVAL AND INSTALLATION (Continued)

(2) Remove upper link nuts (Fig. 7) and separate links from the stabilizer bar with Remover MB-990635.

(3) Remove the stabilizer bar clamps bolts from the frame rails and remove the stabilizer bar.

(4) Remove the stabilizer bar link nuts from the axle brackets (Fig. 7).

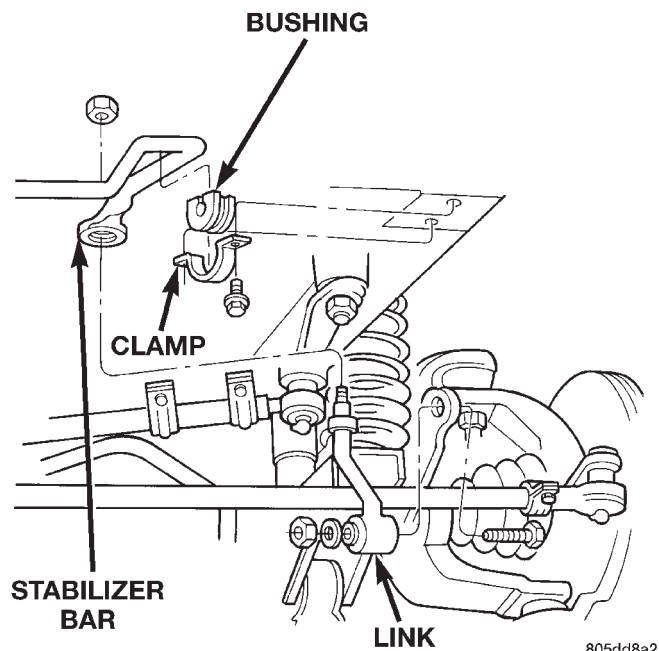


Fig. 7 Stabilizer Bar

INSTALLATION

(1) Position the stabilizer bar on the frame rail and install the clamps 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 into the stabilizer bar and axle brackets.

(3) Tighten the nuts at the axle bracket end to 95 N·m (70 ft. lbs.).

(4) Tighten the stabilizer bar to link nuts to 61 N·m (45 ft. lbs.).

(5) Remove the supports and lower the vehicle.

(6) Tighten the nuts at the axle bracket end to 95 N·m (70 ft. lbs.).

TRACK BAR

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. 8).

NOTE: Use a universal puller to separate the ball stud from the frame rail bracket.

(3) Remove the bolt and flag nut from the axle shaft tube bracket (Fig. 8). Remove the track bar.

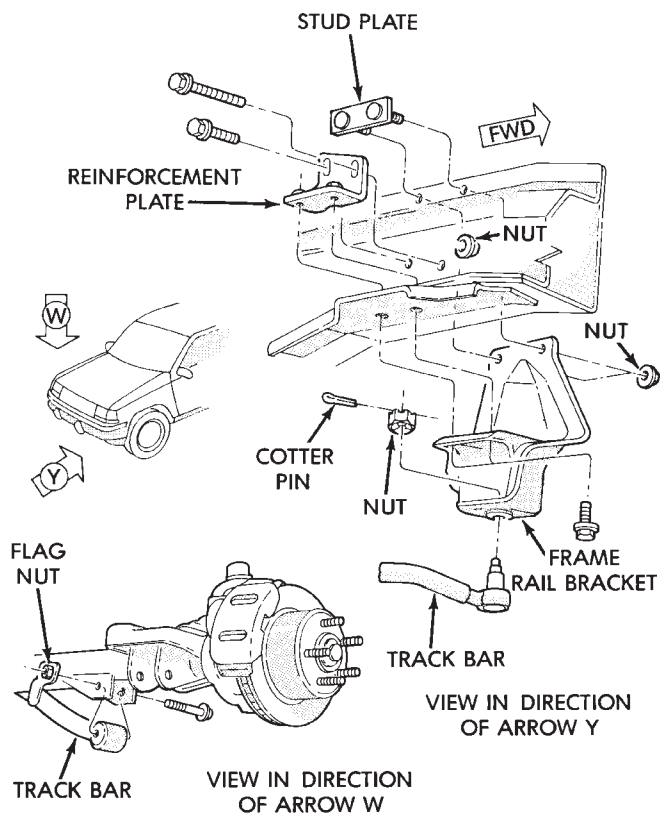


Fig. 8 Track Bar

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 81 N·m (60 ft. lbs.). Install a new cotter pin.

(4) Remove the supports and lower the vehicle.

(5) Tighten the bolt at the axle shaft tube bracket to 75 N·m (55 ft. lbs.).

(6) Check alignment if a new track bar was installed.

HUB BEARING

The Hub Bearing is serviced as an assembly.

REMOVAL

(1) Raise and support the vehicle.

(2) Remove the wheel and tire assembly.

(3) Remove the brake components from the axle, refer to Group 5 Brakes.

(4) Remove the cotter pin, nut retainer and axle hub nut (Fig. 9).

REMOVAL AND INSTALLATION (Continued)

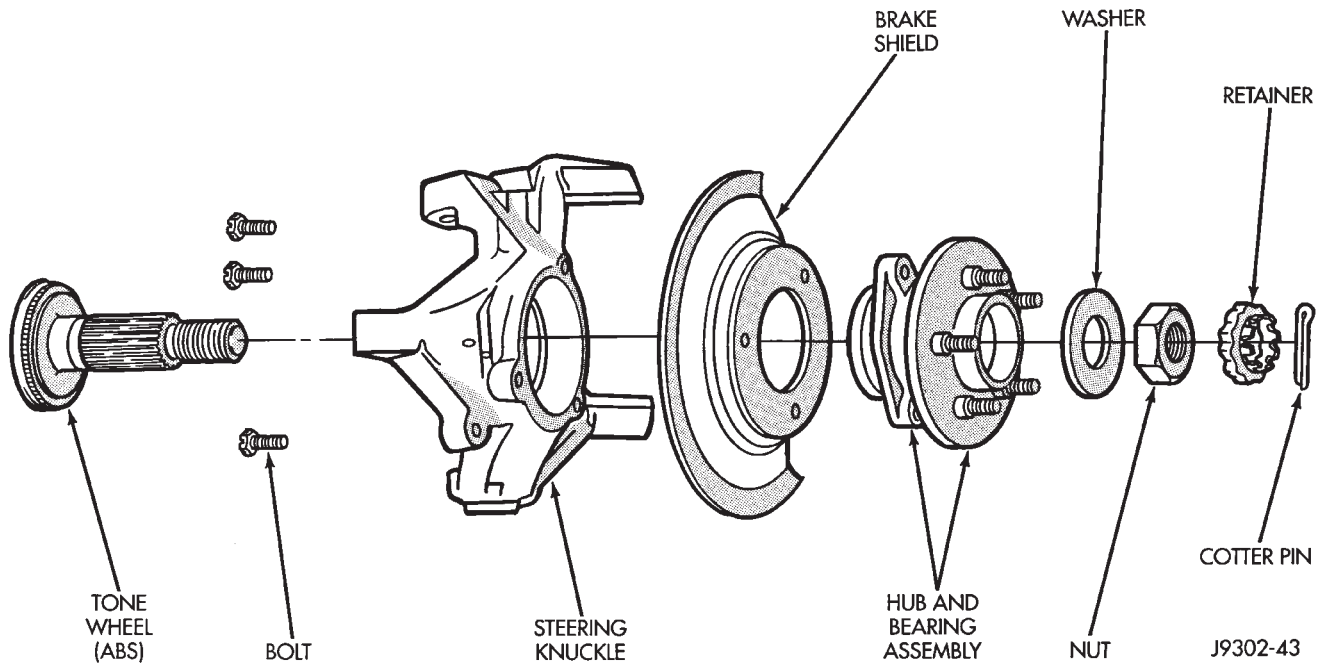


Fig. 9 Hub Bearing & Knuckle

(5) Remove the hub mounting bolts and remove hub bearing from the steering knuckle and axle shaft.

INSTALLATION

- (1) Install the hub bearing and brake dust shield to the knuckle.
- (2) Install the hub 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 components, refer to Group 5 Brakes.
- (5) Install the wheel and tire assembly.
- (6) Remove support and lower the vehicle.

WHEEL MOUNTING 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. 10).

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.

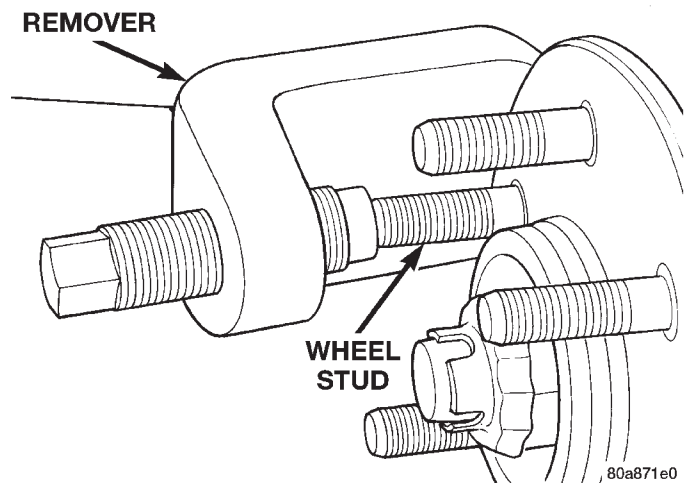


Fig. 10 Wheel Stud Removal

- (3) Tighten lug nut until the stud is pulled into the hub flange. Verify that the stud is properly seated into the flange.
- (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.

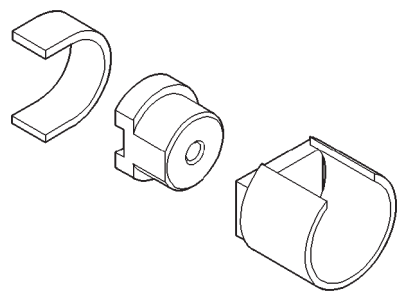
SPECIFICATIONS

TORQUE CHART

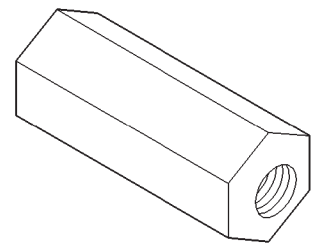
DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	23 N·m (17 ft. lbs.)
Lower Nut	28 N·m (250 in. lbs.)
Suspension Arm Upper	
Nuts	75 N·m (55 ft. lbs.)
Suspension Arm Lower	
Axle Bracket Nut	115 N·m (85 ft. lbs.)
Frame Bracket Nut	176 N·m (130 ft. lbs.)
Stabilizer Bar	
Clamp Bolt	54 N·m (40 ft. lbs.)
Link Upper Nut	61 N·m (45 ft. lbs.)
Link Lower Bolt	95 N·m (70 ft. lbs.)
Track Bar	
Ball Stud Nut	81 N·m (60 ft. lbs.)
Axle Bracket Bolt	75 N·m (55 ft. lbs.)
Track Bar Bracket	
Bolts	121 N·m (90 ft. lbs.)
Nut	121 N·m (90 ft. lbs.)
Support Bolts	95 N·m (70 ft. lbs.)

SPECIAL TOOLS

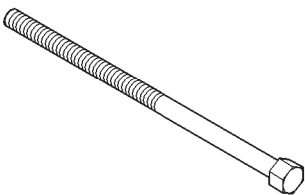
FRONT SUSPENSION



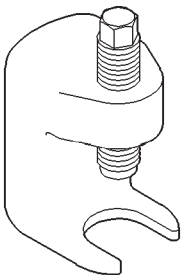
Remover/Installer Suspension Bushing 7932
(J-35581)



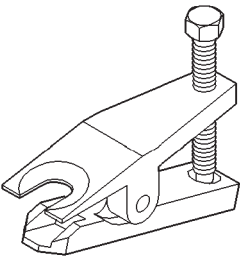
Nut, Long 7603 (J-21474-18)



Bolt, Special 7604 (J-21474-19)



Remover C-4150A



Remover Tie Rod End MB-990635

REAR SUSPENSION

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DESCRIPTION AND OPERATION

REAR SUSPENSION

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

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

Upper And Lower Suspension: The suspension arms use bushings to isolate road noise. The suspension arms are bolted to the body and axle through the rubber bushings. The lower suspension arm has provision for the use of cam bolts at the axle to allow for pinion angle or thrust angle adjustment. The cams are available as a service kit and are not installed at the factory. The suspension arm travel is limited through the use of jounce bumpers in compression and shock absorbers in rebound.

Shock Absorbers: The shock absorbers dampen jounce and rebound of the vehicle over various road conditions. The top of the shock absorbers are bolted to the body. The bottom of the shocks are bolted to the axle shock absorber bracket.

Coil Springs: The coil springs mount up in the fender shield that is part of the unitized body bracket. There is a rubber isolator between the top of the spring and bracket to isolate road noise. The bottom of the spring seats on the axle pad and is retained with a clip.

Stabilizer Bar: The stabilizer bar is used to control vehicle body roll during turns. The spring steel bar helps to equalize the vehicle body in relationship to the suspension. The bar extends across the underside of the chassis and connects to the frame rails. Links are connected from the bar to the axle brackets. Stabilizer bar are isolated by rubber bushings.

Track Bar: The track bar is used to control rear axle lateral movement. The track bar is attached to a

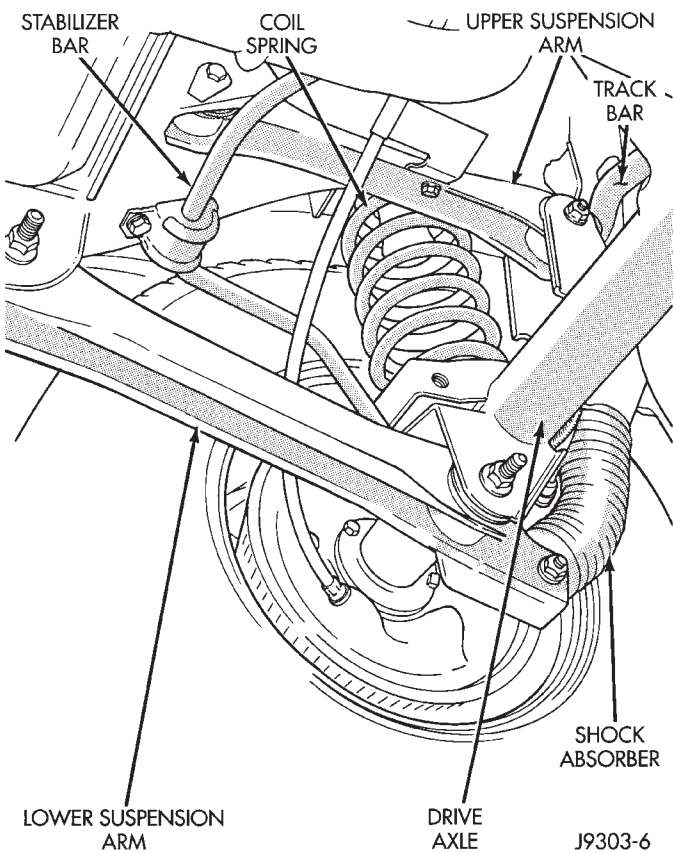


Fig. 1 Rear Suspension

frame rail bracket and an axle bracket. It is isolated with bushings at both ends.

CAUTION: Suspension components that use rubber bushings (except stabilizer bar) should be tightened with the vehicle at normal ride height. This will prevent premature failure of the bushing and maintain ride comfort. Rubber bushings must never be lubricated.

DIAGNOSIS AND TESTING

SHOCK DIAGNOSIS

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 AND INSTALLATION

SHOCK ABSORBER

REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support it.
- (2) Remove the upper nut and retainer from the frame rail stud (Fig. 2).
- (3) Remove the lower nut and bolt from the axle bracket. Remove the shock absorber.

INSTALLATION

- (1) Install the shock absorber on the upper frame rail stud. Install the shock absorber on the axle bracket.
- (2) Install the retainer and nut on the stud. Tighten the upper nut to 70 N·m (52 ft. lbs.).
- (3) Install lower bolt and nut finger tight.
- (4) Remove the supports and lower the vehicle.
- (5) Tighten the lower nut to 92 N·m (68 ft. lbs.).

COIL SPRING

REMOVAL

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

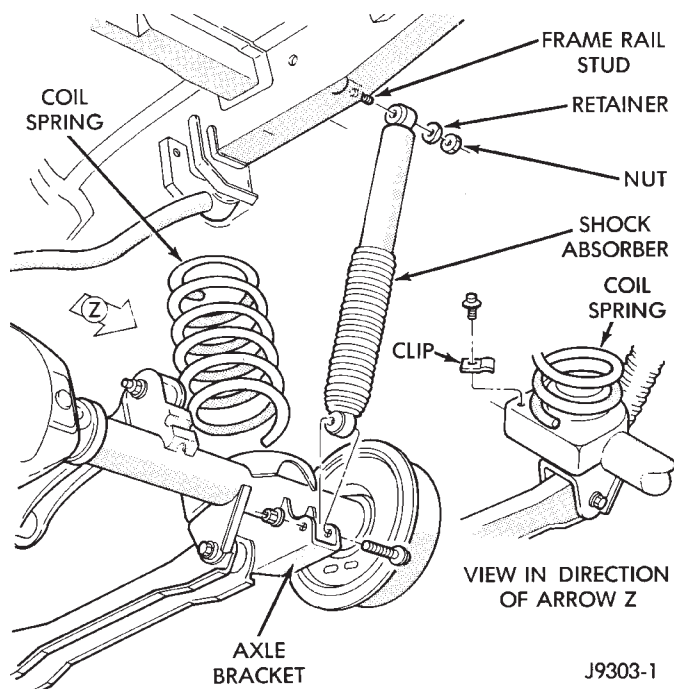


Fig. 2 Rear Coil Spring & Shock Absorber

- (2) Disconnect the stabilizer bar link and shock absorber from the axle bracket.
- (3) Disconnect the track bar from the frame rail bracket.
- (4) Lower the axle until the spring is free from the upper mount seat. Remove the coil spring retainer bolt (Fig. 2) and remove the spring.

INSTALLATION

Inspect isolator for damage or wear. Replace the isolator if necessary before installing spring.

- (1) Position the coil spring on the axle pad. Install the spring retainer and bolt. Tighten the bolt to 22 N·m (16 ft. lbs.).
- (2) Raise the axle into position until the spring seats in the upper mount.
- (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 track bar and shock absorber to specified torque.

REMOVAL AND INSTALLATION (Continued)

LOWER SUSPENSION ARM

REMOVAL

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

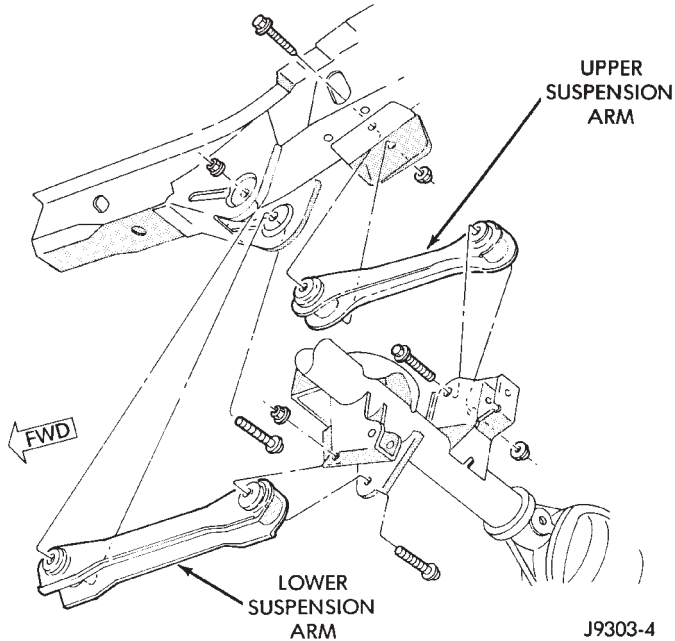


Fig. 3 Upper & Lower Suspension Arms

INSTALLATION

- (1) Position the lower suspension arm at the axle bracket and frame rail bracket.
- (2) Install the 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.).

UPPER SUSPENSION ARM

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the upper suspension arm nut and bolt at the axle bracket (Fig. 3). Remove the ABS wire bracket from the arm.
- (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. Install the ABS wire bracket onto the arm.
- (3) Remove the supports and lower the vehicle.
- (4) Tighten the upper suspension arm nuts to 75 N·m (55 ft. lbs.).

STABILIZER BAR

REMOVAL

- (1) Raise and support the vehicle. Remove one wheel and tire.
- (2) Disconnect the stabilizer bar links from the axle brackets (Fig. 4).
- (3) Lower the exhaust by disconnecting the muffler and tail pipe hangers.
- (4) Disconnect the stabilizer bar from the links.
- (5) Disconnect the stabilizer bar clamps from the frame rails. Remove the stabilizer bar.

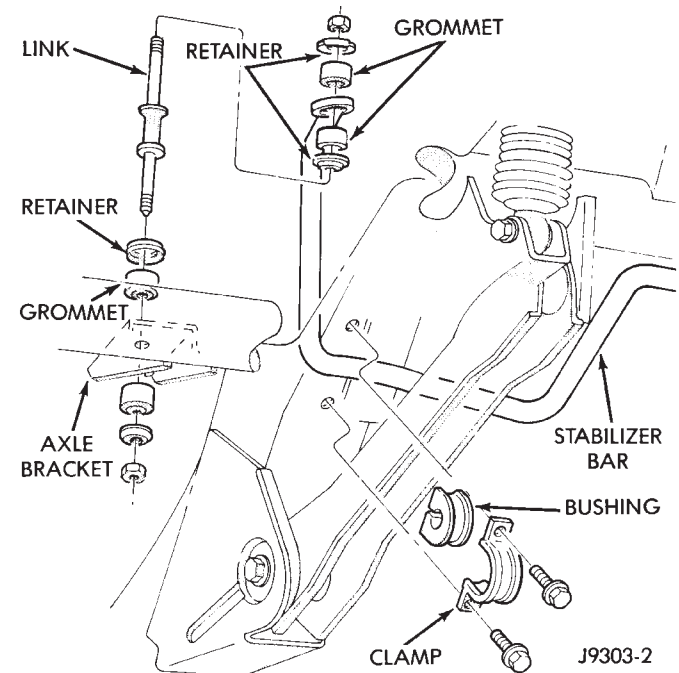


Fig. 4 Rear Stabilizer Bar

INSTALLATION

- (1) Position the stabilizer bar on the frame rail and install the clamps 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 and grommets onto the stabilizer bar and axle brackets. Install the nuts and tighten to 36 N·m (27 ft. lbs.).
- (3) Connect the muffler and tail pipe to their hangers.
- (4) Install the wheel and tire assembly.

REMOVAL AND INSTALLATION (Continued)

TRACK BAR

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the bolt and nut from the frame rail bracket (Fig. 5).
- (3) Remove the bolt from the axle tube bracket (Fig. 5). Remove the track bar.

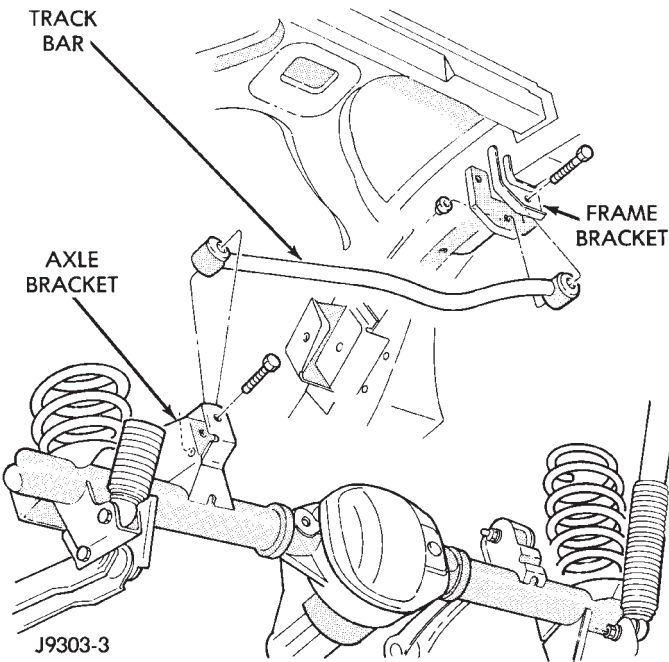


Fig. 5 Rear Track Bar

INSTALLATION

- (1) Install the track bar to the axle bracket and install a new bolt.
- (2) It may be necessary to pry the axle assembly over to install the track bar. Install the track bar to the frame rail bracket. Loosely install the bolt and flag nut.
- (3) Remove the supports and lower the vehicle.
- (4) Tighten the track bar bolts 100 N·m (74 ft. lbs.).

SPECIFICATIONS

TORQUE CHART

DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	70 N·m (52 ft. lbs.)
Lower Nut	92 N·m (68 ft. lbs.)
Suspension Arm Upper	
Nuts	75 N·m (55 ft. lbs.)
Suspension Arm Lower	
Nuts	177 N·m (130 ft. lbs.)
Stabilizer Bar	
Clamp Bolt	54 N·m (40 ft. lbs.)
Link Nut	36 N·m (27 ft. lbs.)
Track Bar	
Frame Bracket Nut	100 N·m (74 ft. lbs.)
Axle Bracket Bolt	100 N·m (74 ft. lbs.)

SUSPENSION

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ALIGNMENT

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GENERAL INFORMATION

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

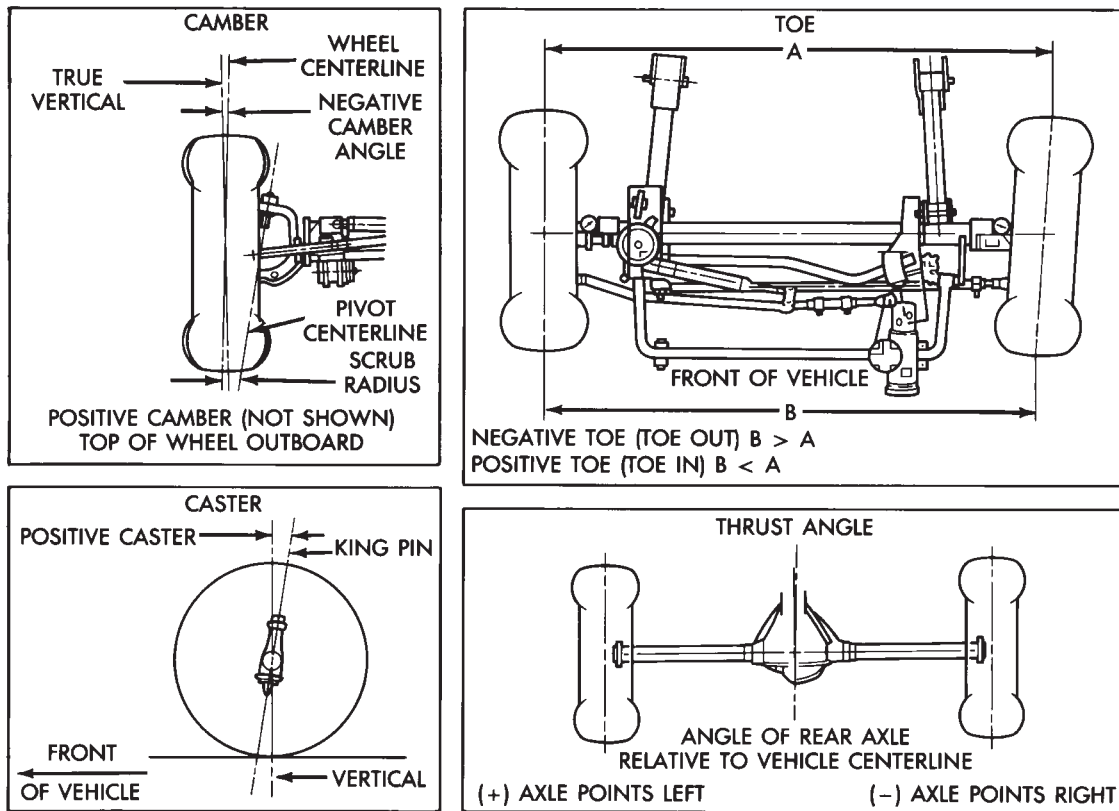
uneven tire wear. The wheel toe position is the **final** front wheel alignment adjustment.

- **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.

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.

GENERAL INFORMATION (Continued)



J9402-57

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, air pressure and tread wear.

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

SERVICE PROCEDURES (Continued)

SUSPENSION AND STEERING SYSTEM DIAGNOSIS

CONDITION	POSSIBLE CAUSES	CORRECTION
FRONT END NOISE	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components	1. 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. 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.	1. Replace wheel bearings. 2. Tighten or replace components as necessary. 3. Replace or balance tires. 4. Align vehicle to specifications.
VEHICLE INSTABILITY	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components 3. Tire pressure. 4. Alignment.	1. 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. Column coupler binding. 3. Tire pressure. 4. Alignment.	1. Adjust or replace steering gear. 2. Replace coupler. 3. Adjust tire pressure. 4. Align vehicle to specifications.
VEHICLE PULLS TO ONE SIDE	1. Tire pressure. 2. Alignment. 3. Loose or worn steering or suspension components 4. Radial tire lead. 5. Brake pull. 6. Weak or broken spring.	1. Adjust tire pressure. 2. Align vehicle to specifications. 3. Tighten or replace components as necessary. 4. Rotate or replace tire as necessary. 5. Repair brake as necessary. 6. Replace spring.

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.

CAMBER

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

CASTER

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.

SERVICE PROCEDURES (Continued)

Caster can be adjusted by loosening and rotating the cams on the lower suspension arm (Fig. 2). **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.**

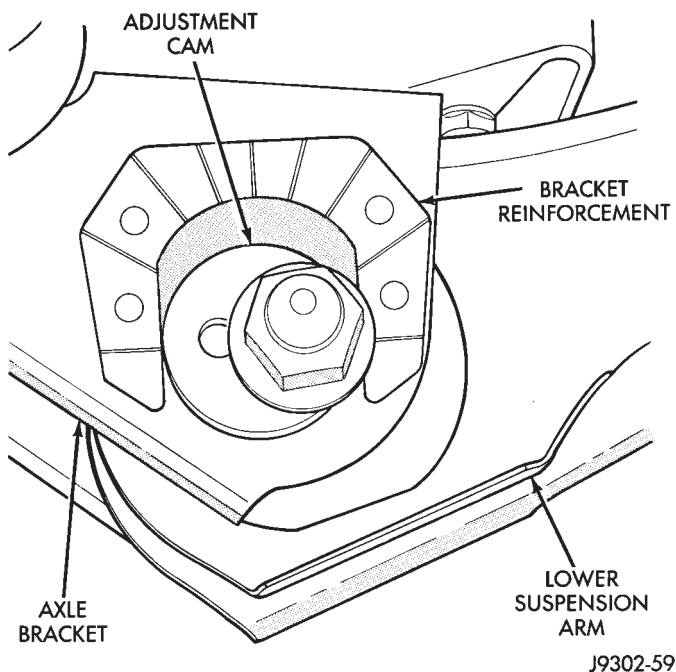


Fig. 2 Cam Adjuster

TOE POSITION (LHD)

NOTE: The wheel toe position adjustment should be the final adjustment.

(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:

- Vehicles with 2.5L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 4.0L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 5.2L engine: 49 N·m (36 ft. lbs.)

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

(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:

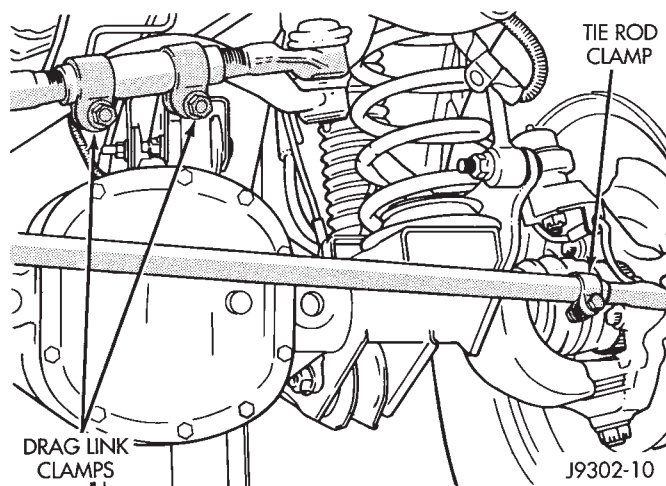


Fig. 3 Drag Link and Tie Rod Clamp (LHD)

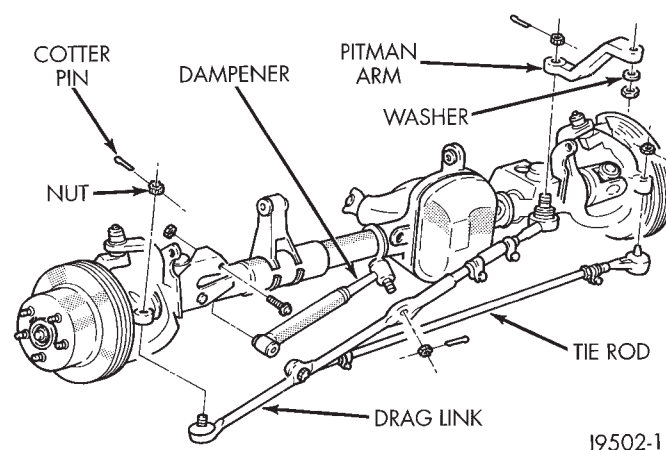


Fig. 4 Steering Linkage (LHD)

- Vehicles with 2.5L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 4.0L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 5.2L engine: 49 N·m (36 ft. lbs.)

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

(5) Verify the toe setting.

TOE POSITION (RHD)

NOTE: The wheel toe position adjustment should be the final adjustment.

(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. 5).

(3) Adjust the left wheel toe position with the drag link (Fig. 5). Turn the sleeve until the left wheel is at the correct positive TOE-IN position. Position the clamp bolts to their original position and tighten to:

SERVICE PROCEDURES (Continued)

- Vehicles with 2.5L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 4.0L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 5.2L engine: 49 N·m (36 ft. lbs.)

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

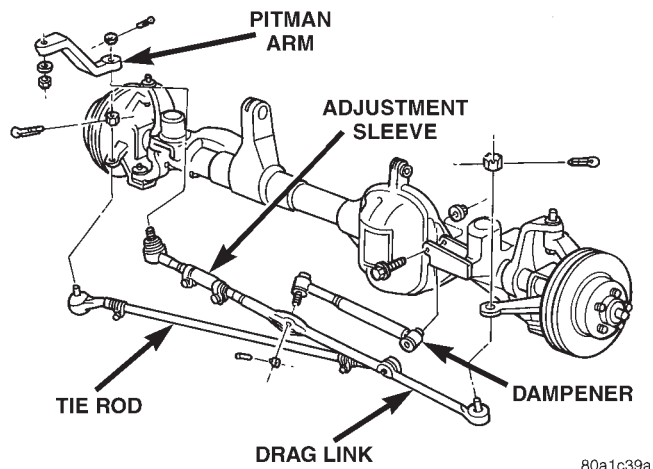


Fig. 5 Steering Linkage (RHD)

(4) Adjust the right wheel toe position with the tie rod. Turn the sleeve until the right wheel is at the same TOE-IN position as the left wheel. Position the clamp bolt to its original position and tighten to:

- Vehicles with 2.5L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 4.0L engine: 27 N·m (20 ft. lbs.)
- Vehicles with 5.2L engine: 49 N·m (36 ft. lbs.)

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

(5) Verify the toe setting.

SPECIFICATIONS

ALIGNMENT

FRONT WHEELS

ADJUSTMENT	PREFERRED	RANGE
CASTER	7°	6.5° to 7.5°
CAMBER (not adjustable)	NA	- 1.13° to + 0.13°
TOE-IN (each wheel)	0.12°	0° to + 0.22°
Toe Differential Left to Right .05°		

REAR AXLE

ADJUSTMENT	SPECIFICATION
THRUST ANGLE (not adjustable)	± .25°
TOTAL TOE-IN (not adjustable)	0.00 to + 0.5°

FRONT SUSPENSION

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DESCRIPTION AND OPERATION

FRONT SUSPENSION

The front suspension is a link/coil design (Fig. 1). This design is used on Left Hand Drive (LHD) and Right Hand Drive (RHD) vehicles. The suspension is comprised of:

- Drive axle (4WD), tube axle (2WD)
- Dual-action shock absorbers
- Coil springs
- Upper and lower suspension arms
- Stabilizer bar
- Track bar
- Jounce Bumper

Link/Coil Suspension: The link/coil suspension allows each wheel to adapt to different road surfaces without greatly affecting the opposite wheel. Wheels are attached to a hub/bearings which bolts to the knuckles. The hub/bearing is not serviceable and is replaced as a unit. Steering knuckles pivot on replaceable ball studs attached to the axle tube yokes.

Shock Absorbers: The shock absorbers dampen jounce and rebound motion of the vehicle over various road conditions. The top of the shock absorbers are bolted to the body. The bottom of the shocks are bolted to the axle brackets.

Coil Springs: The coil springs control ride quality and maintain proper ride height. 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 pad and is retained with a clip.

Upper And Lower Suspension: The suspension arms use bushings to isolate road noise. The suspension arms are bolted to the frame and axle through the rubber bushings. The lower suspension arm uses

cam bolts at the axle to allow for caster and pinion angle adjustment. The suspension arm travel is limited through the use of jounce bumpers in compression and shocks absorbers in rebound.

Stabilizer Bar: 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. The bar extends across the front underside of the chassis and connects to the frame rails. Links are connected from the bar to the axle brackets. Stabilizer bar mounts are isolated by rubber bushings.

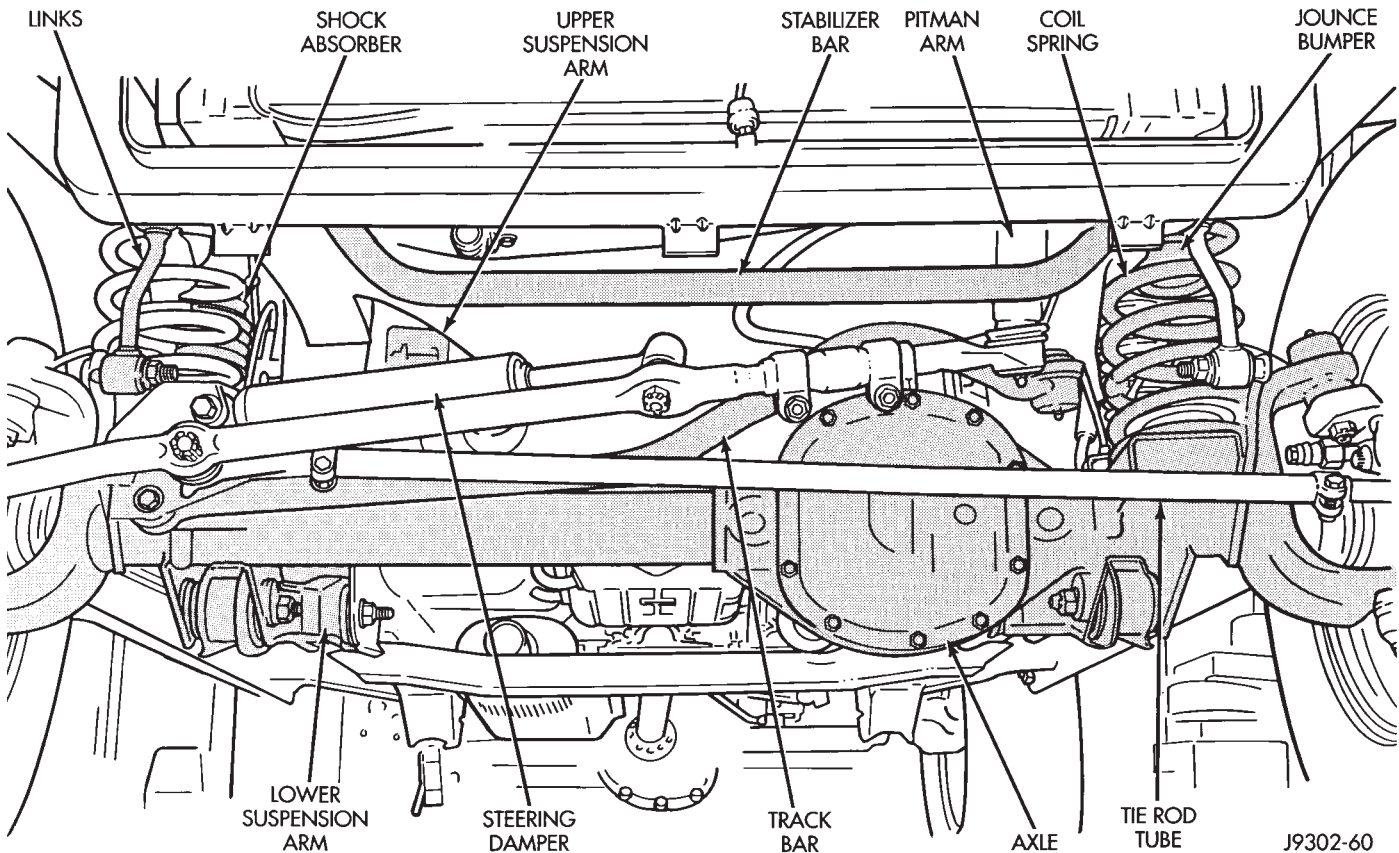
Track Bar: The track bar is used to control front axle lateral movement. The bar is attached to a frame rail bracket with a ball stud and isolated with a bushing at the axle bracket.

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.

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)

**Fig. 1 Front Suspension (LHD)**

NOTE: The service procedures and torque specifications are the same for LHD and RHD vehicles. The following service procedures and pictures were developed with a LHD vehicle.

DIAGNOSIS AND TESTING**SHOCK DIAGNOSIS**

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 AND INSTALLATION

SHOCK ABSORBER

REMOVAL

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

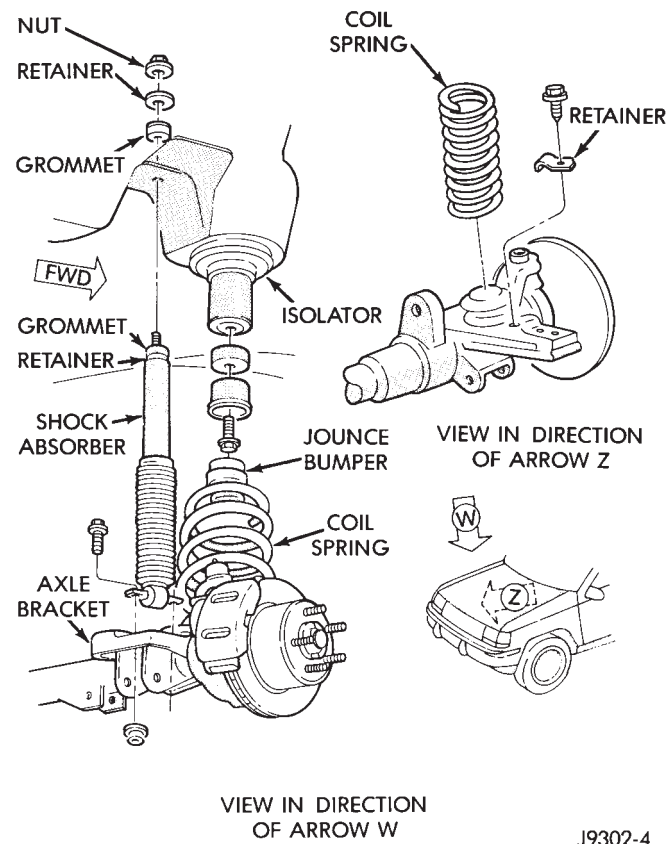


Fig. 2 Coil Spring & Shock Absorber

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

INSTALLATION

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

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

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

COIL SPRING

REMOVAL

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

(2) Remove rear lower suspension arm bolts.

(3) Remove caliper flex hose brackets from the frame rails.

(4) Remove ABS sensor wires from brackets.

(5) Disconnect the stabilizer bar link and shock absorber from the axle.

(6) Disconnect the track bar from the frame rail bracket.

(7) Disconnect the drag link from the pitman arm.

(8) Lower the axle until the spring is free from the upper mount. Remove the coil spring retainer bolt (Fig. 2) and remove the spring.

(9) Remove the jounce bumper if necessary from the upper spring mount (Fig. 2).

INSTALLATION

(1) Install the jounce bumper on the upper spring mount.

(2) Position the coil spring on the axle pad. Install the spring retainer and bolt. Tighten bolt to 22 N·m (16 ft lb).

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

(4) Install lower suspension arms and rear bolts.

(5) Install caliper flex hose brackets to the frame rails.

(6) Install ABS sensor wires into brackets.

(7) Connect the stabilizer bar links and shock absorbers to the axle bracket. Connect the track bar to the frame rail bracket.

(8) Install drag link to pitman arm.

(9) Remove the supports and lower the vehicle.

(10) Tighten all suspension components to proper torque.

STEERING KNUCKLE

For service procedures on the steering knuckle and ball joints refer to Group 3 Differentials And Driveline.

LOWER SUSPENSION ARM

REMOVAL

(1) Raise and support the vehicle.

(2) Paint or scribe alignment marks on the cam adjusters and suspension arm for installation reference (Fig. 3).

(3) Remove the lower suspension arm nut, cam and cam bolt from the axle (Fig. 4).

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

REMOVAL AND INSTALLATION (Continued)

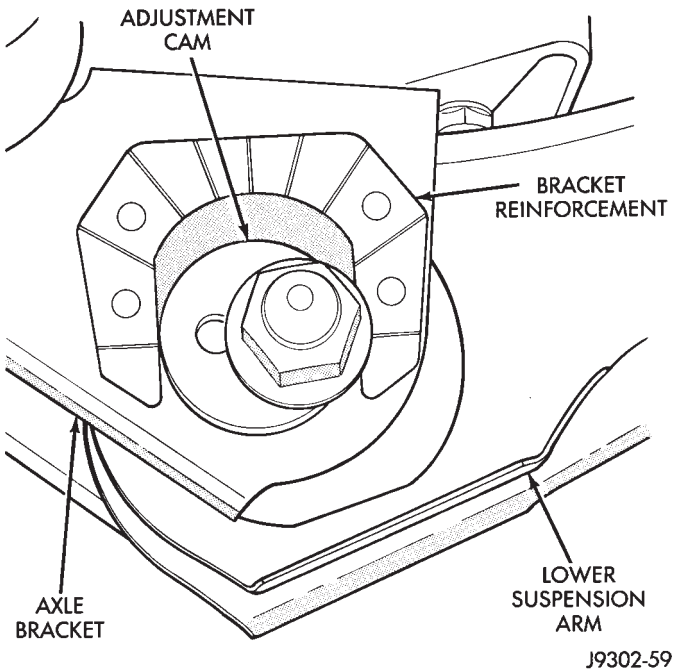


Fig. 3 Cam Adjuster

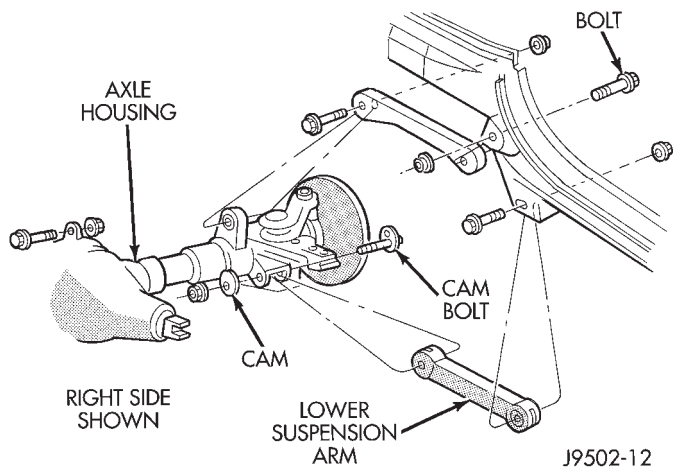


Fig. 4 Upper & Lower Suspension Arms

INSTALLATION

- (1) Position the lower suspension arm at the axle bracket and frame rail bracket.
- (2) Install the rear bolts and finger tighten the new nuts.
- (3) Install a new cam bolt, cam and new nut in the axle. Re-align the reference marks.
- (4) Install the bolts and finger tighten the new nuts.
- (5) Lower the vehicle.
- (6) Tighten the axle bracket nut to 115 N·m (85 ft. lbs.).
- (7) Tighten the frame bracket nut to 176 N·m (130 ft. lbs.).
- (8) Check the alignment if new parts were installed.

UPPER SUSPENSION ARM

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the upper suspension arm nut and bolt at the axle bracket (Fig. 4).
- (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 bracket to 75 N·m (55 ft. lbs.).

AXLE BUSHING

REMOVAL

- (1) Remove the upper suspension arm from axle.
- (2) Position spacer 7932-1 (J-35581-1) over the bushing in the axle for two-wheel drive axles and right side on Model 30 axle.
- (3) Install Bushing Removal/Installer (Fig. 5).
- (4) Remove the bushing by tightening the Long Nut.

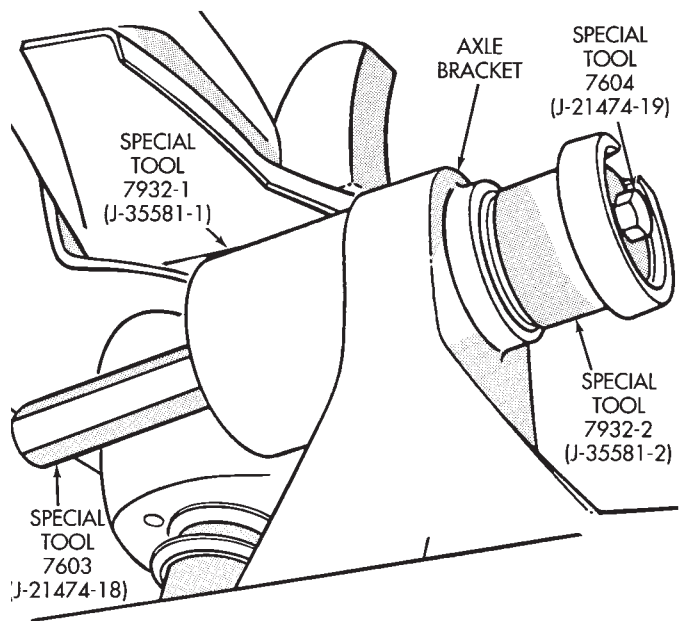


Fig. 5 Bushing Removal

NOTE: For two-wheel drive axles and right side on Model 30 axle, do not remove spacer 7932-1 (J-35581-1). This spacer is need for installation.

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

(1) Position new bushing, Receiver and Installer on axle (Fig. 6).

(2) Install the bushing by tightening the Long Nut.

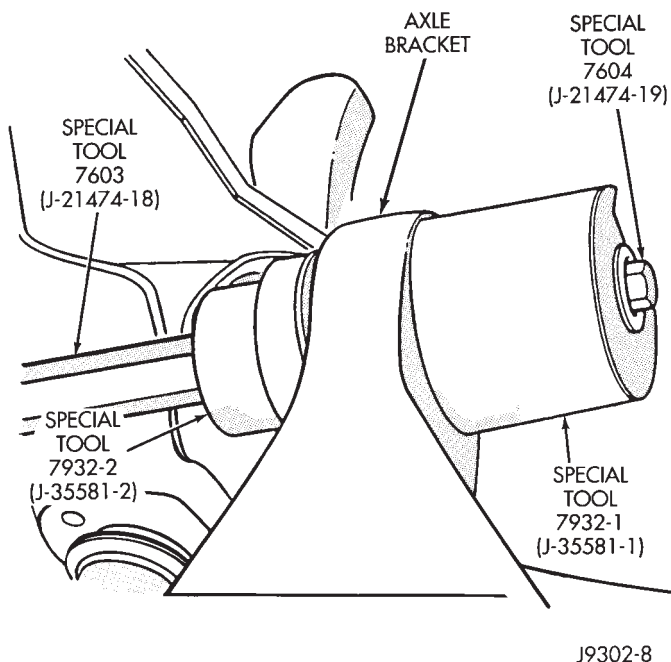


Fig. 6 Bushing Installation

(3) Remove tools and install the upper suspension arm.

STABILIZER BAR

REMOVAL

(1) Raise and support the vehicle.

(2) Remove upper link bolts (Fig. 7) and separate links from the stabilizer bar with Remover MB-990635.

(3) Remove the stabilizer bar clamps bolts from the frame rails and remove the stabilizer bar.

(4) Remove the stabilizer bar link nuts from the axle brackets (Fig. 7).

INSTALLATION

(1) Position the stabilizer bar on the frame rail and install the clamps 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 into the stabilizer bar and axle brackets.

(3) Tighten the nuts at the axle bracket end to 95 N·m (70 ft. lbs.).

(4) Tighten the stabilizer bar to link nuts to 61 N·m (45 ft. lbs.).

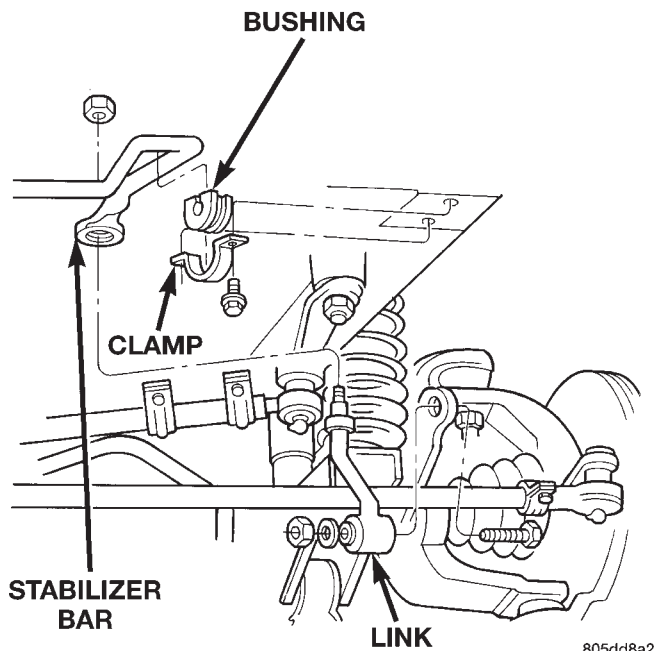


Fig. 7 Stabilizer Bar

(5) Remove the supports and lower the vehicle.

(6) Tighten the nuts at the axle bracket end to 95 N·m (70 ft. lbs.).

TRACK BAR

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. 8).

NOTE: Use a universal puller to separate the ball stud from the frame rail bracket.

(3) Remove the bolt and flag nut from the axle shaft tube bracket (Fig. 8). 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.

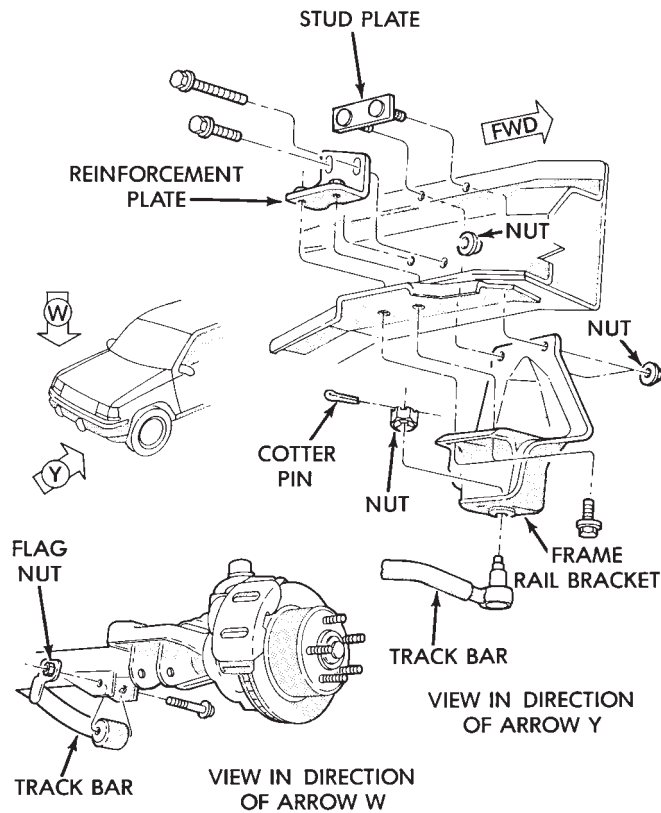
(3) Tighten the ball stud nut to 81 N·m (60 ft. lbs.). Install a new cotter pin.

(4) Remove the supports and lower the vehicle.

(5) Tighten the bolt at the axle shaft tube bracket to 75 N·m (55 ft. lbs.).

(6) Check alignment if a new track bar was installed.

REMOVAL AND INSTALLATION (Continued)



J9302-1

Fig. 8 Track Bar

HUB BEARING

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 Group 5 Brakes.
- (4) Remove the cotter pin, nut retainer and axle hub nut (Fig. 9).
- (5) Remove the hub mounting bolts and remove hub bearing from the steering knuckle and axle shaft.

INSTALLATION

- (1) Install the hub bearing and brake dust shield to the knuckle.
- (2) Install the hub 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 Group 5 Brakes.
- (5) Install the wheel and tire assembly.
- (6) Remove support and lower the vehicle.

WHEEL MOUNTING 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.

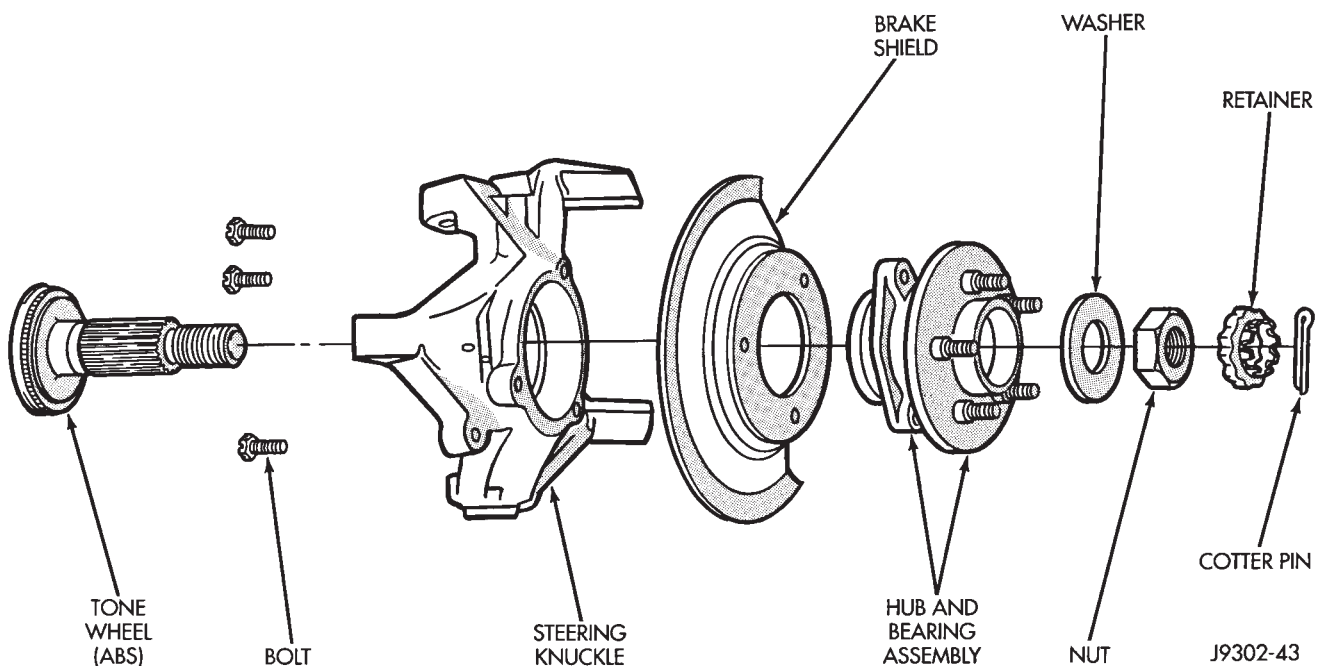


Fig. 9 Hub Bearing & Knuckle

REMOVAL AND INSTALLATION (Continued)

(4) Remove stud from hub with Remover C-4150A (Fig. 10).

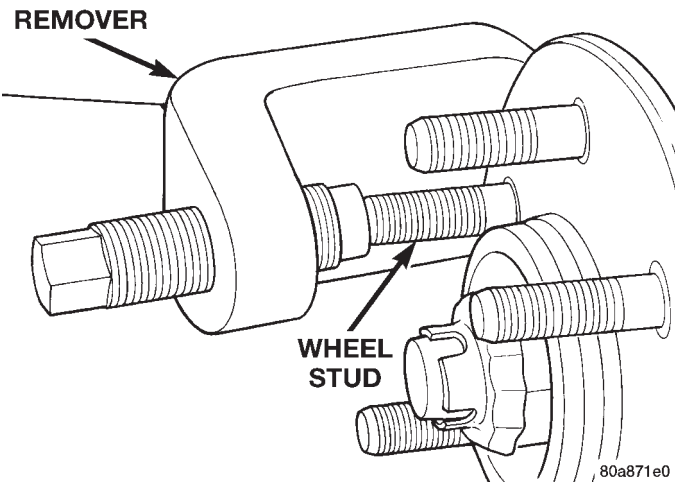


Fig. 10 Wheel Stud Removal

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.
- (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.

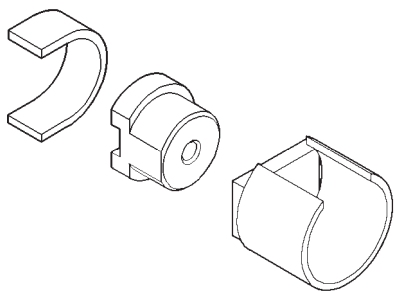
SPECIFICATIONS

TORQUE CHART

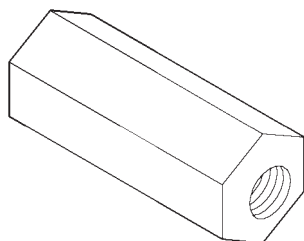
DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	23 N·m (17 ft. lbs.)
Lower Nut	28 N·m (21 ft. lbs.)
Suspension Arm Upper	
Nuts	75 N·m (55 ft. lbs.)
Suspension Arm Lower	
Axle Bracket Nut	115 N·m (85 ft. lbs.)
Frame Bracket Nut	176 N·m (130 ft. lbs.)
Stabilizer Bar	
Clamp Bolt	54 N·m (40 ft. lbs.)
Link Upper Nut	61 N·m (45 ft. lbs.)
Link Lower Bolt	95 N·m (70 ft. lbs.)
Track Bar	
Ball Stud Nut	81 N·m (60 ft. lbs.)
Axle Bracket Bolt	75 N·m (55 ft. lbs.)
Track Bar Bracket	
Bolts	121 N·m (90 ft. lbs.)
Nut	121 N·m (90 ft. lbs.)
Support Bolts	95 N·m (70 ft. lbs.)
Hub Bearing	
Bolts	102 N·m (75 ft. lbs.)

SPECIAL TOOLS

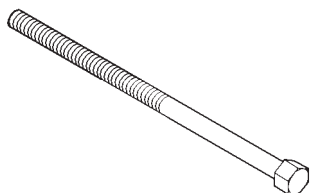
FRONT SUSPENSION



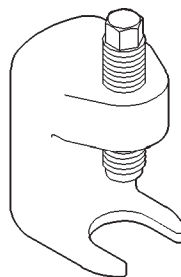
**Remover/Installer Suspension Bushing 7932
(J-35581)**



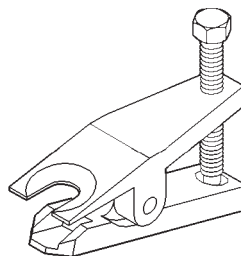
Nut, Long 7603 (J-21474-18)



Bolt, Special 7604 (J-21474-19)



Remover C-4150A



Remover Tie Rod End MB-990635

REAR SUSPENSION

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DESCRIPTION AND OPERATION

REAR SUSPENSION

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

- Drive axle
- Dual-action shock absorbers
- Coil springs
- Upper and lower suspension arms
- Track bar
- Stabilizer bar

Upper And Lower Suspension: The suspension arms use bushings to isolate road noise. The suspension arms are bolted to the body and axle through the rubber bushings. The lower suspension arm has provision for the use of cam bolts at the axle to allow for pinion angle or thrust angle adjustment. The cams are available as a service kit and are not installed at the factory. The suspension arm travel is limited through the use of jounce bumpers in compression and shock absorbers in rebound.

Shock Absorbers: The shock absorbers dampen jounce and rebound of the vehicle over various road conditions. The top of the shock absorbers are bolted to the body. The bottom of the shocks are bolted to the axle shock absorber bracket.

Coil Springs: The coil springs mount up in the fender shield that is part of the unitized body bracket. There is a rubber isolator between the top of the spring and bracket to isolate road noise. The bottom of the spring seats on the axle pad and is retained with a clip.

Stabilizer Bar: The stabilizer bar is used to control vehicle body roll during turns. The spring steel bar helps to equalize the vehicle body in relationship to the suspension. The bar extends across the underside of the chassis and connects to the frame rails. Links are connected from the bar to the axle brackets. Stabilizer bar are isolated by rubber bushings.

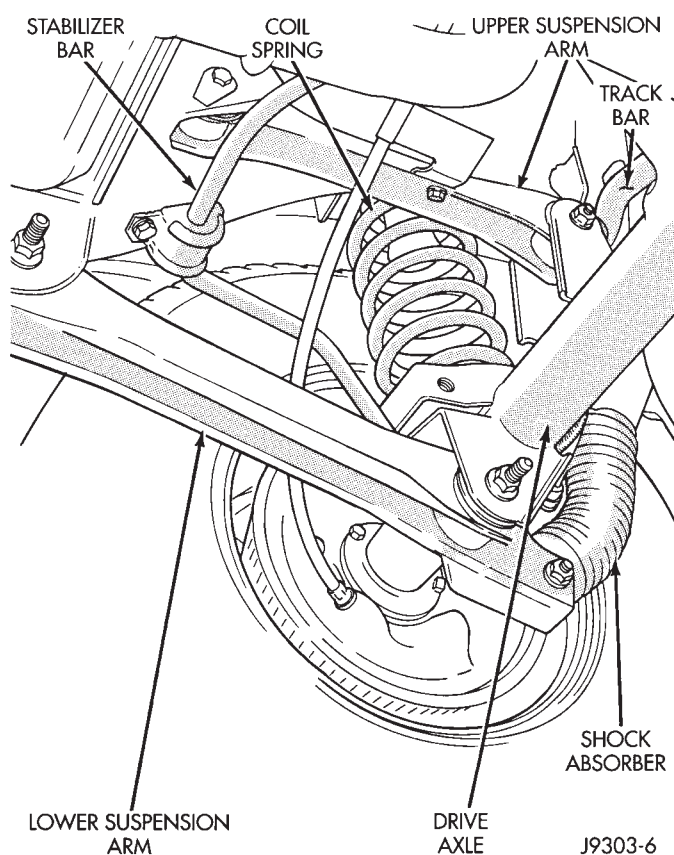


Fig. 1 Rear Suspension

Track Bar: The track bar is used to control rear axle lateral movement. The track bar is attached to a frame rail bracket and an axle bracket. It is isolated with bushings at both ends.

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.

DIAGNOSIS AND TESTING

SHOCK DIAGNOSIS

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 AND INSTALLATION

SHOCK ABSORBER

REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support it.
- (2) Remove the upper nut and retainer from the frame rail stud (Fig. 2).
- (3) Remove the lower nut and bolt from the axle bracket. Remove the shock absorber.

INSTALLATION

- (1) Install the shock absorber on the upper frame rail stud. Install the shock absorber on the axle bracket.
- (2) Install the retainer and nut on the stud. Tighten the upper nut to 70 N·m (52 ft. lbs.).
- (3) Install lower bolt and nut finger tight.
- (4) Remove the supports and lower the vehicle.
- (5) Tighten the lower nut to 92 N·m (68 ft. lbs.).

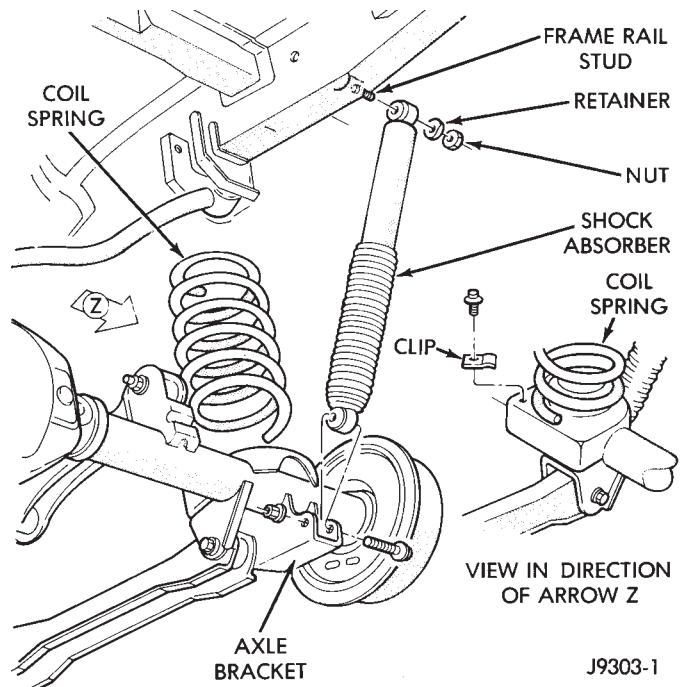


Fig. 2 Rear Coil Spring & Shock Absorber
COIL SPRING

REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support it.
- (2) Disconnect the stabilizer bar link and shock absorber from the axle bracket.
- (3) Disconnect the track bar from the frame rail bracket.
- (4) Lower the axle until the spring is free from the upper mount seat. Remove the coil spring retainer bolt (Fig. 2) and remove the spring.

INSTALLATION

Inspect isolator for damage or wear. Replace the isolator if necessary before installing spring.

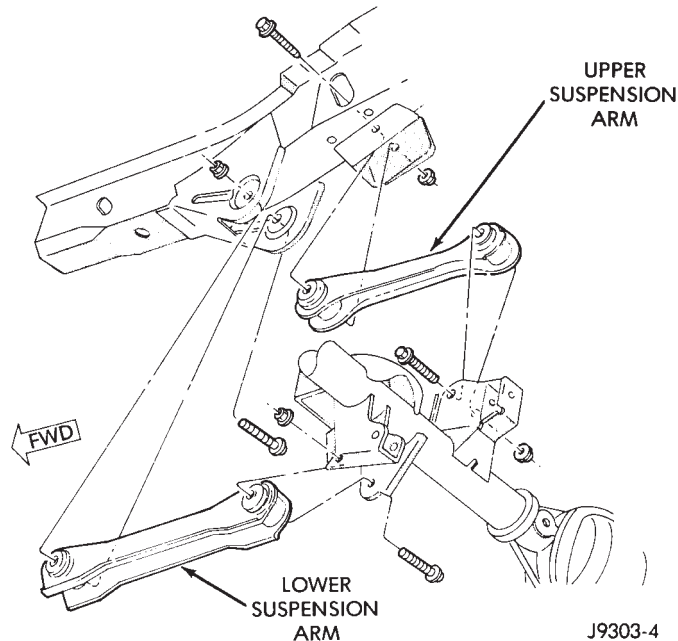
- (1) Position the coil spring on the axle pad. Install the spring retainer and bolt. Tighten the bolt to 22 N·m (16 ft. lbs.).
- (2) Raise the axle into position until the spring seats in the upper mount.
- (3) Connect the stabilizer bar links and shock absorbers to the axle bracket. Connect the track bar to the frame rail bracket.
- (4) Remove the supports and lower the vehicle.
- (5) Tighten the track bar and shock absorber to specified torque.

REMOVAL AND INSTALLATION (Continued)

LOWER SUSPENSION ARM

REMOVAL

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

**Fig. 3 Upper & Lower Suspension Arms**

INSTALLATION

- (1) Position the lower suspension arm at the axle bracket and frame rail bracket.
- (2) Install the 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.).

UPPER SUSPENSION ARM

REMOVAL

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

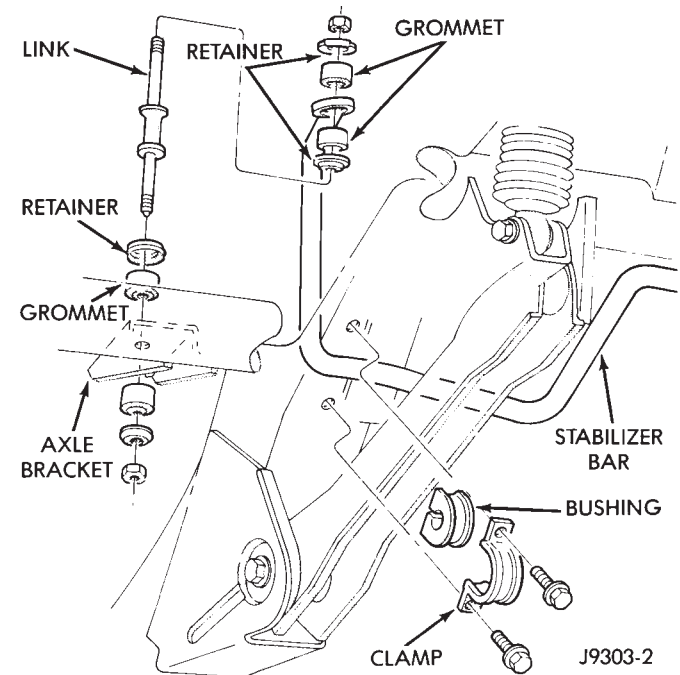
INSTALLATION

- (1) Position the upper suspension arm at the axle and frame rail.
- (2) Install the bolts and finger tighten the nuts. Install the ABS wire bracket onto the arm.
- (3) Remove the supports and lower the vehicle.
- (4) Tighten the upper suspension arm nuts to 75 N·m (55 ft. lbs.).

STABILIZER BAR

REMOVAL

- (1) Raise and support the vehicle. Remove one wheel and tire.
- (2) Disconnect the stabilizer bar links from the axle brackets (Fig. 4).
- (3) Lower the exhaust by disconnecting the muffler and tail pipe hangers.
- (4) Disconnect the stabilizer bar from the links.
- (5) Disconnect the stabilizer bar clamps from the frame rails. Remove the stabilizer bar.

**Fig. 4 Rear Stabilizer Bar**

INSTALLATION

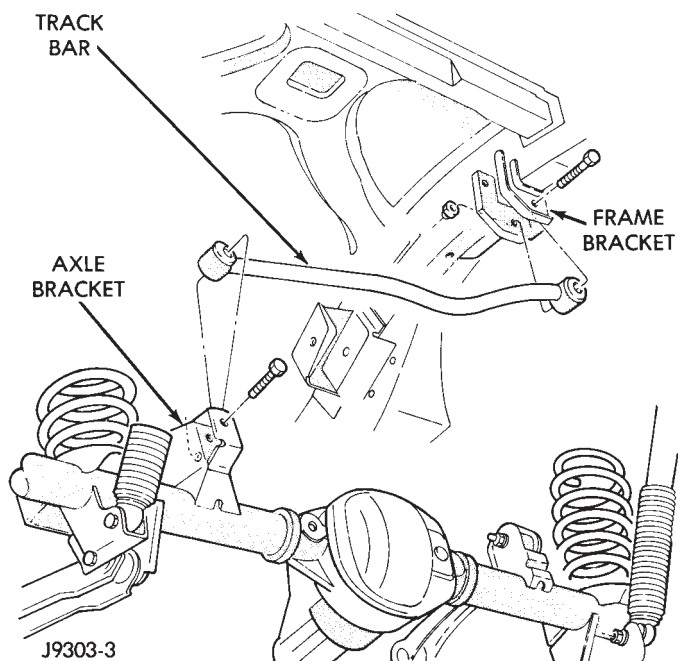
- (1) Position the stabilizer bar on the frame rail and install the clamps and bolts. Ensure the bar is centered with equal spacing on both sides. Tighten the bolts to 54 N·m (40 ft. lbs.).
- (2) Install the links and grommets onto the stabilizer bar and axle brackets. Install the nuts and tighten to 36 N·m (27 ft. lbs.).
- (3) Connect the muffler and tail pipe to their hangers.
- (4) Install the wheel and tire assembly.

TRACK BAR

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the bolt and nut from the frame rail bracket (Fig. 5).
- (3) Remove the bolt from the axle tube bracket (Fig. 5). Remove the track bar.

REMOVAL AND INSTALLATION (Continued)

**Fig. 5 Rear Track Bar****INSTALLATION**

(1) Install the track bar to the axle bracket and install a new bolt.

(2) It may be necessary to pry the axle assembly over to install the track bar. Install the track bar to

the frame rail bracket. Loosely install the bolt and flag nut.

(3) Remove the supports and lower the vehicle.

(4) Tighten the track bar bolts 100 N·m (74 ft. lbs.).

SPECIFICATIONS**TORQUE CHART**

DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	70 N·m (52 ft. lbs.)
Lower Nut	92 N·m (68 ft. lbs.)
Suspension Arm Upper	
Nuts	75 N·m (55 ft. lbs.)
Suspension Arm Lower	
Nuts	177 N·m (130 ft. lbs.)
Stabilizer Bar	
Clamp Bolt	54 N·m (40 ft. lbs.)
Link Nut	36 N·m (27 ft. lbs.)
Track Bar	
Frame Bracket Nut	100 N·m (74 ft. lbs.)
Axle Bracket Bolt	100 N·m (74 ft. lbs.)

