

SUSPENSION

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WHEEL ALIGNMENT

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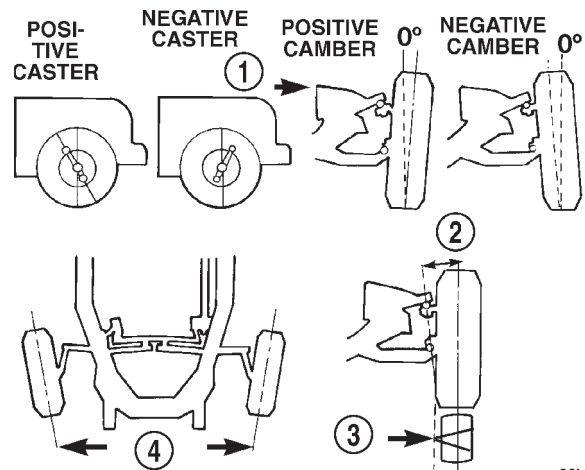
WHEEL ALIGNMENT

DESCRIPTION

Wheel alignment is the positioning of the wheels in relation to the vehicle. This is accomplished through suspension and steering linkage adjustments. An alignment is 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) and (Fig. 2).

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

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.

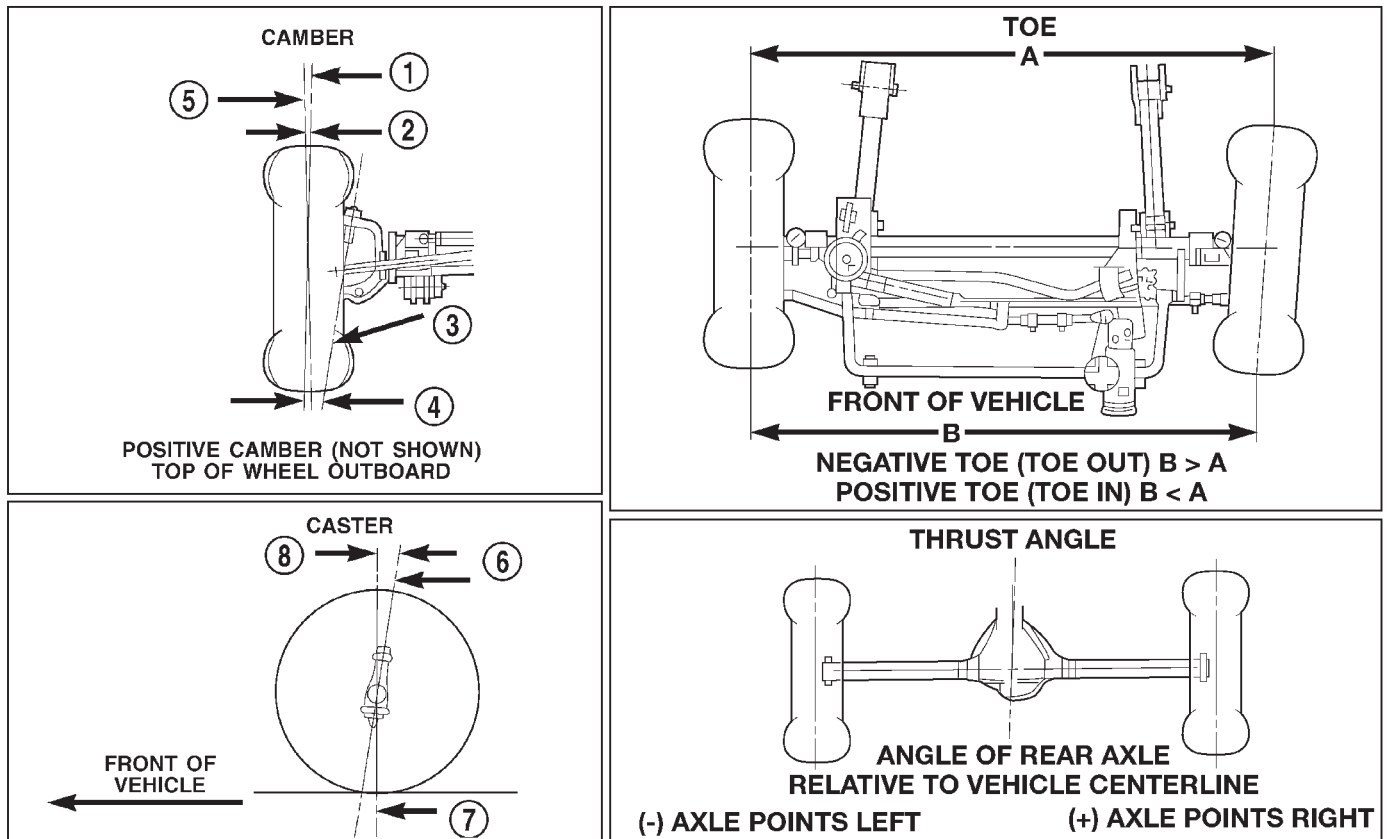


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Fig. 1 Alignment Angles - Independent Front Suspension

- 1 - FRONT OF VEHICLE
- 2 - STEERING AXIS INCLINATION
- 3 - PIVOT POINT
- 4 - TOE-IN

WHEEL ALIGNMENT (Continued)



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Fig. 2 Alignment Angles - Link/Coil

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

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

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 which 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.

• **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.

DIAGNOSIS AND TESTING - PRE-ALIGNMENT

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

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

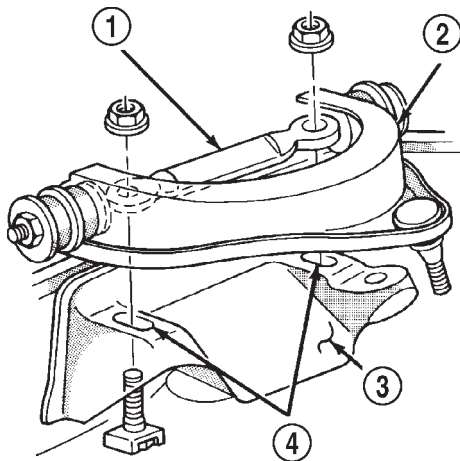
WHEEL ALIGNMENT (Continued)

STANDARD PROCEDURE

STANDARD PROCEDURES - ALIGNMENT I.F.S.

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 several times. Always release the bumper in the down position. **Set the front end alignment to specifications while the vehicle is in its NORMALLY LOADED CONDITION.**

Camber and caster angle adjustments involve changing the position of the upper suspension arm pivot bar (Fig. 3). Refer to the Alignment Specification Chart for the correct setting.



J9402-55

Fig. 3 Caster Camber Adjustment Location

- 1 - PIVOT BAR
- 2 - UPPER SUSPENSION ARM
- 3 - SUSPENSION ARM FRAME MOUNT
- 4 - ADJUSTMENT SLOTS

CASTER: Move the rear position of the pivot bar in or out. This will change the caster angle significantly and camber angle only slightly. To retain camber move the forward pivot very slightly in the opposite direction.

NOTE: For example, to increase a positive caster angle, move the rear position of the pivot bar

inward (toward the engine). Move the front of pivot bar outward (away from the engine) slightly until the original camber angle is obtained.

CAMBER: Move the forward position of the pivot bar in or out. This will change the camber angle significantly and caster angle only slightly. The camber angle should be adjusted as close as possible to the **preferred service specification**. After adjustment is made tighten pivot bar nuts to specifications.

TOE POSITION: The wheel toe position adjustment should be the final adjustment.

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

(2) Loosen the tie rod adjustment sleeve clamp bolts/nuts.

NOTE: Each front wheel should be adjusted for one-half of the total toe position specification. This will ensure the steering wheel will be centered when the wheels are positioned straight-ahead.

(3) Adjust the wheel toe position by turning the tie rod adjustment sleeves as necessary.

STANDARD PROCEDURE - CASTER CORRECTION MEASUREMENT

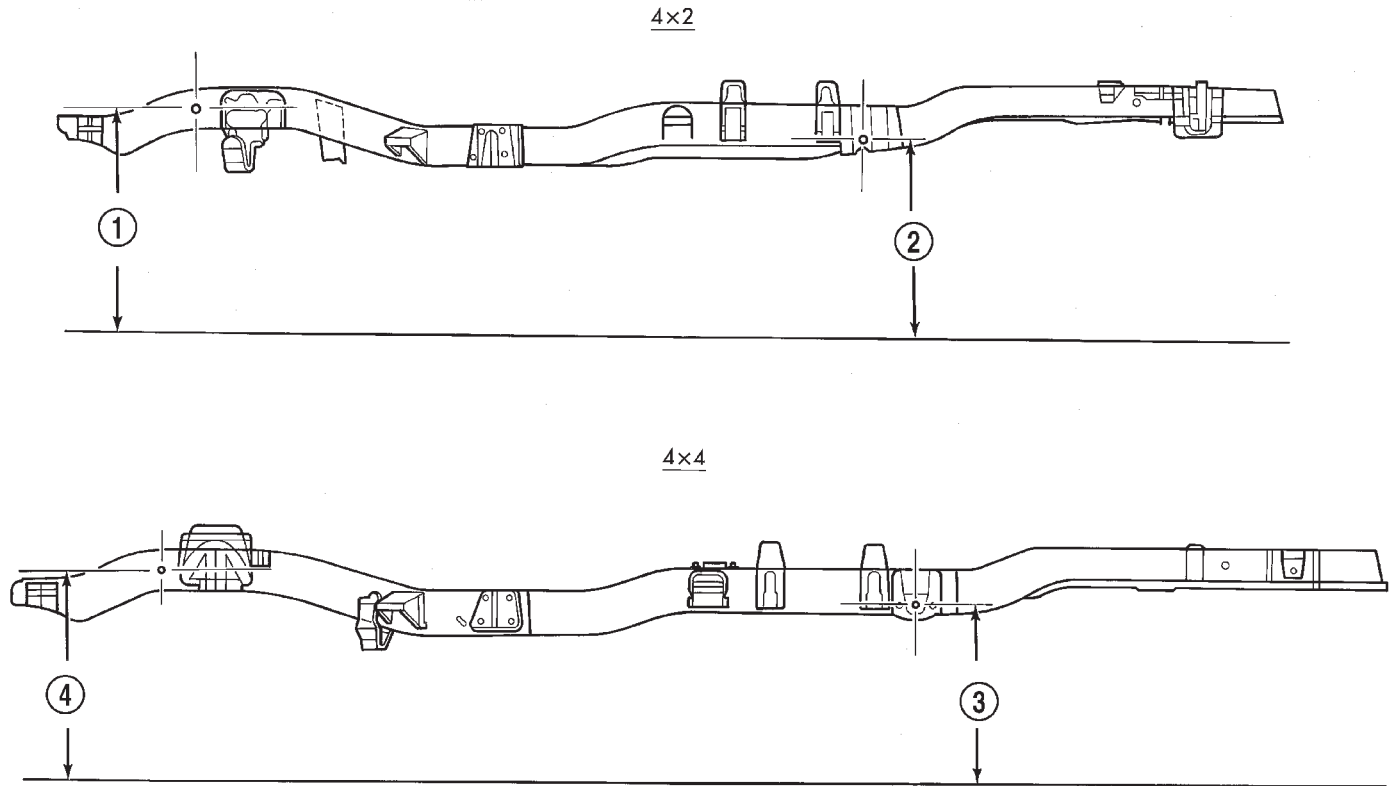
NOTE: To determine the correct caster alignment angle for Cab-Chassis vehicles the following procedure must be performed.

NOTE: 4x2 11000 GVW has a solid front axle and uses a 4x4 frame.

(1) Take a height measurement to the center of the front gauge hole in the frame. Take another measurement to the center of the rear spring hanger bolt (Fig. 4). Take these measurements on both sides of the vehicle.

(2) Subtract the front measurement from the rear measurement and use the average between the right and left side. Use this number (caster correlation value) with the Corrected Caster Chart to obtain the preferred caster angle.

WHEEL ALIGNMENT (Continued)



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Fig. 4 Chassis Measurement

1 - GAUGE HOLE
2 - HANGER BOLT

3 - HANGER BOLT
4 - GAUGE HOLE

WHEEL ALIGNMENT (Continued)

CORRECTED CASTER CHART-CAB CHASSIS

Caster Correlation Value (inches)	4x2 8800 lb. GVW 134.7 in. wheel base	4x4 8800 lb. GVW 4x2 & 4x4 11000 lb. GVW 134.7 & 138.7 in. wheel base	4x2 & 4x4 11000 lb. GVW 162.7 in. wheel base
	Caster $\pm$ 1 deg.	Caster $\pm$ 1 deg.	Caster $\pm$ 1 deg.
-5.00	4.27°	3.77°	3.81°
-4.75	4.39°	3.89°	3.91°
-4.50	4.51°	4.01°	4.01°
-4.25	4.64°	4.14°	4.11°
-4.00	4.76°	4.26°	4.21°
-3.75	4.88°	4.38°	4.31°
-3.50	5.00°	4.50°	4.41°
-3.25	5.12°	4.62°	4.51°
-3.00	5.25°	4.75°	4.61°
-2.75	5.37°	4.87°	4.71°
-2.50	5.49°	4.99°	4.81°
-2.25	5.61°	5.11°	4.91°
-2.00	5.74°	5.24°	5.01°
-1.75	5.86°	5.36°	5.11°
-1.50	5.98°	5.48°	5.21°
-1.25	6.10°	5.60°	5.31°
-1.00	6.23°	5.73°	5.41°
-0.75	6.33°	5.83°	5.51°
-0.50	6.47°	5.97°	5.61°
-0.25	6.59°	6.09°	5.71°
0.00	6.71°	6.21°	5.81°

STANDARD PROCEDURE - ALIGNMENT LINK/COIL SUSPENSION

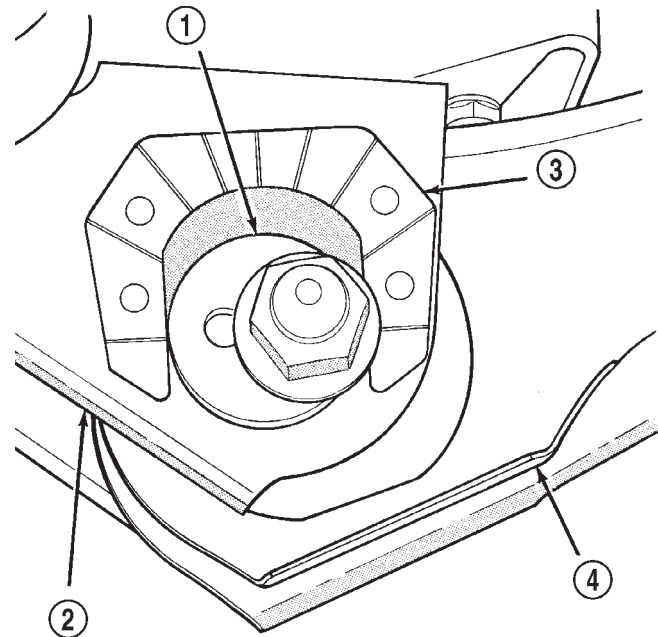
Before each alignment reading the vehicle should be jounced (rear first, then front). Grasp each bumper at the center and jounce the vehicle up and down several times. Always release the bumper in the down position. **Set the front end alignment to specifications while the vehicle is in its NORMALLY LOADED CONDITION.**

CAMBER: The wheel camber angle is preset and is not adjustable.

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 make left and right turn. Observe the steering wheel return-to-center position. Low caster will cause poor steering wheel returnability.

Caster can be adjusted by rotating the cams on the lower suspension arm (Fig. 5). (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).



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Fig. 5 Adjustment Cam

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

TOE POSITION: The wheel toe position adjustment should be the final adjustment.

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

(2) Loosen the adjustment sleeve clamp bolts.

(3) Adjust the right wheel toe position with the drag link. Turn the sleeve until the right wheel is at the correct TOE-IN position. Position clamp bolts to their original position and tighten to specifications. **Make sure the toe setting does not change during clamp tightening.**

(4) Adjust left wheel toe position with tie rod at left knuckle. Turn the sleeve until the left wheel is at the correct TOE-IN position. Position clamp bolts to their original position and tighten to specifications. **Make sure the toe setting does not change during clamp tightening.**

(5) Verify the right toe setting.

2 - 6 WHEEL ALIGNMENT

BR/BE

WHEEL ALIGNMENT (Continued)

SPECIFICATIONS

ALIGNMENT

NOTE: *4 x 2 11,000 GVW has a solid front axle with link/coil suspension system.

DESCRIPTION			SPECIFICATION	
4 x 2 & 4 x 4	GROSS VEHICLE WEIGHT lbs.	WHEEL BASE inches	PREFERRED CASTER ± 1.00°	PREFERRED CAMBER ± 0.50°
4 x 2	6,400	118.7	3.66°	0.50°
4 x 2	6,400	134.7	3.89°	0.50°
4 x 2	6,400	138.7	3.99°	0.50°
4 x 2	6,400	154.7	4.17°	0.50°
4 x 2	8,800	134.7	3.53°	0.50°
4 x 2	8,800	138.7	3.59°	0.50°
4 x 2	8,800	154.7	3.78°	0.50°
4 x 2	10,500	134.7	3.33°	0.50°
4 x 2	10,500	154.7	3.58°	0.50°
4 x 4	6,400	118.7	2.86°	0.50° Non Adjustable
4 x 4	6,400	134.7	3.04°	0.50° Non Adjustable
4 x 4	6,600	138.7	3.19°	0.50° Non Adjustable
4 x 4	6,600	154.7	3.37°	0.50° Non Adjustable
4 x 4	8,800	134.7	2.68°	0.50° Non Adjustable
4 x 4	8,800	138.7	2.74°	0.50° Non Adjustable
4 x 4	8,800	154.7	2.88°	0.50° Non Adjustable
4 x 4	10,500	134.7	2.48°	0.50° Non Adjustable
4 x 4	10,500	154.7	2.63°	0.50° Non Adjustable
CAB-CHASSIS VEHICLES				
4 x 2 / 4 x 4	8,800	134.7	Caster Correction Measurement	0.50° Non Adjustable
*4 x 2 / 4 x 4	11,000	138.7		0.50° Non Adjustable
*4 x 2 / 4 x 4	11,000	162.7		0.50° Non Adjustable
Preferred Total Toe-In 0.10° (± 0.10°) Preferred Cross Caster 0° (± 0.5°) Preferred Cross Camber 0° (± 0.5°) Thrust Angle 0° (± 0.4°)				

FRONT - 2WD

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FRONT - 2WD

DESCRIPTION

DESCRIPTION

The independent front suspension (IFS) is comprised of (Fig. 1) and (Fig. 2):

- Shock absorbers
- Coil springs
- Upper and lower suspension arms
- Stabilizer bar
- Steering Knuckles
- Jounce Bumpers

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.

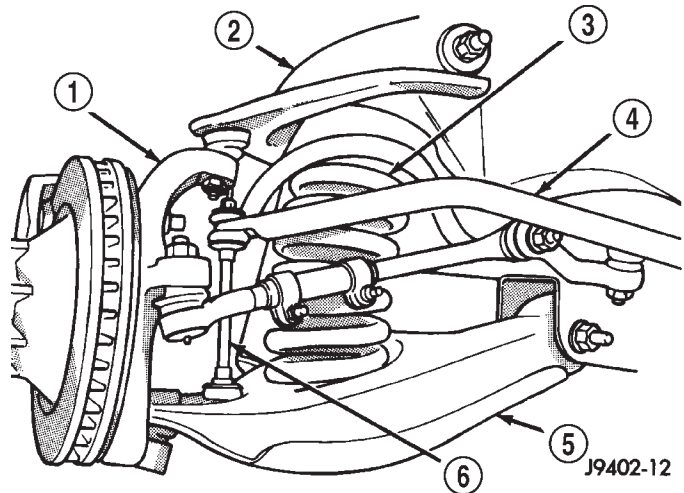
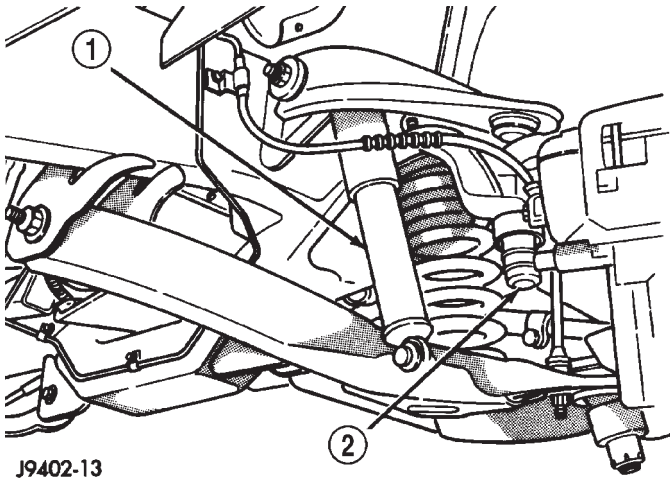


Fig. 1 Independent Front Suspension

- 1 - KNUCKLE
- 2 - SUSPENSION ARM
- 3 - COIL SPRING
- 4 - STABILIZER BAR
- 5 - SUSPENSION ARM
- 6 - LINK

FRONT - 2WD (Continued)



J9402-13

Fig. 2 Independent Front Suspension

1 - SHOCK

2 - JOUNCE BUMPER

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.

DESCRIPTION

The upper suspension arm bolts on frame brackets through the arm pivot shaft. The frame brackets have slotted holes which allow the arms to be adjusted for caster and camber. Pivot shaft bushings are not replaceable.

The lower suspension arms bolt to the lower frame brackets and pivot through bushings, these bushings are not replaceable.

The suspension arms have lube for life riveted ball studs.

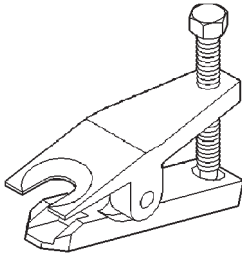
SPECIFICATIONS**TORQUE CHART****TORQUE SPECIFICATIONS**

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Shock Absorber Upper Nut	54	40	—
Shock Absorber Lower Bolt	142	105	—
Lower Suspension Arm Frame Nuts	169	125	—
Lower Suspension Arm Ball Joint Nut	149	110	—
Upper Suspension Arm Pivot Bar Nuts	169	125	—
Upper Suspension Arm Ball Joint Nut	81	60	—
Stabilizer Bar Clamp Bolt	54	40	—
Stabilizer Bar Link Nuts	37	27	—
Hub Bearing 2500/3500 Nut	380	280	—

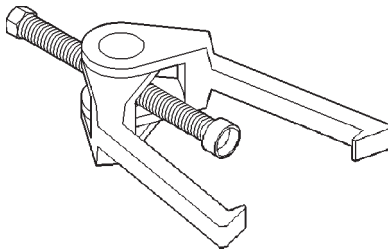
FRONT - 2WD (Continued)

SPECIAL TOOLS

INDEPENDENT FRONT SUSPENSION



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Remover, Tie Rod End MB-990635**Puller Tie Rod C-3894-A**

HUB / BEARING

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assembly.
- (3) Remove the caliper adapter bolts from the steering knuckle and remove caliper adapter assembly (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPERS - REMOVAL).

NOTE: Do not allow brake hose to support caliper adapter assembly.

- (4) Remove the rotor from the hub/bearing wheel studs.

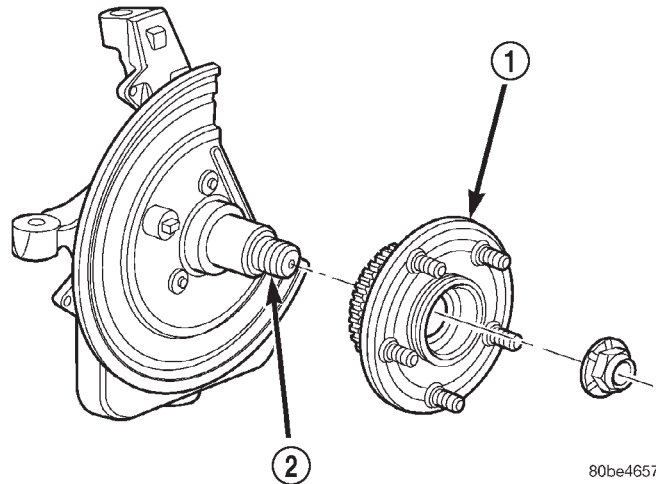
- (5) Remove the hub/bearing nut (Fig. 3) and slide the hub/bearing off the spindle. On 3500 HD models the hub spindle shaft must be removed (Fig. 4).

CAUTION: The hub/bearing nut can not be re-used.

INSTALLATION

- (1) On models with all-wheel antilock system (ABS), check condition of tone wheel on hub/bearing. If teeth on wheel are damaged, hub/bearing assembly will have to be replaced (tone wheel is not serviced separately).

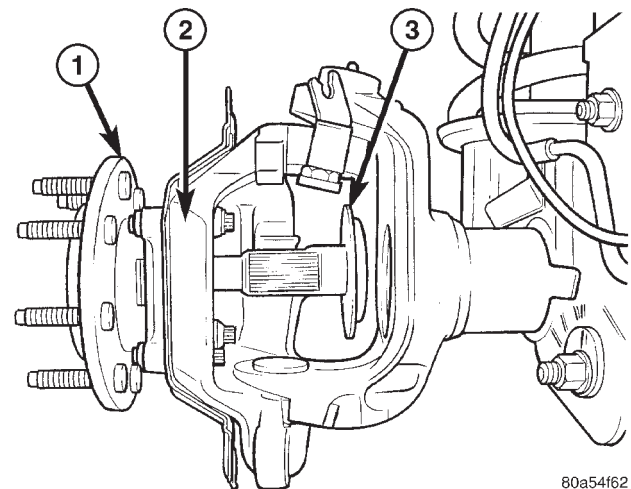
- (2) Slide the hub/bearing onto the spindle. On 3500 HD slide the spindle stub shaft into the hub/bearing and tighten.



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Fig. 3 Caliper Adapter Assembly

- 1 - HUB/BEARING
- 2 - SPINDLE



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Fig. 4 SPINDLE STUB SHAFT

- 1 - Hub/Bearing
- 2 - Knuckle
- 3 - Spindle Stub Shaft

- (3) Install the **new** hub/bearing nut and tighten to:

- 2500/3500: 380 N·m (280 ft lbs.)

- (4) Install the rotor onto hub/bearing wheel studs.

- (5) Install the caliper adapter assembly (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPERS - INSTALLATION), and tighten adapter bolts to:

- 2500/3500: 285 N·m (210 ft lbs.)

- (6) Install the wheel and tire assembly and lower the vehicle, (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

- (7) Apply brakes several times to seat brake shoes. Be sure to obtain firm pedal before moving vehicle.

KNUCKLE

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assembly.
- (3) Remove the brake caliper and rotor, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPERS - REMOVAL).
- (4) Remove the cotter pin and nut from the tie-rod end. Remove the tie rod end from the knuckle with Puller C-3894-A.
- (5) Remove the cotter pins and nuts from the upper and lower ball joints. Separate upper ball joint from knuckle with remover MD-990635. Separate lower ball joint with remover C-4150A and remove knuckle.

INSTALLATION

- (1) Position the knuckle on the ball joints and install the ball joint nuts.
- (2) Tighten the upper ball joint nut to 81 N·m (60 ft. lbs.) and install cotter pin.
- (3) Tighten the lower ball joint nut to:
 - 149 N·m (110 ft. lbs.) Install the cotter pin.
- (4) Install the tie rod end on the steering knuckle and tighten the nut to 108 N·m (80 ft. lbs.). Install cotter pin.
- (5) Install the brake rotor and caliper, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPERS - INSTALLATION).
- (6) Install wheel and tire assembly (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).
- (7) Remove support and lower vehicle.

LOWER BALL JOINT

DIAGNOSIS AND TESTING - LOWER BALL JOINT

- (1) Raise the front of the vehicle. Place safety floor stands under both lower suspension arms as far outboard as possible. Lower the vehicle to allow the stands to support some or all of the vehicle weight.

NOTE: The upper suspension arms must not be in maximum rebound position.

- (2) Remove the tire and wheel assembly.
- (3) Mount a dial indicator solidly under the lower suspension arm.
- (4) Position indicator plunger against the bottom of the steering knuckle lower ball joint boss.

NOTE: The dial Indicator plunger must be perpendicular to the machined surface of the steering knuckle lower ball joint boss.

- (5) Position a pry bar over the top of the upper suspension arm and under the pivot bar of the upper suspension arm. Pry down on the upper suspension arm and then zero the dial indicator.

- (6) Reposition the pry bar under the upper suspension arm and on top of the frame rail. Pry up on the upper suspension arm and record the dial indicator reading.

- (7) If the travel exceeds 0.8 mm (0.030 in.) replace the suspension arm.

LOWER CONTROL ARM

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the tire and wheel assembly.
- (3) Remove the brake caliper assembly and rotor, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - REMOVAL).
- (4) Remove the cotter pin and nut from the tie rod. Remove the tie rod end from the steering knuckle with Puller C-3894-A.
- (5) Remove the stabilizer bar link from lower suspension arm.
- (6) Support the lower suspension arm outboard end with jack. Place a jack under the arm in the front of the shock mount.
- (7) Remove the cotter pin and nut from the lower ball joint. Separate the ball joint with Remover C-4150A.
- (8) Remove the lower shock bolt from the suspension arm.
- (9) Lower the jack and suspension arm until spring tension is relieved. Remove spring and rubber isolator (Fig. 6).
- (10) Remove bolts mounting suspension arm to crossmember and remove arm.

INSTALLATION

- (1) Position the suspension arm on the crossmember and install the bolts and nuts snug.
- (2) Install the rubber isolator on top of the spring. Position the spring into upper spring seat.
- (3) Raise the lower suspension arm with a jack and position the spring into the lower suspension arm mount.
- (4) Install the lower shock bolt and tighten to 142 N·m (105 ft. lbs.).
- (5) Install the steering knuckle on the lower ball joint. Install the lower ball joint nut and tighten to:

LOWER CONTROL ARM (Continued)

- 136 N·m (110 ft. lbs.) Install the lower ball joint cotter pin.

(6) Install the stabilizer bar link on the lower suspension arm. Install the grommet, retainer and nut and tighten to 37 N·m (27 ft. lbs.).

(7) Install the tie rod end on the steering knuckle and tighten nut to 108 N·m (80 ft. lbs.). Install cotter pin.

(8) Install the brake rotor and caliper assembly, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - INSTALLATION).

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

(10) Remove the support and lower the vehicle.

(11) Tighten the suspension arm crossmember nuts to 169 N·m (125 ft. lbs.).

SHOCK

DIAGNOSIS AND TESTING - SHOCK

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 vehicle.
- (2) Remove shock upper nut and remove retainer and grommet.
- (3) Remove lower mounting bolt from suspension arm and remove shock (Fig. 5).

INSTALLATION

- (1) Extend shock fully, install retainer and grommet on top of shock absorber. Check grommets and retainer for wear.

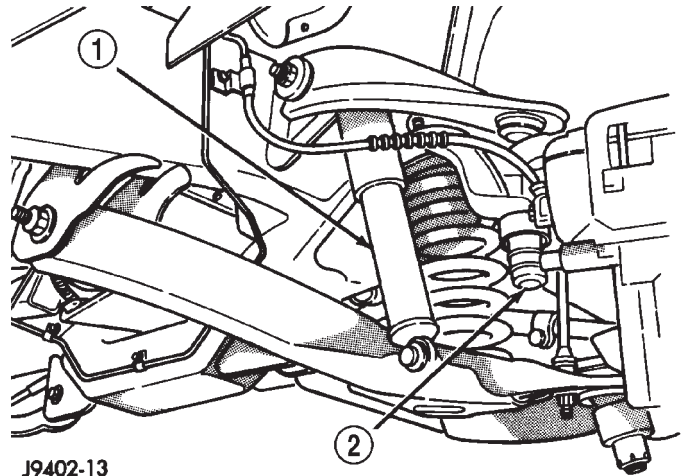


Fig. 5 Shock

- 1 - SHOCK
2 - JOUNCE BUMPER

(2) Guide shock up through upper suspension arm bracket. Install top grommet, retainer and nut. Tighten nut to 54 N·m (40 ft. lbs.).

(3) Align bottom end of shock into lower suspension arm and install mounting bolt. Tighten bolt to 142 N·m (105 ft. lbs.).

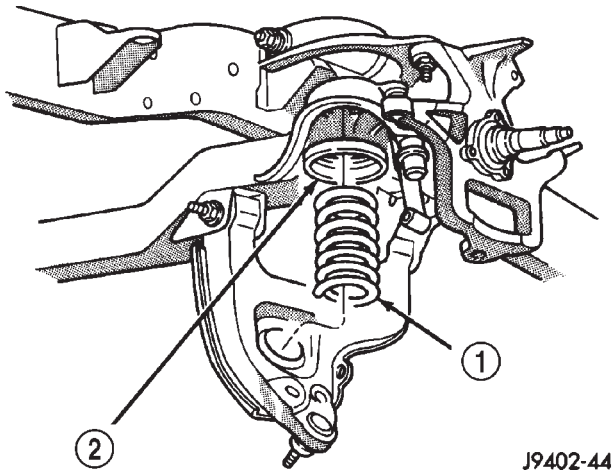
(4) Remove support and lower vehicle.

SPRING

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the tire and wheel assembly.
- (3) Remove the brake caliper assembly and rotor, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - REMOVAL).
- (4) Remove the cotter pin and nut from the tie rod. Remove the tie rod end from the steering knuckle with Puller C-3894-A.
- (5) Remove the stabilizer bar link from the lower suspension arm.
- (6) Support the lower suspension arm outboard end with a jack. Place a jack under the arm in front of the shock mount.
- (7) Remove the cotter pin and nut from the lower ball joint. Separate the ball joint with Remover C-4150A.
- (8) Remove the lower shock bolt from the suspension arm.
- (9) Lower the jack and suspension arm until spring tension is relieved. Remove spring and rubber isolator (Fig. 6).

SPRING (Continued)

**Fig. 6 Coil Spring**

- 1 - COIL SPRING
2 - RUBBER ISOLATER

INSTALLATION

(1) Install the rubber isolator on top of the spring. Position the spring into the upper spring seat.

(2) Raise the lower suspension arm with a jack and position the spring into the lower suspension arm mount.

(3) Install the lower shock bolt and tighten to 142 N·m (105 ft. lbs.).

(4) Install the steering knuckle on the lower ball joint. Install the lower ball joint nut and tighten to:

- 136 N·m (110 ft. lbs.)

Install the lower ball joint cotter pin.

(5) Install the stabilizer bar link on the lower suspension arm. Install the grommet, retainer and nut and tighten to 37 N·m (27 ft. lbs.).

(6) Install the tie rod end on the steering knuckle and tighten nut to 108 N·m (80 ft. lbs.). Install cotter pin.

(7) Install the brake rotor and caliper assembly, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - INSTALLATION).

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

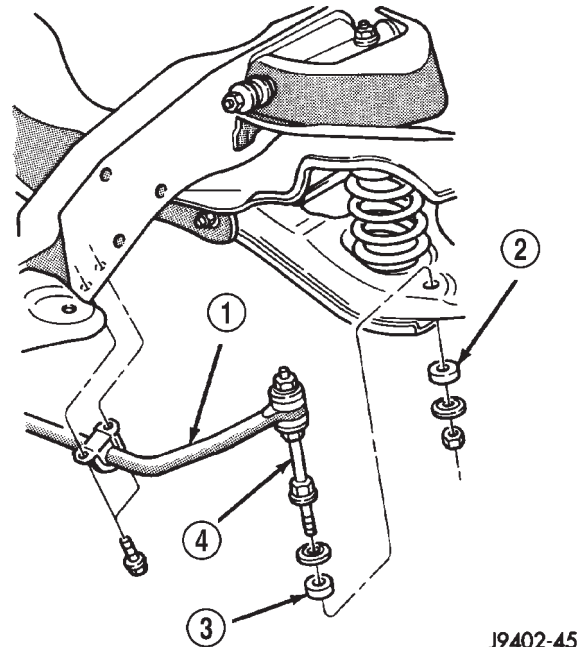
(9) Remove the support and lower the vehicle.

STABILIZER BAR**REMOVAL**

(1) Raise and support the vehicle.

(2) Remove the link nuts, retainers and grommets from lower suspension arm and stabilizer bar (Fig. 7).

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

**Fig. 7 STABILIZER BAR**

- 1 - STABILIZER BAR
2 - GROMMET
3 - GROMMET
4 - LINK

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 links on stabilizer bar and lower suspension arm. Install grommets, retainers and nuts. Tighten nuts to 37 N·m (27 ft. lbs.).

(3) Remove the supports and lower the vehicle.

UPPER BALL JOINT**DIAGNOSIS AND TESTING - UPPER BALL JOINT**

(1) Position a floor jack under the lower suspension arm. Raise the wheel and allow the tire to lightly contact the floor (vehicle weight relieved from the tire).

(2) Mount a dial indicator solidly on the upper suspension arm.

(3) Position the indicator plunger against the upper ball stud boss of the steering knuckle.

(4) Grasp the top of the tire and apply force in and out. Look for movement at the ball joint between the upper suspension arm and steering knuckle.

(5) If lateral movement is greater than 0.8 mm (0.030 in.), replace the suspension arm.

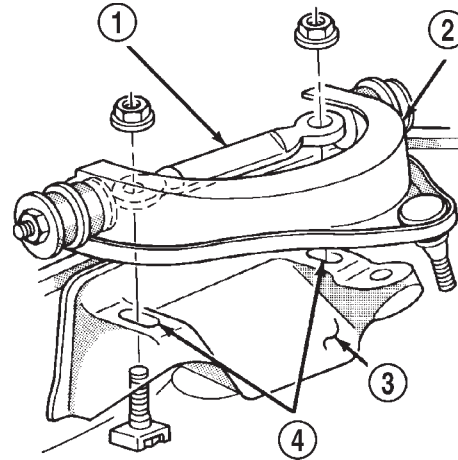
UPPER CONTROL ARM

REMOVAL

- (1) Raise and support vehicle.
- (2) Remove tire and wheel assembly.
- (3) Support lower suspension arm at outboard end with jack stand.
- (4) Remove upper ball joint cotter pin and nut.
- (5) Separate ball joint from knuckle with remover MB-990635.
- (6) Remove pivot bar bolts from upper suspension arm bracket and remove arm from vehicle (Fig. 8).

INSTALLATION

- (1) Position the upper suspension arm on the bracket and install the pivot bar bolts. Tighten to 169 N·m (125 ft. lbs.).
- (2) Install the ball joint in the knuckle. Install the nut and tighten to 81 N·m (60 ft. lbs.) and replacement the cotter pin.
- (3) Remove the jack from the lower suspension arm.
- (4) Install the tire and wheel assembly, (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).
- (5) Remove the support and lower the vehicle.



J9402-55

Fig. 8 Upper Suspension Arm

- 1 - PIVOT BAR
- 2 - UPPER SUSPENSION ARM
- 3 - SUSPENSION ARM FRAME MOUNT
- 4 - ADJUSTMENT SLOTS

(6) Align the front suspension, (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

FRONT - 4WD

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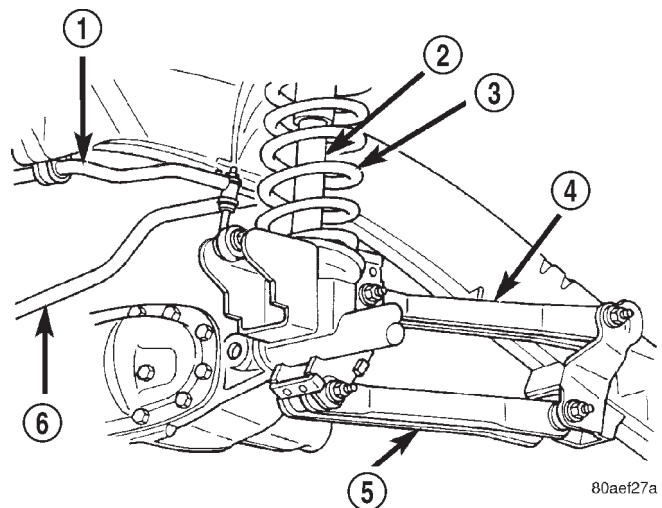
FRONT - 4WD

DESCRIPTION

DESCRIPTION

The link/coil suspension allows each wheel to adapt to different road surfaces. The suspension is comprised of (Fig. 1) :

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



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Fig. 1 Link/Coil Suspension

- 1 - STABILIZER BAR
- 2 - SHOCK ABSORBER
- 3 - COIL SPRING
- 4 - UPPER SUSPENSION ARM
- 5 - LOWER SUSPENSION ARM
- 6 - TRACK BAR

FRONT - 4WD (Continued)

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 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.

DESCRIPTION

The upper and lower 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.

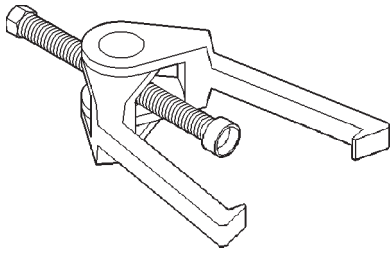
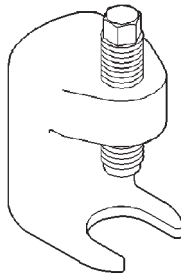
SPECIFICATIONS**TORQUE CHART***TORQUE SPECIFICATIONS*

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Shock Absorber Upper Nut	47	35	—
Shock Absorber Lower Bolt	135	100	—
Shock Absorber Bracket	75	55	—
Suspension Arm Lower Axle Nut	190	140	—
Suspension Arm Lower Frame Nut	190	140	—
Suspension Arm Upper Axle Nut	163	120	—
Suspension Arm Upper Frame Nut	163	120	—
Stabilizer Bar Clamp Bolt	54	40	—
Stabilizer Bar Link Upper Nut	37	27	—
Stabilizer Bar Link Lower Nut	47	35	—
Track Bar Ball Stud Nut	95	70	—
Track Bar Axle Bracket Bolt	176	130	—
Hub/Bearing Nut	245	180	—
Hub/Bearing Bolts	166	122	—

FRONT - 4WD (Continued)

SPECIAL TOOLS

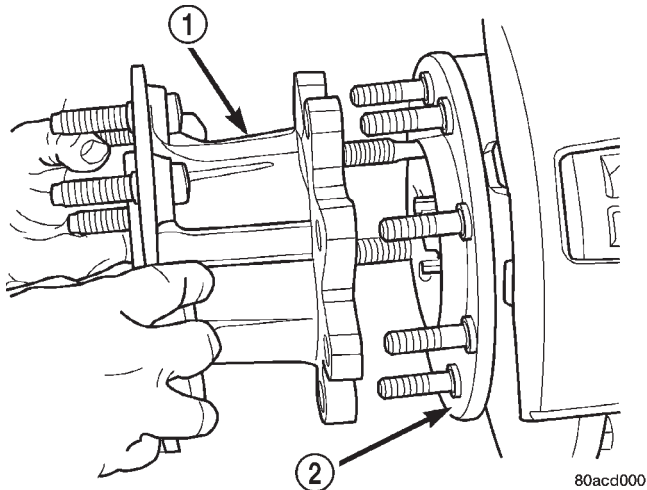
LINK/COIL SUSPENSION

**Puller C-3894-A****Remover, Wheel Stud C-4150A**

HUB / BEARING

REMOVAL

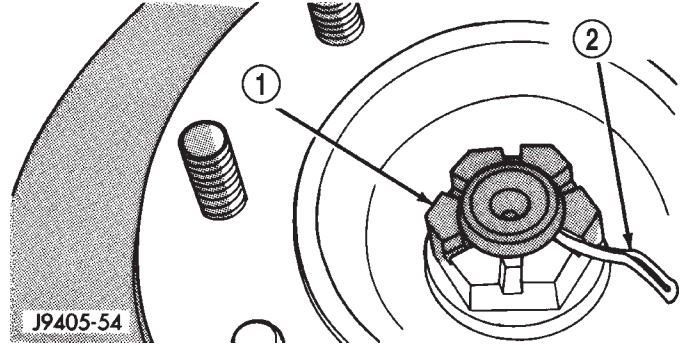
- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assembly.
- (3) Remove the hub extension mounting nuts and remove the extension from the rotor if equipped (Fig. 2).

**Fig. 2 Hub Extension**

- 1 - HUB EXTENSION
- 2 - HUB

- (4) Remove the brake caliper, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPERS - REMOVAL).

- (5) Remove the cotter pin and the hub nut from the axle shaft (Fig. 3).

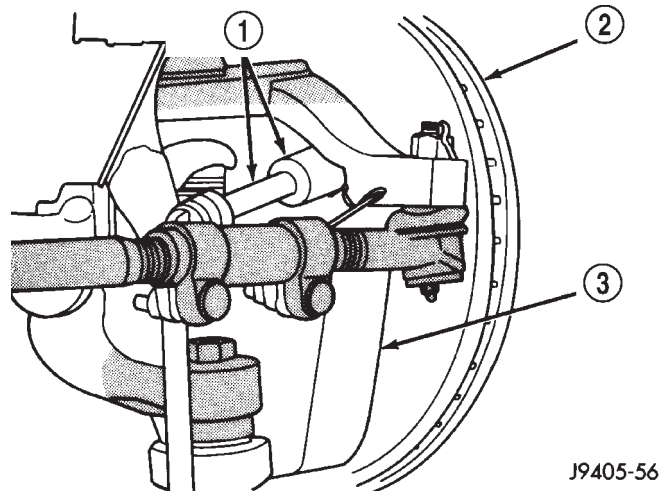
**Fig. 3 Hub Nut Cotter Pin**

- 1 - HUB NUT
- 2 - COTTER PIN

- (6) Disconnect the ABS wheel speed sensor wire from under the hood. Remove the sensor wire from the frame and steering knuckle if equipped.

- (7) Back off the hub/bearing mounting bolts 1/4 inch each (Fig. 4). Then tap the bolts with a hammer to loosen the hub/bearing from the steering knuckle.

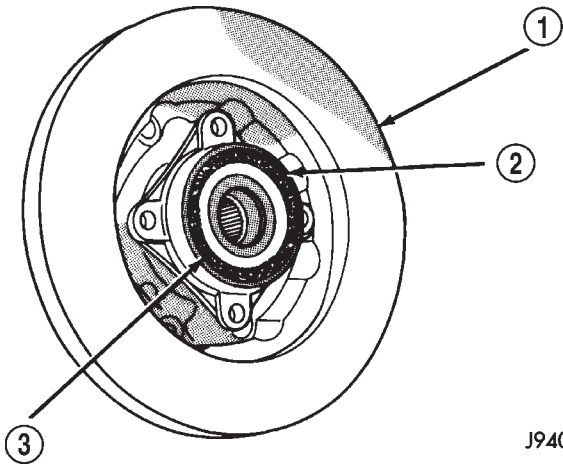
- (8) Remove the hub/bearing mounting bolts and remove the hub/bearing.

**Fig. 4 Hub/Bearing Mounting Bolts**

- 1 - SOCKET AND EXTENSION
- 2 - ROTOR AND HUB
- 3 - STEERING KNUCKLE

HUB / BEARING (Continued)

(9) Remove the rotor assembly (Fig. 5), brake shield and spacer from the steering knuckle.

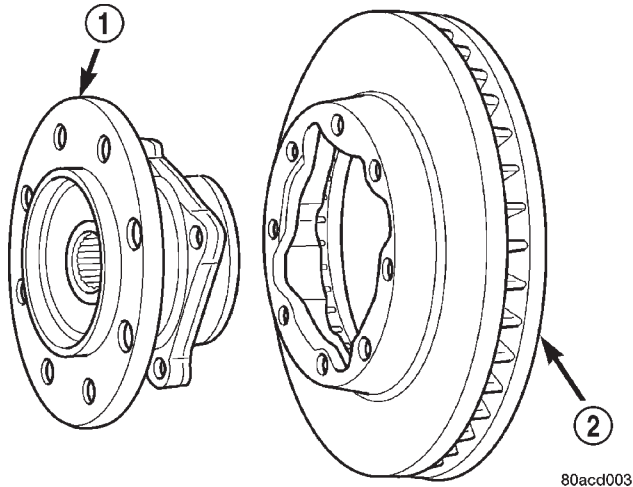


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Fig. 5 Rotor Hub/Bearing Assembly

- 1 - ROTOR AND HUB
- 2 - UNIT BEARING ASSEMBLY
- 3 - SEAL

(10) Press out the wheel studs/hub extension studs and separate the rotor from the hub (Fig. 6).

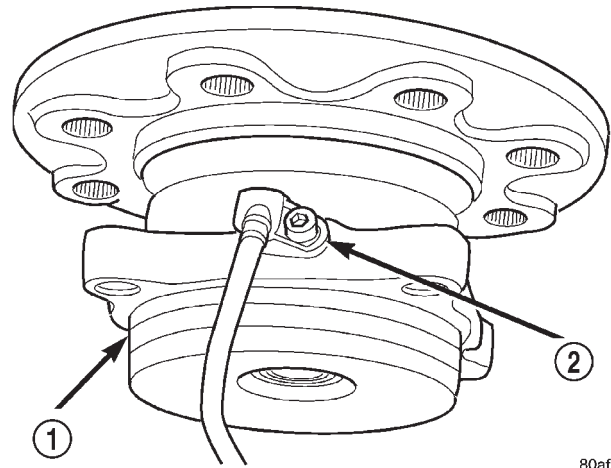


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Fig. 6 Rotor And Hub/Bearing

- 1 - HUB BEARING
- 2 - ROTOR

(11) Remove the wheel speed sensor (Fig. 7) from the hub bearing if equipped.



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Fig. 7 Wheel Speed Sensor

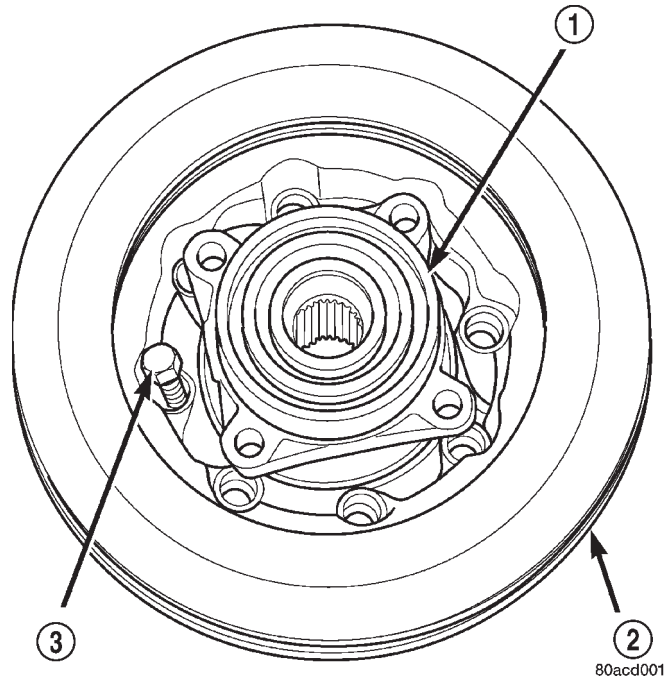
- 1 - HUB BEARING
- 2 - WHEEL SPEED SENSOR

INSTALLATION

(1) Install the wheel speed sensor in the hub bearing if equipped.

(2) Position the rotor on the hub/bearing.

(3) Press the wheel studs/hub extension studs through the back side of the rotor and through the hub bearing flange (Fig. 8).



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Fig. 8 Rotor, Hub/Bearing And Stud

- 1 - HUB BEARING
- 2 - ROTOR
- 3 - STUD

HUB / BEARING (Continued)

(4) Apply a liberal quantity of anti-seize compound to the splines of the front drive shaft.

(5) Insert the two rearmost, top and bottom rotor hub bolts in the steering knuckle. Insert the bolts through the back side of the knuckle so they extend out the front face as shown.

(6) Position the hub spacer (Fig. 9) and brake shield (Fig. 10) on bolts just installed in knuckle.

NOTE: If the vehicle is equipped with a wheel speed sensor the brake shield must be positioned on the hub bearing (Fig. 11).

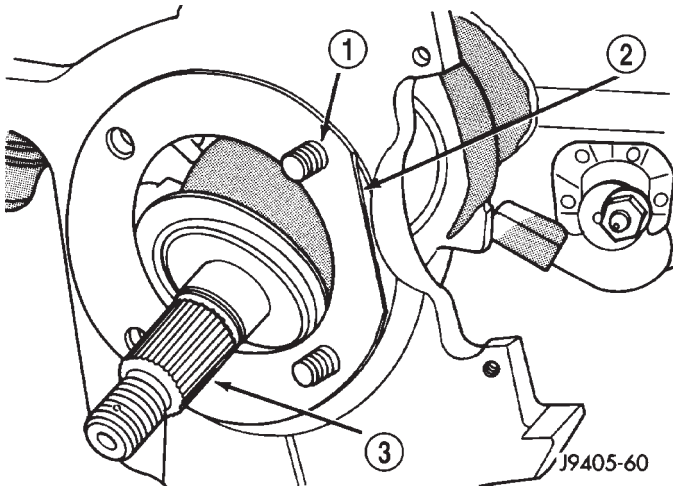


Fig. 9 Hub Spacer

- 1 - ROTOR HUB BOLTS
- 2 - HUB SPACER (POSITION FLAT TO REAR)
- 3 - APPLY ANTI-SEIZE COMPOUND TO SPLINES

(7) Align the rotor hub with the drive shaft and start the shaft into the rotor hub splines.

NOTE: Position wheel speed sensor wire at the top of the knuckle if equipped.

(8) Align the bolt holes in the hub bearing flange with the bolts installed in the knuckle. Then thread the bolts into the bearing flange far enough to hold the assembly in place.

(9) Install the remaining bolts. Tighten the hub/bearing bolts to 166 N·m (122 ft. lbs.).

(10) Install the washer and hub nut and tighten to 245 N·m (180 ft. lbs.).

(11) Install a new cotter pin in the hub nut. Tighten the nut as needed to align the cotter pin hole in the shaft with the opening in nut.

(12) Install the brake caliper, (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPERS - INSTALLATION).

(13) Install the sensor wire to the steering knuckle and frame and if equipped. Connect the wheel speed sensor wire under the hood.

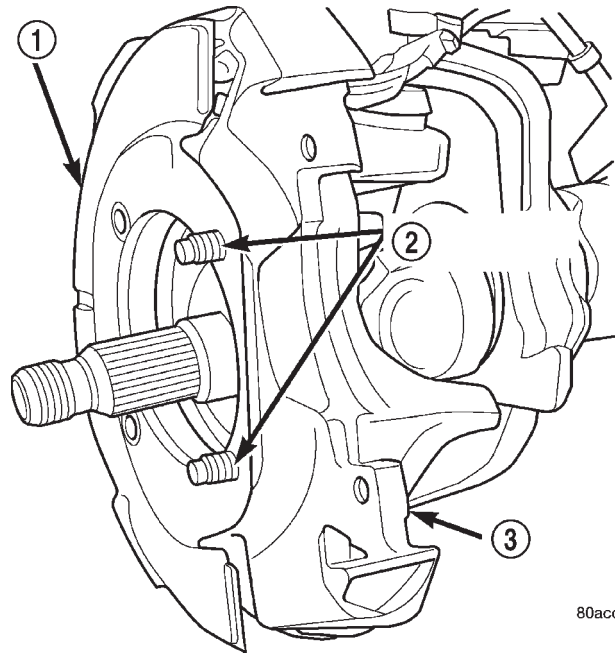


Fig. 10 Brake Shield

- 1 - BRAKE SHIELD
- 2 - HUB BEARING BOLTS
- 3 - STEERING KNUCKLE

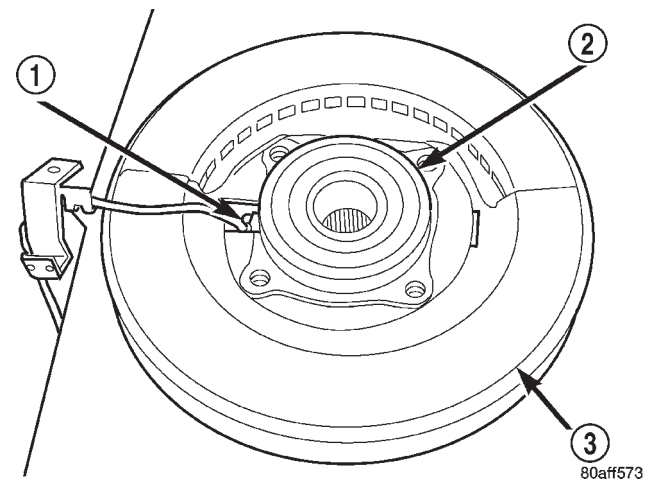


Fig. 11 Brake Shield With Wheel Speed Sensor

- 1 - WHEEL SPEED SENSOR
- 2 - HUB BEARING
- 3 - SHIELD

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

(15) Remove the support and lower the vehicle.

(16) Apply the brakes several times to seat the brake shoes and caliper piston. Do not move the vehicle until a firm brake pedal is obtained.

KNUCKLE

REMOVAL

- (1) Remove hub bearing and axle shaft.
- (2) Remove tie-rod or drag link end from the steering knuckle arm.
- (3) Remove the ABS sensor wire and bracket from knuckle. Refer to Brakes, for proper procedures.
- (4) Remove the cotter pin from the upper ball stud nut. Remove the upper and lower ball stud nuts.
- (5) Strike the steering knuckle with a brass hammer to loosen.
- (6) Remove knuckle from axle tube yokes.

INSTALLATION

- (1) Position the steering knuckle on the ball studs.
- (2) Install and tighten lower ball stud nut to 47 N·m (35 ft. lbs.) torque. Do not install cotter pin at this time.
- (3) Install and tighten upper ball stud nut to 94 N·m (70 ft. lbs.) torque. Advance nut to next slot to line up hole and install new cotter pin.
- (4) Retorque lower ball stud nut to 190–217 N·m (140–160 ft. lbs.) torque. Advance nut to next slot to line up hole and install new cotter pin.
- (5) Install the hub bearing and axle shaft.
- (6) Install tie-rod or drag link end onto the steering knuckle arm.
- (7) Install the ABS sensor wire and bracket to the knuckle. Refer to Brakes, for proper procedure.

UPPER CONTROL ARM

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the upper suspension arm nut and bolt at the axle bracket (Fig. 12).
- (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 nut at the axle bracket to 163 N·m (120 ft. lbs.). Tighten nut at frame bracket to 163 N·m (120 ft. lbs.).

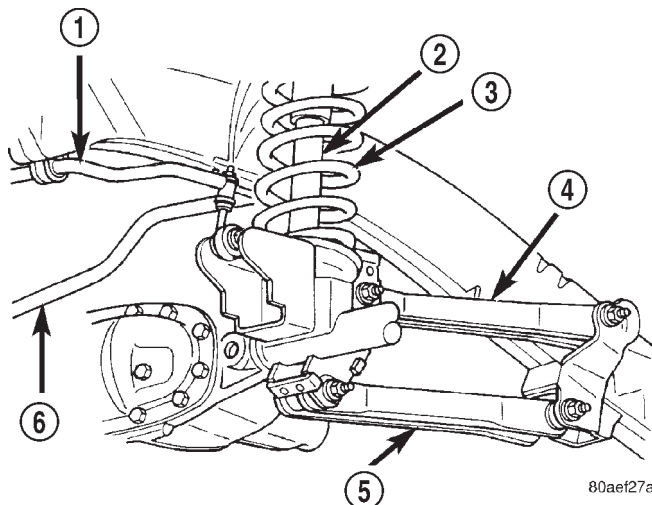


Fig. 12 Upper and Lower Suspension Arm

- 1 - STABILIZER BAR
- 2 - SHOCK ABSORBER
- 3 - COIL SPRING
- 4 - UPPER SUSPENSION ARM
- 5 - LOWER SUSPENSION ARM
- 6 - TRACK BAR

UPPER BALL JOINT

REMOVAL - DANA 44 & 60

- (1) Position tools as shown to remove upper ball stud (Fig. 13).

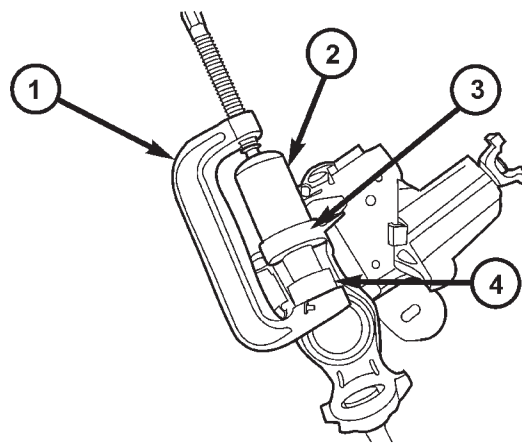


Fig. 13 UPPER BALL JOINT REMOVAL

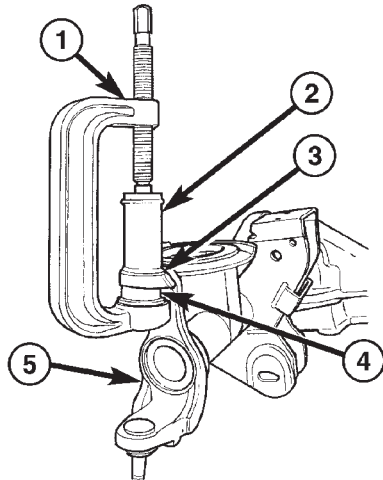
- 1 - SPECIAL TOOL C4212-F
- 2 - SPECIAL TOOL 6761
- 3 - KNUCKLE
- 4 - SPECIAL TOOL 8445-3

UPPER BALL JOINT (Continued)

INSTALLATION

INSTALLATION - DANA 44 AXLE

(1) Position tools as shown to install upper ball stud (Fig. 14).



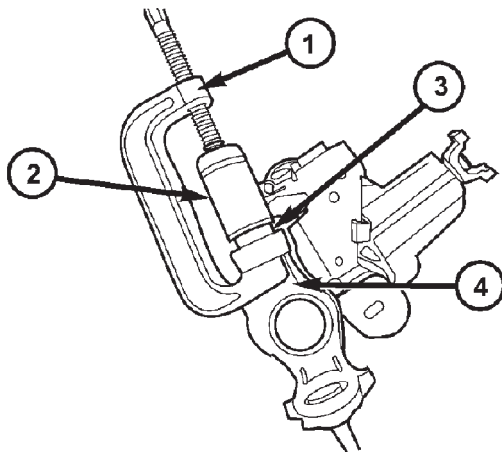
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Fig. 14 UPPER BALL JOINT INSTALLATION

- 1 - SPECIAL TOOL C-4212-F
- 2 - SPECIAL TOOL 6758
- 3 - BALL JOINT
- 4 - SPECIAL TOOL 6289-C
- 5 - KNUCKLE

INSTALLATION - DANA 60 AXLE

(1) Position tools as shown to install upper ball stud (Fig. 15).



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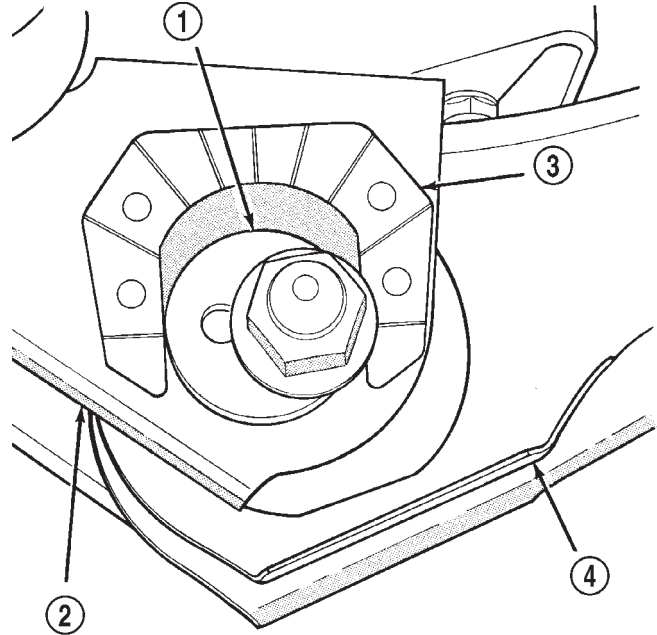
Fig. 15 UPPER BALL JOINT INSTALLATION

- 1 - SPECIAL TOOL C4212-F
- 2 - SPECIAL TOOL 8445-2
- 3 - BALL JOINT
- 4 - KNUCKLE

LOWER CONTROL 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. 16).



J9302-59

Fig. 16 Cam Adjuster

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

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

(4) Remove the nut and bolt from the frame rail bracket and remove the lower suspension arm (Fig. 12).

INSTALLATION

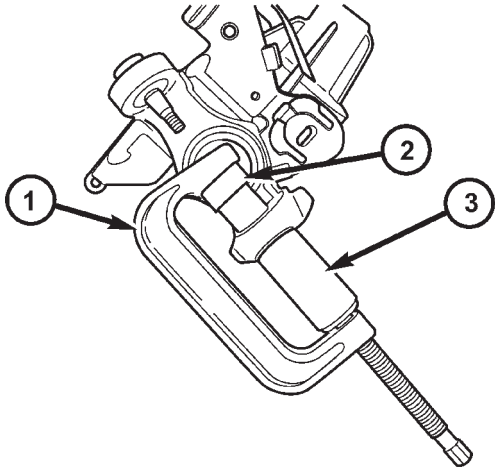
- (1) Position the lower suspension arm at the axle bracket and frame rail bracket.
- (2) Install the rear bolt and finger tighten the nut.
- (3) Install the cam bolt, cam and nut in the axle and align the reference marks.
- (4) Remove support and lower the vehicle.
- (5) Tighten cam nut at the axle bracket to 190 N·m (140 ft. lbs.). Tighten rear nut at the frame bracket to 190 N·m (140 ft. lbs.).

LOWER BALL JOINT

REMOVAL

REMOVAL - DANA 44 AXLE

(1) Position tools as shown to remove lower ball stud (Fig. 17).



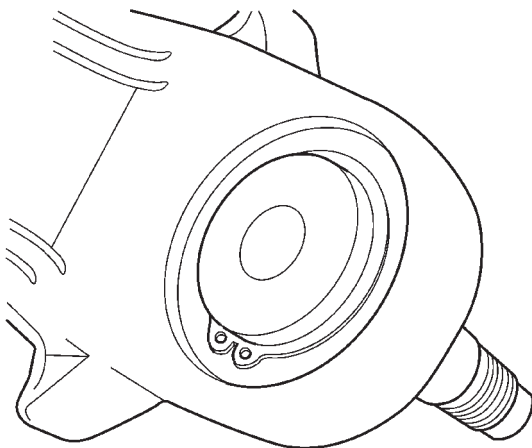
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Fig. 17 LOWER BALL JOINT REMOVAL

- 1 - SPECIAL TOOL C4212-F
- 2 - SPECIAL TOOL 8445-3
- 3 - SPECIAL TOOL 8445-1

REMOVAL - DANA 60 AXLE

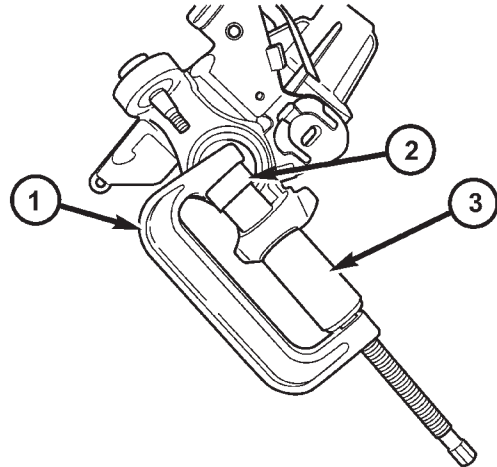
(1) Remove lower snap ring from the lower ball joint (Fig. 18).



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Fig. 18 LOWER SNAP RING

(2) Position tools as shown to remove lower ball stud (Fig. 19).



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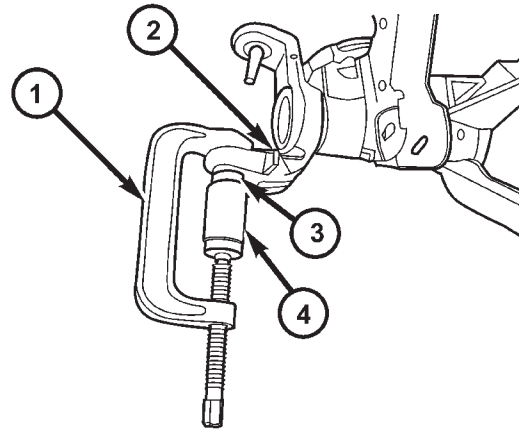
Fig. 19 LOWER BALL JOINT REMOVAL

- 1 - SPECIAL TOOL C4212-F
- 2 - SPECIAL TOOL 8445-3
- 3 - SPECIAL TOOL 8445-1

INSTALLATION

INSTALLATION - DANA 44 AXLE

(1) Position tools as shown to install lower ball stud (Fig. 20).



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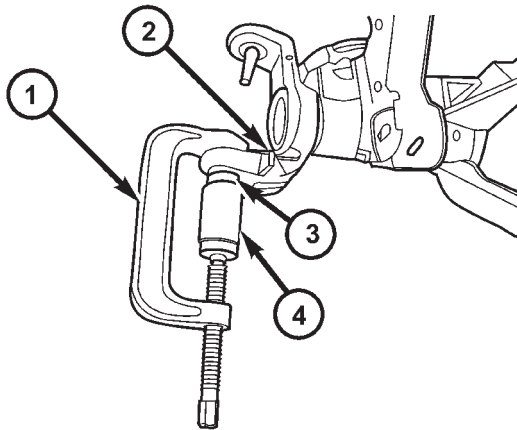
Fig. 20 LOWER BALL JOINT INSTALL

- 1 - SPECIAL TOOL C4212-F
- 2 - KNUCKLE
- 3 - BALL JOINT
- 4 - SPECIAL TOOL 6758

LOWER BALL JOINT (Continued)

INSTALLATION - DANA 60 AXLE

(1) Position tools as shown to install lower ball stud (Fig. 21).



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Fig. 21 LOWER BALL JOINT INSTALL

- 1 - SPECIAL TOOL C4212-F
- 2 - KNUCKLE
- 3 - BALL JOINT
- 4 - SPECIAL TOOL 8445-2

SHOCK**DIAGNOSIS AND TESTING - SHOCK**

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.

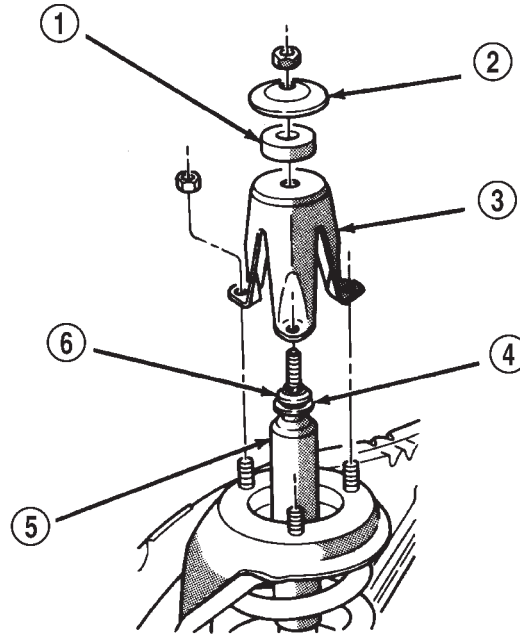
The shock absorbers are not refillable or adjustable. If a malfunction occurs, the shock absorber must be replaced. To test a shock absorber, hold it in an upright position and force the piston in and out of the cylinder four or five times. The action throughout each stroke should be smooth and even.

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 in the engine compartment.

(2) Remove three nuts from the upper shock bracket (Fig. 22).



J9402-46

Fig. 22 Shock Absorber and Bracket

- 1 - GROMMET
- 2 - RETAINER
- 3 - BRACKET
- 4 - RETAINER
- 5 - SHOCK
- 6 - GROMMET

(3) Remove the lower bolt from the axle bracket (Fig. 23). Remove the shock absorber from engine compartment.

INSTALLATION

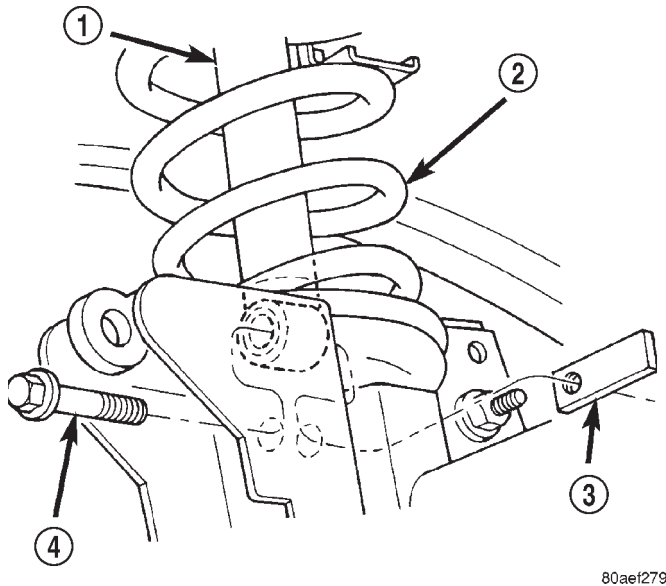
(1) Position the lower retainer and grommet on the upper stud. Insert the shock absorber through the spring from engine compartment.

(2) Install the lower bolt and tighten to 135 N·m (100 ft. lbs.).

(3) Install the upper shock bracket and three nuts. Tighten nuts to 75 N·m (55 ft. lbs.).

(4) Install upper grommet and retainer. Install upper shock nut and tighten to 47 N·m (35 ft. lbs.).

SHOCK (Continued)

**Fig. 23 Shock Absorber Axle Mount**

- 1 - SHOCK
- 2 - SPRING
- 3 - FLAG NUT
- 4 - SHOCK BOLT

SPRING

REMOVAL

- (1) Raise and support the vehicle. Position a hydraulic jack under the axle to support it.
- (2) Paint or scribe alignment marks on lower suspension arm cam adjusters and axle bracket for installation reference.
- (3) Remove the upper suspension arm and loosen lower suspension arm bolts.
- (4) Mark and disconnect the front propeller shaft from the axle 4x4 models.
- (5) Disconnect the track bar from the frame rail bracket.
- (6) Disconnect the drag link from pitman arm.
- (7) Disconnect the stabilizer bar link and shock absorber from the axle.
- (8) Lower the axle until the spring is free from the upper mount. Remove the coil spring.

INSTALLATION

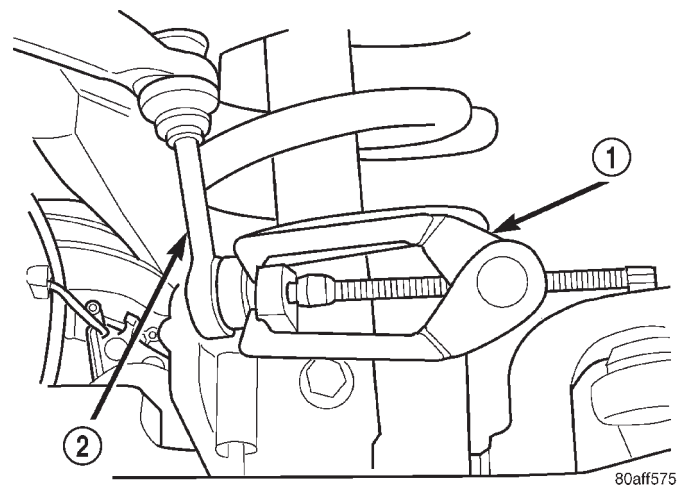
- (1) Position the coil spring on the axle pad.
- (2) Raise the axle into position until the spring seats in the upper mount.
- (3) Connect the stabilizer bar links and shock absorbers to the axle bracket. Connect the track bar to the frame rail bracket.
- (4) Install the upper suspension arm.
- (5) Install the front propeller shaft to the axle 4x4 model.

- (6) Install drag link to pitman arm and tighten nut to specifications. Install new cotter pin.
- (7) Remove the supports and lower the vehicle.
- (8) Tighten the following suspension components to specifications:
 - Link to stabilizer bar nut.
 - Lower shock bolt.
 - Track bar bolt at axle shaft tube bracket.
 - Upper suspension arm nut at axle bracket.
 - Upper suspension nut at frame bracket.
 - Align lower suspension arm reference marks and tighten cam nut.
 - Lower suspension nut at frame bracket.

STABILIZER BAR

REMOVAL

- (1) Raise and support the vehicle.
- (2) Hold the stabilizer link shafts with a wrench and remove the link nuts at the stabilizer bar.
- (3) Remove the retainers and grommets from the stabilizer bar links.
- (4) Remove the stabilizer bar link nuts from the axle brackets.
- (5) Remove the links from the axle brackets with Puller C-3894-A (Fig. 24).
- (6) Remove the stabilizer bar clamps from the frame rails and remove the stabilizer bar.

**Fig. 24 Stabilizer Link**

- 1 - PULLER
- 2 - LINK

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.
- (2) Tighten the clamp bolts to 54 N·m (40 ft. lbs.).
- (3) Install links to the axle bracket and tighten nut to 47 N·m (35 ft. lbs.).

STABILIZER BAR (Continued)

(4) Install links, retainers, grommets and nuts to the stabilizer bar. Hold the link shaft with a wrench and tighten the nuts to 37 N·m (27 ft. lbs.).

(5) Remove the supports and lower the vehicle.

TRACK BAR

DIAGNOSIS AND TESTING - TRACK BAR

- (1) Turn the front wheel 90° to the left of center.
- (2) Mount a dial indicator to the left frame rail in front of the track bar ball joint (Fig. 25).
- (3) Position the dial indicator plunger on the ball joint end cap next to the grease fitting and zero the indicator.

NOTE: Dial indicator plunger must be perpendicular to the ball joint end cap.

(4) Turn the front wheel 180° to the right and record the dial indicator reading. Repeat this step three times and record all readings.

(5) If any of the readings exceed 2.03 mm (0.080 in) replace the track bar.

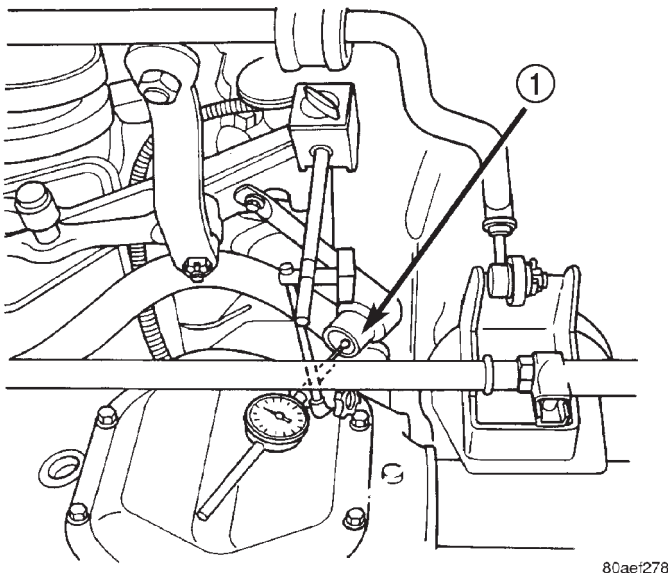


Fig. 25 Dial Indicator Location

1 - TRACK BAR BALL JOINT

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. 26).
- (3) Remove ball stud from bracket with Puller C-4150A (Fig. 27).
- (4) Remove the bolt and flag nut from the axle bracket and remove the track bar (Fig. 26).

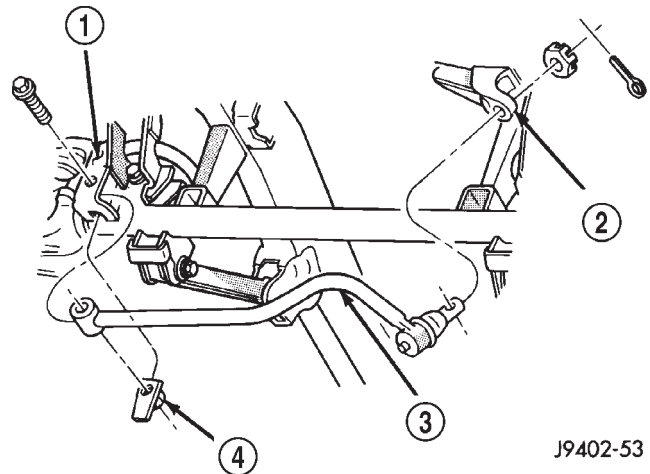


Fig. 26 Track Bar

- 1 - AXLE BRACKET
- 2 - FRAME BRACKET
- 3 - TRACK BAR
- 4 - FLAG NUT

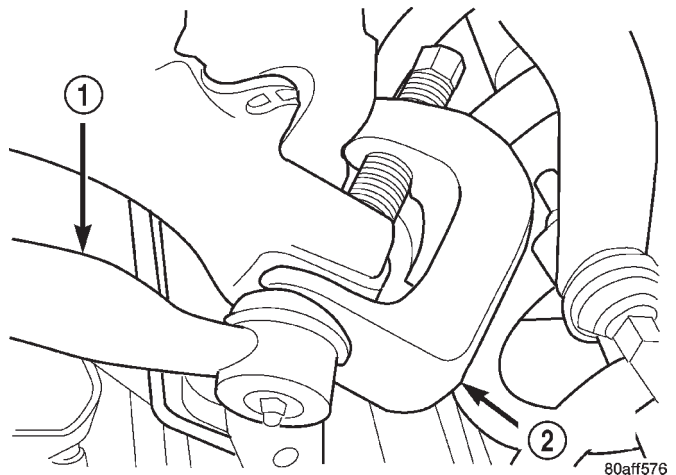


Fig. 27 Track Bar Puller

- 1 - TRACK BAR
- 2 - PULLER

INSTALLATION

- (1) Install the track bar at axle bracket. Loosely install the retaining bolt and flag nut.
- (2) Pry the axle assembly over to install the track bar at the frame rail bracket.
- (3) Install the retaining nut on the stud. Tighten the ball stud nut to 95 N·m (70 ft. lbs.). Install a new cotter pin.
- (4) Remove the supports and lower the vehicle.
- (5) Tighten the bolt at the axle bracket to 176 N·m (130 ft. lbs.).

REAR

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REAR

DESCRIPTION

The rear suspension is comprised of:

- Shock Absorbers
- Jounce Bumpers
- Stabilizer Bar (optional)
- Leaf Springs
- Drive Axle

CAUTION: A vehicle should always be loaded so the vehicle weight center-line is located immediately forward of the rear axle. Correct vehicle loading provides proper front tire-to-road contact. This results in maximum vehicle handling stability and safety. Incorrect vehicle weight distribution can cause excessive tire tread wear, spring fatigue or failure, and erratic steering.

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.

DIAGNOSIS AND TESTING - SPRING AND SHOCK

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

If the vehicle is used for severe, off-road operation, the springs should be examined periodically. Check for broken and shifted leaves, loose and missing clips, and broken center bolts. Refer to Spring and Shock Absorber Diagnosis chart for additional information.

REAR (Continued)

SPRING AND SHOCK ABSORBER

CONDITION	POSSIBLE CAUSES	CORRECTION
SPRING SAGS	1. Broken leaf. 2. Spring fatigue.	1. Replace spring. 2. Replace spring.
SPRING NOISE	1. Loose spring clamp bolts. 2. Worn bushings. 3. Worn or missing spring tip inserts.	1. Tighten to specification. 2. Replace bushings. 3. Replace spring tip inserts.
SHOCK NOISE	1. Loose mounting fastener. 2. Worn bushings. 3. Leaking shock.	1. Tighten to specification. 2. Replace shock. 3. Replace shock.

SPECIFICATIONS

TORQUE CHART

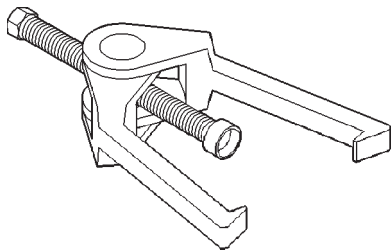
TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Shock Absorber Lower Nut	136	100	—
Shock Absorber Upper Nut	136	100	—
Spring Clamp Nuts 6,010-10,500 GVW	149	110	—
Spring Clamp Nuts 11,000 GVW Cab-Chassis	163	120	—
Spring Front and Rear Eye and Shackle Bolt/Nut 6,010-6,400 GVW	163	120	—
Spring Front and Rear Eye and Shackle Bolt/Nut 8,800-11,000 GVW	176	130	—
Stabilizer Bar Retainer Nuts	54	40	—
Stabilizer Bar Link Ball Stud Nut	68	50	—
Stabilizer Bar Link Upper Nut	68	50	—
Stabilizer Bar Frame Bracket Nuts	54	40	—
Jounce Bumper Bolts	61	45	—

REAR (Continued)

SPECIAL TOOLS

SUSPENSION-REAR

*Puller C-3894-A*

BUSHINGS

REMOVAL

- (1) Remove the spring from the vehicle.
- (2) Position the spring eye in a press.
- (3) Press the bushing out with an appropriate size driver.

INSTALLATION

- (1) Press new bushing into the spring eye with an appropriate size driver. The bushing should be centered in the spring eye.
- (2) Install the spring on the vehicle.

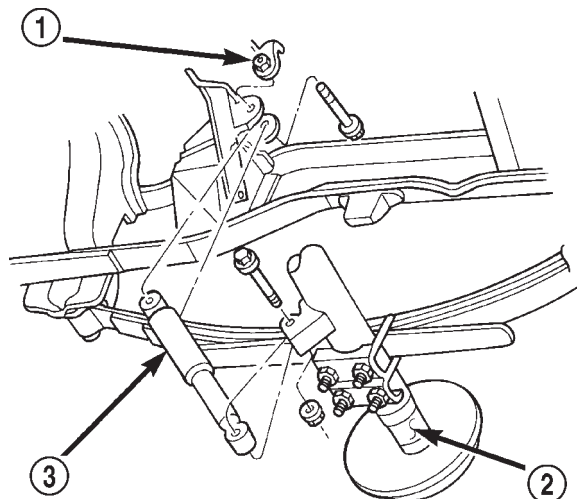
SHOCK

REMOVAL

- (1) Raise vehicle and support axle.
- (2) Remove the bolt and flag nut from the frame crossmember bracket (Fig. 1).
- (3) Remove the bolt and nut from the axle bracket.
- (4) Remove the rear shock absorber from the vehicle.

INSTALLATION

- (1) Position the shock absorber in the brackets.
- (2) Install the bolts through the brackets and the shock. Install the flag nut on the top bolt and nut on lower bolt.
- (3) Tighten the upper and lower bolt/nuts Tighten to 136 N.m (100 ft. lbs.)
- (4) Remove the support and lower the vehicle.



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Fig. 1 Shock Absorber

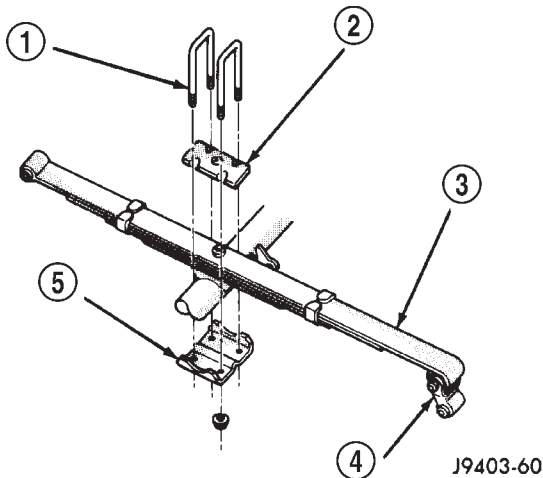
- 1 - FLAG NUT
2 - AXLE
3 - SHOCK

SPRING

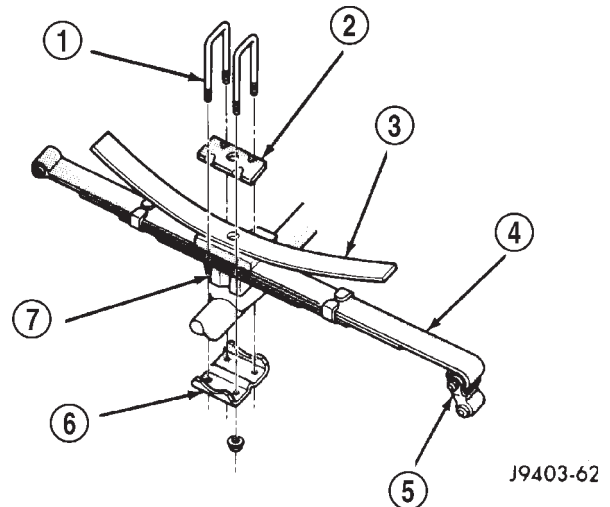
REMOVAL

- (1) Raise the vehicle and support the axle to remove all weight from the springs.
- (2) Remove the nuts and spring clamp bolts that attach the spring to the axle (Fig. 2) and (Fig. 3) and (Fig. 4).
- (3) Remove the nuts and bolts from the spring front and rear shackle eyes. **Note: To remove front eye bolt on left side spring fuel tank must be removed, (Refer to 14 - FUEL SYSTEM/FUEL DELIVERY/FUEL TANK - REMOVAL).**
- (4) Remove the spring from the vehicle.
- (5) Remove the shackle from the spring.

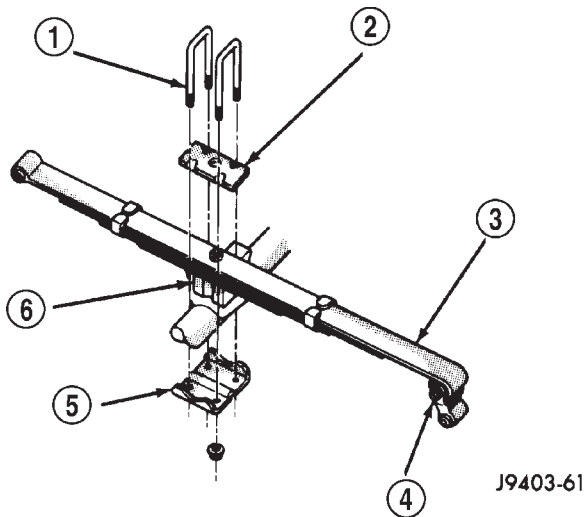
SPRING (Continued)

**Fig. 2 Rear Spring - 4x2**

- 1 - SPRING CLAMP BOLTS
- 2 - SPRING SEAT
- 3 - SPRING
- 4 - SHACKLE
- 5 - SPRING PLATE

**Fig. 4 Rear Spring - Cab-Chassis 11000 GVW**

- 1 - SPRING CLAMP BOLT
- 2 - SPRING SEAT
- 3 - AUXILIARY SPRING
- 4 - SPRING
- 5 - SHACKLE
- 6 - SPRING PLATE
- 7 - SPACER

**Fig. 3 Rear Spring - 4x4**

- 1 - SPRING CLAMP BOLT
- 2 - SPRING SEAT
- 3 - SPRING
- 4 - SHACKLE
- 5 - SPRING PLATE
- 6 - SPACER

(2) Position spring on axle shaft tube so spring center bolt is inserted into the locating hole in the axle tube spring pad or spacer.

(3) Align spring front eye with bolt hole in the front bracket. Install the eye pivot bolt and nut.

(4) Align shackle eye with bolt hole in rear bracket. Install bolt and nut.

(5) Tighten the spring front and rear eye pivot bolt snug do not torque.

(6) Install spring clamp bolts and the retaining nuts.

(7) Align the auxiliary spring with the primary spring if equipped. Tighten the nuts until they force the plate flush against the axle tube.

(8) Remove the supports and lower the vehicle so that the weight is being supported by the tires.

(9) Tighten the spring clamp retaining nuts to specifications

(10) Tighten spring front and rear eye pivot bolt nuts and shackle eye to specifications.

INSTALLATION

(1) Install shackle on rear spring eye and install bolt and nut.

STABILIZER BAR

REMOVAL

- (1) Raise and support vehicle.
- (2) Remove nuts from the links at the stabilizer bar and separate the links with Puller C-3894-A (Fig. 5).
- (3) Remove stabilizer bar retainer nuts and retainers (Fig. 6).
- (4) Remove stabilizer bar and replace worn, cracked or distorted bushings.
- (5) Remove links upper mounting nuts and bolts and remove links.

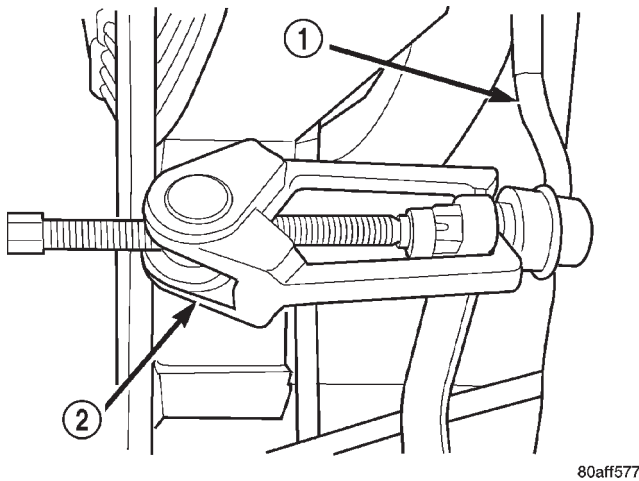


Fig. 5 Stabilizer Link

- 1 - LINK
2 - PULLER

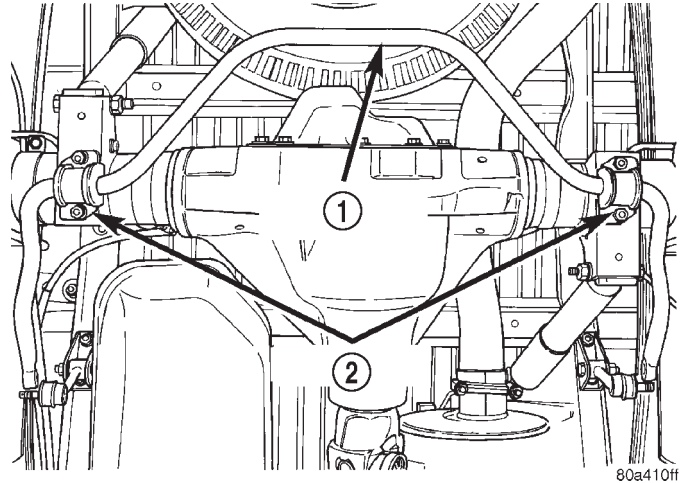


Fig. 6 Stabilizer Bar Mounting Bolts And

- 1 - STABILIZER BAR
2 - RETAINERS

INSTALLATION

- (1) Install link into frame brackets and install mounting nuts and bolts.
- (2) Install the stabilizer bar and center it with equal spacing on both sides. Install stabilizer bar retainers and tighten nuts to 54 N·m (40 ft. lbs.).
- (3) Install stabilizer link ball studs into the bar and tighten nuts to 68 N·m (50 ft. lbs.).
- (4) Remove support and lower vehicle.
- (5) Tighten upper link mounting nuts to 68 N·m (50 ft. lbs.).

