

SUSPENSION

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WHEEL ALIGNMENT

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WHEEL ALIGNMENT

DESCRIPTION

NOTE: Suspension components with rubber/urethane bushings should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

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 (Fig. 1).

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

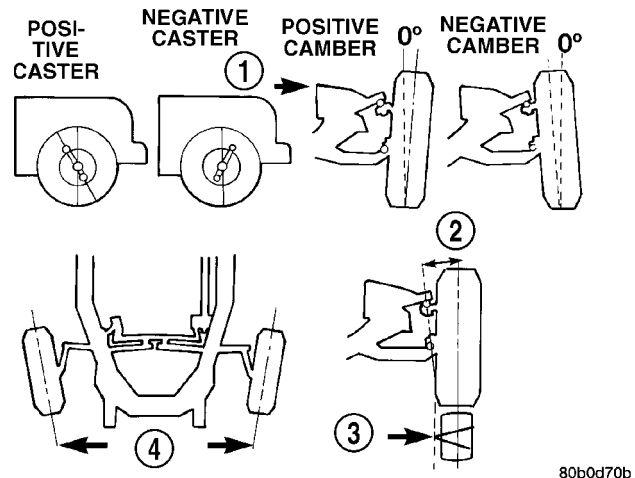


Fig. 1 Wheel Alignment Measurements

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

WHEEL ALIGNMENT (Continued)

OPERATION

• **CASTER** is the forward or rearward tilt of the steering knuckle from vertical. Tilting the top of the knuckle forward provides less positive caster. Tilting the top of the knuckle rearward provides more positive caster. Positive caster promotes directional stability. This angle enables the front wheels to return to a straight ahead position after turns (Fig. 1)

• **CAMBER** is the inward or outward tilt of the wheel relative to the center of the vehicle. Tilting the top of the wheel inward provides negative camber. Tilting the top of the wheel outward provides positive camber. Incorrect camber will cause wear on the inside or outside edge of the tire (Fig. 1)

• **TOE** is the difference between the leading inside edges and trailing inside edges of the front tires. Wheel toe position out of specification cause's unstable steering, uneven tire wear and steering wheel off-center. The wheel toe position is the **final** front wheel alignment adjustment (Fig. 1)

• **THRUST ANGLE** is the angle of the rear axle relative to the centerline of the vehicle. Incorrect thrust angle can cause off-center steering and exces-

sive tire wear. This angle is not adjustable, damaged component(s) must be replaced to correct the thrust angle (Fig. 1)

DIAGNOSIS AND TESTING - PRE-ALIGNMENT INSPECTION

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

(6) On 4x4 vehicles check suspension height (LD only).

(7) Road test the vehicle.

SUSPENSION AND STEERING SYSTEM DIAGNOSIS

CONDITION	POSSIBLE CAUSES	CORRECTION
FRONT END NOISE	1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Loose or worn steering or suspension components.	1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Tighten or replace components as necessary.
EXCESSIVE PLAY IN STEERING	1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Loose or worn steering gear.	1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Replace steering gear.
FRONT WHEELS SHIMMY	1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Tires worn or out of balance. 4. Alignment.	1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Replace or balance tires. 4. Align vehicle to specifications.
VEHICLE INSTABILITY	1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Tire pressure. 4. Alignment.	1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Adjust tire pressure. 4. Align vehicle to specifications.

WHEEL ALIGNMENT (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
EXCESSIVE STEERING EFFORT	1. Loose or worn steering gear. 2. Column coupler binding. 3. Tire pressure. 4. Alignment.	1. Replace steering gear. 2. Replace coupler. 3. Adjust tire pressure. 4. Align vehicle to specifications.
VEHICLE PULLS TO ONE SIDE	1. Tire pressure. 2. Tire. 3. Alignment. 4. Loose or worn steering or suspension components. 5. Radial tire lead. 6. Brake pull. 7. Weak or broken spring. 8. Ride height (LD) 4WD only.	1. Adjust tire pressure. 2. Criss-Cross Front Tires. 3. Align vehicle to specifications. 4. Tighten or replace components as necessary. 5. Rotate or replace tire as necessary. 6. Repair brake as necessary. 7. Replace spring. 8. Measure and adjust ride height. (LD only)

STANDARD PROCEDURE**STANDARD PROCEDURE - HEIGHT MEASUREMENT - 4WD (LD)**

The vehicle suspension height **MUST** be measured and adjusted before performing wheel alignment procedure. Also when front suspension components have been replaced. This measure must be performed with the vehicle supporting it's own weight and taken on both sides of the vehicle.

- (1) Inspect tires and set to correct pressure.
- (2) Jounce the front of the vehicle.
- (3) Measure and record the height from the ground at the centerline of the rear lower control arm bolt front tip (Fig. 2).

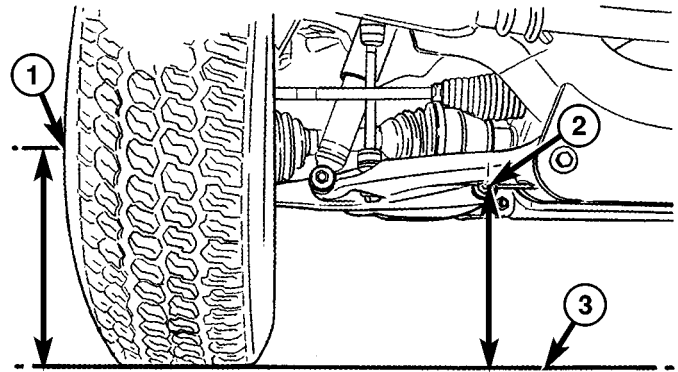
- (4) Measure and record the height from the ground at the front spindle centerline (Static Load Radius) (Fig. 2).

- (5) Subtract the first measurement from the second measurement. The difference between the two measurement should be 58 mm (2.3 inches) $\pm$ 3 mm (0.12 inches).

- (6) If value is greater than 61 mm (2.4 inches), tighten the torsion bar bolt until the specification is achieved (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

- (7) If value is less than 55 mm (2.1 inches), loosen the torsion bar bolt until the specification is achieved, (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

- (8) Repeat the previous steps until the ride height is within specifications.



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Fig. 2 HEIGHT MEASUREMENT

- 1 - HEIGHT FROM THE GROUND AT THE FRONT SPINDLE CENTERLINE (STATIC LOAD RADIUS)
- 2 - CENTERLINE OF THE REAR LOWER CONTROL ARM BOLT FRONT TIP
- 3 - GROUND LINE

STANDARD PROCEDURE - HEIGHT ADJUSTMENT - 4WD (LD)

The vehicle suspension height **MUST** be measured and adjusted before performing wheel alignment procedure (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE). Also when front suspension components have been replaced. This measurement must be performed with the vehicle supporting it's own weight and taken on both sides of the vehicle.

WHEEL ALIGNMENT (Continued)

To adjust the vehicle height turn the torsion bar adjustment bolt **CLOCKWISE** to raise the vehicle and **COUNTER CLOCKWISE** to lower the vehicle.

CAUTION: ALWAYS raise the vehicle to the correct suspension height, **NEVER** lower the vehicle to obtain the correct suspension height. If the vehicle suspension height is too high, lower the vehicle below the height specification. Then raise the vehicle to the correct suspension height specification. This will insure the vehicle maintains the proper suspension height.

NOTE: If a height adjustment has been made, perform height measurement again on both sides of the vehicle.

STANDARD PROCEDURE - CAMBER AND CASTER ADJUSTMENT

NOTE: 4X4 (LD) SUSPENSION HEIGHT MEASUREMENT MUST BE PERFORMED BEFORE AN ALIGNMENT.

NOTE: When the upper control arm pivot bolts are loosened the upper control arm will normally go inwards toward the frame automatically with the weight of the vehicle.

Camber and caster angle adjustments involve changing the position of the upper control arm in conjunction with the slotted holes in the frame brackets. Install special tool 8876 between the top of the upper control arm bracket and the upper control arm (on 1500 series 4X2 & 4X4). Install special tool 8876 between the bottom of the upper control arm bracket pressing the tool against the frame and the upper control arm (on 2500/3500 series 4X2) in order to move the upper control arm outwards for proper adjustment with the vehicle at normal ride height (Fig. 3).

STANDARD PROCEDURE - TOE ADJUSTMENT

4X4 SUSPENSION HEIGHT MEASUREMENT MUST BE PERFORMED BEFORE AN ALIGNMENT.

The wheel toe position adjustment is the final adjustment.

(1) Start the engine and turn wheels both ways before straightening the wheels. Secure the steering wheel with the front wheels in the straight-ahead position.

(2) Loosen the tie rod jam nuts.

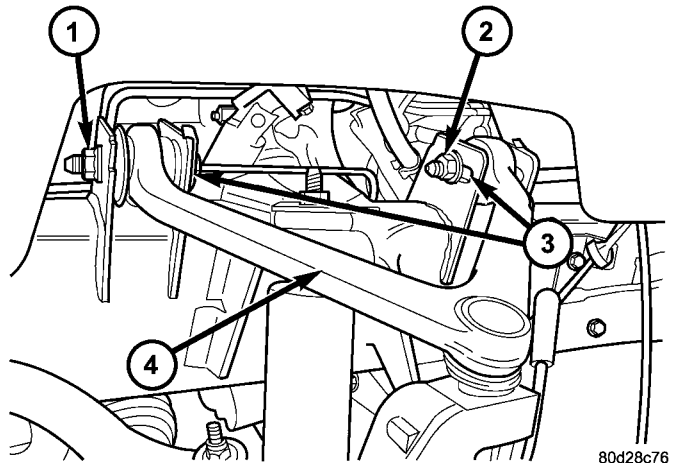


Fig. 3 CASTER & CAMBER ADJUSTMENT

- 1 - FRONT PIVOT BOLT
- 2 - REAR PIVOT BOLT
- 3 - SLOTTED HOLES FOR ADJUSTMENT OF CASTER & CAMBER
- 4 - UPPER CONTROL ARM

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 inner tie rod as necessary (Fig. 4).

(4) Tighten the tie rod jam nut to 75 N·m (55 ft. lbs.).

(5) Verify the specifications

(6) Turn off engine.

STANDARD PROCEDURE - CAMBER, CASTER AND TOE ADJUSTMENT

NOTE: 4X4 (LD) SUSPENSION HEIGHT MEASUREMENT MUST BE PERFORMED BEFORE AN ALIGNMENT.

Camber and caster angle adjustments involve changing the position of the upper control arm with the slots in the frame brackets using special tool 8876 to move the upper control arm outwards for proper adjustment. (Fig. 3)

NOTE: When the upper control arm pivot bolts are loosened the upper control arm will normally go inwards toward the frame automatically with the weight of the vehicle.

CASTER

Moving the front or rear position of the upper control arm in or out, will change the caster angle and camber angle significantly. To maintain the camber

WHEEL ALIGNMENT (Continued)

angle while adjusting caster, move one pivot bolt of the upper control arm in or out. Then move the other pivot bolt of the upper control arm in the opposite direction. Install special tool 8876 between the top of the upper control arm bracket and the upper control arm (on 1500 series 4X2 & 4X4). Install special tool 8876 between the bottom of the upper control arm bracket pressing the tool against the frame and the upper control arm (on 2500/3500 series 4X2) in order to move the upper control arm outwards for proper adjustment with the vehicle at normal ride height (Fig. 3).

To increase positive caster angle, move the rear position of the upper control arm inward (toward the engine). Move the front of the upper control arm outward (away from the engine) slightly until the original camber angle is obtained using special tool 8876 to move the upper control arm for proper adjustment. (Fig. 3)

CAMBER

Move both pivot bolts of the upper control arm together in or out. This will change the camber angle significantly and little effect on the caster angle using special tool 8876 to move the upper control arm for proper adjustment. (Fig. 3)

After adjustment is made tighten the upper control arm nuts to proper torque specification.

TOE ADJUSTMENT

The wheel toe position adjustment is the final adjustment.

(1) Start the engine and turn wheels both ways before straightening the wheels. Secure the steering wheel with the front wheels in the straight-ahead position.

(2) Loosen the tie rod jam 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 inner tie rod as necessary (Fig. 4).

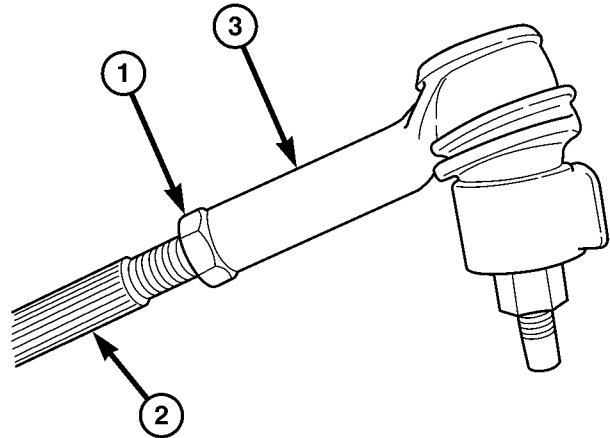
(4) Tighten the tie rod jam nut to 75 N·m (55 ft. lbs.).

(5) Verify the specifications

(6) Turn off engine.

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



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Fig. 4 TIE ROD END

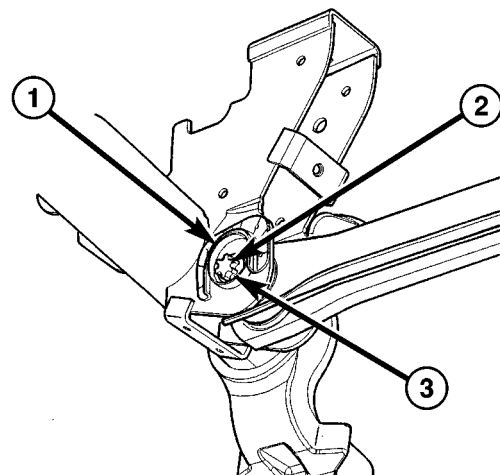
- 1 - JAM NUT
- 2 - TIE ROD - INNER
- 3 - TIE ROD END - OUTER

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).



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Fig. 5 ALIGNMENT ADJUSTMENT CAM

- 1 - BRACKET REINFORCEMENT
- 2 - ADJUSTING BOLT
- 3 - ADJUSTMENT CAM

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

2 - 6 WHEEL ALIGNMENT

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WHEEL ALIGNMENT (Continued)

(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 and a straight steering wheel.

(6) Road test the vehicle.

SPECIFICATIONS**ALIGNMENT**

NOTE: All alignment specifications are in degrees.

SPECIFICATIONS

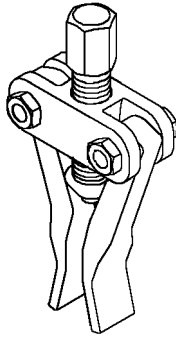
DESCRIP-TION	SPECIFICATION			
VEHICLE 1500	WHEEL BASE	CASTER (3.0° Max, +.75° Target)	CAMBER (± .50°)	TOTAL TOE-IN (± .10°)
4X2	120.5 in	4.0°	.0°	.10°
4X2	140.5 in	4.2°	.0°	.10°
4X2	160.5 in	4.4°	.0°	.10°
VEHICLE 1500	WHEEL BASE	CASTER (3.0° Max, +.75° Target)	CAMBER (±.50°)	TOTAL TOE-IN (±.10°)
4X4	120.5 in	4.2°	.0°	.10°
4X4	140.5 in	4.4°	.0°	.10°
4X4	160.5 in	4.6°	.0°	.10°

DESCRIP- TION	SPECIFICATION			
MAX RT/LT DIF- FERENCE 4X2 1500	—	.40°	.50°	0.06°
MAX RT/LT DIF- FERENCE 4X4 1500	—	.40°	.60°	0.06°
VEHICLE 4X2 2500 & 3500	WHEEL BASE	CASTER (3.25° Max, +.75° Target)	CAMBER (±.50°)	TOTAL TOE-IN (0.20° ±.10°)
4X2 2500&3500	140	4.0°	0.0°	.10° ± .05°
4X2 2500&3500	160	4.3°	0.0°	.10° ± .05°
MAX RT/LT DIF- FERENCE 4X2 2500&3500	—	±0.4°	±0.6°	0.1°
VEHICLE 4X4 2500&3500	WHEEL BASE	CASTER (4.0° Min, +.75° Target)	CAMBER (.25° ±.5°)	TOTAL TOE-IN (0.20° ±.10°)
4X4 2500&3500	140	4.5°	.25°	.10° ± .05°
4X4 2500&3500	160	4.7°	.25°	.10° ± .05°
MAX RT/LT DIF- FERENCE 4X4 2500&3500	—	±.5°	±.5°	0.1°
DESCRIP- TION	REAR SPECIFICATION			
CAMBER (-.10° ± 0.35°)		TOTAL TOE-IN (0.30° ± 0.35°)		
THRUST ANGLE 0° ± 0.4° 4X2 4X4 1500				
THRUST ANGLE -0.2° ± 0.2° 4X2 4X4 2500&3500				

WHEEL ALIGNMENT (Continued)

SPECIAL TOOLS

WHEEL ALIGNMENT



8876 - CAMBER/CASTER ADJUSTMENT TOOL

FRONT - INDEPENDENT FRONT SUSPENSION

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FRONT - INDEPENDENT FRONT SUSPENSION

DESCRIPTION

DESCRIPTION

The front suspension is designed to allow each wheel to adapt to different road surfaces independently. The wheels are mounted to hub/bearings units bolted to the steering knuckle. The double-row hub bearings are sealed and lubricated for life. The steering knuckles turn (pivot) on ball joints.

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

- Shock absorbers
- Torsion bar - 4X4 (LD only)
- Coil Spring - 4X2
- Control arms
- Steering knuckles
- Stabilizer bar
- Stabilizer link
- Tie Rod Ends
- Hub/Bearing
- Rack & Pinion
- Ball Joints

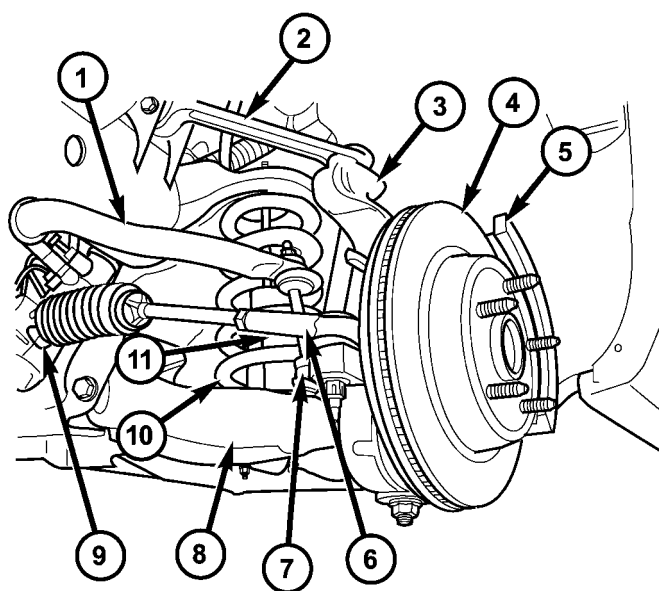
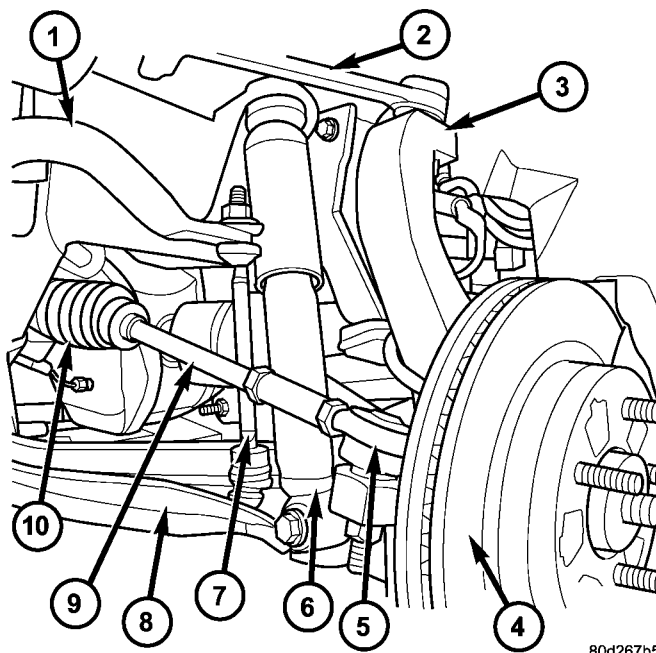


Fig. 1 FRONT SUSPENSION - 4X2

- 1 - STABILIZER BAR
- 2 - UPPER CONTROL ARM
- 3 - STEERING KNUCKLE
- 4 - ROTOR
- 5 - CALIPER ADAPTER
- 6 - OUTER TIE ROD END
- 7 - STABILIZER LINK
- 8 - LOWER CONTROL ARM
- 9 - RACK & PINION
- 10 - COIL SPRING
- 11 - SHOCK ABSORBER

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Fig. 2 FRONT SUSPENSION - 4X4 (LD ONLY)

- 1 - STABILIZER BAR
- 2 - UPPER CONTROL ARM
- 3 - STEERING KNUCKLE
- 4 - ROTOR
- 5 - OUTER TIE ROD END
- 6 - SHOCK ABSORBER
- 7 - STABILIZER LINK
- 8 - LOWER CONTROL ARM
- 9 - INNER TIE ROD
- 10 - RACK & PINION

NOTE: Components attached with a nut must be torqued to specification.

NOTE: Suspension components with rubber/urethane bushings should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

DESCRIPTION

The upper control arm bolts on frame brackets. The frame brackets have slotted holes which allow the arms to be adjusted for caster and camber.

The lower control arms bolt to the lower frame brackets and pivots through bushings.

The control arms have lube for life ball studs. The control arm travel (jounce) is limited through the use of rubber/urethane bumpers. Rebound travel is limited by the shock absorber.

2 - 10 FRONT - INDEPENDENT FRONT SUSPENSION

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FRONT - INDEPENDENT FRONT SUSPENSION (Continued)

SPECIFICATIONS

TORQUE CHART

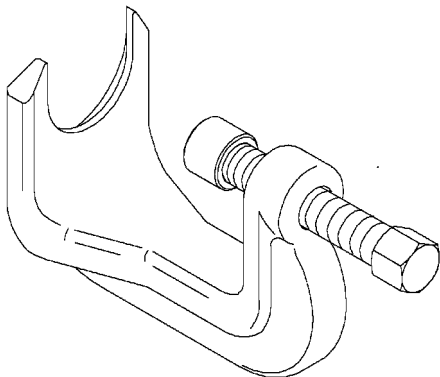
TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Shock Absorber Upper Nut 4X4	54	40	—
Shock Absorber Lower Bolt 4X4	135	100	—
Shock Absorber Upper Nut 4X2	54	40	—
Shock Absorber Lower Bolt 4X2	34	25	—
Lower Suspension Arm Frame Nuts	204	150	—
Lower Suspension Arm Frame Nuts	285	210	—
Lower Suspension Arm Ball Joint Nut 1500 series only	52 Then an additional 90°	38 Then an additional 90°	—
Lower Suspension Arm Ball Joint Nut (HD 4X2 only)	135	100	—
Upper Suspension Arm Frame Nuts (LD)	132	97	—
Upper Suspension Arm Frame Nuts (HD 4X2 only)	170	125	—
Upper Suspension Arm Ball Joint Nut 1500 series only	54 Then an additional 90°	40 Then an additional 90°	—
Stabilizer Bar Frame Bolt	61	45	—
Stabilizer Link Lower Control Arm Nut	102	75	—
Stabilizer Link Stabilizer Bar Nut	38	27	—
Hub/Bearing Bolts (LD)	163	120	—
Hub/Bearing Bolts (HD 4X2)	176	130	—
Tie Rod End Nut	61 Then an additional 90°	45 Then an additional 90°	—

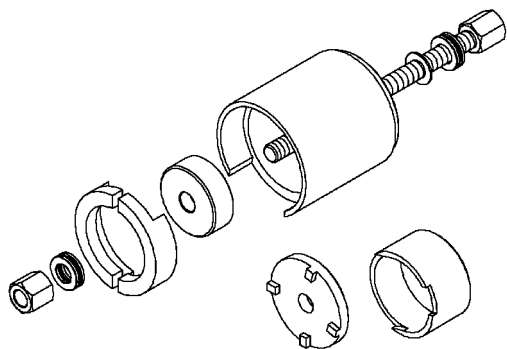
FRONT - INDEPENDENT FRONT SUSPENSION (Continued)

SPECIAL TOOLS

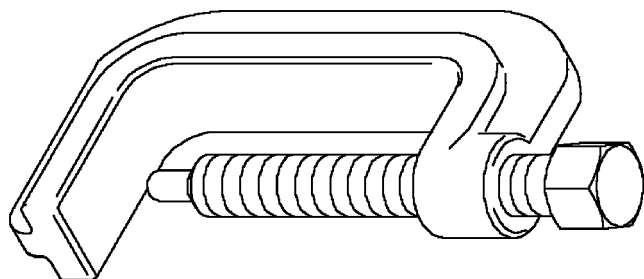
FRONT SUSPENSION



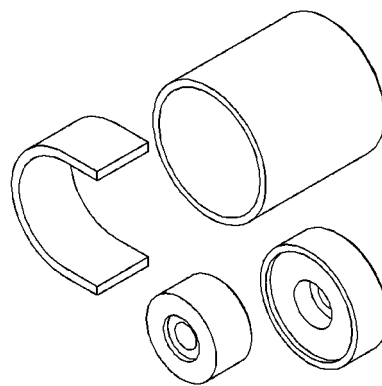
PULLER - 8677



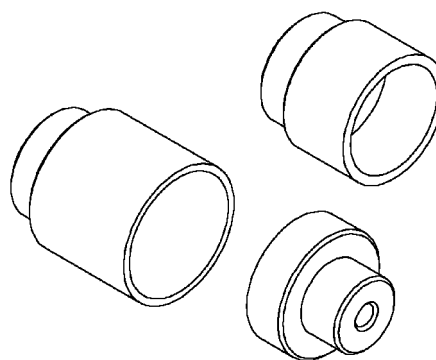
4WD BUSHING REMOVAL/INSTALL KIT - 8682



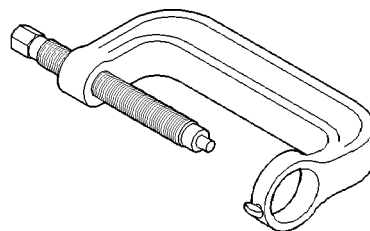
TORSION BAR LOADER/UNLOADER - 8686



TORSION BAR BUSHING REMOVAL/INSTALL - 8835

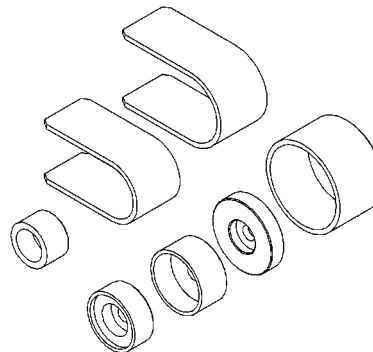


RECEIVER/ DRIVER BALLJOINT - 8698



C-4212F-EC114af

BALL JOINT PRESS - C-4212F



**2WD - LOWER CONTROL ARM BUSHING
REMOVAL/INSTALL - 8836**

BUSHINGS

REMOVAL

REMOVAL - LOWER CONTROL ARM BUSHINGS - 4WD (LD)

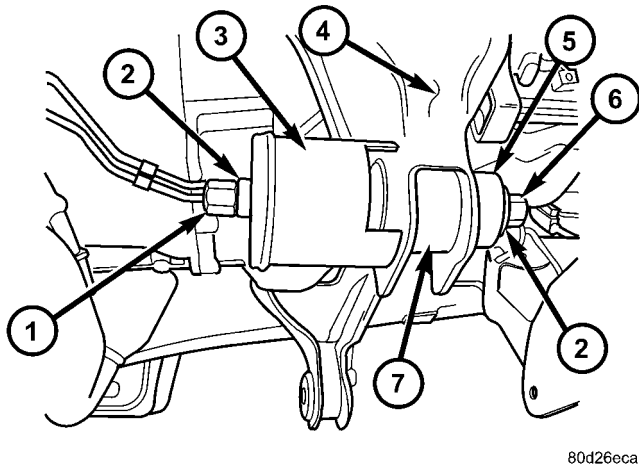
(1) Remove the lower control arm (Refer to 2 - SUSPENSION/FRONT/LOWER CONTROL ARM - REMOVAL).

(2) Secure the control arm in a vise.

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

FRAME MOUNTED BUSHING

(1) Install the bushing tool 8682-3 (receiver) and 8682-4 (driver) with the threaded rod and the two bearings as shown for the replacement of the frame bushing (Fig. 3)



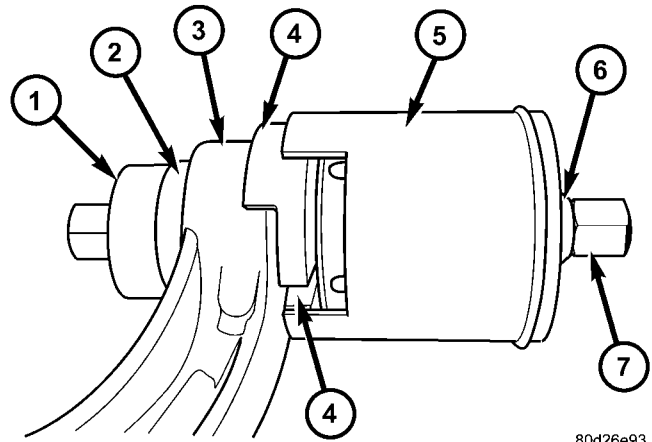
80d26eca

Fig. 3 FRAME BUSHING REMOVAL

- 1 - THREADED ROD
- 2 - BEARINGS
- 3 - 8682-3 (RECEIVER)
- 4 - FRAME
- 5 - 8682-4 (DRIVER)
- 6 - NUT
- 7 - BUSHING

CONTROL ARM BUSHING

(1) Install bushing remover tools 8682-2 (adapter), 8682-3 (receiver) and 8682-4 (driver) with the threaded rod and the two bearings as shown (Fig. 4)



80d26e93

Fig. 4 CONTROL ARM BUSHING REMOVAL

- 1 - 8682-4 (DRIVER)
- 2 - BUSHING
- 3 - LOWER CONTROL ARM
- 4 - 8682-2 (ADAPTER)
- 5 - 8682-3 (RECEIVER)
- 6 - BEARING
- 7 - THREADED ROD

REMOVAL - TORSION BAR CROSSMEMBER BUSHING

(1) Remove the torsion bar cross member (Refer to 13 - FRAME & BUMPERS/FRAME/REAR CROSSMEMBER - REMOVAL).

(2) Secure the cross member in a vise.

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

(3) Install special tools 8838 threaded rod, 8835-1, 8835-4 and 8835-3 as shown in the graphic below (Fig. 5).

(4) Press out the bushing.

REMOVAL - LOWER CONTROL ARM BUSHINGS - 2WD (LD)

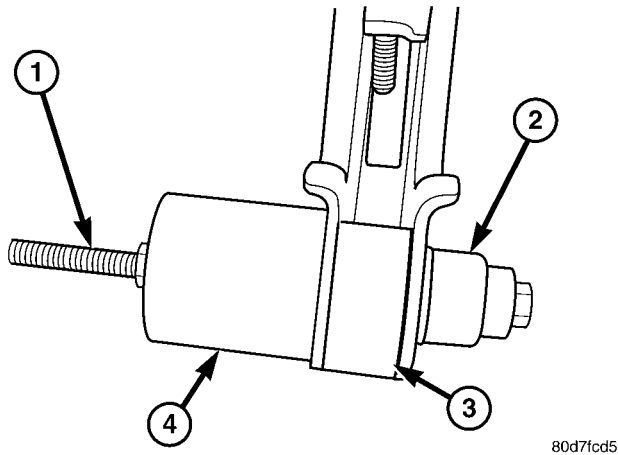
NOTE: HD 4X2 bushings are not servicable.

(1) Remove the lower control arm (Refer to 2 - SUSPENSION/FRONT/LOWER CONTROL ARM - REMOVAL).

(2) Secure the control arm in a vise.

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

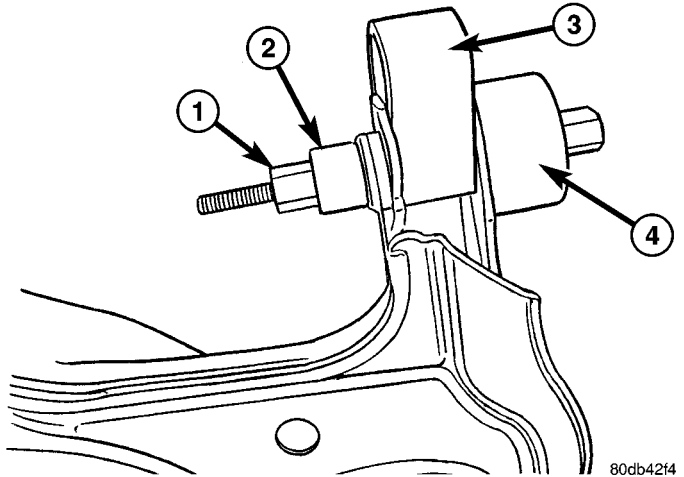
BUSHINGS (Continued)



80d71cd5

Fig. 5 TORSION BAR CROSS MEMBER BUSHING - REMOVAL

- 1 - 8838
- 2 - 8835-1
- 3 - 8835-4
- 4 - 8835-3



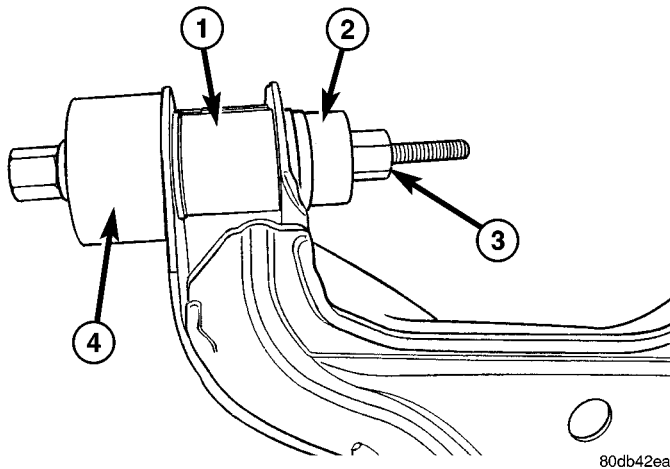
80db42f4

Fig. 7 SMALL LOWER CONTROL ARM BUSHING - REMOVAL

- 1 - 8839 (THREADED ROD)
- 2 - 8836-6 (DRIVER)
- 3 - 8836-3 (SPACER)
- 4 - 8836-2 (RECEIVER)

LARGE BUSHING

(1) Install bushing remover tools 8836-2 (receiver), 8836-4 (spacer) and 8836-5 (driver) with the threaded rod 8839 and the bearing as shown (Fig. 6) for replacement of the large bushing.



80db42ea

Fig. 6 LARGE LOWER CONTROL ARM BUSHING - REMOVAL

- 1 - 8836-4 (SPACER)
- 2 - 8836-5 (DRIVER)
- 3 - 8839 (THREADED ROD)
- 4 - 8836-2 (RECEIVER)

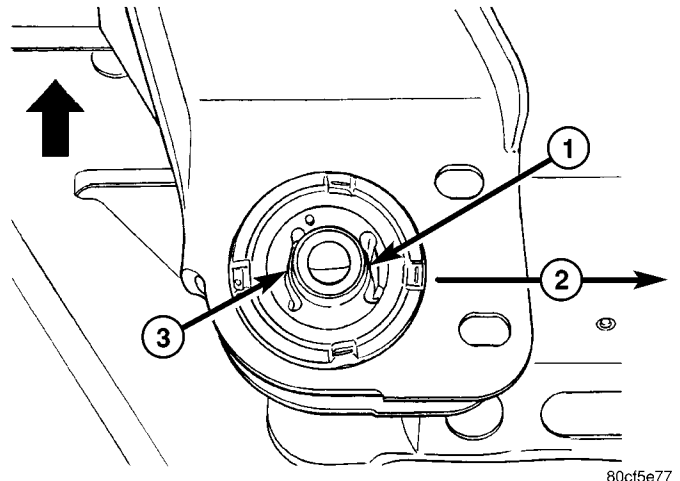
SMALL BUSHING

(1) Install the bushing tool 8836-6 (driver), 8836-3 (spacer) and 8836-2 (receiver) with the threaded rod 8839 and the bearing as shown for the replacement of the small bushing (Fig. 7)

INSTALLATION

INSTALLATION - LOWER CONTROL ARM BUSHINGS - 4WD (LD)

NOTE: Be careful to properly orient the bushing voids in the correct position to within $\pm 10^\circ$. The correct position places the long narrow void outboard of the bushing and the short wide void inboard of the bushing (Fig. 8).



80cf5e77

Fig. 8 REAR LOWER CONTROL ARM BUSHING

- 1 - SHORT - WIDE VOID
- 2 - INWARD TOWARD VEHICLE
- 3 - LONG - THIN VOID

BUSHINGS (Continued)

FRAME MOUNTED BUSHING

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

(1) Install the new bushing into the frame using special tools 8682-3 (receiver), 8682-1 (driver) with the two bearings and the threaded rod (Fig. 9) making sure to properly orient the bushing as shown (Fig. 8).

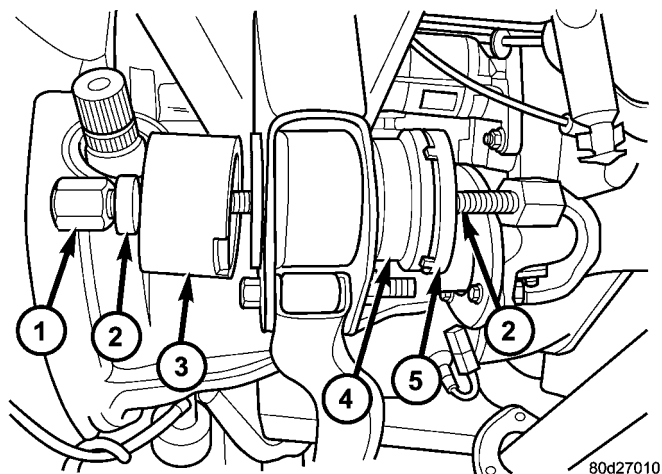


Fig. 9 FRAME BUSHING INSTALL

- 1 - THREADED ROD
- 2 - BEARINGS
- 3 - 8682-3 (RECEIVER)
- 4 - BUSHING
- 5 - 8682-1 (DRIVER)

CONTROL ARM BUSHING

(1) Install the new lower control arm bushings into the lower control arm using tools 8682-1 (driver), 8682-5 (receiver) and the two bearings with the threaded rod (Fig. 10) making sure to properly orient the bushing in the control (Fig. 8).

- (1) Remove the control arm from the vise.
- (2) Install the lower control arm (Refer to 2 - SUSPENSION/FRONT/LOWER CONTROL ARM - INSTALLATION).
- (3) Reset the vehicle ride height (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).
- (4) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

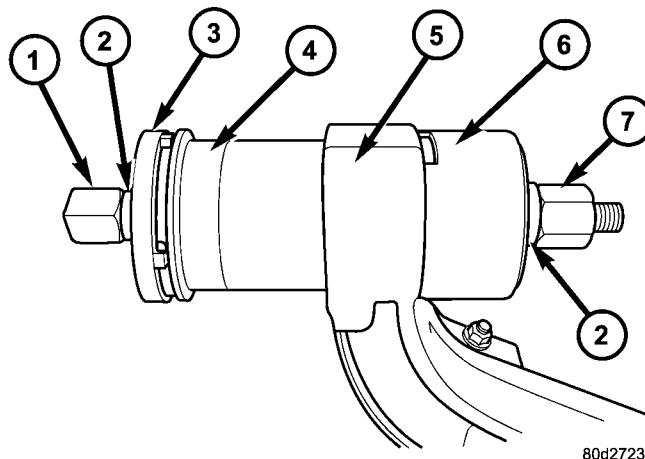


Fig. 10 CONTROL ARM BUSHING INSTALL

- 1 - THREADED ROD
- 2 - BEARINGS
- 3 - 8682-1 (DRIVER)
- 4 - BUSHING
- 5 - CONTROL ARM
- 6 - 8682-5 (RECEIVER)
- 7 - NUT

INSTALLATION - TORSION BAR CROSS MEMBER BUSHING

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

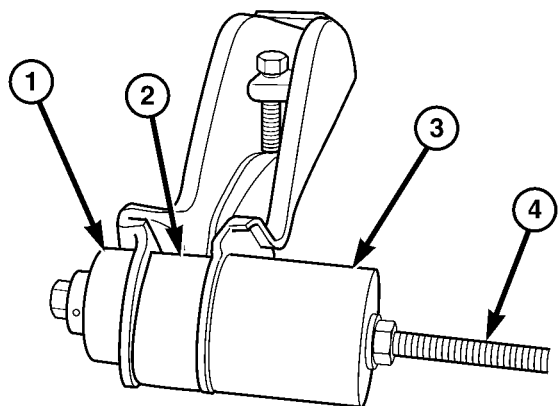
(1) Install the new bushing into the cross member using special tools 8835-2, 8835-4 and 8835-3 with the bearing and the threaded rod 8838 (Fig. 11) making sure to properly orient the bushing.

- (2) Remove the cross member from the vise.
- (3) Install the torsion bar cross member (Refer to 13 - FRAME & BUMPERS/FRAME/REAR CROSS-MEMBER - INSTALLATION).
- (4) Reset the vehicle ride height (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).
- (5) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

INSTALLATION - LOWER CONTROL ARM BUSHINGS - 2WD (LD)

NOTE: HD 4X2 bushings are not servicable.

BUSHINGS (Continued)



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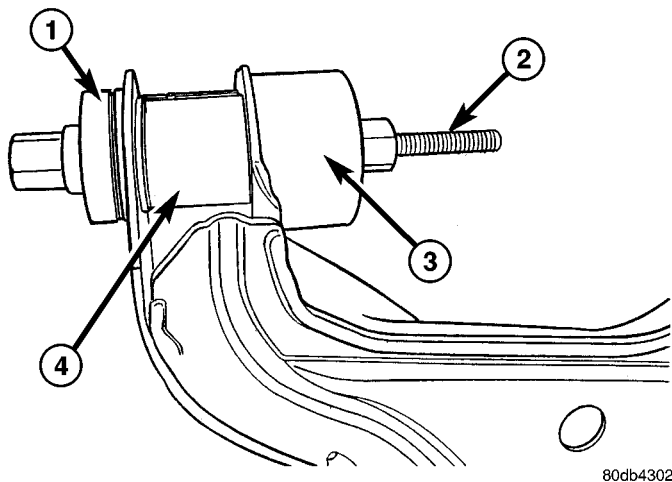
Fig. 11 TORSION BAR CROSS MEMBER BUSHING - INSTALLATION

- 1 - 8835-2
- 2 - 8835-4
- 3 - 8835-3
- 4 - 8838

LARGE BUSHING

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

(1) Install the new bushing into the lower control arm using special tools 8836-2 (receiver), 8836-1 (driver), 8836-4 (spacer) with the bearing and the threaded rod (8839) (Fig. 12).



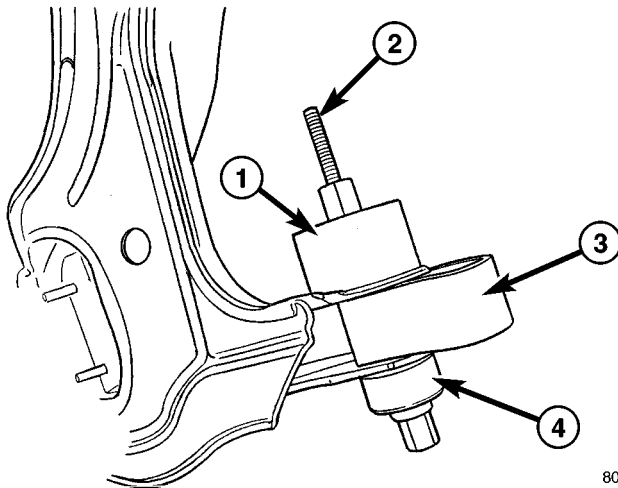
80db4302

Fig. 12 LARGE LOWER CONTROL ARM BUSHING - INSTALL

- 1 - 8836-1 (DRIVER)
- 2 - 8839 (THREADED ROD)
- 3 - 8836-2 (RECEIVER)
- 4 - 8836-4 (SPACER)

SMALL BUSHING

(1) Install the small bushings into the lower control arm using tools 8836-7 (driver), 8836-2 (receiver), 8836-3 (spacer) and the bearing with the threaded rod (8839) (Fig. 13).



80db4318

Fig. 13 SMALL LOWER CONTROL ARM BUSHING - INSTALL

- 1 - 8836-2 (RECEIVER)
- 2 - 8839 (THREADED ROD)
- 3 - 8836-3 (SPACER)
- 4 - 8836-7 (DRIVER)

- (1) Remove the control arm from the vise.
- (2) Install the lower control arm (Refer to 2 - SUSPENSION/FRONT/LOWER CONTROL ARM - INSTALLATION).
- (3) Reset the vehicle ride height (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).
- (4) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

HUB / BEARING

REMOVAL

REMOVAL - 4X4

- (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/ROTORS - REMOVAL).
- (4) Remove the ABS wheel speed sensor if equipped, (Refer to 5 - BRAKES/ELECTRICAL/FRONT WHEEL SPEED SENSOR - REMOVAL).
- (5) Remove the halfshaft nut.

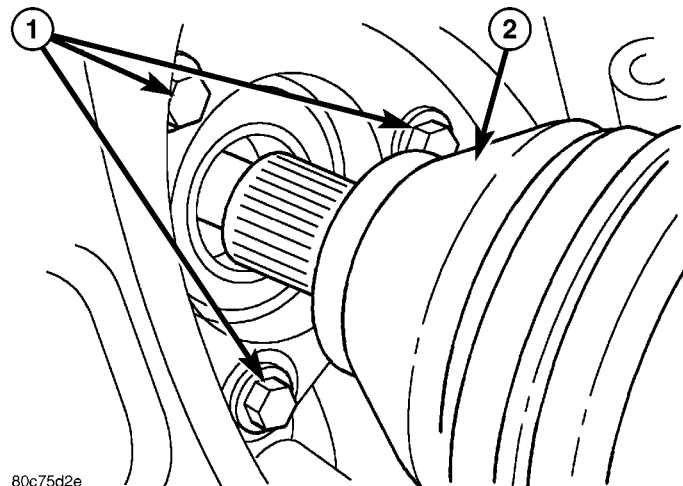
HUB / BEARING (Continued)

NOTE: Do not strike the knuckle with a hammer to remove the tie rod end or the ball joint. Damage to the steering knuckle will occur.

(6) Remove the tie rod end nut and separate the tie rod from the knuckle using special tool 8677.

(7) Remove the upper ball joint nut and separate the upper ball joint from the knuckle using special tool 8677.

(8) Pull down on the steering knuckle to separate the halfshaft from the hub/bearing.



80c75d2e

Fig. 14 HALFSHAFT / HUB/BEARING

- 1 - HUB/BEARING MOUNTING NUTS
- 2 - HALF SHAFT

(9) Remove the three hub/bearing mounting bolts from the steering knuckle (Fig. 14).

(10) Slide the hub/bearing out of the steering knuckle (Fig. 14).

(11) Remove the brake dust shield.

REMOVAL - 4X2

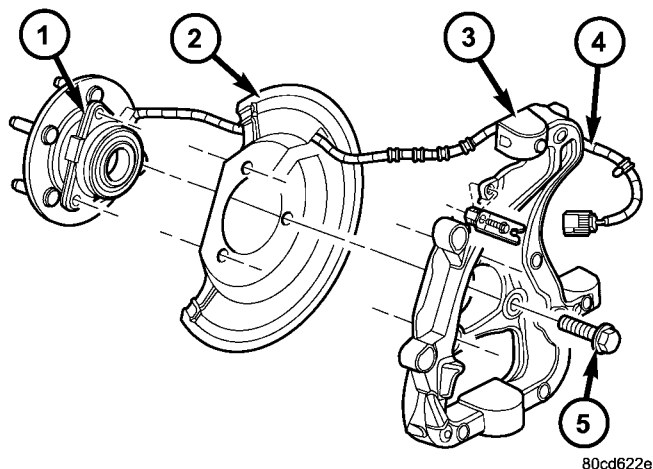
(1) Raise and support the vehicle.
 (2) Remove the wheel and tire assembly.
 (3) Remove the brake caliper and rotor (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - REMOVAL).

(4) Remove the ABS wheel speed sensor if equipped, (Refer to 5 - BRAKES/ELECTRICAL/FRONT WHEEL SPEED SENSOR - REMOVAL) (Fig. 15)

(5) Remove the three hub/bearing mounting bolts from the steering knuckle (Fig. 15).

(6) Slide the hub/bearing out of the steering knuckle (Fig. 15).

(7) Remove the brake dust shield (Fig. 15).



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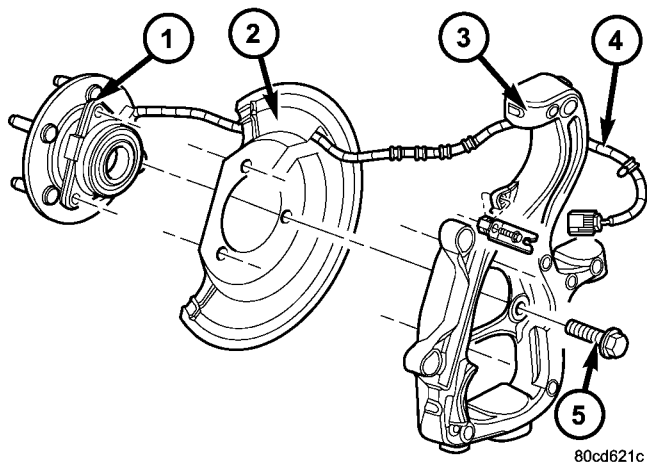
Fig. 15 HUB/BEARING 4X2

- 1 - HUB/BEARING
- 2 - DUST SHIELD
- 3 - STEERING KNUCKLE
- 4 - WHEEL SPEED SENSOR WIRE
- 5 - HUB/BEARING MOUNTING NUT

INSTALLATION**INSTALLATION - 4X4**

(1) Install the brake dust shield (Fig. 16).

(2) Install the hub/bearing into the steering knuckle and tighten the bolts to 163 N·m (120 ft. lbs.) (Fig. 16).



80cd621c

Fig. 16 HUB/BEARING 4X4

- 1 - HUB/BEARING
- 2 - DUST SHIELD
- 3 - STEERING KNUCKLE
- 4 - WHEEL SPEED SENSOR WIRE
- 5 - HUB/BEARING MOUNTING NUT

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

HUB / BEARING (Continued)

(4) Install the ABS wheel speed sensor if equipped (Refer to 5 - BRAKES/ELECTRICAL/FRONT WHEEL SPEED SENSOR - INSTALLATION).

(5) Install the upper ball joint nut to the steering knuckle and tighten to 54 N·m (40 ft. lbs.) (on 1500 series only an additional 90° turn).

(6) Install the tie rod end nut to the steering knuckle and tighten to 61 N·m (45 ft. lbs.) then an additional 90°.

(7) Install the halfshaft nut and tighten to 251 N·m (185 ft. lbs.).

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

(9) Remove the support and lower vehicle.

INSTALLATION - 4X2

(1) Install the brake dust shield (Fig. 15).

(2) Install the hub/bearing into the steering knuckle and tighten the bolts to 163 N·m (120 ft. lbs.) (Fig. 15).

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

(4) Install the ABS wheel speed sensor if equipped (Refer to 5 - BRAKES/ELECTRICAL/FRONT WHEEL SPEED SENSOR - INSTALLATION) (Fig. 15).

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

(6) Remove the support and lower vehicle.

KNUCKLE

DESCRIPTION

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

OPERATION

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

REMOVAL

(1) Raise and support the vehicle.

(2) Remove the wheel and tire assembly.

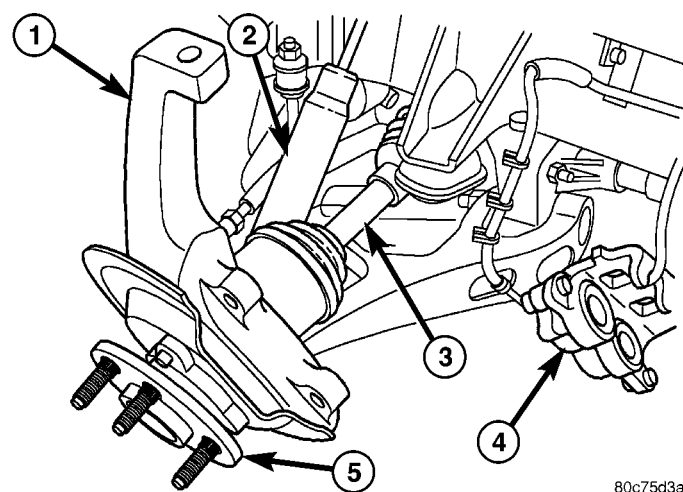
(3) Remove the brake caliper, rotor (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - REMOVAL), shield and ABS wheel speed sensor if equipped (Refer to 5 - BRAKES/ELECTRICAL/FRONT WHEEL SPEED SENSOR - REMOVAL).

(4) Remove the front halfshaft nut (if equipped).

(5) Remove the tie rod end nut. Separate the tie rod from the knuckle with Remover 8677.

CAUTION: When installing Remover 8677 to separate the ball joint, be careful not to damage the ball joint seal.

(6) Remove the upper ball joint nut. Separate the ball joint from the knuckle with Remover 8677 (Fig. 17)

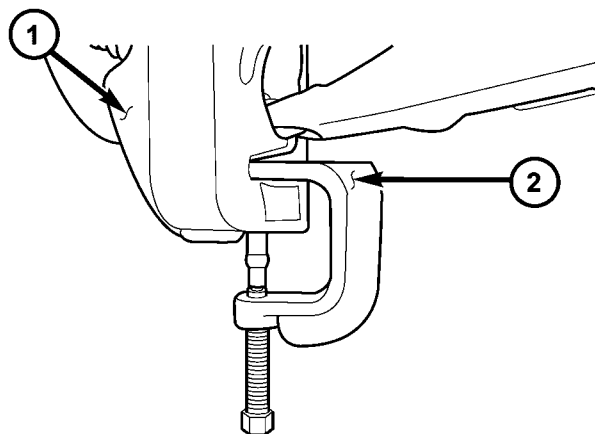


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Fig. 17 STEERING KNUCKLE

- 1 - STEERING KNUCKLE
- 2 - SHOCK
- 3 - HALFSHAFT
- 4 - DISC BRAKE CALIPER
- 5 - HUB/BEARING

(7) Remove the lower ball joint nut. Separate the ball joint from the knuckle with Remover 8677 (Fig. 18) and remove the knuckle.



80d267c7

Fig. 18 LOWER BALL JOINT SEPARATION

- 1 - STEERING KNUCKLE
- 2 - SPECIAL TOOL 8677

KNUCKLE (Continued)

(8) Remove the hub/bearing from the steering knuckle (Refer to 2 - SUSPENSION/FRONT/HUB / BEARING - REMOVAL).

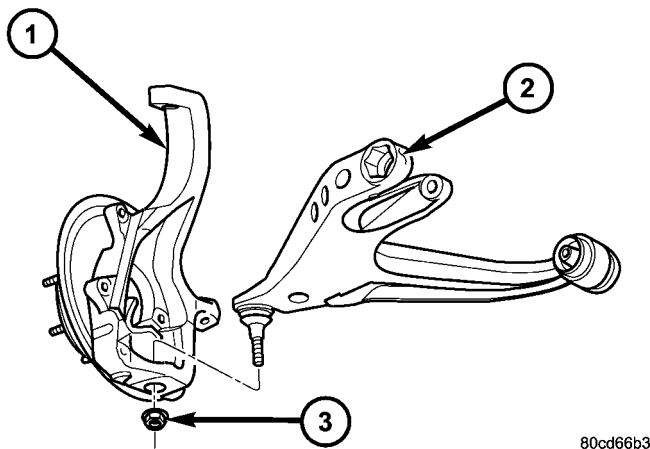
INSTALLATION

CAUTION: The ball joint stud tapers must be **CLEAN** and **DRY** before installing the knuckle. Clean the stud tapers with mineral spirits to remove dirt and grease.

NOTE: When installing hub/bearing with ABS brakes, position the speed sensor opening towards the front of the vehicle.

(1) Install the hub/bearing to the steering knuckle and tighten the bolts to 163 N·m (120 ft. lbs.)(LD) or 176 N·m (130 ft. lbs.)(HD 4X2) (Fig. 19).

(2) Install the knuckle onto the upper and lower ball joints (Fig. 19).



80cd66b3

Fig. 19 STEERING KNUCKLE

- 1 - STEERING KNUCKLE
- 2 - LOWER CONTROL ARM
- 3 - LOWER BALL JOINT NUT

(3) Install the upper and lower ball joint nuts. Tighten the upper ball joint nut to 54 N·m (40 ft. lbs.) (on 1500 series only an additional 90° turn is required) and the lower ball joint nut to 52 N·m (38 ft. lbs.)(on 1500 series only an additional 90° turn is required)(LD) or 135 N·m (100 ft. lbs.)(HD 4X2).

(4) Remove the hydraulic jack from the lower suspension arm.

(5) Install the tie rod end and tighten the nut to 61 N·m (45 ft. lbs.).

(6) Install the front halfshaft into the hub/bearing (if equipped).

(7) Install the the halfshaft nut and tighten to 251 N·m (185 ft. lbs.) (if equipped).

(8) Install the ABS wheel speed sensor if equipped (Refer to 5 - BRAKES/ELECTRICAL/FRONT WHEEL SPEED SENSOR - INSTALLATION) and brake shield, rotor and caliper (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - INSTALLATION).

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

(10) Remove the support and lower the vehicle.

(11) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

LOWER BALL JOINT

DIAGNOSIS AND TESTING - LOWER BALL JOINT

NOTE: If the ball joint is equipped with a lubrication fitting, grease the joint then road test the vehicle before performing test.

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

(2) Mount a dial indicator solidly to the topside of the lower control arm and then zero the dial indicator.

(3) Position the indicator plunger against the bottom surface of the steering knuckle.

NOTE: The dial indicator plunger must be perpendicular to the machined surface of the steering knuckle.

(4) Position a pry bar under the tire assembly. Pry upwards on the tire assembly.

(5) If the travel exceeds 0.5 mm (0.020 in.), replace the lower ball joint (Refer to 2 - SUSPENSION/FRONT/LOWER BALL JOINT - REMOVAL).

REMOVAL

(1) Remove the tire and wheel assembly.

(2) Remove the brake caliper and rotor (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - REMOVAL).

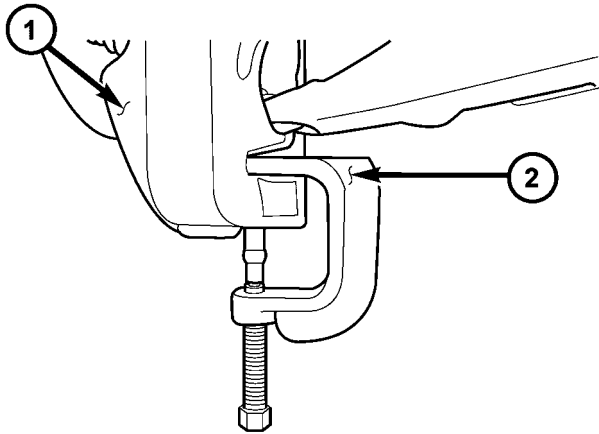
(3) Disconnect the tie rod from the steering knuckle (Refer to 19 - STEERING/LINKAGE/TIE ROD END - REMOVAL).

(4) Remove the steering knuckle (Fig. 20)(Refer to 2 - SUSPENSION/FRONT/KNUCKLE - REMOVAL).

(5) Move the halfshaft to the side and support the halfshaft out of the way (If Equipped).

(6) Remove the snap ring, from the lower control arm (HD 4X2 only)

LOWER BALL JOINT (Continued)



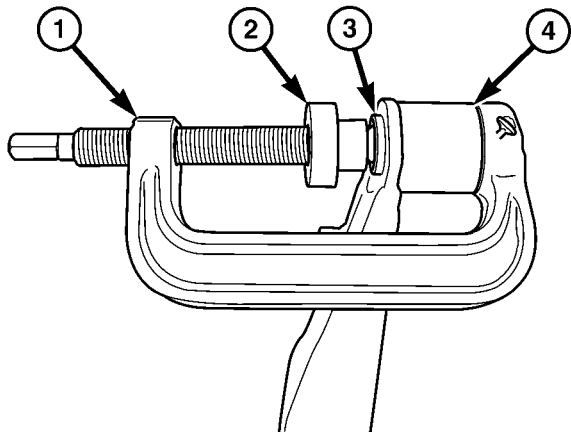
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Fig. 20 LOWER BALL JOINT SEPARATION

- 1 - STEERING KNUCKLE
2 - SPECIAL TOOL 8677

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

(7) Press the ball joint from the lower control arm using special tools C-4212-F (PRESS), 8698-2 (RECEIVER) and 8698-3 (DRIVER) (Fig. 21).



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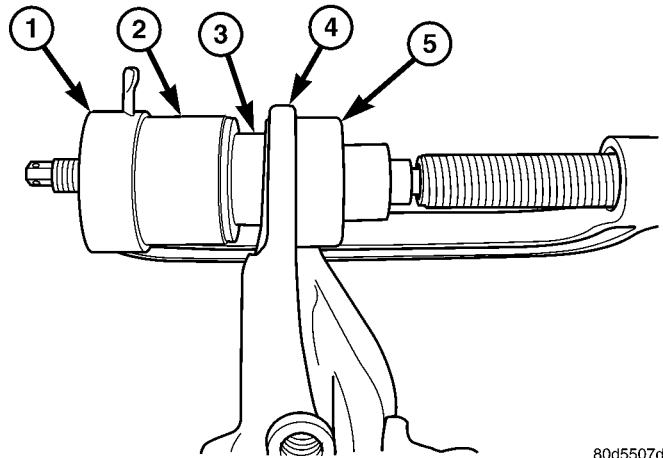
Fig. 21 REMOVAL LOWER BALL JOINT

- 1 - PRESS - C-4212-F
2 - DRIVER - 8698-3
3 - BALL JOINT
4 - RECEIVER - 8698-2

INSTALLATION

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

(1) Install the ball joint into the control arm and press in using special tools C-4212-F (press), 8698-1 (driver) and 8698-3 (receiver) (Fig. 22).



80d5507d

Fig. 22 INSTALL LOWER BALL JOINT

- 1 - PRESS - C-4212-F
2 - DRIVER - 8698-1
3 - BALL JOINT
4 - LOWER CONTROL ARM
5 - RECEIVER - 8698-3

(2) Install the ball joint boot.

(3) Stake the ball joint flange in four evenly spaced places around the ball joint flange, using a chisel and hammer (LD only).

(4) Replace the snap ring (HD 4X2 only)

(5) Remove the support for the halfshaft and install into position (If Equipped).

(6) Install the steering knuckle (Refer to 2 - SUSPENSION/FRONT/KNUCKLE - INSTALLATION).

(7) Install the tie rod end into the steering knuckle (Refer to 19 - STEERING/LINKAGE/TIE ROD END - INSTALLATION).

(8) Install and tighten the halfshaft nut to 251 N·m (185 ft. lbs.). (If Equipped).

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

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

(11) Check the vehicle ride height (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

(12) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

LOWER CONTROL ARM

REMOVAL

REMOVAL - 4X4 (LD)

- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assembly.
- (3) Remove the upper ball joint nut. Separate ball joint from the steering knuckle with Remover 8677.
- (4) Remove the front halfshaft, (Refer to 3 - DIFFERENTIAL & DRIVELINE/HALF SHAFT - REMOVAL).
- (5) Remove the torsion bar, (Refer to 2 - SUSPENSION/FRONT/TRACK BAR - REMOVAL).
- (6) Remove the shock absorber lower bolt.
- (7) Remove the stabilizer bar link (Refer to 2 - SUSPENSION/FRONT/STABILIZER LINK - REMOVAL).
- (8) Remove the lower ball joint nut. Separate ball joint from the steering knuckle with Remover 8677.
- (9) Remove the control arm pivot bolts and suspension arm from frame rail brackets (Fig. 23).

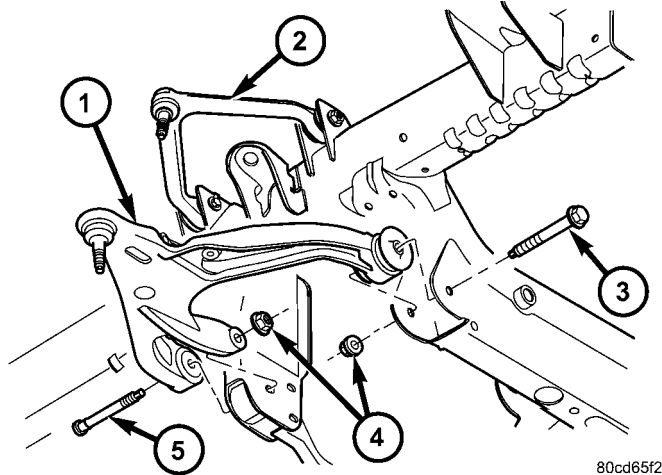


Fig. 23 LOWER CONTROL ARM

- 1 - LOWER CONTROL ARM
- 2 - UPPER CONTROL ARM
- 3 - FRONT BOLT
- 4 - NUTS
- 5 - REAR BOLT

REMOVAL - 4X2

- (1) Raise and support the vehicle.
- (2) Remove the tire and wheel assembly.
- (3) Support the lower control arm at the outboard side of the lower control arm to support vehicle weight.
- (4) Remove the shock (Refer to 2 - SUSPENSION/FRONT/SHOCK - REMOVAL).
- (5) Install Spring Compressor DD-1278 up through the lower suspension arm, coil spring and shock hole

in the frame. The bell-shaped adapter goes against the lower suspension arm. Install the nut on top of the tool at the shock hole.

- (6) Tighten the spring compressor nut against bell-shaped adapter finger tight then loosen 1/2 turn.

NOTE: This will hold the spring in place until the lower suspension arm is separated from the steering knuckle.

- (7) Remove the stabilizer link (Refer to 2 - SUSPENSION/FRONT/STABILIZER LINK - REMOVAL).

- (8) Remove the lower ball joint nut at the steering knuckle.

- (9) Install Ball Joint Remover tool 8677 on the lower ball joint and separate the ball joint from the knuckle.

NOTE: Do not allow the upper control arm and steering knuckle to rebound downwards they must be supported.

- (10) Support the upper control arm and steering knuckle out of the way.

- (11) Remove the lower control arm support.

- (12) Tighten the spring compressor tool to allow clearance for the lower ball joint to be removed out of the knuckle.

- (13) Loosen the tension on the spring compressor tool slowly allowing the lower suspension arm to pivot downward.

- (14) Remove the spring compressor tool.

- (15) Remove coil spring and isolator pad from the vehicle (Fig. 26).

- (16) Remove the front and rear pivot bolts (Fig. 24).

- (17) Remove the lower control arm.

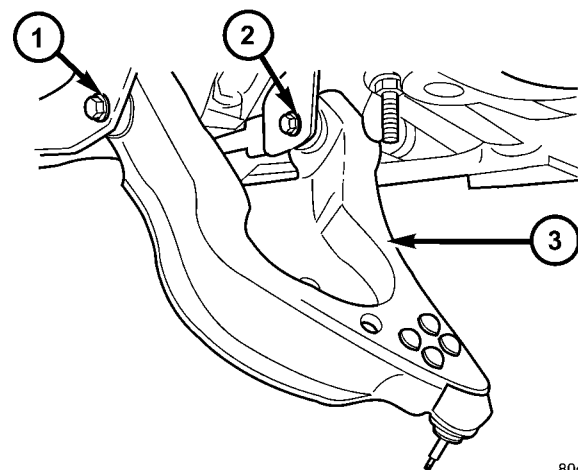


Fig. 24 LOWER CONTROL ARM - 4X2

- 1 - FRONT PIVOT BOLT
- 2 - REAR PIVOT BOLT
- 3 - LOWER CONTROL ARM

LOWER CONTROL ARM (Continued)**INSTALLATION****INSTALLATION - 4X4 (LD)**

(1) Position the lower control arm at the frame rail brackets. Install the pivot bolts and nuts. Tighten the nuts finger-tight.

CAUTION: The ball joint stud taper must be CLEAN and DRY before installing the knuckle. Clean the stud taper with mineral spirits to remove dirt and grease.

(2) Insert the lower ball joint into the steering knuckle. Install and tighten the retaining nut to 52 N·m (38 ft. lbs.)(on 1500 series only an additional 90° turn is required).

(3) Install the torsion bar, (Refer to 2 - SUSPENSION/FRONT/TRACK BAR - INSTALLATION).

(4) Install shock absorber lower bolt and tighten to 135 N·m (100 ft. lbs.).

(5) Install the front halfshaft, (Refer to 3 - DIFFERENTIAL & DRIVELINE/HALF SHAFT - INSTALLATION).

(6) Insert the upper ball joint into the steering knuckle. Install and tighten the retaining nut to 54 N·m (40 ft. lbs.)(on 1500 series only an additional 90° turn is required).

(7) Install the stabilizer bar link (Refer to 2 - SUSPENSION/FRONT/STABILIZER LINK - INSTALLATION).

(8) Tighten the lower control arm front pivot nut to 204 N·m (150 ft. lbs.). Tighten rear pivot bolt to 204 N·m (150 ft. lbs.).

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

(10) Remove the support and lower the vehicle.

(11) Adjust the front suspension height and perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

INSTALLATION - 4X2

(1) Install the lower control arm into place on the vehicle.

(2) Install the front and rear control arm pivot bolts finger tight.

(3) Install the coil spring into the frame pocket (Refer to 2 - SUSPENSION/FRONT/SPRING - INSTALLATION).

(4) Install the Spring Compressor DD-1278 up through the lower suspension arm, coil spring and shock hole in the frame.

(5) Tighten the tool nut to compress the coil spring.

(6) Remove the support from the upper control arm and steering knuckle.

(7) Position the lower ball joint into the steering knuckle.

(8) Install the retaining nut on the lower ball joint and tighten to 52 N·m (38 ft. lbs.)(on 1500 series only an additional 90° turn is required) or 135 N·m (100 ft. lbs.)(HD 4X2 only).

(9) Support the lower control arm at the outboard side of the lower control arm to support vehicle weight.

(10) Remove the spring compressor tool.

(11) Install the shock absorber. (Refer to 2 - SUSPENSION/FRONT/SHOCK - INSTALLATION).

(12) Install the stabilizer link (Refer to 2 - SUSPENSION/FRONT/STABILIZER LINK - INSTALLATION).

(13) Remove the lower control arm support.

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

(15) Lower the vehicle to the floor with vehicle weight and Tighten the front and rear control arm pivot bolts to 204 N·m (150 ft. lbs.)(LD) or 285 N·m (210 ft. lbs.)(HD 4X2 only).

(16) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

SPRING**REMOVAL**

(1) Raise and support vehicle.

(2) Remove the front wheel and tire assembly.

(3) Support the lower control arm at the outboard side of the lower control arm to support vehicle weight.

(4) Remove the shock absorber (Refer to 2 - SUSPENSION/FRONT/SHOCK - REMOVAL).

(5) Install Spring Compressor DD-1278 up through the lower suspension arm, coil spring and shock hole in the frame. The bell-shaped adapter goes against the lower suspension arm. Install the nut on top of the tool at the shock hole (Fig. 25).

(6) Tighten the spring compressor nut against bell-shaped adapter finger tight then loosen 1/2 turn.

NOTE: This will hold the spring in place until the lower suspension arm is separated from the steering knuckle.

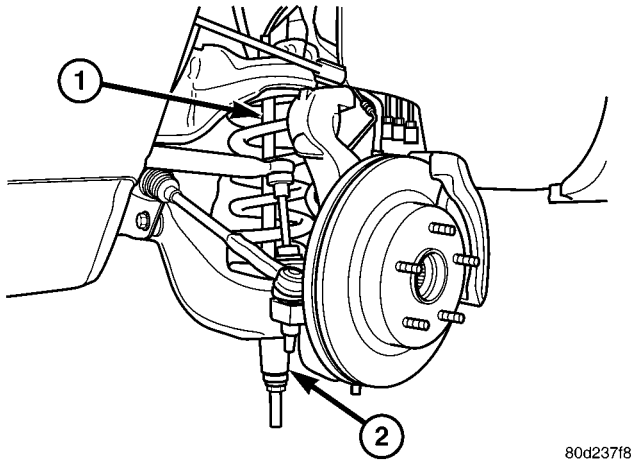
(7) Remove the stabilizer link (Refer to 2 - SUSPENSION/FRONT/STABILIZER LINK - REMOVAL).

(8) Remove the lower ball joint nut at the steering knuckle.

(9) Install Ball Joint Remover tool 8677 on the lower ball joint and separate the ball joint from the knuckle.

(10)

SPRING (Continued)



80d23718

Fig. 25 SPRING COMPRESSOR TOOL

- 1 - SPECIAL TOOL DD-1278
2 - BELL-SHAPED ADAPTER

NOTE: Do not allow the upper control arm and steering knuckle to rebound downwards they must be supported. Support the upper control arm and steering knuckle out of the way.

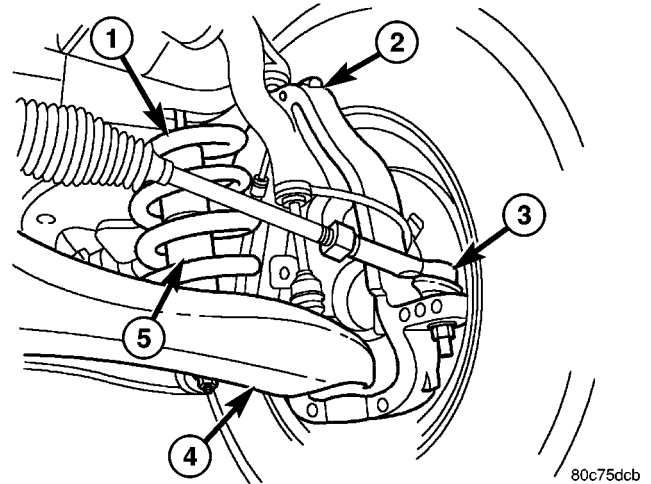
- (11) Remove the lower control arm support.
(12) Tighten the spring compressor tool to allow clearance for the lower ball joint to be removed out of the knuckle.

NOTE: It may necessary to loosen the control arm pivot bolt to allow downward swing.

- (13) Loosen the tension on the spring compressor tool slowly allowing the lower suspension arm to pivot downward.
(14) Remove the spring compressor tool.
(15) Remove coil spring and isolator pad from the vehicle (Fig. 26).

INSTALLATION

- (1) Tape the isolator pad to the top of the coil spring. Position the spring in the lower suspension arm well. Be sure that the coil spring is seated in the well.
(2) Install Spring Compressor DD-1278 up through the lower suspension arm, coil spring and shock hole in the frame.
(3) Tighten the tool nut to compress the coil spring.



80c75dcb

Fig. 26 COIL SPRING

- 1 - COIL SPRING
2 - STEERING KNUCKLE
3 - OUTER TIE ROD END
4 - LOWER CONTROL ARM
5 - SHOCK

- (4) Remove the support from the upper control arm and steering knuckle.

- (5) Position the lower ball joint into the steering knuckle.

- (6) Install the retaining nut on the lower ball joint and tighten to 52 N·m (38 ft. lbs.) (on 1500 series only an additional 90° turn is required) or 135 N·m (100 ft. lbs.) (HD 4X2 only).

- (7) Remove the spring compressor tool.

- (8) Support the lower control arm at the outboard side of the lower control arm to support vehicle weight.

- (9) Install the shock absorber. (Refer to 2 - SUSPENSION/FRONT/SHOCK - INSTALLATION).

- (10) Install the stabilizer link (Refer to 2 - SUSPENSION/FRONT/STABILIZER LINK - INSTALLATION).

- (11) Remove the lower control arm support.

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

- (13) Lower the vehicle to the floor with vehicle weight and Tighten the front and rear control arm pivot bolts if loosened to 204 N·m (150 ft. lbs.) (LD) or 285 N·m (210 ft. lbs.) (HD 4X2 only).

- (14) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

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

REMOVAL - 4X2

- (1) Raise and support vehicle.
- (2) Support the lower control arm outboard end.
- (3) Remove the upper shock absorber nut, retainer and grommet.
- (4) Remove the lower nuts and remove the shock absorber.

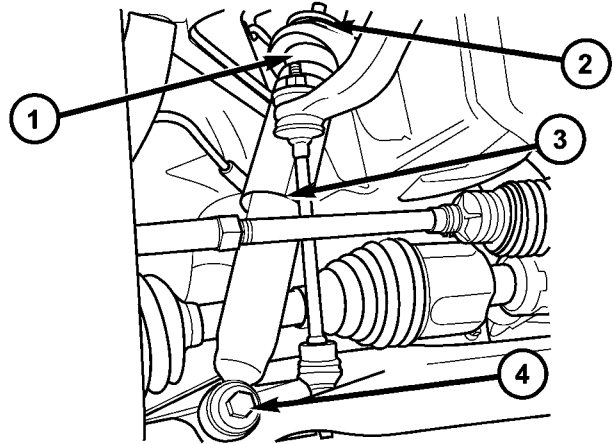
REMOVAL - 4X4

- (1) Raise and support the vehicle.
- (2) Remove the tire and wheel assembly.
- (3) Support the lower control arm outboard end.
- (4) Remove the upper shock nut and with the insulator and retainer (Fig. 27).
- (5) Remove the lower shock bolt (Fig. 27).
- (6) Remove the shock

INSTALLATION

INSTALLATION - 4X2

NOTE: Upper shock nut must be replaced or use Mopar Lock 'N Seal or Loctite® 242 on existing nut.



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Fig. 27 SHOCK 4X4

- 1 - INSULATOR & RETAINER
- 2 - NUT
- 3 - SHOCK ABSORBER
- 4 - BOLT

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

(2) Install the lower nuts and tighten the nuts to 34 N·m (25 ft. lbs.).

(3) Install the upper grommet, retainer and new nut or use Mopar Lock 'N Seal or Loctite® 242 on existing nut, on the shock absorber stud. Tighten nut to 54 N·m (40 ft. lbs.).

(4) Remove the support from the lower control arm outboard end.

(5) Lower the vehicle.

INSTALLATION - 4X4

(1) Install the upper part of the shock into the frame bracket with the insulators and retainers (Fig. 27).

(2) Install the nut and Tighten to 54 N·m (40 ft. lbs.).

(3) Install the lower part of the shock into the lower control arm and Tighten the bolt to 135 N·m (100 ft. lbs.) (Fig. 27).

(4) Remove the support from the lower control arm outboard end.

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

(6) Remove the support and lower the vehicle.

STABILIZER BAR

DESCRIPTION

The bar extends across the front underside of the chassis and connects to the frame crossmember. The ends of the bar mount to the lower suspension arm. All mounting points of the stabilizer bar are isolated by bushings (Fig. 28).



80d267b1

Fig. 28 STABILIZER BAR

OPERATION

The stabilizer bar is used to minimize vehicle front sway during turns. The bar helps to maintain a flat attitude to the road surface.

REMOVAL

NOTE: To service the stabilizer bar the vehicle should be on a drive on hoist. The vehicle suspension must be at curb height for stabilizer bar installation.

(1) Remove the stabilizer bar link upper nuts and remove the retainers and grommets (Fig. 29).

(2) Remove the stabilizer bar retainer, bolts and retainers from the frame crossmember (Fig. 29) and remove the bar.

(3) If necessary, remove the bushings from the stabilizer bar.

INSTALLATION

NOTE: To service the stabilizer bar the vehicle must be on a drive on hoist. The vehicle suspension must be at curb height for stabilizer bar installation.

(1) If removed, install the bushings on the stabilizer bar.

(2) Position the stabilizer bar on the frame crossmember brackets and install the bracket and bolts finger-tight (Fig. 29).

NOTE: Check the alignment of the bar to ensure there is no interference with the either frame rail or chassis component. Spacing should be equal on both sides.

(3) Install the stabilizer bar to the stabilizer link and install the grommets and retainers.

(4) Install the nuts to the stabilizer link and tighten to 38 N·m (27 ft. lbs.).

(5) Tighten the brackets to the frame to 61 N·m (45 ft. lbs.).

STABILIZER LINK

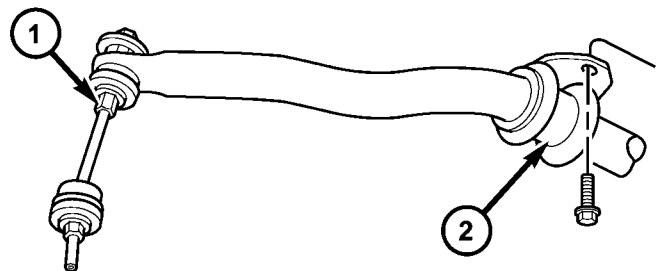
REMOVAL

REMOVAL - 4X4

- (1) Raise and support the vehicle.
- (2) Remove the lower nut (Fig. 29).
- (3) Remove the upper nut, retainers and grommets (Fig. 29).
- (4) Remove the stabilizer link from the vehicle (Fig. 29).

REMOVAL - 4X2

- (1) Raise and support the vehicle.
- (2) Remove the lower nut (Fig. 29).
- (3) Remove the upper nut, retainer and grommets (Fig. 29).
- (4) Remove the stabilizer link from the vehicle (Fig. 29).



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Fig. 29 STABILIZER LINK

- 1 - STABILIZER LINK
2 - SWAY BAR BRACKET

STABILIZER LINK (Continued)**INSTALLATION****INSTALLATION - 4X4**

- (1) Install the stabilizer link to the vehicle.
- (2) Install the lower nut and Tighten to 102 N·m (75 ft. lbs.).
- (3) Install the retainers, grommets and upper nut and Tighten to 38 N·m (27 ft. lbs.).
- (4) Remove the support and lower the vehicle.

INSTALLATION - 4X2

- (1) Install the stabilizer link to the vehicle (Fig. 29).
- (2) Install the lower nut and Tighten to 102 N·m (75 ft. lbs.).
- (3) Install the retainers, grommets and upper nut and Tighten to 38 N·m (27 ft. lbs.).
- (4) Remove the support and lower the vehicle.

TORSION BAR**DESCRIPTION**

The front of the bar connects to the back side of the lower suspension arm. The rear end of the bar is mounted in a anchor that rests in the frame cross-member.

OPERATION

The torsion bars are used to control ride height and ride quality. The vehicle height is adjusted through an anchor adjustment bolt that increases or decreases the wind up of the torsion bar. Increasing or decreasing the bar angle changes the wind up of the suspension arms.

REMOVAL

CAUTION: The left and right side torsion bars are NOT interchangeable. The bars are identified and stamped R or L, for right or left. The bars do not have a front or rear end and can be installed with either end facing forward.

- (1) Raise and support the vehicle with the front suspension hanging.
- (2) Remove the transfer case skid plate (Refer to 13 - FRAME & BUMPERS/FRAME/TRANSFER CASE SKID PLATE - REMOVAL).

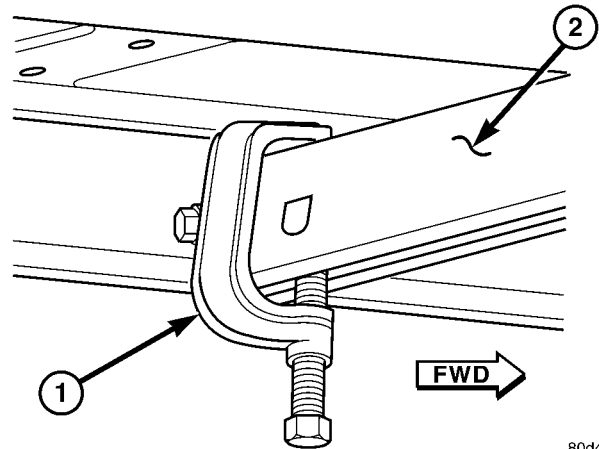
NOTE: Count and record the number of turns for installation reference.

- (3) Mark the adjustment bolt setting.
- (4) Install Special Tool - 8686 to the anchor arm and the cross member (Fig. 30).

(5) Increase the tension on the anchor arm tool until the load is removed from the adjustment bolt and the adjuster nut (Fig. 30).

(6) Turn the adjustment bolt counterclockwise to remove the bolt and the adjuster nut..

(7) Remove the Special Tool - 8686, allowing the torsion bar to unload (Fig. 30).



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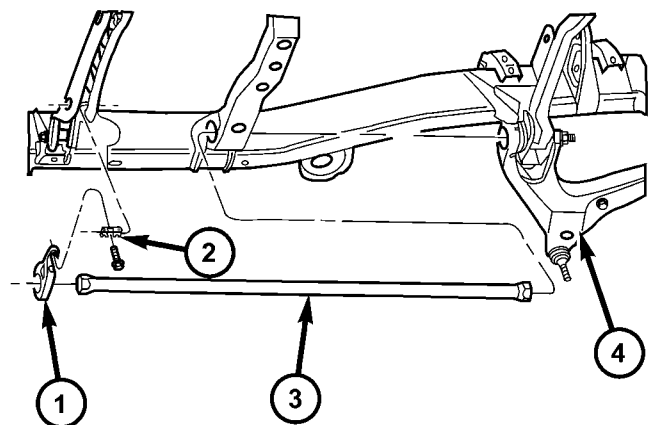
Fig. 30 LOADING/UNLOADING TORSION BAR

- 1 - SPECIAL TOOL - 8686
2 - CROSSMEMBER

(8) Remove torsion bar and anchor. Remove anchor from torsion bar (Fig. 31).

(9) Remove all foreign material from torsion bar mounting in anchor and suspension arm.

(10) Inspect adjustment bolt, bearing and swivel for damage.



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Fig. 31 TORSION BAR

- 1 - ANCHOR
2 - SWIVEL
3 - TORSION BAR
4 - LOWER CONTROL ARM

TORSION BAR (Continued)

INSTALLATION

CAUTION: The left and right side torsion bars are NOT interchangeable. The bars are identified and stamped R or L, for right or left. The bars do not have a front or rear end and can be installed with either end facing forward.

- (1) Insert torsion bar ends into anchor and suspension arm.
- (2) Position the anchor in the frame crossmember.
- (3) Install Special Tool - 8686 to the anchor and the crossmember (Fig. 30).
- (4) Increase the tension on the anchor in order to load the torsion bar.
- (5) Install the adjustment bolt and the adjuster nut.
- (6) Turn adjustment bolt clockwise the recorded amount of turns.
- (7) Remove tool - 8686 from the torsion bar crossmember (Fig. 30).
- (8) Install the transfer case skid plate (Refer to 13 - FRAME & BUMPERS/FRAME/TRANSFER CASE SKID PLATE - INSTALLATION).
- (9) Lower vehicle and adjust the front suspension height (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).
- (10) Perform a wheel alignment (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

UPPER BALL JOINT

DIAGNOSIS AND TESTING - UPPER BALL JOINT

NOTE: If the ball joint is equipped with a lubrication fitting, grease the joint then road test the vehicle before performing test.

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

(3) Mount a dial indicator solidly to the frame and then zero the dial indicator.

(4) Position dial indicator plunger on the topside of the upper ball joint (Fig. 32).

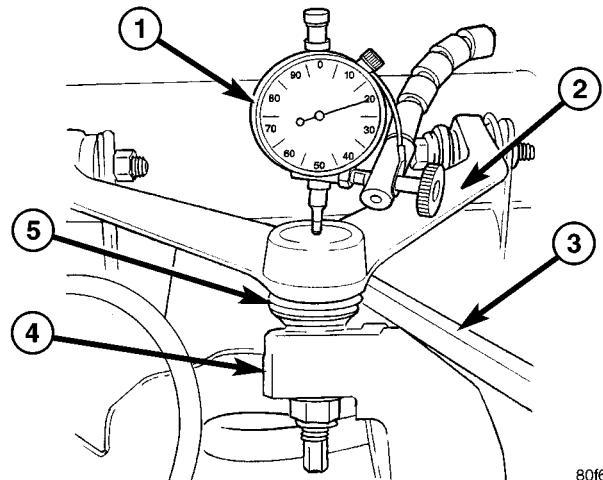
NOTE: The dial indicator plunger must be perpendicular to the machined surface of the ball joint (Fig. 32).

NOTE: Use care not to pry or tear the ball joint boot, when checking the free play.

(5) Position a pry bar between the steering knuckle and the upper control arm. Pry upwards on the upper control arm (Fig. 32).

(6) If the travel exceeds 0.5 mm (0.020 in.), replace the upper control arm since the upper ball joint is integral to the arm (Refer to 2 - SUSPENSION/FRONT/UPPER CONTROL ARM - REMOVAL).

(7) If the upper ball joint is within specs reinstall the front tires (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).



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Fig. 32 UPPER BALL JOINT PLAY

- 1 - DIAL INDICATOR
- 2 - UPPER CONTROL ARM
- 3 - PRY BAR
- 4 - KNUCKLE
- 5 - BALL JOINT BOOT

UPPER CONTROL ARM

REMOVAL

- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove the nut from upper ball joint.
- (4) Separate upper ball joint from the steering knuckle with Remover 8677 (Fig. 33)

CAUTION: When installing Remover 8677 to separate the ball joint, be careful not to damage the ball joint seal.

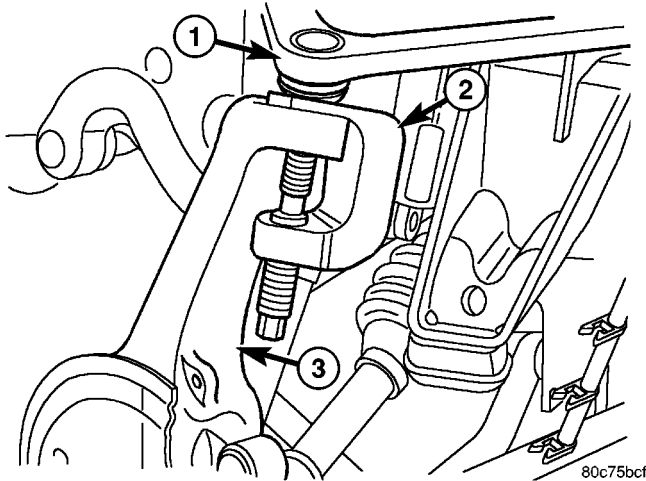


Fig. 33 UPPER BALL JOINT SEPARATION

- 1 - UPPER CONTROL ARM
- 2 - REMOVER
- 3 - STEERING KNUCKLE

- (5) Remove the control arm pivot bolts and remove control arm (Fig. 34).

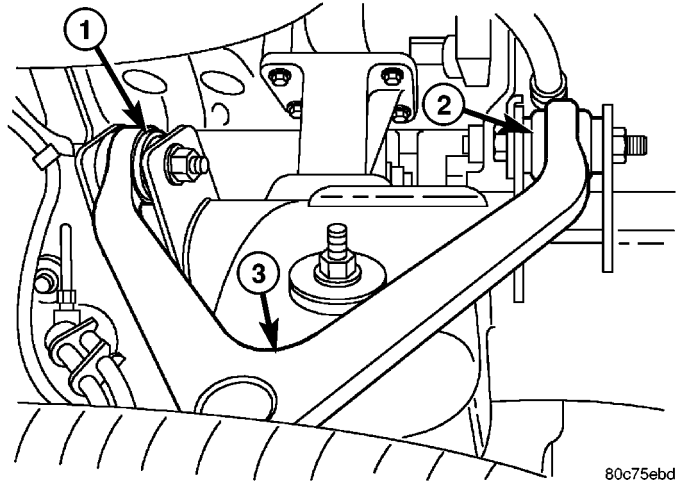


Fig. 34 UPPER CONTROL ARM

- 1 - REAR PIVOT BOLT
- 2 - FRONT PIVOT BOLT
- 3 - UPPER CONTROL ARM

INSTALLATION

- (1) Position the control arm into the frame brackets. Install bolts and tighten to 132 N·m (97 ft. lbs.)(LD) or 170 N·m (125 ft. lbs.)(HD 4X2 only).
- (2) Insert the ball joint in steering knuckle and tighten the upper ball joint nut to 54 N·m (40 ft. lbs.)(on 1500 series only an additional 90° turn is required).
- (3) Install the wheel and tire assembly,(Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).
- (4) Remove the support and lower vehicle.
- (5) Perform a wheel alignment, (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

FRONT - LINK/COIL

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FRONT - LINK/COIL

SPECIFICATIONS

TORQUE CHART

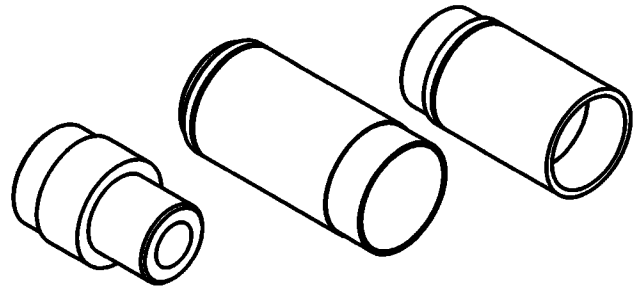
TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Shock Absorber Upper Nut	54	40	—
Shock Absorber Lower Bolt	121	89	—
Lower Suspension Arm Frame Nuts	217	160	—
Lower Suspension Arm Axle Nut	217	160	—
Upper Suspension Arm Frame Nuts	149	110	—
Upper Suspension Arm Axle Nut	149	110	—
Stabilizer Bar Frame Bolt	61	45	—
Stabilizer Link Lower Control Arm Nut	102	75	—

FRONT - LINK/COIL (Continued)

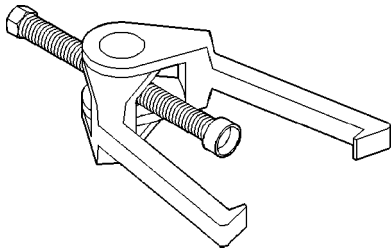
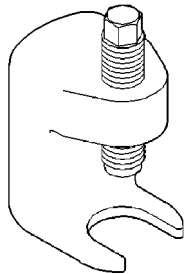
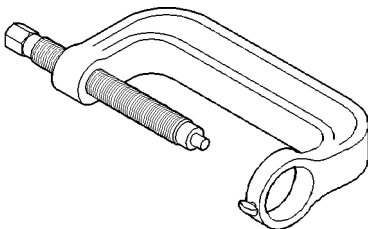
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Stabilizer Link Stabilizer Bar Nut	38	27	—
Hub/Bearing Bolts	202	149	—
Axle Nut	179 Beginning Torque, Then Rotate 5 to 10 Times With a Final Torque of 356	132 Beginning Torque, Then Rotate 5 to 10 Times With a Final Torque of 263	—
Tie Rod End Nut	75	55	—

NOTE: Suspension components with rubber/urethane bushings should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

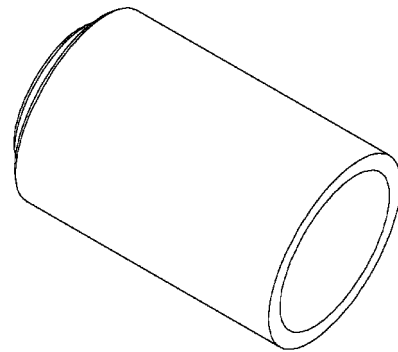
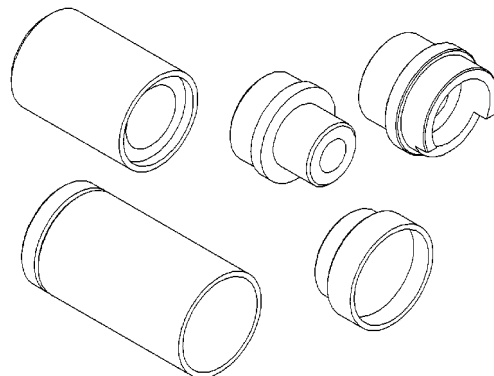


SPECIAL TOOLS

9 1/4 AA

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

C-4212F-8C1194af

BALL JOINT PRESS - C-4212F**REMOVER / INSTALLER BALLJOINT - 8445****RECEIVER CUP - 6761****BALLJOINT RECIEVER/INSTALLER KIT- 8975**

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. 1).

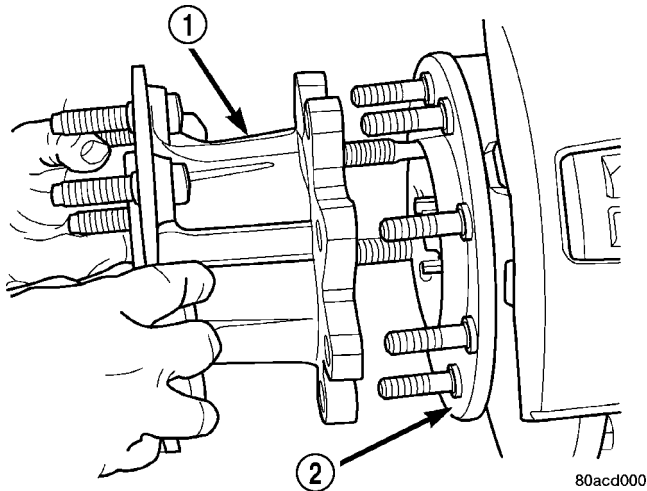


Fig. 1 Hub Extension

- 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. 2).

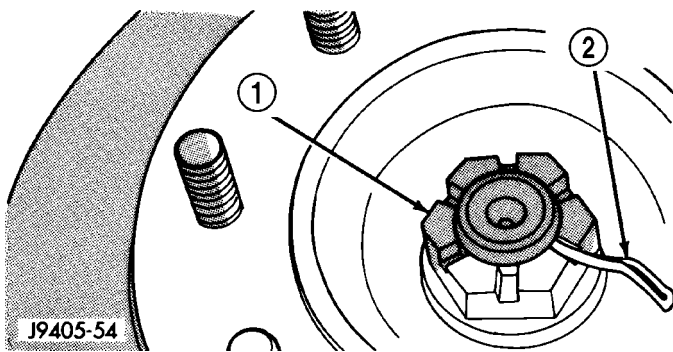


Fig. 2 Hub Nut Cotter Pin

- 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. 3). 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.

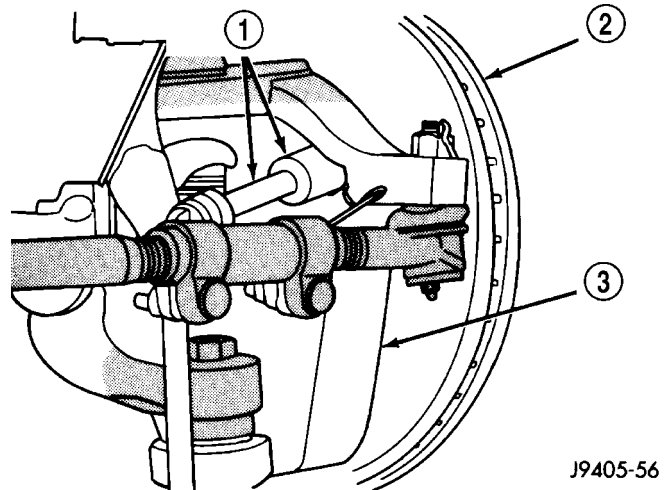


Fig. 3 Hub/Bearing Mounting Bolts

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

- (9) Remove the rotor assembly (Fig. 4), brake shield and spacer from the steering knuckle.

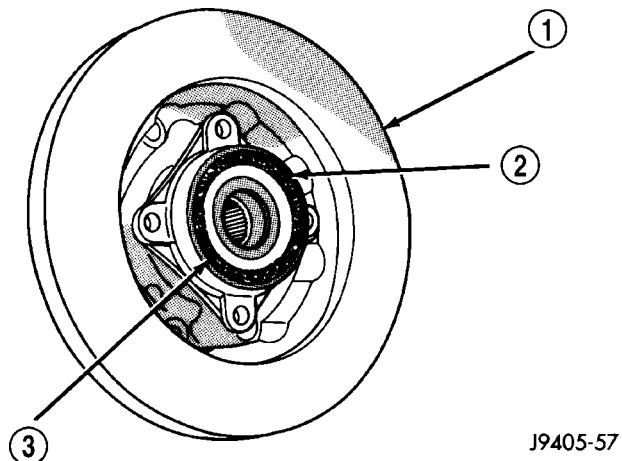


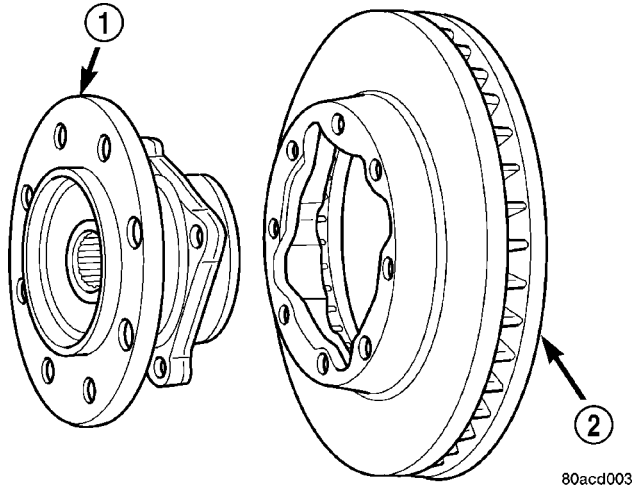
Fig. 4 Rotor Hub/Bearing Assembly

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

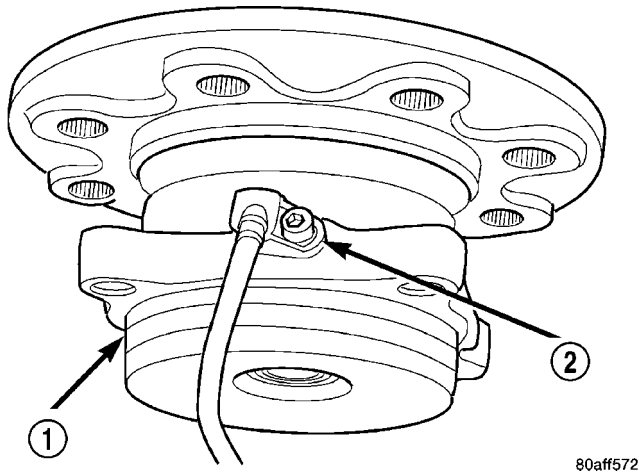
- (10) Press out the wheel studs/hub extension studs and separate the rotor from the hub (Fig. 5).

- (11) Remove the wheel speed sensor (Fig. 6) from the hub bearing if equipped.

HUB / BEARING (Continued)

**Fig. 5 ROTOR AND HUB/BEARING**

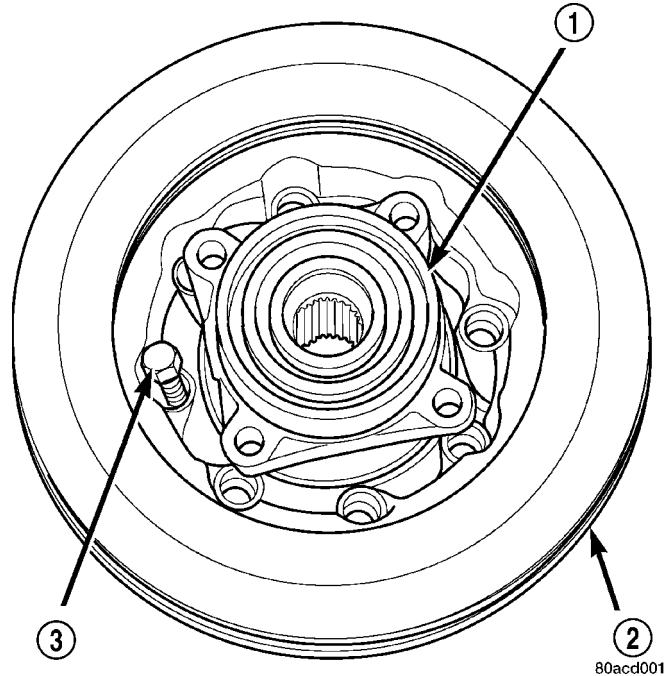
- 1 - HUB BEARING
2 - ROTOR

**Fig. 6 Wheel Speed Sensor**

- 1 - HUB BEARING
2 - WHEEL SPEED SENSOR

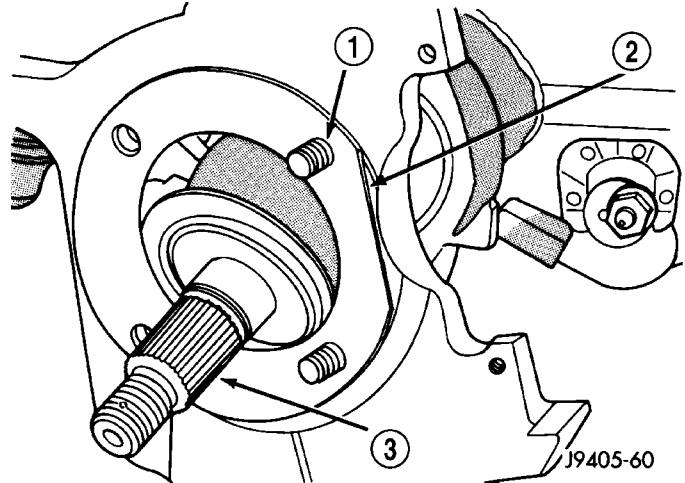
INSTALLATION

- (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. 7).
- (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. 8) and brake shield (Fig. 9) on bolts just installed in knuckle.

**Fig. 7 Rotor, Hub/Bearing And Stud**

- 1 - HUB BEARING
2 - ROTOR
3 - STUD

NOTE: If the vehicle is equipped with a wheel speed sensor the brake shield must be positioned on the hub bearing (Fig. 10).

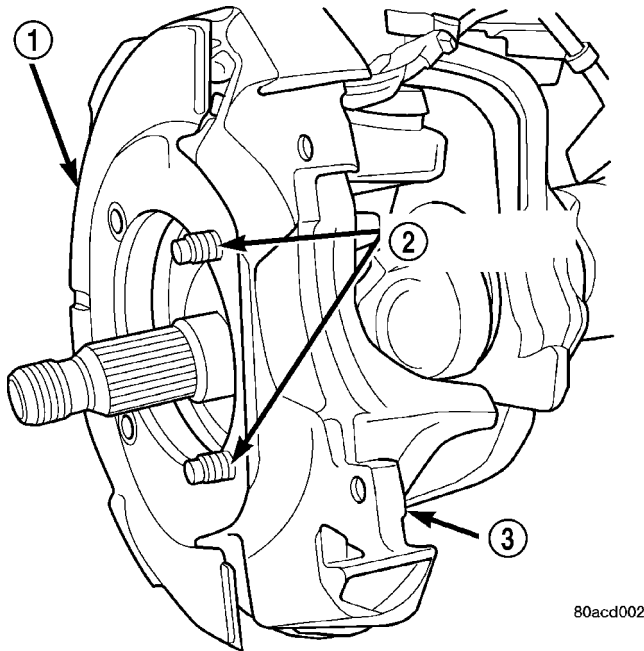
**Fig. 8 Hub Spacer**

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

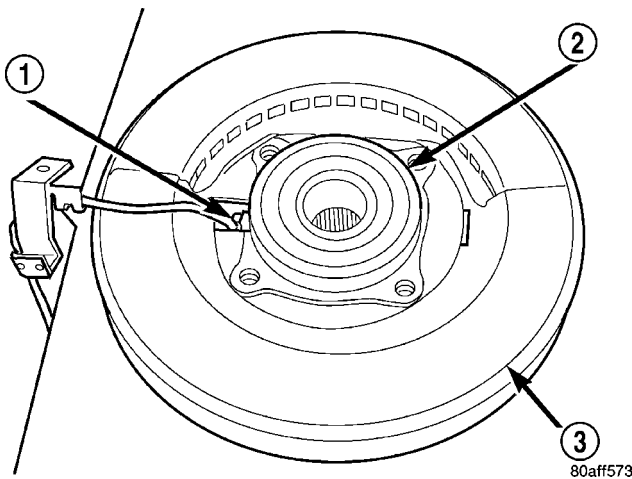
- (7) Align the rotor hub with the drive shaft and start the shaft into the rotor hub splines.

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

HUB / BEARING (Continued)

**Fig. 9 Brake Shield**

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

**Fig. 10 Brake Shield With Wheel Speed Sensor**

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

(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 202 N·m (149 ft. lbs.).

(10) Install the washer and axle nut and tighten a beginning torque of 179 N·m (132 ft. lbs.).

(11) Rotate the axle 5 to 10 times to seat the hub bearing.

(12) Tighten to a final torque of 356 N·m (263 ft. lbs.).

(13) Align the axle nut to the next forward cotter pin hole and install a new cotter pin in the axle nut.

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

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

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

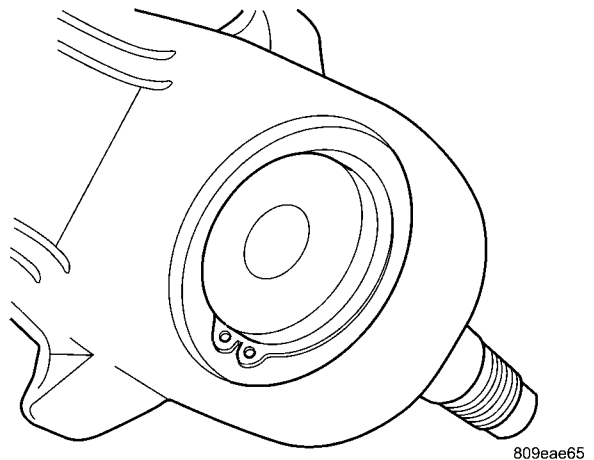
(17) Remove the support and lower the vehicle.

(18) 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.

LOWER BALL JOINT

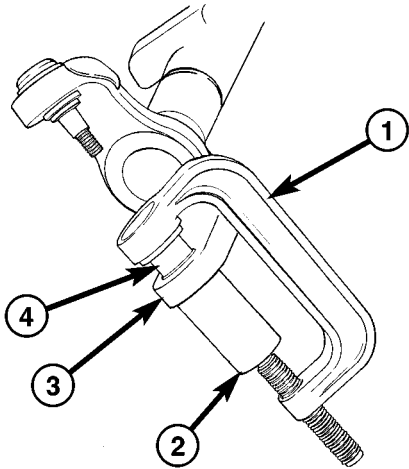
REMOVAL

(1) Remove lower snap ring from the lower ball joint (Fig. 11).

**Fig. 11 LOWER SNAP RING**

(2) Position special tool 8975-2 (RECEIVER) and 8975-4 (DRIVER) with tool C4212-F as shown to remove lower ball stud (Fig. 12).

LOWER BALL JOINT (Continued)



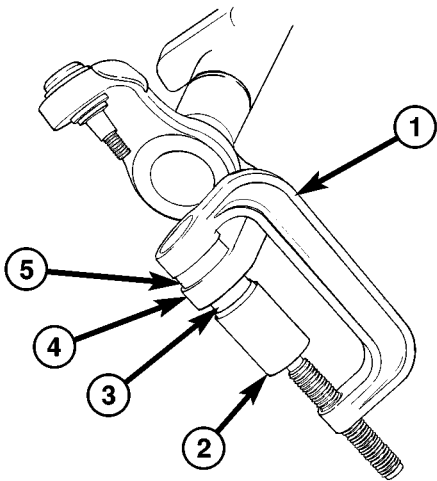
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Fig. 12 LOWER BALL JOINT REMOVAL

- 1 - SPECIAL TOOL C4212-F
- 2 - SPECIAL TOOL 8975-2
- 3 - KNUCKLE
- 4 - SPECIAL TOOL 8975-4

INSTALLATION

(1) Position special tool 8975-1 (DRIVER) and 8975-3 (RECEIVER) with C4212-F as shown to install lower ball stud (Fig. 13).



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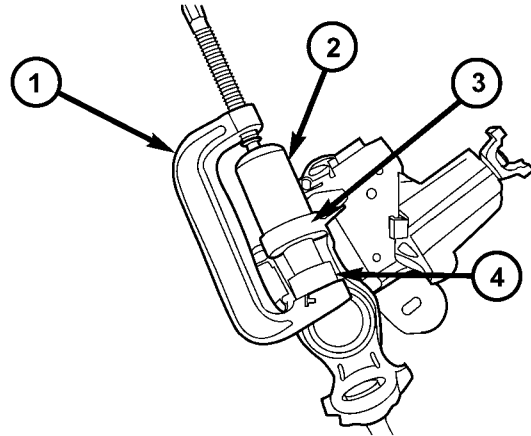
Fig. 13 LOWER BALL JOINT INSTALLATION

- 1 - SPECIAL TOOL C4212-F
- 2 - SPECIAL TOOL 8975-1
- 3 - BALL JOINT
- 4 - KNUCKLE
- 5 - SPECIAL TOOL 8975-3

UPPER BALL JOINT

REMOVAL

(1) Position special tool 6761 (RECEIVER) and 8445-3 (DRIVER) with C-4212-F as shown to remove upper ball stud (Fig. 14).



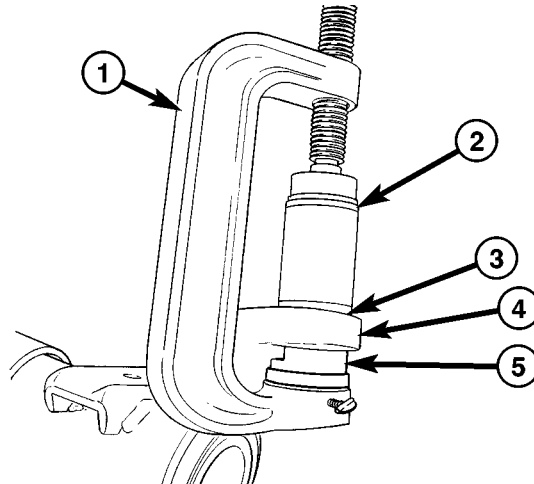
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Fig. 14 UPPER BALL JOINT REMOVAL

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

INSTALLATION

(1) Position special tool 8445-2 (DRIVER) and 8975-5 (RECEIVER) with C-4212-F as shown to install upper ball stud (Fig. 15).



80ef05ea

Fig. 15 UPPER BALL JOINT INSTALLATION

- 1 - SPECIAL TOOL C4212-F
- 2 - SPECIAL TOOL 8445-2
- 3 - BALL JOINT
- 4 - KNUCKLE
- 5 - SPECIAL TOOL 8975-5

KNUCKLE

REMOVAL

- (1) Remove the hub bearing (Refer to 2 - SUSPENSION/FRONT/HUB / BEARING - REMOVAL).
- (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 (Refer to 2 - SUSPENSION/FRONT/HUB / BEARING - INSTALLATION).
- (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 SUSPENSION ARM

REMOVAL

REMOVAL - LEFT

- (1) Raise and support the vehicle.
- (2) Remove the upper suspension arm nut and bolt at the axle bracket (Fig. 16).
- (3) Remove the nut and bolt at the frame rail and remove the upper suspension arm.

REMOVAL - RIGHT

- (1) Raise and support the vehicle.
- (2) Disconnect the exhaust system at the manifolds.
- (3) Disconnect the rubber exhaust mounts at the muffler.
- (4) Support the transmission.
- (5) Remove the transmission cross member.
- (6) Lower the exhaust system down in order to gain access to the removal of the upper bolt.

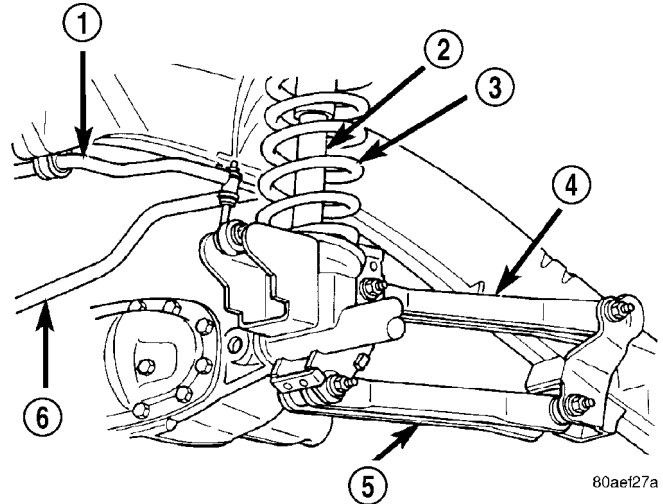


Fig. 16 Link/Coil Suspension

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

- (7) Remove the nut and bolt at the frame rail and remove the upper suspension arm.
- (8) Remove the upper suspension arm nut and bolt at the axle bracket.
- (9) Remove the suspension arm from the vehicle.

INSTALLATION

INSTALLATION - LEFT

- (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.).

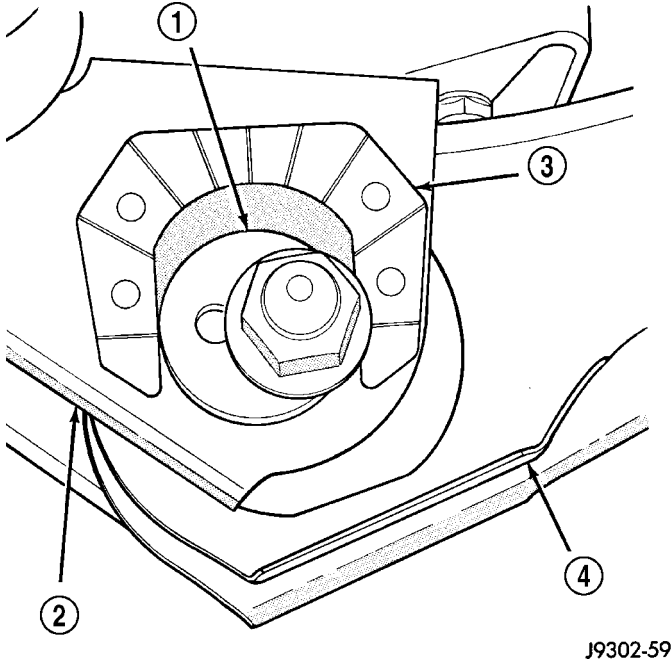
INSTALLATION - RIGHT

- (1) Position the upper suspension arm at the axle and frame rail.
- (2) Install the bolts, then finger tighten the nuts.
- (3) Reconnect the rubber exhaust mounts at the muffler.
- (4) Reconnect the exhaust at the manifolds.
- (5) Install the transmission crossmember.
- (6) Remove the supports and lower the vehicle.
- (7) 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.).

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. 17).



J9302-59

Fig. 17 Adjustment Cam

- 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. 17).

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 217 N·m (160 ft. lbs.). Tighten rear nut at the frame bracket to 217 N·m (160 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.

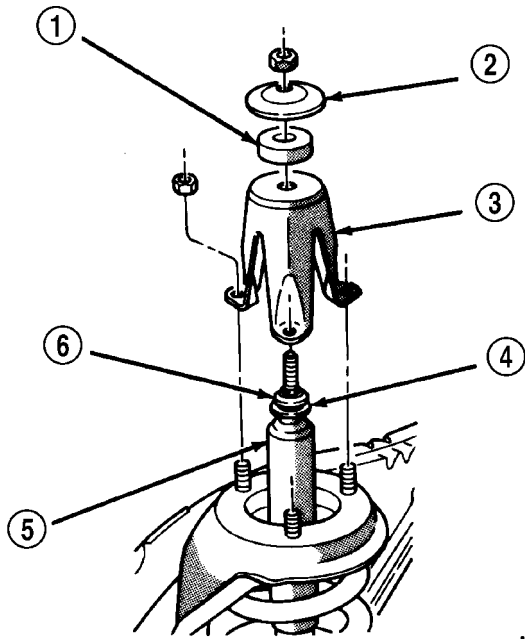
REMOVAL

- (1) Remove the nut, retainer and grommet from the upper stud in the engine compartment.
- (2) Remove three nuts from the upper shock bracket (Fig. 18).
- (3) Remove the lower bolt from the axle bracket (Fig. 19). Remove the shock absorber from engine compartment.

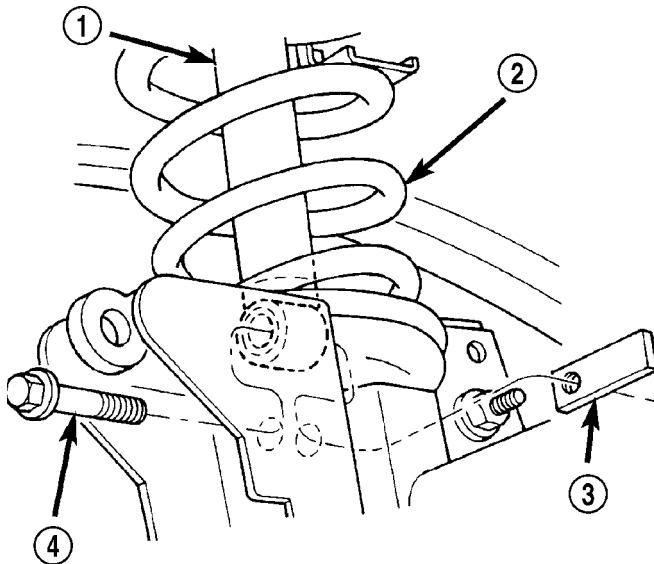
INSTALLATION

- (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. 18 Shock Absorber and Bracket**

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

**Fig. 19 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. 20).
- (6) Remove the stabilizer bar clamps from the frame rails and remove the stabilizer bar.

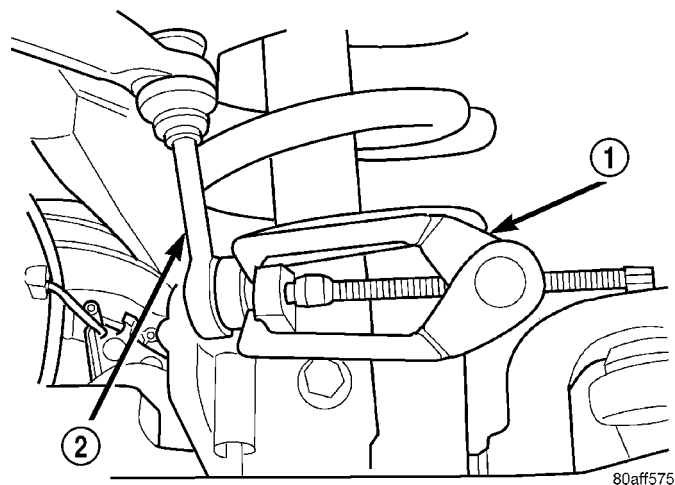


Fig. 20 Stabilizer Link

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 61 N·m (45 ft. lbs.).
- (3) Install links to the axle bracket and tighten nut to 47 N·m (35 ft. lbs.).
- (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.

REAR

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REAR

DESCRIPTION

The rear suspension is comprised of:

- Shock Absorbers
- Jounce Bumpers
- Stabilizer Bar (optional)
- Leaf Springs
- Auxiliary Leaf Spring (3500 series)
- Auxiliary Spring Bumpers (3500 series)
- 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	135	100	—
Shock Absorber Upper Nut	135	100	—
Spring Clamp U-Bolts Nuts	149	110	—
Spring Front & Rear Bolt & Nut	163	120	—
Spring Spring Rear Shackle Nuts	163	120	—
Jounce Bumper Bolts	40	30	—
Auxiliary Spring Bumpers	41	30	—

BUSHINGS

REMOVAL

- (1) Remove the spring from the vehicle.
- (2) Make small relief cuts in the flared up end of the bushing metal being careful not to cut the spring. Use a punch to bend the flared bushing metal down for push out.
- (3) Position the spring eye in a press.
- (4) 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) Stake the outer metal of the bushing in a minimum of six points to retain the bushing.
- (3) Install the spring on the vehicle.

JOUNCE BUMPER

REMOVAL

- (1) Remove the two bolts securing the jounce bumper to the bracket (Fig. 1).
- (2) Remove the jounce bumper.

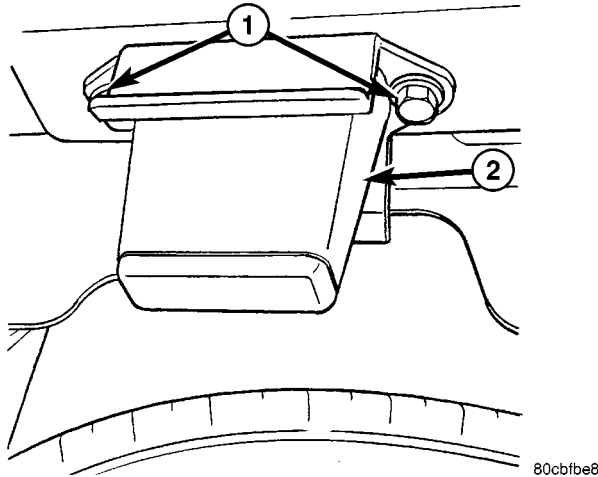


Fig. 1 JOUNCE BUMPER

- 1 - MOUNTING BOLTS
2 - JOUNCE BUMPER

INSTALLATION

- (1) Install the jounce bumper.
- (2) Install the two bolts securing the jounce bumper to the bracket. Tighten the bolts to 40 N·m (30 ft. lbs.).

AUXILIARY SPRING BUMPERS (3500)

REMOVAL

- (1) Remove the nut securing the auxiliary spring bumper to the bracket (Fig. 2).
- (2) Remove the auxiliary spring bumper.

INSTALLATION

- (1) Install the auxiliary spring bumper.
- (2) Install the nut securing the auxiliary spring bumper to the bracket (Fig. 2). Tighten the nut to 61 N·m (45 ft. lbs.).

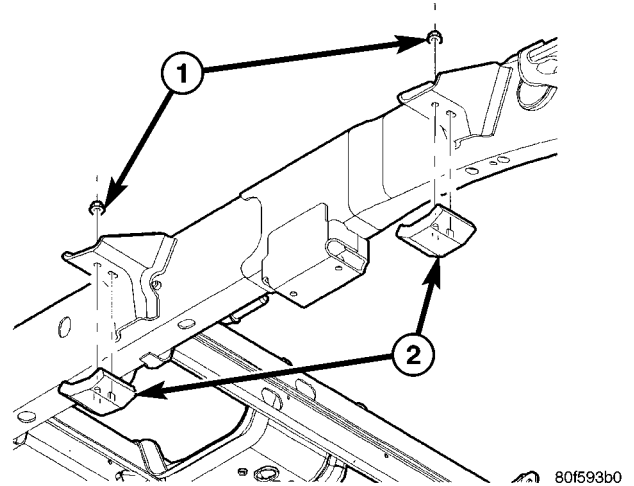


Fig. 2 AUXILIARY SPRING BUMPER (3500)

- 1 - NUTS
2 - AUXILIARY SPRING BUMPERS

SHOCK

REMOVAL

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

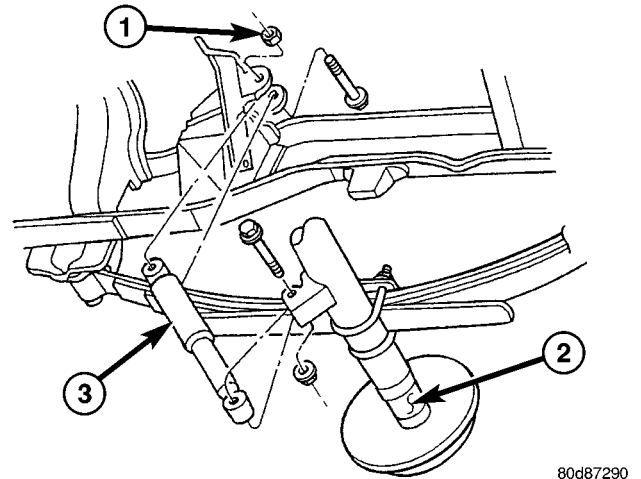


Fig. 3 SHOCK ABSORBER

- 1 - NUT
2 - AXLE
3 - SHOCK ABSORBER

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 135 N·m (100 ft. lbs.)
- (4) Remove the support and lower the vehicle.

SPRING

DESCRIPTION

The rear suspension system uses a multi-leaf springs and a solid drive axle. The forward end of the springs are mounted to the body rail hangers through rubber bushings. The rearward end of the springs are attached to the body by the use of shackles. The spring and shackles use rubber bushings.

OPERATION

The springs control ride quality and maintain vehicle ride height. The shackles allow the springs to change their length as the vehicle moves over various road conditions.

REMOVAL

- (1) Raise and support the vehicle.
- (2) Support the axle with a suitable holding fixture.
- (3) Remove the nuts, spring clamp bolts and the plate that attach the spring to the axle (Fig. 4).
- (4) Remove the nuts and bolts from the spring front and rear shackle (Fig. 4).
- (5) Remove the spring from the vehicle.

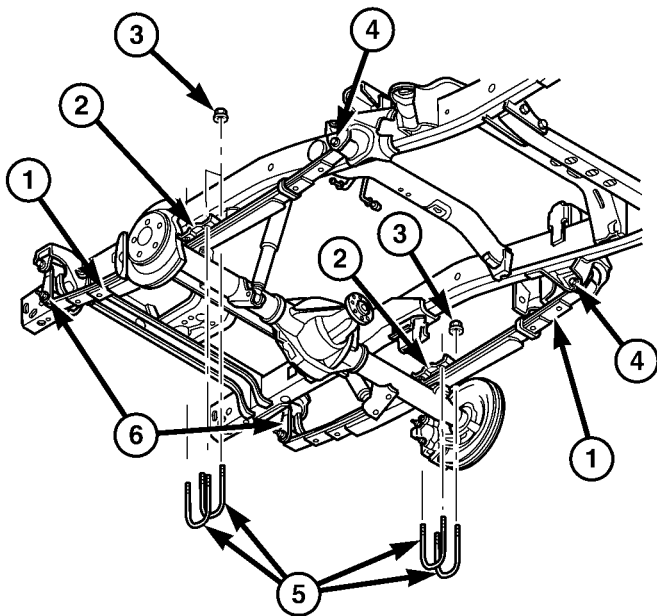


Fig. 4 REAR SPRING

- 1 - LEAF SPRING
- 2 - PLATE
- 3 - NUTS
- 4 - FRONT NUT & BOLT
- 5 - SPRING CLAMP BOLTS
- 6 - SHACKLES

INSTALLATION

- (1) Position spring on axle shaft tube so spring center bolt is inserted into the locating hole in the axle tube.
- (2) Align the front of the spring with the bolt hole in the front bracket. Install the eye pivot bolt and nut.
- (3) Align the rear of the spring into the shackle and install the bolt and nut.
- (4) Tighten the spring front and rear eye pivot bolt snug do not torque.
- (5) Install the spring clamp bolts, plate and the retaining nuts.
- (6) Remove the holding fixture for the rear axle.
- (7) Remove the supports and lower the vehicle so that the weight is being supported by the tires.
- (8) Tighten the spring clamp retaining nuts to 149 N·m (110 ft. lbs.).
- (9) Tighten the spring front and rear pivot bolt nuts to 163 N·m (120 ft. lbs.).

SPRING TIP INSERTS

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove both rear tire and wheel assemblies
- (3) Position a large C-Clamp adjacent to the spring clinch clip and clamp the leaves of the spring together

CAUTION: When working on the front leaf spring clinch clamps finish the front before starting on the rear to prevent personal injury.

- (4) Use an appropriate pry bar to bend open the spring clinch clip (Fig. 5). If necessary, remove the existing spring clinch clip isolators.

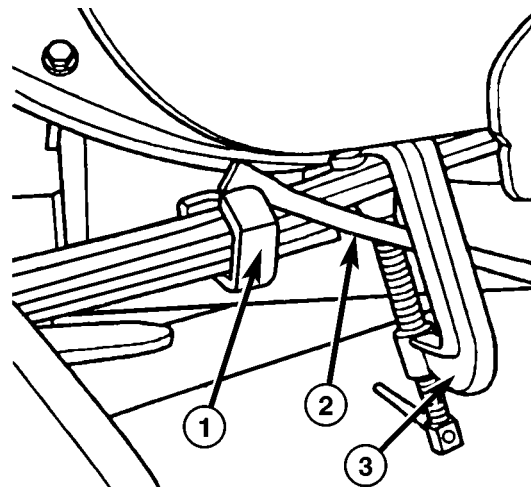
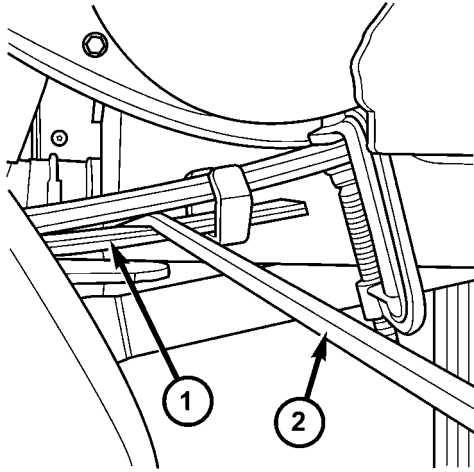


Fig. 5 C-CLAMP AND PRY BAR

- 1 - REAR LEAF SPRING CLINCH CLAMP
- 2 - PRY BAR
- 3 - C-CLAMP

SPRING TIP INSERTS (Continued)

(5) Use the pry bar to spread apart the leaf (Fig. 6). The clearance between the leaves should be enough to remove the old liner (if necessary) and install the replacement liner.

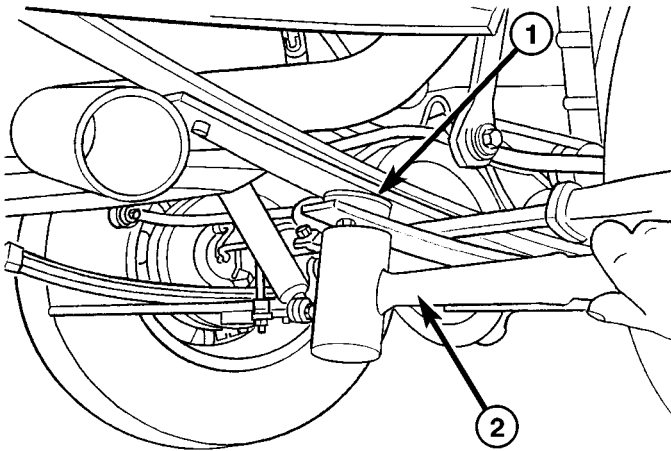


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Fig. 6 SPRING SEPARATION

- 1 - REAR LEAF SPRING
2 - PRY BAR

(6) If necessary, remove the old spring tip liner (Fig. 7).



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Fig. 7 SPRING TIP LINER REMOVAL

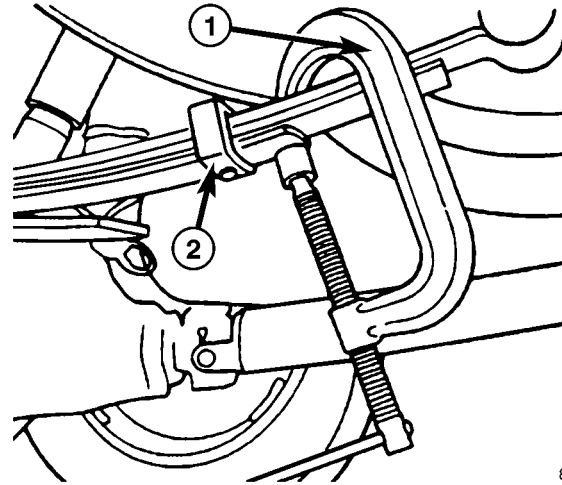
- 1 - SPRING TIP LINER
2 - RUBBER Mallet

INSTALLATION

(1) With the prybar still inserted between the leaves, install a new spring tip liner onto the leaf.

(2) Firmly seat the spring tip liner onto the leaf. A C-Clamp can be used to compress the adjacent leaves together (Fig. 8) which will seat the liner retaining pin into the hole.

NOTE: THE SPRING TIP LINER IS PROPERLY INSTALLED WHEN THE RETAINING PIN IS POINTING TOWARD THE PAVEMENT AND THE WEAR PAD IS CONTACTING THE LEAF SPRING.



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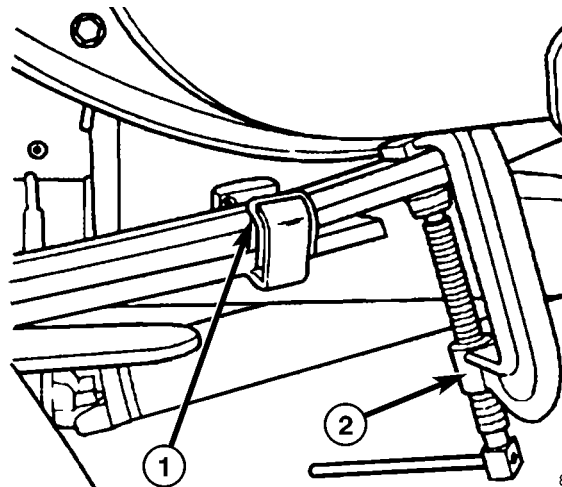
Fig. 8 CLINCH CLIP

- 1 - C-CLAMP
2 - SPRING CLINCH CLAMP

(3) Apply a small amount of lubricant oil onto the tip liner wear pad.

(4) Install all the spring tip liners.

(5) Place one spring clinch clip isolator onto the outboard side of the spring clinch clip (Fig. 9) and one isolator on the inboard side of the spring clinch clip.



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Fig. 9 CLINCH CLIP ISOLATOR

- 1 - SPRING CLINCH CLIP ISOLATOR
2 - C-CLAMP

SPRING TIP INSERTS (Continued)

(6) Using large adjustable pliers, close the spring clinch clip until the isolator contacts the leaf spring (Fig. 10).

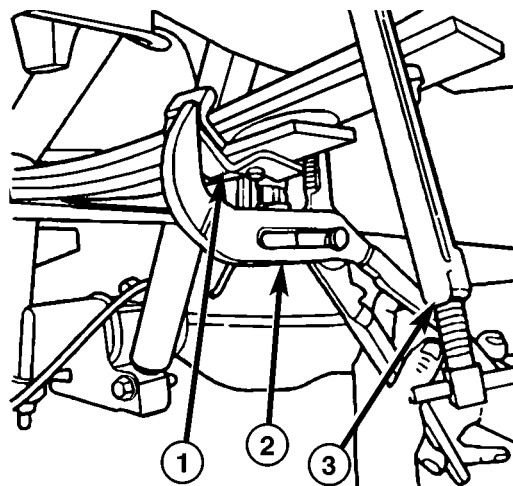
CAUTION: DO NOT USE A HAMMER TO CLOSE THE SPRING CLINCH CLIP. DAMAGE TO THE ISOLATOR MAY RESULT.

(7) Use an appropriate pry bar to bend open the spring clinch clip. If necessary, remove the existing spring clinch clip isolators.

(8) Repeat procedure for the other side of the vehicle.

(9) Install the tire wheel assemblies.

(10) Lower the vehicle.



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Fig. 10 CLINCH CLIP REASSEMBLY

- 1 - SPRING CLINCH CLIP
- 2 - ADJUSTABLE PLIERS
- 3 - C-CLAMP