

SUSPENSION 2N

INDEX

	Page		Page
Suspension Jounce and Windup Bumpers	2N-1	Shock Absorbers	2N-1
Front Spring	2N-4	Spring Bushing Replacement	2N-7
General	2N-1	Stabilizer Bar	2N-3
Rear Spring	2N-6	Torque Specifications	2N-8

GENERAL

Jeep vehicles are equipped with semi-elliptic leaf springs and dual-action hydraulic shock absorbers at front and rear. A front axle stabilizer bar is standard on Cherokee, Wagoneer, and Truck models and CJ models with the molded hard top. A front stabilizer bar is optional on all other CJ models.

Front and rear suspension springs are mounted parallel to the frame side rails. The forward end of the front springs and the rear end of the rear springs are attached to the frame by pivoting shackles. The opposite spring ends are attached to the frame by fixed pivot bolts. All spring ends have silent-block type rubber bushings which do not require lubrication.

The front springs are mounted below the axle on all Jeep vehicles. CJ models use multi-leaf front springs (fig. 2N-1). Cherokee, Wagoneer, and Truck models use tapered-leaf or multi-leaf front springs (fig. 2N-2).

The multi-leaf rear springs used on CJ models are mounted below the axle (fig. 2N-3).

The rear springs used on Cherokee, Wagoneer, and Truck models are either multi-leaf or tapered-leaf springs and are mounted above the axle (figs. 2N-4 and 2N-5).

The leaf springs on all Jeep models are attached to the axle by U-bolts and tie plates and are positioned on the axle by spring saddles welded to the axle tubes. Spring center bolts and spring clips are used to align and hold the spring leaves in position. If the vehicle is used for severe, off-road operation, the springs should be examined periodically for broken or shifted leaves, loose or missing clips, and broken center bolts.

Squeaking noises can be generated when movement between the spring bushings and metal parts occurs. This noise can usually be eliminated by tightening the spring attaching bolts to the specified torque. However,

if squeak noises persist after bolt tightening, check for a bushing that is loose in the spring eye, or misaligned (not centered in spring eye), or spring misalignment caused by damaged suspension components. Repair as necessary if any of these conditions are discovered.

The spring eye bushings do not require any type of lubrication. Do not attempt to eliminate bushing noises by lubricating them. Grease and mineral oil-base lubricants can cause deterioration of the bushing rubber.

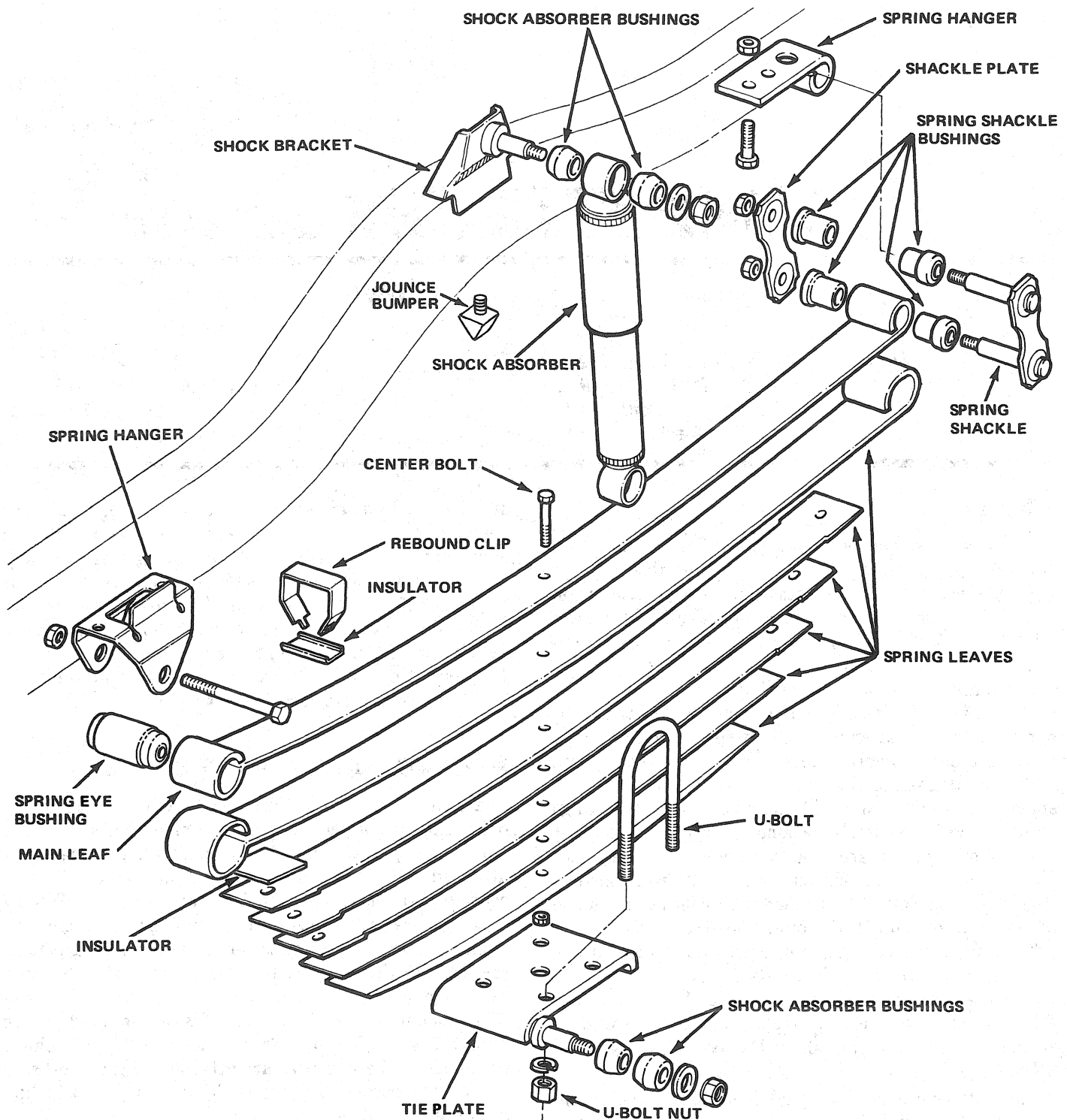
SUSPENSION JOUNCE AND WINDUP BUMPERS

A front axle windup bumper is used on CJ models only. The bumper consists of a stamped bracket with a rubber bumper attached to it (fig. 2N-6). The bracket is attached to the inner side of the right frame rail adjacent to and just above the front axle housing. During severe operation when extreme spring movement and front axle travel occurs, the bumper contacts a pad on the front axle housing to prevent excessive housing movement.

All models are equipped with frame-mounted jounce bumpers located at the front and rear of the vehicle suspension. The bumpers are attached to the underside of the frame rails and are positioned over and in line with the axle tubes.

SHOCK ABSORBERS

The hydraulic, dual-action shock absorbers used on Jeep vehicles are designed to control suspension spring movement. The shock absorber upper ends are attached to brackets located on the frame rails. The lower ends are attached to the spring tie plate or axle tube. Rubber bushings are installed in the shock mounting eyes to damp out road shock and noise.

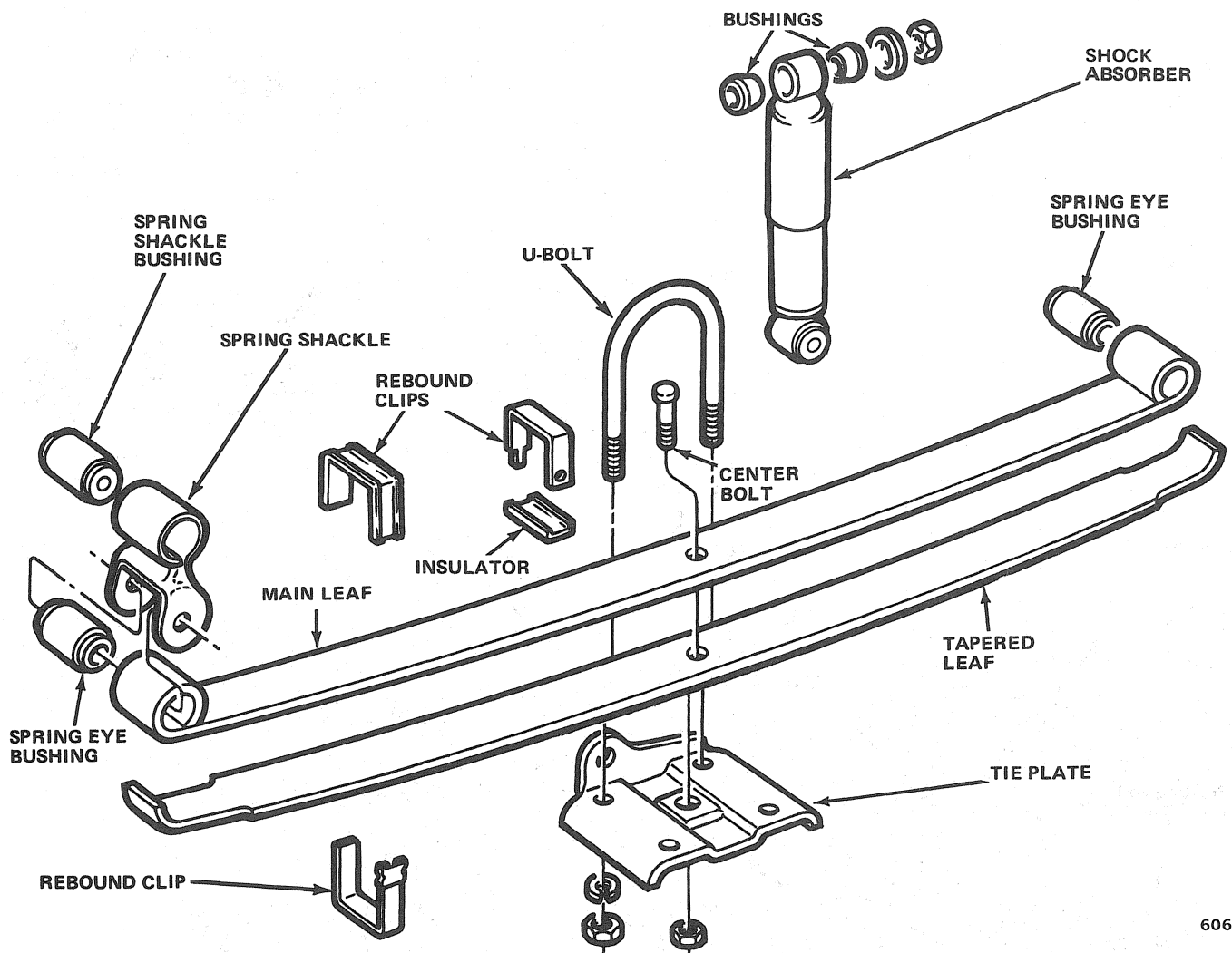


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Fig. 2N-1 Front Spring and Shock Absorber—CJ

Dual front shock absorbers are available as an option on Cherokee and J-10 Truck models. The internal valving of these shock absorbers is designed to increase the damping forces needed to cushion the loads encountered in off-road operation.

Squeak noises from the shock bushings can be generated if movement between the bushings and metal parts occurs. This noise can usually be eliminated by tightening the shock mounting nuts. However, if squeak noises persist, check for damaged or worn bushings or



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Fig. 2N-2 Front Spring and Shock Absorber—Cherokee-Wagoneer-Truck

damaged shock mounting components. Repair as necessary if any of these conditions are discovered.

The shock absorber bushings do not require any type of lubrication. Do not lubricate the bushings in an attempt to reduce bushing noises. Grease or mineral oil-base lubricants can cause deterioration of the bushing rubber.

The shock absorbers are not refillable or adjustable. If a malfunction occurs, the shock absorber must be replaced as an assembly. To test a unit, hold it in an upright position and work the shock piston up and down four or five times. Shock action throughout each stroke should be smooth and produce an equal amount of resistance in each direction.

Shock Absorber Replacement

- (1) Raise vehicle.
- (2) Position hydraulic jack under axle and raise axle to relieve springs of axle weight.

- (3) Remove washers and locknuts attaching shock absorber to upper and lower mounting pins.

- (4) Remove shock absorber and remove bushings from shock mounting eyes.

- (5) Install replacement bushings in shock mounting eyes. Do not lubricate bushings, install them dry.

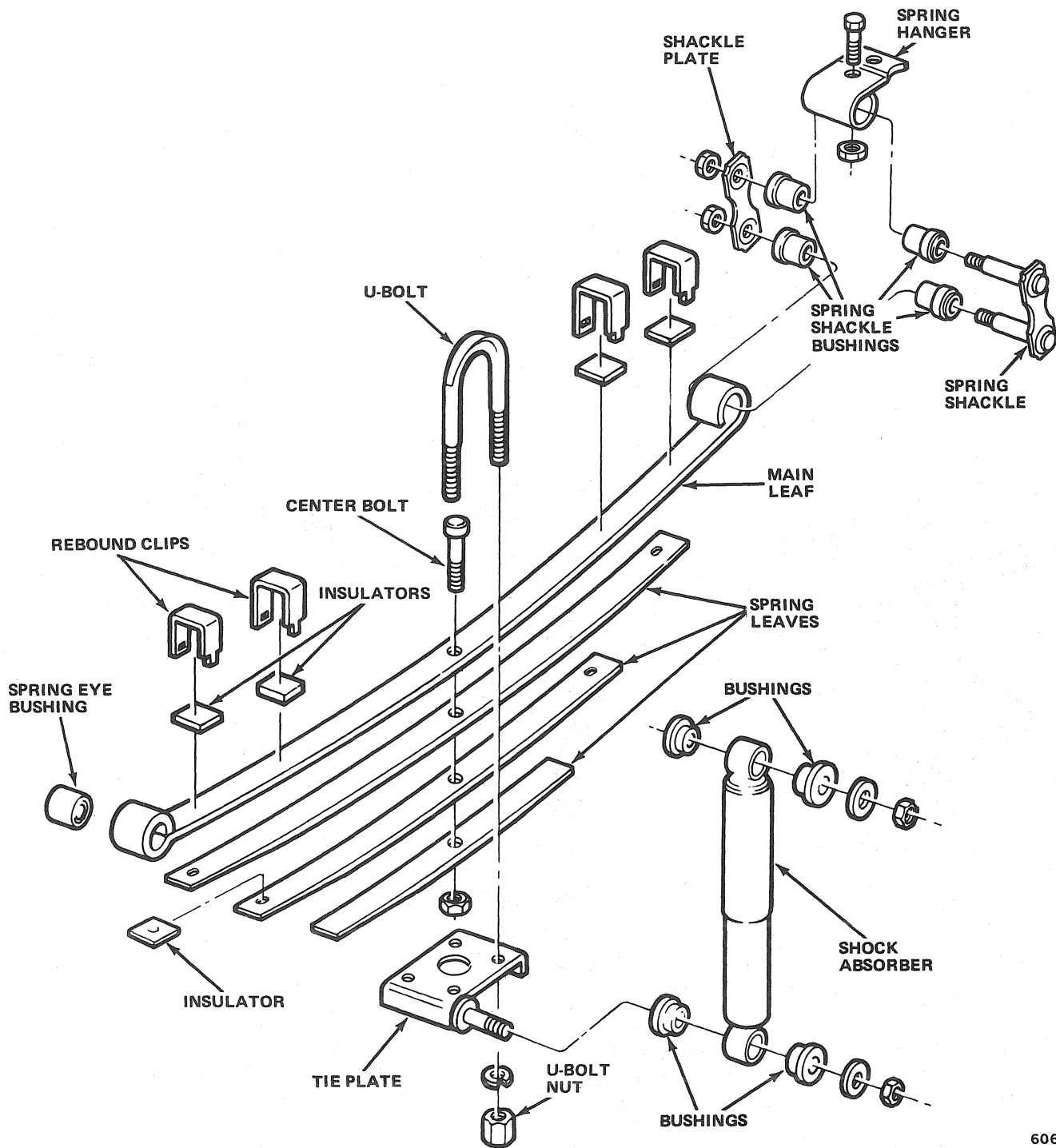
- (6) Position replacement shock absorber on mounting pins.

- (7) Install shock absorber attaching washers and locknuts. Tighten locknuts to specified torque.

- (8) Lower vehicle and remove hydraulic jack.

STABILIZER BAR

The stabilizer bar extends across the front underside of the frame and is attached to the frame rails by clamps and rubber bushings (fig. 2N-7). The bar ends extend rearward to a position above the front springs and are connected to the axle and springs by connecting links (fig. 2N-8).



60693

Fig. 2N-3 Rear Spring and Shock Absorber—CJ

FRONT SPRING

Removal

- (1) Raise vehicle.
- (2) Support vehicle using safety stands placed under frame rails.
- (3) Position hydraulic jack under axle and raise axle to relieve springs of axle weight.
- (4) Disconnect stabilizer bar, if equipped.

- (5) Remove spring U-bolts and tie plates.
- (6) Remove bolt attaching spring front eye to shackle.
- (7) Remove bolt attaching spring rear eye to spring hanger.
- (8) Remove spring.

NOTE: The spring can be disassembled by removing the spring rebound clips and spring center bolt. If the spring bushings are to be removed, refer to Spring Bushing Replacement.

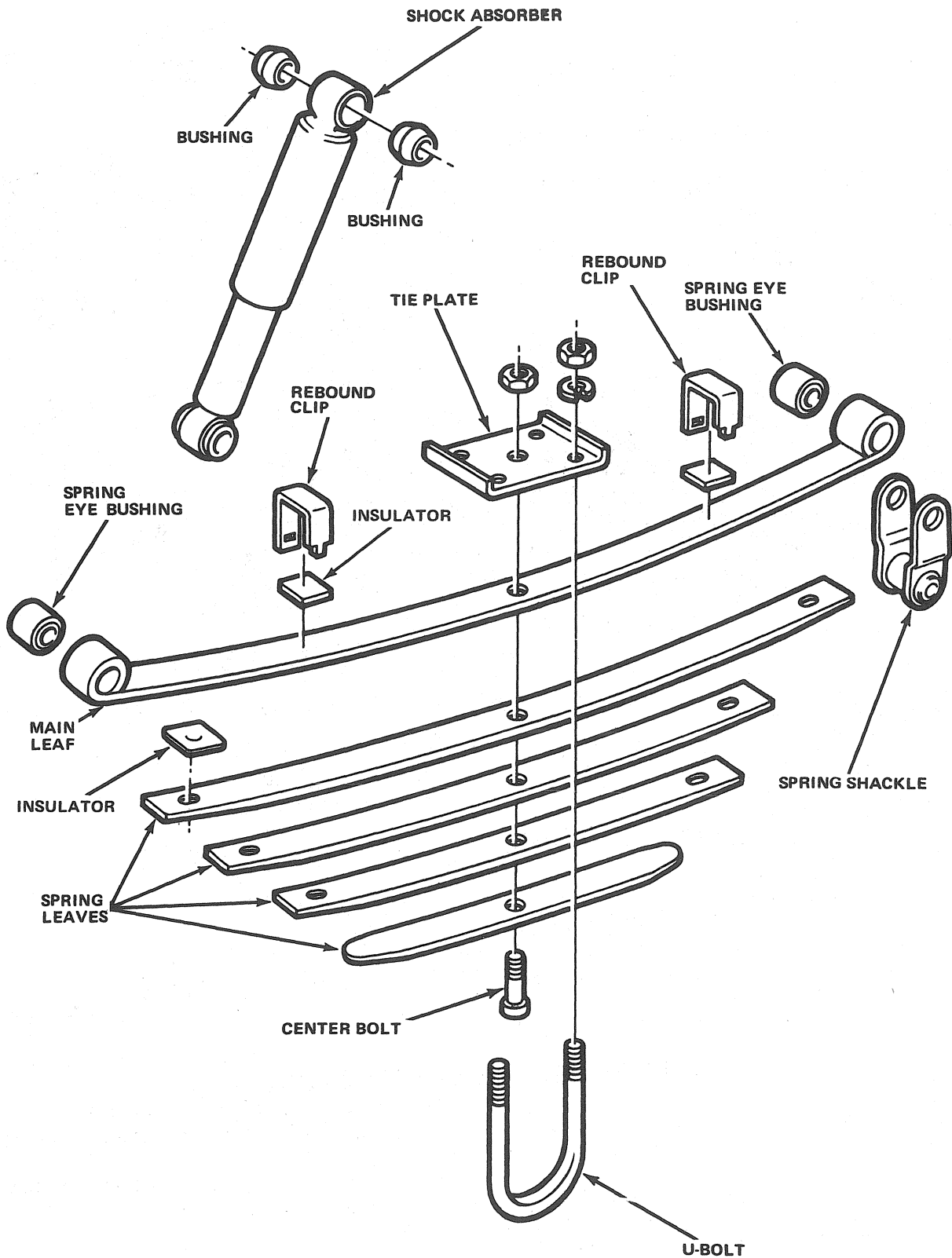


Fig. 2N-4 Rear Spring and Shock Absorber—Cherokee-Wagoneer-Truck

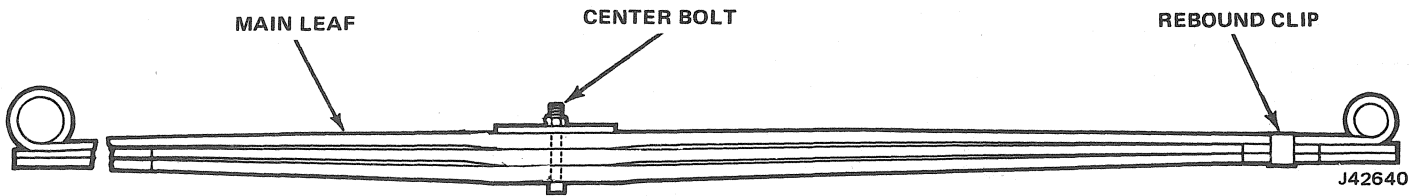


Fig. 2N-5 Tapered Rear Leaf Spring—Cherokee-Wagoneer-Truck (Typical)

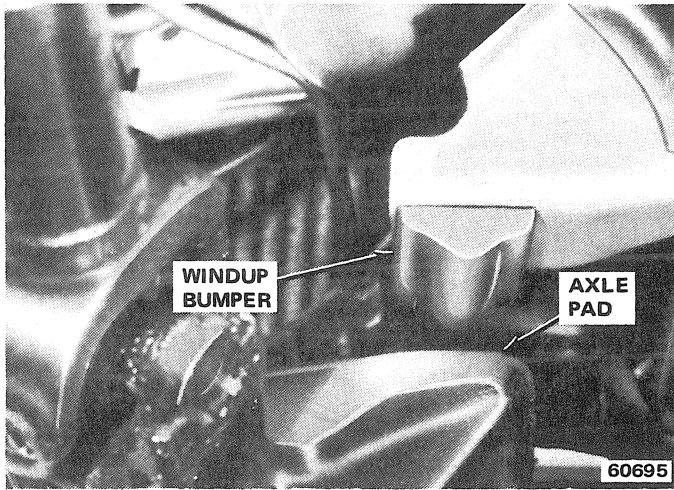


Fig. 2N-6 Front Axle Windup Bumper

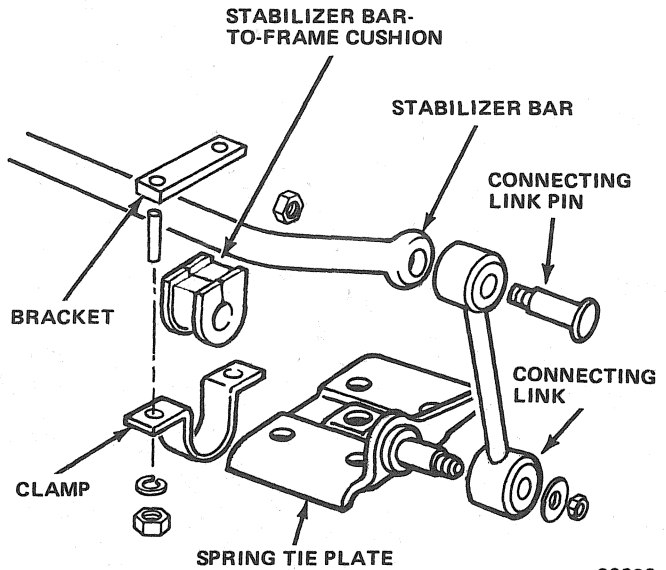


Fig. 2N-8 Stabilizer Bar Mounting

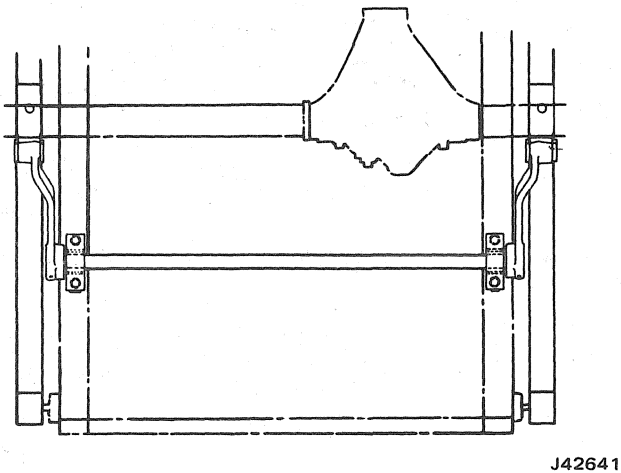


Fig. 2N-7 Stabilizer Bar Position

Installation

- (1) Position spring rear eye in hanger bracket and loosely install attaching bolt and nut. Do not tighten bolt at this time.
- (2) Position spring front eye in shackle and loosely install attaching bolt and nut. Do not tighten bolt at this time.
- (3) Position axle on spring and install spring tie plate and U-bolts. Tighten U-bolt nuts to specified torque.
- (4) Connect stabilizer bar, if equipped.

- (5) Remove hydraulic jack used to support axle weight.
- (6) Remove support stands and lower vehicle.
- (7) Tighten spring front and rear attaching bolts and nuts to specified torque.

REAR SPRING

Spring Mounted Below Axle

Removal

- (1) Raise vehicle.
- (2) Support vehicle using safety stands placed under frame rails.
- (3) Position hydraulic jack under axle and raise axle to relieve springs of axle weight.
- (4) Remove tie plate U-bolts.
- (5) Remove bolt attaching spring rear eye to shackle.
- (6) Remove bolt attaching spring front eye to mounting bracket on frame.
- (7) Remove spring.

NOTE: The spring can be disassembled by removing the spring rebound clips and spring center bolt. If the spring bushings are to be removed, refer to Spring Bushing Replacement.

Installation

(1) Position spring front eye in frame mounting bracket and loosely install attaching bolt and nut. Do not tighten bolt at this time.

(2) Position spring rear eye in shackle and loosely install attaching bolt and nut. Do not tighten bolt at this time.

(3) Install spring tie plate and U-bolts. Tighten U-bolt nuts to specified torque.

(4) Remove hydraulic jack used to support axle.

(5) Remove support stands and lower vehicle.

(6) Tighten spring eye mounting bolts and nuts to specified torque.

Spring Mounted Above Axle

Removal

(1) Raise vehicle.

(2) Support vehicle using safety stands placed under frame rails.

(3) If left-side spring is to be serviced, remove fuel tank skid plate.

(4) Position hydraulic jack under axle and raise axle to relieve springs of axle weight.

(5) Disconnect shock absorber at axle.

(6) Remove wheel.

(7) Remove tie plate U-bolts and tie plate.

(8) Remove bolt attaching spring rear eye to spring shackle.

(9) Remove bolt attaching spring front eye to spring hanger on frame rail.

(10) Remove spring.

NOTE: The spring can be disassembled by removing the spring rebound clips and center bolt. If the spring bushings are to be removed, refer to Spring Bushing Replacement.

Installation

(1) Position spring front eye in spring hanger and loosely install attaching bolt and nut. Do not tighten bolt at this time.

(2) Position spring rear eye in shackle and loosely install attaching bolt and nut. Do not tighten nut at this time.

(3) Position axle on spring and install spring tie plate and U-bolts. Tighten U-bolt nuts to specified torque.

(4) Connect shock absorber to axle.

(5) Install wheel.

(6) Install fuel tank skid plate if removed.

(7) Remove hydraulic jack.

(8) Remove support stands and lower vehicle.

(9) Tighten spring attaching bolts to specified torque.

SPRING BUSHING REPLACEMENT

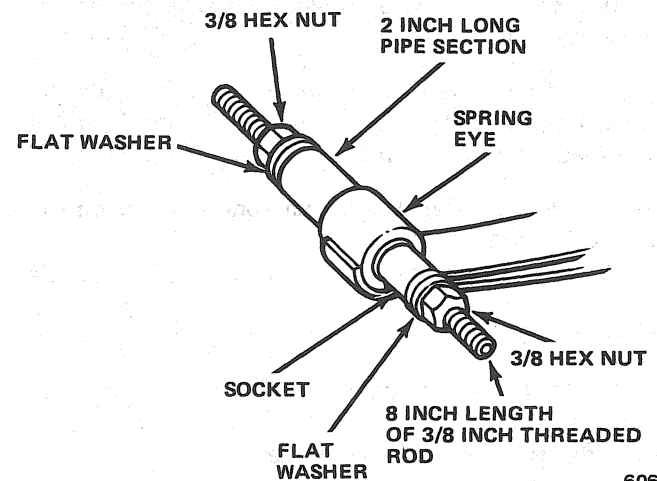
Small Bushing

(1) Insert 3/8 by 8 inch (0.95 by 20.3 cm) length of threaded rod halfway through bushing.

(2) Place suitable size socket on one end of rod with open end of socket toward bushing. Socket will serve as bushing driver.

NOTE: The socket must be large enough in diameter to bear against the metal outer sleeve on the bushing but still be small enough to pass through the spring eye.

(3) Install one flat washer and one hex nut on rod behind socket (fig. 2N-9).



60697

Fig. 2N-9 Bushing Replacement Tools—Small Bushing

(4) Install 2 inch (5.08 cm) long section of suitable size pipe on opposite end of threaded rod. Pipe will serve as bushing receiver.

NOTE: The inside diameter of the pipe must be large enough to accommodate the bushing but still seat against the spring eye surface properly.

(5) Install flat washer and hex nut on rod to secure pipe section. Be sure flat washer is large enough in diameter to support and maintain alignment of pipe section.

(6) Tighten both hex nuts finger-tight and align all components.

NOTE: Be sure socket is positioned in the spring eye and aligns with the bushing. The pipe section must butt against the spring eye surface so the bushing can pass through it. The socket will act as a press ram and press the bushing out of the spring eye.

- (7) Tighten nut at socket end of rod until bushing is pressed out of spring eye.
- (8) Remove bushing tools and old bushing.
- (9) Install replacement bushing on threaded rod.
- (10) Assemble and align bushing tools as outlined in previous steps.
- (11) Align bushing with spring eye and press bushing into eye.
- (12) Loosen bushing tools and check bushing position. Bushing must be centered in spring eye. Ends of bushing must be flush or slightly below side surfaces of spring eye.
- (13) If bushing is not centered, reinstall bushing tools and correct bushing position as necessary.

Large Bushing

- (1) Insert 1/2 by 11 inch (1.27 by 27.9 cm) length of threaded rod halfway through bushing.
- (2) Install suitable size deep socket on one end of rod with open end of socket toward bushing. Socket will serve as bushing driver.

NOTE: *The socket must be large enough in diameter to bear against the metal outer sleeve on the bushing but still be small enough to pass through the spring eye.*

- (3) Install one flat washer and one hex nut on rod behind socket (fig. 2N-10).
- (4) Install 3 inch (7.62 cm) long section of suitable size pipe on opposite end of rod. Pipe will serve as bushing receiver.

NOTE: *The inside diameter of the pipe must be large enough to accommodate the bushing but still seat against the spring eye surface properly.*

- (5) Install flat washer and one hex nut on rod behind pipe section. Be sure flat washer is large enough in diameter to support and maintain alignment of the pipe section.

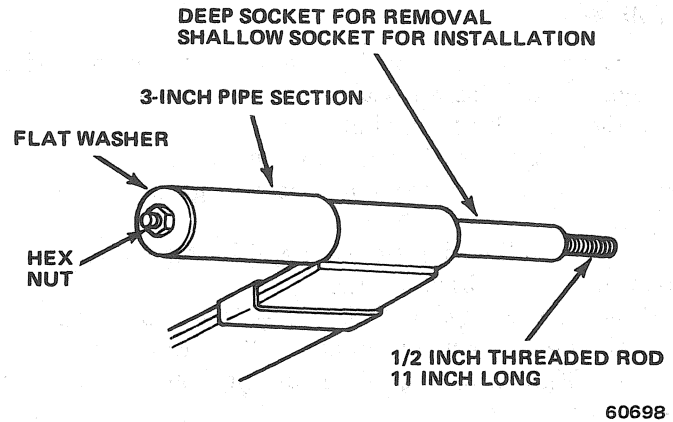


Fig. 2N-10 Bushing Replacement Tools—Large Bushing

- (6) Tighten both nuts finger-tight and align all components.

NOTE: *Be sure the socket is positioned in the spring eye and aligns with the bushing. The pipe section must butt against the spring eye so that bushing can pass through it. The socket will act as a press ram and press the bushing out of the spring eye and into the section of pipe.*

- (7) Tighten nut at socket and press bushing out of spring eye.
- (8) Remove tools and old bushing.
- (9) Install replacement bushing on threaded rod and assemble bushing tools as outlined in previous steps.
- (10) Align bushing with spring eye and press bushing into eye.
- (11) Loosen tools and check bushing position. Bushing must be centered in spring eye. Ends of bushing must be flush with or slightly below side surfaces of spring eye.
- (12) If bushing is not centered, reinstall tools and correct bushing position as necessary.

SPECIFICATIONS
Torque Specifications

Service Set-To Torques should be used when assembling components. Service In-Use Recheck Torques should be used for checking a pre-torqued item.

	USA (ft. lbs.)		Metric (N·m)	
	Service Set-To Torque	Service In-Use Recheck Torque	Service Set-To Torque	Service In-Use Recheck Torque
Shock Absorber Upper Locknut (7/16-20)	35	25-40	47	34-54
Shock Absorber Lower Locknut (1/2-20)	45	35-50	61	47-68
Spring Pivot Bolts (CJ)	100	80-120	136	108-163
Spring Shackle Nuts (CJ)	24	18-30	33	24-41
Spring U-Bolt Nuts (9/16-18)	100	85-105	136	115-142
Spring U-Bolt Nuts (1/2-20)	55	45-65	75	61-88
Spring Shackle and Pivot Bolts/Nuts (Cke-Wag-Trk)	100	80-120	136	108-163
Stabilizer Bar Mounting Bracket Bolts (All)	35	27-45	47	37-61
Wheel Nuts (CJ)	85	65-90	115	88-122
Wheel Nuts (Cke-Wag-J10 Trk)	85	65-90	115	88-122
Wheel Nuts (J20 Trk)	130	110-150	176	149-203
Spring Center Bolts	35	25-40	47	34-54
Stabilizer Bar Link Nuts	55	48-62	75	65-84

All torque values given in foot-pounds and newton-meters with dry fits unless otherwise specified.