SUSPENSION

CONTENTS

	page		page
FRONT SUSPENSION	**9**	**WHEEL ALIGNMENT**	**1**
REAR SUSPENSION	**36**		

WHEEL ALIGNMENT

INDEX

	page		page
DESCRIPTION AND OPERATION		**SERVICE PROCEDURES**	
WHEEL ALIGNMENT GENERAL INFORMATION	1	WHEEL ALIGNMENT CHECK AND ADJUSTMENT PROCEDURE	5
DIAGNOSIS AND TESTING		**SPECIFICATIONS**	
PRE-ALIGNMENT VEHICLE INSPECTION	4	VEHICLE ALIGNMENT SPECIFICATIONS AT CURB HEIGHT	8
SUSPENSION AND STEERING DIAGNOSIS	3		

DESCRIPTION AND OPERATION

WHEEL ALIGNMENT GENERAL INFORMATION

Proper vehicle wheel alignment is the proper adjustment of all interrelated front and rear suspension angles (Fig. 1). These angles are what affects the handling and steering of the vehicle when it is in motion.

The method of checking a vehicle's front and rear wheel alignment will vary depending on the type and manufacturer of the equipment being used. Instructions furnished by the manufacturer of the equipment being used should always be followed to ensure accuracy of the alignment, except alignment specifications recommended by Chrysler Corporation **MUST ALWAYS** be used.

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

Wheel alignment adjustments should be made in the following sequence, to ensure that an accurate alignment is performed.

(1) Rear Wheel Toe Adjustment within specifications for both total toe and thrust angle.

(2) Front Wheel Toe Adjustment within specifications for total toe.

DESCRIPTION AND OPERATION (Continued)

(3) **Toe** is measured in degrees or inches and is the distance that the front edges of the tires are closer (or farther apart) than the rear edges (Fig. 1). See Front Wheel Drive Specifications for correct front and rear wheel Toe specifications.

(4) **Thrust Angle** is defined as the average of the Toe settings on each rear wheel. If this measurement is out of specification, re-adjust rear wheel Toe so that each wheel has 1/2 of the total Toe measurement. When re-adjusting, do not exceed the total Toe specification.

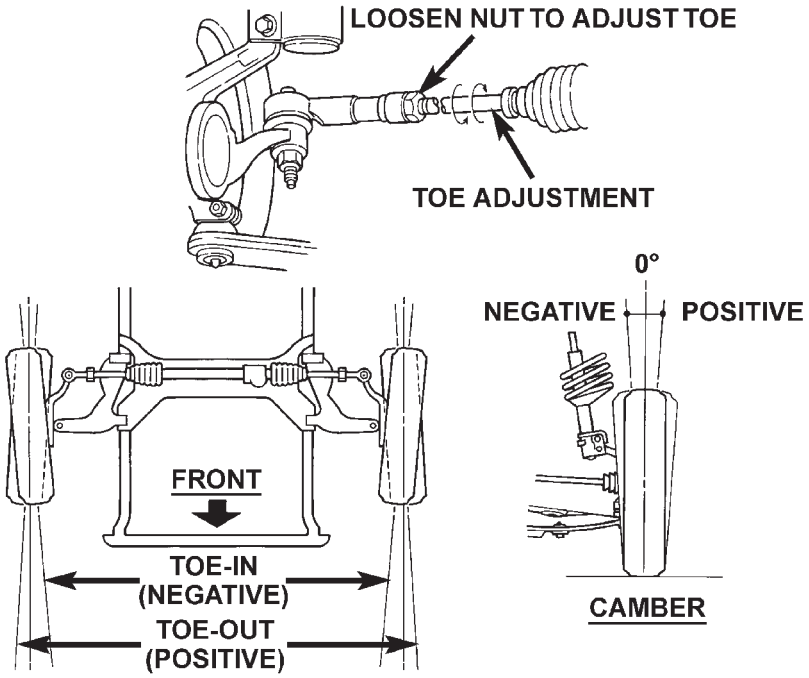


Fig. 1 Alignment Camber/Toe

DIAGNOSIS AND TESTING

SUSPENSION AND STEERING DIAGNOSIS

CONDITION	POSSIBLE CAUSES	POTENTIAL CORRECTIONS
Front End Whine On Turns	1. Defective Wheel Bearing 2. Incorrect Wheel Alignment 3. Worn Tires	1. Replace Wheel Bearing 2. Check And Reset Wheel Alignment 3. Replace Tires
Front End Growl Or Grinding On Turns	1. Defective Wheel Bearing 2. Engine Mount Grounding Against Frame Or Body Of Vehicle. 3. Worn Or Broken C/V Joint 4. Loose Wheel Lug Nuts 5. Incorrect Wheel Alignment 6. Worn Tires	1. Replace Wheel Bearing 2. Check For Motor Mount Hitting Frame Rail And Reposition Engine As Required 3. Replace C/V Joint 4. Verify Wheel Lug Nut Torque 5. Check And Reset Wheel Alignment 6. Replace Tires
Front End Clunk Or Snap On Turns	1. Loose Wheel Lug Nuts 2. Worn Or Broken C/V Joint 3. Worn Or Loose Tie Rod Or Ball Joint 4. Worn Control Arm Bushing 5. Loose Sway Bar Or Upper Strut Attachment	1. Verify Wheel Lug Nut Torque 2. Replace C/V Joint 3. Tighten Or Replace Tie Rod End Or Ball Joint 4. Replace Control Arm Bushing 5. Tighten Sway Bar Or Upper Strut Attachment To Specified Torque
Front End Whine With Vehicle Going Straight At A Constant Speed	1. Defective Wheel Bearing 2. Incorrect Wheel Alignment 3. Worn Tires	1. Replace Wheel Bearing 2. Check And Reset Wheel Alignment 3. Replace Tires
Front End Growl Or Grinding With Vehicle Going Straight At A Constant Speed	1. Engine Mount Grounding 2. Worn Or Broken C/V Joint	1. Reposition Engine As Required 2. Replace C/V Joint
Front End Whine When Accelerating Or Decelerating	1. Worn Or Defective Transaxle Gears Or Bearings	1. Replace Transaxle Gears Or Bearings
Front End Clunk When Accelerating Or Decelerating	1. Worn Or Broken Engine Mount 2. Worn Or Defective Transaxle Gears Or Bearings 3. Loose Wheel Lug Nuts 4. Worn Or Broken C/V Joint 5. Worn Or Loose Ball Joint 6. Worn Or Loose Control Arm Bushing 7. Loose Crossmember Bolts	1. Replace Engine Mount 2. Replace Transaxle Gears Or Bearings 3. Verify Wheel Lug Nut Torque 4. Replace C/V Joint 5. Tighten Or Replace Ball Joint 6. Tighten To Specified Torque Or Replace Control Arm Bushing 7. Tighten Crossmember Bolts To Specified Torque

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	POTENTIAL CORRECTIONS
Road Wander	1. Incorrect Tire Pressure	1. Inflate Tires To Rcommended Pressure
	2. Incorrect Front Or Rear Wheel Toe	2. Check And Reset Front Wheel Toe
	3. Worn Wheel Bearings	3. Replace Wheel Bearing
	4. Worn Control Arm Bushings	4. Replace Control Arm Bushing
	5. Excessive Friction In Steering Gear	5. Replace Steering Gear
	6. Excessive Friction In Steering Shaft Coupling	6. Replace Steering Coupler
	7. Excessive Friction In Strut Upper Bearing	7. Replace Strut Bearing
Lateral Pull	1. Unequal Tire Pressure	1. Inflate All Tires To Recommended Pressure
	2. Radial Tire Lead	2. Perform Lead Correction Procedure
	3. Incorrect Front Wheel Camber	3. Check And Reset Front Wheel Camber
	4. Power Steering Gear Imbalance	4. Replace Power Steering Gear
	5. Wheel Braking	5. Correct Braking Condition Causing Lateral Pull
Excessive Steering Free Play	1. Incorrect Steering Gear Adjustment	1. Adjust Or Replace Steering Gear
	2. Worn Or Loose Tie Rod Ends	2. Replace Or Tighten Tie Rod Ends
	3. Loose Steering Gear Mounting Bolts	3. Tighten Steering Gear Bolts To The Specified Torque
	4. Loose Or Worn Steering Shaft Coupler	5. Replace Steering Shaft Coupler
Excessive Steering Effort	1. Low Tire Pressure	1. Inflate All Tires To Recommended Pressure
	2. Lack Of Lubricant In Steering Gear	2. Replace Steering Gear
	3. Low Power Steering Fluid Level	3. Fill Power Steering Fluid Reservoir To Correct Level
	4. Loose Power Steering Pump Belt	4. Correctly Adjust Power Steering Pump Drive Belt
	5. Lack Of Lubricant In Steering Ball Joints	5. Lubricate Or Replace Steering Ball Joints
	6. Steering Gear Malfunction	6. Replace Steering Gear
	7. Lack Of Lubricant In Steering Coupler	7. Replace Steering Coupler

PRE-ALIGNMENT VEHICLE INSPECTION

CAUTION: If the front suspension crossmember shows any sign of impact damage, the steering column to steering gear coupling must be inspected. Refer to Group 19 Steering in this service manual for the inspection procedure.

Before any attempt is made to change or correct the wheel alignment factors, the following inspection and necessary corrections must be made on those parts which influence the steering of the vehicle.

(1) Be sure the fuel tank is full when the wheel alignment specifications are checked and or adjusted. A full tank of fuel weighs approximately 75 pounds, if the fuel tank is not full this reduction in weight will affect the curb height of the vehicle and the alignment specifications.

(2) Alignment specifications of a vehicle can be the most accurately checked and set when the passenger

DIAGNOSIS AND TESTING (Continued)

compartment and trunk of the vehicle are vacant with the exception of the spare tire. People, luggage, and any other appreciable weight will adversely affect the checking and setting of the camber specification.

(3) Check and if required, inflate all of the tires to the recommended air pressure. All tires must be of the same size and in good condition and have approximately the same tread wear. **Note the type of tread wear on the tire, this will aid in diagnosing problems. Refer to Group 22 Tires And Wheels in this service manual for the tire wear diagnosis.**

(4) Check the front tire and wheel assemblies for radial runout.

(5) Before beginning the alignment process, inspect all suspension component fasteners for looseness and/or loss of specified torque.

(6) Inspect the lower front ball joints and all steering linkage for looseness and any signs of wear and or damage.

(7) Inspect the tie rod ends for looseness and any signs of wear and or damage.

(8) Inspect the rubber bushings on all suspension components for signs of wear or deterioration. If any bushings show signs of wear or deterioration they should be replaced prior to aligning the vehicle.

SERVICE PROCEDURES

WHEEL ALIGNMENT CHECK AND ADJUSTMENT PROCEDURE

CASTER CAMBER

Front and rear Caster and Camber settings on this vehicle are determined at the time the vehicle is designed, by the location of the vehicle's suspension components. This is called a Net Build vehicle and results in no required adjustment of Caster and Camber after vehicle is built or when servicing the suspension components. Thus Caster and Camber are not normally considered an adjustable specification when performing an alignment on this vehicle. Though Caster and Camber are not adjustable they must be checked to ensure they meet vehicle specifications.

If front and or rear camber is found not to meet the vehicle alignment specifications, it can be adjusted using a Mopar Service Kit developed to allow for camber adjustment. If a vehicle's front or rear camber is found to be outside the specifications, the vehicles suspension components should be inspected for any signs of damage on bending. **This must be done before using the Mopar Service Kit for setting camber to meet required specification.**

If a vehicles caster is not within manufacturers alignment specifications, check for damaged suspension components or body parts. This type of damage can cause component locations to move affecting vehicle alignment. **No adjustment can be made for the Caster setting on this vehicle.**

CAUTION: Do not attempt to adjust the vehicles Caster or Camber by heating, bending or any other modification of the suspension components.

(1) Correctly position vehicle on alignment rack and install all required equipment on vehicle, per the alignment equipment manufacturers specifications.

(2) Center the steering wheel and lock in place using a steering wheel clamp.

NOTE: Prior to reading each alignment specification, jounce the front and rear of the vehicle an equal number of times. Induce jounce (rear first then front) by grasping center of bumper and jouncing each end of vehicle an equal number of times. Bumper should always be released when vehicle is at the bottom of the jounce cycle.

(3) Correctly jounce vehicle and read front and rear alignment settings and compare to vehicle specifications for Camber, Caster and Toe. See Alignment Specifications in this group of the service manual for required specifications. **If front and rear camber readings are within required specifications proceed to step Step 3 in the Front And Rear Toe Setting procedure. If Camber readings are not within specifications refer to step Step 1 in the following camber adjustment bolt package installation procedure, for the front and rear Camber adjustment procedure.**

CAMBER ADJUSTMENT BOLT PACKAGE INSTALLATION PROCEDURE

(1) If front and or rear camber readings obtained are not within the required specification range, a Mopar Service Kit is available to provide the required adjustment. The kit contains new bolts and nuts for the strut clevis bracket to steering knuckle attachment. The bolts contained in the service kit, are slightly undersize allowing for movement between the strut clevis bracket and steering knuckle. The movement allowed by the undersize bolts will provide approximately 2 degrees of camber adjustment per side of vehicle. To install new bolts in service kit follow the procedure below.

SERVICE PROCEDURES (Continued)

CAUTION: The Mopar Service Kit for allowing adjustment of front and rear camber are different for the front and rear of the vehicle. When using the service kits be sure that the front and rear strut attaching bolts are always used in the right location on the vehicle.

(2) Raise front and or rear of vehicle until tires are not supporting the weight of the vehicle.

CAUTION: The steering knuckle and rear knuckle to strut assembly attaching bolts are serrated and must not be turned during removal. Remove nuts while holding bolts stationary in the steering knuckles.

(3) Remove original upper bolt attaching the front or rear strut clevis bracket to the steering knuckle or rear knuckle (Fig. 2) or (Fig. 3).

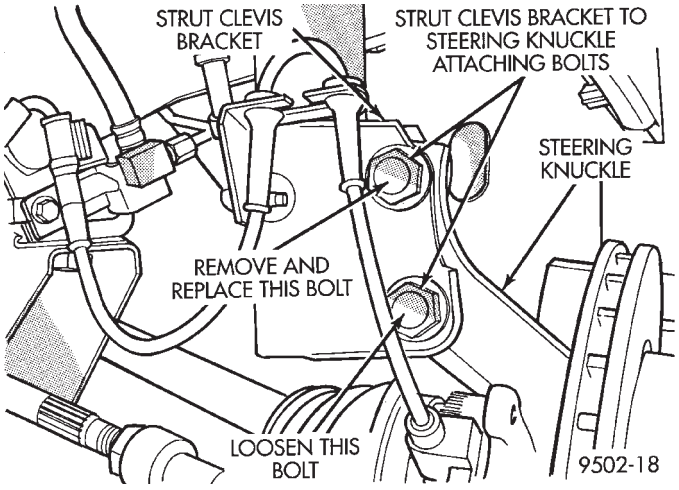


Fig. 2 Front Strut Clevis Bracket To Steering Knuckle Attaching Bolts

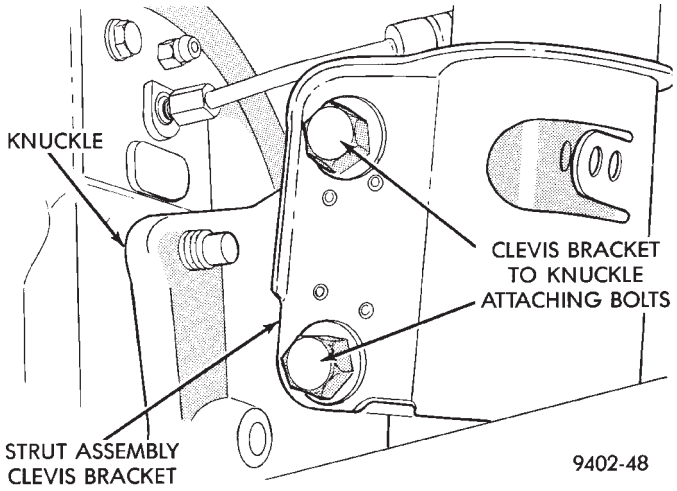


Fig. 3 Rear Strut Clevis Bracket Attaching Bolts

(4) Loosen lower bolt attaching strut clevis bracket to steering knuckle or rear knuckle **ONLY** enough to allow knuckle to move in clevis bracket.

(5) Install bolt from service kit into the upper strut clevis bracket to steering knuckle or rear knuckle mounting hole.

CAUTION: Only the nuts supplied in the service kits MUST be used with the service kit replacement bolts. The original nuts will not properly secure the strut clevis bracket to steering knuckle or rear knuckle.

(6) Install nut provided in service kit on the replacement bolt.

(7) Tighten upper bolt and nut from service kit until snug, but still allowing movement between strut clevis bracket and knuckle.

(8) Remove original lower bolt. Install bolt from service kit into the bottom hole of the strut clevis bracket. Install nut and snug.

(9) Lower vehicle until full weight of vehicle is supported by the suspension and then jounce front and rear of vehicle an equal amount of times.

(10) Adjust front and or rear camber to the preferred setting by pushing or pulling on the top of the front or rear tire. When camber is correctly set tighten upper and lower strut clevis bracket bolts. Again jounce front and rear of vehicle an equal amount of times and verify front and rear camber setting. See Alignment Specifications in this group of the service manual for required specifications.

(11) When vehicle is at correct camber setting torque both front strut clevis bracket to steering knuckle attaching bolts to 53 N·m (40 ft. lbs.) plus an additional 1/4 turn after required torque is met. Torque rear strut clevis bracket to rear knuckle attaching bolts to 95 N·m (70 ft. lbs.).

(12) If Toe readings obtained are not within the required specification range, adjust Toe to meet the preferred specification setting. Toe is adjustable using the following Toe setting procedure.

FRONT AND REAR TOE SETTING PROCEDURE

(1) Prepare vehicle as described in the Pre-Alignment Vehicle Inspection procedure.

(2) Center steering wheel and lock in place using a steering wheel clamp.

(3) When performing the Toe setting procedure, set rear wheel Toe to preferred specification first, then set front wheel Toe to the preferred specification.

(4) Loosen nuts on attaching bolts, for the left and right rear lateral links to rear crossmember (Fig. 4).

(5) Rotate lateral link adjustment cams (Fig. 5) until the preferred rear Toe specification is obtained. See Alignment Specifications in this group of the service manual for preferred specification.

SERVICE PROCEDURES (Continued)

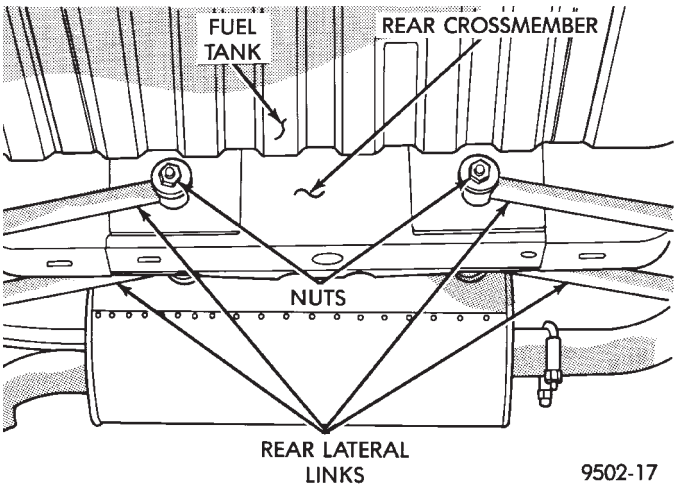


Fig. 4 Rear Lateral Link To Crossmember Attaching Bolts

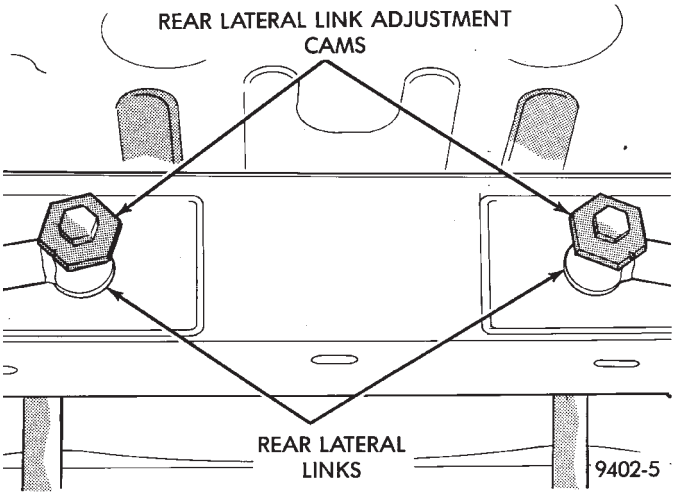


Fig. 5 Rear Wheel Toe Adjustment Cams

(6) While holding Toe adjustment cams from turning, tighten left and right lateral links to rear crossmember attaching bolt nuts. This will securely hold adjustment cams in position. Then while holding lateral link attaching bolt and adjustment cam from turning, torque nut of lateral link attaching bolt to 95 N·m (70 ft. lbs.) (Fig. 6).

CAUTION: Do not twist front inner tie rod to steering gear rubber boots during front wheel Toe adjustment.

(7) Loosen inner to outer tie rod end jam nuts (Fig. 7). Grasp inner tie rods at serrations and rotate tie rods (Fig. 7) to set the front wheel Toe to the preferred specification. See Alignment Specifications in this group of the service manual for preferred specification.

(8) Tighten tie rod locknuts to 54 N·m (40 ft.lbs.) torque.

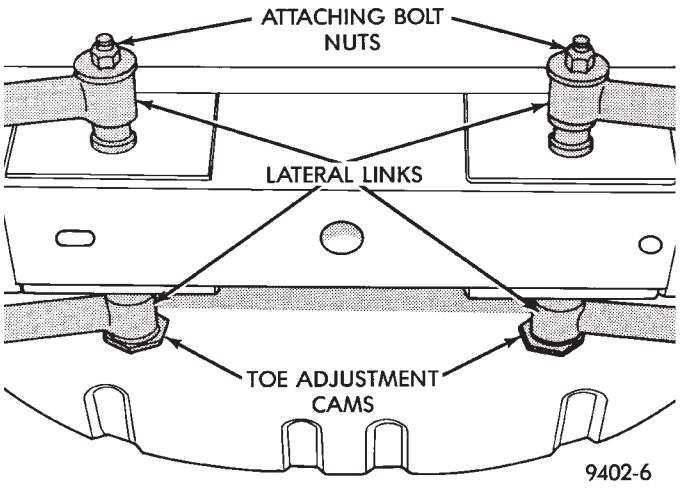


Fig. 6 Torquing Rear Lateral Link Attaching Bolts

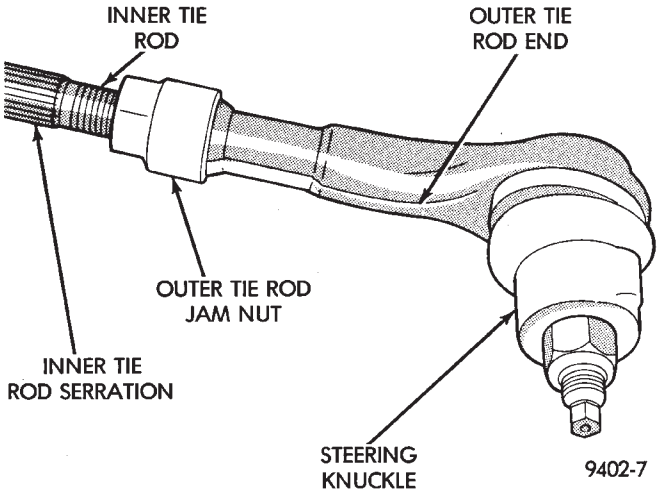


Fig. 7 Front Wheel Toe Adjustment

(9) Adjust steering gear to tie rod boots at tie rod.
(10) Remove steering wheel clamp.

SPECIFICATIONS

VEHICLE ALIGNMENT SPECIFICATIONS AT CURB HEIGHT

FRONT WHEEL ALIGNMENT	ACCEPTABLE ALIGNMENT RANGE AT CURB HEIGHT	PREFERRE SETTING
CAMBER	-0.4° to +0.4°	+0.0°
TOTAL TOE . . . . . Specified In Degrees (See Note)	0.3°in to 0.1°out	0.1° in
CASTER* . . . . . *Side To Side Caster Difference Not To Exceed	+1.8° to +3.8° 1.0° or less	+2.8°
REAR WHEEL ALIGNMENT	ACCEPTABLE ALIGNMENT RANGE AT CURB HEIGHT	PREFERRE SETTING
CAMBER	-.75° to +0.25°	-0.25°
TOTAL TOE . . . . . Specified In Degrees (See Note) TOE OUT: When Backed On Alignment Rack Is TOE In When Driving	0.3° in to 0.1° out	0.1° in
THRUST ANGLE	-0.10° to +0.10°	
Note: Total Toe is the arithmetic sum of the left and right wheel Toe settings. Positive is Toe-in, negative is Toe-out. Total Toe must be equally split between each front wheel to ensure the steering wheel is centered after setting Toe. Left and Right Toe must be equal to within 0.02 degrees.		

FRONT SUSPENSION

INDEX

	page
GENERAL INFORMATION	
GENERAL INFORMATION	9
DESCRIPTION AND OPERATION	
BALL JOINT	13
COIL SPRING	13
FRONT SUSPENSION	9
FRONT WHEEL HUB BEARING	13
LOWER CONTROL ARM	12
McPHERSON STRUT ASSEMBLY	12
STABILIZER BAR	12
STEERING KNUCKLE	12
WHEEL MOUNTING STUDS	13
DIAGNOSIS AND TESTING	
BALL JOINT ASSEMBLY	14
HUB/BEARING	14
LOWER CONTROL ARM	14
MCPHERSON STRUT ASSEMBLY	13
STABILIZER BAR	14
STEERING KNUCKLE	13
REMOVAL AND INSTALLATION	
FRONT WHEEL MOUNTING STUDS	25
HUB BEARING	23
LOWER CONTROL ARM	20
MCPHERSON STRUT	15
STABILIZER BAR	22
STEERING KNUCKLE	16
DISASSEMBLY AND ASSEMBLY	
BALL JOINT	29
LOWER CONTROL ARM FRONT ISOLATOR BUSHING	31
LOWER CONTROL ARM REAR ISOLATOR BUSHING	32
McPHERSON STRUT	27
SPECIFICATIONS	
FRONT SUSPENSION FASTENER TORQUES	33
SPECIAL TOOLS	
FRONT SUSPENSION	34

GENERAL INFORMATION

GENERAL INFORMATION

CAUTION: ONLY FRAME CONTACT HOISTING EQUIPMENT CAN BE USED ON THIS VEHICLE. All vehicles have a fully independent rear suspension. The vehicles can not be hoisted using equipment designed to lift a vehicle by the rear axle. If this type of hoisting equipment is used, damage to rear suspension components will occur.

CAUTION: At no time when servicing a vehicle, can a sheet metal screw, bolt or other metal fastener be installed in the shock tower to take the place of an original plastic clip. Also, NO holes can be drilled into the front shock tower in the area shown in (Fig. 1), for the installation of any metal fasteners into the shock tower.

Because of the minimum clearance in this area (Fig. 1) installation of metal fasteners could damage the coil spring coating and lead to a corrosion failure of the spring. If a plastic clip is missing, or is lost or broken during servicing a vehicle, replace only with the equivalent part listed in the Mopar parts catalog.

DESCRIPTION AND OPERATION

FRONT SUSPENSION

This vehicle has a gas pressurized MacPherson strut front suspension design (Fig. 2).

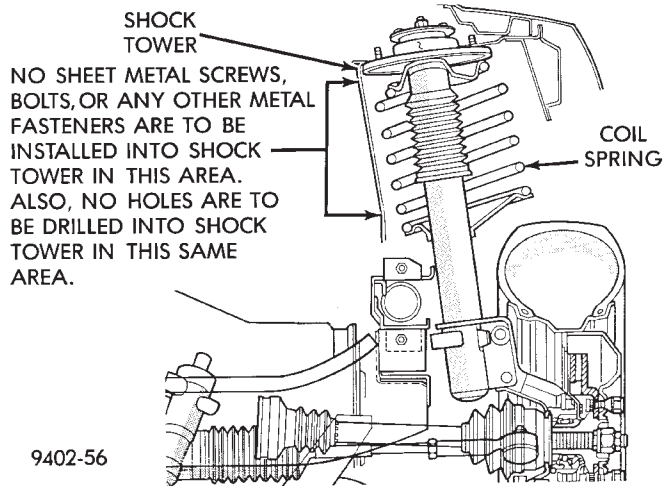


Fig. 1 Shock Tower To Spring Minimum Clearance Area

A MacPherson strut assembly is used in place of the front suspension upper control arm and upper ball joint. The bottom of the MacPherson strut, mounts directly to the steering knuckle using 2 attaching bolts and nuts going through the clevis

DESCRIPTION AND OPERATION (Continued)

bracket and steering knuckle (Fig. 2). The top of the strut is mounted directly to the strut tower of the vehicle by the strut mount assembly's 3 studs and attaching nuts (Fig. 2). During steering maneuvers, the strut assembly (through a pivot bearing in the upper strut mount assembly) and steering knuckle (through the lower ball joint) turn as an assembly (Fig. 2).

The MacPherson strut assembly includes the following components: A rubber isolated top mount, an upper spring seat/bearing assembly, jounce bumper, dust shield, coil spring with plastic noise insulator and the strut dampener.

A cast lower control arm assembly (Fig. 2) is attached to the front suspension crossmember using 2 rubber isolator bushings and to the steering knuckle by means of a ball joint.

A sealed for life front hub and bearing assembly is attached to the front steering knuckle. The outer C/V joint assembly is splined to the front hub and bearing assembly and is retained by a prevailing torque nut.

DESCRIPTION AND OPERATION (Continued)

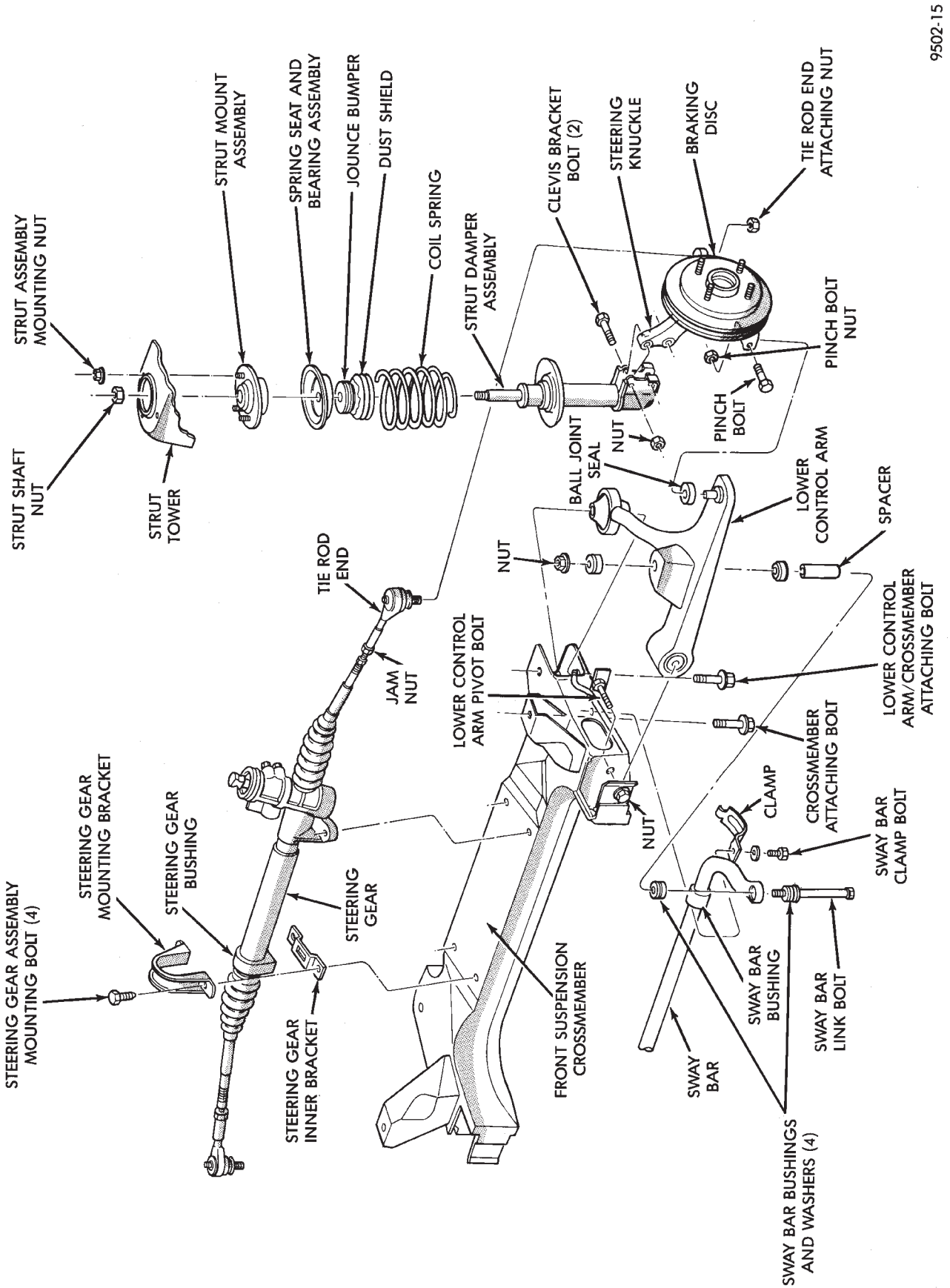


Fig. 2 Front Suspension (Typical)

DESCRIPTION AND OPERATION (Continued)

McPHERSON STRUT ASSEMBLY

The front strut and suspension of the vehicle is supported by coil springs positioned around the struts. The springs are contained between an upper seat, located just below the top strut mount assembly and a lower spring seat on the strut lower housing.

The top of each strut assembly is bolted to the upper fender reinforcement (shock tower) through a rubber isolated mount.

The bottom of the strut assembly attaches to the top of the steering knuckle using 2 thru-bolts and prevailing torque nuts. Caster and camber is a fixed setting (net build) on all vehicles and is not required to be adjusted.

STEERING KNUCKLE

The steering knuckle (Fig. 3) is a single casting with legs machined for attachment to the front strut assembly and lower control arm ball joint. The steering knuckle also has machined abutments on the casting to support and align the front brake caliper assembly. The knuckle also holds the front drive shaft outer C/V joint hub and bearing assembly. The hub is positioned through the bearing and knuckle, with the constant velocity stub shaft splined through the hub. The outer C/V joint is retained to the hub/bearing using a hub nut. The hub nut is held on the stub shaft using a nut retainer and cotter pin.

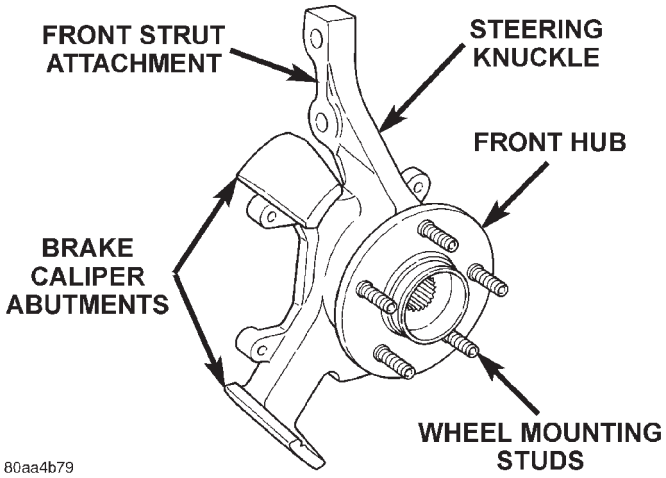


Fig. 3 Steering Knuckle Assembly

LOWER CONTROL ARM

The lower control arm (Fig. 4) is a ductile iron casting using 2 rubber bushings to isolate it from the front suspension crossmember and frame of the vehicle. The isolator bushings consist of 2 metal encased rubber isolated pivot bushings. The front of the lower control arm is bolted to the front crossmember using a bolt through the center of the rubber pivot bushing (Fig. 4). The rear of the lower control arm is mounted to both the front crossmember and the frame rail of the vehicle using a thru-bolt. The thru-bolt goes through both the crossmember and rear lower control arm bushing, threading directly into the frame rail of the vehicle. The lower control arms are inter-connected through a linked rubber isolated stabilizer bar.

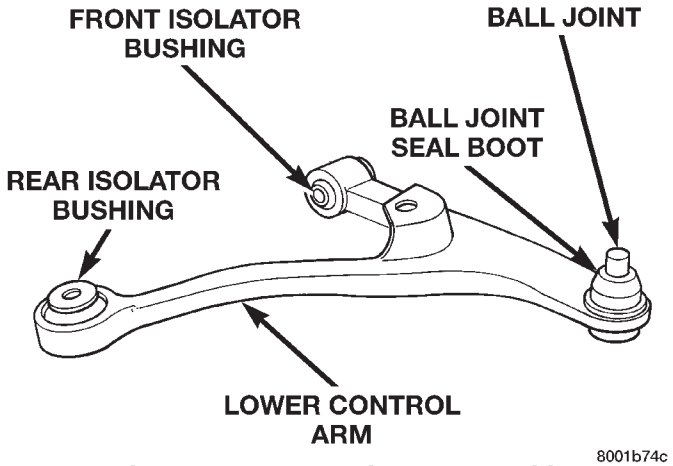


Fig. 4 Lower Control Arm Assembly

STABILIZER BAR

The stabilizer bar (Fig. 5) interconnects both front lower control arms of the vehicle and is attached to the front suspension cradle.

Jounce and rebound movements affecting one wheel are partially transmitted to the opposite wheel of the vehicle to stabilize body roll.

Attachment of the stabilizer bar to the front suspension cradle is through 2 rubber-isolator bushings and bushing retainers (Fig. 5). The stabilizer bar to lower control arm attachment is done utilizing a rubber isolated stabilizer bar attaching link (Fig. 5). All parts of the stabilizer bar are serviceable, and the stabilizer bar to crossmember bushings are split for easy removal and installation. The split in the stabilizer bar to crossmember bushing must be positioned toward the front of the vehicle, when the stabilizer bar is installed on the vehicle.

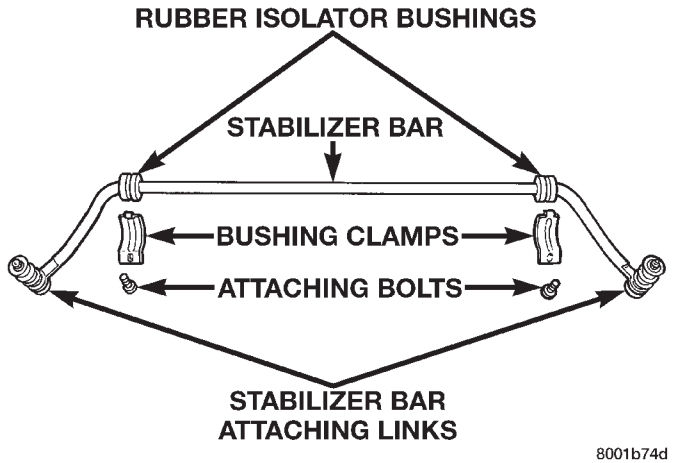


Fig. 5 Stabilizer Bar And Components

DESCRIPTION AND OPERATION (Continued)

FRONT WHEEL HUB BEARING

The front wheel hub bearing used on the Neon is a Unit 1 type cartridge bearing (Fig. 6).

The wheel bearing is serviced separately from the front steering knuckle and front hub assembly. Installation and retention of the front wheel bearing into the steering knuckle, is by means of an interference press fit using a retaining compound and a retaining snap ring (Fig. 6). Installation of the front hub into the front wheel bearing, must be done after wheel bearing and retaining snap ring is installed in steering knuckle.

The unit 1 wheel bearing is serviced only as a complete assembly less the wheel hub. If the front wheel bearing requires replacement, the hub must be removed from the original wheel bearing and transferred to the replacement bearing.

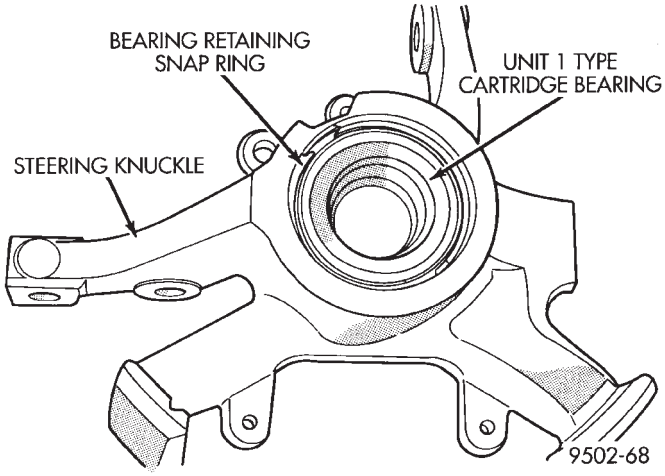


Fig. 6 Front Wheel Hub Bearing

COIL SPRING

Coil springs are rated separately for each corner or side of the vehicle depending on optional equipment and type of vehicle service. During service procedures when both springs are removed, mark springs to ensure installation in original position. Each coil spring comes with a plastic sleeve on the second coil of the spring. This plastic sleeve is a noise insulator for the coil spring. **If coil springs require replacement, be sure that the springs needing replacement, are replaced with springs meeting the correct load rating for the vehicle and its specific options.**

BALL JOINT

The ball joint (Fig. 7) is pressed into the lower control arm and has a non-tapered stud with a notch for steering knuckle clamp bolt clearance. The ball joint stud is clamped and locked into the steering knuckle leg using a pinch bolt. The ball joint used on this vehicle is replaceable and if found defective can be serviced as a separate component of the lower control arm assembly.

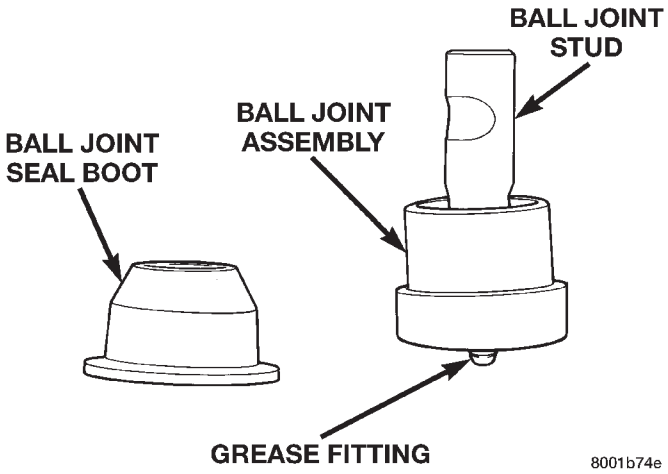


Fig. 7 Ball Joint Assembly

WHEEL MOUNTING STUDS

If wheel attaching studs need to be replaced in the hub and bearing assembly the studs **CAN NOT** be hammered out of the hub flange. If a stud is removed by hammering it out of the bearing flange, damage to the hub and bearing assembly will occur leading to premature bearing failure.

Use the procedure and special tools shown in the service procedures section for the wheel mounting studs when replacing the wheel attaching studs.

The hub and bearing assembly does not require removal from the steering knuckle or the rear knuckle to replace the wheel attaching studs in the hub and bearing assembly.

DIAGNOSIS AND TESTING

MCPHERSON STRUT ASSEMBLY

(1) Inspect for damaged or broken coil springs (Fig. 8).

(2) Inspect for torn or damaged strut assembly dust boots (Fig. 8).

(3) Lift dust boot (Fig. 9) and inspect strut assembly for evidence of fluid running from the upper end of fluid reservoir. (Actual leakage will be a stream of fluid running down the side and dripping off lower end of unit). A slight amount of seepage between the strut rod and strut shaft seal is not unusual and does not affect performance of the strut assembly. Also inspect jounce bumpers for signs of damage or deterioration.

STEERING KNUCKLE

The front suspension steering knuckle is not a repairable component of the front suspension. **IT MUST BE REPLACED IF FOUND TO BE DAM-**

DIAGNOSIS AND TESTING (Continued)

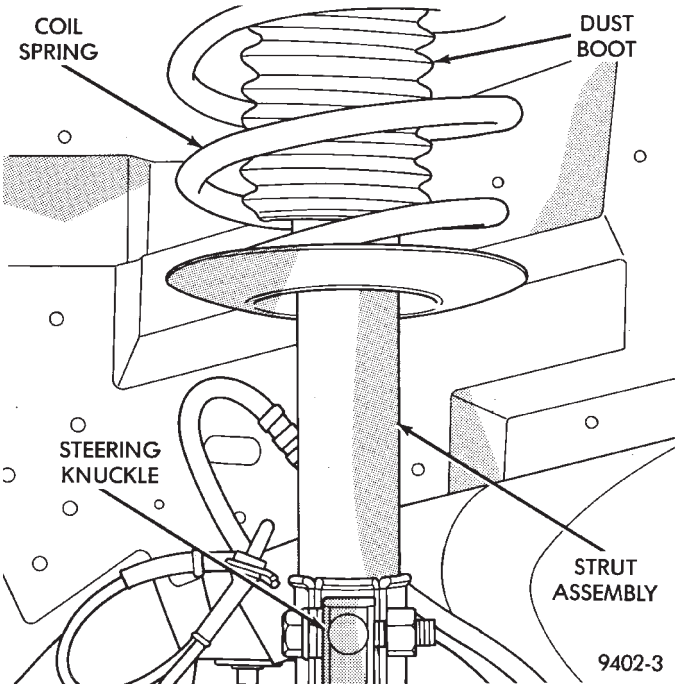


Fig. 8 McPherson Strut Assembly Inspection

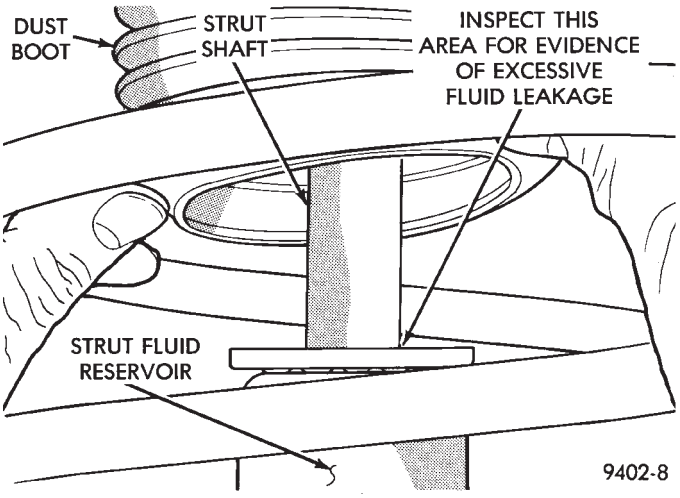


Fig. 9 Strut Assembly Leakage Inspection

AGED IN ANY WAY. If it is determined that the steering knuckle is bent when servicing the vehicle, no attempt is to be made to straighten the steering knuckle.

On this vehicle the steering knuckle must be removed from the vehicle when servicing the front hub bearing.

LOWER CONTROL ARM

If damaged, the lower control arm casting is serviced only as a complete component. Inspect lower control arm for signs of damage from contact with the ground or road debris. If lower control arm shows any sign of damage, inspect lower control arm for distortion. **Do not attempt to repair or straighten a broken or bent lower control arm.**

The serviceable components of the lower control arm are: the ball joint assembly, ball joint assembly grease seal and control arm bushings. Inspect both control arm bushings for severe deterioration, and replace if required. Inspect ball joint per inspection procedure in this section of the service manual and replace if required. Service procedures to replace these components are detailed in the specific component removal and installation sections in this group of the service manual.

BALL JOINT ASSEMBLY

With the weight of the vehicle resting on the road wheels. Grasp the grease fitting as shown in (Fig. 10) and with no mechanical assistance or added force attempt to move the grease fitting.

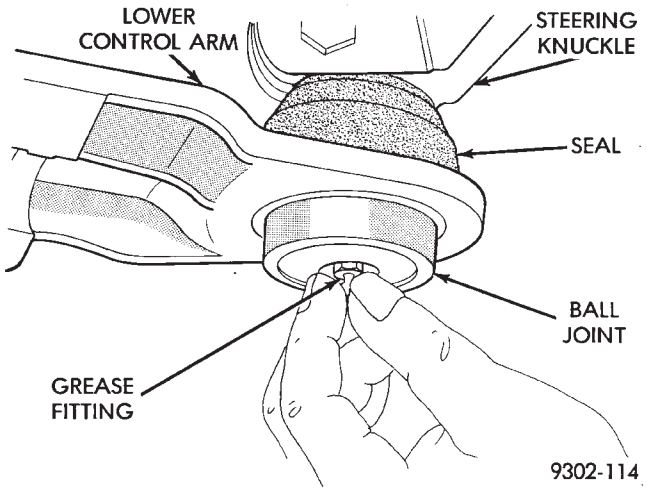


Fig. 10 Checking Ball Joint Wear

If the ball joint is worn the grease fitting will move easily. If movement is noted, replacement of the ball joint is recommended.

STABILIZER BAR

Inspect for broken or distorted sway bar bushings, bushing retainers, and worn or damaged sway bar to strut attaching links. If sway bar to front suspension cradle bushing replacement is required, bushing can be removed from sway bar by opening slit and peeling bushing off sway bar.

HUB/BEARING

The hub bearing is designed for the life of the vehicle and requires no type of periodic maintenance. The following procedure may be used for diagnosing the condition of the hub bearing.

With the wheel, disc brake caliper, and brake rotor removed, rotate the wheel hub. Any roughness or resistance to rotation may indicate dirt intrusion or a

DIAGNOSIS AND TESTING (Continued)

failed hub bearing. If the hub bearing exhibits any of these conditions during diagnosis, the hub bearing will require replacement, the bearing is not serviceable.

Damaged bearing seals and the resulting excessive grease loss may also require bearing replacement. Moderate grease weapage from the hub bearing is considered normal and should not require replacement of the hub bearing.

REMOVAL AND INSTALLATION

MCPHERSON STRUT

REMOVE

WARNING: DO NOT REMOVE STRUT ROD NUT WHILE STRUT ASSEMBLY IS INSTALLED IN VEHICLE, OR BEFORE STRUT ASSEMBLY SPRING IS COMPRESSED.

(1) Loosen wheel nuts.

(2) Raise vehicle on jack stands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(3) Remove wheel and tire assembly from location on front of vehicle requiring strut removal.

(4) If both strut assemblies are removed, mark the strut assemblies right or left according to which side of the vehicle they were removed from.

(5) Remove hydraulic brake hose routing bracket and attaching screw from strut damper bracket. If vehicle is equipped with Anti-Lock brakes, hydraulic hose routing bracket is combined with speed sensor cable routing bracket (Fig. 11).

CAUTION: The steering knuckle to strut assembly attaching bolts are serrated and must not be turned during removal. Remove nuts while holding bolts stationary in the steering knuckles.

(6) Remove the 2 bolts (Fig. 12) attaching the strut to the steering knuckle.

(7) Remove the 3 nuts attaching the upper mount of the strut (Fig. 13) to the strut tower of the vehicle .

INSTALL

(1) Install strut assembly into strut tower, aligning the 3 studs on the upper strut mount into the holes in shock tower. Install the 3 upper strut mount retaining nut and washer assemblies (Fig. 13). Torque the 3 nuts to 31 N·m (23 ft. lbs.).

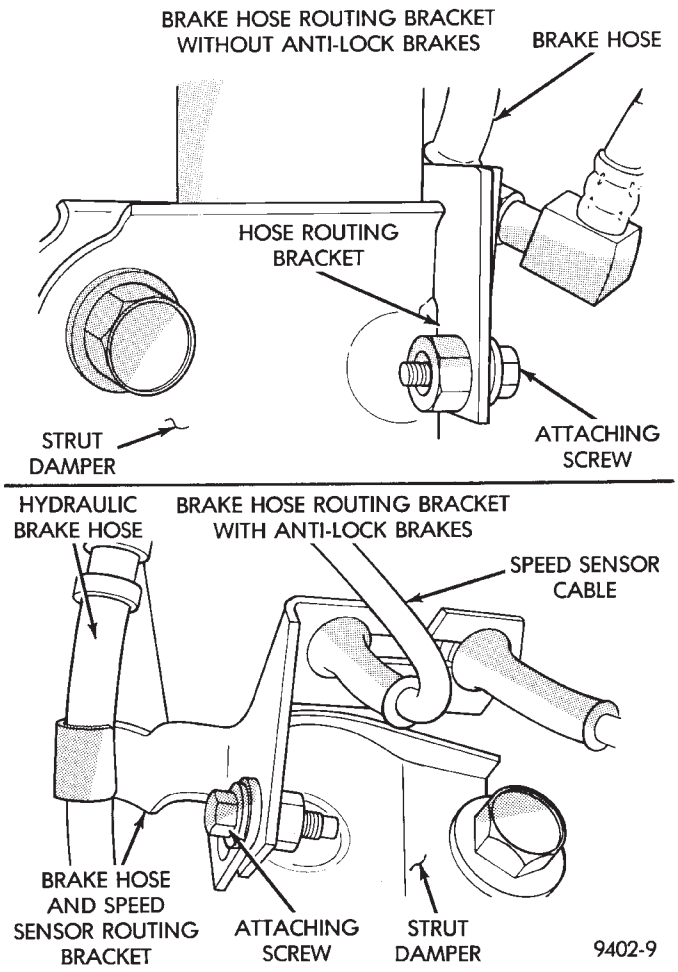


Fig. 11 Brake Hose And Speed Sensor Cable Routing Brackets

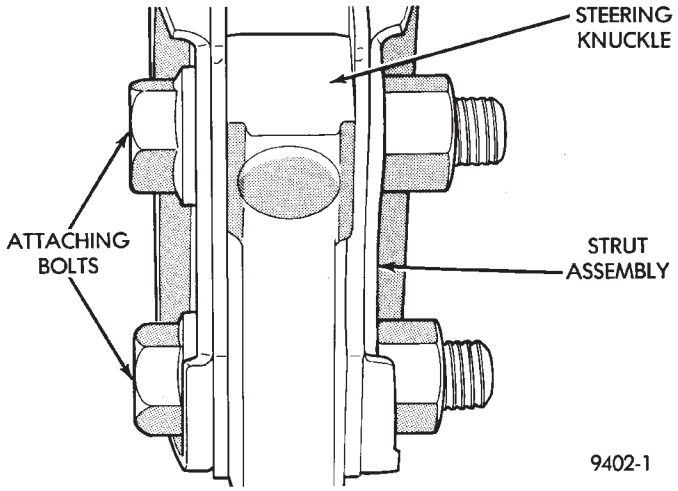


Fig. 12 Strut To Steering Knuckle Attaching Bolts

CAUTION: The steering knuckle to strut assembly attaching bolts are serrated and must not be turned during installation. Install nuts while holding bolts stationary in the steering knuckles.

REMOVAL AND INSTALLATION (Continued)

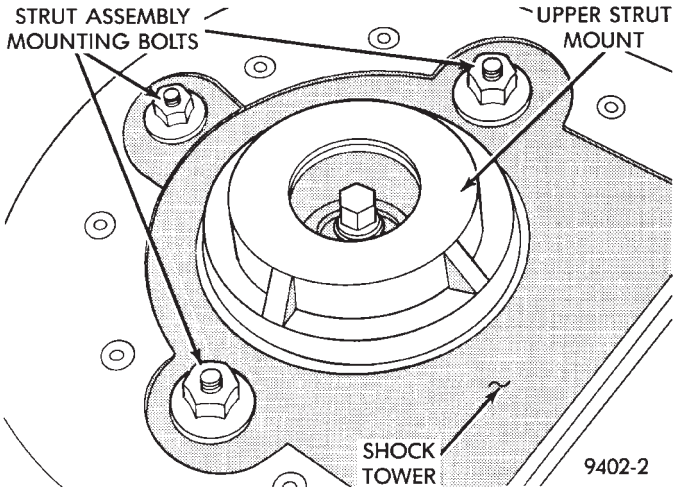


Fig. 13 Strut To Shock Tower Mounting

(2) Align strut assembly with steering knuckle. Position arm of steering knuckle into strut assembly, aligning the strut assembly to steering knuckle mounting holes. Install the 2 strut assembly to steering knuckle attaching bolts (Fig. 12). Attaching bolts should be installed with the nuts facing the front of the vehicle. Torque both attaching bolts to 53 N·m (40 ft. lbs.) plus an additional 1/4 turn after specified torque is met.

(3) Install hydraulic brake hose routing bracket and attaching screw onto strut damper bracket. If vehicle is equipped with Anti-Lock brakes, hydraulic hose routing bracket is combined with speed sensor cable routing bracket (Fig. 11). Torque bracket attaching bolts (Fig. 11) to 13 N·m (10 ft. lbs.).

(4) Tighten the wheel mounting stud nuts in proper sequence until all nuts are torqued to half specification. Then repeat the tightening sequence to the full specified torque of 135 N·m (100 ft. lbs.).

STEERING KNUCKLE

REMOVE

(1) Remove cotter pin, nut lock, and spring washer (Fig. 14).

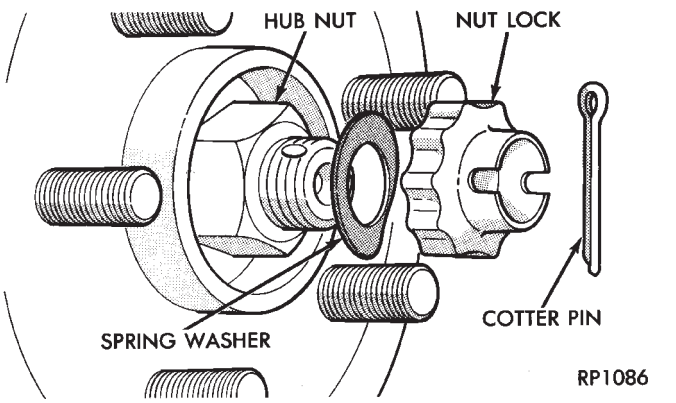


Fig. 14 Cotter Pin, Nut Lock, And Spring Washer

CAUTION: Wheel bearing damage will result if after loosening hub nut, vehicle is rolled on the ground or the weight of the vehicle is allowed to be supported by the tires.

(2) Loosen hub nut while vehicle is on the floor with the brakes applied (Fig. 15). **The hub and driveshaft are splined together through the knuckle (bearing) and retained by the hub nut.**

(3) Raise vehicle on jack stands or centered on a

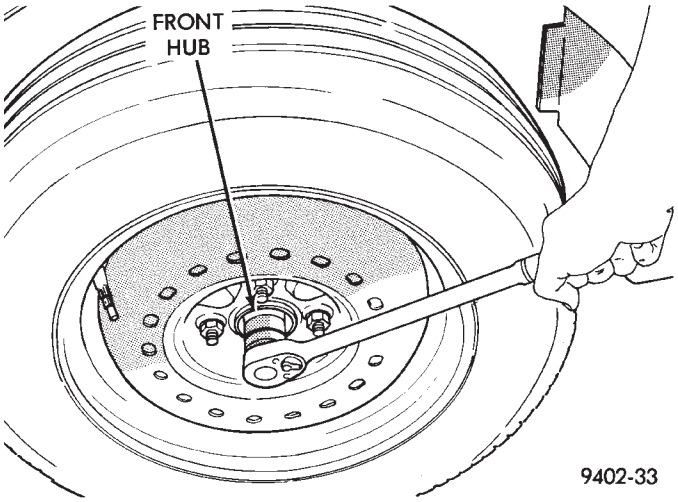


Fig. 15 Loosening Front Hub Retaining Nut

frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(4) Remove the front tire and wheel.

(5) Remove front disc brake caliper to steering knuckle attaching bolts (Fig. 16).

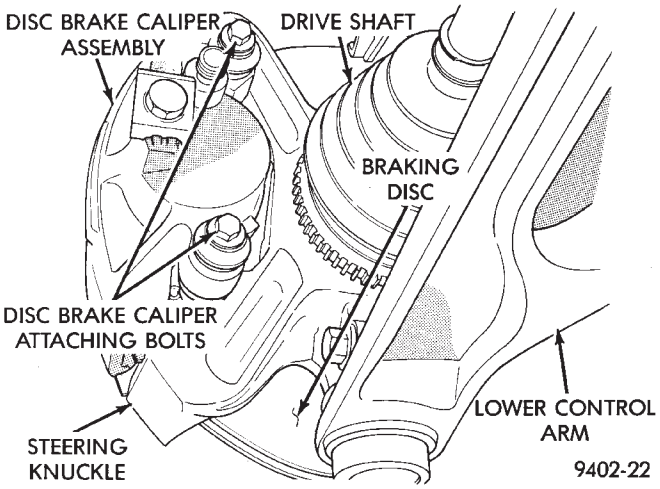


Fig. 16 Disc Brake Caliper Attaching Bolts

(6) Remove the disc brake caliper from the steering knuckle. Caliper is removed by first lifting bottom of caliper away from steering knuckle, and then

REMOVAL AND INSTALLATION (Continued)

removing top of caliper out from under steering knuckle (Fig. 17).

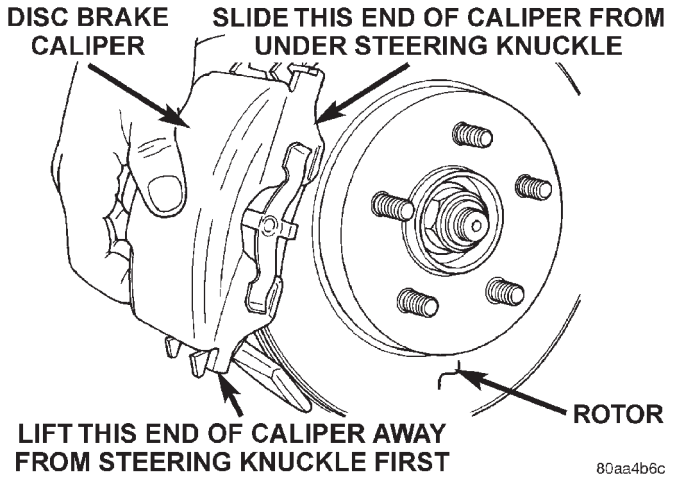


Fig. 17 Brake Caliper Removal

(7) Support brake disc brake caliper assembly using a wire hook and not by hydraulic hose (Fig. 18).

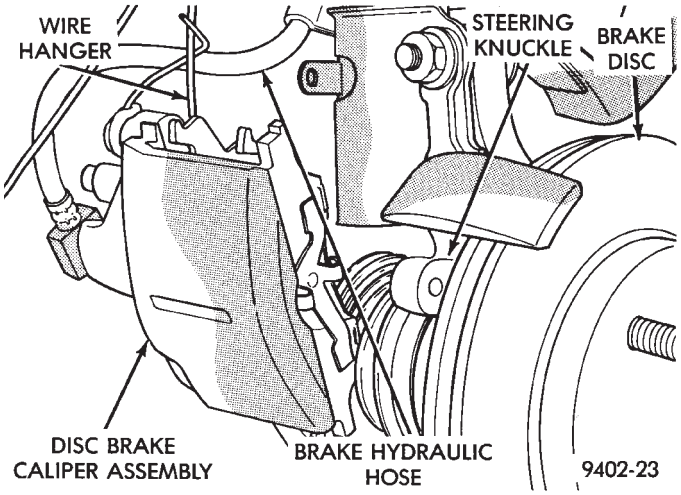


Fig. 18 Supporting Brake Caliper

(8) Remove the rotor from the front hub/bearing (Fig. 19).

(9) Remove the nut attaching outer tie rod end to the steering knuckle (Fig. 20). **Nut is to be removed from tie rod end using the following procedure, hold tie rod end stud with a 11/32 socket while loosening and removing nut with wrench.**

(10) Remove the tie rod end stud from steering knuckle arm, using Remover, Special Tool MB-990635 (Fig. 21).

(11) Remove nut and bolt (Fig. 22), clamping ball joint stud, from steering knuckle.

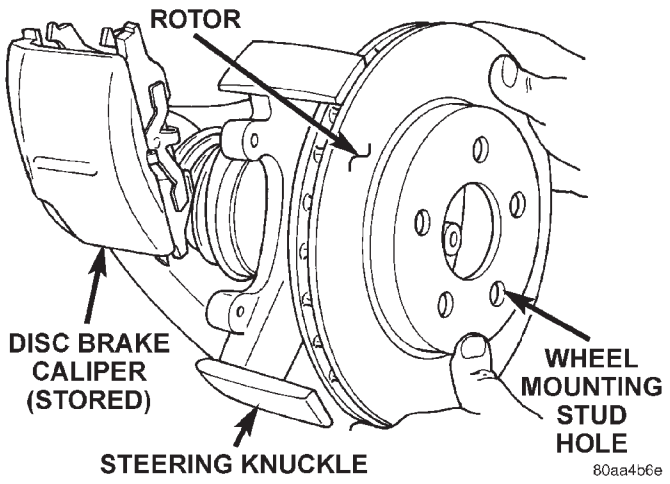


Fig. 19 Remove /Install Rotor

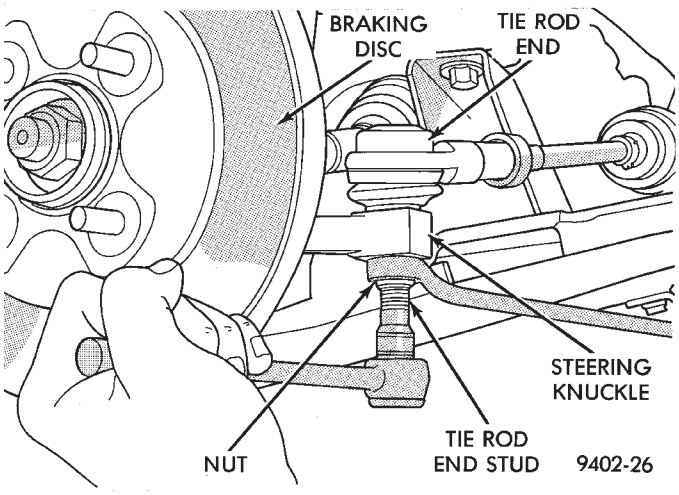


Fig. 20 Tie Rod End Attaching Nut

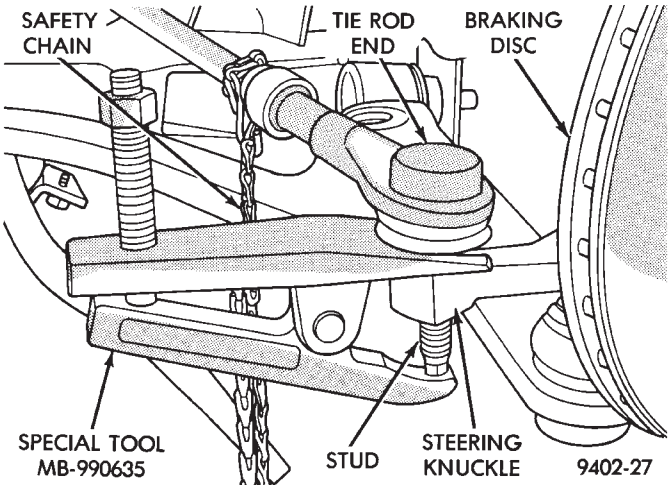


Fig. 21 Tie Rod End Removal From Steering Knuckle

(12) Separate ball joint stud from steering knuckle by prying down on lower control arm (Fig. 23). **Note: Use caution when separating ball joint stud**

REMOVAL AND INSTALLATION (Continued)

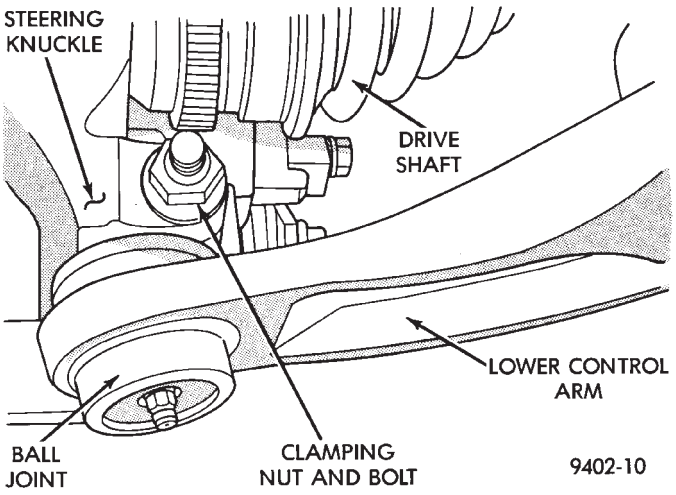


Fig. 22 Steering Knuckle To Ball Joint Clamp Bolt

from steering knuckle, so ball joint seal does not get cut.

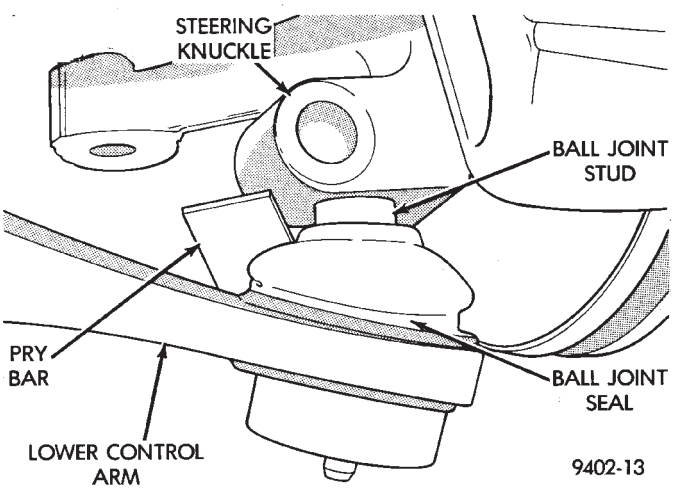


Fig. 23 Separate Ball Joint Stud from Knuckle Assembly

NOTE: Care must be taken not to separate the inner C/V joint during this operation. Do not allow driveshaft to hang by inner C/V joint, driveshaft must be supported.

(13) Pull steering knuckle assembly out and away from outer C/V joint of the driveshaft assembly (Fig. 24).

CAUTION: The steering knuckle to strut assembly attaching bolts are serrated and must not be turned during removal. Remove nuts while holding bolts stationary in the steering knuckles.

(14) Remove the 2 steering knuckle to strut damper clevis bracket attaching bolts (Fig. 25).

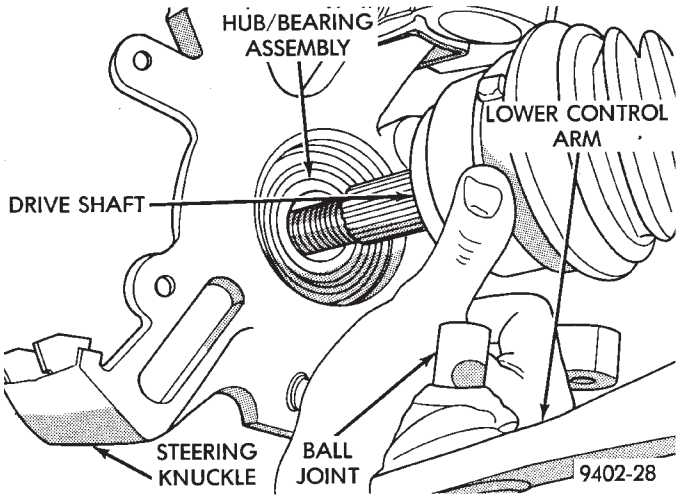


Fig. 24 Steering Knuckle Separation From Driveshaft

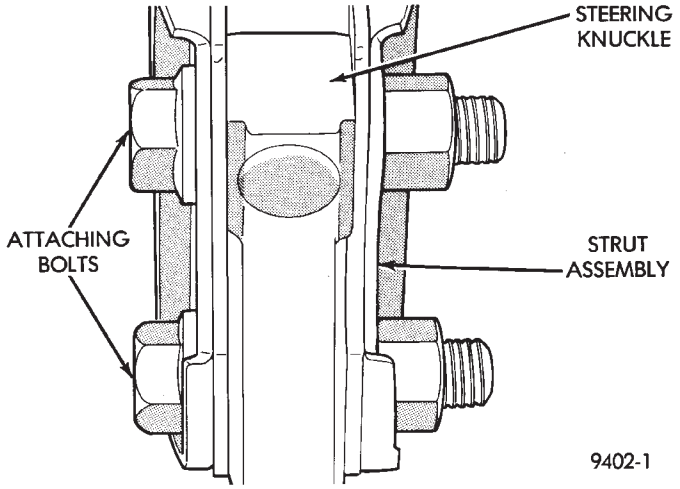


Fig. 25 Remove Steering Knuckle To Strut Attaching Bolts

(15) **The cartridge type front wheel bearing used on this vehicle is not transferable to the replacement steering knuckle. If the replacement steering knuckle does not come with a hub and bearing assembly, a new bearing must be installed in the steering knuckle. Installation of the new wheel bearing must be done before installing steering knuckle on vehicle.** Refer to Hub and Bearing Service in this section of the service manual for proper wheel bearing removal and installation procedure.

INSTALL

(1) Install a new cartridge hub and bearing assembly into the steering knuckle. Refer to Hub And Bearing Service in this section of the service manual for proper wheel bearing removal and installation procedure.

REMOVAL AND INSTALLATION (Continued)

CAUTION: The steering knuckle to strut assembly attaching bolts are serrated and must not be turned during installation. Install nuts while holding bolts stationary in the steering knuckles.

(2) Install steering knuckle back in clevis bracket of strut damper assembly (Fig. 25). Install the strut damper to steering knuckle attaching bolts. **Note: The steering knuckle to strut assembly attaching bolts are serrated and must not be turned in steering knuckle during installation.** Torque attaching nuts to 54 N·m (40 ft. lbs.) plus an additional 1/4 turn after specified torque is met.

(3) Slide drive shaft back into front hub and bearing assembly. Then install steering knuckle onto the ball joint stud (Fig. 24).

(4) Install a **NEW** steering knuckle to ball joint stud, clamp bolt and nut (Fig. 22). Torque the clamp bolt to 100 N·m (75 ft. lbs.).

(5) Install tie rod end into the steering knuckle. Start tie rod end to steering knuckle attaching nut onto stud of tie rod end. While holding stud of tie rod end stationary, tighten tie rod end to steering knuckle attaching nut (Fig. 20). Then using a crowfoot and 11/32 socket (Fig. 26), torque tie rod end attaching nut to 55 N·m (40 ft. lbs.).

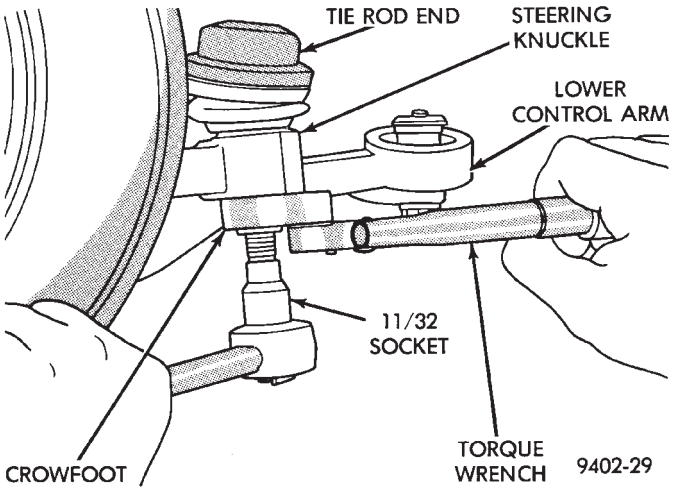


Fig. 26 Torquing Tie Rod End Attaching Nut

(6) Install the rotor on the hub/bearing (Fig. 19).

(7) Install the disc brake caliper on the steering knuckle. Caliper is installed by first sliding top of caliper under top abutment on steering knuckle. Then installing bottom of caliper against bottom abutment of steering knuckle (Fig. 27).

(8) Install the disc brake caliper to steering knuckle attaching bolts (Fig. 16). Tighten the caliper attaching bolts to a torque of 31 N·m (23 ft. lbs.).

(9) Clean all foreign matter from the threads of the outer C/V joint stub axle (Fig. 28). Install hub nut onto threads of stub axle and tighten nut.

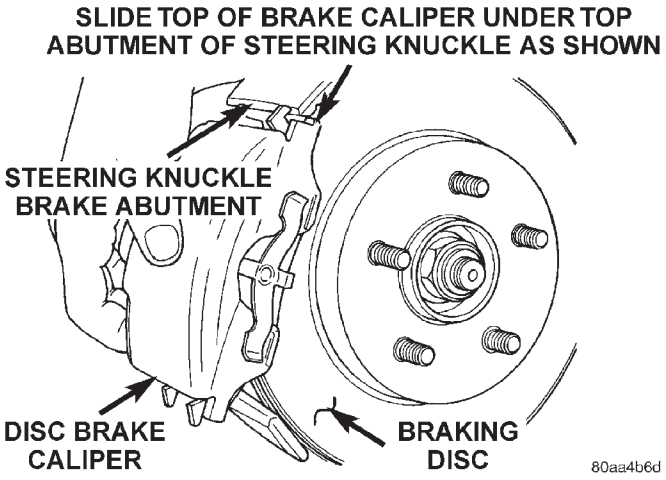


Fig. 27 Brake Caliper Installation

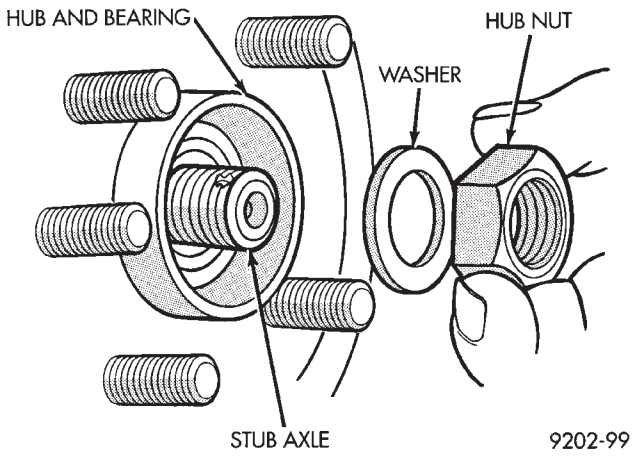


Fig. 28 Front Hub To Stub Shaft Nut

(10) With vehicle brakes applied to keep braking disc from turning, tighten hub nut to a torque of 183 N·m (135 ft. lbs.) (Fig. 29).

(11) Install front wheel and tire assembly. Install front wheel lug nuts and torque to 135 N·m (100 ft. lbs.).

(12) Lower vehicle.

(13) Install the spring washer, hub nut lock, and new cotter pin (Fig. 30). Wrap cotter pin prongs tightly around the hub nut lock (Fig. 31).

(14) Set front Toe on vehicle to required specification. Use procedure listed under Wheel Alignment, in the Front Suspension Service Procedures section of this service manual.

REMOVAL AND INSTALLATION (Continued)

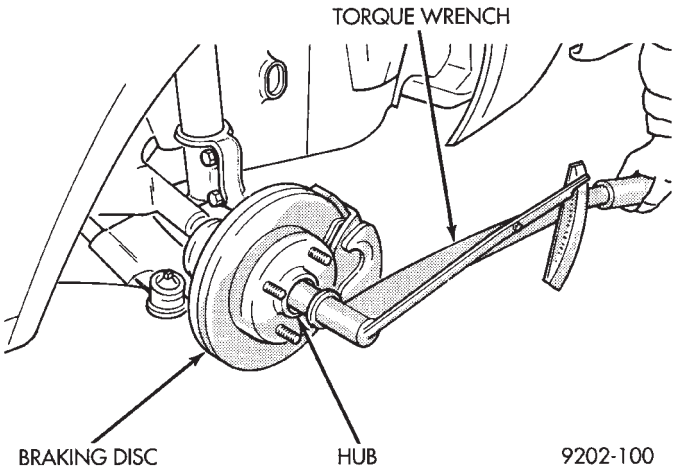


Fig. 29 Torquing Front Hub Nut

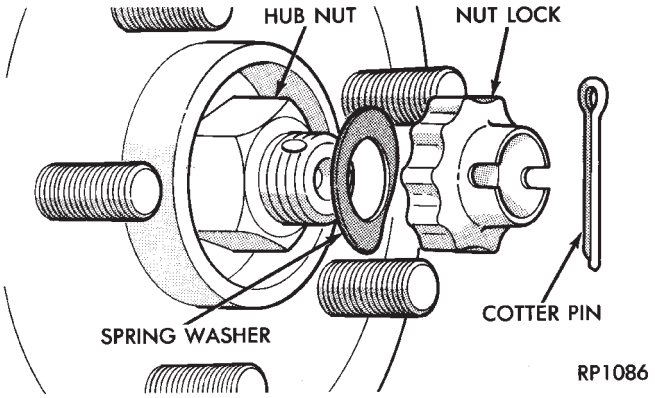


Fig. 30 Spring Washer, Nut Lock, And New Cotter Pin

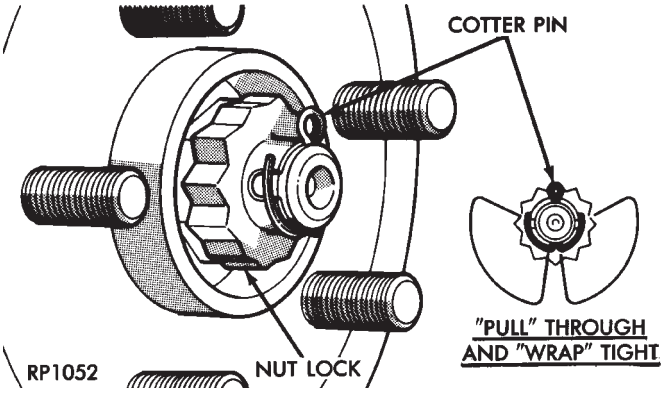


Fig. 31 Cotter Pin Correctly Installed

LOWER CONTROL ARM

REMOVE

(1) Raise vehicle on jack stands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual for the required lifting procedure to be used. Remove wheel and tire assembly from side of vehicle requiring service to lower control arm.

(2) Remove the steering knuckle to ball joint ball stud, clamping nut and bolt (Fig. 32).

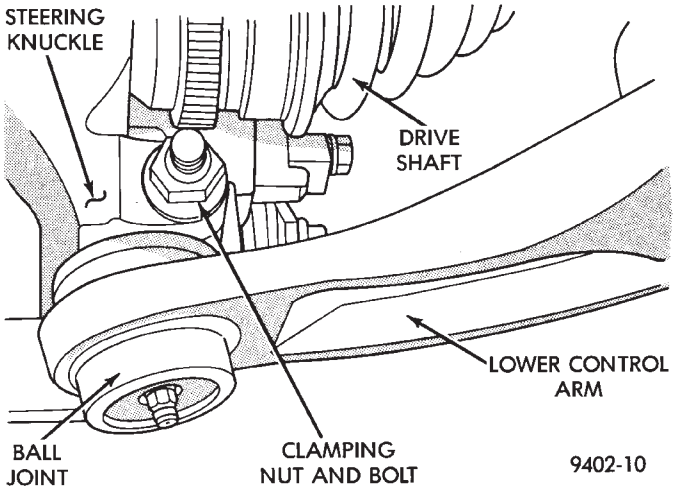


Fig. 32 Control Arm To Steering Knuckle Attachment

(3) Remove the 2 attaching links connecting the stabilizer bar to the lower control arms (Fig. 33).

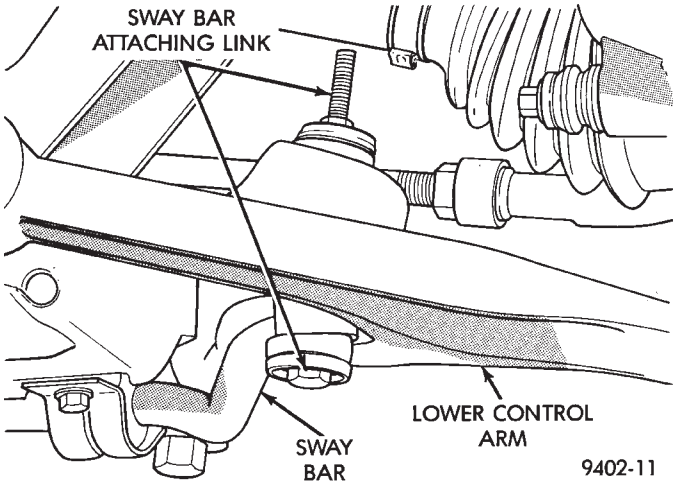


Fig. 33 Stabilizer Bar Link To Lower Control Arm Attachment

(4) Loosen but do not remove bolts attaching stabilizer bar retainers to front suspension crossmember (Fig. 34). Then rotate stabilizer bar and attaching links away from lower control arms

CAUTION: Pulling steering knuckle out from vehicle after releasing from ball joint can separate inner C/V joint. See Driveshafts.

(5) Using a pry bar, separate steering knuckle from ball joint stud (Fig. 35). **Use caution when separating ball joint stud from steering knuckle, so ball joint seal does not get cut.**

REMOVAL AND INSTALLATION (Continued)

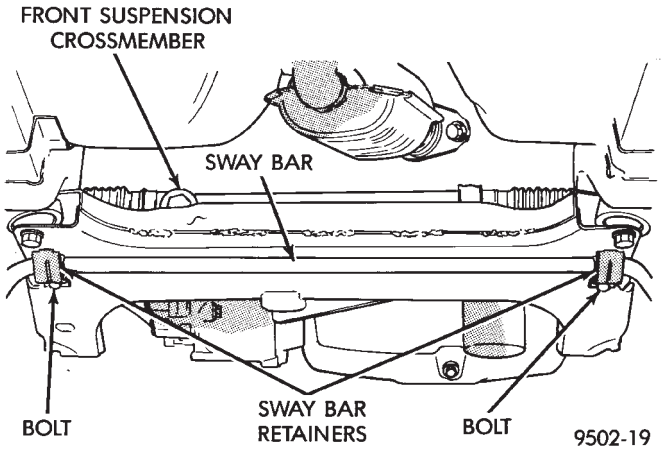


Fig. 34 Stabilizer Bar To Crossmember Retainers

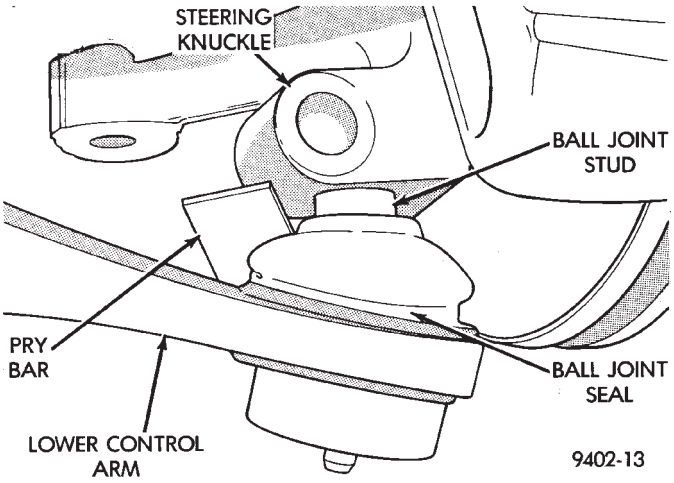


Fig. 35 Ball Joint Separation From Steering Knuckle

(6) Remove front lower control arm bushing to crossmember attaching nut and bolt (Fig. 36). Remove rear lower control arm to crossmember and frame rail attaching bolt (Fig. 36). Then remove lower control arm from crossmember.

INSTALL

(1) Position lower control arm into front crossmember. Then install rear lower control arm to crossmember and frame rail attaching bolt (Fig. 36). **Do not tighten rear attaching bolt at this time** . Then install front lower control arm to crossmember nut and bolt (Fig. 36).

(2) Torque front lower control arm nut and bolt to 163 N·m (120 ft. lbs.), first and then torque rear lower control arm attaching bolt to same torque specification.

(3) Install ball joint stud into steering knuckle. Then install steering knuckle to ball joint stud clamping bolt and nut (Fig. 32). Torque clamping bolt to 95 N·m (70 ft. lbs.).

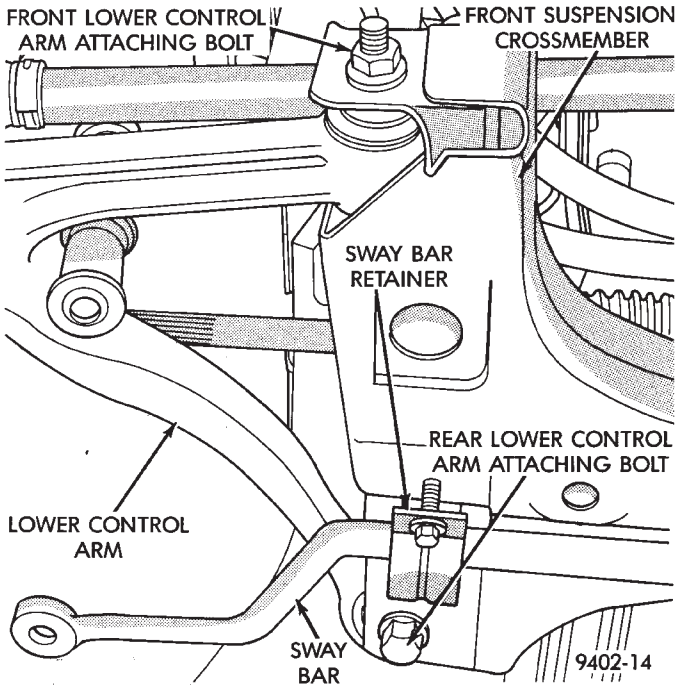


Fig. 36 Lower Control Arm Attaching Bolts

(4) Assemble stabilizer bar to lower control arm link assemblies and bushings as shown in (Fig. 37).

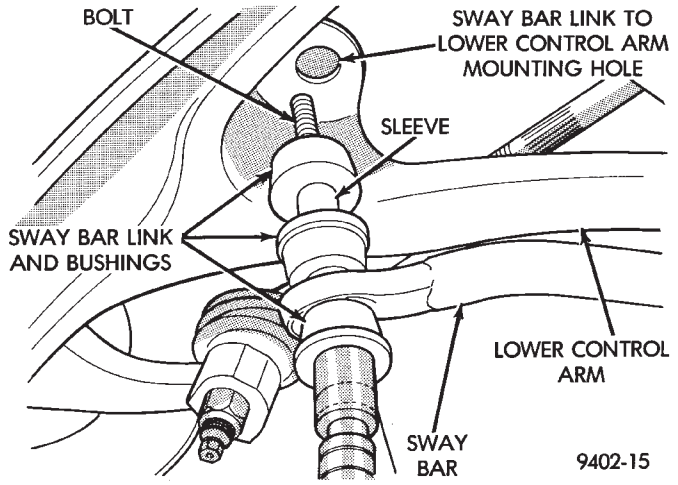


Fig. 37 Assembled Stabilizer Bar Link And Bushings

(5) Rotate stabilizer bar into position, installing the stabilizer bar link assemblies into the lower control arms. Then install the top stabilizer bar link bushings and nuts (Fig. 38). **DO NOT TIGHTEN LINK ASSEMBLIES AT THIS TIME**

(6) Lower vehicle so suspension is supporting the total weight of the vehicle.

(7) Torque the stabilizer bar to lower control arm link assemblies (Fig. 38) to 28 N·m (21 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

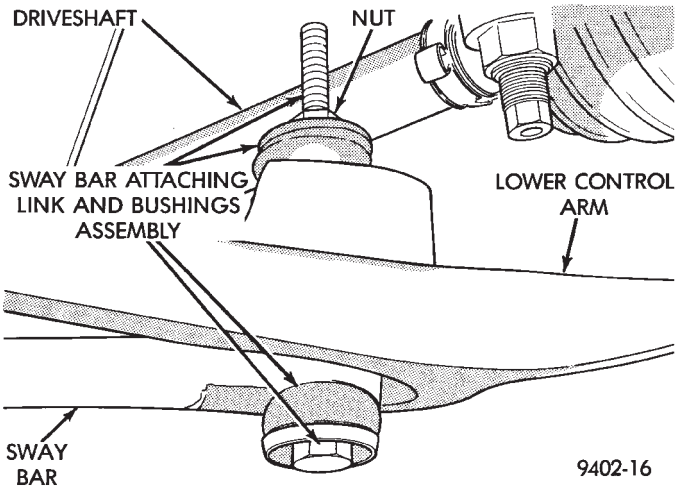


Fig. 38 Installed Stabilizer Bar To Lower Control Arm Attaching Link

(8) Torque the 2 stabilizer bar bushing retainer, to crossmember attaching bolts (Fig. 34) to 28 N·m (21 ft. lbs.).

STABILIZER BAR

REMOVE

(1) Raise vehicle on jack stands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(2) Remove nuts and stabilizer bar attaching link assemblies from the front lower control arms (Fig. 39).

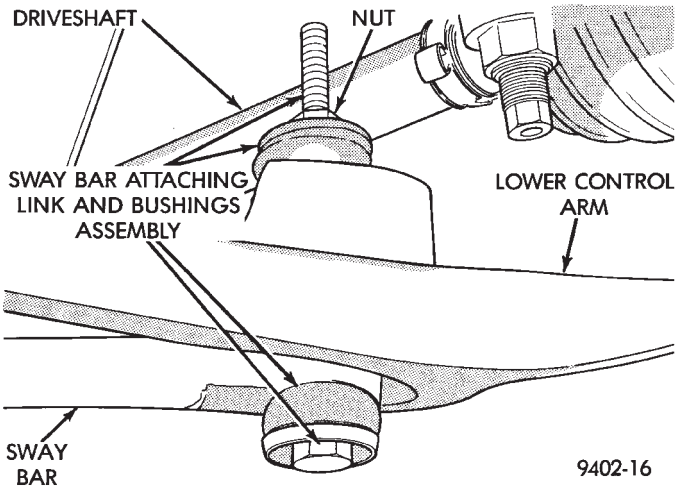


Fig. 39 Sabilizer Bar To Lower Control Arm Attaching Links

(3) Remove bolts at front crossmember to stabilizer bar bushing retainers (Fig. 40). Then remove bushing retainers, stabilizer bar, and bushings from front crossmember.

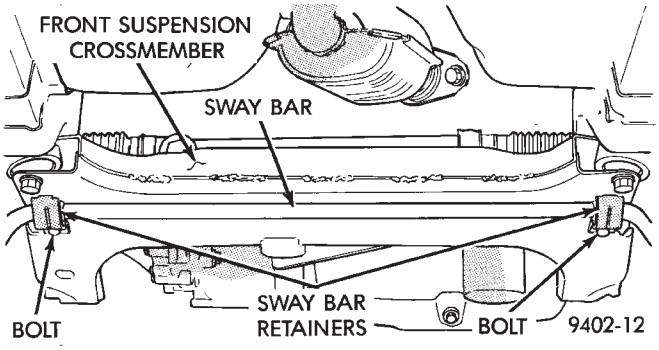


Fig. 40 Front Stabilizer Bar Bushing Retainers

INSTALL

(1) If inspection determines replacement of stabilizer bar to lower control arm attachment link bushings is required, replace bushings before installing stabilizer bar. Refer to (Fig. 41) for proper orientation of attaching link bushing components.

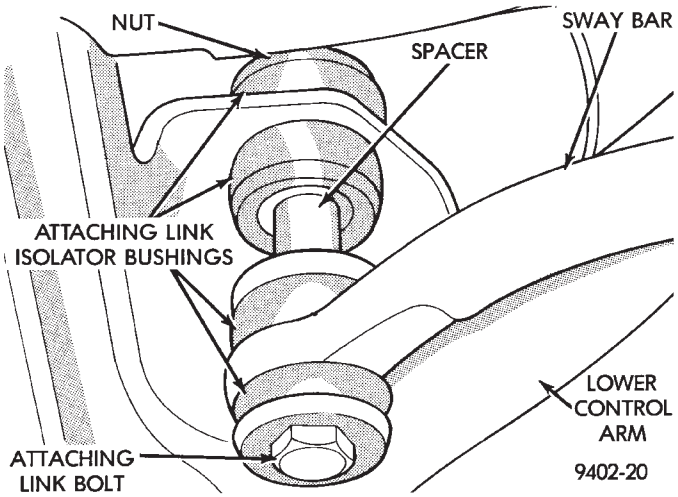


Fig. 41 Stabilizer Bar Attaching Link Assembly Bushing Orientation

(2) If stabilizer bar to front crossmember bushings require replacement at time of inspection, install new bushings before installing stabilizer bar. Bushings are replaced by opening slit on bushings and peeling them off stabilizer bar. Install new bushings on stabilizer bar, by spreading bushing at slit and forcing them on stabilizer bar. **Bushings must be installed on stabilizer bar with slit in bushing facing front of vehicle when stabilizer bar is installed (Fig. 42).**

(3) Position stabilizer bar into front crossmember, so cutouts in stabilizer bar bushings are aligned with raised bead in crossmember. Install stabilizer bar bushing retainers onto crossmember aligning raised bead on retainer with cutouts in bushings (Fig. 43).

REMOVAL AND INSTALLATION (Continued)

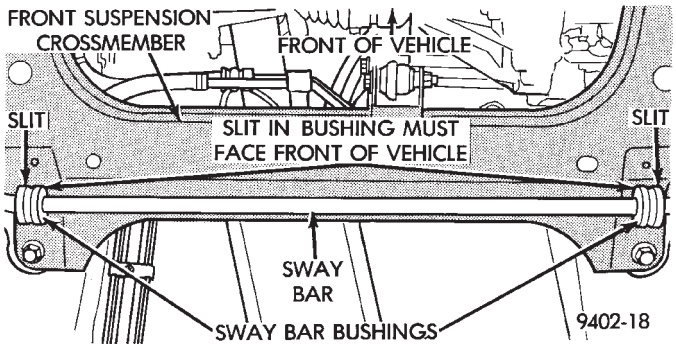


Fig. 42 Correct Stabilizer Bar To Crossmember Bushing Installation

Do not tighten stabilizer bar bushing retainers at this time.

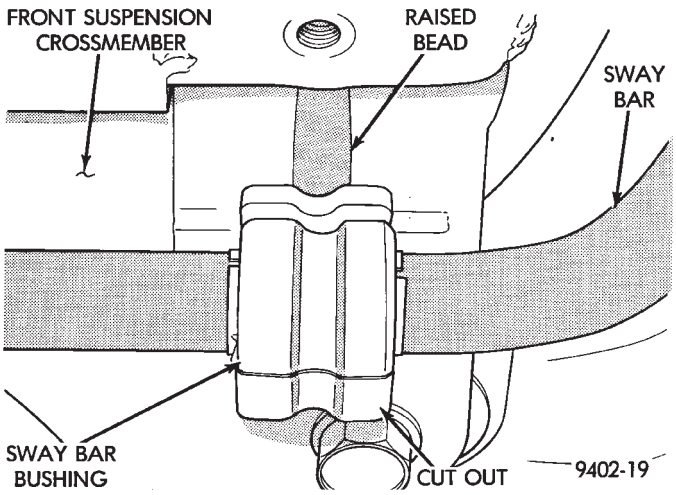


Fig. 43 Stabilizer Bar To Crossmember Bushing Position

(4) Align stabilizer bar attaching link and bushing assemblies with attaching link mounting holes in the lower control arms (Fig. 44). Install stabilizer bar attaching links into both lower control arms. Install the attaching link to stabilizer bar bushing and retaining nut. Torque the stabilizer bar attaching link nut (Fig. 44) to 28 N·m (21 ft. lbs.).

(5) Lower vehicle so the suspension is supporting the total weight of the vehicle.

(6) With lower control arms of the vehicle at curb height, tighten stabilizer bar bushing to crossmember retainer attaching bolts to 28 N·m (21 ft. lbs.) torque.

HUB BEARING

REMOVE

(1) Remove the steering knuckle, hub and the hub bearing as an assembly from the vehicle. Refer to Steering Knuckle in the Removal And Installation section in this group of the service manual for the required steering knuckle removal procedure.

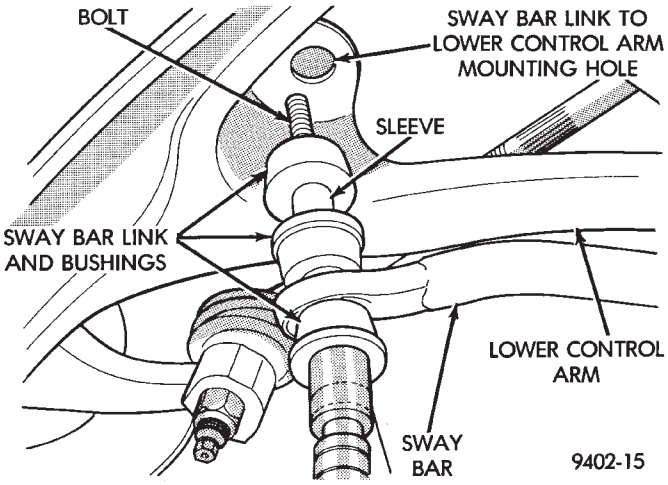


Fig. 44 Stabilizer Bar Link To Control Arm Attachment

The removal and installation of the steering knuckle hub bearing is to ONLY be done with the steering knuckle removed from the vehicle. Removal of the hub bearing from the steering knuckle MUST be done using an arbor press and the following procedure.

(2) Install Bearing Splitter, Special Tool P334 on the steering knuckle and hub/bearing assembly as shown in (Fig. 45) to support steering knuckle when pressing out hub.

(3) Position steering knuckle and hub and bearing in an arbor press supported by Bearing Splitter, Special Tool P334 as shown in (Fig. 45).

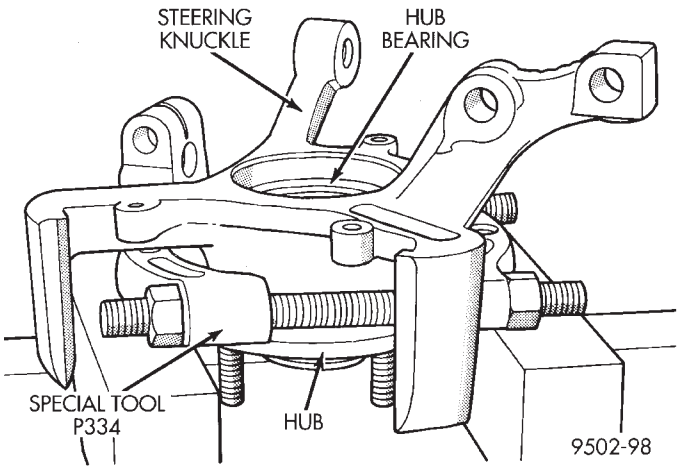


Fig. 45 Supporting Steering Knuckle For Hub Removal

(4) Position Driver, Special Tool 6644-2 on the small end of the hub to drive hub out of bearing. Using arbor press remove hub from bearing. The one bearing race will come out with hub when hub is removed from bearing.

REMOVAL AND INSTALLATION (Continued)

(5) Remove Bearing Splitter, Special Tool P334 from the steering knuckle.

CAUTION: Safety goggles and or face protection should always be worn when removing the snap ring (Fig. 46) retaining the hub/bearing in the steering knuckle. When the snap ring is removed from the steering knuckle it could fly out of the steering knuckle with great force possibly causing personal injury.

(6) Using a screw driver, (Fig. 46) remove the snap ring retaining the hub bearing in the steering knuckle.

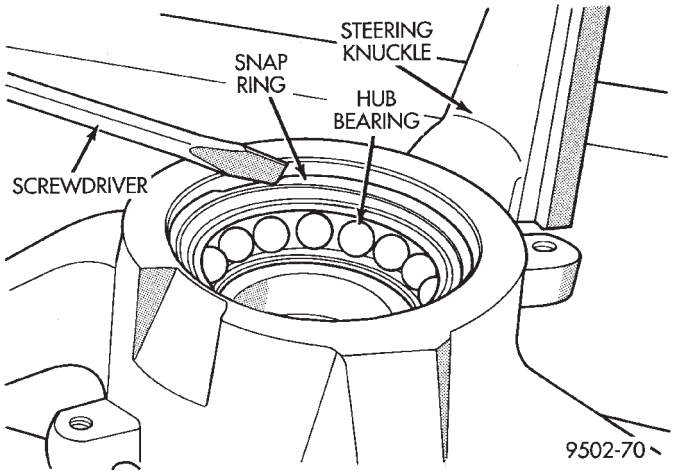


Fig. 46 Hub Bearing Retaining Snap Ring Removal

(7) Place steering knuckle in an arbor press (Fig. 47) supported by press blocks as shown. Press blocks must not obstruct hub bearing bore in steering knuckle so bearing can be pressed out of knuckle. Place Bearing Driver, Special Tool MB-990799 on outer race of hub bearing (Fig. 47). Press hub bearing completely out of the steering knuckle.

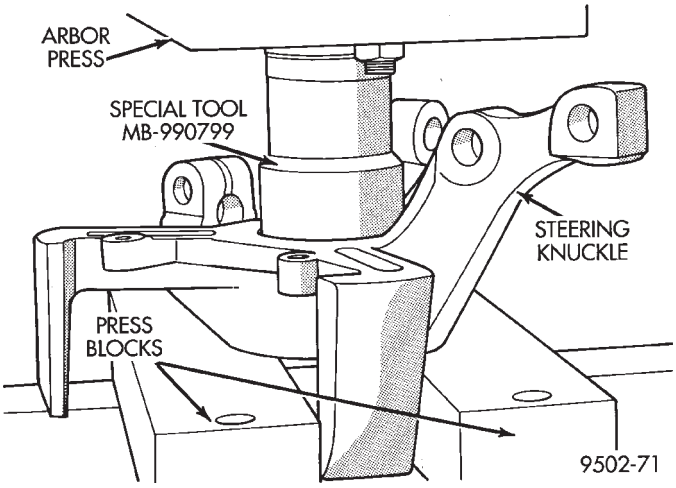


Fig. 47 Hub Bearing Removal From Steering Knuckle

(8) Install Bearing Splitter, Special Tool P334 on hub so it is between the flange of the hub and the bearing race remaining on the hub (Fig. 48). Place hub, bearing race and the bearing splitter in an arbor press as shown in (Fig. 48). Place Driver, Special Tool 6644-2 on end of hub (Fig. 48). Press the hub out of the bearing race.

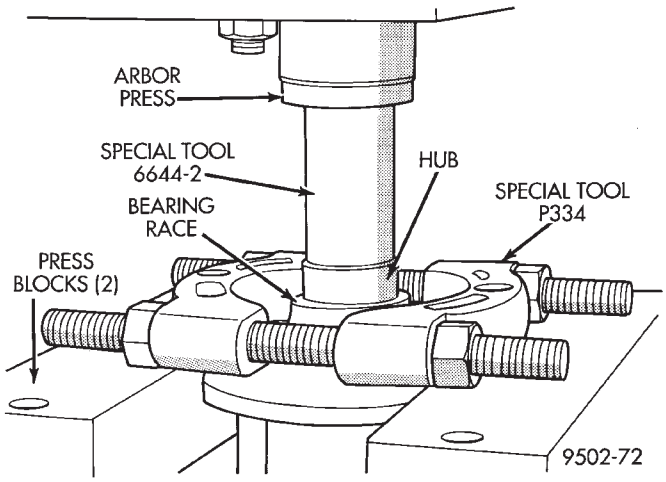


Fig. 48 Removing Bearing Race From Hub

INSTALL

(1) Wipe bore of steering knuckle clean of any grease or dirt with a **clean dry** shop towel.

CAUTION: Do not use any type of solvent on the hub bearing when cleaning it.

CAUTION: The hub bearing must be wiped as clean as possible. Any remaining rust preventative on the bearing can effect the bonding action of the adhesive to the bearing.

(2) Clean the rust preventative from the replacement hub bearing using a **clean dry** shop towel.

CAUTION: When applying adhesive to bore of steering knuckle, do not allow adhesive to get into the snap ring in bore or on the seal of the hub bearing

(3) Apply Loctite Adhesive # 640 or an equivalent, to the bore of the steering knuckle. The adhesive is to be applied to the entire bore wall suface, from the shoulder at the bottom to just below the snap ring groove.

(4) Place new hub bearing into bore of steering knuckle. Be sure the bearing is square with the bore. Place the steering knuckle in an arbor press with Receiver, Special Tool C-4698-2 supporting steering knuckle (Fig. 49). Place Diver, Special Tool 5052 (Fig. 49) on the outer race of the hub bearing. Press the

REMOVAL AND INSTALLATION (Continued)

hub bearing into the steering knuckle until it is fully bottomed in the bore of the steering knuckle.

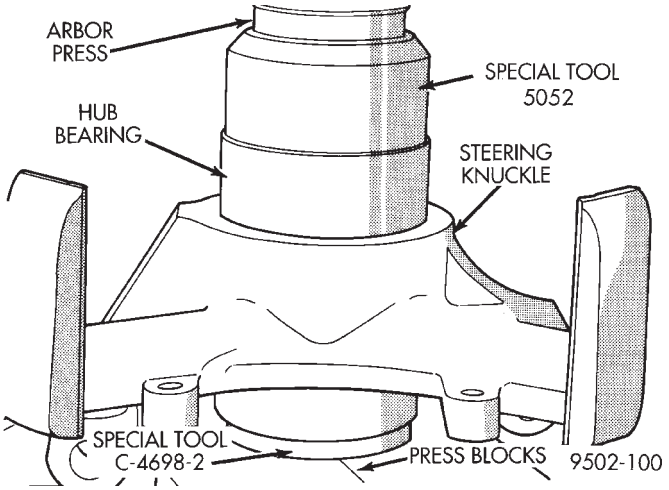


Fig. 49 Pressing Hub Bearing Into Steering Knuckle

CAUTION: When installing the retaining snap ring for the hub bearing care must be taken not to damage seal on new hub bearing.

(5) Install hub bearing retaining snap ring into snap ring groove in hub bearing bore of steering knuckle (Fig. 50). Be sure snap ring is fully seated in snap ring groove.

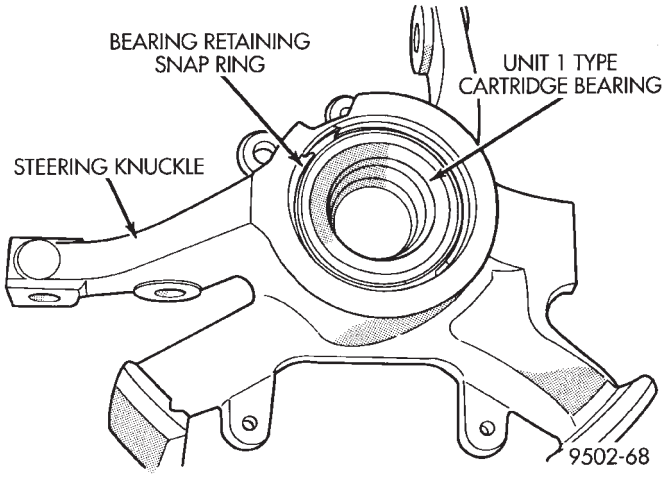


Fig. 50 Hub Bearing Retaining Snap Ring Installed

(6) Place steering knuckle with hub bearing installed in an arbor press with Receiver, Special Tool MB-990799 supporting inner race of the hub bearing (Fig. 51). Place hub in nub bearing making sure it is square with bearing. Place Driver, Special Tool 6522 on front face of hub (Fig. 51). Press the hub into the hub bearing until hub is fully bottomed in hub bearing.

(7) Install the steering knuckle, hub and the hub bearing as an assembly on the vehicle. Refer to Steering Knuckle in the Removal And Installation section in this group of the service manual for the required steering knuckle installation procedure.

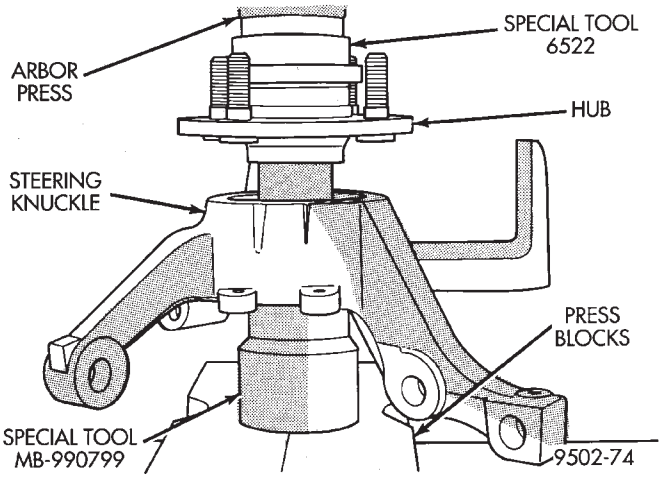


Fig. 51 Pressing Hub Into Hub Bearing

(8) Install the wheel and tire on the vehicle.

(9) Lower the vehicle.

(10) Set the front wheel Toe to the required specification. Refer to Wheel Alignment Check And Adjustment Procedure in the Service Procedures Section in this group of the service manual.

CAUTION: After the vehicle is aligned it can only be moved a short distance and then parked. Do not move the vehicle any further until the adhesive has cured for a minimum of two hours. Driving the vehicle before the adhesive is allowed to cure properly, will affect the retention of the bearing in the bore of the steering knuckle.

FRONT WHEEL MOUNTING STUDS

CAUTION: If a wheel attaching stud needs to be replaced in the front hub/bearing, the stud CAN NOT be hammered out of the hub flange. If the stud is removed by hammering it out of the bearing flange, damage to the hub bearing will occur leading to premature bearing failure.

The following procedure and special tools shown **MUST** be used when replacing wheel attaching studs.

The hub and bearing assembly does not require removal from the steering knuckle to replace wheel attaching studs in the hub and bearing assembly.

REMOVE

(1) Raise vehicle on jackstands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

REMOVAL AND INSTALLATION (Continued)

(2) Remove the front wheel and tire.

(3) Remove the 2 bolts (Fig. 52) attaching the disc brake caliper to the steering knuckle .

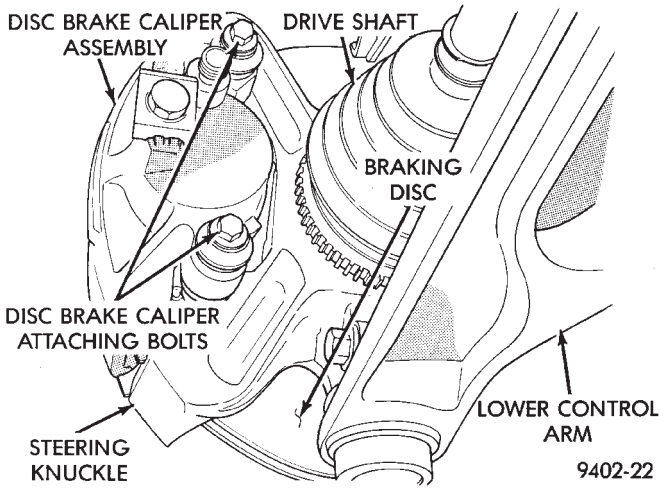


Fig. 52 Caliper Attaching Bolts

(4) Remove the disc brake caliper from the steering knuckle. Caliper is removed by first lifting bottom of caliper away from steering knuckle, and then removing top of caliper out from under steering knuckle (Fig. 53).

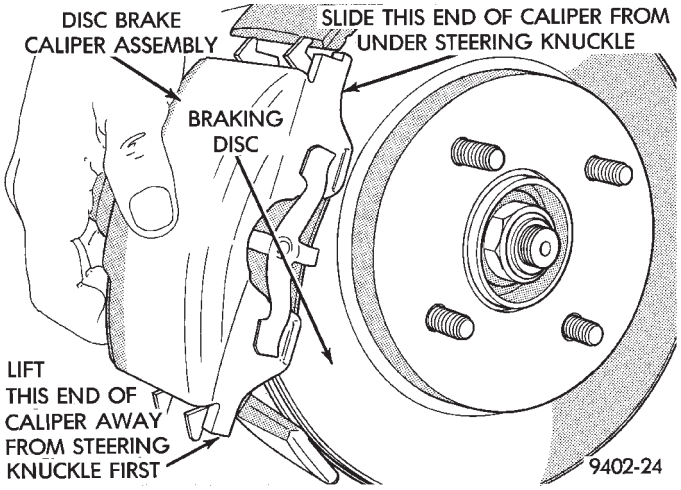


Fig. 53 Brake Caliper Removal

(5) Support the disc brake caliper using a wire hook, (Fig. 54) not by the hydraulic flex hose.

(6) Remove the rotor from the front hub (Fig. 55).

(7) Install a lug nut on the wheel stud being removed from the hub/bearing, so threads on stud are even with end of lug nut (Fig. 56). Rotate hub so stud requiring removal is aligned with notch cast into front of steering knuckle. Install Remover, Special Tool C-4150 on hub/bearing flange and wheel stud (Fig. 56).

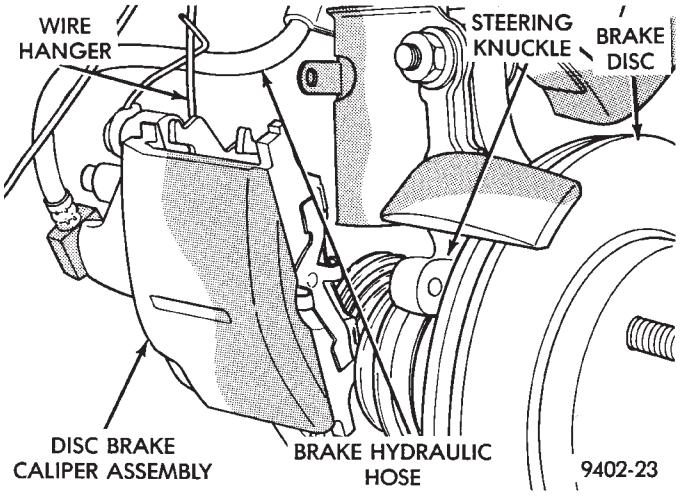


Fig. 54 Correctly Supported Brake Caliper

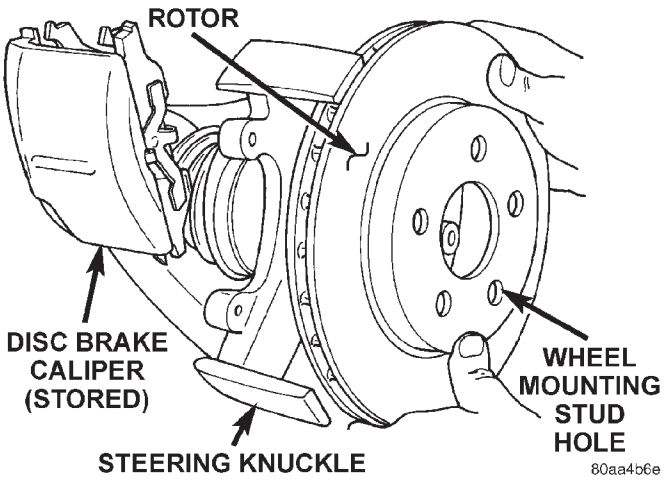


Fig. 55 Remove/Install Rotor

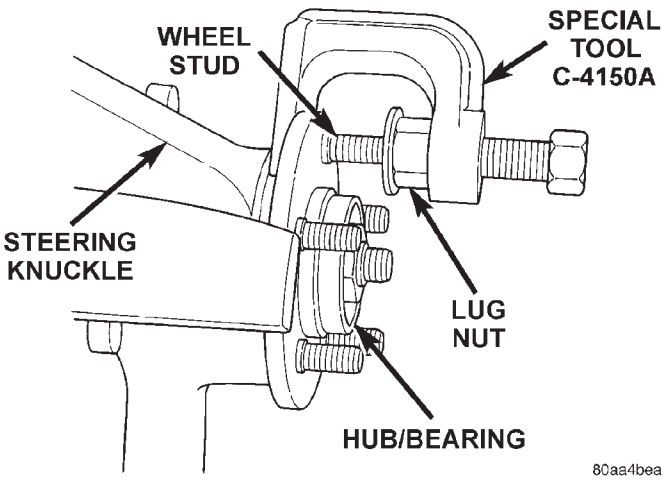


Fig. 56 Removing Wheel Stud From Hub/Bearing

REMOVAL AND INSTALLATION (Continued)

(8) Tighten Special Tool C-4150, pushing the wheel stud out of the hub and bearing flange. When shoulder of wheel stud is past flange remove special tool from hub/bearing. Remove lug nut from stud and remove stud from flange.

INSTALL

(1) Install replacement stud in flange of hub/bearing. Install washers and wheel lug nut on stud (Fig. 57). Lug nut **MUST** be installed with the flat side of the lug nut against the washers (Fig. 57).

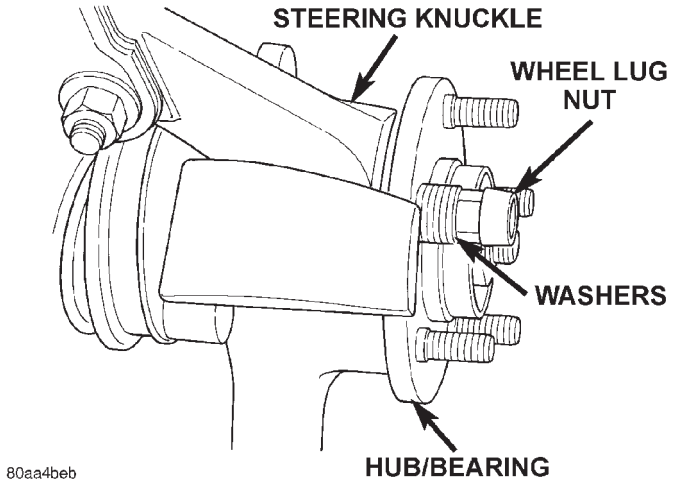


Fig. 57 Installing Wheel Stud

(2) Tighten the wheel lug nut. This will pull the wheel stud into the flange of the hub/bearing. When the head of the stud is fully seated against the bearing flange, remove the lug nut and washers from the stud.

(3) Install rotor on front hub (Fig. 55).

(4) Install disc brake caliper on steering knuckle. Caliper is installed by first sliding top of caliper under top abutment on steering knuckle. Then install bottom of caliper against bottom abutment on steering knuckle (Fig. 58).

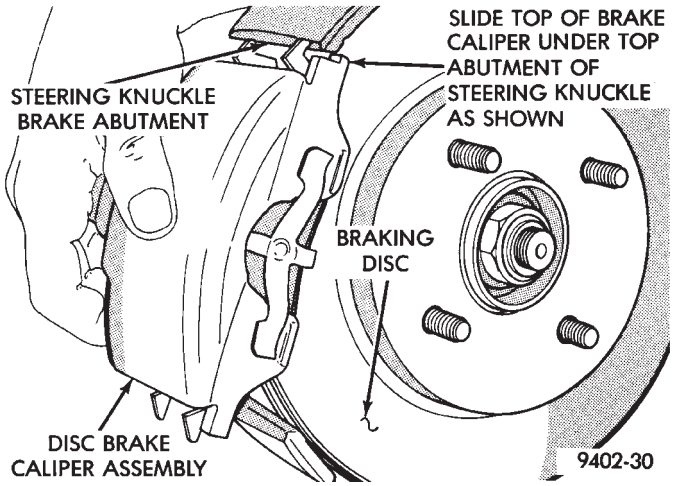


Fig. 58 Disc Brake Caliper Installation

(5) Install the disc brake caliper to steering knuckle attaching bolts (Fig. 53). Tighten the attaching bolts to a torque of 31 N·m (23 ft. lbs.).

(6) Install front wheel and tire. Install front wheel lug nuts and torque to 135 N·m

(7) (100 ft. lbs.).

(8) Lower vehicle.

DISASSEMBLY AND ASSEMBLY

McPHERSON STRUT

DISASSEMBLY

(1) Clamp the strut assembly in a vise, with the strut in a vertical position. **When clamping the strut assembly in the vise, do not clamp strut using the body of the strut only by strut clevis bracket (Fig. 59).**

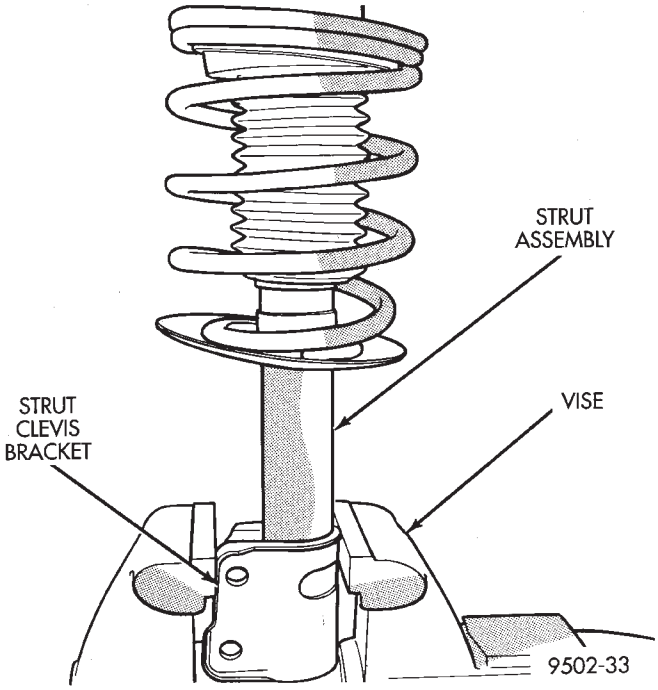


Fig. 59 Strut Assembly Correctly Clamped In Vise

(2) Mark coil spring and strut assembly right or left, according to which side of the vehicle the strut was removed from, and which strut coil spring was removed from.

WARNING: DO NOT REMOVE STRUT ROD NUT, BEFORE STRUT ASSEMBLY COIL SPRING IS COMPRESSED, REMOVING SPRING TENSION FROM UPPER SPRING SEAT AND BEARING ASSEMBLY.

DISASSEMBLY AND ASSEMBLY (Continued)

WARNING: WHEN COMPRESSING COIL SPRING FOR REMOVAL FROM STRUT ASSEMBLY, THE FIRST FULL TOP AND BOTTOM COIL OF THE COIL SPRING MUST BE CAPTURED BY THE JAWS OF THE COIL SPRING COMPRESSOR (Fig. 60).

(3) Compress the strut assembly coil spring, using Spring Compressor, Special Tool C-4838 (Fig. 60).

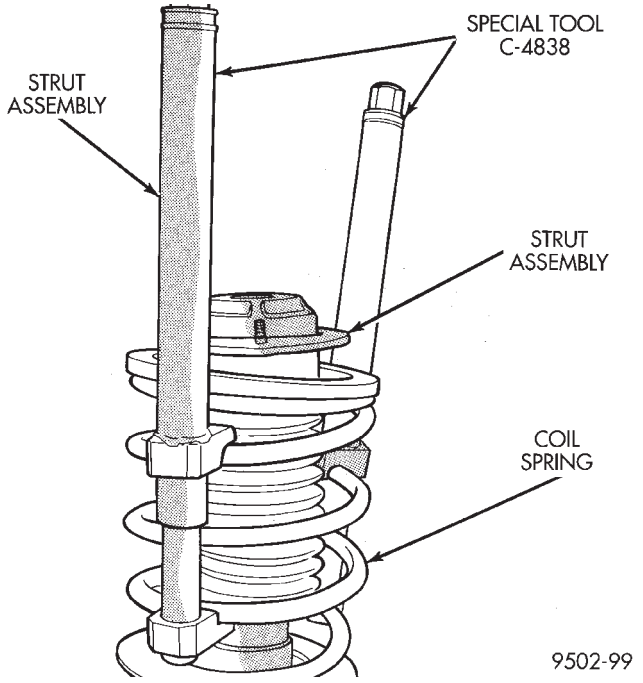


Fig. 60 Compressing Strut Assembly Coil Spring

(4) Install Socket, Strut Nut, Special Tool L-4558A (or L-4558) on the strut shaft retaining nut (Fig. 61). Then install a 10 mm socket on the hex of the strut damper shaft (Fig. 61). While holding strut shaft from turning, remove the strut shaft retaining nut.

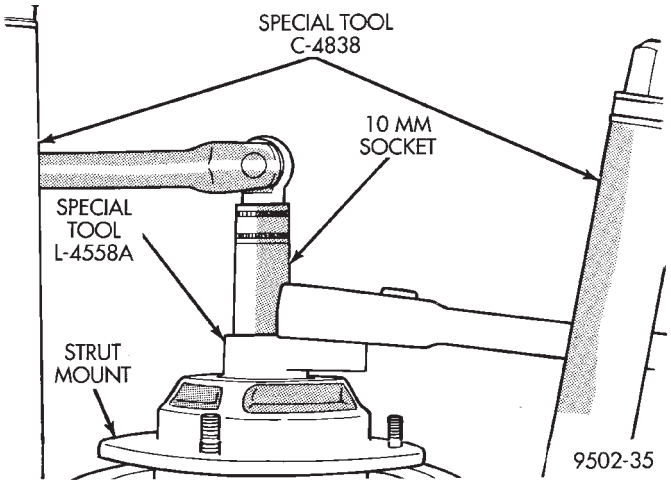


Fig. 61 Strut Shaft Retaining Nut Removal Tools

(5) Remove the strut assembly mount/isolator (Fig. 62) from the strut.

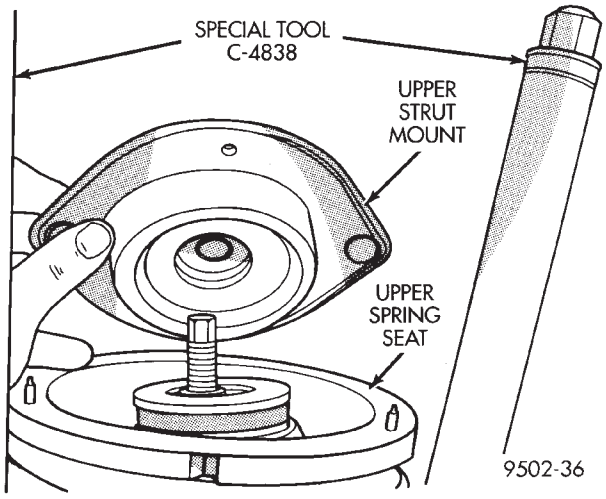


Fig. 62 Strut Mount

(6) Remove the upper spring seat, pivot bearing and dust shield as an assembly (Fig. 63) from the strut.

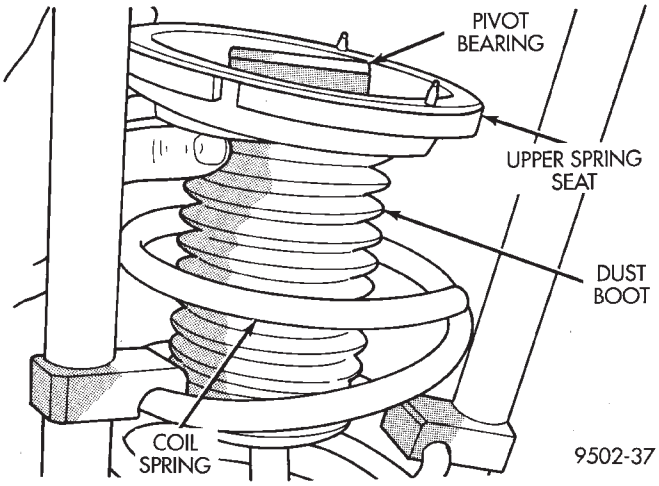


Fig. 63 Upper Spring Seat Assembly

(7) Remove the jounce bumper (Fig. 64) from the shaft of the strut assembly.

(8) Remove the coil spring from the strut assembly (Fig. 65). **Mark left and right on the coil springs for their installation back on the correct side of the vehicle.**

WARNING: IF A REPLACEMENT COIL SPRING IS TO BE INSTALLED ON THE STRUT ASSEMBLY, THE FIRST FULL TOP AND BOTTOM COIL OF THE SPRING MUST BE CAPTURED BY THE JAWS OF THE COIL SPRING COMPRESSOR.

(9) Inspect the strut for any binding of the strut shaft over the full stroke of the shaft.

DISASSEMBLY AND ASSEMBLY (Continued)

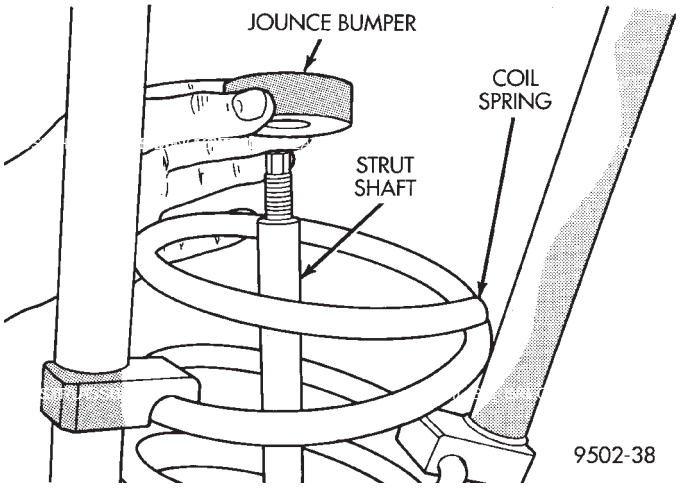


Fig. 64 Jounce Bumper Removal

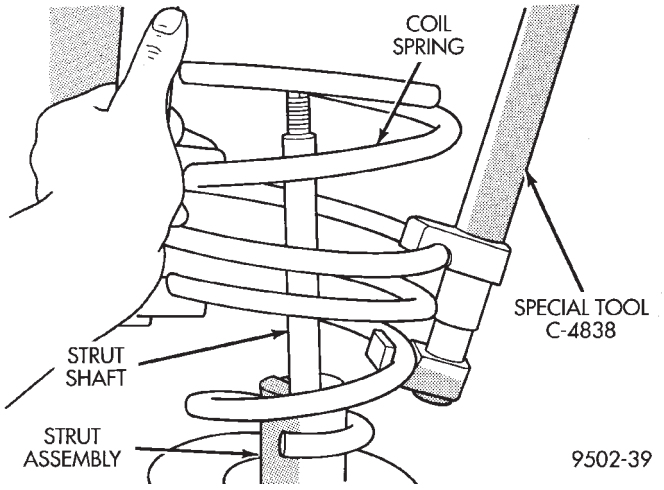


Fig. 65 Strut Assembly Coil Spring

(10) Inspect the strut mount and the upper spring seat assembly (Fig. 66) for any of the following conditions:

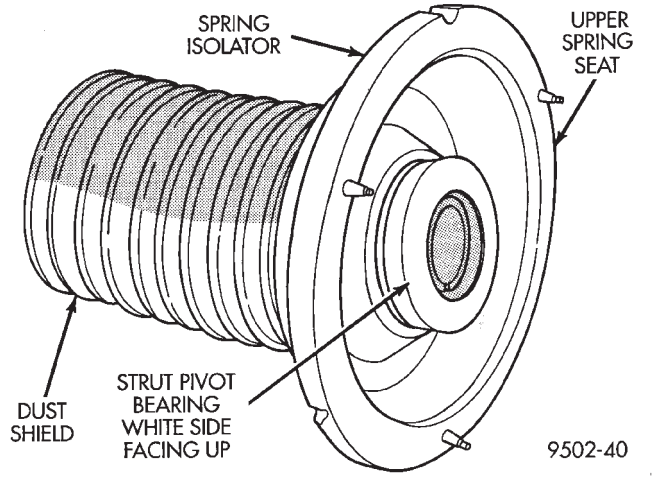


Fig. 66 Upper Spring Mount And Isolator Assembly Components

- Mount for cracks and distortion and retaining studs for any sign of damage.
- Severe deterioration of rubber isolator,
- Binding strut assembly pivot bearing. If pivot bearing is replaced it is to be installed with the white side of bearing facing up (Fig. 66).
- Inspect dust shield for rips and/or deterioration.
- Inspect jounce bumper for cracks and signs of deterioration.

(11) Replace any components of the strut assembly found to be worn or defective during the inspection, before assembling the strut.

ASSEMBLE

(1) Clamp the strut assembly in a vise, with the strut in a vertical position. **When clamping the strut assembly in the vise, do not clamp strut using the body of the strut only by strut clevis bracket (Fig. 59).**

(2) Install the compressed coil spring onto the strut. Coil spring is to be installed with smaller coil down, so spring correctly seats on strut assembly (Fig. 65).

(3) Install jounce bumper on the strut shaft (Fig. 64).

(4) Install dust shield, pivot bearing and upper spring seat as an assembly on the strut (Fig. 63).

(5) Position upper spring seat alignment notch with clevis bracket on strut assembly.

(6) Install strut mount on strut assembly (Fig. 62) and the strut mount retaining nut on the shaft of the strut assembly.

WARNING: THE FOLLOWING 2 STEPS MUST BE COMPLETELY DONE BEFORE SPRING COMPRESSOR, SPECIAL TOOL C-4838 IS RELEASED FROM THE COIL SPRING.

(7) Install Socket, Strut Nut, Special Tool L-4558A (or L-4558) on the strut shaft retaining nut (Fig. 61). Then install a 10 mm socket through the center of the socket and on the hex of the strut shaft (Fig. 61). While holding strut shaft from turning, torque strut shaft retaining nut to 75 N·m (55 ft. lbs.).

(8) Equally loosen both Spring Compressors, Special Tool C-4838 until top coil of spring is fully seated against upper spring seat and strut mount. Then relieve all tension from spring compressors and remove spring compressors from strut assembly spring.

BALL JOINT

DISASSEMBLE

(1) Using a screw driver or other suitable tool, pry seal boot off of ball joint assembly (Fig. 67).

DISASSEMBLY AND ASSEMBLY (Continued)

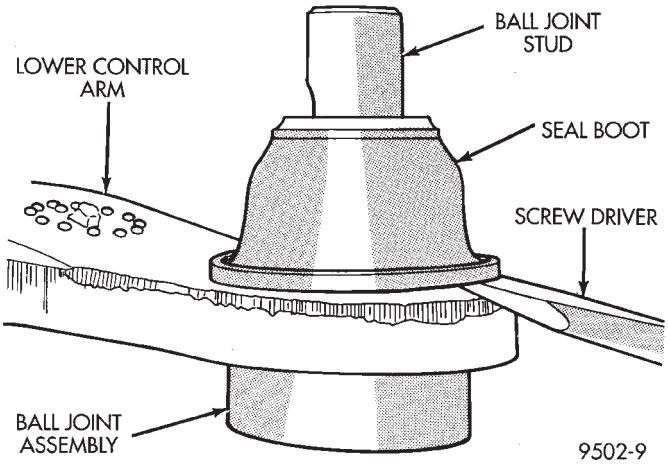


Fig. 67 Ball Joint Seal Boot Removal

(2) Position Receiving Cup, Special Tool 6758 to support lower control arm while receiving ball joint assembly (Fig. 68). Install Remover/Installer, Special Tool 6804 in top of ball joint assembly (Fig. 68).

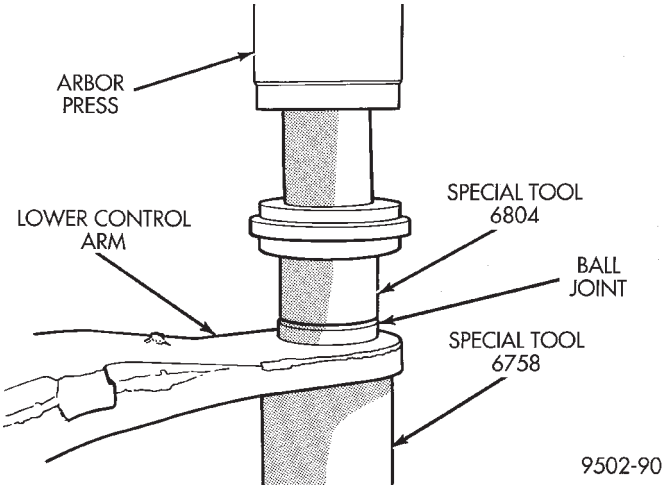


Fig. 68 Removing Ball Joint From Lower Control Arm

(3) Using arbor press, press ball joint assembly completely out of lower control arm.

ASSEMBLE

CAUTION: When installing ball joint in its mounting hole in lower control arm, position ball joint so notch in ball joint stud is facing the front lower control arm bushing. This will ease assembly of ball joint to steering knuckle when attempting to install pinch bolt.

(1) By hand, position ball joint assembly into ball joint bore of lower control arm. Be sure ball joint assembly is not cocked in the bore of the control arm, this will cause binding of the ball joint assembly, when being pressed into lower control arm.

(2) Position assembly in an arbor press with Receiving Cup, Special Tool 6758 supporting lower control arm (Fig. 69). Then install Remover/Installer, Special Tool 6804 on the bottom of the ball joint assembly (Fig. 69).

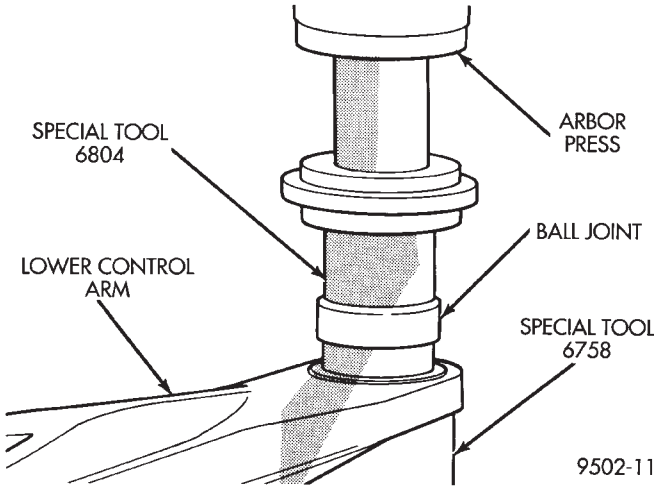


Fig. 69 Installing Ball Joint In Lower Control Arm

(3) Carefully align all pieces. Using the arbor press apply pressure against ball joint assembly (Fig. 69), until ball joint is fully seated against bottom surface of lower control arm. Do not apply excessive pressure against ball joint and lower control arm.

(4) Install a **NEW** ball joint assembly sealing boot on ball joint assembly. Install sealing boot as far as possible on ball joint assembly.

CAUTION: Do not use an arbor press to install the sealing boot on the lower control arm ball joint assembly. Damage to the sealing boot can occur do to excessive pressure applied to sealing boot when being installed.

(5) Position Receiving Cup, Special Tool 6758 over sealing boot so it is aligned properly with bottom edge of sealing boot (Fig. 70). Apply pressure **BY HAND** to special tool 6758, until sealing boot is pressed squarely against top surface of lower control arm.

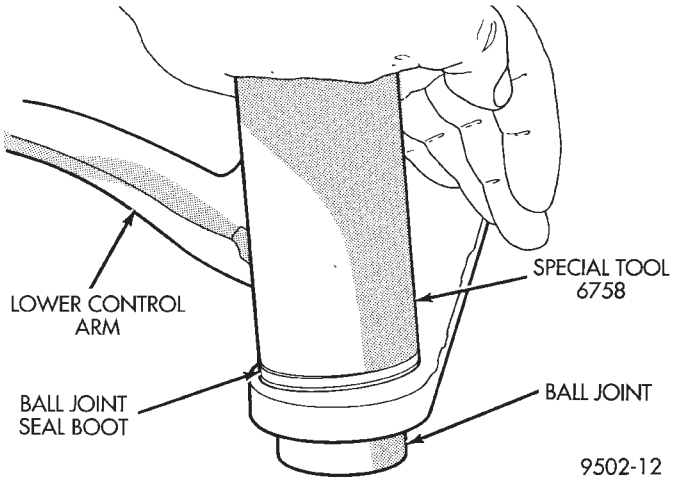


Fig. 70 Ball Joint Seal Boot Installation

DISASSEMBLY AND ASSEMBLY (Continued)

LOWER CONTROL ARM FRONT ISOLATOR BUSHING

DISASSEMBLY

To perform the removal and replacement of the lower control arm front isolator bushing, the lower control arm must be removed from the vehicle.

(1) Remove the lower control arm assembly from the vehicle. See Lower Control Arm in the Removal And Installation Section in this group of the service manual for the required removal procedure.

(2) Mount Remover/Installer, Special Tool C-4212-F in a vise (Fig. 71). Install Bushing Remover, Special Tool 6804 and Bushing Receiver, Special Tool 6758 on Special Tool C-4212-F (Fig. 71).

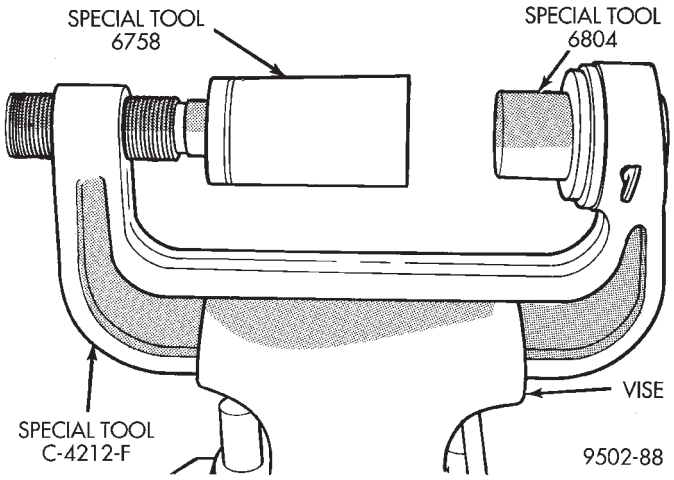


Fig. 71 Special Tools Assembled For Removing Front Bushing

(3) Install lower control arm on Special Tools assembled for removal of the front isolator bushing as shown in (Fig. 72). Be sure Special Tool 6758 is square on lower control arm and Special Tool 6804 is positioned correctly on isolator bushing.

(4) Tighten screw on Remover/Installer Special Tool C-4212-F to press front bushing out of lower control arm.

ASSEMBLY

(1) Mount Installer Cup, Special Tool C-4212-F on Remover/Installer, Special Tool C-4212-F (Fig. 73). Then mount Bushing Installer, Special Tool 6810 on screw portion of Remover/Installer Special Tool C-4212-F (Fig. 73).

(2) Start front bushing into lower control arm **by hand, making sure it is square with its mounting hole in the lower control arm.** Bushing is to be installed in lower control arm from the machined surface side of lower control arm bushing hole (Fig. 74).

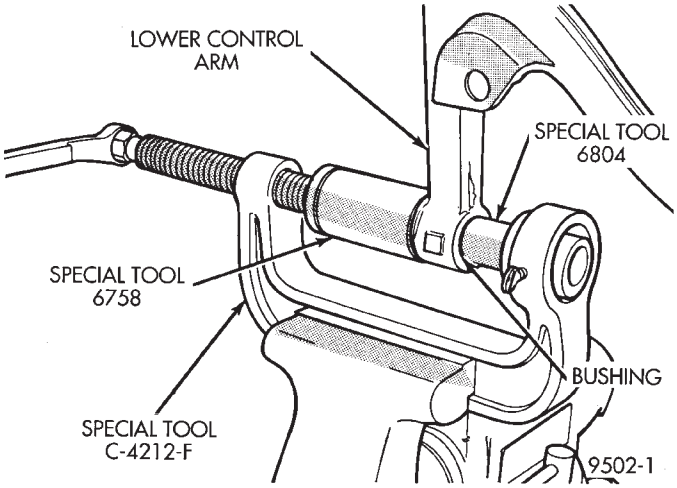


Fig. 72 Removing Front Bushing From Lower Control Arm

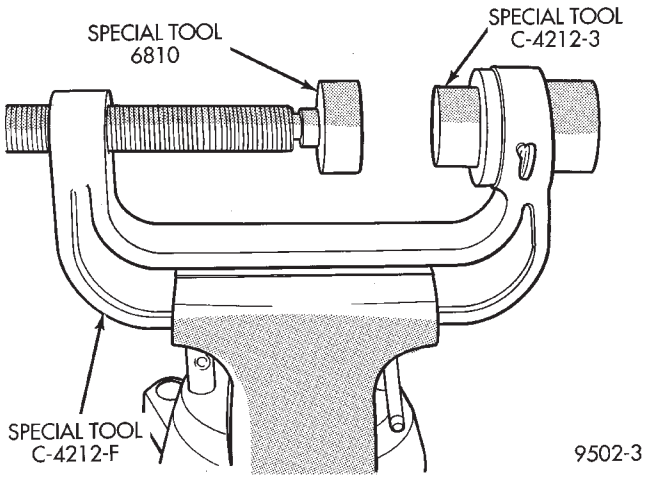


Fig. 73 Special Tools Assembled For Installing Front Bushing

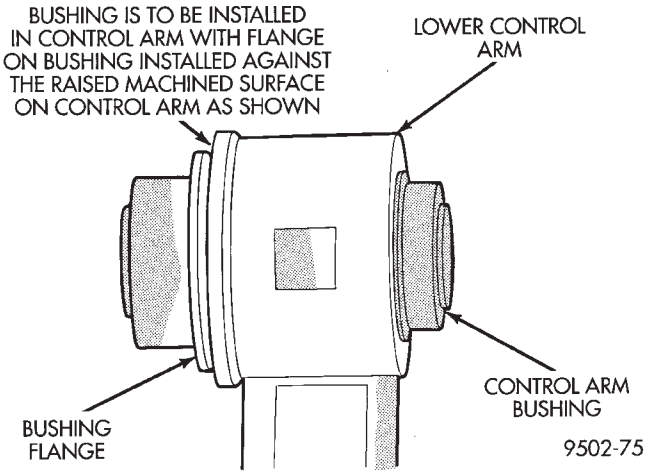


Fig. 74 Installation Direction Of Lower Control Arm Front Bushing

DISASSEMBLY AND ASSEMBLY (Continued)

(3) Install lower control arm as shown in (Fig. 75) on Special Tools assembled for installing front isolator bushing into lower control arm. Be sure Special Tool C-4212-F is square on lower control arm and Special Tool 6810 is positioned correctly on isolator bushing.

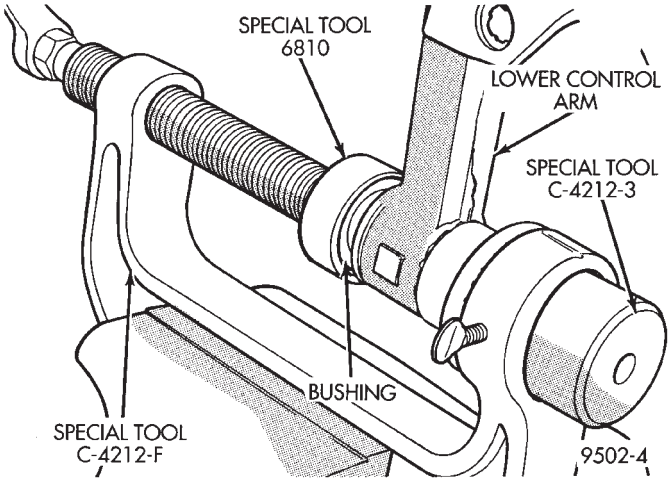


Fig. 75 Front Bushing Installation

(4) Tighten screw on Remover/Installer Special Tool C-4212-F pressing front bushing into lower control arm. Continue pressing front bushing into lower control arm until special tool 6810 is sitting flush on the machined surface of the lower control arm (Fig. 76). This will correctly position front bushing in lower control arm.

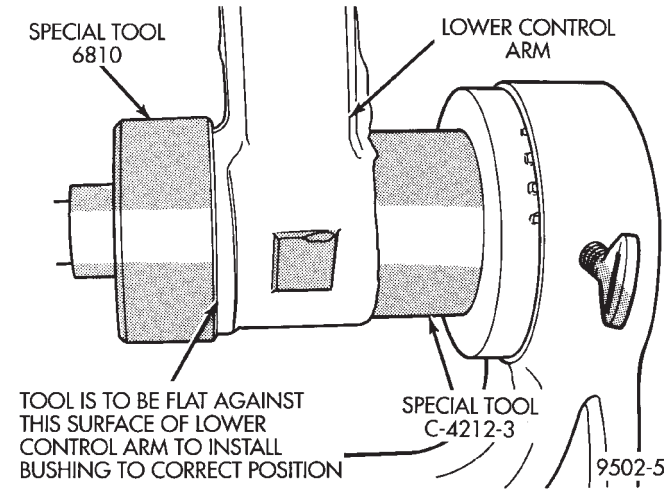


Fig. 76 Installation Position Of Front Lower Control Arm Bushing

(5) Install the lower control arm assembly back on the vehicle. See Lower Control Arm in the Removal And Installation Section in this group of the service manual for the required installation procedure.

LOWER CONTROL ARM REAR ISOLATOR BUSHING

DISASSEMBLY

Removal and installation of the lower control arm rear isolator bushing is done using an arbor press. Do not attempt to use a different procedure from that below for the removal and replacement of rear lower control arm bushing.

(1) Remove the lower control arm assembly from the vehicle. See Lower Control Arm in the Removal And Installation Section in this group of the service manual for the required removal procedure.

(2) Position lower control arm in an arbor press supported at rear bushing using Receiver Cup, Special Tool 6556 (Fig. 77). Position Remover/Installer, Special Tool 6758 on top of rear control arm bushing (Fig. 77).

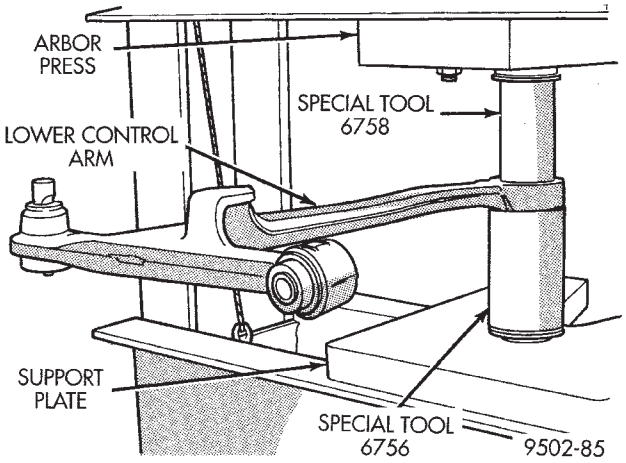


Fig. 77 Special Tools Assembled For Removing Rear Bushing

(3) Press isolator bushing out of the lower control arm.

DISASSEMBLY AND ASSEMBLY (Continued)

ASSEMBLY

(1) Install the rear bushing into the lower control arm in the direction indicated in (Fig. 78). **Rear bushing must be positioned in lower control arm with the void in the bushing pointing toward the compression strut of the lower control arm as shown in (Fig. 78).**

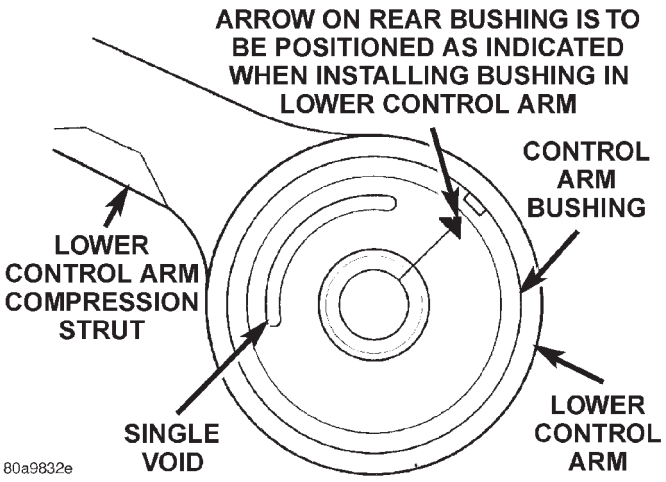


Fig. 78 Correct Installation Of Bushing In Lower Control Arm

(2) Place lower control arm in an arbor press supported at rear bushing hole using Receiver Cup, Special Tool 6556 (Fig. 79). Correctly position Remover/Installer, Special Tool 6760 on top of rear control arm bushing (Fig. 79).

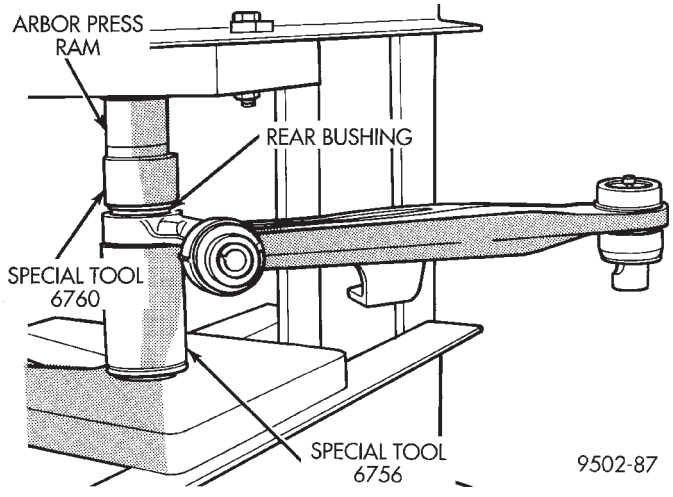


Fig. 79 Rear Bushing Installation

(3) Press rear bushing into lower control arm, until flange on bushing is flush with machined surface of lower control arm (Fig. 80).

(4) Install the lower control arm assembly back on the vehicle. See Lower Control Arm in the Removal And Installation Section in this group of the service manual for the required installation procedure.

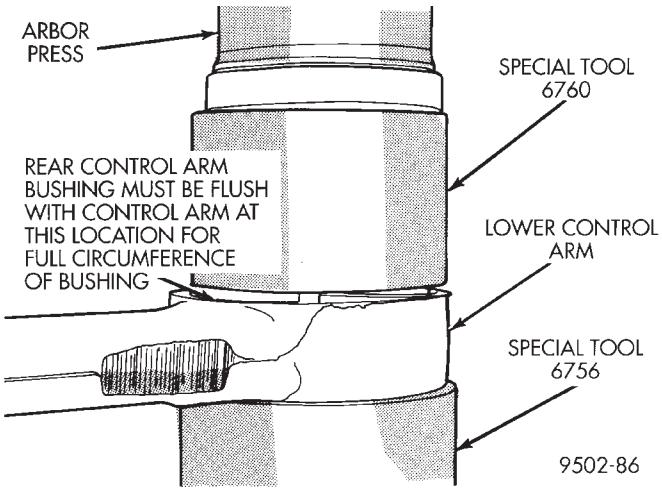


Fig. 80 Correctly Installed Rear Bushing

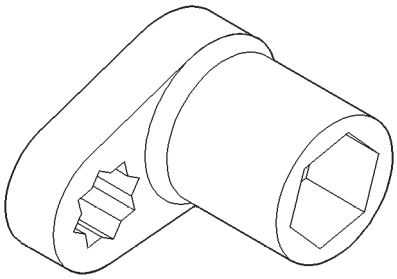
SPECIFICATIONS

FRONT SUSPENSION FASTENER TORQUES

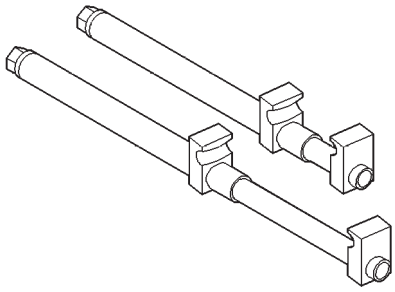
DESCRIPTION	TORQUE
McPHERSON STRUT:	
To Shock Tower Attaching Nuts	34 N·m (300 in. lbs.)
Clevis Bracket To Steering Knuckle	54 N·m (40 ft. lbs.) + 90° Turn
Strut Shaft Nut	74 N·m (55 ft. lbs.)
STEERING KNUCKLE:	
Ball Joint Stud To Steering Knuckle Nut/Bolt	95 N·m (70 ft. lbs.)
Disc Brake Caliper Bolts	22 N·m (16 ft. lbs.)
STEERING GEAR:	
To Crossmember Attaching Bolts	68 N·m (50 ft. lbs.)
Tie Rod End Adjusting Sleeve Nut	75 N·m (55 ft. lbs.)
Tie Rod End To Steering Knuckle Nut	54 N·m (40 ft. lbs.)
FRONT SUSPENSION CROSSMEMBER:	
To Body Attaching Bolts	163 N·m (120 ft. lbs.)
Lower Control Arm Pivot Bolt	163 N·m (120 ft. lbs.)
STABILIZER BAR:	
Bushing Retainer To Crossmember Bolts	28 N·m (21 ft. lbs.)
To Control Arm Attaching Link Nut	28 N·m (21 ft. lbs.)
HUB AND BEARING:	
Front Stub Axle To Hub Bearing Nut	183 N·m (135 ft. lbs.)
Wheel Mounting Lug Nut	109-150 N·m (80-110 ft. lbs.)

SPECIAL TOOLS

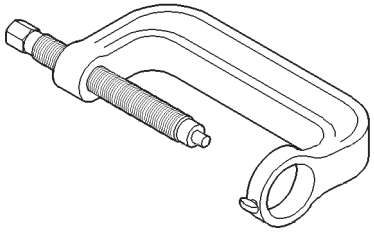
FRONT SUSPENSION



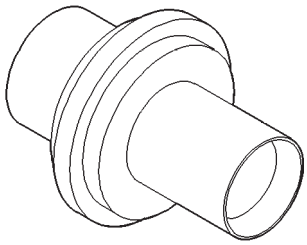
Socket/Holder Front Strut Nut L-4558A



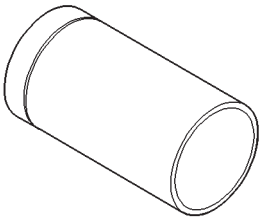
Compressor Strut Coil Spring C-4838



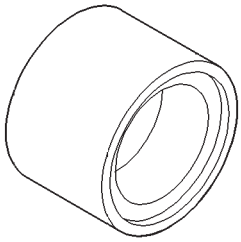
Press Remover/Installer C-4212-F



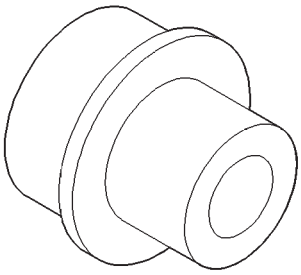
Remover Lower Control Arm Small Bushing And Ball Joint 6804



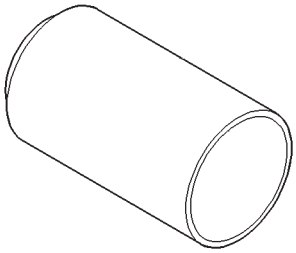
Installer Ball Joint 6758



Installer Lower Control Arm Small Bushing 6810

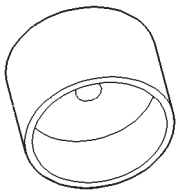


Adapter Ball Joint Remover/Installer C-4212-3

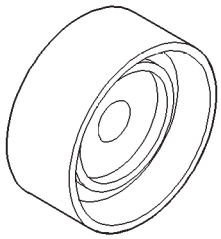


Receiver Ball Joint 6756

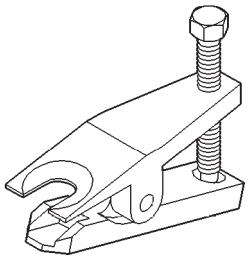
SPECIAL TOOLS (Continued)



Installer Ball Joint 6760

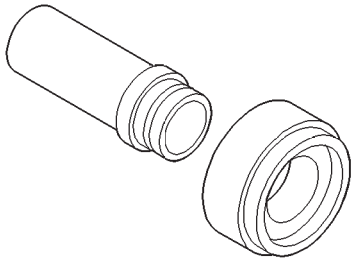


Installer Bearing 5052

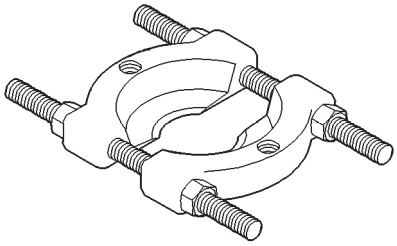


8011d8e6

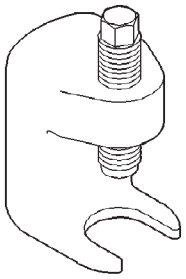
Remover Tie Rod End MB-990635



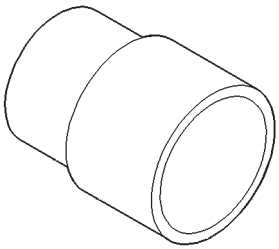
Installer Adapter C-4698-2



Puller Bearing P-334



Remover Lower Ball Joint C-4150A



Remover Ball Joint MB-990799

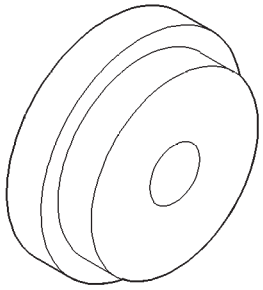
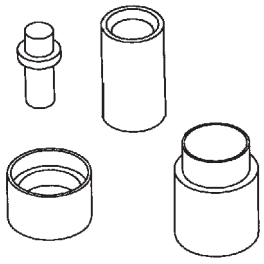


Fig. 81 Installer Bearing Cup 6522



Remover/Installer Lower Control Arm Bushing 6644-2

REAR SUSPENSION

INDEX

page

GENERAL INFORMATION
GENERAL INFORMATION 36
DESCRIPTION AND OPERATION
COIL SPRING 38
KNUCKLE 38
LATERAL LINKS AND TENSION STRUTS 38
REAR SUSPENSION 36
STABILIZER BAR 38
STRUT ASSEMBLY 38
DIAGNOSIS AND TESTING
LATERAL LINKS 39
STABILIZER BAR AND BUSHINGS 39
STABILIZER BAR ATTACHING LINKS 39
STRUT INSPECTION (ON VEHICLE) 38
SUSPENSION KNUCKLE 39
TENSION STRUT 39

page

SERVICE PROCEDURES
REAR WHEEL ALIGNMENT 39
REMOVAL AND INSTALLATION
COIL SPRING 41
KNUCKLE 42
LATERAL LINKS 45
STABILIZER BAR 41
STRUT ASSEMBLY 39
DISASSEMBLY AND ASSEMBLY
STABILIZER BAR BUSHINGS 49
STRUT ASSEMBLY 47
SPECIFICATIONS
REAR SUSPENSION FASTENER TORQUE SPECIFICATIONS 50
SPECIAL TOOLS
REAR SUSPENSION 50

GENERAL INFORMATION

GENERAL INFORMATION

CAUTION: Only frame contact or wheel lift hoisting equipment can be used on vehicles having a fully independent rear suspension. Vehicles with independent rear suspension can not be hoisted using equipment designed to lift a vehicle by the rear axle. If this type of hoisting equipment is used damage to rear suspension components will occur.

NOTE: If a rear suspension component becomes bent, damaged or fails, no attempt should be made to straighten or repair it. Always replace with a new component.

DESCRIPTION AND OPERATION

REAR SUSPENSION

The rear suspension system used on this vehicle is a fully independent type rear suspension system (Fig. 1).

DESCRIPTION AND OPERATION (Continued)

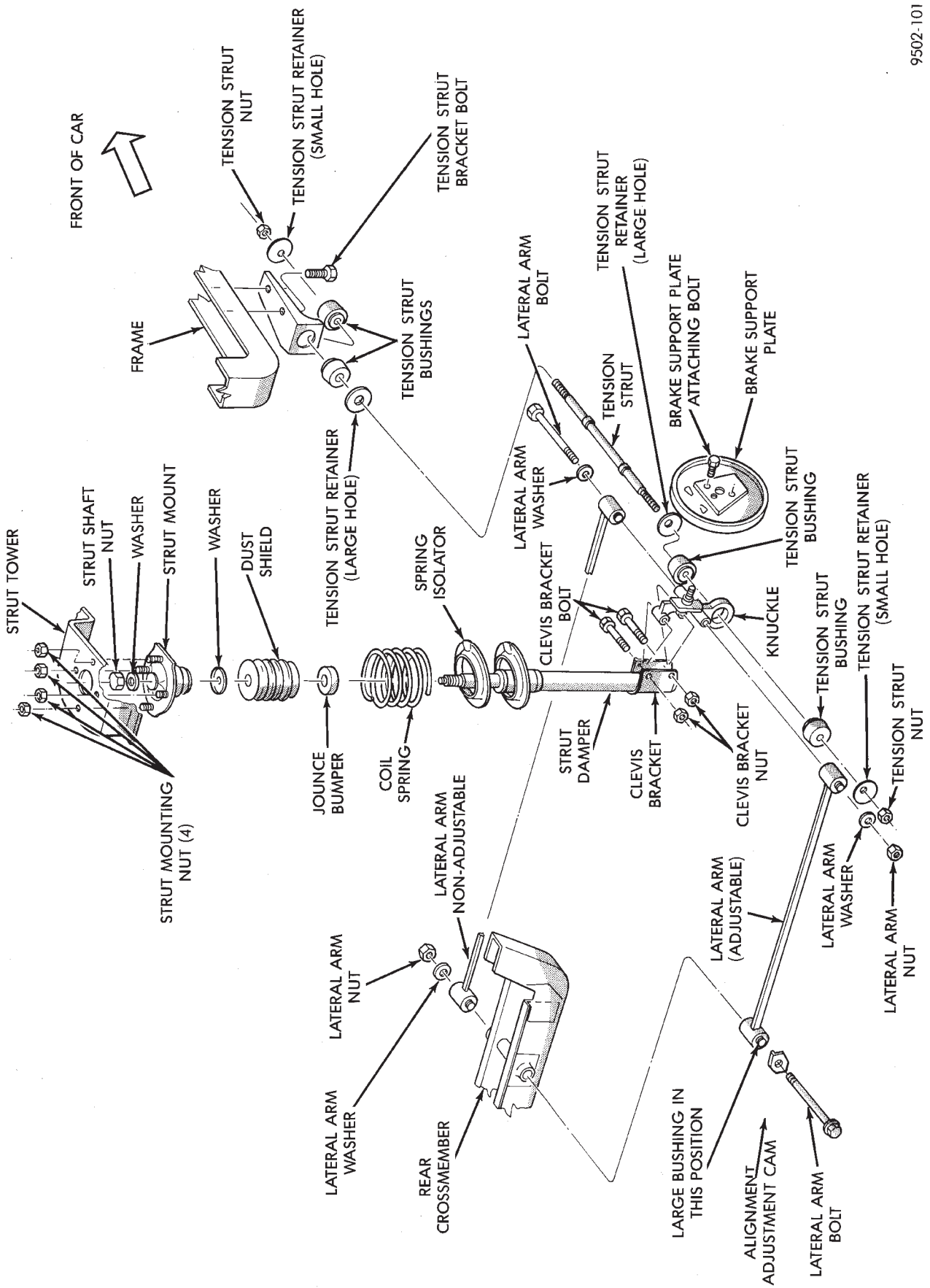


Fig. 1 Neon Fully Independent Rear Suspension

DESCRIPTION AND OPERATION (Continued)

STRUT ASSEMBLY

The rear strut assemblies support the weight of the vehicle using coil springs positioned around the struts. The coil springs are contained between the upper mount of the strut assembly and a lower spring seat on the body of the strut assembly.

The top of each strut assembly is bolted to the top of the inner fender through a rubber isolated mount.

The bottom of the strut assembly attaches to the rear knuckle using 2 thru-bolts and prevailing torque nuts. Rear Caster and camber on this vehicle is a fixed setting (net build) and is not required to be adjusfted as a normal procedure when performing an alignment on this vehicle.

COIL SPRING

Rear coil springs are rated separately for each corner or side of the vehicle depending on optional equipment and type of vehicle service. During service procedures when both rear coil springs are removed, mark the coil springs to ensure installation of the springs in their original position. **If coil springs require replacement, be sure the springs needing replacement, are replaced with springs meeting the correct load rating for the vehicle and its specific options.**

STABILIZER BAR

The stabilizer bar interconnects both rear strut assemblies and is attached to the rear frame rails of the vehicle.

Jounce and rebound movements affecting one wheel are partially transmitted to the opposite wheel of the vehicle to stabilize body roll.

Attachment of the stabilizer bar to the rear frame rails of the vehicle is through 2 rubber-isolator bushings and bushing retainers. The stabilizer bar to strut assembly attachment is done utilizing a rubber isolated stabilizer bar attaching link. All parts of the stabilizer bar are serviceable, and the stabilizer bar to frame rail isolator bushings are split for easy removal and installation. The split in the stabilizer bar to crossmember bushing must be positioned toward the rear of the vehicle, when the stabilizer bar is installed on the vehicle.

KNUCKLE

A forged rear knuckle bolts to each rear strut assembly. The movement of the rear knuckle is controlled laterally using two lateral arms attached to the knuckle. The outboard ends of the two lateral arms are mounted forward and rearward of the spindle centerline, and inboard ends are mounted to the rear crossmember. Fore and aft movement of the knuckle is controlled by using a tension strut.

LATERAL LINKS AND TENSION STRUTS

The lateral arms and tension strut have rubber isolator bushings at each end. The lateral arms are attached to the rear crossmember and knuckle, using a unique bolt and nut assembly at each end. The lateral arm to rear crossmember attaching bolts are longer than the lateral arm to knuckle attaching bolts. Each lateral arm to knuckle attaching bolt and nut assembly uses 2 flat washers. Each lateral arm to rear crossmember attaching bolt uses 1 flat washer and 1 adjustment cam to provide a means for rear wheel Toe adjustment. The tension strut assembly attaches to a bracket on the frame rail and to the bottom of the knuckle.

Lateral arms, tension struts and knuckles are normally replaced only when the part has been damaged or when the vehicle has been involved in an accident. If a suspension part has been damaged, be sure to check the underbody dimensions of the car. If underbody dimensions of the vehicle are not correct, the frame must be straightened before replacement suspension components are installed.

DIAGNOSIS AND TESTING

STRUT INSPECTION (ON VEHICLE)

(1) Inspect for damaged or broken coil springs (Fig. 2).

(2) Inspect for torn or damaged strut assembly dust boots (Fig. 2).

(3) Inspect for damaged lower spring isolator (Fig. 2).

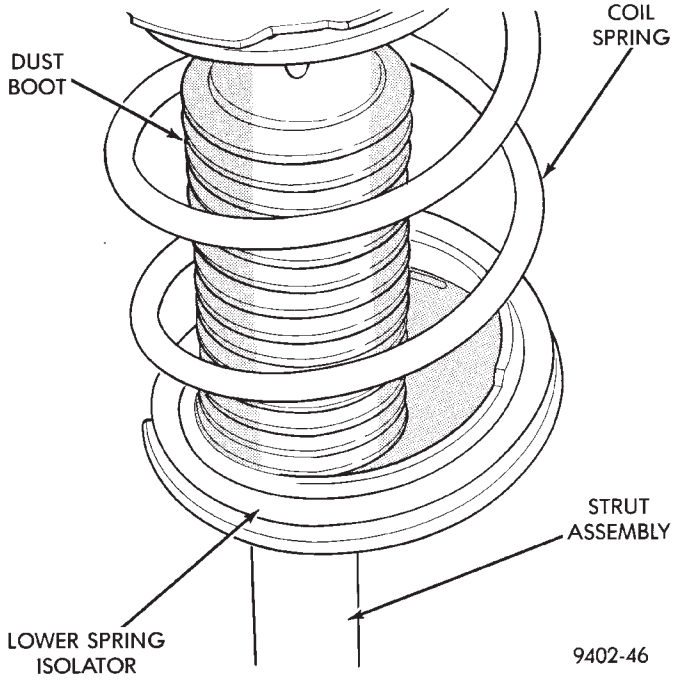


Fig. 2 On Vehicle Strut Assembly Inspection

DIAGNOSIS AND TESTING (Continued)

(4) Lift dust boot and inspect strut assembly for evidence of fluid running from the upper end of fluid reservoir. (Actual leakage will be a stream of fluid running down the side and dripping off lower end of unit). A slight amount of seepage between the strut rod and strut shaft seal is not unusual and does not affect performance of the strut assembly (Fig. 3). Also inspect jounce bumpers for signs of damage or deterioration.

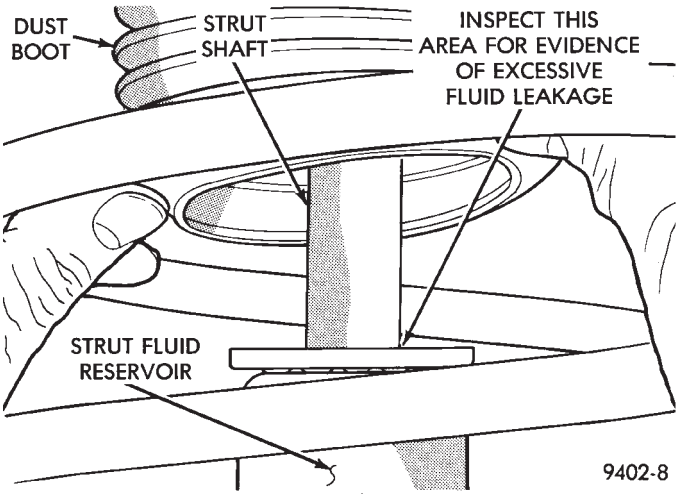


Fig. 3 Strut Assembly Leakage Inspection

SUSPENSION KNUCKLE

The rear suspension knuckle is not a repairable component of the rear suspension. If it is determined that the knuckle is broken or bent when servicing the vehicle, no attempt is to be made to repair or to straighten the knuckle. **THE KNUCKLE MUST BE REPLACED IF FOUND TO BE DAMAGED IN ANY WAY.**

LATERAL LINKS

Inspect the lateral link isolator bushings and sleeves for signs of damage or deterioration. If the lateral link isolator bushings or sleeves are damaged or are deteriorated, replacement of the lateral link assembly will be required. The isolator bushings are not serviceable as a separate component of the lateral link assembly.

Inspect the lateral links for signs of contact with the ground or road debris which has bent or caused other damage to the lateral link assembly. If the lateral link is bent or damaged, the lateral link will require replacement. **Do not attempt to repair or straighten a lateral link.**

TENSION STRUT

Inspect the tension strut bushings and retainers for signs of deterioration or damage. If the tension strut bushings are deteriorated or the retainers are damaged, replacement of the tension strut bushings and or the retainers will be required. The bushings and retainers are serviceable as separate components of the tension strut.

Inspect the tension strut for signs of contact with the ground or road debris which has bent or caused other damage to the tension strut. If the tension strut is bent or damaged the tension strut will require replacement. **Do not attempt to repair or straighten a tension strut.**

STABILIZER BAR AND BUSHINGS

Inspect the stabilizer bar for damage or bending. Inspect for broken or distorted stabilizer bar bushings, bushing retainers, and worn or damaged stabilizer bar to strut attaching links. If stabiizer bar to rear frame rail bushing replacement is required, bushings can be removed from sway bar by opening slit and peeling bushing off sway bar.

STABILIZER BAR ATTACHING LINKS

Inspect the bushings and sleeves in the stabilizer bar attaching links for damage or deterioration. Inspect the stabilizer bar attaching link to ensure it is not bent or broken. If any of these conditions are present when inspecting the attaching links, replacement of the attaching link is required.

SERVICE PROCEDURES

REAR WHEEL ALIGNMENT

Refer to Front And Rear Wheel Toe Setting Procedures in the Wheel Alignment Check And Adjustment section in this group of the service manual for the required rear wheel Toe setting procedure.

REMOVAL AND INSTALLATION

STRUT ASSEMBLY

REMOVE

(1) Raise vehicle on jackstands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(2) Remove the rear wheel and tire assembly from the vehicle.

(3) Remove hydraulic flex hose bracket, from bracket on rear strut assembly (Fig. 4). If vehicle is equipped with Anti-Lock brakes, the wheel speed sensor cable routing clip is also attached to the strut assembly bracket.

(4) Support rear knuckle, suspension and brake components of vehicle before removing clevis bracket to knuckle attaching bolts. **Do not let weight of**

REMOVAL AND INSTALLATION (Continued)

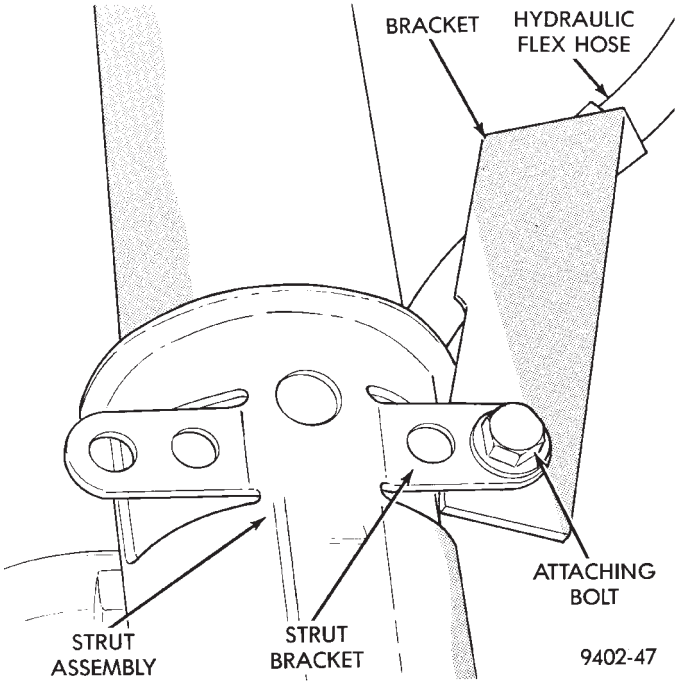


Fig. 4 Hydraulic Flex Hose Bracket Attachment To Strut

rear knuckle and assembled components hang unsupported when strut is removed.

CAUTION: The knuckle to strut assembly attaching bolts are serrated and must not be turned during removal. Remove nuts while holding bolts stationary in knuckle.

(5) Remove the 2 clevis bracket bolts (Fig. 5) attaching strut assembly to rear knuckle.

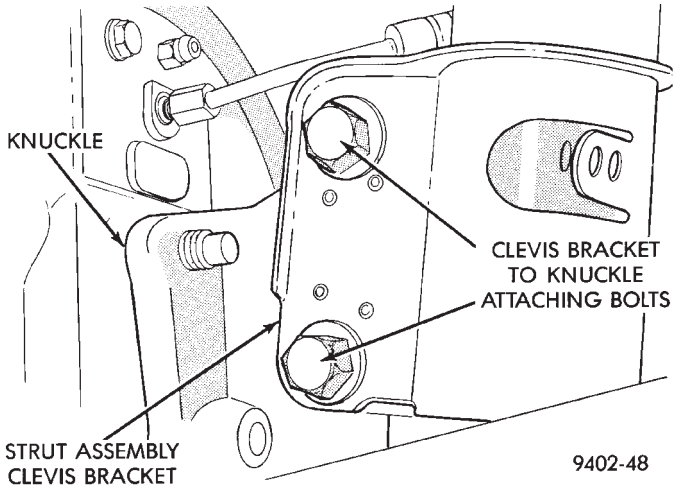


Fig. 5 Knuckle To Clevis Bracket Bolts

(6) Lower vehicle. Access to rear upper strut mount to strut tower attaching bolts, is through the trunk of the vehicle.

(7) Remove carpet (if required) from top of strut tower. Then remove rubber dust shield (Fig. 6) from top of strut tower, this will allow easier access to upper strut mount attaching nuts.

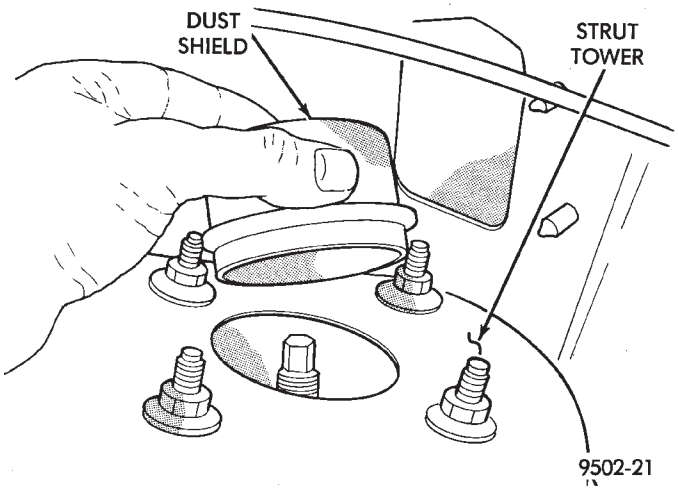


Fig. 6 Dust Shield Removal From Strut Tower

(8) Loosen but do not remove the 4 upper strut mount to strut tower attaching nuts (Fig. 7). Then while supporting the strut assembly fully remove the 4 strut mount attaching nuts.

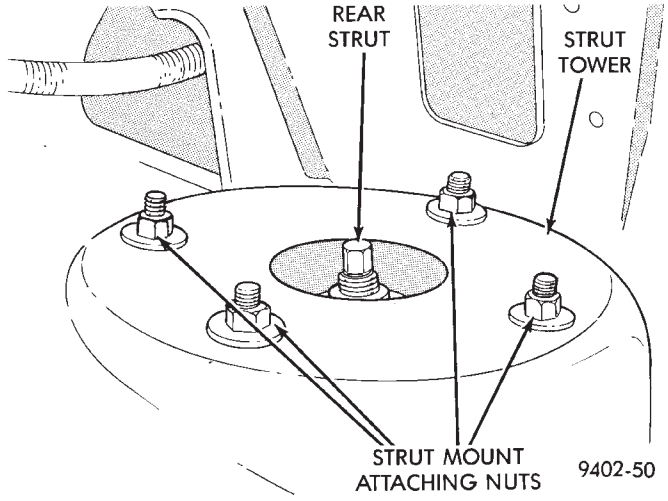


Fig. 7 Strut Mount Attaching Nuts

(9) Remove strut assembly from knuckle, by sliding knuckle out of clevis bracket on strut assembly. Then remove strut assembly from vehicle.

INSTALL

(1) Position strut assembly back into vehicle with the 4 studs on strut mount assembly through holes in strut tower of vehicle. Install the 4 strut mount to body attaching nuts (Fig. 7) onto mount studs. Torque the 4 strut mount to body attaching nuts to 34 N·m (300 in. lbs).

REMOVAL AND INSTALLATION (Continued)

(2) Install dust shield into hole on top of strut tower (Fig. 6). Install carpeting back on top of rear strut tower.

(3) Raise vehicle.

CAUTION: The knuckle to strut assembly attaching bolts are serrated and must not be turned during installation. Install and torque nuts while holding bolts stationary in knuckle.

(4) Install knuckle assembly into clevis bracket on strut assembly. Install the 2 clevis bracket to knuckle assembly attaching bolts and nuts (Fig. 5). Torque both clevis bracket to knuckle assembly attaching nuts to 95 N·m (70 ft. lbs.).

(5) Install hydraulic flex hose bracket, on strut assembly bracket (Fig. 4). Install and securely tighten bolt attaching hose bracket to strut bracket. If vehicle is equipped with Anti-Lock brakes, the wheel speed sensor cable routing clip is also attached to the strut assembly bracket.

(6) Install wheel and tire assembly on vehicle. Tighten the wheel mounting stud nuts in proper sequence until all nuts are torqued to half specification. Then repeat tightening sequence to full specified torque of 135 N·m (100 ft. lbs.).

(7) Lower vehicle to the ground.

(8) Check and reset rear wheel TOE to specifications if required. Refer to Front And Rear Toe Setting Procedure in the Wheel Alignment Check And Adjustment section in this group of the service manual for the required Toe setting procedure.

COIL SPRING

Coil springs are rated separately for each side of vehicle depending on optional equipment and type of service. During service procedures where both springs are removed, mark springs (Chalk, Tape, etc.) (Fig. 8) to ensure installation in original position. If the coils springs require replacement. **Be sure that the springs needing replacement, are replaced with springs meeting the correct load and spring rate for the vehicle.**

NOTE: During service procedures requiring removal or installation of a coil spring with Spring Compressor, Special Tool C-4838. It is required that the first full top and bottom coil of the coil spring be captured by the jaws of spring compressor (Fig. 8).

Replacement of the coil spring requires removal of the strut assembly from the vehicle, and the disassembly of the strut. Refer to strut assembly in the removal and installation section in this group of the service manual for the required removal and replacement procedure for the strut assembly. Then refer to strut assembly in the disassembly and assembly section in this group of the service manual for the required procedure to disassemble and assemble the strut assembly for the removal of the coil spring.

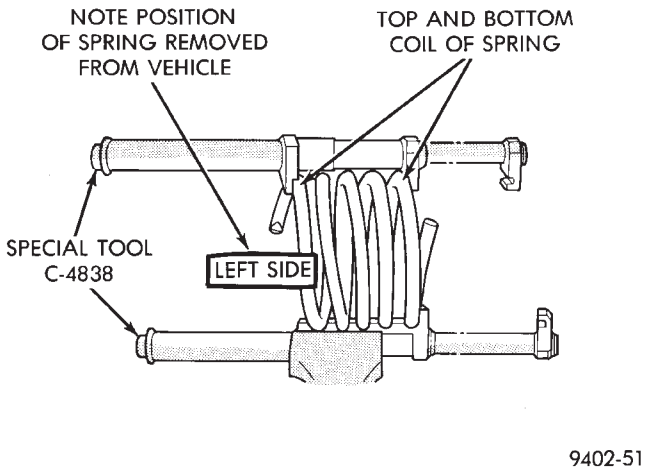


Fig. 8 Identifying Coil Springs

STABILIZER BAR

REMOVE

(1) Raise vehicle on jackstands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(2) Remove both rear wheel and tire assemblies from the vehicle.

(3) Remove rear stabilizer bar from the 2 stabilizer bar to strut attaching links (Fig. 9).

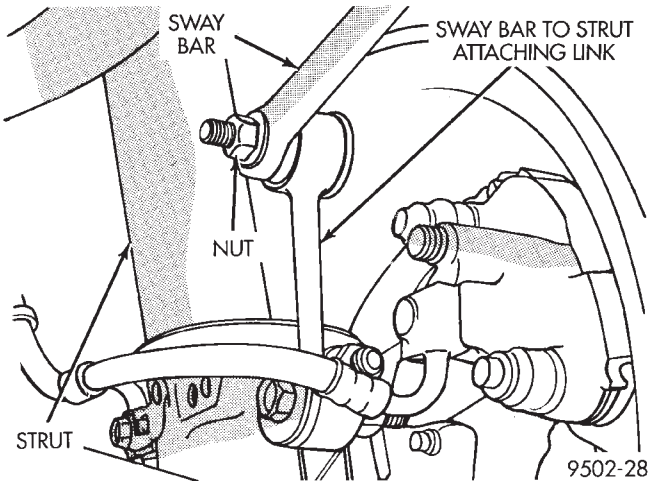


Fig. 9 Sway Bar To Strut Attaching Link

(4) Rotate stabilizer bar down slightly to clear attaching links.

(5) Remove the 2 stabilizer bar to rear frame rail retainers (Fig. 10).

REMOVAL AND INSTALLATION (Continued)

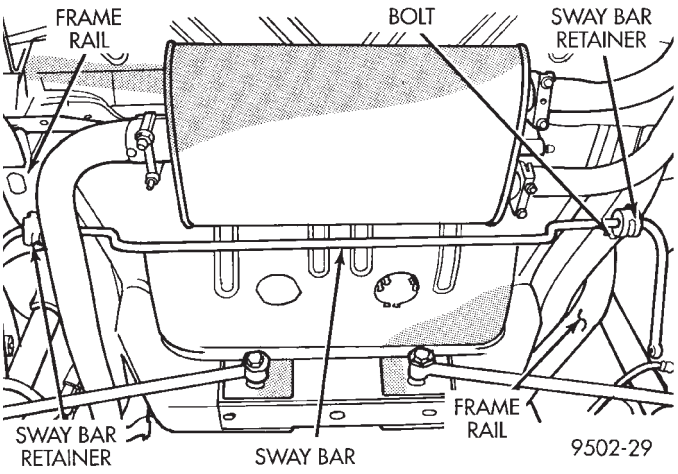


Fig. 10 Sway Bar To Frame Rail Retainers

(6) Remove stabilizer bar from vehicle.

STABILIZER BAR AND BUSHING INSPECTION

Inspect for broken or distorted retainers and bushings. If bushing replacement is required, bushing can be removed by opening slit in bushing and removing bushing from around stabilizer bar. When bushings are installed on stabilizer bar, bushings must be installed with slit positioned on stabilizer bar so slit will face rear of vehicle when stabilizer bar is installed (Fig. 11).

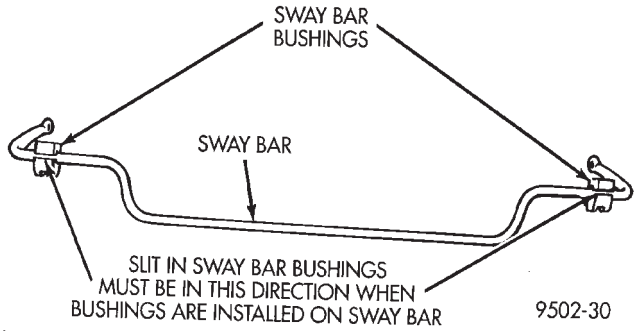


Fig. 11 Bushings Correctly Installed On Stabilizer Bar

INSTALL

(1) Install stabilizer bar and isolator bushings back into the vehicle as an assembly. Position stabilizer bar so it is centered in the vehicle and does not contact other suspension components or vehicle body.

(2) Install the 2 stabilizer bar to frame rail retainers into frame rail and loosely install both retainer attaching bolts (Fig. 10).

(3) Position both stabilizer bar to strut assembly attaching links on stabilizer bar. Install and securely tighten the stabilizer bar attaching link to stabilizer bar attaching nuts (Fig. 9).

(4) Install wheel and tire assembly on vehicle. Tighten the wheel mounting stud nuts in proper sequence until all nuts are torqued to half specification. Then repeat the tightening sequence to the full specified torque of 129 N·m (95 ft. lbs.).

(5) Lower the vehicle to the ground.

(6) With suspension supporting the full weight of the vehicle, securely tighten the stabilizer bar retainer to frame rail attaching bolts (Fig. 9).

KNUCKLE

REMOVE

(1) Raise vehicle on jackstands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(2) Remove the rear wheel and tire.

(3) If vehicle is equipped with rear disc brakes, remove the rear caliper from the adapter. Refer to Rear Disk Brakes in Group 5 Brakes of this Service manual for required caliper removal procedure. After removing the caliper, store the caliper by hanging it from frame of the vehicle (Fig. 12). Do not let weight of rear caliper hang from flexible brake hose.

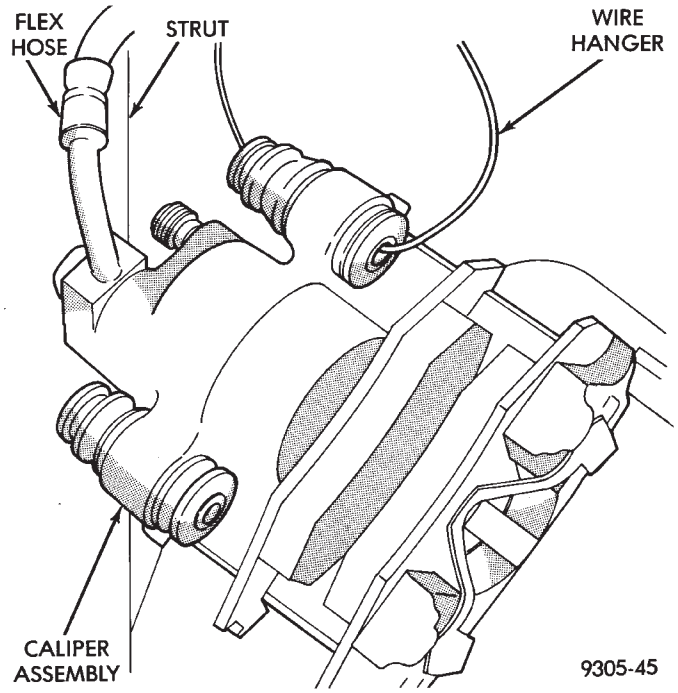


Fig. 12 Storing Rear Caliper

(4) If vehicle is equipped with rear disc brakes, remove rotor from hub. If vehicle is equipped with rear drum brakes, remove brake drum from hub.

(5) If vehicle is equipped with ABS brakes, remove the speed sensor head from the rear disc brake adapter (Fig. 13).

REMOVAL AND INSTALLATION (Continued)

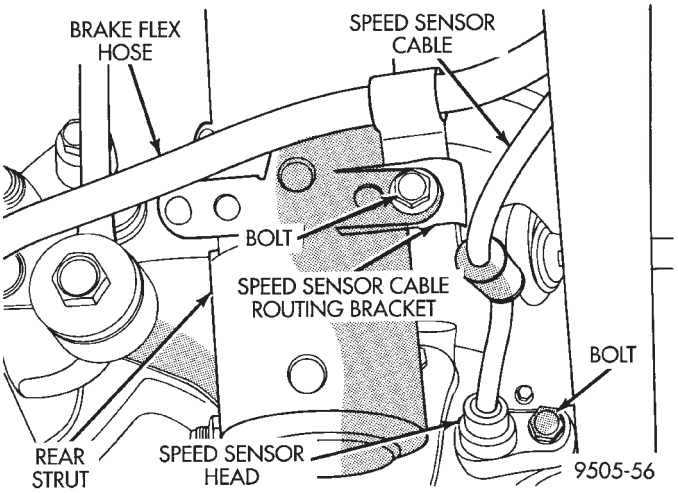


Fig. 13 Speed Sensor Head Attachment To Disc Brake Adapter

(6) Remove rear hub/bearing retaining nut (Fig. 14). Then remove the hub/bearing from the knuckle.

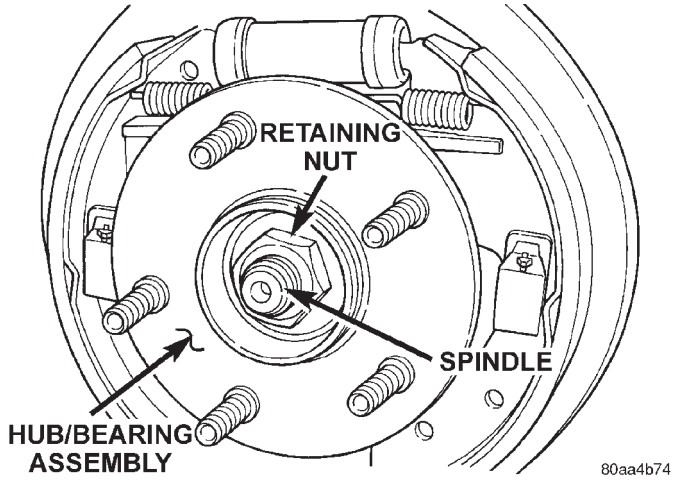


Fig. 14 Hub/ Bearing Retaining Nut

(7) If vehicle is equipped with rear drum brakes remove the 4 bolts (Fig. 15) attaching rear brake support plate to knuckle. Then remove brake support plate, brake shoes and wheel cylinder as an assembly from rear knuckle (Fig. 15). **It is not necessary to remove brake flex hose from wheel cylinder when removing support plate.** Brake support plate when removed, must be supported in same manner as caliper assembly.

(8) On vehicles equipped with rear disc brakes, remove the 4 bolts attaching disc brake adapter to rear knuckle (Fig. 16). Then remove the adapter, rotor shield, park brake shoes and park brake cable as an assembly from knuckle.

CAUTION: The knuckle to strut assembly attaching bolts are serrated and must not be turned during removal. Loosen and remove nuts while holding bolts stationary in knuckle.

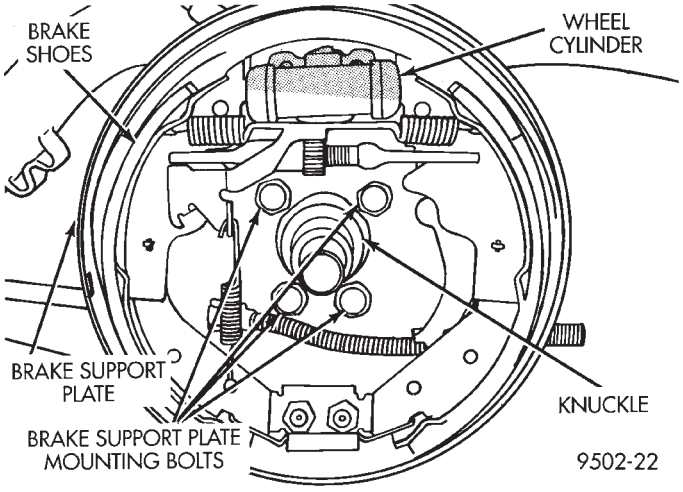


Fig. 15 Drum Brake Support Plate Mounting Bolts

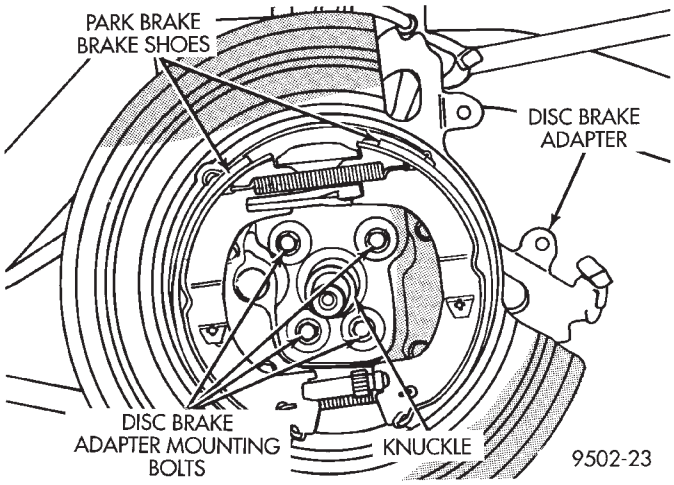


Fig. 16 Disc Brake Adapter Mounting

(9) Loosen but do not remove at this time, the 2 strut assembly to knuckle attaching bolts (Fig. 17). Then remove the lateral links to knuckle attaching bolt (Fig. 17).

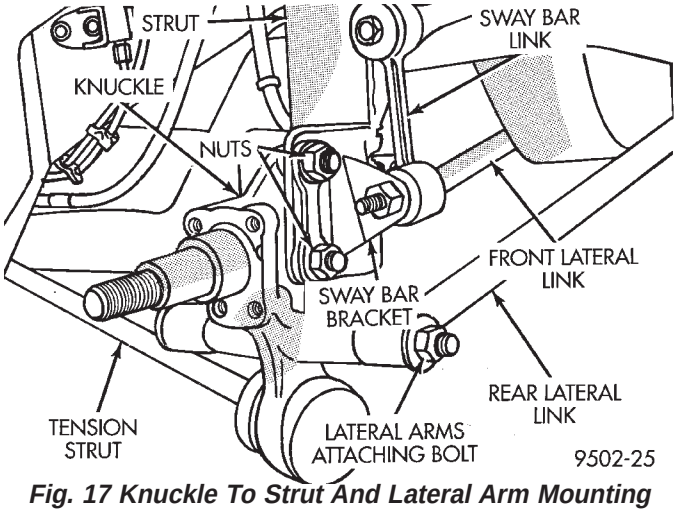


Fig. 17 Knuckle To Strut And Lateral Arm Mounting Bolts

REMOVAL AND INSTALLATION (Continued)

(10) Hold tension strut from turning by using a large adjustable wrench on flat of tension strut (Fig. 18) and remove tension strut nut. Then remove nut, tension strut retainer and rear tension strut bushing from tension strut at rear knuckle (Fig. 18).

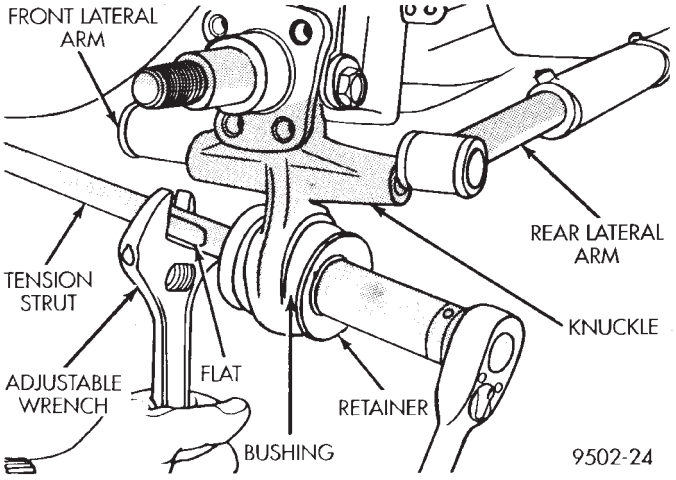


Fig. 18 Tension Strut To Rear Knuckle Attachment

(11) Remove both rear knuckle to strut assembly clevis bracket attaching bolts (Fig. 17). If vehicle is equipped with a rear sway bar also remove the sway bar link to strut mounting bracket (Fig. 17).

(12) Remove knuckle assembly from strut, by sliding knuckle straight out of clevis bracket on strut assembly. Then remove knuckle from tension strut.

INSTALL

(1) Insert tension strut, tension strut bushing and tension strut retainer into knuckle. Then install knuckle into clevis bracket on rear strut assembly. **Be sure stepped area of bushing is squarely seated into hole in knuckle.**

CAUTION: The knuckle to strut assembly attaching bolts are serrated and must not be turned during installation. Tighten and torque nuts while holding bolts stationary in knuckle.

(2) Install the 2 strut assembly clevis bracket to knuckle attaching bolts and nuts (Fig. 17). Torque the attaching bolts to 95 N·m (70 ft. lbs.).

(3) Install the lateral arms to knuckle attaching bolt, washers and nut as shown in (Fig. 17). **Do not tighten the lateral link bolt at this time. The vehicle must be at curb height when tightening the lateral link bolts.**

(4) Install tension strut bushing, tension strut retainer and nut on tension strut (Fig. 19). **When installing tension strut retainers, the retainers must be installed on tension strut, with cupped side of retainer facing away from bushing and knuckle (Fig. 19).**

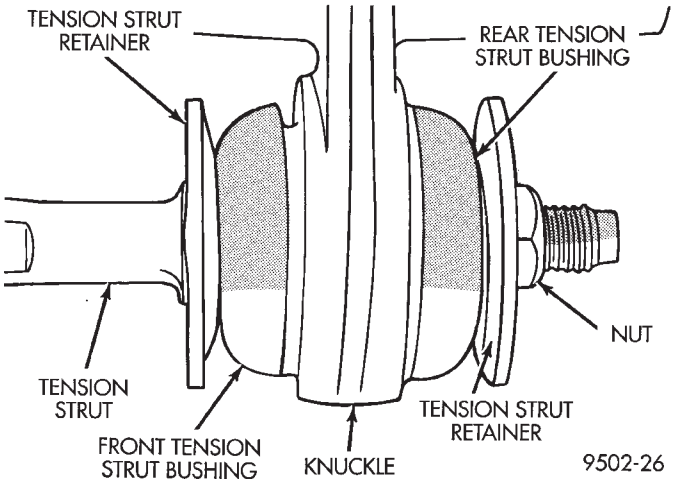


Fig. 19 Tension Strut Bushings Installed On Tension Strut

(5) Position a large adjustable wrench on flat of tension strut to keep it from turning, (Fig. 20) and then torque tension strut nut to 95 N·m (70 ft. lbs.).

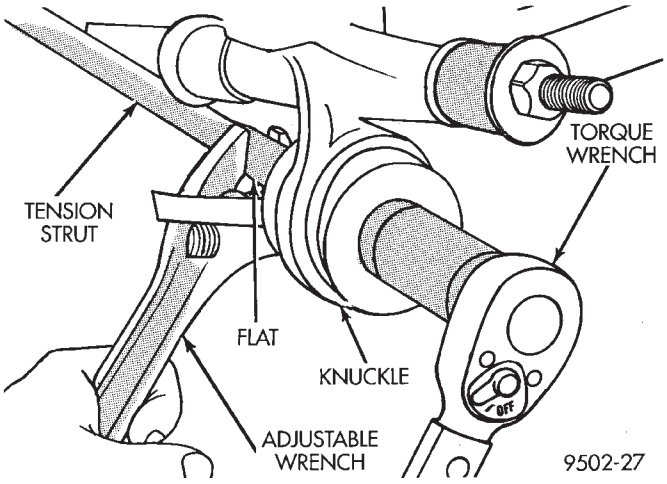


Fig. 20 Torquing Tension Strut Nut

(6) On vehicles equipped with rear drum brakes, install rear brake support plate assembly onto the knuckle (Fig. 15). Install the 4 bolts (Fig. 15) attaching rear brake support plate to rear knuckle. Torque attaching bolts to 68 N·m (50 ft. lbs.).

(7) On vehicles equipped with rear disc brakes, install the disc brake adapter on knuckle (Fig. 16) Install the 4 bolts attaching the disc brake adapter to knuckle (Fig. 16). Torque attaching bolts to 68 N·m (50 ft. lbs.).

(8) If vehicle is equipped with ABS brakes, install speed sensor head into rear brake support plate or disc brake adapter or (Fig. 13). Torque speed sensor head mounting bolt to 7 N·m (60 in. lbs.).

REMOVAL AND INSTALLATION (Continued)

CAUTION: The hub/bearing retaining nut must be tightened to but must not exceed its required torque specification. The proper torque specification of the retaining nut is critical to the life of the hub bearing.

(9) Install rear hub and bearing assembly on knuckle. Install hub and bearing assembly retaining nut (Fig. 14), and torque to 217 N·m (160 ft. lbs).

(10) If vehicle is equipped with rear disc brakes, install rear braking disc on hub. If vehicle is equipped with rear drum brakes, install the brake drum on hub.

(11) If vehicle is equipped with rear disc brakes, install rear braking disc on hub. Carefully install rear brake caliper over braking disc and install on adapter. Tighten the caliper assembly to adapter mounting bolts to 22 N·m (192 in. lbs.). Refer to Rear Disc Brakes in Group 5 Brakes in this service manual for required caliper installation procedure.

(12) Install wheel and tire assembly on vehicle. Tighten the wheel mounting stud nuts in proper sequence until all nuts are torqued to half specification. Then repeat the tightening sequence to the full specified torque of 135 N·m (100 ft. lbs.).

(13) Lower vehicle.

(14) With suspension supporting total weight of vehicle, and lateral links at correct curb height, torque both lateral link attaching bolts to 95 N·m (70 ft. lbs.).

(15) Check and reset rear wheel TOE to specifications if required. Refer to Front And Rear Toe Setting Procedure in the Wheel Alignment Check And Adjustment section in this group of the service manual for the required Toe setting procedure.

LATERAL LINKS

The rear suspension lateral links (Fig. 21) are only serviced as complete assemblies. The isolator bushings used in the lateral links are not serviced as separate components. The rear lateral link assemblies are unique, having different size bushings to accommodate the rear Toe adjustment cams. The rearward lateral links, must be installed with small bushing sleeve at knuckle and large bushing sleeve at rear crossmember. This is required to accommodate the rear Toe adjustment cam.

REMOVE

(1) Raise vehicle on jackstands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(2) Remove the rear wheel and tire assembly from the side of the vehicle requiring lateral link removal.

(3) Remove the nut, bolt and washers attaching the lateral links to the knuckle (Fig. 22).

(4) Remove nut, bolt, washer and Toe adjustment cam, attaching lateral links requiring removal, from rear crossmember (Fig. 23). Then remove lateral links from vehicle.

INSTALL

Rear lateral links when being installed, must be specifically positioned and orientated on the vehicle.

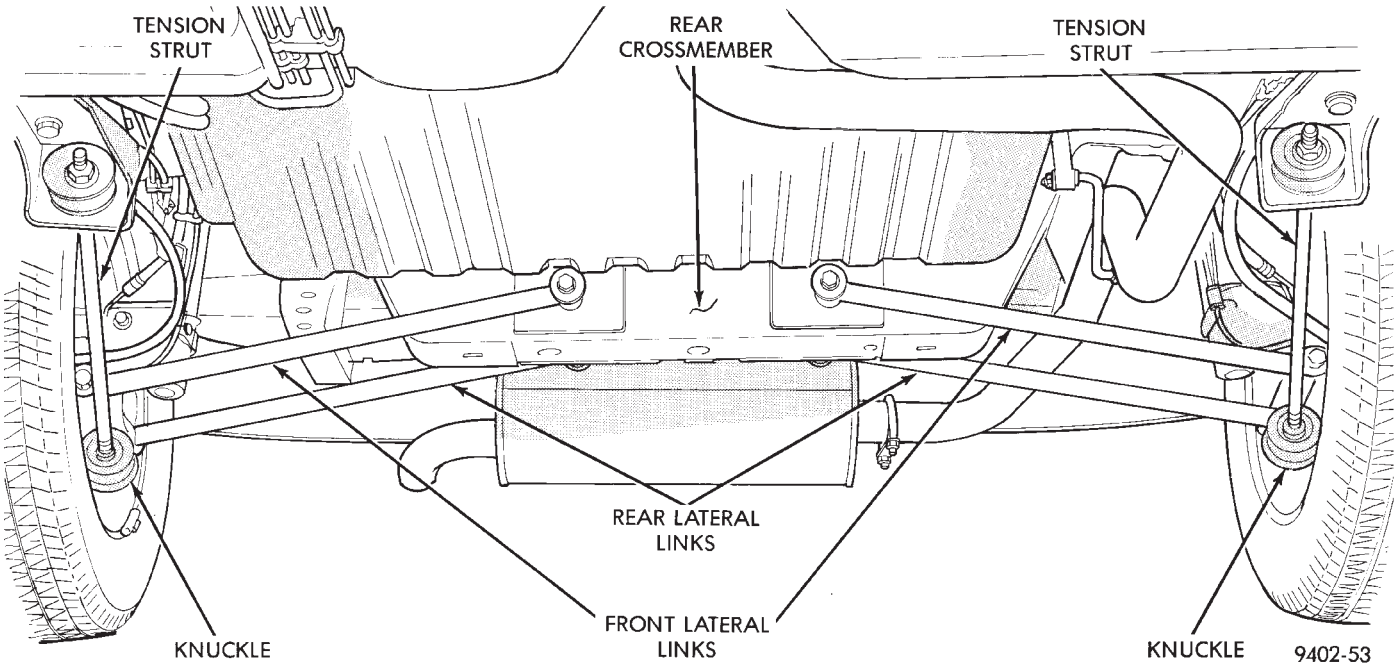


Fig. 21 Rear Suspension Lateral Links

REMOVAL AND INSTALLATION (Continued)

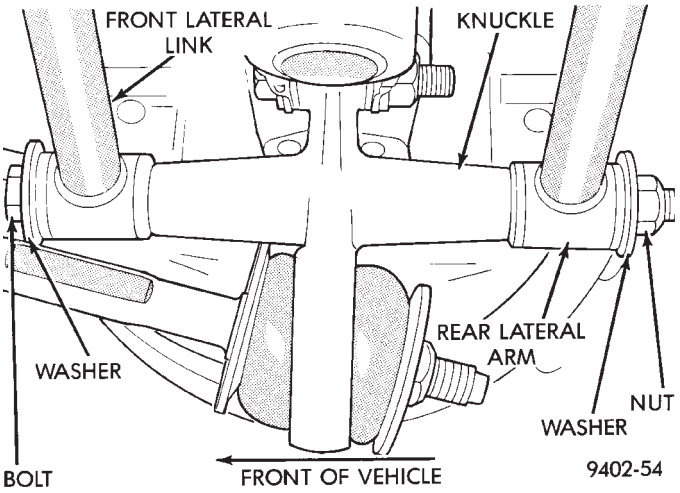


Fig. 22 Lateral Link Attachment To Knuckle

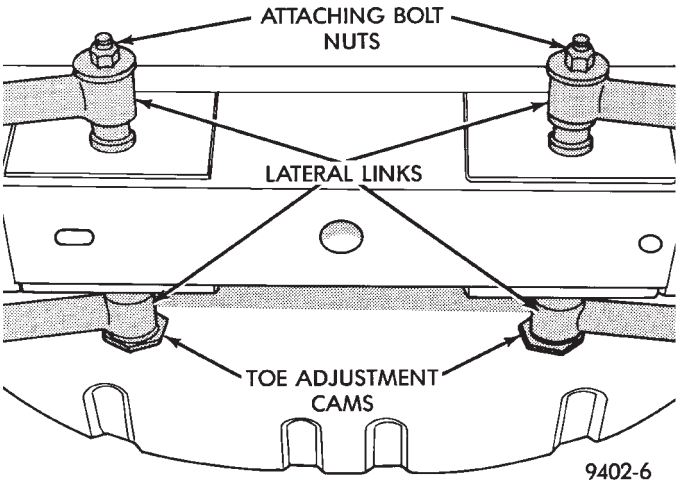


Fig. 23 Lateral Link Attachment To Crossmember

The lateral link having same size bushing sleeves, must be mounted to the crossmember and knuckle toward front of vehicle. The lateral link with different size bushing sleeves, must be mounted to the crossmember and knuckle toward rear of vehicle. The lateral link with small and large bushing sleeves, must be installed with small bushing sleeve at knuckle and large bushing sleeve at rear crossmember. This is required to accommodate the rear Toe adjustment cam at rear crossmember.

The lateral link mounting bolts are different lengths, and need to be installed in specific locations and direction on vehicle. **The lateral link mounting bolt at knuckle MUST be installed, with head of bolt facing front of vehicle. The lateral link mounting bolt at crossmember MUST be installed, with head of bolt facing rear of vehicle. The long attaching bolt must be used at rear crossmember and short bolt used at knuckle.**

(1) Install washer on short lateral link attaching bolt. Then install short lateral link attaching bolt, into lateral link having the same size bushing sleeves. Then install lateral link, bolt and washer onto knuckle as an assembly, with head of bolt facing to front of vehicle (Fig. 22).

(2) Install lateral link with small and large bushing sleeve, on lateral link attaching bolt in rear knuckle (Fig. 22). **Small bushing sleeve must be installed on bolt in rear knuckle with large bushing sleeve at crossmember of vehicle.**

(3) Install washer and nut onto lateral link attaching bolt at rear knuckle (Fig. 22). **Do not tighten the lateral link to rear knuckle attaching bolt at this time.**

(4) Install Toe adjustment cam on long lateral link attaching bolt. Install long lateral link attaching bolt and adjustment cam, into lateral link toward rear of vehicle, having the large bushing sleeve. Then pass lateral link attaching bolt into rear crossmember (Fig. 24). **Head of long lateral link to crossmember attaching bolt must face to rear of vehicle when installed.**

(5) Position forward rear lateral link against rear crossmember (Fig. 24). Then pass the lateral link attaching bolt through front lateral link bushing sleeve.

(6) Install washer and nut onto lateral link attaching bolt at rear crossmember (Fig. 24). **Do not tighten the lateral link to rear crossmember attaching bolt at this time.**

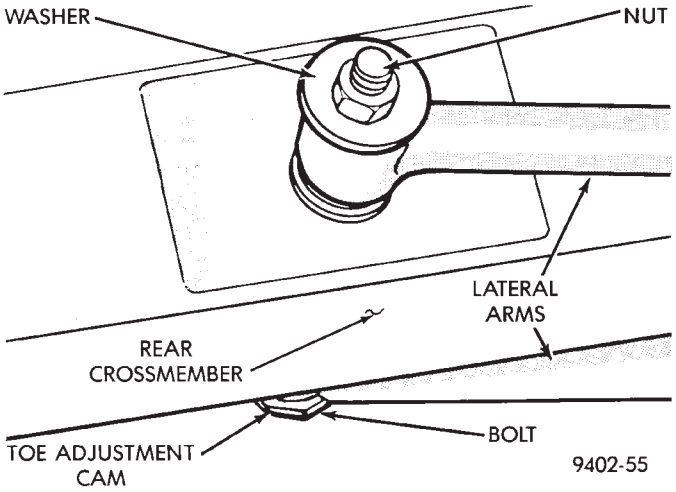


Fig. 24 Lateral Link Attachment To Crossmember

(7) Install wheel and tire assembly on vehicle. Tighten the wheel mounting stud nuts in proper sequence until all nuts are torqued to half specification. Then repeat the tightening sequence to the full specified torque of 135 N·m (100 ft. lbs.).

(8) Lower vehicle to the ground.

REMOVAL AND INSTALLATION (Continued)

(9) With suspension supporting total weight of vehicle, and lateral links at correct curb height, torque both lateral link attaching bolts to 95 N·m (70 ft. lbs.).

(10) Check and reset rear wheel TOE to specifications if required. Refer to Front And Rear Toe Setting Procedure in the Wheel Alignment Check And Adjustment section in this group of the service manual for the required Toe setting procedure.

DISASSEMBLY AND ASSEMBLY

STRUT ASSEMBLY

DISASSEMBLY

The rear strut unit is not serviced and must be replaced as an assembly if found to be defective. The strut is available with 2 calibrations, be sure strut is replaced with an assembly of the same calibration.

The components of the strut assembly listed below are replaceable if found to be defective.

- Coil spring (Coil springs come in a standard rate of 120 lb./in. be sure spring is replaced with a spring of the same rate.)
- Dust shield
- Mount assembly
- Jounce Bumper
- Lower Spring Isolator
- Shaft Nut

(1) Remove strut assembly requiring service from the vehicle. Refer to Strut Assembly Removal in Servicing Rear Struts, in this section of the service manual.

(2) Position strut assembly in a vise (Fig. 25). Using paint or equivalent, mark the strut unit, lower spring isolator, spring and upper strut mount for indexing of the parts at assembly.

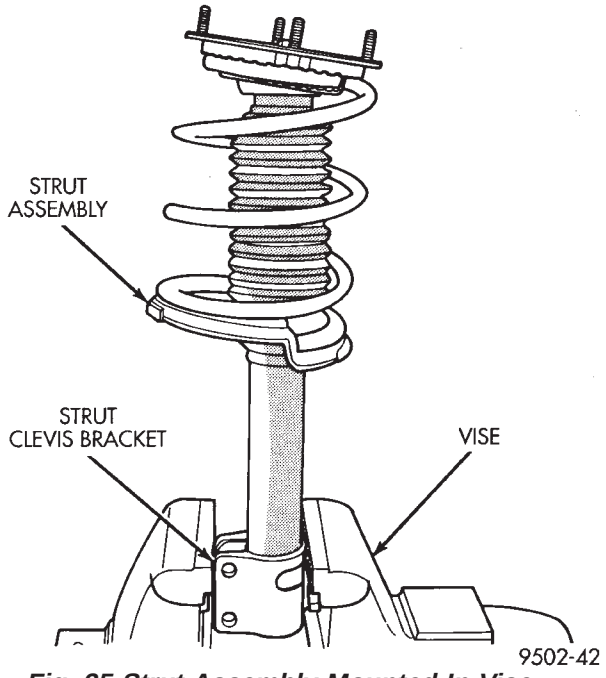


Fig. 25 Strut Assembly Mounted In Vise

(3) Position Spring Compressors, Special Tool C-4838 on the strut assembly spring (Fig. 26). Compress coil spring until all load is removed from upper strut mount assembly.

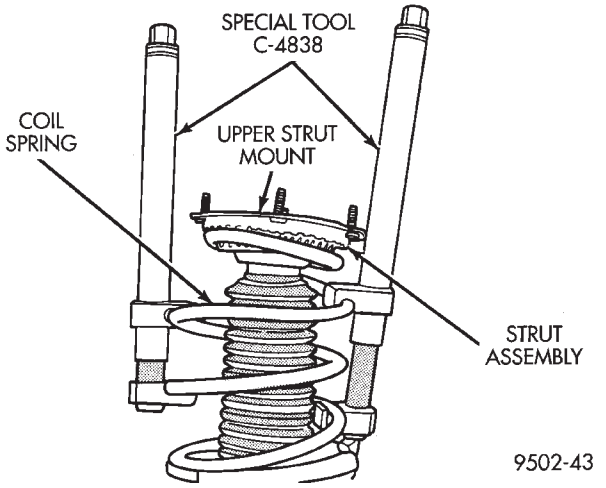


Fig. 26 Compressing Strut Assembly Coil Spring

DISASSEMBLY AND ASSEMBLY (Continued)

(4) Install Strut Rod Socket, Special Tool, L-4558A or L-4558 on strut shaft nut (Fig. 27). Inserted a 10 mm socket through special tool and onto end of strut shaft (Fig. 27) to keep strut shaft from turning. Remove strut shaft nut from strut shaft.

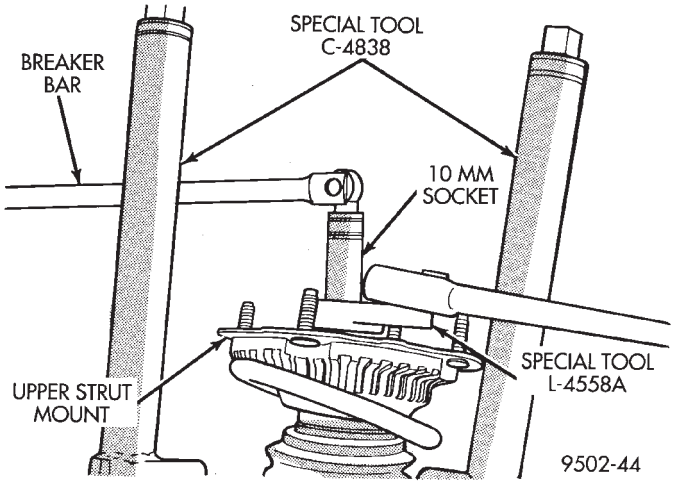


Fig. 27 Removing/Installing Strut Shaft Nut

(5) Remove washer (Fig. 28) between strut shaft nut and upper strut mount and isolator.

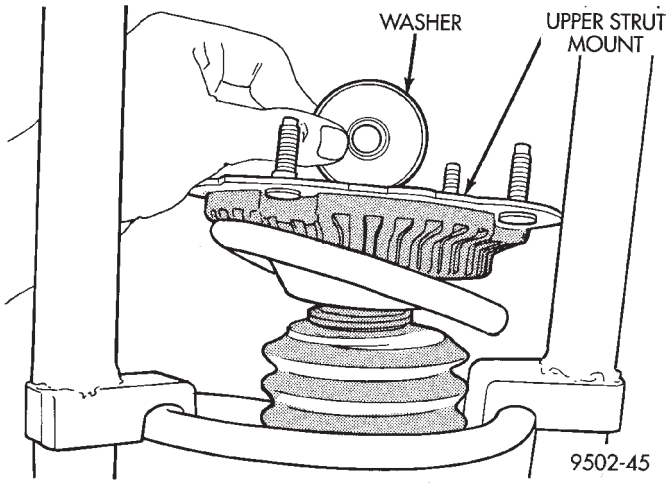


Fig. 28 Strut Mount Washer

(6) Remove upper strut mount assembly from strut shaft and spring (Fig. 29).

(7) Remove the washer from strut shaft, that is between the strut upper mount assembly and dust shield (Fig. 30).

(8) Remove the coil spring and spring compressor as an assembly from the strut (Fig. 31).

(9) Remove the dust shield from the strut assembly (Fig. 32).

(10) Remove the jounce bumper (Fig. 33) from the shaft of the strut assembly.

(11) Remove the coil spring lower isolator from the strut assembly spring seat (Fig. 34).

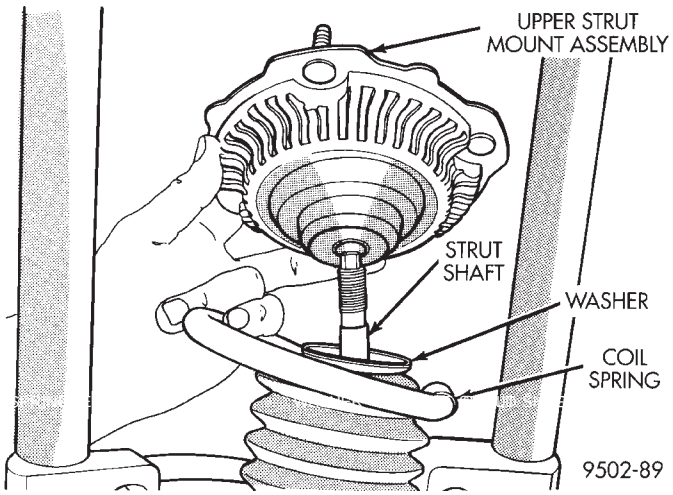


Fig. 29 Upper Strut Mount

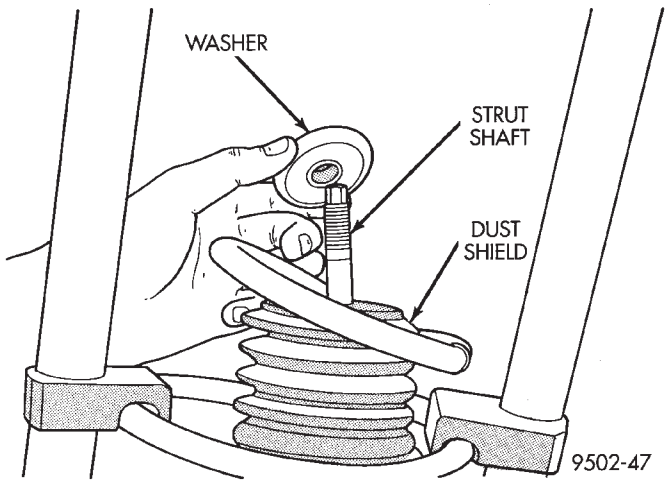


Fig. 30 Washer

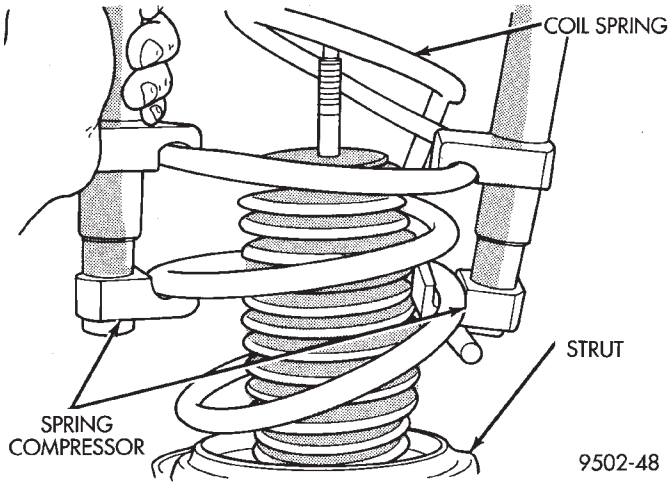


Fig. 31 Coil Spring And Compressor

(12) Inspect all disassembled components for signs of abnormal wear or failure replacing any components as required. Inspect strut unit for signs of abnormal oil leakage and for loss of gas charge. To

DISASSEMBLY AND ASSEMBLY (Continued)

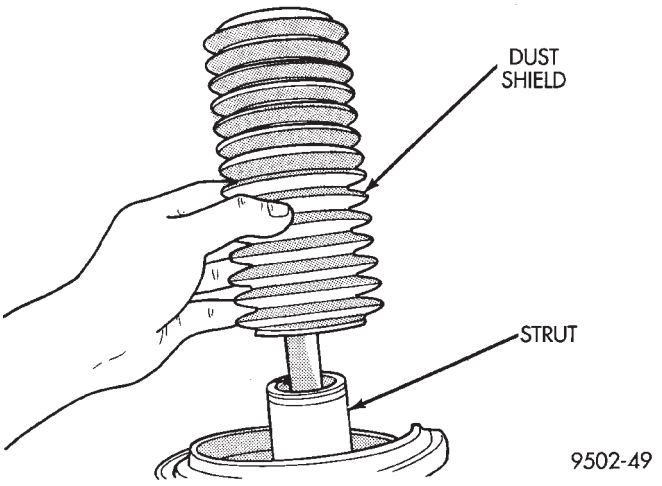


Fig. 32 Dust Shield

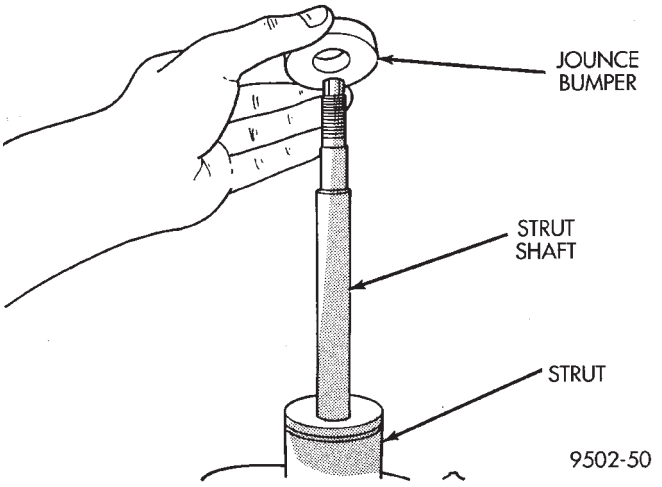


Fig. 33 Jounce Bumper

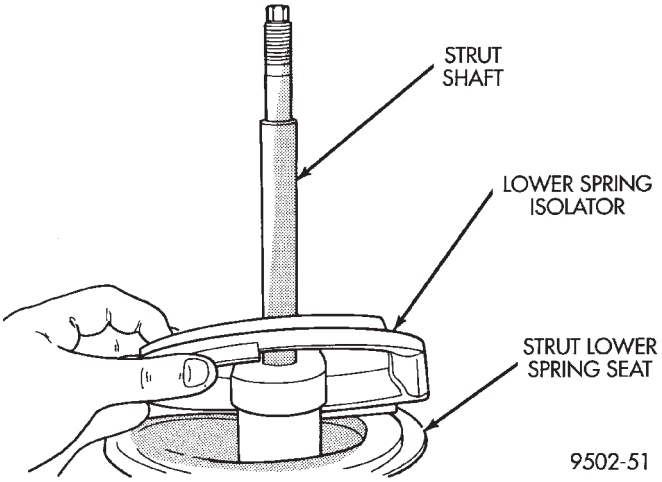


Fig. 34 Coil Spring Lower Isolator

check for loss of gas charge in strut unit. Push strut shaft into body of strut and release, strut shaft should return to its fully extended position. If strut shaft does not return to its fully extended position replace strut unit.

ASSEMBLY

(1) Install the original or a new isolator on lower spring seat of strut (Fig. 34).

(2) Install jounce bumper on strut shaft (Fig. 33).

(3) Install the dust shield on the strut assembly (Fig. 32).

(4) Lower the coil spring onto the strut unit (Fig. 31). Position end of coil spring against edge of spring isolator on lower spring seat of strut assembly.

(5) Install washer on strut shaft with raised edge of washer facing upward (Fig. 30).

(6) Install the strut assembly upper mount onto the strut shaft (Fig. 29).

(7) Install the washer on the strut assembly upper mount (Fig. 28). Washer must be installed with the raised edge of the washer facing down.

(8) Install the upper strut mount to strut shaft retaining nut.

(9) Using Strut Rod Socket, Special Tool, L-4558A and a 10 mm socket (Fig. 27) to keep strut shaft from turning, torque the strut shaft nut to 61 N·m (45 ft. lbs.).

(10) Equally loosen the Spring Compressors, Special Tool C-4838 until spring is seated on upper strut mount and all tension is relieved from the spring compressors.

(11) Install the strut assembly back into the vehicle. Refer to Strut Assembly Removal in Servicing Rear Struts in this section of the service manual.

(12) Check and reset rear wheel TOE to specifications if required.

STABILIZER BAR BUSHINGS

(1) If stabilizer bar to frame rail bushings require replacement at time of inspection, install new bushings before installing stabilizer bar. Bushings are replaced by opening slit on bushings and peeling them off stabilizer bar. Install new bushings on stabilizer bar, by spreading bushing at slit and forcing them on stabilizer bar. **Bushings must be installed on stabilizer bar with slit in bushing facing rear of vehicle when stabilizer bar is installed (Fig. 35).**

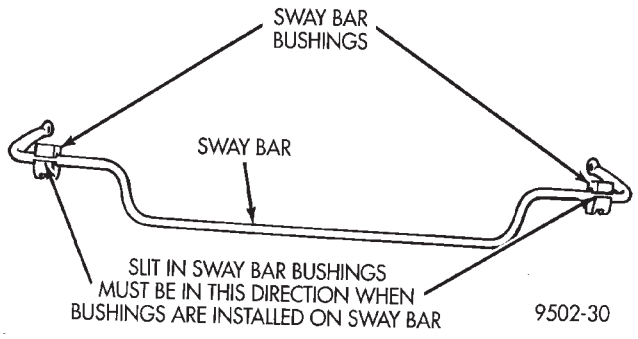


Fig. 35 Correct Stabilizer Bushing Installation

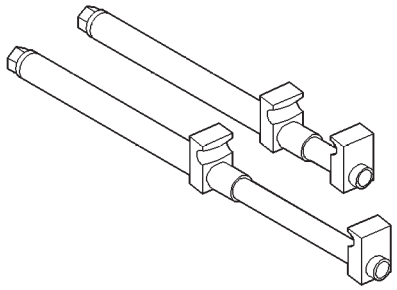
SPECIFICATIONS

REAR SUSPENSION FASTENER TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
STRUT ASSEMBLY:	
To Body Attaching Nuts	34 N·m (300 in. lbs.)
Clevis Bracket To Knuckle Nut/Bolt	95 N·m (70 ft. lbs.)
Strut Assembly Shaft Nut	75 N·m (55 ft. lbs.)
BRAKE SUPPORT PLATE:	
To Knuckle Bolts	68 N·m (50 ft. lbs.)
STABILIZER BAR:	
Bushing Retainer To Frame Bolt	34 N·m (300 in. lbs.)
To Strut Attaching Link Nut	34 N·m (300 in. lbs.)
TENSION STRUT:	
Shaft Nut	95 N·m (70 ft. lbs.)
Bracket To Body Attaching Bolts	95 N·m (70 ft. lbs.)
LATERAL LINK:	
Attaching Nut	95 N·m (70 ft. lbs.)
DISC BRAKE CALIPER:	
To Adapter Mounting Bolt	22 N·m (16 ft. lbs.)
Brake Hose To Caliper Mounting Bolt	45 N·m (35 ft. lbs.)
Adapter To Knuckle Mounting Bolt	68 N·m (50 ft. lbs.)
BRAKE HOSE:	
Bracket Mounting Bolt	23 N·m (17 ft. lbs.)
HUB AND BEARING:	
To Knuckle Retaining Nut	216 N·m (160 ft. lbs.)
Wheel Stud Lug Nuts (All Wheel Types)	109-150 N·m (80-110 ft. lbs.)

SPECIAL TOOLS

REAR SUSPENSION



Compressor Strut Coil Spring C-4838